MINIB®

more than just heat

CHILLED BEAM

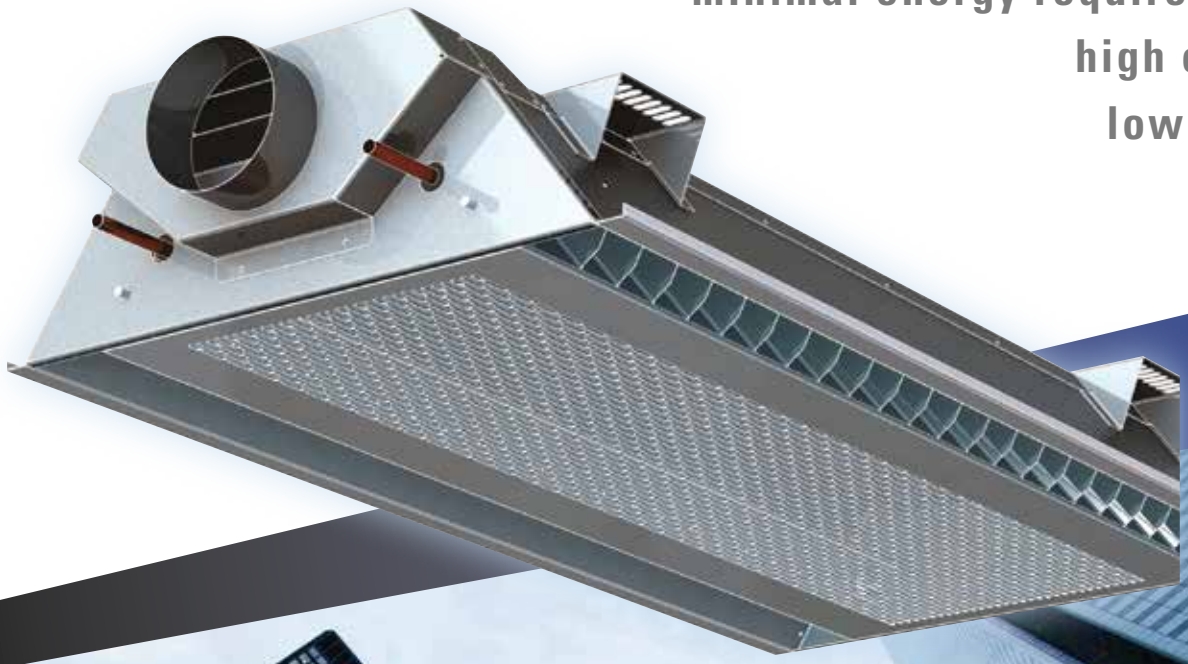
effective and efficient

COOLING, HEATING AND VENTILATION

minimal energy requirements

high output

low noise



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ABOUT US

ABOUT THE COMPANY

MINIB ranks among the leading manufacturers of HVAC systems in the Czech Republic. It currently exports its products to more than thirty countries in Europe, Asia, Australia, and America.

Since 1999, MINIB has been systematically innovating production technology and its products, and it invests quite considerable amounts in its own development and design, with the goal of offering its customers advanced technical and aesthetic solutions.

MINIB is an economically stable company which has been consistently generating profit.

ABOUT THE MANUFACTURING PROCESS

The manufacturing facility is located in Býkev near Mělník, and has excellent road connections. It is furnished with state-of-the-art manufacturing technology. Most manufacturing operations are carried out on CNC machines, which allows us to meet even the most sophisticated requirements of our demanding customers.

All products are made only from high-quality materials with long life cycle, which allows us to offer ten-year warranty on the heat exchangers.

CERTIFICATION

Our company is a holder of a quality management certificate, ISO 9001:2016 for the field of design, development, manufacturing and sale of heating and cooling units. The entire product portfolio is tested in an independent accredited testing chamber, which allows us to guarantee the stated heating and cooling output values. Our company is also a holder of numerous utility models and patents.

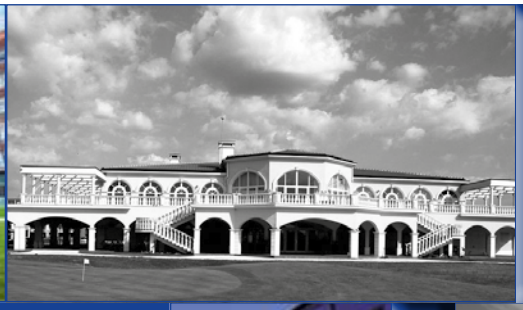

CERTIFICATE

ČSN EN ISO 9001:2016

TÜV SÜD ISO 9001

REFERENCES

LEICESTER



NIŽNIJ NOVGOROD

PRAGUE

CASTLE DOBŘÍŠ

MOSCOW

CASTLE DĚČÍN

VORONEZH

PRAGUE

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CHILLED BEAM DESCRIPTION

BASIC INFORMATION

Chilled beams are modern devices based on a water to air system, which makes it possible to efficiently change the temperature of the air and to distribute it silently with minimal energy requirements.

A chilled beam does not contain a fan; it functions by way of entraining the primary air through nozzles, driven by the induced injection effect drawing the secondary air to the room. This principle is explained in more detail in the next chapter.

The primary air is centrally treated fresh air from outside, which is distributed by HVAC ducts to the Chilled beams installed in the ceilings of the rooms concerned.

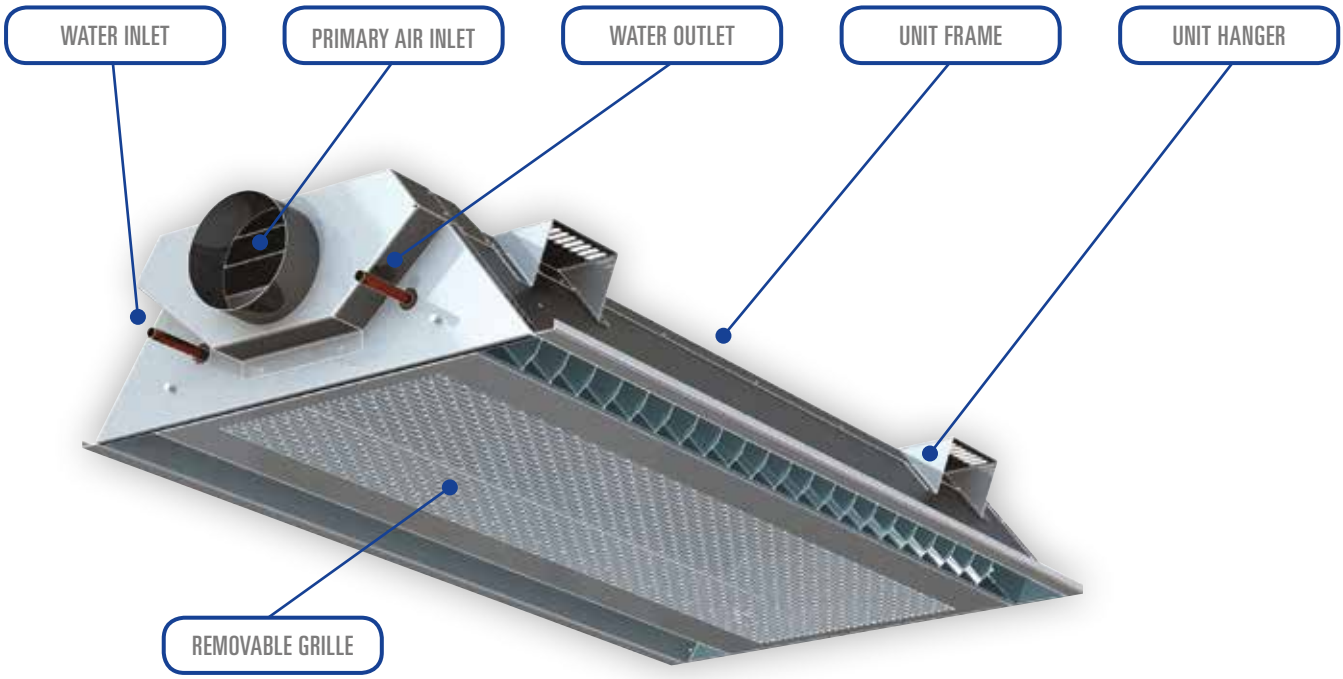
The secondary air is the air in the room that is drawn in through a heat exchanger within the Chilled beam; the secondary air is cooled by the heat exchanger when the cooling function is on, and heated by the heat exchanger when the heating function is on.

In the case of cooling, it is necessary to ensure correct design of the temperature of the cold water supplied, so that the dew point is not reached, which would lead to condensation of the air humidity.

Optimal mixing of the primary and the secondary air occurs in the Chilled beam.

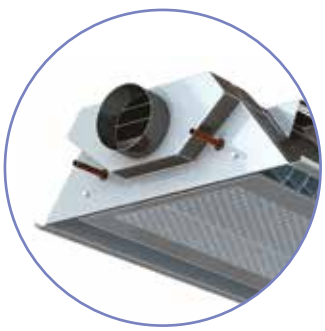
The cooling or heating output, to cover the thermal losses or gains, is therefore provided by the change of the condition of the secondary air, using a water to air heat exchanger and also by the supply of the centrally treated primary air.

The troughs metal parts and grilles are made of galvanized sheet metal. The visible surfaces of the trough and grilles are painted white as a standard design. The unit can also be supplied in different colours, depending on the end user's request. The pipes for the water supply and the drain are made of copper. The unit grille is removable and secured with a steel wire to prevent it falling down when removed for service.

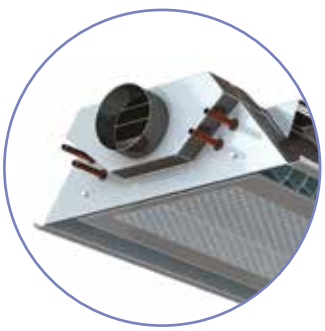


AVAILABLE VERSIONS

2 PIPE VERSION

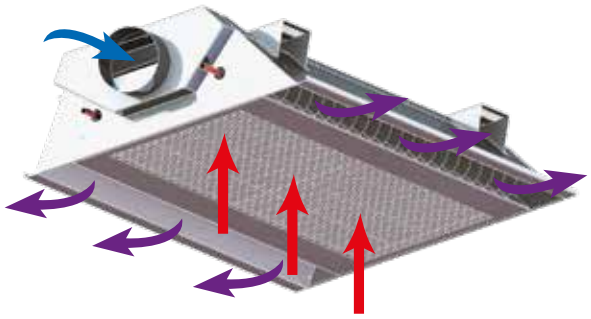


4 PIPE VERSION

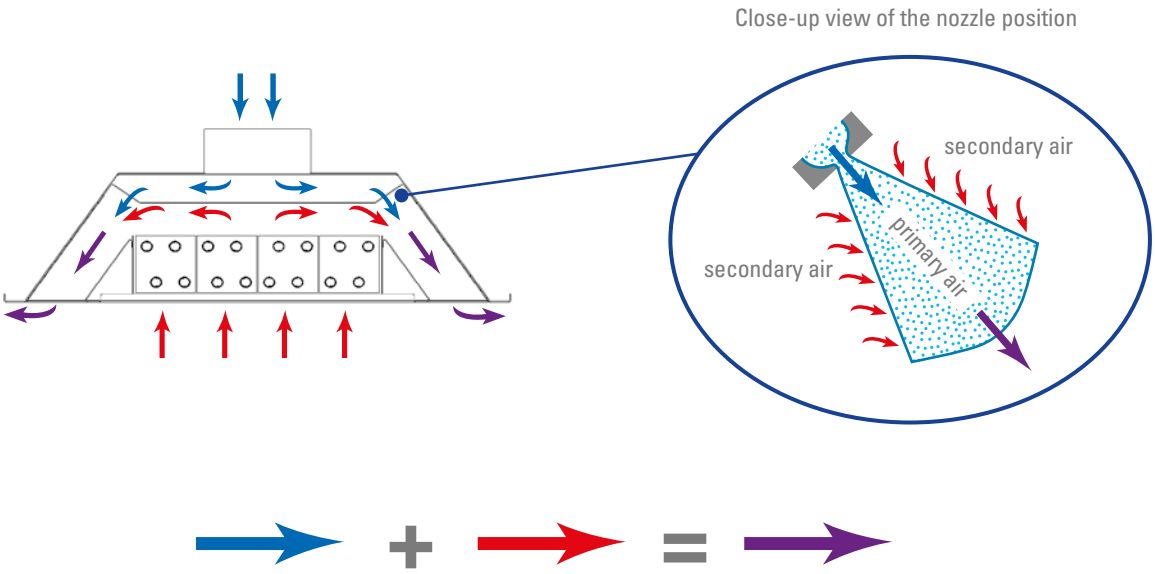


CHILLED BEAM DESCRIPTION

CHILLED BEAM PRINCIPLE



Chilled beams, also known as active cooling beams, are connected to the distribution system for external treated air, the primary air. The primary air is pushed under pressure through nozzles behind which the ejection effect takes and sucks in the secondary air from the room. This suction of the secondary air from the room occurs through a heat exchanger where the air is cooled or heated. The primary and secondary air is mixed inside the unit, and the mixed air is subsequently distributed to the room. This “induction” takes place inside the Chilled beam.

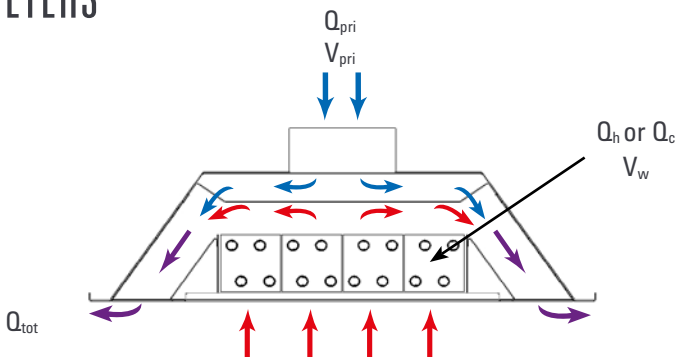


CHILLED BEAM BENEFITS

- Specially developed for high cooling and heating outputs
- Very high level of comfort
- Does not contain fan
- Silent operation
- Ideal for installation in a ceiling
- Does not reduce the usable area and its variable functional arrangement
- Low installation height of the unit is suitable for new construction projects, as well as renovations
- Optimisation of air flow by adjustable slats
- Great variability of the air connection
- Doesn´t need supply of energy
- Minimum maintenance requirements
- Low operating cost
- Allows for non-standard design according to the customer’s request

CALCULATION OF THE CHILLED BEAM PARAMETERS

DEFINITION OF PARAMETERS



Parameter	Unit	Definition
Qtot	[W]	Total output
Qpri	[W]	Output on the primary air side (cooling or heating)
Qc	[W]	Cooling output on the water side (cooling output of the secondary air)
Qh	[W]	Heating output on the water side (heating output of the secondary air)
T	[-]	Nozzle adjustment
L	[mm]	Unit length
Vpri	[m3/hr; l/s]	Volume flow of the primary air
Vw	[l/h; l/s]	Volume flow of the water
Δ tpri	[K]	Difference between the temperature of the air in the room and the primary air (the supplied external treated air)
Δ tiw	[K]	Difference between the temperature of the air in the room and the mean temperature of the water
Δ pv	[Pa]	Air pressure drop
Δ pw	[kPa]	Water pressure drop
LA,eq	[dB]	Equivalent level of acoustic pressure in distance of 2 m from the induction unit

INLET WATER TEMPERATURE WHEN COOLING

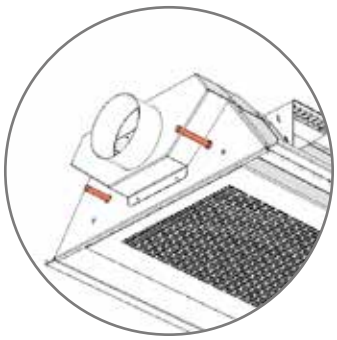
In the case of cooling, it is necessary to ensure correct design of the temperature of the cold water supplied, so that the dew point is not reached on the heat exchanger, which would lead to condensation of the air humidity. Indicative values of the dew point are provided in the table below.

INDICATIVE TABLE FOR DEW POINT DETERMINATION

Room air temperature (C°)	Relative humidity (%)										
	40	45	50	55	60	65	70	75	80	85	90
15	1,5	3,2	4,7	6,0	7,3	8,5	9,6	10,6	11,6	12,5	13,4
16	2,4	4,1	5,6	7,0	8,2	9,4	10,5	11,6	12,6	13,5	14,4
17	3,3	5,0	6,5	7,9	9,2	10,4	11,5	12,5	13,5	14,5	15,4
18	4,2	5,9	7,4	8,8	10,1	11,3	12,5	13,5	14,5	15,4	16,3
19	5,1	6,8	8,4	9,8	11,1	12,3	13,4	14,5	15,5	16,4	17,3
20	5,9	7,7	9,3	10,7	12,0	13,2	14,4	15,4	16,4	17,4	18,3
21	6,9	8,6	10,2	11,6	12,9	14,2	15,3	16,4	17,4	18,4	19,3
22	7,8	9,5	11,1	12,6	13,9	15,1	16,3	17,4	18,4	19,4	20,3
23	8,7	10,4	12,0	13,5	14,8	16,1	17,2	18,3	19,4	20,3	21,3
24	9,6	11,3	12,9	14,4	15,8	17,0	18,2	19,3	20,3	21,3	22,3
25	10,5	12,3	13,9	15,3	16,7	18,0	19,2	20,3	21,3	22,3	23,2
26	11,4	13,2	14,8	16,3	17,6	18,9	20,1	21,2	22,3	23,3	24,2
27	12,3	14,1	15,7	17,2	18,6	19,9	21,1	22,2	23,3	24,3	25,2
28	13,1	15,0	16,6	18,1	19,5	20,8	22,0	23,2	24,2	25,2	26,2
29	14,0	15,9	17,5	19,0	20,4	21,8	23,0	24,1	25,2	26,2	27,2
30	14,9	16,8	18,4	20,0	21,4	22,7	23,9	25,1	26,2	27,2	28,2

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version



Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-2P	2F	600	7	2,1	50	15	20	25	30	56	66	75	84	94	103	112	125	0,035	3,7	<29
			9	2,5	75	18	25	31	37	75	87	100	112	125	137	150	125	0,035	3,7	<29
			11	2,9	100	21	29	36	43	91	106	121	136	152	167	182	125	0,035	3,7	<29
			12	3,3	125	24	32	40	48	105	122	140	157	175	192	210	125	0,035	3,7	30
			13	3,6	150	26	35	44	53	118	137	157	177	196	216	235	125	0,035	3,7	32
			15	4,2	200	31	41	51	61	140	164	187	211	234	257	281	125	0,035	3,7	34
	3F		16	4,4	50	32	43	53	64	106	123	141	159	176	194	212	125	0,035	3,7	<29
			19	5,4	75	39	52	65	78	147	172	196	221	245	270	294	125	0,035	3,7	<29
			22	6,2	100	45	60	75	91	182	212	243	273	303	334	364	125	0,035	3,7	<29
			25	7,0	125	51	68	84	101	213	248	284	319	355	390	425	125	0,035	3,7	31
			28	7,6	150	56	74	93	111	241	281	321	361	401	441	481	125	0,035	3,7	33
			32	8,8	200	64	86	107	129	290	338	387	435	483	532	580	125	0,035	3,7	35
	4B		19	5,2	50	38	51	63	76	109	128	146	164	182	200	219	125	0,035	3,7	<29
			23	6,3	75	46	61	76	92	142	165	189	212	236	259	283	125	0,035	3,7	<29
			26	7,2	100	53	70	88	105	168	196	225	253	281	309	337	125	0,035	3,7	<29
			29	8,0	125	58	78	97	117	192	224	256	288	320	352	384	125	0,035	3,7	<29
			32	8,8	150	64	85	106	127	213	249	284	320	355	391	426	125	0,035	3,7	30
			36	10,0	200	73	97	122	146	251	292	334	376	418	459	501	125	0,035	3,7	32
	4I		25	7,0	50	51	67	84	101	134	156	178	200	223	245	267	125	0,035	3,7	<29
			31	8,5	75	62	82	103	123	167	195	223	251	279	307	334	125	0,035	3,7	<29
			35	9,8	100	71	95	118	142	195	228	260	293	326	358	391	125	0,035	3,7	<29
			39	10,9	125	79	105	132	158	220	257	293	330	367	403	440	125	0,035	3,7	<29
			43	11,9	150	86	115	144	173	242	283	323	364	404	444	485	125	0,035	3,7	30
			49	13,7	200	99	133	166	199	282	329	376	423	470	517	564	125	0,035	3,7	32
	5A		38	10,5	50	76	102	127	153	170	198	227	255	284	312	340	125	0,035	3,7	<29
			46	12,8	75	93	125	156	187	212	247	283	318	353	389	424	125	0,035	3,7	30
			53	14,8	100	108	144	180	216	243	284	324	365	406	446	487	125	0,035	3,7	32
			60	16,6	125	121	161	201	241	267	312	356	401	446	490	535	125	0,035	3,7	34
			65	18,2	150	132	176	220	264	286	334	381	429	477	524	572	125	0,035	3,7	35
			76	21,0	200	153	203	254	305	313	366	418	470	522	575	627	125	0,035	3,7	38
	2F	1200	16	4,5	50	33	43	54	65	111	129	147	166	184	203	221	125	0,035	5,5	<29
			20	5,5	75	40	53	67	80	148	172	197	222	246	271	295	125	0,035	5,5	<29
			23	6,4	100	46	62	77	93	179	209	239	269	299	329	358	125	0,035	5,5	<29
			26	7,2	125	52	69	87	104	207	242	276	311	345	380	414	125	0,035	5,5	<29
			28	7,9	150	57	76	95	114	232	271	310	348	387	426	465	125	0,035	5,5	31
			33	9,1	200	66	88	111	133	277	323	370	416	462	508	555	125	0,035	5,5	33

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-2P	3F	1200	34	9,5	50	69	92	115	138	204	238	272	306	340	374	408	125	0,035	5,5	<29
			42	11,7	75	85	113	141	169	284	332	379	427	474	521	569	125	0,035	5,5	<29
			49	13,5	100	98	131	163	196	352	411	470	529	587	646	705	125	0,035	5,5	<29
			54	15,1	125	110	146	183	219	412	481	550	619	687	756	825	125	0,035	5,5	31
			60	16,5	150	120	160	201	241	467	544	622	700	778	856	933	125	0,035	5,5	32
			69	19,1	200	139	186	232	278	563	657	751	845	939	1033	1126	125	0,035	5,5	34
	4B		41	11,3	50	82	109	137	164	212	248	283	318	354	389	424	125	0,035	5,5	<29
			49	13,7	75	99	133	166	199	275	321	367	413	458	504	550	125	0,035	5,5	<29
			56	15,7	100	114	152	190	228	328	382	437	491	546	601	655	125	0,035	5,5	<29
			63	17,4	125	127	169	211	253	374	436	498	560	623	685	747	125	0,035	5,5	<29
			68	19,0	150	138	184	230	276	415	484	553	622	692	761	830	125	0,035	5,5	<29
			78	21,8	200	158	211	264	317	488	569	651	732	813	894	976	125	0,035	5,5	31
	4I		54	15,1	50	110	146	183	219	265	309	353	397	441	485	529	125	0,035	5,5	<29
			66	18,4	75	134	178	223	267	331	386	441	497	552	607	662	125	0,035	5,5	<29
			76	21,1	100	154	205	256	307	387	451	516	580	645	709	774	125	0,035	5,5	<29
			85	23,5	125	171	228	285	342	436	509	581	654	726	799	872	125	0,035	5,5	<29
			93	25,7	150	187	250	312	374	480	560	640	720	800	880	960	125	0,035	5,5	<29
			107	29,6	200	215	287	359	431	558	651	745	838	931	1024	1117	125	0,035	5,5	31
	5A		76	21,0	50	153	203	254	305	305	355	406	457	508	559	609	125	0,035	5,5	<29
			93	25,7	75	187	249	311	374	385	449	513	577	641	705	769	125	0,035	5,5	<29
			107	29,7	100	216	288	360	432	447	522	596	671	745	820	894	125	0,035	5,5	30
			119	33,2	125	241	322	402	482	497	580	662	745	828	911	994	125	0,035	5,5	32
			131	36,3	150	264	352	440	529	537	626	716	805	895	984	1074	125	0,035	5,5	33
			151	42,0	200	305	407	509	610	597	696	796	895	995	1094	1193	125	0,035	5,5	36
	2F	1800	25	7,0	50	51	68	85	102	180	211	241	271	301	331	361	250	0,069	4,6	<29
			31	8,7	75	63	84	105	126	241	281	321	361	401	441	481	250	0,069	4,6	<29
			36	10,0	100	73	97	122	146	292	340	389	437	486	535	583	250	0,069	4,6	<29
			41	11,3	125	82	109	137	164	337	393	449	505	561	617	673	250	0,069	4,6	30
			45	12,4	150	90	120	150	180	378	441	504	566	629	692	755	250	0,069	4,6	31
			52	14,3	200	104	139	174	209	450	526	601	676	751	826	901	250	0,069	4,6	34
	3F		54	14,9	50	108	145	181	217	335	391	447	503	559	615	671	250	0,069	4,6	<29
			66	18,3	75	133	177	222	266	466	544	622	699	777	855	932	250	0,069	4,6	<29
			76	21,2	100	154	205	257	308	577	673	769	865	961	1057	1153	250	0,069	4,6	<29
			85	23,7	125	172	230	287	345	674	787	899	1011	1124	1236	1349	250	0,069	4,6	31
			94	26,0	150	189	252	315	378	763	890	1017	1144	1271	1398	1525	250	0,069	4,6	32
			108	30,1	200	219	292	364	437	919	1073	1226	1379	1532	1686	1839	250	0,069	4,6	35
	4B		64	17,8	50	129	172	215	258	347	405	463	521	579	637	695	250	0,069	4,6	<29
			77	21,5	75	156	209	261	313	450	525	600	675	750	825	900	250	0,069	4,6	<29
			89	24,6	100	179	239	299	358	535	625	714	803	892	981	1071	250	0,069	4,6	<29
			99	27,4	125	199	266	332	398	610	712	813	915	1017	1119	1220	250	0,069	4,6	<29
			108	29,9	150	217	290	362	434	677	790	903	1016	1129	1242	1355	250	0,069	4,6	<29
			123	34,2	200	249	332	415	498	796	929	1061	1194	1327	1459	1592	250	0,069	4,6	32
	4I		85	23,7	50	172	230	287	344	429	500	572	643	715	786	858	250	0,069	4,6	<29
			104	28,8	75	210	280	350	420	536	626	715	804	894	983	1073	250	0,069	4,6	<29
			119	33,2	100	241	322	402	483	627	731	835	940	1044	1149	1253	250	0,069	4,6	<29
			133	37,0	125	269	359	448	538	706	824	941	1059	1176	1294	1412	250	0,069	4,6	<29
			146	40,4	150	294	392	490	588	777	907	1037	1166	1296	1425	1555	250	0,069	4,6	<29
			167	46,5	200	338	451	564	677	904	1055	1205	1356	1507	1657	1808	250	0,069	4,6	31

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-2P	5A	1800	113	31,5	50	229	305	381	458	470	548	626	704	783	861	939	250	0,069	4,6	<29
			139	38,5	75	280	374	467	561	594	693	792	891	990	1089	1188	250	0,069	4,6	<29
			160	44,5	100	324	432	539	647	691	807	922	1037	1152	1268	1383	250	0,069	4,6	<29
			179	49,8	125	362	482	603	724	770	898	1026	1154	1283	1411	1539	250	0,069	4,6	31
			196	54,5	150	396	529	661	793	833	972	1111	1249	1388	1527	1666	250	0,069	4,6	33
			227	62,9	200	458	610	763	915	928	1083	1238	1392	1547	1702	1857	250	0,069	4,6	35
	2F	2400	35	9,7	50	70	94	117	141	262	306	350	394	437	481	525	500	0,139	17,4	<29
			43	11,9	75	87	116	145	174	349	407	466	524	582	640	698	500	0,139	17,4	<29
			50	13,8	100	101	134	168	201	423	493	564	634	705	775	845	500	0,139	17,4	<29
			56	15,5	125	113	151	188	226	488	569	650	732	813	894	976	500	0,139	17,4	30
			61	17,1	150	124	165	207	248	547	638	729	820	911	1002	1093	500	0,139	17,4	31
			71	19,8	200	144	192	240	288	652	760	869	978	1086	1195	1304	500	0,139	17,4	34
	3F		74	20,5	50	149	199	249	299	493	575	657	739	822	904	986	500	0,139	17,4	<29
			91	25,2	75	183	245	306	367	683	797	910	1024	1138	1252	1366	500	0,139	17,4	<29
			105	29,2	100	212	283	354	424	843	984	1124	1265	1405	1546	1686	500	0,139	17,4	<29
			118	32,7	125	237	317	396	475	985	1149	1313	1477	1641	1805	1969	500	0,139	17,4	31
			129	35,8	150	260	347	434	521	1113	1298	1484	1669	1855	2040	2225	500	0,139	17,4	32
			149	41,4	200	301	402	502	602	1340	1564	1787	2011	2234	2458	2681	500	0,139	17,4	35
	4B		88	24,5	50	178	237	297	356	508	593	678	762	847	932	1016	500	0,139	17,4	<29
			107	29,6	75	216	287	359	431	657	766	876	985	1095	1204	1313	500	0,139	17,4	<29
			122	34,0	100	247	329	412	494	781	911	1041	1171	1301	1432	1562	500	0,139	17,4	<29
			136	37,8	125	275	366	458	549	889	1038	1186	1334	1482	1631	1779	500	0,139	17,4	<29
			148	41,2	150	299	399	499	599	987	1152	1316	1481	1645	1810	1974	500	0,139	17,4	30
			170	47,2	200	343	457	572	686	1159	1353	1546	1739	1932	2126	2319	500	0,139	17,4	32
	4I		117	32,6	50	237	316	395	474	619	722	825	928	1031	1134	1237	500	0,139	17,4	<29
			143	39,8	75	289	385	482	578	774	902	1031	1160	1289	1418	1547	500	0,139	17,4	<29
			165	45,7	100	333	443	554	665	903	1054	1205	1355	1506	1656	1807	500	0,139	17,4	<29
			184	51,0	125	371	494	618	742	1018	1187	1357	1526	1696	1866	2035	500	0,139	17,4	<29
			201	55,7	150	405	540	675	810	1120	1307	1494	1681	1867	2054	2241	500	0,139	17,4	<29
			231	64,1	200	466	622	777	932	1303	1520	1737	1954	2171	2388	2605	500	0,139	17,4	32
	5A		151	42,0	50	305	407	509	610	652	761	870	979	1087	1196	1305	500	0,139	17,4	<29
			185	51,4	75	374	498	623	747	826	964	1102	1240	1377	1515	1653	500	0,139	17,4	<29
			214	59,3	100	432	575	719	863	964	1124	1285	1445	1606	1767	1927	500	0,139	17,4	<29
			239	66,3	125	482	643	804	965	1074	1253	1432	1611	1790	1969	2148	500	0,139	17,4	31
			262	72,7	150	529	705	881	1057	1164	1358	1552	1746	1940	2134	2328	500	0,139	17,4	32
			302	83,9	200	610	814	1017	1221	1300	1516	1733	1949	2166	2383	2599	500	0,139	17,4	35
	2F	3000	45	12,4	50	90	121	151	181	330	385	440	495	550	605	660	500	0,139	19,1	<29
			55	15,3	75	111	149	186	223	439	512	585	658	731	804	877	500	0,139	19,1	<29
			64	17,8	100	129	172	215	258	530	619	707	796	884	972	1061	500	0,139	19,1	<29
			72	19,9	125	145	193	241	290	612	714	815	917	1019	1121	1223	500	0,139	19,1	30
			79	21,9	150	159	212	265	318	685	799	914	1028	1142	1256	1371	500	0,139	19,1	32
			91	25,4	200	185	246	308	369	816	953	1089	1225	1361	1497	1633	500	0,139	19,1	34
	3F		95	26,3	50	192	255	319	383	620	723	827	930	1033	1137	1240	500	0,139	19,1	<29
			116	32,3	75	235	314	392	470	856	999	1141	1284	1427	1569	1712	500	0,139	19,1	<29
			135	37,4	100	272	363	453	544	1055	1231	1407	1583	1759	1935	2111	500	0,139	19,1	<29
			151	41,9	125	305	406	508	609	1231	1437	1642	1847	2052	2258	2463	500	0,139	19,1	31
			165	45,9	150	334	445	557	668	1391	1622	1854	2086	2318	2550	2781	500	0,139	19,1	33
			191	53,1	200	386	515	644	773	1674	1953	2232	2511	2790	3069	3348	500	0,139	19,1	35

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-2P	4B	3000	113	31,4	50	228	304	380	457	636	742	848	954	1060	1167	1273	500	0,139	19,1	<29
			137	38,0	75	277	369	461	553	821	958	1095	1232	1368	1505	1642	500	0,139	19,1	<29
			157	43,6	100	317	423	528	634	975	1138	1301	1463	1626	1788	1951	500	0,139	19,1	<29
			174	48,4	125	352	470	587	705	1111	1296	1481	1666	1851	2036	2221	500	0,139	19,1	<29
			190	52,8	150	384	512	640	768	1232	1437	1643	1848	2053	2259	2464	500	0,139	19,1	30
			218	60,5	200	440	587	733	880	1446	1688	1929	2170	2411	2652	2893	500	0,139	19,1	32
	4I		151	41,8	50	304	406	507	608	775	904	1034	1163	1292	1421	1550	500	0,139	19,1	<29
			184	51,0	75	371	494	618	741	969	1130	1291	1453	1614	1776	1937	500	0,139	19,1	<29
			211	58,6	100	426	569	711	853	1131	1320	1508	1697	1885	2074	2262	500	0,139	19,1	<29
			235	65,4	125	475	634	792	951	1274	1486	1698	1910	2123	2335	2547	500	0,139	19,1	<29
			257	71,5	150	520	693	866	1039	1402	1636	1870	2103	2337	2571	2804	500	0,139	19,1	30
			296	82,2	200	598	797	996	1196	1630	1902	2173	2445	2716	2988	3260	500	0,139	19,1	32
	5A		189	52,5	50	381	509	636	763	793	925	1057	1189	1322	1454	1586	500	0,139	19,1	<29
			231	64,2	75	467	623	779	934	1005	1173	1340	1508	1675	1843	2010	500	0,139	19,1	<29
			267	74,2	100	539	719	899	1079	1173	1369	1564	1760	1955	2151	2346	500	0,139	19,1	<29
			299	82,9	125	603	804	1005	1206	1308	1526	1745	1963	2181	2399	2617	500	0,139	19,1	31
			327	90,9	150	661	881	1101	1321	1419	1655	1892	2128	2365	2601	2838	500	0,139	19,1	32
			378	104,9	200	763	1017	1271	1526	1587	1851	2115	2380	2644	2909	3173	500	0,139	19,1	35

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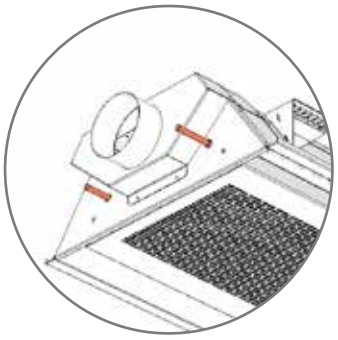
CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version



Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-2P	2F	600	7	2,1	50	15	20	25	30	108	156	202	248	293	125	0,035	3,7	<29
			9	2,5	75	18	25	31	37	143	208	270	331	390	125	0,035	3,7	<29
			11	2,9	100	21	29	36	43	174	252	327	401	473	125	0,035	3,7	<29
			12	3,3	125	24	32	40	48	201	291	378	463	546	125	0,035	3,7	30
			13	3,6	150	26	35	44	53	225	326	424	519	613	125	0,035	3,7	32
			15	4,2	200	31	41	51	61	269	389	505	619	731	125	0,035	3,7	34
	3F		16	4,4	50	32	43	53	64	253	366	476	584	689	125	0,035	3,7	<29
			19	5,4	75	39	52	65	78	352	509	662	811	958	125	0,035	3,7	<29
			22	6,2	100	45	60	75	91	435	630	819	1004	1185	125	0,035	3,7	<29
			25	7,0	125	51	68	84	101	509	736	957	1173	1385	125	0,035	3,7	31
			28	7,6	150	56	74	93	111	576	833	1083	1327	1567	125	0,035	3,7	33
			32	8,8	200	64	86	107	129	694	1004	1305	1600	1889	125	0,035	3,7	35
	4B		19	5,2	50	38	51	63	76	216	312	406	498	588	125	0,035	3,7	<29
			23	6,3	75	46	61	76	92	280	405	526	645	761	125	0,035	3,7	<29
			26	7,2	100	53	70	88	105	333	482	626	767	906	125	0,035	3,7	<29
			29	8,0	125	58	78	97	117	379	549	713	874	1032	125	0,035	3,7	<29
			32	8,8	150	64	85	106	127	421	609	792	971	1146	125	0,035	3,7	30
			36	10,0	200	73	97	122	146	495	716	931	1141	1347	125	0,035	3,7	32
	4I		25	7,0	50	51	67	84	101	256	370	481	589	696	125	0,035	3,7	<29
			31	8,5	75	62	82	103	123	320	463	602	737	871	125	0,035	3,7	<29
			35	9,8	100	71	95	118	142	374	541	703	861	1017	125	0,035	3,7	<29
			39	10,9	125	79	105	132	158	421	609	792	970	1146	125	0,035	3,7	<29
			43	11,9	150	86	115	144	173	464	671	872	1069	1262	125	0,035	3,7	30
			49	13,7	200	99	133	166	199	539	780	1014	1243	1467	125	0,035	3,7	32
	5A		38	10,5	50	76	102	127	153	374	542	704	863	1019	125	0,035	3,7	<29
			46	12,8	75	93	125	156	187	461	667	866	1062	1254	125	0,035	3,7	30
			53	14,8	100	108	144	180	216	534	773	1004	1231	1453	125	0,035	3,7	32
			60	16,6	125	121	161	201	241	599	867	1127	1381	1631	125	0,035	3,7	34
			65	18,2	150	132	176	220	264	658	953	1238	1518	1792	125	0,035	3,7	35
			76	21,0	200	153	203	254	305	765	1107	1438	1763	2081	125	0,035	3,7	38
	2F	1200	16	4,5	50	33	43	54	65	211	306	398	487	575	125	0,035	5,5	<29
			20	5,5	75	40	53	67	80	282	409	531	651	769	125	0,035	5,5	<29
			23	6,4	100	46	62	77	93	343	496	645	790	933	125	0,035	5,5	<29
			26	7,2	125	52	69	87	104	396	573	745	913	1078	125	0,035	5,5	<29
			28	7,9	150	57	76	95	114	444	643	836	1024	1209	125	0,035	5,5	31
			33	9,1	200	66	88	111	133	530	767	997	1222	1443	125	0,035	5,5	33

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-2P	3F	1200	34	9,5	50	69	92	115	138	488	706	918	1124	1328	125	0,035	5,5	<29
			42	11,7	75	85	113	141	169	680	985	1280	1568	1852	125	0,035	5,5	<29
			49	13,5	100	98	131	163	196	843	1220	1586	1943	2295	125	0,035	5,5	<29
			54	15,1	125	110	146	183	219	987	1428	1856	2274	2685	125	0,035	5,5	31
			60	16,5	150	120	160	201	241	1116	1616	2100	2574	3039	125	0,035	5,5	32
			69	19,1	200	139	186	232	278	1347	1950	2535	3106	3668	125	0,035	5,5	34
	4B		41	11,3	50	82	109	137	164	419	607	788	966	1141	125	0,035	5,5	<29
			49	13,7	75	99	133	166	199	543	786	1022	1253	1479	125	0,035	5,5	<29
			56	15,7	100	114	152	190	228	647	937	1217	1492	1762	125	0,035	5,5	<29
			63	17,4	125	127	169	211	253	738	1068	1388	1701	2009	125	0,035	5,5	<29
			68	19,0	150	138	184	230	276	820	1186	1542	1890	2231	125	0,035	5,5	<29
			78	21,8	200	158	211	264	317	964	1395	1813	2222	2624	125	0,035	5,5	31
	4I		54	15,1	50	110	146	183	219	506	732	952	1166	1377	125	0,035	5,5	<29
			66	18,4	75	134	178	223	267	633	916	1191	1460	1724	125	0,035	5,5	<29
			76	21,1	100	154	205	256	307	740	1071	1392	1706	2015	125	0,035	5,5	<29
			85	23,5	125	171	228	285	342	834	1207	1569	1922	2270	125	0,035	5,5	<29
			93	25,7	150	187	250	312	374	918	1329	1728	2117	2500	125	0,035	5,5	<29
			107	29,6	200	215	287	359	431	1068	1546	2009	2463	2908	125	0,035	5,5	31
	5A		76	21,0	50	153	203	254	305	682	988	1284	1573	1858	125	0,035	5,5	<29
			93	25,7	75	187	249	311	374	839	1214	1578	1934	2283	125	0,035	5,5	<29
			107	29,7	100	216	288	360	432	972	1406	1828	2240	2646	125	0,035	5,5	30
			119	33,2	125	241	322	402	482	1090	1577	2050	2513	2967	125	0,035	5,5	32
			131	36,3	150	264	352	440	529	1197	1733	2252	2760	3259	125	0,035	5,5	33
			151	42,0	200	305	407	509	610	1390	2011	2614	3204	3783	125	0,035	5,5	36
	2F	1800	25	7,0	50	51	68	85	102	345	499	649	795	939	250	0,069	4,6	<29
			31	8,7	75	63	84	105	126	460	666	866	1061	1253	250	0,069	4,6	<29
			36	10,0	100	73	97	122	146	558	807	1049	1286	1518	250	0,069	4,6	<29
			41	11,3	125	82	109	137	164	644	932	1211	1485	1753	250	0,069	4,6	30
			45	12,4	150	90	120	150	180	722	1045	1358	1665	1966	250	0,069	4,6	31
			52	14,3	200	104	139	174	209	862	1247	1621	1986	2345	250	0,069	4,6	34
	3F		54	14,9	50	108	145	181	217	802	1161	1509	1850	2184	250	0,069	4,6	<29
			66	18,3	75	133	177	222	266	1115	1614	2098	2571	3036	250	0,069	4,6	<29
			76	21,2	100	154	205	257	308	1380	1997	2595	3181	3756	250	0,069	4,6	<29
			85	23,7	125	172	230	287	345	1613	2334	3034	3719	4391	250	0,069	4,6	31
			94	26,0	150	189	252	315	378	1824	2640	3432	4206	4966	250	0,069	4,6	32
			108	30,1	200	219	292	364	437	2200	3183	4138	5071	5988	250	0,069	4,6	35
	4B		64	17,8	50	129	172	215	258	687	993	1291	1583	1869	250	0,069	4,6	<29
			77	21,5	75	156	209	261	313	889	1286	1672	2049	2419	250	0,069	4,6	<29
			89	24,6	100	179	239	299	358	1058	1530	1989	2438	2879	250	0,069	4,6	<29
			99	27,4	125	199	266	332	398	1205	1744	2267	2779	3281	250	0,069	4,6	<29
			108	29,9	150	217	290	362	434	1338	1937	2517	3085	3643	250	0,069	4,6	<29
			123	34,2	200	249	332	415	498	1573	2276	2958	3626	4281	250	0,069	4,6	32
	4I		85	23,7	50	172	230	287	344	820	1187	1543	1891	2233	250	0,069	4,6	<29
			104	28,8	75	210	280	350	420	1026	1485	1930	2365	2793	250	0,069	4,6	<29
			119	33,2	100	241	322	402	483	1199	1735	2255	2763	3263	250	0,069	4,6	<29
			133	37,0	125	269	359	448	538	1350	1954	2540	3113	3676	250	0,069	4,6	<29
			146	40,4	150	294	392	490	588	1487	2152	2797	3428	4048	250	0,069	4,6	<29
			167	46,5	200	338	451	564	677	1729	2503	3253	3987	4707	250	0,069	4,6	31

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-2P	5A	1800	113	31,5	50	229	305	381	458	1055	1527	1985	2432	2872	250	0,069	4,6	<29
			139	38,5	75	280	374	467	561	1297	1877	2439	2990	3530	250	0,069	4,6	<29
			160	44,5	100	324	432	539	647	1502	2174	2826	3463	4090	250	0,069	4,6	<29
			179	49,8	125	362	482	603	724	1685	2438	3169	3884	4586	250	0,069	4,6	31
			196	54,5	150	396	529	661	793	1851	2678	3481	4266	5038	250	0,069	4,6	33
			227	62,9	200	458	610	763	915	2148	3108	4040	4951	5846	250	0,069	4,6	35
	2F	2400	35	9,7	50	70	94	117	141	502	726	944	1157	1366	500	0,139	17,4	<29
			43	11,9	75	87	116	145	174	668	966	1256	1539	1818	500	0,139	17,4	<29
			50	13,8	100	101	134	168	201	808	1170	1521	1864	2201	500	0,139	17,4	<29
			56	15,5	125	113	151	188	226	933	1350	1755	2150	2539	500	0,139	17,4	30
			61	17,1	150	124	165	207	248	1046	1513	1967	2410	2846	500	0,139	17,4	31
			71	19,8	200	144	192	240	288	1247	1804	2345	2874	3393	500	0,139	17,4	34
	3F		74	20,5	50	149	199	249	299	1179	1707	2218	2719	3210	500	0,139	17,4	<29
			91	25,2	75	183	245	306	367	1633	2364	3073	3766	4446	500	0,139	17,4	<29
			105	29,2	100	212	283	354	424	2017	2919	3794	4650	5491	500	0,139	17,4	<29
			118	32,7	125	237	317	396	475	2356	3409	4431	5431	6412	500	0,139	17,4	31
			129	35,8	150	260	347	434	521	2662	3853	5008	6137	7247	500	0,139	17,4	32
			149	41,4	200	301	402	502	602	3207	4641	6032	7393	8730	500	0,139	17,4	35
	4B		88	24,5	50	178	237	297	356	1004	1453	1889	2314	2733	500	0,139	17,4	<29
			107	29,6	75	216	287	359	431	1298	1878	2441	2991	3532	500	0,139	17,4	<29
			122	34,0	100	247	329	412	494	1543	2233	2902	3556	4199	500	0,139	17,4	<29
			136	37,8	125	275	366	458	549	1757	2543	3305	4051	4783	500	0,139	17,4	<29
			148	41,2	150	299	399	499	599	1950	2822	3668	4496	5309	500	0,139	17,4	30
			170	47,2	200	343	457	572	686	2291	3315	4309	5281	6235	500	0,139	17,4	32
	4I		117	32,6	50	237	316	395	474	1184	1713	2226	2729	3222	500	0,139	17,4	<29
			143	39,8	75	289	385	482	578	1480	2141	2783	3411	4028	500	0,139	17,4	<29
			165	45,7	100	333	443	554	665	1728	2501	3251	3984	4705	500	0,139	17,4	<29
			184	51,0	125	371	494	618	742	1947	2817	3662	4488	5299	500	0,139	17,4	<29
			201	55,7	150	405	540	675	810	2144	3102	4032	4941	5835	500	0,139	17,4	<29
			231	64,1	200	466	622	777	932	2492	3606	4687	5745	6783	500	0,139	17,4	32
	5A		151	42,0	50	305	407	509	610	1470	2128	2765	3389	4002	500	0,139	17,4	<29
			185	51,4	75	374	498	623	747	1807	2615	3399	4165	4918	500	0,139	17,4	<29
			214	59,3	100	432	575	719	863	2093	3029	3937	4825	5698	500	0,139	17,4	<29
			239	66,3	125	482	643	804	965	2347	3396	4415	5411	6389	500	0,139	17,4	31
			262	72,7	150	529	705	881	1057	2578	3731	4849	5943	7018	500	0,139	17,4	32
			302	83,9	200	610	814	1017	1221	2992	4329	5627	6897	8144	500	0,139	17,4	35
	2F	3000	45	12,4	50	90	121	151	181	631	913	1187	1455	1718	500	0,139	19,1	<29
			55	15,3	75	111	149	186	223	839	1214	1577	1933	2283	500	0,139	19,1	<29
			64	17,8	100	129	172	215	258	1014	1468	1908	2338	2761	500	0,139	19,1	<29
			72	19,9	125	145	193	241	290	1170	1693	2200	2696	3184	500	0,139	19,1	30
			79	21,9	150	159	212	265	318	1311	1897	2465	3021	3567	500	0,139	19,1	32
			91	25,4	200	185	246	308	369	1562	2260	2937	3600	4251	500	0,139	19,1	34
	3F		95	26,3	50	192	255	319	383	1483	2146	2790	3419	4037	500	0,139	19,1	<29
			116	32,3	75	235	314	392	470	2048	2964	3852	4721	5575	500	0,139	19,1	<29
			135	37,4	100	272	363	453	544	2525	3654	4750	5821	6873	500	0,139	19,1	<29
			151	41,9	125	305	406	508	609	2946	4263	5542	6792	8019	500	0,139	19,1	31
			165	45,9	150	334	445	557	668	3327	4815	6258	7670	9057	500	0,139	19,1	33
			191	53,1	200	386	515	644	773	4005	5795	7533	9232	10901	500	0,139	19,1	35

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

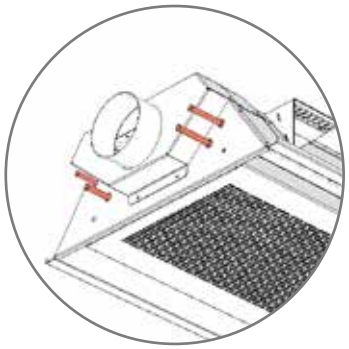
HEATING OUTPUT FOR SELECTED CONDITIONS - 2 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-2P	4B	3000	113	31,4	50	228	304	380	457	1257	1819	2365	2898	3422	500	0,139	19,1	<29
			137	38,0	75	277	369	461	553	1622	2348	3051	3740	4416	500	0,139	19,1	<29
			157	43,6	100	317	423	528	634	1927	2789	3625	4443	5246	500	0,139	19,1	<29
			174	48,4	125	352	470	587	705	2194	3175	4127	5058	5973	500	0,139	19,1	<29
			190	52,8	150	384	512	640	768	2434	3523	4579	5612	6626	500	0,139	19,1	30
			218	60,5	200	440	587	733	880	2858	4136	5375	6588	7779	500	0,139	19,1	32
	4I		151	41,8	50	304	406	507	608	1483	2146	2789	3418	4036	500	0,139	19,1	<29
			184	51,0	75	371	494	618	741	1853	2682	3485	4272	5044	500	0,139	19,1	<29
			211	58,6	100	426	569	711	853	2164	3131	4070	4988	5890	500	0,139	19,1	<29
			235	65,4	125	475	634	792	951	2436	3526	4583	5617	6632	500	0,139	19,1	<29
			257	71,5	150	520	693	866	1039	2682	3882	5046	6184	7302	500	0,139	19,1	30
			296	82,2	200	598	797	996	1196	3118	4512	5865	7188	8487	500	0,139	19,1	32
	5A		189	52,5	50	381	509	636	763	1790	2590	3367	4126	4872	500	0,139	19,1	<29
			231	64,2	75	467	623	779	934	2200	3183	4138	5071	5988	500	0,139	19,1	<29
			267	74,2	100	539	719	899	1079	2548	3687	4793	5874	6936	500	0,139	19,1	<29
			299	82,9	125	603	804	1005	1206	2857	4135	5374	6586	7777	500	0,139	19,1	31
			327	90,9	150	661	881	1101	1321	3138	4541	5903	7234	8542	500	0,139	19,1	32
			378	104,9	200	763	1017	1271	1526	3642	5270	6850	8395	9912	500	0,139	19,1	35

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version



Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-4P	2F	600	7	2,1	50	15	20	25	30	46	53	61	68	76	84	91	125	0,035	2,3	<29
			9	2,5	75	18	25	31	37	61	71	81	91	101	111	122	125	0,035	2,3	<29
			11	2,9	100	21	29	36	43	74	86	98	110	123	135	147	125	0,035	2,3	<29
			12	3,3	125	24	32	40	48	85	99	113	128	142	156	170	125	0,035	2,3	30
			13	3,6	150	26	35	44	53	95	111	127	143	159	175	191	125	0,035	2,3	32
			15	4,2	200	31	41	51	61	114	133	152	171	190	209	228	125	0,035	2,3	34
	3F		16	4,4	50	32	43	53	64	86	100	114	129	143	157	171	125	0,035	2,3	<29
			19	5,4	75	39	52	65	78	119	139	159	179	199	219	238	125	0,035	2,3	<29
			22	6,2	100	45	60	75	91	147	172	197	221	246	270	295	125	0,035	2,3	<29
			25	7,0	125	51	68	84	101	172	201	230	259	287	316	345	125	0,035	2,3	31
			28	7,6	150	56	74	93	111	195	227	260	292	325	357	390	125	0,035	2,3	33
			32	8,8	200	64	86	107	129	235	274	313	353	392	431	470	125	0,035	2,3	35
	4B		19	5,2	50	38	51	63	76	89	104	119	134	148	163	178	125	0,035	2,3	<29
			23	6,3	75	46	61	76	92	115	135	154	173	192	211	231	125	0,035	2,3	<29
			26	7,2	100	53	70	88	105	137	160	183	206	229	252	275	125	0,035	2,3	<29
			29	8,0	125	58	78	97	117	156	183	209	235	261	287	313	125	0,035	2,3	<29
			32	8,8	150	64	85	106	127	174	203	232	261	290	319	347	125	0,035	2,3	30
			36	10,0	200	73	97	122	146	204	238	272	306	340	374	408	125	0,035	2,3	32
	4I		25	7,0	50	51	67	84	101	108	126	144	162	180	197	215	125	0,035	2,3	<29
			31	8,5	75	62	82	103	123	135	157	180	202	225	247	270	125	0,035	2,3	<29
			35	9,8	100	71	95	118	142	157	184	210	236	262	289	315	125	0,035	2,3	<29
			39	10,9	125	79	105	132	158	177	207	236	266	296	325	355	125	0,035	2,3	<29
			43	11,9	150	86	115	144	173	195	228	260	293	326	358	391	125	0,035	2,3	30
			49	13,7	200	99	133	166	199	227	265	303	341	379	416	454	125	0,035	2,3	32
	5A		38	10,5	50	76	102	127	153	126	147	168	189	210	231	252	125	0,035	2,3	<29
			46	12,8	75	93	125	156	187	160	187	213	240	266	293	320	125	0,035	2,3	33
			53	14,8	100	108	144	180	216	188	220	251	282	314	345	377	125	0,035	2,3	35
			60	16,6	125	121	161	201	241	213	248	284	319	355	390	426	125	0,035	2,3	37
			65	18,2	150	132	176	220	264	234	273	313	352	391	430	469	125	0,035	2,3	38
			76	21,0	200	153	203	254	305	271	316	362	407	452	497	542	125	0,035	2,3	41
	2F	1200	16	4,5	50	33	43	54	65	90	104	119	134	149	164	179	125	0,035	3,4	<29
			20	5,5	75	40	53	67	80	120	140	160	180	199	219	239	125	0,035	3,4	<29
			23	6,4	100	46	62	77	93	145	169	194	218	242	266	290	125	0,035	3,4	<29
			26	7,2	125	52	69	87	104	168	196	224	252	280	308	336	125	0,035	3,4	<29
			28	7,9	150	57	76	95	114	188	220	251	282	314	345	376	125	0,035	3,4	31
			33	9,1	200	66	88	111	133	225	262	300	337	374	412	449	125	0,035	3,4	33

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-4P	3F	1200	34	9,5	50	69	92	115	138	165	193	220	248	275	303	330	125	0,035	3,4	<29
			42	11,7	75	85	113	141	169	230	269	307	346	384	422	461	125	0,035	3,4	<29
			49	13,5	100	98	131	163	196	286	333	381	428	476	523	571	125	0,035	3,4	<29
			54	15,1	125	110	146	183	219	334	390	446	501	557	613	668	125	0,035	3,4	31
			60	16,5	150	120	160	201	241	378	441	504	567	630	693	756	125	0,035	3,4	32
			69	19,1	200	139	186	232	278	456	532	609	685	761	837	913	125	0,035	3,4	34
	4B		41	11,3	50	82	109	137	164	173	202	231	259	288	317	346	125	0,035	3,4	<29
			49	13,7	75	99	133	166	199	224	262	299	336	374	411	448	125	0,035	3,4	<29
			56	15,7	100	114	152	190	228	267	312	356	401	445	490	534	125	0,035	3,4	<29
			63	17,4	125	127	169	211	253	304	355	406	457	507	558	609	125	0,035	3,4	<29
			68	19,0	150	138	184	230	276	338	395	451	507	564	620	676	125	0,035	3,4	<29
			78	21,8	200	158	211	264	317	398	464	530	596	663	729	795	125	0,035	3,4	31
	4I		54	15,1	50	110	146	183	219	213	249	284	320	355	391	426	125	0,035	3,4	<29
			66	18,4	75	134	178	223	267	267	311	356	400	445	489	534	125	0,035	3,4	<29
			76	21,1	100	154	205	256	307	312	364	416	468	520	572	624	125	0,035	3,4	<29
			85	23,5	125	171	228	285	342	351	410	468	527	586	644	703	125	0,035	3,4	<29
			93	25,7	150	187	250	312	374	387	451	516	580	645	709	774	125	0,035	3,4	<29
			107	29,6	200	215	287	359	431	450	525	600	675	750	825	900	125	0,035	3,4	31
	5A		76	21,0	50	153	203	254	305	226	263	301	339	376	414	452	125	0,035	3,4	<29
			93	25,7	75	187	249	311	374	287	334	382	430	478	525	573	125	0,035	3,4	31
			107	29,7	100	216	288	360	432	339	395	452	508	565	621	677	125	0,035	3,4	33
			119	33,2	125	241	322	402	482	384	448	512	576	641	705	769	125	0,035	3,4	35
			131	36,3	150	264	352	440	529	425	496	567	637	708	779	850	125	0,035	3,4	36
			151	42,0	200	305	407	509	610	495	577	660	742	825	907	990	125	0,035	3,4	39
	2F	1800	25	7,0	50	51	68	85	102	146	171	195	219	244	268	292	250	0,069	3,1	<29
			31	8,7	75	63	84	105	126	195	227	260	292	325	357	390	250	0,069	3,1	<29
			36	10,0	100	73	97	122	146	236	276	315	354	394	433	473	250	0,069	3,1	<29
			41	11,3	125	82	109	137	164	273	318	364	409	455	500	546	250	0,069	3,1	30
			45	12,4	150	90	120	150	180	306	357	408	459	510	561	612	250	0,069	3,1	31
			52	14,3	200	104	139	174	209	365	426	487	548	608	669	730	250	0,069	3,1	34
	3F		54	14,9	50	108	145	181	217	272	317	362	408	453	498	544	250	0,069	3,1	<29
			66	18,3	75	133	177	222	266	378	441	504	567	630	693	756	250	0,069	3,1	<29
			76	21,2	100	154	205	257	308	467	545	623	701	779	857	935	250	0,069	3,1	<29
			85	23,7	125	172	230	287	345	546	637	729	820	911	1002	1093	250	0,069	3,1	31
			94	26,0	150	189	252	315	378	618	721	824	927	1030	1133	1236	250	0,069	3,1	32
			108	30,1	200	219	292	364	437	745	869	993	1118	1242	1366	1490	250	0,069	3,1	35
	4B		64	17,8	50	129	172	215	258	283	330	378	425	472	519	566	250	0,069	3,1	<29
			77	21,5	75	156	209	261	313	367	428	489	550	611	672	733	250	0,069	3,1	<29
			89	24,6	100	179	239	299	358	436	509	582	654	727	800	873	250	0,069	3,1	<29
			99	27,4	125	199	266	332	398	497	580	663	746	829	912	995	250	0,069	3,1	<29
			108	29,9	150	217	290	362	434	552	644	736	828	920	1012	1104	250	0,069	3,1	<29
			123	34,2	200	249	332	415	498	649	757	865	973	1081	1190	1298	250	0,069	3,1	32
	4I		85	23,7	50	172	230	287	344	346	403	461	518	576	634	691	250	0,069	3,1	<29
			104	28,8	75	210	280	350	420	432	504	576	648	720	793	865	250	0,069	3,1	<29
			119	33,2	100	241	322	402	483	505	589	673	758	842	926	1010	250	0,069	3,1	<29
			133	37,0	125	269	359	448	538	569	664	759	853	948	1043	1138	250	0,069	3,1	<29
			146	40,4	150	294	392	490	588	627	731	835	940	1044	1149	1253	250	0,069	3,1	<29
			167	46,5	200	338	451	564	677	729	850	971	1093	1214	1336	1457	250	0,069	3,1	31

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-4P	5A	1800	113	31,5	50	229	305	381	458	348	406	464	522	580	638	696	250	0,069	3,1	<29
			139	38,5	75	280	374	467	561	442	516	589	663	736	810	884	250	0,069	3,1	30
			160	44,5	100	324	432	539	647	522	609	697	784	871	958	1045	250	0,069	3,1	32
			179	49,8	125	362	482	603	724	593	692	791	890	988	1087	1186	250	0,069	3,1	34
			196	54,5	150	396	529	661	793	656	765	875	984	1094	1203	1312	250	0,069	3,1	36
			227	62,9	200	458	610	763	915	765	892	1020	1147	1274	1402	1529	250	0,069	3,1	38
	2F	2400	35	9,7	50	70	94	117	141	213	248	283	319	354	390	425	500	0,139	11,7	<29
			43	11,9	75	87	116	145	174	283	330	377	424	472	519	566	500	0,139	11,7	<29
			50	13,8	100	101	134	168	201	343	400	457	514	571	628	685	500	0,139	11,7	<29
			56	15,5	125	113	151	188	226	395	461	527	593	659	725	790	500	0,139	11,7	30
			61	17,1	150	124	165	207	248	443	517	591	664	738	812	886	500	0,139	11,7	31
			71	19,8	200	144	192	240	288	528	616	704	792	880	968	1056	500	0,139	11,7	34
	3F		74	20,5	50	149	199	249	299	399	466	533	599	666	732	799	500	0,139	11,7	<29
			91	25,2	75	183	245	306	367	553	645	738	830	922	1014	1107	500	0,139	11,7	<29
			105	29,2	100	212	283	354	424	683	797	911	1025	1139	1253	1366	500	0,139	11,7	<29
			118	32,7	125	237	317	396	475	798	931	1064	1197	1330	1463	1596	500	0,139	11,7	31
			129	35,8	150	260	347	434	521	902	1052	1202	1353	1503	1653	1803	500	0,139	11,7	32
			149	41,4	200	301	402	502	602	1086	1267	1448	1629	1810	1991	2173	500	0,139	11,7	35
	4B		88	24,5	50	178	237	297	356	414	483	552	621	690	759	828	500	0,139	11,7	<29
			107	29,6	75	216	287	359	431	535	625	714	803	892	981	1071	500	0,139	11,7	<29
			122	34,0	100	247	329	412	494	636	743	849	955	1061	1167	1273	500	0,139	11,7	<29
			136	37,8	125	275	366	458	549	725	846	967	1087	1208	1329	1450	500	0,139	11,7	<29
			148	41,2	150	299	399	499	599	805	939	1073	1207	1341	1475	1609	500	0,139	11,7	30
			170	47,2	200	343	457	572	686	945	1103	1260	1418	1575	1733	1890	500	0,139	11,7	32
	4I		117	32,6	50	237	316	395	474	499	582	665	748	831	914	997	500	0,139	11,7	<29
			143	39,8	75	289	385	482	578	623	727	831	935	1039	1143	1247	500	0,139	11,7	<29
			165	45,7	100	333	443	554	665	728	850	971	1092	1214	1335	1456	500	0,139	11,7	<29
			184	51,0	125	371	494	618	742	820	957	1094	1230	1367	1504	1640	500	0,139	11,7	<29
			201	55,7	150	405	540	675	810	903	1054	1204	1355	1505	1656	1806	500	0,139	11,7	<29
			231	64,1	200	466	622	777	932	1050	1225	1400	1575	1750	1925	2100	500	0,139	11,7	32
	5A		151	42,0	50	305	407	509	610	484	564	645	726	806	887	968	500	0,139	11,7	<29
			185	51,4	75	374	498	623	747	614	717	819	921	1024	1126	1229	500	0,139	11,7	30
			214	59,3	100	432	575	719	863	726	848	969	1090	1211	1332	1453	500	0,139	11,7	32
			239	66,3	125	482	643	804	965	825	963	1100	1238	1375	1513	1650	500	0,139	11,7	34
			262	72,7	150	529	705	881	1057	913	1065	1218	1370	1522	1674	1826	500	0,139	11,7	35
			302	83,9	200	610	814	1017	1221	1065	1243	1420	1598	1775	1953	2130	500	0,139	11,7	38
	2F	3000	45	12,4	50	90	121	151	181	267	312	357	401	446	490	535	500	0,139	12,9	<29
			55	15,3	75	111	149	186	223	355	415	474	533	592	651	711	500	0,139	12,9	<29
			64	17,8	100	129	172	215	258	430	501	573	645	716	788	859	500	0,139	12,9	<29
			72	19,9	125	145	193	241	290	496	578	661	743	826	909	991	500	0,139	12,9	30
			79	21,9	150	159	212	265	318	555	648	740	833	925	1018	1110	500	0,139	12,9	32
			91	25,4	200	185	246	308	369	662	772	882	992	1103	1213	1323	500	0,139	12,9	34
	3F		95	26,3	50	192	255	319	383	502	586	670	754	837	921	1005	500	0,139	12,9	<29
			116	32,3	75	235	314	392	470	694	809	925	1041	1156	1272	1387	500	0,139	12,9	<29
			135	37,4	100	272	363	453	544	855	998	1140	1283	1425	1568	1711	500	0,139	12,9	<29
			151	41,9	125	305	406	508	609	998	1164	1330	1497	1663	1829	1996	500	0,139	12,9	31
			165	45,9	150	334	445	557	668	1127	1315	1503	1690	1878	2066	2254	500	0,139	12,9	33
			191	53,1	200	386	515	644	773	1356	1582	1809	2035	2261	2487	2713	500	0,139	12,9	35

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

COOLING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qc [W]											Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Cooling output of the primary air				Cooling output on the water side										
IJ	T	L	Vpri		Δp	Qpri [W]				Qc [W]							Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature							[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	6	7	8	9	10	11	12				
IJ-4P	4B	3000	113	31,4	50	228	304	380	457	519	605	691	778	864	951	1037	500	0,139	12,9	<29
			137	38,0	75	277	369	461	553	669	781	892	1004	1115	1227	1339	500	0,139	12,9	<29
			157	43,6	100	317	423	528	634	795	928	1060	1193	1325	1458	1590	500	0,139	12,9	<29
			174	48,4	125	352	470	587	705	905	1056	1207	1358	1509	1660	1810	500	0,139	12,9	<29
			190	52,8	150	384	512	640	768	1004	1172	1339	1506	1674	1841	2009	500	0,139	12,9	30
			218	60,5	200	440	587	733	880	1179	1375	1572	1768	1965	2161	2358	500	0,139	12,9	32
	4I		151	41,8	50	304	406	507	608	625	729	833	937	1041	1145	1250	500	0,139	12,9	<29
			184	51,0	75	371	494	618	741	781	911	1041	1171	1301	1431	1561	500	0,139	12,9	<29
			211	58,6	100	426	569	711	853	912	1064	1215	1367	1519	1671	1823	500	0,139	12,9	<29
			235	65,4	125	475	634	792	951	1027	1198	1369	1540	1711	1882	2053	500	0,139	12,9	<29
			257	71,5	150	520	693	866	1039	1130	1319	1507	1695	1884	2072	2260	500	0,139	12,9	30
			296	82,2	200	598	797	996	1196	1314	1533	1752	1971	2189	2408	2627	500	0,139	12,9	32
	5A		189	52,5	50	381	509	636	763	588	686	784	882	980	1078	1176	500	0,139	12,9	<29
			231	64,2	75	467	623	779	934	747	871	996	1120	1245	1369	1494	500	0,139	12,9	30
			267	74,2	100	539	719	899	1079	883	1031	1178	1325	1472	1619	1767	500	0,139	12,9	32
			299	82,9	125	603	804	1005	1206	1004	1171	1338	1505	1673	1840	2007	500	0,139	12,9	34
			327	90,9	150	661	881	1101	1321	1111	1296	1481	1666	1851	2037	2222	500	0,139	12,9	35
			378	104,9	200	763	1017	1271	1526	1296	1513	1729	1945	2161	2377	2593	500	0,139	12,9	38

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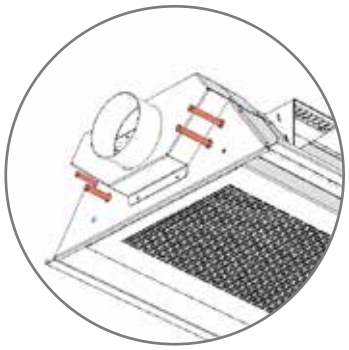
CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version



Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-4P	2F	600	7	2,1	50	15	20	25	30	97	141	183	224	265	125	0,035	2,9	<29
			9	2,5	75	18	25	31	37	130	188	244	299	353	125	0,035	2,9	<29
			11	2,9	100	21	29	36	43	157	228	296	363	428	125	0,035	2,9	<29
			12	3,3	125	24	32	40	48	182	263	342	419	495	125	0,035	2,9	30
			13	3,6	150	26	35	44	53	204	295	383	470	555	125	0,035	2,9	32
			15	4,2	200	31	41	51	61	243	352	457	561	662	125	0,035	2,9	34
	3F		16	4,4	50	32	43	53	64	229	331	430	527	622	125	0,035	2,9	<29
			19	5,4	75	39	52	65	78	318	460	598	732	865	125	0,035	2,9	<29
			22	6,2	100	45	60	75	91	393	569	739	906	1070	125	0,035	2,9	<29
			25	7,0	125	51	68	84	101	459	665	864	1059	1251	125	0,035	2,9	31
			28	7,6	150	56	74	93	111	520	752	977	1198	1414	125	0,035	2,9	33
			32	8,8	200	64	86	107	129	627	907	1178	1444	1705	125	0,035	2,9	35
	4B		19	5,2	50	38	51	63	76	191	276	359	440	519	125	0,035	2,9	<29
			23	6,3	75	46	61	76	92	247	357	464	569	672	125	0,035	2,9	<29
			26	7,2	100	53	70	88	105	294	425	553	677	800	125	0,035	2,9	<29
			29	8,0	125	58	78	97	117	335	485	630	772	912	125	0,035	2,9	<29
			32	8,8	150	64	85	106	127	372	538	700	857	1012	125	0,035	2,9	30
			36	10,0	200	73	97	122	146	437	633	822	1008	1190	125	0,035	2,9	32
	4I		25	7,0	50	51	67	84	101	232	336	436	535	632	125	0,035	2,9	<29
			31	8,5	75	62	82	103	123	290	420	546	669	790	125	0,035	2,9	<29
			35	9,8	100	71	95	118	142	339	491	638	782	923	125	0,035	2,9	<29
			39	10,9	125	79	105	132	158	382	553	719	881	1040	125	0,035	2,9	<29
			43	11,9	150	86	115	144	173	421	609	791	970	1145	125	0,035	2,9	30
			49	13,7	200	99	133	166	199	489	708	920	1128	1332	125	0,035	2,9	32
	5A		38	10,5	50	76	102	127	153	345	499	649	795	939	125	0,035	2,9	<29
			46	12,8	75	93	125	156	187	412	596	775	950	1122	125	0,035	2,9	33
			53	14,8	100	108	144	180	216	468	678	881	1080	1275	125	0,035	2,9	35
			60	16,6	125	121	161	201	241	518	749	974	1193	1409	125	0,035	2,9	37
			65	18,2	150	132	176	220	264	562	813	1057	1296	1530	125	0,035	2,9	38
			76	21,0	200	153	203	254	305	640	927	1205	1476	1743	125	0,035	2,9	41
	2F	1200	16	4,5	50	33	43	54	65	191	277	360	441	521	125	0,035	4,4	<29
			20	5,5	75	40	53	67	80	256	370	481	590	696	125	0,035	4,4	<29
			23	6,4	100	46	62	77	93	310	449	584	715	845	125	0,035	4,4	<29
			26	7,2	125	52	69	87	104	359	519	674	826	976	125	0,035	4,4	<29
			28	7,9	150	57	76	95	114	402	582	757	927	1095	125	0,035	4,4	31
			33	9,1	200	66	88	111	133	480	695	903	1107	1307	125	0,035	4,4	33

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-4P	3F	1200	34	9,5	50	69	92	115	138	440	637	828	1015	1199	125	0,035	4,4	<29
			42	11,7	75	85	113	141	169	614	889	1155	1416	1672	125	0,035	4,4	<29
			49	13,5	100	98	131	163	196	761	1101	1431	1754	2072	125	0,035	4,4	<29
			54	15,1	125	110	146	183	219	891	1289	1675	2053	2424	125	0,035	4,4	31
			60	16,5	150	120	160	201	241	1008	1458	1896	2323	2743	125	0,035	4,4	32
			69	19,1	200	139	186	232	278	1216	1760	2288	2804	3311	125	0,035	4,4	34
	4B		41	11,3	50	82	109	137	164	370	536	696	853	1008	125	0,035	4,4	<29
			49	13,7	75	99	133	166	199	480	694	903	1106	1306	125	0,035	4,4	<29
			56	15,7	100	114	152	190	228	572	827	1075	1318	1556	125	0,035	4,4	<29
			63	17,4	125	127	169	211	253	652	943	1226	1503	1774	125	0,035	4,4	<29
			68	19,0	150	138	184	230	276	724	1048	1362	1669	1971	125	0,035	4,4	<29
			78	21,8	200	158	211	264	317	851	1232	1601	1962	2317	125	0,035	4,4	31
	4I		54	15,1	50	110	146	183	219	459	665	864	1059	1250	125	0,035	4,4	<29
			66	18,4	75	134	178	223	267	575	832	1081	1325	1564	125	0,035	4,4	<29
			76	21,1	100	154	205	256	307	672	972	1263	1548	1828	125	0,035	4,4	<29
			85	23,5	125	171	228	285	342	757	1095	1424	1745	2060	125	0,035	4,4	<29
			93	25,7	150	187	250	312	374	834	1206	1568	1922	2269	125	0,035	4,4	<29
			107	29,6	200	215	287	359	431	969	1403	1824	2235	2639	125	0,035	4,4	31
	5A		76	21,0	50	153	203	254	305	640	926	1203	1474	1741	125	0,035	4,4	<29
			93	25,7	75	187	249	311	374	763	1103	1434	1758	2076	125	0,035	4,4	31
			107	29,7	100	216	288	360	432	866	1253	1628	1996	2356	125	0,035	4,4	33
			119	33,2	125	241	322	402	482	956	1384	1798	2204	2603	125	0,035	4,4	35
			131	36,3	150	264	352	440	529	1038	1501	1952	2392	2824	125	0,035	4,4	36
			151	42,0	200	305	407	509	610	1181	1710	2222	2723	3216	125	0,035	4,4	39
	2F	1800	25	7,0	50	51	68	85	102	312	452	588	720	850	250	0,069	3,8	<29
			31	8,7	75	63	84	105	126	417	603	784	961	1134	250	0,069	3,8	<29
			36	10,0	100	73	97	122	146	505	731	950	1164	1375	250	0,069	3,8	<29
			41	11,3	125	82	109	137	164	583	844	1097	1344	1587	250	0,069	3,8	30
			45	12,4	150	90	120	150	180	654	946	1230	1507	1780	250	0,069	3,8	31
			52	14,3	200	104	139	174	209	780	1129	1467	1798	2123	250	0,069	3,8	34
	3F		54	14,9	50	108	145	181	217	724	1048	1362	1670	1972	250	0,069	3,8	<29
			66	18,3	75	133	177	222	266	1007	1457	1894	2321	2741	250	0,069	3,8	<29
			76	21,2	100	154	205	257	308	1246	1803	2343	2871	3391	250	0,069	3,8	<29
			85	23,7	125	172	230	287	345	1456	2107	2739	3357	3964	250	0,069	3,8	31
			94	26,0	150	189	252	315	378	1647	2383	3098	3797	4483	250	0,069	3,8	32
			108	30,1	200	219	292	364	437	1986	2874	3735	4578	5406	250	0,069	3,8	35
	4B		64	17,8	50	129	172	215	258	606	877	1140	1398	1650	250	0,069	3,8	<29
			77	21,5	75	156	209	261	313	785	1136	1476	1809	2136	250	0,069	3,8	<29
			89	24,6	100	179	239	299	358	934	1352	1757	2153	2542	250	0,069	3,8	<29
			99	27,4	125	199	266	332	398	1065	1540	2002	2454	2898	250	0,069	3,8	<29
			108	29,9	150	217	290	362	434	1182	1710	2223	2725	3217	250	0,069	3,8	<29
			123	34,2	200	249	332	415	498	1389	2010	2613	3202	3781	250	0,069	3,8	32
	4I		85	23,7	50	172	230	287	344	744	1077	1400	1716	2026	250	0,069	3,8	<29
			104	28,8	75	210	280	350	420	931	1348	1752	2147	2535	250	0,069	3,8	<29
			119	33,2	100	241	322	402	483	1088	1574	2046	2508	2961	250	0,069	3,8	<29
			133	37,0	125	269	359	448	538	1226	1774	2305	2825	3336	250	0,069	3,8	<29
			146	40,4	150	294	392	490	588	1350	1953	2539	3111	3674	250	0,069	3,8	<29
			167	46,5	200	338	451	564	677	1569	2271	2952	3618	4272	250	0,069	3,8	31

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-4P	5A	1800	113	31,5	50	229	305	381	458	992	1435	1865	2286	2699	250	0,069	3,8	<29
			139	38,5	75	280	374	467	561	1182	1710	2223	2725	3217	250	0,069	3,8	30
			160	44,5	100	324	432	539	647	1341	1941	2523	3093	3652	250	0,069	3,8	32
			179	49,8	125	362	482	603	724	1481	2144	2787	3415	4033	250	0,069	3,8	34
			196	54,5	150	396	529	661	793	1608	2326	3024	3706	4376	250	0,069	3,8	36
			227	62,9	200	458	610	763	915	1830	2648	3443	4219	4982	250	0,069	3,8	38
	2F	2400	35	9,7	50	70	94	117	141	454	657	854	1047	1237	500	0,139	14,4	<29
			43	11,9	75	87	116	145	174	605	875	1137	1394	1646	500	0,139	14,4	<29
			50	13,8	100	101	134	168	201	732	1059	1377	1687	1993	500	0,139	14,4	<29
			56	15,5	125	113	151	188	226	845	1222	1589	1947	2299	500	0,139	14,4	30
			61	17,1	150	124	165	207	248	947	1370	1781	2182	2577	500	0,139	14,4	31
			71	19,8	200	144	192	240	288	1129	1633	2123	2602	3072	500	0,139	14,4	34
	3F		74	20,5	50	149	199	249	299	1065	1541	2002	2454	2898	500	0,139	14,4	<29
			91	25,2	75	183	245	306	367	1475	2134	2774	3399	4014	500	0,139	14,4	<29
			105	29,2	100	212	283	354	424	1821	2635	3425	4198	4957	500	0,139	14,4	<29
			118	32,7	125	237	317	396	475	2127	3077	4000	4902	5789	500	0,139	14,4	31
			129	35,8	150	260	347	434	521	2403	3478	4520	5540	6542	500	0,139	14,4	32
			149	41,4	200	301	402	502	602	2895	4190	5446	6674	7881	500	0,139	14,4	35
	4B		88	24,5	50	178	237	297	356	887	1283	1668	2044	2414	500	0,139	14,4	<29
			107	29,6	75	216	287	359	431	1146	1658	2155	2642	3119	500	0,139	14,4	<29
			122	34,0	100	247	329	412	494	1362	1972	2563	3141	3709	500	0,139	14,4	<29
			136	37,8	125	275	366	458	549	1552	2246	2919	3578	4224	500	0,139	14,4	<29
			148	41,2	150	299	399	499	599	1722	2492	3240	3970	4688	500	0,139	14,4	30
			170	47,2	200	343	457	572	686	2023	2928	3805	4664	5507	500	0,139	14,4	32
	4I		117	32,6	50	237	316	395	474	1074	1555	2021	2476	2924	500	0,139	14,4	<29
			143	39,8	75	289	385	482	578	1343	1943	2526	3096	3656	500	0,139	14,4	<29
			165	45,7	100	333	443	554	665	1569	2270	2951	3616	4270	500	0,139	14,4	<29
			184	51,0	125	371	494	618	742	1767	2557	3323	4073	4809	500	0,139	14,4	<29
			201	55,7	150	405	540	675	810	1945	2815	3659	4485	5295	500	0,139	14,4	<29
			231	64,1	200	466	622	777	932	2262	3273	4254	5214	6156	500	0,139	14,4	32
	5A		151	42,0	50	305	407	509	610	1385	2004	2605	3193	3770	500	0,139	14,4	<29
			185	51,4	75	374	498	623	747	1650	2388	3104	3804	4492	500	0,139	14,4	30
			214	59,3	100	432	575	719	863	1873	2710	3523	4317	5098	500	0,139	14,4	32
			239	66,3	125	482	643	804	965	2068	2993	3890	4767	5629	500	0,139	14,4	34
			262	72,7	150	529	705	881	1057	2244	3247	4220	5172	6108	500	0,139	14,4	35
			302	83,9	200	610	814	1017	1221	2554	3696	4805	5888	6953	500	0,139	14,4	38
	2F	3000	45	12,4	50	90	121	151	181	572	827	1075	1318	1556	500	0,139	15,8	<29
			55	15,3	75	111	149	186	223	759	1099	1428	1750	2067	500	0,139	15,8	<29
			64	17,8	100	129	172	215	258	918	1329	1727	2117	2500	500	0,139	15,8	<29
			72	19,9	125	145	193	241	290	1059	1533	1992	2441	2883	500	0,139	15,8	30
			79	21,9	150	159	212	265	318	1187	1717	2232	2735	3230	500	0,139	15,8	32
			91	25,4	200	185	246	308	369	1414	2046	2659	3259	3849	500	0,139	15,8	34
	3F		95	26,3	50	192	255	319	383	1339	1938	2519	3087	3645	500	0,139	15,8	<29
			116	32,3	75	235	314	392	470	1849	2675	3478	4262	5033	500	0,139	15,8	<29
			135	37,4	100	272	363	453	544	2279	3299	4288	5255	6205	500	0,139	15,8	<29
			151	41,9	125	305	406	508	609	2660	3849	5003	6131	7239	500	0,139	15,8	31
			165	45,9	150	334	445	557	668	3003	4346	5650	6924	8176	500	0,139	15,8	33
			191	53,1	200	386	515	644	773	3615	5231	6800	8334	9840	500	0,139	15,8	35

The calculation of the output and other parameters according to the customer requirements can be made upon request.

CALCULATION OF THE CHILLED BEAM PARAMETERS

HEATING OUTPUT FOR SELECTED CONDITIONS - 4 pipe version

Unit	Nozzle	Unit length	Volume flow of the primary air		Pressure drop of the primary air	Total output Qtot = Qpri + Qh [W]									Volume flow of the water		Pressure drop of the water	Ekvivalent level of acustic pressure
						Heating output of the primary air				Heating output on the water side								
IJ	T	L	Vpri		Δp	Qpri [W]				Qh [W]					Vw		Δpw	LA,eq
[-]	[-]	[mm]	[m3/h]	[l/s]	[Pa]	Δ tpri [K] Difference between the room air and the primary air temperature				Δ tiw [K] Difference between the room air and the mean water temperature					[l/h]	[l/s]	[kPa]	[dB]
						6	8	10	12	20	30	40	50	60				
IJ-4P	4B	3000	113	31,4	50	228	304	380	457	1110	1607	2088	2559	3022	500	0,139	15,8	<29
			137	38,0	75	277	369	461	553	1433	2073	2695	3303	3900	500	0,139	15,8	<29
			157	43,6	100	317	423	528	634	1702	2463	3201	3924	4633	500	0,139	15,8	<29
			174	48,4	125	352	470	587	705	1938	2804	3645	4467	5275	500	0,139	15,8	<29
			190	52,8	150	384	512	640	768	2150	3111	4044	4956	5852	500	0,139	15,8	30
			218	60,5	200	440	587	733	880	2524	3652	4747	5818	6870	500	0,139	15,8	32
	4I		151	41,8	50	304	406	507	608	1346	1948	2531	3102	3663	500	0,139	15,8	<29
			184	51,0	75	371	494	618	741	1682	2434	3163	3877	4578	500	0,139	15,8	<29
			211	58,6	100	426	569	711	853	1964	2842	3694	4527	5345	500	0,139	15,8	<29
			235	65,4	125	475	634	792	951	2211	3200	4159	5097	6019	500	0,139	15,8	<29
			257	71,5	150	520	693	866	1039	2435	3523	4579	5612	6627	500	0,139	15,8	30
			296	82,2	200	598	797	996	1196	2830	4095	5323	6523	7703	500	0,139	15,8	32
	5A		189	52,5	50	381	509	636	763	1689	2444	3176	3893	4596	500	0,139	15,8	<29
			231	64,2	75	467	623	779	934	2012	2911	3784	4637	5476	500	0,139	15,8	30
			267	74,2	100	539	719	899	1079	2283	3303	4294	5262	6213	500	0,139	15,8	32
			299	82,9	125	603	804	1005	1206	2520	3647	4741	5810	6860	500	0,139	15,8	34
			327	90,9	150	661	881	1101	1321	2734	3957	5143	6304	7443	500	0,139	15,8	35
			378	104,9	200	763	1017	1271	1526	3113	4504	5855	7175	8473	500	0,139	15,8	38

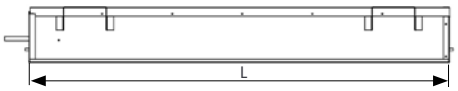
The calculation of the output and other parameters according to the customer requirements can be made upon request.

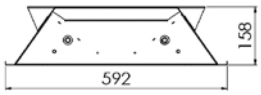
POSSIBLE CONNECTIONS TO HVAC

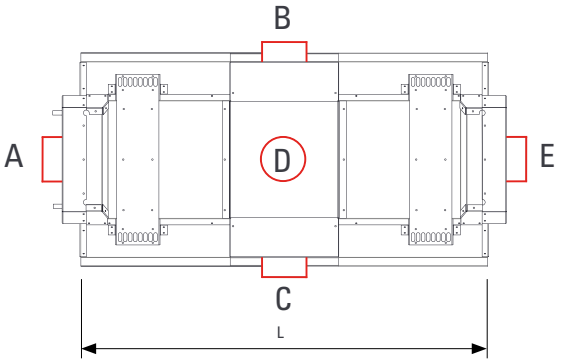
BASIC DIMENSIONS

The basic height and width of the unit are identical for all units. Only the length L is different. The total height of the unit differs depending on the type of air supply selected.

The different versions (A, B, C, D, E) determine the positions of the air connection relative to the water connection position.

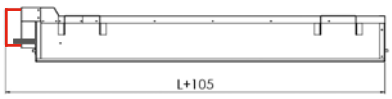


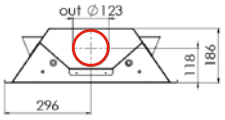


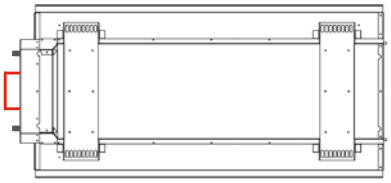


DIMENSIONS FOR AIR INLET

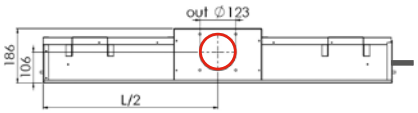
CONNECTION A

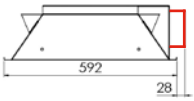


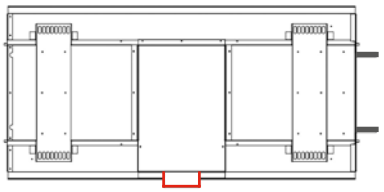




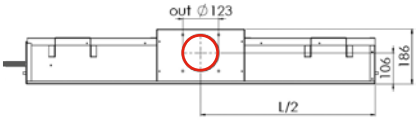
CONNECTION B

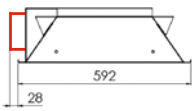


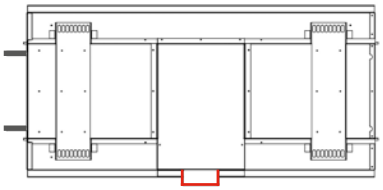




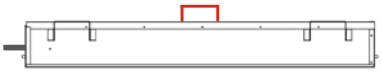
CONNECTION C

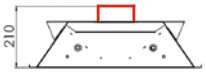


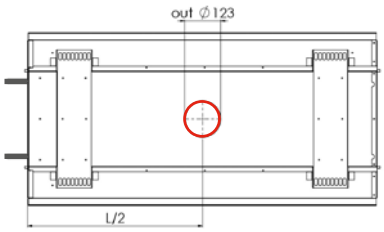




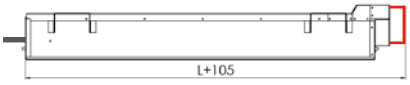
CONNECTION D

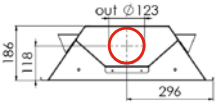


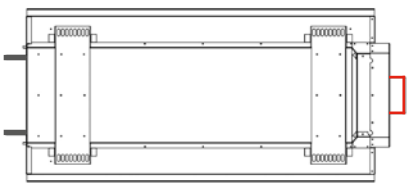




CONNECTION E



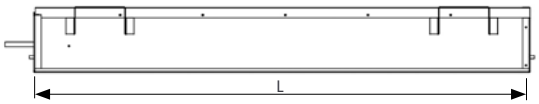


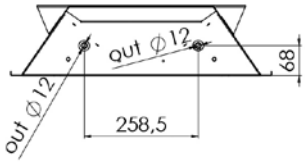


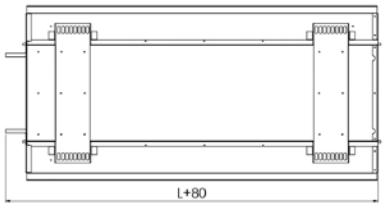
POSSIBLE CONNECTIONS TO HVAC

DIMENSIONS FOR WATER INLET AND OUTLET

Operating pressure and temperature: max. 10bar at max. temperature 100°C







The distances and diameter of the pipes for water inlet and outlet are identical for all air connection types. The water circuit is connected to copper pipes with diameter 12 mm.

OVERVIEW OF ALL VERSIONS OF THE CHILLED BEAM

Length L [mm]	Connection					Nozzle adjustment T					Weight [kg]
	A	B	C	D	E	2F	3F	4B	4I	5A	
600	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	18
1200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	26
1800	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	39
2400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	62
3000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	75

✓ possible version

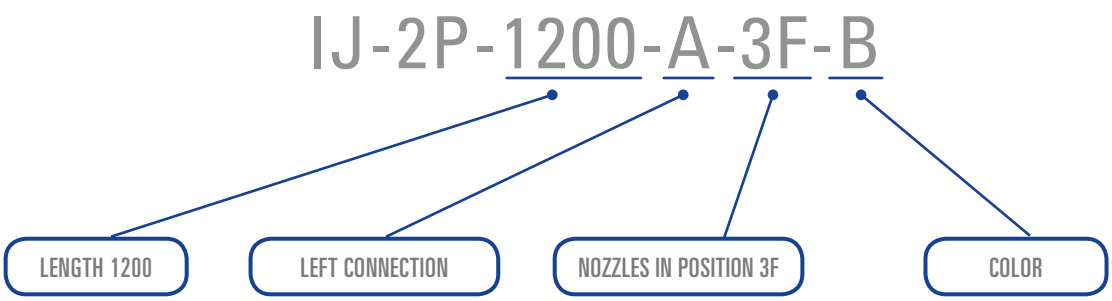
✗ not possible

CHILLED BEAM ORDERING CODE

NAME	IJ-2P, IJ-4P
LENGTH	600, 1200, 1800, 2400, 3000 [mm]
CONNECTION	A, B, C, D, E (according to the connecting diagram)
NOZZLE ADJUSTMENT	2F, 3F, 4B, 4I, 5A
COLOR	B (according to the customer's request, available colors according to the RAL sampler)

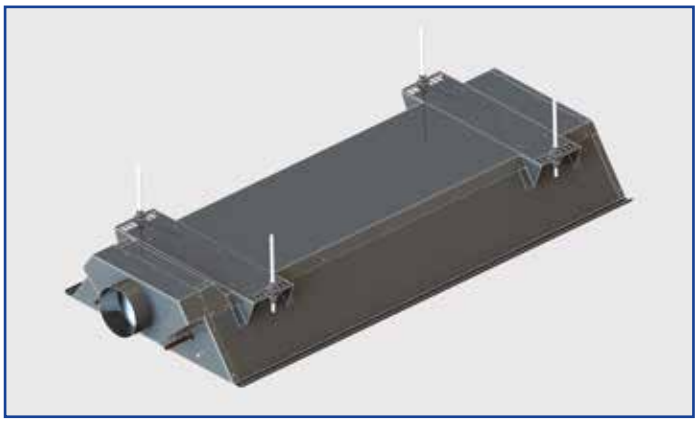
Some parameters of the unit connection can be changed upon request, depending on the manufacturing possibilities.

EXAMPLE OF THE CODE:

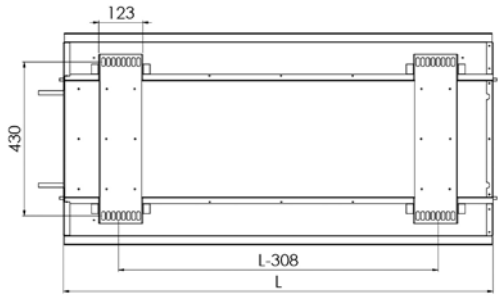


INSTALLATION

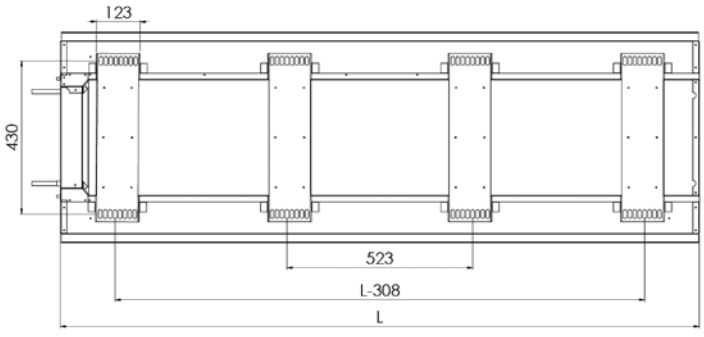
METHOD AND CLOSE-UP VIEW OF THE MOUNTING



SPACING OF HOLES FOR SUSPENSION OF THE UNIT FROM THE CEILING



for L = 600 a 1200

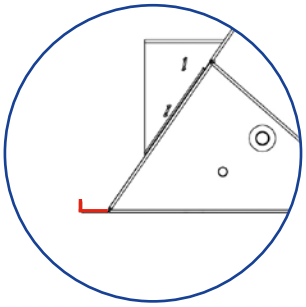


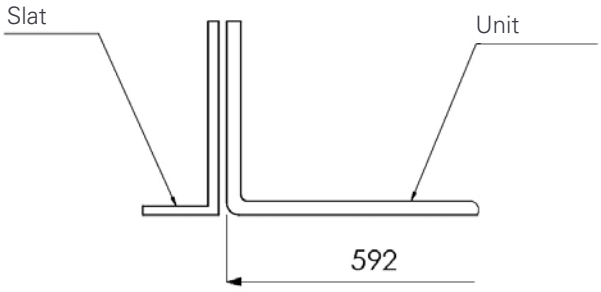
for L = 1800, 2400 and 3000

INSTALLATION AND MAINTENANCE

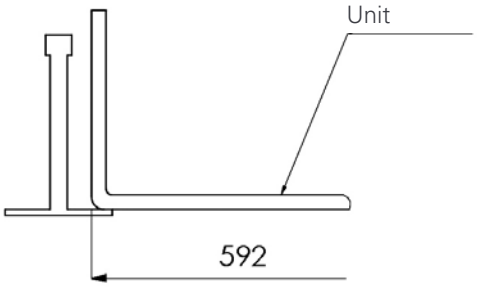
METHODS OF INSTALLATION

The unit is to be mounted using screws on the threaded bar at such distance from the ceiling that the bottom edge of the unit is leveled with the ceiling. A rubber ring is placed between the leg of the unit and the spacer with the nut; the rubber ring is primarily designed for dampening of vibrations, if any. Units 600 and 1200 are mounted using 4 threaded bars. Units 1800, 2400 and 3000 are mounted using 8 threaded bars. The installation of the Chilled beam in several basic types of ceilings is shown on the following diagrams.

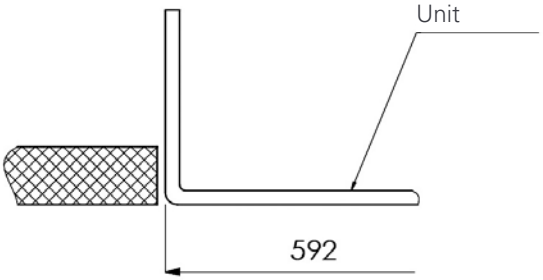




nstallation in slat ceilings



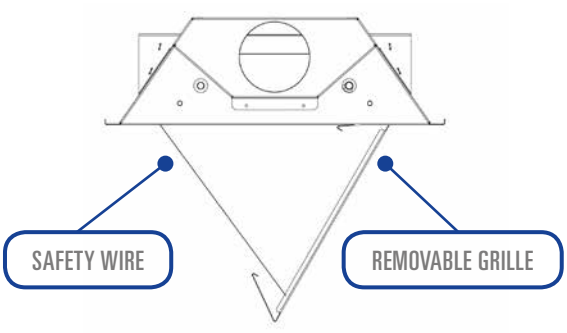
installation in T-ceiling panels



installation in drywall and other closed ceiling types

MAINTENANCE OF THE UNIT

Maintenance of the Chilled beam by the ordinary user is very easy. As the temperature of the water supply must be above the dew point, it is not necessary to remove the heat exchanger during regular maintenance. We recommend removing the removable cover once a year and removing the contamination, if any, from the inner parts of the unit.



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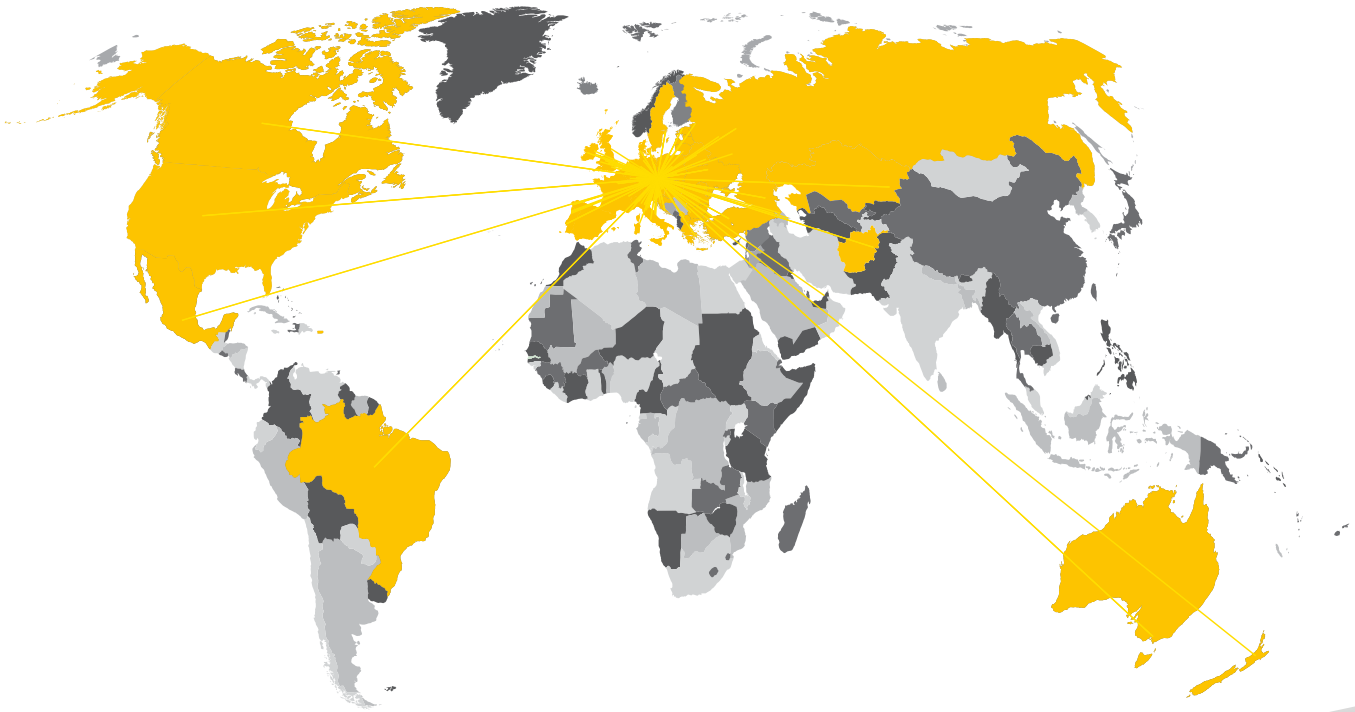
more than just heat



HEAD OFFICE

MINIB, a.s.
Střešovická 465/49, 162 00 Praha 6
Czech Republic

PRODUCTION

Manufacturing plant of MINIB, a.s.
Býkev u Mělníka 84, 276 01 Býkev
Czech Republic

FOREIGN TRADE

Phone: +420 220 180 809
Cell Phone: +420 604 770 777
Cell Phone: +420 736 795 115
E-mail: export@minib.cz
www.minib.com