Krantz

Multifunction exposed ceiling Krantz Cool

Cooling and Heating Systems

DS 4198 E 12.2020/1

Multifunction exposed ceiling Krantz Cool

Technology and design

The multifunction exposed ceiling Krantz Cool is a ceiling induction device that delivers fresh air supply and high specific cooling and heating capacities while simultaneously maintaining high thermal comfort levels. It is designed for visible installation in rooms without a suspended ceiling.

Thanks to its extremely flat design, it can be installed close to the ceiling above a metal ceiling sail, which then presents the only visible surface to the room. The secondary air that flows in above the ceiling sail enables the sail to have a uniform, finished appearance with end-to-end perforation.

The uniform and aesthetic appearance, as well as a customizable color scheme, hole pattern, and size, offers much leeway for architectural design.

All of the primary functions are located above the Krantz Cool ceiling sail – cooling, heating, and fresh air supply – contained in one compact unit.

It may also be combined with:
- acoustic ceiling sails
- radiant cooling and heating sails
- Multifunction exposed ceiling AVACS
- Opticlean ceiling sails

bei gleichbleibenden Erscheinungsbild möglich.

Air fistribution function

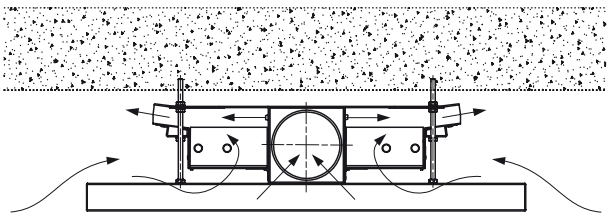

Fig. 1: Design and function of Krantz Cool

The induction unit consists of a galvanized sheet steel housing with a primary air connection on the front, a built-in two-part heat exchanger either as a 2- or 4-pipe system, two parallel rows of induction nozzles with different nozzle diameters, and two linear outlet openings for the horizontal supply of air. The front unit is also made of galvanized sheet steel and is color-coated where visible. The RAL color of the visible surface can be freely selected (standard, pure white, RAL 9010). Cross members made of 2 mm sheet steel are used to suspend the sail elements.

For maintenance purposes, the metal ceiling sail can be folded down on one side to allow access to the induction unit.

Table 1: main dimensions

Nominal length:	1800, 2100, 2400, 2700 or 3000 mm
Nominal width:	1150 mm
Minimum suspension height h_{min}:	200 mm
Induction unit – Length: multifunction sail – 300 mm – Width: – Height:	 560 mm 150 mm
Water connection: Calibrated pipe end 15 mm, suitable for plug/press connections	
Primary air connection:	DN125, front side

Key
1. Primary air connection, front side
2. Water connections
3. Adjustable air louvers
4. Perforated ceiling sail
5. Cross members for suspending ceiling elements
6. Induction unit
7. Suspension points, threaded rods

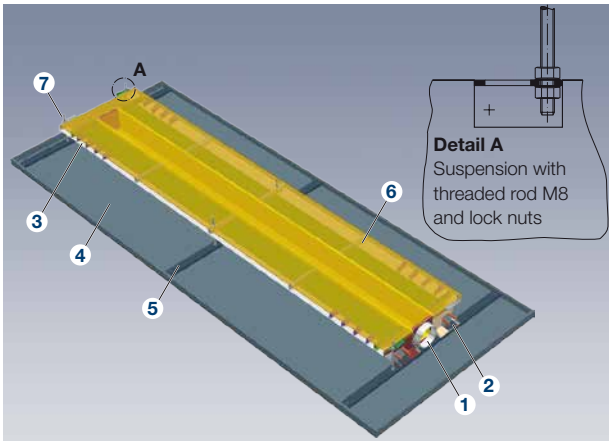

Fig. 2: Design of Krantz Cool

www.krantz.de DS 4198 E Bl. 2 12.2020/1

Multifunction exposed ceiling Krantz Cool

Table 2: Performance data for nominal length 1800 mm

Reference data cooling		Reference data heating	
ϑ_{Room}	26 °C	ϑ_{Room}	22 °C
$\vartheta_{Primary\ air}$	16 °C	$\vartheta_{Primary\ air}$	22 °C
$\vartheta_{Water\ supply}$	16 °C	$\vartheta_{Water\ supply}$	50 °C
$\vartheta_{Water\ return}$	19 °C	$\vartheta_{Water\ return}$	40 °C
$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	8.5 K	$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	23 K

						Cooling				Heating			
L_N	Nozzle	Primary air volume flow		Air side pressure loss	Sound power level	Water side cooling capacity	Air side cooling capacity	Overall capacity	Water side pressure loss	Water side heating capacity	Air side heating capacity	Overall capacity	Water side pressure loss
mm	mm	l/s	m³/h	Pa	dB(A)	W	W	W	kPa	W	W	W	kPa
1800	4	7.5	27	68	< 20	330	91	421	0.6	423	0	423	0.1
		9.6	35	111	< 20	439	116	554	0.9	524	0	524	0.1
		11.3	41	152	21	526	136	662	1.2	606	0	606	0.1
		13.3	48	214	25	635	161	795	1.7	707	0	707	0.1
	5	10.4	38	52	< 20	371	126	496	0.7	466	0	466	0.1
		12.5	45	75	< 20	445	151	596	0.9	539	0	539	0.1
		14.6	53	103	21	519	176	695	1.2	612	0	612	0.1
		16.7	60	134	25	593	201	794	1.5	685	0	685	0.1
	6	12.5	45	36	< 20	379	151	530	0.7	480	0	480	0.1
		15.8	57	57	< 20	458	191	649	1.0	563	0	563	0.1
		19.6	71	87	23	546	236	782	1.3	657	0	657	0.1
		22.9	83	129	28	625	277	901	1.7	740	0	740	0.1
	7	16.7	60	33	< 20	404	201	606	0.8	528	0	528	0.1
		20.8	75	52	< 20	490	252	742	1.1	620	0	620	0.1
		25.0	90	75	23	576	302	878	1.4	711	0	711	0.1
		29.2	105	102	28	662	352	1014	1.8	802	0	802	0.1
	8	20.8	75	33	< 20	428	252	679	0.9	563	0	563	0.1
		26.3	95	53	24	515	317	832	1.2	668	0	668	0.1
		32.1	116	79	30	609	387	997	1.6	781	0	781	0.1
		37.5	135	108	34	697	453	1150	2.0	886	0	886	0.1
	10	32.5	117	38	27	490	392	883	1.1	678	0	678	0.1
		36.3	131	47	30	534	438	972	1.3	735	0	735	0.1
		40.0	144	58	33	578	483	1061	1.5	791	0	791	0.1
		43.8	158	69	36	621	528	1150	1.6	848	0	848	0.1

Exchange of water side capacity
Example: L_N = 1800 mm; Nozzle = 4 mm; Primary air volume flow = 27 m³/h; water side cooling capacity = 330 W
where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp.)}$ = 8.5 K
Water side cooling capacity where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp.)}$ = 10 K
Water side cooling capacity (10 K) = 330 W · (10 K / 8.5 K) = 388 W
The minimum water volume flow is 70 l/h for all nominal lengths.

www.krantz.de DS 4198 E Bl. 3 12.2020/11

Multifunction exposed ceiling Krantz Cool

Table 3: Performance data for nominal length 2100 mm

Reference data cooling		Reference data heating	
ϑ_{Room}	26 °C	ϑ_{Room}	22 °C
$\vartheta_{Primary\ air}$	16 °C	$\vartheta_{Primary\ air}$	22 °C
$\vartheta_{Water\ supply}$	16 °C	$\vartheta_{Water\ supply}$	50 °C
$\vartheta_{Water\ return}$	19 °C	$\vartheta_{Water\ return}$	40 °C
$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	8.5 K	$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	23 K

						Cooling				Heating			
L_N	Nozzle	Primary air volume flow		Air side pressure loss	Sound power level	Water side cooling capacity	Air side cooling capacity	Overall capacity	Water side pressure loss	Water side heating capacity	Air side heating capacity	Overall capacity	Water side pressure loss
mm	mm	l/s	m³/h	Pa	dB(A)	W	W	W	kPa	W	W	W	kPa
2 100	4	9.0	32	65	< 20	394	109	502	0.8	509	0	509	0.1
		11.5	41	107	< 20	524	139	663	1.4	631	0	631	0.1
		13.5	49	147	22	629	163	792	1.9	729	0	729	0.1
		16.0	58	207	27	759	193	952	2.6	851	0	851	0.1
	5	12.5	45	50	< 20	445	151	596	1.0	563	0	563	0.1
		15.0	54	73	< 20	534	181	715	1.4	650	0	650	0.1
		17.5	63	99	23	623	211	834	1.9	738	0	738	0.1
		20.0	72	129	27	711	241	953	2.4	826	0	826	0.1
	6	15.0	54	34	< 20	458	181	639	1.1	582	0	582	0.1
		19.0	68	55	< 20	552	229	782	1.5	682	0	682	0.1
		23.5	85	84	26	658	284	942	2.1	795	0	795	0.1
		27.5	99	123	31	753	332	1 085	2.6	895	0	895	0.1
	7	20.0	72	32	< 20	488	241	729	1.2	640	0	640	0.1
		25.0	90	50	22	591	302	893	1.7	750	0	750	0.1
		30.0	108	72	27	694	362	1 056	2.3	859	0	859	0.1
		35.0	126	98	31	797	423	1 219	2.9	969	0	969	0.1
	8	25.0	90	32	21	517	302	818	1.4	682	0	682	0.1
		31.5	113	50	28	622	380	1 002	1.9	808	0	808	0.1
		38.5	139	75	33	735	465	1 199	2.5	943	0	943	0.1
		45.0	162	103	38	840	543	1 383	3.1	1 069	0	1 069	0.2
	10	39.0	140	37	31	593	471	1 064	1.7	821	0	821	0.1
		43.5	157	45	34	645	525	1 170	2.0	889	0	889	0.1
		48.0	173	55	37	698	579	1 277	2.3	957	0	957	0.1
		52.5	189	66	40	750	634	1 384	2.6	1 025	0	1 025	0.2

Exchange of water side capacity
Example: L_N = 2 100 mm; Nozzle = 4 mm; Primary air volume flow = 32 m³/h; water side cooling capacity = 394 W
where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp)}$ = 8.5 K
Water side cooling capacity where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp.)}$ = 10 K
Water side cooling capacity (10 K) = 394 W · (10 K / 8.5 K) = 464 W
The minimum water volume flow is 70 l/h for all nominal lengths.

www.krantz.de DS 4198 E Bl. 4 12.2020/1

Multifunction exposed ceiling Krantz Cool

Table 4: Performance data for nominal length 2400 mm

Reference data cooling		Reference data heating	
ϑ_{Room}	26 °C	ϑ_{Room}	22 °C
$\vartheta_{Primary\ air}$	16 °C	$\vartheta_{Primary\ air}$	22 °C
$\vartheta_{Water\ supply}$	16 °C	$\vartheta_{Water\ supply}$	50 °C
$\vartheta_{Water\ return}$	19 °C	$\vartheta_{Water\ return}$	40 °C
$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	8.5 K	$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	23 K

						Cooling				Heating			
L_N	Nozzle	Primary air volume flow		Air side pressure loss	Sound power level	Water side cooling capacity	Air side cooling capacity	Overall capacity	Water side pressure loss	Water side heating capacity	Air side heating capacity	Overall capacity	Water side pressure loss
mm	mm	l/s	m³/h	Pa	dB(A)	W	W	W	kPa	W	W	W	kPa
2 400	4	10.5	38	65	< 20	457	127	584	1.2	596	0	596	0.1
		13.4	48	105	< 20	610	162	772	2.0	738	0	738	0.1
		15.8	57	145	23	731	190	922	2.8	852	0	852	0.1
		18.7	67	204	28	884	225	1 109	3.9	994	0	994	0.2
	5	14.6	53	50	< 20	519	176	695	1.5	659	0	659	0.1
		17.5	63	71	21	623	211	834	2.1	762	0	762	0.1
		20.4	74	97	25	726	246	973	2.8	864	0	864	0.1
		23.3	84	127	29	830	282	1 112	3.5	966	0	966	0.1
	6	17.5	63	33	< 20	537	211	748	1.6	685	0	685	0.1
		22.2	80	54	22	647	268	915	2.3	801	0	801	0.1
		27.4	99	82	28	771	331	1 102	3.1	933	0	933	0.1
		32.1	116	121	33	881	387	1 268	3.9	1 049	0	1 049	0.2
	7	23.3	84	31	< 20	571	282	853	1.8	752	0	752	0.1
		29.2	105	49	24	691	352	1 043	2.5	880	0	880	0.1
		35.0	126	70	30	811	423	1 234	3.3	1 008	0	1 008	0.2
		40.8	147	96	34	931	493	1 424	4.2	1 135	0	1 135	0.2
	8	29.2	105	31	24	606	352	958	2.0	801	0	801	0.1
		36.8	132	49	31	728	444	1 172	2.8	948	0	948	0.1
		44.9	162	73	37	860	542	1 402	3.7	1 106	0	1 106	0.2
		52.5	189	100	41	983	634	1 616	4.7	1 252	0	1 252	0.2
	10	45.5	164	36	34	695	549	1 244	2.6	964	0	964	0.1
		50.8	183	44	37	756	613	1 369	3.0	1 043	0	1 043	0.2
		56.0	202	54	40	817	676	1 493	3.4	1 122	0	1 122	0.2
		61.3	221	65	43	879	739	1 618	3.8	1 201	0	1 201	0.2

Exchange of water side capacity
Example: L_N = 2 400 mm; Nozzle = 4 mm; Primary air volume flow = 38 m³/h; water side cooling capacity = 457 W
where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp)}$ = 8.5 K
Water side cooling capacity where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp.)}$ = 10 K
Water side cooling capacity (10 K) = 457 W · (10 K / 8.5 K) = 538 W
The minimum water volume flow is 70 l/h for all nominal lengths.

www.krantz.de DS 4198 E Bl. 5 12.2020/11

Multifunction exposed ceiling Krantz Cool

Table 5: Performance data for nominal length 2700 mm

Reference data cooling		Reference data heating	
ϑ_{Room}	26 °C	ϑ_{Room}	22 °C
$\vartheta_{Primary\ air}$	16 °C	$\vartheta_{Primary\ air}$	22 °C
$\vartheta_{Water\ supply}$	16 °C	$\vartheta_{Water\ supply}$	50 °C
$\vartheta_{Water\ return}$	19 °C	$\vartheta_{Water\ return}$	40 °C
$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	8.5 K	$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	23 K

						Cooling				Heating			
L_N	Nozzle	Primary air volume flow		Air side pressure loss	Sound power level	Water side cooling capacity	Air side cooling capacity	Overall capacity	Water side pressure loss	Water side heating capacity	Air side heating capacity	Overall capacity	Water side pressure loss
mm	mm	l/s	m³/h	Pa	dB(A)	W	W	W	kPa	W	W	W	kPa
2 700	4	12.0	43	64	< 20	521	145	666	1.7	683	0	683	0.1
		15.3	55	105	< 20	695	185	880	2.8	845	0	845	0.1
		18.0	65	145	24	834	217	1052	3.8	975	0	975	0.1
		21.3	77	203	28	1008	258	1266	5.3	1138	0	1138	0.2
	5	16.7	60	49	< 20	593	201	794	2.1	756	0	756	0.1
		20.0	72	71	22	712	241	953	2.9	873	0	873	0.1
		23.3	84	97	26	830	282	1112	3.8	990	0	990	0.2
		26.7	96	126	30	949	322	1271	4.8	1107	0	1107	0.2
	6	20.0	72	33	< 20	616	241	858	2.3	787	0	787	0.1
		25.3	91	53	23	742	306	1048	3.1	920	0	920	0.1
		31.3	113	81	29	883	378	1261	4.2	1070	0	1070	0.2
		36.7	132	120	35	1009	443	1452	5.4	1204	0	1204	0.2
	7	26.7	96	31	20	654	322	976	2.5	864	0	864	0.1
		33.3	120	48	27	791	402	1194	3.5	1010	0	1010	0.2
		40.0	144	69	32	929	483	1412	4.6	1156	0	1156	0.2
		46.7	168	94	36	1066	563	1630	5.9	1302	0	1302	0.2
	8	33.3	120	30	27	695	402	1097	2.8	919	0	919	0.1
		42.0	151	48	33	835	507	1342	3.8	1087	0	1087	0.2
		51.3	185	72	39	985	620	1605	5.1	1268	0	1268	0.2
		60.0	216	99	43	1125	724	1850	6.5	1436	0	1436	0.3
	10	52.0	187	35	37	797	628	1425	3.6	1106	0	1106	0.2
		58.0	209	44	40	867	700	1568	4.1	1197	0	1197	0.2
		64.0	230	54	43	937	773	1710	4.7	1288	0	1288	0.2
		70.0	252	64	45	1007	845	1852	5.3	1378	0	1378	0.3

Exchange of water side capacity
Example: L_N = 2 700 mm; Nozzle = 4 mm; Primary air volume flow = 43 m³/h; water side cooling capacity = 521 W
where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp}$ = 8.5 K
Water side cooling capacity where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp.)}$ = 10 K
Water side cooling capacity (10 K) = 521 W · (10 K / 8.5 K) = 613 W
The minimum water volume flow is 70 l/h for all nominal lengths.

www.krantz.de DS 4198 E Bl. 6 12.2020/1

Multifunction exposed ceiling Krantz Cool

Table 6: Performance data for nominal length 3000 mm

Reference data cooling		Reference data heating	
ϑ_{Room}	26 °C	ϑ_{Room}	22 °C
$\vartheta_{Primary\ air}$	16 °C	$\vartheta_{Primary\ air}$	22 °C
$\vartheta_{Water\ supply}$	16 °C	$\vartheta_{Water\ supply}$	50 °C
$\vartheta_{Water\ return}$	19 °C	$\vartheta_{Water\ return}$	40 °C
$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	8.5 K	$\Delta\vartheta_{(Room\ air\ temp.–mean\ water\ temp.)}$	23 K

						Cooling				Heating			
L_N	Nozzle	Primary air volume flow		Air side pressure loss	Sound power level	Water side cooling capacity	Air side cooling capacity	Overall capacity	Water side pressure loss	Water side heating capacity	Air side heating capacity	Overall capacity	Water side pressure loss
mm	mm	l/s	m³/h	Pa	dB(A)	W	W	W	kPa	W	W	W	kPa
3 000	4	13.5	49	63	< 20	585	163	748	2.3	769	0	769	0.1
		17.3	62	102	< 20	781	208	989	3.8	952	0	952	0.1
		20.3	73	141	23	937	244	1 182	5.2	1 099	0	1 099	0.2
		24.0	86	198	28	1 133	290	1 423	7.2	1 282	0	1 282	0.2
	5	18.8	68	48	< 20	667	226	894	2.9	853	0	853	0.1
		22.5	81	69	22	801	272	1 072	3.9	985	0	985	0.1
		26.3	95	94	26	934	317	1 251	5.1	1 116	0	1 116	0.2
		30.0	108	122	30	1 067	362	1 429	6.5	1 248	0	1 248	0.2
	6	22.5	81	32	< 20	695	272	967	3.1	890	0	890	0.1
		28.5	103	51	24	837	344	1 181	4.2	1 039	0	1 039	0.2
		35.3	127	79	30	996	426	1 421	5.7	1 208	0	1 208	0.2
		41.3	149	116	36	1 137	498	1 635	7.2	1 358	0	1 358	0.3
	7	30.0	108	30	22	737	362	1 100	3.4	976	0	976	0.1
		37.5	135	46	28	892	453	1 345	4.7	1 140	0	1 140	0.2
		45.0	162	67	33	1 046	543	1 590	6.3	1 304	0	1 304	0.3
		52.5	189	91	38	1 201	634	1 835	8.0	1 469	0	1 469	0.3
	8	37.5	135	29	28	784	453	1 236	3.8	1 038	0	1 038	0.2
		47.3	170	47	35	941	570	1 511	5.2	1 227	0	1 227	0.2
		57.8	208	70	41	1 111	697	1 808	7.0	1 430	0	1 430	0.3
		67.5	243	95	45	1 268	815	2 083	8.8	1 619	0	1 619	0.4
	10	58.5	211	34	39	900	706	1 606	4.8	1 249	0	1 249	0.2
		65.3	235	42	42	978	788	1 766	5.6	1 351	0	1 351	0.3
		72.0	259	52	45	1 057	869	1 926	6.4	1 453	0	1 453	0.1
		78.8	284	62	47	1 136	951	2 086	7.2	1 555	0	1 555	0.4

Exchange of water side capacity
Example: L_N = 3 000 mm; Nozzle = 4 mm; Primary air volume flow = 49 m³/h; water side cooling capacity = 585 W
where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp)}$ = 8.5 K
Water side cooling capacity where $\Delta\vartheta_{(room\ air\ temp.\ –\ mean\ water\ temp.)}$ = 10 K
Water side cooling capacity (10 K) = 585 W · (10 K / 8.5 K) = 688 W
The minimum water volume flow is 70 l/h for all nominal lengths.

www.krantz.de DS 4198 E Bl. 7 12.2020/11

Krantz GmbH
Uersfeld 24, 52072 Aachen
Telefon: +49 241 441-1
Telefax: +49 241 441-555
info@krantz.de | www.krantz.de