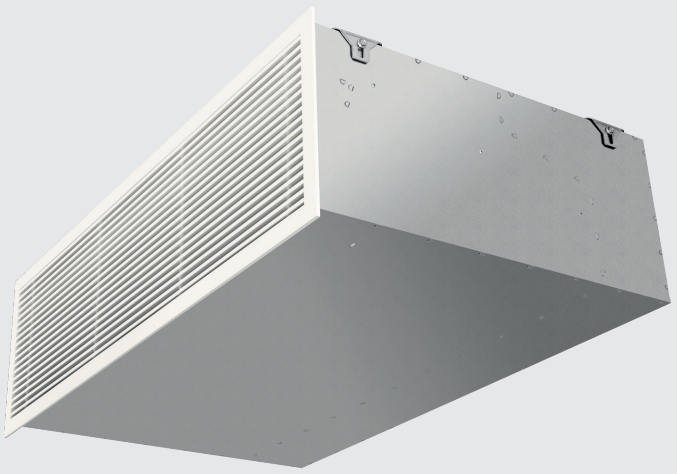
Active chilled beam

WallAir



Description

The WallAir active chilled beam is a wall mounted one-way induction type air-conditioning unit that is designed to ventilate, cool and/or heat buildings. Recommended to use in rooms where a comfortable climate and individual room control is needed.

Air duct connection: Ø100, Ø125

Main features

- Elegant exterior design
- Energy efficient high performance operation
- Cooling and/or heating
- Optional fixed (AG) or adjustable (DH) supply air grille
- Silent operation

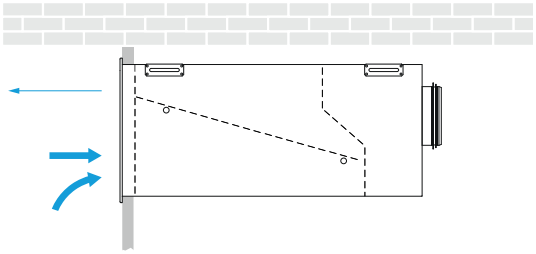
Quick selection

Size (mm)	Airflow l/s [m³/h]	Pressure (Pa)	Cooiling capacity*		
			Air	Water	Total (W)
600	15 [54]	50	180	313	493
	20 [72]	100	240	390	630
800	15 [54]	50	180	410	590
	20 [72]	100	240	498	738
1000	15 [54]	50	180	506	686
	20 [72]	100	240	610	850
1200	15 [54]	50	180	607	787
	20 [72]	100	240	723	963

*at Δt = 10 °C

Function

The primary air from the supply air system is connected to the plenum box and distributed through specially shaped nozzles. As the air is discharged through the nozzles, the high velocity air jets above the coil create a low-pressure zone. This low-pressure zone draws ambient room air through the coil, and as it passes the coil fins it is conditioned (cooling - heating), according to the water temperature flowing through the coil. The conditioned air then mixes with the air jets (ventilation air, humidity control) before it is discharged back into the occupied space. The conditioned/mixed air discharged along the ceiling provides an optimal Coanda effect which is always the objective when the occupied zone requires low air velocities.



Materials

The connection and plenum air box are made of galvanized steel. The front grille is made of aluminium and is powder coated in standard white RAL 9003 colour, or can be painted according to preference. The heat exchanger consists of copper and aluminium.

Mounting instructions and Maintenance

See separate Maintenance and Installation guide.

Technical data

Sound power level / octave band L_W dB
Sound Pressure Level L_{PA} dB (A) (read from the power tables)

Corr: K_0 dB from Table 2 $_{LW} = L_{PA} + K_0$

Natural attenuation as shown in Table 2 apply to don incl. orifice damping.

The measurements have been performed in accordance with ISO 9614-2 and ISO 11691: 1995.

T.2. Sound pressure level L_{PA}

Room volume capacity (m^3)	Room type	Correction (dB)
25	hard	+ 2
25	attenuated	- 2
150	hard	- 3
150	normal	- 5
150	attenuated	- 7

The sound pressure level L_{PA} dB(A) applies to an equivalent surface of 10 m^2, which corresponds to an attenuation of 4 dB in a 25 m^3 room with normal atteunation.
Please see the chart to the right for correction examples of different room types.

T.3. Correction K_0 dB

Size (mm)	Medium frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
600	+19	-3	+2	+2	0	-5	-14	-25
800	+15	+1	+4	+2	0	-5	-14	-30
1000	+13	+5	+4	+2	0	-6	-17	-29
1200	+14	+4	+4	+2	0	-7	-17	-28

Tolerance: ± 3 dB

T.4. Sound attenuation dB

Size (mm)	Medium frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
600	23	12	10	15	14	12	16	16
800	17	10	10	17	14	13	15	16
1000	16	11	11	14	14	12	15	15
1200	17	10	9	13	12	11	14	15

Tolerance: ± 3 dB

T.5. Sound level

Size (mm)	Primary airflow		Sound level, dB(A) at given pressure (Pa)						
			Cooling				Heating		
	l/s	[m^3/h]	50 Pa	75 Pa	100 Pa	150 Pa	50 Pa	75 Pa	100 Pa
600	10	[36]	<20				<20		
800									
1000									
1200									
600	15	[54]	<20				<20		
800									
1000									
1200									
600	20	[72]	-	-	-	22	-	-	<20
800			<20	<20	<20	20	<20	<20	<20
1000			<20	<20	<20	<20	<20	<20	<20
1200			<20	<20	<20	<20	<20	<20	<20
600	25	[90]	-	-	-	25	-	-	-
800			<20	<20	<20	23	-	-	<20
1000			<20	<20	<20	20	<20	<20	<20
1200			<20	<20	<20	<20	<20	<20	<20
1000	30	[108]	<20	<20	20	23	-	<20	20
1200			<20	<20	<20	20	<20	<20	<20
1000	35	[126]	-	-	-	27	-	-	-
1200			20	20	20	24		20	

Selection guide

Example for WallAir cooling

An office has dimensions of 3.5 x 4.5 x 2.7 (m^3).

There is a cooling load of 40 W / m^2
(40 x 3.5 x 4.5 = 630 W)

Preconditions:
Dimensioned room temperature: 25.0 °C
Available duct pressure: 100 Pa.
Supply air temperature: 16 °C
(Δt: the room, supply air temperature: 9.0 ° C).
Airflow: 20 l/s.
Cooling water supply and return: 14.0 / 17.0 °C. (Δt =3.0°C). Δt.
Room-water average temperature: 9.5 ° C.

Attention!
Because the supply air temperature is lower than the design room temperature, this provides a beneficial effect on the cooling load.
Therefore, we can compensate for this.

(20.0 x 9.0 x 1.2 = 216 W)
The total cooling load of the water is therefore 630-216 = 414 W, then the cold air supply 216 W.

We choose a WallAir 800 according to the chart on page 5.
Δt water-rooms: 9.5 °C. Cooling power: 473 W.

The water flow is calculated from the formula:
P = qv x CPV x + δv Δtv. (CPV x δv ≈ 4200).

qv = (473 / (3 x 4200)) -> qv = 0.038 l/s.

The water flow at 0,038 l/s gives a correction of 0.945 according to the first chart.

The final cooling effect will be: 473 x 0.94 = 445 W,
we then add air at 216 W, the total cooling capacity 661 W and we can handle the cooling load of 630 W.

Example for WallAir heating

An office has dimensions of 3.5 x 4.5 x 2.7 (m^3).

There is a heat requirement of 30 W / m^2
(30 x 3.5 x 4.5 = 473 W).

Preconditions:
Dimensioned room temperature: 22.0 °C
Available duct pressure: 100 Pa.
Supply air temperature: 18 °C.
Airflow: 20 l/s.
Heating water flow and return: 45.0 / 39.0 °C. (Δt = 6.0 °C). Δt.

Attention!
Because the supply air temperature is lower than the design room temperature gives an adverse effect on the heat demand. We therefore need to compensate for this.

(20.0 x 4.0 x 1.2 = 96 W).
The total heat demand is therefore 473 + 96 = 569 W.

We choose a WallAir 800, according to the chart on page 6.
Δt water room: 20.0 °C. Heat output: 603 W.

The water flow is calculated from the formula:
P = qv x CPV x + δv Δtv. (CPV x δv ≈ 4200).

qv = (603 / (6 x 4200)) -> qv = 0.024 l/s.

The water flow of 0.024 l/s gives a correction of 0.97 according to the chart first.

The final heat output is therefore: 603 x 0.97 = 585 W,
which can handle the heat requirement of 569 W.

Selection chart

T.6. Cooling capacity - water

Size (mm)	Primary airflow		Cooling capacity*) water (W) for pressure (Pa) at given Δt (°C)																		
			50 Pa					75 Pa					100 Pa					150 Pa				
	l/s	[m³/h]	6	7	8	9	10	6	7	8	9	10	6	7	8	9	10	6	7	8	9	10
600			173	202	230	259	288	186	217	248	279	310	199	232	265	298	331	216	252	288	324	360
800			231	270	308	347	385	248	290	331	373	414	266	310	354	399	443	287	335	382	430	478
1000	10	[36]	290	339	387	436	484	312	364	416	468	520	334	389	445	500	556	360	420	480	540	600
1200			350	409	467	526	584	377	440	502	565	628	403	470	538	605	672	436	508	581	653	726
600			188	219	250	282	313	202	235	269	302	336	215	251	287	323	359	233	272	310	349	388
800	15	[54]	246	287	328	369	410	265	309	353	397	441	283	330	377	424	471	305	356	407	458	509
1000			304	354	405	455	506	326	381	435	490	544	349	407	466	524	582	377	440	503	566	629
1200			364	425	486	546	607	392	457	522	588	653	418	488	558	627	697	452	527	602	678	753
600								220	256	293	329	366	234	273	312	351	390	253	295	338	380	422
800	20	[72]	260	303	346	390	433	280	326	373	419	466	299	349	398	448	498	323	377	430	484	538
1000			319	372	425	478	531	343	400	457	514	571	366	427	488	549	610	395	461	526	592	658
1200			377	440	503	566	629	406	473	541	608	676	434	506	578	651	723	469	547	625	703	781
600																		272	318	363	409	454
800	25	[90]											318	371	424	477	530	344	401	458	516	573
1000								359	419	479	539	599	383	447	511	575	639	415	484	553	622	691
1200			392	458	523	589	654	422	492	562	633	703	451	526	601	676	751	487	568	649	730	811
1000	30	[108]											402	469	536	603	670	434	506	578	651	723
1200								437	510	583	656	729	467	545	623	701	779	505	589	674	758	842
1000	35	[126]																454	530	606	681	757
1200													486	567	648	729	810	525	613	700	788	875

* Cooling capacity: Valid at water flow 0.066 l / s.
The levels correspond to 4 dB room attenuation in a normal acoustic room with a 25 m³ room volume, according to the chart on page 3.

T.7. Cooling capacity – air

Δt (°C)	Cooling capacity air (W) at primary airflow l/s [m³/h] for following sizes (mm)														
	8 [29]	10 [36]	12 [43]	15 [54]	20 [72]	25 [90]	30 [108]	35 [126]	40 [144]	45 [162]	55 [198]	65 [234]	72 [259]	75 [270]	85 [306]
2	19	24	29	36	48	60	72	84	96	108	132	156	173	180	204
3	29	36	43	54	72	90	108	126	144	162	198	234	259	270	306
4	39	48	57	72	96	120	144	168	192	216	264	312	346	360	408
5	48	60	72	90	120	150	180	210	240	270	330	390	432	450	510
6	58	72	86	108	144	180	216	252	288	324	396	468	518	540	612
7	67	84	101	126	168	210	252	294	336	378	462	546	605	630	714
8	77	96	115	144	192	240	288	336	384	432	528	624	691	720	816
9	86	108	130	162	216	270	324	378	432	486	594	702	778	810	918
10	96	120	144	180	240	300	360	420	480	540	660	780	864	900	1020

T.8. Heating capacity in case of 4 or 6 pipe rooms

Primary airflow l/s	Primary airflow [m³/h]	Size (mm)	Heating capacity*) water (W) for pressure (Pa) at given Δt (°C)															
			50 Pa						75 Pa						100 Pa			
			4 pipe rows			6 pipe rows			4 pipe rows			6 pipe rows			4 pipe rows			6 pipe rows		
			10	15	20	10	15	20	10	15	20	10	15	20	10	15	20	10	15	20
10	[36]	600	149	224	298	174	261	348	161	242	322	188	282	376	172	258	344	201	301	402
		800	200	300	400	234	350	467	216	324	432	252	378	505	230	345	460	269	403	537
		1000	251	377	502	293	440	586	270	405	540	315	473	631	289	434	578	338	506	675
		1200	304	456	608	355	533	710	327	491	654	382	573	764	350	525	700	409	613	818
15	[54]	600	162	243	324	189	284	378	175	263	350	204	307	409	187	281	374	218	328	437
		800	213	320	426	249	373	498	229	344	458	267	401	535	245	368	490	286	429	572
		1000	264	396	528	308	463	617	284	426	568	332	498	663	303	455	606	354	531	708
		1200	315	473	630	368	552	736	339	509	678	396	594	792	363	545	726	424	636	848
20	[72]	600													203	305	406	237	356	474
		800	225	338	450	263	394	526	242	363	484	283	424	565	258	387	516	301	452	603
		1000	276	414	552	322	484	645	297	446	594	347	520	694	317	476	634	370	555	741
		1200	328	492	656	383	575	766	352	528	704	411	617	822	376	564	752	439	659	878
25	[90]	600																		
		800													276	414	552	322	484	645
		1000							312	468	624	364	547	729	333	500	666	389	583	778
		1200	340	510	680	397	596	794	366	549	732	427	641	855	390	585	780	456	683	911
30	[108]	1000													349	524	698	408	611	815
		1200							379	569	758	443	664	885	405	608	810	473	710	946
35	[126]	1000																		
		1200													422	633	844	493	739	986

*Heating capacity: Valid at water flow 0.066 l/s.

T.9. Heating capacity in case of 8 or 10 pipe rooms

Primary airflow l/s	Primary airflow [m³/h]	Size (mm)	Heating capacity*) water (W) for pressure (Pa) at given Δt (°C)															
			50 Pa						75 Pa						100 Pa			
			8 pipe rows			10 pipe rows			8 pipe rows			10 pipe rows			8 pipe rows			10 pipe rows		
			10	15	20	10	15	20	10	15	20	10	15	20	10	15	20	10	15	20
10	[36]	600	201	301	402	224	335	447	217	326	434	242	362	483	232	348	464	258	387	516
		800	270	404	539	300	450	600	291	437	582	324	486	648	310	465	620	345	518	690
		1000	338	508	677	377	565	753	364	546	728	405	608	810	390	584	779	434	650	867
		1200	410	615	820	456	684	912	441	661	882	491	736	981	472	708	944	525	788	1050
15	[54]	600	218	328	437	243	365	486	236	354	472	263	394	525	252	378	504	281	421	561
		800	287	431	574	320	479	639	309	463	617	344	515	687	330	495	661	368	551	735
		1000	356	534	712	396	594	792	383	574	766	426	639	852	408	613	817	455	682	909
		1200	425	637	849	473	709	945	457	685	914	509	763	1017	489	734	979	545	817	1089
20	[72]	600													274	410	547	305	457	609
		800	303	455	607	338	506	675	326	489	652	363	545	726	348	522	696	387	581	774
		1000	372	558	744	414	621	828	400	601	801	446	668	891	427	641	855	476	713	951
		1200	442	663	884	492	738	984	474	712	949	528	792	1056	507	760	1014	564	846	1128
25	[90]	600																		
		800													372	558	744	414	621	828
		1000							421	631	841	468	702	936	449	673	898	500	749	999
		1200	458	687	917	510	765	1020	493	740	987	549	824	1098	526	789	1051	585	878	1170
30	[108]	1000													470	706	941	524	785	1047
		1200							511	766	1022	569	853	1137	546	819	1092	608	911	1215
35	[126]	1000																		
		1200													569	853	1138	633	950	1266

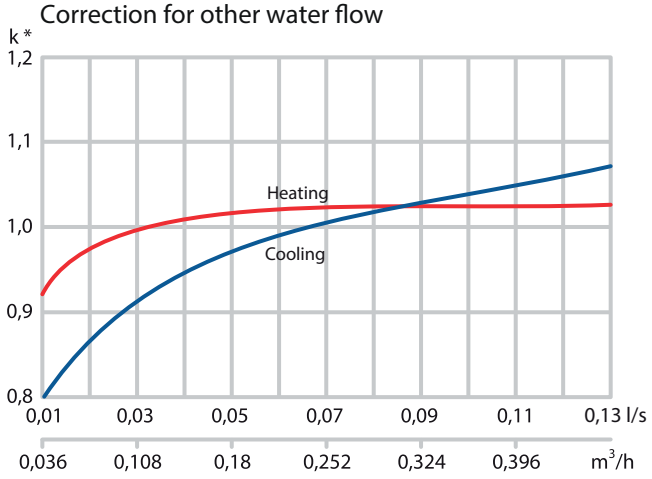
*Heating capacity: Valid at water flow 0.066 l/s.
The levels correspond to 4 dB room attenuation in a normal acoustic room with a 25 m³ room volume, according to the chart on page 3.

Correction Chart

The chart below applies:

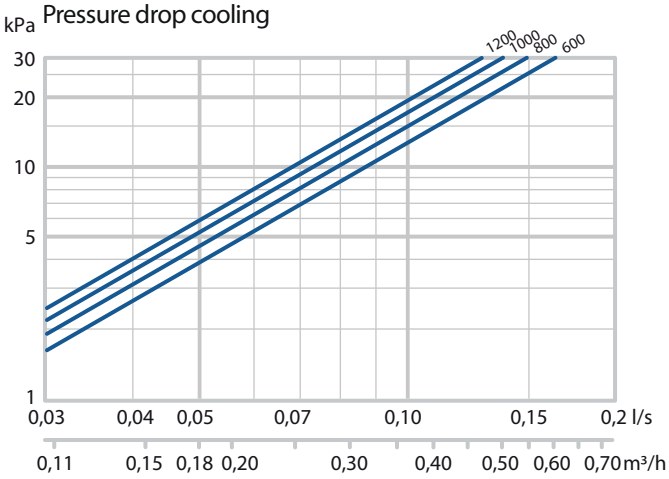
- Correction diagram for water flow refers to one water circuit, the two water circuits halve water flow.
- Blue curve = cold
- Red curve= heating
- k = correction factor
- 1wc / 2wc = number of water circuits

D.1.
Correction for other water flow

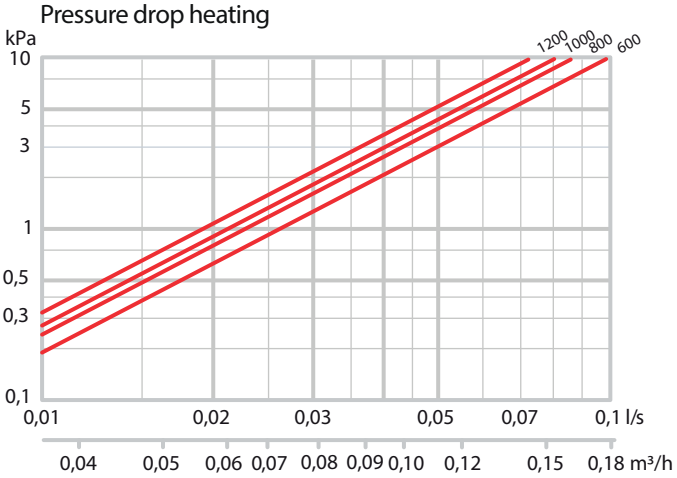


k*= correction factor
** applies to 1 water circuit, when 2 water circuits the water flow is halved

D.2.
Pressure drop cooling

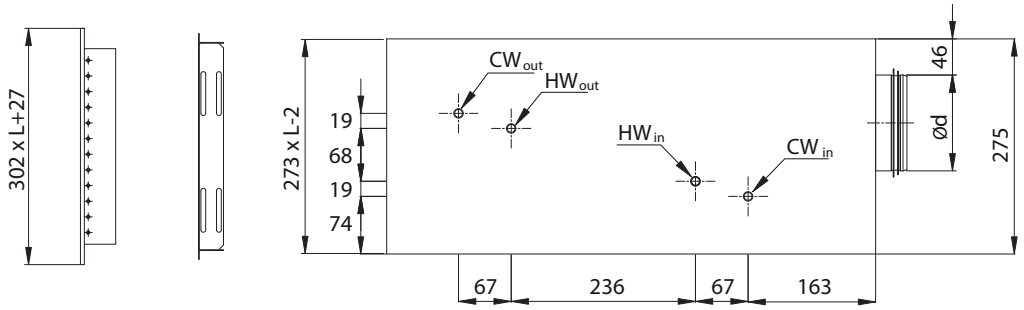


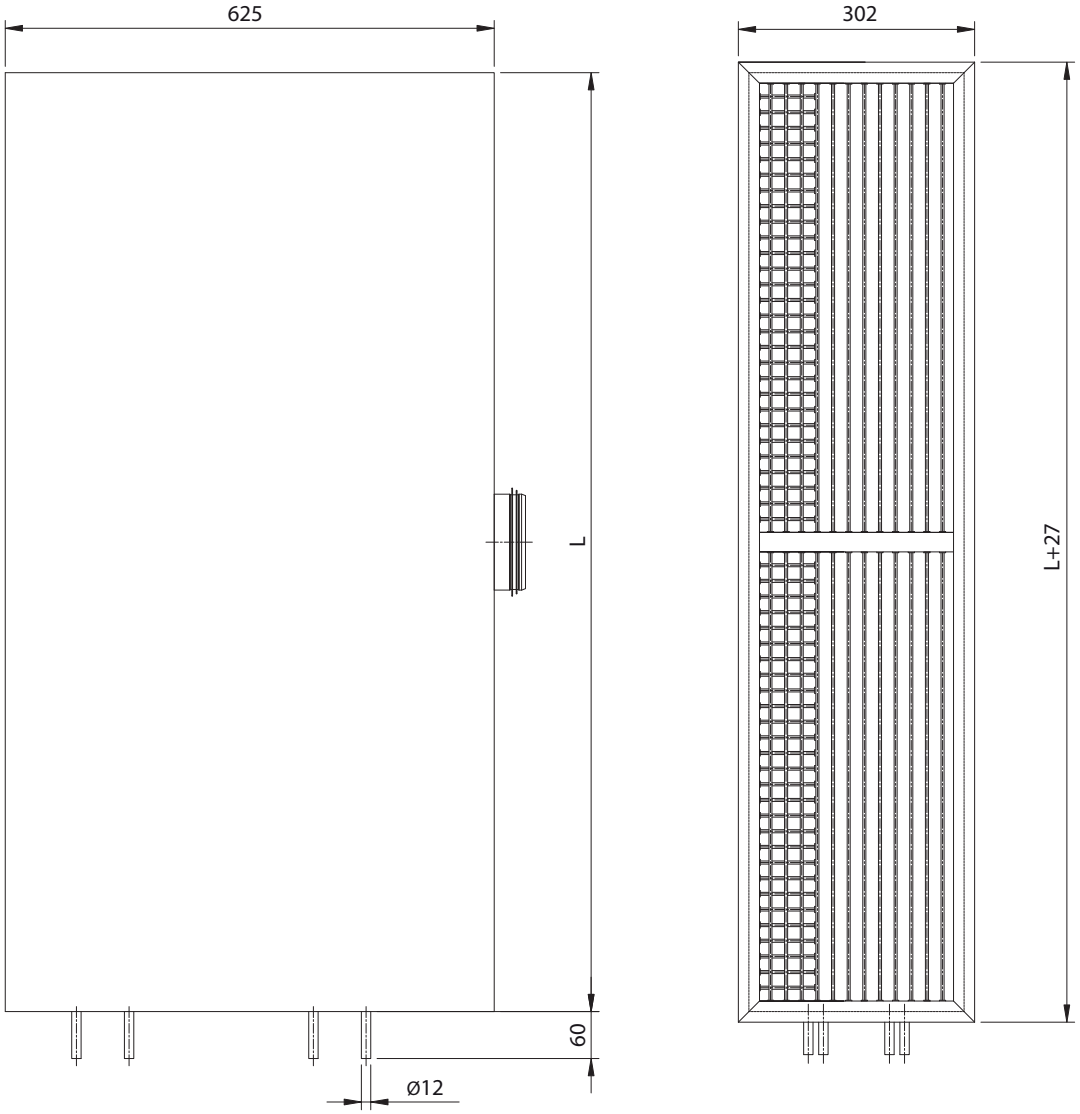
D.3.
Pressure drop heating



Pressure drop heating: 4 = 40%
6 = 60%
8 = 80%
10 = 100% of the chart value.

Dimensions





T.10. Dimensions

Size (mm)=L	Weight	Water flow	Tube dimension heat transfer fluid	
			Cooling	Heating
600	12	0,6	Ø12	Ø12
800	20	0,9		
1000	34	1,2		
1200	45	1,5		

Specification

Ordering code:	XX	-XXXX	-XXX	-X	-X	-X	-X	-X
Product acronym:	WA							
Size designation (mm):		600						
		800						
		1000						
		1200						
Duct connection (Ød, mm):			100					
			125					
Configuration:				without heating	0			
				4 pipe heating	1			
				6 pipe heating	2			
				8 pipe heating	3			
				10 pipe heating	4			
Water connection:						left	L	
						right	R	
Grille option:							AG	A
							DH	D
Room controller:								without control 0
								intergrated control 1
								external control 2
Example: WA-600-100-1-L-D-1-2								

Use Airvent selection program for exact type.