

Primo

Climate system for installation along the perimeter wall



PERIMETER WALL SYSTEM PRIMO

- A complete climate system for installation along the perimeter wall.
- High capacity and small space requirements.
- Prefabricate parts promote uncomplicated installation.
- Modular designed units offering immense flexibility. Adapted for new building and renovation projects as well as replacement of existing induction units.

FUNCTIONS

- Ventilation
- Cooling
- Heating
- Integrated room temperature control
- Space for electrical trunking

AREAS OF APPLICATION

New build, extension and refurbishment of:

- Offices
- Conference facilities
- Hotels



KEY FIGURES

- Cooling capacity:** 1926 W (L = 1600 mm, $\Delta t_{mk} = 10^\circ\text{C}$, pressure 300 Pa and $q_l = 45$ l/s).
- Heating capacity:** 2025 W (L = 1600 mm, $\Delta t_{mv} = 30^\circ\text{C}$, pressure 300 Pa and $q_l = 45$ l/s).
- Air flow:** 6 to 45 l/s.
- Pressure range:** 150 - 300 Pa.
- Lengths:** 600, 800, 1000, 1300 and 1600 mm.
- Heights:** From 365 mm.
- Duct dimensions:** $\varnothing 125$, $\varnothing 160$, $\varnothing 200$ mm.
- Control:** System integrated control equipment for sequence control per room.

CHARACTERISTIC FOR Primo

The perimeter wall system Primo in many ways represents a completely new way to construct a perimeter wall system. Among the advantages offered by the system, despite its minimal space requirements, are all the functions you would expect a climate system to feature.

The entire system is installed against the facade, which means that no installation space is required on the floor, ceiling or in the corridor.

- Primo is a complete system with the functions cooling, heating, ventilation and temperature control. The system also has electrical trunking and perimeter casing.
- Thanks to its modular design Primo is the perfect choice for new building as well as for renovation projects and for the replacement of old induction and mini-air units.
- The modules are based on measurement adapted prefabricated parts that permit quick and easy assembly.
- Sound insulating, prefabricated wall blocks.
- Thermally insulated distribution pipes.
- Stifab Farex's well-known pipe connection with double o-ring seals that take up both pipe expansion and building tolerances ± 7 mm.
- Correct air flow adjusted at the factory. If there is a need to change the air flow at a later date this is easily done by adding or removing plugs from the nozzle strip.

The flexible design and the possibility to position wall blocks between each module means that placement of partition walls can be decided at a later stage. Naturally, this method even lets you change the placement of the partition walls after the system has been commissioned.

Using the Stifab Farex web-based software, ProPipe, both the design and selection are easy. Pro-Pipe is available on our website: www.stifarex.se

Primo

Primo is a complete climate system with the functions cooling, heating, ventilation and temperature control.

Installation

The prefabricated pipe system is suspended on the mounting rail by the means of brackets and secured. You can choose between first installing the complete pipe system by itself and then installing the units or fit the units as the installation of the pipe system progresses. Associated valve assemblies with hoses are easily installed using quick action couplings and join the unit with the distribution pipe.

Connection:

Connection respective termination fittings are installed at the beginning and end.

Control equipment:

The connection cable is connected to snap-in terminals on the unit's connection card and is routed on to the adjacent unit. The transformer is suspended on a wall rail and is connected to the connection card, number as required.

Casing:

Electrical trunking, perimeter casing and supply air grille are

fitted in position after which the room regulator is connected to the snap-in terminals on the unit's connection card.

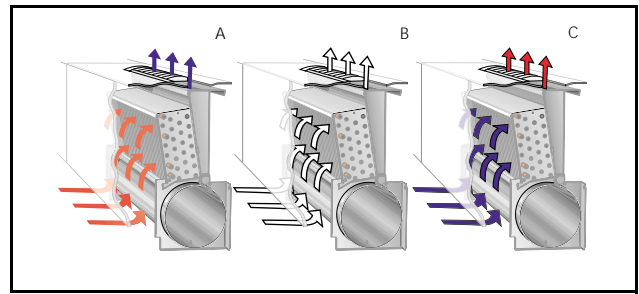


Figure 1. Operating modes.
A=Cooling, B=Neutral, C=Heating

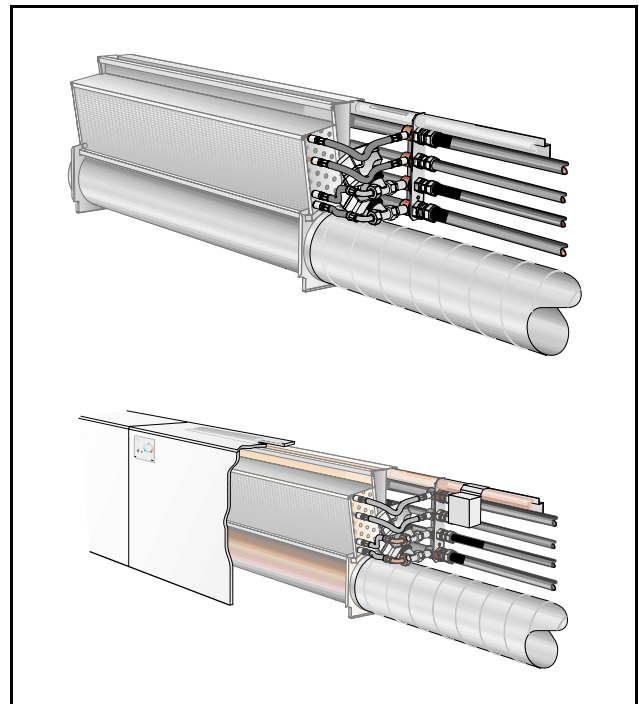


Figure 2. Installation.

CONNECTION DIMENSIONS

Cooling (water): Plain pipe ends CU Ø28 x 1.0 mm

Heating (water): Plain pipe ends CU Ø22 x 1.0 mm

Air: Duct Ø125, Ø160 or Ø200 mm

RANGE AVAILABLE ON ORDER

Length: 600, 800, 1000, 1300 and 1600 mm, (figure 4)

Dimensions: Ø125 mm height: 365-565 mm, depth: 183 mm
Ø160 mm height: 400-600 mm, depth: 183 mm
Ø200 mm height: 450-650 mm, depth: 220 mm

SPECIAL TYPES

- Primo with air connection in the unit's duct from below.
 - Primo with front position distribution pipe (figure 5).
 - Optional brand of valves.
- Contact Stifab Farex for further information about special types.

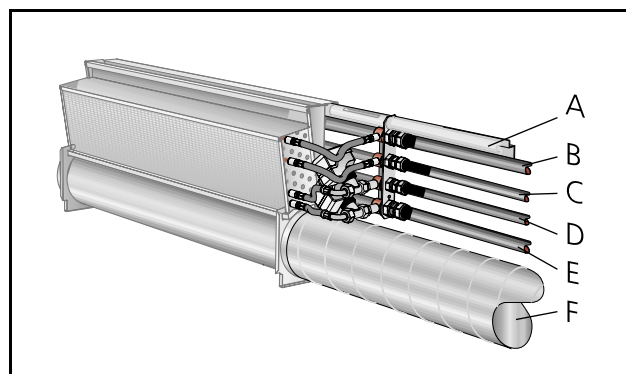


Figure 3. Connection dimensions.

- A. Installation pipe, control cable Ø25 mm
- B. Return cooling Ø28 mm
- C. Return heat Ø22 mm
- D. Supply heat Ø22 mm
- E. Supply cooling Ø28 mm
- F. Air duct Ø125, 160 or 200 mm

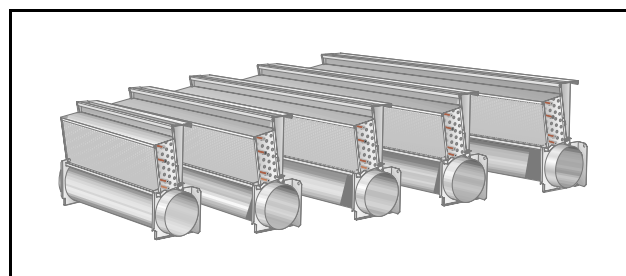


Figure 4. Range available on order.

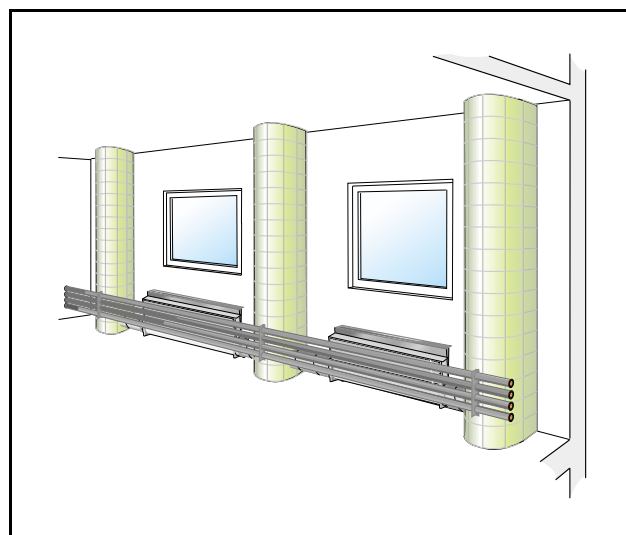


Figure 5. Primo with front position distribution pipe.



Primo

ACCESSORIES

Mounting rail MR

Telescopic outlet air connection fitting OE

Telescopic outlet air connection fitting for full height units. The telescopic outlet air connection fitting is required to give maximal unit performance.

Connection pipes PR, PM, PL and PJ

For connection of heat, cooling and control cable routing between units. Pipe set supplied measurement adapted and as standard complete with the necessary connection fittings.

Wall block WB

Prefabricated wall blocks. Available in different sizes adapted to the type of unit.

Connection components CS

Contains compression ring couplings, pipe stop with venting nipples, end cover and grease, extra o-rings and self-vulcanising tape.

Corner solution PC

Coupling fittings to go around a corner.

Control equipment RWB

Room regulator, control cable and transformer, see the RWB brochure.

Perimeter casing PrimoFront

See the perimeter casing brochure, PrimoFront.

Supply air grille GA

Grille with fixed slats for sill installation. Colour: RAL 9010, gloss value 30 ±6%.

Dimensions L=600, 800, 1000, 1300 and 1600 mm.
B=100 mm. Hole cut-out size = L + 10 x 105 mm.

Supply air grille PrimoFlex

Grille with adjustable deflectors for sill installation. Colour: RAL 9010, gloss value 30 ±6%.

Dimensions L=600, 800, 1000, 1300 and 1600 mm.
B=100 mm. Hole cut-out size = L + 10 x 105 mm.

Draining hose HD

Hose for connection to the unit's condensation tray.

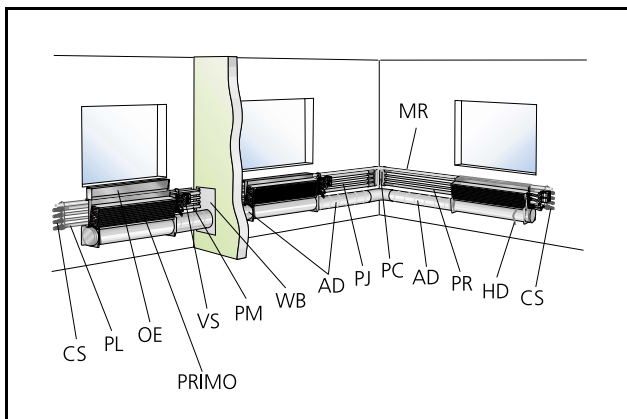


Figure 6. Assembly drawing accessories.

RECOMMENDED LIMIT VALUES, WATER

Max. recommended operating pressure: 600 kPa

Max. recommended test pressure for testing completed installations: 900 kPa

Max. recommended pressure drop across the unit: 20 kPa

Min. warm water flow per unit:

Primo length 600, 800 and 1000 mm: 0.013 l/s

Primo length 1300 and 1600 mm: 0.013 l/s

Highest supply temperature: + 80°C

Min. cold water flow per unit:

Primo length 600 and 800 mm: 0.02 l/s

Primo 1000, 1300 and 1600 mm: 0.04 l/s

Min. cold water temperature: Should always be dimensioned so that the system works without condensation.



Figure 7. Supply air grille PrimoFlex.



Figure 8. Perimeter casing PrimoFront.

TECHNICAL SPECIFICATION

Cooling

Selection tables 1-4

The tables are organised according to ducting pressure, unit size and air flow rate.

Stated capacities for cooling and warm water in tables 1-9 refer to a unit with casing and telescopic outlet air connection fitting. Use power factor 1.02 for units without casing. The capacity for a unit without casing then becomes $P_{k/v}(W) = P_{table} \cdot 1.02$. Use correction factor 0.9 for units without a telescopic outlet air connection fitting. The capacity for a unit without telescopic outlet air connection fitting $P_{k/v}(W) = P_{table} \cdot 0.9$. Sound levels are stated for a unit with casing and attenuation 10 m² Sabine.

This is how to use the selection tables:

1. Perimeter wall unit's length (mm)
2. Primary air flow (l/s)
3. Sound level (dB(A))*
4. Primary air capacity P_l (W)
5. Water cooling capacity P_k (W)
*10 m² Sabine including casing.

1	2	3	4				5							
			Δt_{mk}				Δt_{mk}							
600	17	20	122	163	204	245	231	275	318	360	405	446	488	530
600	20	20	144	192	240	288	235	280	323	366	409	451	492	534
600	21	20	151	202	252	302	236	280	324	367	409	452	494	535
800	11	20	79	106	132	158	272	337	375	423	489	533	590	637
800	14	20	101	134	168	202	288	353	398	450	518	569	628	684

Heating

Selection tables 6-9

Heating capacity tables 6-9. This is how to use the selection tables:

1. Perimeter wall unit's length (mm)
2. Primary air flow (l/s)
3. Sound level (dB(A))
4. Heating capacity P_v (W)

1	2	3	4					
			Δt_{mv}					
600	17	20	335	450	563	680	796	915
600	20	20	337	451	566	682	797	914
600	21	20	335	449	564	679	794	909
800	11	20	380	529	649	804	954	1133
800	14	20	411	565	699	857	1013	1189

Units of measure

- P:** Output W, kW
t_r: Room temperature °C
v: Velocity m/s
q: Flow l/s
p: Pressure Pa, kPa
t_m: Mean water temperature °C
 Δt_m : Temperature difference [t_r-t_m] °C
 Δt : Temperature difference, between supply and return °C
 Δt_r : Temperature difference, between room and primary air °C
 Δp : Pressure drop Pa, kPa
k_{pk}: Pressure constant
 Supplemental index: k=cooling, i=air, v=heating

The air's cooling capacity can also be calculated according to the formula:

$$P_l (W) = q_l \cdot 1.2 \cdot \Delta t_l, \text{ where:}$$

P_l = Primary air cooling capacity (W)

q_l = The air flow (l/s)

Δt_l = Temperature difference (°C)

The pressure drop on the water side is calculated using the formula:

$$\Delta p = (q/k_p)^2 \text{ (kPa) where:}$$

Δp =pressure drop in the water coil (kPa)

q = water flow per unit (l/s), taken from **Diagram 1 or 4** where the value is divided by the number of units on the branch.

k_p =Pressure constant which is taken from **table 5 or 11**



Table 1. Data - cooling. Selection guide, cooling - pressure 300 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Cooling capacity primary air (W)				Cooling capacity water (W) Unit with casing							
			Δt_l 6	8	10	12	Δt_{mk} 5	6	7	8	9	10	11	12
600	9	<25	65	86	108	130	222	249	296	342	387	432	476	501
600	12	<25	86	115	144	173	235	269	316	362	407	453	498	530
600	15	<25	108	144	180	216	244	284	331	377	423	470	514	553
600	18	25	130	173	216	259	250	294	342	389	435	481	527	569
600	21	27	151	202	252	302	254	300	348	395	442	489	535	580
600	23	28	166	221	276	331	254	302	350	397	444	491	537	584
800	12	<25	86	115	144	173	309	344	410	474	538	602	663	696
800	15	<25	108	144	180	216	322	365	431	496	560	624	686	726
800	18	25	130	173	216	259	333	383	449	514	578	643	705	752
800	21	27	151	202	252	302	342	397	464	529	594	659	722	775
800	24	28	173	230	288	346	349	409	476	541	606	672	735	793
800	27	29	194	259	324	389	354	417	484	550	616	681	746	807
800	30	30	216	288	360	432	357	423	490	556	622	688	753	816
800	33	31	238	317	396	475	358	425	492	559	625	691	757	822
1000	16	<25	115	154	192	230	385	434	518	596	680	727	811	888
1000	19	26	137	182	228	274	400	456	541	621	705	760	844	922
1000	22	27	158	211	264	317	413	476	562	642	727	789	874	954
1000	25	28	180	240	300	360	425	494	580	662	747	816	901	982
1000	28	29	202	269	336	403	435	510	596	679	765	839	924	1007
1000	31	30	223	298	372	446	443	523	610	694	781	859	945	1028
1000	34	31	245	326	408	490	450	533	621	707	794	876	963	1047
1000	37	32	266	355	444	533	456	542	630	717	805	890	977	1063
1000	40	32	288	384	480	576	460	548	637	725	813	900	988	1075
1000	43	33	310	413	516	619	462	552	641	730	819	908	996	1084
1300	21	27	151	202	252	302	512	575	688	792	904	966	1077	1181
1300	24	28	173	230	288	346	527	598	711	817	929	999	1111	1215
1300	27	29	194	259	324	389	541	619	733	840	953	1030	1142	1248
1300	30	30	216	288	360	432	554	639	753	861	975	1059	1171	1278
1300	33	31	238	317	396	475	565	657	772	881	995	1085	1198	1306
1300	36	32	259	346	432	518	576	673	788	899	1013	1109	1223	1332
1300	39	32	281	374	468	562	585	687	803	915	1030	1130	1245	1355
1300	42	33	302	403	504	605	593	700	816	929	1045	1150	1265	1376
1300	45	33	324	432	540	648	600	711	828	942	1058	1167	1282	1395
1600	27	29	194	259	324	389	644	725	866	997	1137	1216	1355	1485
1600	30	30	216	288	360	432	659	747	889	1021	1162	1249	1389	1520
1600	33	31	238	317	396	475	673	769	911	1044	1186	1280	1420	1552
1600	36	32	259	346	432	518	686	789	932	1066	1208	1309	1450	1583
1600	39	32	281	374	468	562	698	808	951	1087	1229	1337	1478	1612
1600	42	33	302	403	504	605	709	825	969	1106	1249	1362	1504	1640
1600	45	33	324	432	540	648	720	841	985	1123	1267	1386	1529	1665

The stated capacity for cooling water refers to a unit with casing and telescopic outlet air connection fitting. Sound levels apply for a unit with casing and attenuation 10 m² Sabine.

Table 2. Data - cooling. Selection guide, cooling - pressure 250 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Cooling capacity primary air (W)				Cooling capacity water (W) Unit with casing							
			Δt_l 6	8	10	12	Δt_{mk} 5	6	7	8	9	10	11	12
600	8	<25	58	77	96	115	195	241	269	303	351	383	424	459
600	11	<25	79	106	132	158	210	256	291	330	378	416	459	500
600	14	<25	101	134	168	202	222	268	307	348	395	436	478	521
600	17	<25	122	163	204	245	231	275	318	360	405	446	488	530
600	20	25	144	192	240	288	235	280	323	366	409	451	492	534
600	21	25	151	202	252	302	236	280	324	367	409	452	494	535
800	11	<25	79	106	132	158	272	337	375	423	489	533	590	637
800	14	<25	101	134	168	202	288	353	398	450	518	569	628	684
800	17	<25	122	163	204	245	302	366	417	473	540	595	655	714
800	20	25	144	192	240	288	313	377	432	490	556	613	673	733
800	23	26	166	221	276	331	322	385	443	503	567	625	683	743
800	26	27	187	250	312	374	328	391	451	512	573	631	689	748
800	29	28	209	278	348	418	332	394	455	516	576	635	694	752
800	31	28	223	298	372	446	333	395	456	517	577	637	696	756
1000	14	<25	101	134	168	202	359	402	483	525	605	681	725	800
1000	17	<25	122	163	204	245	374	426	507	557	638	714	766	842
1000	20	25	144	192	240	288	388	447	528	586	667	744	802	879
1000	23	26	166	221	276	331	400	465	547	611	691	769	834	911
1000	26	27	187	250	312	374	410	481	562	632	713	791	861	939
1000	29	28	209	278	348	418	418	493	575	649	730	809	883	962
1000	32	29	230	307	384	461	424	503	585	662	744	823	901	980
1000	35	30	252	336	420	504	429	510	592	672	753	834	913	993
1000	38	30	274	365	456	547	431	514	596	678	759	840	921	1002
1000	40	31	288	384	480	576	432	515	597	679	761	843	924	1005
1300	19	<25	137	182	228	274	480	539	647	704	811	912	971	1072
1300	22	26	158	211	264	317	496	563	671	736	843	945	1012	1113
1300	25	27	180	240	300	360	510	585	693	765	873	976	1050	1152
1300	28	28	202	269	336	403	523	604	713	792	900	1004	1084	1187
1300	31	28	223	298	372	446	535	622	731	816	924	1028	1115	1218
1300	34	29	245	326	408	490	545	638	746	838	946	1050	1142	1246
1300	37	30	266	355	444	533	554	651	760	856	964	1070	1166	1270
1300	40	31	288	384	480	576	561	663	772	872	980	1086	1186	1291
1300	43	31	310	413	516	619	567	672	781	885	994	1100	1203	1309
1300	45	32	324	432	540	648	570	677	787	892	1001	1108	1213	1319
1600	24	26	173	230	288	346	602	676	810	882	1016	1143	1217	1343
1600	27	27	194	259	324	389	618	700	834	914	1049	1176	1258	1385
1600	30	28	216	288	360	432	632	722	857	944	1079	1208	1297	1424
1600	33	29	238	317	396	475	646	742	878	973	1107	1236	1332	1460
1600	36	30	259	346	432	518	658	761	897	998	1133	1263	1365	1494
1600	39	30	281	374	468	562	670	779	915	1022	1157	1287	1396	1525
1600	42	31	302	403	504	605	680	795	931	1043	1179	1310	1423	1553
1600	45	32	324	432	540	648	689	809	945	1063	1198	1330	1448	1579

The stated capacity for cooling water refers to a unit with casing and telescopic outlet air connection fitting. Sound levels apply for a unit with casing and attenuation 10 m² Sabine.



Table 3. Data - cooling. Selection guide, cooling - pressure 200 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Cooling capacity primary air (W)				Cooling capacity water (W) Unit with casing							
			Δt_l 6	8	10	12	Δt_{mk} 5	6	7	8	9	10	11	12
600	7	<25	50	67	84	101	185	208	251	274	319	344	367	411
600	10	<25	72	96	120	144	195	225	267	297	341	373	403	446
600	13	<25	94	125	156	187	201	237	279	314	356	393	428	470
600	16	<25	115	154	192	230	206	245	285	324	365	404	442	482
600	19	<25	137	182	228	274	208	248	288	327	367	406	444	483
800	10	<25	72	96	120	144	261	292	354	385	449	485	516	579
800	13	<25	94	125	156	187	270	310	370	410	472	514	553	615
800	16	<25	115	154	192	230	278	324	383	429	490	538	583	643
800	19	<25	137	182	228	274	284	335	393	444	503	555	605	664
800	22	<25	158	211	264	317	289	343	400	454	512	567	619	677
800	25	25	180	240	300	360	292	348	404	460	516	572	626	682
800	28	26	202	269	336	403	293	349	405	460	516	572	626	682
1000	13	<25	94	125	156	187	319	360	438	479	556	597	673	714
1000	16	<25	115	154	192	230	337	386	464	513	590	640	716	765
1000	19	<25	137	182	228	274	352	409	487	544	621	677	754	810
1000	22	<25	158	211	264	317	365	429	506	569	646	709	785	848
1000	25	25	180	240	300	360	376	445	522	590	667	734	811	878
1000	28	26	202	269	336	403	385	457	534	606	682	754	830	901
1000	31	26	223	298	372	446	391	466	543	617	694	768	844	918
1000	34	27	245	326	408	490	395	471	548	624	700	776	852	927
1000	36	28	259	346	432	518	396	473	549	626	702	778	853	929
1300	18	<25	130	173	216	259	429	486	590	646	749	805	907	963
1300	21	<25	151	202	252	302	447	512	616	680	783	848	950	1014
1300	24	<25	173	230	288	346	463	536	639	711	814	886	989	1060
1300	27	25	194	259	324	389	477	557	660	739	842	921	1023	1101
1300	30	26	216	288	360	432	490	575	679	763	866	951	1053	1137
1300	33	27	238	317	396	475	501	591	695	784	887	976	1078	1167
1300	36	28	259	346	432	518	510	605	708	802	904	998	1099	1193
1300	39	28	281	374	468	562	517	615	718	816	918	1015	1116	1213
1300	42	29	302	403	504	605	523	623	726	826	928	1027	1129	1228
1300	45	30	324	432	540	648	527	629	732	833	935	1036	1137	1237
1600	23	<25	166	221	276	331	539	611	741	812	942	1013	1141	1212
1600	26	25	187	250	312	374	557	637	767	847	976	1056	1184	1263
1600	29	26	209	278	348	418	573	662	792	879	1008	1095	1223	1310
1600	32	27	230	307	384	461	588	684	813	908	1037	1131	1259	1353
1600	35	27	252	336	420	504	602	704	833	934	1063	1163	1291	1391
1600	38	28	274	365	456	547	614	722	851	958	1086	1193	1320	1426
1600	41	29	295	394	492	590	625	738	867	979	1107	1218	1346	1457
1600	44	29	317	422	528	634	635	752	881	997	1125	1241	1368	1483
1600	45	30	324	432	540	648	637	756	885	1002	1130	1247	1375	1491

The stated capacity for cooling water refers to a unit with casing and telescopic outlet air connection fitting. Sound levels apply for a unit with casing and attenuation 10 m² Sabine.

Table 4. Data - cooling. Selection guide, cooling - pressure 150 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Cooling capacity primary air (W)				Cooling capacity water (W) Unit with casing							
			Δt_l 6	8	10	12	Δt_{mk} 5	6	7	8	9	10	11	12
600	6	<25	43	58	72	86	165	185	226	247	269	290	314	354
600	9	<25	65	86	108	130	176	204	243	272	301	330	361	400
600	12	<25	86	115	144	173	183	216	254	288	322	356	390	428
600	15	<25	108	144	180	216	187	223	259	295	331	366	402	437
600	16	<25	115	154	192	230	188	224	260	295	331	366	402	437
800	9	<25	65	86	108	130	234	264	321	352	383	414	449	506
800	12	<25	86	115	144	173	244	282	338	377	416	455	496	552
800	15	<25	108	144	180	216	253	297	351	396	441	485	532	586
800	18	<25	130	173	216	259	259	307	360	409	457	505	555	607
800	21	<25	151	202	252	302	263	313	365	415	465	515	565	616
800	24	<25	173	230	288	346	265	315	366	415	465	515	565	616
1000	11	<25	79	106	132	158	253	284	352	382	450	517	565	616
1000	14	<25	101	134	168	202	285	326	394	435	502	570	605	672
1000	17	<25	122	163	204	245	312	361	429	478	545	613	657	724
1000	20	<25	144	192	240	288	332	388	456	512	579	646	699	766
1000	23	<25	166	221	276	331	345	407	475	536	604	671	729	796
1000	26	<25	187	250	312	374	353	418	486	551	618	686	748	815
1000	29	<25	209	278	348	418	354	421	489	556	624	691	757	824
1000	31	<25	223	298	372	446	354	421	489	556	624	691	757	824
1300	15	<25	108	144	180	216	340	382	473	514	604	694	727	817
1300	18	<25	130	173	216	259	373	425	516	567	657	747	791	881
1300	21	<25	151	202	252	302	401	462	553	613	703	793	847	937
1300	24	<25	173	230	288	346	425	493	584	652	743	832	895	984
1300	27	<25	194	259	324	389	444	519	610	685	775	865	934	1024
1300	30	<25	216	288	360	432	458	539	630	710	800	890	966	1055
1300	33	<25	238	317	396	475	468	553	644	728	818	908	989	1079
1300	36	25	259	346	432	518	473	561	652	739	830	920	1005	1094
1300	39	26	281	374	468	562	473	564	654	744	834	924	1012	1101
1300	42	26	302	403	504	605	473	564	654	744	834	924	1012	1101
1600	19	<25	137	182	228	274	427	480	594	646	759	872	914	1026
1600	22	<25	158	211	264	317	460	523	637	699	812	925	978	1090
1600	25	<25	180	240	300	360	489	562	675	747	860	972	1035	1147
1600	28	<25	202	269	336	403	515	596	709	789	902	1015	1087	1199
1600	31	<25	223	298	372	446	537	625	739	826	939	1051	1132	1244
1600	34	<25	245	326	408	490	555	650	764	857	970	1083	1170	1282
1600	37	25	266	355	444	533	570	670	784	883	996	1109	1202	1314
1600	40	26	288	384	480	576	581	686	800	903	1016	1129	1228	1340
1600	43	27	310	413	516	619	589	697	811	918	1031	1144	1247	1359
1600	45	27	324	432	540	648	592	702	816	925	1038	1151	1257	1369

The stated capacity for cooling water refers to a unit with casing and telescopic outlet air connection fitting. Sound levels apply for a unit with casing and attenuation 10 m² Sabine.



Primo

Cooling

Diagram 1 and 2. The function between the cooling capacity P_k (W), temperature change Δt_k (°C) and cooling water flow q_k (l/s) per unit.

Diagram 3. The function of the correction factor for the cooling capacity P_k (W) and the cooling water flow q_k (l/s). Different water rates have some influence on the cooling capacity effect. By checking the obtained water flow rate using diagram 3, the specified outputs in tables 1-4 may need to be ad-

justed upwards or downwards according to the formula:

$$P_{\text{corrected}} = P_{k(\text{table 1-4})} \cdot k_{(\text{diagram 3a/3b})}$$

Table 5. Pressure constant k_{pk} for calculation of the pressure drop for the cooling water. The pressure constant k_{pk} is presented based on the size of the unit, the number of units in series and the distance (c-c) between the units.

Diagram 1. Water flow cooling capacity, per unit.

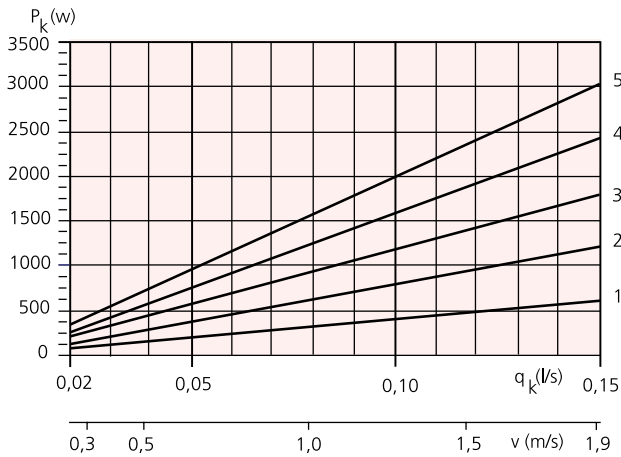


Diagram 2. Water flow cooling capacity, per branch.

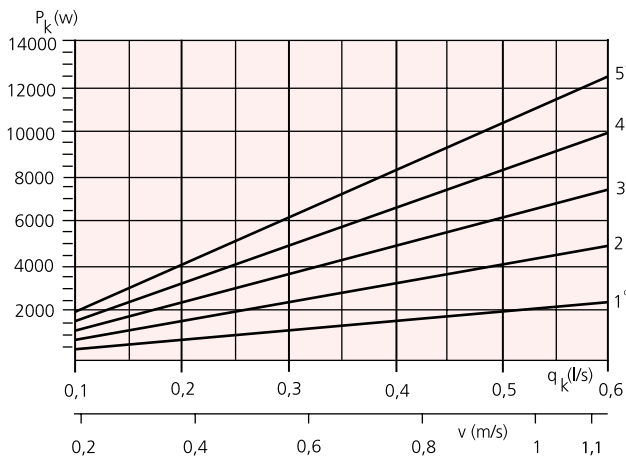
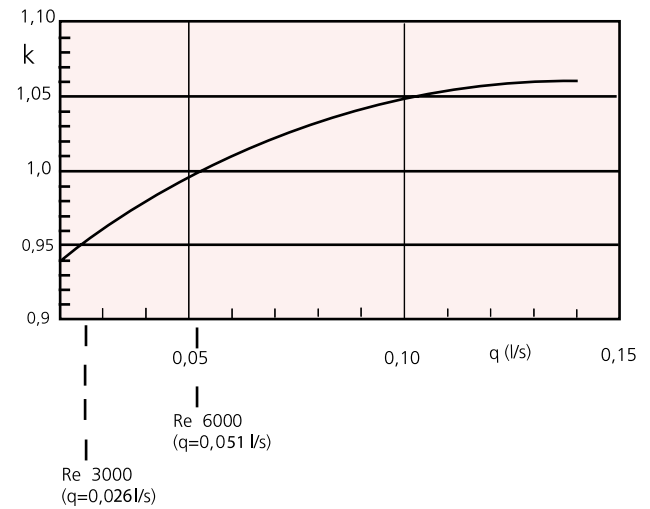
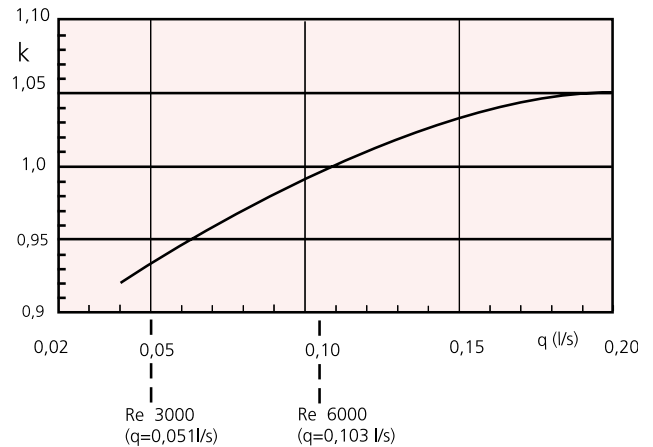


Diagram 3a. Water flow capacity correction



Applies to Primo sizes 600 and 800.

Diagram 3b. Water flow capacity correction



Applies to Primo sizes 1000, 1300 and 1600.

Table 5. Pressure constant cooling k_{pk}

	Unit size	C-C 1.2 (m)				C-C 2.4 (m)				C-C 3.6 (m)			
		Number of units				Number of units				Number of units			
		1	4	8	12	1	4	8	12	1	4	8	12
Cooling k_{pk}	600	0.0103	0.0102	0.0098	0.0090	0.0103	0.0102	0.0094	0.0081	0.0103	0.0100	0.0090	0.0074
	800	0.0093	0.0093	0.0089	0.0083	0.0093	0.0093	0.0086	0.0076	0.0093	0.0091	0.0083	0.0070
	1000	0.0197	0.0190	0.0167	0.0135	0.0197	0.0190	0.0148	0.0109	0.0197	0.0180	0.0133	0.0094
	1300	0.0185	-	-	-	0.0185	0.0179	0.0142	0.0107	0.0185	0.0171	0.0129	0.0092
	1600	0.0183	-	-	-	0.0183	0.0178	0.0142	0.0106	0.0183	0.0169	0.0129	0.0092

The pressure drop on the water side is calculated using the formula:

$\Delta p = (q/k_p)^2$ (kPa) where:

Δp =pressure drop in the water coil (kPa)

q = water flow per unit (l/s), taken from **Diagram 1 or 4** where the value is divided by the number of units on the branch.

k_p =Pressure constant which is taken from **table 5 or 11**



Table 6. Data - heating. Selection guide, heating pressure 300 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Heating capacity water (W) at Δt_{mv} °C Unit with casing					
			Δt_{mv} 15	20	25	30	35	40
600	9	<25	290	388	502	594	701	807
600	12	<25	318	423	539	640	750	860
600	15	<25	338	449	566	674	788	900
600	18	25	348	463	582	696	813	929
600	21	27	349	467	587	706	826	945
600	23	28	345	467	587	706	828	950
800	12	<25	398	533	694	820	971	1118
800	15	<25	429	572	735	870	1023	1174
800	18	25	454	604	768	911	1068	1222
800	21	27	473	628	793	944	1104	1262
800	24	28	485	646	812	969	1132	1293
800	27	29	492	656	823	986	1151	1316
800	30	30	492	658	827	994	1162	1331
800	33	31	492	658	827	994	1165	1337
1000	16	<25	517	693	901	1064	1259	1449
1000	19	26	548	732	941	1113	1311	1505
1000	22	27	575	765	975	1156	1357	1554
1000	25	28	596	793	1004	1193	1397	1598
1000	28	29	613	815	1028	1224	1430	1635
1000	31	30	625	831	1046	1248	1457	1665
1000	34	31	633	843	1058	1266	1478	1690
1000	37	32	635	848	1065	1278	1493	1708
1000	40	32	635	849	1066	1283	1501	1720
1000	43	33	635	849	1066	1283	1503	1725
1300	22	27	696	932	1210	1430	1691	1946
1300	24	28	717	958	1237	1463	1726	1983
1300	27	29	746	994	1274	1509	1775	2036
1300	30	30	771	1026	1307	1550	1819	2083
1300	33	31	792	1054	1336	1587	1859	2127
1300	36	32	811	1077	1361	1619	1894	2165
1300	39	32	825	1097	1382	1647	1924	2199
1300	42	33	837	1113	1399	1670	1950	2228
1300	45	33	844	1124	1412	1688	1971	2253
1600	27	29	864	1158	1506	1778	2104	2423
1600	30	30	896	1197	1547	1828	2157	2479
1600	33	31	925	1233	1584	1875	2207	2532
1600	36	32	951	1267	1618	1918	2252	2582
1600	39	32	975	1296	1649	1957	2295	2627
1600	42	33	995	1323	1677	1993	2333	2669
1600	45	33	1013	1347	1702	2025	2368	2707

Sound levels apply for a unit with casing and attenuation 10 m² Sabine.

Table 7. Data - heating. Selection guide, heating pressure 250 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Heating capacity water (W) at Δt_{mv} °C Unit with casing					
			Δt_{mv} 15	20	25	30	35	40
600	8	<25	274	380	467	577	685	811
600	11	<25	303	414	514	628	740	864
600	14	<25	323	437	546	662	777	899
600	17	<25	335	450	563	680	796	915
600	20	25	335	451	566	682	797	915
600	21	25	335	451	566	682	797	915
800	11	<25	380	529	649	804	954	1133
800	14	<25	411	565	699	857	1013	1189
800	17	<25	436	594	738	900	1059	1233
800	20	25	455	615	768	932	1094	1265
800	23	26	467	629	787	952	1115	1284
800	26	27	474	636	797	961	1125	1291
800	29	28	474	636	797	961	1125	1291
800	31	28	474	636	797	961	1125	1291
1000	15	<25	498	691	849	1049	1244	1475
1000	17	<25	519	715	882	1085	1284	1513
1000	20	25	546	747	926	1133	1335	1561
1000	23	26	569	773	961	1171	1377	1601
1000	26	27	586	793	990	1201	1410	1631
1000	29	28	600	808	1010	1223	1433	1652
1000	32	29	608	817	1023	1236	1447	1663
1000	35	30	612	821	1029	1240	1451	1665
1000	38	30	612	821	1229	1240	1451	1665
1000	40	31	612	821	1229	1240	1451	1665
1300	20	<25	663	920	1132	1399	1659	1967
1300	22	26	684	945	1165	1435	1699	2006
1300	25	27	713	979	1211	1485	1754	2057
1300	28	28	738	1008	1251	1528	1801	2102
1300	31	28	760	1033	1285	1566	1842	2140
1300	34	29	778	1054	1314	1597	1875	2171
1300	37	30	793	1071	1338	1621	1902	2196
1300	40	31	805	1084	1355	1640	1922	2213
1300	43	31	813	1093	1368	1652	1934	2223
1300	45	32	816	1096	1373	1657	1939	2226
1600	25	26	828	1150	1414	1748	2074	2460
1600	27	27	849	1175	1448	1785	2114	2498
1600	30	28	879	1210	1495	1836	2170	2552
1600	33	29	906	1241	1537	1882	2221	2600
1600	36	30	930	1269	1575	1924	2266	2643
1600	39	30	951	1294	1609	1960	2306	2680
1600	42	31	970	1315	1639	1992	2340	2711
1600	45	32	986	1333	1663	2018	2368	2738

Sound levels apply for a unit with casing and attenuation 10 m² Sabine.



Table 8. Data - heating. Selection guide, heating pressure 200 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Heating capacity water (W) at Δt_{mv} °C Unit with casing					
			Δt_{mv} 15	20	25	30	35	40
600	7	<25	275	356	441	530	655	781
600	10	<25	299	394	492	593	715	837
600	13	<25	315	419	525	634	752	871
600	16	<25	321	430	540	652	766	881
600	19	<25	321	430	540	652	766	881
800	10	<25	386	501	620	745	922	1099
800	13	<25	412	540	674	811	984	1158
800	16	<25	431	571	714	861	1031	1201
800	19	<25	444	592	742	896	1062	1228
800	22	<25	451	604	758	915	1077	1240
800	25	25	452	606	762	919	1078	1240
800	28	26	452	606	762	919	1078	1240
1000	13	<25	498	646	800	960	1188	1417
1000	16	<25	524	686	854	1027	1252	1477
1000	19	<25	545	719	898	1082	1303	1525
1000	22	<25	562	746	934	1126	1343	1562
1000	25	25	574	765	959	1158	1371	1586
1000	28	26	581	777	976	1177	1388	1599
1000	31	26	583	782	983	1186	1392	1600
1000	34	27	583	782	983	1186	1392	1600
1000	36	28	583	782	983	1186	1392	1600
1300	18	<25	670	870	1078	1295	1599	1905
1300	21	<25	696	910	1132	1361	1663	1965
1300	24	<25	719	945	1179	1419	1717	2015
1300	27	25	737	975	1219	1469	1763	2058
1300	30	26	753	999	1252	1509	1800	2091
1300	33	27	765	1019	1278	1541	1828	2116
1300	36	28	773	1033	1297	1565	1848	2132
1300	39	28	778	1042	1309	1579	1859	2140
1300	42	29	780	1045	1314	1585	1862	2140
1300	45	30	780	1045	1314	1585	1862	2140
1600	23	<25	843	1094	1357	1629	2010	2392
1600	26	25	868	1134	1410	1696	2073	2452
1600	29	26	891	1170	1458	1755	2129	2504
1600	32	27	912	1202	1501	1808	2178	2550
1600	35	27	929	1229	1538	1854	2221	2589
1600	38	28	944	1253	1569	1893	2256	2621
1600	41	29	956	1272	1596	1925	2285	2646
1600	44	29	965	1288	1616	1950	2307	2664
1600	45	30	968	1292	1622	1957	2312	2668

Sound levels apply for a unit with casing and attenuation 10 m² Sabine.

Table 9. Data - heating. Selection guide, heating pressure 150 Pa

Unit length (mm)	Air flow (l/s)	Sound level dB (A)	Heating capacity water (W) at Δt_{mv} °C Unit with casing					
			Δt_{mv} 15	20	25	30	35	40
600	6	<25	246	324	422	501	603	722
600	9	<25	277	369	473	566	673	788
600	12	<25	296	397	503	605	713	823
600	15	<25	303	407	511	616	722	828
600	16	<25	302	407	511	616	722	828
800	9	<25	351	463	602	715	859	1027
800	12	<25	382	509	653	781	930	1093
800	15	<25	405	542	690	828	980	1139
800	18	<25	420	563	712	857	1009	1164
800	21	<25	426	572	720	868	1017	1168
800	24	<25	426	572	720	868	1017	1168
1000	11	<25	444	584	762	903	1088	1305
1000	14	<25	477	633	817	975	1165	1377
1000	17	<25	504	673	861	1031	1225	1433
1000	20	<25	525	703	894	1074	1270	1474
1000	23	<25	540	724	916	1103	1298	1499
1000	26	<25	548	736	928	1117	1312	1508
1000	29	<25	550	738	928	1117	1312	1508
1000	31	<25	550	738	928	1117	1312	1508
1300	15	<25	595	784	1022	1212	1460	1749
1300	18	<25	629	833	1078	1284	1537	1822
1300	21	<25	658	876	1125	1345	1602	1883
1300	24	<25	682	912	1165	1396	1656	1933
1300	27	<25	702	941	1196	1437	1698	1971
1300	30	<25	717	963	1219	1467	1728	1997
1300	33	<25	728	978	1234	1486	1747	2012
1300	36	25	734	986	1242	1496	1755	2016
1300	39	26	735	987	1242	1496	1755	2016
1300	42	26	735	987	1242	1496	1755	2016
1600	19	<25	747	983	1282	1521	1831	2194
1600	22	<25	781	1033	1338	1593	1908	2267
1600	25	<25	811	1078	1387	1657	1976	2331
1600	28	<25	837	1117	1431	1712	2035	2386
1600	31	<25	860	1150	1467	1760	2085	2431
1600	34	<25	879	1178	1498	1799	2126	2468
1600	37	25	895	1201	1522	1830	2157	2495
1600	40	26	907	1218	1539	1853	2180	2514
1600	43	27	915	1229	1550	1867	2193	2523
1600	45	27	919	1234	1554	1872	2197	2524

Sound levels apply for a unit with casing and attenuation 10 m² Sabine.



Heating

Table 10. Heat capacity with natural convection (without primary air).

Diagram 4 and 5. The function between the heating capacity P_v (W), the temperature change Δt_v °C and the heating water flow q_v (l/s), per unit.

Table 11. Pressure constant k_{pv} for the calculation of the pressure drop for the warm water. The pressure constant k_{pv} is presented based on the size of the unit, the number of units in series and the distance (c-c) between the units.

Table 10. Heat capacity with natural convection

Δt_{mv} °C	Primo 600 W	Primo 800 W	Primo 1000 W	Primo 1300 W	Primo 1600 W
15	99	139	179	239	298
20	151	212	272	363	453
25	209	293	376	502	627
30	272	381	490	654	817
35	341	477	613	818	1022
40	414	579	745	993	1241

Diagram 4. Water flow heating capacity, per unit.

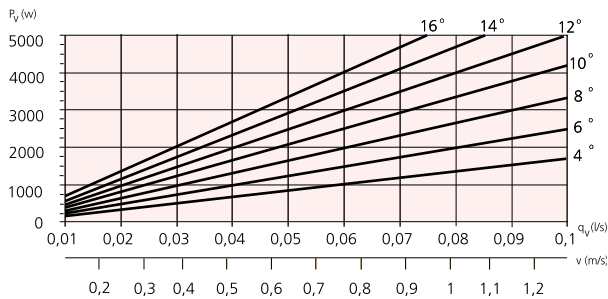


Diagram 5. Water flow heating capacity, per branch.

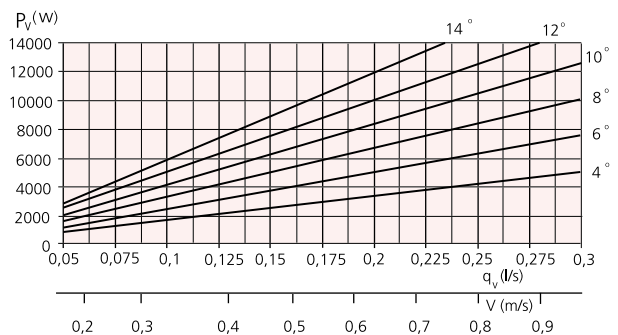


Table 11. Pressure constant-heating k_{pv}

	Unit size	C-C 1.2 (m)				C-C 2.4 (m)				C-C 3.6 (m)			
		Number of units				Number of units				Number of units			
		1	4	8	12	1	4	8	12	1	4	8	12
Heating k_{pv}	600	0.0150	0.0142	0.0117	0.0089	0.0149	0.0136	0.0099	0.0069	0.0149	0.0130	0.0087	0.0058
	800	0.0142	0.0139	0.0115	0.0088	0.0145	0.0133	0.0098	0.0069	0.0145	0.0127	0.0087	0.0058
	1000	0.0135	0.0135	0.0113	0.0087	0.0141	0.0130	0.0097	0.0068	0.0141	0.0124	0.0086	0.0058
	1300	-	-	-	-	0.0136	0.0126	0.0095	0.0067	0.0136	0.0121	0.0085	0.0057
	1600	-	-	-	-	0.0132	0.0123	0.0067	0.0067	0.0132	0.0118	0.0084	0.0057

Sound

Table 12. Octave band divided sound effect can be obtained by adding stated dB(A) value (table 1-4) to the correction factors in table 12.

Table 13. The natural attenuation is the total sound output reduction from the ducting to the room including the unit's end reflection.

Diagram 6. The sound reduction index for calculating the resulting reduction with wall penetration.

Table 12. Sound power.

$L_W = L_A + K_1$						
Hz	125	250	500	1K	2K	4K
K_1 dB	0	-1	-1	-1	-3	-4

Table 13. Natural attenuation.

Length h (mm)	Centre frequency 1/1 octave (Hz)							
	63	125	250	500	1K	2K	4K	8K
600	19	13	14	12	15	18	13	14
800	18	12	13	11	14	17	12	13
1000	16	11	12	9	13	15	11	12
1300	15	9	10	8	11	14	9	10
1600	14	8	9	7	10	13	8	9

With casing the natural attenuation increases by 2-3 dB.

Wall penetration with wall block WB

Reduction index: R_W 28 for $t = 100$ mm (ref. $1m^2$).

Reduction index: R_W 29 for $t = 150$ mm (ref. $1m^2$).

Applies with jointing around all openings (air duct, pipe, electrical trunking and outer edges).

Example:

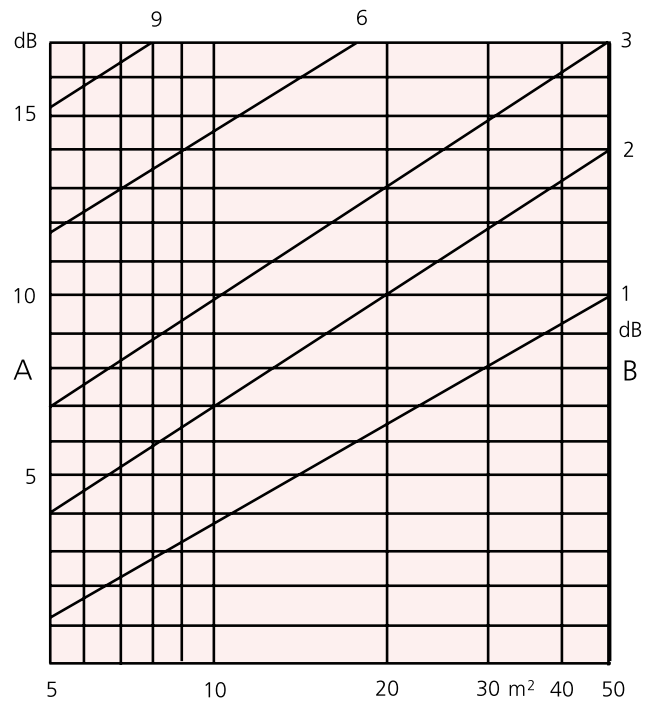
$12m^2$ wall R_W 38, wall penetration VF-1 ($t = 100$ mm): R_W 28.

Difference 10 dB.

Reduction 3 dB according to Diagram 6.

Resulting in $R_W = 38 - 3 = 35$

Diagram 6



A = Difference $R_W - R_W$ wall block, **B** = Reduction dB

EXAMPLE

Cooling

Along a southern facade there are four similar offices with measurements $w \times d \times h = 3.6 \times 3.4 \times 2.7\text{m}$. The cooling requirement is 65W/m^2 , which gives in total 795 W/office . The air flow should be 26 l/s . Available pressure, primary air, is 250 Pa .

The sound level from installations must not exceed 30 dB(A) .

Selected room temperature summer: 24°C

The cooling water's supply temperature is 15°C and the selected return temperature is 18°C .

Supply air temperature 15°C gives: $\Delta t_1 = 9^\circ\text{C}$

SOLUTION

Cooling

The supply air that maintains a temperature of 15°C gives the cooling capacity $P_1 = 1.2 \times 26\text{ l/s} \times 9 = 280\text{ W}$. The remaining cooling requirement $795 - 280 = 515\text{W}$ should be cooled using water.

Table 2 gives for the Primo size 1000 and the air flow 26 l/s (250Pa) the cooling capacity 600 W at $\Delta t_{mk} = 7,5^\circ\text{C}$, which is sufficient to cover the requirement.

From **Diagram 1** it can be read that the output 600 W gives 0.047 l/s in cooling water flow.

Diagram 3b shows that the water flow per unit 0.047 l/s does not give sufficient turbulent flow. We see that the water flow 0.047 l/s gives 93% of the nominal capacity. This is compensated by counting up the unit's requisite performance with: $515/0.93 = 554\text{W}$.

With the c-c distance 3.6 m the pressure drop can be calculated based on the water flow 0.047 l/s and the pressure drop constant $k_{pk} = 0.018$, which is taken from **Table 5**. The pressure drop will then be: $\Delta p_k = (q_k / k_{pk})^2 = (0.047/0.018)^2 = 7\text{ kPa}$.

Sound level

Table 2 shows that the sound level for Primo size 1000 with the air flow 26 l/s is 27 dB(A) .

Solution:

A total of $1 \times$ Primo size 1000 in each room, placed at c-c 3.6 m .

Heating

The method for the heating calculation is the same as for cooling.

The heating capacity can be found in **tables 6-10**. The water flow is taken from **diagrams 4-5** and the pressure constant k_{pv} can be found in **table 11**.

Pressure drop, sound levels, any correction for insufficient turbulent flow and much more can quickly and easily be attained with the help of the Stifab Farex web-based software, Pro Pipe.

Table 14. Weight

	Size: (mm)	Ducting dimensions		
		Ø125	Ø160	Ø200
Dry weight (kg)	600	6.6	6.9	7.6
	800	8.8	9.2	10.0
	1000	11.0	11.5	12.3
	1300	14.1	14.9	16.1
	1600	17.4	18.3	19.7
Weight water filled (kg)	600	7.5	7.8	8.5
	800	10.1	10.5	11.3
	1000	12.6	13.1	13.9
	1300	16.2	17	18.2
	1600	20	20.9	22.3

Primo

DIMENSIONS

Length Primo	
Length Primo:	L = 600, 800, 1000, 1300 and 1600 mm
Outlet telescopic outlet air connection fitting internally:	Length 110 mm

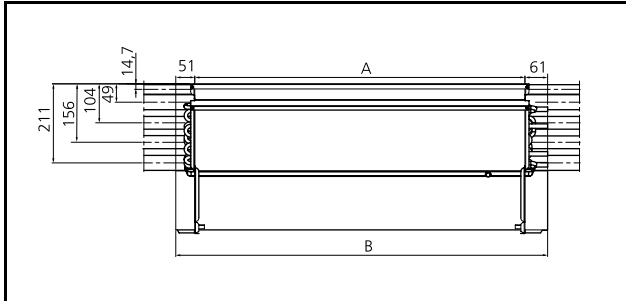


Figure 9. View: front.
A=Outlet telescopic outlet air connection fitting, B=Length

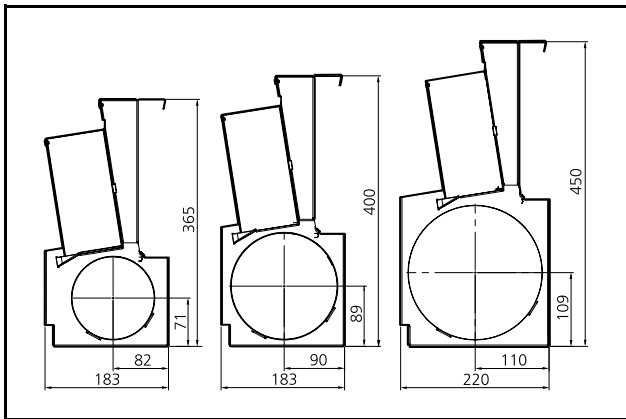


Figure 10. View: end.
Ø125, Ø160 and Ø200

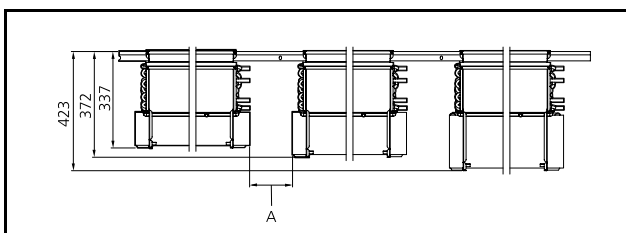


Figure 11. Assembly area.
A=Min. installation spacing 200 mm

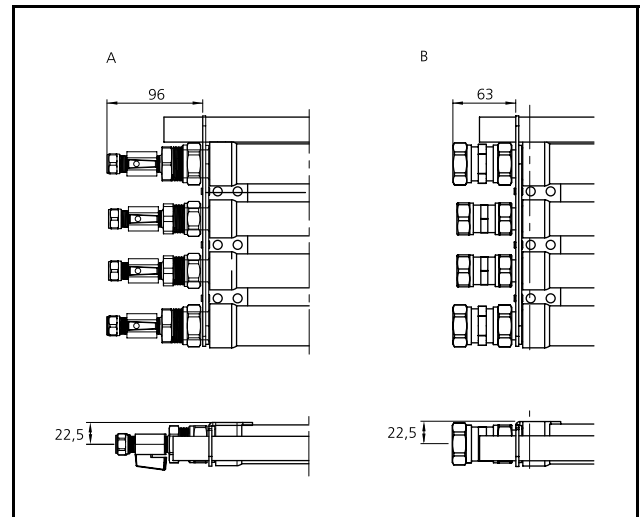


Figure 12. Connection components.
A=Pipe end, B=Pipe coupling

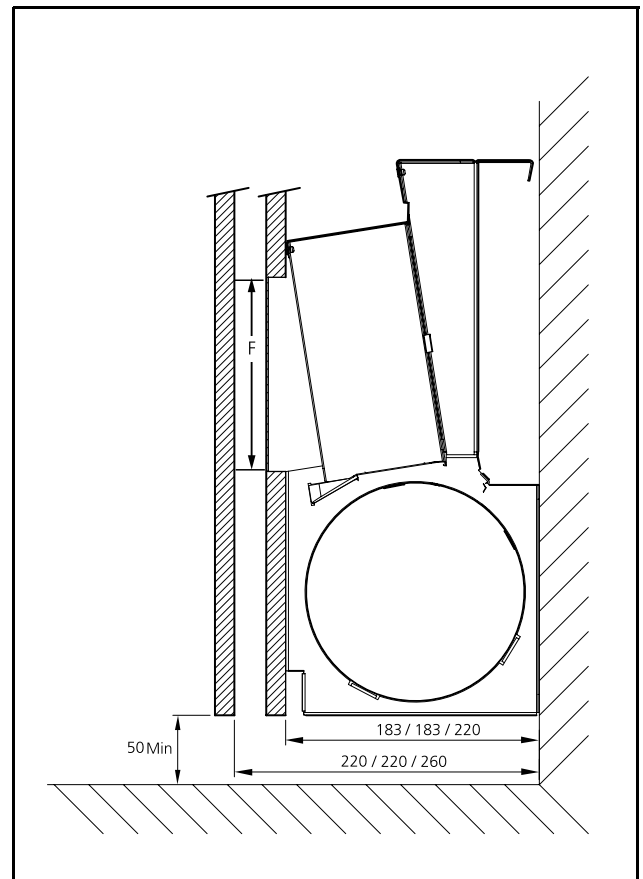


Figure 13. Secondary air opening.
Minimum distance between the floor and casing or circulation air opening in the front panel.
F= Front grille size 130 x unit length (mm) where the free area must be at least 48,7%.

Primo

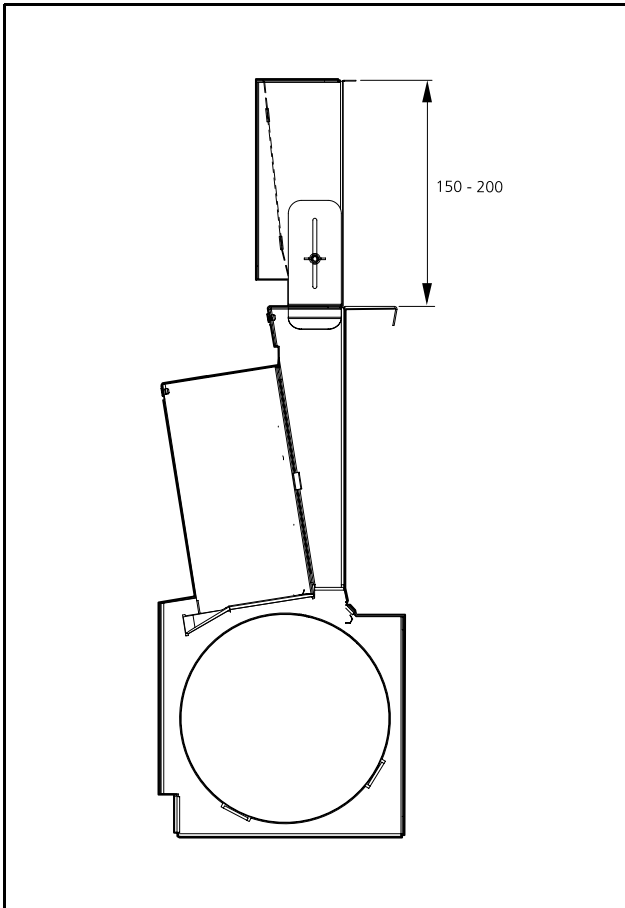


Figure 14. Outlet telescopic outlet air connection fitting.

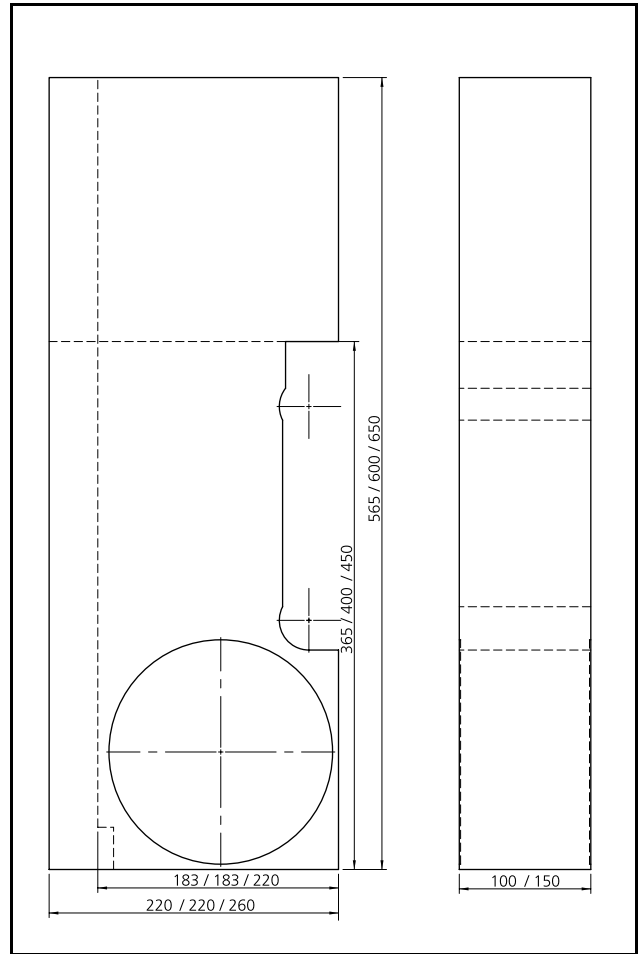


Figure 15. Wall block WB.

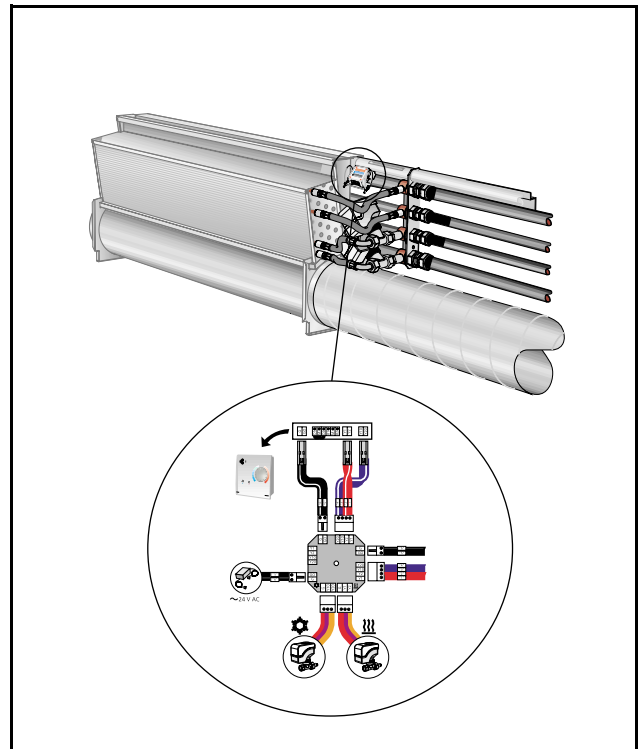


Figure 16. Control equipment RWB.

SPECIFICATION

Climate system type Primo for cooling, heating and ventilation. The system shall comprise Stifab Farex room control equipment and essential accessories for connection of pipes and the air supply.

The Stifab Farex delivery shall include all material for each unit branch shown on the drawings for the physical limit of contract.

Wall penetrations shall be carried out using Stifab Farex wall block WB or any other method as set out on the drawing. Carried out by the ventilation contractor or another contractor. Stifab Farex casing PrimoFront as set out on the drawing should be carried out by the ventilation contractor or another contractor.

ORDER KEY

Product

Climate unit PRIMO a- b- ccc- dddd- eee- ff

Version:

Type:

W=facade

Ducting dimensions:

125, 160 and 200 mm

Size:

600, 800, 1000,
1300 and 1600

Drive pressure:

150-300 Pa

Air flow: (l/s)

Limits of contract

Stifab Farex's limits of contract are at the connection points for water. At these connection points the plumbing contractor connects to plain pipe ends, fills the system, vents and performs pressure testing.

the ventilation contractor connects to the duct connections with dimensions as set out on the basic size drawing under the section "DIMENSIONS".

The electrical contractor provides an earthed 220 V socket for each transformer and a fitted connection box for each thermostat.

The building contractor makes the cut outs in interior walls and soundproofs as per the drawings.



ACCESSORIES

Telescopic outlet air connection fitting **PRIMO** a- T- OE- aaaa

Size:
600, 800, 1000,
1300 and 1600

Valve set **PRIMO** a- T- VS aa- b- ccc

Fits all unit sizes:
6-8=size 600, 800
10-16=size 1000,
1300, 1600

Type:
A=With actuators
and connection
card
B=Without actua-
tors and connec-
tion card

Hose length:
L=300, 500 and
700 mm

Mounting rail L=2400 mm **PRIMO** a- T- MR- 2400

Connection pipe: **PRIMO** a- T- aa- bbb- ccc

Type:
PR=Connection pipe
right
PM=Connection pipe
centre
PL=Connection pipe
left
PJ=Connection pipe
splice

Length interval (mm)

Also state the exact
length

Ventilation duct: **PRIMO** a- T- AD- aaa- bbb- ccc

Duct dimension:
Ø125, 160 or 200

Length interval (mm)

Also state the exact
length.

Wall block **PRIMO** a- T- WB- aaa- bbb-

Ducting dimensions
Ø125, 160 or 200 mm

Thickness:
100 or 150 mm

Connection components **PRIMO** a- T- aa- bbb

Type:
CS=Connection and
termination complete
CE=Only pipe termination

Size:
125=duct termination Ø125
160=duct termination Ø160
200=duct termination Ø200

Connection components **PRIMO** a- T- Cl- aa

Type:
Cl=Compression ring coupling
1x

Pipe diameter:
22 mm
28 mm

Corner solution: **PRIMO** a- T- PC- aa

Elbow:
90

Grille with fixed slats **PRIMO** a- T- GA- aaaa

Size:
600, 800, 1000, 1300, 1600

Grille with adjustable deflectors **PRIMOFLEX** a- bbbb

Version:

Size:
600, 800, 1000, 1300, 1600

EXPLANATORY TEXT

Example of the specification text.

Stifab Farex climate system Primo consists of the climate units, electronic room control equipment and requisite accessories for the connection of pipes and ventilation, with following functions:

- Cooling
- Heating
- Ventilation
- Integrated room temperature control (optional)
- Space for electrical trunking
- Sound insulating wall block (optional)
- Cleanable
- The Stifab Farex delivery shall include all material for each unit branch shown on the drawings for the physical limit of contract.
- Each unit should be supplied with preset prescribed air flow. (optional)
- Wall penetrations should be designed with:
 - Wall block: WB (optional)
 - According to the method set out on the drawing
- The building contractor marks out reference lines on the perimeter wall for the suspension of perimeter wall units.
- The plumbing contractor connects to plain pipe ends 22 mm (heating) 500 and 700 mm (cooling), fills, vents, pressure tests and bears responsibility for the planned water flow reaching every system branch.
- The electrical contractor provides an earthed outlet socket for each transformer, placed at the most 1000 mm from the transformer and lower than the top of the system.
- The electrical contractor fits a mounting box for each thermostat as set out on the drawing.
- The electrical contractor carries out sound insulation between cable trunking and the perimeter unit. The building contractor carries out hole-making in partition walls and sound insulation as set out on the drawing.

Accessories:

- Window sill grille: GA aaa or PRIMOFLEX xx
- Drain to condensation tray HD xx
- Wall penetration WB -a - bbb - ccc - ddd xx
- Distribution pipe PR, PM, PL or PJ - aaa - bbb xx
- Connection fitting CS - aaa xx
- Mounting rail MR xx
- Room regulator RWB RE. (see separate brochure)
- Transformer RWB TS - 2 (see separate brochure)
- Control cable, see brochure RWB

Quantities are specified by number or with reference to the drawing.

Size: FA XX-1 PRIMO a - b - ccc - dddd - eee - ff

FA XX-2 PRIMO a - b - ccc - dddd - eee - ff.

Quantities are specified by number or with reference to the drawing.

Accessories for the perimeter wall system in the room

Control equipment

See the separate section in the catalogue Indoor Climate Systems.

