elektronski potpis projektanta	elektronski potpis revidenta

INVESTITOR[1]	Opština Žabljak
OBJEKAT[2]	Objekat za komunalno i vodovod Žabljak
LOKACIJA[3]	kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opstina Zabljak
DIO TEHNIČKE DOKUMENTACIJE[4]	GLAVNI PROJEKAT TERMOTEHNIČKIH INSTALACIJA
PROJEKTANT[5]	D.O.O. " ANGELINI" Podgorica
ODGOVORNO LICE[6]	Milica Šušić
ODGOVORNI INŽENJER[7]	Miloš Dragaš dipl. Ing. maš
SARADNICI NA PROJEKTU[8]	

1. Naziv/ime investitora;
2. Naziv projektovanog objekta;
3. Mjesto građenja, planski dokument, urbanistička parcela, katastarska parcela;
4. Arhitektonski projekat, građevinski projekat, elektrotehnički projekat odnosno mašinski projekat (ako je u pitanju naslovna strana dijela tehničke dokumentacije);
5. Naziv privrednog društva, pravnog lica odnosno preduzetnika koji je izradio dio tehničke dokumentacije;
6. Ime odgovornog lica u privrednom društvu, pravnom licu odnosno ime i prezime preduzetnika;
7. Ime i prezime glavnog inženjera;
8. Ime i prezime saradnika na izradi dijela tehničke dokumentacije.

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TEHNIČKI OPIS

1.1. TEHNIČKI OPIS

OPTI PODACI O OBJEKTU

Objekat:	Objekat za komunalno i vodovod Žabljak
Lokacija:	kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opstina Zabljak
Investitor:	Opština Žabljak
Projekat:	GLAVNI PROJEKAT TERMOTEHNIČKIH INSTALACIJA

Projektni parametrij

- Klimatska zona: III zona
- Ljetna spoljnja temperatura: 30°C
- Zimska spoljnja temperatura: -20°C
- Zimska unutrašnja temperatura: 21°C

Opšti koncept termotehničkih instalacija

Sagledavanje arhitektonskog rešenja za predmetni objekat, prilikom projektovanja i kao i odabira instalacija vođeno je računa da se izabere najbolje rešenje sa stanovišta investiono-eksplatacionih uslova i rešenje koje će obezbijediti visok nivo komfora kakav ovaj objekat i zaslužuje.
Prostorije stalog boravka su tretirane tako da toplotu odaju tri sledeća sistema:
Sistem radijatorskog grijanja
Sistem podnog grijanja
Sistem grijanja kaloriferima
Svi sistemi se napajaju sa kotla na pelet uz rezervu el. Kotla. Cijeli objekat se grije uz izuzetak WC-a u stepenišnom prostoru. Tavanski prostor se ne grije, ali je kapacitet kotla predviđen da zadovolji eventualne buduće potrebe tavana.

Hidraulički princip rada instalacije termotehnike

Po projektnom zadatku, predviđeno je da se objekta ima glavni i rezervni izvor toplote.

Kao glavni iizvor toplote koristi se kotao na pelet, toplotnog kapaciteta 200Kw (po zahtjevu investitora usvojen je kotao sa rezervom kako bi se eventualno tavan u bućnosti mogao koristiti kao korisni prostor). Kako invesitor ima zahtjev da silos bude značajno većih gabarita od standarnih, tako je predviđen silos zapremine 5m3. Silos i pristupno stepenište je potrebno dopremiti u djelovima (rastavljivo), i po tom pricipu ga montirati u tehničku prostoriju. Dimenzije su date kao detalj u grafičkoj dokumentaciji, u sklopu priloga 3.1.

Rezervni izvor toplote je elektro kotao kapaciteta 140kW, tip: TK-prefessional 140, proizvođač: Mikoterm ili ekvivalent.

Predviđeno je da kotao na pelet ima svoj hidraulički krug. Cirkulaciona pumpa kotla je "vođena" senzorom temperature na beferu (skretnici), koja diktira brzinu rada cirkulacione pumpe. Kotlovska cirkulaciona pumpa (u hidrauličkoj šemi označena kao CP-KO) je tipa: TOP-S 50/7 DM PN6/10, proizvođača: WILO ili ekvivalent.
Predviđen je trokraki miješni ventil sa trotačkastim motornim pogonom koji ima funkciju "zaštite hladnog kraja", tip ventila je CV306 GG dn50 sa motornim pogonom TA-MC 100/230, proizvođač: Tour and Anderson ili

ekvivalent. Kotlvska cirkulaciona pumpa ima mogućnost podešavanja rada na tri brzine. Rezrevni izbor toplote (elelktro kotao) se veže na hidrauličku mrežu kotla nakon trokrakog ventila. Bafer toplote se isporučuje izolovan, predviđen je da radi na pritisku sistema do 3bar. Gabariti bafera su:

- Prečnik bez izolacije: fi 790,
- Prečink sa izolaciojom fi 990, visina
- Bez izolacije: 2040mm,
- Visina sa izolacijom: 2090mm,
- Težina : 133kg

Slika 1: Bafer toplote

Voda se u akumulatoru toplote priprema na 75C. Tako akumulirana toplota se dalje po zahtjevu korisnika šalje na sisteme podnog grijanja, sistema radijatora ili kalorifera. Tip bafera je PM1000, proizvođača: SUNSYSTEM ili ekvivalent

Trokraki ventili obezbjeđuju potisnu tempraturu 45 stepeni na niskotemperaturnim sisitemima. Svaki od sitema ima lokalnu kontrolu.

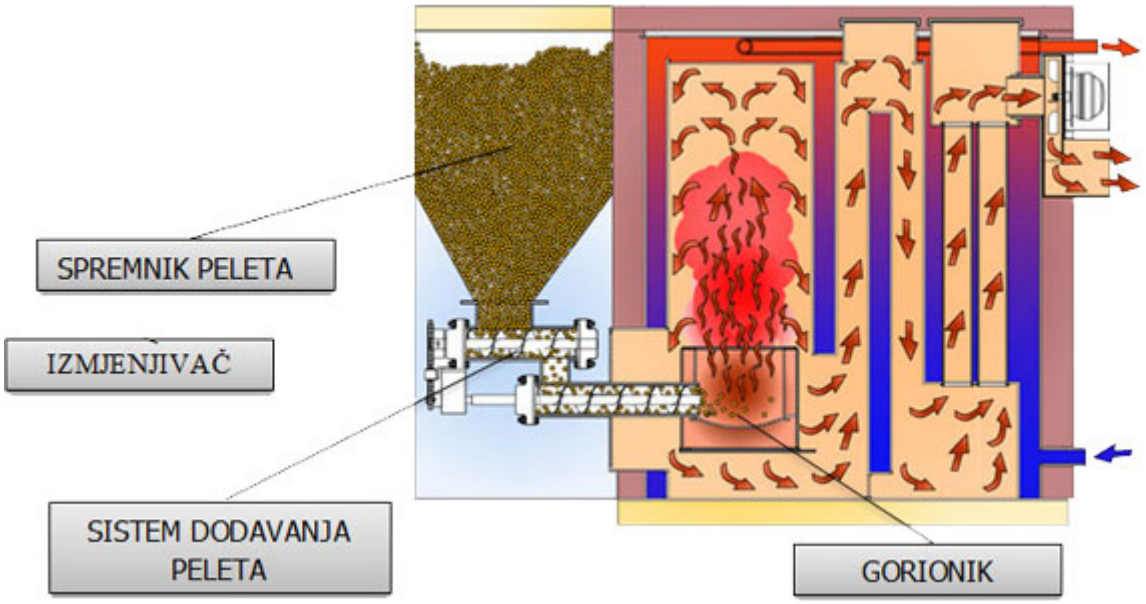
Opis Kotla

EKOLINE kotlovi rade po principu sagorjevanja uz pomoć sekundarnog dotoka vazduha čime se ostvaruje značajna ušteda energenata.
Proces sagorevanja u kotlu, počinje ubacivanjem određene količine peleta u gorionik, nagon čega se pali grijač koji zagrijava pelet. Zagrijavanjem peleta dolazi do stvaranja bio gasa u gorioniku, koji se zapali usled toplote koju stvara grijač. Nakon prvog paljenja grijač se gasi, a dalje sagorevanje peleta se postiže toplotom dobijenom sagorevenjem bio gasa iz peleta i dodavanjem vazduha pomoću turbine. Dodavanje peleta i vazduha je zavisno od količine toplote koju želimo da proizvedemo.

Slika 1, kotao Kovan Ecoline

Konstrukcija EKOLINE kotla, u kome se vrši prenos toplote na radni medij (vodu) je konstruisana na taj način da se dobije visok stepen iskorištenja u sagorevanju i visok stepen iskorištenja toplote koja se proizvede u kotlu.
Visok stepen iskorištenja u sagorevanju, koji iznosi 96.4 %, dobija se na sledeći način:
Gorionik kotla je konstruisan na taj način da se mogu kontrolisati svi paremetre koji utiču na sagorevanje pelleta.
Pri izradi gorionika korišteni su vatrootporni čelici koji dobro podnose visoke temperature, a u samom gorioniku pri sagorevanju se razvija teperatura i do 1200 °C.
U konstrukciji kotla, pored komora za razmenu toplote, postoji dodatna komora u kojoj se vrši sagorevanje peleta gde se postiže efekat „povratnog plamena“. Ovaj efekat „povratnog plamena“ je vraćanje nesagorjelih produkata sagorevanja nazad u gorionik, gde se vrši dodatno sagorevanje i dobijanje dodatne toplotne energije. Efekat povratnog plamena je moguće dobiti samo u okruženju u kojem se kontroliše ulaz i izlaz vazduha iz sistema, što je slučaj kod EKOLINE kotlova.
Cijelim procesom sagorevanja, i protokom produkata sagorevanja kroz kotao upravlja elektronika, koja reguliše sve parametre koji utiču na sagorevanje (goličina goriva, količina vazduha u gorioniku, količinu vazduha u kotlu...)
Imaju četiri izmjenjivačke komore čime se ostvaruje bolji prenos toplote i manji gubici. Visok stepen iskorištenja toplote dobijen u gorioniku se stvara na sledeći način:
U konstrukciji kotla su 4 komore u kojima se vrši razmena toplote izmedu produkata sagorevanja i vode u sistemu.
Kontroliše se brzina prolaska produkata sagorevanja kroz komore. Nastojanja su da se produkti sagorevanja što duže zadrže u kotlu, jer se na taj nači dobija na vremenu da temperatura što efikasnije prenese u sistem.
Kotlovi su napravljeni od čelika predviđeni za rad na povišenim i visokim temperaturama. Rezultat toga je dugovečnost kotlova.
Elektronika koja upravlja kotlom, ima širok spektar mogućnosti od podešavanja parameratara koji utiču na sagorevanje, regulacije pritiska u kotlu, regulacije temperature vode u sistemu, mogućnost nadogradnje dodatne opreme.
Temperatura vode se može regulisati na dva načina:

Direktno, izborom radne temperature, tj temperature vode koju kotao treba da postigne i održava tokom rada. Mjerenjem spoljne temperature pomoću senzora, koja se zatim poredi sa zadanom/traženom tempraturom. Kotao će raditi sve dok ne postigne zadanu temperaturu na termostatu. Kada se postigne zadana temperatura kotao se gasi. Posle kotao nastavlja automaski da se pali i gasi po potrebi, radi održavanja zadane temperature.



Slika 2, unutrašnjost kotla Kovan Ekoline

Pojava kondenza je čest slučaj kod kotlova na čvrsta goriva, iz razloga jer dolazi do naglog mešanja tople i hladne vode u kotlu. Kod EKOLINE kotlova konstrukcija kotla je napravljena na taj način da se to izbegne. Povrat vode, tačka B, je mesto u kotlu koje ima najmanju tempeteraturu. Povrat podhlađene vode iz sistema ja na mesto u kotlu koje ima najmanju temperaturu, te ja na taj način smanjuje razlika temperatura, a uslov za pojavu kondenza je velika razlika povrata i temperature u kotlu.
Voda koje izlazi iz kotla se uzima sa mjesta A, tj na mjestu gdje je najveća temperatura vode.
Kod klasičnih kotlova, voda iz kotla se uzima direktno, tj na mestu C. To povećava mogućnost pojave kondenza jer dolazi do povećanog mješanja vode u kotlu a samim tim i povećanja temperature na mestu B, što nije dobro jer povećava se mogućnost pojave kondenza. Ali kada se voda iz kotla uzima na mestu A, gde je najveća temperatura vode, tada se smanjuje mešanje vode na mestu B,a samim tim se smanjuje mogućnost povećanje temperature vode u tački B, što smanjuje mogućnost pojave kondenza i omogućava bolje pred-grejanje vode u kotlu.
Gorionik je konstruisan kao kompaktan modul koji je montažno lako odvojiv sa ulogom precizno kontrolisane dostave peleta. Sastoji se od dva pužna vijka spregnuta lančanim prenosom, a pokretana elektromotorom redukovanog broja obrtaja pomoću reduktora. Ovim konstruktivnim rješenjem osim kontrolisane dopreme peleta obezbijeđena je zaštita od povratnog upada peleta u spremniku. Donji puž vrti se brže od puža ispod spremnika, tako da dostavni put uvijek isprazni od peleta. Kao upaljač koristi se električni grijač koji se automatizovano pali i gasi. Grijač je konstruktivno smješten u prolazu vazdušne struje turbine. Kontrolisana doprema vazduha gorenja vrši se vazdušnom turbinom direktnim regulisanjem broja obrtaja turbine.
Upravljanje kotlom je automatizovano putem elektronskog modula opremljenog displejom. Elektronski modul je višefunkcijska ulazna upravljačka jedinica. Smješten je na frontalnoj strani kotla. Putem ovog modula ostvaruje se regulacija i upravljanje kotlom. Servisne funkcije na koje ovim putem direktno utičemo su: temperatura vode, doziranje paljenja, doziranje gorenja, doziranje gašenja, vazduh paljenja, vazduh gorenja, vazduh gašenja, uključenje vodene pumpe. U cilju bezbijednosti i povećanja sigurnosti u upravljačkom strujnom krugu za elektronsku kontrolu i regulaciju ugrađena je sonda koja kontinuirano mjeri temperaturu vode. Sigurnosna sonda u slučaju prekoračenja ograničene temperature (>100 °C) dejstvuje automatski i isključuje električno napajanje kotla i time spriječava ponovno paljenje sve dok se uzrok ne otkloni.
Kako bi se eliminisali uticaji kvaliteta dimnjaka na rad kotla, na izlazu iz kotla kao njegov integralni dio, instaliran je ventilator. Elektronskim modulom kontroliše se njegov broj obrtaja tako da uvijek podpritisak koji proizvodi

iznosi 35-40 Pa, a koji je potreban da se savladaju otpori u dimovodnim kanalima i da se ostvari potreban podpritisak od 20 Pa u gorioniku. Pri startovanju kotla prvo se uključuje ventilator (na taj način izvuku se u dimnjak svi eventualno zaostali gasovi), nakon određenog vremena upali se kotao. Nakon gašenja kotla ventilator ostaje u radu još 2 minute da izvuče sve
zaostale gasove nastale gorenjem. Rad ventilatora je bešuman. Čišćenje ventilatora nije potrebno jer u njemu nema nakupljanja nečistoća u vidu gareži, pepela i kondenza.

Radijatorski grijanje

Za obezbjeđenje komfornih uslova za boravak ljudi, predviđeno je grijanje objekta aluminijskim člankastim radijatorima.
Za sve prostorije predviđeni su aluminijski člankasti radijatori.

Radijatori su tipa "Orion 500/95". Smješteni su na spoljnim zidovima, u skladu sa dogovorenim pozicijama sa odgovornim inženjerom arhitekture. Fiksiraju se pomoću konzola i držača, sa usponom prema vertikalama zbog odzračivanja.. Predviđeni aluminijski člankasti radijatori su priključne visine 500 mm.

Za radijatore odnosno cijevnim registrima u kupatilima predviđeni su radijatorski termostatski ugaoni ventili, tipa „ RA-N-A", i radijatorski ugaoni navijci „RVL-S-A".

Za sve radijatore predviđena je termostatska glava. Tip termostatske glave je „RA". Termostatska glava je sa senzorom sa gasnim punjenjem za javne objekte (dodatno oklopljena), za regulaciju temperature prostora, zaštitom od smrzavanja i mogućnošću ograničavanja i fiksiranja postavne vrijednosti temperature. Prema EN 215 vrijeme zatvaranja 12 minuta.

Za nesmetanu regulaciju protoka odabrana je frekventno regulisana cirkulaciona, i bypass ventil koji omogućava prestrujavenje vode uslijed malog opterećenja.

Magistranle cijevi se upajaju u razdjlnike/sabirnike odakle se Pex-al-Pex cijevima razvodedo radijatora.

Sistem podnog grijanja

U skladu sa projektnim zadatkom, toplovodno podno grijanje je projektovano za hladne površine u kojima se često boravi. Za ovaj projekat razvod cijevne mreže podnog grijanja je urađen Tacker sistem polaganja cijevi. Kao najkomforniji sistem izabrane su cijevi tipa Rautherm S 16x1.5mm proizvedenih od umreženog polietilena PE-X, koje se postavljaju betonskom estrihu poda. Tacker ploče su debljine 30mm i postavlja se na betonsku ploču, mora se obezbijediti sigurno pričvršćene ploče lijepljenjem preko cijele površine, na ćoškovima ploče se postavljaju dilatacione fuge i ivična izolaciona traka. Nakon postavljanja cijevi na ploču se izliva sloj estriha debljine 40-60mm. Ploča je vodootporna i sačinjena je od ekspandiranog polistirena. Cijevi se pričvrščuću na izolaciju tacker iglicama.

Predviđeni režim toplovodnog podnog grijanja je 40/34 °C. Razvod krugova podnog grijanja je cijevnom zmijom razmakom sa razmakom 150mm. Prilikom dimenzionisanja krugova, poštovao se standard EN1264-2 po kojem temperatura poda ne smije preći 29 °C u svim prostorijama dužeg boravka, odnosno 33°C u prostorijama povremenog boravka. Važno je napomenuti da se cijevi na izlazu iz ormarića moraju izolovati kako ne bi došlo do pojave „hot spot" zone.

Čelične magistralne cijevi se dovode do ormarića podnog grijanja. Cijevi imaju izolaciju debljine 13mm. Ormarić je montiran u zidu, i on se može odabrati prema RAL paleti. Debljina ormarića je 75mm, a širina zavisno od veličine razdjelnika/sabirnika 750 mm. Odabrani tip je REHAU UP 75.

Za razdjelnik/sabirnik tipa HKV-D, proizvođača REHAU odabrani su termalni aktuatori UNI (230V) koji se zavisno od ulaznog signala automatski otvaraju i zatvaraju. Hidraulička regulacija se vrši termostatskom pumpnom grupom.

Regulaciju temperature u grejnim prostorijama vrše zidni termostati tipa Nea HT, proizvođača: Rehau. Ugrađeni regulatori su hibridno povezani. Hibridna tehnologija centralne regulacije jedinice dozvoljava povezivanje varijante sa bazom bez dodatnih komponenti, pri čemu se mogu kombinovati žičani i bežični rad kontrolera. Opremljen je matrix displejem.

Centralna kontrola razdjelnika i sabirnika se vrši preko baze NEA H. Baza može kontrolisati maksimalno do 12 aktuatora 230V.

Podnim senzorom temperature koji se isporučuje uz kontroler, omogućava se limitiranje temperature podne površine po zadatim kriterijumima (grijanje: zone stalnog boravka tp= 29°C, zone povremenog boravka tp=33°C).

Grijanje zone garaže

U objektu su dvije nezavisne prostorije koje služe kao garaže. Zone se griju preko toplovodnih kalorifera tip"Atlas 23E46".

Kaloriferi su dimenzionisani pri kapacitetu 45/35. Napajaju se sa sistema kotla na pelet. Regulacija temperature se vrši preko trokrakog ventila sa motornim pogonom, tip ventila i pogona: CV 306 GG DN40 + TA-MC 100/230. Cijevni razvod je potrebno izolovati izolacijom od 19mm.

Ventilacija sanitarnih prostorije

Kako sanitarne prostoriju nemaju prirodnu ventilaciju, predviđeno je da se ventiliraju mehanički, uz pomoć kanalskog ventilatora. Distributivni element je aeroventil tipa: AOV, proizvođača ENPRO ili ekvivalent. Ventilator je poziciniranan u hodniku objekta. Izlaz na fasadu je preko spoljne protivkišne žaluzine koja ima zaštitu od ptica, tip: WLA-11-N, proizvođač: Lindab ili ekvivalent. Na sistem sanitarne ventilacije na dodata je i garderoba kao poslednja prostorija u nizu. Ventilator je tipa: TD 800/200, proizvoča: S&P. Dokumentacija je data u sklopu numeričke dokumentacije. Predviđene su još dva sistema sanitarne ventilacije u objektu, jedan na prizemlju, drugi u suterenu. Za oba sistema su predviđeni kanalski ventilatori tipa: TD 250/100, proizvođača: S&P ili ekvivalent. Distributivni elementi aeroventili tipa: AOV, proizvođača: ENPRO ili ekvivalnet. Obzirom da potrebe za ventilacijom nisu velike, predviđa se da će se vazduh nadoknaditi infiltracijom. Predviđen je kanalski razvod pocinčanim kanalima

Ventilacija garaže

Projekat ventilacije garaže za potrebe komunalne službe Žabljaka, urađena je u skladu važećih normi i tehničkih propisa koja važe za ovu vrstu objekta

Proračun potrebne količine vazduha je rađen na osnovu kriterijuma da je neophodneo izvršiti 6 izmena vazduha na čas dok je kontrolni proračun urađen na osnovu kriterijuma maksimalne dozvoljene koncentracije CO (ugljen monoksida) u vazduhu i zahteva iz PTN za zaštitu garaža za putničke automobile od požara i eksplozija ("Sl. list SCG", br. 31/2005), kao i proračun na osnovu standarda s 7346-7:2006. Kako su garaže predviđene za 4, odnosno 6 vozila, osvojen je kriterijum broja izmjena vazduha.

Usvojeni distributivni elementi su čelične konstrukcije. Ventilatori koji se nalaze u požarnoj zoni su konstrukciju da mogu da izdrže temperaturu od 400C u trajanju od 90 minuta.

PRINCIP OBAVLJANJA VENTILACIJE I ODIMLJAVANJA

Izvlačenje vazduha za ventilaciju garaže u nivou podruma, odnosno dima u slučaju odimljavanja garaže, vrši se uz pomoc aksijalnih ventilatora. Ventilatori su kružnog poprečnog prejeka. Montiraju se pri plagfonu garaže, ugradna visina od gornje tačke ventilatora je cca 6.5m. Distributivni elementi su pozicionirani pri plafonu i u donjoj zoni garaže. Nadoknada vazduha nije predviđena, jer segmentna vrata zahvataju veliku površinu, i preko njih če se pojaviti infiltracija.
Na ovaj način se iz garaže odstranjuju laki produkti sagorevanja (ugljen-monoksid) i teži produkti sagorevanja (ugljen-dioksid) u približnom odnosu koji odgovara njihovoj koncentraciji u vazdušnom prostoru garaže.
Projektom se predviđa da se kanal za tampon zonu u dijelu koda prolazi kroz požarni sektor rade od pocinkovanog lima, sa dihtovanjem trakom koja je otporna na visoke temperature. Vertikalne priključke (donji odsis) i priključke za resetke raditi sa klasičnim dihtovanjem. Djelovi kanala koji moraju funkcionisati u periodu odimljavanja, su otporni na požar u vremenskom trajanju od 120 minuta i poseduju Izveštaj o ispitivanju u svemu prema SRPS EN 1366 - 9.
Sve rešetke za odis otpadnog vazduha su snabedevene regulatorima protoka zbog mogućnosti uregulisavanja sistema i ravnomernog odsisa iz svih delova garaže.

Ventilatori za izvlačenje vazduha i dima, moraju da se uključuje u tri slučaja:

1. Redovna ventilacija - provjetravanje. Povremeno uključivanje ventilatora za izbacivanje vazduha iz garaže, preko predhodno podešenog vremenskog releja, nezavisno od procenta sadržaja ugljenmonoksida u garaži. Obično se relej podešava tako da se ventilacija uključuje svakog sata, sa dužinom rada od 15 min, i prekidom od 22h do 08h. Sistem je moguće aktivirati i ručno ukoliko se pojavi potreba za ventilacijom izvan programiranog vremena.
2. Incidentna ventilacija - uključivanje ventilatora za izbacivanje vazduha iz garaže vrši se automatski, po dojavi senzora za prekoračenje dozveljene koncentracije CO u garaži. Maksimalna dozvoljena koncentracija CO je 250ppm.
3. Režim odimljavanja u slučaju požara - ventilatori rade na drugoj većoj brzini.

Proračunata količina vazduha po garaži je 9932 m3/h (6ACH). Ventilator ventilacije/odmiljavanja je tipa: THT-63-4T-1.5-F-400_IE3, proizvođača Sodeca ili ekvivalent. Fasadna žaluzina je tipa: WLS-11-N-1500x800, proizvođač: Lindab ili ekvivalent. Distributivne rešetke u prostoru su tipa: SD-22D-575x125, proizvođača: Lindab ili ekvivalent.

Proračuni distributivnih elemenata, ventilatora date su u numeričkoj dokumentaciji, a pozicije u grafičkoj.

NATPRITISNA VENTILACIJA TAMPON PROSTORA

U tampon zoni predviđena je funkcionalna veza sa stambenim dijelom objekta preko stepeništa i lifta. Stepenišnom prostoru se pristupa preko tampon prostora.

U slučaju izbijanja požara u garaži, širenje gasova može za posledicu imati povećanje pritiska, praćeno isticanjem vrelih gasova izvan garaže ka predprostorima lifta. Dim koji je nastao zbog požara dobija snagu potiska na gore zahvaljujući svojoj smanjenoj gustini. Kroz procjepe u vratima dolazi do curenja ka oknu lifta i gornjim spratovima, to može dovesti do kontaminacije boravišnog prostora, evakuacionih hodnika i stepeništa. Osim toga, ovaj potisak na gore može prouzrokovati širenje dima preko puteva curenja kroz vertikalne barijere između prostorija, npr. vrata, zidovi, pregrade.

Zbog toga se javlja potreba za kontrolom širenja dima u slučaju požara u garaži. Pored standardnih tehnika kao što su podela na PP sektore, zidovima i vratima otpornim na požar i sistemima odsisne ventilacije toplih dimnih gasova-odimljavanjem, primjenjuju se sistemi sa stvaranjem nadpritiska.

Ciljevi sistema sa nadpritiskom :

a) Da štićeni protivpožarni prilazni putevi (tj. protivpožarni šahtovi) treba da se održavaju na taj način da suštinski budu bez dima, tako da se pristup spratu koji je zahvatio požar može postići bez upotrebe aparata za disanje.
b) da ograniči širenje dima u utvrđenom protivpožarnom putu pod normalnim protivpožarnim uslovima.

U skladu sa Pravilnikom o tehničkim zahtevima za zaštitu garaža za putničke automobile od požara i eksplozija ("Sl. list SCG", br. 31/2005) u predprostorima lifta (tampon prostorima na obe etaže) predviđen je sistem za ostvarivanje nadpritiska (25-80 Pa). Tampon prostori u slučaju požara moraju biti u natpritisku da bi se sprečio prodor dima ka boravišnom dijelu objekta. Sistem natpritisne ventilacije radi samo u slučaju požara, Uključivanje se vrši putem požarne signalizacije, preko PP centrale.

Sistem natpritisne ventilacije je projektovan u skladu sa standardom 12101-6. U slučaju stambeno-poslovnog objekta prema standardu se predmetni sistemi klasifikuju kao Klasa A sistema sa nadpritiskom.

Količina vazduha za ostvarivanje natpritiska je određena na osnovu strožijeg kriterijuma od kriterijum razlike pritisaka I kriterijuma protoka. Kriterijum razlike pritisaka je proveren prema razlici pritisaka od 50 Pa dok je za kriterijum protoka uzeto u obzir da su jedna vrata otvorena između prostora zahvaćenog požarom i boravišnog prostora

Sistemi NP se snabdevaju svežim vazduhom iz spoljašnje sredine uz pomoć kanalskog razvoda, zahvat na nivou prizemlja. Kanalski ventilatori EC-8050 su smešteni u tampon prostorijama. Na krajevima kanala su predviđene rešetke za vazduh koje obezbeđuju da brzina strujanja vazduha ne ometa evakuaciju

Ventilator na ubacivanju vazduha u tampon zonu je tipa: IRB/4-355, proizvođača S&P ili ekvivalent. Fasadna žaluzina je tipa: WLA-11-Nl-1200x700, proizvođač: Lindab ili ekvivalent. Distributivna rešetka u prostoru tampona je tipa: AD-11-1200x500, proizvođača: lindab ili ekvivalent. Rastere'enje tampona se vrši na 50Pa preko mehaničke rasteretne klapne tipa: ARK2-600x675/50Pa, proizvođač: Trox ili ekvivalent

Rack prostorije

Hlađenje RACK prostorije se vrši preko dva nezavisna sistema koja će imati redudentan princip rada. Zidne jedinice su montirane u RACK prostoriji, a njima upravlja žičani kotroler, tipa: PREMTB100, proizvođača: LG ili ekvivalent. Kontroler ima mogućnost setovanja vremena rada jedne i druge split jedinice. Unutrašnje jedinoce su tipa MJ-12PC NSJ, proizvođača: LG ili ekvivalent. Spoljna jedinica je tipa: UUA1.UL0, proizvođača: LG ili ekvivalent. Kondenzni razvod unutrašnjih jedinica je predviđen u sifon lavaboa najbližeg toaleta. Kondenzat se upaja u sifon preko HL slivnika. Spoljne jedinice su smještene u garaži jedna ispod druge. Bakarni razvod je 6.35x9.52. Komunikacioni kabl 2x0.75 je predviđen da ide uz bakarne cijevi.

ODGOVORNI PROJEKTANT:

Podgorica, Oktobar. 2023. god.

Miloš Dragaš dipl.ing.maš.
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TEHNIČKI USLOVI ZA IZVOĐENJE RADOVA

1.2. TEHNIČKI USLOVI ZA IZVOĐENJE RADOVA

1.2.1. OPŠTI USLOVI

1. Izgradnji investicionih objekata može se pristupiti kada se obezbijede sredstva za finansiranje investicionog objekta i dobije odobrenje za gradnju.
2. Investitor i izvođač radova, kome je ustupljena izgradnja investicionog objekta, odnosno izvođenje radova, zaključuju Ugovor o gradnji. Ugovor pored osnovnih odredbi mora sadržati i odredbe o danu početka i završetka radova, o stručnom nadzoru nad izgradnjom objekta, o garantnim rokovima za kvalitet izvedenih radova i o načinu plaćanja.
3. Izvođač je obavezan izvesti cjelokupnu instalaciju po ovom projektu, a u skladu sa važećim propisima o izgradnji investicionih objekata.
4. Izvođač radova dužan je da izvesti nadzorni organ o danu početka radova i to 8 dana unaprijed.
5. Izvođač radova dužan je:
   a) da radove izvodi prema važećim tehničkim propisima, normativima i obaveznim standardima koji važe za građenje te vrste investicionog objekta;
   b) da ugrađuje materijal koji odgovara propisanim standardima, odnosno koji poseduje atest izdat od strane organizacije registrovane za delatnost ispitivanja tog materijala, ako za taj materijal ne postoji standard;
   c) da blagovremeno preduzme mjere sigurnosti investicionog objekta, opreme i investicionog materijala, radnika, prolaznika, saobraćaja i susjednih objekata;
   d) da se pridržava investiciono-tehničke dokumentacije na osnovu koje je izdato odobrenje za građenje;
   e) da unutrašnjom kontrolom obezbijedi da se radovi izvode u skladu sa odredbama pod a, b, c i d;
6. Izvođač radova dužan je da vodi građevinski dnevnik i inspekcijsku knjigu posebno za svaki objekat. Ako se na istom mjestu izvode radovi na više objekata, koji predstavljaju tehničku, ili funkcionalnu cjelinu, može se voditi jedan građevinski dnevnik i jedna inspekcijska knjiga.
7. U toku izvođenja radova investitor je dužan da obezbijedi stručni nadzor, koji može da vrši ovlašćeni radnik investitora, koji poseduje odgovarajuću stručnu spremu i praksu utvrđenu opštim aktom investitora.
8. Ako izvođač radova zapazi nedostatak u investiciono-tehničkoj dokumentaciji, dužan je da na te nedostatke blagovrijemeno upozori investitora.
9. Ako investitor ne otkloni nedostatke na koje je upozoren, izvođač radova je dužan da o tome obavijesti organ upravljanja, koji je dao odobrenje za građenje objekta i obustavi radove, ako ti nedostaci ugrožavaju sigurnost objekta, život i zdravlje ljudi, ili susedne objekte.
10. Ako izvođač za vrijeme izvođenja radova primijeti da se moraju izvesti naknadni radovi na objektu, koji nisu obuhvaćeni pogodbenim predračunom, ili kada nastanu izmjene koje mogu imati uticaja na učinak i na utrošak materijala, dužan je o tome odmah podnijeti investitoru naknadni predračun. Izvođač će pristupiti izvođenju naknadnih radova, tek pošto mu investitor odobri predračun za te radove.
11. Ukoliko izvođač izvede instalaciju u svemu po odobrenom projektu i sa materijalom predviđenim ovim projektom, snosi odgovornost za ispravno funkcionisanje sistema samo u pogledu izvršenih radova, kvaliteta materijala i kapaciteta pojedinih elemenata.
12. Samovoljno menjanje projekta od strane izvođača je strogo zabranjeno.
13. Za manje izmjene u odnosu na usvojeni projekat dovoljna je saglasnost nadležnog organa. Ukoliko se ukaže potreba za većim izmjenama projekta, onda je potrebno da projektant preradi projekat i tako prerađeni projekat mora se uputiti ponovo na odobrenje investitoru.

14. Ukoliko investitor bude raspolagao nekim materijalom i ukoliko ga ustupi izvođaču u cilju njegove ugradnje u postrojenje, izvođač je dužan da sav materijal pregleda i neispravan odbaci. Ukoliko izvođač smatra da investitorov materijal nije propisanog kvalileta, on će odbiti da ga ugradi i to će konstatovati u građevinskom dnevniku. Ako nadzorni organ bude izričito zahtevao da se ugradi neodgovarajući materijal, izvođač će ga ugraditi, ali tada ne

odgovara ni za njega, ni za posledice, a garancija se izuzima za taj deo instalacije, što se konstatuje odgovarajućom dokumentacijom u pismenoj formi i obaveznim upisom u građevinski dnevnik.

15. Izvođač je obavezan, ukoliko prilikom izvođenja radova primijeti da je predloženo rešenje tehnički neispravno, loše ili neusaglašeno sa građevinskim objektom ili drugim instalacijama, a koje su nastale na gradilištu prilikom izvođenja, da o tome odmah obavijesti investitora i traži izmjenu projekta. Takođe, ako izvođač radova utvrdi da se usled greške u projektu ili usled pogrešnih uputstava inveslitora, tj. njegovog nadzornog organa radovi izvode na štetu trajnosti, stabilnosti, funkcionalnosti i kvalileta, odgovara sam za nastalu štetu ako na ove činjenice ne upozori investitora upisom u građevinski dnevnik.
16. Ako izvođač za vrijeme montaže primijeti da se moraju izvesti naknadni radovi na postrojenju, koji nisu obuhvaćeni u pogodbenom primeru, ili izmjene koje imaju uticaj na učinak ili obim postrojenja, dužan je da investitoru odmah podnese predračun za te naknadne radove ili izmjene postrojenja, odnosno instalacija. Izvođač će pristupiti izvođenju naknadnih radova ili izmjena postrojenja tek pošto mu investitor odobri predračun za te radove. Investitor mora dati odgovor na dopunsku ponudu u roku od $8 \div 15$ dana, u protivnom će se smatrati da ponuda nije usvojena.
17. U cijenu montaže postrojenja, odnosno instalacije uračunati su (ukoliko to ugovor drugačije ne definiše):
    a) potpuna montaža instalacije, njeno ispitivanje, regulacija i puštanje u probni rad;
    b) obuka radnika odmah po završetku montaže;
    c) naknada za montere, njihove pomoćnike i druga lica neophodna pri ispitivanju, regulaciji i probnom pogonu.
18. Izvođač radova mora za pojedine stručne radove imati na gradilištu rukovodeće tehničko osoblje koje ima zakonsko pravo za rukovanje takvim radovima. Svi radnici moraju imati odgovarajuće kvalifikacije i stvarno stručno znanje potrebno za izvođenje radova na datoj vrsti instalacije. Nadzorni organ ima pravo i dužnost da putem građevinskog dnevnika naredi izvođaču da sa gradilišta odstrani nestručino osoblje.
19. Svi proizvođači opreme, oruđa za rad i uređaja na mehanizovan i električni pogon dužni su da prilikom isporuke daju korisniku atest odgovarajuće stručne ustanove u skladu sa važećim zakonima o bezbjednosti, zaštiti i zdravlju na radu.
20. Sve otpatke i smeće koje izvođač sa svojim radnicima pri izvođenju ovih radova načini, dužan je da o svom trošku odnese sa gradilišta na mjesto gdje mu se odredi (odredbom lokalne samouprave).
21. Mjere bezbednosti zaposlenih radnika na ovom poslu dužan je da preuzme sam izvođač u svemu po važećim propisima.
22. Finansijske obaveze između investitora i izvođača međusobno se regulišu ugovorom u kome se reguliše i način isplate.
23. Za vrijeme izvođenja radova izvođač je dužan da na gradilištu vodi građevinski dnevnik. U njemu moraju biti upisane sve promjene i odstupanja od glavnog projekta. Građevinski dnevnik ovjerava nadzorni organ i predstavnik izvođača.
24. Pored građevinskog dnevnika nadzorni organ investitora za svoj račun vodi građevinsku knjigu u koju se evidentiraju svi izvedeni radovi. Građevinska knjiga služi kao osnov za sastavljanje situacije za naplatu, kao i za trajno dokumentovanje obima izvedenih radova. Građevinska knjiga mora biti zapečaćena i ovjerena od strane investitora, a potpisuju je nadzorni organ i predstavnik izvođača.
25. Nakon završetka montažnih radova celokupno postrojenje se mora ispitati. Ispitivanje vrši izvođač radova uz obavezno prisustvo nadzornog organa.
26. O izvršenom ispitivanju moraju se sačiniti zapisnici koji moraju da sadrže:
    a) predmet ispitivanja;
    b) popis lica koja su vršila i prisustvovala ispitivanju;
    c) datum i vrijeme ispitivanja;
    d) okolnosti pod kojima je ispitivanje vršeno (temperatura, kiša, snijeg i slično);
    e) rezultati ispitivanja sa tačno dobijenim vrednostima, fotografijama, video zapisima i slično;
    f) zaključak u kome se konstatuje da rezultati ispitivanja zadovoljavaju ili ne;
    g) svojeručni potpis lica koja su vršila ispitivanje i koja su prisustvovala ispitivanju.
27. Po završetku radova izvršiće se tehnički pregled od strane stručne komisije koju obrazuje organ uprave, koji je izdao odobrenje za građenje. U komisiju za tehnički pregled ne mogu biti imenovana lica, koja imaju svojstvo

radnika kod investitora, kod organizacije koja je izdala investiciono tehničku dokumentaciju, ili kod izvođača radova, lica koja su vršila stručni nadzor i lica koja vrše nadzor nad primjenom odredbe Zakona o projektovanju i građenju investicionih objekata.

28. Za tehnički prijem izvođač odnosno investitor dužan je kompletirati i komisiji staviti na uvid sledeću dokumentaciju:
    a) odobrenja za gradnju sa saglasnostima nadležnih organa i ustanova (MUP, PTT, vodoprivreda, energetika, zaštita na radu, protivpožarna zaštita, urbanisti itd.);
    b) kompletnu investiciono-tehničku dokumentaciju (mašinsko-tehnološki, građevinski i elektrotehnički projekat, radioničku dokumentaciju i sl.) sa unijetim izmjenama i dopunama;
    c) ocjenu ovlašćene stručne ustanove za izvođenje objekata sa aspekta zaštite na radu i protivpožarne zaštite;
    d) atestnu dokumentaciju ugrađenog materijala;
    e) zapisnik o izvršenoj kontroli i prijemu postrojenja prije montaže;
    f) zapisnik, izveštaj o ispitivanju i rezultate ispitivanja;
    g) ateste zavarivača;
    h) dnevnik rada i građevinsku knjigu;
    i) izveštaj o internom pregledu izvedenih radova;
    j) uputstvo za puštanje u rad i održavanje sa šemama postrojenja.
29. Odobrenje za upotrebu objekta izdaje se u roku od 15 dana od dana prijema predloga tehničke komisije za upotrebu objekta.
30. Odobrenje za upotrebu objekta daje organ uprave, koji je obrazovao komisiju za tehnički pregled.
31. Odobrenje za upotrebu objekta daje se na zahtjev investitora, ili izvođača radova.
32. Ugovorom utvrđen garantni rok za izvedene radove računa se od dana prijema objekta od strane komisije za tehnički pregled, odnosno od dana dobijanja odobrenja za upotrebu investicionog objekta.

1.2.2. TEHNIČKI USLOVI ZA VAZDUŠNE SISTEME

a) OPŠTI DIO

1. Instalacija mora biti izvedena u svemu prema ovom projektu i može se ustupiti samo onom izvođaču koji je u stanju da se izričito obaveže i dokaže da je u mogućnosti da postrojenje isporuči, montira reguliše, ispita i pusti u rad i to u cjelini, uključujući i automatiku, tačno prema projektu.
2. Svi elementi postrojenja moraju biti takvi da u svim detaljima odgovaraju specificiranim karakteristikama i moraju imati takve dimenzije da se mogu uklopiti u gabarite predviđene projektom.

3. Elementi instalacije koji nisu serijski proizvodi, već se ugrađuju posebno, kao na primer kanali za vazduh i slično, moraju biti izrađeni od najboljeg mogućeg materijala, na najbolji način koji se predviđa za tu vrstu radova. Površinska zaštita mora biti izvedena tačno kako je naznačeno, a gdje nije naznačeno, na način uobičajen za tu vrstu radova ali u svakom slučaju odličnog kvaliteta. Izvođač instalacije izjavljuje da raspolaže znanjem i mogućnostima koji se od izvođača instalacije ove vrste zahtevaju, tj:
   – da može nabaviti, isporučiti, montirati, povezati sa ostalim elementima instalacije, regulisati i pustiti u rad sve elemente instalacije predviđene ovim projektom kao i da za ovu opremu nabavi odgovarajuće prospekte, uputstva ili objašnjenja koja bi mu za tu svrhu bila potrebna;
   – da raspolaže znanjem i mogućnostima razrade, dopune, usklađivanja pojedinih detalja u okviru montaže instalacije, a koje projekt tretira i to na odgovarajućem tehničkom i estetskom nivou. Ovi detalji se odnose na: vješanje cijevi i kanla, izradu čvrstih i kliznih oslonaca, postavljanje sudova za odzračivanje i vođenje ispusnih cijevi do najbližeg odgovarajućeg mjesta, postavljanje opreme na plivajuće elastične ili čvrste fundamente, uklapanje opreme u arhitektonsko-građevinsku cjelinu itd.;
   – da raspolaže mogućnostima potrebnim za regulaciju;
   – protoka vazduha kroz sve kanale, rešetke i otvore;
   – temperature vazduha u prostorijama ili kanalima za vazduh.

b) VENTILATORI

1. Svi ventilatori u instalaciji moraju biti kapaciteta, statičkog pritiska i broja obrtaja kao što je naznačeno u specifikaciji, a dimenzija takvih da se mogu ugraditi u za njih određen prostor. Ventilatori moraju da spadaju u klasu bešumnih, tj. da daju najmanji mogoći šum pri datom broju obrtaja, kapacitetu i statičkom pritisku, a u skladu sa zahtjevima o nivou buke za pojedine sisteme koji su dati ovim projektom. Ventilatori treba da budu spojeni sa elektromotorima preko klinastih kaiševa ili preko spojnica. Klinasti kaiševi i remenice moraju da budu snabdJeveni štitnicima.
2. Elektromotori za pogon ventilatora moraju da budu izrađeni za priključak na trofazni sistem naizmjenične struje 380-400V, 50Hz, ili na priključak naizmjenične struje 230V, 50Hz. Elektromotori su potpuno zatvorene konstrukcije, sa kliznim kolutovima i moraju biti snabdJeveni sa odgovarajućim trokrakim upuštačima. Elektromotori se postavljaju na klizne šine od livenog gvožđa ili presovanog čelika.
3. Ventilatori i elektromotori se postavljaju na plivajuće fundamente. Definitivne mjere fundamenata se moraju odrediti prema dimenzijama isporučenih ventilatora i elektromotora.
4. Električne instalacije moraju se izraditi od OG provodnika sa upotrebom odgovarajućih vodonepropusnih elemenata i armature.
5. Ventilatorske sekcije su tipski proizvodi i treba ih ugraditi na mjesta i prema šemi veze koja je razrađena u grafičkoj dokumentaciji ovog elaborata.
6. Za izradu ravnih i fazonskih djelova pravougaonih kanala prema DIN 24190 i DIN 24191 mora se upotrebiti lim sledećih debljina i to:
   a) za kanale sa većom ivicom od 100 mm do 250 mm zaključno debljine 0,60 mm,
   b) za kanale sa većom ivicom od 265 mm do 530 mm zaključno debljine 0,60 mm,
   c) za kanale sa većom ivicom od 560 mm do 1000 mm zaključno debljine 0,80 mm,
   d) za kanale sa većom ivicom od 1060 mm do 2000 mm zaključno debljine 1,00 mm,
   e) za sve kanale koji služe za odimljavnje minimalna debljina je 2,00 mm.

   Kod redukcija i drugih fazonskih djelova za određivanje debljine lima važi dimenzija veće ivice na kraju manjeg presjeka.
7. Za izradu prirubnica mora se upotrebiti valjani profilisani čelik i to:
   – za djelove od lima debljine 0,50 mm do 0,75 mm L 25x25x4 mm,
   – za djelove od lima debljine 1,00 mm do 1,25 mm L 30x30x5 mm.
8. Spajanje limova ravnih i fazonskih djelova limenih vazdušnih kanala treba izvesti pomoću dvostruko povijenog šava. Na krajevima ravnih i fazonskih djelova treba postaviti prirubnice od ugaonog gvožđa koje moraju prethodno biti minizirane. Krajevi lima pojedinih djelova moraju biti povijeni preko prirubnice (pertlovani). Između prirubnice treba staviti zaptivač od pletenice 5 do 8 mm ili gumiranih lepenki, gumiranih pluta ili slično debljine 3-4 mm,a za spajanje prirubnica upotrebiti zavrtnje 1/4" sa šestougaonom glavom.
9. Vješalice i konzole za kanale moraju biti izrađene od valjanog čelika 0 40 i L dimenzija 25x25x3 mm, 35x35x3 mm, sa upotrebom navrtke 3/8" i podmetača sa rupom 0 13. Elementi vješalice moraju obuhvatiti kanal sa 4 strane. Vješalice se učvršćuju na tavanici.
10. Kanali treba da su izvedeni sa što je moguće manje skretanja. Svako koljeno kanala treba da je izvedeno sa lopaticama za usmjeravnje (prema preporukama struke i tehničkih pravila), a i sto važi i za račvanje. Kanali sa dužom dimenzijom presjeka većom od 500 mm treba da budu "naš panovani" kako bi se izbeglo bubnjanje.
11. Kanali kružnog poprečnog presjeka moraju se izvesti od spiro kanala. Krajevi kanala moraju biti sa duplo ojačanim šavom i specijalno oblikovanom spoljnom ivicom, koja daje potrebnu krutost kanalu. Unutrašnja površina kanala mora biti glatka bez ikakvih nabora, varova i slično koji bi povećavali otpor vazduha ili bili uzrok oštećenja unutrašnjeg zaptivnog sloja ili cinčanog antikorozivnog sloja. Kanali moraju biti izrađeni od pocinkovanog lima debljine 0,50 mm do 1,25 mm i širine 60 mm do 160 mm. Širina i debljina trake mora da, za određeni prečnik kanala, daje optimum čvrstoće i težine.

12. Fazonski komadi za spiro kanale moraju biti tako izrađeni da obezbjeđuju potpunu zaptivenost spoja. Krajevi komada moraju biti snabdeveni odgovarajućim zaptivačima koji se stavljaju između zida kanala koji se navlači na fazonski komad i zida fazonskog komada.
13. Vješanje kanala izvesti obujmicama i perforiranom trakom. Između kanala i obujmice postaviti meku gumenu traku. Maksimalno rastojanje između oslonaca klima kanala:
    – do 350 mm, L=4,0 m,
    – od 350 mm do 500 mm, L=3,0 m,
    – od 500 mm do 800 mm, L=2,5 m,
    – preko 800 mm, L=2,0 m.
14. Klima i ventilacione komore moraju da imaju unutrašnje površine sasvim glatke i otporne na vlagu, tako da mogu lako da se čiste, peru i dezinfikuju. Spojevi uglova i drugi djelovi moraju biti izvedeni tako da ne omogućavaju skupljanje prašine i vlage.
15. Na vazdušnim kanalima treba predvidjeti dovoljan broj otvora za čišćenje kanala od prašine kao i za pristup usmerivačima za vazduh ukoliko su isti ugrađeni.
16. Distributivni organi moraju da obezbjeđuju ravnomjerno strujanje vazduha u prostorijama bez osjećaja promaje i buke.
17. Sve rešetke za ubacivanje vazduha su sa lopaticama u horizontalnom ili vertikalnom pravcu, sa tim što lopatice koje se vide (ukoliko su rešetke sa 2 reda lopatica) treba da budu paralelne dužoj osi rešetke, odnosno pravca kanala. Ove lopatice treba da su paralelne jedna drugoj i potpuno otvorene. Ukoliko je projektom traženo lopatice koje se vide mogu da budu i u vertikalnom položaju.
18. Iza poslednjeg reda lopatica treba da se nalazi mehanički demper za regulaciju protoka vazduha.
19. Klapne imaju osovine izvan kanala odnosno komora i mogu biti na ručni ili motorni pogon. Svi ručni prekidači moraju biti pristupačni.
20. U otvore za uzimanje svježeg vazduha su ugrađene žaluzine da ne bi upadala kiša ili snijeg. Ovi otvori moraju biti pokriveni mrežom gustine od najmanje 6 otvora po 2 cm. Brzina vazduha kroz svijetli presjek ovih otvora treba da je manje od 5 m/s. Kod otvora za izbacivanje vazduha brzine mogu biti i veće.

c) GRIJAČI I HLADNjACI KLIMA KOMORA

1. Usvojeni grijači i hladnjaci odabrani su prema podacima proizvođača klima komora. U zavisnosti od izbora opreme, ugradnju izvršiti prema preporukama i zahtjevima proizvođača.

d) AUTOMATIKA

1. Automatiku montirati u potpunosti prema priloženoj šemi odnosno elemente automatike postaviti na mjesta predviđena projektom. Izvođač je dužan da kod naručivanja automatike obezbijedi od isporučioca iste, detaljne šeme povezivanja, uputstva za montažu, regulisanje i rukovanje a bilo bi poželjno da se u cijenu isporuke automatike uključe troškovi za jedno odgovorno lice od strane isporučioca automatike koje bi vršilo kontrolu montaže i regulisanja automatike.

e) MONTAŽA INSTALACIJE

1. Izvođač instalacije dužan je da cjelokupnu opremu predviđenu ovim projektom montira na način predviđen crtežima, tehničkim opisom i ovim tehničkim uslovima. Izvođač je dužan da obezbijedi svoju stručnu i radnu snagu, svoj alat, mašine, instrumente i sve ostalo što je za montažu potrebno. Radovi na izradi temelja za motore, ventilatore, klima komore i drugo izvode se prema detaljima glavnog građevinskog projekta a izvođač instalacija dužan je da da sva potrebna uputstva i podatke.
2. Isto tako svi zidarski radovi potrebni za nošenje kanala, klima komora, odsisnih komora, ventilatora i drugih elemenata instalacije spadaju u obavezu izvođača ove instalacije. Prije svakog štemovanja ili bušenja betona potrebno je tražiti saglasnost nadzornog organa građevinskih radova odnosno zahtijevati da se građevinski

posao izvede i dati uputstvo kako da se izvede. Izvođač je dužan da nakon štemovanja i ugrađivanja elemenata izvrši zatvaranje rupa na način koji odgovara vrsti elementa koji je ugrađen.

3. Svi zidarski radovi potrebni za pričvršćivanje držača, nosača, obujmica za nošenje kanala i drugih elemenata instalacije, spadaju u obavezu izvođača instalacija.
4. Prije svakog štemovanja ili bušenja betona potrebno je tražiti saglasnost nadzornog organa građevinskih radova, odnosno zahtijevati da se građevinski posao izvede i dati uputstvo kako da se izvede. Izvođač je dužan da nakon ugrađivanja elemenata izvrši zatvaranje rupa na način koji odgovara vrsti ugrađenih elemenata. Izvođenje ovakvih vrsta radova obavezno davati stručnim licima odgovarajuće struke, posebno ukoliko se radi o otovrima većih dimenzija (>200 mm), obavezno prepustiti izvođaču građevinskih radova.

f) ISPITIVANjE INSTALACIJE

1. Posle montaže instalacije potrebno je izvršiti ispitivanje na pritisak svih kanala za vazduh na nepropusnost pri radnim uslovima. Nakon ispitivanja na nepropusnost potrebno je pristupiti regulisanju količine vazduha koja se ubacuje odnosno izvlači kroz rešetke. Potrebno je prekontrolisati divergenciju rešetki za ubacivanje i pomoću dempera u kanalima i na rešetkama podesiti instalaciju tako da se na svakoj rešetki dobije količina vazduha predviđena projektom.
2. Ako se ukaže potreba može se mijenjati remenica na elektromotoru ventilatora odnosno povećati ili smanjiti broj obrtaja ventilatora. U prostorijama se ne smije dozvoliti ni najmanji osjećaj promaje i koncentrisanog mlaza vazduha, što se može regulisati podešavanjem prednjih lopatica na rešetkama za ubacivanje i uravnoteženjem količina vazduha po prostorijama. U slučaju pojave promaje može se u cilju uravnoteženja odstupiti od količine vazduha predviđene projektom za +- 5%.
3. Regulaciju instalacije sa vazdušne strane izvršiti instrumentima prema standardu DIN 1946. Posle ovog regulisanja može se pristupiti podešavanju automatike. Termostate treba podesiti prema uputstvima u ovom projektu, a na način određen od strane isporučioca automatike. Isto tako treba podesiti releje i druge djelove automatike. Posle regulisanja ovih djelova instalacije treba istu pustiti u rad i izmjeriti temperaturu i vlažnost vazduha u pojedinim prostorijama.
4. Mjerenje temperature vrši se na sredini prostorije, na visini 1,20 m od poda. Ova mjerenja treba vršiti pri uslovima sličnim projektnim a izbjegavati svaku vrstu preračunavanja koja su kod ovih vrsta instalacija nemoguća. Sve instrumente za mjerenje obezbeđuje izvođač, dok troškovi pogonske energije za mjerenje, ispitivanja i regulisanje kao i goriva za loženje u tom periodu (i vode za kondenzator) padaju na teret investitora. Svaka strana je dužna da plati svoje osoblje, dok se troškovi komisija svih vrsta dijele na pola između izvođača i investitora, ako to drugačije ugovorom nije ustanovljeno.
5. Prije izrade i montaže elemenata kanalske mreže stručni nadzor treba sa izvođačem radova da precizira tehnologiju zaptivanja kanalskog sistema i sve detalje oko tipa i načina postavljanja prirubničnih spojeva, kao i način njegovog kačenja i oslanjanja kanalske mreže.
6. Testiranje na zaptivenost kanalske mreže vrši se samo u fazi izvođenja na neizolovanoj kanalskoj mreži. Ovo testiranje je moguće vršiti i po segmentima.
7. Testiranje na zaptivenost treba izbjegavati nakon potpune montaže, jer bi to predstavljao rizik kako za izvođača tako i za investitora.
8. Kod kanala kružnog poprečnog presjeka (spiro kanali) testira se od 10÷20% površine kanalske mreže, a kod pravougaonog porpečnog presjeka od 20÷30% površine kanalske mreže.
9. Minimalan broj mjesta za testiranje na zaptivenost je tri.
10. Najbolje je uzeti segment kod klima komore ili ventilatora, jer su tu najveći presjeci kao i protoci vazduha. Sledeći segmenti koji se testiraju su sva veća račvanja, skretanja itd, kao i najudaljenija mjesta kanalske mreže
11. Potrebno je testiranje nekada izvršiti i u pravim djelovima kanala i to najmanje 2, a najviše 4 segmenta kanala (prirubnički spojevi). Ovo je neophodno izvršiti kod svih kanala koji prolaze kroz prostorije koje su predviđene za rad sa natpritiskom ili potpritiskom, prostorijama koje su namijenjene za skladištenje otpada, zagađenim vazduhom, prostorije toalete i WC-a, itd.

12. Dio kanalske mreže koji se testira treba odvojiti na prirubničkim spojevima. Ta mjesta kao i eventualne elemnte za ubacivanje vazduha (rešetke, anemostati i sl.) treba zadihtovati što je najbolje moguće.
13. Na tako pripremljenu mrežu koja se testira postavlja se oprema za mjerenje, koja mora biti kalabrisana i mora posjedovati odgovaraju tačnost (atestirana i sertifikovana). Ova oprema se sastoji od:
    - Visokopritisnog ventilatora malog protoka,
    - Kana sa elastičnim crijevom za priključenje,
    - Mlaznice,
    - Diferencijalnog manometra,
    - Manometra na kanalskoj mreži i
    - Ventil za kontrolu pritiska.
14. Prije puštanja u rad visokopritisnog ventilatora za testiranje svi regulatori protoka moraju biti poptuno otvoreni. Kada se dostigne vrijednost izabranog ispitnog pritiska u kanalskoj mreži koja se testira, pritisak se održava konstantnim u vremenu od $4 \div 5$ min. Nakon toga se očitava razlika pritisaka ispred i iza mlaznice na diferencijalnom manometru. Iz dijagrama protok-napor ugrađene mlaznice, a na osnovu očitane razlike pritisaka, dobija se protok vazduha kroz kanal sa elastičnim crijevom, što u stvari predstavlja količinu vazduha koja curi iz testiranog dijela kanalske mreže objekta.
15. Upoređivanjem izračunatog faktora curenja i njegove maksimalne vrijednosti za usvojenu klasu curenja dobija se zaključak o kvalitetu zaptivenosti kanalske mreže.
16. Ako se dobije negativan rezultat, odnosno veća vrijednost curenja vazduha, testiranje se ponavljanja na drugom dijelu kanalske mreže (sledećem odabranom segmentu).
17. Ukoliko je dobijeni rezultat negativan u odnosu $>50\%$, onda se vrši testiranje zaptivenosti cjelokupne kanalske mreže.
18. Nakon izvršenog testiranja donosi se odluka o prihvatanju, popravci zaptivanja ili zamjeni kompletne kanalske mreže.
19. Prilikom svih ovih ispitivanja, kao i donošenja odluka mora biti striktno uz prisustvo nadzornog organa.
20. Nakon balansiranja vazdušnih sistema manjak porotoka vazduha nije dozvoljen. Ukupan protok vazduha u sistemu može biti veći do 10%, ali nikako manji od projektovanog. Ukoliko su protoci $>10\%$ obavezna je saglasnost projektanta.
21. Na elemntima za ubacivanje vazduha u prostorije ne toleriše se manjak protoka. On može biti veći i to za 20%, a kod indukcionih aparata samo 5% od projektovanog.
22. Frekventnim regulatorom se povećavaju protok i napor ventilatora i to je poželjna rezerva koju ima investitor. Ovo se ne smije koristiti za korekciju greške projektne dokumentacije i izvedenih radova.

g) IZOLACIJA INSTALACIJE

1. Svi kanali sistema za klimatizaciju odnosno za ubacivanje spoljnjeg obrađenog vazduha, moraju da se izoluju od klima komora do distributivnih organa. Izolaciju izvesti tako da se uz smanjenje termičkih gubitaka spriječi i pojava kondezacije.
2. Sve djelove instalacije, izrađene od čelika, koji se nalaze van klima komora, grejno-ventilacionih i ventilatorskih sekcija i ventilatora, treba premazati minijumom i obojiti masnom bojom prema izboru investitora. Isto tako svi djelovi kanala koji prolaze kroz prostorije toaleta, WC-a i slično, u kojima dolazi do isparavanja, moraju biti zaštićeni protiv korozije.
3. Oruđa za rad i uređaji na mehanizovani pogon moraju da imaju ateste u smislu odredaba Zakona o zaštiti na radu, kao i ugrađene tablice sa tehničkim karakteristikama.
4. Instalacije koje tretira ovaj projekt izvesti u svemu prema tehničkim propisima. Sve ostalo mora se usaglasiti shodno ugovoru i tehničkim normama, standardima, propisima i preporukama za ovu vrstu instalacija.
5. Posle uspješno izvršenih proba može se pristupiti zatvaranju kanala i aparata. Može se smatrati da je postrojenje u kvalitativnom pogledu primljeno od investitora, te se može izvršiti obračun.

Podgorica, Oktobar, 2023. god.

ODGOVORNI PROJEKTANT:

Miloš Dragaš, dipl.ing.maš.

PROGRAM KONTROLE I OSIGURANJA KVALITETA SA USLOVIMA ZA ISPUNJAVANJE OSNOVNIH ZAHTJEVA ZA OBJEKAT TOKOM GRAĐENJA I ODRŽAVANJA OBJEKTA

1.3. PROGRAM KONTROLE I OSIGURANJA KVALITETA SA USLOVIMA ZA ISPUNJAVANJE OSNOVNIH ZAHTJEVA ZA OBJEKAT TOKOM GRAĐENJA I ODRŽAVANJA OBJEKTA

1. Sastavni dio projektne dokumentacije su:
   - tehnički opis,
   - proračun,
   - opšti, tehnički i tehnološki uslovi za radove i projektovanu opremu,
   - program kontrole i osiguranja kvaliteta,
   - priloženi crteži.

2. Sav materijal za izvođenje radova predmetne instalacije obavezan je obezbijediti izvođač radova prema specifikaciji materijala u projektnoj dokumentaciji, a u skladu sa važećim zakonskim propisima.

3. Za sav ugrađeni materijal i opremu moraju se dostaviti atesti i sertifikati kojima se dokazuje kvalitet ugrađenog materijala.

4. Investitor je obvezan osigurati stalni stručni nadzor nad izvođenjem ugovorenih radova.

5. Investitor je obavezan prije početka radova dostaviti izvođaču radova imena ovlašćenih osoba za vršenje stručnog nadzora nad izvođenjem radova.

6. Izvođač radova je obavezan imenovati, svog ovlašćenog predstavnika - rukovodioca radova, prije početka radova, i o tome pismeno obavijestiti investitora.

7. Sve probleme u pogledu ugovorenih radova, investitor će rješavati sa izvođačem radova, preko ovlašćene osobe za vršenje stručnog nadzora.

8. Izvođač radova se obavezuje da će redovno upisivati u građevinski dnevnik sve potrebne podatke, koje je obavezan upisivati, i da će osobi ovlašćenoj za vršenje stučnog nadzora omogućiti svakodnevno uvid u građevinski dnevnik.

9. Svi radovi vezani uz predmetnu instalaciju moraju biti stručno i kvalitetno izvedeni tačno po crtežima i tehničkom opisu, a po uputstvima projektanta i nadzornog organa.

10. Cijela instalacija mora biti izvedena potpuno nepropusno, o čemu izvođač radova garantuje sa odgovarajućim atestima o izvršenoj probi na odgovarajući pritisak.

11. Po završetku ugovorenih radova, a prije početka korištenja odnosno stavljanja u pogon instalacije, investitor je obavezan zatražiti tehnički pregled izvedenih radova u svrhu utvrđivanja njihove tehničke ispravnosti.

12. Sve garantne listove, ateste i sertifikate ugrađenog materijala i opreme, zajedno sa svim potrebnim uputstvima za rukovanje i održavanje izvedene instalacije, izvođač radova je obavezan dostaviti investitoru prije izvršenog tehničkog pregleda.

13. Za kvalitet izvedenih radova izvođač garantuje 2 (dvije) godine od dana izvršenog tehničkog prijema, a za ugrađenu opremu prema garantnom listu proizvođača opreme.

14. Izvođač radova ne odgovara za kvarove nastale nasilnim oštećenjem ili nestručnim korišćenjem izvedene instalacije.

15. Preglede instalacija treba vršiti barem jednom godišnje i od strane ovlaštene organizacije, nabaviti atest o ispravnom funkcioniranju instalacija (atest o funkcionalnosti instalacije).

Podgorica, Oktobar, 2023. god.

ODGOVORNI PROJEKTANT:

Miloš Dragaš, dipl.ing.maš.

UPUTSTVO ZA UPRAVLJANJE GRAĐEVINSKIM OTPADOM ODNOSNO OPASNIM OTPADOM KOJI NASTAJE TOKOM GRAĐENJA, KORIŠĆENJA ODNOSNO UKLANJANJA OBJEKTA

1.4. UPUTSTVO ZA UPRAVLJANJE GRAĐEVINSKIM OTPADOM, ODNOSNO OPASNIM OTPADOM KOJI NASTAJE TOKOM GRAĐENJA, KORIŠĆENJA ODNOSNO UKLANJANJA OBJEKTA

Pri izradi uputstva za upravljanje građevinskim otpadom, odnosno opasnim otpadom koji nastaje tokom građenja, korišćenja odnosno uklanjanja objekta korišćen je Zakon o upravljanju otpadom (Sl. list Crne Gore br. 64/11 i 39/16) i Pravilnik o postupanju sa građevinskim otpadom, načinu i postupku prerade građevinskog otpada, uslovima i načinu odlaganja cement azbestnog građevinskog otpada (Sl. list Crne Gore, br. 50/12).

Upravljanje otpadom sprovodi se na način kojim se ne stvara negativan uticaj na životnu sredinu i zdravlje ljudi, a naročito:

- na vodu, vazduh, zemljište, biljke i životinje;
- u pogledu buke i mirisa;
- na područja od posebnog interesa (zaštićena prirodna i kulturna dobra).

Upravljanje otpadom zasniva se na principima:

a) održivog razvoja, kojim se obezbjeđuje efikasnije korišćenje resursa, smanjenje količine otpada i postupanje sa otpadom na način kojim se doprinosi ostvarivanju ciljeva održivog razvoja;
b) blizine i regionalnog upravljanja otpadom, radi obrade otpada što je moguće bliže mjestu nastajanja u skladu sa ekonomskom opravdanošću izbora lokacije, dok se regionalno upravljanje otpadom obezbjeđuje razvojem i primjenom regionalnih strateških planova zasnovanih na nacionalnoj politici;
c) predostrožnosti, odnosno preventivnog djelovanja, preduzimanjem mjera za sprečavanje negativnih uticaja na životnu sredinu i zdravlje ljudi i u slučaju nepostojanja naučnih i stručnih podataka;
d) "zagađivač plaća", prema kojem proizvođač otpada snosi troškove upravljanja otpadom i preventivnog djelovanja i troškove sanacionih mjera zbog negativnih uticaja na životnu sredinu i zdravlje ljudi;
e) hijerarhije, kojim se obezbjeđuje poštovanje redosljeda prioriteta u upravljanju otpadom i to: sprječavanje, priprema za ponovnu upotrebu, recikliranje i drugi način prerade (upotreba energije) i zbrinjavanje otpada.

Planovi i programi upravljanja otpadom dati su na državnom i lokalnom nivou. Državni plan upravljanja otpadom je osnovni dokument kojim se određuju dugoročni ciljevi upravljanja otpadom i utvrđuju uslovi za racionalno i održivo upravljanje otpadom u Crnoj Gori. Lokalni plan donosi skupština jedinice lokalne samouprave, na period na koji je donijet Državni plan. Lokalni plan može da se mijenja i dopunjuje po potrebi. Lokalni plan mora biti usaglašen sa Državnim planom.

Opštinski organ ili neki drugi državni organ koji je nadležan za poslove prostornog uređenja utvrđuje i odobrava lokaciju za odlaganje zemlje od iskopa sa gradilišta i drugog građevinskog otpada. U skladu sa ovim izvođač radova je obavezan da traži dozvolu od nadležne Opštine za odlaganje građevinskog otpada.

Prilikom nastanka građevinskog otpada potrebno je izraditi dokumente kojima se evidentiraju količine i vrste otpada. Ova evidencija se mora redovno voditi kako bi se znale tačne količine otpada koji je nastao kao i otpada koji su preuzele kompanije sa kojima je potpisan ugovor.

Upravljanje opasnim otpadom u nadležnosti je Ministarstva odrzivog razvoja i turizma, a sistem upravljanja otpadom podrazumijeva učešće svih subjekata od lokalnog i nacionalnog nivoa.

Jedinica lokalne samouprave urediće sakupljanje opasnog otpada, kroz obezbjeđivanje besplatnog odlaganja ovih vrsta otpada u postojećim i novoizgrađenim reciklažnim dvorištima. Sakupljene kolicine ovog otpada vršiće društvo koje upravlja reciklažnim dvorištem i predavaće ovlašćenom pravnom licu za sakupljanje opasnog otpada, shodno zakonskim propisima i obavezama.

1.5. UPUTSTVO ZA UPRAVLJANJE GRAĐEVINSKIM OTPADOM, ODNOSNO OPASNIM OTPADOM KOJI NASTAJE TOKOM GRAĐENJA, KORIŠĆENJA ODNOSNO UKLANJANJA OBJEKTA

1. Građevinski otpad je otpad koji nastaje prilikom izgradnje, održavanja i rušenja građevinskih objekata.
2. Postupanje sa građevinskim otpadom na gradilištu:
   - Građevinski otpad na gradilištu skladišti se odvojeno po vrstama građevinskog otpada u skladu sa katalogom otpada i odvojeno od drugog otpada, na način kojim se ne zagađuje životna sredina;
   - Odlaganje građevinskog otpada koji se privremeno ne skladišti na gradilištu ili u objektu u kojem se izvode građevinski radovi može se vršiti u kontejnere postavljenim na gradilištu, uz gradilište ili uz objekat na kojem se izvode građevinski radovi;
   - Kontejneri moraju biti izrađeni na način kojim se omogućava bez pretovara odvoženje otpada u postrojenje za dalju obradu;
   - Investitor mora obezbijediti da se iz objekta izdvoji opasan građevinski materijal, radi sprečavanja miješanja opasnog građevinskog materijala sa neopasnim građevinskim otpadom, ukoliko je to tehnički izvodljivo;
   - Građevinski otpad može se privremeno skladištiti na gradilištu do završetka građevinskih radova, a najduže jednu godinu;
   - Građevinski otpad može se privremeno skladištiti i na drugom gradilištu investitora ili drugom mjestu koje je uređeno za privremeno skladištenje građevinskog otpada.
3. Plan upravljanja građevinskim otpadom:
   - Investitor objekta čija je zapremina objekta zajedno sa zemljanim iskopom veća od 2,000 m3 sačinjava plan upravljanja građevinskim otpadom;
   - Investitor vodi evidenciju o vrsti i količini građevinskog otpada u skladu sa zakonom;
   - Plan upravljanja građevinskim otpadom sadrži i podatke o:
     a) načinu izdvajanja opasnog građevinskog otpada prije uklanjanja objekta, ukoliko je predviđeno uklanjanje objekta;
     b) načinu odvojenog sakupljanja građevinskog otpada na gradilištu;
     c) načinu obrade građevinskog otpada na gradilištu;
     d) procijenjenoj zapremini zemljanog iskopa, nastalog zbog vršenja građevinskih radova na gradilištu i postupanje sa njim;
     e) procijenjenoj zapremini korišćenja zemljanog iskopa na gradilištu koji nije nastao zbog građevinskih radova na gradilištu.
4. Građevinski otpad investitor odnosno izvođač građevinskih radova koji je ovlašćen od strane investitora, predaje sakupljaču građevinskog otpada ili neposredno postrojenju za obradu građevinskog otpada.
5. Preradu građevinskog otpada investitor može da vrši na gradilištu na osnovu dozvole u skladu za zakonom.
6. Građevinski otpad (otpadni beton, opeka, keramika i građevinski materijal na bazi gipsa ili mješavina građevinskog otpada sa zemljanim iskopom) može se ponovno upotrijebiti za izvođenje građevinskih radova na gradilištu na kojem je otpad nastao ukoliko zapremina otpada ne prelazi 50 m3.
7. Sakupljač građevinskog otpada može građevinski otpad skladištiti, najduže godinu dana u postrojenju za preradu građevinskog otpada.
8. Prerada građevinskog otpada:
   - Prerada građevinskog otpada vrši se u postrojenjima za preradu građevinskog otpada u skladu sa zakonom;
   - Postrojenje za preradu građevinskog otpada mora biti ograđeno ogradom visine najmanje dva metra radi sprječavanja pristupa neovlašćenim licima;
   - U postrojenju za preradu građevinskog otpada moraju se preduzimati mjere sprječavanja emisije prašine, raznošenja sitnog građevinskog materijala vjetrom i emisije buke, radi zaštite životne sredine;
   - Postrojenje za preradu građevinskog otpada mora biti opremljeno opremom za pranje točkova vozila prije izlaska na javnu saobraćajnicu;

- U postrojenju za preradu građevinskog otpada mora se obezbijedititi recikliranje više od 70% građevinskog otpada;
- Postrojenje za preradu građevinskog otpada mora obezbijediti dalju preradu ili odstranjivanje ostataka građevinskog otpada koja nastaje kod recikliranja u postrojenju za preradu građevinskog otpada.

1.5.1 UPUTSTVO ZA UPRAVLJANJE OPASNIM OTPADOM

2. Opasni otpad je otpad koji sadrži elemente ili jedinjenja koja imaju jedno ili više od sljedećih opasnih svojstava: eksplozivnost, reaktivnost, zapaljivost, nadražljivost, štetnost, toksičnost, infektivnost, kancerogenost, korozivnost, mutagenost, teratogenost, ekotoksičnost, svojstvo nagrizanja i svojstvo otpuštanja otrovnih gasova hemijskom ili biološkom reakcijom i osjetljivost/razdražljivost, kao i otpad iz kojeg, nakon odlaganja, može nastati druga materija koja ima neko od opasnih svojstava.

3. Zabranjeno je miješanje različitih vrsta opasnog otpada i miješanje opasnog sa neopasnim otpadom.
4. Pod miješanjem opasnog otpada smatra se i razrjeđivanje opasnih materija.
5. Otpad se može miješati pod uslovom da se njegovim miješanjem povećava bezbjednost postupaka obrade otpada i ako:
   - se miješanje sprovodi u skladu sa dozvolom za obradu otpada;
   - se miješanjem otpada ne povećava negativan uticaj na životnu sredinu i zdravlje ljudi;
   - je postupak miješanja u skladu s najboljim dostupnim tehnikama.
6. Tokom sakupljanja, transporta i privremenog skladištenja opasan otpad pakuje se i označava u skladu sa zakonom kojim je uređen prevoz opasnih materija.
7. Opasni otpad tokom prevoza unutar države mora da prati isprava o prevozu opasnih materija, u skladu sa zakonom.
8. Opasni otpad može biti u elektronskom obliku.
9. Sakupljanje, preradu ili zbrinjavanje opasnog komunalnog otpada može da vrši privredno društvo ili preduzetnik koje posjeduje dozvolu za obradu otpada.
10. Sakupljanje, odnosno transport otpada može da vrši privredno društvo ili preduzetnik ako ima opremu za sakupljanje, odnosno transport otpada i potreban broj zaposlenih.
11. Zabranjeno je privrednom društvu ili preduzetniku da preuzima otpad od imaoca koji ne stvara otpad u toku obavljanja djelatnosti ili aktivnosti.
12. Sredstva i oprema kojima se sakuplja, odnosno transportuje otpad moraju da obezbjeđuju sprječavanje rasipanja ili prelivanja otpada i širenje prašine, buke i mirisa.
13. Prilikom obavljanja poslova sakupljanja, odnosno transporta otpada u vozilu kojim se vrši transport otpada, privredno društvo ili preduzetnik mora da ima:
    - kopiju akta o upisu u registar sakupljača odnosno prevoznika otpada;
    - formular o transportu otpada.
14. Sredstva i oprema kojima se sakuplja, odnosno transportuje opasni otpad moraju da ispunjavaju uslove utvrđene zakonom kojima je uređen prevoz opasnih materija.
15. Odstranjivanje otpada vrši se na lokaciji koja je za tu namjenu određena prostorno planskim dokumentom, kao i u postrojenjima ili objektima koji ispunjavaju uslove utvrđene zakonom.
16. Odstranjivanje otpada vrši se u skladu sa zakonom.
17. Zabranjeno je paljenje otpada na otvorenom prostoru.

Podgorica, Novembar, 2022. god. ODGOVORNI PROJEKTANT:

Miloš Dragaš, dipl.ing.maš.

1.6. Spisak korišćenih propisa, standarda i literature

Pri izradi GLAVNOG MAŠINSKOG PROJEKTA TERMOTEHNIČKIH INSTALACIJA korišćeni su sledeći propisi, standardi i literatura:

- PROPISI

– Zakon o planiranju prostora i izgradnji objekata (Sl. list Crne Gore, br. 64/17 i 44/18);
– Zakon o zaštiti i spašavanju (Sl. list Crne Gore br. 13/07, 05/08, 86/09, 32/11 i 54/16);
– Zakon o zaštiti i zdravlju na radu (Sl. list Crne Gore, br. 34/14 i 44/18);
– Zakon o zaštiti buke u životnoj sredini (Sl. list Crne Gore, br. 28/11, 28/12 i 01/14);
– Zakon o upravljanju otpadom (Sl. list Crne Gore br. 64/11 i 39/16);
– Zakon o životnoj sredini (Sl. list Crne Gore br. 48/08 i 52/16);
– Zakon o standardizaciji (Sl. list Crne Gore br. 13/08);
– Pravilnik o postupanju sa građevinskim otpadom, načinu i postupku prerade građevinskog otpada, uslovima i načinu odlaganja cement azbestnog građevinskog otpada (Sl. list Crne Gore, br. 50/12);
– Pravilnik o tehničkim zahtjevima za zaštitu garaža za putničke automobile od požara i eksplozija (Sl. list Crne Gore, br. 9/12);
– Pravilnik o mjerama zaštite i zdravlja na radu od rizika izloženosti buci (Sl. list Crne Gore, br. 37/16);
– Pravilnik o mjerama i normativima zaštite na radu na oruđima za rad (Sl. list SFRJ br.18/91);
– Pravilnik o graničnim vrijednostima buke u životnoj sredini, načinu utvrđivanja indikatora buke i akustičnih zona i metodama ocjenjivanja štetnih efekata buke (Sl. list Crne Gore, br. 60/11);
– Pravilnik o načinu izrade i sadržini tehničke dokumentacije za građenje objekta (Sl.list Crne Gore, br. 44/18).

- STANDARDI

– ISO 5457 – Formati tehničkih crteža;
– MEST EN ISO 5455:2014 – Tehnički crteži – Razmjere.

- LITERATURA

– Recknagel, Sprengler, Schramek, Čeperković: Grejanje i klimatizacija, Interklima, Vrnjačka Banja, 2012.
– Branislav Todorović i Milica Milinković, Razvod vazduha u klimatizacionim sistemima, SMEITS, Beograd, 2003.
– Branislav Živković, Zoran Stajić, Mali termotehnički priručnik, SMEITS, Beograd, 2003.
– Boris Labudović i ostali, Priručnik za ventilaciju i klimatizaciju, 2 izdanje, Energetika Marketing, Zagreb, 2003.

Podgorica, Oktobar, 2023. god. ODGOVORNI PROJEKTANT:

Miloš Dragaš, dipl.ing.maš.

NUMERIČKA DOKUMENTACIJA

PRORAČUNSKA DOKUMENTACIJA

Description of materials and building elements

ISO 6946
ISO 10077
ISO 13370
ISO 10456

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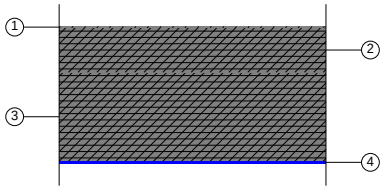
1. BUILDING ENVELOPE

1.1. Floors in contact with the ground

1.1.1. Screeds

PNT2 — Total surface area 241.4 m²



Layer list:

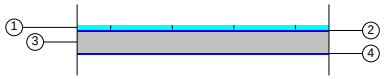
1 -	Ferobeton	0.30 cm
2 -	Armirani beton	10.00 cm
3 -	Armirani beton sa aditivima	20.00 cm
4 -	PVC HI membrana	0.50 cm

Properties

Thermal transmittance, U: 0.29 W/(m²·K)
Total thickness 30.80 cm
Characteristic length of, B': 10.87 m
Thermal resistance of the floor slab, Rf: 0.142 (m²·K)/W
Floor slab surface area, A: 496.8 m²
Floor slab perimeter, P: 91.40 m
Thermal conductivity, λ: 2.000 W/(m·K)

PNT1 — Total surface area 209.4 m²

1. BUILDING ENVELOPE



Layer list:

1 -	Keramicke plocice	1.00 cm
2 -	Lijepak	0.50 cm
3 -	Cementni estrih	5.00 cm
4 -	Par.pr vod.npr folija	0.50 cm

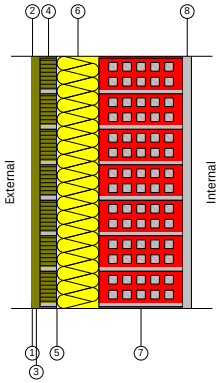
Properties

Thermal transmittance, U: 0.30 W/(m²·K)
Total thickness 7.00 cm
Characteristic length of, B': 10.87 m
Thermal resistance of the floor slab, Rf: 0.079 (m²·K)/W
Floor slab surface area, A: 496.8 m²
Floor slab perimeter, P: 91.40 m
Thermal conductivity, λ: 2.000 W/(m·K)

1.2. Façades

1.2.1. Opaque fraction of the façades

FZ1 — Total surface area 530.5 m²



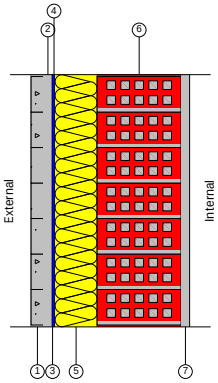
Layer list:

1 -	Falcovani Lim	0.10 cm
2 -	PE folija	0.02 cm
3 -	OSB ploca	1.80 cm
4 -	Drvena letva	4.00 cm
5 -	PE folija	0.02 cm
6 -	Termoizolacija	10.00 cm
7 -	Giter blok	20.00 cm
8 -	Malter	2.00 cm

Properties

Thermal transmittance, U: 0.25 W/(m²·K)
Total thickness 37.94 cm

FZ4 — Total surface area 151.6 m²



Layer list:

1 -	Kamen	3.00 cm
2 -	Cementni malter	2.00 cm
3 -	Dv.kompomentra hi	0.20 cm
4 -	Lijepak	0.50 cm
5 -	Termoizolacija	10.00 cm
6 -	Giter blok	20.00 cm
7 -	Malter	2.00 cm

Properties

Thermal transmittance, U: 0.28 W/(m²·K)
Total thickness 37.70 cm

1.2.2. Façade openings

Rolo vrata 325x390

Properties

Thermal transmittance, U: 2.90 W/(m²·K)
Absorptance, α_S: 0.600 (colour)

140x40

Properties

Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

520x240

Properties

Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

390x240

Properties
Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

300x240

Properties
Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

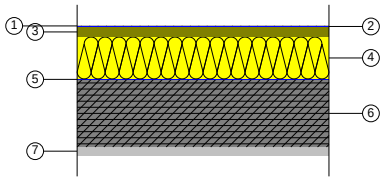
620x240

Properties
Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

1.3. Roofs

1.3.1. Infilled part of the flat roofs

RK — Total surface area 157.8 m²



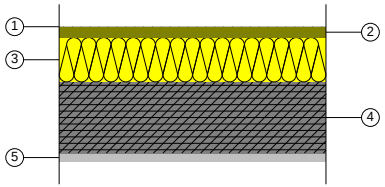
Layer list:

1 -	Lim	0.06 cm
2 -	PE folija	0.20 cm
3 -	Daska	2.40 cm
4 -	Termoizolacija	10.00 cm
5 -	PE folija	0.20 cm
6 -	Armirani beton	16.00 cm
7 -	Malter	2.00 cm

Properties
Thermal transmittance, U: 0.30 W/(m²·K)
Total thickness 30.86 cm

1.3.2. Infilled part of the roofs

KK — Total surface area 466.0 m²



Layer list:

1 -	Lim	0.06 cm
2 -	Daska	2.40 cm
3 -	Termoizolacija	10.00 cm
4 -	Armirani beton	16.00 cm
5 -	Malter	2.00 cm

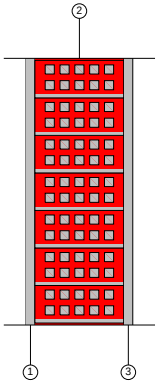
Properties
Thermal transmittance, U: 0.30 W/(m²·K)
Total thickness 30.46 cm

2. PARTITIONING SYSTEM

2.1. Internal vertical partitioning

2.1.1. Non-visible part of the internal vertical partitioning

UZ1 — Total surface area 1130.2 m²

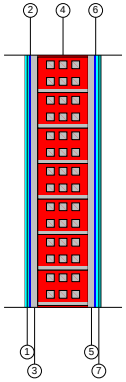


Layer list:

1 -	Malter	2.00 cm
2 -	Giter blok	20.00 cm
3 -	Malter	2.00 cm

Properties — Thermal transmittance, U: 1.43 W/(m²·K)
Total thickness 24.00 cm

UZ 8 — Total surface area 54.1 m²



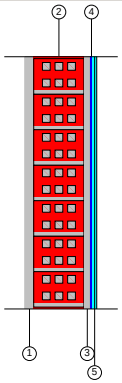
Layer list:

1 -	Keramicke plocice	1.00 cm
2 -	Lijepak	0.50 cm
3 -	Cementni malter	1.50 cm
4 -	Giter blok	12.00 cm
5 -	Cementni malter	1.50 cm
6 -	Lijepak	0.50 cm
7 -	Keramicke plocice	1.00 cm

2. PARTITIONING SYSTEM

Properties Thermal transmittance, U: 1.78 W/(m²·K)
Total thickness 18.00 cm

UZ7 Total surface area 49.7 m²



Layer list:

1 -	Malter	2.00 cm
2 -	Giter blok	12.00 cm
3 -	Malter	1.50 cm
4 -	Lijepak	0.50 cm
5 -	Keramicke plocice	1.00 cm

Properties Thermal transmittance, U: 1.82 W/(m²·K)
Total thickness 17.00 cm

2.1.2. Internal vertical openings

90x220

Properties Thermal transmittance, U: 2.50 W/(m²·K)
Absorptance, α_s: 0.600 (colour)

70x220

Properties Thermal transmittance, U: 2.50 W/(m²·K)
Absorptance, α_s: 0.600 (colour)

80x220

Properties Thermal transmittance, U: 2.50 W/(m²·K)
Absorptance, α_s: 0.600 (colour)

140x40

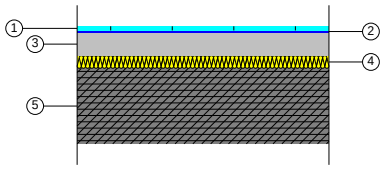
Properties Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

160x230

Properties Thermal transmittance, U: 2.50 W/(m²·K)
Solar factor, g: 0.700
Interior solar attenuation coefficient, Fr: 0.500
Opaque fraction, Ff: 0

2.2. Internal horizontal partitioning

PMK2 Total surface area 851.5 m²

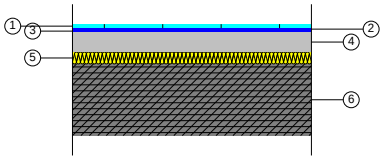


Layer list:

1 -	Keramicke plocice	1.00 cm
2 -	Lijepak	0.50 cm
3 -	Cementni estrih	5.50 cm
4 -	Termoizolacija	3.00 cm
5 -	Armirani beton	18.00 cm

Properties Thermal transmittance, U: 0.79 W/(m²·K)
Total thickness 28.00 cm

PMK1 s Total surface area 43.3 m²



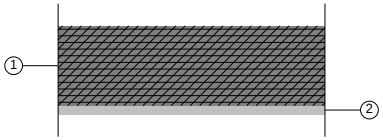
Layer list:

1 -	Keramicke plocice	1.00 cm
2 -	Lijepak	0.50 cm
3 -	Hidroizolacija	0.50 cm
4 -	Cementni estrih	5.00 cm
5 -	Termoizolacija	3.00 cm
6 -	Armirani beton	18.00 cm

Properties

Thermal transmittance, U: 0.78 W/(m²·K)
Total thickness 28.00 cm

PL2 — Total surface area 377.5 m²



Layer list:

1 -	Armirani beton	18.00 cm
2 -	Malter	2.00 cm

Properties

Thermal transmittance, U: 2.93 W/(m²·K)
Total thickness 20.00 cm

3. MATERIALS

3. MATERIALS

Layers					
Material	e	ρ	λ	RT	Cp
Falcovani Lim	0.10	7800.00	58.500	0.000	460.00
PE folija	0.02	1000.00	0.150	0.001	1340.00
OSB ploca	1.80	650.00	0.130	0.138	1522.00
Drvena letva	4.00	468.00	0.160	0.250	1500.00
Termoizolacija	10.00	24.00	0.034	2.941	840.00
Giter blok	20.00	1400.00	0.480	0.417	920.00
Malter	2.00	2000.00	1.600	0.013	1000.00
Kamen	3.00	2600.00	1.700	0.018	920.00
Cementni malter	2.00	2200.00	1.600	0.013	1050.00
Dv.kompomentra hi	0.20	1000.00	0.230	0.009	1460.00
Lijepak	0.50	35.00	0.700	0.007	920.00
Keramicke plocice	1.00	1700.00	1.300	0.008	920.00
Cementni malter	1.50	2200.00	1.400	0.011	1050.00
Giter blok	12.00	1400.00	0.480	0.250	920.00
Malter	1.50	2000.00	1.600	0.009	1000.00
Keramicke plocice	1.00	1700.00	1.050	0.010	920.00
Lim	0.06	7800.00	58.500	0.000	460.00
PE folija	0.20	1000.00	0.150	0.013	1340.00
Daska	2.40	468.00	0.160	0.150	1500.00
Armirani beton	16.00	2200.00	2.600	0.062	960.00
Cementni estrih	5.50	2200.00	1.600	0.034	1050.00
Termoizolacija	3.00	24.00	0.034	0.882	840.00
Armirani beton	18.00	2200.00	2.600	0.069	960.00

Used abbreviations			
e	*Thickness cm*	RT	*Thermal resistance (m²·K)/W*
ρ	*Density kg/m³*	Cp	*Specific heat J/(kg·K)*
λ	*Thermal conductivity W/(m·K)*		

Layers					
Material	e	ρ	λ	RT	Cp
Hidroizolacija	0.50	1000.00	0.190	0.026	1460.00
Cementni estrih	5.00	2200.00	1.600	0.031	1050.00
Ferobeton	0.30	2000.00	1.650	0.002	1000.00
Armirani beton	10.00	2200.00	2.600	0.038	960.00
Armirani beton sa aditivima	20.00	2200.00	2.650	0.075	960.00
PVC HI membrana	0.50	1000.00	0.190	0.026	1460.00
Par.pr vod.npr folija	0.50	1000.00	0.150	0.033	1340.00

Used abbreviations			
e	*Thickness cm*	RT	*Thermal resistance (m²·K)/W*
ρ	*Density kg/m³*	Cp	*Specific heat J/(kg·K)*
λ	*Thermal conductivity W/(m·K)*		

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1. LOAD CALCULATION SUMMARY

1.1. Cooling

Zone cooling loads summary: Zone 1

	External					Internal		Ventilation			Total			
	A (m²)	Conduction (W)	Solar (W)	Lat. inf. (W)	Sens. inf. (W)	Lat. (W)	Sens. (W)	Airflow (l/s)	Lat. (W)	Sens. (W)	Lat. (W)	Sens. (W)	Total (W/m²)	Total (W)
Peak cooling loads per space														
Sprat/28/IT	4	13	0	0	0	150	2500	0	0	0	150	2513	616	2663
Zone simultaneous peak cooling load: 21 of August at 16h (15 apparent solar time)														
Zone 1	1001.5							0			150	2513	2.66	2663

Abbreviations	
A	Area
Conduction	Conduction heating load
Solar	Solar heating load
Lat. inf.	Latent infiltration
Sens. inf.	Sensible infiltration
Lat.	Latent
Sens.	Sensible

1.2. Heating

Zone heating loads summary: Zone 1

	A (m²)	Φ_T (W)	Φ_V (W)	Φ_{RH} (W)	$\Phi_{HL,S}$ (W)	Φ_{HL} (W)
Space design heating load						
Podrum/Garaza 1 (Garaza 12)	241.4	12645	17019	4346	29326	39112
Podrum/1/Stepeniste	14.1	455	0	254	815	815
Podrum/2/Toalet	3.9	114	0	71	212	212

Podrum/4/Tehnicka prostorija (Podstanica)	63.3	951	0	1140	2405	2405
Podrum/7/Kancelarija	8.5	918	234	153	1366	1501
Prizemlje/1/Vjetrobran	4.9	747	246	88	1102	1244
Prizemlje/1/Vjetrobran inv	3.9	331	194	70	572	683
Prizemlje/2/Portir	2.4	573	90	43	759	811
Prizemlje/3/Hol	39.9	300	630	719	1534	1896
Prizemlje/4/Bife	30.4	2001	1148	548	3591	4251
Prizemlje/5/Kancelarija	7.2	542	271	129	928	1083
Prizemlje/6/Prodavnica	46.4	3978	1749	834	6540	7546
Prizemlje/7/Hodnik	18.7	419	707	337	1276	1683
Prizemlje/8/Kancelarija	10.5	352	398	190	852	1081
Prizemlje/9/Garderoba	18.9	931	764	340	1901	2340
Prizemlje/9/Tus (Garderoba)	6.9	291	281	125	640	802
Prizemlje/Stepeniste	9.9	-191	0	178	-14	-14
Sprat/1/Cekaonica	62.9	4065	2374	1132	7341	8707
Sprat/2/Hodnik	51.5	2413	1733	927	4838	5834
Sprat/3/Sastanci direktor (Kancelarija)	13.4	1854	483	240	2686	2963
Sprat/4/Kancelarija	13.4	1838	481	240	2666	2943
Sprat/5/Kancelarija	23.3	1608	846	420	2818	3305
Sprat/6/Sekretarica (Kancelarija)	8.6	258	289	154	640	806
Sprat/7/Direktor (Kancelarija)	13.9	1320	534	251	2114	2421
Sprat/8/Kancelarija	20.3	1447	737	366	2508	2932
Sprat/9/Kancelarija	15.1	1295	563	271	2125	2449
Sprat/10/Kancelarija	20.3	1450	740	366	2514	2940
Sprat/11/Kancelarija	20.3	1421	738	366	2479	2903
Sprat/12/Kancelarija	20.4	1701	741	366	2804	3230
Sprat/13/Kancelarija	20.3	1712	737	366	2814	3238
Sprat/14/Kancelarija	20.3	1700	740	366	2802	3227
Sprat/15/Kancelarija	20.3	1714	738	366	2816	3241

Sprat/16/Kancelarija	23.3	1936	849	420	3197	3685
Sprat/17/Kancelarija	23.3	1927	846	420	3185	3671
Sprat/18/Kancelarija	19.6	2069	698	354	3187	3589
Sprat/19/Kancelarija	19.6	2258	695	354	3403	3802
Sprat/20/Relax Zona (Kancelarija)	10.0	1311	336	180	1908	2102
Sprat/22/Toalet	7.1	74	0	127	231	231
Sprat/23/Toalet	4.0	44	0	72	133	133
Sprat/24/Toalet	7.1	102	0	127	263	263
Sprat/25/Hodnik	7.5	501	251	134	875	1019

Zone design heating load

Zone 1	1001.5	114152	137082

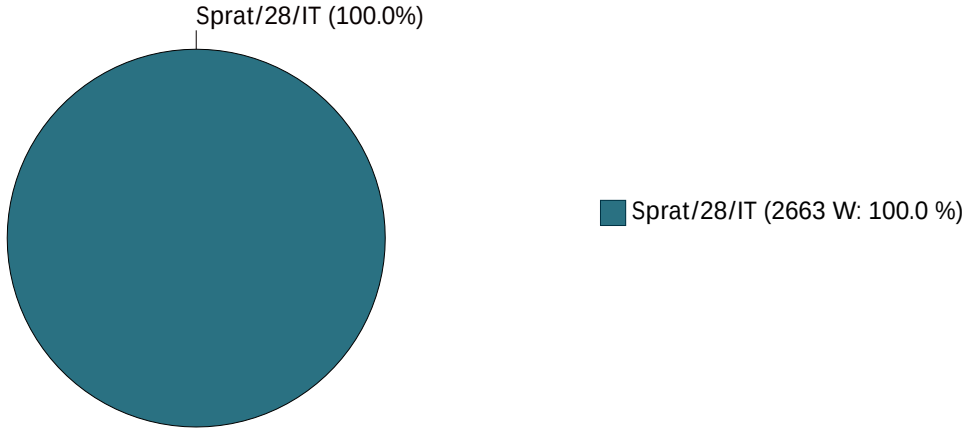
Abbreviations

A	Area
F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
$F_{HL,S}$	Design simultaneous thermal load
F_{HL}	Design thermal load

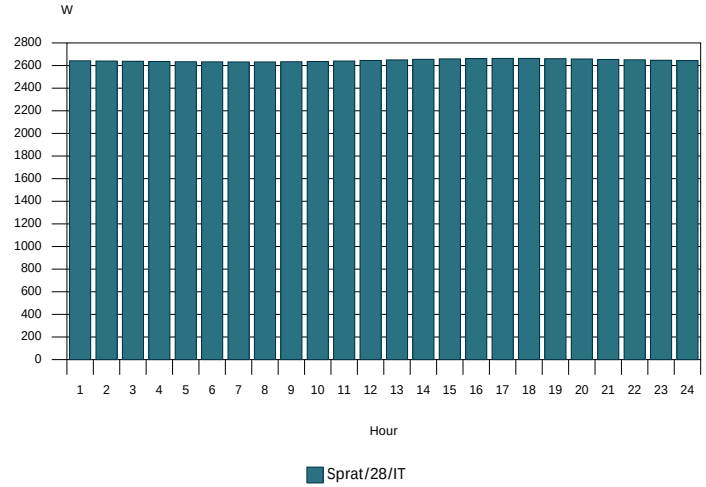
1.3. Graphs

Simultaneous peak cooling load (2663 W)
21 of August at 16h (15 apparent solar time)

Loads summary

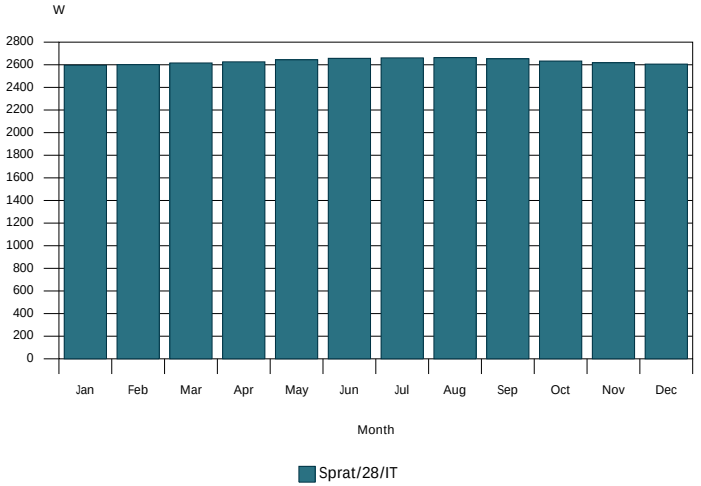


Hourly peak cooling load progression (21 of August)

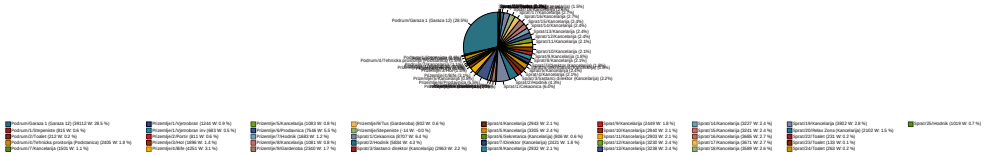


Annual peak cooling load progression

Loads summary



Peak heating load (137082 W)



2. LOAD CALCULATION PER SPACE

2.1. Cooling

Peak cooling load

Space: Sprat/28/IT — Zone: Zone 1

Net floor area = 4.3 m² Net volume = 14.28 m³

Design conditions

Indoor:	Outdoor:
Space air temperature = 25.0 °C	Dry-bulb temperature = 31.9 °C
Relative humidity = 50.00%	Wet-bulb temperature = 18.9 °C

Time of peak cooling load: 21 of August at 16h (15 apparent solar time)

Conduction heat gains (opaque surfaces)

	A (m²)	U (W/(m²·K))	b	Tilt (°)	Convective component (W)	Radiative component (W)	Sensible load (W)
Zone boundary partition							
Partition wall	4.0	1.43	0.01	V(90)	0	0	0
Partition wall	8.9	1.43	0.01	V(90)	0	0	1
Internal floor slab	4.3	3.55	0.20	H(180)	11	1	12
						TOTAL:	13

Abbreviations	
A	Area
U	Heat transmission coefficient
b	Adjacent space correction factor
Tilt	Tilt angle

Internal heat gains

	Sensible heat gain (W)	Convective component (W)	Radiative component (W)	Latent cooling gain/load (W)	Sensible load (W)
Internal gains					
Internal equipment	2500	1250	1250	150	2500
			TOTAL:	150	2500

Total cooling load

Total load per unit area (W/m²)	Sensible heat factor	Latent load (W)	Latent cooling factor (0.0%) (W)	Sensible load (W)	Sensible cooling factor (0.0%) (W)	TOTAL COOLING LOAD
615.52	0.94	150	0.0	2513	0.0	2663 W

2.2. Heating

Peak heating load

Space: Podrum/Garaza 1 (Garaza 12) Zone: Zone 1

Net floor area = 241.45 m² Net volume = 1496.95 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 12.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SW)	SW(244)	18.0	0.25	V(90)	147
Façade (SW)	SW(244)	30.6	0.25	V(90)	249
Façade (NW)	NW(334)	106.4	0.28	V(90)	949
Façade (NE)	NE(64)	18.6	0.25	V(90)	152
Façade (NE)	NE(64)	30.6	0.25	V(90)	249
				TOTAL:	1746

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior door	SW(244)	12.7	2.90	V(90)	1176
Exterior door	SW(244)	12.7	2.90	V(90)	1176
Exterior door	SW(244)	12.7	2.90	V(90)	1176
Exterior door	NE(64)	12.1	2.90	V(90)	1121

Exterior door	NE(64)	12.7	2.90	V(90)	1176
Exterior door	NE(64)	12.7	2.90	V(90)	1176
				TOTAL:	7002

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	6.20	-0.15	-30
Outward	2.70	0.10	9
Outward	3.20	0.10	10
Outward	7.00	0.50	112
Outward	7.00	0.50	112
Outward	6.20	0.15	30
Outward	6.20	-0.15	-30
Outward	6.98	0.50	112
Outward	6.98	0.50	112
Outward	6.20	0.15	30
Outward	17.16	0.50	275
Outward	17.16	0.50	275
Outward	2.70	0.10	9
Outward	6.20	-0.15	-30
Outward	3.20	0.10	10
Outward	7.00	0.50	112
Outward	7.00	0.50	112
Outward	6.20	-0.15	-30
Outward	6.98	0.50	112
Outward	6.98	0.50	112
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0

Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.10	0.00	0
Outward	3.90	0.00	0
Outward	3.10	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
Outward	3.25	0.00	0
Outward	3.90	0.00	0
		TOTAL:	1422

	A (m²)	U (W/(m²·K))	f_{g1}	G_w	Tilt (°)	Thermal loss (W)
Via the ground						
Slab-on-ground floor	241.4	0.29	1.45	1.00	H(180)	1297
					TOTAL:	1297

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	4.2	1.43	0.33	V(90)	62
Interior door	2.0	2.50	0.33	V(90)	52

				TOTAL:	114

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	4.8	1.43	21.0	V(90)	-61
Partition wall	9.2	1.43	15.0	V(90)	-39
Partition wall	4.7	1.43	16.0	V(90)	-27
Partition wall	13.4	1.43	10.0	V(90)	38
Partition wall	8.3	1.43	21.0	V(90)	-106
Partition wall	0.4	1.43	21.0	V(90)	-5
Partition wall	7.3	1.43	21.0	V(90)	-93
Partition wall	0.6	1.43	21.0	V(90)	-8
Partition wall	9.3	1.43	15.0	V(90)	-40
Partition wall	3.9	1.43	21.0	V(90)	-51
Partition wall	0.6	1.43	24.0	V(90)	-11
Partition wall	6.8	1.43	24.0	V(90)	-117
Partition wall	1.6	1.43	24.0	V(90)	-28
Partition wall	15.9	1.43	24.0	V(90)	-273
Internal floor slab	120.1	0.83	2.2	H(180)	983
Internal floor slab	119.8	0.83	2.2	H(180)	980
Interior door	2.0	2.50	21.0	V(90)	-45
Interior door	2.0	2.50	15.0	V(90)	-15
Interior window	2.0	2.50	16.0	V(90)	-20
				TOTAL:	1063

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient

e_k	Orientation correction factor
f_{g1}	Correction factor due to outdoor dry-bulb temperature oscillation
G_w	Correction factor due to basement water
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	416	-	17019
		TOTAL:	17019

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
241.45	18.00	4346

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
12645	17019	4346	0.15	39112 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Podrum/1/Stepeniste — Zone: Zone 1

Net floor area = 14.12 m² Net volume = 38.13 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 15.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	f_{g1}	G_W	Tilt (°)	Thermal loss (W)
Via the ground						
Slab-on-ground floor	14.1	0.30	1.45	1.00	H(180)	96
					TOTAL:	96

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	9.2	1.43	0.33	V(90)	150
Partition wall	9.2	1.43	0.26	V(90)	122
Partition wall	2.3	1.43	0.05	V(90)	6
Interior door	2.0	2.50	0.26	V(90)	46
Interior door	2.0	2.50	0.05	V(90)	9
				TOTAL:	334

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	2.3	1.43	16.0	V(90)	-3

Partition wall	9.2	1.43	12.0	V(90)	39
Internal floor slab	4.2	0.83	21.0	H(180)	-21
Interior door	2.0	2.50	16.0	V(90)	-5
Interior door	2.0	2.50	12.0	V(90)	15
				TOTAL:	25

Abbreviations

A	Area
U	Heat transmission coefficient
f_{g1}	Correction factor due to outdoor dry-bulb temperature oscillation
G_W	Correction factor due to basement water
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
14.12	18.00	254

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}

(W)	(W)	(W)		
455	0	254	0.15	815 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Podrum/2/Toalet Zone: Zone 1

Net floor area = 3.92 m² Net volume = 10.59 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 16.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	f_{g1}	G_w	Tilt (°)	Thermal loss (W)
Via the ground						
Slab-on-ground floor	3.9	0.30	1.45	1.00	H(180)	28
					TOTAL:	28

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	6.6	1.43	0.05	V(90)	18
				TOTAL:	18

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	4.3	1.43	10.0	V(90)	37
Partition wall	4.7	1.43	12.0	V(90)	27
Partition wall	2.3	1.43	15.0	V(90)	3
Internal floor slab	0.5	0.83	24.0	H(180)	-3
Internal floor slab	3.2	0.83	24.0	H(180)	-21

Interior window	2.0	2.50	12.0	V(90)	20
Interior door	2.0	2.50	15.0	V(90)	5
				TOTAL:	67

Abbreviations

A	Area
U	Heat transmission coefficient
f_{g1}	Correction factor due to outdoor dry-bulb temperature oscillation
G_W	Correction factor due to basement water
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A	f_{RH}	F_{RH}
(m^2)	(W/m^2)	(W)
3.92	18.00	71

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
114	0	71	0.15	212 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Podrum/4/Tehnicka prostorija (Podstanica) Zone: Zone 1

Net floor area = 63.34 m² Net volume = 171.02 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 10.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (NE)	NE(64)	32.4	0.25	V(90)	247
Façade (SE)	SE(154)	13.4	0.28	V(90)	112
				TOTAL:	360

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	2.0	2.50	V(90)	147
				TOTAL:	147

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	2.70	0.15	12
Outward	12.72	0.50	191
Outward	5.52	0.50	83
Outward	2.00	0.50	30

Outward	1.20	0.50	18
Outward	3.44	0.50	52
Outward	4.98	0.50	75
Outward	4.98	0.50	75
Outward	1.40	0.00	0
Outward	1.40	0.00	0
Outward	1.40	0.00	0
Outward	1.40	0.00	0
		TOTAL:	535

	A (m²)	U (W/(m²·K))	f_{g1}	G_w	Tilt (°)	Thermal loss (W)
Via the ground						
Slab-on-ground floor	63.3	0.30	1.45	1.00	H(180)	293
					TOTAL:	293

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	24.6	1.43	0.26	V(90)	279
Partition wall	4.3	1.43	0.05	V(90)	10
				TOTAL:	289

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	13.4	1.43	12.0	V(90)	-38
Partition wall	4.3	1.43	16.0	V(90)	-37
Internal floor slab	30.1	0.83	21.0	H(180)	-276
Internal floor slab	7.2	0.83	21.0	H(180)	-66
Internal floor slab	6.0	0.83	21.0	H(180)	-55
Internal floor slab	17.1	0.83	24.0	H(180)	-200

TOTAL:	-671

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
f_{g1}	Correction factor due to outdoor dry-bulb temperature oscillation
G_W	Correction factor due to basement water
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A	f_{RH}	F_{RH}
(m^2)	(W/m^2)	(W)
63.34	18.00	1140

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
951	0	1140	0.15	2405 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Podrum/7/Kancelarija — Zone: Zone 1

Net floor area = 8.51 m² Net volume = 22.98 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SW)	SW(244)	7.2	0.25	V(90)	75
				TOTAL:	75

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	2.0	2.50	V(90)	201
				TOTAL:	201

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	2.70	0.10	11
Outward	3.40	0.50	70
Outward	3.40	0.50	70
Outward	1.40	0.00	0
Outward	1.40	0.00	0

Outward	1.40	0.00			0
Outward	1.40	0.00			0
				TOTAL:	151

	A (m²)	U (W/(m²·K))	f_{g1}	G_w	Tilt (°)	Thermal loss (W)
Via the ground						
Slab-on-ground floor	8.5	0.30	1.45	1.00	H(180)	80
					TOTAL:	80

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	6.8	1.43	0.33	V(90)	129
Partition wall	9.2	1.43	0.33	V(90)	176
				TOTAL:	305

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	4.8	1.43	12.0	V(90)	61
Interior door	2.0	2.50	12.0	V(90)	45
				TOTAL:	106

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
f_{g1}	Correction factor due to outdoor dry-bulb temperature oscillation

G_w	Correction factor due to basement water
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of different zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	4	-	234
		TOTAL:	234

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
8.51	18.00	153

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
918	234	153	0.15	1501 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/1/Vjetrobran — Zone: Zone 1

Net floor area = 4.92 m² Net volume = 18.19 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 18.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SE)	SE(154)	5.0	0.25	V(90)	49
				TOTAL:	49

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	7.3	2.50	V(90)	690
				TOTAL:	690

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.10	14
Outward	3.33	0.50	63
Outward	3.03	0.00	0
Outward	2.40	0.00	0
Outward	3.03	0.00	0

Outward	2.40	0.00		0
			TOTAL:	77

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	4.7	0.83	0.26	H(180)	39
				TOTAL:	39

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	5.5	1.43	21.0	V(90)	-23
Partition wall	8.6	1.43	20.0	V(90)	-25
Partition wall	5.5	1.78	21.0	V(90)	-29
Internal floor slab	4.9	0.83	21.0	H(180)	-12
Interior window	3.7	2.50	20.0	V(90)	-18
				TOTAL:	-108

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	5	-	246
		TOTAL:	246

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
4.92	18.00	88

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}
(W)	(W)	(W)		
747	246	88	0.15	1244 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/1/Vjetrobran inv — Zone: Zone 1

Net floor area = 3.87 m² Net volume = 14.33 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 18.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SE)	SE(154)	2.8	0.25	V(90)	27
				TOTAL:	27

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	3.2	2.50	V(90)	303
				TOTAL:	303

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.10	14
Outward	1.63	0.50	31
Outward	1.63	0.50	31
Outward	1.33	0.00	0
Outward	2.40	0.00	0

Outward	1.33	0.00	0
Outward	2.40	0.00	0
		TOTAL:	76

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	3.8	0.83	0.26	H(180)	32
				TOTAL:	32

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	8.8	1.43	21.0	V(90)	-38
Partition wall	5.5	1.78	21.0	V(90)	-29
Partition wall	2.6	1.78	20.0	V(90)	-9
Partition wall	4.0	1.43	20.0	V(90)	-12
Internal floor slab	3.9	0.83	21.0	H(180)	-10
Interior door	2.0	2.50	20.0	V(90)	-10
				TOTAL:	-107

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	4	-	194
		TOTAL:	194

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
3.87	18.00	70

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}
(W)	(W)	(W)		
331	194	70	0.15	683 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/2/Portir — Zone: Zone 1

Net floor area = 2.38 m² Net volume = 8.79 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SE)	SE(154)	2.1	0.25	V(90)	22
				TOTAL:	22

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	3.9	2.50	V(90)	395
				TOTAL:	395

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	1.61	0.50	33
Outward	1.61	0.50	33
Outward	1.61	0.00	0
Outward	2.40	0.00	0

Outward	1.61	0.00		0
Outward	2.40	0.00		0
			TOTAL:	66

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.83	0.26	H(180)	21
				TOTAL:	21

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	5.5	1.78	18.0	V(90)	29
Partition wall	5.5	1.78	18.0	V(90)	29
Partition wall	4.0	1.43	20.0	V(90)	6
Interior door	2.0	2.50	20.0	V(90)	5
				TOTAL:	69

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	2	-	90
		TOTAL:	90

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
2.38	18.00	43

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
573	90	43	0.15	811 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/3/Hol — Zone: Zone 1

Net floor area = 39.93 m² Net volume = 147.73 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 20.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	39.9	0.83	0.26	H(180)	352
				TOTAL:	352

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	11.1	1.43	21.0	V(90)	-16
Partition wall	23.2	1.43	21.0	V(90)	-33
Partition wall	20.6	1.43	21.0	V(90)	-29
Partition wall	4.0	1.43	21.0	V(90)	-6
Partition wall	8.6	1.43	18.0	V(90)	25
Partition wall	2.6	1.78	18.0	V(90)	9
Partition wall	4.0	1.43	18.0	V(90)	12
Internal floor slab	32.2	0.83	21.0	H(180)	-27
Interior door	2.0	2.50	21.0	V(90)	-5
Interior door	2.0	2.50	21.0	V(90)	-5

Interior door	2.0	2.50	21.0	V(90)	-5
Interior window	3.7	2.50	18.0	V(90)	18
Interior door	2.0	2.50	18.0	V(90)	10
				TOTAL:	-52

Abbreviations

A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	12	-	630
		TOTAL:	630

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
39.93	18.00	719

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
300	630	719	0.15	1896 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/4/Bife Zone: Zone 1

Net floor area = 30.42 m² Net volume = 112.57 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SE)	SE(154)	9.1	0.25	V(90)	95
Façade (NE)	NE(64)	20.6	0.25	V(90)	215
				TOTAL:	310

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	9.4	2.50	V(90)	959
				TOTAL:	959

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.10	15
Outward	3.70	0.15	23
Outward	4.98	0.50	102
Outward	3.70	0.10	15

Outward	5.52	0.50	113
Outward	1.37	0.50	28
Outward	4.98	0.50	102
Outward	3.90	0.00	0
Outward	2.40	0.00	0
Outward	3.90	0.00	0
Outward	2.40	0.00	0
		TOTAL:	398

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	30.1	0.83	10.0	H(180)	276
Partition wall	5.5	1.43	18.0	V(90)	23
Partition wall	20.6	1.43	20.0	V(90)	29
Interior door	2.0	2.50	20.0	V(90)	5
				TOTAL:	334

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	22	-	1148
		TOTAL:	1148

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
30.42	18.00	548

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
2001	1148	548	0.15	4251 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/5/Kancelarija Zone: Zone 1

Net floor area = 7.18 m² Net volume = 26.54 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (NE)	NE(64)	3.1	0.25	V(90)	32
				TOTAL:	32

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	4.3	2.50	V(90)	444
				TOTAL:	444

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	1.81	0.00	0
Outward	2.40	0.00	0
Outward	1.81	0.00	0
Outward	2.40	0.00	0

			TOTAL:		0
	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	7.2	0.83	10.0	H(180)	66
				TOTAL:	66

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of different zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	5	-	271
		TOTAL:	271

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
7.18	18.00	129

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
542	271	129	0.15	1083 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/6/Prodavnica — Zone: Zone 1

Net floor area = 46.35 m² Net volume = 171.51 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SW)	SW(244)	32.9	0.25	V(90)	343
Façade (SE)	SE(154)	9.1	0.25	V(90)	95
				TOTAL:	437

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
Exterior window	SW(244)	7.2	2.50	V(90)	738
Exterior window	SE(154)	9.4	2.50	V(90)	959
				TOTAL:	2435

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	0.20	0.10	1
Outward	3.40	0.50	70

Outward	9.12	0.50	187
Outward	1.37	0.50	28
Outward	3.70	0.10	15
Outward	4.98	0.50	102
Outward	4.98	0.50	102
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.90	0.00	0
Outward	2.40	0.00	0
Outward	3.90	0.00	0
Outward	2.40	0.00	0
		TOTAL:	505

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	36.8	0.83	0.33	H(180)	412
Partition wall	7.4	1.43	0.02	V(90)	7
Partition wall	8.1	1.43	0.02	V(90)	8
				TOTAL:	427

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	0.5	1.43	2.2	V(90)	14
Partition wall	8.3	1.43	12.0	V(90)	106

Partition wall	8.8	1.43	18.0	V(90)	38
Partition wall	11.1	1.43	20.0	V(90)	16
				TOTAL:	173

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	33	-	1749
		TOTAL:	1749

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
46.35	18.00	834

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
3978	1749	834	0.15	7546 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/7/Hodnik — Zone: Zone 1

Net floor area = 18.74 m² Net volume = 69.36 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (NE)	NE(64)	2.0	0.25	V(90)	21
				TOTAL:	21

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	2.4	2.50	V(90)	244
				TOTAL:	244

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.10	15
Outward	1.20	0.50	25
Outward	0.99	0.00	0
Outward	2.40	0.00	0
Outward	0.99	0.00	0

Outward	2.40	0.00		0
			TOTAL:	40

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	8.1	0.83	0.26	H(180)	74
Internal floor slab	1.7	0.83	0.01	H(180)	1
				TOTAL:	74

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	4.2	0.83	15.0	H(180)	21
Internal floor slab	6.0	0.83	10.0	H(180)	55
Partition wall	0.2	1.43	2.2	V(90)	7
Partition wall	10.8	1.43	15.0	V(90)	92
Partition wall	12.7	1.82	24.0	V(90)	-70
Partition wall	7.5	1.82	24.0	V(90)	-41
Partition wall	18.3	1.82	24.0	V(90)	-100
Partition wall	3.9	1.43	12.0	V(90)	51
Partition wall	23.2	1.43	20.0	V(90)	33
Internal floor slab	0.5	0.83	16.0	H(180)	2
Interior door	2.0	2.50	24.0	V(90)	-15
Interior door	2.0	2.50	20.0	V(90)	5
				TOTAL:	39

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient

U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	13	-	707
		TOTAL:	707

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
18.74	18.00	337

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
419	707	337	0.15	1683 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/8/Kancelarija — Zone: Zone 1

Net floor area = 10.55 m² Net volume = 39.03 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	10.5	0.83	0.33	H(180)	118
Partition wall	8.1	1.43	0.02	V(90)	8
				TOTAL:	126

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	0.4	1.43	2.2	V(90)	12
Partition wall	12.6	1.43	15.0	V(90)	108
Partition wall	0.4	1.43	12.0	V(90)	5
Partition wall	7.3	1.43	12.0	V(90)	93
Partition wall	0.6	1.43	12.0	V(90)	8
				TOTAL:	226

Abbreviations

A	Area

U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	8	-	398
		TOTAL:	398

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
10.55	18.00	190

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
352	398	190	0.15	1081 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/9/Garderoba Zone: Zone 1

Net floor area = 18.88 m² Net volume = 69.84 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 24.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (NE)	NE(64)	12.7	0.25	V(90)	142
				TOTAL:	142

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.20	0.10	14
Outward	3.44	0.50	76
		TOTAL:	90

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	0.5	0.83	0.05	H(180)	1
				TOTAL:	1

	A	U	T_{ad}	Tilt	Thermal loss

	(m²)	(W/(m²·K))	(°C)	(°)	(W)
Via spaces heated at a different temperature					
Internal floor slab	0.5	0.83	16.0	H(180)	3
Internal floor slab	17.1	0.83	10.0	H(180)	200
Partition wall	1.1	1.43	2.2	V(90)	34
Partition wall	1.6	1.43	12.0	V(90)	28
Partition wall	15.9	1.43	12.0	V(90)	273
Partition wall	18.3	1.82	21.0	V(90)	100
Internal floor slab	1.1	0.83	21.0	H(180)	3
Internal floor slab	16.9	0.83	21.0	H(180)	42
Interior door	2.0	2.50	21.0	V(90)	15
				TOTAL:	697

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate	h_V	Thermal loss

	(l/s)		(W)
Ventilation			
Infiltration	14	-	764
		TOTAL:	764

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A	f_{RH}	F_{RH}
(m²)	(W/m²)	(W)
18.88	18.00	340

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}
(W)	(W)	(W)		
931	764	340	0.15	2340 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor

F_{HL} Design thermal load

Loads summary

Peak heating load

Space: Prizemlje/9/Tus (Garderoba) Zone: Zone 1

Net floor area = 6.95 m² Net volume = 25.70 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 24.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	3.2	0.83	0.05	H(180)	6
Internal floor slab	2.1	0.83	0.01	H(180)	1
				TOTAL:	7

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	3.2	0.83	16.0	H(180)	21
Partition wall	0.4	1.43	2.2	V(90)	13
Partition wall	0.6	1.43	12.0	V(90)	11
Partition wall	6.8	1.43	12.0	V(90)	117
Partition wall	12.7	1.82	21.0	V(90)	70
Partition wall	7.5	1.82	21.0	V(90)	41
Internal floor slab	3.5	0.83	21.0	H(180)	9
Internal floor slab	0.4	0.83	16.0	H(180)	3
				TOTAL:	284

Abbreviations	
A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	5	-	281
		TOTAL:	281

Abbreviations	
h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
6.95	18.00	125

Abbreviations	

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
291	281	125	0.15	802 W

Abbreviations	
F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Prizemlje/Stepeniste — Zone: Zone 1

Net floor area = 9.91 m² Net volume = 36.67 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 15.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	0.6	0.83	0.01	H(180)	0
				TOTAL:	0

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Partition wall	0.6	1.43	2.2	V(90)	11
Partition wall	9.3	1.43	12.0	V(90)	40
Partition wall	10.8	1.43	21.0	V(90)	-92
Partition wall	12.6	1.43	21.0	V(90)	-108
Internal floor slab	5.1	0.83	21.0	H(180)	-25
Internal floor slab	3.3	0.83	21.0	H(180)	-16
				TOTAL:	-191

Abbreviations

A	Area

U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
9.91	18.00	178

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
-191	0	178	0.15	-14 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/1/Cekaonica — Zone: Zone 1

Net floor area = 62.87 m² Net volume = 232.82 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (SE)	SE(154)	7.6	0.25	V(90)	79
				TOTAL:	79

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	14.9	2.50	V(90)	1525
				TOTAL:	1525

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.30	0.10	14
Outward	6.80	0.50	139
Outward	6.20	0.00	0
Outward	2.40	0.00	0
Outward	6.20	0.00	0

Outward	2.40	0.00		0
			TOTAL:	153

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	5.9	0.82	1.00	H(180)	198
Partition wall	5.3	1.43	0.01	V(90)	3
Internal floor slab	70.6	3.55	0.20	H(180)	2058
				TOTAL:	2260

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	3.9	0.83	18.0	H(180)	10
Internal floor slab	32.2	0.83	20.0	H(180)	27
Internal floor slab	4.9	0.83	18.0	H(180)	12
				TOTAL:	49

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	45	-	2374
		TOTAL:	2374

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
62.87	18.00	1132

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}
(W)	(W)	(W)		
4065	2374	1132	0.15	8707 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/2/Hodnik — Zone: Zone 1

Net floor area = 51.50 m² Net volume = 169.96 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	5.6	1.43	0.01	V(90)	2
Partition wall	5.5	1.43	0.01	V(90)	2
Partition wall	4.0	1.43	0.01	V(90)	2
Partition wall	6.9	1.43	0.01	V(90)	4
Internal floor slab	51.5	3.55	0.20	H(180)	1502
Interior door	2.0	2.50	0.01	V(90)	2
				TOTAL:	1514

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	10.5	0.83	2.2	H(180)	165
Internal floor slab	5.1	0.83	15.0	H(180)	25
Internal floor slab	18.5	0.83	2.2	H(180)	291
Internal floor slab	3.5	0.83	24.0	H(180)	-9
Internal floor slab	10.5	0.83	2.2	H(180)	164

Internal floor slab	1.1	0.83	24.0	H(180)	-3
Partition wall	3.1	1.43	16.0	V(90)	22
Partition wall	3.1	1.43	16.0	V(90)	22
Partition wall	12.2	1.43	16.0	V(90)	87
Partition wall	6.6	1.43	16.0	V(90)	47
Partition wall	12.2	1.43	16.0	V(90)	87
				TOTAL:	899

Abbreviations

A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	33	-	1733
		TOTAL:	1733

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
51.50	18.00	927

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
2413	1733	927	0.15	5834 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/3/Sastanci direktor (Kancelarija) Zone: Zone 1

Net floor area = 13.35 m² Net volume = 47.35 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	3.2	0.29	H(0)	39
Roof	N(0)	0.5	0.29	H(0)	6
Façade (SW)	SW(244)	9.5	0.25	V(90)	99
Façade (SE)	SE(154)	7.6	0.25	V(90)	79
				TOTAL:	223

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	9.4	2.50	V(90)	959
				TOTAL:	959

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.15	23
Outward	1.37	0.50	28

Outward	2.57	0.75		79
Outward	3.56	0.50		73
Outward	1.22	0.75		37
Outward	3.90	0.00		0
Outward	2.40	0.00		0
Outward	3.90	0.00		0
Outward	2.40	0.00		0
			TOTAL:	240

	A (m^2)	U ($W/(m^2 \cdot K)$)	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	4.3	0.82	1.00	H(180)	145
Partition wall	0.5	1.43	0.20	V(90)	6
Internal floor slab	9.6	3.55	0.20	H(180)	279
				TOTAL:	430

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	9	-	483
		TOTAL:	483

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
13.35	18.00	240

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1854	483	240	0.15	2963 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity

f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/4/Kancelarija — Zone: Zone 1

Net floor area = 13.36 m² Net volume = 47.14 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.5	0.29	H(0)	6
Roof	N(0)	2.7	0.29	H(0)	32
Façade (SE)	SE(154)	7.5	0.25	V(90)	78
Façade (NE)	NE(64)	9.5	0.25	V(90)	99
				TOTAL:	216

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SE(154)	9.4	2.50	V(90)	959
				TOTAL:	959

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.78	0.50	78
Outward	1.00	0.75	31

Outward	1.37	0.50		28
Outward	2.57	0.75		79
Outward	3.90	0.00		0
Outward	2.40	0.00		0
Outward	3.90	0.00		0
Outward	2.40	0.00		0
			TOTAL:	215

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	4.3	0.82	1.00	H(180)	145
Partition wall	0.5	1.43	0.20	V(90)	6
Internal floor slab	10.1	3.55	0.20	H(180)	296
				TOTAL:	447

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	9	-	481
		TOTAL:	481

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
13.36	18.00	240

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1838	481	240	0.15	2943 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity

f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/5/Kancelarija — Zone: Zone 1

Net floor area = 23.32 m² Net volume = 82.96 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.8	0.29	H(0)	9
Roof	N(0)	7.8	0.29	H(0)	94
Façade (SE)	SE(154)	2.5	0.25	V(90)	26
Façade (NE)	NE(64)	7.2	0.25	V(90)	75
				TOTAL:	203

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	0.67	0.75	21
Outward	3.88	0.75	119

Outward	3.00	0.00			0
Outward	2.40	0.00			0
Outward	3.00	0.00			0
Outward	2.40	0.00			0
				TOTAL:	140

	A (m^2)	U ($W/(m^2 \cdot K)$)	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.6	0.82	1.00	H(180)	87
Partition wall	0.8	1.43	0.20	V(90)	9
Internal floor slab	14.8	3.55	0.20	H(180)	430
				TOTAL:	527

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)

Ventilation

Infiltration	16	-	846
		TOTAL:	846

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
23.32	18.00	420

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1608	846	420	0.15	3305 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/6/Sekretarica (Kancelarija) Zone: Zone 1

Net floor area = 8.58 m² Net volume = 28.31 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	7.3	1.43	0.02	V(90)	7
Internal floor slab	8.6	3.55	0.20	H(180)	250
				TOTAL:	258

Abbreviations

A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	6	-	289
		TOTAL:	289

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
8.58	18.00	154

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
258	289	154	0.15	806 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor

F_{HL} Design thermal load

Peak heating load

Space: Sprat/7/Direktor (Kancelarija) Zone: Zone 1

Net floor area = 13.95 m² Net volume = 52.36 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	8.6	0.29	H(0)	104
Roof	N(0)	0.8	0.29	H(0)	9
Façade (SW)	SW(244)	7.2	0.25	V(90)	75
Façade (SE)	SE(154)	2.5	0.25	V(90)	26
				TOTAL:	213

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.88	0.75	119
Outward	0.67	0.75	21

Outward	3.00	0.00			0
Outward	2.40	0.00			0
Outward	3.00	0.00			0
Outward	2.40	0.00			0
				TOTAL:	140

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.6	0.82	1.00	H(180)	87
Partition wall	0.8	1.43	0.20	V(90)	9
Internal floor slab	4.5	3.55	0.20	H(180)	132
				TOTAL:	229

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)

Ventilation			
Infiltration	10	-	534
		TOTAL:	534

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
13.95	18.00	251

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1320	534	251	0.15	2421 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/8/Kancelarija — Zone: Zone 1

Net floor area = 20.32 m² Net volume = 72.28 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.7	0.29	H(0)	8
Roof	N(0)	6.8	0.29	H(0)	82
Façade (NE)	NE(64)	5.4	0.25	V(90)	56
				TOTAL:	146

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.40	0.75	104
Outward	3.00	0.00	0
Outward	2.40	0.00	0

Outward	3.00	0.00		0
Outward	2.40	0.00		0
			TOTAL:	104

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	76
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.8	3.55	0.20	H(180)	375
				TOTAL:	459

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	14	-	737

TOTAL:	737

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
20.32	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1447	737	366	0.15	2932 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/9/Kancelarija Zone: Zone 1

Net floor area = 15.06 m² Net volume = 55.23 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	7.5	0.29	H(0)	91
Roof	N(0)	0.7	0.29	H(0)	8
Façade (SW)	SW(244)	5.4	0.25	V(90)	56
				TOTAL:	155

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.40	0.75	105
Outward	3.00	0.00	0
Outward	2.40	0.00	0

Outward	3.00	0.00		0
Outward	2.40	0.00		0
			TOTAL:	105

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	77
Partition wall	6.6	1.43	0.02	V(90)	7
Partition wall	7.3	1.43	0.02	V(90)	7
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	6.8	3.55	0.20	H(180)	199
				TOTAL:	298

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)

Ventilation

Infiltration	11	-	563
		TOTAL:	563

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
15.06	18.00	271

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1295	563	271	0.15	2449 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/10/Kancelarija — Zone: Zone 1

Net floor area = 20.33 m² Net volume = 72.61 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	7.5	0.29	H(0)	91
Roof	N(0)	0.7	0.29	H(0)	8
Façade (SW)	SW(244)	5.4	0.25	V(90)	56
				TOTAL:	155

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.10	15
Outward	3.40	0.75	105
Outward	3.00	0.00	0

Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
		TOTAL:	120

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	77
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.1	3.55	0.20	H(180)	353
				TOTAL:	438

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			

Infiltration	14	-	740
		TOTAL:	740

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
20.33	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1450	740	366	0.15	2940 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/11/Kancelarija Zone: Zone 1

Net floor area = 20.34 m² Net volume = 72.36 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.7	0.29	H(0)	8
Roof	N(0)	6.8	0.29	H(0)	82
Façade (NE)	NE(64)	5.4	0.25	V(90)	56
				TOTAL:	146

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.10	15
Outward	3.40	0.75	105
Outward	3.00	0.00	0

Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
		TOTAL:	120

	A (m^2)	U ($W/(m^2 \cdot K)$)	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	76
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.9	3.55	0.20	H(180)	375
				TOTAL:	459

	A (m^2)	U ($W/(m^2 \cdot K)$)	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	16.9	0.83	24.0	H(180)	-42
				TOTAL:	-42

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	14	-	738
		TOTAL:	738

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
20.34	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}

(W)	(W)	(W)		
1421	738	366	0.15	2903 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/12/Kancelarija Zone: Zone 1

Net floor area = 20.35 m² Net volume = 72.69 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	7.5	0.29	H(0)	91
Roof	N(0)	0.7	0.29	H(0)	8
Façade (SW)	SW(244)	5.4	0.25	V(90)	56
				TOTAL:	155

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.40	0.75	105
Outward	3.00	0.00	0
Outward	2.40	0.00	0

Outward	3.00		0.00		0
Outward	2.40		0.00		0
				TOTAL:	105

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	77
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.1	3.55	0.20	H(180)	354
				TOTAL:	438

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	16.9	0.83	2.2	H(180)	266
				TOTAL:	266

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	14	-	741
		TOTAL:	741

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
20.35	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1701	741	366	0.15	3230 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/13/Kancelarija — Zone: Zone 1

Net floor area = 20.32 m² Net volume = 72.29 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.7	0.29	H(0)	8
Roof	N(0)	6.8	0.29	H(0)	82
Façade (NE)	NE(64)	5.4	0.25	V(90)	56
				TOTAL:	146

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.40	0.75	104
Outward	3.00	0.00	0
Outward	2.40	0.00	0

Outward	3.00		0.00		0
Outward	2.40		0.00		0
				TOTAL:	104

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	76
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.8	3.55	0.20	H(180)	375
				TOTAL:	459

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	16.9	0.83	2.2	H(180)	265
				TOTAL:	265

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	14	-	737
		TOTAL:	737

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
20.32	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1712	737	366	0.15	3238 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/14/Kancelarija — Zone: Zone 1

Net floor area = 20.32 m² Net volume = 72.61 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	7.5	0.29	H(0)	91
Roof	N(0)	0.7	0.29	H(0)	8
Façade (SW)	SW(244)	5.4	0.25	V(90)	56
				TOTAL:	155

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.40	0.75	105
Outward	3.00	0.00	0
Outward	2.40	0.00	0

Outward	3.00		0.00		0
Outward	2.40		0.00		0
				TOTAL:	105

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	77
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.1	3.55	0.20	H(180)	353
				TOTAL:	438

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	16.9	0.83	2.2	H(180)	265
				TOTAL:	265

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	14	-	740
		TOTAL:	740

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
20.32	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1700	740	366	0.15	3227 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/15/Kancelarija — Zone: Zone 1

Net floor area = 20.35 m² Net volume = 72.38 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.7	0.29	H(0)	8
Roof	N(0)	6.8	0.29	H(0)	82
Façade (NE)	NE(64)	5.4	0.25	V(90)	56
				TOTAL:	146

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.40	0.75	105
Outward	3.00	0.00	0
Outward	2.40	0.00	0

Outward	3.00		0.00		0
Outward	2.40		0.00		0
				TOTAL:	105

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.3	0.82	1.00	H(180)	76
Partition wall	0.7	1.43	0.20	V(90)	8
Internal floor slab	12.9	3.55	0.20	H(180)	375
				TOTAL:	459

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	16.9	0.83	2.2	H(180)	266
				TOTAL:	266

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	14	-	738
		TOTAL:	738

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
20.35	18.00	366

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1714	738	366	0.15	3241 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/16/Kancelarija — Zone: Zone 1

Net floor area = 23.31 m² Net volume = 83.25 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	8.6	0.29	H(0)	104
Roof	N(0)	0.8	0.29	H(0)	9
Façade (SW)	SW(244)	7.2	0.25	V(90)	75
Façade (NW)	NW(334)	2.5	0.25	V(90)	26
				TOTAL:	213

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	SW(244)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.70	0.15	23
Outward	3.70	0.10	15

Outward	3.88	0.75	119
Outward	0.67	0.75	21
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
		TOTAL:	178

	A (m^2)	U ($W/(m^2 \cdot K)$)	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.6	0.82	1.00	H(180)	87
Partition wall	0.8	1.43	0.20	V(90)	9
Internal floor slab	13.9	3.55	0.20	H(180)	405
				TOTAL:	502

	A (m^2)	U ($W/(m^2 \cdot K)$)	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	19.4	0.83	2.2	H(180)	304
				TOTAL:	304

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length

Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	16	-	849
		TOTAL:	849

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
23.31	18.00	420

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1936	849	420	0.15	3685 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/17/Kancelarija Zone: Zone 1

Net floor area = 23.31 m² Net volume = 82.92 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.8	0.29	H(0)	9
Roof	N(0)	7.8	0.29	H(0)	94
Façade (NW)	NW(334)	2.5	0.25	V(90)	26
Façade (NE)	NE(64)	7.2	0.25	V(90)	75
				TOTAL:	203

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NE(64)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	0.67	0.75	21
Outward	3.88	0.75	119

Outward	3.70	0.10		15
Outward	3.00	0.00		0
Outward	2.40	0.00		0
Outward	3.00	0.00		0
Outward	2.40	0.00		0
			TOTAL:	155

	A (m^2)	U ($W/(m^2 \cdot K)$)	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	2.6	0.82	1.00	H(180)	87
Partition wall	0.8	1.43	0.20	V(90)	9
Internal floor slab	14.7	3.55	0.20	H(180)	430
				TOTAL:	526

	A (m^2)	U ($W/(m^2 \cdot K)$)	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	19.4	0.83	2.2	H(180)	305
				TOTAL:	305

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	16	-	846
		TOTAL:	846

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
23.31	18.00	420

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}

(W)	(W)	(W)		
1927	846	420	0.15	3671 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/18/Kancelarija Zone: Zone 1

Net floor area = 19.65 m² Net volume = 68.44 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	3.6	0.29	H(0)	43
Roof	N(0)	0.6	0.29	H(0)	7
Façade (SW)	SW(244)	10.5	0.25	V(90)	109
Façade (NW)	NW(334)	15.3	0.25	V(90)	160
				TOTAL:	319

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NW(334)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	2.83	0.75	87
Outward	3.30	0.10	14

Outward	5.27	0.50	108
Outward	1.21	0.75	37
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
		TOTAL:	246

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	0.6	1.43	0.20	V(90)	7
Internal floor slab	15.5	3.55	0.20	H(180)	452
				TOTAL:	459

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	19.6	0.83	2.2	H(180)	308
				TOTAL:	308

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge

T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	13	-	698
		TOTAL:	698

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
19.65	18.00	354

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}

(W)	(W)	(W)		
2069	698	354	0.15	3589 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/19/Kancelarija Zone: Zone 1

Net floor area = 19.64 m² Net volume = 68.16 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Roof	N(0)	0.6	0.29	H(0)	7
Roof	N(0)	2.9	0.29	H(0)	35
Façade (NW)	NW(334)	15.2	0.25	V(90)	159
Façade (NE)	NE(64)	10.5	0.25	V(90)	109
				TOTAL:	310

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NW(334)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	6.68	0.50	137
Outward	5.48	0.50	112

Outward	1.00	0.75	31
Outward	2.83	0.50	58
Outward	2.83	0.75	87
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0
Outward	2.40	0.00	0
		TOTAL:	425

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	0.6	1.43	0.20	V(90)	7
Internal floor slab	16.1	3.55	0.20	H(180)	470
				TOTAL:	477

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	19.6	0.83	2.2	H(180)	308
				TOTAL:	308

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length

Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_V	Thermal loss (W)
Ventilation			
Infiltration	13	-	695
		TOTAL:	695

Abbreviations

h_V	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
19.64	18.00	354

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
2258	695	354	0.15	3802 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/20/Relax Zona (Kancelarija) Zone: Zone 1

Net floor area = 10.00 m² Net volume = 32.99 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	Ori. (°)	A (m²)	U (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (opaque surface elements)					
Façade (NW)	NW(334)	4.0	0.25	V(90)	42
				TOTAL:	42

	Ori. (°)	A (m²)	U_{global} (W/(m²·K))	Tilt (°)	Thermal loss (W)
Outside (fenestration)					
Exterior window	NW(334)	7.2	2.50	V(90)	738
				TOTAL:	738

	Length (m)	Y (W/(m²·K))	Thermal loss (W)
Outside (linear thermal bridges)			
Outward	3.30	0.10	14
Outward	3.40	0.50	70
Outward	3.00	0.00	0
Outward	2.40	0.00	0
Outward	3.00	0.00	0

Outward	2.40	0.00			0
				TOTAL:	83

	A (m^2)	U ($W/(m^2 \cdot K)$)	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	10.0	3.55	0.20	H(180)	292
				TOTAL:	292

	A (m^2)	U ($W/(m^2 \cdot K)$)	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	10.0	0.83	2.2	H(180)	157
				TOTAL:	157

Abbreviations

Ori.	Orientation
A	Area
U	Heat transmission coefficient
U_{global}	Fenestration global thermic coeficient
e_k	Orientation correction factor
b_u	Adjacent space correction factor
Tilt	Tilt angle
Length	Length
Y	Linear thermal transmission coefficient of the thermal bridge
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of different zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	6	-	336
		TOTAL:	336

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A (m^2)	f_{RH} (W/m^2)	F_{RH} (W)
10.00	18.00	180

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
1311	336	180	0.15	2102 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/22/Toalet — Zone: Zone 1

Net floor area = 7.05 m² Net volume = 23.27 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 16.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	5.5	1.43	0.01	V(90)	2
Internal floor slab	7.1	3.55	0.20	H(180)	181
				TOTAL:	183

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	3.5	0.83	2.2	H(180)	40
Internal floor slab	3.2	0.83	2.2	H(180)	37
Partition wall	4.5	1.43	21.0	V(90)	-32
Partition wall	3.1	1.43	21.0	V(90)	-22
Partition wall	3.1	1.43	21.0	V(90)	-22
Partition wall	12.2	1.43	21.0	V(90)	-87
Interior door	1.8	2.50	21.0	V(90)	-22
				TOTAL:	-109

Abbreviations	
A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A	f_{RH}	F_{RH}
(m^2)	(W/m^2)	(W)
7.05	18.00	127

Abbreviations	
f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T	F_V	F_{RH}	f_S	F_{HL}
(W)	(W)	(W)		
74	0	127	0.15	231 W

Abbreviations	
F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor

F_{HL}	Design thermal load

Peak heating load

Space: Sprat/23/Toalet — Zone: Zone 1

Net floor area = 4.00 m² Net volume = 13.19 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 16.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Internal floor slab	4.0	3.55	0.20	H(180)	102
				TOTAL:	102

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	4.0	0.83	2.2	H(180)	46
Partition wall	4.6	1.43	21.0	V(90)	-33
Partition wall	6.6	1.43	21.0	V(90)	-47
Interior door	2.0	2.50	21.0	V(90)	-25
				TOTAL:	-59

Abbreviations

A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor

Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
4.00	18.00	72

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
44	0	72	0.15	133 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/24/Toalet — Zone: Zone 1

Net floor area = 7.07 m² Net volume = 23.35 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 16.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	5.6	1.43	0.01	V(90)	2
Partition wall	1.8	1.43	0.01	V(90)	1
Partition wall	3.1	1.43	0.01	V(90)	2
Internal floor slab	7.1	3.55	0.20	H(180)	181
				TOTAL:	186

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	0.5	0.83	21.0	H(180)	-2
Internal floor slab	5.8	0.83	2.2	H(180)	66
Internal floor slab	0.4	0.83	24.0	H(180)	-3
Partition wall	4.5	1.43	21.0	V(90)	-32
Partition wall	0.7	1.43	21.0	V(90)	-5
Partition wall	12.2	1.43	21.0	V(90)	-87
Interior door	1.8	2.50	21.0	V(90)	-22

TOTAL: -84

Abbreviations

A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Thermal heating capacity

A (m²)	f_{RH} (W/m²)	F_{RH} (W)
7.07	18.00	127

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
102	0	127	0.15	263 W

Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration

F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

Peak heating load

Space: Sprat/25/Hodnik Zone: Zone 1

Net floor area = 7.45 m² Net volume = 24.58 m³

Design conditions

Indoor:	Outdoor:
Indoor design temperature = 21.0 °C	Design external temperature = -20.0 °C
	Annual average external temperature = -0.6 °C

Design thermal loss due to transmission

	A (m²)	U (W/(m²·K))	b_u	Tilt (°)	Thermal loss (W)
Via an unheated space (surface elements)					
Partition wall	2.2	1.78	0.01	V(90)	1
Partition wall	2.2	1.78	0.01	V(90)	1
Internal floor slab	7.4	3.55	0.20	H(180)	217
Interior door	1.8	2.50	0.01	V(90)	1
Interior door	1.8	2.50	0.01	V(90)	1
				TOTAL:	222

	A (m²)	U (W/(m²·K))	T_{ad} (°C)	Tilt (°)	Thermal loss (W)
Via spaces heated at a different temperature					
Internal floor slab	7.1	0.83	2.2	H(180)	111
Internal floor slab	0.1	0.83	2.2	H(180)	2
Partition wall	4.5	1.43	16.0	V(90)	32
Partition wall	4.6	1.43	16.0	V(90)	33
Partition wall	4.5	1.43	16.0	V(90)	32
Interior door	1.8	2.50	16.0	V(90)	22

Interior door	2.0	2.50	16.0	V(90)	25
Interior door	1.8	2.50	16.0	V(90)	22
				TOTAL:	279

Abbreviations

A	Area
U	Heat transmission coefficient
b_u	Adjacent space correction factor
Tilt	Tilt angle
T_{ad}	Indoor temperature of the adjacent space. (In heat transfer between spaces of diferent zones the mean temperature between indoor design temperature and outdoor dry-bulb temperature is considered as indoor temperature of the adjacent space).

Design thermal loss due to ventilation and infiltration

	Airflow rate (l/s)	h_v	Thermal loss (W)
Ventilation			
Infiltration	5	-	251
		TOTAL:	251

Abbreviations

h_v	Thermal efficiency of the heat recovery system

Thermal heating capacity

A	f_{RH}	F_{RH}
(m²)	(W/m²)	(W)
7.45	18.00	134

Abbreviations

f_{RH}	Re-heating factor
F_{RH}	Thermal re-heating capacity

Design thermal load

F_T (W)	F_V (W)	F_{RH} (W)	f_S	F_{HL}
501	251	134	0.15	1019 W

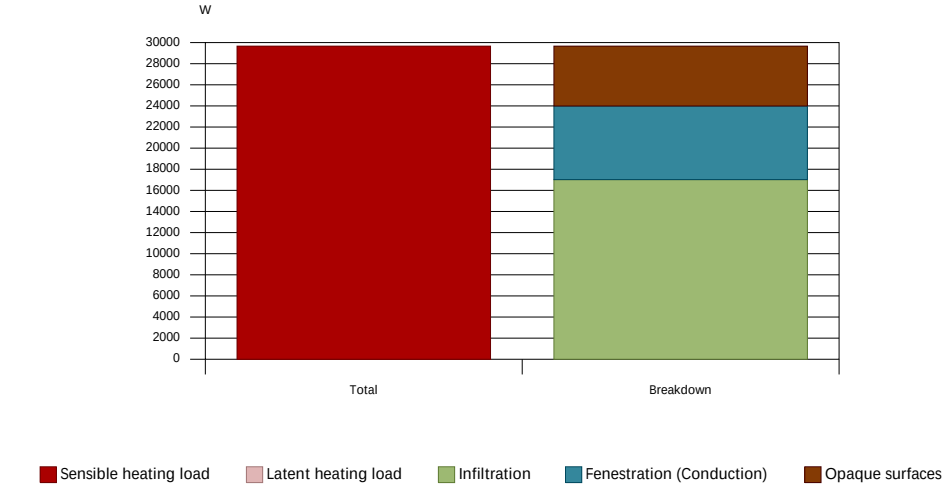
Abbreviations

F_T	Design thermal loss due to transmission
F_V	Design thermal loss due to ventilation and infiltration
F_{RH}	Thermal re-heating capacity
f_S	Thermal loads safety factor
F_{HL}	Design thermal load

2.3. Graphs

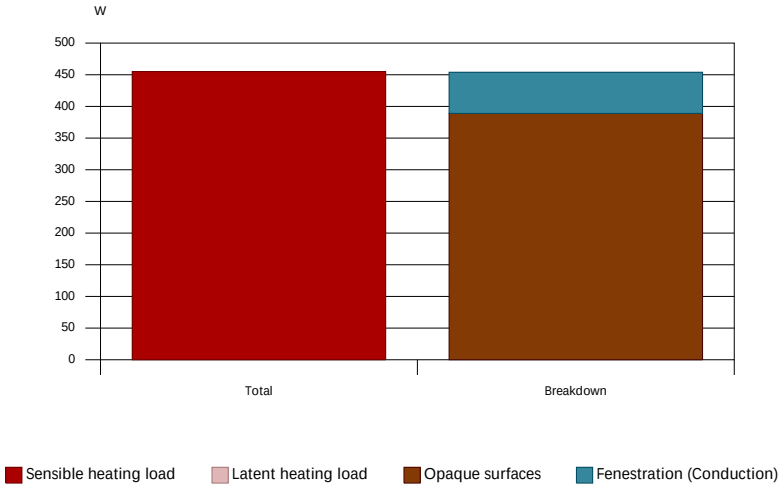
Podrum/Garaza 1 (Garaza 12)

Peak heating load



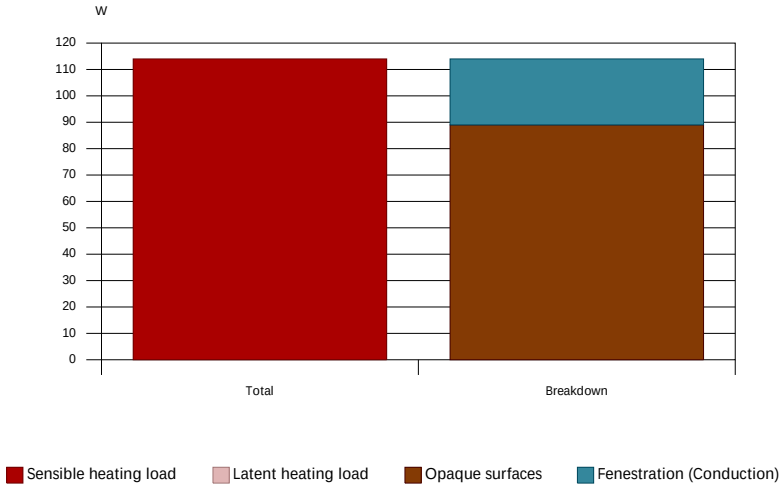
Podrum/1/Stepeniste

Peak heating load



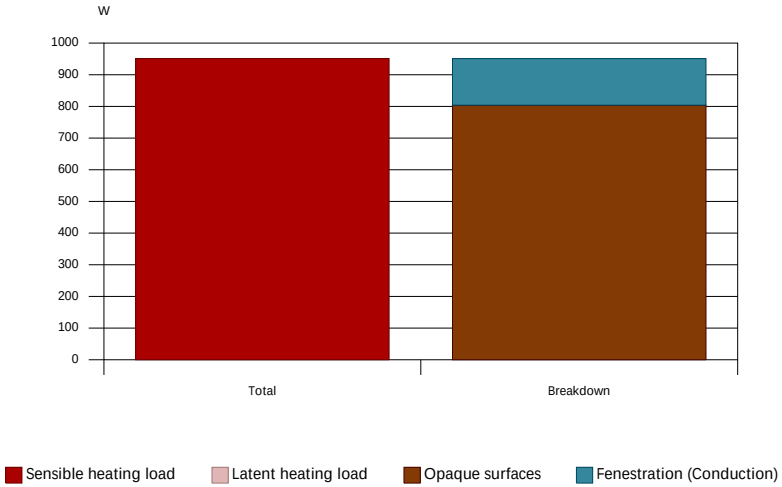
Podrum / 2 / Toalet

Peak heating load



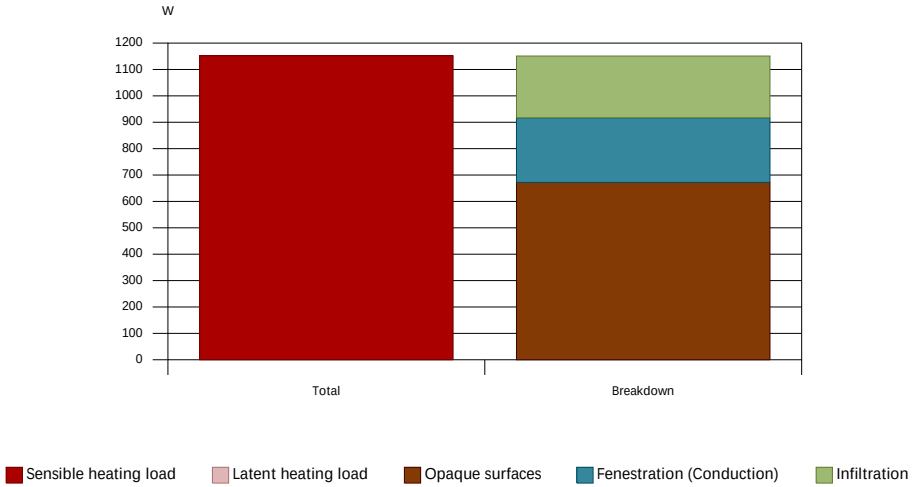
Podrum / 4 / Tehnicka prostorija (Podstanica)

Peak heating load



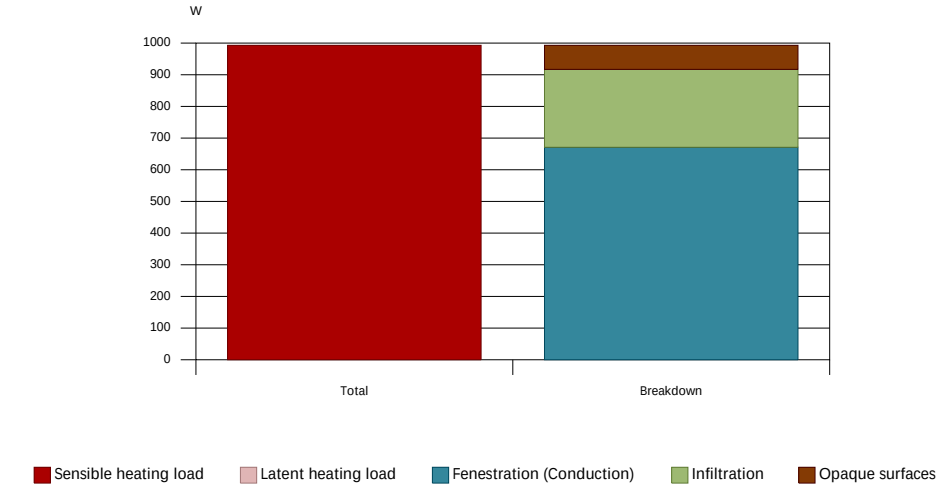
Podrum/7/Kancelarija

Peak heating load



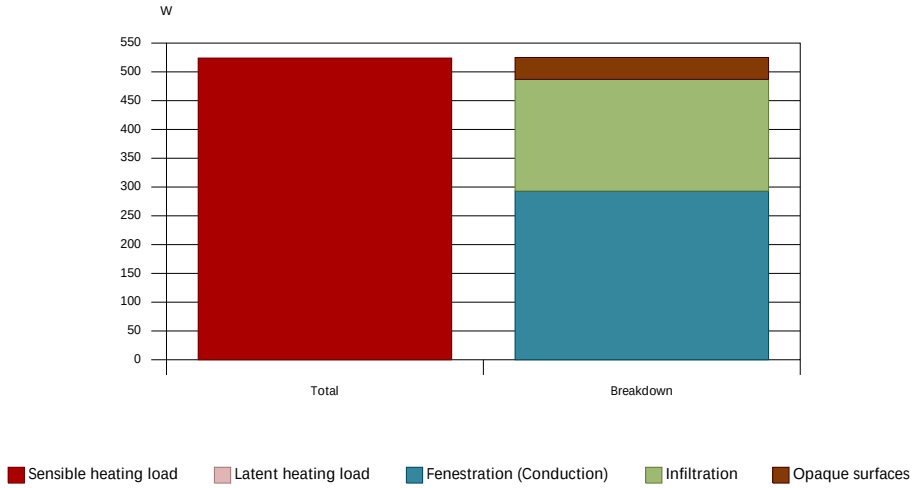
Prizemlje/1/Vjetrobran

Peak heating load



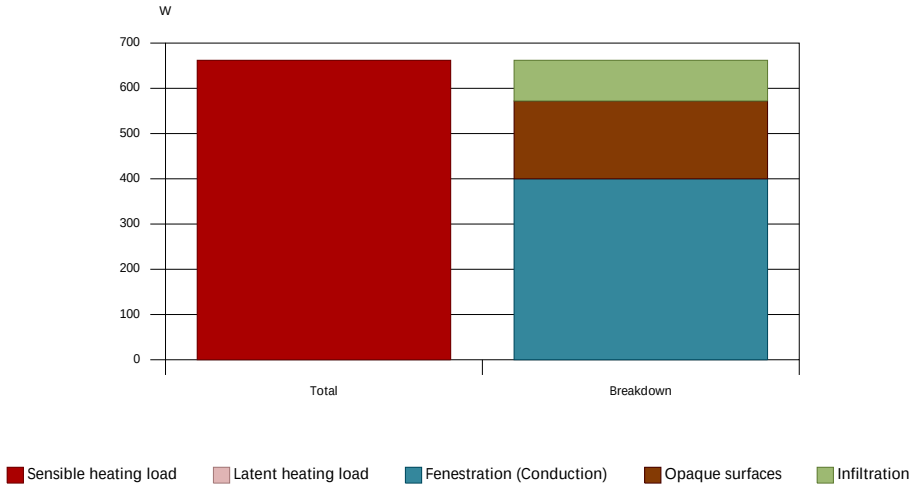
Prizemlje/1/Vjetrobran inv

Peak heating load



Prizemlje/2/Portir

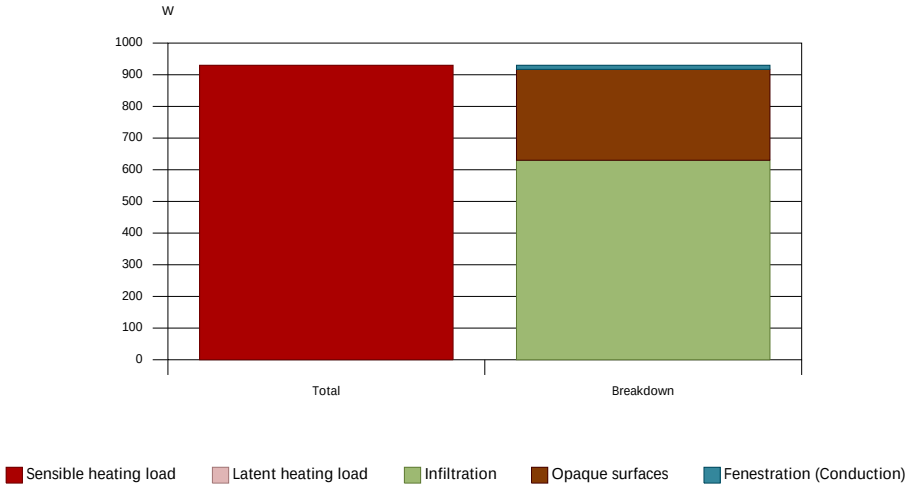
Peak heating load



Loads summary

Prizemlje/3/Hol

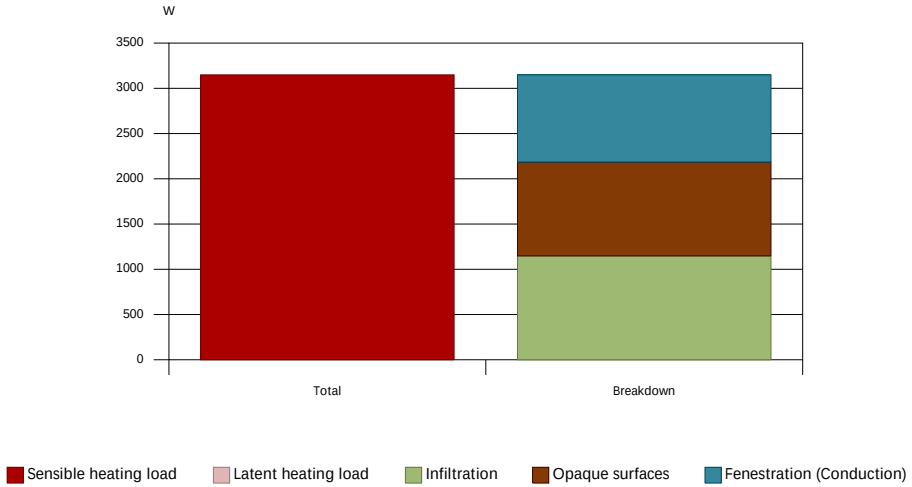
Peak heating load



Loads summary

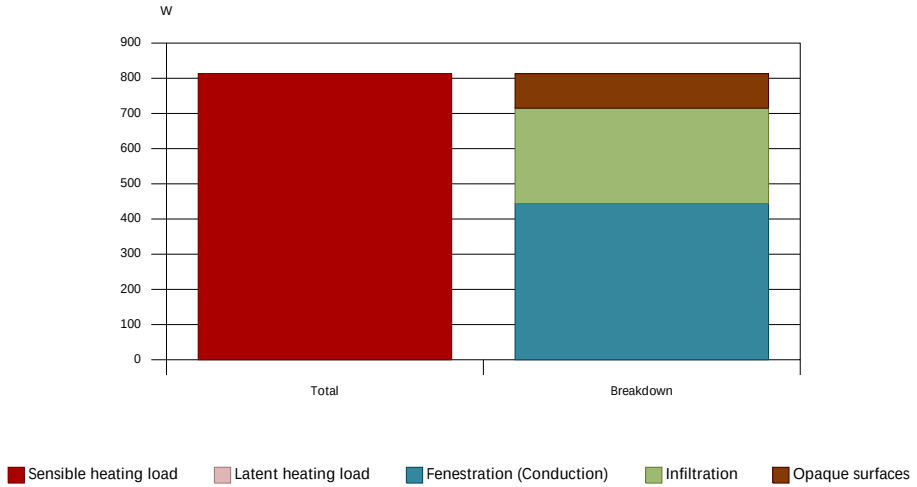
Prizemlje/4/Bife

Peak heating load



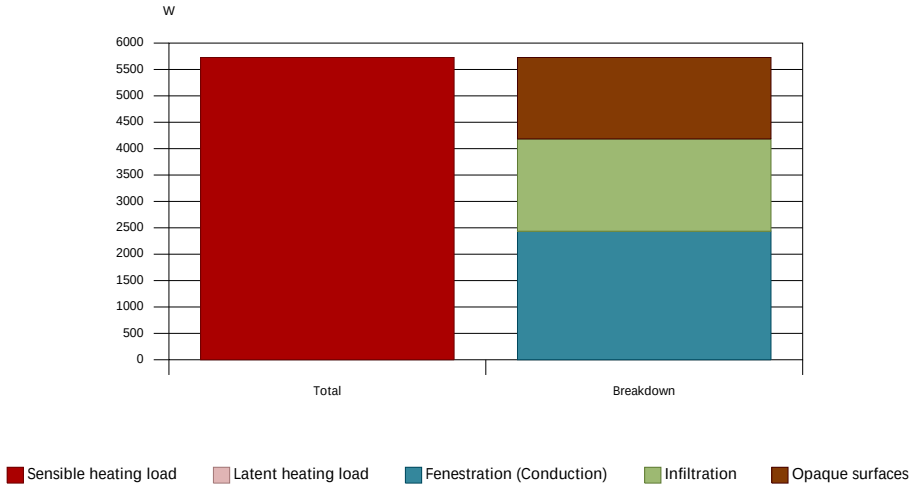
Prizemlje/5/Kancelarija

Peak heating load



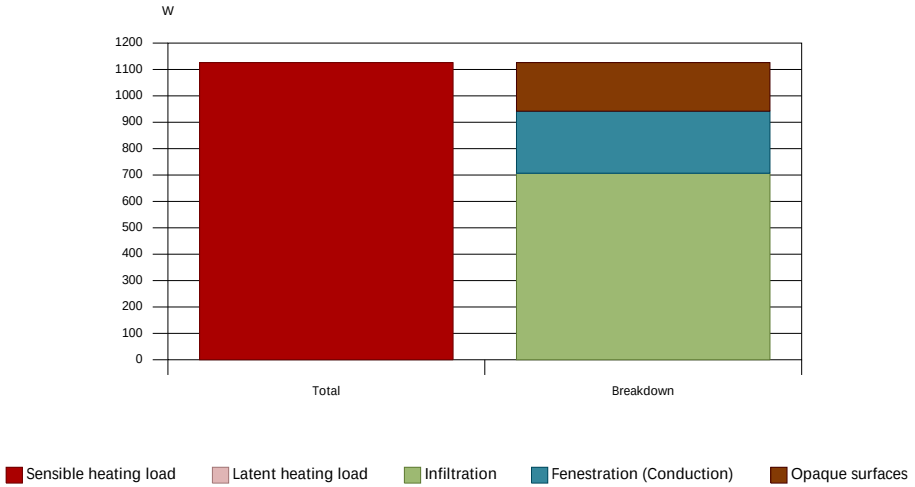
Prizemlje/6/Prodavnica

Peak heating load



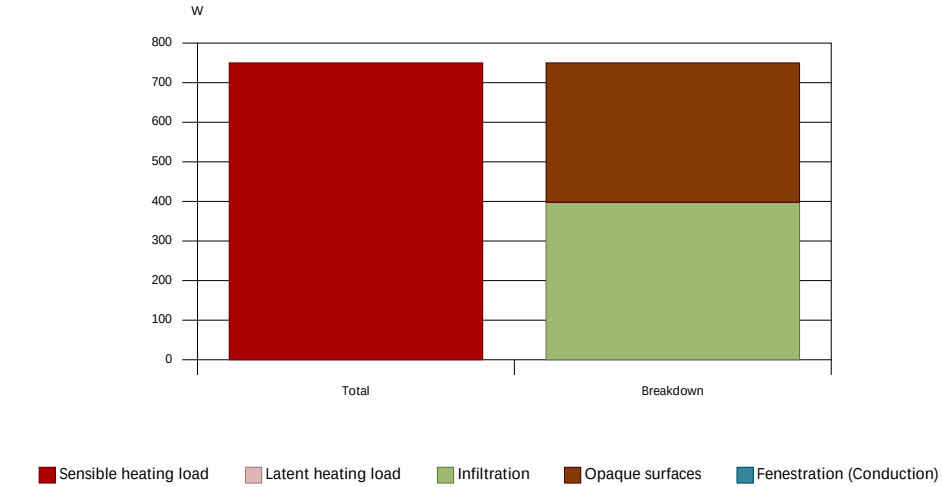
Prizemlje/7/Hodnik

Peak heating load



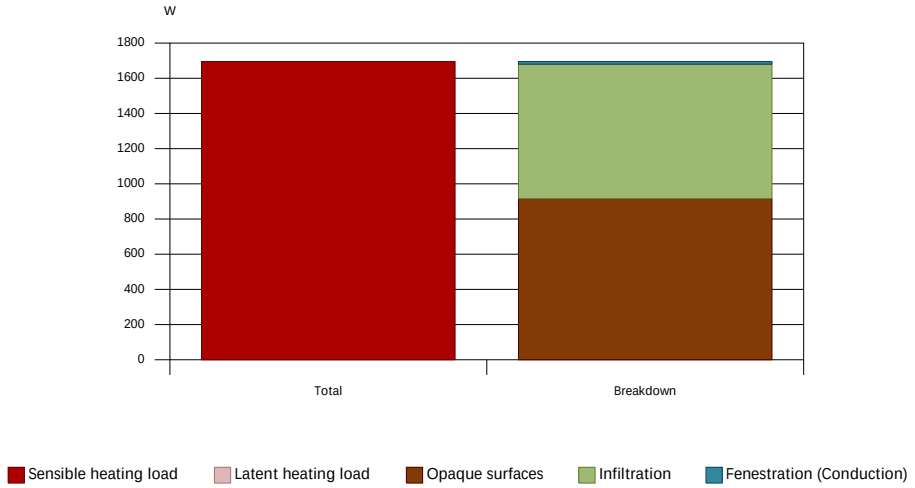
Prizemlje/8/Kancelarija

Peak heating load



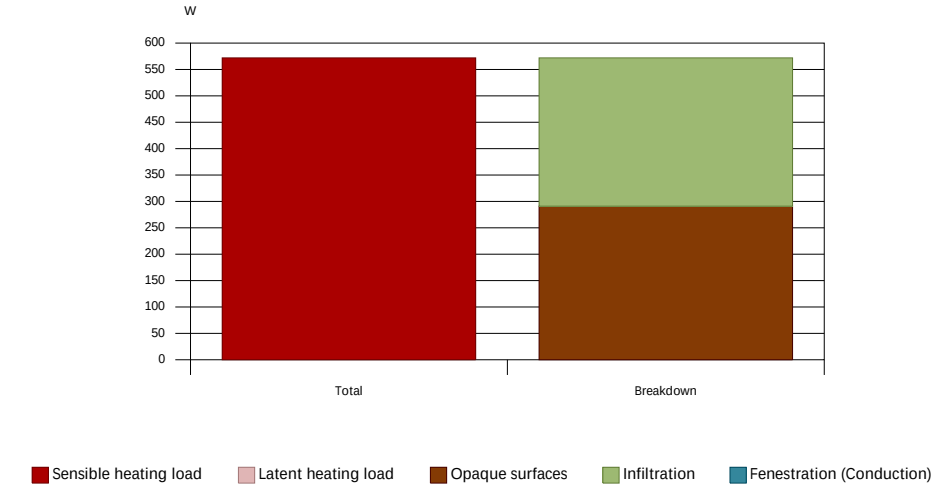
Prizemlje/9/Garderoba

Peak heating load



Prizemlje/9/Tus (Garderoba)

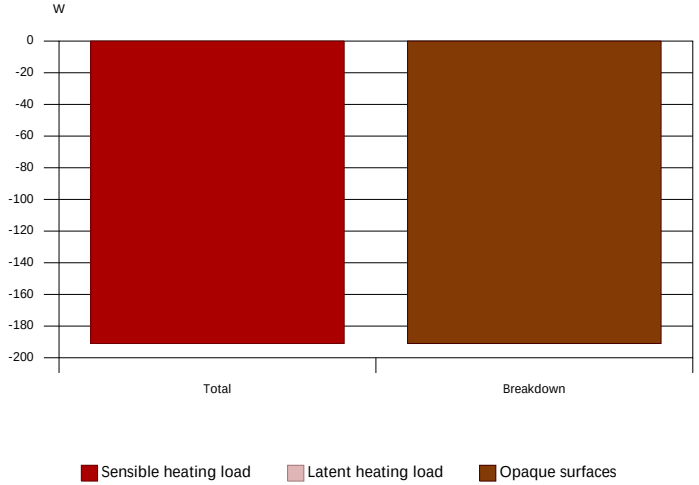
Peak heating load



Loads summary

Prizemlje/Stepeniste

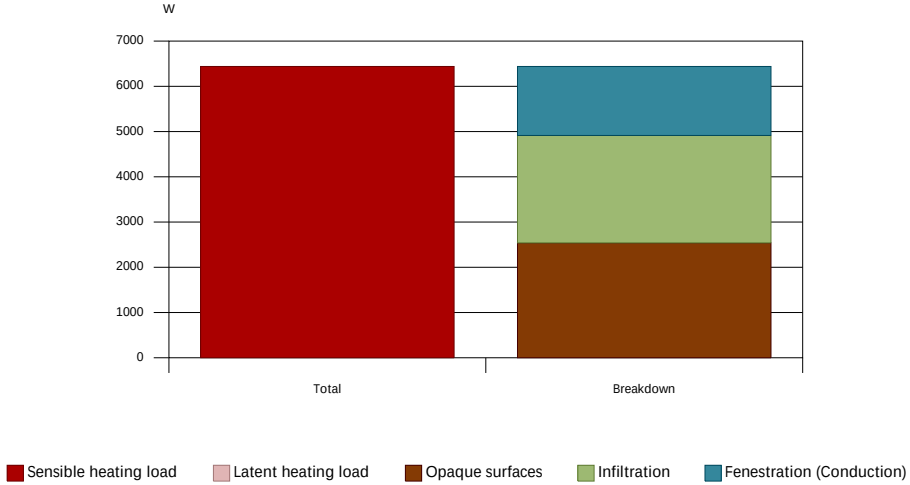
Peak heating load



Loads summary

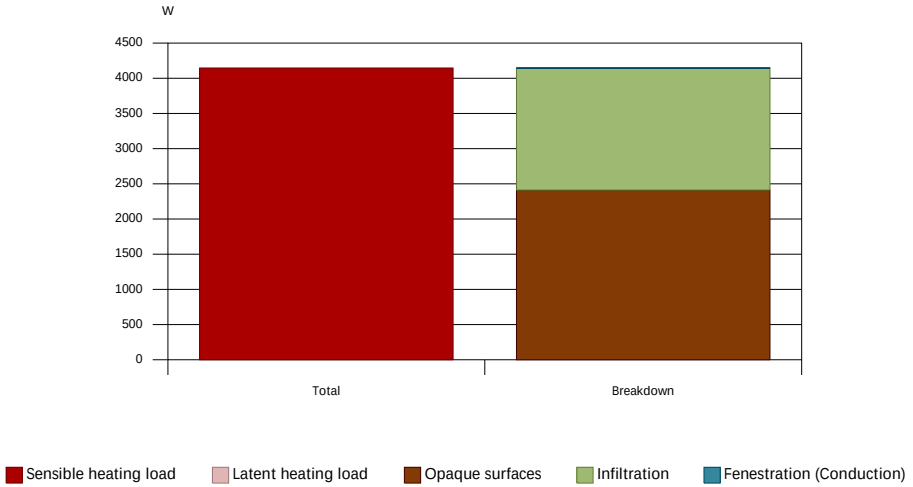
Sprat/1/Cekaonica

Peak heating load



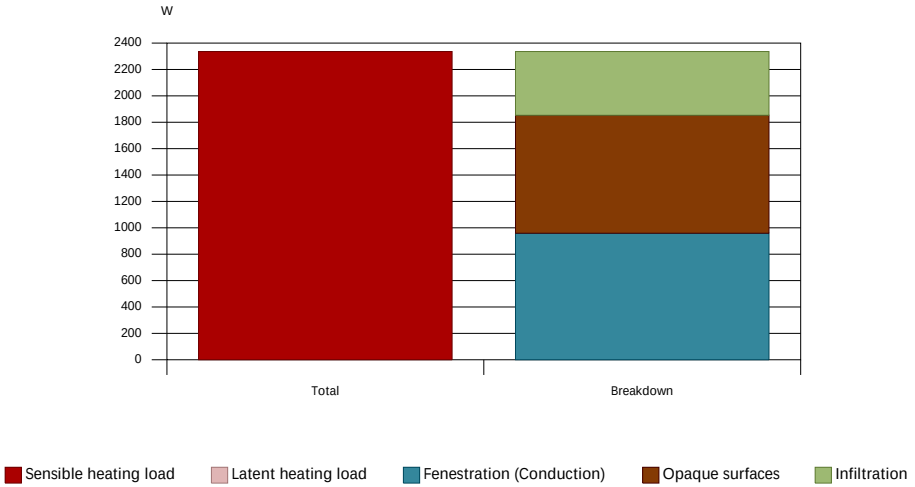
Sprat/2/Hodnik

Peak heating load



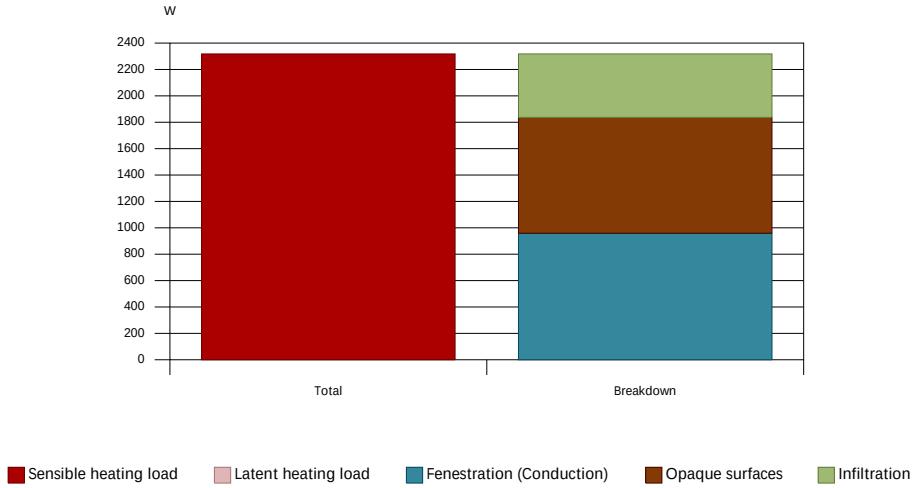
Sprat/3/Sastanci direktor (Kancelarija)

Peak heating load



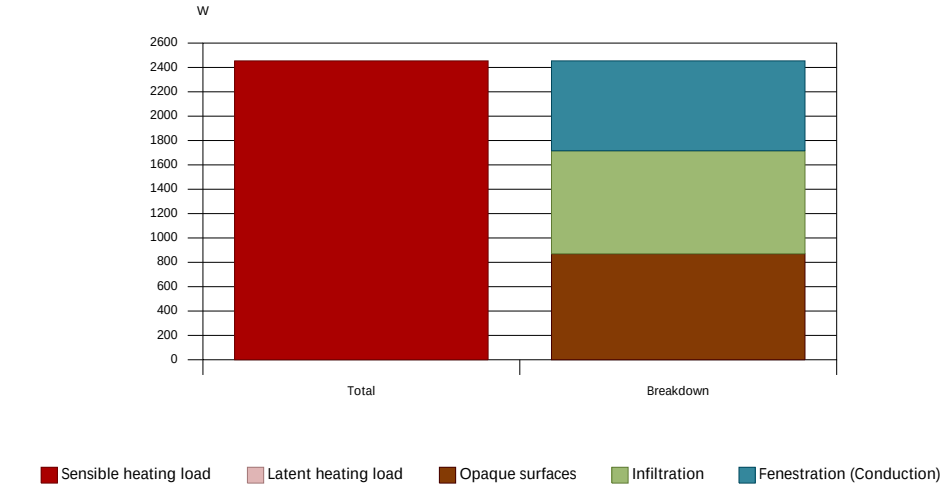
Sprat/4/Kancelarija

Peak heating load



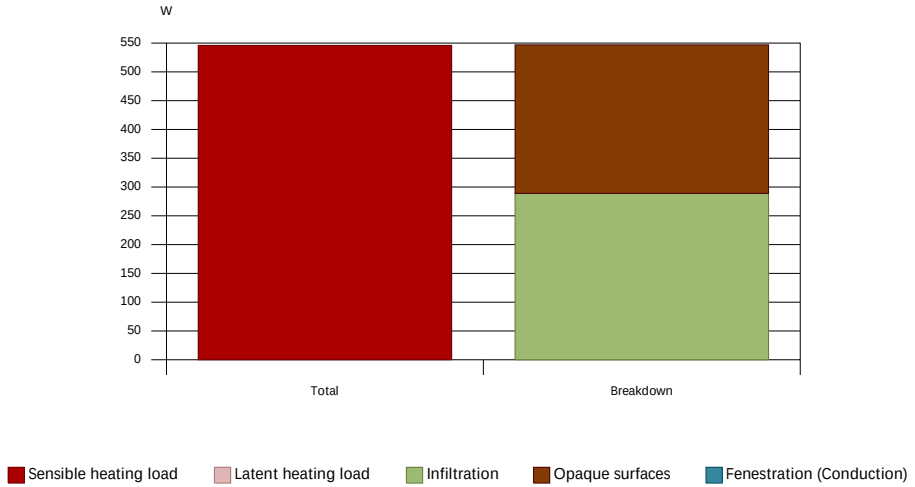
Sprat/5/Kancelarija

Peak heating load



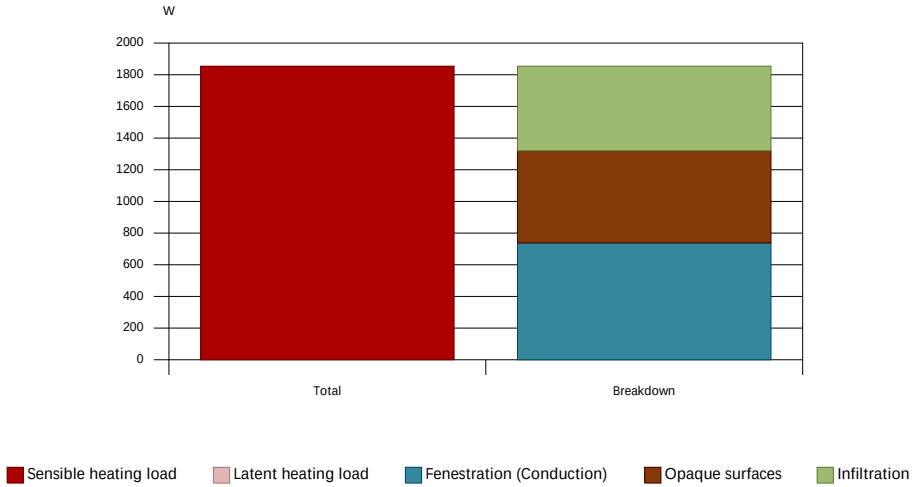
Sprat/6/Sekretarica (Kancelarija)

Peak heating load



Sprat/7/Direktor (Kancelarija)

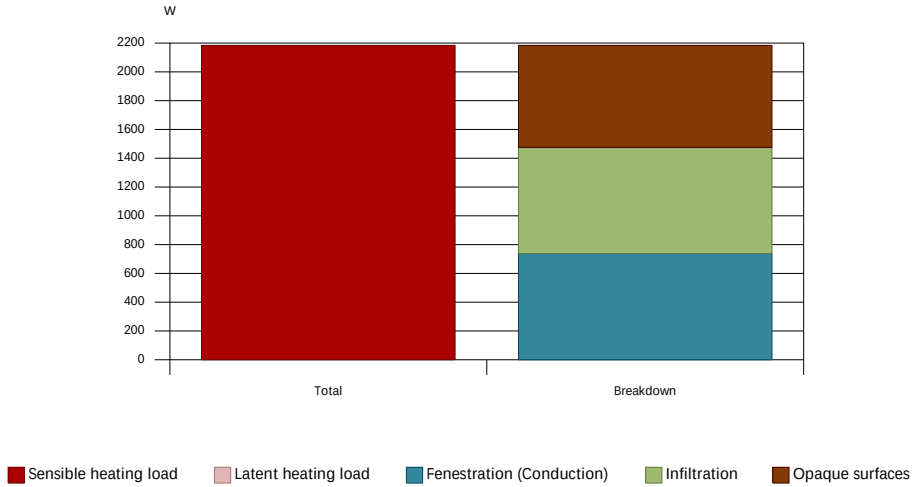
Peak heating load



Loads summary

Sprat / 8 / Kancelarija

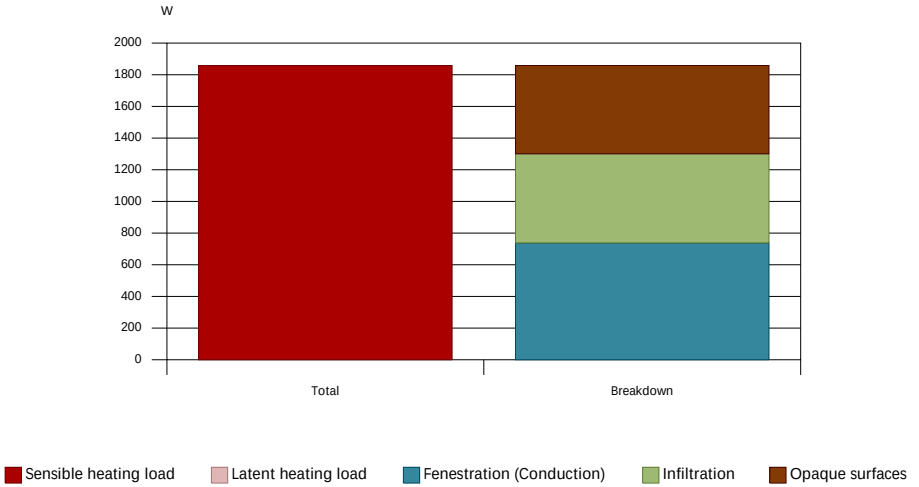
Peak heating load



Loads summary

Sprat / 9 / Kancelarija

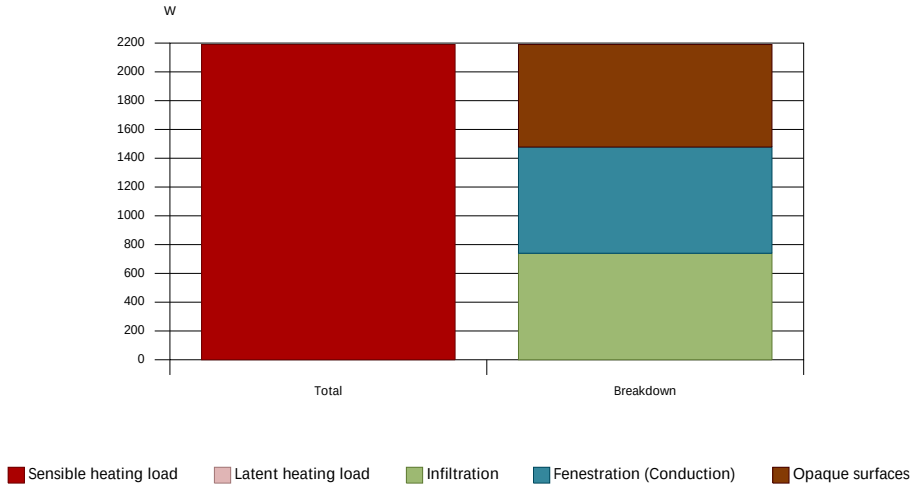
Peak heating load



Loads summary

Sprat/10/Kancelarija

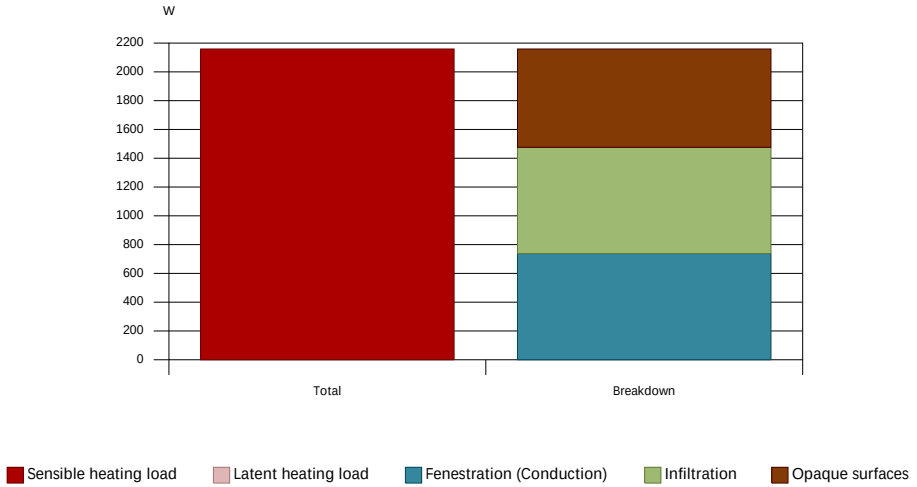
Peak heating load



Loads summary

Sprat/11/Kancelarija

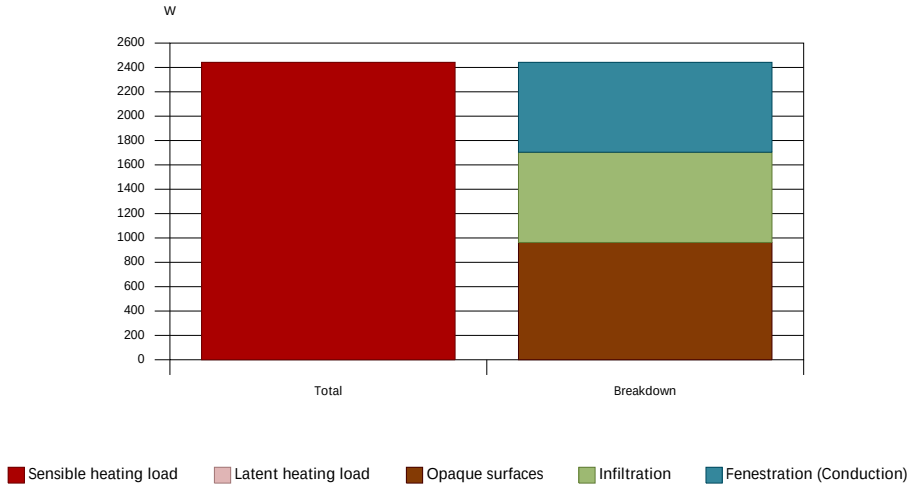
Peak heating load



Loads summary

Sprat/12/Kancelarija

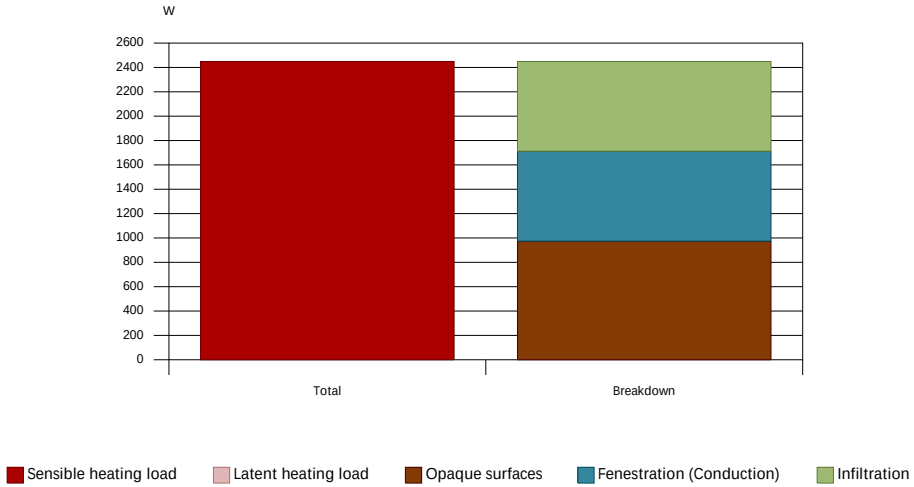
Peak heating load



Loads summary

Sprat/13/Kancelarija

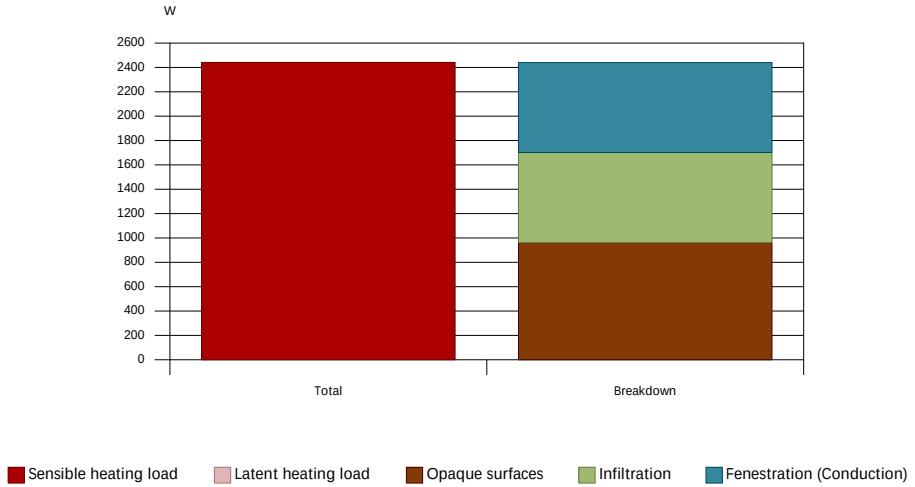
Peak heating load



Loads summary

Sprat/14/Kancelarija

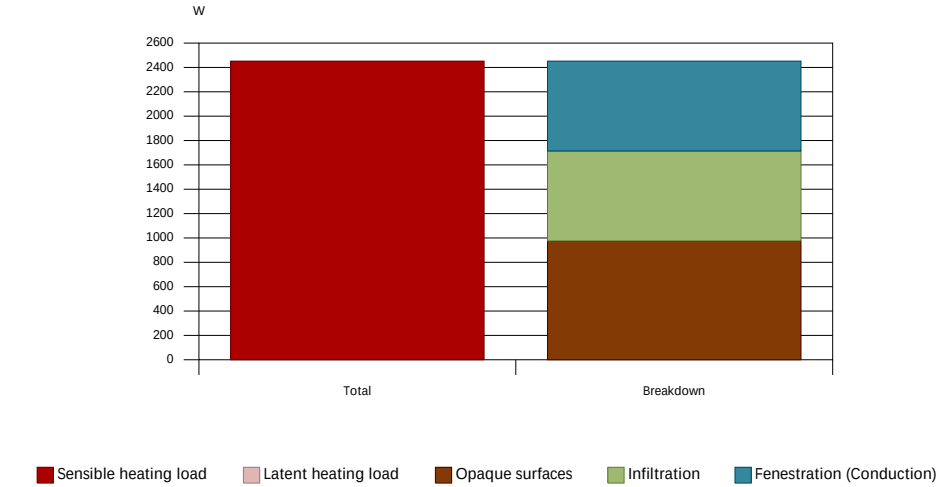
Peak heating load



Loads summary

Sprat/15/Kancelarija

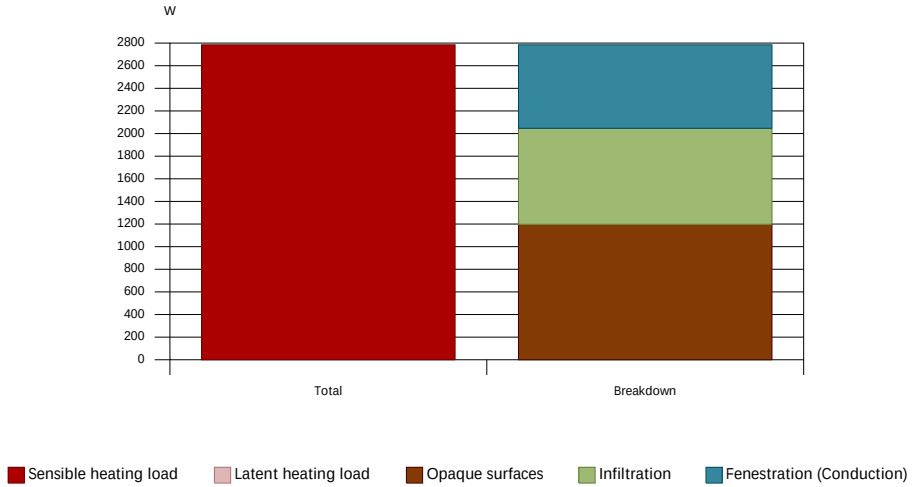
Peak heating load



Loads summary

Sprat/16/Kancelarija

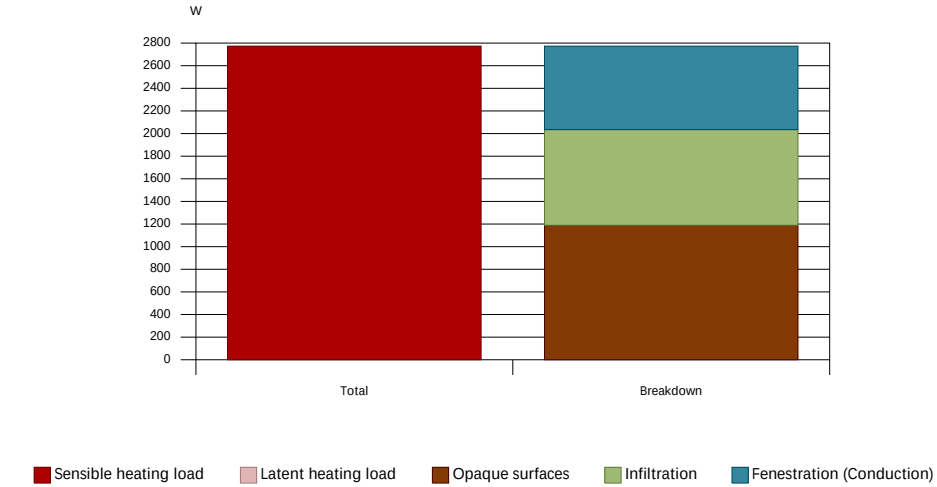
Peak heating load



Loads summary

Sprat/17/Kancelarija

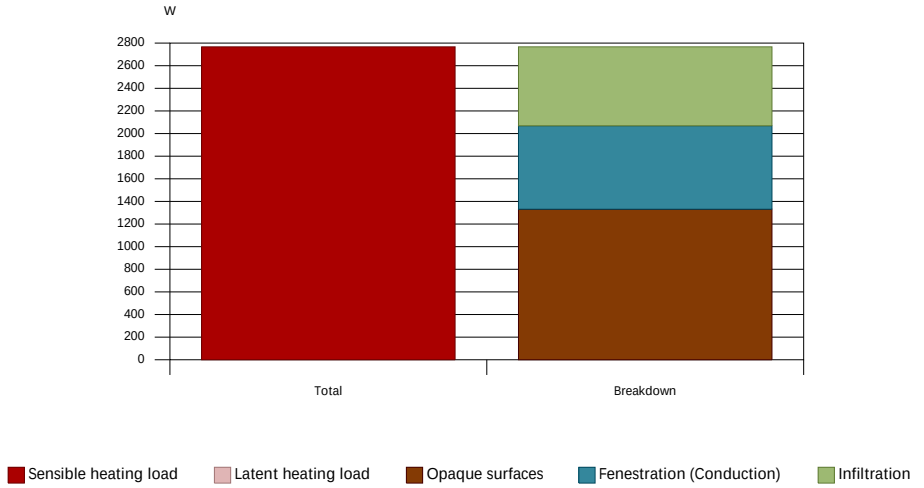
Peak heating load



Loads summary

Sprat/18/Kancelarija

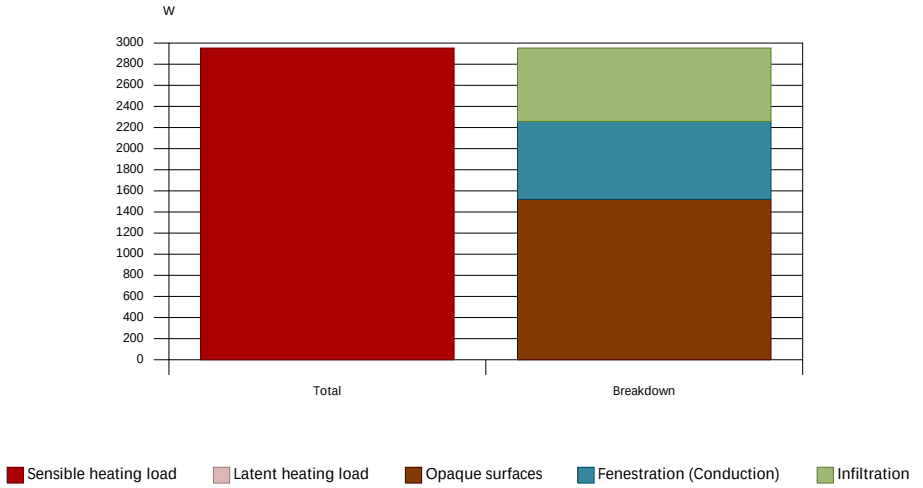
Peak heating load



Loads summary

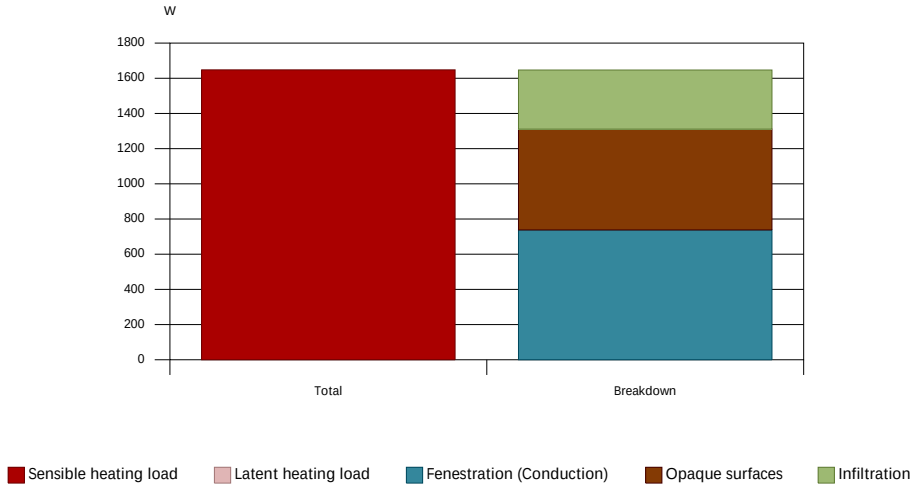
Sprat/19/Kancelarija

Peak heating load



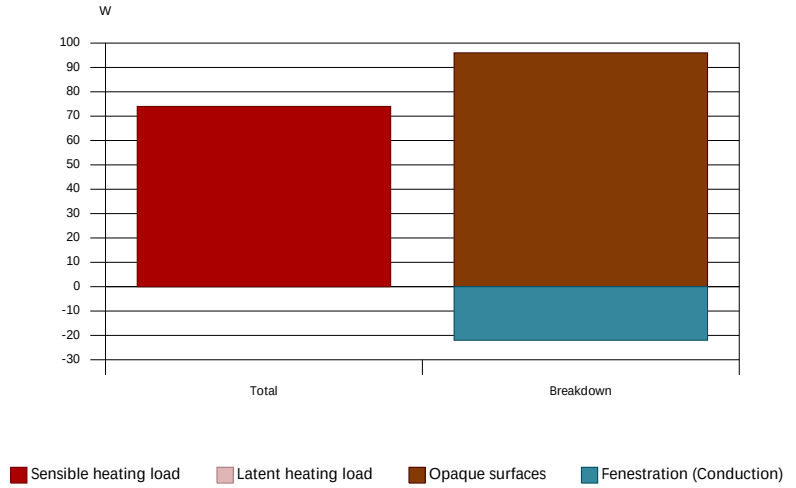
Sprat/20/Relax Zona (Kancelarija)

Peak heating load



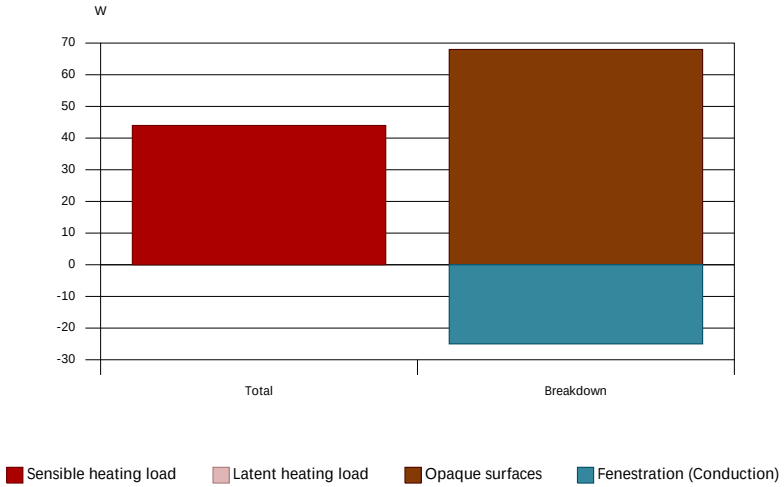
Sprat/22/Toalet

Peak heating load



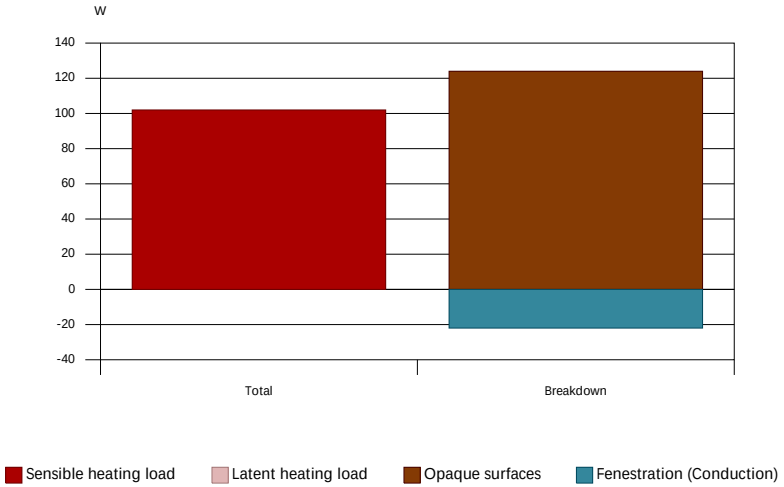
Sprat/23/Toalet

Peak heating load



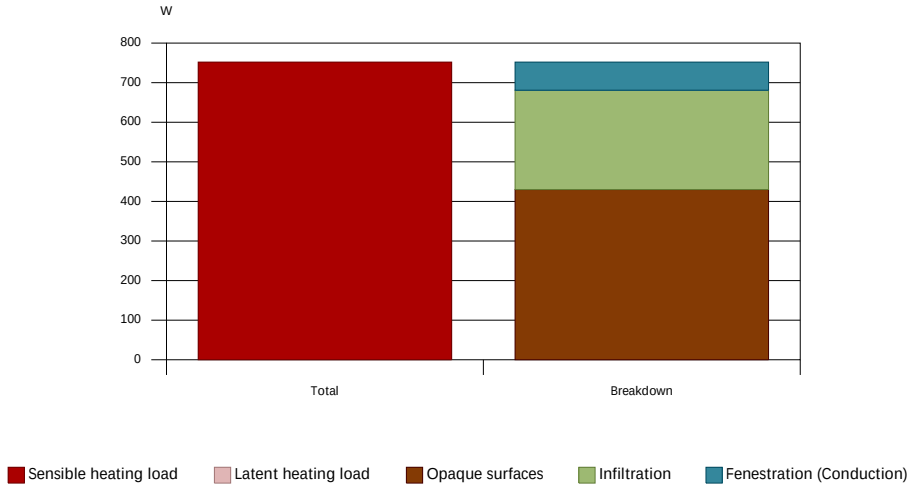
Sprat/24/Toalet

Peak heating load



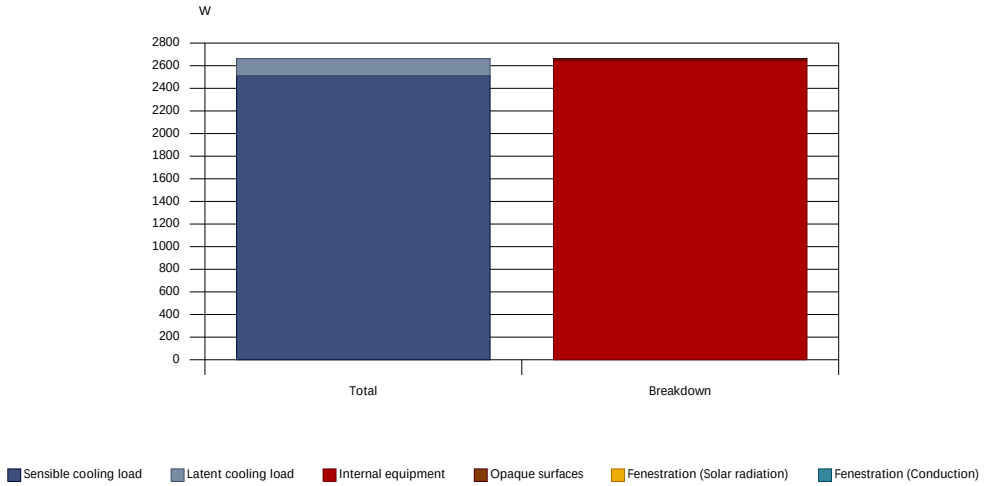
Sprat/25/Hodnik

Peak heating load

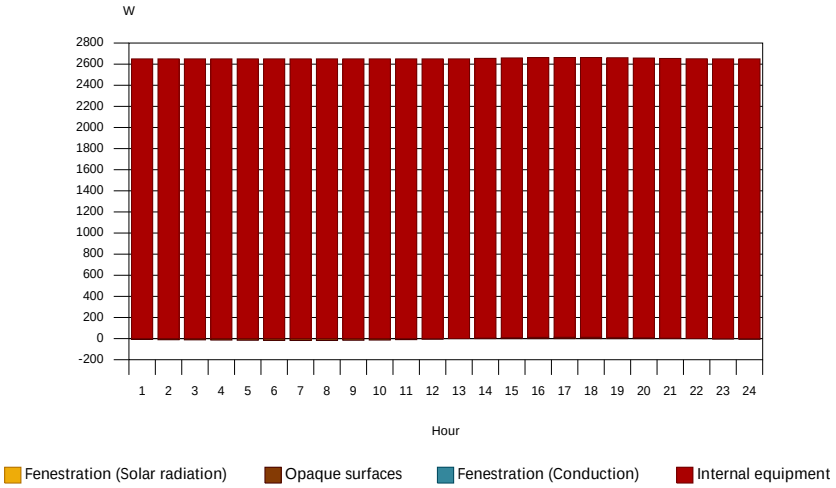


Sprat/28/IT

Peak cooling load (21 of August at 16h)

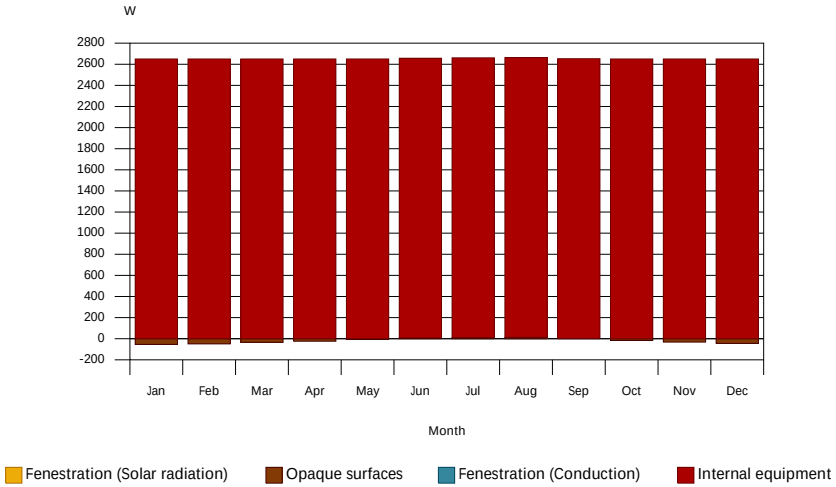


Hourly cooling load progression (21 of August)



Annual peak cooling load progression

Loads summary



Gubici toplote									Izbor kalorifera		
Oznaka prostorije	Tun,z	Povrsina	Trans.	Vent.	FRH	Ukupno (5% Rez.)	Podno grijanje	Potrebna toplota	Sadražaj vode u kariferu	Količina	Visak
/	°C	m2	W	W	W	W	W	W	l	[-]	/
1	2	3	4	5	6	7	8	9	13	14	15
KALORIFERI											
Podrum/Garaza 1 (Garaza 12)	12	241.4	12645	17019	4346	39112		39112	2.20	3	1.36

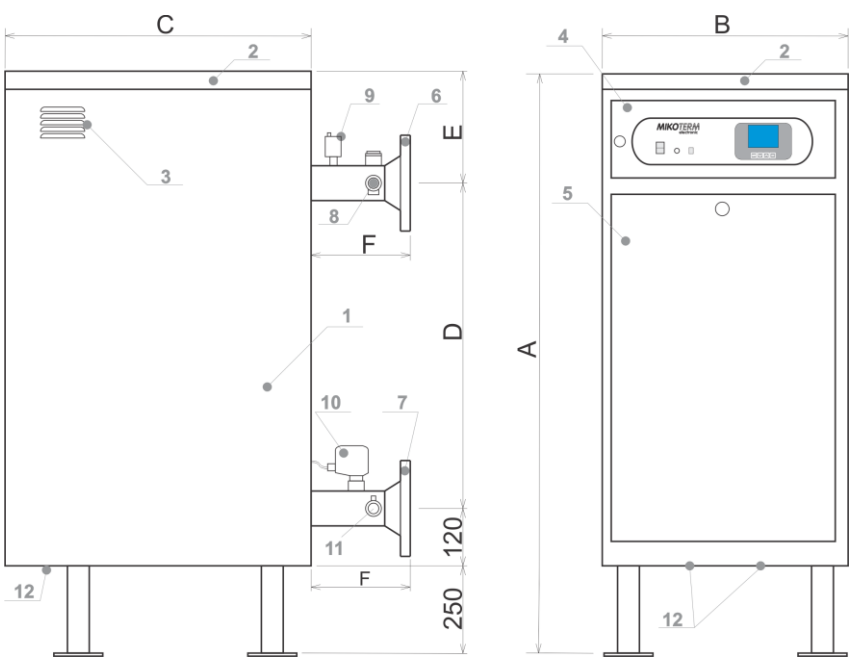
Gubici toplote									Izbor radijatora							
Oznaka prostorije	Tun,z	Povrsina	Trans.	Vent.	FRH	Ukupno (5% Rez.)	Podno grijanje	Potrebna toplota	Esponent n	Snaga po jednom članku 75/65/21°C	Sadrzaj vode po clanku radijatora	Proračunski broj članaka	Usvojeni broj članaka	Sadražaj vode radijatora	Odavanje toplote radijatora	Visak
/	°C	m2	W	W	W	W	W	W	[-]	W	l	[-]	[-]	l	W	/
1	2	3	7	8	9	10	11	12	17	18	19	20	21	22	23	24
RADIJATORI																
Podrum/1/Stepeniste	21	14.1	455	0	254	815		815	1.32	124.63	0.34	6.5	7	2.38	872	1.07
Podrum/3/Toalet	21	3.9	114	0	71	212		212	1.32	124.63	0.34	1.7	5	1.70	623	2.94
odrum/4/Tehnicka prostorija (Podstanic	21	63.3	951	0	1140	2405		2405	1.32	124.63	0.34	19.3	20	6.80	2493	1.04
Podrum/7/Kancelarija	21	8.5	918	234	153	1501		1501	1.32	124.63	1.34	12.0	10	13.40	1246	0.83
Prizemlje/1/Vjetrobran	21	4.9	747	246	88	1244		1244	1.32	124.63	0.34	10.0	12	4.08	1496	1.20
Prizemlje/1/Vjetrobran inv	21	3.9	331	194	70	683		683	1.32	124.63	0.34	5.5	6	2.04	748	1.09
Prizemlje/2/Portir	21	2.4	573	90	43	811	256	555	1.32	124.63	0.34	4.5	6	2.04	748	1.35
Prizemlje/3/Hol	21	39.9	300	630	719	1896		1896	1.32	124.63	0.34	15.2	16	5.44	1994	1.05
Prizemlje/4/Bife	21	30.4	2001	1148	548	4251		4251	1.32	124.63	0.34	34.1	36	12.24	4487	1.06
Prizemlje/5/Kancelarija	21	7.2	542	271	129	1083	596	487	1.32	124.63	0.34	3.9	5	1.70	623	1.28
Prizemlje/6/Prodavnica	21	46.4	3978	1749	834	7546		7546	1.32	124.63	0.34	60.5	61	20.74	7603	1.01
Prizemlje/7/Hodnik	21	18.7	419	707	337	1683		1683	1.32	124.63	0.34	13.5	15	5.10	1869	1.11
Prizemlje/8/Kancelarija	21	10.5	352	398	190	1081	879	202	1.32	124.63	0.34	1.6	5	1.70	623	3.08
Prizemlje/9/Garderoba	21	18.9	931	764	340	2340	1349	991	1.32	124.63	0.34	8.0	10	3.40	1246	1.26
Prizemlje/9/Tus (Garderoba)	21	6.9	291	281	125	802	510	292	1.32	124.63	0.34	2.3	5	1.70	623	2.13
Sprat/1/Cekaonica	21	62.9	4065	2374	1132	8707		8707	1.32	124.63	0.34	69.9	71	24.14	8849	1.02
Sprat/2/Hodnik	21	51.5	2413	1733	927	5834		5834	1.32	124.63	0.34	46.8	49	16.66	6107	1.05
Sprat/3/Sastanci direktor (Kancelarija)	21	13.4	1854	483	240	2963	1109	1854	1.32	124.63	0.34	14.9	16	5.44	1994	1.08
Sprat/4/Kancelarija	21	13.4	1838	481	240	2943	1102	1841	1.32	124.63	0.34	14.8	16	5.44	1994	1.08
Sprat/5/Kancelarija	21	23.3	1608	846	420	3305	1932	1373	1.32	124.63	0.34	11.0	12	4.08	1496	1.09
Sprat/6/Sekretarica (Kancelarija)	21	8.6	258	289	154	806	629	177	1.32	124.63	0.34	1.4	5	1.70	623	3.52
Sprat/7/Direktor (Kancelarija)	21	13.9	1320	534	251	2421	1118	1303	1.32	124.63	0.34	10.5	12	4.08	1496	1.15
Sprat/8/Kancelarija	21	20.3	1447	737	366	2932	1684	1248	1.32	124.63	0.34	10.0	11	3.74	1371	1.10
Sprat/9/Kancelarija	21	15.1	1295	563	271	2449	1245	1204	1.32	124.63	0.34	9.7	11	3.74	1371	1.14
Sprat/10/Kancelarija	21	20.3	1450	740	366	2940	1684	1256	1.32	124.63	0.34	10.1	11	3.74	1371	1.09
Sprat/11/Kancelarija	21	20.3	1421	738	366	2903	1684	1219	1.32	124.63	0.34	9.8	11	3.74	1371	1.12

Gubici toplote									Izbor kalorifera								
Oznaka prostorije	Tun,z	Povrsina	Trans.	Vent.	FRH	Ukupno (5% Rez.)	Podno grijanje	Potrebna toplota	Sadražaj vode u kariferu	Količina	Visak						
/	˚C	m2	W	W	W	W	W	W	l	[-]	/						
1	2	3	4	5	6	7	8	9	13	14	15						
Sprat/12/Kancelarija	21	20.4	1701	741	366	3230	1684	1546	1.32	124.63	0.34	12.4	13	4.42	1620	1.05	
Sprat/13/Kancelarija	21	20.3	1712	737	366	3238	1684	1554	1.32	124.63	0.34	12.5	13	4.42	1620	1.04	
Sprat/14/Kancelarija	21	20.3	1700	740	366	3227	1684	1543	1.32	124.63	0.34	12.4	13	4.42	1620	1.05	
Sprat/15/Kancelarija	21	20.3	1714	738	366	3241	1684	1557	1.32	124.63	0.34	12.5	13	4.42	1620	1.04	
Sprat/16/Kancelarija	21	23.3	1936	849	420	3685	1922	1763	1.32	124.63	0.34	14.1	15	5.10	1869	1.06	
Sprat/17/Kancelarija	21	23.3	1927	846	420	3671	1922	1749	1.32	124.63	0.34	14.0	15	5.10	1869	1.07	
Sprat/18/Kancelarija	21	19.6	2069	698	354	3589	1600	1989	1.32	124.63	0.34	16.0	18	6.12	2243	1.13	
Sprat/19/Kancelarija	21	19.6	2258	695	354	3802	1601	2201	1.32	124.63	0.34	17.7	18	6.12	2243	1.02	
Sprat/20/Relax Zona (Kancelarija)	21	10	1311	336	180	2102	815	1287	1.32	124.63	0.34	10.3	12	4.08	1496	1.16	
Sprat/22/Toalet	21	7.1	74	0	127	231		231	1.32	124.63	0.34	1.9	5	1.70	623	2.70	
Sprat/23/Toalet	21	4	44	0	72	133		133	1.32	124.63	0.34	1.1	5	1.70	623	4.69	
Sprat/24/Toalet	21	7.1	102	0	127	263		263	1.32	124.63	0.34	2.1	5	1.70	623	2.37	
Sprat/25/Hodnik	21	7.5	501	251	134	1019		1019	1.32	124.63	0.34	8.2	9	3.06	1122	1.10	

Električni kotlovi TK-Profesional snage 120 ÷ 240kW

Električni kotlovi TK-Profesional snage 120, 140, 160, 180, 200, 240kW su kompaktni uređaji namenjeni zagrevanju većih stambenih ili poslovnih objekata. Sud kotla je izrađen od čeličnog lima, ispitan na pritisku od 6bar, a max. radni pritisak je 4bar. Prirubnice pomoću kojih se kotao povezuje na grejnu instalaciju nalaze se sa zadnje strane kotla. Na povratnoj cevi kotla (donjoj) se nalazi slavina za punjenje i pražnjenje i indikator protoka (Flow switch), a na potisnoj cevi (gornjoj) sigurnosni ventili i automatski odzračni ventil.
Spoljni omotač kotla je izrađen od dekapiranog lima zaštićen elektrostatičkom plastifikacijom. Sa prednje strane se nalaze vrata koja pokrivaju komandnu tablu i vrata koja pokrivaju razvodnu tablu.
Na komandnoj tabli se nalazi glavni prekidač za uključenje kotla, sigurnosni termostat, signalna sijalica i mikroprocesorski termoregulator sa LCD displejem na kome su stalno prikazane zadate i trenutne vrednosti parametara sistema. Mikroprocesorski termoregulator obezbeđuje precizno merenje i održavanje temperature tokom rada, kao i inteligentno upravljanje radom grejača.
Donja vrata pokrivaju razvodnu tablu sa kompletnom automatikom kotla i rednim stezaljkama za priključenje napojnog kabla, kao i pomoćnim klemama za povezivanje komande za cirkulacionu pumpu i spoljnjeg uslova za rad (sobni termostat ili sl.). Donja vrata moraju biti zatvorena u toku rada kotla, a pristup njima i kompletnoj automatici koju pokrivaju dozvoljen je samo stručnom licu.
Zaštitni elementi: Kotlovi su opremljeni ‘’Multistage protection’’sistemom zaštite, koji permanentno prati temperaturu i pritisak u sistemu, u slučaju približavanja pritiska ili temperature nedozvoljennim vrednostima prikazuje na displeju odgovarajuća upozorenja, a u slučaju prekoračenja graničnih vrednosti pritiska ili temperature isključuje sve grejače, odnosno u trećem stepenu zaštite isključuje kompletno napajanje uređaja pomoću zaštitnih sklopova, čime je garantovana bezbednost u havarijskom režimu.

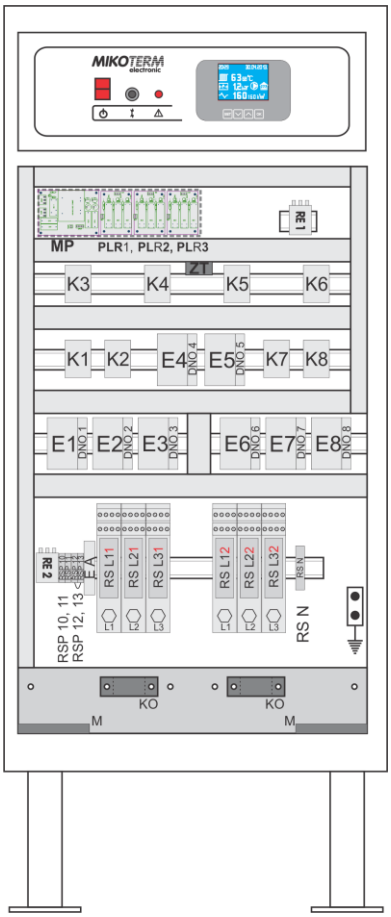
Tehničke karakteristike		**120kW**	**140kW**	**160kW**	**180kW**	**200kW**	**240kW**
Dimenzije	**A**	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm
	B	600mm	600mm	600mm	600mm	600mm	600mm
	C	750mm	750mm	750mm	750mm	750mm	750mm
	D	810mm	765mm	765mm	765mm	765mm	765mm
	E	330mm	365mm	365mm	365mm	365mm	365mm
	F	210mm	270mm	270mm	270mm	270mm	270mm
Težina		150kg	170kg	190kg	220kg	240kg	270kg
Zapremina suda		130ℓ	130ℓ	130ℓ	170ℓ	170ℓ	170ℓ
Grejači		12×10kW	14×10kW	8×20kW	9×20kW	10×20kW	12×20kW
Grejne grupe		6×20kW	7×20kW	8×20kW	9×20kW	10×20kW	6×40kW
Priključni napon		3N ~ 400V 50Hz	3N ~ 400V 50Hz	3N ~ 400V 50Hz	3N ~ 400V 50Hz	3N ~ 400V 50Hz	3N ~ 400V 50Hz
Priključci na hidr. mrežu		DN65 (2½"); PN16	DN80 (3"); PN16	DN80 (3"); PN16	DN80 (3"); PN16	DN80 (3"); PN16	DN80 (3"); PN16
Min i Max radni pritisak		0,4 bar ÷ 4 bar	0,4 bar ÷ 4 bar	0,4 bar ÷4 bar	0,4 bar ÷ 4 bar	0,4 bar ÷ 4 bar	0,4 bar ÷ 4 bar
Ventil sigurnosti		2 × ½" 4 bar	2 × ½" 4 bar	2 × ¾" 4 bar	2 × ¾" 4 bar	2 × ¾" 4 bar	2 × ¾" 4 bar
Stepen zaštite		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Radna temperatura		10 ÷ 90℃	10 ÷ 90℃	10 ÷ 90 ℃	10 ÷ 90 ℃	10 ÷ 90 ℃	10 ÷ 90 ℃
Sigurnosni termostat		95 ºC	95 ºC	95 ºC	95 ºC	95 ºC	95 ºC
Osigurači grejača		6 × 3P C40A	7 × 3P C40A	8 × 3P C40A	9 × 3P C40A	10 × 3P C40A	12 × 3P C40A
Max nazivna struja		3 × 174A	3 × 203A	3 × 232A	3 × 261A	3 × 290A	3 × 348A
Potrebni glavni osigurači		3 × 200 A	3 × 250 A	3 × 250 A	3 × 300 A	3 × 315 A	3 × 400 A
Potreban kabl za priklj.		2 kabla Cu 3 × 50mm^2	2 kabla Cu 3 × 70mm^2	2 kabla Cu 3 × 70mm^2	3 kabla Cu 3 × 50mm^2	3 kabla Cu 3 × 70mm^2	3 kabla Cu 3 × 70mm^2
Potreban zaštitni vod		Cu 1 × 50 mm^2	Cu 1 × 50 mm^2	Cu 1 × 50 mm^2	Cu 1 × 70 mm^2	Cu 1 × 70 mm^2	Cu 1 × 70 mm^2



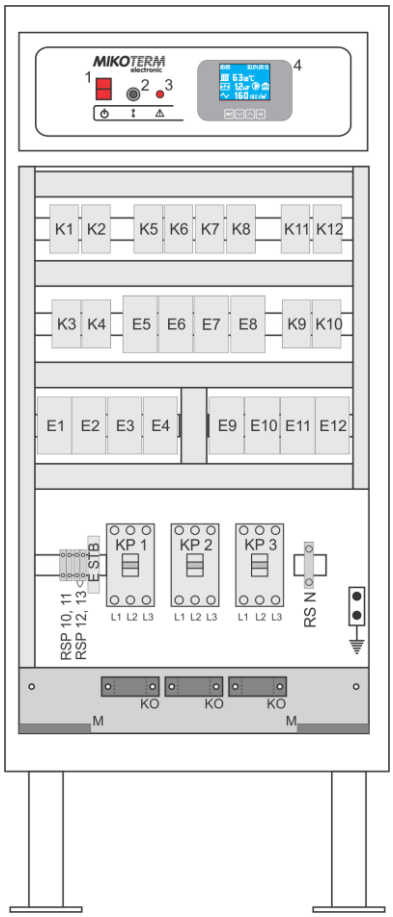
Legenda:

1) Omotač kotla
2) Poklopac kotla
3) Žaluzine za ventilaciju
4) Vrata komandne table
5) Vrata razvodne table
6) Potisni vod kotla DN80
7) Povratni vod kotla DN80
8) Sigurnosni ventili
9) Automatski odzračni ventil
10) Indikator protoka (Flow switch)
11) Slavina za punjenje/pražnjenje ½"
12) Kablovski uvodnici

Raspored komponenti na razvodnoj tabli
(Broj kontaktora i automatskih osigurača zavisi od snage kotla)



Kotlovi snage 120÷160kW



Kotlovi 180÷240kW

Legenda:

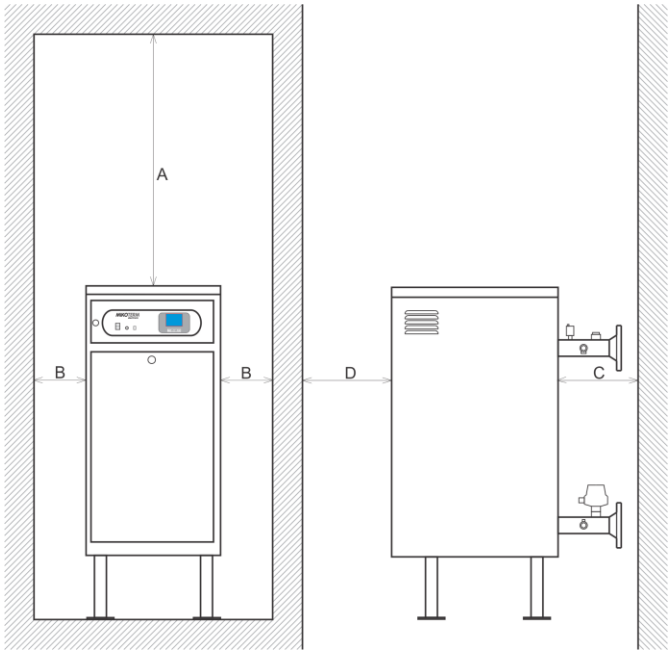
-1 - Glavni prekidač
-2 - Sigurnosni termostat (95 °C)
-3 - Signalna sijalica pregrevanja
-4 - Mikroprocesorski termoregulator EK_CPU_1_3
-MP - Mrežna ploča (napajanje CPU i relejnih ploča)
-PLR - Relejna ploča (uključenje kontaktora)
-ZT - Zaštitni termostat automatike kotla
-K1,...,KX- Kontaktori za uključenje grejača
-E1,...,EX- Automatski osigurači grejača

120÷160kW:
-DNO1, ..., DNOX – Daljinski Naponski Okidač nadgrađen na Automatski Osigurač
-RSL11 ÷ RSL23 – Redna stezaljka za priključenje napojnih kablova

180÷240kW:
-KP1, KP2, KP3 -Kompaktni Prekidač za priključenje napojnih kablova sa ugrađenim naponskim okidačem

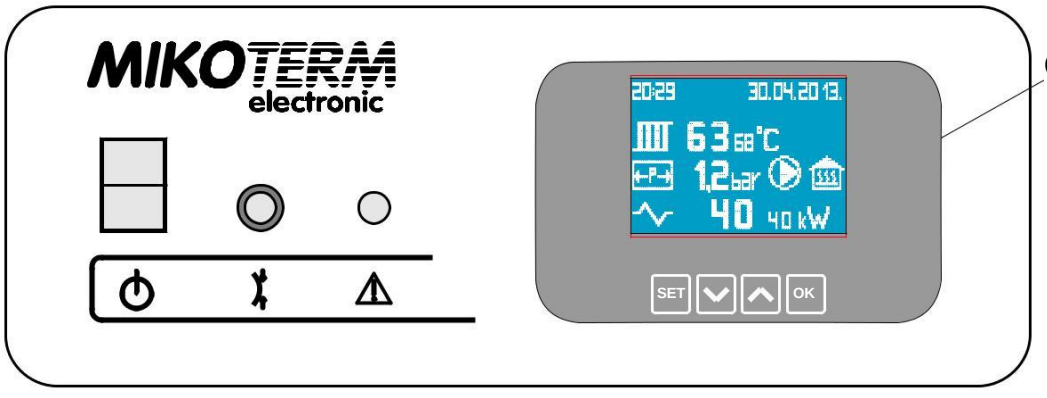
-EA- Osigurač upravljačkog kola
-RS N - Redna stezaljka nultog voda
-RSP **10**, RSP **11** - Priključne kleme komande pumpe
-RSP **12**, RSP **13** - Priključne kleme spoljnjeg uslova za rad kotla
-RSP **14**, RSP **15** (OPCIONO) - Priključne kleme senzora spoljne temperature
-KO- Kablovska obujmica
-M - Ventilator

Minimalne dimenzije slobodnog prostora za montažu kotla



A=700mm / B=500mm / C=700mm / D=1000mm

Komandna tabla kotla



- Glavni prekidač - uključuje kotao i daje uslov za uključenje grejnih grupa.

- Sigurnosni termostat sa ručnim resetom podešen na 95 °C. Ukoliko temperatura u kotlu dostigne 95 °C, ovaj termostat uključuje sigurnosni rele, preko koga se aktiviraju sigurnosni sklopovi (naponski okidači nadgrađeni na automatske osigurače). Automatski osigurači se isključuju čime je napajanje kontaktora i grejača prekinuto.

⚠ - Signalna sijalica termičkog preopterećenja (pregrevanja) kotla. Uključuje se kada se aktivira sigurnosni termostat.

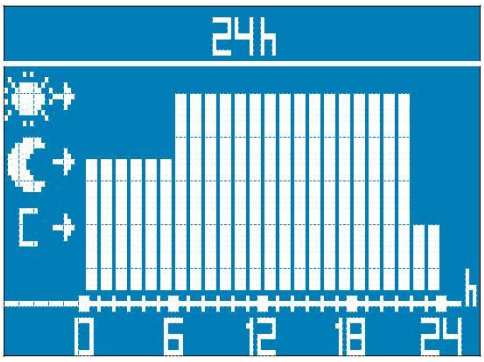
CPU - Mikroprocesorski termoregulator - pomoću njega se zadaje radna temperatura i snaga kotla, prate zadate i trenutne vrednosti temperature i snage, kao i trenutni pritisak u sistemu, status cirkulacione pumpe (uključena / isključena) i stanje spoljnjeg uslova za rad (dozvoljen rad kotla / nije dozvoljen rad kotla), spoljna temperatura (opciono).

Princip rada

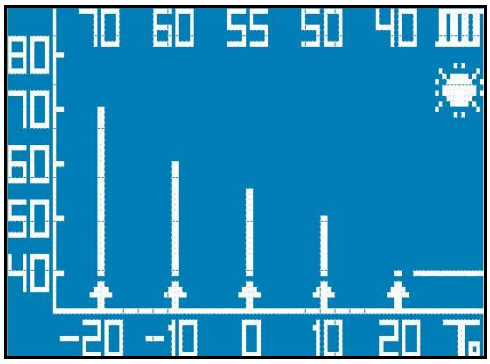
Senzori temperature, hidrauličnog pritiska (i spoljne temperature - opciono) prate promene u sistemu i šalju informacije mikrokontroleru koji ih obrađuje i na osnovu njih upravlja radom kotla.
Komunikacija korisnika sa uređajem je olakšana i unapređena prikazom svih parametara sistema na grafičkom LCD displeju i jednostavnim komandovanjem pomoću četiri tastera.
Radna temperatura se zadaje u koracima od 1 °C, moguće je zadati vrednost u rasponu od 10 ÷ 90 °C. U OTC režimu (opcioni režim vođenja prema spoljnoj temperaturi) moguće je zadati dve nezavisne radne krive (zadaju se sa po 5 referentnih tačaka) i jednu fiksnu temperaturu. U ovom režimu, rad kotla se programira na 24-časovnom nivou, pri čemu je za svaki sat moguće odabrati jednu od dve radne krive ili fiksnu vrednost temperature.
Snaga kotla se zadaje u koracima od 20kW (za kotao snage 240kW u koracima od 40kW), odnosno grejači su raspoređeni u više grejnih grupa (u zavisnosti od nominalne snage kotla). Uključivanje i isključivanje grejnih grupa je sukcesivno, sa razmakom od 3sec sa podelom angažovane snage na 3 stepena temperaturno pomerena za po 3 °C. Grejne grupe nemaju određeni redosled uključivanja, već mikroprocesor odlučuje o njihovom uključivanju i isključivanju na osnovu vremena rada svake grejne grupe. Tako se postiže ravnomerna podela vremena rada grejnih grupa, što rezultira dužim vekom uređaja.
Termoregulator može upravljati i radom cirkulacione pumpe. Pumpa se uključuje kada je aktivan spoljni uslov za rad kotla (koji se povezuje na pomoćne kleme RSP 12 i RSP 13). Ovo je takođe i uslov za rad grejnih grupa. Pumpa ostaje uključena 2 minuta posle isključenja spoljnjeg uslova za rad zbog odnošenja toplotne energije disipirane sa grejača posle isključenja. Komandni napon za uključenje cirkulacione pumpe (230V 50Hz) se šalje na pomoćne kleme RSP 10 i RSP 11. Takođe, termoregulator uključuje pumpu bez obzira na spoljni uslov za rad ukoliko temperatura kotla pređe 90 °C, da bi smanjio temperaturu u kotlu.

Vođenje temperature kotla prema spoljnoj temperaturi - O.T.C. režim rada

Opcino, uređaji iz ove serije se mogu poručiti sa verzijom mikroprocesorskog termoregulatora koji ima mogućnost vođenja temperature kotla u zavisnosti od spoljne temperature - ‘’Outdoor Temperature Compensation’’, u daljem tekstu O.T.C. režim rada. Uz kotao se u tom slučaju dobija i spoljni senzor temperature u plastičnoj zaštitnoj kutiji, koji se montira na spoljnoj strani objekta i povezuje 2-žilnim kablom sa kotlom.
U OTC režimu moguće je zadati dve nezavisne radne krive (zadaju se sa po 5 referentnih tačaka) i jednu fiksnu temperaturu. U ovom režimu, rad kotla se programira na 24-časovnom nivou, pri čemu je za svaki sat moguće odabrati jednu od dve radne krive ili fiksnu vrednost temperature (slika 1). Na primeru sa slike 1 u periodu od 00÷06h temperatura kotla će klizati po ekonomičnoj radnoj krivi, u periodu od 06÷22h po udobnoj radnoj krivi i u periodu od 22÷24h održavaće fiksnu vrednost zadate temperature.



Slika 1



Slika 2

Udobna radna kriva (označena simbolom sunca) je predviđena za korišćenje tokom dana. Ekonomična radna kriva (označena simbolom meseca) za korišćenje tokom noći - kada su spoljne temperature niže, ali je potrebna niža temperatura prostora koji se greje, pa bi primena iste krive koja je korišćena tokom dana bila neekonomična. Naravno, ovo je samo najčešše korišćena logika, a u zavisnosti od karakteristika objekta, tipa grejnog sistema i ostalih specifičnih uslova, periodi korišćenja radnih krivi mogu biti raspoređeni na bilo koji način - na svaki sat moguće je preći na korišćenje druge krive ili fiksne termperature.
Radne krive se mogu formirati po želji - na korisniku je da odabere prema konkretnom objektu i konkretnom tipu grejanja optimalan oblik radnih krivi kao i periode u kojima će se one koristiti.
Na slici 2 je prikazano podešavanje udobne radne krive. Zadate su vrednosti u 5 referentnih tačaka:

1) Spoljna temp. T_O = -20 °C → temp. kotla 70 °C
2) Spoljna temp. T_O = -10 °C → temp. kotla 60 °C
3) Spoljna temp. T_O = 0 °C → temp. kotla 55 °C
4) Spoljna temp. T_O = 10 °C → temp. kotla 50 °C
5) Spoljna temp. T_O = 20 °C → temp. kotla 40 °C

Mikrokontroler ‘’spajanjem’’ ovih 5 tačaka generiše krivu po kojoj će ‘’klizati’’ temperatura potisnog voda kotla. Na isti način zadaje se druga (ekonomična) radna kriva. Princip formiranja radnih krivi je takav da je moguće zadati praktično neograničen broj krivih različitog oblika. Ovakav način zadavanja radnih krivi, kao i mogućnost njihovog kombinovanja čini OTC režim primenjivim u svakoj konkretnoj situaciji, na objektima različitim po svojoj nameni, tipu grejnog sistema, prostornoj orijentaciji itd. Ukoliko je potrebno, korekcije inicijalno zadatih radnih krivi, kao i 24h programiranja korisnik može izvršiti na jednostavan i brz način, podesiti kotao, a time i ceo sistem grejanja tako da dobije optimalan komfor u grejanju na najekonomičniji način.

PRORAČUN CIJEVNE MREŽE – RADIJATORSKO GRIJANJE

Diagnostics

Global

Basic info:	
Name of proj.:	
Address:	
City:	
Designer:	
Date of calc:	Tuesday 7 November 2023 1:26

Info on pipes type:			
Type A:	EN 10220	Type B:	FON PERT
Type C:		Type D:	
Type E:		Type F:	
Type G:		Type H:	
Type I:		Type J:	
Type K:		Type L:	
Type M:		Type N:	
Type O:		Type P:	

Symbol of the heat source:	BOILER

Parameters of the heating agent:			
θs, [°C]:	75.00	θr, [°C]:	65.00
θr,r, [°C]:	62.97		
Type of agent:	Ethylene glycol	oncentration, [%]:	20.0

Info on the heating system:	
The total water flow in the installation Minst, [kg/s]:	1.880
Total installation capacity Vinst, [l]:	708
Calculation thermal power of the installation ΦHL,inst, [W]:	73890
Power lost Φlost,inst, [W]:	14974
Total power transferred by the installation Φtot,inst, [W]:	88865

Parameters of the heat source: BOILER			
ΔpHS, [Pa]:	1000	VHS, [l]:	10.0
Required disposable pressure in the source Δpdisp, [Pa]:			1121
Additional power reserve for charging the bufferΦHL,reserve, [W]			
he total design power of the heat source in winter ΦHL,winter, []:			73890
culated thermal power of the source in the summer ΦHL,summer, [W]:			
design power of the heat source in transition period ΦHL,part, []:			
Number of concurrently working flat stations.NFS,sim, [pcs.]:			

Statistics of rooms and radiators for the heat source: BOILER			
Heated rooms:			
Overheated:	0	Surplus of power, [W]:	0
Underheated:	0	Shortage of power, [W]:	0
Heating power, [W]:	0	Heat gains from pipes, [W]:	3
Underheated rooms:			
Heating power, [W]:	0	Heat gains from pipes, [W]:	0
Radiators:			
Overheating:	152	Surplus of power, [W]:	0
Underheating:	0	Shortage of power, [W]:	0
Design heating power, [W]:	0	Actual heating power, [W]:	0

Pipes CH

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	EN 10220	5.00		65	73890	6.700	0.48	60	302	50.9	6149	62.98	0.01	19.41
	EN 10220	0.50		20	4848	0.440	0.31	123	61	0.5	87	63.12	0.01	0.20
	EN 10220	1.00		65	73890	6.700	0.48	60	60	0.0	60	62.97	0.00	3.88
	EN 10220	0.50		20	4848	0.440	0.31	123	61	0.3	78	63.11	0.01	0.20
	EN 10220	12.00		20	4848	0.440	0.31	123	1475	9.4	1933	63.10	0.20	4.69
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	251	64.35	0.04	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.85	0.05	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	0.3	36	64.31	0.03	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.80	0.05	0.06
	FON PERT	5.80		16x2	622	0.056	0.14	22	128	7.9	203	63.76	0.55	0.66
	FON PERT	2.80		16x2	870	0.079	0.19	60	168	7.9	316	64.28	0.20	0.32
	EN 10220	0.50		25	8578	0.778	0.34	103	51	0.5	82	63.34	0.01	0.32
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	0.3	36	63.79	0.03	0.06
	FON PERT	9.30		16x2	870	0.079	0.19	59	550	7.9	698	63.75	0.61	1.05
	FON PERT	9.80		16x2	622	0.056	0.14	22	218	7.9	293	63.32	0.88	1.11
	FON PERT	6.80		16x2	622	0.056	0.14	22	151	7.9	226	63.68	0.65	0.77
	FON PERT	5.80		16x2	622	0.056	0.14	22	128	7.9	204	63.80	0.56	0.66
	FON PERT	8.80		16x2	622	0.056	0.14	22	195	7.9	271	63.44	0.79	1.00
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.37	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.72	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.49	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.85	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.42	0.05	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	251	63.82	0.04	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.54	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.77	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.90	0.05	0.06
	EN 10220	5.00		65	69043	6.260	0.45	53	265	1.2	387	63.00	0.01	19.41
	EN 10220	2.50		25	8578	0.778	0.34	103	256	0.3	276	63.34	0.03	1.59
	EN 10220	0.50		65	69043	6.260	0.45	53	26	0.3	60	63.00	0.00	1.94
	FON PERT	13.30		16x2	622	0.056	0.14	22	297	7.9	372	62.93	1.15	1.50
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	62.98	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.03	0.05	0.06
	FON PERT	5.80		16x2	994	0.090	0.22	85	490	7.9	683	64.14	0.36	0.66
	FON PERT	0.50		16x2	994	0.090	0.22	85	42	0.3	51	64.17	0.03	0.06
	FON PERT	0.50		16x2	994	0.090	0.22	85	42	11.8	331	64.20	0.03	0.06
	FON PERT	2.80		16x2	622	0.056	0.14	22	62	7.9	137	64.16	0.27	0.32
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	64.20	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	64.25	0.05	0.06
	FON PERT	3.80		20x2	1491	0.135	0.19	44	166	8.6	317	64.41	0.18	0.76

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	0.50		20x2	1491	0.135	0.19	44	22	0.3	28	64.43	0.02	0.10
	FON PERT	0.50		20x2	1491	0.135	0.19	44	22	36.5	660	64.45	0.02	0.10
	FON PERT	10.80		20x2	1491	0.135	0.19	44	473	8.6	624	64.02	0.49	2.17
	FON PERT	0.50		20x2	1491	0.135	0.19	44	22	36.5	659	64.06	0.02	0.10
	FON PERT	0.50		20x2	1491	0.135	0.19	44	22	0.3	28	64.04	0.02	0.10
	EN 10220	0.50		20	4973	0.451	0.32	129	65	0.5	92	63.59	0.01	0.20
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	0.3	22	64.01	0.04	0.06
	FON PERT	6.82		16x2	746	0.068	0.17	35	242	7.9	350	63.97	0.55	0.77
	FON PERT	12.82		16x2	746	0.068	0.17	35	447	7.9	555	63.44	0.96	1.45
	FON PERT	9.82		16x2	746	0.068	0.17	35	345	7.9	453	63.67	0.75	1.11
	FON PERT	1.82		16x2	994	0.090	0.22	85	154	7.9	347	64.57	0.11	0.21
	FON PERT	5.82		16x2	994	0.090	0.22	85	492	7.9	685	64.26	0.36	0.66
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	0.3	22	63.48	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	0.3	22	63.71	0.04	0.06
	FON PERT	0.50		16x2	994	0.090	0.22	85	42	0.3	51	64.29	0.03	0.06
	FON PERT	0.50		16x2	994	0.090	0.22	85	42	0.3	51	64.60	0.03	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	11.8	180	63.52	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	11.8	181	64.05	0.04	0.06
	FON PERT	0.50		16x2	994	0.090	0.22	85	42	11.8	332	64.33	0.03	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	11.8	180	63.75	0.04	0.06
	FON PERT	0.50		16x2	994	0.090	0.22	85	42	11.8	332	64.64	0.03	0.06
	EN 10220	2.50		25	7581	0.687	0.30	81	202	1.3	262	63.35	0.03	1.59
	EN 10220	0.50		25	7581	0.687	0.30	81	40	0.5	64	63.36	0.01	0.32
	FON PERT	15.82		20x2	1864	0.169	0.23	64	1018	8.6	1254	64.06	0.57	3.18
	FON PERT	25.82		20x2	1989	0.180	0.25	72	1863	8.6	2131	63.70	0.85	5.19
	FON PERT	15.82		20x2	1864	0.169	0.23	64	1018	8.6	1254	64.06	0.57	3.18
	FON PERT	0.50		20x2	1864	0.169	0.23	64	32	0.3	41	64.08	0.02	0.10
	FON PERT	0.50		20x2	1864	0.169	0.23	64	32	0.3	41	64.08	0.02	0.10
	FON PERT	0.50		20x2	1864	0.169	0.23	64	32	0.3	41	64.16	0.02	0.10
	FON PERT	13.82		20x2	1864	0.169	0.23	64	889	8.6	1125	64.15	0.50	2.78
	FON PERT	0.50		20x2	1989	0.180	0.25	72	36	0.3	46	63.72	0.02	0.10
	FON PERT	0.50		20x2	1864	0.169	0.23	64	32	36.5	1028	64.09	0.02	0.10
	FON PERT	0.50		20x2	1864	0.169	0.23	64	32	36.5	1028	64.09	0.02	0.10
	FON PERT	0.50		20x2	1864	0.169	0.23	64	32	36.5	1028	64.18	0.02	0.10
	FON PERT	0.50		20x2	1989	0.180	0.25	72	36	36.5	1170	63.74	0.02	0.10
	EN 10220	6.50		32	21132	1.916	0.49	147	952	1.8	1164	63.32	0.03	7.06
	EN 10220	2.50		25	7099	0.643	0.28	71	178	1.3	231	62.25	0.03	1.59
	EN 10220	0.50		25	7099	0.643	0.28	71	36	0.5	57	62.25	0.01	0.32
	FON PERT	0.50		16x2	870	0.079	0.19	58	29	0.3	35	62.68	0.03	0.06
	FON PERT	25.51		16x2	870	0.079	0.19	57	1461	7.9	1608	62.65	1.54	2.88
	FON PERT	10.51		16x2	1371	0.124	0.31	148	1558	7.9	1925	64.15	0.46	1.19

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	29.51		16x2	624	0.056	0.14	23	681	7.9	756	61.44	2.54	3.34
	FON PERT	12.51		16x2	1371	0.124	0.31	148	1856	7.9	2222	64.04	0.54	1.41
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	0.3	90	64.17	0.02	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	23	11	0.3	15	61.48	0.04	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	0.3	90	64.06	0.02	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	0.3	36	64.20	0.03	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	11.8	624	64.19	0.02	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	58	29	11.8	250	62.71	0.03	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	11.8	624	64.08	0.02	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	23	11	11.8	125	61.53	0.05	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	251	64.24	0.04	0.06
	FON PERT	25.51		16x2	622	0.056	0.14	23	582	7.9	657	61.79	2.28	2.88
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	61.83	0.04	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	61.88	0.05	0.06
	FON PERT	5.51		16x2	870	0.079	0.19	60	329	7.9	477	64.17	0.37	0.62
	EN 10220	0.50		25	8333	0.756	0.33	97	49	0.5	78	63.15	0.01	0.32
	EN 10220	2.50		25	8333	0.756	0.33	97	243	0.3	261	63.15	0.03	1.59
	EN 10220	3.50		50	47911	4.344	0.52	98	343	1.3	510	62.88	0.01	8.16
	EN 10220	0.50		50	32478	2.945	0.35	46	23	0.6	61	63.01	0.00	1.17
	EN 10220	9.00		32	15432	1.399	0.36	80	716	1.3	798	62.66	0.05	9.78
	FON PERT	0.50		16x2	624	0.057	0.14	22	11	0.3	14	63.34	0.05	0.06
	FON PERT	10.56		16x2	624	0.057	0.14	22	236	7.9	312	63.29	0.94	1.19
	FON PERT	10.56		16x2	870	0.079	0.19	59	623	7.9	771	63.68	0.70	1.19
	FON PERT	8.56		16x2	873	0.079	0.19	60	513	7.9	662	63.84	0.57	0.97
	FON PERT	5.56		16x2	870	0.079	0.19	60	332	7.9	479	64.07	0.37	0.63
	FON PERT	0.50		16x2	870	0.079	0.19	59	30	0.3	36	63.71	0.03	0.06
	FON PERT	0.50		16x2	873	0.079	0.19	60	30	0.3	36	63.88	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	0.3	36	64.10	0.03	0.06
	FON PERT	0.50		16x2	1119	0.102	0.25	104	52	0.3	63	64.52	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	251	63.75	0.04	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	22	11	11.8	125	63.38	0.05	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	251	64.14	0.04	0.06
	FON PERT	0.50		16x2	873	0.079	0.19	60	30	11.8	253	63.91	0.04	0.06
	FON PERT	0.50		16x2	1119	0.102	0.25	104	52	11.8	418	64.55	0.03	0.06
	FON PERT	4.56		16x2	870	0.079	0.19	60	273	7.9	420	64.16	0.32	0.52
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	0.3	36	64.19	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	251	64.23	0.04	0.06
	FON PERT	1.56		16x2	1119	0.102	0.25	104	162	7.9	407	64.49	0.08	0.18
	FON PERT	18.56		16x2	870	0.079	0.19	58	1077	7.9	1224	63.06	1.17	2.10
	FON PERT	0.50		16x2	870	0.079	0.19	59	29	0.3	36	63.09	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	59	29	11.8	250	63.12	0.03	0.06

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	15.56		16x2	1119	0.101	0.25	105	1629	7.9	1873	63.59	0.80	1.76
	FON PERT	0.50		16x2	1119	0.101	0.25	105	52	0.3	63	63.61	0.03	0.06
	FON PERT	0.50		16x2	1119	0.101	0.25	105	52	11.8	418	63.64	0.03	0.06
	FON PERT	7.56		16x2	873	0.079	0.19	60	456	7.9	604	64.10	0.51	0.85
	FON PERT	21.56		20x2	1740	0.158	0.22	57	1234	8.6	1439	63.78	0.81	4.33
	FON PERT	0.50		16x2	873	0.079	0.19	61	30	0.3	37	64.13	0.03	0.06
	FON PERT	21.56		16x2	994	0.090	0.22	84	1816	7.9	2008	63.22	1.19	2.44
	FON PERT	12.56		20x2	1740	0.158	0.22	57	717	8.6	923	64.20	0.49	2.53
	FON PERT	0.50		20x2	1740	0.158	0.22	57	29	0.3	37	64.22	0.02	0.10
	FON PERT	0.50		20x2	1740	0.158	0.22	57	29	0.3	37	63.80	0.02	0.10
	FON PERT	0.50		16x2	994	0.090	0.22	84	42	0.3	50	63.25	0.03	0.06
	FON PERT	0.50		20x2	1740	0.158	0.22	57	28	0.3	36	64.51	0.02	0.10
	FON PERT	0.50		20x2	1740	0.158	0.22	57	29	36.5	896	63.82	0.02	0.10
	FON PERT	0.50		16x2	873	0.079	0.19	61	30	11.8	253	64.17	0.04	0.06
	FON PERT	0.50		20x2	1740	0.158	0.22	57	29	36.5	897	64.24	0.02	0.10
	FON PERT	0.50		16x2	994	0.090	0.22	84	42	11.8	331	63.28	0.03	0.06
	FON PERT	0.50		20x2	1740	0.158	0.22	57	28	36.5	897	64.53	0.02	0.10
	FON PERT	1.56		20x2	1740	0.158	0.22	57	89	8.6	294	64.73	0.06	0.31
	FON PERT	0.50		20x2	1740	0.158	0.22	57	28	0.3	36	64.75	0.02	0.10
	FON PERT	0.50		20x2	1740	0.158	0.22	57	28	36.5	897	64.77	0.02	0.10
	FON PERT	6.56		20x2	1740	0.158	0.22	57	374	8.6	580	64.49	0.26	1.32
	EN 10220	2.50		25	8827	0.801	0.35	108	271	1.3	353	63.65	0.03	1.59
	EN 10220	0.50		25	8827	0.801	0.35	108	54	0.5	87	63.65	0.01	0.32
	EN 10220	7.00		25	8333	0.756	0.33	97	679	1.8	776	63.12	0.08	4.47
	FON PERT	14.56		16x2	622	0.056	0.14	22	325	7.9	400	63.04	1.26	1.65
	FON PERT	10.56		16x2	1371	0.124	0.31	148	1566	7.9	1932	64.23	0.46	1.19
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.09	0.05	0.06
	FON PERT	9.56		16x2	1371	0.124	0.31	148	1417	7.9	1784	64.29	0.42	1.08
	FON PERT	3.56		16x2	746	0.068	0.17	36	128	7.9	236	64.35	0.29	0.40
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	0.3	23	64.39	0.04	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	0.3	90	64.25	0.02	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	0.3	90	64.31	0.02	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	64.04	0.05	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	11.8	624	64.28	0.02	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.14	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	11.8	181	64.43	0.04	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	11.8	624	64.33	0.02	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	64.09	0.05	0.06
	FON PERT	18.56		16x2	870	0.079	0.19	58	1081	7.9	1228	63.23	1.17	2.10
	FON PERT	0.50		16x2	870	0.079	0.19	59	29	0.3	36	63.27	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	59	29	11.8	251	63.30	0.04	0.06

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	5.56		16x2	622	0.056	0.14	22	123	7.9	198	63.99	0.52	0.63
	EN 10220	0.50		25	8217	0.745	0.32	94	47	1.3	118	62.97	0.01	0.32
	EN 10220	0.50		25	8217	0.745	0.32	94	47	0.5	76	62.98	0.01	0.32
	EN 10220	1.00		50	32478	2.945	0.35	46	46	0.3	67	63.02	0.00	2.33
	EN 10220	3.00		40	23651	2.144	0.41	84	253	1.8	399	62.81	0.01	4.38
	FON PERT	17.56		16x2	1371	0.124	0.31	149	2609	7.9	2975	63.86	0.74	1.99
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	0.3	90	63.89	0.02	0.06
	FON PERT	16.56		16x2	622	0.056	0.14	22	371	7.9	446	62.84	1.41	1.87
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	62.88	0.05	0.06
	FON PERT	0.50		16x2	1371	0.124	0.31	148	74	11.8	624	63.91	0.02	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	62.93	0.05	0.06
	FON PERT	17.56		16x2	622	0.056	0.14	22	394	7.9	469	62.64	1.48	1.99
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	62.69	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	62.74	0.05	0.06
	EN 10220	0.50		25	8596	0.779	0.34	103	52	0.5	82	62.96	0.01	0.32
	FON PERT	0.50		16x2	624	0.057	0.14	22	11	0.3	14	62.89	0.05	0.06
	FON PERT	14.80		16x2	624	0.057	0.14	22	332	7.9	408	62.85	1.27	1.67
	FON PERT	9.80		16x2	622	0.056	0.14	22	218	7.9	293	63.39	0.88	1.11
	FON PERT	6.80		16x2	622	0.056	0.14	22	151	7.9	226	63.75	0.65	0.77
	FON PERT	6.80		16x2	622	0.056	0.14	22	151	7.9	226	63.75	0.65	0.77
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.44	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.80	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.80	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.49	0.05	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	22	11	11.8	125	62.94	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.85	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.85	0.05	0.06
	EN 10220	2.50		25	8596	0.779	0.34	103	258	1.3	335	62.96	0.03	1.59
	FON PERT	11.80		16x2	873	0.079	0.19	60	704	7.9	852	63.66	0.77	1.33
	FON PERT	0.50		16x2	873	0.079	0.19	60	30	0.3	36	63.70	0.03	0.06
	FON PERT	0.50		16x2	873	0.079	0.19	60	30	11.8	253	63.73	0.04	0.06
	FON PERT	11.80		16x2	622	0.056	0.14	22	263	7.9	338	63.17	1.04	1.33
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	0.3	14	63.21	0.05	0.06
	FON PERT	0.50		16x2	622	0.056	0.14	22	11	11.8	124	63.26	0.05	0.06
	FON PERT	13.80		16x2	873	0.079	0.19	59	819	7.9	968	63.51	0.89	1.56
	FON PERT	0.50		16x2	873	0.079	0.19	60	30	11.8	253	63.57	0.04	0.06
	FON PERT	0.50		16x2	873	0.079	0.19	60	30	0.3	36	63.54	0.03	0.06
	FON PERT	2.80		16x2	873	0.079	0.19	61	170	7.9	319	64.39	0.20	0.32
	FON PERT	0.50		16x2	873	0.079	0.19	61	30	0.3	37	64.43	0.03	0.06
	FON PERT	0.50		16x2	873	0.079	0.19	61	30	11.8	253	64.47	0.04	0.06
	FON PERT	15.80		16x2	870	0.079	0.19	58	924	7.9	1071	63.35	1.01	1.79

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	0.50		16x2	870	0.079	0.19	59	30	11.8	251	63.41	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	59	30	0.3	36	63.38	0.03	0.06
	FON PERT	10.80		16x2	1122	0.102	0.25	105	1134	7.9	1379	63.97	0.56	1.22
	FON PERT	0.50		16x2	1122	0.102	0.25	105	52	0.3	63	64.00	0.03	0.06
	FON PERT	0.50		16x2	1122	0.102	0.25	105	52	11.8	421	64.03	0.03	0.06
	EN 10220	2.50		20	4973	0.451	0.32	129	323	1.3	388	63.58	0.04	0.98
	EN 10220	9.00		32	15434	1.399	0.36	80	716	1.8	829	62.78	0.05	9.78
	FON PERT	7.80		16x2	746	0.068	0.17	35	275	7.9	383	63.69	0.60	0.88
	FON PERT	14.80		16x2	746	0.068	0.17	34	503	7.9	611	62.27	1.06	1.67
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	0.3	22	63.73	0.04	0.06
	EN 10220	0.50		25	6838	0.620	0.27	66	33	0.5	53	62.72	0.01	0.32
	FON PERT	1.30		16x2	870	0.079	0.19	60	78	7.9	226	64.40	0.09	0.15
	FON PERT	9.80		16x2	746	0.068	0.17	35	343	7.9	451	63.49	0.74	1.11
	FON PERT	16.80		16x2	746	0.068	0.17	34	578	7.9	686	62.91	1.21	1.90
	FON PERT	0.50		16x2	746	0.068	0.17	34	17	0.3	22	62.31	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	0.3	22	63.53	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	17	0.3	22	62.95	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	0.3	36	64.43	0.03	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	34	17	11.8	180	62.35	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	11.8	180	63.77	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	17	11.8	180	62.99	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	11.8	180	63.57	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	60	30	11.8	252	64.47	0.04	0.06
	EN 10220	2.50		25	6838	0.620	0.27	66	166	0.3	178	62.71	0.03	1.59
	FON PERT	5.80		16x2	746	0.068	0.17	35	205	7.9	314	63.90	0.47	0.66
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	0.3	22	63.94	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	11.8	181	63.98	0.04	0.06
	FON PERT	7.80		16x2	746	0.068	0.17	35	275	7.9	383	63.69	0.60	0.88
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	0.3	22	63.73	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	11.8	180	63.77	0.04	0.06
	FON PERT	9.80		16x2	746	0.068	0.17	35	343	7.9	451	63.49	0.74	1.11
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	11.8	180	63.57	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	18	0.3	22	63.53	0.04	0.06
	FON PERT	15.80		16x2	746	0.068	0.17	34	545	7.9	653	63.00	1.15	1.79
	FON PERT	0.50		16x2	746	0.068	0.17	35	17	0.3	22	63.04	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	35	17	11.8	180	63.08	0.04	0.06
	EN 10220	6.50		25	6838	0.620	0.27	66	431	1.8	496	62.68	0.09	4.15
	EN 10220	0.60		65	73890	0.000	0.00	0	0	0.0	0	62.97	10.42	2.33
	EN 10220	2.00		32	16159	1.465	0.37	87	174	0.6	219	63.26	0.01	2.17
	FON PERT	28.50		16x2	1371	0.124	0.31	149	4248	7.9	4614	63.24	1.15	3.22
	FON PERT	0.50		16x2	1371	0.124	0.31	149	74	0.3	90	63.26	0.02	0.06

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	0.50		16x2	1371	0.124	0.31	149	74	11.8	624	63.28	0.02	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	59	30	11.8	251	63.70	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	59	30	0.3	36	63.66	0.03	0.06
	FON PERT	10.80		16x2	870	0.079	0.19	59	637	7.9	784	63.63	0.71	1.22
	FON PERT	0.50		16x2	1243	0.113	0.28	125	63	11.8	514	63.87	0.02	0.06
	FON PERT	0.50		16x2	1243	0.113	0.28	125	63	0.3	75	63.85	0.02	0.06
	FON PERT	12.80		16x2	1243	0.113	0.28	125	1605	7.9	1906	63.82	0.60	1.45
	FON PERT	0.50		16x2	1243	0.113	0.28	125	63	11.8	514	63.42	0.02	0.06
	FON PERT	0.50		16x2	1243	0.113	0.28	125	63	0.3	76	63.40	0.02	0.06
	FON PERT	20.80		16x2	1243	0.113	0.28	126	2614	7.9	2915	63.37	0.94	2.35
	EN 10220	9.00		25	8578	0.778	0.34	103	923	1.8	1026	63.31	0.10	5.74
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	11.8	181	64.36	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	36	18	0.3	23	64.32	0.04	0.06
	FON PERT	3.85		16x2	746	0.068	0.17	36	138	7.9	246	64.28	0.31	0.44
	FON PERT	4.80		16x2	873	0.079	0.19	61	290	7.9	439	64.22	0.33	0.54
	FON PERT	0.50		16x2	873	0.079	0.19	61	30	0.3	37	64.26	0.03	0.06
	FON PERT	0.50		16x2	873	0.079	0.19	61	30	11.8	253	64.29	0.04	0.06
	FON PERT	15.56		16x2	1119	0.101	0.25	105	1629	7.9	1873	63.59	0.80	1.76
	FON PERT	0.50		16x2	1119	0.101	0.25	105	52	0.3	63	63.61	0.03	0.06
	FON PERT	0.50		16x2	1119	0.101	0.25	105	52	11.8	418	63.64	0.03	0.06
	EN 10220	1.00		65	73890	6.746	0.48	60	60	0.0	60	75.00	0.00	3.88
	EN 10220	5.00		65	73890	6.746	0.48	60	302	5.1	892	75.00	0.01	19.41
	EN 10220	0.50		20	4848	0.443	0.31	122	61	9.0	506	74.71	0.01	0.20
	EN 10220	12.00		20	4848	0.443	0.31	122	1468	8.8	1904	74.99	0.26	4.69
	FON PERT	0.50		16x2	870	0.079	0.20	65	33	1153.8	21975	74.40	0.05	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2306.2	22380	73.92	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.98	0.06	0.06
	FON PERT	0.50		16x2	870	0.079	0.20	65	32	0.3	39	74.44	0.04	0.06
	FON PERT	2.95		16x2	870	0.079	0.20	65	192	7.9	341	74.70	0.26	0.33
	FON PERT	5.95		16x2	622	0.057	0.14	24	144	7.9	220	74.70	0.72	0.67
	EN 10220	0.50		20	4848	0.443	0.31	122	61	0.3	78	74.72	0.01	0.20
	EN 10220	0.50		25	8578	0.783	0.34	102	51	8.2	525	74.75	0.01	0.32
	FON PERT	8.95		16x2	622	0.057	0.14	24	216	7.9	292	74.74	1.08	1.01
	FON PERT	9.45		16x2	870	0.079	0.20	65	614	7.9	764	74.74	0.83	1.07
	FON PERT	5.95		16x2	622	0.057	0.14	24	144	7.9	220	74.74	0.72	0.67
	FON PERT	6.95		16x2	622	0.057	0.14	24	168	7.9	245	74.74	0.85	0.79
	FON PERT	9.95		16x2	622	0.057	0.14	24	240	7.9	316	74.74	1.20	1.13
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.66	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	74.02	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2082.7	20244	73.84	0.06	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	73.91	0.04	0.06

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.54	0.06	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1002.3	19081	73.87	0.04	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2073.8	20150	73.60	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2087.2	20290	73.96	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2069.3	20104	73.48	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.90	0.06	0.06
	EN 10220	5.00		65	69043	6.304	0.45	53	264	1.8	451	74.99	0.01	19.41
	EN 10220	2.50		25	8578	0.783	0.34	102	255	0.3	275	74.79	0.04	1.59
	FON PERT	13.45		16x2	622	0.057	0.14	24	323	7.9	400	74.74	1.59	1.52
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2053.4	19941	73.09	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.15	0.06	0.06
	FON PERT	5.95		16x2	994	0.091	0.22	82	488	7.9	683	74.74	0.46	0.67
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	766.1	19072	74.24	0.04	0.06
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	0.3	49	74.28	0.04	0.06
	FON PERT	2.95		16x2	622	0.057	0.14	24	72	7.9	148	74.74	0.36	0.33
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2100.7	20430	74.32	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	74.38	0.06	0.06
	FON PERT	3.95		20x2	1491	0.136	0.19	42	166	8.6	319	74.74	0.23	0.79
	FON PERT	0.50		20x2	1491	0.136	0.19	42	21	1103.1	19519	74.48	0.03	0.10
	FON PERT	0.50		20x2	1491	0.136	0.19	42	21	0.3	27	74.51	0.03	0.10
	FON PERT	10.95		20x2	1491	0.136	0.19	42	461	8.6	614	74.74	0.62	2.20
	FON PERT	0.50		20x2	1491	0.136	0.19	42	21	1069.6	18917	74.09	0.03	0.10
	FON PERT	0.50		20x2	1491	0.136	0.19	42	21	0.3	27	74.12	0.03	0.10
	EN 10220	2.50		20	4973	0.454	0.32	128	321	9.0	789	74.92	0.05	0.98
	EN 10220	0.50		20	4973	0.454	0.32	128	64	1.9	164	74.93	0.01	0.20
	FON PERT	5.97		16x2	994	0.091	0.22	82	489	7.9	684	74.87	0.46	0.68
	FON PERT	6.97		16x2	746	0.068	0.17	45	311	7.9	421	74.87	0.71	0.79
	FON PERT	1.97		16x2	994	0.091	0.22	82	161	7.9	356	74.87	0.15	0.22
	FON PERT	9.97		16x2	746	0.068	0.17	44	444	7.9	553	74.87	1.02	1.13
	FON PERT	12.97		16x2	746	0.068	0.17	44	576	7.9	686	74.87	1.25	1.47
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	0.3	49	74.40	0.04	0.06
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	0.3	49	74.71	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1559.5	21812	73.80	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	74.15	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.62	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1575.8	22048	74.10	0.05	0.06
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	853.7	21249	74.37	0.04	0.06
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	882.6	21976	74.68	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1543.1	21577	73.57	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.85	0.05	0.06
	EN 10220	0.50		25	7581	0.692	0.30	80	40	8.2	410	74.87	0.01	0.32

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	EN 10220	2.50		25	7581	0.692	0.30	80	201	2.0	293	74.91	0.04	1.59
	FON PERT	13.97		20x2	1864	0.170	0.24	62	866	8.6	1104	74.87	0.64	2.81
	FON PERT	15.97		20x2	1864	0.170	0.24	62	990	8.6	1228	74.87	0.73	3.21
	FON PERT	25.97		20x2	1989	0.182	0.25	69	1802	8.6	2074	74.87	1.09	5.22
	FON PERT	15.97		20x2	1864	0.170	0.24	62	990	8.6	1228	74.87	0.73	3.21
	FON PERT	0.50		20x2	1864	0.170	0.24	62	31	0.3	40	74.23	0.02	0.10
	FON PERT	0.50		20x2	1989	0.181	0.25	70	35	557.3	17545	73.76	0.02	0.10
	FON PERT	0.50		20x2	1864	0.170	0.24	62	31	0.3	40	74.14	0.02	0.10
	FON PERT	0.50		20x2	1864	0.170	0.24	62	31	0.3	40	74.14	0.02	0.10
	FON PERT	0.50		20x2	1864	0.170	0.24	62	31	702.2	19421	74.12	0.02	0.10
	FON PERT	0.50		20x2	1864	0.170	0.24	62	31	711.3	19674	74.21	0.02	0.10
	FON PERT	0.50		20x2	1864	0.170	0.24	62	31	702.2	19421	74.12	0.02	0.10
	FON PERT	0.50		20x2	1989	0.181	0.25	70	35	0.3	45	73.78	0.02	0.10
	EN 10220	0.50		65	69043	6.304	0.45	53	26	0.3	61	74.97	0.00	1.94
	EN 10220	6.50		32	21132	1.929	0.49	146	951	1.2	1098	74.97	0.04	7.06
	EN 10220	0.50		25	7099	0.648	0.28	71	35	8.2	360	74.84	0.01	0.32
	EN 10220	2.50		25	7099	0.648	0.28	71	177	2.0	257	74.88	0.04	1.59
	FON PERT	12.66		16x2	1371	0.125	0.31	143	1810	7.9	2181	74.83	0.69	1.43
	FON PERT	25.66		16x2	870	0.079	0.19	65	1668	7.9	1818	74.83	2.03	2.90
	FON PERT	29.66		16x2	624	0.057	0.14	24	711	7.9	788	74.83	3.19	3.35
	FON PERT	10.66		16x2	1371	0.125	0.31	143	1523	7.9	1894	74.83	0.58	1.21
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	0.3	87	74.14	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.20	65	33	0.3	39	74.33	0.04	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	23	12	2207.6	21536	71.59	0.06	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	72.80	0.04	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	0.3	87	74.25	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1025.1	19488	72.76	0.04	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	380.5	18035	74.11	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.20	65	33	1151.0	21919	74.28	0.04	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	392.8	18619	74.22	0.03	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	23	12	0.3	15	71.64	0.06	0.06
	FON PERT	25.66		16x2	622	0.057	0.14	24	611	7.9	687	74.83	2.84	2.90
	FON PERT	0.50		16x2	622	0.057	0.14	23	12	2241.7	21738	71.94	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	23	12	0.3	15	71.99	0.06	0.06
	FON PERT	5.66		16x2	870	0.079	0.20	65	367	7.9	517	74.83	0.51	0.64
	EN 10220	0.50		25	8333	0.761	0.33	97	48	8.2	496	74.74	0.01	0.32
	EN 10220	2.50		25	8333	0.761	0.33	97	241	0.3	260	74.78	0.04	1.59
	EN 10220	0.50		50	32478	2.965	0.35	46	23	0.6	62	74.96	0.00	1.17
	EN 10220	3.50		50	47911	4.374	0.52	98	343	1.9	597	74.97	0.01	8.16
	EN 10220	9.00		32	15432	1.409	0.36	79	713	1.9	838	74.96	0.08	9.78
	FON PERT	5.71		16x2	870	0.079	0.20	65	371	7.9	520	74.74	0.51	0.65

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	10.71		16x2	624	0.057	0.14	24	261	7.9	338	74.74	1.23	1.21
	FON PERT	8.71		16x2	873	0.080	0.20	65	570	7.9	720	74.74	0.73	0.98
	FON PERT	10.71		16x2	870	0.079	0.20	65	696	7.9	845	74.74	0.90	1.21
	FON PERT	0.50		16x2	870	0.079	0.20	65	33	0.3	39	74.23	0.04	0.06
	FON PERT	0.50		16x2	1119	0.102	0.25	100	50	0.3	61	74.62	0.03	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	1034.3	19827	73.96	0.04	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	24	12	0.3	15	73.51	0.06	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	73.83	0.04	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	24	12	2120.5	20733	73.45	0.06	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1061.4	20212	74.18	0.04	0.06
	FON PERT	0.50		16x2	1119	0.102	0.25	101	50	639.4	20171	74.58	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1029.4	19595	73.79	0.04	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	0.3	39	74.00	0.04	0.06
	FON PERT	4.71		16x2	870	0.079	0.20	65	306	7.9	455	74.74	0.42	0.53
	FON PERT	0.50		16x2	870	0.079	0.20	65	33	1067.8	20336	74.27	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.20	65	33	0.3	39	74.32	0.04	0.06
	FON PERT	1.71		16x2	1119	0.102	0.25	100	172	7.9	419	74.74	0.12	0.19
	FON PERT	18.71		16x2	870	0.079	0.19	65	1217	7.9	1366	74.74	1.53	2.12
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	978.9	18621	73.17	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	73.21	0.04	0.06
	FON PERT	15.71		16x2	1119	0.102	0.25	101	1580	7.9	1827	74.74	1.03	1.78
	FON PERT	0.50		16x2	1119	0.102	0.25	101	50	0.3	61	73.71	0.03	0.06
	FON PERT	0.50		16x2	1119	0.102	0.25	101	50	548.9	17297	73.67	0.03	0.06
	FON PERT	12.71		20x2	1740	0.159	0.22	55	699	8.6	907	74.91	0.62	2.56
	FON PERT	7.71		16x2	873	0.080	0.20	65	504	7.9	655	74.91	0.65	0.87
	FON PERT	21.71		16x2	994	0.091	0.22	82	1782	7.9	1977	74.91	1.56	2.46
	FON PERT	21.71		20x2	1740	0.159	0.22	55	1194	8.6	1402	74.91	1.04	4.36
	FON PERT	0.50		20x2	1740	0.159	0.22	55	28	0.3	36	74.28	0.02	0.10
	FON PERT	0.50		20x2	1740	0.159	0.22	55	27	0.3	36	74.58	0.02	0.10
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	793.4	19726	73.32	0.04	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	0.3	39	74.26	0.04	0.06
	FON PERT	0.50		20x2	1740	0.159	0.22	55	28	0.3	36	73.87	0.02	0.10
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	1176.5	22557	74.21	0.04	0.06
	FON PERT	0.50		20x2	1740	0.159	0.22	55	28	885.8	21345	74.26	0.03	0.10
	FON PERT	0.50		20x2	1740	0.159	0.22	55	27	913.5	22019	74.55	0.03	0.10
	FON PERT	0.50		20x2	1740	0.159	0.22	55	28	844.2	20332	73.84	0.03	0.10
	FON PERT	0.50		16x2	994	0.091	0.22	82	41	0.3	49	73.35	0.04	0.06
	FON PERT	1.71		20x2	1740	0.159	0.22	55	94	8.6	302	74.91	0.09	0.34
	FON PERT	0.50		20x2	1740	0.159	0.22	55	27	936.5	22580	74.80	0.03	0.10
	FON PERT	0.50		20x2	1740	0.159	0.22	55	27	0.3	36	74.82	0.02	0.10
	FON PERT	6.71		20x2	1740	0.159	0.22	55	369	8.6	577	74.91	0.33	1.35

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	EN 10220	0.50		25	8827	0.806	0.35	108	54	8.2	556	74.92	0.01	0.32
	EN 10220	2.50		25	8827	0.806	0.35	108	270	2.0	394	74.95	0.04	1.59
	EN 10220	7.00		25	8333	0.761	0.33	97	676	1.2	744	74.88	0.10	4.47
	FON PERT	3.71		16x2	746	0.068	0.17	45	166	7.9	276	74.92	0.38	0.42
	FON PERT	14.71		16x2	622	0.057	0.14	24	354	7.9	431	74.92	1.66	1.66
	FON PERT	9.71		16x2	1371	0.125	0.31	143	1388	7.9	1759	74.92	0.53	1.10
	FON PERT	10.71		16x2	1371	0.125	0.31	143	1531	7.9	1902	74.92	0.59	1.21
	FON PERT	0.50		16x2	746	0.068	0.17	45	22	0.3	27	74.54	0.05	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	74.21	0.06	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	413.6	19603	74.36	0.03	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.26	0.06	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	0.3	87	74.33	0.03	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2373.2	23047	73.20	0.06	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	45	22	1657.7	23204	74.49	0.05	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2404.5	23378	74.15	0.06	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	407.4	19311	74.31	0.03	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	0.3	87	74.39	0.03	0.06
	FON PERT	18.71		16x2	870	0.079	0.19	65	1216	7.9	1366	74.92	1.53	2.12
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1105.3	21025	73.34	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	73.39	0.04	0.06
	FON PERT	5.71		16x2	622	0.057	0.14	24	139	7.9	215	74.92	0.71	0.65
	EN 10220	0.50		25	8217	0.750	0.33	94	47	8.2	482	74.93	0.01	0.32
	EN 10220	0.50		25	8217	0.750	0.33	94	47	2.0	155	74.93	0.01	0.32
	EN 10220	1.00		50	32478	2.965	0.35	46	46	0.3	67	74.96	0.01	2.33
	EN 10220	3.00		40	23651	2.159	0.41	84	253	1.2	353	74.95	0.02	4.38
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2350.9	22819	72.80	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.05	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	72.86	0.06	0.06
	FON PERT	17.71		16x2	622	0.057	0.14	24	425	7.9	502	74.92	2.06	2.00
	FON PERT	17.71		16x2	1371	0.125	0.31	143	2533	7.9	2904	74.92	0.96	2.00
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2373.2	23042	72.99	0.06	0.06
	FON PERT	16.71		16x2	622	0.057	0.14	24	402	7.9	478	74.92	1.87	1.89
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	0.3	87	73.96	0.03	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	143	72	364.3	17266	73.94	0.03	0.06
	EN 10220	0.50		25	8596	0.785	0.34	103	51	8.2	527	74.82	0.01	0.32
	FON PERT	6.95		16x2	622	0.057	0.14	24	168	7.9	245	74.82	0.85	0.79
	FON PERT	14.95		16x2	624	0.057	0.14	24	363	7.9	440	74.82	1.76	1.69
	FON PERT	6.95		16x2	622	0.057	0.14	24	168	7.9	245	74.82	0.85	0.79
	FON PERT	9.95		16x2	622	0.057	0.14	24	240	7.9	317	74.82	1.20	1.13
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.97	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.97	0.06	0.06

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	0.50		16x2	624	0.057	0.14	24	12	0.3	15	73.06	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.61	0.06	0.06
	FON PERT	0.50		16x2	624	0.057	0.14	24	12	2132.0	20835	73.00	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2182.5	21214	73.91	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2182.5	21214	73.91	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2169.0	21074	73.55	0.06	0.06
	EN 10220	2.50		25	8596	0.785	0.34	103	256	2.0	374	74.86	0.03	1.59
	FON PERT	11.95		16x2	873	0.080	0.20	65	782	7.9	932	74.82	0.99	1.35
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	1029.2	19725	73.78	0.04	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	0.3	39	73.82	0.04	0.06
	FON PERT	11.95		16x2	622	0.057	0.14	24	288	7.9	364	74.82	1.43	1.35
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	2160.0	20981	73.32	0.06	0.06
	FON PERT	0.50		16x2	622	0.057	0.14	24	12	0.3	15	73.38	0.06	0.06
	FON PERT	13.95		16x2	873	0.080	0.20	65	913	7.9	1063	74.82	1.15	1.58
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	1016.5	19479	73.62	0.04	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	0.3	39	73.66	0.04	0.06
	FON PERT	2.95		16x2	873	0.080	0.20	65	193	7.9	343	74.82	0.26	0.33
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	1086.9	20849	74.51	0.05	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	0.3	39	74.55	0.04	0.06
	FON PERT	15.95		16x2	870	0.079	0.19	65	1037	7.9	1186	74.82	1.31	1.80
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1011.9	19254	73.46	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	73.50	0.04	0.06
	FON PERT	10.95		16x2	1122	0.102	0.25	101	1106	7.9	1354	74.82	0.72	1.24
	FON PERT	0.50		16x2	1122	0.102	0.25	101	51	585.4	18560	74.06	0.03	0.06
	FON PERT	0.50		16x2	1122	0.102	0.25	101	51	0.3	61	74.10	0.03	0.06
	EN 10220	9.00		32	15434	1.409	0.36	79	713	1.2	791	74.93	0.08	9.78
	EN 10220	0.50		25	6838	0.624	0.27	66	33	8.2	334	74.70	0.01	0.32
	FON PERT	16.95		16x2	746	0.068	0.17	44	748	7.9	858	74.69	1.59	1.92
	FON PERT	7.95		16x2	746	0.068	0.17	44	353	7.9	463	74.69	0.81	0.90
	FON PERT	1.45		16x2	870	0.079	0.20	65	94	7.9	244	74.69	0.13	0.16
	FON PERT	9.95		16x2	746	0.068	0.17	44	441	7.9	551	74.69	1.01	1.13
	FON PERT	14.95		16x2	746	0.068	0.17	44	661	7.9	771	74.69	1.42	1.69
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	26	73.09	0.05	0.06
	FON PERT	0.50		16x2	870	0.079	0.20	65	32	0.3	39	74.56	0.04	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1448.6	20259	73.63	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.88	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.27	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1456.3	20371	73.83	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	43	22	1407.6	19671	73.04	0.05	0.06
	FON PERT	0.50		16x2	870	0.079	0.20	65	32	1084.0	20651	74.51	0.05	0.06
	FON PERT	9.00		16x2	746	0.068	0.17	43	390	1393.3	19835	73.22	0.87	1.02

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.68	0.05	0.06
	EN 10220	2.50		25	6838	0.624	0.27	66	165	0.3	177	74.74	0.04	1.59
	FON PERT	5.95		16x2	746	0.068	0.17	45	265	7.9	375	74.69	0.61	0.67
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1467.2	20528	74.03	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	74.08	0.05	0.06
	FON PERT	7.95		16x2	746	0.068	0.17	44	353	7.9	463	74.69	0.81	0.90
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1456.3	20370	73.83	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.88	0.05	0.06
	FON PERT	9.95		16x2	746	0.068	0.17	44	441	7.9	551	74.69	1.01	1.13
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1448.6	20259	73.63	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	27	73.68	0.05	0.06
	FON PERT	15.95		16x2	746	0.068	0.17	44	705	7.9	814	74.69	1.51	1.80
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	1412.9	19748	73.13	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	44	22	0.3	26	73.18	0.05	0.06
	EN 10220	6.50		25	6838	0.624	0.27	66	428	1.2	474	74.86	0.12	4.15
	EN 10220	2.00		32	16159	1.475	0.38	87	173	0.6	219	74.93	0.02	2.17
	FON PERT	28.66		16x2	1371	0.125	0.31	143	4103	7.9	4474	74.83	1.50	3.24
	FON PERT	0.50		16x2	1371	0.125	0.31	144	72	281.5	13349	73.31	0.03	0.06
	FON PERT	0.50		16x2	1371	0.125	0.31	144	72	0.3	88	73.33	0.03	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	1102.6	20985	73.74	0.04	0.06
	FON PERT	0.50		16x2	870	0.079	0.19	65	33	0.3	39	73.79	0.04	0.06
	FON PERT	10.95		16x2	870	0.079	0.20	65	712	7.9	861	74.70	0.91	1.24
	FON PERT	0.50		16x2	1243	0.113	0.28	121	60	0.3	73	73.93	0.03	0.06
	FON PERT	0.50		16x2	1243	0.113	0.28	121	60	475.8	18520	73.90	0.03	0.06
	FON PERT	12.95		16x2	1243	0.113	0.28	121	1563	7.9	1868	74.70	0.77	1.46
	FON PERT	0.50		16x2	1243	0.113	0.28	121	61	0.3	74	73.48	0.03	0.06
	FON PERT	0.50		16x2	1243	0.113	0.28	121	61	426.4	16594	73.45	0.03	0.06
	FON PERT	20.95		16x2	1243	0.113	0.28	121	2530	7.9	2835	74.70	1.22	2.37
	EN 10220	9.00		25	8578	0.783	0.34	102	919	1.2	991	74.91	0.13	5.74
	FON PERT	0.50		16x2	746	0.068	0.17	45	22	0.3	27	74.46	0.05	0.06
	FON PERT	0.50		16x2	746	0.068	0.17	45	22	1592.0	22283	74.41	0.05	0.06
	FON PERT	4.00		16x2	746	0.068	0.17	45	179	7.9	289	74.87	0.40	0.45
	FON PERT	4.95		16x2	873	0.080	0.20	65	324	7.9	474	74.82	0.43	0.56
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	1074.0	20597	74.34	0.04	0.06
	FON PERT	0.50		16x2	873	0.080	0.20	65	33	0.3	39	74.38	0.04	0.06
	FON PERT	15.71		16x2	1119	0.102	0.25	101	1580	7.9	1827	74.74	1.03	1.78
	FON PERT	0.50		16x2	1119	0.102	0.25	101	50	0.3	61	73.71	0.03	0.06
	FON PERT	0.50		16x2	1119	0.102	0.25	101	50	548.9	17297	73.67	0.03	0.06

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
MANIF	20x5				4848	4.8	0.123	0.123	7.4	0.443			
MANIF	20x5				4848	4.8	0.123	0.122	7.3	0.440			
MANIF	25x10				8578	8.6	0.218	0.216	13.0	0.778			
MANIF	25x10				8578	8.6	0.218	0.218	13.1	0.783			
MANIF	20x6				4973	5.0	0.127	0.125	7.5	0.451			
MANIF	20x6				4973	5.0	0.127	0.126	7.6	0.454			
MANIF	25x4				7581	7.6	0.193	0.191	11.5	0.687			
MANIF	25x4				7581	7.6	0.193	0.192	11.5	0.692			
MANIF	25x7				7099	7.1	0.181	0.179	10.7	0.643			
MANIF	25x7				7099	7.1	0.181	0.180	10.8	0.648			
MANIF	25x9				8333	8.3	0.212	0.210	12.6	0.756			
MANIF	25x9				8333	8.3	0.212	0.211	12.7	0.761			
MANIF	25x6				8827	8.8	0.225	0.222	13.3	0.801			
MANIF	25x6				8827	8.8	0.225	0.224	13.4	0.806			
MANIF	25x9				8217	8.2	0.209	0.207	12.4	0.745			
MANIF	25x9				8217	8.2	0.209	0.208	12.5	0.750			
MANIF	25x11				8596	8.6	0.219	0.216	13.0	0.779			
MANIF	25x11				8596	8.6	0.219	0.218	13.1	0.785			
MANIF	25x9				6838	6.8	0.174	0.172	10.3	0.620			
MANIF	25x9				6838	6.8	0.174	0.173	10.4	0.624			
BALL VALVE	65				73890	73.9	1.880	1.874	112.4	6.746	462.128	21	
REVERSE V F	65				73890	73.9	1.880	1.874	112.4	6.746	89.490	568	
FILTER	65				73890	73.9	1.880	1.861	111.7	6.700	59.660	1261	
BALL VALVE	65				73890	73.9	1.880	1.861	111.7	6.700	462.128	21	
BALL VALVE	20				4848	4.8	0.123	0.122	7.3	0.440	45.550	9	
BALL VALVE	20				4848	4.8	0.123	0.123	7.4	0.443	45.550	9	
FILTER	20				4848	4.8	0.123	0.123	7.4	0.443	6.920	409	
BALL VALVE	20				4848	4.8	0.123	0.123	7.4	0.443	45.550	9	
RA-N-A	15	3.50		0.60	870	0.9	0.022	0.022	1.3	0.079	0.170	21936	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.00		0.61	622	0.6	0.016	0.016	0.9	0.057	0.120	22365	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.55	622	0.6	0.016	0.016	0.9	0.057	0.126	20228	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.52	870	0.9	0.022	0.022	1.3	0.079	0.182	19043	
RA-N-A	15	3.00		0.55	622	0.6	0.016	0.016	0.9	0.057	0.126	20275	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
RA-N-A	15	3.00		0.54	622	0.6	0.016	0.016	0.9	0.057	0.126	20135	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.54	622	0.6	0.016	0.016	0.9	0.057	0.127	20089	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
BALL VALVE	25				8578	8.6	0.218	0.218	13.1	0.783	72.230	12	
FILTER	25				8578	8.6	0.218	0.218	13.1	0.783	11.928	431	
BALL VALVE	25				8578	8.6	0.218	0.216	13.0	0.778	72.230	12	
BALL VALVE	25				8578	8.6	0.218	0.218	13.1	0.783	72.230	12	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.54	622	0.6	0.016	0.016	0.9	0.057	0.127	19926	
RLV-S-A	15				994	1.0	0.025	0.025	1.5	0.090	1.702	281	
RA-N-A	15	4.00		0.51	994	1.0	0.025	0.025	1.5	0.091	0.208	19022	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.55	622	0.6	0.016	0.016	0.9	0.057	0.126	20415	
RLV-S-A	15				1491	1.5	0.038	0.038	2.3	0.135	1.702	632	
RA-N-A	15	5.00		0.53	1491	1.5	0.038	0.038	2.3	0.136	0.308	19492	
RLV-S-A	15				1491	1.5	0.038	0.038	2.3	0.135	1.702	632	
RA-N-A	15	5.00		0.51	1491	1.5	0.038	0.038	2.3	0.136	0.313	18890	
BALL VALVE	20				4973	5.0	0.127	0.126	7.6	0.454	45.550	10	
BALL VALVE	20				4973	5.0	0.127	0.125	7.5	0.451	45.550	10	
FILTER	20				4973	5.0	0.127	0.126	7.6	0.454	6.920	431	
BALL VALVE	20				4973	5.0	0.127	0.126	7.6	0.454	45.550	10	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.58	746	0.7	0.019	0.019	1.1	0.068	0.147	21551	
RLV-S-A	15				994	1.0	0.025	0.025	1.5	0.090	1.702	281	
RA-N-A	15	4.00		0.57	994	1.0	0.025	0.025	1.5	0.091	0.197	21200	
RLV-S-A	15				994	1.0	0.025	0.025	1.5	0.090	1.702	281	
RA-N-A	15	3.50		0.59	994	1.0	0.025	0.025	1.5	0.091	0.194	21927	
RA-N-A	15	3.00		0.60	746	0.7	0.019	0.019	1.1	0.068	0.145	22021	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.59	746	0.7	0.019	0.019	1.1	0.068	0.146	21785	
RLV-S-A	15				1864	1.9	0.047	0.047	2.8	0.169	1.702	987	
RA-N-A	15	6.00		0.52	1864	1.9	0.047	0.047	2.8	0.170	0.386	19380	
RLV-S-A	15				1864	1.9	0.047	0.047	2.8	0.169	1.702	987	
RA-N-A	15	6.00		0.53	1864	1.9	0.047	0.047	2.8	0.170	0.384	19634	
RA-N-A	15	6.00		0.52	1864	1.9	0.047	0.047	2.8	0.170	0.386	19380	
RLV-S-A	15				1864	1.9	0.047	0.047	2.8	0.169	1.702	987	
RLV-S-A	15				1989	2.0	0.051	0.050	3.0	0.180	1.702	1123	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
RA-N-A	15	6.50		0.47	1989	2.0	0.051	0.050	3.0	0.181	0.434	17499	
BALL VALVE	25				7581	7.6	0.193	0.191	11.5	0.687	72.230	9	
FILTER	25				7581	7.6	0.193	0.192	11.5	0.692	11.928	337	
BALL VALVE	25				7581	7.6	0.193	0.192	11.5	0.692	72.230	9	
BALL VALVE	25				7581	7.6	0.193	0.192	11.5	0.692	72.230	9	
BALL VALVE	25				7099	7.1	0.181	0.179	10.7	0.643	72.230	8	
FILTER	25				7099	7.1	0.181	0.180	10.8	0.648	11.928	295	
BALL VALVE	25				7099	7.1	0.181	0.180	10.8	0.648	72.230	8	
BALL VALVE	25				7099	7.1	0.181	0.180	10.8	0.648	72.230	8	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.59	622	0.6	0.016	0.016	0.9	0.057	0.122	21723	
RLV-S-A	15				1371	1.4	0.035	0.035	2.1	0.124	1.702	534	
RA-N-A	15	5.00		0.50	1371	1.4	0.035	0.035	2.1	0.125	0.291	18532	
RLV-S-A	15				1371	1.4	0.035	0.035	2.1	0.124	1.702	534	
RA-N-A	15	5.00		0.48	1371	1.4	0.035	0.035	2.1	0.125	0.295	17948	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.59	870	0.9	0.022	0.022	1.3	0.079	0.170	21880	
RA-N-A	15	3.50		0.52	870	0.9	0.022	0.022	1.3	0.079	0.180	19449	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RLV-S-A	15				624	0.6	0.016	0.016	0.9	0.057	1.702	110	
RA-N-A	15	3.00		0.58	624	0.6	0.016	0.016	0.9	0.057	0.123	21521	
BALL VALVE	25				8333	8.3	0.212	0.210	12.6	0.756	72.230	11	
FILTER	25				8333	8.3	0.212	0.211	12.7	0.761	11.928	407	
BALL VALVE	25				8333	8.3	0.212	0.211	12.7	0.761	72.230	11	
BALL VALVE	25				8333	8.3	0.212	0.211	12.7	0.761	72.230	11	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.55	870	0.9	0.022	0.022	1.3	0.079	0.176	20297	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.53	870	0.9	0.022	0.022	1.3	0.079	0.179	19556	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.54	870	0.9	0.022	0.022	1.3	0.079	0.177	20173	
RLV-S-A	15				1119	1.1	0.028	0.028	1.7	0.102	1.702	356	
RA-N-A	15	4.00		0.54	1119	1.1	0.028	0.028	1.7	0.102	0.228	20110	
RA-N-A	15	3.00		0.56	624	0.6	0.016	0.016	0.9	0.057	0.125	20718	
RLV-S-A	15				624	0.6	0.016	0.016	0.9	0.057	1.702	111	
RLV-S-A	15				873	0.9	0.022	0.022	1.3	0.079	1.702	216	
RA-N-A	15	3.50		0.53	873	0.9	0.022	0.022	1.3	0.080	0.179	19788	
RA-N-A	15	3.50		0.50	870	0.9	0.022	0.022	1.3	0.079	0.184	18582	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
RA-N-A	15	4.50		0.46	1119	1.1	0.028	0.028	1.7	0.102	0.246	17236	
RLV-S-A	15				1119	1.1	0.028	0.028	1.7	0.101	1.702	355	
RLV-S-A	15				1740	1.7	0.044	0.044	2.6	0.158	1.702	860	
RA-N-A	15	5.50		0.55	1740	1.7	0.044	0.044	2.6	0.159	0.352	20297	
RLV-S-A	15				1740	1.7	0.044	0.044	2.6	0.158	1.702	860	
RA-N-A	15	5.50		0.57	1740	1.7	0.044	0.044	2.6	0.159	0.344	21310	
RLV-S-A	15				1740	1.7	0.044	0.044	2.6	0.158	1.702	861	
RA-N-A	15	5.00		0.59	1740	1.7	0.044	0.044	2.6	0.159	0.339	21983	
RA-N-A	15	3.50		0.61	873	0.9	0.022	0.022	1.3	0.080	0.168	22518	
RLV-S-A	15				873	0.9	0.022	0.022	1.3	0.079	1.702	217	
RLV-S-A	15				994	1.0	0.025	0.025	1.5	0.090	1.702	281	
RA-N-A	15	4.00		0.53	994	1.0	0.025	0.025	1.5	0.091	0.204	19677	
RLV-S-A	15				1740	1.7	0.044	0.044	2.6	0.158	1.702	861	
RA-N-A	15	5.00		0.61	1740	1.7	0.044	0.044	2.6	0.159	0.335	22544	
BALL VALVE	25				8827	8.8	0.225	0.222	13.3	0.801	72.230	12	
FILTER	25				8827	8.8	0.225	0.224	13.4	0.806	11.928	457	
BALL VALVE	25				8827	8.8	0.225	0.224	13.4	0.806	72.230	12	
BALL VALVE	25				8827	8.8	0.225	0.224	13.4	0.806	72.230	12	
RLV-S-A	15				1371	1.4	0.035	0.035	2.1	0.124	1.702	534	
RA-N-A	15	5.00		0.52	1371	1.4	0.035	0.035	2.1	0.125	0.285	19223	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.62	746	0.7	0.019	0.019	1.1	0.068	0.141	23177	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	2.50		0.63	622	0.6	0.016	0.016	0.9	0.057	0.117	23363	
RA-N-A	15	2.50		0.62	622	0.6	0.016	0.016	0.9	0.057	0.118	23032	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RLV-S-A	15				1371	1.4	0.035	0.035	2.1	0.124	1.702	534	
RA-N-A	15	5.00		0.53	1371	1.4	0.035	0.035	2.1	0.125	0.283	19515	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.57	870	0.9	0.022	0.022	1.3	0.079	0.173	20986	
BALL VALVE	25				8217	8.2	0.209	0.207	12.4	0.745	72.230	11	
FILTER	25				8217	8.2	0.209	0.208	12.5	0.750	11.928	396	
BALL VALVE	25				8217	8.2	0.209	0.208	12.5	0.750	72.230	11	
BALL VALVE	25				8217	8.2	0.209	0.208	12.5	0.750	72.230	11	
RA-N-A	15	5.00		0.46	1371	1.4	0.035	0.035	2.1	0.125	0.302	17179	
RLV-S-A	15				1371	1.4	0.035	0.035	2.1	0.124	1.702	534	
RA-N-A	15	2.50		0.62	622	0.6	0.016	0.016	0.9	0.057	0.118	23027	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
RA-N-A	15	3.00		0.61	622	0.6	0.016	0.016	0.9	0.057	0.119	22804	
RLV-S-A	15				873	0.9	0.022	0.022	1.3	0.079	1.702	216	
RA-N-A	15	3.50		0.53	873	0.9	0.022	0.022	1.3	0.080	0.180	19686	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.56	622	0.6	0.016	0.016	0.9	0.057	0.124	20966	
RLV-S-A	15				873	0.9	0.022	0.022	1.3	0.079	1.702	216	
RA-N-A	15	3.50		0.52	873	0.9	0.022	0.022	1.3	0.080	0.181	19439	
RLV-S-A	15				873	0.9	0.022	0.022	1.3	0.079	1.702	217	
RA-N-A	15	3.50		0.56	873	0.9	0.022	0.022	1.3	0.080	0.175	20809	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.52	870	0.9	0.022	0.022	1.3	0.079	0.181	19216	
RLV-S-A	15				1122	1.1	0.029	0.028	1.7	0.102	1.702	358	
RA-N-A	15	4.50		0.50	1122	1.1	0.029	0.028	1.7	0.102	0.238	18499	
BALL VALVE	25				8596	8.6	0.219	0.218	13.1	0.785	72.230	12	
BALL VALVE	25				8596	8.6	0.219	0.216	13.0	0.779	72.230	12	
FILTER	25				8596	8.6	0.219	0.218	13.1	0.785	11.928	433	
BALL VALVE	25				8596	8.6	0.219	0.218	13.1	0.785	72.230	12	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.57	622	0.6	0.016	0.016	0.9	0.057	0.124	21059	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.57	622	0.6	0.016	0.016	0.9	0.057	0.123	21199	
RLV-S-A	15				622	0.6	0.016	0.016	0.9	0.056	1.702	110	
RA-N-A	15	3.00		0.57	622	0.6	0.016	0.016	0.9	0.057	0.123	21199	
RA-N-A	15	3.00		0.56	624	0.6	0.016	0.016	0.9	0.057	0.125	20820	
RLV-S-A	15				624	0.6	0.016	0.016	0.9	0.057	1.702	110	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.55	746	0.7	0.019	0.019	1.1	0.068	0.150	20501	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.55	746	0.7	0.019	0.019	1.1	0.068	0.151	20343	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.55	746	0.7	0.019	0.019	1.1	0.068	0.151	20232	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.50		0.53	746	0.7	0.019	0.019	1.1	0.068	0.153	19721	
BALL VALVE	25				6838	6.8	0.174	0.173	10.4	0.624	72.230	7	
BALL VALVE	25				6838	6.8	0.174	0.172	10.3	0.620	72.230	7	
FILTER	25				6838	6.8	0.174	0.173	10.4	0.624	11.928	274	
BALL VALVE	25				6838	6.8	0.174	0.173	10.4	0.624	72.230	7	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.50		0.52	746	0.7	0.019	0.019	1.1	0.068	0.154	19440	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.50		0.53	746	0.7	0.019	0.019	1.1	0.068	0.153	19645	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	3.50		0.56	870	0.9	0.022	0.022	1.3	0.079	0.175	20612	
RA-N-A	15	3.00		0.55	746	0.7	0.019	0.019	1.1	0.068	0.151	20344	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RA-N-A	15	3.00		0.55	746	0.7	0.019	0.019	1.1	0.068	0.151	20232	
MSV-F2 PN16	65	4			73890	73.9	1.880	1.861	111.7	6.700	36.879	3300	
VF-3	65			0.91	73890	73.9	1.880	1.861	111.7	6.700	59.575	1265	
RLV-S-A	15				1371	1.4	0.035	0.035	2.1	0.124	1.702	534	
RA-N-A	15	5.50		0.36	1371	1.4	0.035	0.035	2.1	0.125	0.343	13261	
RA-N-A	15	3.50		0.57	870	0.9	0.022	0.022	1.3	0.079	0.173	20946	
RLV-S-A	15				870	0.9	0.022	0.022	1.3	0.079	1.702	215	
RA-N-A	15	4.50		0.50	1243	1.2	0.032	0.032	1.9	0.113	0.264	18447	
RLV-S-A	15				1243	1.2	0.032	0.031	1.9	0.113	1.702	439	
RA-N-A	15	4.50		0.45	1243	1.2	0.032	0.031	1.9	0.113	0.279	16520	
RLV-S-A	15				1243	1.2	0.032	0.031	1.9	0.113	1.702	439	
RA-N-A	15	3.00		0.60	746	0.7	0.019	0.019	1.1	0.068	0.144	22256	
RLV-S-A	15				746	0.7	0.019	0.019	1.1	0.068	1.702	158	
RLV-S-A	15				873	0.9	0.022	0.022	1.3	0.079	1.702	217	
RA-N-A	15	3.50		0.55	873	0.9	0.022	0.022	1.3	0.080	0.176	20558	
RA-N-A	15	4.50		0.46	1119	1.1	0.028	0.028	1.7	0.102	0.246	17236	
RLV-S-A	15				1119	1.1	0.028	0.028	1.7	0.101	1.702	355	
ELBOW90	20				4848	4.8	0.123	0.123	7.4	0.443	17.641	63	
ELBOW90	20				4848	4.8	0.123	0.123	7.4	0.443	17.641	63	
ELBOW90	20				4848	4.8	0.123	0.123	7.4	0.443	17.641	63	
ELBOW90	20				4848	4.8	0.123	0.123	7.4	0.443	17.641	63	
ELBOW90	20				4848	4.8	0.123	0.123	7.4	0.443	17.641	63	
ELBOW90	20				4848	4.8	0.123	0.123	7.4	0.443	17.641	63	
ELBOW90	20				4848	4.8	0.123	0.122	7.3	0.440	17.641	62	
ELBOW90	20				4848	4.8	0.123	0.122	7.3	0.440	17.641	62	
ELBOW90	20				4848	4.8	0.123	0.122	7.3	0.440	17.641	62	
ELBOW90	20				4848	4.8	0.123	0.122	7.3	0.440	17.641	62	
ELBOW90	20				4848	4.8	0.123	0.122	7.3	0.440	17.641	62	
ELBOW90	20				4848	4.8	0.123	0.122	7.3	0.440	17.641	62	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.135	7.904	29	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.135	7.904	29	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.135	7.904	29	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.136	7.904	30	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.136	7.904	30	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.136	7.904	30	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.135	7.904	29	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.135	7.904	29	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.135	7.904	29	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.136	7.904	30	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.136	7.904	30	
ELBOW90	20x2				1491	1.5	0.038	0.038	2.3	0.136	7.904	30	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	20x2				1989	2.0	0.051	0.050	3.0	0.180	7.904	52	
ELBOW90	20x2				1989	2.0	0.051	0.050	3.0	0.182	7.904	53	
ELBOW90	20x2				1989	2.0	0.051	0.050	3.0	0.182	7.904	53	
ELBOW90	20x2				1989	2.0	0.051	0.050	3.0	0.182	7.904	53	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.169	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1864	1.9	0.047	0.047	2.8	0.170	7.904	46	
ELBOW90	20x2				1989	2.0	0.051	0.050	3.0	0.180	7.904	52	
ELBOW90	20x2				1989	2.0	0.051	0.050	3.0	0.180	7.904	52	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.056	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.056	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.056	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.101	3.850	69	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.101	3.850	69	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.101	3.850	69	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.158	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.090	3.850	55	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	
ELBOW90	16x2				994	1.0	0.025	0.025	1.5	0.091	3.850	56	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	20x2				1740	1.7	0.044	0.044	2.6	0.159	7.904	40	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				1122	1.1	0.029	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1122	1.1	0.029	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1122	1.1	0.029	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1122	1.1	0.029	0.028	1.7	0.102	3.850	71	
ELBOW90	16x2				1122	1.1	0.029	0.028	1.7	0.102	3.850	71	
ELBOW90	16x2				1122	1.1	0.029	0.028	1.7	0.102	3.850	71	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.056	3.850	21	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				622	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.124	3.850	104	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				1371	1.4	0.035	0.035	2.1	0.125	3.850	106	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				870	0.9	0.022	0.022	1.3	0.079	3.850	43	
ELBOW90	16x2				1243	1.2	0.032	0.031	1.9	0.113	3.850	86	
ELBOW90	16x2				1243	1.2	0.032	0.031	1.9	0.113	3.850	86	
ELBOW90	16x2				1243	1.2	0.032	0.031	1.9	0.113	3.850	86	
ELBOW90	16x2				1243	1.2	0.032	0.032	1.9	0.113	3.850	87	
ELBOW90	16x2				1243	1.2	0.032	0.032	1.9	0.113	3.850	87	
ELBOW90	16x2				1243	1.2	0.032	0.032	1.9	0.113	3.850	87	
ELBOW90	16x2				1243	1.2	0.032	0.032	1.9	0.113	3.850	87	
ELBOW90	16x2				1243	1.2	0.032	0.032	1.9	0.113	3.850	87	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
ELBOW90	16x2				1243	1.2	0.032	0.032	1.9	0.113	3.850	87	
ELBOW90	16x2				1243	1.2	0.032	0.031	1.9	0.113	3.850	86	
ELBOW90	16x2				1243	1.2	0.032	0.031	1.9	0.113	3.850	86	
ELBOW90	16x2				1243	1.2	0.032	0.031	1.9	0.113	3.850	86	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				746	0.7	0.019	0.019	1.1	0.068	3.850	31	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.079	3.850	42	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				873	0.9	0.022	0.022	1.3	0.080	3.850	43	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				624	0.6	0.016	0.016	0.9	0.057	3.850	22	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.101	3.850	69	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.101	3.850	69	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.101	3.850	69	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
ELBOW90	16x2				1119	1.1	0.028	0.028	1.7	0.102	3.850	70	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				994	1.0	0.025	0.025	1.5	0.091	5.390	28	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				1491	1.5	0.038	0.038	2.3	0.136	5.390	64	
MANIF	20				1491	1.5	0.038	0.038	2.3	0.136	5.390	64	
MANIF	20				994	1.0	0.025	0.025	1.5	0.091	5.390	28	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				994	1.0	0.025	0.025	1.5	0.091	5.390	28	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				1864	1.9	0.047	0.047	2.8	0.170	5.390	100	
MANIF	20				1864	1.9	0.047	0.047	2.8	0.170	5.390	100	
MANIF	20				1989	2.0	0.051	0.050	3.0	0.182	5.390	113	
MANIF	20				1864	1.9	0.047	0.047	2.8	0.170	5.390	100	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.125	5.390	54	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				624	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.125	5.390	54	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				624	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				873	0.9	0.022	0.022	1.3	0.080	5.390	22	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				1119	1.1	0.028	0.028	1.7	0.102	5.390	36	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				1119	1.1	0.028	0.028	1.7	0.102	5.390	36	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.159	5.390	87	
MANIF	20				873	0.9	0.022	0.022	1.3	0.080	5.390	22	
MANIF	20				994	1.0	0.025	0.025	1.5	0.091	5.390	28	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.159	5.390	87	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.159	5.390	87	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.159	5.390	87	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.125	5.390	54	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.125	5.390	54	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.125	5.390	54	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				624	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
MANIF	20				873	0.9	0.022	0.022	1.3	0.080	5.390	22	
MANIF	20				622	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				873	0.9	0.022	0.022	1.3	0.080	5.390	22	
MANIF	20				873	0.9	0.022	0.022	1.3	0.080	5.390	22	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				1122	1.1	0.029	0.028	1.7	0.102	5.390	36	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.125	5.390	54	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				1243	1.2	0.032	0.032	1.9	0.113	5.390	44	
MANIF	20				1243	1.2	0.032	0.032	1.9	0.113	5.390	44	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				873	0.9	0.022	0.022	1.3	0.080	5.390	22	
MANIF	20				1119	1.1	0.028	0.028	1.7	0.102	5.390	36	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				994	1.0	0.025	0.025	1.5	0.090	5.390	28	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				1491	1.5	0.038	0.038	2.3	0.135	5.390	63	
MANIF	20				1491	1.5	0.038	0.038	2.3	0.135	5.390	63	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				994	1.0	0.025	0.025	1.5	0.090	5.390	28	
MANIF	20				994	1.0	0.025	0.025	1.5	0.090	5.390	28	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
MANIF	20				1864	1.9	0.047	0.047	2.8	0.169	5.390	98	
MANIF	20				1989	2.0	0.051	0.050	3.0	0.180	5.390	112	
MANIF	20				1864	1.9	0.047	0.047	2.8	0.169	5.390	98	
MANIF	20				1864	1.9	0.047	0.047	2.8	0.169	5.390	98	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.124	5.390	53	
MANIF	20				624	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.124	5.390	53	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				624	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				873	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				1119	1.1	0.028	0.028	1.7	0.102	5.390	35	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				1119	1.1	0.028	0.028	1.7	0.101	5.390	35	
MANIF	20				873	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.158	5.390	86	
MANIF	20				994	1.0	0.025	0.025	1.5	0.090	5.390	28	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.158	5.390	86	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.158	5.390	86	
MANIF	20				1740	1.7	0.044	0.044	2.6	0.158	5.390	86	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.124	5.390	53	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.124	5.390	53	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.124	5.390	53	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				624	0.6	0.016	0.016	0.9	0.057	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	
MANIF	20				873	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				622	0.6	0.016	0.016	0.9	0.056	5.390	11	

Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp	Sta.
	mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa	
MANIF	20				873	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				873	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				1122	1.1	0.029	0.028	1.7	0.102	5.390	36	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				1371	1.4	0.035	0.035	2.1	0.124	5.390	53	
MANIF	20				870	0.9	0.022	0.022	1.3	0.079	5.390	21	
MANIF	20				1243	1.2	0.032	0.031	1.9	0.113	5.390	44	
MANIF	20				1243	1.2	0.032	0.031	1.9	0.113	5.390	44	
MANIF	20				746	0.7	0.019	0.019	1.1	0.068	5.390	16	
MANIF	20				873	0.9	0.022	0.022	1.3	0.079	5.390	22	
MANIF	20				1119	1.1	0.028	0.028	1.7	0.101	5.390	35	

Other CH heating receivers

Symbol	ΦHL	θs	Δθr	M	Δp	V
	W	oC	K	kg/s	Pa	l
500/95 - 7	870	74.35	10.00	0.022	2000	2.7
500/95 - 5	622	73.85	10.00	0.016	2000	1.7
500/95 - 5	622	73.90	10.00	0.016	2000	1.7
500/95 - 5	622	73.54	10.00	0.016	2000	2.0
500/95 - 5	622	73.42	10.00	0.016	2000	2.0
500/95 - 5	622	73.77	10.00	0.016	2000	1.7
500/95 - 7	870	73.82	10.00	0.022	2000	2.4
500/95 - 5	622	73.03	10.00	0.016	2000	1.7
500/95 - 8	994	74.20	10.00	0.025	2000	2.7
500/95 - 5	622	74.25	10.00	0.016	2000	1.7
500/95 - 12	1491	74.45	10.00	0.038	2000	4.1
500/95 - 12	1491	74.06	10.00	0.038	2000	4.1
500/95 - 6	746	73.52	10.00	0.019	2000	2.7
500/95 - 6	746	73.75	10.00	0.019	2000	2.7
500/95 - 8	994	74.33	10.00	0.025	2000	2.7
500/95 - 15	1864	74.09	10.00	0.047	2000	5.1
500/95 - 15	1864	74.18	10.00	0.047	2000	5.1
500/95 - 11	1371	74.19	10.00	0.035	2000	3.7
500/95 - 5	622	71.88	10.00	0.016	2000	1.7
500/95 - 5	624	71.53	10.00	0.016	2000	1.7
500/95 - 7	870	72.71	10.00	0.022	2000	2.4
500/95 - 11	1371	74.08	10.00	0.035	2000	3.7
500/95 - 7	870	74.24	10.00	0.022	2000	2.4
500/95 - 7	870	73.75	10.00	0.022	2000	2.4
500/95 - 7	870	74.23	10.00	0.022	2000	2.4
500/95 - 7	873	73.91	10.00	0.022	2000	2.0
500/95 - 5	624	73.38	10.00	0.016	2000	2.4
500/95 - 7	870	74.14	10.00	0.022	2000	3.1
500/95 - 9	1119	74.55	10.00	0.028	2000	2.4
500/95 - 7	870	73.12	10.00	0.022	2000	2.4
500/95 - 9	1119	73.64	10.00	0.028	2000	3.1
500/95 - 14	1740	73.82	10.00	0.044	2000	4.8
500/95 - 8	994	73.28	10.00	0.025	2000	2.7
500/95 - 7	873	74.17	10.00	0.022	2000	4.8
500/95 - 14	1740	74.24	10.00	0.044	2000	4.8
500/95 - 14	1740	74.53	10.00	0.044	2000	4.8
500/95 - 11	1371	74.28	10.00	0.035	2000	3.7
500/95 - 7	870	73.30	10.00	0.022	2000	2.4
500/95 - 11	1371	74.33	10.00	0.035	2000	3.7
500/95 - 5	622	73.14	10.00	0.016	2000	1.7
500/95 - 6	746	74.43	10.00	0.019	2000	2.0
500/95 - 5	622	74.09	10.00	0.016	2000	1.7
500/95 - 5	622	72.74	10.00	0.016	2000	1.7
500/95 - 5	622	72.93	10.00	0.016	2000	1.7
500/95 - 11	1371	73.91	10.00	0.035	2000	3.7
500/95 - 5	622	73.49	10.00	0.016	2000	1.7
500/95 - 7	873	73.73	10.00	0.022	2000	2.0
500/95 - 5	624	72.94	10.00	0.016	2000	3.1
500/95 - 5	622	73.85	10.00	0.016	2000	1.7
500/95 - 5	622	73.85	10.00	0.016	2000	5.1
500/95 - 7	873	73.57	10.00	0.022	2000	2.4
500/95 - 7	873	74.47	10.00	0.022	2000	2.0
500/95 - 7	870	73.41	10.00	0.022	2000	2.4

Symbol	ΦHL	θs	Δθr	M	Δp	V
	W	oC	K	kg/s	Pa	l
500/95 - 5	622	73.26	10.00	0.016	2000	2.4
500/95 - 9	1122	74.03	10.00	0.029	2000	2.0
500/95 - 6	746	73.98	10.00	0.019	2000	2.0
500/95 - 6	746	73.57	10.00	0.019	2000	2.4
500/95 - 6	746	72.35	10.00	0.019	2000	2.4
500/95 - 6	746	73.77	10.00	0.019	2000	2.0
500/95 - 6	746	72.99	10.00	0.019	2000	2.4
500/95 - 7	870	74.47	10.00	0.022	2000	2.4
500/95 - 6	746	73.57	10.00	0.019	2000	2.4
500/95 - 6	746	73.08	10.00	0.019	2000	2.4
500/95 - 6	746	73.77	10.00	0.019	2000	2.4
500/95 - 11	1371	73.28	10.00	0.035	2000	3.7
500/95 - 7	870	73.70	10.00	0.022	2000	2.7
500/95 - 10	1243	73.87	10.00	0.032	2000	2.7
500/95 - 10	1243	73.42	10.00	0.032	2000	2.7
500/95 - 8	994	74.64	10.00	0.025	2000	2.7
500/95 - 6	746	74.05	10.00	0.019	2000	2.7
500/95 - 16	1989	73.74	10.00	0.051	2000	5.4
500/95 - 15	1864	74.09	10.00	0.047	2000	5.1
500/95 - 14	1740	74.77	10.00	0.044	2000	4.8
500/95 - 6	746	74.36	10.00	0.019	2000	2.7
500/95 - 7	873	74.29	10.00	0.022	2000	1.7
500/95 - 9	1119	73.64	10.00	0.028	2000	3.1

Circuits - CH Heating

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σς	Δp Pa
Riser/Plot: / Circulation by the receiver: OTHER HEAT RECEIVER w in the room: 1																	
Δpdisp = 1121 Pa Δpgr = 0 Pa Δp = 1121 Pa Δpover = 0 Pa ΔH = 0.00 m LCIR = 2.00 m																	
	BOILER											ΔpHS = 1000 Pa					
	A	EN 10220	1.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	60	0.0	60
	OTHER HEAT RECEIVER							Φr = 73890 W Aut. = 0.00				Δp = 0 Pa					
	A	EN 10220	1.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	60	0.0	60
Riser/Plot: / Circulation by the receiver: 500/95 - 10 w in the room: 1																	
Δpdisp = 36583 Pa Δpgr = 2 Pa Δp = 36634 Pa Δpover = -51 Pa ΔH = 0.10 m LCIR = 79.75 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	1468	8.8	1904
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	0.3	78
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	9.0	506
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											
	BALL VALVE	dn = 20 mm				kv = 45.550											
	B	FON PERT	20.95	16x2		1243	1.2	1.000	0.032	0.032	1.9	0.113	0.279	121	2530	7.9	2835
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.278	121	61	0.3	74
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.278	121	61	426.4	16594
	RA-N-A	Preset: 4.50			dn = 15 mm												
		Authority= 0.45			kv = 0.279 m³/h												
	500/95 - 10							Φr = 1243 W Aut. = 0.00				Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.277	125	63	11.8	514
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.277	125	63	0.3	76
	B	FON PERT	20.80	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.277	126	2614	7.9	2915
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.5	87
	BALL VALVE	dn = 20 mm				kv = 45.550											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.3	78
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	1475	9.4	1933
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 10 w in the room: 1																	
Δpdisp = 36584 Pa Δpgr = 4 Pa Δp = 36584 Pa Δpover = 0 Pa ΔH = 0.10 m LCIR = 63.75 m																	

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	1468	8.8	1904
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	0.3	78
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	9.0	506
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											
	BALL VALVE	dn = 20 mm				kv = 45.550											
	B	FON PERT	12.95	16x2		1243	1.2	1.000	0.032	0.032	1.9	0.113	0.279	121	1563	7.9	1868
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.032	1.9	0.113	0.279	121	60	0.3	73
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.032	1.9	0.113	0.279	121	60	475.8	18520
	RA-N-A	Preset: 4.50			dn = 15 mm												
		Authority= 0.50			kv = 0.264 m³/h												
	500/95 - 10							Φr = 1243 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.277	125	63	11.8	514
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.277	125	63	0.3	75
	B	FON PERT	12.80	16x2		1243	1.2	1.000	0.032	0.031	1.9	0.113	0.277	125	1605	7.9	1906
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.5	87
	BALL VALVE	dn = 20 mm				kv = 45.550											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.3	78
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	1475	9.4	1933
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36585 Pa Δpgr = 5 Pa Δp = 36585 Pa Δpover = 0 Pa ΔH = 0.10 m LCIR = 43.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	1468	8.8	1904
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	0.3	78
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	9.0	506
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											
	BALL VALVE	dn = 20 mm				kv = 45.550											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	B	FON PERT	2.95	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	192	7.9	341
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	32	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1153.8	21975
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.60			kv = 0.170 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	251
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	2.80	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	168	7.9	316
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.5	87
	BALL VALVE	dn = 20 mm				kv = 45.550											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.3	78
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	1475	9.4	1933
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1															
		Δpdisp = 36584 Pa Δpgr = 4 Pa Δp = 36584 Pa Δpover = 0 Pa ΔH = 0.10 m LCIR = 49.75 m															
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	1468	8.8	1904
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	0.3	78
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	9.0	506
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											
	BALL VALVE	dn = 20 mm				kv = 45.550											
	B	FON PERT	5.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	144	7.9	220
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2306.2	22380
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.61			kv = 0.120 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	11	0.3	14

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	5.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	128	7.9	203
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.5	87
	BALL VALVE		dn = 20 mm			kv = 45.550											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.3	78
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	1475	9.4	1933
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36584 Pa Δpgr = 3 Pa Δp = 36584 Pa Δpover = 0 Pa ΔH = 0.10 m LCIR = 59.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	1468	8.8	1904
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	0.3	78
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.123	7.4	0.443	0.315	122	61	9.0	506
	BALL VALVE		dn = 20 mm			kv = 45.550											
	FILTER		dn = 20 mm			kv = 6.920											
	BALL VALVE		dn = 20 mm			kv = 45.550											
	B	FON PERT	10.95	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	712	7.9	861
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1102.6	20985
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.57		kv = 0.173 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	30	11.8	251
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	30	0.3	36
	B	FON PERT	10.80	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	637	7.9	784
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.5	87
	BALL VALVE		dn = 20 mm			kv = 45.550											
	A	EN 10220	0.50	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	61	0.3	78
	A	EN 10220	12.00	20		4848	4.8	1.000	0.123	0.122	7.3	0.440	0.313	123	1475	9.4	1933
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1															
		Δpdisp = 36742 Pa Δpgr = 161 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.05 m LCIR = 49.85 m															
	VIRTUAL OTHER HEAT SOURCE CH						ΔpHS = 0 Pa										
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm			kv = 462.128												
	REVERSE V F	dn = 65 mm			kv = 89.490												
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	64	1.9	164
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	321	9.0	789
	BALL VALVE	dn = 20 mm			kv = 45.550												
	FILTER	dn = 20 mm			kv = 6.920												
	BALL VALVE	dn = 20 mm			kv = 45.550												
	B	FON PERT	4.00	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	179	7.9	289
	MANIF	dn = 20 mm			kv = 5.390												
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	22	1592.0	22283
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.60			kv = 0.144 m³/h												
	500/95 - 6							Φr = 746 W	Aut. = 0.00	Δp = 2000 Pa							
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	11.8	181
	RLV-S-A	dn = 15 mm			kv = 1.702												
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	0.3	23
	B	FON PERT	3.85	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	138	7.9	246
	MANIF	dn = 20 mm			kv = 5.390												
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	65	0.5	92
	BALL VALVE	dn = 20 mm			kv = 45.550												
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	323	1.3	388
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm			kv = 59.660												
	BALL VALVE	dn = 65 mm			kv = 462.128												
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1															

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
Δpdisp = 36742 Pa Δpgr = 162 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.08 m LCIR = 55.79 m																	
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	64	1.9	164
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	321	9.0	789
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											
	BALL VALVE	dn = 20 mm				kv = 45.550											
	B	FON PERT	6.97	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	311	7.9	421
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1575.8	22048
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.60			kv = 0.145 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	11.8	181
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	0.3	22
	B	FON PERT	6.82	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	242	7.9	350
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	65	0.5	92
	BALL VALVE	dn = 20 mm				kv = 45.550											
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	323	1.3	388
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																	
Δpdisp = 36741 Pa Δpgr = 161 Pa Δp = 36741 Pa Δpover = 0 Pa ΔH = 3.08 m LCIR = 61.79 m																	
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	64	1.9	164
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	321	9.0	789
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											
	BALL VALVE	dn = 20 mm				kv = 45.550											
	B	FON PERT	9.97	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	444	7.9	553
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1559.5	21812
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.59			kv = 0.146 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	11.8	180
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	0.3	22
	B	FON PERT	9.82	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	345	7.9	453
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	65	0.5	92
	BALL VALVE	dn = 20 mm				kv = 45.550											
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	323	1.3	388
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																	
Δpdisp = 36741 Pa Δpgr = 160 Pa Δp = 36741 Pa Δpover = 0 Pa ΔH = 3.08 m LCIR = 67.79 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	64	1.9	164
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	321	9.0	789
	BALL VALVE	dn = 20 mm				kv = 45.550											
	FILTER	dn = 20 mm				kv = 6.920											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	BALL VALVE	dn = 20 mm					kv = 45.550										
	B	FON PERT	12.97	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	576	7.9	686
	MANIF	dn = 20 mm					kv = 5.390										
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1543.1	21577
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.58			kv = 0.147 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	11.8	180
	RLV-S-A	dn = 15 mm					kv = 1.702										
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	0.3	22
	B	FON PERT	12.82	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	447	7.9	555
	MANIF	dn = 20 mm					kv = 5.390										
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	65	0.5	92
	BALL VALVE	dn = 20 mm					kv = 45.550										
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	323	1.3	388
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm					kv = 59.660										
	BALL VALVE	dn = 65 mm					kv = 462.128										
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 8 w in the room: 1																
	Δpdisp = 36743 Pa Δpgr = 162 Pa Δp = 36743 Pa Δpover = 0 Pa ΔH = 3.08 m LCIR = 53.79 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm					kv = 462.128										
	REVERSE V F	dn = 65 mm					kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	64	1.9	164
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	321	9.0	789
	BALL VALVE	dn = 20 mm					kv = 45.550										
	FILTER	dn = 20 mm					kv = 6.920										
	BALL VALVE	dn = 20 mm					kv = 45.550										
	B	FON PERT	5.97	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	489	7.9	684
	MANIF	dn = 20 mm					kv = 5.390										
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	0.3	49
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	853.7	21249
	RA-N-A	Preset: 4.00			dn = 15 mm												

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	Authority= 0.57		kv = 0.197 m³/h														
	500/95 - 8							Φr = 994 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	42	11.8	332
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	42	0.3	51
	B	FON PERT	5.82	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	492	7.9	685
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	65	0.5	92
	BALL VALVE		dn = 20 mm				kv = 45.550										
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	323	1.3	388
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 8 w in the room: 1																
	Δpdisp = 36744 Pa Δpgr = 163 Pa Δp = 36804 Pa Δpover = -60 Pa ΔH = 3.08 m LCIR = 45.79 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	64	1.9	164
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.126	7.6	0.454	0.323	128	321	9.0	789
	BALL VALVE		dn = 20 mm				kv = 45.550										
	FILTER		dn = 20 mm				kv = 6.920										
	BALL VALVE		dn = 20 mm				kv = 45.550										
	B	FON PERT	1.97	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	161	7.9	356
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	0.3	49
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	882.6	21976
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.59		kv = 0.194 m³/h												
	500/95 - 8							Φr = 994 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	42	11.8	332
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	42	0.3	51
	B	FON PERT	1.82	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	154	7.9	347

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	65	0.5	92
	BALL VALVE		dn = 20 mm				kv = 45.550										
	A	EN 10220	2.50	20		4973	5.0	1.000	0.127	0.125	7.5	0.451	0.321	129	323	1.3	388
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 15 w in the room: 1														
			Δpdisp = 36743 Pa Δpgr = 162 Pa Δp = 36743 Pa Δpover = 0 Pa ΔH = 3.11 m LCIR = 73.79 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	201	2.0	293
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	40	8.2	410
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	13.97	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	866	8.6	1104
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	31	0.3	40
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	31	711.3	19674
	RA-N-A		Preset: 6.00		dn = 15 mm												
			Authority= 0.53		kv = 0.384 m³/h												
	500/95 - 15							Φr = 1864 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	32	36.5	1028
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	32	0.3	41
	B	FON PERT	13.82	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	889	8.6	1125
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	40	0.5	64
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	202	1.3	262
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 15 w in the room: 1															
		Δpdisp = 36742 Pa Δpgr = 162 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.11 m LCIR = 77.79 m															
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	201	2.0	293
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	40	8.2	410
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	15.97	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	990	8.6	1228
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	31	0.3	40
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	31	702.2	19421
	RA-N-A	Preset: 6.00			dn = 15 mm												
		Authority= 0.52			kv = 0.386 m³/h												
	500/95 - 15	Φr = 1864 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	32	36.5	1028
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	32	0.3	41
	B	FON PERT	15.82	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	1018	8.6	1254
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	40	0.5	64
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	202	1.3	262
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 16 w in the room: 1														
			Δpdisp = 36740 Pa Δpgr = 160 Pa Δp = 36740 Pa Δpover = 0 Pa ΔH = 3.08 m LCIR = 97.79 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	201	2.0	293
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	40	8.2	410
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	25.97	20x2		1989	2.0	1.000	0.051	0.050	3.0	0.182	0.251	69	1802	8.6	2074
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	20x2		1989	2.0	1.000	0.051	0.050	3.0	0.181	0.251	70	35	0.3	45
	B	FON PERT	0.50	20x2		1989	2.0	1.000	0.051	0.050	3.0	0.181	0.251	70	35	557.3	17545
	RA-N-A		Preset: 6.50		dn = 15 mm												
			Authority= 0.47		kv = 0.434 m³/h												
	500/95 - 16							Φr = 1989 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	20x2		1989	2.0	1.000	0.051	0.050	3.0	0.180	0.249	72	36	36.5	1170
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	20x2		1989	2.0	1.000	0.051	0.050	3.0	0.180	0.249	72	36	0.3	46
	B	FON PERT	25.82	20x2		1989	2.0	1.000	0.051	0.050	3.0	0.180	0.249	72	1863	8.6	2131
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	40	0.5	64
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	202	1.3	262
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 15 w in the room: 1														
			Δpdisp = 36742 Pa Δpgr = 162 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.11 m LCIR = 77.79 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	201	2.0	293
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.192	11.5	0.692	0.301	80	40	8.2	410
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	15.97	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	990	8.6	1228
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	31	0.3	40
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.170	0.235	62	31	702.2	19421
	RA-N-A		Preset: 6.00		dn = 15 mm												
			Authority= 0.52		kv = 0.386 m³/h												
	500/95 - 15							Φr = 1864 W Aut. = 0.00 Δp = 2000 Pa									
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	32	36.5	1028
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	32	0.3	41
	B	FON PERT	15.82	20x2		1864	1.9	1.000	0.047	0.047	2.8	0.169	0.234	64	1018	8.6	1254
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	40	0.5	64
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		7581	7.6	1.000	0.193	0.191	11.5	0.687	0.299	81	202	1.3	262
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
Riser/Plot: / Circulation by the receiver: 500/95 - 12 w in the room: 1																	
Δpdisp = 36743 Pa Δpgr = 162 Pa Δp = 36743 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 85.75 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	10.95	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.136	0.188	42	461	8.6	614
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.136	0.188	42	21	0.3	27
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.136	0.188	42	21	1069.6	18917
	RA-N-A	Preset: 5.00		dn = 15 mm													
		Authority= 0.51		kv = 0.313 m³/h													
	500/95 - 12							Φr = 1491 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.135	0.187	44	22	36.5	659
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.135	0.187	44	22	0.3	28
	B	FON PERT	10.80	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.135	0.187	44	473	8.6	624
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4		dn = 65 mm													
		kv = 36.879 m³/h															
	VF-3	Preset:		dn = 65 mm													
		Authority= 0.91		kv = 59.575 m³/h													
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 12 w in the room: 1																	
Δpdisp = 36744 Pa Δpgr = 163 Pa Δp = 36744 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 71.75 m																	

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	3.95	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.136	0.188	42	166	8.6	319
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.136	0.188	42	21	0.3	27
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.136	0.188	42	21	1103.1	19519
	RA-N-A	Preset: 5.00			dn = 15 mm												
		Authority= 0.53			kv = 0.308 m³/h												
	500/95 - 12							Φr = 1491 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.135	0.187	44	22	36.5	660
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.135	0.187	44	22	0.3	28
	B	FON PERT	3.80	20x2		1491	1.5	1.000	0.038	0.038	2.3	0.135	0.187	44	166	8.6	317
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36743 Pa Δpgr = 163 Pa Δp = 36743 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 69.75 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	2.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	72	7.9	148
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2100.7	20430
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.55			kv = 0.126 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	2.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	62	7.9	137
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 8 w in the room: 1																
	Δpdisp = 36743 Pa Δpgr = 163 Pa Δp = 36743 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 75.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	5.95	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	488	7.9	683
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	0.3	49
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	766.1	19072
	RA-N-A	Preset: 4.00			dn = 15 mm												
		Authority= 0.51			kv = 0.208 m³/h												
	500/95 - 8	Φr = 994 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	42	11.8	331
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	42	0.3	51
	B	FON PERT	5.80	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.222	85	490	7.9	683
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																	
Δpdisp = 36740 Pa Δpgr = 160 Pa Δp = 36740 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 90.75 m																	
	VIRTUAL OTHER HEAT SOURCE CH	ΔpHS = 0 Pa															
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	13.45	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	323	7.9	400
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2053.4	19941
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.54			kv = 0.127 m³/h												
	500/95 - 5	Φr = 622 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	13.30	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	297	7.9	372
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36742 Pa Δpgr = 162 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 75.75 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	5.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	144	7.9	220
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2087.2	20290
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.55			kv = 0.126 m³/h												
	500/95 - 5	Φr = 622 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	5.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	128	7.9	204
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36742 Pa Δpgr = 161 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 81.75 m																
	VIRTUAL OTHER HEAT SOURCE CH	ΔpHS = 0 Pa															
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	8.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	216	7.9	292
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2073.8	20150
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.54			kv = 0.126 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	8.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	195	7.9	271
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																	
Δpdisp = 36741 Pa Δpgr = 161 Pa Δp = 36741 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 83.75 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm				kv = 72.230											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	FILTER	dn = 25 mm					kv = 11.928										
	BALL VALVE	dn = 25 mm					kv = 72.230										
	B	FON PERT	9.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	240	7.9	316
	MANIF	dn = 20 mm					kv = 5.390										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2069.3	20104
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.54			kv = 0.127 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm					kv = 1.702										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	9.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	218	7.9	293
	MANIF	dn = 20 mm					kv = 5.390										
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE	dn = 25 mm					kv = 72.230										
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm					kv = 59.660										
	BALL VALVE	dn = 65 mm					kv = 462.128										
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36742 Pa Δpgr = 162 Pa Δp = 36742 Pa Δpover = 0 Pa ΔH = 3.10 m LCIR = 77.75 m																
	VIRTUAL OTHER HEAT SOURCE CH							ΔpHS = 0 Pa									
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm					kv = 462.128										
	REVERSE V F	dn = 65 mm					kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE	dn = 25 mm					kv = 72.230										
	FILTER	dn = 25 mm					kv = 11.928										
	BALL VALVE	dn = 25 mm					kv = 72.230										

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	6.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	168	7.9	245
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2082.7	20244
	RA-N-A		Preset: 3.00		dn = 15 mm												
			Authority= 0.55		kv = 0.126 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	6.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	151	7.9	226
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36743 Pa Δpgr = 163 Pa Δp = 36743 Pa Δpover = 0 Pa ΔH = 3.12 m LCIR = 82.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.536	32.2	1.929	0.493	146	951	1.2	1098
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.410	24.6	1.475	0.377	87	173	0.6	219
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	919	1.2	991
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	255	0.3	275
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.218	13.1	0.783	0.341	102	51	8.2	525
	BALL VALVE		dn = 25 mm			kv = 72.230											
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	9.45	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	614	7.9	764
	MANIF		dn = 20 mm			kv = 5.390											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1002.3	19081
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.52		kv = 0.182 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	251
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	9.30	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	550	7.9	698
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	51	0.5	82
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	256	0.3	276
	A	EN 10220	9.00	25		8578	8.6	1.000	0.218	0.216	13.0	0.778	0.339	103	923	1.8	1026
	A	EN 10220	2.00	32		16159	16.2	1.000	0.411	0.407	24.4	1.465	0.375	87	174	0.6	219
	A	EN 10220	6.50	32		21132	21.1	1.000	0.538	0.532	31.9	1.916	0.490	147	952	1.8	1164
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 14 w in the room: 1														
			Δpdisp = 36900 Pa Δpgr = 320 Pa Δp = 36900 Pa Δpover = 0 Pa ΔH = 6.11 m LCIR = 42.27 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	270	2.0	394
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	54	8.2	556
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	1.71	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	94	8.6	302
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	27	0.3	36
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	27	936.5	22580

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	RA-N-A		Preset: 5.00		dn = 15 mm												
			Authority= 0.61		kv = 0.335 m³/h												
	500/95 - 14							Φr = 1740 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	28	36.5	897
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	28	0.3	36
	B	FON PERT	1.56	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	89	8.6	294
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	54	0.5	87
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	271	1.3	353
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1														
			Δpdisp = 36899 Pa Δpgr = 319 Pa Δp = 36899 Pa Δpover = 0 Pa ΔH = 6.11 m LCIR = 54.27 m														
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	270	2.0	394
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	54	8.2	556
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	7.71	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	504	7.9	655
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	0.3	39
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	1176.5	22557
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.61		kv = 0.168 m³/h												

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	500/95 - 7							Φr = 873 W		Aut. = 0.00	Δp = 2000 Pa						
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	30	11.8	253
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	30	0.3	37
	B	FON PERT	7.56	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	60	456	7.9	604
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	54	0.5	87
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	271	1.3	353
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 8 w in the room: 1																
	Δpdisp = 36896 Pa Δpgr = 316 Pa Δp = 36896 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 82.27 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	270	2.0	394
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	54	8.2	556
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	21.71	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	1782	7.9	1977
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	0.3	49
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.091	0.223	82	41	793.4	19726
	RA-N-A		Preset: 4.00		dn = 15 mm												
			Authority= 0.53		kv = 0.204 m³/h												
	500/95 - 8							Φr = 994 W		Aut. = 0.00	Δp = 2000 Pa						
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.221	84	42	11.8	331

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.221	84	42	0.3	50
	B	FON PERT	21.56	16x2		994	1.0	1.000	0.025	0.025	1.5	0.090	0.221	84	1816	7.9	2008
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	54	0.5	87
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	271	1.3	353
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 14 w in the room: 1																
	Δpdisp = 36897 Pa Δpgr = 317 Pa Δp = 36897 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 82.27 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	270	2.0	394
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	54	8.2	556
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	21.71	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	1194	8.6	1402
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	28	0.3	36
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	28	844.2	20332
	RA-N-A		Preset: 5.50		dn = 15 mm												
			Authority= 0.55		kv = 0.352 m³/h												
	500/95 - 14							Φr = 1740 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	29	36.5	896
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	29	0.3	37

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	21.56	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	1234	8.6	1439
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	54	0.5	87
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	271	1.3	353
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 14 w in the room: 1																
	Δpdisp = 36898 Pa Δpgr = 318 Pa Δp = 36898 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 64.27 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	270	2.0	394
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	54	8.2	556
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	12.71	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	699	8.6	907
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	28	0.3	36
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	28	885.8	21345
	RA-N-A		Preset: 5.50		dn = 15 mm												
			Authority= 0.57		kv = 0.344 m³/h												
	500/95 - 14							Φr = 1740 W Aut. = 0.00 Δp = 2000 Pa									
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	29	36.5	897
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	29	0.3	37
	B	FON PERT	12.56	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	717	8.6	923
	MANIF		dn = 20 mm			kv = 5.390											

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	54	0.5	87
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	271	1.3	353
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 14 w in the room: 1																
	Δpdisp = 36899 Pa Δpgr = 318 Pa Δp = 36899 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 52.27 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	270	2.0	394
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.224	13.4	0.806	0.351	108	54	8.2	556
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	6.71	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	369	8.6	577
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	27	0.3	36
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.159	0.219	55	27	913.5	22019
	RA-N-A	Preset: 5.00			dn = 15 mm												
		Authority= 0.59			kv = 0.339 m³/h												
	500/95 - 14	Φr = 1740 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	28	36.5	897
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	28	0.3	36
	B	FON PERT	6.56	20x2		1740	1.7	1.000	0.044	0.044	2.6	0.158	0.218	57	374	8.6	580
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	54	0.5	87
	BALL VALVE	dn = 25 mm				kv = 72.230											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	2.50	25		8827	8.8	1.000	0.225	0.222	13.3	0.801	0.349	108	271	1.3	353
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1															
		Δpdisp = 36890 Pa Δpgr = 310 Pa Δp = 36890 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 76.27 m															
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	17.71	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	425	7.9	502
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2350.9	22819
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.61			kv = 0.119 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	11	0.3	14
	B	FON PERT	17.56	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	394	7.9	469
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 11 w in the room: 1																
	Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.11 m LCIR = 76.27 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	17.71	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	2533	7.9	2904
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	0.3	87
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	364.3	17266
	RA-N-A	Preset: 5.00			dn = 15 mm												
		Authority= 0.46			kv = 0.302 m³/h												
	500/95 - 11							Φr = 1371 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	74	11.8	624
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	74	0.3	90
	B	FON PERT	17.56	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	149	2609	7.9	2975
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1															
		Δpdisp = 36891 Pa Δpgr = 310 Pa Δp = 37066 Pa Δpover = -176 Pa ΔH = 6.09 m LCIR = 74.27 m															
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	16.71	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	402	7.9	478
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2373.2	23042
	RA-N-A	Preset: 2.50			dn = 15 mm												
		Authority= 0.62			kv = 0.118 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	16.56	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	371	7.9	446
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																	
Δpdisp = 36891 Pa Δpgr = 311 Pa Δp = 36891 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 78.27 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	18.71	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	1216	7.9	1366
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1105.3	21025
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.57			kv = 0.173 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	29	11.8	251
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	29	0.3	36
	B	FON PERT	18.56	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	58	1081	7.9	1228
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																	
Δpdisp = 36892 Pa Δpgr = 312 Pa Δp = 36979 Pa Δpover = -87 Pa ΔH = 6.11 m LCIR = 70.27 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	14.71	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	354	7.9	431
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2373.2	23047
	RA-N-A	Preset: 2.50			dn = 15 mm												
		Authority= 0.62			kv = 0.118 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	14.56	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	325	7.9	400
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 11 w in the room: 1																	
Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 60.27 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	9.71	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	1388	7.9	1759
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	0.3	87
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	413.6	19603
	RA-N-A	Preset: 5.00			dn = 15 mm												
		Authority= 0.53			kv = 0.283 m³/h												
	500/95 - 11	Φr = 1371 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.306	148	74	11.8	624
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.306	148	74	0.3	90
	B	FON PERT	9.56	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	1417	7.9	1784
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 11 w in the room: 1																
	Δpdisp = 36893 Pa Δpgr = 312 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 62.27 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	10.71	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	1531	7.9	1902
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	0.3	87
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	407.4	19311
	RA-N-A	Preset: 5.00			dn = 15 mm												
		Authority= 0.52			kv = 0.285 m³/h												
	500/95 - 11	Φr = 1371 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.306	148	74	11.8	624
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.306	148	74	0.3	90
	B	FON PERT	10.56	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	1566	7.9	1932
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1															
		Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 48.27 m															
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	3.71	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	166	7.9	276
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	22	1657.7	23204
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.62			kv = 0.141 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	11.8	181
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	0.3	23
	B	FON PERT	3.56	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	128	7.9	236
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1															
		Δpdisp = 36893 Pa Δpgr = 312 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 52.27 m															
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	2.0	155
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.208	12.5	0.750	0.327	94	47	8.2	482
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	5.71	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	139	7.9	215
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2404.5	23378
	RA-N-A	Preset: 2.50			dn = 15 mm												
		Authority= 0.63			kv = 0.117 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	5.56	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	123	7.9	198
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	0.5	76
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	0.50	25		8217	8.2	1.000	0.209	0.207	12.4	0.745	0.324	94	47	1.3	118

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4				dn = 65 mm											
		kv = 36.879 m³/h															
	VF-3	Preset:				dn = 65 mm											
		Authority= 0.91				kv = 59.575 m³/h											
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 9 w in the room: 1															
		Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 84.75 m															
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	10.95	16x2		1122	1.1	1.000	0.029	0.028	1.7	0.102	0.252	101	1106	7.9	1354
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1122	1.1	1.000	0.029	0.028	1.7	0.102	0.251	101	51	0.3	61
	B	FON PERT	0.50	16x2		1122	1.1	1.000	0.029	0.028	1.7	0.102	0.251	101	51	585.4	18560
	RA-N-A	Preset: 4.50				dn = 15 mm											
		Authority= 0.50				kv = 0.238 m³/h											
	500/95 - 9	Φr = 1122 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		1122	1.1	1.000	0.029	0.028	1.7	0.102	0.250	105	52	11.8	421
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1122	1.1	1.000	0.029	0.028	1.7	0.102	0.250	105	52	0.3	63
	B	FON PERT	10.80	16x2		1122	1.1	1.000	0.029	0.028	1.7	0.102	0.250	105	1134	7.9	1379
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1														
			Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 94.75 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE		dn = 25 mm			kv = 72.230											
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	15.95	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	1037	7.9	1186
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1011.9	19254
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.52		kv = 0.181 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	30	11.8	251
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	30	0.3	36
	B	FON PERT	15.80	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	58	924	7.9	1071
	MANIF		dn = 20 mm			kv = 5.390											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36896 Pa Δpgr = 316 Pa Δp = 36896 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 68.75 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	2.95	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	193	7.9	343
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	0.3	39
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	1086.9	20849
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.56			kv = 0.175 m³/h												
	500/95 - 7							Φr = 873 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	30	11.8	253
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	30	0.3	37

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	2.80	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	170	7.9	319
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36894 Pa Δpgr = 313 Pa Δp = 36894 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 90.75 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	13.95	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	913	7.9	1063
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	0.3	39
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	1016.5	19479
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.52			kv = 0.181 m³/h												
	500/95 - 7	Φr = 873 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	253

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	13.80	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	819	7.9	968
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1														
			Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 86.75 m														
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE		dn = 25 mm				kv = 72.230										
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	11.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	288	7.9	364
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2160.0	20981
	RA-N-A		Preset: 3.00		dn = 15 mm												
			Authority= 0.56		kv = 0.124 m³/h												

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	11.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	263	7.9	338
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36894 Pa Δpgr = 314 Pa Δp = 36894 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 86.75 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE		dn = 25 mm				kv = 72.230										
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	11.95	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	782	7.9	932
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	0.3	39
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	1029.2	19725

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.53		kv = 0.180 m³/h												
	500/95 - 7							Φr = 873 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	253
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	11.80	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	704	7.9	852
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1														
			Δpdisp = 36895 Pa Δpgr = 314 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 76.75 m														
	VIRTUAL OTHER HEAT SOURCE CH									ΔpHS = 0 Pa							
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE		dn = 25 mm				kv = 72.230										
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	6.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	168	7.9	245
	MANIF		dn = 20 mm				kv = 5.390										

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2182.5	21214
	RA-N-A		Preset: 3.00		dn = 15 mm												
			Authority= 0.57		kv = 0.123 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	6.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	151	7.9	226
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 314 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 76.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE		dn = 25 mm			kv = 72.230											
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	6.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	168	7.9	245
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2182.5	21214
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.57			kv = 0.123 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	6.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	151	7.9	226
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36894 Pa Δpgr = 313 Pa Δp = 36894 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 82.75 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE	dn = 25 mm				kv = 72.230											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	9.95	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	240	7.9	317
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	12	2169.0	21074
	RA-N-A		Preset: 3.00		dn = 15 mm												
			Authority= 0.57		kv = 0.124 m³/h												
	500/95 - 5						Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa						
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	11.8	124
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	11	0.3	14
	B	FON PERT	9.80	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.139	22	218	7.9	293
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36896 Pa Δpgr = 315 Pa Δp = 36896 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 72.75 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	4.95	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	324	7.9	474
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	0.3	39
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	1074.0	20597
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.55			kv = 0.176 m³/h												
	500/95 - 7							Φr = 873 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	30	11.8	253
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	30	0.3	37
	B	FON PERT	4.80	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	61	290	7.9	439
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.12 m LCIR = 92.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	256	2.0	374
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.218	13.1	0.785	0.342	103	51	8.2	527
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	14.95	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	363	7.9	440
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	12	0.3	15
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	12	2132.0	20835
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.56			kv = 0.125 m³/h												
	500/95 - 5	Φr = 624 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	22	11	11.8	125
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	22	11	0.3	14
	B	FON PERT	14.80	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	22	332	7.9	408
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	52	0.5	82
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8596	8.6	1.000	0.219	0.216	13.0	0.779	0.339	103	258	1.3	335
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																
	Δpdisp = 36892 Pa Δpgr = 312 Pa Δp = 36892 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 107.75 m																
	VIRTUAL OTHER HEAT SOURCE CH	ΔpHS = 0 Pa															
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	15.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	705	7.9	814
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	26
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1412.9	19748
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.53			kv = 0.153 m³/h												
	500/95 - 6	Φr = 746 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	17	11.8	180
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	17	0.3	22
	B	FON PERT	15.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	34	545	7.9	653
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																
	Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36939 Pa Δpover = -45 Pa ΔH = 6.10 m LCIR = 95.75 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	9.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	441	7.9	551
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1448.6	20259
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.55			kv = 0.151 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	11.8	180
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	0.3	22
	B	FON PERT	9.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	343	7.9	451
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0

Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1

Δpdisp = 36894 Pa Δpgr = 314 Pa Δp = 36894 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 91.75 m

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	7.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	353	7.9	463
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1456.3	20370
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.55			kv = 0.151 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	11.8	180
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	0.3	22
	B	FON PERT	7.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	275	7.9	383
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1															
		Δpdisp = 36894 Pa Δpgr = 314 Pa Δp = 36894 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 87.75 m															
	VIRTUAL OTHER HEAT SOURCE CH							ΔpHS = 0 Pa									
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	5.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	45	265	7.9	375
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1467.2	20528
	RA-N-A	Preset: 3.00 dn = 15 mm															
		Authority= 0.55 kv = 0.150 m³/h															
	500/95 - 6	Φr = 746 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	11.8	181
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	36	18	0.3	22
	B	FON PERT	5.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	205	7.9	314
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1														
			Δpdisp = 36896 Pa Δpgr = 315 Pa Δp = 36896 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 78.75 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm		kv = 462.128												
	REVERSE V F		dn = 65 mm		kv = 89.490												
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE		dn = 25 mm		kv = 72.230												
	FILTER		dn = 25 mm		kv = 11.928												
	BALL VALVE		dn = 25 mm		kv = 72.230												
	B	FON PERT	1.45	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	94	7.9	244
	MANIF		dn = 20 mm		kv = 5.390												
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	32	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	32	1084.0	20651
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.56		kv = 0.175 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	252
	RLV-S-A		dn = 15 mm		kv = 1.702												
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	1.30	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	78	7.9	226
	MANIF		dn = 20 mm		kv = 5.390												
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE		dn = 25 mm		kv = 72.230												
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																	
Δpdisp = 36892 Pa Δpgr = 312 Pa Δp = 36892 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 109.75 m																	
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE		dn = 25 mm			kv = 72.230											
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	16.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	748	7.9	858
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	26
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	43	22	1407.6	19671
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.53		kv = 0.153 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	17	11.8	180
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	17	0.3	22
	B	FON PERT	16.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	34	578	7.9	686
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1															
		Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36893 Pa Δpover = 0 Pa ΔH = 6.10 m LCIR = 114.25 m															
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	14.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	661	7.9	771
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	9.00	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	43	390	1393.3	19835
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.52			kv = 0.154 m³/h												
	500/95 - 6	Φr = 746 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	34	17	11.8	180
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	34	17	0.3	22
	B	FON PERT	14.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	34	503	7.9	611
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE	dn = 25 mm				kv = 72.230											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																
	Δpdisp = 36893 Pa Δpgr = 313 Pa Δp = 36939 Pa Δpover = -45 Pa ΔH = 6.10 m LCIR = 95.75 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	9.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	441	7.9	551
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1448.6	20259
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.55			kv = 0.151 m³/h												
	500/95 - 6							Φr = 746 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	11.8	180
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	0.3	22

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	B	FON PERT	9.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	343	7.9	451
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 6 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.12 m LCIR = 91.75 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	23	0.6	62
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.824	49.4	2.965	0.353	46	46	0.3	67
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.600	36.0	2.159	0.411	84	253	1.2	353
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.2	791
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	428	1.2	474
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	165	0.3	177
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.173	10.4	0.624	0.272	66	33	8.2	334
	BALL VALVE	dn = 25 mm				kv = 72.230											
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	7.95	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	353	7.9	463
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	0.3	27
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.167	44	22	1456.3	20371
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.55			kv = 0.151 m³/h												

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	500/95 - 6							Φr = 746 W		Aut. = 0.00	Δp = 2000 Pa						
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	11.8	180
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	18	0.3	22
	B	FON PERT	7.80	16x2		746	0.7	1.000	0.019	0.019	1.1	0.068	0.166	35	275	7.9	383
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	33	0.5	53
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	166	0.3	178
	A	EN 10220	6.50	25		6838	6.8	1.000	0.174	0.172	10.3	0.620	0.270	66	431	1.8	496
	A	EN 10220	9.00	32		15434	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.8	829
	A	EN 10220	3.00	40		23651	23.7	1.000	0.602	0.596	35.7	2.144	0.408	84	253	1.8	399
	A	EN 10220	1.00	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	46	0.3	67
	A	EN 10220	0.50	50		32478	32.5	1.000	0.826	0.818	49.1	2.945	0.351	46	23	0.6	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 11 w in the room: 1														
			Δpdisp = 36887 Pa Δpgr = 307 Pa Δp = 36887 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 111.15 m														
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	28.66	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	4103	7.9	4474
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	144	72	0.3	88
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	144	72	281.5	13349
	RA-N-A		Preset: 5.50		dn = 15 mm												
			Authority= 0.36		kv = 0.343 m³/h												

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	500/95 - 11							Φr = 1371 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	149	74	11.8	624
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	149	74	0.3	90
	B	FON PERT	28.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	149	4248	7.9	4614
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36885 Pa Δpgr = 305 Pa Δp = 36885 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 105.16 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	25.66	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	24	611	7.9	687
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	23	12	0.3	15
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.057	0.139	23	12	2241.7	21738
	RA-N-A		Preset: 3.00		dn = 15 mm												
			Authority= 0.59		kv = 0.122 m³/h												
	500/95 - 5							Φr = 622 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	11	11.8	124
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	22	11	0.3	14

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	B	FON PERT	25.51	16x2		622	0.6	1.000	0.016	0.016	0.9	0.056	0.138	23	582	7.9	657
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36887 Pa Δpgr = 307 Pa Δp = 36887 Pa Δpover = 0 Pa ΔH = 6.12 m LCIR = 105.16 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	25.66	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	1668	7.9	1818
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1025.1	19488
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.52			kv = 0.180 m³/h												
	500/95 - 7	Φr = 870 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	58	29	11.8	250
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	58	29	0.3	35
	B	FON PERT	25.51	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	57	1461	7.9	1608
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE	dn = 25 mm				kv = 72.230											

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36885 Pa Δpgr = 304 Pa Δp = 36885 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 113.16 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	29.66	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	711	7.9	788
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	23	12	0.3	15
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	23	12	2207.6	21536
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.58			kv = 0.123 m³/h												
	500/95 - 5					Φr = 624 W Aut. = 0.00 Δp = 2000 Pa											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	23	11	11.8	125
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	23	11	0.3	15
	B	FON PERT	29.51	16x2		624	0.6	1.000	0.016	0.016	0.9	0.056	0.139	23	681	7.9	756
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 11 w in the room: 1														
			Δpdisp = 36889 Pa Δpgr = 308 Pa Δp = 36889 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 75.16 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm			kv = 462.128											
	REVERSE V F		dn = 65 mm			kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER		dn = 25 mm			kv = 11.928											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	BALL VALVE		dn = 25 mm			kv = 72.230											
	B	FON PERT	10.66	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	1523	7.9	1894
	MANIF		dn = 20 mm			kv = 5.390											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	0.3	87
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	392.8	18619
	RA-N-A		Preset: 5.00		dn = 15 mm												
			Authority= 0.50		kv = 0.291 m³/h												
	500/95 - 11							Φr = 1371 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.306	148	74	11.8	624
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.306	148	74	0.3	90
	B	FON PERT	10.51	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	1558	7.9	1925
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
			Riser/Plot: / Circulation by the receiver: 500/95 - 11 w in the room: 1														
			Δpdisp = 36888 Pa Δpgr = 308 Pa Δp = 36888 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 79.16 m														
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm		kv = 462.128												
	REVERSE V F		dn = 65 mm		kv = 89.490												
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER		dn = 25 mm		kv = 11.928												
	BALL VALVE		dn = 25 mm		kv = 72.230												
	BALL VALVE		dn = 25 mm		kv = 72.230												
	B	FON PERT	12.66	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	1810	7.9	2181
	MANIF		dn = 20 mm		kv = 5.390												
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	0.3	87
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.125	0.307	143	72	380.5	18035
	RA-N-A		Preset: 5.00		dn = 15 mm												
			Authority= 0.48		kv = 0.295 m³/h												
	500/95 - 11							Φr = 1371 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	74	11.8	624
	RLV-S-A		dn = 15 mm		kv = 1.702												
	B	FON PERT	0.50	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	74	0.3	90
	B	FON PERT	12.51	16x2		1371	1.4	1.000	0.035	0.035	2.1	0.124	0.305	148	1856	7.9	2222
	MANIF		dn = 20 mm		kv = 5.390												
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE		dn = 25 mm		kv = 72.230												
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm		kv = 59.660												
	BALL VALVE		dn = 65 mm		kv = 462.128												
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1															
		Δpdisp = 36889 Pa Δpgr = 308 Pa Δp = 36889 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 65.16 m															
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	177	2.0	257
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.180	10.8	0.648	0.282	71	35	8.2	360
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	5.66	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	367	7.9	517
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1151.0	21919
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.59			kv = 0.170 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	251
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	5.51	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	329	7.9	477
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	36	0.5	57
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		7099	7.1	1.000	0.181	0.179	10.7	0.643	0.280	71	178	1.3	231
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
		Riser/Plot: / Circulation by the receiver: 500/95 - 9 w in the room: 1															
		Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.11 m LCIR = 99.27 m															

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	15.71	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	1580	7.9	1827
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	50	0.3	61
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	50	548.9	17297
	RA-N-A	Preset: 4.50			dn = 15 mm												
		Authority= 0.46			kv = 0.246 m³/h												
	500/95 - 9							Φr = 1119 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.101	0.249	105	52	11.8	418
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.101	0.249	105	52	0.3	63
	B	FON PERT	15.56	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.101	0.249	105	1629	7.9	1873
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 9 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.11 m LCIR = 99.27 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	15.71	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	1580	7.9	1827
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	50	0.3	61
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	50	548.9	17297
	RA-N-A	Preset: 4.50			dn = 15 mm												
		Authority= 0.46			kv = 0.246 m³/h												
	500/95 - 9							Φr = 1119 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.101	0.249	105	52	11.8	418
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.101	0.249	105	52	0.3	63
	B	FON PERT	15.56	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.101	0.249	105	1629	7.9	1873
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36894 Pa Δpgr = 313 Pa Δp = 36894 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 105.27 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	18.71	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	1217	7.9	1366
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	978.9	18621
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.50			kv = 0.184 m³/h												
	500/95 - 7	Φr = 870 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	29	11.8	250
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	29	0.3	36
	B	FON PERT	18.56	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	58	1077	7.9	1224
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 77.27 m																
	VIRTUAL OTHER HEAT SOURCE CH	ΔpHS = 0 Pa															
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	4.71	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	306	7.9	455
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1067.8	20336
	RA-N-A	Preset: 3.50		dn = 15 mm													
		Authority= 0.55		kv = 0.176 m³/h													
	500/95 - 7	Φr = 870 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	251
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	4.56	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	273	7.9	420
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4		dn = 65 mm													
		kv = 36.879 m³/h															
	VF-3	Preset:		dn = 65 mm													
		Authority= 0.91		kv = 59.575 m³/h													
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 5 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.11 m LCIR = 89.27 m																
	VIRTUAL OTHER HEAT SOURCE CH					ΔpHS = 0 Pa											
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	10.71	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	261	7.9	338
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	12	0.3	15
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.140	24	12	2120.5	20733
	RA-N-A	Preset: 3.00			dn = 15 mm												
		Authority= 0.56			kv = 0.125 m³/h												
	500/95 - 5	Φr = 624 W Aut. = 0.00 Δp = 2000 Pa															
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	22	11	11.8	125
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	22	11	0.3	14
	B	FON PERT	10.56	16x2		624	0.6	1.000	0.016	0.016	0.9	0.057	0.139	22	236	7.9	312
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 85.27 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	BALL VALVE	dn = 25 mm				kv = 72.230											
	B	FON PERT	8.71	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	570	7.9	720
	MANIF	dn = 20 mm				kv = 5.390											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	0.3	39
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.080	0.196	65	33	1034.3	19827
	RA-N-A	Preset: 3.50			dn = 15 mm												
		Authority= 0.53			kv = 0.179 m³/h												
	500/95 - 7							Φr = 873 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	60	30	11.8	253
	RLV-S-A	dn = 15 mm				kv = 1.702											
	B	FON PERT	0.50	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.195	60	30	0.3	36
	B	FON PERT	8.56	16x2		873	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	513	7.9	662
	MANIF	dn = 20 mm				kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE	dn = 25 mm				kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER	dn = 65 mm				kv = 59.660											
	BALL VALVE	dn = 65 mm				kv = 462.128											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 36.879 m³/h															
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.91			kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 314 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 89.27 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE	dn = 65 mm				kv = 462.128											
	REVERSE V F	dn = 65 mm				kv = 89.490											
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER	dn = 25 mm				kv = 11.928											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	10.71	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	696	7.9	845
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1029.4	19595
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.53		kv = 0.179 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	251
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	30	0.3	36
	B	FON PERT	10.56	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	59	623	7.9	771
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 7 w in the room: 1																
	Δpdisp = 36895 Pa Δpgr = 315 Pa Δp = 36895 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 79.27 m																
	VIRTUAL OTHER HEAT SOURCE CH							ΔpHS = 0 Pa									
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	5.71	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	371	7.9	520
	MANIF		dn = 20 mm				kv = 5.390										
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	0.3	39
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.195	65	33	1061.4	20212
	RA-N-A		Preset: 3.50		dn = 15 mm												
			Authority= 0.54		kv = 0.177 m³/h												
	500/95 - 7							Φr = 870 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	11.8	251
	RLV-S-A		dn = 15 mm				kv = 1.702										
	B	FON PERT	0.50	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	30	0.3	36
	B	FON PERT	5.56	16x2		870	0.9	1.000	0.022	0.022	1.3	0.079	0.194	60	332	7.9	479
	MANIF		dn = 20 mm				kv = 5.390										
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE		dn = 25 mm				kv = 72.230										
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm				kv = 59.660										
	BALL VALVE		dn = 65 mm				kv = 462.128										
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: 500/95 - 9 w in the room: 1																
	Δpdisp = 36896 Pa Δpgr = 316 Pa Δp = 36896 Pa Δpover = 0 Pa ΔH = 6.09 m LCIR = 71.27 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.874	112.4	6.746	0.483	60	302	5.1	892
	BALL VALVE		dn = 65 mm				kv = 462.128										
	REVERSE V F		dn = 65 mm				kv = 89.490										
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	264	1.8	451
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.751	105.1	6.304	0.451	53	26	0.3	61
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.215	72.9	4.374	0.521	98	343	1.9	597
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.391	23.5	1.409	0.360	79	713	1.9	838
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	676	1.2	744
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	241	0.3	260
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.211	12.7	0.761	0.331	97	48	8.2	496
	FILTER		dn = 25 mm				kv = 11.928										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	BALL VALVE		dn = 25 mm				kv = 72.230										
	B	FON PERT	1.71	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	100	172	7.9	419
	MANIF		dn = 20 mm				kv = 5.390										

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	100	50	0.3	61
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.251	101	50	639.4	20171
	RA-N-A		Preset: 4.00		dn = 15 mm												
			Authority= 0.54		kv = 0.228 m³/h												
	500/95 - 9							Φr = 1119 W		Aut. = 0.00		Δp = 2000 Pa					
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.249	104	52	11.8	418
	RLV-S-A		dn = 15 mm			kv = 1.702											
	B	FON PERT	0.50	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.249	104	52	0.3	63
	B	FON PERT	1.56	16x2		1119	1.1	1.000	0.028	0.028	1.7	0.102	0.249	104	162	7.9	407
	MANIF		dn = 20 mm			kv = 5.390											
	A	EN 10220	0.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	49	0.5	78
	BALL VALVE		dn = 25 mm			kv = 72.230											
	A	EN 10220	2.50	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	243	0.3	261
	A	EN 10220	7.00	25		8333	8.3	1.000	0.212	0.210	12.6	0.756	0.329	97	679	1.8	776
	A	EN 10220	9.00	32		15432	15.4	1.000	0.393	0.389	23.3	1.399	0.358	80	716	1.3	798
	A	EN 10220	3.50	50		47911	47.9	1.000	1.219	1.207	72.4	4.344	0.517	98	343	1.3	510
	A	EN 10220	0.50	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	26	0.3	60
	A	EN 10220	5.00	65		69043	69.0	1.000	1.757	1.739	104.3	6.260	0.448	53	265	1.2	387
	A	EN 10220	5.00	65		73890	73.9	1.000	1.880	1.861	111.7	6.700	0.479	60	302	50.9	6149
	FILTER		dn = 65 mm			kv = 59.660											
	BALL VALVE		dn = 65 mm			kv = 462.128											
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 36.879 m³/h														
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.91		kv = 59.575 m³/h												
	A	EN 10220	0.60	65		73890	73.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0

Pipes - Overview table

Symbol	dn	Lpro	L	N	V	Mpro	M
	mm	m	m	l	l	kg	kg
FON PERT	20x2	277.7	277.7	56	56	30	30
FON PERT	16x2	1605.5	1605.5	182	182	134	134
EN 10220	65	23.6	23.6	92	92	124	124
EN 10220	50	10.0	10.0	23	23	41	41
EN 10220	40	6.0	6.0	9	9	18	18
EN 10220	32	53.0	53.0	58	58	135	135
EN 10220	25	89.0	89.0	57	57	177	177
EN 10220	20	32.0	32.0	12	12	45	45

Pipes

dn	Catalogue number	Lpro	Lexist	L	N	Vexist	V	Mpro	Mexist	M
mm		m	m	m	l	l	l	kg	kg	kg
Symbol:	FON PERT	Producer:		VIEGA						
Pipe PE-RT Fonterra, with EVOH layer, for underfloor heating.										
16x2	678 975	1605.5		1605.5	182		182	134		134
20x2	657 345	277.7		277.7	56		56	30		30
Total		1883.2		1883.2	237		237	164		164
Symbol:	EN 10220	Producer:								
Steel pipes, PN 25, acc. to EN 10220:2002. Roughness k = 0.4 mm (pipes in operation).										
20		32.0		32.0	12		12	45		45
25		89.0		89.0	57		57	177		177
32		53.0		53.0	58		58	135		135
40		6.0		6.0	9		9	18		18
50		10.0		10.0	23		23	41		41
65		23.6		23.6	92		92	124		124
Total		213.6		213.6	251		251	540		540

Accessories - Overview table

Type	Symbol	dn	Pipe symbol	Npro	Nexist	N
		mm		pcs.	pcs.	pcs.
	VF-3	65	EN 10220	1		1
	MANIFOLD	x10	EN 10220	1		1
	MANIFOLD	x11	EN 10220	1		1
	MANIFOLD	x4	EN 10220	1		1
	MANIFOLD	x5	EN 10220	1		1
	MANIFOLD	x6	EN 10220	2		2
	MANIFOLD	x7	EN 10220	1		1
	MANIFOLD	x9	EN 10220	3		3
	BALL VALVE	20	EN 10220	6		6
	BALL VALVE	25	EN 10220	24		24
	BALL VALVE	65	EN 10220	2		2
	ELBOW90	16x2	FON PERT	396		396
	ELBOW90	20x2	FON PERT	60		60
	ELBOW90	20	EN 10220	12		12
	FILTER	20	EN 10220	2		2
	FILTER	25	EN 10220	8		8
	FILTER	65	EN 10220	1		1
	REVERSE V F	65	EN 10220	1		1
	MSV-F2 PN16	65	EN 10220	1		1
	RLV-S-A	15	FON PERT	76		76
	RA-N-A	15	FON PERT	76		76

Accessories

Type	Symbol	dn	Catalogue number	Npro	Nexist	N
		mm		pcs.	pcs.	pcs.
Accessories on pipes: EN 10220						
Symbol: MANIFOLD		Producer:				
Apartment manifold (assume only when no specific appliance available)						
	MANIFOLD	x10		1		1
	MANIFOLD	x11		1		1
	MANIFOLD	x4		1		1
	MANIFOLD	x5		1		1
	MANIFOLD	x6		2		2
	MANIFOLD	x7		1		1
	MANIFOLD	x9		3		3
	Total			10		10
Symbol: BALL VALVE		Producer:				
Ball valve (assume only when no actual hydraulic characteristics of valve is available).						
	BALL VALVE	20		6		6
	BALL VALVE	25		24		24
	BALL VALVE	65		2		2
	Total			32		32
Symbol: ELBOW90		Producer:				
Elbow 90 deg.						
	ELBOW90	20		12		12
	Total			12		12
Symbol: MSV-F2 PN16		Producer:	DANFOSS			
Manual balancing valve with smooth initial preset, type MSV-F2, collar PN 16.						
	MSV-F2 PN16	65	003Z0162	1		1
	Total			1		1
Symbol: FILTER		Producer:				
Mesh filter, grid size 0.32 x 0.2 mm (assume only when no specific appliance available).						
	FILTER	20		2		2
	FILTER	25		8		8
	FILTER	65		1		1
	Total			11		11
Symbol: REVERSE V F		Producer:				
Reverse collar valve, (assume only when no actual hydraulic characteristics of valve is						
	REVERSE V F	65		1		1
	Total			1		1
Symbol: VF-3		Producer:	DANFOSS			
Three-way mixing valve VF 3 cooperating with drive-motor, Kvs = 6.3 .. 320 m3/h, flange.						
	VF-3	65	065B1665	1		1
	Total			1		1
Accessories on pipes: FON PERT						
Symbol: RLV-S-A		Producer:	DANFOSS			
Cut-off valve angle, type RLV-S, mounted on return radiator branches, enables cutting-of						
initial preset.						
	RLV-S-A	15	003L0123	76		76
	Total			76		76

Type	Symbol	dn	Catalogue number	Npro	Nexist	N
		mm		pcs.	pcs.	pcs.
Symbol:	RA-N-A	Producer:	DANFOSS			
Angle thermostatic valve with initial preset, type RA-N, with standard endings (nipples)						
	RA-N-A	15	013G3903	76		76
	Total			76		76
Symbol:	ELBOW90	Producer:				
Elbow 90 deg.						
	ELBOW90	16x2		396		396
	ELBOW90	20x2		60		60
	Total			456		456

PRORAČUN CIJEVNE MREŽE – PODNO GRIJANJE

Global

Basic info:	
Name of proj.:	
Address:	
City:	
Designer:	
Date of calc:	Tuesday 7 November 2023 1:53

Info on pipes type:			
Type A:	EN 10220	Type B:	
Type C:		Type D:	
Type E:		Type F:	
Type G:		Type H:	
Type I:		Type J:	
Type K:		Type L:	
Type M:		Type N:	
Type O:		Type P:	

Symbol of the heat source:	OTHER HEAT SOURCE CH

Parameters of the heating agent:			
θs, [°C]:	45.00	θr, [°C]:	35.00
θr,r, [°C]:	39.80		
Type of agent:	Ethylene glycol	oncentration, [%]:	15.0

Info on the heating system:	
The total water flow in the installation Minst, [kg/s]:	2.026
Total installation capacity Vinst, [l]:	832
Calculation thermal power of the installation ΦHL,inst, [W]:	39899
Power lost Φlost,inst, [W]:	1548
Total power transferred by the installation Φtot,inst, [W]:	41447

Parameters of the heat source: OTHER HEAT SOURCE CH			
ΔpHS, [Pa]:	1000	VHS, [l]:	10.0
Required disposable pressure in the source Δpdisp, [Pa]:			1362
Additional power reserve for charging the bufferΦHL,reserve, [W]			
he total design power of the heat source in winter ΦHL,winter, []:			39899
culated thermal power of the source in the summer ΦHL,summer, [W]:			
design power of the heat source in transition period ΦHL,part, []:			
Number of concurrently working flat stations.NFS,sim, [pcs.]:			

Statistics of rooms and radiators for the heat source: OTHER HEAT SOURCE CH			
Heated rooms:			
Overheated:	0	Surplus of power, [W]:	0
Underheated:	0	Shortage of power, [W]:	0
Heating power, [W]:	0	Heat gains from pipes, [W]:	9
Underheated rooms:			
Heating power, [W]:	0	Heat gains from pipes, [W]:	0
Radiators:			
Overheating:	10	Surplus of power, [W]:	0
Underheating:	0	Shortage of power, [W]:	0
Design heating power, [W]:	0	Actual heating power, [W]:	0

Pipes CH

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	EN 10220	10.00		65	39899	7.193	0.51	71	708	40.2	6029	39.82	0.01	38.82
	EN 10220	1.00		65	39899	7.193	0.51	71	71	0.0	71	39.81	0.00	3.88
	EN 10220	7.00		32	7760	1.399	0.36	81	570	276.5	18242	39.91	0.03	7.61
	EN 10220	10.00		25	4794	0.864	0.38	129	1287	298.1	22394	39.85	0.05	6.38
	EN 10220	0.50		65	39899	7.193	0.51	71	35	0.3	78	39.83	0.00	1.94
	EN 10220	3.00		25	4794	0.864	0.38	129	386	2.3	548	39.80	0.02	1.91
	EN 10220	1.00		65	39899	7.193	0.51	71	71	0.3	114	39.81	0.00	3.88
	EN 10220	0.50		65	39899	7.193	0.51	71	35	0.0	35	39.81	0.00	1.94
	EN 10220	0.60		65	39899	0.000	0.00	0	0	0.0	0	39.81	5.87	2.33
	EN 10220	7.00		65	39899	7.193	0.51	71	495	0.9	617	39.83	0.01	27.17
	EN 10220	6.00		65	35105	6.329	0.45	55	331	0.3	365	39.85	0.01	23.29
	EN 10220	0.50		32	8813	1.589	0.41	104	52	233.3	19290	39.91	0.00	0.54
	EN 10220	2.00		32	7760	1.399	0.36	81	163	1.9	283	39.89	0.01	2.17
	EN 10220	3.00		32	8813	1.589	0.41	104	312	1.9	466	39.91	0.01	3.26
	EN 10220	3.00		32	10288	1.855	0.47	140	421	1.0	527	39.88	0.01	3.26
	EN 10220	10.00		32	10288	1.855	0.47	140	1402	1.7	1594	39.87	0.03	10.87
	EN 10220	0.50		32	10288	1.855	0.47	140	70	89.3	10106	39.88	0.00	0.54
	EN 10220	10.00		50	27345	4.930	0.59	128	1277	1.7	1568	39.85	0.01	23.33
	EN 10220	3.00		32	8244	1.486	0.38	91	274	1.0	343	39.88	0.01	3.26
	EN 10220	0.50		32	8244	1.486	0.38	91	46	270.6	19564	39.88	0.00	0.54
	EN 10220	4.00		65	35105	6.329	0.45	55	221	1.2	342	39.84	0.00	15.53
	EN 10220	5.00		25	4794	0.864	0.38	129	644	1.7	767	39.79	0.03	3.19
	EN 10220	0.50		50	19101	3.443	0.41	64	32	1.2	134	39.86	0.00	1.17
	EN 10220	10.00		32	8244	1.486	0.38	91	914	1.7	1037	39.87	0.04	10.87
	EN 10220	5.00		50	19101	3.443	0.41	64	318	0.3	346	39.87	0.01	11.66
	EN 10220	10.00		65	39899	7.209	0.52	71	705	15.0	2699	45.00	0.01	38.82
	EN 10220	1.00		65	39899	7.209	0.52	71	71	0.3	114	45.00	0.00	3.88
	EN 10220	1.00		65	39899	7.209	0.52	71	71	0.0	71	45.00	0.00	3.88
	EN 10220	7.00		32	7760	1.402	0.36	81	567	84.5	5994	44.95	0.03	7.61
	EN 10220	10.00		25	4794	0.866	0.38	128	1281	80.2	6986	44.92	0.07	6.38
	EN 10220	0.50		65	39899	7.209	0.52	71	35	0.3	79	44.97	0.00	1.94
	EN 10220	5.00		25	4794	0.866	0.38	128	640	2.3	803	44.95	0.03	3.19
	EN 10220	7.00		65	39899	7.209	0.52	71	494	0.9	616	44.98	0.01	27.17
	EN 10220	6.00		65	35105	6.343	0.45	55	330	0.3	363	44.97	0.01	23.29
	EN 10220	0.50		32	8813	1.592	0.41	103	52	84.0	7006	44.92	0.00	0.54
	EN 10220	2.00		32	7760	1.402	0.36	81	162	2.5	322	44.96	0.01	2.17
	EN 10220	3.00		32	8813	1.592	0.41	103	310	2.5	518	44.93	0.01	3.26
	EN 10220	3.00		32	10288	1.859	0.48	140	419	1.0	526	44.89	0.01	3.26
	EN 10220	10.00		32	10288	1.859	0.48	140	1397	1.2	1529	44.93	0.04	10.87
	EN 10220	0.50		32	10288	1.859	0.48	140	70	86.8	9866	44.88	0.00	0.54
	EN 10220	10.00		50	27345	4.941	0.59	127	1273	1.1	1472	44.96	0.02	23.33
	EN 10220	3.00		32	8244	1.489	0.38	91	273	1.0	342	44.90	0.01	3.26
	EN 10220	0.50		32	8244	1.489	0.38	91	45	84.5	6171	44.88	0.00	0.54
	EN 10220	4.00		65	35105	6.343	0.45	55	220	1.8	403	44.97	0.01	15.53
	EN 10220	3.00		25	4794	0.866	0.38	128	384	1.2	469	44.97	0.02	1.91
	EN 10220	0.50		50	19101	3.451	0.41	63	32	1.8	185	44.94	0.00	1.17
	EN 10220	10.00		32	8244	1.489	0.38	91	910	1.2	994	44.94	0.05	10.87
	EN 10220	5.00		50	19101	3.451	0.41	63	317	0.3	344	44.94	0.01	11.66

Room	Symbol	dn	Preset	Δpst	Aut.	ΦHL	ΦHL	M	Q	Q	Q	kv	Δp
		mm		kPa		W	kW	kg/s	l/s	l/min	m3/h	m3/h	Pa
TEH.PROST.	BALL VALVE	65				39899	39.9	2.026	1.998	119.9	7.193	469.288	23
TEH.PROST.	BALL VALVE	65				39899	39.9	2.026	2.002	120.1	7.209	469.288	24
TEH.PROST.	FILTER	65				39899	39.9	2.026	1.998	119.9	7.193	60.584	1410
TEH.PROST.	REVERSE V	65				39899	39.9	2.026	2.002	120.1	7.209	114.951	393
TEH.PROST.	MSV-F2 PN16	65	4			39899	39.9	2.026	1.998	119.9	7.193	37.451	3689
TEH.PROST.	VF-3	65			0.79	39899	39.9	2.026	2.002	120.1	7.209	60.498	1420
SPRAT	ASV-I	32	3			8244	8.2	0.419	0.414	24.8	1.489	6.030	6102
SPRAT	ASV-PV G 25	32	7	18.0		8244	8.2	0.419	0.413	24.8	1.486	3.366	19495
SPRAT	ASV-PV G 25	32	0	25.0		10288	10.3	0.522	0.515	30.9	1.855	5.865	9999
SPRAT	ASV-I	32	2.8			10288	10.3	0.522	0.516	31.0	1.859	5.950	9759
SPRAT	ASV-PV G 25	32	6	19.0		8813	8.8	0.447	0.441	26.5	1.589	3.625	19211
SPRAT	ASV-I	32	3.2			8813	8.8	0.447	0.442	26.5	1.592	6.050	6927
SPRAT	ASV-I	32	3			7760	7.8	0.394	0.389	23.4	1.402	6.030	5407
SPRAT	ASV-PV G 25	32	0	25.0		7760	7.8	0.394	0.389	23.3	1.399	3.330	17651
PRIZEMLJE	ASV-PV G 25	25	4	21.0		4794	4.8	0.243	0.240	14.4	0.864	1.882	21084
PRIZEMLJE	ASV-I	25	2.4			4794	4.8	0.243	0.241	14.4	0.866	3.634	5682
TEH.PROST.	ELBOW90	65				39899	39.9	2.026	2.002	120.1	7.209	257.038	79
TEH.PROST.	ELBOW90	65				39899	39.9	2.026	1.998	119.9	7.193	257.038	78
TEH.PROST.	ELBOW90	65				39899	39.9	2.026	2.002	120.1	7.209	257.038	79
TEH.PROST.	ELBOW90	65				39899	39.9	2.026	1.998	119.9	7.193	257.038	78
PRIZEMLJE	ELBOW90	25				4794	4.8	0.243	0.240	14.4	0.864	40.175	46
PRIZEMLJE	ELBOW90	25				4794	4.8	0.243	0.241	14.4	0.866	40.175	46
PRIZEMLJE	ELBOW90	65				39899	39.9	2.026	1.998	119.9	7.193	257.038	78
PRIZEMLJE	ELBOW90	65				39899	39.9	2.026	2.002	120.1	7.209	257.038	79
PRIZEMLJE	ELBOW90	25				4794	4.8	0.243	0.241	14.4	0.866	40.175	46
PRIZEMLJE	ELBOW90	25				4794	4.8	0.243	0.240	14.4	0.864	40.175	46
PRIZEMLJE	ELBOW90	25				4794	4.8	0.243	0.241	14.4	0.866	40.175	46
PRIZEMLJE	ELBOW90	25				4794	4.8	0.243	0.240	14.4	0.864	40.175	46
SPRAT	ELBOW90	32				7760	7.8	0.394	0.389	23.4	1.402	69.986	40
SPRAT	ELBOW90	32				7760	7.8	0.394	0.389	23.3	1.399	69.986	40
SPRAT	ELBOW90	32				8813	8.8	0.447	0.442	26.5	1.592	69.986	52
SPRAT	ELBOW90	32				8813	8.8	0.447	0.441	26.5	1.589	69.986	52
SPRAT	ELBOW90	32				10288	10.3	0.522	0.515	30.9	1.855	69.986	70
SPRAT	ELBOW90	32				10288	10.3	0.522	0.516	31.0	1.859	69.986	71
SPRAT	ELBOW90	32				8244	8.2	0.419	0.413	24.8	1.486	69.986	45
SPRAT	ELBOW90	32				8244	8.2	0.419	0.414	24.8	1.489	69.986	45

Other CH heating receivers

Symbol	ΦHL	θs	Δθr	M	Δp	V
	W	oC	K	kg/s	Pa	l
RZ5-SPR.(9)	7760	44.91	5.00	0.394	18466	82.6
RZ1-PR.(6)	4794	44.85	5.00	0.243	12478	67.2
RZ4-SPR.(8)	8813	44.91	5.00	0.447	11989	84.5
RZ2-SPR.(9)	10288	44.88	5.00	0.522	15000	95.5
RZ3-SPR.(8)	8244	44.88	5.00	0.419	11709	79.9

Circuits - CH Heating

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
Riser/Plot: / Circulation by the receiver: OTHER HEAT RECEIVER w in the room: TEH.PROST.																	
Δpdisp = 1369 Pa Δpgr = 7 Pa Δp = 1369 Pa Δpover = 0 Pa ΔH = 0.40 m LCIR = 4.00 m																	
	OTHER HEAT SOURCE CH											ΔpHS = 1000 Pa					
	A	EN 10220	1.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	71	0.0	71
	A	EN 10220	1.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	71	0.3	114
	OTHER HEAT RECEIVER							Φr = 39899 W Aut. = 0.00				Δp = 0 Pa					
	A	EN 10220	1.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	71	0.3	114
	A	EN 10220	1.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	71	0.0	71
Riser/Plot: / Circulation by the receiver: RZ5-SPR.(9) w in the room: SPRAT																	
Δpdisp = 54957 Pa Δpgr = 109 Pa Δp = 54933 Pa Δpover = 24 Pa ΔH = 6.51 m LCIR = 73.50 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	705	15.0	2699
	BALL VALVE	dn = 65 mm kv = 469.288															
	REVERSE V	dn = 65 mm kv = 114.951															
	VF-3	Preset: dn = 65 mm															
		Authority= 0.79 kv = 60.498 m³/h															
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	494	0.9	616
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	35	0.3	79
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	220	1.8	403
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	330	0.3	363
	A	EN 10220	2.00	32		7760	7.8	1.000	0.394	0.389	23.4	1.402	0.358	81	162	2.5	322
	A	EN 10220	7.00	32		7760	7.8	1.000	0.394	0.389	23.4	1.402	0.358	81	567	84.5	5994
	ASV-I	Preset: 3 dn = 32 mm															
		kv = 6.030 m³/h															
	RZ5-SPR.(9)	Φr = 7760 W Aut. = 0.00 Δp = 18466 Pa															
	A	EN 10220	7.00	32		7760	7.8	1.000	0.394	0.389	23.3	1.399	0.358	81	570	276.5	18242
	ASV-PV G 25	Preset: 0 dn = 32 mm															
		Δpst = 25.00 kPa kv = 3.330 m³/h															
	A	EN 10220	2.00	32		7760	7.8	1.000	0.394	0.389	23.3	1.399	0.358	81	163	1.9	283
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	331	0.3	365
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	221	1.2	342
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.3	78
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	495	0.9	617
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	708	40.2	6029
	BALL VALVE	dn = 65 mm kv = 469.288															
	FILTER	dn = 65 mm kv = 60.584															
	MSV-F2 PN16	Preset: 4 dn = 65 mm															
		kv = 37.451 m³/h															
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.0	35
	A	EN 10220	0.60	65		39899	39.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: RZ4-SPR.(8) w in the room: SPRAT																	
Δpdisp = 54957 Pa Δpgr = 110 Pa Δp = 54944 Pa Δpover = 13 Pa ΔH = 6.51 m LCIR = 93.50 m																	
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	705	15.0	2699

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	BALL VALVE	dn = 65 mm				kv = 469.288											
	REVERSE V	dn = 65 mm				kv = 114.951											
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.79			kv = 60.498 m³/h												
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	494	0.9	616
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	35	0.3	79
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	220	1.8	403
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	330	0.3	363
	A	EN 10220	10.00	50		27345	27.3	1.000	1.388	1.372	82.3	4.941	0.588	127	1273	1.1	1472
	A	EN 10220	0.50	50		19101	19.1	1.000	0.970	0.959	57.5	3.451	0.411	63	32	1.8	185
	A	EN 10220	5.00	50		19101	19.1	1.000	0.970	0.959	57.5	3.451	0.411	63	317	0.3	344
	A	EN 10220	3.00	32		8813	8.8	1.000	0.447	0.442	26.5	1.592	0.407	103	310	2.5	518
	A	EN 10220	0.50	32		8813	8.8	1.000	0.447	0.442	26.5	1.592	0.407	103	52	84.0	7006
	ASV-I	Preset: 3.2			dn = 32 mm												
		kv = 6.050 m³/h															
	RZ4-SPR.(8)	Φr = 8813 W Aut. = 0.00 Δp = 11989 Pa															
	A	EN 10220	0.50	32		8813	8.8	1.000	0.447	0.441	26.5	1.589	0.406	104	52	233.3	19290
	ASV-PV G 25	Preset: 6			dn = 32 mm												
		Δpst = 19.00 kPa			kv = 3.625 m³/h												
	A	EN 10220	3.00	32		8813	8.8	1.000	0.447	0.441	26.5	1.589	0.406	104	312	1.9	466
	A	EN 10220	5.00	50		19101	19.1	1.000	0.970	0.957	57.4	3.443	0.410	64	318	0.3	346
	A	EN 10220	0.50	50		19101	19.1	1.000	0.970	0.957	57.4	3.443	0.410	64	32	1.2	134
	A	EN 10220	10.00	50		27345	27.3	1.000	1.388	1.369	82.2	4.930	0.587	128	1277	1.7	1568
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	331	0.3	365
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	221	1.2	342
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.3	78
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	495	0.9	617
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	708	40.2	6029
	BALL VALVE	dn = 65 mm				kv = 469.288											
	FILTER	dn = 65 mm				kv = 60.584											
	MSV-F2 PN16	Preset: 4			dn = 65 mm												
		kv = 37.451 m³/h															
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.0	35
	A	EN 10220	0.60	65		39899	39.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: RZ2-SPR.(9) w in the room: SPRAT																
	Δpdisp = 54957 Pa Δpgr = 110 Pa Δp = 54823 Pa Δpover = 134 Pa ΔH = 6.51 m LCIR = 113.50 m																
	VIRTUAL OTHER HEAT SOURCE CH	ΔpHS = 0 Pa															
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	705	15.0	2699
	BALL VALVE	dn = 65 mm				kv = 469.288											
	REVERSE V	dn = 65 mm				kv = 114.951											
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.79			kv = 60.498 m³/h												
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	494	0.9	616
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	35	0.3	79
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	220	1.8	403
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	330	0.3	363

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	10.00	50		27345	27.3	1.000	1.388	1.372	82.3	4.941	0.588	127	1273	1.1	1472
	A	EN 10220	0.50	50		19101	19.1	1.000	0.970	0.959	57.5	3.451	0.411	63	32	1.8	185
	A	EN 10220	5.00	50		19101	19.1	1.000	0.970	0.959	57.5	3.451	0.411	63	317	0.3	344
	A	EN 10220	10.00	32		10288	10.3	1.000	0.522	0.516	31.0	1.859	0.475	140	1397	1.2	1529
	A	EN 10220	3.00	32		10288	10.3	1.000	0.522	0.516	31.0	1.859	0.475	140	419	1.0	526
	A	EN 10220	0.50	32		10288	10.3	1.000	0.522	0.516	31.0	1.859	0.475	140	70	86.8	9866
	ASV-I	Preset: 2.8		dn = 32 mm													
		kv = 5.950 m³/h															
	RZ2-SPR.(9)	Φr = 10288 W Aut. = 0.00 Δp = 15000 Pa															
	A	EN 10220	0.50	32		10288	10.3	1.000	0.522	0.515	30.9	1.855	0.474	140	70	89.3	10106
	ASV-PV G 25	Preset: 0		dn = 32 mm													
		Δpst = 25.00 kPa		kv = 5.865 m³/h													
	A	EN 10220	3.00	32		10288	10.3	1.000	0.522	0.515	30.9	1.855	0.474	140	421	1.0	527
	A	EN 10220	10.00	32		10288	10.3	1.000	0.522	0.515	30.9	1.855	0.474	140	1402	1.7	1594
	A	EN 10220	5.00	50		19101	19.1	1.000	0.970	0.957	57.4	3.443	0.410	64	318	0.3	346
	A	EN 10220	0.50	50		19101	19.1	1.000	0.970	0.957	57.4	3.443	0.410	64	32	1.2	134
	A	EN 10220	10.00	50		27345	27.3	1.000	1.388	1.369	82.2	4.930	0.587	128	1277	1.7	1568
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	331	0.3	365
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	221	1.2	342
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.3	78
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	495	0.9	617
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	708	40.2	6029
	BALL VALVE	dn = 65 mm		kv = 469.288													
	FILTER	dn = 65 mm		kv = 60.584													
	MSV-F2 PN16	Preset: 4		dn = 65 mm													
		kv = 37.451 m³/h															
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.0	35
	A	EN 10220	0.60	65		39899	39.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: RZ3-SPR.(8) w in the room: SPRAT																
	Δpdisp = 54957 Pa Δpgr = 110 Pa Δp = 54826 Pa Δpover = 131 Pa ΔH = 6.51 m LCIR = 102.50 m																
	VIRTUAL OTHER HEAT SOURCE CH											ΔpHS = 0 Pa					
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	705	15.0	2699
	BALL VALVE	dn = 65 mm		kv = 469.288													
	REVERSE V	dn = 65 mm		kv = 114.951													
	VF-3	Preset:		dn = 65 mm													
		Authority= 0.79		kv = 60.498 m³/h													
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	494	0.9	616
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	35	0.3	79
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	220	1.8	403
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.762	105.7	6.343	0.454	55	330	0.3	363
	A	EN 10220	10.00	50		27345	27.3	1.000	1.388	1.372	82.3	4.941	0.588	127	1273	1.1	1472
	A	EN 10220	10.00	32		8244	8.2	1.000	0.419	0.414	24.8	1.489	0.381	91	910	1.2	994
	A	EN 10220	3.00	32		8244	8.2	1.000	0.419	0.414	24.8	1.489	0.381	91	273	1.0	342
	A	EN 10220	0.50	32		8244	8.2	1.000	0.419	0.414	24.8	1.489	0.381	91	45	84.5	6171
	ASV-I	Preset: 3		dn = 32 mm													
		kv = 6.030 m³/h															

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	RZ3-SPR.(8)							Φr = 8244 W Aut. = 0.00 Δp = 11709 Pa									
	A	EN 10220	0.50	32		8244	8.2	1.000	0.419	0.413	24.8	1.486	0.380	91	46	270.6	19564
	ASV-PV G 25		Preset: 7		dn = 32 mm												
			Δpst = 18.00 kPa		kv = 3.366 m³/h												
	A	EN 10220	3.00	32		8244	8.2	1.000	0.419	0.413	24.8	1.486	0.380	91	274	1.0	343
	A	EN 10220	10.00	32		8244	8.2	1.000	0.419	0.413	24.8	1.486	0.380	91	914	1.7	1037
	A	EN 10220	10.00	50		27345	27.3	1.000	1.388	1.369	82.2	4.930	0.587	128	1277	1.7	1568
	A	EN 10220	6.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	331	0.3	365
	A	EN 10220	4.00	65		35105	35.1	1.000	1.783	1.758	105.5	6.329	0.453	55	221	1.2	342
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.3	78
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	495	0.9	617
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	708	40.2	6029
	BALL VALVE		dn = 65 mm		kv = 469.288												
	FILTER		dn = 65 mm		kv = 60.584												
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 37.451 m³/h														
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.0	35
	A	EN 10220	0.60	65		39899	39.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: RZ1-PR.(6) w in the room: PRIZEMLJE																
	Δpdisp = 54902 Pa Δpgr = 55 Pa Δp = 54598 Pa Δpover = 305 Pa ΔH = 3.27 m LCIR = 71.50 m																
	VIRTUAL OTHER HEAT SOURCE CH										ΔpHS = 0 Pa						
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	705	15.0	2699
	BALL VALVE		dn = 65 mm		kv = 469.288												
	REVERSE V		dn = 65 mm		kv = 114.951												
	VF-3		Preset:		dn = 65 mm												
			Authority= 0.79		kv = 60.498 m³/h												
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	494	0.9	616
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	2.002	120.1	7.209	0.516	71	35	0.3	79
	A	EN 10220	3.00	25		4794	4.8	1.000	0.243	0.241	14.4	0.866	0.377	128	384	1.2	469
	A	EN 10220	5.00	25		4794	4.8	1.000	0.243	0.241	14.4	0.866	0.377	128	640	2.3	803
	A	EN 10220	10.00	25		4794	4.8	1.000	0.243	0.241	14.4	0.866	0.377	128	1281	80.2	6986
	ASV-I		Preset: 2.4		dn = 25 mm												
			kv = 3.634 m³/h														
	RZ1-PR.(6)							Φr = 4794 W Aut. = 0.00 Δp = 12478 Pa									
	A	EN 10220	10.00	25		4794	4.8	1.000	0.243	0.240	14.4	0.864	0.376	129	1287	298.1	22394
	ASV-PV G 25		Preset: 4		dn = 25 mm												
			Δpst = 21.00 kPa		kv = 1.882 m³/h												
	A	EN 10220	3.00	25		4794	4.8	1.000	0.243	0.240	14.4	0.864	0.376	129	386	2.3	548
	A	EN 10220	5.00	25		4794	4.8	1.000	0.243	0.240	14.4	0.864	0.376	129	644	1.7	767
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.3	78
	A	EN 10220	7.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	495	0.9	617
	A	EN 10220	10.00	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	708	40.2	6029
	BALL VALVE		dn = 65 mm		kv = 469.288												
	FILTER		dn = 65 mm		kv = 60.584												
	MSV-F2 PN16		Preset: 4		dn = 65 mm												
			kv = 37.451 m³/h														

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	A	EN 10220	0.50	65		39899	39.9	1.000	2.026	1.998	119.9	7.193	0.515	71	35	0.0	35
	A	EN 10220	0.60	65		39899	39.9	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0

Pipes - Overview table

Symbol	dn	Lpro	L	N	V	Mpro	M
	mm	m	m	l	l	kg	kg
EN 10220	65	60.1	60.1	233	233	315	315
EN 10220	50	31.0	31.0	72	72	127	127
EN 10220	32	79.0	79.0	86	86	202	202
EN 10220	25	36.0	36.0	23	23	72	72

Pipes

dn	Lpro	Lexist	L	N	Vexist	V	Mpro	Mexist	M
mm	m	m	m	l	l	l	kg	kg	kg
Symbol: EN									
Steel pipes, PN 25, acc. to EN 10220:2002. Roughness k = 0.4 mm (pipes									
25	36.0		36.0	23		23	72		72
32	79.0		79.0	86		86	202		202
50	31.0		31.0	72		72	127		127
65	60.1		60.1	233		233	315		315
Total	206.1		206.1	414		414	715		715

Accessories - Overview table

Type	Symbol	dn	Catalogue number	Pipe symbol	Npro	Nexist	N	Price pro	Priceexist	Price	Manufacturer
		mm			pcs.	pcs.	pcs.	PLN	PLN	PLN	
	VF-3	65	065B1665	EN 10220	1		1				DANFOSS
	BALL VALVE	65		EN 10220	2		2				
	ELBOW90	25		EN 10220	6		6				
	ELBOW90	32		EN 10220	8		8				
	ELBOW90	65		EN 10220	6		6				
	FILTER	65		EN 10220	1		1				
	MSV-F2 PN16	65	003Z0162	EN 10220	1		1				DANFOSS
	ASV-PV G 25	25	003L7608	EN 10220	1		1				DANFOSS
	ASV-PV G 25	32	003L7609	EN 10220	4		4				DANFOSS
	REVERSE V	65		EN 10220	1		1				
	ASV-I	25	003L7643	EN 10220	1		1				DANFOSS
	ASV-I	32	003L7644	EN 10220	4		4				DANFOSS

Accessories

Type	Symbol	dn	Catalogue number	Npro	Nexist	N
		mm		pcs.	pcs.	pcs.
Accessories on pipes: EN 10220						
Symbol:	BALL VALVE	Producer:				
Ball valve (assume only when no actual hydraulic characteristics of valve is available).						
	BALL VALVE	65		2		2
	Total			2		2
Symbol:	ASV-I	Producer:	DANFOSS			
Cut-off valve with smooth initial preset, type ASV-I, internal thread, enabling flow mea						
for differential pressure governor e.g. ASV-PV, ASV-P, ASV-PV Plus, mounted on return pi						
	ASV-I	25	003L7643	1		1
	ASV-I	32	003L7644	4		4
	Total			5		5
Symbol:	ELBOW90	Producer:				
Elbow 90 deg.						
	ELBOW90	25		6		6
	ELBOW90	32		8		8
	ELBOW90	65		6		6
	Total			20		20
Symbol:	MSV-F2 PN16	Producer:	DANFOSS			
Manual balancing valve with smooth initial preset, type MSV-F2, collar PN 16.						
	MSV-F2 PN16	65	003Z0162	1		1
	Total			1		1
Symbol:	FILTER	Producer:				
Mesh filter, grid size 0.32 x 0.2 mm (assume only when no specific appliance available).						
	FILTER	65		1		1
	Total			1		1
Symbol:	ASV-PV G 25	Producer:	DANFOSS			
Pressure differential governor, type ASV-PV, external thread, holds constant different c						
ceased.						
	ASV-PV G 25	25	003L7608	1		1
	ASV-PV G 25	32	003L7609	4		4
	Total			5		5
Symbol:	REVERSE V	Producer:				
Reverse valve (assume only when no actual hydraulic characteristics of valve is availabl						
	REVERSE V	65		1		1
	Total			1		1
Symbol:	VF-3	Producer:	DANFOSS			
Three-way mixing valve VF 3 cooperating with drive-motor, Kvs = 6.3 .. 320 m3/h, flange.						
	VF-3	65	065B1665	1		1
	Total			1		1

PRORAČUN CIJEVNE MREŽE – KALORIFERI

!BMaterials - Pipes - Overview table

Global

Basic info:	
Name of proj.:	
Address:	
City:	
Designer:	
Date of calc:	Monday 28 August 2023 0:17

Info on pipes type:			
Type A:	EN 10220	Type B:	
Type C:		Type D:	
Type E:		Type F:	
Type G:		Type H:	
Type I:		Type J:	
Type K:		Type L:	
Type M:		Type N:	
Type O:		Type P:	

Symbol of the heat source:	OTHER HEAT SOURCE CH

Parameters of the heating agent:			
θs, [°C]:	45.00	θr, [°C]:	35.00
θr,r, [°C]:	39.88		
Type of agent:	Ethylene glycol	oncentration, [%]:	15.0

Info on the heating system:	
The total water flow in the installation Minst, [kg/s]:	2.700
Total installation capacity Vinst, [l]:	509
Calculation thermal power of the installation ΦHL,inst, [W]:	53170
Power lost Φlost,inst, [W]:	1274
Total power transferred by the installation Φtot,inst, [W]:	54444

Parameters of the heat source: OTHER HEAT SOURCE CH			
ΔpHS, [Pa]:	1000	VHS, [l]:	10.0
Required disposable pressure in the source Δpdisp, [Pa]:			1641
Additional power reserve for charging the bufferΦHL,reserve, [W]			
he total design power of the heat source in winter ΦHL,winter, []:			53170
culated thermal power of the source in the summer ΦHL,summer, [W]:			
design power of the heat source in transition period ΦHL,part, []:			
Number of concurrently working flat stations.NFS,sim, [pcs.]:			

Statistics of rooms and radiators for the heat source: OTHER HEAT SOURCE CH			
Heated rooms:			
Overheated:	0	Surplus of power, [W]:	0
Underheated:	0	Shortage of power, [W]:	0
Heating power, [W]:	0	Heat gains from pipes, [W]:	3
Underheated rooms:			
Heating power, [W]:	0	Heat gains from pipes, [W]:	0
Radiators:			
Overheating:	6	Surplus of power, [W]:	0
Underheating:	0	Shortage of power, [W]:	0
Design heating power, [W]:	0	Actual heating power, [W]:	0

Pipes CH

Type	Pipe symbol	L	DN prefix	dn	ΦHL	Q	v	R	R·L	Σζ	Δp	θs	Δθr	V
pr.		m		mm	W	m3/h	m/s	Pa/m	Pa		Pa	oC	K	l
	EN 10220	18.00		65	53170	9.585	0.69	124	2228	29.4	9145	39.90	0.02	69.87
	EN 10220	1.00		65	53170	9.585	0.69	124	124	0.0	124	39.88	0.00	3.88
	EN 10220	1.00		65	53170	9.585	0.69	124	124	0.3	200	39.88	0.00	3.88
	EN 10220	0.50		65	53170	9.585	0.69	124	62	0.0	62	39.88	0.00	1.94
	EN 10220	0.60		65	53170	0.000	0.00	0	0	0.0	0	39.88	5.89	2.33
	EN 10220	0.50		50	17770	3.204	0.38	55	28	364.4	26541	39.95	0.00	1.17
	EN 10220	3.00		50	17770	3.204	0.38	55	166	1.8	298	39.95	0.01	7.00
	EN 10220	3.00		50	17700	3.191	0.38	55	165	1.8	296	39.94	0.01	7.00
	EN 10220	0.50		50	17700	3.191	0.38	55	27	350.1	25303	39.94	0.00	1.17
	EN 10220	3.00		50	17700	3.191	0.38	55	165	0.9	232	39.91	0.01	7.00
	EN 10220	0.50		50	17700	3.191	0.38	55	27	339.1	24503	39.91	0.00	1.17
	EN 10220	4.00		65	53170	9.585	0.69	124	495	0.3	572	39.90	0.00	15.53
	EN 10220	10.00		65	53170	9.585	0.69	124	1238	0.3	1314	39.91	0.01	38.82
	EN 10220	10.00		50	17700	3.191	0.38	55	550	1.7	672	39.90	0.02	23.33
	EN 10220	10.00		65	35400	6.382	0.46	56	561	0.6	623	39.90	0.01	38.82
	EN 10220	18.00		65	53170	9.607	0.69	124	2224	15.0	5765	45.00	0.02	69.87
	EN 10220	1.00		65	53170	9.607	0.69	124	124	0.3	200	45.00	0.00	3.88
	EN 10220	1.00		65	53170	9.607	0.69	124	124	0.0	124	45.00	0.00	3.88
	EN 10220	0.50		50	17770	3.211	0.38	55	28	0.5	65	44.95	0.00	1.17
	EN 10220	3.00		50	17700	3.198	0.38	55	164	2.4	340	44.95	0.01	7.00
	EN 10220	0.50		50	17700	3.198	0.38	55	27	0.5	64	44.94	0.00	1.17
	EN 10220	3.00		50	17700	3.198	0.38	55	164	0.9	232	44.92	0.01	7.00
	EN 10220	0.50		50	17700	3.198	0.38	55	27	0.5	64	44.91	0.00	1.17
	EN 10220	4.00		65	53170	9.607	0.69	124	494	0.3	571	44.98	0.00	15.53
	EN 10220	10.00		65	53170	9.607	0.69	124	1235	0.3	1312	44.97	0.01	38.82
	EN 10220	10.00		50	17700	3.198	0.38	55	547	1.1	630	44.95	0.03	23.33
	EN 10220	10.00		65	35400	6.396	0.46	56	559	0.6	621	44.96	0.02	38.82
	EN 10220	3.00		50	17770	3.211	0.38	55	165	2.4	343	44.96	0.01	7.00

Other CH heating receivers

Symbol	ΦHL	θs	Δθr	M	Δp	V
	W	oC	K	kg/s	Pa	l
ATLAS 23R46	17770	44.95	5.00	0.902	30000	20.0
ATLAS 23R46	17700	44.94	5.00	0.899	30000	20.0
ATLAS 23R46	17700	44.91	5.00	0.899	30000	20.0

Circuits - CH Heating

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
Riser/Plot: / Circulation by the receiver: OTHER HEAT RECEIVER w in the room: TEH.PROST.																	
Δpdisp = 1648 Pa Δpgr = 7 Pa Δp = 1648 Pa Δpover = 0 Pa ΔH = 0.40 m LCIR = 4.00 m																	
	OTHER HEAT SOURCE CH																
																	ΔpHS = 1000 Pa
	A	EN 10220	1.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.688	124	124	0.0	124
	A	EN 10220	1.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.688	124	124	0.3	200
	OTHER HEAT RECEIVER																
																	Φr = 53170 W Aut. = 0.00 Δp = 0 Pa
	A	EN 10220	1.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	124	0.3	200
	A	EN 10220	1.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	124	0.0	124
Riser/Plot: / Circulation by the receiver: ATLAS 23R46 w in the room: TEH.PROST.																	
Δpdisp = 75989 Pa Δpgr = 65 Pa Δp = 75989 Pa Δpover = 0 Pa ΔH = 3.91 m LCIR = 71.50 m																	
	VIRTUAL OTHER HEAT SOURCE CH																
																	ΔpHS = 0 Pa
	A	EN 10220	18.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	2224	15.0	5765
	BALL VALVE	dn = 65 mm				kv = 469.288											
	REVERSE V	dn = 65 mm				kv = 114.951											
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.80			kv = 60.498 m³/h												
	A	EN 10220	4.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	494	0.3	571
	A	EN 10220	10.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	1235	0.3	1312
	A	EN 10220	3.00	50		17770	17.8	1.000	0.902	0.892	53.5	3.211	0.382	55	165	2.4	343
	A	EN 10220	0.50	50		17770	17.8	1.000	0.902	0.892	53.5	3.211	0.382	55	28	0.5	65
	BALL VALVE	dn = 50 mm				kv = 278.491											
	ATLAS 23R46																
																	Φr = 17770 W Aut. = 0.00 Δp = 30000 Pa
	A	EN 10220	0.50	50		17770	17.8	1.000	0.902	0.890	53.4	3.204	0.381	55	28	364.4	26541
	AB-QM	Preset: 105			dn = 32 mm												
		Q = m³/h			kv = 6.224 m³/h												
	A	EN 10220	3.00	50		17770	17.8	1.000	0.902	0.890	53.4	3.204	0.381	55	166	1.8	298
	A	EN 10220	10.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	1238	0.3	1314
	A	EN 10220	4.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	495	0.3	572
	A	EN 10220	18.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	2228	29.4	9145
	BALL VALVE	dn = 65 mm				kv = 469.288											
	FILTER	dn = 65 mm				kv = 60.584											
	MSV-F2 PN16	Preset: 5			dn = 65 mm												
		kv = 47.822 m³/h															
	A	EN 10220	0.50	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	62	0.0	62
	A	EN 10220	0.60	65		53170	53.2	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
Riser/Plot: / Circulation by the receiver: ATLAS 23R46 w in the room: TEH.PROST.																	
Δpdisp = 75989 Pa Δpgr = 65 Pa Δp = 75989 Pa Δpover = 0 Pa ΔH = 3.91 m LCIR = 91.50 m																	
	VIRTUAL OTHER HEAT SOURCE CH																
																	ΔpHS = 0 Pa
	A	EN 10220	18.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	2224	15.0	5765
	BALL VALVE	dn = 65 mm				kv = 469.288											
	REVERSE V	dn = 65 mm				kv = 114.951											
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.80			kv = 60.498 m³/h												
	A	EN 10220	4.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	494	0.3	571

Type pr.	Pip.	Pipe symbol	L m	dn mm	NWM	ΦHL W	ΦHL kW	PLc	M kg/s	Q l/s	Q l/min	Q m3/h	v m/s	R Pa/m	R·L Pa	Σç	Δp Pa
	A	EN 10220	10.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	1235	0.3	1312
	A	EN 10220	10.00	65		35400	35.4	1.000	1.797	1.777	106.6	6.396	0.458	56	559	0.6	621
	A	EN 10220	3.00	50		17700	17.7	1.000	0.899	0.888	53.3	3.198	0.381	55	164	2.4	340
	A	EN 10220	0.50	50		17700	17.7	1.000	0.899	0.888	53.3	3.198	0.381	55	27	0.5	64
	BALL VALVE	dn = 50 mm				kv = 278.491											
	ATLAS 23R46	Φr = 17700 W Aut. = 0.00 Δp = 30000 Pa															
	A	EN 10220	0.50	50		17700	17.7	1.000	0.899	0.886	53.2	3.191	0.380	55	27	350.1	25303
	AB-QM	Preset: 105			dn = 32 mm												
		Q = m³/h			kv = 6.350 m³/h												
	A	EN 10220	3.00	50		17700	17.7	1.000	0.899	0.886	53.2	3.191	0.380	55	165	1.8	296
	A	EN 10220	10.00	65		35400	35.4	1.000	1.797	1.773	106.4	6.382	0.457	56	561	0.6	623
	A	EN 10220	10.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	1238	0.3	1314
	A	EN 10220	4.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	495	0.3	572
	A	EN 10220	18.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	2228	29.4	9145
	BALL VALVE	dn = 65 mm				kv = 469.288											
	FILTER	dn = 65 mm				kv = 60.584											
	MSV-F2 PN16	Preset: 5			dn = 65 mm												
		kv = 47.822 m³/h															
	A	EN 10220	0.50	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	62	0.0	62
	A	EN 10220	0.60	65		53170	53.2	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0
	Riser/Plot: / Circulation by the receiver: ATLAS 23R46 w in the room: TEH.PROST.																
	Δpdisp = 75989 Pa Δpgr = 65 Pa Δp = 76318 Pa Δpover = -329 Pa ΔH = 3.91 m LCIR = 111.50 m																
	VIRTUAL OTHER HEAT SOURCE CH	ΔpHS = 0 Pa															
	A	EN 10220	18.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	2224	15.0	5765
	BALL VALVE	dn = 65 mm				kv = 469.288											
	REVERSE V	dn = 65 mm				kv = 114.951											
	VF-3	Preset:			dn = 65 mm												
		Authority= 0.80			kv = 60.498 m³/h												
	A	EN 10220	4.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	494	0.3	571
	A	EN 10220	10.00	65		53170	53.2	1.000	2.700	2.669	160.1	9.607	0.687	124	1235	0.3	1312
	A	EN 10220	10.00	65		35400	35.4	1.000	1.797	1.777	106.6	6.396	0.458	56	559	0.6	621
	A	EN 10220	10.00	50		17700	17.7	1.000	0.899	0.888	53.3	3.198	0.381	55	547	1.1	630
	A	EN 10220	3.00	50		17700	17.7	1.000	0.899	0.888	53.3	3.198	0.381	55	164	0.9	232
	A	EN 10220	0.50	50		17700	17.7	1.000	0.899	0.888	53.3	3.198	0.381	55	27	0.5	64
	BALL VALVE	dn = 50 mm				kv = 278.491											
	ATLAS 23R46	Φr = 17700 W Aut. = 0.00 Δp = 30000 Pa															
	A	EN 10220	0.50	50		17700	17.7	1.000	0.899	0.886	53.2	3.191	0.380	55	27	339.1	24503
	AB-QM	Preset: 105			dn = 32 mm												
		Q = m³/h			kv = 6.453 m³/h												
	A	EN 10220	3.00	50		17700	17.7	1.000	0.899	0.886	53.2	3.191	0.380	55	165	0.9	232
	A	EN 10220	10.00	50		17700	17.7	1.000	0.899	0.886	53.2	3.191	0.380	55	550	1.7	672
	A	EN 10220	10.00	65		35400	35.4	1.000	1.797	1.773	106.4	6.382	0.457	56	561	0.6	623
	A	EN 10220	10.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	1238	0.3	1314
	A	EN 10220	4.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	495	0.3	572
	A	EN 10220	18.00	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	2228	29.4	9145
	BALL VALVE	dn = 65 mm				kv = 469.288											

Type	Pip.	Pipe symbol	L	dn	NWM	ΦHL	ΦHL	PLc	M	Q	Q	Q	v	R	R·L	Σç	Δp
pr.			m	mm		W	kW		kg/s	l/s	l/min	m3/h	m/s	Pa/m	Pa		Pa
	FILTER	dn = 65 mm					kv = 60.584										
	MSV-F2 PN16	Preset: 5			dn = 65 mm												
		kv = 47.822 m³/h															
	A	EN 10220	0.50	65		53170	53.2	1.000	2.700	2.663	159.8	9.585	0.686	124	62	0.0	62
	A	EN 10220	0.60	65		53170	53.2	1.000	0.000	0.000	0.0	0.000	0.000	0	0	0.0	0

Pipes - Overview table

Symbol	dn	Lpro	L	N	V	Mpro	M
	mm	m	m	l	l	kg	kg
EN 10220	65	89.1	89.1	346	346	466	466
EN 10220	50	41.0	41.0	96	96	168	168

Company : REHAU
Date : 12.08.2023
Designer :

Building :
Place :

Overall results of underfloor heating

Used systems	UFH: REHAU tacker insulation sheet insulation 30 mm EPS 70
Total heating area	370.80 [m²]
Total heating area	370.80 [m²]
Total area of circuits	356.21 [m²]
Total area of branch supply pipes	14.59 [m²]
Total length of pipe	3087.1 m
Output required for heating	66239 [W]
Underfloor heating output	31958 [W]
Heating circuits output	30928 [W]
Branch supply pipes output	1030 [W]
Required heat input for underfloor heating	41489 [W]
Maximum pressure loss of circuits	30112.25 [Pa]
Max. w	0.46 [m/s]
Total volume flow rate of circuits	6381.69 [kg/h]
Maximum temperature of supply	40 [°C]
Volume of water in system	412 [l]

Manifolds :

Manifold number	Maximum number of circuits	Number of connected circuits	Temp. gradient [K]	Max. pressure loss [kPa]	Flow rate [kg/h]	Velocity [m/s]	Valve setting up [-]
RZ 1 - Pr. (6)	6	6	6.5	12.48	652.81	0.30	--
RZ 3 - Spr. (8)	8	8	5.5	19.07	1345.33	0.41	--
RZ 4 - Spr. (8)	8	8	5.5	19.53	1438.09	0.41	--
RZ 2 - Spr. (9)	9	9	5.5	26.46	1678.71	0.46	--
RZ 5 - Spr. (9)	9	9	5.5	30.11	1266.73	0.46	--

Overall results for manifolds

Floor: Pr.

Overall results for manifold RZ 1 - Pr. (6) - REHAU HKV-D AG stainless steel -6:

Source : REHAU HKV-D AG stainless steel -6

Disposable pressure = 12.48 [kPa]

Temperature of supply	40.0 [°C]
Temperature of return	33.5 [°C]
Total volume flow rate through manifold	652.81 kg/h
Required manifold heat input	4903 [W]
Required disposable pressure for manifold	12478 [Pa]

Underfloor heating:

Used systems	UFH: REHAU tacker insulation sheet insulation 30 mm EPS 70
Total area of circuits	45.99 [m²]
Total length of pipe	505.9 [m]
Total heat output of heating circuits	3673 [W]
Volume of water in heating ciscuits	67.2 [l]
Maximum pressure loss of circuits	12.48 [kPa]
Max. w	0.30 [m/s]
Temperature of return water from underfloor heating	33.5 [°C]
Total volume flow rate of underfloor heating	652.81 [kg/h]

Room	Circuit	Zone	Circuit area [m²]	Spac-ing [mm]	Temp. of floor [°C]	ti [°C]	Specific output [W/m²]	Circuit output [W]	Total area [m²]	Qc Overall output [W]	Length of branch supply pipe [m]	Circuit length [m]	Total length of pipe [m]	Temp. gradient [K]	Flow rate [l/min]	Pressure loss [kPa]	ΔPt [kPa]	Max. w [m/s]	Valve setting
Pr.1 - Garderoba	RZ 1 - Pr. (6/1)	LZ 1	9.33	100	31	24	72.4	675	9.33	675	11.6	93.3	104.9	7.9	1.7	7.87	3.66	0.22	2,5
Pr.1 - Garderoba	RZ 1 - Pr. (6/2)	LZ 1	9.12	100	31	24	72.4	660	9.12	660	9.9	91.2	101.1	7.9	1.7	6.64	3.31	0.21	2,5
Pr.2 - Tus	RZ 1 - Pr. (6/3)	LZ 1	6.73	100	32	24	83.1	559	6.73	559	16.2	67.3	83.5	5.0	2.2	9.29	3.06	0.27	2.67
Pr.8 - Kancelarija	RZ 1 - Pr. (6/4)	LZ 1	10.56	150	29	21	83.3	879	10.56	879	25.5	70.4	95.9	7.0	2.4	12.48	0.00	0.30	6.00 Open.
Pr.2 - Portir	RZ 1 - Pr. (6/5)	LZ 1	3.08	150	29	21	87.9	270	3.08	270	45.0	20.5	65.5	5.5	0.9	1.06	1.01	0.11	2,5
Pr.5 - Kancelarija	RZ 1 - Pr. (6/6)	LZ 1	7.16	150	29	21	87.9	629	7.16	629	7.1	47.7	54.9	5.5	2.1	6.07	5.47	0.27	2,5

Floor: Spr.

Overall results for manifold RZ 3 - Spr. (8) - REHAU HKV-D AG stainless steel -8:

Source : REHAU HKV-D AG stainless steel -8 — Disposable pressure = 19.07 [kPa]

Temperature of supply	40.0 [°C]
Temperature of return	34.5 [°C]
Total volume flow rate through manifold	1345.33 kg/h
Required manifold heat input	8640 [W]
Required disposable pressure for manifold	19072 [Pa]

Underfloor heating:

Used systems	UFH: REHAU tacker insulation sheet insulation 30 mm EPS 70
Total area of circuits	73.07 [m²]
Total length of pipe	602.2 [m]
Total heat output of heating circuits	6420 [W]
Volume of water in heating ciscuits	79.9 [l]
Maximum pressure loss of circuits	19.07 [kPa]
Max. w	0.41 [m/s]
Temperature of return water from underfloor heating	34.5 [°C]
Total volume flow rate of underfloor heating	1345.33 [kg/h]

Room	Circuit	Zone	Circuit area [m²]	Spac-ing [mm]	Temp. of floor [°C]	ti [°C]	Specific output [W/m²]	Circuit output [W]	Total area [m²]	Qc Overall output [W]	Length of branch supply pipe [m]	Circuit length [m]	Total length of pipe [m]	Temp. gradient [K]	Flow rate [l/min]	Pressure loss [kPa]	ΔPt [kPa]	Max. w [m/s]	Valve setting
Spr.14 - Kancelarija	RZ 3 - Spr. (8/1)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	11.2	63.1	74.3	5.5	2.8	13.14	5.58	0.35	2.65
Spr.14 - Kancelarija	RZ 3 - Spr. (8/2)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	17.5	67.8	85.2	5.5	3.2	19.07	0.00	0.41	6.00 Open.
Spr.12 - Kancelarija	RZ 3 - Spr. (8/3)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	15.3	67.8	83.0	5.5	3.2	18.60	0.41	0.41	4.60
Spr.12 - Kancelarija	RZ 3 - Spr. (8/4)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	8.4	63.1	71.5	5.5	2.8	12.67	6.05	0.35	2.63
Spr.10 - Kancelarija	RZ 3 - Spr. (8/5)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	10.6	63.1	73.7	5.5	2.8	13.03	5.58	0.35	2.65
Spr.10 - Kancelarija	RZ 3 - Spr. (8/6)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	17.4	67.8	85.2	5.5	3.2	19.06	0.00	0.41	6.00 Open.
Spr.9 - Kancelarija	RZ 3 - Spr. (8/7)	LZ 1	7.53	150	29	21	87.9	661	7.53	661	21.2	50.2	71.4	5.5	2.5	10.33	7.58	0.31	2,5
Spr.9 - Kancelarija	RZ 3 - Spr. (8/8)	LZ 1	6.66	150	29	21	87.9	585	6.66	585	13.4	44.4	57.8	5.5	2.0	5.62	4.74	0.25	2,5

Overall results for manifold RZ 4 - Spr. (8) - REHAU HKV-D AG stainless steel -8:

Source : REHAU HKV-D AG stainless steel -8 — Disposable pressure = 19.53 [kPa]

Temperature of supply	40.0 [°C]
Temperature of return	34.5 [°C]
Total volume flow rate through manifold	1438.09 kg/h
Required manifold heat input	9236 [W]
Required disposable pressure for manifold	19528 [Pa]

Underfloor heating:

Used systems	UFH: REHAU tacker insulation sheet insulation 30 mm EPS 70
Total area of circuits	78.52 [m²]
Total length of pipe	636.8 [m]
Total heat output of heating circuits	6898 [W]
Volume of water in heating ciscuits	84.5 [l]
Maximum pressure loss of circuits	19.53 [kPa]
Max. w	0.41 [m/s]
Temperature of return water from underfloor heating	34.5 [°C]
Total volume flow rate of underfloor heating	1438.09 [kg/h]

Room	Circuit	Zone	Circuit area [m²]	Spac-ing [mm]	Temp. of floor [°C]	ti [°C]	Specific output [W/m²]	Circuit output [W]	Total area [m²]	Qc Overall output [W]	Length of branch supply pipe [m]	Circuit length [m]	Total length of pipe [m]	Temp. gradient [K]	Flow rate [l/min]	Pressure loss [kPa]	ΔPt [kPa]	Max. w [m/s]	Valve setting
Spr.15 - Kancelarija	RZ 4 - Spr. (8/1)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	11.2	63.1	74.3	5.5	2.8	13.14	6.05	0.35	2.63
Spr.15 - Kancelarija	RZ 4 - Spr. (8/2)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	17.5	67.8	85.3	5.5	3.2	19.08	0.41	0.41	4.60
Spr.13 - Kancelarija	RZ 4 - Spr. (8/3)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	15.3	67.8	83.0	5.5	3.2	18.61	0.83	0.41	4.10
Spr.13 - Kancelarija	RZ 4 - Spr. (8/4)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	8.4	63.1	71.5	5.5	2.8	12.67	6.58	0.35	2.60
Spr.11 - Kancelarija	RZ 4 - Spr. (8/5)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	10.6	63.1	73.7	5.5	2.8	13.03	6.05	0.35	2.63
Spr.11 - Kancelarija	RZ 4 - Spr. (8/6)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	17.4	67.8	85.2	5.5	3.2	19.06	0.41	0.41	4.60
Spr.8 - Kancelarija	RZ 4 - Spr. (8/7)	LZ 1	10.17	150	29	21	87.9	893	10.17	893	19.6	67.8	87.4	5.5	3.2	19.53	0.00	0.41	6.00 Open.
Spr.8 - Kancelarija	RZ 4 - Spr. (8/8)	LZ 1	9.46	150	29	21	87.9	831	9.46	831	13.3	63.1	76.4	5.5	2.8	13.50	5.58	0.35	2.65

Overall results for manifold RZ 2 - Spr. (9) - REHAU HKV-D AG stainless steel -9:

Source : REHAU HKV-D AG stainless steel -9 — Disposable pressure = 26.46 [kPa]

Temperature of supply	40.0 [°C]
Temperature of return	34.5 [°C]
Total volume flow rate through manifold	1678.71 kg/h
Required manifold heat input	10781 [W]
Required disposable pressure for manifold	26463 [Pa]

Underfloor heating:

Used systems	UFH: REHAU tacker insulation sheet insulation 30 mm EPS 70
Total area of circuits	92.12 [m²]
Total length of pipe	719.5 [m]
Total heat output of heating circuits	8093 [W]
Volume of water in heating ciscuits	95.5 [l]
Maximum pressure loss of circuits	26.46 [kPa]
Max. w	0.46 [m/s]
Temperature of return water from underfloor heating	34.5 [°C]
Total volume flow rate of underfloor heating	1678.71 [kg/h]

Room	Circuit	Zone	Circuit area [m²]	Spac-ing [mm]	Temp. of floor [°C]	ti [°C]	Specific output [W/m²	Circuit output [W]	Total area [m²]	Qc Overall output [W]	Length of branch supply pipe [m]	Circuit length [m]	Total length of pipe [m]	Temp. gradient [K]	Flow rate [l/min]	Pressure loss [kPa]	ΔPt [kPa]	Max. w [m/s]	Valve setting
Spr.16 - Kancelarija	RZ 2 - Spr. (9/1)	LZ 1	10.80	150	29	21	87.9	949	10.80	949	9.1	72.0	81.1	5.5	3.2	18.00	7.88	0.40	2.63
Spr.16 - Kancelarija	RZ 2 - Spr. (9/2)	LZ 1	11.60	150	29	21	87.9	1019	11.60	1019	16.8	77.3	94.2	5.5	3.7	26.46	0.00	0.46	6.00 Open.
Spr.18 - Kancelarija	RZ 2 - Spr. (9/3)	LZ 1	9.62	150	29	21	87.9	845	9.62	845	15.2	64.1	79.3	5.5	3.0	15.98	9.17	0.38	2.55
Spr.18 - Kancelarija	RZ 2 - Spr. (9/4)	LZ 1	9.14	150	29	21	87.9	803	9.14	803	10.1	60.9	71.0	5.5	2.7	11.85	8.92	0.34	2,5
Spr.20 - Relax Zona	RZ 2 - Spr. (9/5)	LZ 1	9.79	150	29	21	87.9	860	9.79	860	4.7	65.3	70.0	5.5	2.9	13.18	9.27	0.37	2.52
Spr.19 - Kancelarija	RZ 2 - Spr. (9/6)	LZ 1	9.15	150	29	21	87.9	804	9.15	804	9.7	61.0	70.7	5.5	2.7	11.83	8.94	0.34	2,5
Spr.19 - Kancelarija	RZ 2 - Spr. (9/7)	LZ 1	9.62	150	29	21	87.9	845	9.62	845	14.7	64.1	78.9	5.5	3.0	15.89	9.17	0.38	2.55
Spr.17 - Kancelarija	RZ 2 - Spr. (9/8)	LZ 1	11.60	150	29	21	87.9	1019	11.60	1019	16.4	77.3	93.7	5.5	3.7	26.35	0.11	0.46	5.50
Spr.17 - Kancelarija	RZ 2 - Spr. (9/9)	LZ 1	10.80	150	29	21	87.9	949	10.80	949	8.7	72.0	80.7	5.5	3.2	17.90	7.88	0.40	2.63

Overall results for manifold RZ 5 - Spr. (9) - REHAU HKV-D AG stainless steel -9:

Source : REHAU HKV-D AG stainless steel -9 — Disposable pressure = 30.11 [kPa]

Temperature of supply	40.0 [°C]
Temperature of return	34.5 [°C]
Total volume flow rate through manifold	1266.73 kg/h
Required manifold heat input	8136 [W]
Required disposable pressure for manifold	30112 [Pa]

Underfloor heating:

Used systems	UFH: REHAU tacker insulation sheet insulation 30 mm EPS 70
Total area of circuits	66.51 [m²]
Total length of pipe	622.7 [m]
Total heat output of heating circuits	5843 [W]
Volume of water in heating ciscuits	82.7 [l]
Maximum pressure loss of circuits	30.11 [kPa]
Max. w	0.46 [m/s]
Temperature of return water from underfloor heating	34.5 [°C]
Total volume flow rate of underfloor heating	1266.73 [kg/h]

Room	Circuit	Zone	Circuit area [m²]	Spac-ing [mm]	Temp. of floor [°C]	ti [°C]	Specific output [W/m²	Circuit output [W]	Total area [m²]	Qc Overall output [W]	Length of branch supply pipe [m]	Circuit length [m]	Total length of pipe [m]	Temp. gradient [K]	Flow rate [l/min]	Pressure loss [kPa]	ΔPt [kPa]	Max. w [m/s]	Valve setting
Spr.3 - Sastanci direktor	RZ 5 - Spr. (9/1)	LZ 1	6.67	150	29	21	87.9	586	6.67	586	20.2	44.5	64.7	5.5	2.4	8.61	6.85	0.30	2,5
Spr.3 - Sastanci direktor	RZ 5 - Spr. (9/2)	LZ 1	6.36	150	29	21	87.9	559	6.36	559	18.9	42.4	61.3	5.5	2.2	7.04	5.76	0.27	2,5
Spr.7 - Direktor	RZ 5 - Spr. (9/3)	LZ 1	5.52	150	29	21	87.9	485	5.52	485	14.5	36.8	51.3	5.5	1.9	4.68	4.36	0.24	2,5
Spr.7 - Direktor	RZ 5 - Spr. (9/4)	LZ 1	6.98	150	29	21	87.9	613	6.98	613	17.0	46.5	63.5	5.5	2.2	7.62	6.07	0.28	2,5
Spr.6 - Sekretarica	RZ 5 - Spr. (9/5)	LZ 1	5.70	150	29	21	87.9	501	5.70	501	12.3	38.0	50.3	5.5	1.7	3.72	3.47	0.21	2,5
Spr.5 - Kancelarija	RZ 5 - Spr. (9/6)	LZ 1	10.86	150	29	21	87.9	954	10.86	954	21.2	72.4	93.6	5.5	3.2	20.83	8.67	0.40	2.60

Room	Circuit	Zone	Circuit area [m²]	Spac-ing [mm]	Temp. of floor [°C]	ti [°C]	Specific output [W/m²]	Circuit output [W]	Total area [m²]	Qc Overall output [W]	Length of branch supply pipe [m]	Circuit length [m]	Total length of pipe [m]	Temp. gradient [K]	Flow rate [l/min]	Pressure loss [kPa]	ΔPt [kPa]	Max. w [m/s]	Valve setting
Spr.5 - Kancelarija	RZ 5 - Spr. (9/7)	LZ 1	11.66	150	29	21	87.9	1024	11.66	1024	29.1	77.7	106.8	5.5	3.7	30.11	0.00	0.46	6.00 Open.
Spr.4 - Kancelarija	RZ 5 - Spr. (9/8)	LZ 1	6.67	150	29	21	87.9	586	6.67	586	25.5	44.5	70.0	5.5	2.1	7.79	5.60	0.27	2,5
Spr.4 - Kancelarija	RZ 5 - Spr. (9/9)	LZ 1	6.07	150	29	21	87.9	533	6.07	533	20.7	40.5	61.2	5.5	1.8	5.05	3.94	0.23	2,5

Heat overall results

Floor: Pr.

Room	ti [°C]	Qm [W]	Qr [W]	Specific output [W/m²]	Qc [W]	Q circuits [W]	Q branch supply pipes [W]	Coverage [%]	Qadd [W]
Pr.1 - Garderoba	24	1349	1349	72.3	1349	1335	14	100	0
Pr.2 - Portir	21	1349	1349	87.9	270	270	0	20	1079
Pr.2 - Tus	24	1349	1349	83.1	559	559	0	41	790
Pr.5 - Kancelarija	21	1349	1349	87.9	629	629	0	47	720
Pr.8 - Kancelarija	21	1349	1349	83.3	879	879	0	65	470

Floor: Spr.

Room	ti [°C]	Qm [W]	Qr [W]	Specific output [W/m²]	Qc [W]	Q circuits [W]	Q branch supply pipes [W]	Coverage [%]	Qadd [W]
Spr.10 - Kancelarija	21	3255	3255	87.4	1777	1724	53	55	1478
Spr.11 - Kancelarija	21	3255	3255	87.4	1777	1724	53	55	1478
Spr.12 - Kancelarija	21	3255	3255	87.4	1777	1724	53	55	1478
Spr.13 - Kancelarija	21	3255	3255	87.4	1777	1725	53	55	1478
Spr.14 - Kancelarija	21	3255	3255	87.4	1777	1724	53	55	1478
Spr.15 - Kancelarija	21	3255	3255	87.4	1777	1724	53	55	1478
Spr.16 - Kancelarija	21	3255	3255	87.4	2029	1968	61	62	1226
Spr.17 - Kancelarija	21	3255	3255	87.4	2029	1968	61	62	1226
Spr.18 - Kancelarija	21	4053	4053	87.8	1689	1648	41	42	2364
Spr.19 - Kancelarija	21	4053	4053	87.8	1690	1649	41	42	2363
Spr.20 - Relax Zona	21	2563	2563	87.9	860	860	0	34	1703
Spr.3 - Sastanci direktor	21	3255	3255	87.7	1171	1145	26	36	2084
Spr.4 - Kancelarija	21	3255	3255	87.1	1163	1120	43	36	2092
Spr.5 - Kancelarija	21	3255	3255	87.4	2039	1979	60	63	1216
Spr.6 - Sekretarica	21	3255	3255	77.6	666	501	165	20	2589
Spr.7 - Direktor	21	3255	3255	84.6	1181	1098	83	36	2074
Spr.8 - Kancelarija	21	3255	3255	87.4	1777	1725	53	55	1478
Spr.9 - Kancelarija	21	3255	3255	87.3	1314	1246	68	40	1941

List of used constructions

Pr.2 - Portir, Pr.5 - Kancelarija, Pr.8 - Kancelarija, Pr.1 - Garderoba, Pr.2 - Tus, Spr.3 - Sastanci direktor, Spr.4 - Kancelarija, Spr.5 - Kancelarija, Spr.6 - Sekretarica, Spr.7 - Direktor, Spr.8 - Kancelarija, Spr.9 - Kancelarija, Spr.10 - Kancelarija, Spr.12 - Kancelarija, Spr.13 - Kancelarija, Spr.14 - Kancelarija, Spr.15 - Kancelarija, Spr.17 - Kancelarija, Spr.18 - Kancelarija, Spr.19 - Kancelarija, Spr.20 - Relax Zona, Spr.16 - Kancelarija, Spr.11 - Kancelarija:
List of used floors:

Zone	Build-up	Thickness [mm]	λ [W/mK]	R [m²K/W]
LZ 1	Keramicke plocice	15	0.870	0.017
	Ljepilo	5	0.700	0.007
	Cementni estrih	50	1.400	0.036
	REHAU tacker insulation sheet insulation 30 mm EPS 70	30	0.035	0.857
	AB ploca	200	2.600	0.077

Calculation of underfloor heating

Number of circuit	Floor covering	Output deviation [W]	Coverage [%]	Zone	tsupply [°C]	S [m²]	l-tot [m]	L [mm]	tufh [°C]	Δt [K]	Mh [kg/h]	w [m/s]	R*l+z [Pa]	ΔPt [Pa]	ΔPdif [Pa]	Valve settings
	Source: REHAU HKV-D AG stainless steel -6 : H=12478 Pa; tsupply=40.0 °C															
	RZ 1 - Pr. (6) H=12478 Pa (tsupply=40.0 °C; tr=33.5 (dt=6.5); Q=4903 W; Mh=652.81 kg/h; dPmax=12479 Pa)															
	Pr.1 - Garderoba															
	(ti=24 °C; Qr=1349 W = Qheat=1349 W)	0	100 %													
1	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.3	104.9	100	30.7	7.9	103.54	0.22	7870	3657	951	2,5
2	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.1	101.1	100	30.7	7.9	98.58	0.21	6642	3315	2522	2,5
	Pr.2 - Tus															
	(ti=24 °C; Qr=1349 W > Qheat=559 W)	-790	41 %													
3	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	6.7	83.5	100	31.6	5.0	128.72	0.27	9287	3055	136	2.67
	Pr.8 - Kancelarija															
	(ti=21 °C; Qr=1349 W > Qheat=879 W)	-470	65 %													
4	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.6	95.9	150	28.6	7.0	140.90	0.30	12479	0	0	6.00
	Pr.2 - Portir															Open.
	(ti=21 °C; Qr=1349 W > Qheat=270 W)	-1079	20 %													
5	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	3.1	65.5	150	29.0	5.5	54.44	0.11	1062	1012	10405	2,5
	Pr.5 - Kancelarija															
	(ti=21 °C; Qr=1349 W > Qheat=629 W)	-720	47 %													
6	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	7.2	54.9	150	29.0	5.5	126.63	0.27	6068	5474	937	2,5
	Source: REHAU HKV-D AG stainless steel -9 : H=26463 Pa; tsupply=40.0 °C															
	RZ 2 - Spr. (9) H=26463 Pa (tsupply=40.0 °C; tr=34.5 (dt=5.5); Q=10781 W; Mh=1678.71 kg/h; dPmax=26463 Pa)															
	Spr.16 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=2029 W)	-1226	62 %													
1	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.8	81.1	150	29.0	5.5	190.99	0.40	18000	7884	579	2.63
2	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	11.6	94.2	150	29.0	5.5	219.35	0.46	26463	0	0	6.00
	Spr.18 - Kancelarija															Open.
	(ti=21 °C; Qr=4053 W > Qheat=1689 W)	-2364	42 %													
3	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.6	79.3	150	29.0	5.5	180.68	0.38	15983	9174	1307	2.55
4	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.1	71.0	150	29.0	5.5	161.67	0.34	11847	8923	5693	2,5
	Spr.20 - Relax Zona															
	(ti=21 °C; Qr=2563 W > Qheat=860 W)	-1703	34 %													
5	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.8	70.0	150	29.0	5.5	173.18	0.37	13176	9268	4019	2.52
	Spr.19 - Kancelarija															
	(ti=21 °C; Qr=4053 W > Qheat=1690 W)	-2363	42 %													
6	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.2	70.7	150	29.0	5.5	161.84	0.34	11828	8942	5694	2,5
7	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.6	78.9	150	29.0	5.5	180.65	0.38	15895	9171	1398	2.55
	Spr.17 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=2029 W)	-1226	62 %													
8	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	11.6	93.7	150	29.0	5.5	219.35	0.46	26347	112	5	5.50
9	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.8	80.7	150	29.0	5.5	190.99	0.40	17904	7884	675	2.63
	Source: REHAU HKV-D AG stainless steel -8 : H=19072 Pa; tsupply=40.0 °C															
	RZ 3 - Spr. (8) H=19072 Pa (tsupply=40.0 °C; tr=34.5 (dt=5.5); Q=8640 W; Mh=1345.33 kg/h; dPmax=19072 Pa)															
	Spr.14 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
1	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	74.3	150	29.0	5.5	167.36	0.35	13138	5583	351	2.65
2	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	85.2	150	29.0	5.5	192.16	0.41	19072	0	0	6.00
	Spr.12 - Kancelarija															Open.
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
3	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	83.0	150	29.0	5.5	192.16	0.41	18605	408	59	4.60
4	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	71.5	150	29.0	5.5	167.36	0.35	12673	6054	346	2.63
	Spr.10 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
5	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	73.7	150	29.0	5.5	167.36	0.35	13031	5583	458	2.65
6	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	85.2	150	29.0	5.5	192.16	0.41	19065	0	8	6.00
	Spr.9 - Kancelarija															Open.
	(ti=21 °C; Qr=3255 W > Qheat=1314 W)	-1941	40 %													
7	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	7.5	71.4	150	29.0	5.5	148.98	0.31	10328	7577	1168	2,5
8	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	6.7	57.8	150	29.0	5.5	117.79	0.25	5620	4737	8716	2,5
	Source: REHAU HKV-D AG stainless steel -8 : H=19528 Pa; tsupply=40.0 °C															
	RZ 4 - Spr. (8) H=19528 Pa (tsupply=40.0 °C; tr=34.5 (dt=5.5); Q=9236 W; Mh=1438.09 kg/h; dPmax=19528 Pa)															
	Spr.15 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
1	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	74.3	150	29.0	5.5	167.36	0.35	13142	6054	332	2.63

Number of circuit	Floor covering	Output deviation [W]	Coverage [%]	Zone	tsupply [°C]	S [m²]	l-tot [m]	L [mm]	tufh [°C]	Δt [K]	Mh [kg/h]	w [m/s]	R*l+z [Pa]	ΔPt [Pa]	ΔPdif [Pa]	Valve settings
2	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	85.3	150	29.0	5.5	192.16	0.41	19077	408	43	4.60
	Spr.13 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
3	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	83.0	150	29.0	5.5	192.16	0.41	18606	833	89	4.10
4	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	71.5	150	29.0	5.5	167.36	0.35	12673	6584	270	2.60
	Spr.11 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
5	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	73.7	150	29.0	5.5	167.36	0.35	13031	6054	444	2.63
6	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	85.2	150	29.0	5.5	192.16	0.41	19060	408	60	4.60
	Spr.8 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=1777 W)	-1478	55 %													
7	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.2	87.4	150	29.0	5.5	192.16	0.41	19528	0	0	6.00
8	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	9.5	76.4	150	29.0	5.5	167.36	0.35	13496	5583	449	Open.
	Source: REHAU HKV-D AG stainless steel -9 : H=30112 Pa; tsupply=40.0 °C															
	RZ 5 - Spr. (9) H=30112 Pa (tsupply=40.0 °C; tr=34.5 (dt=5.5); Q=8136 W; Mh=1266.73 kg/h; dPmax=30112 Pa)															
	Spr.3 - Sastanci direktor															
	(ti=21 °C; Qr=3255 W > Qheat=1171 W)	-2084	36 %													
1	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	6.7	64.7	150	29.0	5.5	141.67	0.30	8612	6852	14648	2,5
2	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	6.4	61.3	150	29.0	5.5	129.90	0.27	7040	5761	17312	2,5
	Spr.7 - Direktor															
	(ti=21 °C; Qr=3255 W > Qheat=1181 W)	-2074	36 %													
3	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	5.5	51.3	150	29.0	5.5	113.04	0.24	4679	4362	21072	2,5
4	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	7.0	63.5	150	29.0	5.5	133.34	0.28	7619	6070	16423	2,5
	Spr.6 - Sekretarica															
	(ti=21 °C; Qr=3255 W > Qheat=666 W)	-2589	20 %													
5	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	5.7	50.3	150	29.0	5.5	100.88	0.21	3717	3474	22921	2,5
	Spr.5 - Kancelarija															
	(ti=21 °C; Qr=3255 W > Qheat=2039 W)	-1216	63 %													
6	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	10.9	93.6	150	29.0	5.5	192.06	0.40	20833	8672	608	2.60
7	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	11.7	106.8	150	29.0	5.5	220.40	0.46	30112	0	0	6.00
	Spr.4 - Kancelarija															Open.
	(ti=21 °C; Qr=3255 W > Qheat=1163 W)	-2092	36 %													
8	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	6.7	70.0	150	29.0	5.5	128.07	0.27	7790	5599	16723	2,5
9	UFH: (R=0.024) Keramicke plocice + Ljepilo			LZ 1	40.0	6.1	61.2	150	29.0	5.5	107.38	0.23	5050	3936	21126	2,5

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Ispisni tekst

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Broj projekta

Datum 27.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR
		Premium Smart pumpa sa vlažnim rotorom			
	1	Stratos MAXO 32/0,5-10 PN6/10	PG17	1166,95	1166,95

Premium Smart pumpa Wilo-Stratos MAXO
Inline pumpa visoke efikasnosti sa vla žnim rotorom, sa EC motorom i elektronskim prilagođavanjem snage. Može da se koristi za vodu za grejanje, vodu za hlađenje i smešu voda/glikol.
Indeks energetske efikasnosti (EEI) u zavisnosti od tipa pumpe

između = 0,17 i = 0,19.

Vrste regulacije:
- Neprekidno, automatsko pode šavanje snage prema potrebama postrojenja bez specifikacije zadate vrednosti **Wilo Dynamic Adapt plus** (fabričko podešavanje). Do 20 % uštede električne energije u odnosu na vrstu regulacije dp-v.
- Konstantna temperatura **(T-const.)**
- Konstantna diferencijalna temperatura **(dT-const.)**
- Optimizacija protoka cirkulacione pumpe prema potrebi pomoću umrežavanja i komunikacije sa više pumpi **(Multi-Flow Adaptation).**
- Konstantan protok **(Q-const.)**
- Regulacija diferencijalnog pritiska dp-c na udaljenoj tački u mreži cevovoda **(regulacija slabe tačke)**
- Konstantan diferencijalni pritisak **(dp-c)**
- Varijabilni diferencijalni pritisak **(dp-v)** sa opcijom unosa nominalne radne tačke
- Konstantan broja obrtaja **(n-const.)**
- Korisnički definisana **PID** regulacija

Funkcije:
- Prepoznavanje nivoa toplog
- Prepoznavanje nivoa hladnog
- Automatsko isključivanje pumpa pri detekciji nultog protoka **(No-Flow Stop)**
- Prebacivanje između režima grejanja i režima hlađenja (automatski, eksterno ili ručno)
- Podesivo ograničenje protoka pomoću Q-Limit funkcije **($Q_{min.}$ i $Q_{max.}$)**
- Režimi rada dupleks pumpi: **Paralelni rad** optimizovanog stepena korisnog dejstva za dp-c i dp-v, glavni/rezervni rad
- Memorisanje i vraćanje konfigurisanih podešavanja pumpi **(3 tačke vraćanja)**
- **Prikaz poruka o smetnjama/upozorenja** sa jasnim tekstom, uključujući preporuke za pomoć
- **Funkcija odušivanja** za automatsko odzračivanja prostora rotora
- Automatski **rad sa sniženim intenzitetom**
- Automatska **funkcija deblokade** i integrisana **potpuna zaštita motora**
- **Detekcija rada na suvo**

Prikaz:
- Vrsta regulacije
- Zadata vrednost
- Protok
- Temperatura
- Potrošnja električne energije

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR

- Električna potrošnja
- Aktivni uticaji (npr. STOP, No-Flow Stop)

Verzija:
- **2 analogna ulaza** koji se mogu konfigurisati: 0 – 10 V, 2 – 10 V, – 20 mA, 4 – 20 mA i uobi čajeni PT1000; snabdevanje napona sa +24 V DC
- **2 digitalna ulaza** koja se mogu konfigurisati (Ext. OFF, Ext. Min, Ext. Max, grejanje/hlađenje, ručno upravljanje (odvojeno od automatizacije zgrade), blokada upravljanja (blokada tastature i zaštita od konfigurisanja putem daljinskog upravljača))
- **2 releja za signalizaciju** koja se mogu konfigurisati za **signal rada i signal greške**
- **Utično mesto za Wilo CIF module** sa interfejsima za automatizaciju zgrade (opciona dodatna oprema: CIF moduli Modbus RTU, Modbus TCP, BACnet MS/TP, BACnet IP, LON, PLR,CANopen)
- Wilo Net kao Wilo sistemska sabirnica za međusobnu komunikaciju Wilo proizvoda, z.B. **Multi-Flow Adaptation** ; režim rada dupleks pumpe i Wilo-Smart Gateway
- **Integrisani temperaturni senzor**
- Automatski **pogon u nuždi** pri posebnim stanjima (broj obrtaja pumpe se može definisati), npr. pri otkazu komunikacije preko sabirnica ili vrednosti senzora
- **Grafički displej u boji** (4,3 inča) sa rukovanjem preko ručne komande sa jednim dugmetom
- Očitavanje i podešavanje radnih podataka, kao i npr. podešavanje protokola za puštanje u rad preko Bluetooth interfejsa (bez druge dodatne opreme) preko Wilo-Assistant aplikacije
- Integrisano **upravljanje dupleks pumpama** (dupleks pumpe su fabrički ožičene), kod upotrebe 2 pojedinačne pumpe kao dupleks pumpe, povezivanje preko WILO Net-a
- Detekcija prekida kabla pri analognom signalu (u kombinaciji sa 2 – 10 V ili 4 – 20 mA)
- Mogu ćnost postavljanja na otvorenom prostoru sa zaštitom vremenskih prilika prema uputstvu za ugradnju i upotrebu
- Prethodno podešavanje datuma i vremena
- Obloga toplotne izolacije za primenu u sistemima grejanja

Opseg isporuke
- Pumpa
- Optimizovani Wilo-Connector, isti za sve veličine
- 2x navojni priključak kabla M16 x 1,5
- Podloške za zavrtnje sa prirubnicama M12 i M16 (kod nominalnih prečnika priključaka DN 32 do DN 65)
- 2x zaptivač kod navojnog priključka
- Obloga toplotne izolacije
- Uputstvo za ugradnju i upotrebu, kompaktno

Opciona dodatna oprema:
- Izolacija protiv hladnoće ClimaForm za sprečavanje nastanka kondenzata
- CIF modul: Modbus TCP, Modbus RTU, BACnet IP, BACnet MS/TP, LON, PLR, CANopen
- PT 1000 (B) senzor ugrađen u cevi (za potrošnu vodu)
- PT 1000 (AA) senzor za instalaciju u uronjivu čauru
- Davač diferencijalnog pritiska
- Smart-Gateway

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Broj projekta

Datum 27.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR

Radni podaci
Fluid: Voda 100 %
Temperatura fluida: 45,00 °C
Protok: 7,20 m³/h
Napor: 5,50 m
Min. temperatura fluida: -10 °C
Maks. temperatura fluida: 110 °C
Temperatura okoline min.: -10 °C
Maks. temperatura okoline: 40 °C
Maksimalni radni pritisak: 10 bar
Minimalna usisna visina pri 50 °C: 3 m
Minimalna usisna visina pri 95 °C: 10 m
Minimalna usisna visina pri 110 °C: 16 m

Podaci o motoru
Indeks energetske efikasnosti (EEI): ≤ 0.18
Emitovanje smetnji: EN 61800-3;2004+A1;2012 / stambeni prostor (C1)
Otpornost na smetnje: EN 61800-3;2004+A1;2012 / industrijsko okruženje (C2)
Mrežni priključak: 1~230V/50 Hz
Potrošnja električne energije: 250 W
Broj obrtaja min.: 750 1/min
Broj obrtaja maks.: 4000 1/min
Klasa zaštite motora: IPX4D
Navojni priključak kabla: 5 x M16x1.5

Materijali
Kućište pumpe: 5.1301/EN-GJL-250
Radno kolo: PPS-GF40
Vratilo: 1.4122, sa DLC prevlakom
Materijal ležaja: Grafit, impregniran antimonom

Montažne dimenzije
Cevni priključak sa usisne strane: DN 32, PN 6/10
Cevni priključak sa potisne strane: DN 32, PN 6/10
Ukupna visina: 220 mm

Informacije za slanje porudžbine
Proizvođač: Wilo
Oznaka proizvoda: Stratos MAXO 32/0,5-10 PN6/10
Neto težina oko: 11,1 kg
Broj artikla: 2164579

Ukupna cena	5106,05
plus 20% PDV	1021,21
Ukupna cena sa PDVom	**6127,26**

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Tehnički podaci

Premium Smart pumpa sa vlažnim rotorom Stratos MAXO 32/0,5-10 PN6/10

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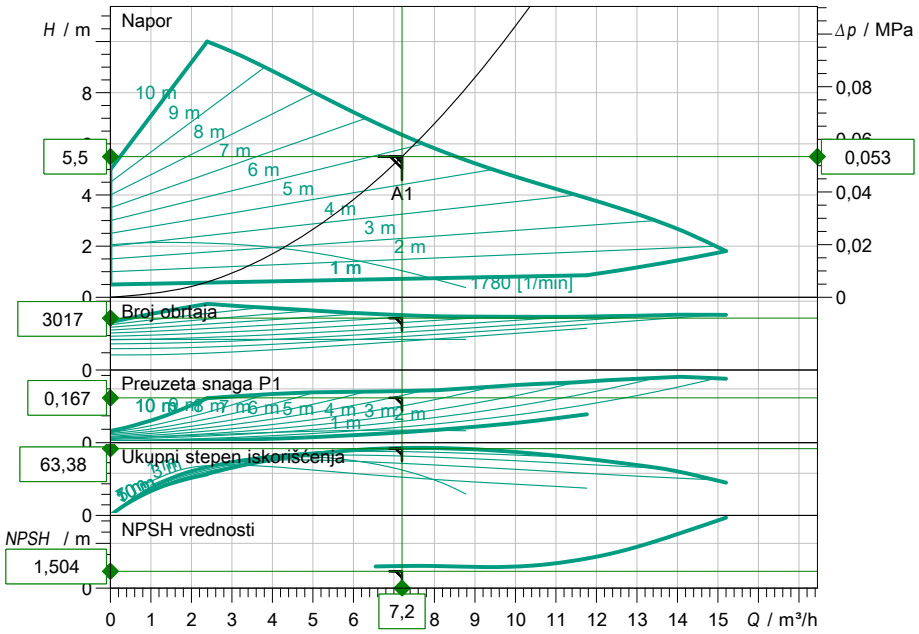
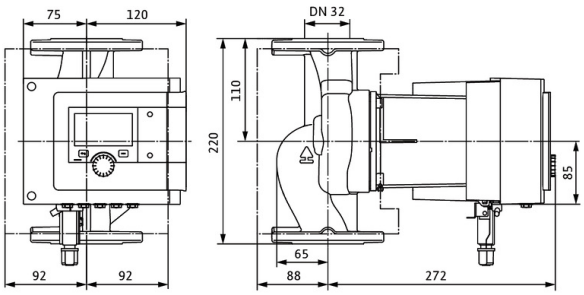
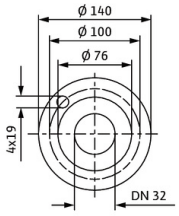
Broj projekta
Mesto ugradnje
Korisnički br. pol.

Datum 27.08.2023

Karakteristično polje







Zadavanje radnih podataka

Protok	7,20 m³/h
Napor	5,50 m
Medij	Voda 100 %
Temperatura fluida	45,00 °C
Gustina	990,30 kg/m³
Kinematska viskoznost	0,60 mm²/s

Hidraulički podaci (radna tačka)

Protok	7,20 m³/h
Napor	5,50 m
Preuzeta snaga P1	0,17 kW

Podaci o proizvodu

Premium Smart pumpa sa vlažnim rotorom Stratos MAXO 32/0,5-10 PN6/10

Radni modus	dp-v
Maks. radni pritisak	1 MPa
Temperatura fluida	-10 °C ... +110 °C
Maks. temperatura okoline	40 °C

Podaci o motoru po motoru/pumpi

Vrsta konstrukcije motora	EC motor
Indeks energetske efikasnosti (EEI)	≤ 0.18
Mrežni priključak	1~ 230 V / 50 Hz
Dozvoljena tolerancija napona	+-10 %
Maks. broj obrtaja	4000
Primljena snaga P1(max)	0,25 kW
Potrošnja struje	1,09 A
Vrsta zaštite	IPX4D
Klasa izolacije	F
Emitted interference	EN 61800-3;2004+A1;20
Interference resistance	EN 61800-3;2004+A1;20
Kablovska uvodnica	

Priključna dimenzija

Cevni priključak sa usisne strane	DN 32, PN 6/10
Cevni priključak sa potisne strane	DN 32, PN 6/10
Dužina	220 mm

Materijali

Kućište pumpe	5.1301/EN-GJL-250
Radno kolo	PPS-GF40
Vratilo	1.4122, sa DLC prevlakom
Materijal ležaja	Grafit, impregniran antimonom

Informacije vezane za poručivanje

Težina oko	11,1 kg
Kataloški broj	2164579

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Broj projekta

Datum 27.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR
		Premium Smart pumpa sa vlažnim rotorom			
	1	Stratos MAXO 40/0,5-12 PN6/10	PG17	1660,56	1660,56

Premium Smart pumpa Wilo-Stratos MAXO
Inline pumpa visoke efikasnosti sa vla žnim rotorom, sa EC motorom i elektronskim prilagođavanjem snage. Može da se koristi za vodu za grejanje, vodu za hlađenje i smešu voda/glikol.
Indeks energetske efikasnosti (EEI) u zavisnosti od tipa pumpe

između = 0,17 i = 0,19.

Vrste regulacije:
- Neprekidno, automatsko pode šavanje snage prema potrebama postrojenja bez specifikacije zadate vrednosti **Wilo Dynamic Adapt plus** (fabričko podešavanje). Do 20 % uštede električne energije u odnosu na vrstu regulacije dp-v.
- Konstantna temperatura **(T-const.)**
- Konstantna diferencijalna temperatura **(dT-const.)**
- Optimizacija protoka cirkulacione pumpe prema potrebi pomoću umrežavanja i komunikacije sa više pumpi **(Multi-Flow Adaptation).**
- Konstantan protok **(Q-const.)**
- Regulacija diferencijalnog pritiska dp-c na udaljenoj tački u mreži cevovoda **(regulacija slabe tačke)**
- Konstantan diferencijalni pritisak **(dp-c)**
- Varijabilni diferencijalni pritisak **(dp-v)** sa opcijom unosa nominalne radne tačke
- Konstantan broja obrtaja **(n-const.)**
- Korisnički definisana **PID** regulacija

Funkcije:
- Prepoznavanje nivoa toplog
- Prepoznavanje nivoa hladnog
- Automatsko isključivanje pumpa pri detekciji nultog protoka **(No-Flow Stop)**
- Prebacivanje između režima grejanja i režima hlađenja (automatski, eksterno ili ručno)
- Podesivo ograničenje protoka pomoću Q-Limit funkcije **($Q_{min.}$ i $Q_{max.}$)**
- Režimi rada dupleks pumpi: **Paralelni rad** optimizovanog stepena korisnog dejstva za dp-c i dp-v, glavni/rezervni rad
- Memorisanje i vraćanje konfigurisanih podešavanja pumpi **(3 tačke vraćanja)**
- **Prikaz poruka o smetnjama/upozorenja** sa jasnim tekstom, uključujući preporuke za pomoć
- **Funkcija odušivanja** za automatsko odzračivanja prostora rotora
- Automatski **rad sa sniženim intenzitetom**
- Automatska **funkcija deblokade** i integrisana **potpuna zaštita motora**
- **Detekcija rada na suvo**

Prikaz:
- Vrsta regulacije
- Zadata vrednost
- Protok
- Temperatura
- Potrošnja električne energije

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR

- Električna potrošnja
- Aktivni uticaji (npr. STOP, No-Flow Stop)

Verzija:
- **2 analogna ulaza** koji se mogu konfigurisati: 0 – 10 V, 2 – 10 V, – 20 mA, 4 – 20 mA i uobi čajeni PT1000; snabdevanje napona sa +24 V DC
- **2 digitalna ulaza** koja se mogu konfigurisati (Ext. OFF, Ext. Min, Ext. Max, grejanje/hlađenje, ručno upravljanje (odvojeno od automatizacije zgrade), blokada upravljanja (blokada tastature i zaštita od konfigurisanja putem daljinskog upravljača))
- **2 releja za signalizaciju** koja se mogu konfigurisati za **signal rada i signal greške**
- **Utično mesto za Wilo CIF module** sa interfejsima za automatizaciju zgrade (opciona dodatna oprema: CIF moduli Modbus RTU, Modbus TCP, BACnet MS/TP, BACnet IP, LON, PLR,CANopen)
- Wilo Net kao Wilo sistemska sabirnica za međusobnu komunikaciju Wilo proizvoda, z.B. **Multi-Flow Adaptation** ; režim rada dupleks pumpe i Wilo-Smart Gateway
- **Integrisani temperaturni senzor**
- Automatski **pogon u nuždi** pri posebnim stanjima (broj obrtaja pumpe se može definisati), npr. pri otkazu komunikacije preko sabirnica ili vrednosti senzora
- **Grafički displej u boji** (4,3 inča) sa rukovanjem preko ručne komande sa jednim dugmetom
- Očitavanje i podešavanje radnih podataka, kao i npr. podešavanje protokola za puštanje u rad preko Bluetooth interfejsa (bez druge dodatne opreme) preko Wilo-Assistant aplikacije
- Integrisano **upravljanje dupleks pumpama** (dupleks pumpe su fabrički ožičene), kod upotrebe 2 pojedinačne pumpe kao dupleks pumpe, povezivanje preko WILO Net-a
- Detekcija prekida kabla pri analognom signalu (u kombinaciji sa 2 – 10 V ili 4 – 20 mA)
- Mogu ćnost postavljanja na otvorenom prostoru sa zaštitom vremenskih prilika prema uputstvu za ugradnju i upotrebu
- Prethodno podešavanje datuma i vremena
- Obloga toplotne izolacije za primenu u sistemima grejanja

Opseg isporuke
- Pumpa
- Optimizovani Wilo-Connector, isti za sve veličine
- 2x navojni priključak kabla M16 x 1,5
- Podloške za zavrtnje sa prirubnicama M12 i M16 (kod nominalnih prečnika priključaka DN 32 do DN 65)
- 2x zaptivač kod navojnog priključka
- Obloga toplotne izolacije
- Uputstvo za ugradnju i upotrebu, kompaktno

Opciona dodatna oprema:
- Izolacija protiv hladnoće ClimaForm za sprečavanje nastanka kondenzata
- CIF modul: Modbus TCP, Modbus RTU, BACnet IP, BACnet MS/TP, LON, PLR, CANopen
- PT 1000 (B) senzor ugrađen u cevi (za potrošnu vodu)
- PT 1000 (AA) senzor za instalaciju u uronjivu čauru
- Davač diferencijalnog pritiska
- Smart-Gateway

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Broj projekta

Datum 27.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR

Radni podaci
Fluid: Voda 100 %
Temperatura fluida: 75,00 °C
Protok: 8,83 m³/h
Napor: 6,00 m
Min. temperatura fluida: -10 °C
Maks. temperatura fluida: 110 °C
Temperatura okoline min.: -10 °C
Maks. temperatura okoline: 40 °C
Maksimalni radni pritisak: 10 bar
Minimalna usisna visina pri 50 °C: 5 m
Minimalna usisna visina pri 95 °C: 12 m
Minimalna usisna visina pri 110 °C: 18 m

Podaci o motoru
Indeks energetske efikasnosti (EEI): ≤ 0.17
Emitovanje smetnji: EN 61800-3;2004+A1;2012 / stambeni prostor (C1)
Otpornost na smetnje: EN 61800-3;2004+A1;2012 / industrijsko okruženje (C2)
Mrežni priključak: 1~230V/50 Hz
Potrošnja električne energije: 570 W
Broj obrtaja min.: 650 1/min
Broj obrtaja maks.: 3600 1/min
Klasa zaštite motora: IPX4D
Navojni priključak kabla: 5 x M16x1.5

Materijali
Kućište pumpe: 5.1301/EN-GJL-250
Radno kolo: PPS-GF40
Vratilo: 1.4028, sa DLC prevlakom
Materijal ležaja: Grafit, impregniran antimonom

Montažne dimenzije
Cevni priključak sa usisne strane: DN 40, PN 6/10
Cevni priključak sa potisne strane: DN 40, PN 6/10
Ukupna visina: 250 mm

Informacije za slanje porudžbine
Proizvođač: Wilo
Oznaka proizvoda: Stratos MAXO 40/0,5-12 PN6/10
Neto težina oko: 16,4 kg
Broj artikla: 2164584

Ukupna cena	3939,10
plus 20% PDV	787,82
Ukupna cena sa PDVom	**4726,92**

Kontakt-osoba
E-Mail
Telefon

Kupac

Kontakt-osoba
E-Mail
Telefon

Tehnički podaci

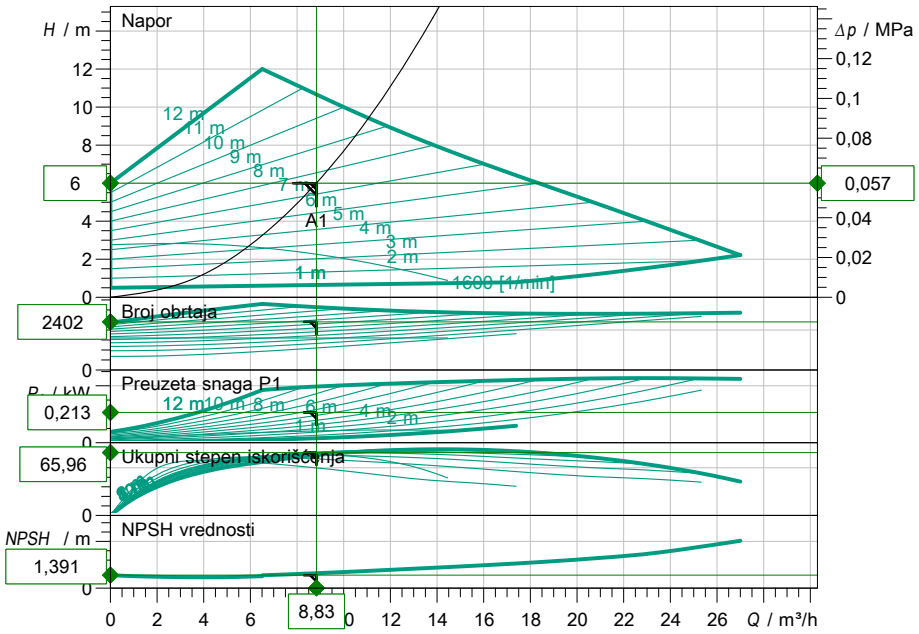
Premium Smart pumpa sa vlažnim rotorom Stratos MAXO 40/0,5-12 PN6/10

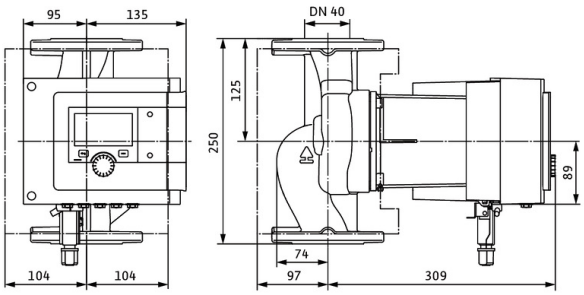
Ime projekta Neimenovani projekat 2023-08-27 19:51:16.467

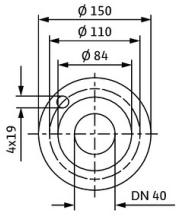
Broj projekta
Mesto ugradnje
Korisnički br. pol.

Datum 27.08.2023

Karakteristično polje







Zadavanje radnih podataka

Protok	8,83 m³/h
Napor	6,00 m
Medij	Voda 100 %
Temperatura fluida	75,00 °C
Gustina	974,80 kg/m³
Kinematska viskoznost	0,38 mm²/s

Hidraulički podaci (radna tačka)

Protok	8,83 m³/h
Napor	6,00 m
Preuzeta snaga P1	0,21 kW

Podaci o proizvodu

Premium Smart pumpa sa vlažnim rotorom Stratos MAXO 40/0,5-12 PN6/10

Radni modus	dp-v
Maks. radni pritisak	1 MPa
Temperatura fluida	-10 °C ... +110 °C
Maks. temperatura okoline	40 °C

Podaci o motoru po motoru/pumpi

Vrsta konstrukcije motora	EC motor
Indeks energetske efikasnosti (EEI)	≤ 0.17
Mrežni priključak	1~ 230 V / 50 Hz
Dozvoljena tolerancija napona	+-10 %
Maks. broj obrtaja	3600
Primljena snaga P1(max)	0,57 kW
Potrošnja struje	2,49 A
Vrsta zaštite	IPX4D
Klasa izolacije	F
Emitted interference	EN 61800-3;2004+A1;20
Interference resistance	EN 61800-3;2004+A1;20
Kablovska uvodnica	

Priključna dimenzija

Cevni priključak sa usisne strane	DN 40, PN 6/10
Cevni priključak sa potisne strane	DN 40, PN 6/10
Dužina	250 mm

Materijali

Kućište pumpe	5.1301/EN-GJL-250
Radno kolo	PPS-GF40
Vratilo	1.4028, sa DLC prevlakom
Materijal ležaja	Grafit, impregniran antimonom

Informacije vezane za poručivanje

Težina oko	16,4 kg
Kataloški broj	2164584

Kontakt-osoba
E-Mail
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Kontakt-osoba
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Telefon

Ispisni tekst

Ime projekta Neimenovani projekat 2023-08-28 00:22:34.457

Broj projekta

Datum 28.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR
		Standardna pumpa sa vlažnim rotorom			
	1	TOP-S 40/10 EM PN6/10 2-SPEEDS	PG2	800,34	800,34

Može da se koristi u svim toplovodnim sistemima za grejanje, u klima uređajima, zatvorenim kružnim tokovima hlađenja i industrijskim cirkulacionim postrojenjima.
Cirkulaciona pumpa sa vlažnim rotorom sa navojnim ili prirubničkim priključkom, mogućnost predizbora stepena broja obrtaja za prilagođavanje snage.

Oprema i funkcija
- Ručno prilagođavanje snage sa 3 stepena broja obrtaja
- Pumpe sa monofaznim motorom:
- P2 do 90W: Interna zaštita od nedozvoljeno visokih temperatura namotaja

- P2 =180W: Potpuna za štita motora zahvaljujući termičkim

zaštitnim kontaktima namotaja u kombinaciji s uređajem za isključenje (opciono: SK 602N/SK 622N)
- Pumpe s 3-faznim motorom:
- P2 do 90W: Interna zaštita od nedozvoljeno visokih temperatura namotaja

- P2 = 180W: Potpuna za štita motora zahvaljujući termičkim

zaštitnim kontaktima namotaja u kombinaciji s uređajem za isključenje (opciono: SK 602N/SK 622N)
- Mrežni priključak 3~230 V sa opcionim preklopnim utikačem
- Kućište pumpe sa KTL prevlakom za optimalnu antikorozivnu zaštitu
- Kombinovana prirubnica PN 6/PN 10 (kod DN 40 do DN 65)
- Obloge toplotne izolacije za primenu u sistemima grejanja

Radni podaci
Fluid: Voda 100 %
Temperatura fluida: 45,00 °C
Protok: 9,60 m³/h
Napor: 7,50 m
Min. temperatura fluida: -20 °C
Maks. temperatura fluida: 130 °C
Temperatura okoline min.: -20 °C
Maks. temperatura okoline: 40 °C
Maksimalni radni pritisak: 10 bar

Podaci o motoru
Emitovanje smetnji: EN 61000-6-3
Otpornost na smetnje: EN 61000-6-2
Mrežni priključak: 1~ 230V/50 Hz
Potrošnja električne energije: 680 W
Broj obrtaja maks.: 2800 1/min
Nominalna struja: 3,47 A
Klasa zaštite motora: IPX4D
Navojni priključak kabla:

Materijali
Kućište pumpe: 5.1301/EN-GJL-250

Kontakt-osoba
E-Mail
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Kupac

Kontakt-osoba
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Telefon

Ispisni tekst

Ime projekta Neimenovani projekat 2023-08-28 00:22:34.457

Broj projekta

Datum 28.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR
		Radno kolo: PP-LGF50 Vratilo: 1.4028 Materijal ležaja: Grafit **Montažne dimenzije** Cevni priključak sa usisne strane: DN 40, PN 6/10 Cevni priključak sa potisne strane: DN 40, PN 6/10 Ukupna visina: 250 mm **Informacije za slanje porudžbine** Proizvođač: Wilo Oznaka proizvoda: TOP-S 40/10 EM PN6/10 2-SPEEDS Neto težina oko: 14,7 kg Broj artikla: 2165524			

Ukupna cena	800,34
plus 20% PDV	160,07
Ukupna cena sa PDVom	**960,41**

Kontakt-osoba
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Telefon

Tehnički podaci

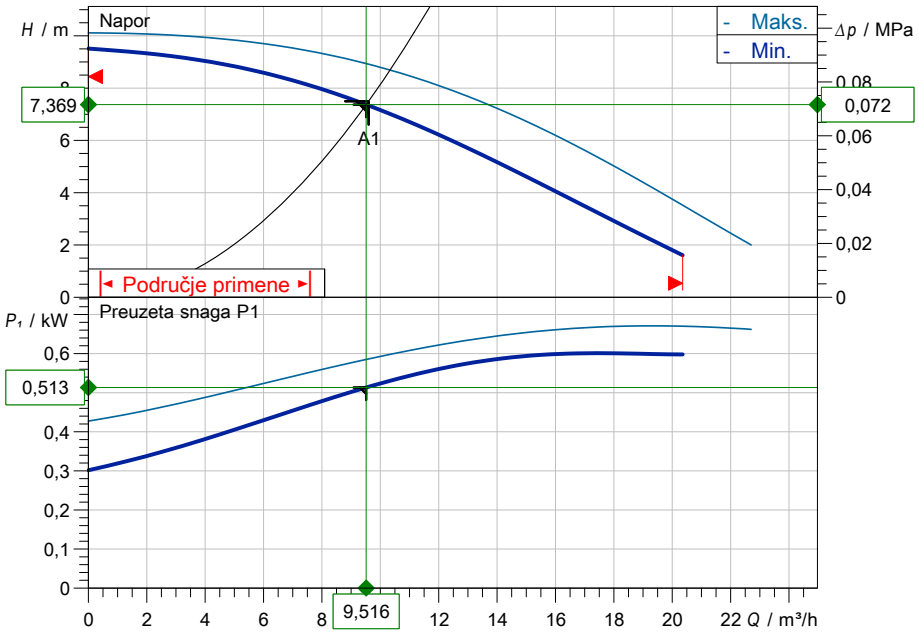
Standardna pumpa sa vlažnim rotorom
TOP-S 40/10 EM PN6/10 2-SPEEI

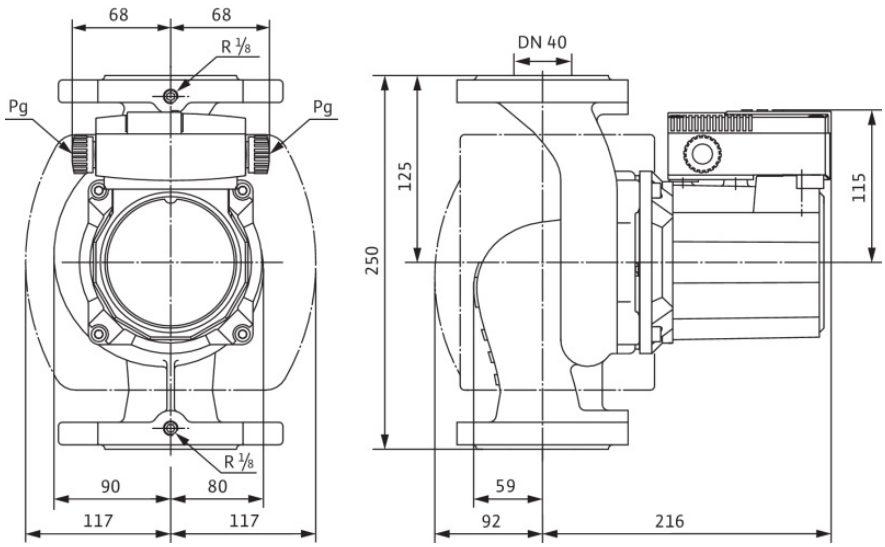
Ime projekta Neimenovani projekat 2023-08-28 00:22:34.457

Broj projekta
Mesto ugradnje
Korisnički br. pol.

Datum 28.08.2023

Karakteristično polje





Zadavanje radnih podataka

Protok	9,60 m³/h
Napor	7,50 m
Medij	Voda 100 %
Temperatura fluida	45,00 °C
Gustina	990,30 kg/m³
Kinematska viskoznost	0,60 mm²/s

Hidraulički podaci (radna tačka)

Protok	9,52 m³/h
Napor	7,37 m
Preuzeta snaga P1	0,51 kW

Podaci o proizvodu

Standardna pumpa sa vlažnim rotorom
TOP-S 40/10 EM PN6/10 2-SPEEDS

Maks. radni pritisak	1 MPa
Temperatura fluida	-20 °C ... + 130 °C
Maks. temperatura okoline	40 °C
Minimalna visina dotoka pri 50 / 95 / 110°C	/ /

Podaci o motoru po motoru/pumpi

Mrežni priključak	1~ 230 V / 50 Hz
Dozvoljena tolerancija napona	+-10 %
Maks. broj obrtaja	
Nominalna snaga P2	0,35 kW
Preuzeta snaga P1	0,68 kW
Potrošnja struje	3,47 A
Vrsta zaštite	IPX4D
Klasa izolacije	H
Motorna zaštita	Internerna zaštita od preg
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2
Kablovska uvodnica	

Priključna dimenzija

Cevni priključak sa usisne strane	DN 40, PN 6/10
Cevni priključak sa potisne strane	DN 40, PN 6/10
Dužina	

Materijali

Kućište pumpe	5.1301/EN-GJL-250
Radno kolo	PP-LGF50
Vratilo	1.4028
Materijal ležaja	Grafit

Informacije vezane za poručivanje

Težina oko	14,7 kg
Kataloški broj	2165524

Kontakt-osoba
E-Mail
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Ispisni tekst

Ime projekta Neimenovani projekat 2023-08-27 19:51:16.467

Broj projekta

Datum 27.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR
		Standardna pumpa sa vlažnim rotorom			
	1	TOP-S 50/7 DM PN6/10	PG2	817,28	817,28

Može da se koristi u svim toplovodnim sistemima za grejanje, u klima uređajima, zatvorenim kružnim tokovima hlađenja i industrijskim cirkulacionim postrojenjima.
Cirkulaciona pumpa sa vlažnim rotorom sa navojnim ili prirubničkim priključkom, mogućnost predizbora stepena broja obrtaja za prilagođavanje snage.

Oprema i funkcija
- Ručno prilagođavanje snage sa 3 stepena broja obrtaja
- Pumpe sa monofaznim motorom:
- P2 do 90W: Interna zaštita od nedozvoljeno visokih temperatura namotaja

- P2 =180W: Potpuna za štita motora zahvaljujući termičkim

zaštitnim kontaktima namotaja u kombinaciji s uređajem za isključenje (opciono: SK 602N/SK 622N)
- Pumpe s 3-faznim motorom:
- P2 do 90W: Interna zaštita od nedozvoljeno visokih temperatura namotaja

- P2 = 180W: Potpuna za štita motora zahvaljujući termičkim

zaštitnim kontaktima namotaja u kombinaciji s uređajem za isključenje (opciono: SK 602N/SK 622N)
- Mrežni priključak 3~230 V sa opcionim preklopnim utikačem
- Kućište pumpe sa KTL prevlakom za optimalnu antikorozivnu zaštitu
- Kombinovana prirubnica PN 6/PN 10 (kod DN 40 do DN 65)
- Obloge toplotne izolacije za primenu u sistemima grejanja

Radni podaci
Fluid: Voda 100 %
Temperatura fluida: 75,00 °C
Protok: 13,50 m³/h
Napor: 4,00 m
Min. temperatura fluida: -20 °C
Maks. temperatura fluida: 130 °C
Temperatura okoline min.: -20 °C
Maks. temperatura okoline: 40 °C
Maksimalni radni pritisak: 10 bar

Podaci o motoru
Emitovanje smetnji: EN 61000-6-3
Otpornost na smetnje: EN 61000-6-2
Mrežni priključak: 3~ 400V/50 Hz
Potrošnja električne energije: 610 W
Broj obrtaja maks.: 2800 1/min
Nominalna struja: 1,19 A
Klasa zaštite motora: IPX4D
Navojni priključak kabla:

Materijali
Kućište pumpe: 5.1301/EN-GJL-250

Kontakt-osoba
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Ispisni tekst

Ime projekta Neimenovani projekat 2023-08-27 19:51:16.467

Broj projekta

Datum 27.08.2023

Poz.	Br.	Oznaka	PG	JC / EUR	UC / EUR
		Radno kolo: PP-LGF50 Vratilo: 1.4028 Materijal ležaja: Grafit **Montažne dimenzije** Cevni priključak sa usisne strane: DN 50, PN 6/10 Cevni priključak sa potisne strane: DN 50, PN 6/10 Ukupna visina: 280 mm **Informacije za slanje porudžbine** Proizvođač: Wilo Oznaka proizvoda: TOP-S 50/7 DM PN6/10 Neto težina oko: 16,6 kg Broj artikla: 2165530			

Ukupna cena	817,28
plus 20% PDV	163,46
Ukupna cena sa PDVom	**980,74**

Kontakt-osoba
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Tehnički podaci

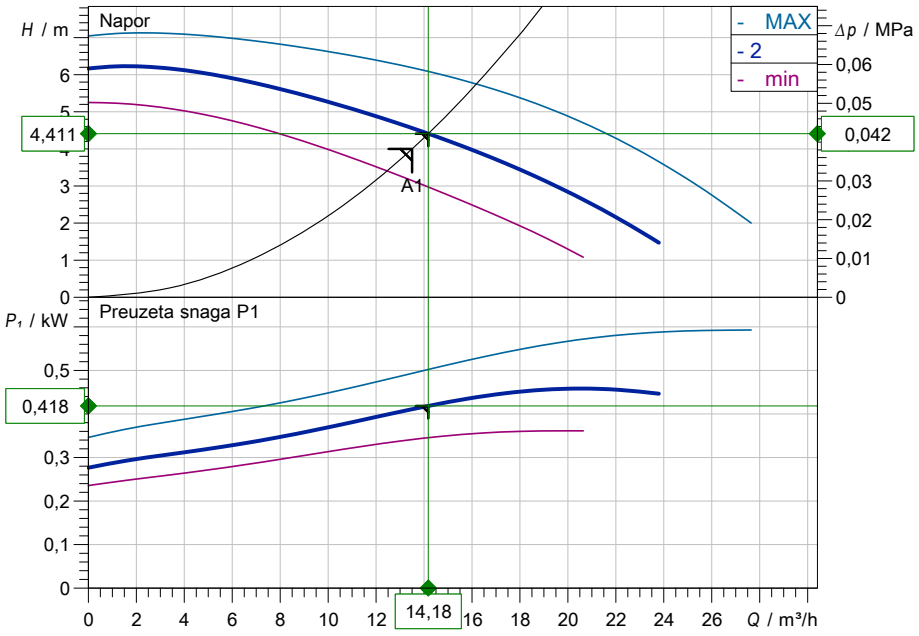
Standardna pumpa sa vlažnim rotorom
TOP-S 50/7 DM PN6/10

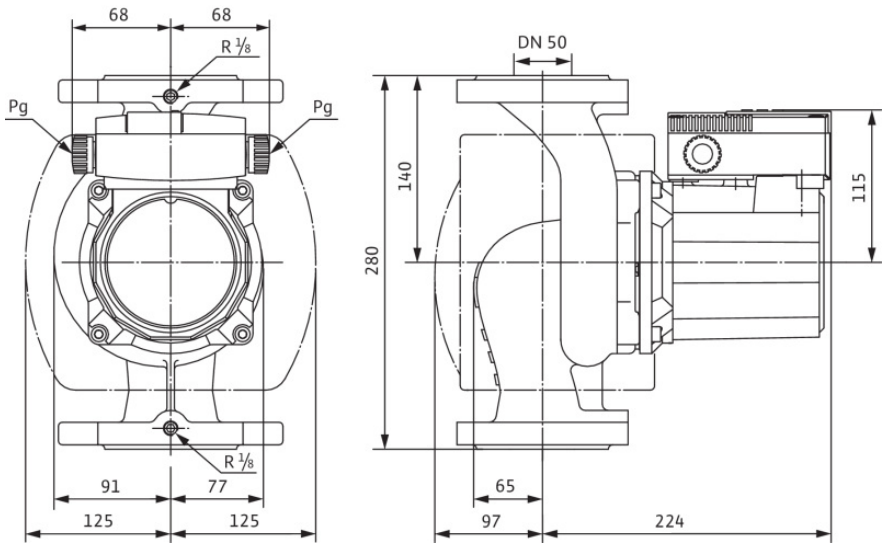
Ime projekta Neimenovani projekat 2023-08-27 19:51:16.467

Broj projekta
Mesto ugradnje
Korisnički br. pol.

Datum 27.08.2023

Karakteristično polje





Zadavanje radnih podataka

Protok	13,50 m³/h
Napor	4,00 m
Medij	Voda 100 %
Temperatura fluida	75,00 °C
Gustina	974,80 kg/m³
Kinematska viskoznost	0,38 mm²/s

Hidraulički podaci (radna tačka)

Protok	14,18 m³/h
Napor	4,41 m
Preuzeta snaga P1	0,42 kW

Podaci o proizvodu

Standardna pumpa sa vlažnim rotorom
TOP-S 50/7 DM PN6/10

Maks. radni pritisak	1 MPa
Temperatura fluida	-20 °C ... + 130 °C
Maks. temperatura okoline	40 °C
Minimalna visina dotoka pri 50 / 95 / 110°C	/ /

Podaci o motoru po motoru/pumpi

Mrežni priključak	3~ 400 V / 50 Hz
Dozvoljena tolerancija napona	+-10 %
Maks. broj obrtaja	
Nominalna snaga P2	0,35 kW
Preuzeta snaga P1	0,61 kW
Potrošnja struje	1,19 A
Vrsta zaštite	IPX4D
Klasa izolacije	H
Motorna zaštita	Internerna zaštita od preg
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2
Kablovska uvodnica	

Priključna dimenzija

Cevni priključak sa usisne strane	DN 50, PN 6/10
Cevni priključak sa potisne strane	DN 50, PN 6/10
Dužina	

Materijali

Kućište pumpe	5.1301/EN-GJL-250
Radno kolo	PP-LGF50
Vratilo	1.4028
Materijal ležaja	Grafit

Informacije vezane za poručivanje

Težina oko	16,6 kg
Kataloški broj	2165530

Date: 13.9.2023.

Project: Untitled

Project: Untitled

Engineering GREAT Solutions

Date: 13.9.2023. **Project: Untitled**

Selected balancing valves

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
Balancing valves (from individual selection)								
		Water Temperature: 40 °C	STAD* 50	7500 l/h	52851-050	** Generic Steel Pipes **	1	
			50 (2")	5.35 kPa		65 (2 1/2")		
			Thread	4.00* turns		0.56 m/s		
			Without drain			51.4 Pa/m		
			PN 25; -20/120 °C					

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Date: 13.9.2023. **Project: Untitled**

Article list

Article N°	Description	Qty
52851-050	STAD* 50; Without drain; Thread; PN 25	1

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Date: 13.9.2023.

Project: Untitled

Project: Untitled

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Date: 13.9.2023. **Project: Untitled**

Selected balancing valves

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
Balancing valves (from individual selection)								
		Water Temperature: 40 °C	STAF 65-2 65 (2 1/2") Flange Standard PN 16; -10/120 °C	8830 l/h 3 kPa 4.92 turns	52181-065	** Generic Steel Pipes ** 65 (2 1/2") 0.66 m/s 69.7 Pa/m	1	

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Date: 13.9.2023. **Project: Untitled**

Article list

Article N°	Description	Qty
52181-065	STAF 65-2; Standard; Flange; PN 16	1

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Date: 13.9.2023.

Project: Untitled

Project: Untitled

Engineering GREAT Solutions

Date: 13.9.2023. **Project: Untitled**

Selected balancing valves

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
Balancing valves (from individual selection)								
		Water Temperature: 40 °C	STAF 65-2 65 (2 1/2") Flange Standard PN 16; -10/120 °C	9607 l/h 3 kPa 5.19 turns	52181-065	** Generic Steel Pipes ** 65 (2 1/2") 0.718 m/s 81.5 Pa/m	1	

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Date: 13.9.2023. **Project: Untitled**

Article list

Article N°	Description	Qty
52181-065	STAF 65-2; Standard; Flange; PN 16	1

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Date: 28.8.2023.

Project: Untitled

Project: Untitled

Engineering GREAT Solutions

Date: 28.8.2023. **Project: Untitled**

Selected control products

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
Control valves / Actuators (from individual selection)								
			CV 306 GG DN40	9600 l/h	60315-240	** Generic Steel Pipes **	1	
			Kvs = 25	14.6 kPa		65 (2 1/2")		
		Water Temperature: 40 °C	Cast iron	-		0.717 m/s		
			Flange			81.4 Pa/m		
			Standard					
			PN 6; -10/150 °C					
			TA-MC 100/230		61100-002		1	
			Close-off Dp : 550 kPa					
			Actuating time : 168; 126*; 56; 26.6 s					
			IP auto(man.) : 54					
			Power Supply : 230 VAC					
			Input : 3-point; 0(2)-10 V; 0(4)-20 mA					
			Output signal : 0-10 V					
			Relay type : No relay					
			Fail-safe type : No					
			Default return position : None					
			Max. Temp. : -					

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Date: 28.8.2023. **Project: Untitled**

Article list

Article N°	Description	Qty
60315-240	CV 306 GG DN40; Standard; Flange; PN 6; Kvs = 25	1
61100-002	TA-MC 100/230; Actuating force = 1000 N; Power Supply = 230 VAC; Relay type = No relay	1

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Date: 27.8.2023.

Project: Untitled

Project: Untitled

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Date: 27.8.2023. **Project: Untitled**

Selected control products

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
Control valves / Actuators (from individual selection)								
			CV 306 GG DN50	13500 l/h	60315-250	** Generic Steel Pipes **	1	
			Kvs = 40	11.3 kPa		65 (2 1/2")		
		Water Temperature: 40 °C	Cast iron	-		1.01 m/s		
			Flange			155 Pa/m		
			Standard					
			PN 6; -10/150 °C					
			TA-MC 100/230		61100-002		1	
			Close-off Dp : 350 kPa					
			Actuating time : 168; 126*; 56; 26.6 s					
			IP auto(man.) : 54					
			Power Supply : 230 VAC					
			Input : 3-point; 0(2)-10 V; 0(4)-20 mA					
			Output signal : 0-10 V					
			Relay type : No relay					
			Fail-safe type : No					
			Default return position : None					
			Max. Temp. : -					

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Date: 27.8.2023. **Project: Untitled**

Article list

Article N°	Description	Qty
60315-250	CV 306 GG DN50; Standard; Flange; PN 6; Kvs = 40	1
61100-002	TA-MC 100/230; Actuating force = 1000 N; Power Supply = 230 VAC; Relay type = No relay	1

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Date: 27.8.2023.

Project: Untitled

Project: Untitled

Engineering GREAT Solutions

Date: 27.8.2023. **Project: Untitled**

Selected control products

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
Control valves / Actuators (from individual selection)								
		Water Temperature: 40 °C	CV 306 GG DN40 Kvs = 20 Cast iron Flange Standard PN 6; -10/150 °C	7200 l/h 12.9 kPa - 	60315-140	** Generic Steel Pipes ** 50 (2") 0.907 m/s 175 Pa/m	1	
			TA-MC 100/230 Close-off Dp : 550 kPa Actuating time : 168; 126*; 56; 26.6 s IP auto(man.) : 54 Power Supply : 230 VAC Input : 3-point; 0(2)-10 V; 0(4)-20 mA Output signal : 0-10 V Relay type : No relay Fail-safe type : No Default return position : None Max. Temp. : -		61100-002		1	
		Water Temperature: 40 °C	CV 306 GG DN40 Kvs = 20 Cast iron Flange Standard PN 6; -10/150 °C	7200 l/h 12.9 kPa - 	60315-140	** Generic Steel Pipes ** 50 (2") 0.907 m/s 175 Pa/m	1	

Engineering GREAT Solutions

Date: 27.8.2023. **Project: Untitled**

Selected control products

#1	#2	Water	Product	Technical Info	Article N°	Pipe	Qty	§
		Water Temperature: 40 °C	CV 306 GG DN40	7200 l/h	60315-140	** Generic Steel Pipes **	1	
			Kvs = 20	12.9 kPa		50 (2")		
			Cast iron	-		0.907 m/s		
			Flange			175 Pa/m		
			Standard					
			PN 6; -10/150 °C					
			TA-MC 100/230		61100-002		1	
			Close-off Dp : 550 kPa					
			Actuating time : 168; 126*; 56; 26.6 s					
			IP auto(man.) : 54					
			Power Supply : 230 VAC					
			Input : 3-point; 0(2)-10 V; 0(4)-20 mA					
			Output signal : 0-10 V					
			Relay type : No relay					
			Fail-safe type : No					
			Default return position : None					
			Max. Temp. : -					

Engineering GREAT Solutions

Date: 27.8.2023. **Project: Untitled**

Article list

Article N°	Description	Qty
60315-140	CV 306 GG DN40; Standard; Flange; PN 6; Kvs = 20	3
61100-002	TA-MC 100/230; Actuating force = 1000 N; Power Supply = 230 VAC; Relay type = No relay	2

Engineering GREAT Solutions

PRORAČUN ELEMENATA KOTLARNICE I ODABIR OPREME

Izbor kotla:

Količina toplotne snage potrebna za grijanje, na osnovu toplotnog proračuna je:

- Toplovodno podno grijanje: 30373W,
- Radijatori: 96839W
- Kaloriferi: 35400W

Odabran je kotao nominalnog kapaciteta 200 kW (Ekoline 200).

Potrebna količina goriva

Potrebnu količinu goriva za cijelu sezonu grijanja određujemo iz jednačine:

$$B = \frac{24 \cdot 3{,}6 \cdot e_t \cdot e_b \cdot y \cdot SD \cdot Q}{(t_u - t_s) \cdot H_d \cdot \eta} kg/god = \frac{24 \cdot 3{,}6 \cdot 0{,}85 \cdot 0{,}9 \cdot 0{,}55 \cdot 3698 \cdot\ 162612}{(21 - (-20)) \cdot 18000 \cdot 0{,}86}$$
$$= 34426.8 kg/god$$

Gdje je:
e – koeficijent ograničenja, e = e_t * e_b
e_t – koeficijent temperaturnog ogrničenja = 0,85
e_b – koeficijent eksploatacionog ograničenja = 0,9
y – koeficijent za vjetrovite predjele i otvoren položaj = 0,55
SD – broj stepen dana, za Žabljak 3698
Q – potrebna količina toplote za grijanje = = 162612 W
Tu – unutrašnja temperatura prostora koja se grije = koristimo 21°C
Ts – spoljašnja projektna temperatura zimi = -20°C
Hd – donja toplotna moć goriva, za pelet = 18000 kJ/kg
η – stepen iskorišćenja postrojenja, η = η_k*η_c*η_r = 0.86
η_k – stepen korisnosti kotla = 0,96
η_c – stepen korisnosti cijevne mreže = 0,95
η_r – stepen korisnosti regulacionog sistema = 0,95

Proračun i dimenzionisanje sigurnosnog voda:

Dimenzionisanje sigurnosnih vodova vrši se prema relacijama koje uključuju kapacitet kotla:

– Povratni vod: $D_R = 15 + 0{,}93 \cdot \sqrt{Q_k/1000} = 15 + 0{,}93 \cdot \sqrt{200000\ \ /1000} = 28m15mm$

Na osnovu izračunatog prečnika razvodnog voda usvaja se navojna cijev. Nazivni prečnik –32 mm ; spoljni prečnik – 33,7 mm ; debljina zida – 4,35 mm ; masa – 4,14 kg/m.

TABLES OF PERFORMANCES
Heating emission

Ta = Air temperature
Q0 = Emission
Tu = Leaving air temperature

EXPORT 2 – 4/6 Pole models

Size		22E46				23E46				24E46			
Motor speed (r.p.m.)		1350		1000		1350		1000		1350		1000	
Air flow (m³/h)		2240		1530		2000		1365		1800		1270	
Water temperature	Ta	Q0	Tu	Q0	Tu	Q0	Tu	Q0	Tu	Q0	Tu	Q0	Tu
	(°C)	(kW)	(°C)	(kW)	(°C)	(kW)	(°C)	(kW)	(°C)	(kW)	(°C)	(kW)	(°C)
35/30°C (Δt = 5°C)	-15	–	–	–	–	–	–	–	–	18,3	11,6	14,5	14,9
	-10	–	–	–	–	–	–	–	–	16,0	13,8	12,7	16,8
	-5	–	–	–	–	–	–	–	–	13,9	16,0	11,0	18,6
	0	–	–	–	–	–	–	–	–	11,8	18,2	9,4	20,4
	5	–	–	–	–	–	–	–	–	9,8	20,3	7,7	22,2
	10	–	–	–	–	–	–	–	–	7,7	22,4	6,2	24,0
	15	–	–	–	–	–	–	–	–	5,8	24,4	4,6	25,6
	20	–	–	–	–	–	–	–	–	3,9	26,5	3,1	27,3
40/30°C (Δt = 10°C)	-15	–	–	–	–	–	–	–	–	18,5	11,9	14,7	15,3
	-10	–	–	–	–	–	–	–	–	16,3	14,2	13,0	17,3
	-5	–	–	–	–	–	–	–	–	14,2	16,4	11,2	19,1
	0	–	–	–	–	–	–	–	–	12,1	18,6	9,6	20,9
	5	–	–	–	–	–	–	–	–	10,0	20,8	8,0	22,7
	10	–	–	–	–	–	–	–	–	8,0	22,8	6,4	24,5
	15	–	–	–	–	–	–	–	–	6,1	24,9	4,8	26,1
	20	–	–	–	–	–	–	–	–	4,2	26,9	3,3	27,8
45/35°C (Δt = 10°C)	-15	13,7	1,0	11,0	3,9	17,7	8,2	14,0	11,8	20,4	14,7	16,2	18,4
	-10	12,2	4,6	9,8	7,2	15,8	11,2	12,5	14,5	18,2	17,0	14,4	20,4
	-5	10,8	8,1	8,7	10,4	13,9	14,0	11,0	17,0	16,0	19,3	12,7	22,3
	0	9,3	11,6	7,5	13,6	12,1	16,8	9,6	19,4	13,9	21,4	11,1	24,1
	5	8,0	15,0	6,4	16,8	10,3	19,6	8,1	21,9	11,9	23,6	9,4	26,0
	10	6,6	18,4	5,3	20,0	8,5	22,3	6,8	24,2	9,8	25,7	7,8	27,8
	15	5,3	21,9	4,2	23,1	6,8	25,0	5,4	26,6	7,9	27,8	6,3	29,5
	20	3,9	25,2	3,2	26,2	5,1	27,6	4,1	28,9	5,9	29,8	4,7	31,1
50/40°C (Δt = 10°C)	-15	15,2	2,7	12,2	5,9	19,6	10,7	15,5	14,7	22,6	17,8	17,9	21,9
	-10	13,7	6,3	11,0	9,2	17,7	13,7	14,0	17,3	20,4	20,2	16,2	24,0
	-5	12,2	9,8	9,8	12,5	15,8	16,5	12,5	19,9	18,2	22,5	14,4	25,9
	0	10,7	13,3	8,7	15,7	13,9	19,3	11,0	22,4	16,0	24,7	12,7	27,8
	5	9,4	16,8	7,5	18,9	12,1	22,1	9,6	24,8	14,0	26,9	11,1	29,7
	10	8,0	20,2	6,4	22,1	10,3	24,9	8,2	27,2	11,9	29,0	9,5	31,5
	15	6,6	23,6	5,3	25,2	8,6	27,6	6,8	29,6	9,9	31,1	7,9	33,2
	20	5,3	27,0	4,3	28,3	6,9	30,3	5,5	31,9	8,0	33,2	6,4	34,9
55/45°C (Δt = 10°C)	-15	16,6	4,5	13,4	7,9	21,5	13,2	17,0	17,6	24,8	21,0	19,6	25,5
	-10	15,1	8,1	12,2	11,3	19,6	16,2	15,4	20,2	22,5	23,4	17,9	27,6
	-5	13,6	11,6	11,0	14,5	17,6	19,0	13,9	22,8	20,3	25,7	16,1	29,5
	0	12,2	15,1	9,8	17,8	15,8	21,8	12,4	25,3	18,1	27,9	14,4	31,5
	5	10,8	18,6	8,7	21,0	13,9	24,7	11,0	27,8	16,1	30,2	12,8	33,4
	10	9,3	22,0	7,5	24,2	12,1	27,4	9,6	30,2	14,0	32,3	11,1	35,2
	15	8,0	25,4	6,5	27,3	10,4	30,2	8,2	32,6	12,0	34,5	9,5	37,0
	20	6,7	28,8	5,4	30,5	8,7	32,9	6,9	35,0	10,0	36,6	8,0	38,8
60/50°C (Δt = 10°C)	-15	18,1	6,2	14,6	9,9	23,4	15,7	18,5	20,4	26,9	24,2	21,4	29,1
	-10	16,6	9,8	13,3	13,3	21,5	18,7	16,9	23,1	24,7	26,6	19,6	31,2
	-5	15,0	13,3	12,1	16,6	19,5	21,5	15,4	25,7	22,4	28,9	17,8	33,2
	0	13,6	16,8	10,9	19,8	17,6	24,4	13,9	28,2	20,2	31,2	16,1	35,1
	5	12,2	20,3	9,8	23,1	15,8	27,3	12,4	30,8	18,2	33,5	14,4	37,1
	10	10,7	23,8	8,7	26,3	13,9	30,0	11,0	33,2	16,1	35,7	12,8	39,0
	15	9,4	27,2	7,6	29,5	12,2	32,8	9,6	35,6	14,0	37,8	11,2	40,7
	20	8,0	30,7	6,5	32,6	10,4	35,6	8,3	38,1	12,1	40,0	9,6	42,6
55/40°C (Δt = 15°C)	-15	15,2	2,8	12,2	5,9	19,7	10,8	15,5	14,8	22,6	17,9	17,9	22,0
	-10	13,7	6,4	11,0	9,3	17,8	13,7	14,0	17,4	20,4	20,3	16,2	24,1
	-5	12,2	9,9	9,9	12,6	15,9	16,6	12,5	20,0	18,2	22,6	14,5	26,0
	0	10,8	13,4	8,7	15,8	14,0	19,4	11,1	22,5	16,1	24,8	12,8	27,9
	5	9,4	16,9	7,6	19,0	12,2	22,2	9,6	25,0	14,1	27,1	11,2	29,8
	10	8,0	20,3	6,5	22,2	10,4	25,0	8,2	27,4	12,0	29,2	9,6	31,7
	15	6,7	23,7	5,4	25,3	8,7	27,7	6,9	29,7	10,0	31,3	8,0	33,4
	20	5,4	27,1	4,3	28,5	7,0	30,4	5,5	32,1	8,1	33,4	6,5	35,1

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1. Information

1.1 Heating	Project number	
	Project name	
	Responsible person	
	date	**2023-08-27**
	Note	
	Language	**English**

2. System data of the solution

2.1 System data, general	configuration standard	**DIN EN 12828, VDI 4708**
2.2 Futher settings for functional requirements	Automatic system monitoring and water make-up accessories	**yes**
	Protection of the system by venting and degassing	**yes**
	Protection of the system by dirt separation	**yes**
	Treatment of the filling and make-up water	**yes**
2.3 Temperatures	highest setpoint setting of the temperature controller (t_{max})	**80** °C
	Expansion coefficient	**2.9** %
	Maximum Flow Temperature (t_v)	**80** °C
	Return temperature (t_r)	**60** °C
	Safety temperature limiter/monitor (t_{stb})	**85** °C
	Antifreeze content	**0.0** %
	Minimum system temperature (t_{min})	**10** °C
2.4 Pressures	Static pressure (p_{st})	**0.2** bar
	Safety Valve Actuating Pressure (p_{sv})	**2.5** bar
	Final pressure (p_e)	**2.0** bar
	Minimum operating pressure (p_0)	**1.0** bar
	Minimum inlet pressure for circulating pumps (p_z)	**1.0** bar
	Evaporation pressure (p_d)	**0.0** bar
	Make up from the water supply	**yes**
	Potable water supply pressure (p_{zl})	**3.5** bar
2.5 Heating power and system volume	**Heat generator**	
	1. Heat generator	
	Heat generator type	**Steel boiler / burner blower**
	Power	**150** kW
	Volume	**405** L
	Expansion line <10m//10m <L<30m	**-**

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2. System data of the solution

Consumer

1. Heating circles

Consumer type	**Panel radiator**
Power	**150** kW
Part Load	**100.0** %
Volume	**1142** L
Flow	**80** °C
Return	**60** °C

Volume	**0** L

Special pipelines/long pipelines

1. Special lines

Diameter in DN	**DN 10**
Length of the transmission line	**0.0** m
Volume	**0** L

Volume	**0** L
Total thermal output of the heat generator	**150** kW
Calculated system volume	**1547** L
Expansion line <10m//10m <L<30m	**DN20//DN20**
Expansion volume	**45** L
Desired minimum water reserve	**0.5** %
Water reserve	**8** L
effective water reserve	**1.7** %
effective water reserve	**26** L

2.6 Approximate values for the system working pressure

Filling pressure at corresponding temperature

80 °C	**2.0** bar
70 °C	**1.9** bar
60 °C	**1.7** bar
50 °C	**1.6** bar
40 °C	**1.5** bar
30 °C	**1.4** bar
20 °C	**1.4** bar
10 °C	**1.4** bar

This table is only correct if the actual system data correspond to the calculation basis.

2.7 System data, separation

Deposition of ferromagnetic particles (magnetite)	**yes**
Flow	**6.40** m³/h
Pipe size	**DN 50 (IG 2)**

2.8 System data, make-up and water treatment

Softening according to VDI 2035	**yes**
Current water hardness	**12.0** °dH
Desired water hardness make-up water	**11.2** °dH
Possible refill quantity per cartridge	**7500** L

2. System data of the solution

2.9	System data, low loss headers	Flow	**6.40** m³/h
2.10	System data, heat exchanger	Heat output (Q)	**150** kW

3. System / Net

3.1 Membrane expansion vessel

Position	Art. No.	Quantity	Article text
3.1.1	8213300	1	**Reflex N 200**

Reflex Reflex N 200
Diaphragm expansion tank for sealed heating and cooling water systems. Vessels fitted according to DIN EN 13831. Approval according to Pressure Equipment Directive 2014/68/EC.

- Durable epoxy resin coating
- Non-replaceable diaphragm according to DIN EN 13831
- 35 litres and above upright
- For antifreeze additive of at least 25 – 50 %
- With threaded connections
- max. permissible system temperature 120 °C
- Max. operating temperature 70 °C

Type	**N 200**
Colour	**grey**
Nominal volume	**200** l
Max. useful volume	**180** l
Max. permissible system temperature	**120** °C
Max. perm. operating temperature	**70** °C
Max. perm. operating pressure	**6** bar
Factory provided gas supply pressure	**1.5** bar
Connection	**R 1"**
Diameter	**634** mm
Height	**758** mm
High water connection	**205** mm
Tilt dimension approx.	**988** mm
Weight	**23.80** kg

Set gas system pressure	**1.0** bar

Position	Art. No.	Quantity	Article text
3.1.2	7613100	1	**Reflex Cap valve SU R 1" x 1"**

Reflex cap valve
For diaphragm expansion vessels in sealed heating and cooling systems.With a safe shut-off to prevent inadvertent closing and a discharge according to DIN EN 12828.

Type	**SU R 1" x 1"**
Max. perm. operating temperature	**120** °C
Max. perm. operating pressure	**10** bar
Connection	**R 1"**
Weight	**0.57** kg

3. System / Net

3.2 Degassing

Position	Art. No.	Quantity	Article text
3.2.1	8832000	1	**Servitec S**

Reflex Servitec
Vacuum spray tube degassing for system and make-up water degassing in sealed heating and chilled water systems, configured as a fully automatic multi-function unit with “auto-start” function and automatic hydraulic compensation of the degassing process and monitoring of the make-up function. Suitable for the media water and water/glycol mixtures up to a mixing ratio of 50/50%. Functional unit comprising hydraulic part designed for wall mounting and electronic, ergonomically arranged Control Smart controller with CE marking. Degassing takes place within the hydraulic part using a diaphragm pump in conjunction with a vertically arranged brass vacuum spray tube. This is equipped with a vacuum spray nozzle, dipstick-tube degassing unit and pressure monitoring. To protect it against dirt, the unit as a whole is located in a housing made from expanded polypropylene with an opening maintenance cover. The Control Smart controller is integrated in a robust plastic housing in which both the power and communication electronics and the control panel with dirt-resistant plastic foil keyboard are housed. Bluetooth is integrated as standard as a communications interface. The controller has a fully automatic microprocessor controller with time function, differentiating error and parameter memory, LED display of the operating modes and general error messaging, visualisation of the control states for system pressure and all relevant operating and fault messages using the Control Smart App via Bluetooth communication. Communication electronics comprising:

– RS485 port (galvanically isolated) for the connection of optional communication components
– Floating output for forwarding of the group message
– Digital input for signal processing of a contact water meter
– Analogue input for measuring the conductivity

– Input for makeup functional request via external signal

Control Smart works with a plug & play function for independent system pressure detection, enabling convenient wireless operation via an app for smartphones and tablets running either iOS or Android to provide simple commissioning as well as visualisation of system operation. The following functions are available:

– Automatic setting of the time and date
– Setting and adjusting the minimum operating pressure p0
– Switch-on times for permanent and interval degassing can be freely specified and entered by the operator
– Free configuration of day of the week and time for interval degassing operating mode including a summer function
– Status, warning and error display relating to facility pressure and operating conditions including diagnostic instructions and handling recommendations
– Automatic software updates

Safety and function-relevant parameters are protected against unauthorised access. Control unit completely assembled and wired ready for connection according to VDE regulations, mains power cable and mains plug, system connections by means of integrated shut-off valves. Vacuum spray degassing of the content, filling and make-

3. System / Net

3.2 Degassing

Position	Art. No.	Quantity	Article text

Servitec S

up water in self-optimising operation with cycles for continuous, interval and make-up degassing. Controlled make-up via reliable two-way motorised ball valve. Actuation takes place via an integrated system pressure interpretation unit or an external 230 V signal (e.g. a pressurisation station) with automatic interruption and fault messaging upon exceeding of the running time and/or the number of cycles. Alternatively, make-up can be performed from an open system separator vessel. Evaluation option provided by a contact water meter including optional possible capacity monitoring of ion exchangers in the make-up pipe. Documentation and control of the entire system in respect of the above mentioned parameters.

Max. electrical rated power	**0.20** kW
Type	**S**
Max. sound pressure level	**55** dB(A)
Max. system volume	**6** m³
Max. system volume glycol	**4** m³
Max. perm. operating temperature	**70** °C
Minimum inlet pressure makeup	**0.10** bar
Pressure side connection	**G 1/2"**
Connection outflow side	**G 1/2"**
Make-up connection	**G 1/2"**
Separation level, dissolved gases to	**90** %
Max. partial volume flow network	**0.050** m³/h
Max. volume flow makeup	**0.080** m³/h
Height	**572** mm
Width	**340** mm
Depth	**211** mm
Weight	**13.80** kg

Data of the connected supply system

Water content	**1547** L
Heat generator safety valve	**2.5** bar
Minimum operating pressure	**1.0** bar
Final pressure of the pressurisation	**2.0** bar
Minimum supply pressure, make-up	**1.0** bar

Position	Art. No.	Quantity	Article text
3.2.2	7945725	1	**Commissioning Cat. 3**

Service description:
Reflex commissioning category 3 for a standard system in the product ranges RSC Compact / Servitec S by the Reflex customer service, comprising:

- without travel and departure expenses,
- Adjustment of system to the operating parameters specified by the client,
- Checking the settings and operating parameters, and the system's performance and function in the overall system,
- Fillsoft and Fillset are checked too
- All set values documented in a report.

3. System / Net

3.2 Degassing

Position	Art. No.	Quantity	Article text

Commissioning Cat. 3

Requirements:

– electrical and hydraulic connection of the control unit, the accessory components and filled supply system.
– The expansion vessels of the pressurisation station must not be filled with water.
– A sufficient supply of filling water must be provided.

Customer benefits:
While it is entirely possible for customers to put a recently purchased system into service themselves, there are a number of reasons why commissioning by Reflex is a better idea.

– Certainty that the system is set up for optimum operation
– Excluding of possible damage due to incorrect commissioning thus reliability and avoidance of time and costs for downtimes

Commissioning date:
the service can take place within the local country inside about three weeks, internationally within about six weeks after placing of the corresponding order.
Services provided by Reflex Service are **net**! The price does not include any site waiting times or work arising from improper installation or improper condition.
Programming of the expansion and bus modules does not form part of commissioning. Programming is billed separately based on time and expenditure.

Type	**Cat. 3**

3.3 Water treatment

Position	Art. No.	Quantity	Article text
3.3.1	6811205	1	**Fillset pulse**

Reflex Fillset Impuls
Fitting with assembly bracket for direct connection of make-up devices for heating and chilled water systems to mains water grids. Featuring in detail:

– Shut-off ball valve fittings
– System separator according to DIN 1988-100 or DIN EN 1717 (BA), with integrated dirt trap
– Assembly bracket for horizontal wall mounting

– Water meter with pulse output

Type	**Impuls 0,8**
Max. perm. operating temperature	**60** °C

3. System / Net

3.3 Water treatment

Position	Art. No.	Quantity	Article text

Fillset pulse

Max. perm. operating pressure	**10** bar
Min. flow pressure	**p_0 + 1,3 bar**
Inlet connection	**R 1/2"**
Outlet connection	**R 1/2"**
Flow rate characteristic value kvs	**0.8** m³/h
Height	**226** mm
Width	**293** mm
Depth	**110** mm
Installation length	**293** mm
Weight	**2.80** kg

3.4 Water make-up

Position	Art. No.	Quantity	Article text
3.4.1	9125660	1	**Fillsoft FG I**

Reflex Fillsoft cartridge housing, compact basic fitting for treatment of filling and makeup water using an ion-exchanger process for the protection of heat generators and hot water heating systems according to VDI 2035. Cartridge housing can be used in combination with the corresponding cartridge inserts (separate products) optionally for water softening or water desalination.Empty housing is assembly-ready with wall mounting bracket for optional equipping with one:

– Fillsoft water softening resin cartridge (green) FSP 6000 for the water softeningor
– Fillsoft Zero mixed bed resin cartridge (grey) FZP 3000 for water desalination

Fillsoft I individually comprising:

– a cylindrical propylene housing with brass thread connections for holding one of the above mentioned water treatment cartridges and optional attachment of a Reflex Softmix mixing mechanism,
– Flow limiter
– Shut-off ball valve with sampling tap

Components are arranged as a compact fitting for installation in the filling and makeup water line.

Type	**FG I**
Max. perm. operating temperature	**40** °C
Max. perm. operating pressure	**8** bar
Inlet connection	**Rp 1/2"**
Outlet connection	**Rp 1/2"**
Height	**600** mm

3. System / Net

3.4 Water make-up

Position	Art. No.	Quantity	Article text
			Fillsoft FG I
			Width **260** mm Weight **1.90** kg
3.4.2	6811800	1	**Fillsoft FSP 6000**
			Reflex Fillsoft cartridge Cation resin cartridge for filling and make-up water softening, fitting in the Fillsoft I or II cartridge housing. Comprising cylindrical polypropylene cartridge filled with cation exchanger resin for softening of filling and make-up water according to VDI 2035 and/or manufacturer specifications in hot water based heating systems according to DIN EN 12828.
			Type **FSP 6000** Colour **green** Max. perm. operating temperature **40** °C Max. perm. operating pressure **8** bar Height **513** mm Weight **1.50** kg
3.4.3	9200276	1	**Reflex Fillsoft Tool**
			Reflex Fillsoft key Sturdy plastic key for safe undoing and tightening of the Reflex Fillsoft fitting to simplify cartridge replacement.
			Type **Tool** Colour **black** Diameter **143** mm Height **298** mm Weight **0.40** kg

3.5 Separator Exdirt

Position	Art. No.	Quantity	Article text
3.5.1	9256650	1	**Exdirt D 2 M**
			Reflex Exdirt Magnet Dirt and sludge separator for heating and cooling water systems or closed liquid-filled plant systems. Suitable for the media water and water/glycol mixtures up to a mixing ratio of 50/50%. Integrated high energy permanent magnet easy clip with plug function for a quick connection without additional assembly effort on the sludge and dirt separator. High

3. System / Net

3.5 Separator Exdirt

Position	Art. No.	Quantity	Article text
			Exdirt D 2 M

performance magnet comprising an isostatic pressed neodymium washer, that is inserted in a TPE plug-in washer. Highly efficient separation and fixing of ferromagnetic particles from the flow directly in the separator chamber thanks to axially-aligned magnetic field. Particles are specifically and permanently removed from the system by simple pulling out of the plug-in magnets from the separator housing, and subsequent cleaning without any interruption to operation. For maintenance tasks, the plug-in magnet can be removed from the separator housing by simply pulling it out.
The cleaning and emptying of the dirt collection chamber is possible via a dedicated desludging ball valve without any necessity to interrupt operation.

Type	**D 2 M**
Housing material	**brass**
Installation variant	**horizontal**
Max. perm. operating temperature	**110** °C
Max. perm. operating pressure	**10** bar
Connection	**IG 2"**
Cleaning connection	**G 3/4"**
Connection variant	**thread**
Max. volume flow	**7.5** m³/h
Diameter	**100** mm
Height	**234** mm
Width	**132** mm
Installation length	**132** mm
Weight	**3.02** kg

Position	Art. No.	Quantity	Article text
3.5.2	9254801	1	**Reflex Exiso A/D 2**

Reflex Exiso
Thermal insulation for Reflex Exvoid micro-bubbles or Exdirt dirt separator. Comprising two shape and temperature-stable, adaptable, form-fitting rigid-foam semi-shells with a folding closure or clamping strap.

Type	**A/D 2**
Colour	**black**
Insulation material	
Insulation strength	**15** mm
Max. perm. operating temperature	**110** °C
Diameter	**135** mm
Height	**270** mm
Width	**134** mm
Depth	**137** mm
Weight	**0.14** kg

4. Heat generator protection 1

4.1 Separator Exvoid-T

Position	Art. No.	Quantity	Article text
4.1.1	9250000	1	**Exvoid T 1/2**

Reflex Exvoid T
Automatic quick and large ventilator for heating and chilled water systems or sealed, liquid-filled system circuits.Suitable for the media water and water/glycol mixtures up to a mixing ratio of 50/50%.Fitting for the permanent discharge of gas bubbles from high points or collection points in the hydraulic/piping system that have been provided for this purpose.

Type	**T 1/2**
Housing material	**brass**
Installation variant	**vertical**
Max. perm. operating temperature	**110** °C
Max. perm. operating pressure	**10** bar
Connection	**IG 1/2"**
Vent connection	**G 1/2"**
Diameter	**63** mm
Height	**122** mm
Central flange-jacket	**46** mm
Width	**78** mm
Weight	**0.63** kg

4.2 Safety valve *Third Party Product*

Position	Art. No.	Quantity	Article text
4.2.1	255325	1	**Safety valve G1" -external-**

Safety valve G1"

Inlet connection	**G 1"**
Outlet connection	**G 1 1/4"**

Trigger pressure SV	**2.5** bar

4.3 Water level limiter *Third Party Product*

Position	Art. No.	Quantity	Article text
4.3.1	255294	1	**Water level limiter -external-**

Water level limiter for water level monitoring of heat generators, type-tested according to VD-TÜV Data Sheet Water Level 100/2. Alternatively, a minimum pressure limiter, flow limiter or another suitable measure for preventing impermissible heating in the event of insufficient water can be deployed.This item is a third-party product that

4. Heat generator protection 1

4.3 Water level limiter *Third Party Product*

Position	Art. No.	Quantity	Article text

Water level limiter -external-

is not part of our company's scope of delivery. These are recommendations for installation in the complete system.

NUMERIČKI PRORAČUN VENTILACIJE

PRORAČUN POTREBNE KOLIČINE VAZDUHA ZA VENTILACIJU GARAŽE Prema Pravilniku o tehničkim zahtjevima za zaštitu garaža za putničke automobile od požara i eksplozija (Sl. list CG br. 13/07 i 32/11 od 03.02.2012.)

OBJEKAT I LOKACIJA: Objekat za komunalno i vodovod Žabljak

INVESTITOR: Opština Žabljak

Nivo garaže:	0	[m]
Korisna površina garaže, P:	242	[m^2]
Visina garaže (prosječna visina), H:	6.84	[m]
Zapremina, V:	1655	[m^3]
Broj parking mjesta, m:	4	PM
Broj izmjena, n:	6	[1/h]
Tip garaže:	Mala, zatvorena	
S ulaza:	10	[m]
S garaže:	15	[m]
S izlaza:	10	[m]

Ovo uputstvo se primenjuje na tehnologiju obrade vazduha u garažama. Garaže su zgrade ili delovi zgrada koji se koriste za parkiranje vozila. Prema korisnoj površini, garaže mogu biti:
1. velike garaže, s korisnom površinom koja iznosi više od 1.500 m2;
2. srednje garaže, s korisnom površinom od 400 do 1.500 m2;
3. male garaže, s korisnom površinom do 400 m2.

Uputstvo se ne primjenjuje na automatizovane ili otvorene garaže. Otvorene garaže imaju otvore koji se ne mogu zatvarati i koji direktno vode napolje. Ovi otvori pokrivaju 1/3 ukupne površine spoljnih zidova. Otvorene srednje i velike garaže imaju otvore na spoljnim zidovima koji su jedni naspram drugih i koji nisu udaljeni više od 70 m. Ovo uputstvo se ne primenjuje na prostorije u kojima je predviđeno da ljudi čekaju duže vreme. Stoga nije neophodno da se u njima obrađuje vazduh koji se dovodi iz spoljne okoline. Ovo uputstvo sadrži odstupanja od trenutno važećih zakonskih uputstava (savezni propisi za garaže).

REZULTATI PRORAČUNA - REŽIM VENTILACIJE

I KRITERIJUM - Prema maksimalno dozvoljenoj koncentraciji CO (VDI 2053)

Proračun ventilacije garaže urađen je prema standardu VDI 2053. Za posmatranu garažu sa malim dolaznim i odlaznim saobraćajem (garaža u stambenoj zgradi) i sa trajno dodeljenim parking mestima usvojeno je sledeće:
- 80% od mogućih parkiranih vozila su premeštena u toku jednog sata (8h-1)

- dozvoljena granična vrednost CO zagađenja je 60 ppm-a
- bilo koje parking mjesto ako se oslobodi, ne zauzima se novim vozilom koje uđe u garažu
- vozila se posmatraju ujutru kada izlaze iz garaže - nova vozila ne ulaze u garažu (hladna emisija)

Prosečno rastojanje za vožnju u garaži se može proceniti na:

$$S_{ulaz} + \frac{S_{gar}}{2} + S_{izl} = \quad \boxed{27.5}$$

Prema tabeli 1, računa sa emisija CO svakog vozila u zavisnosti od pređenog puta.
Za dužinu puta od S = 36 m, hladna emisija za jedno vozilo je:

		Numeričke jednačine za emisiju CO [g] u zavisnosti od pređenog puta S
Topla emisija E_{warm}		$0,008xS$
Hladna emisija $E_{CO,cold}$	$S \le 80m$	$7,6$
	$80m \le S \le 500m$	$0,89xS^{0,49}$

Tabela 1. Emisija CO po vozilu

$$E_{CO,cold} = 7,6\,g$$

Preporučuju se sledeće pretpostavke prilikom procjene količine spoljašnjeg vazduha za ventilaciju garaža sa malim obimom ulaznog i izlaznog saobraćaja, kao što su garaže u stambenim ili poslovnim zgradama:
– mogućnost 60% parkiranih vozila (parking mesta) da se pomera se u roku od sat vremena (frekvencija);
– bilo koje parking mjesto koje se oslobodi nije zauzeto od strane novih vozila koja su ušla u garažu.
Časovna emisija za svako parking mesto za razne pokrete izračunava se po sledećoj formuli:

Maksimalna dozvoljena koncentracija CO:	60	[cm³/m³]
Udarni faktor pogona fp:	0.5	%
Paljenje automobila pri startu:	20	[s]
Emisija CO pri staru vozila:	0.55	[m³CO/m³]
Brzina kretanja vozila po garaži:	5	[km/h]
Emisija CO pri kretanju vozila:	0.6	[m³CO/m³]
Srednja vrijednost najbližeg i najdaljeg parking mjesta:	12	[m]
Ukupna emisija CO po vozilu je:	0.0022	[m³CO/voz
Zagađenje CO u atmosferskom vazduhu:	0	[m³CO/m³]
Potrebna količina vazduha za vantilaciju:	561.944444	[m³/h]

II KRITERIJUM - Prema korisnoj površini garaže

Korisna površina garaže je P. Uzimajući (po normativima) da je po m2 garaže potrebno np= 6 - 12 m3/ m2h potrebna količina vazduha za ventilaciju garaže je:

Korisna površina garaže (P):	242	[m^2]
Usvojena količina vazduha po m^2 garaže:	6	
Potrebna količina vazduha za ventilaciju garaže:	1452	[m^3/h]

III KRITERIJUM - Prema broju parking mjesta

Broj parking mesta u garaži je m. Uzimajući (po normativima) da je po vozilu potrebno nm = 250 - 300 m3/h potrebna količina vazduha za ventilaciju garaže je:

Broj parking mesta u garaži je (m):	4	PM
Usvojeno količina vazduha po vozilu:	300	[m^3/h]
Potrebna količina vazduha za ventilaciju garaže:	1200	[m^3/h]

IV KRITERIJUM - Prema broju izmjena vazduha

Prema standardu BS 7346-7. Zapremina garaže je (V). Uzimajući (po normativima) da je po m3 garaže potrebno nv = 3 - 6 izmjena vazduha na čas potrebna količina vazduha za ventilaciju garaže je:

Zapremina garaže je:	1655	[m^3]
Usvojeni broj izmjena vazduha:	6	
Usvojena količina vazduha u režimu VENTILACIJE:	9931.68	[m^3/h]

UBACIVANJE SVJEŽEG VAZDUHA U GARAŽU

Infiltracijom preko segmentnih vrata se nadoknađuje vazduh

IZBOR PRATEĆE OPREME I VENTILATORA

Izvlačenje vazduha za ventilaciju garaže u nivou suterena vrši se uz pomocu aksijalnog ventilatora i pocinčanih kanala. Zagađeni vazduh ventilaotor izvlači iz garaže i izbacuje ga van objekta. Ventilator se montira unutar garaže po definisanoj poziciji u grafičkoj dokumentaciji. U tampon zoni predviđena je funkcionalna veza sa poslovnim dijelom objekta preko stepeništa I putničkog lifta. Putničkom liftu I stepenišnom prostoru se pristupa preko tampon prostora.
U slučaju izbijanja požara u garaži, širenje gasova može za posledicu imati povećanje pritiska, praćeno isticanjem vrelih gasova izvan garaže ka predprostorima lifta. Dim koji je nastao zbog požara dobija snagu potiska na gore zahvaljujući svojoj smanjenoj gustini. Kroz procjepe u vratima dolazi do curenja ka oknu lifta i gornjim spratovima, to može dovesti do kontaminacije radnog prostora, evakuacionih hodnika i stepeništa. Osim toga, ovaj potisak na gore može prouzrokovati širenje dima preko puteva curenja kroz vertikalne barijere između prostorija, npr. vrata, zidovi, pregrade.

curenja kroz vertikalne barijere između prostorija, npr. vrata, zidovi, pregrade.

Izbor ventilatora za ventilaciju

Za potrebnu količinu vazduha za ventilaciju garaže: $V_V =$ 9931.68 [m3/h]
potreban napor iznosi: $\Delta p_V =$ 129 [Pa]

Usvaja se aksijalni ventilator za izvlačenje vazduha iz garaža:

Usvaja se ventilator:	SODECA	
Tip:	THT-63-4T-1.5-F-400_IE3	
Proizvod:	SODECA	
Napajanje:	220v/50Hz/1pH	
Snaga Nm:	980	[W]
Struja:	2.37	[A]
Protok max.:	10800	[m^3/h]
Broj obrtaja:	1420	[min-1]
Težina:	68	[kg]

Sl. Aksijalni ventilator kružnog pop. presjeka
THT-63-4T-1.5-F-400_IE3

ODGOVORNI PROJEKTANT:

_____
Miloš Dragaš dipl. inž. maš.

UBACIVANJE SVJEŽEG VAZDUHA U TAMPON ZONU

Površina tampon zone uz stepeništa je: $P = axb = 8m^2$

d(dužina)	2.4 [m]	
b(širina)	1.9 [m]	4.56 [m²]

Proračun protoka vazduha kada su otvorena 1 vrata:

Brzina kroz otvorena vrata (zahtev standarda): 0.75 [m/s]

Površina vrata:	a(visina)	2.1 [m]	
	b(širina)	0.9 [m]	1.9 [m²]

Protok kroz otvorena vrata je: 5103 [m³/h]

Pritisak u predprostoru pri protoku vazduha kada su otvorena jedna vrata (prema prEN 12101-6) i pretpostavki da je u garaži atmosferski pritisak PUS=0:

$$P_{LOB} = P_{US} + \left(\frac{Q_{dor}}{0,83xA_{dor}} \right)^2 = \quad 0.82 \text{ [Pa]}$$

Površina curenja iz pretprostora neračunajući otvorena vrata (tabela A.3, str.114):

Vrsta vrata	$A_{rem} =$
Jednokrilna vrata koja se otvaraju prema prostoru pod pritiskom	0.01
Jednokrilna vrata koja se otvaraju spolja	0.02
Dvokrilna vrata sa ili bez centralnog žlijeba	0.03
Vrata za lift	0.06

$A_{rem} =$ 0.02 [m²]

Ukupan potreban dovod vazduha pri otvorenim vratima, uz pretpostavku da nema procepa u zidovima, podovima i na plafonu je:

$$Q_{LOB} = 0,83x\left(A_{REM}xA_{dor} \right)xP_{LOB}^{1/2} = \quad 5157 \text{ [m³/h]}$$

Proračun protoka vazduha kada su vrata zatvorena:

Zahtevani natpritisak predprostora je 50 Pa, pri čemu je:

curenje kroz vrata (tabela A.3, str.114):

$$Q_D = 0,06 + 0,12 = 0,18m^3 / s$$

curenje kroz zidove (tabela A.5, str.116):

$$Q_W = 0,83 x A_{LW} x p^{1/1,6} = 0,83 x 0,00187 x 50^{0,625} = 0,018 m^3 / s$$

dok je onda ukupno curenje kroz procjepe:

$$Q_{DC} = Q_D + Q_W = \quad \boxed{713} \text{ [m}^3\text{/h]}$$

Razlika protoka za otvorena i zatvorena vrata koja iznosi:

$$Q_{REC} = Q_{LOB} - Q_{DC} = \quad \boxed{4444} \text{ [m}^3\text{/h]}$$

recirkuliše se u prostor iz koga se uzima vazduh za ubacivanje. Recirkulacija se izvodi da se ne bi stvorio velik natpritisak i onemogućilo otvaranje vrata. Ovo je rešeno prestrujavanjem vazduha kroz samopodiznu natpritisnu klapnu sa tegom, ugrađenu u zid između tampon zone i stepeništa. Klapna se podešava na diferencijalni pritisak otvaranja od 50 Pa.

ODGOVORNI PROJEKTANT:

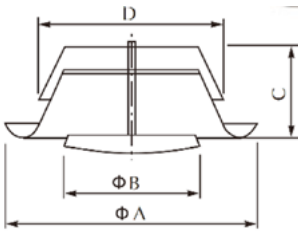
_____

Miloš Dragaš dipl. ing. maš.

AEROVENTIL ZA ODVOD VAZDUHA AOV

- Aeroventil **AOV** se koristi za odvod vazduha iz prostorije
- Montira se u plafonu, na zidu ili direktno na kanalu
- Izrađen od čeličnog lima, plastificiranog u bijeloj boji
- Protok vazduha se reguliše okretanjem kontrolnog diska
- U obimu isporuke montažni prsten
- Elegantan dizajn i nizak nivo buke
- Primjer označavanja **AOV 200**

Tip
Prečnik



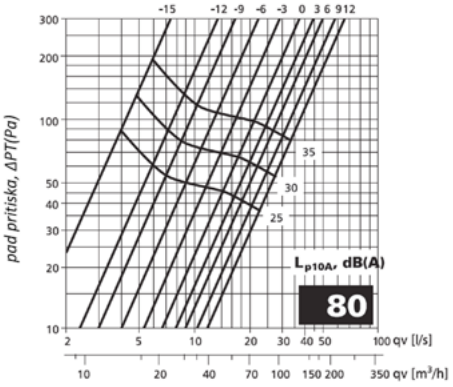
Tip	Dimenzije (mm)			
	A	B	C	D
AOV 80	115	62	42	77,5
AOV 100	138	75	40	97,5
AOV 125	164	100	46	122,5
AOV 150	202	120	50	147,5
AOV 160	211	130	54	157,5
AOV 200	248	158	63	197,5
AOV 250	305	215	75	248

ENPRO® je registrovana i pravno zaštićena robna marka. Sva prava zadržana.

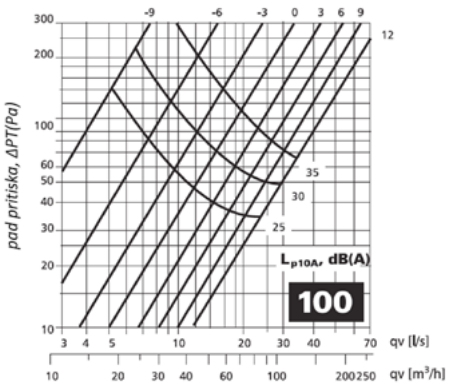
AOV

TEHNIČKI PODACI

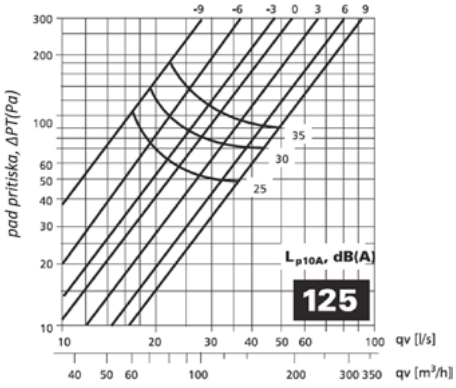
dubina zatvorenosti diska (mm)



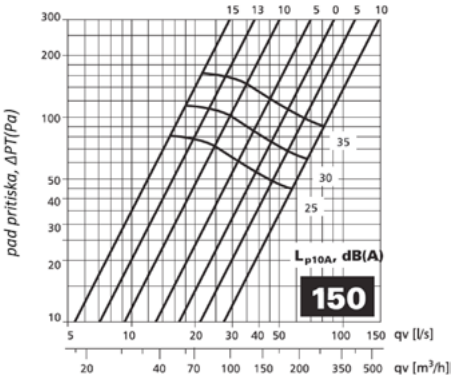
dubina zatvorenosti diska (mm)



dubina zatvorenosti diska (mm)



dubina zatvorenosti diska (mm)



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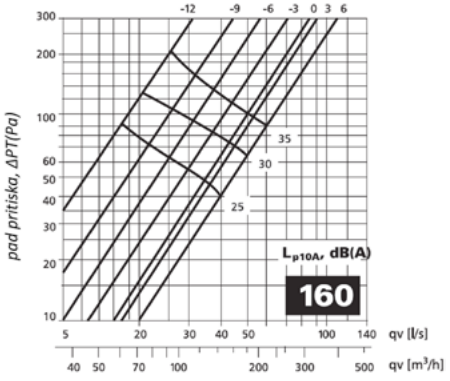
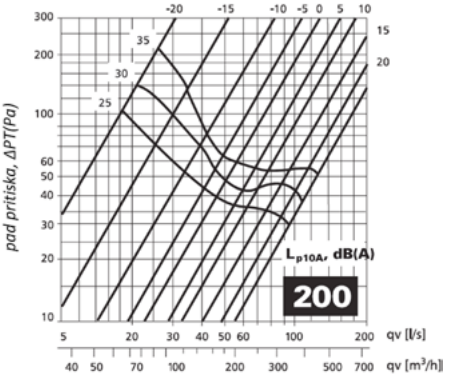
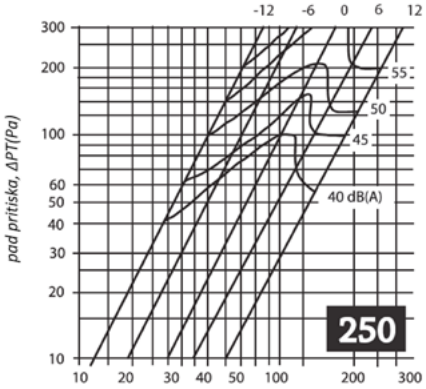


dubina zatvorenosti diska (mm)

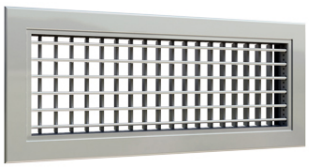


dubina zatvorenosti diska (mm)



Grilles

AD



Description

AD is an adjustable single or double deflection grille made of aluminium. With adjustable blades, the grille is very useful for air supply and can be adapted to the required throw and air spread pattern.
The grille is available with several mounting options and can be delivered with mounting frame, opposed blade damper and plenum box accessories.

Order code

AD-21-1200-500

Function	Supply
Working setup	0 deg
Color	Anodized

Technical data

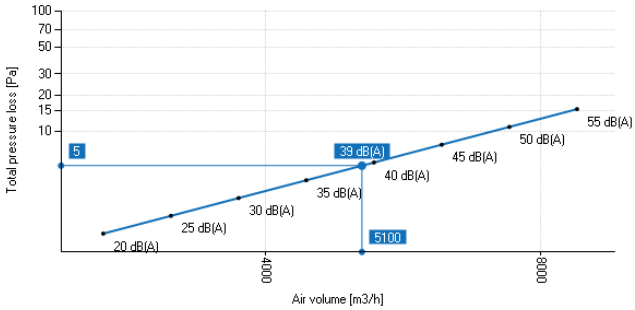
Requirements:			
Air volume	qv	5100	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		1200	
Height, H		500	

Results			
Face velocity	v	2.6	m/s
Total pressure loss	pt	5	Pa
Sound power level	LwA	39	dB(A)
Sound pressure level	LpA	35	dB(A)
Throw	L0.2	23.6	m

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	7	5	0	-3	-8	-14	-13	-9		
L	-	-	-	-	-	-	-	-		

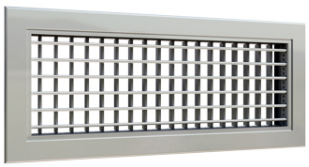
Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

AD



Description

AD is an adjustable single or double deflection grille made of aluminium. With adjustable blades, the grille is very useful for air supply and can be adapted to the required throw and air spread pattern.
The grille is available with several mounting options and can be delivered with mounting frame, opposed blade damper and plenum box accessories.

Order code

AD-21D-425-125

Function	Supply
Working setup	0 deg
Color	Anodized

Technical data

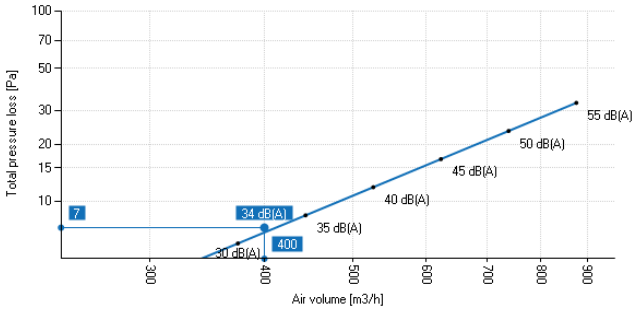
Requirements:			
Air volume	qv	400	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		425	
Height, H		125	

Results			
Face velocity	v	3.0	m/s
Total pressure loss	pt	7	Pa
Sound power level	LwA	34	dB(A)
Sound pressure level	LpA	30	dB(A)
Throw	L0.2	9.0	m

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	7	5	0	-3	-8	-14	-13	-9		
L	-	-	-	-	-	-	-	-		

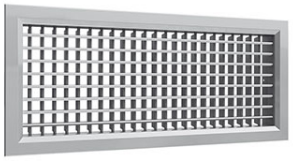
Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

SD



Description

SD is an adjustable single or double deflection grille made of galvanized steel or powder painted black steel. With the adjustable blades, the grille is very suitable for air supply and is adaptable to the required throw and air spread pattern.
The grille is available with several mounting options and can be delivered with mounting frame and opposed blade damper as an accessories.
Available in various standard dimensions. Customized sizes available on request.

Order code

SD-22D-575-125

Function	Supply
Working setup	0 deg
Color	Galvanized steel

Technical data

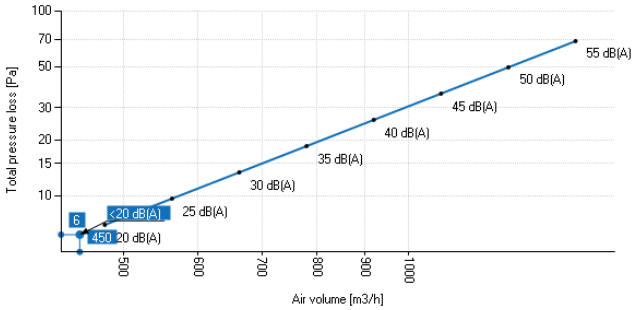
Requirements:			
Air volume	qv	450	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		575	
Height, H		125	

Results			
Face velocity	v	3.1	m/s
Total pressure loss	pt	6	Pa
Sound power level	LwA	<20	dB(A)
Sound pressure level	LpA	<20	dB(A)
Throw	L0.2	16.3	m

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	-1	-1	-1	-2	-7	-12	-16	-16		
L	-	-	-	-	-	-	-	-		

Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

WLA

Description

WLA is an aluminum weather louvre fixed blades with pitch 25mm, pitch 50mm or pitch 100mm suitable for outdoor air intake and air outlet discharge provided with protection net against birds or insects.
Optionally available with visible screw holes fixing or mounting frame.
Delivery as standard with bird net.

Order code

WLA-11-N-500-200	
Function	Inlet
Working setup	None
Color	Anodized

Technical data

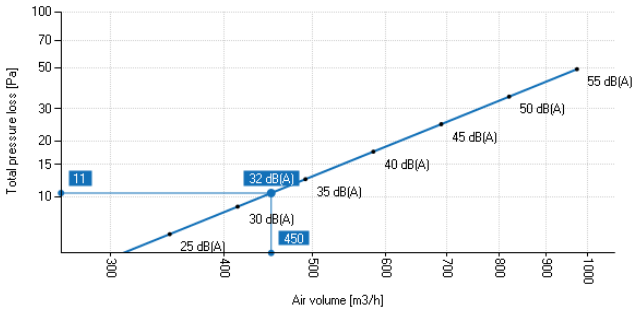
Requirements:			
Air volume	qv	450	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		500	
Height, H		200	

Results			
Face velocity	v	2.5	m/s
Total pressure loss	pt	11	Pa
Sound power level	LwA	32	dB(A)
Sound pressure level	LpA	28	dB(A)

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	-10	-2	3	-3	-9	-11	-19	-22		
L	-	-	-	-	-	-	-	-		

Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

WLA

Description

WLA is an aluminum weather louvre fixed blades with pitch 25mm, pitch 50mm or pitch 100mm suitable for outdoor air intake and air outlet discharge provided with protection net against birds or insects.
Optionally available with visible screw holes fixing or mounting frame.
Delivery as standard with bird net.

Order code

WLA-11-NI-1200-700	
Function	Inlet
Working setup	None
Color	Anodized

Technical data

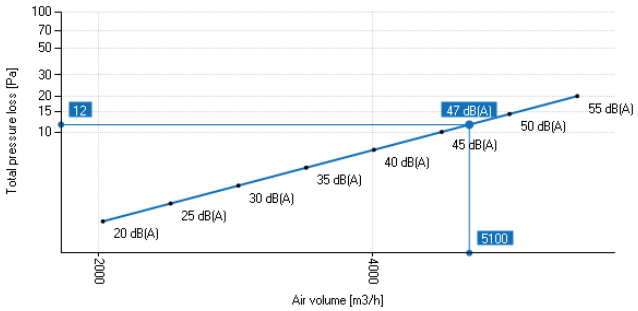
Requirements:			
Air volume	qv	5100	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		1200	
Height, H		700	

Results			
Face velocity	v	2.7	m/s
Total pressure loss	pt	12	Pa
Sound power level	LwA	47	dB(A)
Sound pressure level	LpA	43	dB(A)

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	-10	-2	3	-3	-9	-11	-19	-22		
L	-	-	-	-	-	-	-	-		

Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

WLS

Description

WLS is a steel weather louvre with fixed blades and 50 mm pitch (WLS-11) or variable pitch (WLS-22), suitable for outdoor air intake and air outlet discharge provided with bird net. Optionally available with insect net mounted with visible screw holes fixing or mounting frame.
WLS grille is available in various standard dimensions.
Delivery as standard with bird net.

Order code

WLS-11-I-200-200	
Function	Outlet
Working setup	None
Color	Galvanized steel

Technical data

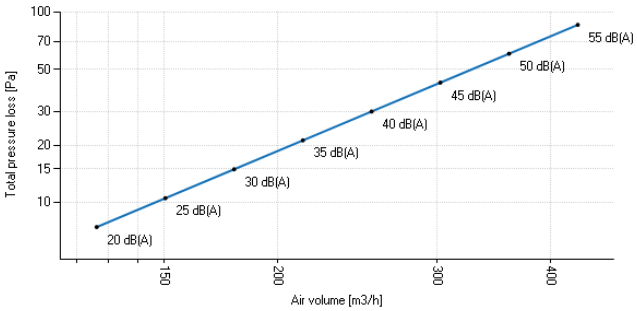
Requirements:			
Air volume	qv	100	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		200	
Height, H		200	

Results			
Face velocity	v	1.2	m/s
Total pressure loss	pt	5	Pa
Sound power level	LwA	<20	dB(A)
Sound pressure level	LpA	<20	dB(A)

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	8	4	1	-3	-8	-14	-18	-17		
L	-	-	-	-	-	-	-	-		

Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

WLS

Description

WLS is a steel weather louvre with fixed blades and 50 mm pitch (WLS-11) or variable pitch (WLS-22), suitable for outdoor air intake and air outlet discharge provided with bird net. Optionally available with insect net mounted with visible screw holes fixing or mounting frame.
WLS grille is available in various standard dimensions.
Delivery as standard with bird net.

Order code

WLS-11-N-400-300	
Function	Inlet
Working setup	None
Color	Galvanized steel

Technical data

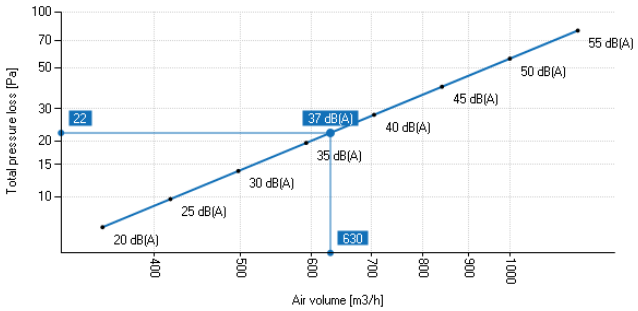
Requirements:			
Air volume	qv	630	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		400	
Height, H		300	

Results			
Face velocity	v	2.2	m/s
Total pressure loss	pt	22	Pa
Sound power level	LwA	37	dB(A)
Sound pressure level	LpA	33	dB(A)

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	-2	-2	-4	-6	-5	-6	-16	-24		
L	-	-	-	-	-	-	-	-		

Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



Grilles

WLS

Description

WLS is a steel weather louvre with fixed blades and 50 mm pitch (WLS-11) or variable pitch (WLS-22), suitable for outdoor air intake and air outlet discharge provided with bird net. Optionally available with insect net mounted with visible screw holes fixing or mounting frame.
WLS grille is available in various standard dimensions.
Delivery as standard with bird net.

Order code

WLS-11-N-1500-800	
Function	Outlet
Working setup	None
Color	Galvanized steel

Technical data

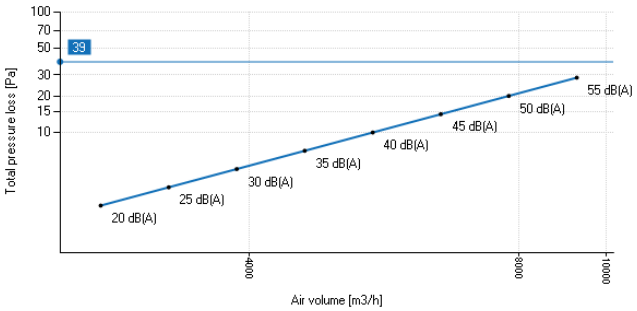
Requirements:			
Air volume	qv	10800	m3/h
Room attenuation	Dr	4	dB
Distance to suspended ceiling		0	m
Length, L		1500	
Height, H		800	

Results			
Face velocity	v	3.3	m/s
Total pressure loss	pt	39	Pa
Sound power level	LwA	59	dB(A)
Sound pressure level	LpA	55	dB(A)

Hz	63	125	250	500	1K	2K	4K	8K	Sum	Sum
Coct	8	4	1	-3	-8	-14	-18	-17		
L	-	-	-	-	-	-	-	-		

Symbols	
Coct	Octave correction value for sound power level
L	Sound attenuation

Pressure and sound power diagram



ETAŽA	SISTEM	PRORAČUNATI PAD PRITISKA	REZERVA 20%	PRORAČUNATA KOLIČINA VAZDUHA	TIP VENTILATORA
			GARAŽA		
Suteren	ViO GARAŽE	129	154.8	9931	THT-63-4T-1.5-F-400_IE3
Suteren	Tampon zona	60	72	5100	IRB/4-355
Suteren	Suteren STV	74	88.8	100	TD-250x100
Prizemlje	Prizemlje Kupatilo i garderoba	80	96	630	TD-800x200
Sprat	Sprat STV	96	115.2	450	TD-500x160

IRB-IRT

5132929200 - IRB/4-355 230V50HZ 450/125 N8 - IN-LINE DUCT FANS

Range of rectangular duct fans suitable for many general ventilation applications where the fan is required to be installed within a rectangular ducted ventilation system or where the space for installation is limited. High performance centrifugal fans. All models suitable for mounting in any orientation. Casing manufactured from heavy gauge galvanised sheet steel. Direct drive backward curved impellers manufactured from aluminium sheet. External rotor motor, Class F insulation with thermal protection. IP55 remote terminal box .

Motors
Motor and impeller fitted on the inspection cover enabling easy cleaning and maintenance.

IRB models: Single-phase 230V-50Hz, IP55, Speed controllable by transformer.

Brand S&P model IRB/4-355 230V50HZ 450/125 N8 for an airflow 5.209 m³/h and static pressure 63 Pa.

Theoretical Working Point

Airflow	5.100 m³/h
Static Pressure	60 Pa
Temperature	20 °C
Altitude	0 m
Density	1,2 kg/m³
Frequency	50 Hz

Working Point

Airflow	5.209 m³/h
Static Pressure	63 Pa
Dynamic pressure	16,3 Pa
Total Pressure	79 Pa
Input power	0,739 kW
Tot efficiency	-
Outlet speed	5,2 m/s
Fan speed	1398 rpm
Specific Fan Power	0,51 W/l/s
Specific Fan Power reg	0,49 W/l/s

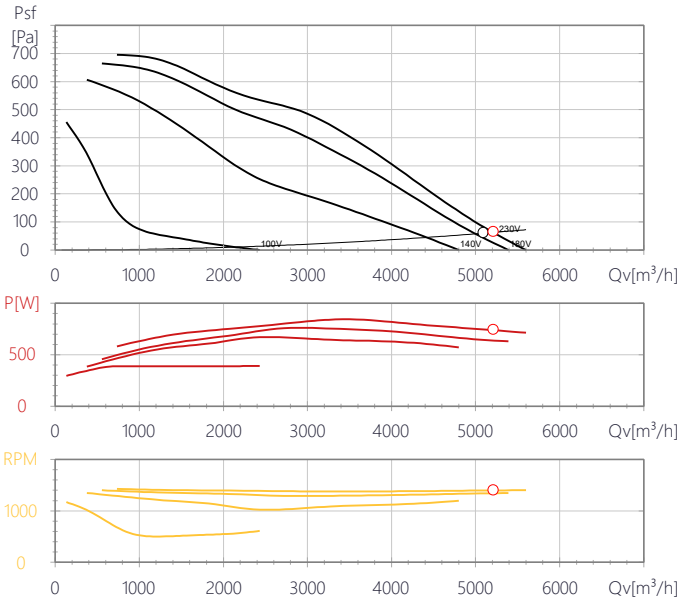
Construction

Discharge diameter	595 mm
Fan size	355
Blades	0
Weight	51,40 kg

Motor Characteristics

Number of poles	4
Motor Power	-
Maximum absorbed current	3,7 A
Voltage	1-230V-50Hz
IP Rating	IP55
Motor insulation class	F

Performance Chart



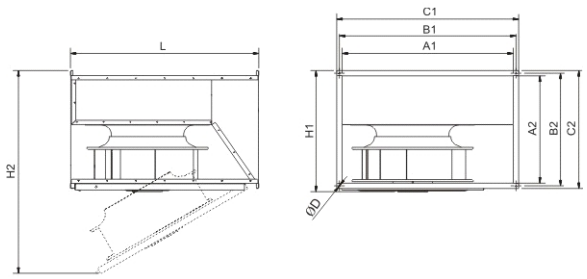
Sound Performance

	63	125	250	500	1k	2k	4k	8k	Overall
Inlet (LwA)	58	78	76	81	77	77	70	68	85
Inlet LpA @ 1,5m	43	63	61	66	62	62	55	53	71
Outlet (LwA)	59	77	82	86	88	82	76	71	92
Outlet LpA @ 1,5m	44	62	67	71	73	67	61	56	77
Surrounding (LwA)	56	68	67	66	66	61	53	51	73
Surrounding LpA @ 1,5m	41	53	52	51	51	46	38	36	59

IRB-IRT

5132929200 - IRB/4-355 230V50HZ 450/125 N8 - IN-LINE DUCT FANS

Drawing



A1	A2	B1	B2	C1	C2	D	H1	H2
700	400	720	420	740	440	8.5	460	1135

L
790

IRB-IRT

5132929200 - IRB/4-355 230V50HZ 450/125 N8 - IN-LINE DUCT FANS

ErP Data

Ecodesign	
Commission regulation (EU) N°1253/2014 of July 2014	
Information requirements (Annex V)	
Product description	IRB/4-355 230V50HZ 450/125 N8
Manufacturer's Info	S&P
Identifier	-
Typology	NRVU unidirectional
Drive	VSD
Type of HRC	None
Thermal efficiency (%)	NA
Qnom (m3/s)	0,82
Pelec (kW)	0,82
SFPint (W/m3/s)	NA
Face velocity (m/s)	2,9
Δps,ext (Pa)	492,5
Δps,int (Pa)	NA
Δps,add (Pa)	NA
Static efficiency fans (%)	54,5
External leakage rate (%)	2
Internal leakage rate (%)	NA
Filter performance	NA
Filter warning	NA
LWA dB(A)	69
https://www.solerpalau.com/	

Warnings

The absorbed current may vary slightly depending on the motor installed

This dimensional drawing may not match with the selected product, especially in the discharge orientation

TD-MIXVENT

5211320600 - TD-250/100 (220-240V 50) RE - IN-LINE DUCT FANS

Range of low profile in-line mixed flow duct fans manufactured in tough reinforced plastic (from 160 to 200 models) or in galvanised steel sheet protected with anti-corrosive epoxy-polyester paint (from 4000 and 6000 models).
The unique design of the support bracket allows the motor and impeller assembly to be fitted or removed without dismantling the adjacent ducting.

Motors
Models 160 to 2000:
IP44, Class B, with permanently lubricated ball bearings and thermal protector.
Supply voltage:
2-speed single-phase, 230V-50Hz (models 160 to 350)
3-speed single-phase, 230V-50/60Hz (models 500 to 2000)
Speed controlable by tension.

Models 4000 to 6000:
IP44, Class B, with permanently lubricated ball bearings and thermal protector.
Supply voltage:
Single-phase 1-speed 230V-50/60Hz, Speed controlable by tension.
Brand S&P model TD-250/100 (220-240V 50) RE for an airflow 102 m³/h and static pressure 88 Pa.

Theoretical Working Point

Airflow	100 m³/h
Static Pressure	84 Pa
Temperature	20 °C
Altitude	0 m
Density	1,2 kg/m³
Frequency	50 Hz

Working Point

Airflow	102 m³/h
Static Pressure	88 Pa
Dynamic pressure	10,2 Pa
Total Pressure	98 Pa
Input power	0,026 kW
Outlet speed	4,1 m/s
Fan speed	2441 rpm
Specific Fan Power	0,90 W/l/s
Specific Fan Power reg	0,88 W/l/s

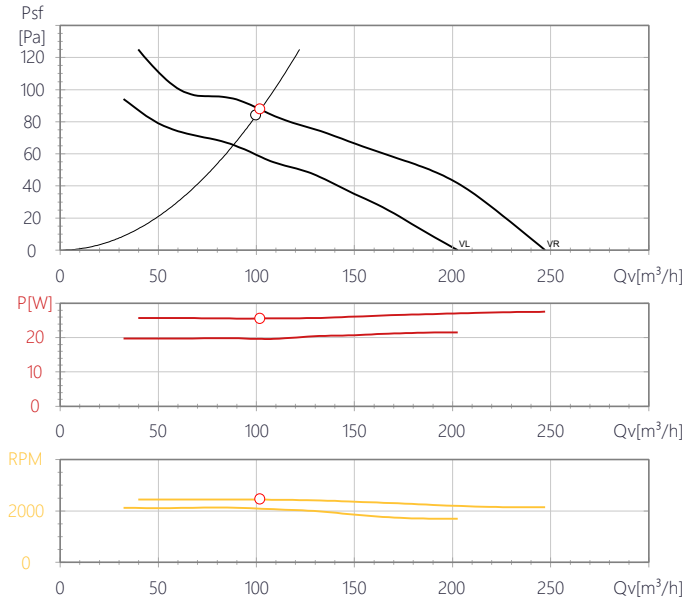
Construction

Discharge diameter	100 mm
Fan size	100
Weight	1,71 kg

Motor Characteristics

Number of poles	2
Voltage	1-230V-50Hz
Maximum absorbed current	0,1 A
IP Rating	IP44
Motor insulation class	B

Performance Chart



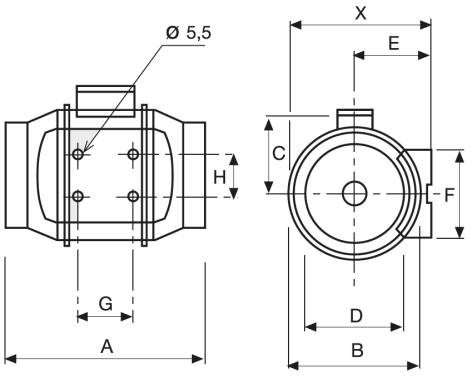
Sound Performance

	63	125	250	500	1k	2k	4k	8k	Overall
Inlet (LwA)	26	32	47	53	54	51	42	32	58
Inlet LpA @ 1,5m	11	18	33	38	40	36	27	18	44
Outlet (LwA)	26	33	49	55	52	50	40	30	58
Outlet LpA @ 1,5m	12	18	35	40	37	35	25	16	44
Surrounding (LwA)	17	22	47	45	49	47	34	23	53
Surrounding LpA @ 1,5m	3	8	32	30	34	33	19	9	39

TD-MIXVENT

5211320600 - TD-250/100 (220-240V 50) RE - IN-LINE DUCT FANS

Drawing



X	A	B	C	D	E	F	G	H
188	303	176	115	97	100	90	80	60

TD-MIXVENT

5211320600 - TD-250/100 (220-240V 50) RE - IN-LINE DUCT FANS

ErP Data

Ecodesign	
Commission regulation (EU) N°1253/2014 of July 2014 Information requirements (Annex V)	
ProductoComercial	TD-250/100 (220-240V 50) RE
Identifier	5211320600
SEC average climate (kWh/(m2.an))	-12
SEC class	NA
SEC cold climate (kWh/(m2.an))	-28,4
SEC warm climate (kWh/(m2.an))	-2,6
Typology	RVU unidirectional
Type of drive	2-speed
Type of HRC	None
Thermal efficiency (%)	0
Maximum flow rate (m3/h)	173
Electrical power input at maximum flow rate (W)	26
Sound power level (LWA)	53
Reference flow rate (m3/s)	0,034
Reference pressure difference (Pa)	50
SPI (W/m3/h)	0,165
Control factor	1
Control typology	Manual
Maximum internal leakage for BVU (%)	Not applicable
Maximum external leakage for BVU and UVU (%)	5
Mixing rate for BVU without duct connection (%)	Not applicable
Position of visual filter warning	Not applicable
description of visual filter warning	Not applicable
Instructions to install supply grilles	F&W Leaflet
Instructions to install exhaust grilles	F&W Leaflet
https://www.solerpalau.com/	
Airflow sensitivity to pressure variation	Not applicable
Indoor/outdoor air tighness (m3/h)	Not applicable
Annual electricity consumption - Average climate (kWh/a)	207
Annual electricity consumption - Warm climate (kWh/a)	207
Annual electricity consumption - Cold climate (kWh/a)	207
Annual heating saved - Average climate (kWh/a)	1715
Annual heating saved - Warm climate (kWh/a)	776
Annual heating saved - Cold climate (kWh/a)	3355

Warnings

The absorbed current may vary slightly depending on the motor installed

This dimensional drawing may not match with the selected product, especially in the discharge orientation

This device has a maximum power below 30W, so the SEC Class parameter does not apply.

TD-MIXVENT

5211301300 - TD-500/160 3V (220-240V 50/60) N8 - IN-LINE DUCT FANS

Range of low profile in-line mixed flow duct fans manufactured in tough reinforced plastic (from 160 to 200 models) or in galvanised steel sheet protected with anti-corrosive epoxy-polyester paint (from 4000 and 6000 models).
The unique design of the support bracket allows the motor and impeller assembly to be fitted or removed without dismantling the adjacent ducting.

Motors
Models 160 to 2000:
IP44, Class B, with permanently lubricated ball bearings and thermal protector.
Supply voltage:
2-speed single-phase, 230V-50Hz (models 160 to 350)
3-speed single-phase, 230V-50/60Hz (models 500 to 2000)
Speed controlable by tension.

Models 4000 to 6000:
IP44, Class B, with permanently lubricated ball bearings and thermal protector.
Supply voltage:
Single-phase 1-speed 230V-50/60Hz, Speed controlable by tension.
Brand S&P model TD-500/160 3V (220-240V 50/60) N8 for an airflow 440 m³/h and static pressure 111 Pa.

Theoretical Working Point

Airflow	450 m³/h
Static Pressure	116 Pa
Temperature	20 °C
Altitude	0 m
Density	1,2 kg/m³
Frequency	50 Hz

Working Point

Airflow	440 m³/h
Static Pressure	111 Pa
Dynamic pressure	29,1 Pa
Total Pressure	140 Pa
Input power	0,053 kW
Outlet speed	6,9 m/s
Fan speed	2563 rpm
Specific Fan Power	0,43 W/l/s
Specific Fan Power reg	0,43 W/l/s

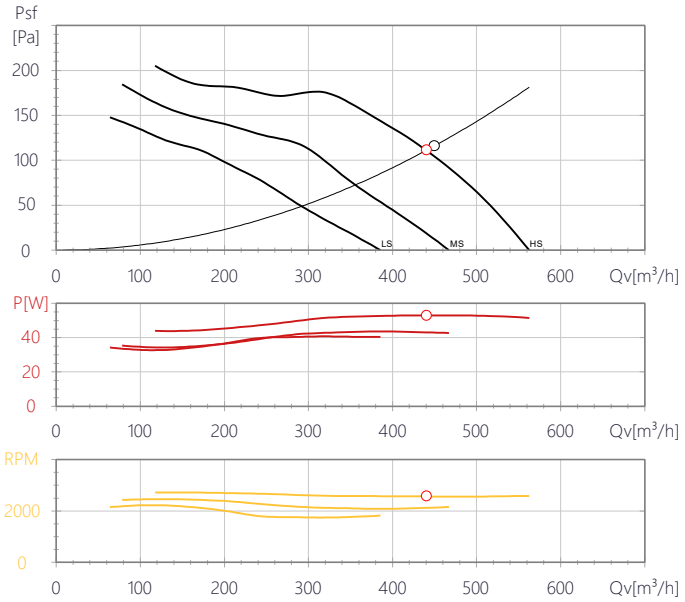
Construction

Discharge diameter	160 mm
Fan size	160
Weight	2,97 kg

Motor Characteristics

Number of poles	2
Voltage	1-230V-50Hz
Maximum absorbed current	0,2 A
IP Rating	IP44
Motor insulation class	B

Performance Chart



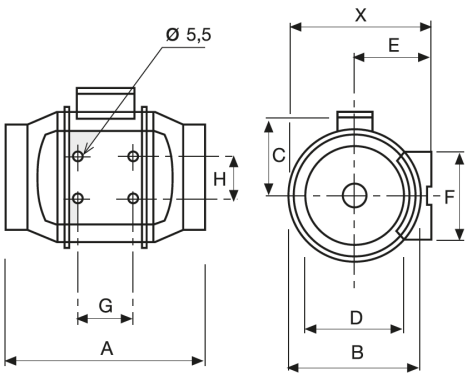
Sound Performance

	63	125	250	500	1k	2k	4k	8k	Overall
Inlet (LwA)	25	36	50	55	59	58	51	42	63
Inlet LpA @ 1,5m	10	22	36	41	44	44	37	28	49
Outlet (LwA)	32	36	51	57	60	58	51	42	64
Outlet LpA @ 1,5m	17	22	37	43	46	44	37	28	50
Surrounding (LwA)	18	31	45	43	49	49	38	26	54
Surrounding LpA @ 1,5m	3	16	31	29	34	35	23	12	39

TD-MIXVENT

5211301300 - TD-500/160 3V (220-240V 50/60) N8 - IN-LINE DUCT FANS

Drawing



X	A	B	C	D	E	F	G	H
212	295	200	127	157	112	130	80	60

TD-MIXVENT

5211301300 - TD-500/160 3V (220-240V 50/60) N8 - IN-LINE DUCT FANS

ErP Data

Ecodesign	
Commission regulation (EU) N°1253/2014 of July 2014	
Information requirements (Annex V)	
Product description	TD-500/160 3V (220-240V 50/60) N8
Manufacturer's Info	S&P
Identifier	-
Typology	NRVU unidirectional
Drive	3-speed
Type of HRC	None
Thermal efficiency (%)	NA
Qnom (m3/s)	0,09
Pelec (kW)	0,05
SFPint (W/m3/s)	NA
Face velocity (m/s)	3,6
Δps,ext (Pa)	168,3
Δps,int (Pa)	NA
Δps,add (Pa)	NA
Static efficiency fans (%)	30,4
External leakage rate (%)	5
Internal leakage rate (%)	NA
Filter performance	NA
Filter warning	NA
LWA dB(A)	54
https://www.solerpalau.com/	

Warnings

The absorbed current may vary slightly depending on the motor installed

This dimensional drawing may not match with the selected product, especially in the discharge orientation

TD-MIXVENT

5211304500 - TD-800/200 N 3V (220-240V 50/60) N8 - IN-LINE DUCT FANS

Range of low profile in-line mixed flow duct fans manufactured in tough reinforced plastic (from 160 to 200 models) or in galvanised steel sheet protected with anti-corrosive epoxy-polyester paint (from 4000 and 6000 models).
The unique design of the support bracket allows the motor and impeller assembly to be fitted or removed without dismantling the adjacent ducting.

Motors
Models 160 to 2000:
IP44, Class B, with permanently lubricated ball bearings and thermal protector.
Supply voltage:
2-speed single-phase, 230V-50Hz (models 160 to 350)
3-speed single-phase, 230V-50/60Hz (models 500 to 2000)
Speed controlable by tension.

Models 4000 to 6000:
IP44, Class B, with permanently lubricated ball bearings and thermal protector.
Supply voltage:
Single-phase 1-speed 230V-50/60Hz, Speed controlable by tension.
Brand S&P model TD-800/200 N 3V (220-240V 50/60) N8 for an airflow 710 m^3/h and static pressure 122 Pa.

Theoretical Working Point

Airflow	630 m^3/h
Static Pressure	96 Pa
Temperature	20 °C
Altitude	0 m
Density	1,2 kg/m^3
Frequency	50 Hz

Working Point

Airflow	710 m^3/h
Static Pressure	122 Pa
Dynamic pressure	23,8 Pa
Total Pressure	146 Pa
Input power	0,100 kW
Outlet speed	6,3 m/s
Fan speed	2228 rpm
Specific Fan Power	0,51 W/l/s
Specific Fan Power reg	0,42 W/l/s

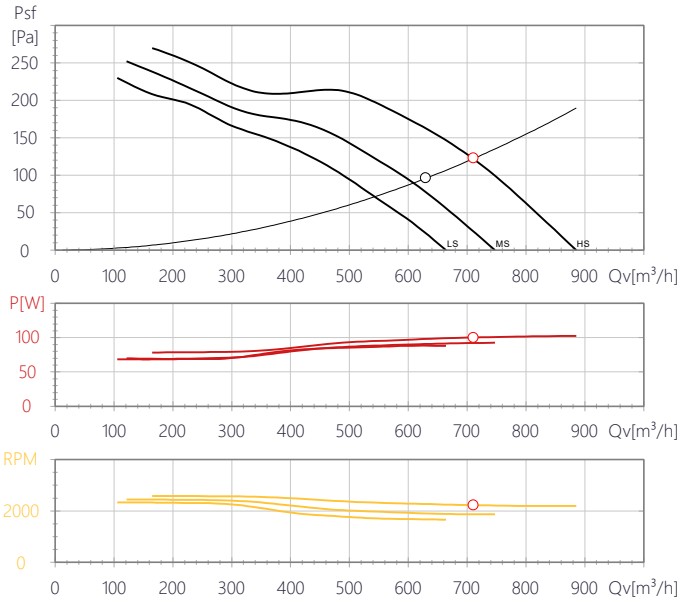
Construction

Discharge diameter	200 mm
Fan size	200
Weight	4,50 kg

Motor Characteristics

Number of poles	2
Voltage	1-230V-50Hz
Maximum absorbed current	0,5 A
IP Rating	IP44
Motor insulation class	B

Performance Chart



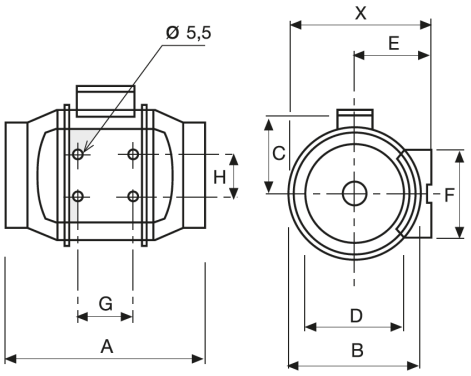
Sound Performance

	63	125	250	500	1k	2k	4k	8k	Overall
Inlet (LwA)	25	39	50	57	61	63	57	48	67
Inlet LpA @ 1,5m	10	25	35	42	46	49	43	34	52
Outlet (LwA)	37	40	51	59	65	64	58	49	69
Outlet LpA @ 1,5m	23	25	36	45	51	49	44	35	54
Surrounding (LwA)	18	35	42	42	49	51	40	28	54
Surrounding LpA @ 1,5m	3	21	28	28	34	36	26	14	39

TD-MIXVENT

5211304500 - TD-800/200 N 3V (220-240V 50/60) N8 - IN-LINE DUCT FANS

Drawing



X	A	B	C	D	E	F	G	H
232.5	302	217	141	198	124	140	100	94

TD-MIXVENT

5211304500 - TD-800/200 N 3V (220-240V 50/60) N8 - IN-LINE DUCT FANS

ErP Data

Ecodesign	
Commission regulation (EU) N°1253/2014 of July 2014	
Information requirements (Annex V)	
Product description	TD-800/200 N 3V (220-240V 50/60) N8
Manufacturer's Info	S&P
Identifier	-
Typology	NRVU unidirectional
Drive	3-speed
Type of HRC	None
Thermal efficiency (%)	NA
Qnom (m3/s)	0,15
Pelec (kW)	0,09
SFPint (W/m3/s)	NA
Face velocity (m/s)	4,5
Δps,ext (Pa)	204,2
Δps,int (Pa)	NA
Δps,add (Pa)	NA
Static efficiency fans (%)	31,5
External leakage rate (%)	5
Internal leakage rate (%)	NA
Filter performance	NA
Filter warning	NA
LWA dB(A)	57
https://www.solerpalau.com/	

Warnings

The absorbed current may vary slightly depending on the motor installed

This dimensional drawing may not match with the selected product, especially in the discharge orientation

THT-63-4T-1.5-F-400 IE3

Ref.: Komunalno Žabljak

400°C/2h and 300°C/2h tubular axial extract fans with short casings

Tubular axial extract fans with short casing for immersed operation in fire risk zones.

Fan:
• Tubular casing in sheet steel.
• Variable angle impeller made of cast aluminium.
• Approved in accordance with standard EN 12101-3, with certifications no.: 0370-CPR-0305 (F400) and 0370-CPR-0973 (F300).
• Airflow direction from motor to impeller.

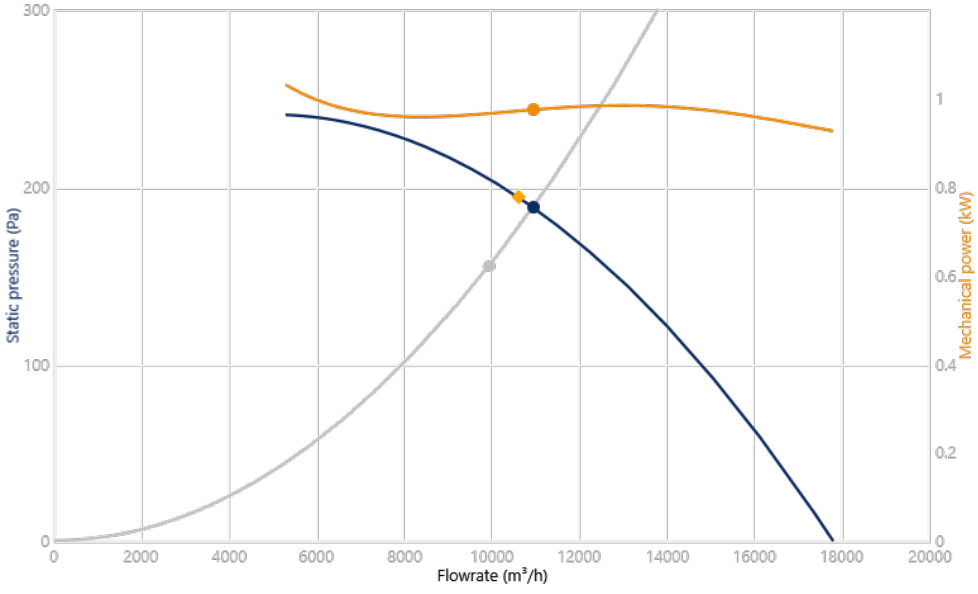
Motor:
• Class H motors for S1 continuous operation and S2 emergency use. With ball bearings, IP55 protection and 1 or 2 speeds, depending on model.
• Motors with IE3 efficiency for powers equal to or greater than 0.75 kW, except single-phase, 2-speed and 8-pole.
• Three-phase 230/400 V 50 Hz (up to 3 kW) and 400/690 V 50 Hz (powers greater than 3 kW).
• Maximum temperature of air to be carried: S1 -20 ºC +40 ºC continuous service, also suitable for warm climates with temperatures up to 50 ºC. S2 operation, 300 ºC/2h, 400 ºC/2h.

Finish:
• Anti-corrosive finish in polyester resin, polymerised at 190 ºC, after degreasing with phosphate-free nanotechnology treatment.

Available versions:
• THT/CL: tubular axial fans with long casing equipped with inspection hatch.

On request:
• Airflow direction from impeller to motor.
• 100% reversible impellers.

CHARACTERISTIC CURVE AND ACOUSTICS AT 20ºC 0MASL 1.2KG/M³



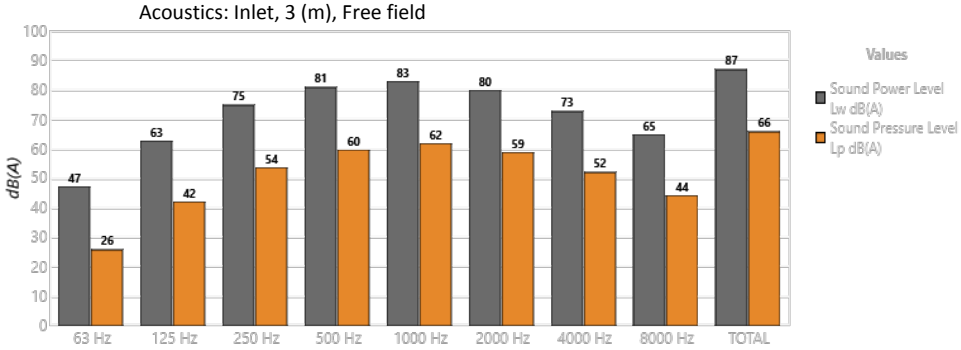
Design Point

Q (m³/h)	9931
Ps (Pa)	155

Service Point (SP)

Q (m³/h)	10944
Ps (Pa)	188.2
Pd (Pa)	57.05
Pt (Pa)	245.3
Impeller (rpm)	1420
Blade Inclination (º)	20
Max. Temp. (ºC)	40
Outlet air speed (m/s)	9.752
Efficiency (%)	76.6
SFP (kW/m³/s)	0.3812
Mechanical power (kW)	0.9734

Acoustics: Inlet, 3 (m), Free field



Band	Lw dB(A)	Lp dB(A)
63 Hz	47	26
125 Hz	63	42
250 Hz	75	54
500 Hz	81	60
1000 Hz	83	62
2000 Hz	80	59
4000 Hz	73	52
8000 Hz	65	44
TOTAL	87	66

TECHNICAL CHARACTERISTICS

Airflow maximum (m³/h)	17796
Speed (rpm)	1420
Maximum static pressure (Pa)	240.6
Maximum total pressure (Pa)	258

ERP

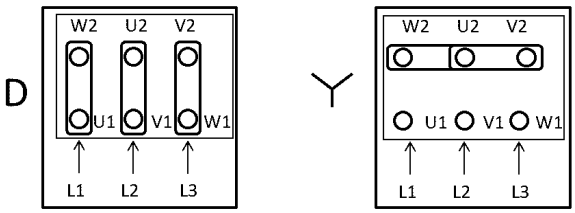
Efficiency	49.5%
Efficiency grade N	55.4
Measurement category	C
Efficiency category	Static
Specific ratio	1.00
Flowrate (m³/h)	10625

Pressure (Pa)	194
Input power (kW)	1.156
Speed (rpm)	1442
Variable speed drive	VSD not necessary
ErP compliance	2015

🔸 **Data established at point of optimum efficiency**

MOTOR DATA

Rated Mechanical Power (kW)	1.1
Hz/phases	50/3
Motor (rpm)	1430
Poles	4P
Max. current (A) 380-400 V Y	2.37
Max. current (A) 220-240 V D	4.1
Motor protection	IP55
Motor class	F400
Motor frame size	90S



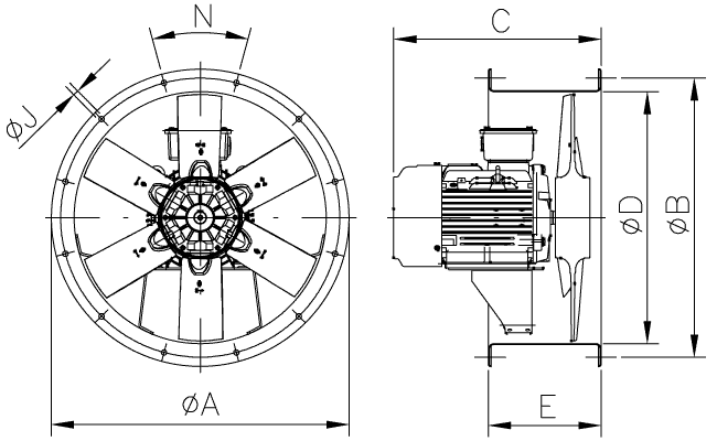
Data can change, please check motor plate

DIMENSIONS

ØA	ØB	C	ØD	E	ØJ	N
730	690	429	640	250	12	12x30º

Dimensions without explicitly defined units are shown in millimeters (mm). Dimensions depending on the motor are approximate

Approx. weight (kg)	45



AVAILABLE ACCESSORIES

INT-KG-20/3CA

IAT

CABLE BOX

C2V

VSD3/A-RFT-2

VSD1/A-RFM-2

VSD3/A-RFT-2-IP66

VSD1/A-RFM-2-IP66

AET

P-400

RT-63

R/THT-63

BTUB

BAC-630

PS-56/63

ACE/400-630

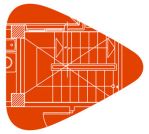
S

CENTRAL CO

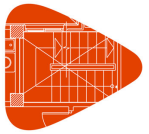
SC

It must be checked that the accessory is suitable for the fan model

Pad pritiska GARAŽA



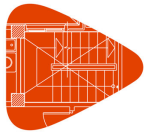
Project:
Location:
Developer:



Project:
Location:
Developer:

Reference	Type	Flow [m³/h]	Diameter equivalent round [mm]	Dimensions [mm]		Velocity [m/s]	Length [m]	Loss of linear pressure [Pa/m]	Total loss of pressure [Pa]	Loss of accumulated pressure [Pa]	Material
				Width	Height						
Duct span: 1 - 35											
1	Straight span	9900	1183.0	1500.0	800.0	2.29	0.09	0.05	0	129	Galvanized steel plate
1500x800	Element with localised pressure loss	9900	-	-	-	-	-	-	-	129	-
2	Straight span	9900	1183.0	1500.0	800.0	2.29	0.60	0.05	0	77	Galvanized steel plate
3	Transition ED4-2	9900	-	-	-	8.82	-	-	29	77	Galvanized steel plate
4	Straight span	9900	630.0	-	-	8.82	0.36	1.14	0	48	Galvanized steel plate
5	Transition ER4-3	9900	-	-	-	5.09	-	-	4	47	Galvanized steel plate
6	Straight span	9900	799.2	900.0	600.0	5.09	0.15	0.35	0	44	Galvanized steel plate
7	Split ER5-3	8100		-	-	4.17	-	-	3	44	Galvanized steel plate
8	Straight span	8100	799.2	900.0	600.0	4.17	0.54	0.24	0	40	Galvanized steel plate
9	Split ER5-3	6300	-	-	-	3.24	-	-	3	40	Galvanized steel plate
10	Straight span	6300	799.2	900.0	600.0	3.24	1.04	0.15	0	37	Galvanized steel plate
11	Split ER5-3	5850	-	-	-	3.01	-	-	0	37	Galvanized steel plate
12	Straight span	5850	799.2	900.0	600.0	3.01	0.21	0.13	0	36	Galvanized steel plate
13	Split ER5-3	4950	-	-	-	2.55	-	-	1	36	Galvanized steel plate
14	Straight span	4950	799.2	900.0	600.0	2.55	0.46	0.10	0	35	Galvanized steel plate
15	Transition ER4-2	4950	-	-	-	3.44	-	-	1	35	Galvanized steel plate
16	Straight span	4950	686.7	800.0	500.0	3.44	2.56	0.20	1	34	Galvanized steel plate
17	Split ER5-3	3150		-	-	2.19	-	-	3	34	Galvanized steel plate
18	Straight span	3150	686.7	800.0	500.0	2.19	0.09	0.09	0	31	Galvanized steel plate
19	Split ER5-3	1800	-	-	-	4.17	-	-	8	31	Galvanized steel plate
20	Straight span	1800	365.3	600.0	200.0	4.17	2.31	0.70	2	23	Galvanized steel plate
21	Split ER5-3	1350	-	-	-	3.13	-	-	3	21	Galvanized steel plate
22	Straight span	1350	365.3	600.0	200.0	3.13	0.20	0.42	0	18	Galvanized steel plate
23	Transition ER4-1	1350	-	-	-	3.75	-	-	1	18	Galvanized steel plate
24	Straight span	1350	337.0	500.0	200.0	3.75	0.35	0.61	0	17	Galvanized steel plate
25	Straight span	1350	337.0	500.0	200.0	3.75	0.91	0.61	1	17	Galvanized steel plate
26	Straight span	900	337.0	500.0	200.0	2.50	0.09	0.30	0	17	Galvanized steel plate
27	Transition ER4-1	900	-	-	-	3.57	-	-	1	17	Galvanized steel plate
28	Straight span	900	286.4	350.0	200.0	3.57	2.28	0.65	1	15	Galvanized steel plate
29	Straight span	450	218.6	200.0	200.0	3.13	0.60	0.69	0	14	Galvanized steel plate
30	Straight span	450	218.6	200.0	200.0	3.13	0.84	0.69	1	13	Galvanized steel plate
31	Straight span	450	218.6	200.0	200.0	3.13	0.17	0.69	0	13	Galvanized steel plate
32	Elbow CR3-1	450	-	-	-	3.13	-	-	1	13	Galvanized steel plate
33	Straight span	450	218.6	200.0	200.0	3.13	8.16	0.69	6	11	Galvanized steel plate
34	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
35	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 28 - 40											
28	Straight span	900	286.4	350.0	200.0	3.57	2.28	0.65	1	15	Galvanized steel plate
36	Straight span	450	218.6	200.0	200.0	3.13	1.24	0.69	1	14	Galvanized steel plate
37	Elbow CR3-1	450	-	-	-	3.13	-	-	1	13	Galvanized steel plate
38	Straight span	450	218.6	200.0	200.0	3.13	8.14	0.69	6	12	Galvanized steel plate
39	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
40	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 25 - 41											
25	Straight span	1350	337.0	500.0	200.0	3.75	0.91	0.61	1	17	Galvanized steel plate
41	Exhaust	450	-	-	-	-	-	-	5	17	-
Duct span: 21 - 45											
21	Split ER5-3	450	-	-	-	3.13	-	-	-13	-5	Galvanized steel plate
42	Straight span	450	218.6	200.0	200.0	3.13	0.09	0.69	0	8	Galvanized steel plate
43	Straight span	450	218.6	200.0	200.0	3.13	3.96	0.69	3	8	Galvanized steel plate
44	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
45	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 19 - 57											
19	Split ER5-3	1350	-	-	-	0.94	-	-	2	19	Galvanized steel plate
46	Straight span	1350	686.7	800.0	500.0	0.94	0.19	0.02	0	17	Galvanized steel plate
47	Transition ER4-2	1350	-	-	-	2.34	-	-	1	17	Galvanized steel plate
48	Straight span	1350	437.3	400.0	400.0	2.34	1.73	0.17	0	15	Galvanized steel plate
49	Straight span	900	286.4	350.0	200.0	3.57	2.50	0.65	2	15	Galvanized steel plate
50	Transition ER4-1	450	-	-	-	3.13	-	-	2	13	Galvanized steel plate
51	Straight span	450	218.6	200.0	200.0	3.13	0.75	0.69	1	12	Galvanized steel plate
52	Elbow CR3-1	450	-	-	-	3.13	-	-	1	11	Galvanized steel plate
53	Straight span	450	218.6	200.0	200.0	3.13	0.26	0.69	0	10	Galvanized steel plate
54	Straight span	450	218.6	200.0	200.0	3.13	0.80	0.69	1	10	Galvanized steel plate
55	Straight span	450	218.6	200.0	200.0	3.13	5.22	0.69	4	9	Galvanized steel plate

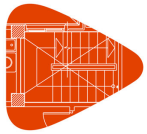
56	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
57	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 49 - 58											
49	Straight span	900	286.4	350.0	200.0	3.57	2.50	0.65	2	15	Galvanized steel plate
58	Exhaust	450	-	-	-	-	-	-	5	13	-
Duct span: 48 - 65											
48	Straight span	1350	437.3	400.0	400.0	2.34	1.73	0.17	0	15	Galvanized steel plate
59	Straight span	450	286.4	350.0	200.0	1.79	2.29	0.19	0	15	Galvanized steel plate
60	Transition ER4-1	450	-	-	-	3.13	-	-	2	15	Galvanized steel plate
61	Straight span	450	218.6	200.0	200.0	3.13	0.98	0.69	1	13	Galvanized steel plate
62	Elbow CR3-1	450	-	-	-	3.13	-	-	1	12	Galvanized steel plate
63	Straight span	450	218.6	200.0	200.0	3.13	6.50	0.69	4	11	Galvanized steel plate
64	Transition ER4-2	450	-	-	-	1.74	-	-	1	7	Galvanized steel plate
65	Exhaust	450	-	-	-	-	-	-	5	6	-
Duct span: 17 - 76											
17	Split ER5-3	1800	-	-	-	4.17	-	-	0	21	Galvanized steel plate
66	Straight span	1800	365.3	600.0	200.0	4.17	1.96	0.70	1	21	Galvanized steel plate
67	Split ER5-3	1350	-	-	-	3.13	-	-	3	19	Galvanized steel plate
68	Straight span	1350	365.3	600.0	200.0	3.13	0.49	0.42	0	16	Galvanized steel plate
69	Transition ER4-1	1350	-	-	-	3.75	-	-	1	16	Galvanized steel plate
70	Straight span	1350	337.0	500.0	200.0	3.75	1.58	0.61	1	15	Galvanized steel plate
71	Transition ER4-1	900	-	-	-	3.57	-	-	1	14	Galvanized steel plate
72	Straight span	900	286.4	350.0	200.0	3.57	1.72	0.65	1	13	Galvanized steel plate
73	Straight span	450	218.6	200.0	200.0	3.13	1.66	0.69	1	11	Galvanized steel plate
74	Elbow CR3-1	450	-	-	-	3.13	-	-	1	10	Galvanized steel plate
75	Straight span	450	218.6	200.0	200.0	3.13	5.92	0.69	4	9	Galvanized steel plate
76	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 72 - 78											
72	Straight span	900	286.4	350.0	200.0	3.57	1.72	0.65	1	13	Galvanized steel plate
77	Straight span	450	218.6	200.0	200.0	3.13	4.82	0.69	3	11	Galvanized steel plate
78	Exhaust	450	-	-	-	-	-	-	5	8	-
Duct span: 70 - 79											
70	Straight span	1350	337.0	500.0	200.0	3.75	1.58	0.61	1	15	Galvanized steel plate
79	Exhaust	450	-	-	-	-	-	-	5	14	-
Duct span: 67 - 81											
67	Split ER5-3	450	-	-	-	3.13	-	-	-13	-6	Galvanized steel plate
80	Straight span	450	218.6	200.0	200.0	3.13	2.83	0.69	2	7	Galvanized steel plate
81	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 13 - 91											
13	Split ER5-3	900	-	-	-	3.57	-	-	-84	-72	Galvanized steel plate
82	Straight span	900	286.4	350.0	200.0	3.57	0.86	0.65	1	12	Galvanized steel plate
83	Straight span	900	286.4	350.0	200.0	3.57	0.88	0.65	1	11	Galvanized steel plate
84	Straight span	450	286.4	350.0	200.0	1.79	0.13	0.19	0	10	Galvanized steel plate
85	Straight span	450	286.4	350.0	200.0	1.79	0.14	0.19	0	10	Galvanized steel plate
86	Transition ER4-1	450	-	-	-	3.13	-	-	2	10	Galvanized steel plate
87	Straight span	450	218.6	200.0	200.0	3.13	0.51	0.69	0	9	Galvanized steel plate
88	Elbow CR3-1	450	-	-	-	3.13	-	-	1	8	Galvanized steel plate
89	Straight span	450	218.6	200.0	200.0	3.13	1.00	0.69	1	7	Galvanized steel plate
90	Straight span	450	218.6	200.0	200.0	3.13	2.22	0.69	2	7	Galvanized steel plate
91	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 83 - 92											
83	Straight span	900	286.4	350.0	200.0	3.57	0.88	0.65	1	11	Galvanized steel plate
92	Exhaust	450	-	-	-	-	-	-	5	10	-
Duct span: 11 - 99											
11	Split ER5-3	450	-	-	-	1.79	-	-	-37	-26	Galvanized steel plate
93	Straight span	450	286.4	350.0	200.0	1.79	0.70	0.19	0	11	Galvanized steel plate
94	Straight span	450	286.4	350.0	200.0	1.79	3.36	0.19	1	11	Galvanized steel plate
95	Elbow CR3-1	450	-	-	-	1.79	-	-	0	10	Galvanized steel plate
96	Transition ER4-1	450	-	-	-	3.13	-	-	2	10	Galvanized steel plate
97	Straight span	450	218.6	200.0	200.0	3.13	3.54	0.69	2	8	Galvanized steel plate
98	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
99	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 9 - 112											
9	Split ER5-3	1800	-	-	-	4.17	-	-	-32	-13	Galvanized steel plate
100	Straight span	1800	365.3	600.0	200.0	4.17	1.76	0.70	1	19	Galvanized steel plate
101	Split ER5-3	1350		-	-	3.13	-	-	3	18	Galvanized steel plate
102	Straight span	1350	365.3	600.0	200.0	3.13	0.64	0.42	0	15	Galvanized steel plate
103	Transition ER4-1	1350	-	-	-	3.75	-	-	1	14	Galvanized steel plate



Project:
Location:
Developer:

104	Straight span	1350	337.0	500.0	200.0	3.75	0.85	0.61	1	14	Galvanized steel plate
105	Straight span	900	337.0	500.0	200.0	2.50	0.18	0.30	0	13	Galvanized steel plate
106	Straight span	900	337.0	500.0	200.0	2.50	0.39	0.30	0	13	Galvanized steel plate
107	Transition ER4-1	900	-	-	-	3.57	-	-	1	13	Galvanized steel plate
108	Straight span	900	286.4	350.0	200.0	3.57	2.22	0.65	1	12	Galvanized steel plate
109	Straight span	450	218.6	200.0	200.0	3.13	0.98	0.69	1	10	Galvanized steel plate
110	Straight span	450	218.6	200.0	200.0	3.13	5.47	0.69	4	9	Galvanized steel plate
111	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
112	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 108 - 115											
108	Straight span	900	286.4	350.0	200.0	3.57	2.22	0.65	1	12	Galvanized steel plate
113	Straight span	450	218.6	200.0	200.0	3.13	4.06	0.69	3	10	Galvanized steel plate
114	Transition ER4-2	450	-	-	-	1.74	-	-	1	7	Galvanized steel plate
115	Exhaust	450	-	-	-	-	-	-	5	7	-
Duct span: 104 - 116											
104	Straight span	1350	337.0	500.0	200.0	3.75	0.85	0.61	1	14	Galvanized steel plate
116	Exhaust	450	-	-	-	-	-	-	5	13	-
Duct span: 101 - 118											
101	Split ER5-3	450	-	-	-	3.13	-	-	-13	-5	Galvanized steel plate
117	Straight span	450	218.6	200.0	200.0	3.13	5.04	0.69	3	8	Galvanized steel plate
118	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 7 - 129											
7	Split ER5-3	1800	-	-	-	4.17	-	-	-69	-48	Galvanized steel plate
119	Straight span	1800	365.3	600.0	200.0	4.17	2.17	0.70	2	20	Galvanized steel plate
120	Split ER5-3	1350	-	-	-	3.13	-	-	3	19	Galvanized steel plate
121	Straight span	1350	365.3	600.0	200.0	3.13	0.38	0.42	0	15	Galvanized steel plate
122	Transition ER4-1	1350	-	-	-	3.75	-	-	1	15	Galvanized steel plate
123	Straight span	1350	337.0	500.0	200.0	3.75	1.51	0.61	1	15	Galvanized steel plate
124	Transition ER4-1	900	-	-	-	3.57	-	-	1	14	Galvanized steel plate
125	Straight span	900	286.4	350.0	200.0	3.57	1.58	0.65	1	12	Galvanized steel plate
126	Straight span	450	218.6	200.0	200.0	3.13	1.40	0.69	1	11	Galvanized steel plate
127	Elbow CR3-1	450	-	-	-	3.13	-	-	1	10	Galvanized steel plate
128	Straight span	450	218.6	200.0	200.0	3.13	5.93	0.69	4	9	Galvanized steel plate
129	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 125 - 133											
125	Straight span	900	286.4	350.0	200.0	3.57	1.58	0.65	1	12	Galvanized steel plate
130	Straight span	450	218.6	200.0	200.0	3.13	1.05	0.69	1	11	Galvanized steel plate
131	Elbow CR3-1	450	-	-	-	3.13	-	-	1	11	Galvanized steel plate
132	Straight span	450	218.6	200.0	200.0	3.13	6.10	0.69	4	9	Galvanized steel plate
133	Exhaust	450	-	-	-	-	-	-	5	5	-
Duct span: 123 - 134											
123	Straight span	1350	337.0	500.0	200.0	3.75	1.51	0.61	1	15	Galvanized steel plate
134	Exhaust	450	-	-	-	-	-	-	5	14	-
Duct span: 120 - 137											
120	Split ER5-3	450	-	-	-	3.13	-	-	-13	-2	Galvanized steel plate
135	Straight span	450	218.6	200.0	200.0	3.13	7.55	0.69	5	11	Galvanized steel plate
136	Transition ER4-2	450	-	-	-	1.74	-	-	1	6	Galvanized steel plate
137	Exhaust	450	-	-	-	-	-	-	5	5	-

Pad pritiska TAMPON ZONA

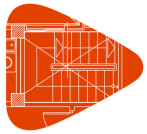


Project:
Location:
Developer:

Reference	Type	Flow [m³/h]	Diameter equivalent round [mm]	Dimensions [mm]		Velocity [m/s]	Length [m]	Loss of linear pressure [Pa/m]	Total loss of pressure [Pa]	Loss of accumulated pressure [Pa]	Material
				Width	Height						
Duct span: 1 - 12											
1	Straight span	5100	625.8	1000.0	350.0	4.05	0.24	0.34	0	60	Galvanized steel plate
WLA-11-NI-1200-700	Element with localised pressure loss	5100	-	-	-	-	-	-	-	60	-
2	Straight span	5100	625.8	1000.0	350.0	4.05	0.39	0.34	0	46	Galvanized steel plate
3	Transition SR4-2	5100	-	-	-	5.06	-	-	1	46	Galvanized steel plate
4	Straight span	5100	572.9	700.0	400.0	5.06	0.58	0.52	0	46	Galvanized steel plate
Lokalni otpor	Element with localised pressure loss	5100	-	-	-	-	-	-	-	45	-
5	Straight span	5100	572.9	700.0	400.0	5.06	0.58	0.52	0	15	Galvanized steel plate
6	Transition SR4-2	5100	-	-	-	4.05	-	-	3	15	Galvanized steel plate
7	Straight span	5100	625.8	1000.0	350.0	4.05	1.13	0.34	0	12	Galvanized steel plate
8	Elbow CR3-1	5100	-	-	-	4.05	-	-	3	11	Galvanized steel plate
9	Straight span	5100	625.8	1000.0	350.0	4.05	2.05	0.34	1	9	Galvanized steel plate
10	Elbow CR3-1	5100	-	-	-	4.05	-	-	3	8	Galvanized steel plate
11	Straight span	5100	625.8	1000.0	350.0	4.05	1.64	0.34	1	6	Galvanized steel plate
12	Supply	5100	-	-	-	-	-	-	5	5	-

Soler&Palau Ventilation Group

Pad pritiska WC SUTEREN

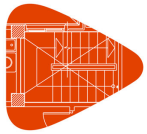


Project:
Location:
Developer:

Reference	Type	Flow [m³/h]	Diameter equivalent round [mm]	Dimensions [mm]		Velocity [m/s]	Length [m]	Loss of linear pressure [Pa/m]	Total loss of pressure [Pa]	Loss of accumulated pressure [Pa]	Material
				Width	Height						
Duct span: 1 - 9											
1	Straight span	100	125.0	-	-	2.26	0.22	0.69	0	74	Galvanized steel plate
AOV 60Pa	Element with localised pressure loss	100	-	-	-	-	-	-	-	74	-
2	Straight span	100	125.0	-	-	2.26	2.87	0.69	2	14	Galvanized steel plate
3	Elbow CD3-1, 3	100	-	-	-	2.26	-	-	0	12	Galvanized steel plate
4	Straight span	100	125.0	-	-	2.26	4.43	0.69	3	11	Galvanized steel plate
5	Elbow CD3-1, 3	100	-	-	-	2.26	-	-	0	8	Galvanized steel plate
6	Straight span	100	125.0	-	-	2.26	2.79	0.69	2	8	Galvanized steel plate
7	Elbow CD3-1, 3	100	-	-	-	2.26	-	-	0	6	Galvanized steel plate
8	Straight span	100	125.0	-	-	2.26	0.57	0.69	0	5	Galvanized steel plate
9	Weather grille	100	-	-	-	-	-	-	5	5	-

Soler&Palau Ventilation

Pad pritiska SANITRNA VENT. PRIZEMLJE



Project:

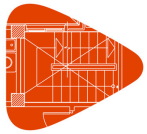
Location:

Developer:

Reference	Type	Flow [m³/h]	Diameter equivalent round [mm]	Dimensions [mm]		Velocity [m/s]	Length [m]	Loss of linear pressure [Pa/m]	Total loss of pressure [Pa]	Loss of accumulated pressure [Pa]	Material
				Width	Height						
Duct span: 1 - 3											
1	Straight span	80	125.0	-	-	1.81	3.45	0.47	2	52	Galvanized steel plate
2	Transition ER4-3	80	-	-	-	2.22	-	-	0	50	Galvanized steel plate
3	Exhaust	80	-	-	-	-	-	-	50	50	-

Reference	Type	Flow [m³/h]	Diameter equivalent round [mm]	Dimensions [mm]		Velocity [m/s]	Length [m]	Loss of linear pressure [Pa/m]	Total loss of pressure [Pa]	Loss of accumulated pressure [Pa]	Material
				Width	Height						
Duct span: 4 - 12											
4	Straight span	550	228.5	300.0	150.0	3.40	0.15	0.80	0	80	Galvanized steel plate
wla-11-n-400x300	Element with localised pressure loss	550	-	-	-	-	-	-	-	79	-
5	Straight span	550	228.5	300.0	150.0	3.40	1.37	0.80	1	57	Galvanized steel plate
6	Elbow CR3-1	550	-	-	-	3.40	-	-	2	56	Galvanized steel plate
7	Straight span	550	228.5	300.0	150.0	3.40	1.13	0.80	1	55	Galvanized steel plate
8	Transition ER4-1	550	-	-	-	5.09	-	-	2	54	Galvanized steel plate
9	Straight span	550	188.9	200.0	150.0	5.09	0.45	2.03	1	51	Galvanized steel plate
10	Straight span	150	160.0	-	-	2.07	1.02	0.44	0	50	Galvanized steel plate
11	Transition ER4-3	150	-	-	-	1.63	-	-	0	50	Galvanized steel plate
12	Exhaust	150	-	-	-	-	-	-	50	50	-
Duct span: 9 - 16											
9	Straight span	550	188.9	200.0	150.0	5.09	0.45	2.03	1	51	Galvanized steel plate
13	Straight span	400	188.9	200.0	150.0	3.70	3.65	1.14	4	50	Galvanized steel plate
14	Elbow CR3-1	400	-	-	-	3.70	-	-	2	46	Galvanized steel plate
15	Straight span	400	188.9	200.0	150.0	3.70	0.58	1.14	1	44	Galvanized steel plate
16	Exhaust	400	-	-	-	-	-	-	7	44	-

Ventilacija sanitarnih prostorija na spratu



Project:

Location:

Developer:

Reference	Type	Flow [m³/h]	Diameter equivalent round [mm]	Dimensions [mm]		Velocity [m/s]	Length [m]	Loss of linear pressure [Pa/m]	Total loss of pressure [Pa]	Loss of accumulated pressure [Pa]	Material
				Width	Height						
Duct span: 1 - 14											
1	Straight span	450	200.0	-	-	3.98	0.08	1.07	0	96	Galvanized steel plate
WLA-11-N-500-200	Element with localised pressure loss	450	-	-	-	-	-	-	-	96	-
2	Straight span	450	200.0	-	-	3.98	0.59	1.07	1	85	Galvanized steel plate
3	Elbow CD3-1, 3	450	-	-	-	3.98	-	-	1	84	Galvanized steel plate
4	Straight span	450	200.0	-	-	3.98	6.76	1.07	7	83	Galvanized steel plate
5	Elbow CD3-1, 3	450	-	-	-	3.98	-	-	1	76	Galvanized steel plate
6	Straight span	450	200.0	-	-	3.98	1.19	1.07	1	75	Galvanized steel plate
7	Transition ED4-1	450	-	-	-	6.22	-	-	2	73	Galvanized steel plate
8	Straight span	450	160.0	-	-	6.22	0.22	3.19	1	71	Galvanized steel plate
9	Straight span	290	160.0	-	-	4.01	4.17	1.43	6	71	Galvanized steel plate
10	Transition ED4-1	290	-	-	-	6.56	-	-	2	65	Galvanized steel plate
11	Straight span	290	125.0	-	-	6.56	0.33	4.80	2	63	Galvanized steel plate
12	Straight span	130	125.0	-	-	2.94	0.84	1.11	1	61	Galvanized steel plate
13	Transition ER4-3	130	-	-	-	2.31	-	-	0	60	Galvanized steel plate
14	Exhaust	130	-	-	-	-	-	-	60	60	-
Duct span: 11 - 21											
11	Straight span	290	125.0	-	-	6.56	0.33	4.80	2	63	Galvanized steel plate
15	Straight span	160	125.0	-	-	3.62	3.75	1.62	6	61	Galvanized steel plate
16	Elbow CD3-1, 3	160	-	-	-	3.62	-	-	1	55	Galvanized steel plate
17	Straight span	160	125.0	-	-	3.62	0.57	1.62	1	54	Galvanized steel plate
18	Straight span	160	125.0	-	-	3.62	0.26	1.62	0	53	Galvanized steel plate
19	Straight span	80	125.0	-	-	1.81	0.96	0.47	0	52	Galvanized steel plate
20	Transition ER4-3	80	-	-	-	2.22	-	-	0	52	Galvanized steel plate
21	Exhaust	80	-	-	-	-	-	-	50	52	-
Duct span: 18 - 24											
18	Straight span	160	125.0	-	-	3.62	0.26	1.62	0	51	Galvanized steel plate
22	Straight span	80	125.0	-	-	1.81	0.69	0.47	0	51	Galvanized steel plate
23	Transition ER4-3	80	-	-	-	2.22	-	-	0	50	Galvanized steel plate
24	Exhaust	80	-	-	-	-	-	-	50	50	-
Duct span: 8 - 28											
8	Straight span	450	160.0	-	-	6.22	0.22	3.19	1	71	Galvanized steel plate
25	Straight span	160	125.0	-	-	3.62	0.98	1.62	2	71	Galvanized steel plate
26	Straight span	80	125.0	-	-	1.81	0.79	0.47	0	69	Galvanized steel plate
27	Transition ER4-3	80	-	-	-	2.22	-	-	0	69	Galvanized steel plate
28	Exhaust	80	-	-	-	-	-	-	50	69	-
Duct span: 25 - 29											
25	Straight span	160	125.0	-	-	3.62	0.98	1.62	2	52	Galvanized steel plate
29	Exhaust	80	-	-	-	-	-	-	50	51	-

ARK2/600x675/50Pa

Width	600
Height	675
Maximum differential pressure	50
Unit	Pa
Total amount	1

Input Data

Strategy: Given volume flow	
Volume flow q_v	5.400 m³/h

Results

Airflow velocity v	3.70 m/s
Free area A_{fr}	0.2837 m²
Number of blades n	2
Total differential pressure Δp_t	75 Pa
Weight m	21 kg

Description

Rectangular pressure relief dampers for the protection of internal spaces from differential pressures in excess of set maximum levels. Ready-to-install component which consists of a casing, blades with low-friction bearings, magnets, and travel stop and sealing parts.

AIR CONDITIONING PROPOSAL SHEET

Date: 13.09.2023.

LGE

Prepared by:

Customer/Contractor Information

Customer

Name :
Address :
City :
State/Province :
Country :
Phone Number :
Fax Number :
E-mail :

Contractor

Name :
Address :
City :
State/Province :
Country :
Phone Number :
Fax Number :
E-mail :

Contents

1. Abbreviations

2. Building Load Summary

3. Model Selection - Summary

4. System Model Selection - ODU

5. System Model Section - IDU

6. System Tree Diagram

7. System Schematic Diagram

8. System Cost Estimate

9. System Type Cost Estimate

10. Project Cost Estimate

11. Pipe Summary

Abbreviations

Abbreviations	Description
TC	Total Cooling Capacity
SC	Sensible Cooling Capacity
HC	Heating Capacity
Capacity Ratio(%)	Corrected Capacity / Room Load
PI	Power Input
IDU	Indoor Unit
ODU	Outdoor Unit
DBT	Dry Bulb Temperature
WBT	Wet Bulb Temperature
IAT	Indoor Air Temperature
OAT	Outdoor Air Temperature
EWT	Entering Water Temperature
LWT	Leaving Water Temperature
RH	Relative Humidity
OA	Outdoor Air
RA	Return Air
SA	Supply Air
EA	Exhaust Air
MCA	Minimum Circuit Ampere
MFA	Maximum Fuse Ampere
MOP	Maximum rating of Overcurrent Protective device
FLA	Full Load Ampere
RLA	Rated Load Ampere
EER	Energy Efficiency Ratio
COP	Coefficient of Performance
ESP	External Static Pressure
AFR	Air Flow Rate
EDT	Estimated Discharge Temperature
Qty	Quantity
Liq	Liquid
WxHxD	Width x Height x Depth
H / M / L	High / Middle / Low
CR	Combination Ratio
Freq.	Frequency
Volt	Voltage
CF(%)	Correction Factor (Total Cooling Capacity / Total Rated Cooling Capacity)

Building Load Summary

1. Project name:Project_20230913
2. Date:13.09.2023.
3. Location :Nation(TITOGRAD, Montenegro), Altitude(33m)
4. Design conditions

		Cooling	Heating
OAT	DBT(°C)	32.0	-14.0
	WBT(°C)	23.6	-14.2
	RH(%)	50.0	90.0
IAT	DBT(°C)	25.0	21.0
	WBT(°C)	18.7	18.9
	RH(%)	55.1	82.0

5. Cooling and Heating Loads

Floor Name	Room Name	Cooling Load(kW)		Heating Load(kW)
		Total	Sensible	

Project_20230913(ver 1.8.13.14)

Project Model Selection Summary

Date: 13.09.2023.

1. Outdoor Units

Model Name	Quantity	Description
UUA1 UL0	1	
Total	1	

2. Indoor Units

Model Name	Quantity	Description
MJ12PC NSJ	1	
Total	1	

3. Pipes

Code	Diameter	Length(m)
P0	6.35 : 9.52	9.0

4. BD Unit (Distributor Box)

Model No.	Quantity

5. Accessories

Model Name	Quantity	Description

Project_20230913(ver 1.8.13.14)

Model Selection - Single (Commercial)1

System Name: Single (Commercial)1 **Date: 13.09.2023.**

System No : 1/1

1. Design Conditions

	Cooling			Heating		
	DBT(°C)	WBT(°C)	RH(%)	DBT(°C)	WBT(°C)	RH(%)
OAT	32.0	23.6	50.0	-14.0	-14.2	90.0
IAT	25.0	18.7	55.1	21.0	18.9	82.0

2. Outdoor

Model Name	Max. Indoors Allowed	Max. Total Overload(%)	Combination Ratio (%)	Additional Refrigerant(kg)
UUA1 UL0	1	12.0(100%)	1:1.00	0.03

Rated / Corrected Capa.(kW)		Rated / Corrected PI(kW)	
Cooling	Heating	Cooling	Heating
3.4/3.5	4.1/3.0	1.0/0.9	1.0/1.1

3. Indoors

Room	Room Load(kW)		Model Name	Type	Rated / Corrected TC(kW)			Capacity Ratio(%)	
	Cooling	Heating			Cooling	Heating	CF(%)	Cooling	Heating
Room	-	-	MJ12PC NSJ	Wall Mounted	3.5/3.5	4.0/3.0	99.1	-	-

#Notes: Correction factor is calculated using combination, temperature, and pipe length.

The result can be slightly different from Product Data Book due to simulation.

4. Pipes

Code	Diameter(Liq:Gas, mm)	Length(m)
P0	6.35 : 9.52	9.0

5. BD Unit (Distributor Box)

Model No.	Quantity

Validation property

System Name: Single (Commercial)1 **Date: 13.09.2023.**

System No : 1/1

6. Validation property

Contents	Limit	Current (Max. value: selected unit)
Total pipe length	30.0 m	9.0 m
Height difference [ODU to IDU]	30.0 m	3.0 m

Note 1 : Except "Longest equivalent pipe length", the other pipe length limitations are actual length.

Project_20230913(ver 1.8.13.14)

Refrigerant Regulation

System Name: Single (Commercial)1 **Date: 13.09.2023.**

System No : 1/1

7. Refrigerant Regulation

Room Name	Minimum Room Area (m^2)	Minimum Room Volume (m^3)	IDU Name
Room	1.01	3.43	MJ12PC NSJ

LGE /current project follows EN378-1:2016.
Calculations generated by LATS HVAC are indicative, please get advice from a qualified HVAC engineer prior to installation. LG cannot be held liable for calculation errors resulting from the software use.
R32 series unit should be installed, operated and stored in a room with a floor area larger than the minimum area.
Pipe-work must be protected from physical damage and must not be installed in an unventilated space if that space if smaller than minimum area for installation.

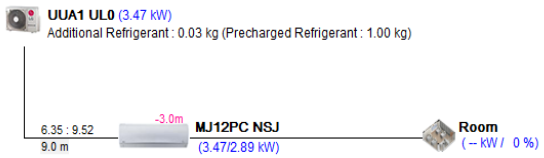
Project_20230913(ver 1.8.13.14)

System Tree Diagram

System Name: Single (Commercial)1 **Date: 13.09.2023.**

System No : 1/1

Single (Commercial)1



Two pipe : Liquid : Gas

R Remote Controller, G Group Control, D Dry Contact
d Leakage Detector, S Temperature Sensor A Air purification kit

Indoor Units	**: 1 of 1**
Combination Ratio	**: 12 of 12 (100%)**
Total Pipe	**: 9 of 30 m**

Project_20230913(ver 1.8.13.14)

System Schematic Diagram

System Name: Single (Commercial)1 **Date: 13.09.2023.**

System No : 1/1

We recommend a bigger size circuit breaker than the one calculated.

Project_20230913(ver 1.8.13.14)

System Cost Estimate

System Name: Single (Commercial)1 **Date: 13.09.2023.**

System No : 1/1

Total Cost	0	Currency	€

1. Outdoor Units

Model Name	Quantity	Unit Cost	Total Cost
UUA1 UL0	1		0
SubTotal	1		0

2. Indoor Units

Model Name	Quantity	Unit Cost	Total Cost
MJ12PC NSJ	1		0
SubTotal	1		0

3. Pipes

Diameter(mm)	Length(m)	Unit Cost	Total Cost
6.35	9.0		0
9.52	9.0		0
SubTotal			0

4. Refrigerant

Refrigerant	Additional Refrigerant(kg)	Unit Cost	Total Cost
R32	0.03		0
SubTotal			0

Project_20230913(ver 1.8.13.14)

Cost Estimate - MULTI

Date: 13.09.2023.

Total Cost	0	Currency	€

1. Outdoor Units

Model Name	Quantity	Unit Cost	Total Cost
UUA1 UL0	1		0
SubTotal	1		0

2. Indoor Units

Model Name	Quantity	Unit Cost	Total Cost
MJ12PC NSJ	1		0
SubTotal	1		0

3. Pipes

Diameter(mm)	Length(m)	Unit Cost	Total Cost
6.35	9.0		0
9.52	9.0		0
SubTotal			0

4. Refrigerant

Refrigerant	Additional Refrigerant(kg)	Unit Cost	Total Cost
R32	0.03		0
SubTotal			0

Project_20230913(ver 1.8.13.14)

Project Cost Estimate

Date: 13.09.2023.

Total Cost	0	Currency	€

1. Outdoor Units

Model Name	Quantity	Unit Cost	Total Cost
UUA1 UL0	1		0
SubTotal	1		0

2. Indoor Units

Model Name	Quantity	Unit Cost	Total Cost
MJ12PC NSJ	1		0
SubTotal	1		0

3. Accessories

Model Name	Quantity	Unit Cost	Total Cost
SubTotal	0		0

4. Branch/Header

Model Name	Quantity	Unit Cost	Total Cost
SubTotal	0		0

5. Pipes

Diameter(mm)	Length(m)	Unit Cost	Total Cost
6.35	9.0		0
9.52	9.0		0
SubTotal			0

6. Refrigerant

Refrigerant	Additional Refrigerant(kg)	Unit Cost	Total Cost
R32	0.03		0
SubTotal			0

Project_20230913(ver 1.8.13.14)

Pipe Summary

Date: 13.09.2023.

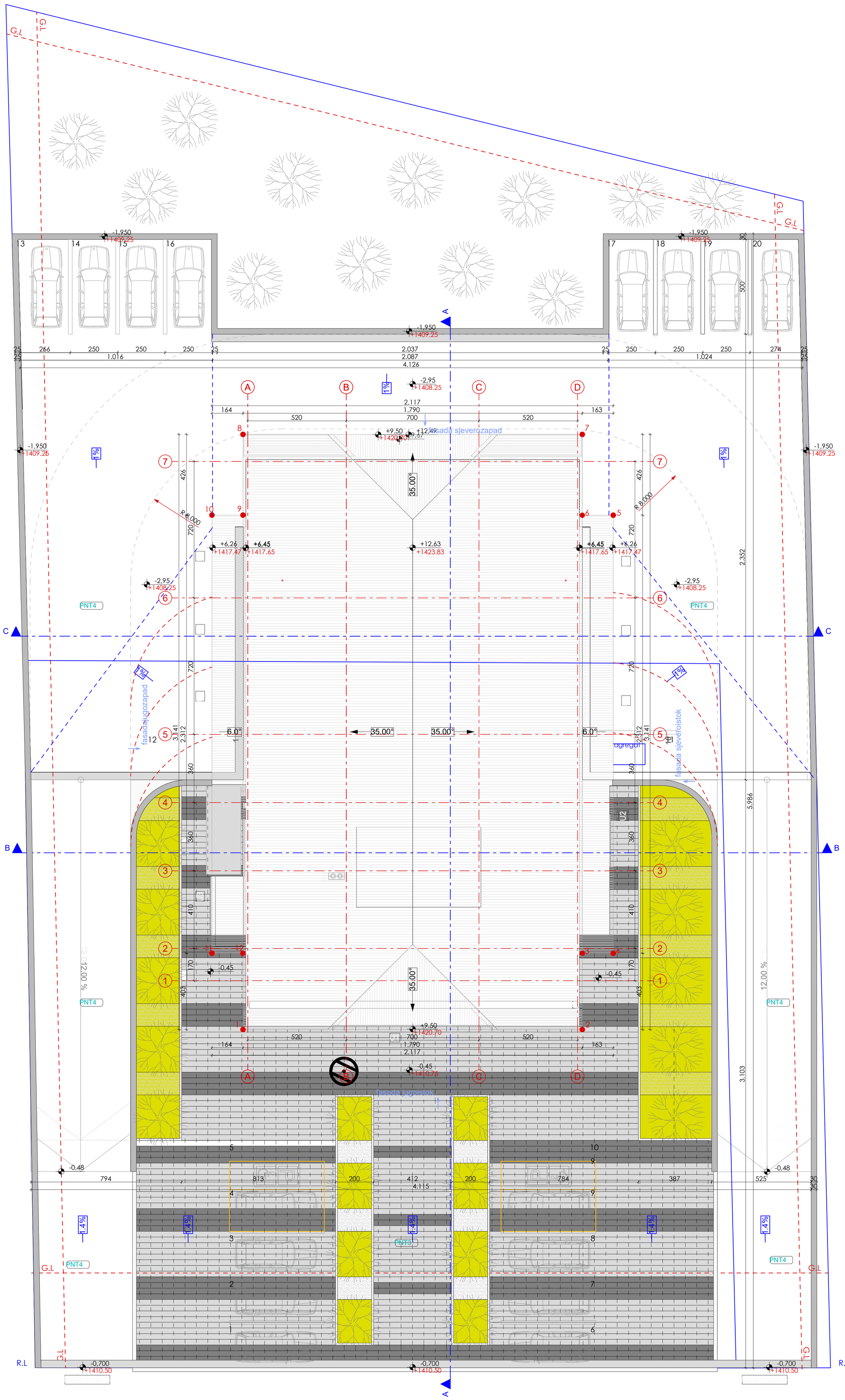
1. Refrigerant Pipe

System Name		Length(m)														
Diameter(mm)	Type	6.35	9.52	12.7	15.88	19.05	22.2	25.4	28.58	31.8	34.9	38.1	41.3	44.5	50.8	53.98
Single (Commercial)1	Liquid	9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Low Gas	-	9.0	-	-	-	-	-	-	-	-	-	-	-	-	-
	High Gas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SubTotal	9.0	9.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		**9.0**	**9.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

SPECIFIKACIJA

PREDMJER I PREDRAČUN RADOVA

GRAFIČKA DOKUMENTACIJA



Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona II, izmjene i dopuna DUP "Žabljak" za zone I,I,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Štefan Vlahović spec.sci.arh. Paraf:	Vrsta tehničke dokumentacije: *Glavni projekat*
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: *Termotehničke instalacija* Razmjera: P 1:100
Saradnik:	Naziv crteža: *SITUACIJA* Broj lista: 3.0 Broj strana:
Datum izrade i M.P.	Datum revizije i M.P.

Формат A1

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	stepenice	keramičke pločice	d.boja	d.boja	15,10м	14,10м²
02	tampon zona	keramičke pločice	d.boja	d.boja	8,70м	4,66м²
03	toalet	keramičke pločice	keramika	d.boja	7,50м	3,19м²
04	tehnička prostorija	keramičke pločice	d.boja	d.boja	50,18м	63,64м²
05	tehnička prostorija	keramičke pločice	d.boja	d.boja	32,00м	62,42м²
06	tehnička prostorija	keramičke pločice	d.boja	d.boja	50,38м	48,16м²
07	kancelarija	keramičke pločice	d.boja	d.boja	11,78м	8,50м²

ukupno neto etaže	**204,66м²**
ukupno bruto etaže	**240,61м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

LEGENDA

POTISNA ČELIČNA CIJEV SISTEMA RADIJATORA

POVRATNA ČELIČNA CIJEV SISTEMA RADIJATORA

POVRATNA ČELIČNA CIJEV SISTEMA PODNOG GRIJANJA

POTISNA ČELIČNA CIJEV SISTEMA PODNOG GRIJANJA

POTISNA ČELIČNA CIJEV SISTEMA KALORIFERA

POVRATNA ČELIČNA CIJEV SISTEMA KALORIFERA

DIMNJAČA FI200

KOTAO NA PELET, TIP: EKO LINE 200kW,
PROIZVODJAČ: KOVAN ILI EKVIVANET

AKUMULATOR TOPLOTE (BAFER), ZAPREMINE 1000l.
TIP: P1000, PROIZVODJAČ: SUNSYSTEM ILI EKVIVALENT

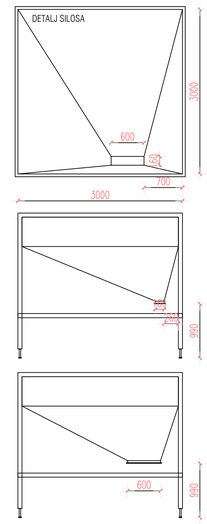
EKSPANZIONA POSUDA , ZAPREMINE: 100l,
TIP: ERCE100, PROIZVODJAČ: ELBI ILI EKVIVALENT

ELELKTRO KOTAO, KAPACITETA 140kW
TIP: TK-PREFOSSIONAL 140, PROIZVODJAČ: MIKOTERM ILI EKVIVALENT

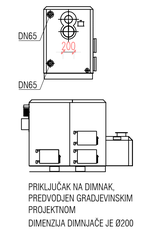
FREKVENTNA CIRKULACIONA PUMPA
TIP: STRATOS MAXO, PROIZVODJAČ: WILO ILI EKVIVALENT

CIRKULACIONA PUMPA
TIP: TOP-S, PROIZVODJAČ: WILO ILI EKVIVALENT

RAZDJELNIK/SABIRNIK DN80



DETALJ SILOSA, ZAPRE



PRIKLJUČAK NA DIMNAK,
PREDVODJEN GRADJEVINSKIM
PROJEKTNOM
DIMENZIJA DIMNJAČE JE Ø200

Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. — Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš — Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija — Razmjera: P 1:50
Saradnik:	Naziv crteža: CM-RASPORED OPREME SUTEREN — Broj lista: 3.1 — Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	vjetrobran	keramičke pločice	d.boja	d.boja	11.36м	7.36м²
02	portir	keramičke pločice	d.boja	d.boja	7.87м	4.10м²
03	hol	keramičke pločice	d.boja	d.boja	26.20м	36.69м²
04	bife	keramičke pločice	d.boja	d.boja	25.52м	30.01м²
05	kancelarija	keramičke pločice	d.boja	d.boja	11.16м	7.16м²
06	tehnika	keramičke pločice	d.boja	d.boja	35.56м	45.50м²
07	hodnik	keramičke pločice	d.boja	d.boja	33.56м	18.15м²
08	kancelarija	keramičke pločice	d.boja	d.boja	14.00м	10.28м²
09	garderoba+tuševi	keramičke pločice	keramika	d.boja	28.58м	25.14м²
10	garaža	ferobeton	d.boja	d.boja	48.22м	120.34м²
11	garaža	ferobeton	d.boja	d.boja	48.40м	119.82м²
12	toalet	keramičke pločice	keramika	d.boja	11.00м	3.75м²
				d.boja		
				ukupno neto etaže		**428.30м²**
				ukupno bruto etaže		**508.74м²**
				ukupno neto objekat		**909.15м²**
				ukupno bruto objekat		**1070.79м²**
				ukupno neto sa podrumom		**1113.81м²**
				ukupno bruto sa podrumom		**1311.40м²**

LEGENDA

- POTISNA ČELIČNA CIJEV SISTEMA RADIJATORA
- POVRATNA ČELIČNA CIJEV SISTEMA RADIJATORA
- POVRATNA ČELIČNA CIJEV SISTEMA PODNOG GRIJANJA
- POTISNA ČELIČNA CIJEV SISTEMA PODNOG GRIJANJA
- POTISNA ČELIČNA CIJEV SISTEMA KALORIFERA
- POVRATNA ČELIČNA CIJEV SISTEMA KALORIFERA
- PPR KONDENZNA CIJEV
- TOPLOVODNI KALORIFER, TIP: ATLAS 23E46, PROIZVODJAČ: SABIANA ILI EKVIVALENT
- SABIRNIK RAZDJELNIK RADIJATORSKOG GRIJANJA
- SPOLJNA JEDINICA SINGLE SPLIT SISTEMA ZA HLADJENJE RACK PROSTORIJE, TIP UUA1 UL0, PROIZVODJAČ: LG ILI EKVIVALENT
- SABIRNIK RAZDJELNIK PODNOG GRIJANJA GRIJANJA

Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija; Razmjera: P 1:50
Saradnik:	Naziv crteža: CM-RASPORED OPREME PRIZEMLJE; Broj lista: 3.2; Broj strane:
Datum izrade i M.P.	Datum revizije i M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	čekaonica	keramičke pločice	d.boja	d.boja	22,60м	31,44м²
02	hodnik	keramičke pločice	d.boja	d.boja		68,54м²
03	sastanci direktor	keramičke pločice	d.boja	d.boja	80,00м	13,60м²
04	kancelarija	keramičke pločice	d.boja	d.boja	15,34м	13,60м²
05	kancelarija	keramičke pločice	d.boja	d.boja	15,36м	23,30м²
06	sekretarica	keramičke pločice	d.boja	d.boja	19,74м	8,58м²
07	direktor	keramičke pločice	d.boja	d.boja	12,20м	13,94м²
08	kancelarija	keramičke pločice	d.boja	d.boja	14,96м	20,33м²
09	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
10	kancelarija	keramičke pločice	d.boja	d.boja	19,16м	20,33м²
11	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
12	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
13	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
14	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
15	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
16	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
17	kancelarija	keramičke pločice	d.boja	d.boja	19,60м	19,23м²
18	kancelarija	keramičke pločice	d.boja	d.boja	19,76м	19,23м²
19	kancelarija	keramičke pločice	d.boja	d.boja	19,12м	9,79м²
20	relax zona	keramičke pločice	d.boja	d.boja	19,12м	2,01м²
21	ostava	keramičke pločice	d.boja	d.boja	12,56м	7,04м²
22	toalet M	keramičke pločice	d.boja	d.boja	5,76м	4,00м²
23	toalet LSPP	keramičke pločice	d.boja	d.boja	17,72м	7,40м²
24	toalet Ž	keramičke pločice	keramika	d.boja	8,00м	2,01м²
25	hodnik	keramičke pločice	keramika	d.boja	17,72м	4,32м²
26	trokadero	keramičke pločice	keramika	d.boja	14,80м	4,32м²
27	arhiva	keramičke pločice	keramika	d.boja	5,76м	11,82м²
28	IT sektor	keramičke pločice	keramika	/	8,60м	
30	stepenice	keramičke pločice	keramika	/	8,60м	
			d.boja		/	
			d.boja			

ukupno neto etaže	**480,85м²**
ukupno bruto etaže	**562,05м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

LEGENDA

- POTISNA ČELIČNA CIJEV SISTEMA RADIJATORA
- POVRATNA ČELIČNA CIJEV SISTEMA RADIJATORA
- POVRATNA ČELIČNA CIJEV SISTEMA PODNOG GRIJANJA
- POTISNA ČELIČNA CIJEV SISTEMA PODNOG GRIJANJA
- POTISNA ČELIČNA CIJEV SISTEMA KALORIFERA
- POVRATNA ČELIČNA CIJEV SISTEMA KALORIFERA
- PPR KONDENZNA CIJEV
- SABIRNIK RAZDJELNIK RADIJATORSKOG GRIJANJA
- UNUTRAŠNJA JEDINICA SINGLE SPLIT SISTEMA ZA HLAĐENJE RACK PROSTORIJE, TIP: MJ12PC NSJ, PROIZVOĐAČ: LG ILI EKVIVALENT
- SABIRNIK RAZDJELNIK PODNOG GRIJANJA GRIJANJA
- ŽIČANI KONTROLER SPLIT SISTEMA, TIP: PREMTB100, PROIZVODJA: LG ILI EKVIVALENT

Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Žabljak" za zone I, LG, H, E, F, C, Opština Žabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija; Razmjera: P 1:50
Saradnik:	Naziv crteža: CM-RASPORED OPREME SPRAT; Broj lista: 3.3; Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	stepenice	keramičke pločice	d.boja	d.boja	15,10м	14,10м²
02	tampon zona	keramičke pločice	d.boja	d.boja	8,70м	4,66м²
03	toalet	keramičke pločice	keramika	d.boja	7,50м	3,19м²
04	tehnička prostorija	keramičke pločice	d.boja	d.boja	50,18м	63,64м²
05	tehnička prostorija	keramičke pločice	d.boja	d.boja	32,00м	62,42м²
06	tehnička prostorija	keramičke pločice	d.boja	d.boja	50,38м	48,16м²
07	kancelarija	keramičke pločice	d.boja	d.boja	11,78м	8,50м²

ukupno neto etaže	**204,66м²**
ukupno bruto etaže	**240,61м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

LEGENDA

POTISNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

POVRATNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

ALUMINIJUMSKI ČLANKASTI RADIJATOR
TIP: ORION 500/95, PROIZVODJAČ: LIPOVICA ILI EKVIVALENT

SABIRNIK RAZDJELNIK RADIJATORSKOG GRIJANJA

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	5
Odavanje toplote:	624 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	7
Odavanje toplote:	874 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	7
Odavanje toplote:	874 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	10
Odavanje toplote:	1248 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	10
Odavanje toplote:	1248 W

Projektant:
"ANGELINI" d.o.o. Podgorica
Danila Kiša br. 1, Podgorica

Investitor:
Opština Žabljak

Objekat:
Objekat za komunalno i vodovod Žabljak

Lokacija:
kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak

Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:

Vrsta tehničke dokumentacije: Glavni projekat

Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:

Dio tehničke dokumentacije: Termotehničke instalacija

Razmjera: P 1:50

Saradnik:

Naziv crteža: RADIJATORI-RASPORED OPREME SUTEREN

Broj lista: 3.4

Broj strane:

Datum revizije и M.P.

Datum izrade и M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	vjetrobran	keramičke pločice	d.boja	d.boja	11.36м	7.36м²
02	portir	keramičke pločice	d.boja	d.boja	7.87м	4.10м²
03	hol	keramičke pločice	d.boja	d.boja	26.20м	36.69м²
04	bife	keramičke pločice	d.boja	d.boja	25.52м	30.01м²
05	kancelarija	keramičke pločice	d.boja	d.boja	11.16м	7.16м²
06	tehnika	keramičke pločice	d.boja	d.boja	35.56м	45.50м²
07	hodnik	keramičke pločice	d.boja	d.boja	33.56м	18.15м²
08	kancelarija	keramičke pločice	keramika	d.boja	14.00м	10.28м²
09	garderoba+tuševi	ferobeton	d.boja	d.boja	28.58м	25.14м²
10	garaža	ferobeton	d.boja	d.boja	48.22м	120.34м²
11	garaža	keramičke pločice	keramika	d.boja	48.40м	119.82м²
12	toalet			d.boja	11.00м	3.75м²

ukupno neto etaže	**428.30м²**
ukupno bruto etaže	**508.74м²**
ukupno neto objekat	**909.15м²**
ukupno bruto objekat	**1070.79м²**
ukupno neto sa podrumom	**1113.81м²**
ukupno bruto sa podrumom	**1311.40м²**

LEGENDA

POTISNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

POVRATNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

ALUMINIJUMSKI ČLANKASTI RADIJATOR
TIP: ORION 500/95, PROIZVODJAČ: LIPOVICA ILI EKVIVALENT

SABIRNIK RAZDJELNIK RADIJATORSKOG GRIJANJA

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	15
Odavanje toplote:	1870 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	5
Odavanje toplote:	623 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	15
Odavanje toplote:	1870 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	8
Odavanje toplote:	998 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	8
Odavanje toplote:	998 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	8
Odavanje toplote:	998 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	15
Odavanje toplote:	1870 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	16
Odavanje toplote:	2026 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	6
Odavanje toplote:	746 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	6
Odavanje toplote:	746 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	6
Odavanje toplote:	746 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	6
Odavanje toplote:	746 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	5
Odavanje toplote:	624 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	5
Odavanje toplote:	624 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	7
Odavanje toplote:	873 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	6
Odavanje toplote:	746 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	8
Odavanje toplote:	1013 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	5
Odavanje toplote:	623 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	5
Odavanje toplote:	624 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	12
Odavanje toplote:	1495 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	12
Odavanje toplote:	1495 W

Model radijatora:	ORION
Tip radijatora:	500/95
Broj članaka:	12
Odavanje toplote:	1495 W

Projektant:

"ANGELINI" d.o.o. Podgorica
Danila Kiša br. 1, Podgorica

Investitor:

Opština Žabljak

Objekat:
Objekat za komunalno i vodovod Žabljak

Lokacija:
kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak

Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:

Vrsta tehničke dokumentacije:
Glavni projekat

Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:

Dio tehničke dokumentacije:
Termotehničke instalacija

Razmjera: P 1:50

Saradnik:

Naziv crteža:
RADIJATORI-RASPORED OPREME PRIZEMLJE

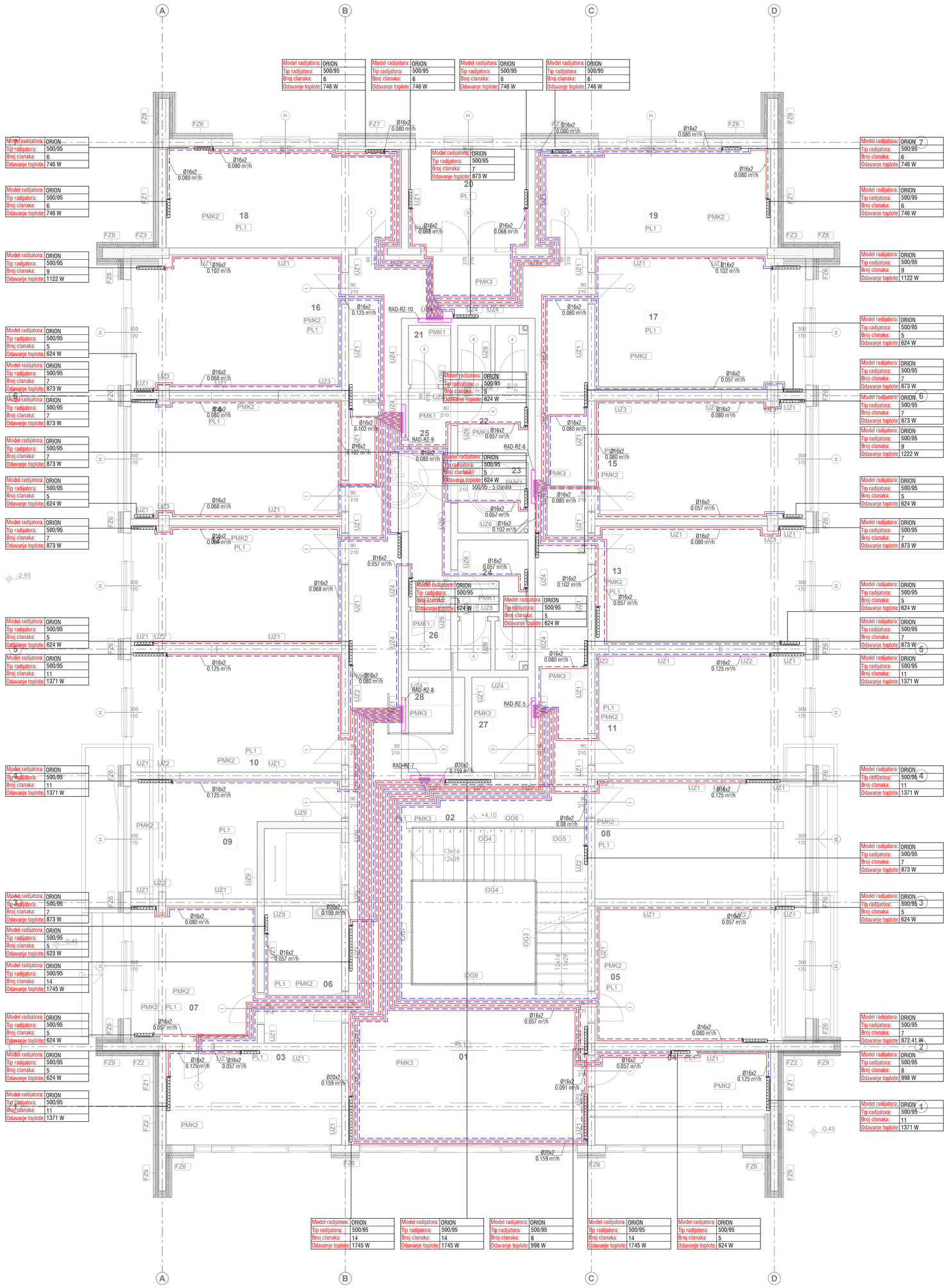
Broj lista: 3.5

Broj strane:

Datum izrade и M.P.

Datum revizije и M.P.

939x841



LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	povrsina
01	čekaonica	keramičke pločice	d.boja	d.boja	22,60м	31,44м²
02	hodnik	keramičke pločice	d.boja	d.boja		68,54м²
03	sastanci direktor	keramičke pločice	d.boja	d.boja	80,00м	13,60м²
04	kancelarija	keramičke pločice	d.boja	d.boja	15,34м	13,60м²
05	kancelarija	keramičke pločice	d.boja	d.boja	15,36м	23,30м²
06	sekretarica	keramičke pločice	d.boja	d.boja	19,74м	8,58м²
07	direktor	keramičke pločice	d.boja	d.boja	12,20м	13,94м²
08	kancelarija	keramičke pločice	d.boja	d.boja	14,96м	20,33м²
09	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
10	kancelarija	keramičke pločice	d.boja	d.boja	19,16м	20,33м²
11	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
12	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
13	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
14	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
15	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
16	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
17	kancelarija	keramičke pločice	d.boja	d.boja	19,60м	19,23м²
18	kancelarija	keramičke pločice	d.boja	d.boja	19,76м	19,23м²
19	kancelarija	keramičke pločice	d.boja	d.boja	19,12м	9,79м²
20	relax zona	keramičke pločice	d.boja	d.boja	19,12м	2,01м²
21	ostava	keramičke pločice	d.boja	d.boja	19,12м	7,04м²
22	toalet M	keramičke pločice	d.boja	d.boja	12,56м	4,00м²
23	toalet LSPP	keramičke pločice	d.boja	d.boja	5,76м	7,40м²
24	toalet Ž	keramičke pločice	d.boja	d.boja	5,76м	7,40м²
25	hodnik	keramičke pločice	keramika	d.boja	17,72м	7,44м²
26	trokadero	keramičke pločice	keramika	d.boja	8,00м	2,01м²
27	arhiva	keramičke pločice	keramika	d.boja	17,72м	4,32м²
28	IT sektor	keramičke pločice	keramika	d.boja	14,80м	4,32м²
30	stepenice	keramičke pločice	keramika	/	5,76м	11,82м²
			d.boja		8,60м	
			d.boja		8,60м	
			d.boja		/	

ukupno neto etaže	**480,85м²**
ukupno bruto etaže	**562,05м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

LEGENDA

POTISNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

POVRATNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

ALUMINIJUMSKI ČLANKASTI RADIJATOR
TIP: ORION 500/95, PROIZVODJAČ: LIPOVICA ILI EKVIVALENT

SABIRNIK RAZDJELNIK RADIJATORSKOG GRIJANJA

Projektant:

"ANGELINI" d.o.o. Podgorica
Danila Kiša br. 1, Podgorica

Investitor:

Opština Žabljak

Objekat:
Objekat za komunalno i vodovod Žabljak

Lokacija:
kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak

Glavni inžinjer: Paraf:
Stefan Vlahović spec.sci.arh.

Vrsta tehničke dokumentacije:
Glavni projekat

Odgovorni inžinjer: Paraf:
Miloš Dragaš dipl.inž.maš

Dio tehničke dokumentacije:
Termotehničke instalacija

Razmjera:
P 1:50

Saradnik:

Naziv crteža:
RADIJATORI-RASPORED OPREME SPRAT

Broj lista:
3.6

Broj strane:

Datum izrade и M.P.

Datum revizije и M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	vjetrobran	keramičke pločice	d.boja	d.boja	11.34м	7.36м²
02	portir	keramičke pločice	d.boja	d.boja	7.87м	4.10м²
03	hol	keramičke pločice	d.boja	d.boja	26.20м	36.69м²
04	bife	keramičke pločice	d.boja	d.boja	25.52м	30.01м²
05	kancelarija	keramičke pločice	d.boja	d.boja	11.16м	7.16м²
06	tehnika	keramičke pločice	d.boja	d.boja	35.56м	45.50м²
07	hodnik	keramičke pločice	d.boja	d.boja	33.56м	18.15м²
08	kancelarija	keramičke pločice	keramika	d.boja	14.00м	10.28м²
09	garderoba+tuševi	ferobeton	d.boja	d.boja	28.58м	25.14м²
10	garaža	ferobeton	d.boja	d.boja	48.22м	120.34м²
11	garaža	keramičke pločice	keramika	d.boja	48.40м	119.82м²
12	toalet			d.boja	11.00м	3.75м²

ukupno neto etaže	**428.30м²**
ukupno bruto etaže	**508.74м²**
ukupno neto objekat	**909.15м²**
ukupno bruto objekat	**1070.79м²**
ukupno neto sa podrumom	**1113.81м²**
ukupno bruto sa podrumom	**1311.40м²**

RZ 1 - Pr. (6) tp=40.0 °C ts=33.5 °C dt=6.5 K (Heating)
H=12478 Pa Qc=4903 W Mh=11.0 l/min dPmax=12479 Pa

Number of circuit	Room	Zone (HT)	Circuit area [m2]	Circuit output (HT) [W]	Spacing [mm]	Total length of pipe [m]	Temp. gradient [K]	Pressure loss [kPa]	Velocity w [m/s]	Flow rate [l/min]	Valve settings
1	Pr.1 - Garderoba	LZ 1	9.3	675	100	104.9	7.9	7.87	0.22	1.7	2.5
2	Pr.1 - Garderoba	LZ 1	9.1	660	100	101.1	7.9	6.64	0.21	1.6	2.5
3	Pr.2 - Tus	LZ 1	6.7	559	100	83.5	5.0	9.29	0.27	2.2	2.67
4	Pr.5 - Kancelarija	LZ 1	10.6	879	150	95.9	7.0	12.48	0.30	2.4	6.00 Open.
5	Pr.2 - Portir	LZ 1	3.1	270	150	65.5	5.5	1.06	0.11	0.9	2.5
6	Pr.5 - Kancelarija	LZ 1	7.2	629	150	54.9	5.5	6.07	0.27	2.1	2.5

LEGENDA

POTISNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

POVRATNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

SABIRNIK RAZDJELNIK PODNOG GRIJANJA

RZ 1 - Pr. (6/3) (tf=40.0°C)	LZ 1: Keramicke plocice
REHAU Tacker	I-tot=83.5 m
Liz=100 [mm]	Pr.2 - Tus
HEAT: LZ:31.6°C	REHAU Pipe PE-Xa RAUTHERM SPEED (500 m) 16x1.5
S=6.7 m2	HEAT: Set.=2.67 (2.2 l/min)

RZ 1 - Pr. (6/2) (tf=40.0°C)	LZ 1: Keramicke plocice
REHAU Tacker	I-tot=101.1 m
Liz=100 [mm]	Pr.1 - Garderoba
HEAT: LZ:30.7°C	REHAU Pipe PE-Xa RAUTHERM SPEED (500 m) 16x1.5
S=9.1 m2	HEAT: Set.=2.5 (1.7 l/min)

RZ 1 - Pr. (6/1) (tf=40.0°C)	LZ 1: Keramicke plocice
REHAU Tacker	I-tot=104.9 m
Liz=100 [mm]	Pr.1 - Garderoba
HEAT: LZ:30.7°C	REHAU Pipe PE-Xa RAUTHERM SPEED (500 m) 16x1.5
S=9.3 m2	HEAT: Set.=2.5 (1.7 l/min)

RZ 1 - Pr. (6/4) (tf=40.0°C)	LZ 1: Keramicke plocice
REHAU Tacker	I-tot=95.9 m
Liz=150 [mm]	Pr.8 - Kancelarija
HEAT: LZ:28.6°C	REHAU Pipe PE-Xa RAUTHERM SPEED (500 m) 16x1.5
S=10.6 m2	HEAT: Set.=6.00 Open (2.4 l/min)

RZ 1 - Pr. (6/6) (tf=40.0°C)	LZ 1: Keramicke plocice
REHAU Tacker	I-tot=54.9 m
Liz=150 [mm]	Pr.5 - Kancelarija
HEAT: LZ:29.0°C	REHAU Pipe PE-Xa RAUTHERM SPEED (500 m) 16x1.5
S=7.2 m2	HEAT: Set.=2.5 (2.1 l/min)

RZ 1 - Pr. (6/5) (tf=40.0°C)	LZ 1: Keramicke plocice
REHAU Tacker	I-tot=85.5 m
Liz=150 [mm]	Pr.2 - Portir
HEAT: LZ:29.0°C	REHAU Pipe PE-Xa RAUTHERM SPEED (500 m) 16x1.5
S=3.1 m2	HEAT: Set.=2.5 (0.9 l/min)

KONTROLER ZA 1 KRUG PODNOG GRIJANJA (RZ 1-PR.6)

KONTROLER ZA 2 KRUGA PODNOG GRIJANJA (RZ 1-PR.6)

Projektant:

"ANGELINI" d.o.o. Podgorica
Danila Kiša br. 1, Podgorica

Investitor:

Opština Žabljak

Objekat:
Objekat za komunalno i vodovod Žabljak

Lokacija:
kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, izmjena i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak

Glavni inžinjer: Stefan Vlahović spec.sci.am. Paraf:

Vrsta tehničke dokumentacije: Glavni projekat

Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:

Dio tehničke dokumentacije: Termotehničke instalacija

Razmjera: P 1:50

Saradnik:

Naziv crteža: PODNO GRIJANJE-RASPORED OPREME PRIZEMLJE

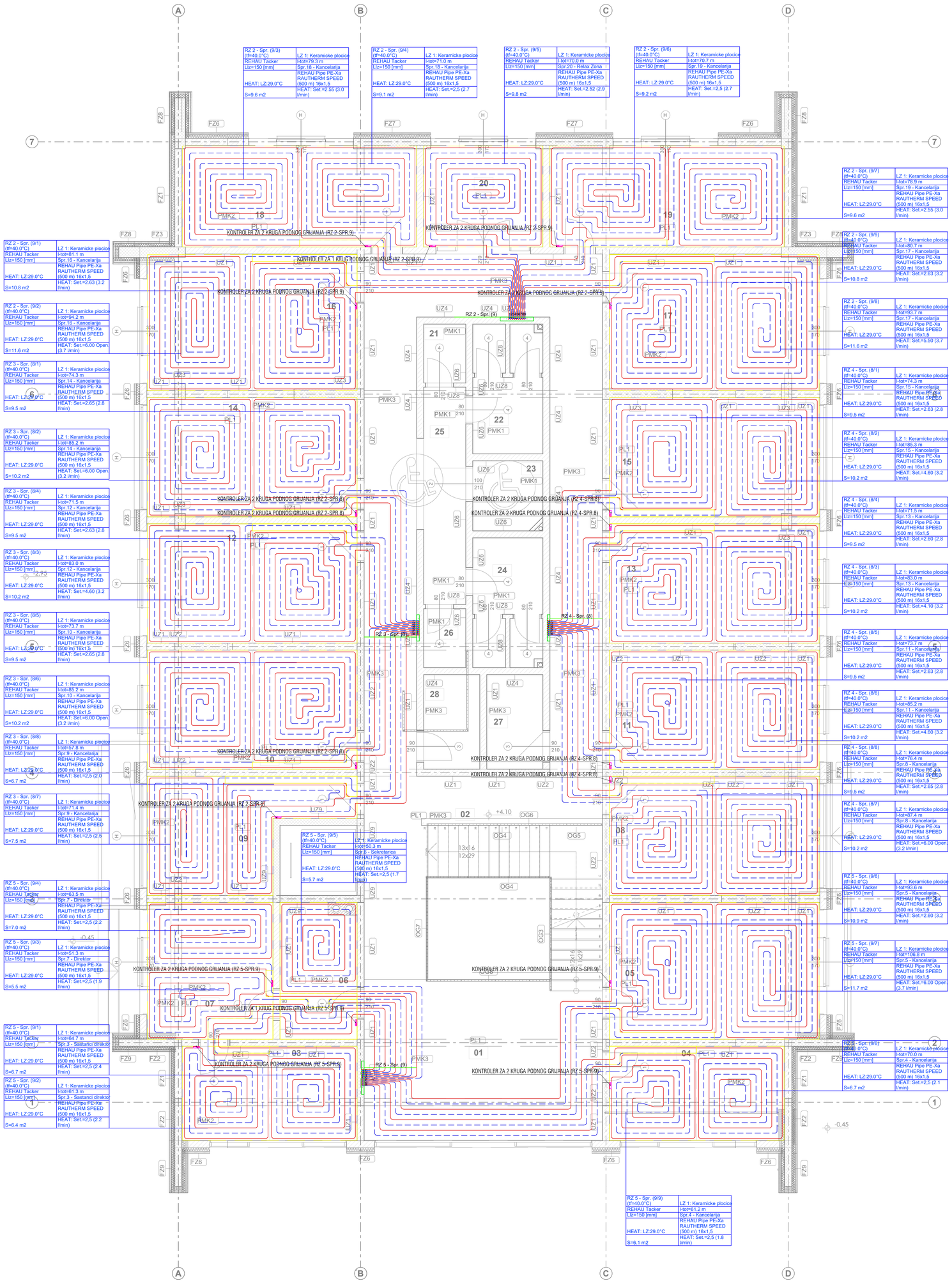
Broj lista: 3.7

Broj strane:

Datum izrade и M.P.

Datum revizije и M.P.

939x841



LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	povrsina
01	Cekaonica	keramičke pločice	d.boja	d.boja	22,60м	31,44м²
02	hodnik	keramičke pločice	d.boja	d.boja		68,54м²
03	sastanci direktor	keramičke pločice	d.boja	d.boja	80,00м	13,60м²
04	kancelarija	keramičke pločice	d.boja	d.boja	15,34м	13,60м²
05	kancelarija	keramičke pločice	d.boja	d.boja	15,36м	23,30м²
06	sekretarica	keramičke pločice	d.boja	d.boja	19,74м	8,58м²
07	direktor	keramičke pločice	d.boja	d.boja	12,20м	13,94м²
08	kancelarija	keramičke pločice	d.boja	d.boja	14,96м	20,33м²
09	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
10	kancelarija	keramičke pločice	d.boja	d.boja	19,16м	20,33м²
11	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
12	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
13	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
14	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
15	kancelarija	keramičke pločice	d.boja	d.boja	12,56м	4,00м²
16	kancelarija	keramičke pločice	d.boja	d.boja	5,76м	7,40м²
17	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
18	kancelarija	keramičke pločice	d.boja	d.boja	19,60м	19,23м²
19	kancelarija	keramičke pločice	d.boja	d.boja	19,76м	19,23м²
20	relax zona	keramičke pločice	d.boja	d.boja	19,12м	9,79м²
21	ostava	keramičke pločice	d.boja	d.boja	19,12м	2,01м²
22	toalet M	keramičke pločice	d.boja	d.boja	19,12м	7,04м²
23	toalet LSPP	keramičke pločice	d.boja	d.boja	12,56м	4,00м²
24	toalet Ž	keramičke pločice	d.boja	d.boja	5,76м	7,40м²
25	hodnik	keramika	d.boja	d.boja	17,72м	7,44м²
26	trokadero	keramičke pločice	keramika	d.boja	8,00м	2,01м²
27	arhiva	keramičke pločice	keramika	d.boja	17,72м	4,32м²
28	IT sektor	keramičke pločice	keramika	d.boja	14,80м	4,32м²
30	stepenice	keramičke pločice	keramika	/	5,76м	11,82м²
			d.boja		8,60м	
			d.boja		8,60м	
			d.boja	/		

ukupno neto etaže	**480,85м²**
ukupno bruto etaže	**562,05м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

RZ 2 - Spr. (9) tp=40.0 °C ts=34.5 °C dt=5.5 K (Heating)
H=26463 Pa Qc=10781 W Mh=28.2 l/min dPmax=26455 Pa

Number of circuit	Room	Zone (HT)	Circuit area	Circuit output (HT)	Spacing	Total length of pipe	Temp. gradient	Pressure loss	Velocity w	Flow rate	Valve settings
			[m2]	[W]	[mm]	[m]	[K]	[kPa]	[m/s]	[l/min]	
1	Spr.16 - Kancelarija	LZ 1	10.8	949	150	81.1	5.5	17.99 (16.00)	0.40	3.2	2.63
2	Spr.16 - Kancelarija	LZ 1	11.6	1019	150	94.2	5.5	26.46	0.46	3.7	6.00 Open.
3	Spr.18 - Kancelarija	LZ 1	9.8	845	150	79.3	5.5	15.98	0.38	3.0	2.55
4	Spr.18 - Kancelarija	LZ 1	9.1	803	150	71.0	5.5	11.84 (11.85)	0.34	2.7	2.5
5	Spr.20 - Relax Zona	LZ 1	9.8	860	150	70.0	5.5	13.17 (13.18)	0.37	2.9	2.52
6	Spr.19 - Kancelarija	LZ 1	9.2	804	150	70.7	5.5	11.82 (11.83)	0.34	2.7	2.5
7	Spr.19 - Kancelarija	LZ 1	9.6	845	150	78.9	5.5	15.89	0.38	3.0	2.55
8	Spr.17 - Kancelarija	LZ 1	11.6	1019	150	93.7	5.5	26.34 (26.35)	0.46	3.7	5.50
9	Spr.17 - Kancelarija	LZ 1	10.8	949	150	80.7	5.5	17.90	0.40	3.2	2.63

RZ 3 - Spr. (8) tp=40.0 °C ts=34.5 °C dt=5.5 K (Heating)
H=19072 Pa Qc=8640 W Mh=22.6 l/min dPmax=19066 Pa

Number of circuit	Room	Zone (HT)	Circuit area	Circuit output (HT)	Spacing	Total length of pipe	Temp. gradient	Pressure loss	Velocity w	Flow rate	Valve settings
			[m2]	[W]	[mm]	[m]	[K]	[kPa]	[m/s]	[l/min]	
1	Spr.14 - Kancelarija	LZ 1	9.5	831	150	74.3	5.5	13.13 (13.14)	0.35	2.8	2.65
2	Spr.14 - Kancelarija	LZ 1	10.2	893	150	85.2	5.5	19.07	0.41	3.2	6.00 Open.
3	Spr.12 - Kancelarija	LZ 1	10.2	893	150	83.0	5.5	18.60	0.41	3.2	4.60
4	Spr.12 - Kancelarija	LZ 1	9.5	831	150	71.5	5.5	12.67	0.35	2.8	2.63
5	Spr.10 - Kancelarija	LZ 1	9.5	831	150	73.7	5.5	13.03	0.35	2.8	2.65
6	Spr.10 - Kancelarija	LZ 1	10.2	893	150	85.2	5.5	19.06	0.41	3.2	6.00 Open.
7	Spr.9 - Kancelarija	LZ 1	7.5	661	150	71.4	5.5	10.32 (10.33)	0.31	2.5	2.5
8	Spr.9 - Kancelarija	LZ 1	6.7	585	150	57.8	5.5	5.62	0.25	2.0	2.5

RZ 4 - Spr. (8) tp=40.0 °C ts=34.5 °C dt=5.5 K (Heating)
H=19528 Pa Qc=9236 W Mh=24.1 l/min dPmax=19522 Pa

Number of circuit	Room	Zone (HT)	Circuit area	Circuit output (HT)	Spacing	Total length of pipe	Temp. gradient	Pressure loss	Velocity w	Flow rate	Valve settings
			[m2]	[W]	[mm]	[m]	[K]	[kPa]	[m/s]	[l/min]	
1	Spr.15 - Kancelarija	LZ 1	9.5	831	150	74.3	5.5	13.14	0.35	2.8	2.63
2	Spr.15 - Kancelarija	LZ 1	10.2	893	150	85.3	5.5	19.07 (19.08)	0.41	3.2	4.60
3	Spr.13 - Kancelarija	LZ 1	10.2	893	150	83.0	5.5	18.60 (18.61)	0.41	3.2	4.10
4	Spr.13 - Kancelarija	LZ 1	9.5	831	150	71.5	5.5	12.67	0.35	2.8	2.60
5	Spr.11 - Kancelarija	LZ 1	9.5	831	150	73.7	5.5	13.03	0.35	2.8	2.63
6	Spr.11 - Kancelarija	LZ 1	10.2	893	150	85.2	5.5	19.05 (19.06)	0.41	3.2	4.60
7	Spr.8 - Kancelarija	LZ 1	10.2	893	150	87.4	5.5	19.52 (19.53)	0.41	3.2	6.00 Open.
8	Spr.8 - Kancelarija	LZ 1	9.5	831	150	76.4	5.5	13.49 (13.50)	0.35	2.8	2.65

RZ 5 - Spr. (9) tp=40.0 °C ts=34.5 °C dt=5.5 K (Heating)
H=30112 Pa Qc=8136 W Mh=21.3 l/min dPmax=30104 Pa

Number of circuit	Room	Zone (HT)	Circuit area	Circuit output (HT)	Spacing	Total length of pipe	Temp. gradient	Pressure loss	Velocity w	Flow rate	Valve settings
			[m2]	[W]	[mm]	[m]	[K]	[kPa]	[m/s]	[l/min]	
1	Spr.3 - Sastanci direktor	LZ 1	6.7	588	150	64.7	5.5	8.61	0.30	2.4	2.5
2	Spr.3 - Sastanci direktor	LZ 1	6.4	559	150	61.3	5.5	7.04	0.27	2.2	2.5
3	Spr.7 - Direktor	LZ 1	5.5	485	150	51.3	5.5	4.68	0.24	1.9	2.5
4	Spr.7 - Direktor	LZ 1	7.0	613	150	63.5	5.5	7.62	0.28	2.2	2.5
5	Spr.6 - Sekretarica	LZ 1	5.7	501	150	50.3	5.5	3.71 (3.72)	0.21	1.7	2.5
6	Spr.5 - Kancelarija	LZ 1	10.9	954	150	93.6	5.5	20.83	0.40	3.2	2.60
7	Spr.5 - Kancelarija	LZ 1	11.7	1024	150	106.8	5.5	30.10 (30.11)	0.46	3.7	6.00 Open.
8	Spr.4 - Kancelarija	LZ 1	6.7	586	150	70.0	5.5	7.79	0.27	2.1	2.5
9	Spr.4 - Kancelarija	LZ 1	6.1	533	150	61.2	5.5	5.05	0.23	1.8	2.5

LEGENDA

POTISNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

POVRATNA PEX-AL-PEX CIJEV SISTEMA RADIJATORA SA RAZDJELNIKA/SABIRNIKA

SABIRNIK RAZDJELNIK PODNOG GRIJANJA

SOBNI TERMOSTAT, TIP: NEA HT, PROIZVODJAČ: REHAU ILI KEVIVLENT

Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Stefan Vlahović spec.sci.am. Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija; Razmjera: P 1:50
Saradnik:	Naziv crteža: PODNO GRIJANJE-RASPORED OPREME SPRAT; Broj lista: 3.8; Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	stepenice	keramičke pločice	d.boja	d.boja	15,10м	14,10м²
02	tampon zona	keramičke pločice	d.boja	d.boja	8,70м	4,66м²
03	toalet	keramičke pločice	keramika	d.boja	7,50м	3,19м²
04	tehnička prostorija	keramičke pločice	d.boja	d.boja	50,18м	63,64м²
05	tehnička prostorija	keramičke pločice	d.boja	d.boja	32,00м	62,42м²
06	tehnička prostorija	keramičke pločice	d.boja	d.boja	50,38м	48,16м²
07	kancelarija	keramičke pločice	d.boja	d.boja	11,78м	8,50м²

ukupno neto etaže	**204,66м²**
ukupno bruto etaže	**240,61м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

LEGENDA

POCINČANI KANAL ZA IZVLAČENJE VAZDUHA

POCINČANI KANAL ZA UBACIVANJE VAZDUHA

FLEKSIBILNA CRIJEVA ZA POVEZIVANJE ELEMENATA VENTILACIJE

DVOREDE ČELIČNE REŠETKE ZA UBACIVANJE/IZVLAČENJE VAZDUHA SA DAMPEROM,
TIP: SD-22D, PROIZVODJAČ: LINDAB ILI EKVIVALENT

MONOFAZNI VENTILATOR NA UBACIVANJU ILI IZVLAČENJU VENTILA,
TIP: IRB-4/355, PROIZVODJAČ: S&P ILI EKVIVALENT

ŽALUZINA ZA IZBACANJE VAZDUHA U SPOLJNU POVRŠINU,
TIP: WLS-11-N/I, PROIZVODJAČ: LINDAB ILI EKVIVALENT

ŽALUZINA ZA ZAHVAT VAZDUHA IZ SPOLJNU POVRŠINU,
TIP: WLA-11-NI, PROIZVODJAČ: LINDAB ILI EKVIVALENT

MEHANIČKA RASTERETNA KLAPNA 50Pa,
TIP: ARK2-600x675, PROIZVODJAČ: TROX ILI EKVIVALENT

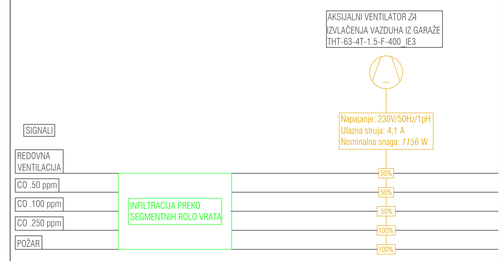
AKSIJALNI VENTILATOR ZA POTREBE VIO GARAŽE,
TIP: THT-63-4T-1.5-F-400_IE3, PROIZVODJAČ: SODECA ILI EKVIVALENT

AEROVENTIL NA IZVLAČENJU VAZDUHA,
TIP: AOV, PROIZVODJAČ: ENPRO

REVIZIONA REŠETKA

DETALJ SAMOPODIZNE RASTERETNE KLAPNE

ŠEMA VEZIVANJA I DJELOVANJA



Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 I UP 247b, zona E, izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Stefan Vlahović spec.sci.am. Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija; Razmjera: P 1:50
Saradnik:	Naziv crteža: VENTILACIJA RASPORED OPREME SUTEREN; Broj lista: 3.9; Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

939x841

LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	vjetrobran	keramičke pločice	d.boja	d.boja	11.36м	7.36м²
02	portir	keramičke pločice	d.boja	d.boja	7.87м	4.10м²
03	hol	keramičke pločice	d.boja	d.boja	26.20м	36.69м²
04	bife	keramičke pločice	d.boja	d.boja	25.52м	30.01м²
05	kancelarija	keramičke pločice	d.boja	d.boja	11.16м	7.16м²
06	tehnika	keramičke pločice	d.boja	d.boja	35.56м	45.50м²
07	hodnik	keramičke pločice	d.boja	d.boja	33.56м	18.15м²
08	kancelarija	keramičke pločice	keramika	d.boja	14.00м	10.28м²
09	garderoba+tuševi	ferobeton	d.boja	d.boja	28.58м	25.14м²
10	garaža	ferobeton	d.boja	d.boja	48.22м	120.34м²
11	garaža	keramičke pločice	keramika	d.boja	48.40м	119.82м²
12	toalet			d.boja	11.00м	3.75м²

ukupno neto etaže	**428.30м²**
ukupno bruto etaže	**508.74м²**
ukupno neto objekat	**909.15м²**
ukupno bruto objekat	**1070.79м²**
ukupno neto sa podrumom	**1113.81м²**
ukupno bruto sa podrumom	**1311.40м²**

LEGENDA

POCINČANI KANAL ZA IZVLAČENJE VAZDUHA

FLESKSIBILNA CRIJEVA ZA POVEZIVANJE ELEMENATA VENTILACIJE

DVOREDE REŠETKE ZA UBACIVANJE/IZVLAČENJE VAZDUHA SA DAMPEROM,
TIP: AD-21D, PROIZVODJAČ: LINDAB ILI EKVIVALENT

PRESTRUJNE REŠETKE,
TIP: AT-11-425x175, PROIZVODJAČ: LINDAB ILI EKVIVALENT

ŽALUZINA ZA ZAHVAT/IZBACANJE VAZDUHA U SPOLJNU POVRŠINU,
TIP: IRB, PROIZVODJAČ: S&P ILI EKVIVALENT

ŽALUZINA ZA IZBACANJE VAZDUHA U SPOLJNU POVRŠINU,
TIP: WLS-11-N/I, PROIZVODJAČ: LINDAB ILI EKVIVALENT

AEROVENTIL,
TIP: AOV, PROIZVODJAČ: ENPRO ILI EKVIVALENT

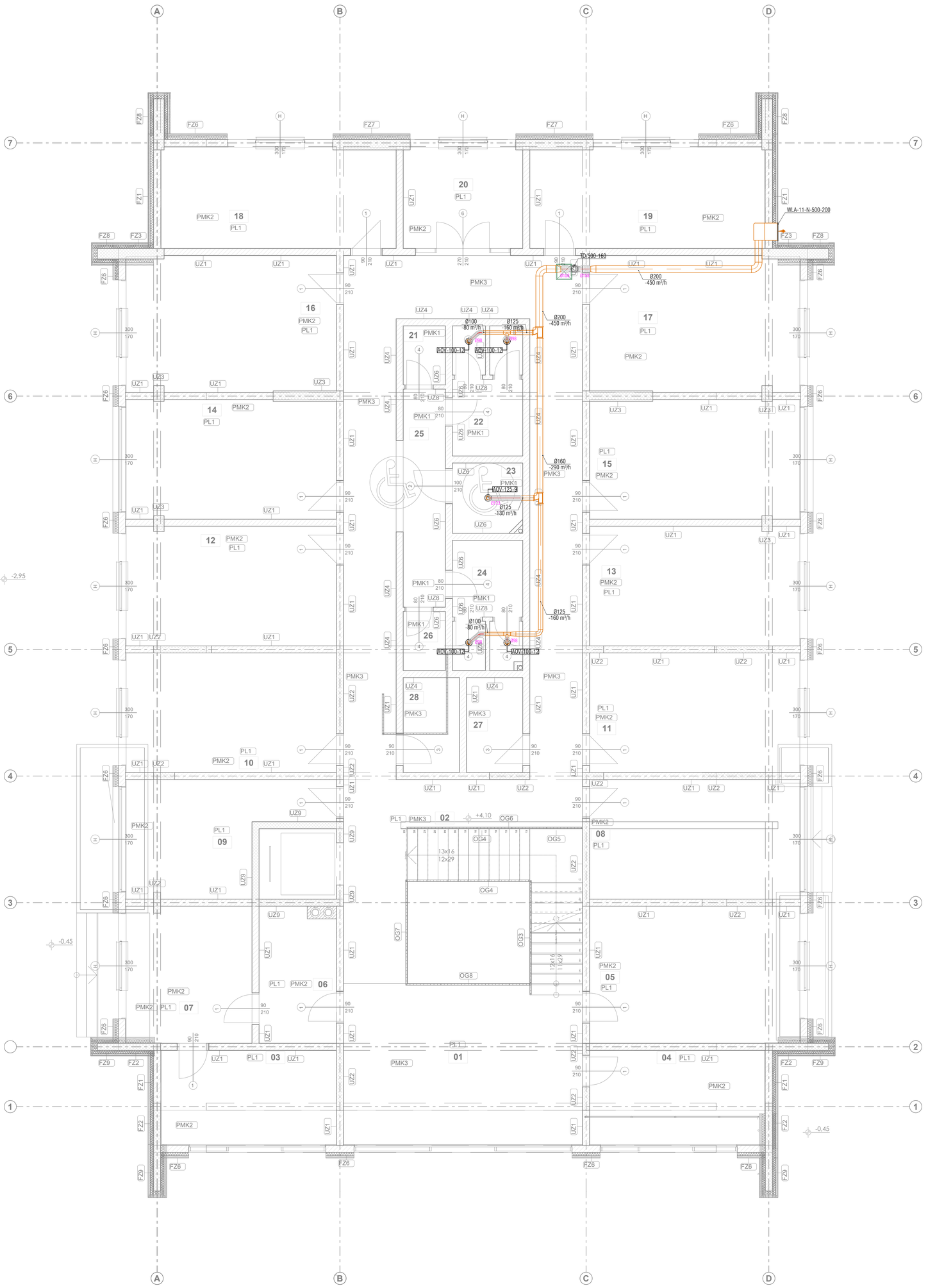
TOPLOVODNI KALORIFER,
TIP: ATLAS 23E46, PROIZVODJAČ: SABIANA ILI EKVIVALENT

AKSIJALNI VENTILATOR NA IZVLAČENJU VAZDUHA,
TIP: TD, PROIZVODJAČ: S&P ILI EKVIVALENT

REVIZIONA REŠETKA

Projektant: **"ANGELINI"** d.o.o. Podgorica, Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija; Razmjera: P 1:50
Saradnik:	Naziv crteža: VENTILACIJA-RASPORED OPREME PRIZEMLJE; Broj lista: 3.10; Broj strane:
Datum izrade i M.P.	Datum revizije i M.P.

939x841



LEGENDA

broj	naziv prostorije	podna obloga	obloga zida	obl.plafona	obim	površina
01	čekaonica	keramičke pločice	d.boja	d.boja	22,60м	31,44м²
02	hodnik	keramičke pločice	d.boja	d.boja	80,00м	68,54м²
03	sastanci direktor	keramičke pločice	d.boja	d.boja	15,34м	13,60м²
04	kancelarija	keramičke pločice	d.boja	d.boja	15,36м	13,60м²
05	kancelarija	keramičke pločice	d.boja	d.boja	19,74м	23,30м²
06	sekretarica	keramičke pločice	d.boja	d.boja	12,20м	8,58м²
07	direktor	keramičke pločice	d.boja	d.boja	14,96м	13,94м²
08	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
09	kancelarija	keramičke pločice	d.boja	d.boja	19,16м	20,33м²
10	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
11	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	20,33м²
12	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
13	kancelarija	keramičke pločice	d.boja	d.boja	19,06м	20,33м²
14	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
15	kancelarija	keramičke pločice	d.boja	d.boja	18,76м	23,30м²
16	kancelarija	keramičke pločice	d.boja	d.boja	19,60м	19,23м²
17	kancelarija	keramičke pločice	d.boja	d.boja	19,76м	19,23м²
18	relax zona	keramičke pločice	d.boja	d.boja	19,12м	9,79м²
19	ostava	keramičke pločice	d.boja	d.boja	19,12м	2,01м²
20	toalet M	keramičke pločice	d.boja	d.boja	12,56м	7,04м²
21	toalet LSPP	keramičke pločice	d.boja	d.boja	5,76м	4,00м²
22	toalet Ž	keramičke pločice	d.boja	d.boja	17,72м	7,40м²
23	hodnik	keramičke pločice	keramika	d.boja	8,00м	7,44м²
24	trokadero	keramičke pločice	keramika	d.boja	17,72м	2,01м²
25	arhiva	keramičke pločice	keramika	d.boja	14,80м	4,32м²
26	IT sektor	keramičke pločice	keramika	d.boja	5,76м	4,32м²
27	stepenice	keramičke pločice	keramika	/	8,60м	11,82м²
			d.boja		8,60м	
			d.boja		/	

ukupno neto etaže	**480,85м²**
ukupno bruto etaže	**562,05м²**
ukupno neto objekat	**909,15м²**
ukupno bruto objekat	**1070,79м²**
ukupno neto sa podrumom	**1113,81м²**
ukupno bruto sa podrumom	**1311,40м²**

LEGENDA

POCINČANI KANAL ZA IZVLAČENJE VAZDUHA

FLEKSIBILNA CRIJEVA ZA POVEZIVANJE ELEMENATA VENTILACIJE

ŽALUZINA ZA ZAHVAT/IZBACANJE VAZDUHA U SPOLJNU POVRŠINU,
TIP: WLA, PROIZVODJAČ: LINDAB ILI EKVIVALENT

AEROVENTIL NA IZVLAČENJU VAZDUHA,
TIP: AOV, PROIZVODJAČ: ENPRO ILI EKVIVALENT

AKSIJALNI VENTILATOR NA IZVLAČENJU VAZDUHA,
TIP: TD, PROIZVODJAČ: S&P ILI EKVIVALENT

REVIZIONA REŠETKA

Projektant:

"ANGELINI" d.o.o. Podgorica
Danila Kiša br. 1, Podgorica

Investitor:

Opština Žabljak

Objekat:
Objekat za komunalno i vodovod Žabljak

Lokacija:
kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opština Žabljak

Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:

Vrsta tehničke dokumentacije:
Glavni projekat

Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:

Dio tehničke dokumentacije:
Termotehničke instalacija

Razmjera: P 1:50

Saradnik:

Naziv crteža:
VENTILACIJA-RASPORED OPREME SPRAT

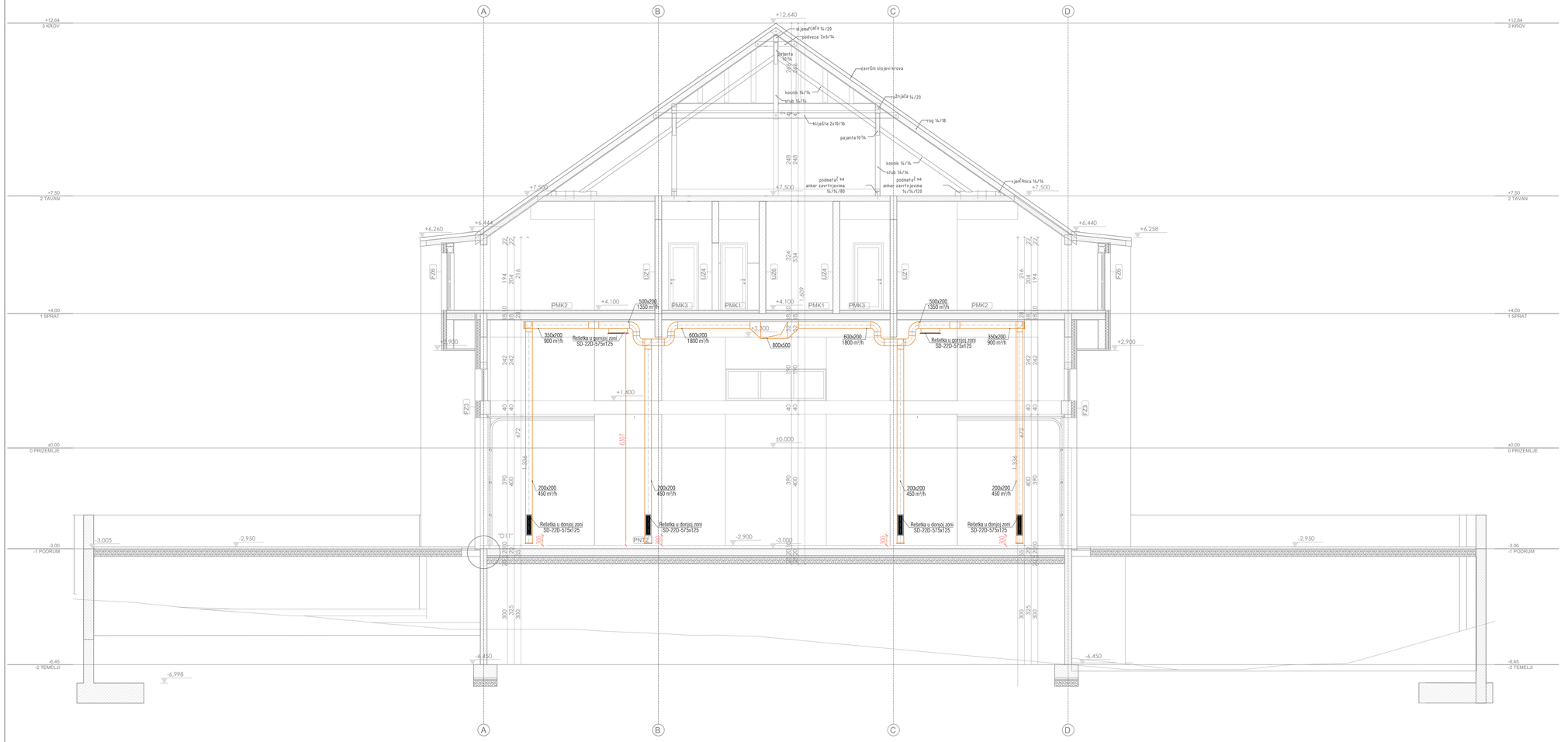
Broj lista: 3.11

Broj strane:

Datum izrade и M.P.

Datum revizije и M.P.

939x841



LEGENDA

PODNČANI KANAL ZA IZVLAČENJE VAZDUHA

JEDNOREDE ČELIČNE REŠETKE ZA UBACIVANJE/IZVLAČENJE VAZDUHA SA DAMPEROM.
TIP: SD-11D-625x175, PROIZVOJAČ: LINDAB ILI EKVIVALENT

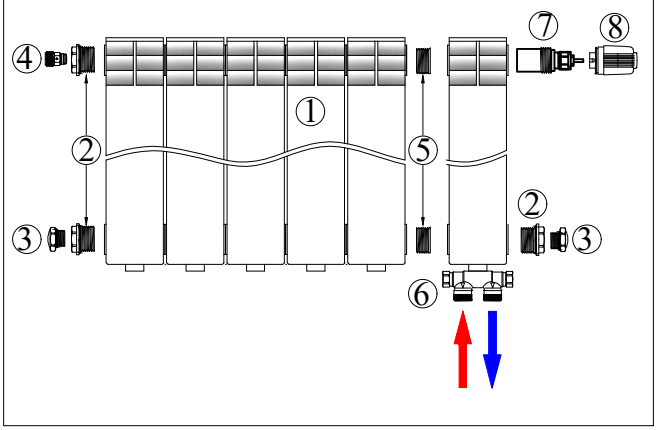
MEHANIČKA RASTERETNA KLAPNA 50Pa
TIP: THT-63-6T-0.75, PROIZVOJAČ: SODECA ILI EKVIVALENT

Projektant: **"ANGELINI"** d.o.o. Podgorica Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak i, UP 247 i UP 247b, zona E, izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Paraf: Stefan Vlahović spec.sci.arh.	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Paraf: Miloš Dragaš dipl.inž.maš	Dio tehničke dokumentacije: Termotehničke instalacija Razmjera: P 1:50
Saradnik:	Naziv crteža: VENTILACIJA-PRESJEK C-C Broj lista: 3.12 Broj strane:
Datum izrade i ≈ M.P.	Datum revizije i ≈ M.P.

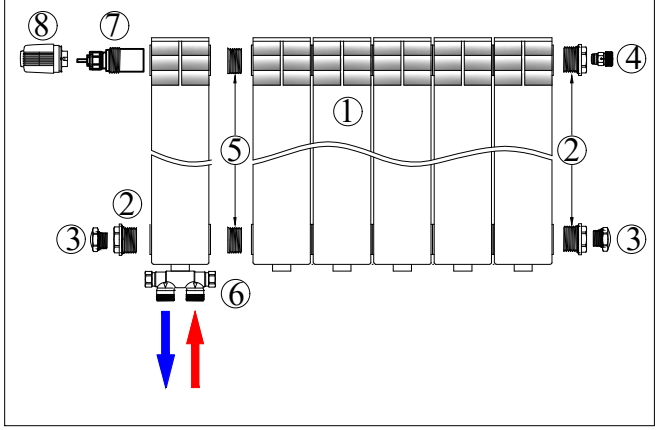
1190x594

DETALJ SPAJANJA RADIJATORA

RP - DESNI PODNI PRIKLJUCAK



LP - LIJEVI PODNI PRIKLJUCAK



① ALUMINIJSKI RADIJATOR, MODEL: "ORION", PROIZVODJAC : "LIPOVICA", HRVATSKA
② REDUKCIJA LIJEVA/DESNA
③ CEP
④ ODZRACNI VENTIL
⑤ SPOJNICE
⑥ DONJI VENTIL -P VENTIL (RP ILI LP) ZA PRIKLJUCAK CIJEVI IZ PODA
⑦ GORNJI VENTIL ZA PRIKLJUCAK TERMOSTATSKE GLAVE
⑧ TERMOSTATSKA GLAVA

Projektant: **"ANGELINI"** d.o.o. Podgorica Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opstina Zabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija Razmjera: P 1:100
Saradnik:	Naziv crteža: DETALJ MONTAŽE RADIJATORA Broj lista: 3.13 Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

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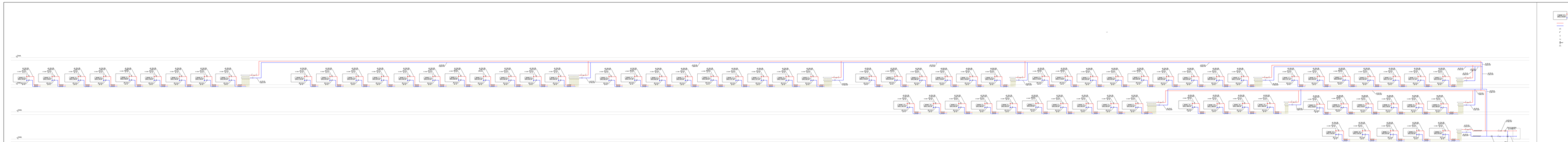


LEGENDA

	INSTALLED
	PROJECTED
	PROJECTED PRESSURE GAUGE
	PROJECTED FLOW METER
	PROJECTED PRESSURE REDUCING VALVE
	PROJECTED PRESSURE GAUGE
	PROJECTED FLOW METER
	PROJECTED PRESSURE REDUCING VALVE
	PROJECTED PRESSURE GAUGE
	PROJECTED FLOW METER
	PROJECTED PRESSURE REDUCING VALVE
	PROJECTED PRESSURE GAUGE
	PROJECTED FLOW METER
	PROJECTED PRESSURE REDUCING VALVE

Consultant: | Location:

MANILA WATER Manila Philippines
Metro Manila - Philippines

Project:
Project of Construction Institutional Bulkings
Metro Manila - Phase 1

Project Proponent:
Manila Water Company, Inc.
Lake Drive, Metropolitan Park
Katuparan, Balara, Quezon City

Project Manager:
MANILA WATER INTERNATIONAL HOLDINGS LIMITED
Unit 1, 1/F, Tower 1, The Enterprise Center
6766 Ayala Avenue, Makati City

Contractor:

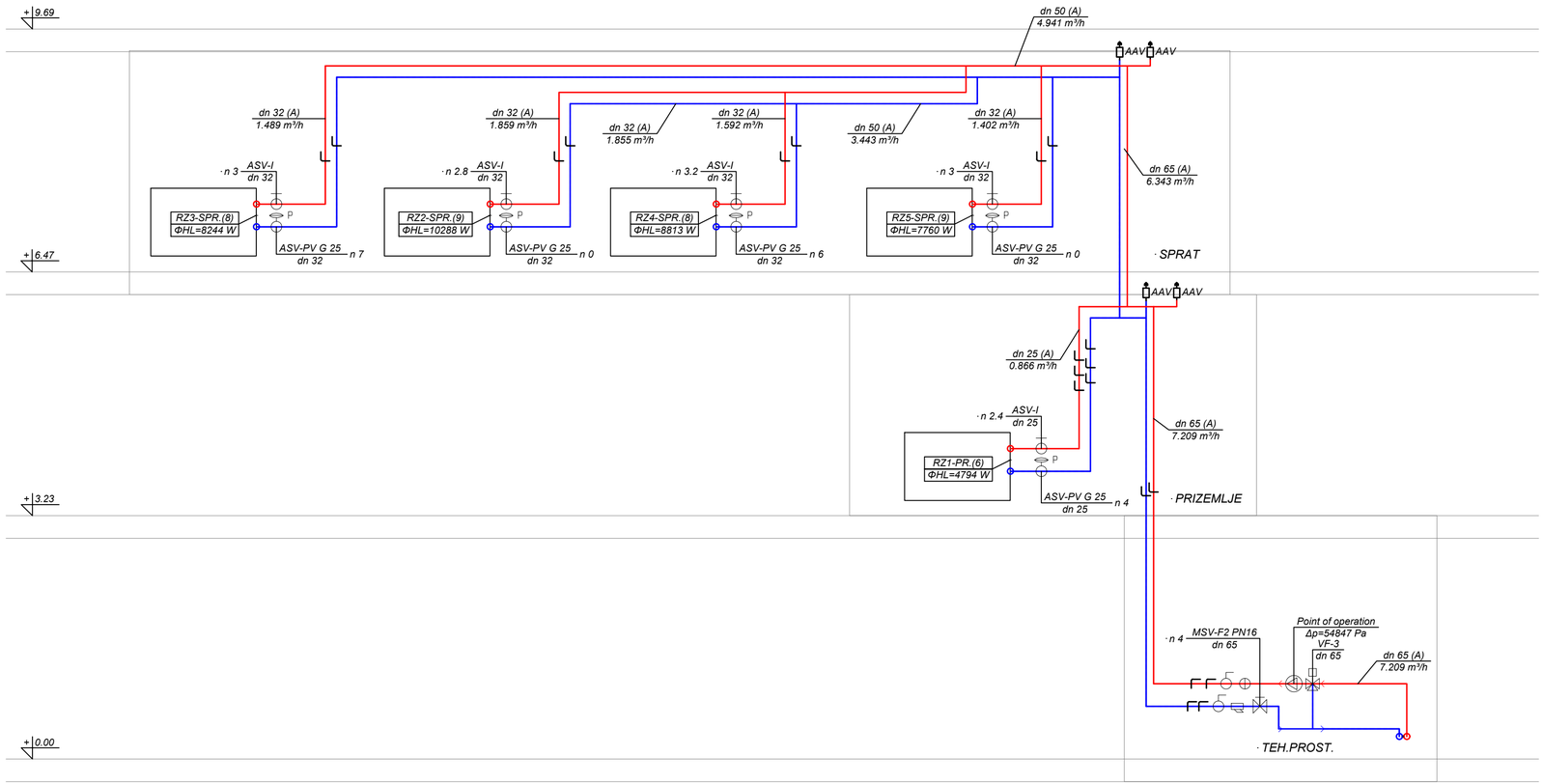
Project Design Consultant:
Manila Water Asia Pacific
Manila Water Center
Katuparan, Balara, Quezon City

Title:
Schematic Diagram
Phase 1 - Area 1

Scale: NTS | Date: 2020-07-17

Sheet Number: LAT-1

2020-07-17



LEGENDA:

500/95 - 14
ΦHL=1745 W — RADIJATOR

PEX-AL-PEX POTISNI CJEVOVOD

PEX-AL-PEX POVRATNI CJEVOVOD

KUGLASTA SLAVINA

LOKALNI OTPORI

NEPOVRATNA KLAPNA

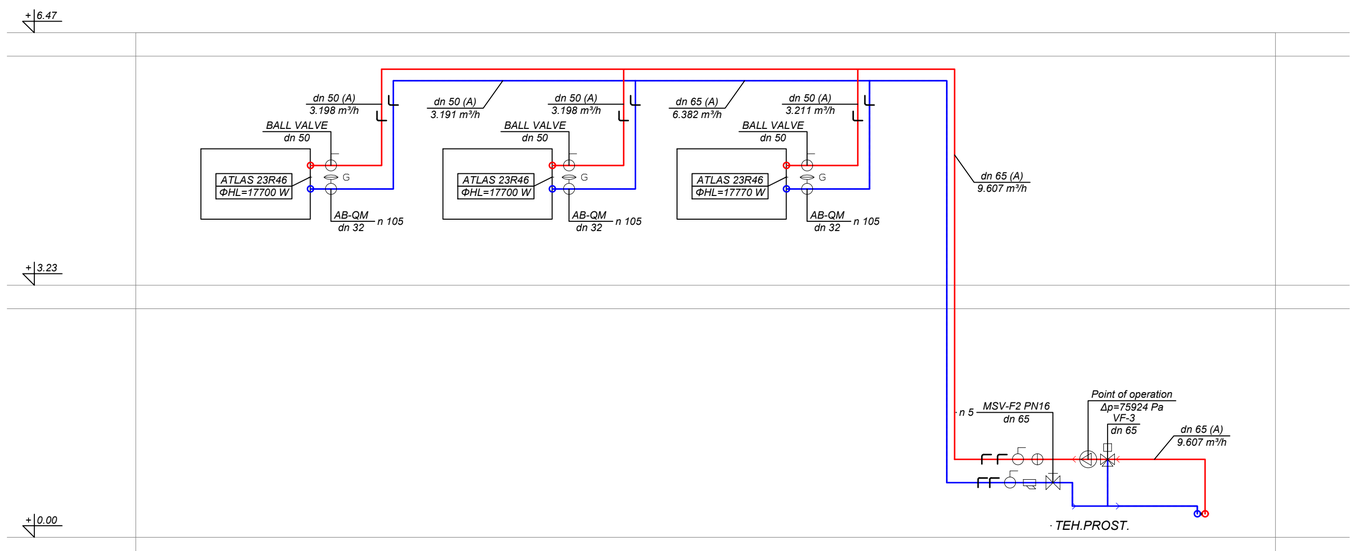
HVATAČ NEČISTOĆE

AAV — AUTOMATSKI ODZRAČNI LONAC

KOSI REGULACIONI VENTIL

Projektant: **"ANGELINI"** d.o.o. Podgorica Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E. Izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opstina Zabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. — Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš — Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija — Razmjera: P 1:50
Saradnik:	Naziv crteža: ŠTRANG ŠEMA PODNO GRIJANJE — Broj lista: 3.15 — Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

660x297



LEGENDA:

500/95 - 14
ΦHL=1745 W — RADIJATOR

PEX-AL-PEX POTISNI CJEVOVOD

PEX-AL-PEX POVRATNI CJEVOVOD

KUGLASTA SLAVINA

LOKALNI OTPORI

NEPOVRATNA KLAPNA

HVATAČ NEČISTOĆE

AAV — AUTOMATSKI ODZRAČNI LONAC

KOSI REGULACIONI VENTIL

Projektant: **"ANGELINI"** d.o.o. Podgorica Danila Kiša br. 1, Podgorica	Investitor: Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Zabljak I, UP 247 i UP 247b, zona E. Izmjene i dopune DUP "Zabljak" za zone I,J,G,H,E,F,C, Opstina Zabljak
Glavni inžinjer: Stefan Vlahović spec.sci.arh. — Paraf:	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Miloš Dragaš dipl.inž.maš — Paraf:	Dio tehničke dokumentacije: Termotehničke instalacija — Razmjera: P 1:50
Saradnik:	Naziv crteža: ŠTRANG ŠEMA KALORIFERI — Broj lista: 3.16 — Broj strane:
Datum izrade и M.P.	Datum revizije и M.P.

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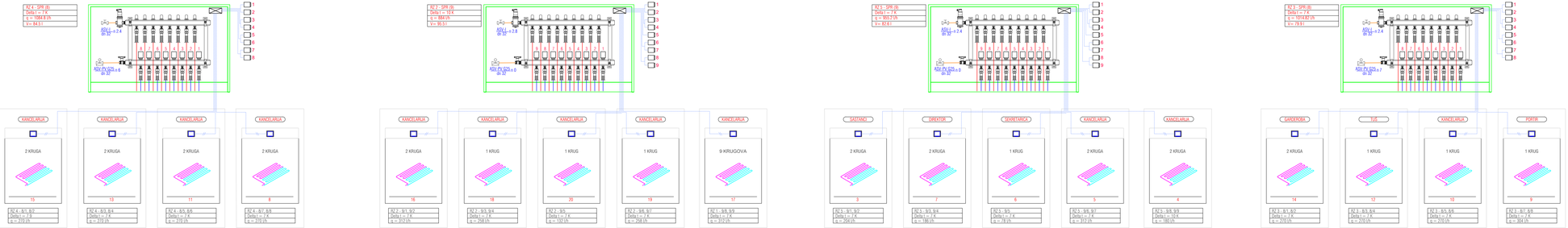

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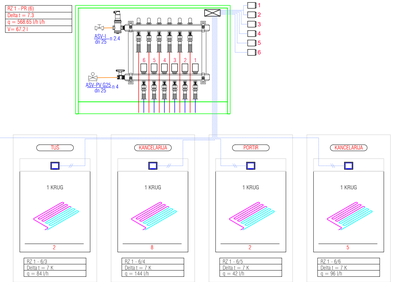

Prizemlje

PRIKAZ NA DAS
NEA R Mass 24 V / 230 V

S. 1-1 Konekcije u bazi

1. Konekcija TI
2. Konekcija pumpe
3. PCC
4. Napon
5. Osigurač
6. Limiter temperatura
7. Redukcioni kanal, eksterni tajmer
8. Grijanje/hlađenje - changeover
9. Konekcija termostata
10. LEDs
11. Strain relief
12. Konekcija aktuatora
13. DIP prekidač
14. Kontakti za poklopac kućišta sa integrisanim sistemskim satom

OBJEŠNJENJE

LEGENDA

ORMARIĆ PODNOG GRIJANJA, TIP: UP75, REHAU ILI EKVIVALENT

ČELIČNI RAZDJELNIK/SABIRNIK, TIP: HKV-D, REHAU ILI EKVIVALENT

LEPTIR VENTIL

ODZRAČNI VENTIL

REGULACIONI RAZDJELNIK SA MOGUĆNOŠĆU POVEZIVANJA DO 8 SOBNIH REGULATORA I 14 TERMIČKIH SERVO POGONA TIP NEA SMART 2.0 BASE, REHAU ILI EKVIVALENT

TERMIČKI SERVO POGON, TIP: UNI MINI 24V, REHAU ILI EKVIVALENT

REGULATOR DIF.PRITISKA, TIP: ASV-P/ASV-I, DANFOSS ILI EKVIVALENT

PRITISNO NEZAVISNI VENTIL SA MOTORNIM POGONOM, TIP: AB-QM, DANFOSS ILI EKVIVALENT

KRUG PODNOG GRIJANJA

Projektant:	Investitor:
"ANGELINI" d.o.o. Podgorica Danila Kiša br. 1, Podgorica	Opština Žabljak
Objekat: Objekat za komunalno i vodovod Žabljak	Lokacija: kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak i, UP 2471 i UP 2470, dio E. limjanei i dijapurne DUP "Žabljak" za zone I, II,G,H,E,F,C, Opština Žabljak
Glavni inžinjer: Parafi: Stefan Vlahović spec.sci.arh.	Vrsta tehničke dokumentacije: Glavni projekat
Odgovorni inžinjer: Parafi: Miloš Dragaš dipl.inž.maš	Do tehničke dokumentacije: Termotehničke instalacija — Razmjera: P 1:100
Saradnici:	Naziv crteža: ŠEMA VEZE PODNOG GRIJANJA — Broj lista: 3.17 — Broj strane:
Datum izrade =+ M.P.	Datum revizije =+ M.P.

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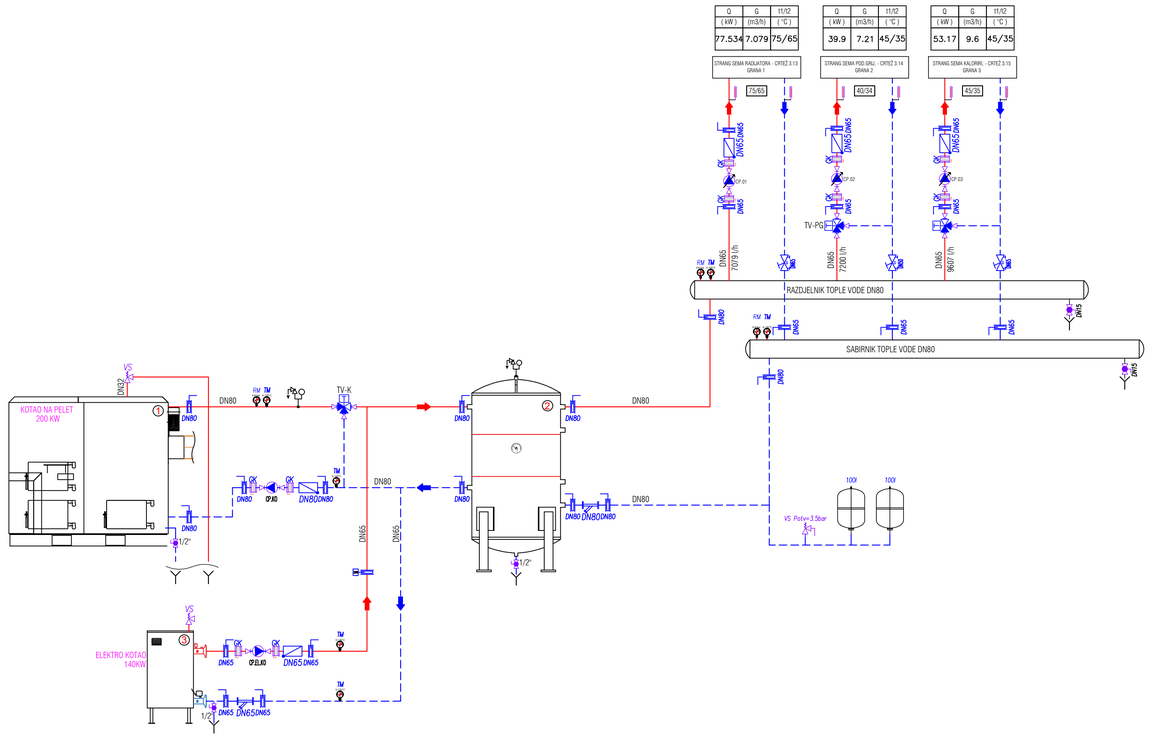

TABELA 1. CIRKULACIONE PUMPE - PODSTANICA PODRUM										
NO.	Sistem:	Tip	Protok	Napor	Težina	El.Motor			Broj aparata	Mjesto ugradnje /aparata	Poz.u šemi
						Snaga	Napon	Struja			
			m3/h	kPa	kg	W	V	A			
1	Kotlovska pumpa	TOP-S 50/7 DM PN6/10	13.5	40	16.6	610	400 V/3ph/50Hz	1.19	1	Kotlarnica	CP-KO
2	Pumpa elektro kotla	TOP-S 50/7 DM PN6/10	13.5	40	16.6	610	400 V/3ph/50Hz	1.19	1	Kotlarnica	CP-el.KO
3	Grana 1 - Radijatorsko grijanje	Stratos MAXO 40/0,5-12 PN6/10	8.83	40	16.4	570	230V/1ph/50Hz	2.49	1	Kotlarnica	CP-01
4	Grana 2 - Podno grijanje	Stratos MAXO 32/0,5-10 PN10	7.2	55	11.1	250	230V/1ph/50Hz	1.09	1	Kotlarnica	CP-02
5	Grana 3 - Kaloriferi	TOP-S 40/10	9.6	77	14.7	680	230V/1ph/50Hz	3.74	1	Kotlarnica	CP-03

TABELA 2. TROKRAKI VENTILI SA MOTORNIM POKRETAČEM												
NO	Oznaka		Tip	Protok	Kvs	Pad pritiska	Nazivni prečnik	Tip spoja	Pokretač	Napajanje	Ulazni signal	Izlazni signal	Vrijeme zatvaranja	Pozicija ugradnje
	-		-	l/h	-	kPa	DN	-	-	VAC	V/mA	mA	sec	-
1	TV	K	CV 306 GG	13500	Kvs = 40	11.3	DN50	sp.navoj	TA-MC 100/230	230 VAC	3-tačke; 0(2)-10 V; 0(4)-20 mA	0-10VDC	26.6,56,126,168	kotlarnica
2	TV	PG	CV 306 GG	7200	Kvs = 20	12.9	DN40	sp.navoj	TA-MC 100/230	230 VAC	3-tačke; 0(2)-10 V; 0(4)-20 mA	0-10VDC	26.6,56,126,168	kotlarnica
3	TV	KAL	CV 306 GG	9600	Kvs = 25	14.6	DN40	sp.navoj	TA-MC 100/230	230 VAC	3-tačke; 0(2)-10 V; 0(4)-20 mA	0-10VDC	26.6,56,126,168	kotlarnica

TABELA 3. EKSPANZIONE POSUDE									
NO.	Funkcija	Sistem	Tip	Zapremina	Dimenzije		Priključak	Težina	Broj aparata	Mesto ugradnje aparata
					V	D				
				Lit.	mm	mm	-	kg		
1	Ekspanziona posuda sistema grijanje	Kotlovi i grejni sistemi	ERCE 100	100	795	500	1"	23.08	2	Kotlarnica

Specifikacija armature		
Poz. oznaka	Naziv	Kol.
GK	Gumeni kompezator DN65, PN6	10
HN DN65	Hvatac nesistoca DN65, PN16	1
HN DN80	Hvatac nesistoca DN80, PN16	1
LV DN65	Leptir ventil DN65, PN6	16
LV DN80	Leptir ventil DN80, PN6	10
M	Manometar 0-6 bar	3
NV DN80	Nepovratni ventil DN65, PN6	3
NV DN65	Nepovratni ventil DN80, PN6	1
PIP	Slavina za punjenje i pražnjenje DN15, PN10	5
RU	Kosi regulacioni ventil DN65	3
TM	Termometar u čauri	12
VS	Ventil sigurnosti sa oprugom DN32, Pot=3 bar	2
VS	Ventil sigurnosti sa oprugom DN20, PN 16, Pot=6 bar	2

LEGENDA

- POVRATNA BEŠAVNA ČELIČNA CIJEV
- POTISNA BEŠAVNA ČELIČNA CIJEV

1. KOTAO NA PELET, KAPACITETA 200KW
   TIP: EKOLINE 200, PROIZVOĐAČ: KOVAN ILI EKVIVALENT
   VISOK STEPEN SAGORIJEVANJA KOJI IZNOSI 96,4%
   KOTAO IMA SOPSTVENU ELEKTRONIKU KOJA UPRAVLJA PROCESOM SAGORIJEVANJA
   U KONSTRUKCIJI KOTLA SU 4 KOMORE U KOJIMA SE VRŠI RAZMJENA TOPLOTE
   ELEKTRONIKA IMA ŠIROK SPEKTAR PODEŠAVANJA KOTLA.
   MOGUĆNOST SAGORIJEVANJA , REGULACIJA PRITISKA U KOTLU, REGULACIJU TEMPERATRE VODE U SISTEMU,
   MOGUĆNOST NADOGRADNJE OPREME
2. AKUMULATOR TOPLE VODE, ZAPREMINE 1000l
   TIP: P1000, PROIZVOĐAČ: SUNSYSTEM ILI EKVIVALENT
3. ELEKTRO KOTAO KAPACITETA 140kW
   UNUTAR UREĐAJA SE NALAZE GRIJAČI 14x10kW
   VENTIL SIGURNOSTI 2x1/2, 4bar
   ZAŠTITA: IP20
   SIGURNOSNI TERMOSTAT JE PODEŠEN NA 95C
   POTREBNI GLAVNI OSIGURAČI: 3x250A

- LEPTIR VENTIL (DN65)
- NEPOVRATNI VENTIL (DN65)
- FREKV. CIRK, PUMPA. U TABELI DATI TIPOVI (CP.03)
- CIRK, PUMPA. U TABELI DATI TIPOVI (CP.00)
- KOSI REGULACIONI VENTIL, TIP: STAF, PROIZVOĐAČ: TOUR AND ANDERSON ILI EKVIVALENT
- PIP SLAVINA (DN15)
- TROKRAKI MIJEŠNI VENTIL, TIP: CV306 GG+TA-MC, PROIZVOĐAČ: TOUR AND ANDERSON ILI EKVIVALENT
- VENTIL SIGURNOSTI (VS DN32)
- GUMENI KOMPEZATOR (GK 100l)
- EKSPANZIONA POSUDA, ZAPREMINE 100l, TIP: ERCE 100, PROIZVOĐAČ: ELBI ILI EKVIVALENT

Projektant:

"ANGELINI" d.o.o, Podgorica
Danila Kiša br. 1, Podgorica

Investitor:

Opština Žabljak

Objekat:
Objekat za komunalno i vodovod Žabljak

Lokacija:
kat.par.br. 1815/15 i kat.par.br. 1815/16 KO Žabljak I, UP 247 i UP 247b, zona E, Izmjene i dopune DUP "Žabljak" za zone I,J,G,H,E,F,C, Opština Žabljak

Glavni inžinjer: Paraf:
Stefan Vlahović spec.sci.arh.

Vrsta tehničke dokumentacije:
Glavni projekat

Odgovorni inžinjer: Paraf:
Miloš Dragaš dipl.inž.maš

Dio tehničke dokumentacije:
Termotehničke instalacija

Razmjera:
P 1:100

Saradnik:

Naziv crteža:
HIDRAULIČKA ŠEMA

Broj lista:
3.18

Broj strane:

Datum izrade и M.P.

Datum revizije и M.P.

830x297