

Active chilled beam

CornerAir



Description

The CornerAir active chilled beam is a one-way induction type air-conditioning unit that is designed for exposed installation, mounted directly under the ceiling against the corner. CornerAir is primarily designed to ventilate, cool and/or heat buildings, where a comfortable climate and individual room control is needed.

The airflow and pressure chosen by the customer is set at the factory. The coil is equipped with either cooling function, or cooling and heating function together. Air duct connection: Ø100 mm.

Main features

- Energy efficient high performance operation
- Elegant exterior design
- Airflows up to 30 l/s
- Low product height (120mm)
- High flexibility with AirFlex air deflectors
- Silent operation
- Easy accessible front panel
- ControlAir automatic control (optional)

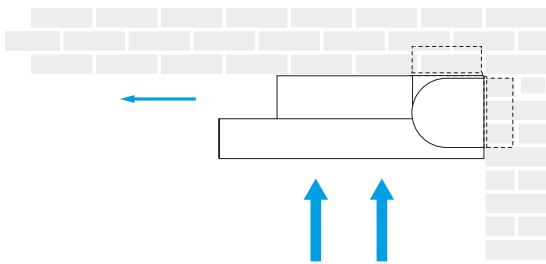
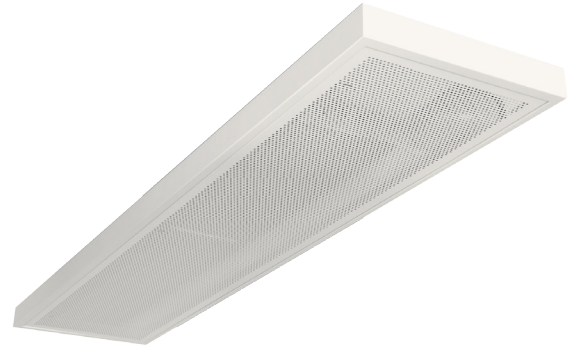
Quick selection

Size (mm)	Airflow (l/s)	Pressure (Pa)	Cooling capacity ^{*)} (W)		
			Air	Water	Total
1500	15	50	180	372	552
		100		432	612
1800	15	50	180	439	619
		100		510	690
2100	20	50	240	546	786
		100		635	875
2400	20	50	240	636	876
		100		739	979
2700	25	50	300	747	1047
		100		869	1169
3000	30	50	360	851	1211
		100		990	1350

^{*)}at $\Delta T = 10 \text{ }^\circ\text{K}$

Function

The primary air from the supply air system, 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 that is always the objective when the occupied zone requires low air velocities.

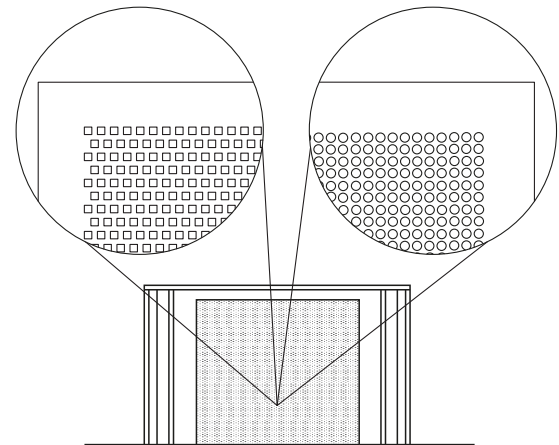


Materials

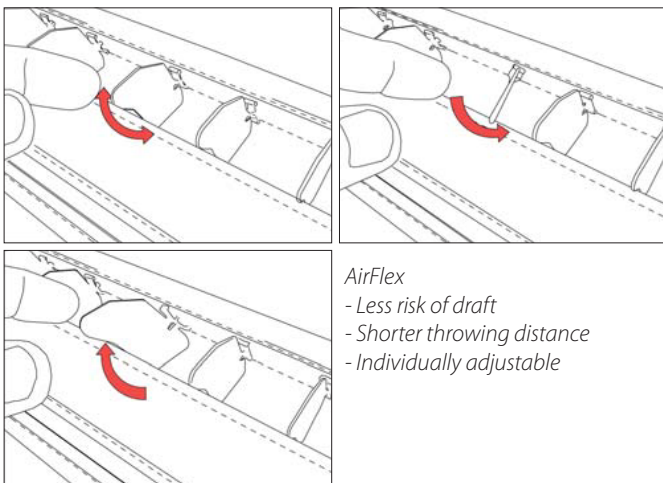
The duct and plenum air box are made of galvanized steel. The visible front plate and side panels are powder coated sheet steel painted in standard white RAL 9003 colour (or in any other RAL colour requested by the customer). The heat exchanger fins are made of aluminium, and the pipes are made of copper. The AirFlex air deflectors are made of polyamid plastic. Square or circular perforation as standard options.

AirFlex- adjustable air deflectors

CornerAir is equipped with AirFlex air deflectors, which can be manually and individually adjusted on each side of the air slots, as standard option. AirFlex allows the operator to easily adjust the direction and throw distance of the discharged conditioned air. With the fine-tuning capabilities of the AirFlex deflectors a highly flexible, pleasant and draught-free indoor climate is achieved.



Square or circular perforation as standard options



- AirFlex*
- Less risk of draft
 - Shorter throwing distance
 - Individually adjustable

Mounting instructions

CornerAir is mounted against the ceiling/wall. For the suspension there are two fixing points towards the ceiling and two against the wall.made inside the beam.

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 1 $L_{w} = L_{PA} + K_0$

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.

Dimensions

The sound pressure level L_{PA} dB(A) applies to an equivalent surface of 10 m², which corresponds to an attenuation of 4 dB in a 25 m³ room with normal atteenuation.

Please see the chart to the right for correction examples of different room types.

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

Correction K_0 dB

Size (mm)	Medium frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
1500	+14	-9	-2	+2	0	-4	-11	-18
1800	+9	-6	-2	+1	0	-2	-12	-20
2100	+9	-6	-2	+1	0	-2	-12	-20
2400	+10	-9	-1	+3	0	-5	-18	-35
2700	+10	-9	-1	+3	0	-5	-18	-35
3000	+10	-5	-4	+1	-1	-2	-19	-20

Sound attenuation

Size (mm)	Medium frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
1500	21	21	13	7	9	15	18	22
1800	22	21	14	7	9	15	17	23
2100	22	21	14	7	9	15	17	23
2400	21	18	11	6	8	13	17	19
2700	21	18	11	6	8	13	17	19
3000	20	19	13	5	8	13	16	22

Soundlevel

Primary airflow (l/s) [m ³ /h]	Size (mm)	Soundlevel, dB(A) at given pressure (Pa)					
		Cooling			Heating		
		50 Pa	75 Pa	100 Pa	50 Pa	75 Pa	100 Pa
10 [36]	1500						
	1800						
	2100		<20			<20	
	2400						
	2700						
15 [54]	1500						
	1800						
	2100		<20			<20	
	2400						
	2700						
20 [72]	1500						
	1800						
	2100		<20			<20	
	2400						
	2700						
25 [90]	1800						
	2100						
	2400		<20			<20	
	2700						
	3000						
30 [108]	2400		21			21	
	2700		21			21	
	3000		20			20	

Selection guide

Example for CornerAir cooling

An office has dimensions of 6.0 x 4.0 x 2.7 (m).

There is a cooling load of 45 W / m²
(45 x 6.0 x 4.0 = 1080 W)

Preconditions:

Dimensioned room temperature: 24.0 °C
Available duct pressure: 100 Pa.
Supply air temperature: 16 °C
(Δt: the room, supply air temperature: 8.0 °C).
Airflow: 25 l/s.
Cooling water supply and return: 14.0 / 17.0 °C. (Δt = 3.0°C). Δt.
Room-water average temperature: 8.5 °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.

$$(25.0 \times 8.0 \times 1.2 = 240 \text{ W})$$

The total cooling load of the water is therefore
1080-240 = 708 W, then the cold air supply 240 W.

We choose a CornerAir 33 according to the chart on page 5.
Δt water-rooms: 8.5 °C. Cooling power: 893 W.

The water flow is calculated from the formula:
 $P = qv \times CPV \times \delta v \Delta tv$. (CPV x δv ≈ 4200).

$$qv = (893 / (3 \times 4200)) \rightarrow qv = 0.071 \text{ l/s.}$$

The water flow at 0,071 l/s gives a correction of 1.0 according to the first chart.

The final cooling effect will be: 893 x 1.0 = 893 W, wethen add air at 240 W, the total cooling capacity 1133 W and we can handle the cooling load of 1080 W.

Example for CornerAir heating

An office has dimensions of 6.0 x 4.0 x 2.7 (m).

There is a heat requirement of 30 W / m²
(30 x 6.0 x 4.0 = 360 W).

Preconditions:

Dimensioned room temperature: 22.0 °C
Available duct pressure: 100 Pa.
Supply air temperature: 18 °C.
Airflow: 25 l/s.
Heating water flow and return: 45.0 / 39.0 °C. (Δt = 6.0 °C). Δt.
Room-water average temperature: 20.0 °C (22 - ((45 + 39) / 2)).

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.

$$(25.0 \times 4.0 \times 1.2 = 120 \text{ W}).$$

The total heat demand is therefore 720 + 120 = 840 W.

We choose a CornerAir 30, according to the chart on page 6.
Δt water room: 20.0 °C. Heat output: 998 W.

The water flow is calculated from the formula:
 $P = qv \times CPV \times \delta v \Delta tv$. (CPV x δv ≈ 4200).

$$qv = (998 / (6 \times 4200)) \rightarrow qv = 0.040 \text{ l/s.}$$

The water flow of 0.026 l/s gives a correction of 1.01 according to the chart first.

The final heat output is therefore: 998 x 1.01 = 1008 W, which can handle the heat requirement of 840 W.

Selection chart Cooling capacity - water

Primary airflow l/s [m3/h]	Size (mm)	Cooling capacity*) water (W) for pressure (Pa) at given ΔT (°C)																	
		50 Pa						75 Pa						100 Pa					
		6	7	8	8,5	9	10	6	7	8	8,5	9	10	6	7	8	8,5	9	10
10 [36]	1500	201	235	268	285	302	335	215	251	287	305	323	359	234	273	312	332	351	390
	1800	242	282	322	343	363	403	265	309	353	375	397	441	281	328	375	399	422	469
	2100	283	330	377	400	424	471	309	361	412	438	464	515	329	384	438	466	493	548
	2400	318	371	424	451	477	530	347	405	463	492	521	579	370	431	493	524	554	616
	2700	352	411	470	499	528	587	385	449	514	546	578	642	410	478	546	581	615	683
15 [54]	1500	223	260	298	317	335	372	238	278	318	338	357	397	259	302	346	368	389	432
	1800	263	307	351	373	395	439	287	335	383	407	431	479	306	357	408	434	459	510
	2100	304	354	405	430	455	506	332	387	442	470	498	553	353	412	470	500	529	588
	2400	356	415	474	504	534	593	389	454	518	551	583	648	413	482	551	586	620	689
	2700	407	475	543	577	611	679	446	520	594	632	669	743	474	553	632	672	711	790
	3000	442	515	589	626	662	736	483	564	644	684	725	805	514	599	685	728	770	856
20 [72]	1500	242	283	323	344	364	404	259	302	346	368	389	432	282	329	376	400	423	470
	1800	286	333	381	405	428	476	312	364	416	442	468	520	332	387	442	470	498	553
	2100	328	382	437	464	491	546	358	418	478	507	537	597	381	445	508	540	572	635
	2400	382	445	509	541	572	636	417	487	556	591	626	695	443	517	591	628	665	739
	2700	435	508	580	616	653	725	475	554	634	673	713	792	506	590	674	717	759	843
	3000	471	550	628	667	707	785	515	601	686	729	772	858	548	639	730	776	822	913
25 [90]	1800	293	342	390	415	439	488	314	366	418	445	471	523	341	398	454	483	511	568
	2100	341	398	454	483	511	568	373	435	497	528	559	621	397	463	529	562	595	661
	2400	395	461	526	559	592	658	431	503	575	611	647	719	459	536	612	650	689	765
	2700	448	523	598	635	672	744	490	572	654	694	735	817	521	608	695	739	782	869
	3000	496	578	661	702	743	826	541	631	722	767	812	902	576	672	768	816	864	960
30 [108]	2400	397	465	531	565	598	664	426	497	568	604	639	710	463	540	618	657	695	772
	2700	463	540	618	656	695	772	506	591	675	717	760	844	539	629	718	763	808	898
	3000	511	596	681	723	766	851	559	652	745	791	838	931	594	693	792	842	891	990

Cooling capacity: Valid at water flow 0.066 l / s.
For suspended installation contact Airvent.

*) 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.

Selection chart Cooling capacity – air

ΔT (°C)	Cooling capacity air (W) at primary airflow l/s [m3/h] for following sizes (mm)					
	10 [36]	15 [54]	20 [72]	25 [90]	30 [108]	35 [126]
2	24	36	48	60	72	96 / 84
3	36	54	72	90	108	144 / 126
4	48	72	96	120	144	192 / 168
5	60	90	120	150	180	244 / 210
6	72	108	144	180	216	288 / 252
7	84	126	168	210	252	336 / 294
8	96	144	192	240	288	384 / 336
9	108	162	216	270	324	432 / 378
10	120	180	240	300	360	480 / 420

Selection chart Heating capacity - water

Primary airflow l/s [m3/h]	Size (mm)	Heating capacity*) water (W) for pressure (Pa) at given ΔT (°C)														
		50 Pa					75 Pa					100 Pa				
		10	15	20	25	30	10	15	20	25	30	10	15	20	25	30
10 [36]	1500	174	261	348	436	523	187	280	373	467	560	203	304	406	507	608
	1800	210	315	420	525	630	229	344	458	573	687	244	366	488	610	732
	2100	245	368	490	613	735	268	402	536	670	804	285	428	570	713	855
	2400	275	413	550	688	825	301	452	602	753	903	320	480	640	800	960
	2700	305	458	610	763	915	334	501	668	835	1022	355	533	710	888	1065
15 [54]	1500	193	290	387	484	580	206	310	413	516	619	225	337	449	562	674
	1800	228	342	456	570	684	249	374	498	623	747	265	398	530	663	795
	2100	263	395	526	658	789	288	432	576	720	864	306	459	612	765	918
	2400	308	462	616	770	924	337	506	674	843	1011	358	537	716	895	1074
	2700	353	530	706	883	1059	386	579	772	965	1158	411	617	822	1028	1233
	3000	383	575	766	958	1149	418	627	836	1045	1254	445	668	890	1113	1335
20 [72]	1500	210	315	420	525	630	225	337	449	562	674	244	367	489	611	733
	1800	248	372	496	620	744	271	407	542	678	813	288	432	576	720	864
	2100	284	426	568	710	825	310	465	620	775	930	330	495	660	825	990
	2400	330	495	660	825	990	361	542	722	903	1083	384	576	768	960	1152
	2700	377	566	754	943	1131	412	618	824	1030	1236	438	657	876	1095	1314
	3000	409	614	818	1023	1227	447	671	894	1118	1341	475	713	950	1188	1425
25 [90]	1800	254	381	508	634	761	272	408	544	680	816	295	443	591	738	886
	2100	296	444	592	740	888	323	485	646	808	969	344	516	688	860	1032
	2400	342	513	684	855	1026	374	561	748	935	1122	398	597	796	995	1194
	2700	389	548	778	973	1167	425	638	850	1063	1275	452	678	904	1130	1356
	3000	429	644	858	1073	1287	469	704	938	1173	1407	499	749	998	1248	1497
30 [108]	2400	345	518	691	863	1036	369	554	738	923	1108	401	602	803	1004	1204
	2700	402	603	804	1005	1206	439	659	878	1098	1317	467	701	934	1168	1401
	3000	443	665	886	1108	1329	484	726	968	1210	1452	515	773	1030	1288	1545

Heating capacity: Valid at water flow 0.03 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..

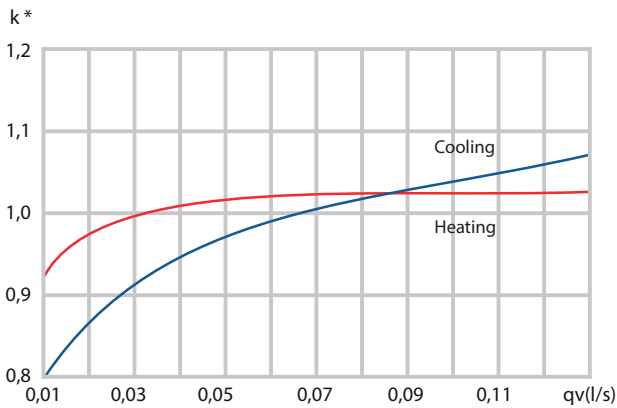
Correction Chart

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

Diagram 1.

Correction for other water flow



k* = correction factor

** applies to 1 water circuit, when 2 water circuits the water flow is halved

Diagram 2. Pressure drop cooling

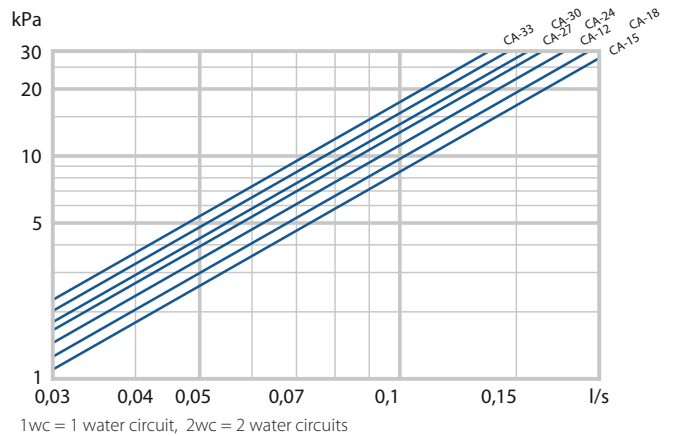
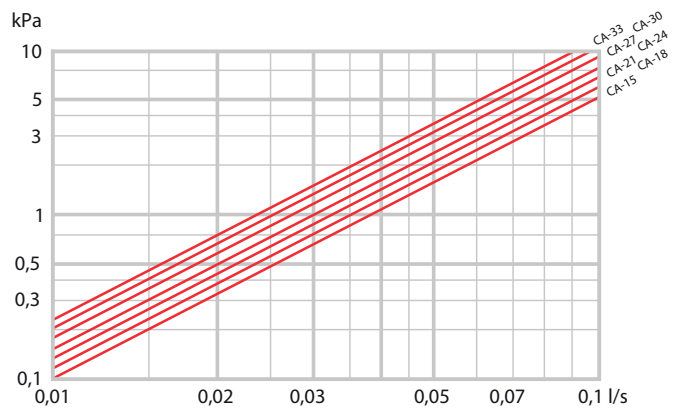
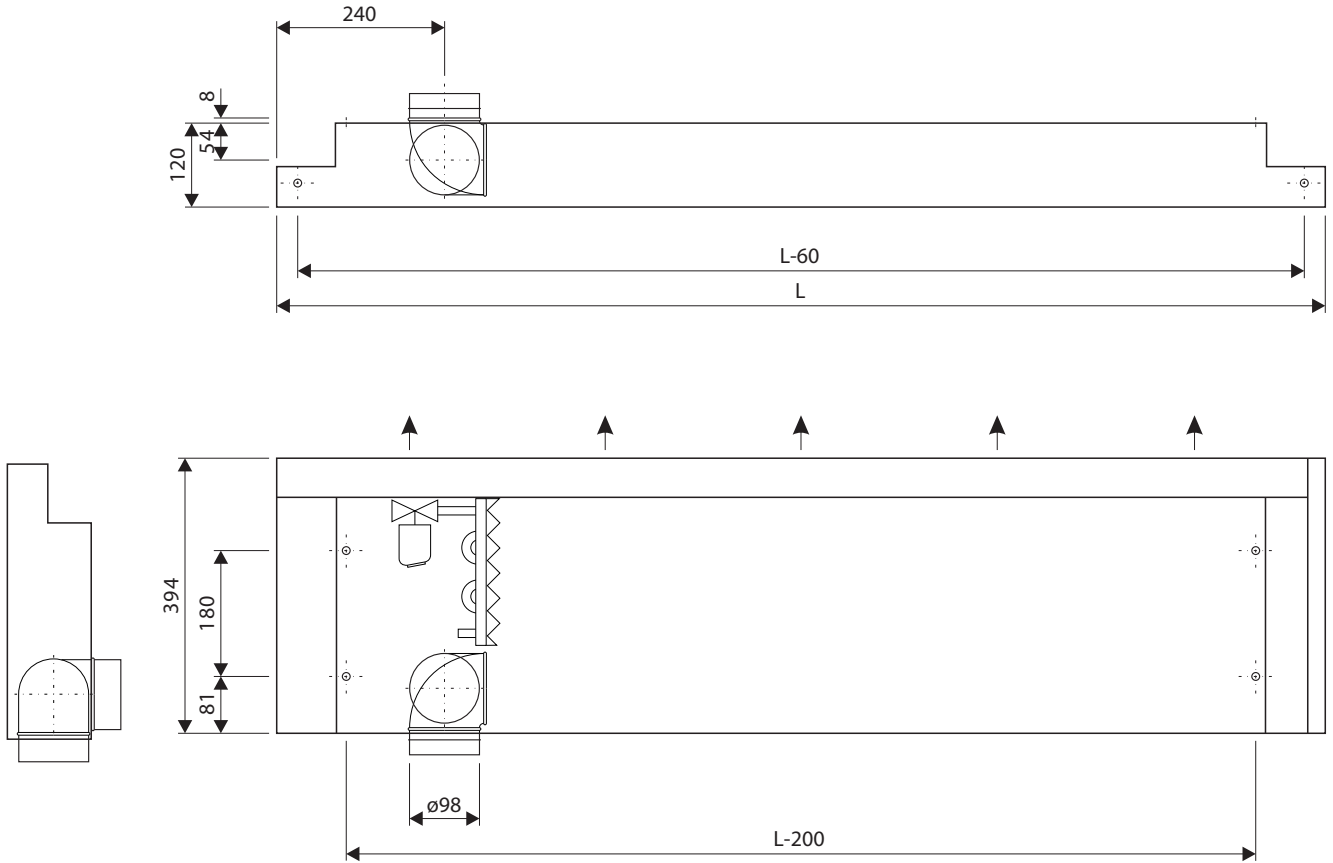


Diagram 3. Pressure drop heating

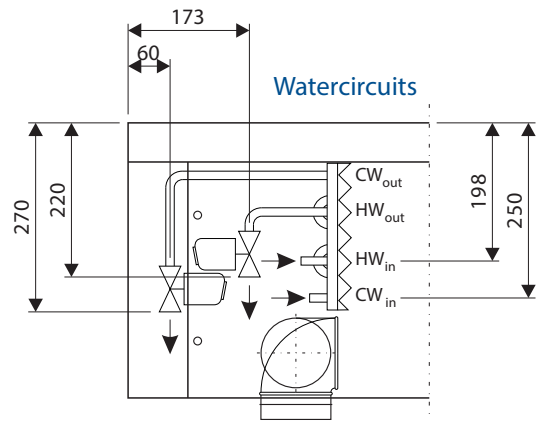


Dimensions



Dimensions

Size (mm)=L	Weight	Water flow	Tube dimension heat transfer fluid	
			Cooling	Heating
1500	21	1,8	Ø12	Ø12
1800	25	1,0		
2100	29	1,2		
2400	33	1,4		
2700	37	1,6		
3000	41	1,8		



Specification

Ordering code	XX -XXXX -XXX -X -X -X -X -X
Product acronym	CA
Size designation (mm)	1500 1800 2400 2700 3000
Duct connection (Ød,mm)	100 ^{*)}
Configuration	without heating 0 with heating 1
Water connection	left L right R
Perforation option	square Q circular D
Nr. of water circuits in coil	one water circuit 1 two water circuits 2
Room controller	without control 0 intergrated control 1 external control 2

Example: CA-1500-100-0-L-Q-1-0

^{*)} Size of connection is fixed.