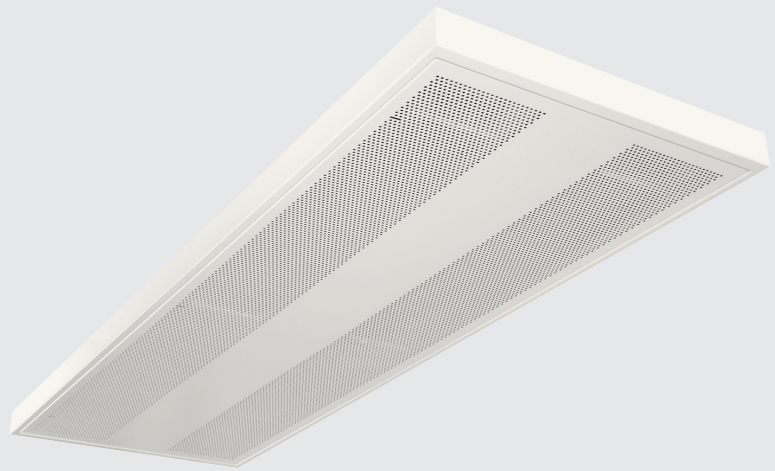


Two-way induction type active chilled beam

FreeAir



Description

The FreeAir active chilled beam is a two-way induction type air-conditioning unit that is designed for exposed installation, mounted directly against the ceiling. It is suitable for ventilation, cooling and heating. The primary air from the air handling unit is injected through the specially shaped nozzles and discharged into the room along the ceiling. Causing induction of the room air to flow through the cooling and/or heating coil, which then mixed with the primary air flows back into the room through the linear slot openings on the two sides of the beam. The conditioned/mixed air discharged along the ceiling provides the optimal coanda effect which is always the objective when the occupied zone requires low air velocities.

Air duct connection: Ø100 mm

Main features

- exposed installation
- primary air ventilation
- cooling
- heating (optional)
- ControlAir regulation system (optional)

Quick selection

Size (mm)	Airflow m ³ /h [l/s]	Pressure (Pa)	Cooling capacity ^{*)} (W)		
			Air	Water	Total
1500	54 [15]	50	180	565	745
		100		649	829
1800	72 [20]	50	240	743	983
		100		854	1094
2100	90 [25]	50	300	963	1263
		100		1007	1307
2400	90 [25]	50	240	959	1259
		100		1102	1402
2700	108 [30]	50	360	1094	1454
		100		1257	1617
3000	126 [35]	50	420	1222	1642
		100		1405	1825

^{*)} at ΔT = 10 °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. The fronts are produced with square perforation as standard.

AirFlex- adjustable air deflectors

FreeAir is equipped with AirFlex air deflectors, which can be manually and individually adjusted on each side of the air slots, as a 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 draft-free indoor climate can be achieved.

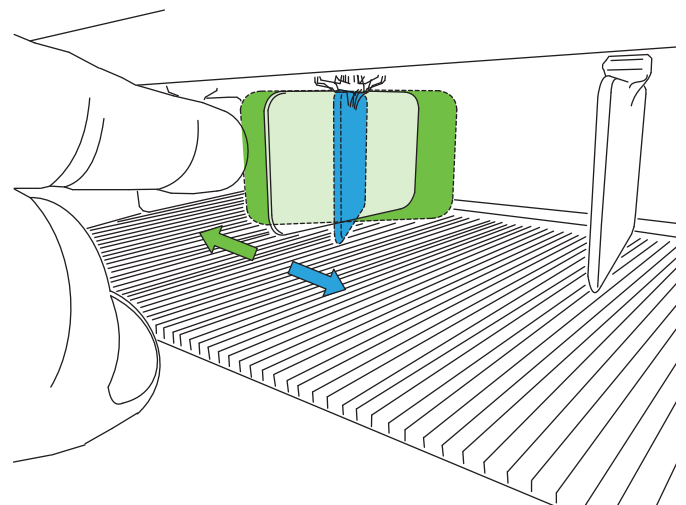
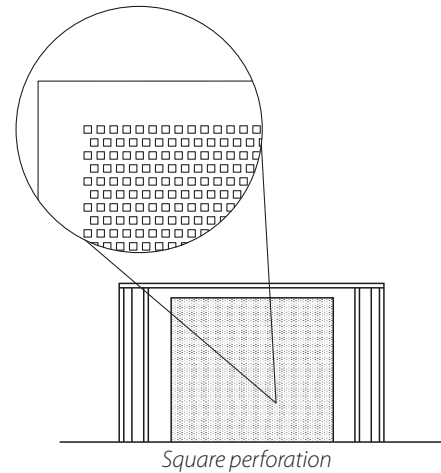
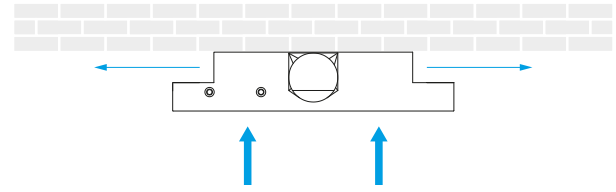
- Less risk of draft
- Shorter throw length
- Individually adjustable

Mounting instructions

See FreeAir Maintenance and Installation Guide catalog.

Maintenance

See FreeAir Maintenance and Installation Guide catalog.



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 attenuation.

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	+2	-4	-3	+2	+1	-6	-19	-28
1800	+6	-1	-4	+1	+1	-4	-15	-25
2100	+6	-1	-4	+1	+1	-4	-15	-25
2400	+3	-1	-7	-4	-1	0	-19	-30
2700	+3	-1	-7	-4	-1	0	-19	-30
3000	+2	-2	-4	0	0	-1	-17	-27

Tol. ± 3 dB

Sound attenuation dB

Size (mm)	Medium frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
1500	24	19	11	4	6	12	16	19
1800	25	21	13	6	5	12	16	19
2100	25	21	13	6	5	12	16	19
2400	24	21	13	4	5	11	16	19
2700	24	21	13	4	5	11	16	19
3000	23	20	12	4	5	12	17	20

Tol. ± 3 dB

Soundlevel

Size (mm)	Primary airflow l/s [m ³ /h]		Soundlevel, dB(A) at given pressure (Pa)						
			Cooling			Heating			
			50 Pa	75 Pa	100 Pa	50 Pa	75 Pa	100 Pa	
1500	10	[36]	<20	<20	<20	<20	<20	<20	
1800									
1500	15	[54]	<20	<20	<20	<20	<20	<20	
1800									
2100									
2400									
2700					20	21		20	21
3000					21	20		21	20
1500	20	[72]	<20	20	21	<20	20	21	
1800					21			21	
2100					20			<20	
2400				<20		<20		<20	
2700				20	21	22	20	21	22
3000				<20	22	25	<20	22	25
1500	25	[90]	20	21	22	20	21	22	
1800			20	22	24	20	22	24	
2100			21	22	22	21	22	22	
2400			<20	<20	20	<20	<20	20	
2700			21	22	23	21	22	23	
3000			<20	24	27	<20	24	27	
1800	30	[108]	23	26	27	23	26	27	
2100			21	22	23	21	22	23	
2400			20	20	22	20	20	22	
2700			23	24	25	23	24	25	
3000			22	25	28	22	25	28	
2100	35	[126]	22	23	24	22	23	24	
2400			21	22	24	21	22	24	
2700			25	26	27	25	26	27	
3000			26	27	29	26	27	29	

Selection chart

Cooling capacity – water

Size (mm)	Primary airflow		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
1500	10	[36]	299	349	398	423	448	498	321	375	428	455	482	535	343	400	458	486	515	572
1800			342	399	456	485	513	570	368	429	490	521	552	613	393	459	524	557	590	655
1500	15	[54]	339	396	452	480	509	565	364	425	486	516	546	607	389	454	519	552	584	649
1800			388	453	518	550	582	647	418	487	557	592	626	696	446	521	595	632	670	744
2100			416	486	555	590	625	694	448	522	597	634	671	746	479	559	638	678	718	798
2400			444	518	592	629	666	740	478	557	637	677	716	796	511	596	681	723	766	851
2700			454	529	605	643	680	756	488	569	650	691	732	813	521	608	695	739	782	869
3000			463	540	618	656	695	772	498	581	664	706	747	830	532	621	710	754	798	887
1500	20	[72]	383	447	511	543	575	639	412	481	550	584	618	687	441	515	588	625	662	735
1800			446	520	594	632	669	743	479	559	639	679	719	799	512	598	683	726	769	854
2100			483	564	644	684	725	805	519	606	692	735	779	865	555	648	740	786	833	925
2400			520	607	694	737	780	867	559	652	746	792	839	932	598	697	797	847	896	996
2700			550	641	733	779	824	916	591	690	788	837	887	985	632	737	842	895	948	1053
3000			579	676	772	820	869	965	622	726	830	881	933	1037	665	776	887	943	998	1109
1500	25	[90]	433	505	578	614	650	722	466	543	621	660	698	776	498	581	664	706	747	830
1800			476	555	634	674	714	793	512	597	682	725	768	853	547	638	730	775	821	921
2100			578	674	770	819	867	963	591	690	788	837	887	985	604	705	806	856	906	1007
2400			575	671	767	815	863	959	619	722	825	876	928	1031	661	771	882	937	992	1102
2700			605	706	807	858	908	1009	651	760	868	922	977	1085	696	812	928	985	1044	1160
3000			635	741	847	900	953	1059	683	797	910	967	1024	1138	730	852	974	1034	1095	1217
1800	30	[108]	501	585	668	710	752	835	539	629	718	763	808	898	576	672	768	816	864	960
2100			554	647	739	785	832	924	596	695	794	844	894	993	637	743	850	903	956	1062
2400			608	709	810	861	912	1013	653	762	871	926	980	1089	698	815	931	989	1048	1164
2700			656	766	875	930	985	1094	706	823	941	1000	1058	1176	754	880	1006	1068	1131	1257
3000			705	823	940	999	1058	1175	758	884	1010	1074	1137	1263	810	945	1080	1148	1215	1350
2100	35	[126]	572	668	763	811	859	954	615	718	820	871	923	1025	658	767	877	932	986	1096
2400			628	733	838	890	942	1047	676	788	901	957	1013	1126	722	843	963	1023	1084	1204
2700			681	795	908	965	1022	1135	732	854	976	1037	1098	1220	783	914	1044	1109	1175	1305
3000			733	855	978	1039	1100	1222	788	920	1051	1117	1183	1314	843	984	1124	1194	1265	1405

Cooling capacity: Valid at water flow 0,066 l/s.

For suspended installation contact Airvent.

At the internal connection and ControlAir controller reduces the cooling capacity by 8%.

*) 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 [m ³ /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

Size (mm)	Primary airflow l/s [m ³ /h]		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
1500	10	[36]	259	389	518	648	777	278	417	556	695	834	297	446	594	743	891
1800			296	444	592	740	888	319	479	638	798	957	341	512	682	853	1023
1500	15	[54]	294	441	588	735	882	316	474	632	790	948	337	506	674	843	1011
1800			336	504	672	840	1008	362	543	724	905	1086	387	581	774	968	1161
2100			361	542	722	903	1083	388	582	776	970	1164	415	623	830	1038	1245
2400			385	578	770	963	1155	414	621	828	1035	1242	443	665	886	1108	1329
2700			393	590	786	983	1179	423	635	846	1058	1269	452	678	904	1130	1356
3000			401	602	802	1003	1203	432	648	864	1080	1296	461	692	922	1153	1383
1500	20	[72]	332	498	664	830	996	357	536	714	893	1071	382	573	764	955	1146
1800			386	579	772	965	1159	415	623	830	1038	1245	444	666	888	1110	1332
2100			419	629	838	1048	1257	450	675	900	1125	1350	481	722	962	1203	1443
2400			451	677	902	1128	1353	485	728	970	1213	1455	518	777	1036	1295	1554
2700			476	714	952	1190	1428	512	768	1024	1280	1536	548	822	1096	1370	1644
3000			502	753	1004	1255	1506	539	809	1078	1348	1617	577	866	1154	1443	1731
1500	25	[90]	375	563	750	938	1125	404	606	808	1010	1212	432	648	864	1080	1296
1800			412	618	824	1030	1236	444	666	888	1110	1332	474	711	948	1185	1422
2100			501	752	1002	1253	1503	512	768	1024	1280	1536	524	786	1048	1310	1572
2400			499	749	998	1248	1497	536	804	1072	1340	1608	573	860	1146	1433	1719
2700			525	788	1050	1313	1575	564	846	1128	1410	1692	603	905	1206	1508	1809
3000			551	827	1102	1378	1653	592	888	1184	1480	1776	633	950	1266	1583	1899
1800	30	[108]	434	651	868	1085	1302	467	701	934	1168	1401	499	749	998	1248	1497
2100			480	720	960	1200	1440	516	774	1032	1290	1548	552	828	1104	1380	1656
2400			527	791	1054	1318	1581	566	849	1132	1415	1698	605	908	1210	1513	1815
2700			569	854	1138	1423	1707	612	918	1224	1530	1836	654	981	1308	1635	1962
3000			611	917	1222	1528	1833	657	986	1314	1643	1971	702	1053	1404	1755	2106
2100	35	[126]	496	744	992	1240	1488	533	800	1066	1333	1599	570	855	1140	1425	1710
2400			544	816	1088	1360	1632	586	879	1172	1465	1758	626	939	1252	1569	1878
2700			590	885	1180	1475	1770	634	951	1268	1585	1902	679	1019	1358	1698	2037
3000			635	953	1270	1588	1905	683	1025	1366	1708	2049	731	1097	1462	1828	2193

Heating capacity: Valid at water flow 0,03 l/s.

At the internal connection and ControlAir controller reduces the heating effect of 8%.

^{*)} 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 flows

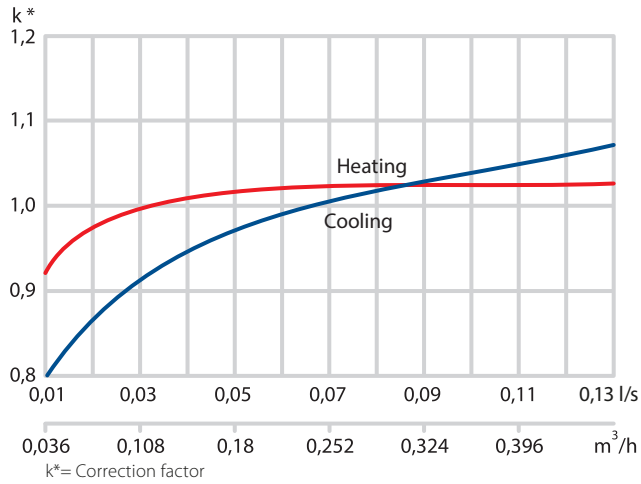


Diagram 2.
Pressure drop cooling, FreeAir

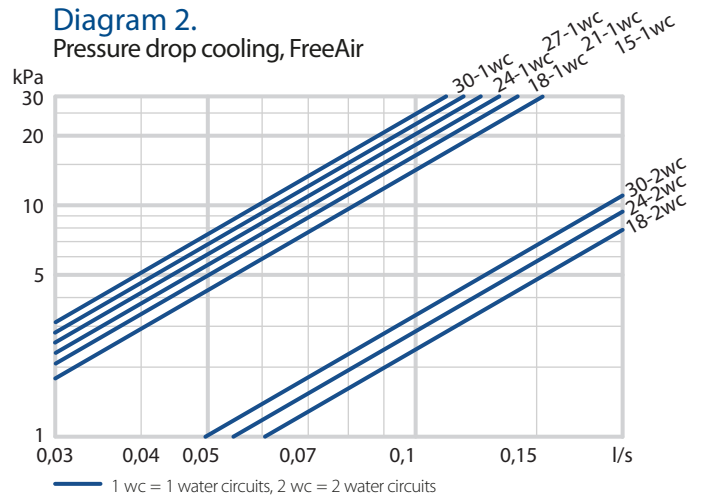
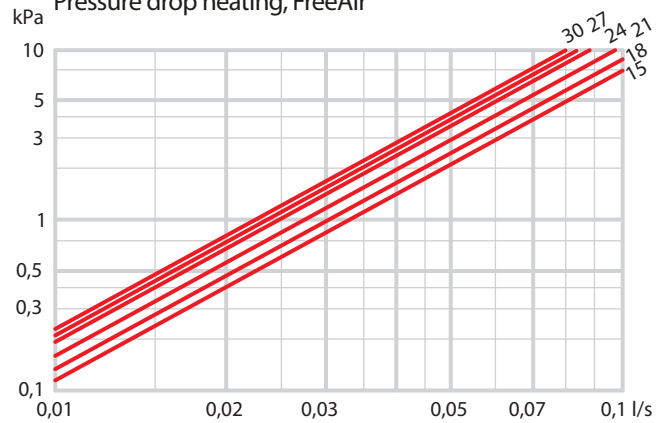
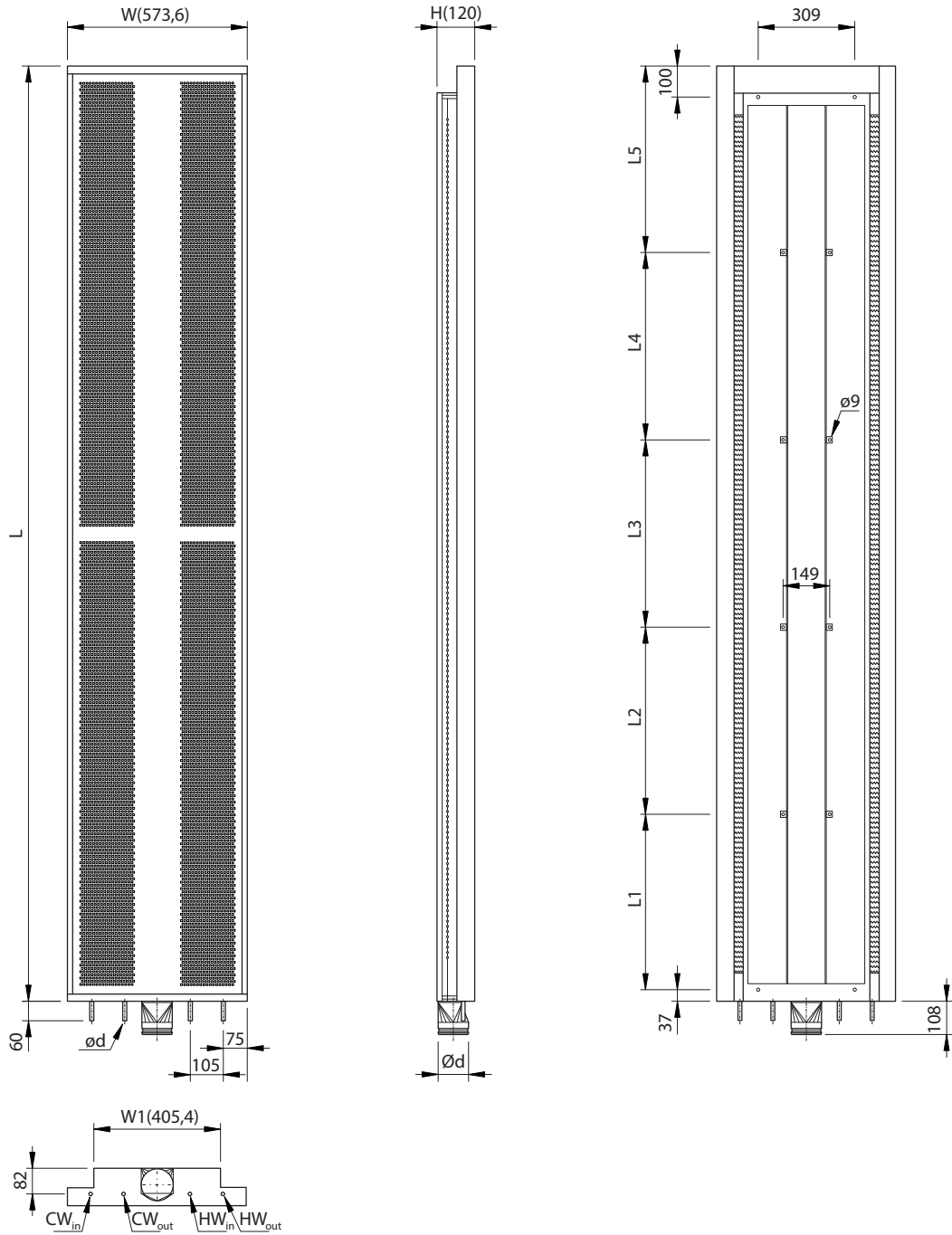


Diagram 3.
Pressure drop heating, FreeAir



Dimensions



Dimensions

Size (mm)	Dimensions (mm)					Weight (kg)	Water volume(l)
	L	W	W1	H	$\varnothing d$		
1500	1500	573,6	405,4	120	100	27	1,4
1800	1800					29	1,6
2100	2100					32	1,9
2400	2400					34	2,2
2700	2700					37	2,5
3000	3000					40	2,7

Tube dimensions

Number of water circuits	15	18	21	24	27	30
1	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$
2	-	-	$\varnothing 15$	$\varnothing 15$	$\varnothing 15$	$\varnothing 15$
Heating	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$	$\varnothing 12$

Specification

Ordering code:	XXX	-XXX	-XX	-XX	-XxXXX	-X
Product type:	FAL					
Coil type	1-circuit cooling	C1				
	2-circuit cooling	C2				
	1-circuit cooling and heating	C1H				
	2-circuit cooling and heating	C2H				
	1-circuit changeover	C1O				
	2-circuit changeover	C2O				
Size (mm):	1500	15				
	1800	18				
	2400	24				
	2700	27				
	3000	30				
Nozzle position	side A	A1				
		A2				
		A3				
		A4				
		A5				
		A6				
Duct size(s)					1x100	
Example: FAL-C1H-18-A2-1x100						