

# KH-NH series – Industrial cubic type air coolers



- ❄ Glycol water.
- ❄ High efficiency coils.
- ❄ Integrated solenoid valve.
- ❄ Double defrost tray.

Industrial cubic air-cooled units, with glycol water, equipped with control valves, for high, positive and negative temperature cold rooms, built in galvanised steel structure and bodywork with polyester paint.

## Features

- ▶ 400V 3N 50Hz power supply. Available in 60Hz. Others voltages by request.
- ▶ High efficiency air cooling coil, made of copper tubes and aluminium fins, with 4 and 5 mm fin spacing.
- ▶ Air defrosting.
- ▶ Double stainless steel hinged condensate tray.
- ▶ High-flow axial fans at 1 300 rpm.
- ▶ Optimised hydraulic circuit for glycol water.
- ▶ Threaded hydraulic connections.
- ▶ Solenoid valve for control integrated in the unit.

## Options

- ▶ Electric defrosting by means of resistors embedded in coil and condensate tray.
- ▶ Electronic control unit with fan control relays and solenoid coil, as well as chamber temperature and defrosting probes.
- ▶ Anti-corrosion coil coating.

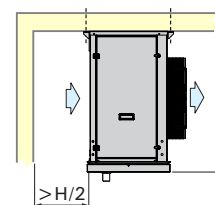
## Electronic control panel (optional)

All units can be combined with an advanced multi-function controller, consisting of an electronic board integrated in the control panel and digital control unit.



## Ceiling mounting

Air coolers units are prepared for fixing to the ceiling of the chamber.

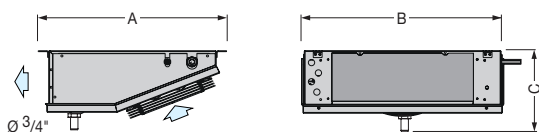


400V 3N 50Hz | High temperature | Positive temperature | Glycol water

Refrigerant Application	Series / Model	Cooling capacity (W) according to cold room temperature		Coil			Fans					Hydraulic circuit			Electric defrost		Weight (kg)
		10 °C / 85 % HR (0 °C / 5 °C) PG 25 %	0 °C / 85 % RH (-10 °C / -5 °C) PG 35 %	Fin spacing (mm)	Area (m <sup>2</sup> )	Vol. (litres)	Air flow (m <sup>3</sup> /h)	Nx Ø (mm)	Capacity (kW)	Max. current (A)	Range (m)	Flow (m <sup>3</sup> /h)	Pressure drop (mwc)	Hydraulic connections	kW	A	
High	AKH-NH-1 145	7 740	7 290	4	46	12	4 000	1x Ø 450	0.5	1.1	22	1.4	16	1 1/4"	6x 700	6	74
	AKH-NH-2 150	11 490	10 810	4	67	17	5 700	1x Ø 500	0.7	1.4	26	2.1	16	1 1/4"	6x 700	6	96
	AKH-NH-1 245	13 970	13 180	4	93	23	8 000	2x Ø 450	1.1	2.1	22	2.5	17	1 1/2"	9x 800	10	103
	AKH-NH-2 250	20 380	19 220	4	134	33	11 400	2x Ø 500	1.3	2.8	26	3.7	17	2"	12x 800	14	138
	AKH-NH-1 345	19 580	18 490	4	139	33	12 000	3x Ø 450	1.6	3.2	22	3.5	23	2"	12x 1 000	17	159
	AKH-NH-2 350	29 110	27 450	4	201	50	17 100	3x Ø 500	2.0	4.2	26	5.2	22	2"	15x 1 000	22	184
	AKH-NH-1 445	26 030	24 660	4	186	44	16 000	4x Ø 450	2.1	4.3	22	4.6	48	2"	12x 1 250	22	205
	AKH-NH-2 450	38 820	36 600	4	268	66	22 800	4x Ø 500	2.7	5.6	26	6.8	48	2"	15x 1 250	27	272
Positive	MKH-NH-1 145	7 330	6 915	5	36	12	4 200	1x Ø 450	0.5	1.1	22	1.3	11	1 1/4"	6x 700	6	72
	MKH-NH-2 150	10 880	10 250	5	52	17	6 100	1x Ø 500	0.7	1.4	26	1.9	11	1 1/4"	6x 700	6	93
	MKH-NH-1 245	13 280	12 540	5	73	23	8 400	2x Ø 450	1.0	2.1	22	2.3	14	1 1/2"	9x 800	10	99
	MKH-NH-2 250	19 390	18 300	5	105	33	12 200	2x Ø 500	1.3	2.8	26	3.4	14	2"	12x 800	14	132
	MKH-NH-1 345	18 650	17 630	5	109	33	12 600	3x Ø 450	1.5	3.2	22	3.2	20	2"	12x 1 000	17	153
	MKH-NH-2 350	27 720	26 200	5	157	48	18 300	3x Ø 500	2.0	4.2	26	4.8	20	2"	15x 1 000	22	175
	MKH-NH-1 445	24 870	23 510	5	145	44	16 800	4x Ø 450	2.0	4.3	22	4.5	43	2"	12x 1 250	22	197
	MKH-NH-2 450	36 960	34 930	5	210	64	24 400	4x Ø 500	2.6	5.6	26	6.5	42	2"	15x 1 250	27	260

Dimensions

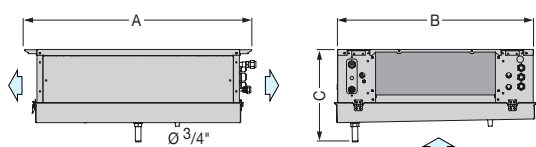
JB series



Dimensions (mm)	A	B	C
1 series	460	643	235
2 series	460	993	235
3 series	538	1 691	235
4 series	590	2 064	285

All dimensions see page 55.

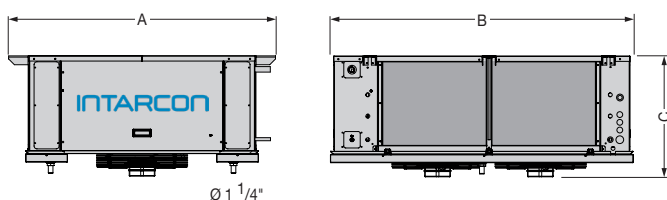
JD series



Dimensions (mm)	A	B	C
1 series	852	736	310
2 series	852	1 086	310
3 series	852	1 786	310
4 series	942	2 186	360
5 series	942	2 186	360

All dimensions see page 57.

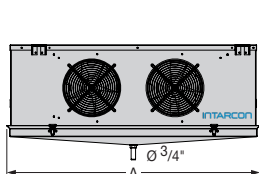
KD series



Dimensions (mm)	A	B	C
1 series	1 385	1 567	625
2 series	1 385	1 967	633
3 series	1 385	2 467	633

All dimensions see page 59.

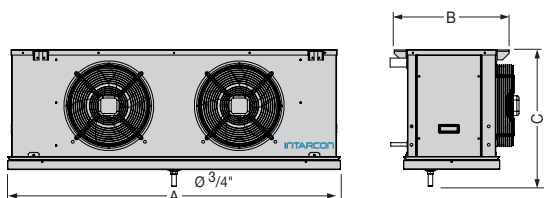
JC series



Dimensions (mm)	A	B	C
12 series	1 200	530	547
22 series	1 500	530	547
23 series	1 500	530	547
34 series	1 900	530	547

All dimensions see page 61.

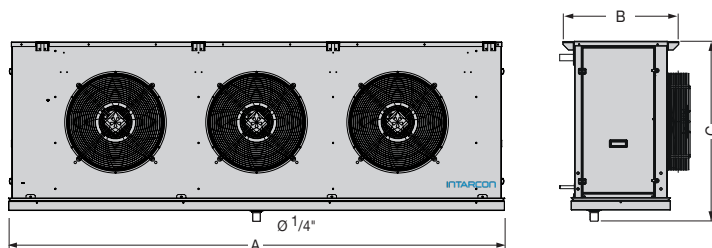
KC series



Dimensions (mm)	A	B	C
0 series	880	530	581
1 series	1 230	530	581
2 series	1 530	530	581
3 series	1 930	530	581
4 series	2 430	530	581

All dimensions see page 63.

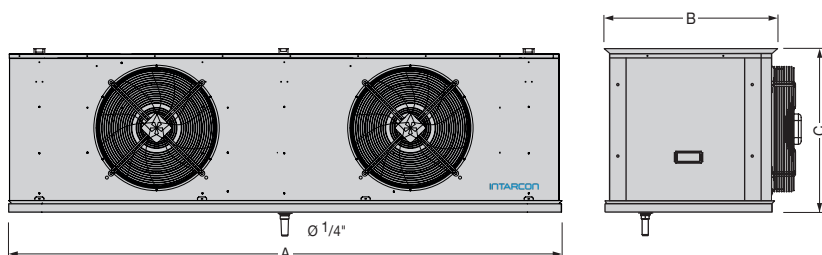
KH series



Dimensions (mm)	A	B	C
11 series	1 180	625	730
21 series	1 180	625	980
12 series	1 930	625	730
22 series	1 930	625	982
13 series	2 680	625	730
23 series	2 680	625	982
14 series	3 430	625	730
24 series	3 430	625	982

All dimensions see page 67.

KJ series



Dimensions (mm)	A	B	C
12 series	3 000	960	970
13 series	4 200	960	970
14 series	5 400	960	970
22 series	3 800	1 050	1 270
23 series	5 400	1 050	1 270
24 series	7 000	1 050	1 270

# Hydraulic piping calculation



The following table shows the properties of the main secondary fluids as well as the maximum recommended cooling capacity for the different hydraulic pipe diameters.

Fluid	Nominal diameter	Inches	DN															
			3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"
Copper (DIN 1057)			15.0	18.0		22.0		28.0		35.0	42.0	54.0	64.0	76.0	88.9	108.0	133.0	159.0
Galvanised steel (DIN EN 10255)			17.2	21.3		26.9		33.7		42.4	48.3	60.3		76.1	88.9	114.3	139.7	168.3
Carbon steel / Stainless steel (DIN EN 10220/10216)		Dext.	17.2	21.3		26.9		33.7		42.4	48.3	60.3		76.1	88.9	114.3	139.7	168.3
PEX, PB, 10 bar, SDR 9				20.0		25.0		32.0		40.0	50.0	63.0	75.0	90.0	110.0	125.0	160.0	200.0
PE, PB class 2, 10 bar, SDR 11			16.0	20.0	22.0	25.0	28.0	32.0		40.0	50.0	63.0	75.0	90.0				
ABS, PP-R, 10 bar, SDR 17						25.0				32.0	40.0	50.0	63.0	75.0	90.0	110.0	140.0	160.0

Fluid	%	Fluid temp. (°C)	Frozen temp (°C)	Density (kg/m³)	Specific heat (kJ/kg·K)	Viscosity (mPa·s)	Duct W/mK	Max. recommended cooling capacity(kW)															
								(calculated for a temperature difference of 5 K and a pressure drop of 400 Pa/m)															
Water		7	0	1 000	4.21	1.4	0.58	1.4	2.6	3.5	4.7	6.9	8.7	12	17	29	57	93	153	236	396	666	967
Ethanol	30 %	-10	-17	975	3.65	12.7	0.45	0.4	0.9	1.4	2.2	3.8	4.9	6.8	10	17	35	58	96	150	254	450	747
Propylene glycol	15 %	5	-4	1 015	4.04	2.9	0.51	1.2	2.2	3.0	4.1	6.0	7.5	10	15	26	50	82	135	210	353	619	943
Propylene glycol	25 %	0	-9	1 026	3.91	5.6	0.46	1.0	1.8	2.6	3.5	5.1	6.5	8.9	13	22	44	73	120	187	315	555	915
Propylene glycol	30 %	-5	-13	1 033	3.84	9.1	0.44	0.6	1.4	2.2	3.0	4.5	5.7	7.9	12	20	40	66	110	171	290	512	847
Propylene glycol	35 %	-10	-17	1 040	3.76	16	0.43	0.3	0.8	1.3	2.0	3.4	4.8	6.9	10	18	36	59	98	154	263	466	773
Propylene glycol	40 %	-15	-22	1 047	3.68	28	0.41		0.4	0.7	1.1	1.9	2.6	4.1	7	15	31	52	86	136	233	416	694
Propylene glycol	45 %	-20	-27	1 055	3.59	54	0.40			0.4	0.5	1.0	1.3	2.1	3.6	7.9	21	43	74	117	202	363	610
Propylene glycol	50 %	-25	-32	1 062	3.51	110	0.38				0.5	0.6	1	1.7	3.8	10	22	45	86	169	307	520	
Propylene glycol	55 %	-30	-39	1 070	3.41	239	0.37					0.8	1.7	4.7	9.7	20	39	85	196	412			
Propylene glycol	60 %	-40	-46	1 079	3.30	969	0.37									2.3	4.9	9.4	20	47	99		
Hot propylene glycol	50 %	20	-32	1 038	3.63	6.1	0.38	0.9	1.7	2.3	3.2	4.7	5.9	8.2	12	20	41	67	111	172	291	512	845
Ethylene glycol	10 %	5	-3	1 018	4.02	2.1	0.54	1.3	2.3	3.2	4.3	6.3	7.9	11	16	27	52	86	141	218	366	640	940
Ethylene glycol	20 %	0	-8	1 036	3.82	3.4	0.50	1.1	2.0	2.8	3.8	5.6	7.0	9.6	14	24	47	77	127	197	331	581	910
Ethylene glycol	30 %	-5	-15	1 056	3.62	5.8	0.47	0.9	1.7	2.4	3.2	4.8	6.1	8.3	12	21	41	68	112	175	296	520	858
Ethylene glycol	35 %	-10	-19	1 066	3.51	8.6	0.45	0.6	1.4	2.1	2.9	4.3	5.4	7.5	11	19	38	62	103	161	273	481	795
Ethylene glycol	40 %	-15	-23	1 077	3.39	13	0.44	0.4	0.9	1.4	2.2	3.8	4.8	6.6	9.7	17	34	56	94	147	249	441	731
Ethylene glycol	45 %	-20	-28	1 088	3.27	21	0.43		0.6	0.9	1.4	2.4	3.3	5.2	8.4	15	30	50	84	132	225	399	663
Ethylene glycol	50 %	-25	-34	1 100	3.15	34	0.42			0.5	0.8	1.4	2.0	3.1	5.3	12	26	44	74	116	199	356	595
Ethylene glycol	55 %	-30	-40	1 112	3.01	57	0.41				0.5	0.8	1.1	1.8	3	6.7	18	37	63	101	174	312	524
Alkali	18 %	-10	-28	942	4.25	2.7	0.44	1.2	2.2	3.1	4.1	6.1	7.6	10	15	26	51	83	137	213	358	627	919
Alkali	21 %	-20	-37	939	4.27	4.3	0.41	1.1	2.0	2.8	3.8	5.6	7.0	10	14	24	48	78	129	201	339	596	921
Alkali	25 %	-30	-45	933	4.30	7.4	0.37	0.8	1.7	2.5	3.4	5.0	6.3	9	13	22	44	72	120	187	316	557	921
Calcium chloride	15 %	0	-11	1 086	4.04	2.4	0.55	1.3	2.3	3.3	4.4	6.4	8.1	11	16	27	54	88	144	223	375	657	1 009
Calcium chloride	20 %	-5	-17	1 117	3.99	3.5	0.54	1.2	2.2	3.0	4.1	6.0	7.6	10	15	26	51	83	137	213	359	630	1 024
Calcium chloride	25 %	-20	-29	1 143	3.96	9.9	0.51	0.6	1.5	2.4	3.3	4.9	6.2	8.5	12	22	43	71	118	185	313	553	916
Calcium chloride	30 %	-30	-55	1 278	3.93	25	0.48	0.3	0.6	1.0	1.6	2.8	3.8	6.1	10	19	38	64	107	168	286	509	848
Sodium chloride	10 %	0	-7	1 078	4.12	2.0	0.60	1.4	2.5	3.4	4.6	6.7	8.4	11	17	28	56	91	149	231	388	679	1 021
Sodium chloride	15 %	-5	-12	1 120	4.08	2.6	0.59	1.3	2.4	3.3	4.4	6.5	8.2	11	16	28	54	89	147	227	382	669	1 051
Sodium chloride	20 %	-10	-17	1 161	4.05	4.1	0.56	1.2	2.2	3.1	4.1	6.1	7.7	10	15	26	52	85	139	217	365	641	1 056
Lithium chloride	10 %	-5	-12	1 056	3.60	3.0	0.59	1.1	2.0	2.7	3.7	5.4	6.8	9.3	13	23	45	75	122	190	320	561	873
Lithium chloride	15 %	-15	-25	1 082	3.35	6.0	0.56	0.8	1.6	2.2	3.0	4.5	5.6	7.8	11	19	39	64	105	163	276	486	802
Potassium formate																							
Freezium	25 %	-5	-15	1 155	3.12	2.7	0.51	1.0	1.8	2.6	3.4	5.0	6.3	8.7	12	21	42	69	113	176	295	517	827
Hycool20, Freezium	30 %	-10	-20	1 206	2.93	3.8	0.50	0.9	1.7	2.3	3.1	4.6	5.7	7.9	11	20	39	63	104	162	272	478	787
Hycool30, Freezium	35 %	-25	-30	1 269	2.73	7.1	0.45	0.7	1.4	1.9	2.6	3.9	4.9	6.7	9.7	17	33	55	91	142	240	423	698
Tyfoxit F15	25 %	-5	-15	1 232	3.17	3.6	0.52	1.0	1.8	2.5	3.4	5.0	6.4	8.7	13	22	43	70	115	178	300	527	867
Tyfoxit F40	40 %	-25	-40	1 354	2.65	11	0.44	0.5	1.0	1.7	2.4	3.5	4.5	6.2	9	16	31	52	86	134	228	402	665
Potassium acetate																							
Tyfoxit	60 %	-10	-20	1 162	3.20	6.4	0.48	0.8	1.6	2.2	3.0	4.4	5.6	7.6	11	19	38	63	103	161	272	479	790
Tyfoxit	70 %	-25	-31	1 193	3.10	17	0.45	0.3	0.7	1.1	1.7	3.0	4.1	6	8.9	16	31	52	87	136	231	410	681
Tyfoxit	80 %	-35	-40	1 222	3.00	44	0.43		0.3	0.4	0.7	1.1	1.6	2.5	4.4	9.4	25	42	70	112	192	344	576
Potassium acetate-formate																							
Temper -10		0	-10	1 090	3.54	2.8	0.51	1.1	2.0	2.8	3.7	5.5	6.9	9.4	14	23	46	75	124	192	323	566	887
Temper -15		-5	-15	1 120	3.39	3.8	0.49	1.0	1.8	2.5	3.4	5.0	6.4	9.4	13	22	43	70	115	180	302	530	873
Temper -20		-10	-20	1 149	3.23	5.1	0.47	0.9	1.7	2.3	3.1	4.6	5.8	8	12	20	39	65	107	167	281	494	814
Temper -30		-20	-30	1 190	3.00	10	0.44	0.5	1.1	1.8	2.5	3.8	4.8	6.6	9.6	17	33	55	92	143	242	428	708
Temper -40		-30	-40	1 225	2.88	24	0.41		0.5	0.8	1.2	2.0	2.8	4.4	7.6	14	28	46	77	121	206	367	611
Temper -55		-45	-55	1 267	2.62	58	0.38			0.3	0.4	0.8	1.1	1.7	2.9	6.5	18	35	59	94	162	292	490
Temper -60		-50	-60	1 288	2.59	108	0.38				0.4	0.6	0.9	1.6	3.5	9.5	20	41	79	141	256	434	
Betaine (Thermera AC)		-5	-15	1 0																			