

# Industrial air cooler VCI

## Cooling/Freezing

Cu/Al - R404A

GEA Refrigeration



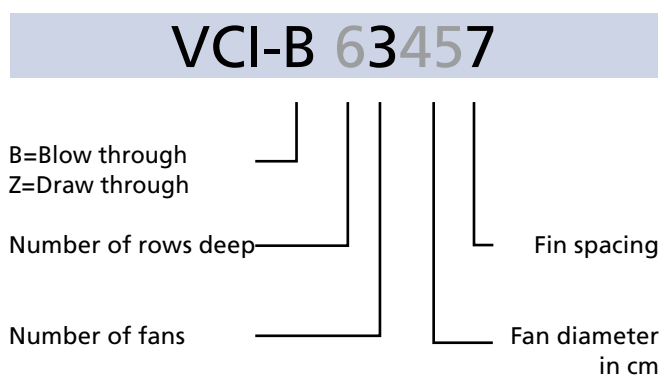
Goedhart



# Goedhart VCI

The extensive range Goedhart VCI single discharge ceiling mounted industrial air coolers are available with capacities between 3,4 and 149 kW. The Goedhart VCI air coolers are suitable for cooling and freezing applications and with a wide variety of accessories and options available. The coil block is standard build from aluminium end plates, copper tubes and aluminium fins. The fans are arranged for blow-through air configuration for the Goedhart VCI-B and draw-through for the Goedhart VCI-Z (please state which is required when ordering).. The modular design incorporates 5 different sizes of fan, with model options of up to 8 fans per cooler.

## Type description



## Coil block

- Tube pitch : 50x50 mm straight
- Fin spacing : 4, 6, 7, 8 and 10 mm
- Material : 15mm o.d copper tube
- : aluminium HT-lamellen
- Optimized cooling circuits
- Standard refrigerant connections are positioned on the left hand side of the unit when looking with the direction of the airflow.
- A good thermal contact is achieved by expansion of the tubes into the fin collars, that are also utilised as spacers to provide a constant distance between the fins.
- All coolers are pressure tested to 30 bar (lower by cooling mediums) and are supplied with a light over pressure charge of dry nitrogen.
- Suitable for all known refrigerants and coolants, with the exception of NH3.

## Casing

- Construction for ceiling mounting
- The flush mounting protects against and prevents accumulation of dust and dirt.
- Casing material of galvanized sheet steel
- Finishing is standard white epoxy spray (RAL 9003)
- Bend/header projection by end covers, easy removed for maintenance
- Hinged drip tray.
- Defrost by hot gas spiral or electric defrost elements will be fixed to the bottom side of the coil.

# General range features

## Capacity

The listed nominal cooling capacities are based on R404A en DT1

### Influence of Coating on Capacity

The use of coated fins, or of a fully coated coil will result in a capacity decrease of approximately 3%

### Capacity optimisation

Since Goedhart tries to limit stock products, we are capable of optimising the circuitry of our evaporators. In order to do this, the following information is needed :

- Design capacity
- Air volume
- Refrigerant
- Air on temperature
- Evaporating temperature
- Liquid temperature before expansion valve.

## Sound data

The mean sound pressure (LpA @ 3m ± 2 dB (A)) each air cooler is a calculated indication value according to the EN13487 standard parallel pipe. Goedhart uses the fan manufacturer's sound power level (LwA) at the inlet side of the fan. Changes to or by the fan or the product, affect the sound, in these cases, consult the manufacturer for the new indication value. In critical sound requirements, we advise you to consult an expert.

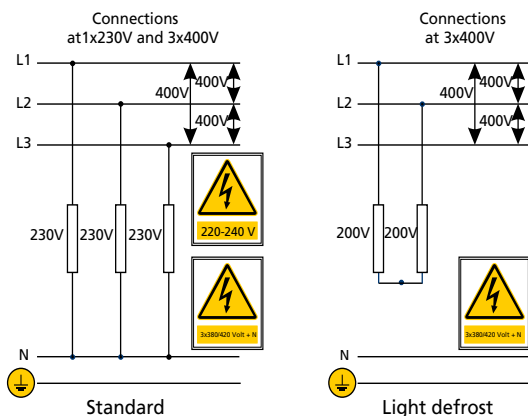
## Defrostsystem:

For room temperatures where ice build-up can be expected and where the coilblock can not be defrosted by the room air, electric or hotgas defrost is necessary.

With low temperatures we also advise fan periphery heating.

### Electrical defrost:

The Goedhart VRB and VRZ can be provided with electric defrost. A distinction can be made here between heavy defrost loads for low temperatures and light defrost load for higher temperatures (room temperature approximately 0 °C). The stainless steel heater elements are fitted in the coilblock in tubes, which forms a high conductive medium between the heaters and the fins. The driptray heaters are fitted to the underside of the aluminium inner tray with aluminium profiles. The heater elements which are rated for 220/240 V are connected for supply 380/415 V with neutral. The coilblock elements are removable from the end opposite to the refrigerant connections, whilst the tray heater elements can



be removed once the outer tray has been taken off.

### Hot gas defrost:

The coil block is suited for hot gas defrost (hot gas supply through the suction header). At an extra price the driptray can be provided with a hotgas/cooling medium spiral. The stainless steel tubes of the hotgas spiral are enclosed in special aluminium profiles that are rigidly secured to the underside of the aluminium inner tray, thus providing a good bond for maximum heat transfer. Just as with electric defrost a distinction is made with hotgas defrost between light defrost load (room temperature about 0°C) and heavy defrost load.

## Accessories:

Standard accessories for the Goedhart VCI air coolers are:

- blow-through / draw-through air configuration
- Electric defrost, hot gas defrost and/or water defrost
- Fan periphery heating
- Insulated drip tray
- Insulated hygienic polyester drip tray
- Goedhart VCI-Z supplied with bellmouth connection per fan for a longer air throw
- Goedhart VCI-B supplied with air diffusor for a longer air throw
- Goedhart VCI-B supplied with air diffusor with air operated damper to increase defrost efficiency (airvolume reduced to approx. 90% and capacity reduced to approx. 95%)

The accessories are included in the price list.

## Optional extras:

Various optional extras for the VCI are available, price and delivery upon request:

- Isulation disks
- Feet for floor mounting
- Coating of the coil block
- Fan hood
- 60 Hz motors
- EC-fans
- Single phase motors
- Coolants (glycol, water, etc.)
- Pump system
- Other casing materials
- Other fin spacings
- Sea water resistant fins

## Mounting and Maintenance

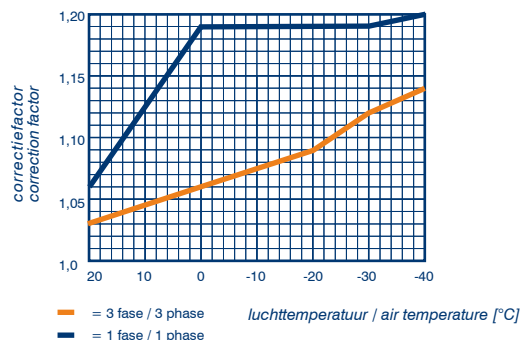
Goedhart VCI is delivered on a wooden frame. When on the frame, Goedhart VCI can be handled by forklift truck, which makes positioning and installation simple. Refer to our maintenance and installation manual.



# Fans

The manufacturer of the fans is Süd Electric (we reserve the right to alter the manufacturer). The fans have glass fibre reinforced polypropylene impellers. The motors are available for 400V-50Hz-3 phase or 230V-50Hz-1 phase electrical supply. 2-Speed regulation can be achieved at 400/690V-50Hz-3 phase by using a Δ-Y reconnection (fig. 1). 3 Phase motors are suitable for a frequency controller (A sinus filter is needed, fig. 2). 1 Phase motors are suitable for phase control and transformer. The motors are standard executed with a thermo contact. The fans are suitable for operation in air temperature applications between -40 °C and +45 °C. When the air temperature is lower than -40 °C, special fans are needed. These special fans have a longer delivery time. The technical data in the table below are the same as on the motor name plates and is valid for an air temperature of +40 °C.

For air temperatures lower than +40 °C, the current amperage can be calculated by using the diagram multiplication factor, suitable thermal overloads can then be selected.



## Three phase - 50 Hz

Fan type	Δ					Y			Protection class*	Fan heating
	Tension	Speed	Input	FLC	Sound power indication each fan LwA (+/-2dB(A))	Speed	Input	FLC		
	V	min <sup>-1</sup>	Watt	A	dB(A)	min <sup>-1</sup>	Watt	A		

### 4 pole motor (n=1500 rpm nom.)

400-32°	3x400/690	1350	250	0.60	74	1050	150	0.30	IP44	460
450-32°	3x400/690	1350	400	0.85	78	1050	300	0.50	IP44	580
500-40°	3x400/690	1380	880	1.90	85	1050	660	1.15	IP44	580
560-36°	3x400/690	1300	1250	2.30	85	1000	750	1.30	IP66	700
630-32°***	3x400/690	1300	1250	2.30	86	1000	750	1.30	IP66	820
630-28°***	3x230/400				88	1400	1400	2.50	IP66	820

### 6 pole motor (n=1000 rpm nom.)

400-28°	3x400/690	900	105	0.33	63	750	65	0.13	IP44	460
450-32°	3x400/690	900	180	0.40	69	750	120	0.20	IP44	580
500-40°	3x400/690	900	500	1.00	81	760	350	0.65	IP44	580
560-32°	3x400/690	880	680	1.60	75	680	400	0.90	IP66	700
630-36°	3x400/690	880	680	1.60	80	680	400	0.90	IP66	820

## Single phase - 50 Hz

Ventilator type	Speed	Input	FLC	Protection class*
	min <sup>-1</sup>	Watt	A	

### 4 pole motor (n=1500 rpm nom.)

400-32°	1350	450	1.95	IP44
450-32°	1350	450	1.95	IP44
500-40°	1330	700	3.40	IP44
560-36°	1350	920	4.00	IP66
630-32°	1350	1300	7.10	IP66

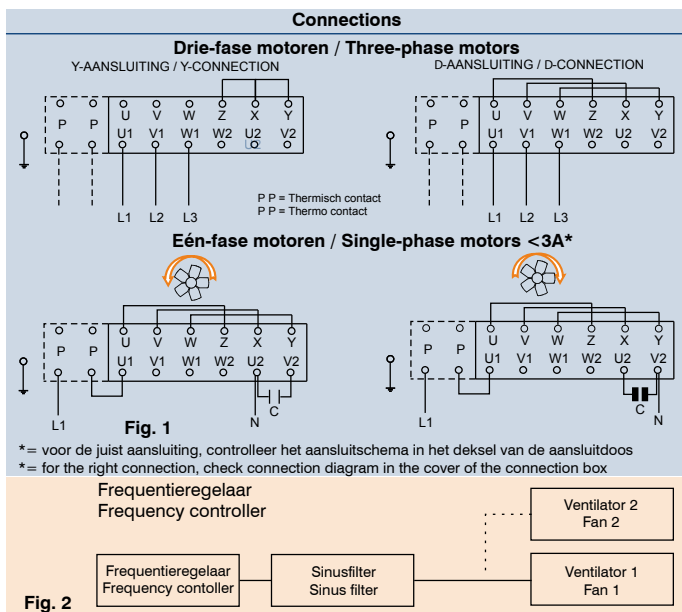
### 6 pole motor (n=1000 rpm nom.)

400-28°	900	250	1.10	IP44
450-32°	900	250	1.10	IP44
500-40°	900	400	1.75	IP44
560-32°	870	700	3.40	IP66
630-36°	870	700	3.40	IP66

\*= IP44 motors also available in IP66 execution (extra price)

\*\*= Only cooling conditions

\*\*\*= Only freezing conditions



# Correction factors

## Correction factors DT1 (=air-on)

The capacities are based on R-404A direct expansion, DT1 and a RH of 85 %. DT1 is the difference between air-on temperature and the evaporation temperature of the cooler. The evaporation temperature is the saturate temperature corresponding to the pressure at the suction outlet of the cooler.

The nominal capacities: (SC1)  $t_o=0^{\circ}\text{C}$  and  $\text{DT1}=10\text{K}$   
 (SC2)  $t_o=-8^{\circ}\text{C}$  and  $\text{DT1}=8\text{K}$   
 (SC3)  $t_o=-25^{\circ}\text{C}$  and  $\text{DT1}=7\text{K}$

Correction factors for various air-on temperatures and temperature differences (DT1) are as indicated in the table below. The requested capacity must be multiplied by a correction factor from the table. so that a cooler with the resulting nominal capacity can be chosen from the selection tables.

$Q_{\text{nominal}} = \text{factor} \times Q_{\text{requested}}$

## Cooling

DT1	SC1-DT1 =10K-Air-on=10°C (0/+10)									
	Evaporation temperature (°C)									
K	+7	+6	+5	+4	+3	+2	+1	0	-1	-2
6	1,87	1,87	1,87	1,88	1,88	1,89	1,89	1,89	1,89	1,90
7	1,53	1,53	1,54	1,54	1,54	1,55	1,55	1,55	1,55	1,56
8	1,28	1,28	1,28	1,29	1,29	1,30	1,30	1,30	1,30	1,31
9	1,11	1,11	1,11	1,12	1,12	1,13	1,13	1,13	1,13	1,14
10	0,98	0,98	0,98	0,99	0,99	0,99	1,00	1,00	1,00	1,01
11	0,89	0,89	0,89	0,90	0,90	0,91	0,91	0,91	0,91	0,92
12	0,78	0,79	0,79	0,79	0,80	0,80	0,80	0,80	0,80	0,81

## Cooling / Freezing

DT1	SC2-DT1 =8K-Air-on=0°C (-8/0)									
	Evaporation temperature (°C)									
K	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12
6	1,32	1,34	1,39	1,43	1,46	1,46	1,47	1,47	1,48	1,49
7	1,05	1,08	1,12	1,15	1,18	1,19	1,19	1,20	1,20	1,21
8	0,86	0,88	0,91	0,94	0,97	1,00	1,00	1,01	1,01	1,02
9	0,76	0,76	0,78	0,80	0,82	0,86	0,86	0,87	0,87	0,88
10	0,66	0,67	0,69	0,71	0,73	0,74	0,74	0,75	0,75	0,76
11	0,58	0,59	0,59	0,60	0,62	0,64	0,64	0,65	0,66	0,67
12	0,55	0,54	0,54	0,54	0,55	0,55	0,56	0,57	0,58	0,59

## Freezing

DT1	SC3-DT1 =7K-Air-on=-18°C (-25/-18)									
	Evaporation temperature (°C)									
K	-21	-22	-23	-24	-25	-26	-27	-28	-29	-30
6	1,20	1,20	1,21	1,21	1,22	1,22	1,23	1,23	1,24	1,24
7	0,99	0,99	0,99	1,00	1,00	1,00	1,01	1,01	1,02	1,02
8	0,83	0,84	0,84	0,84	0,85	0,85	0,85	0,85	0,86	0,86
9	0,72	0,72	0,72	0,73	0,73	0,73	0,73	0,74	0,74	0,74
10	0,63	0,63	0,63	0,64	0,64	0,64	0,64	0,65	0,65	0,65
11	0,56	0,56	0,56	0,57	0,57	0,57	0,50	0,58	0,58	0,58
12	0,50	0,51	0,51	0,51	0,51	0,51	0,52	0,52	0,52	0,52

## Rekenvoorbeeld

Lamelafstand	: 6 mm	-	DT1 = +3- (+10) = 7K
Gevraagde capaciteit	: 30 kW	-	Correctiefactor = 1,54
Luchtintrede temperatuur	: +10 oC	-	Vermenigvuldig gevraagde capaciteit met correctie factor.
Verdampingstemperatuur	: +3 oC		30 kW x 1,54 = 46,2 kW
Euroventconditie	: SC1		
Koudemiddel	: R-404A	-	Selecteer luchtkoeler uit tabel (SC1 type VCI-B 44566=46,5 kW)

# Attention!

### Moisture carry over from the coil block:

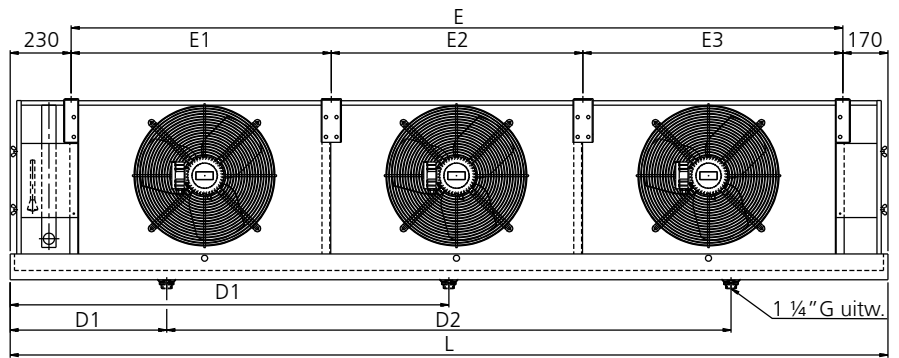
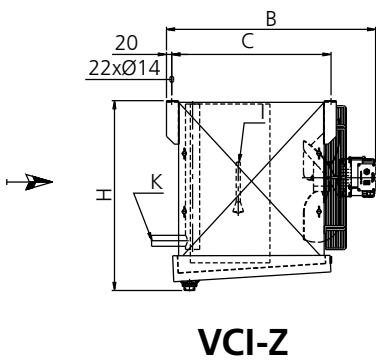
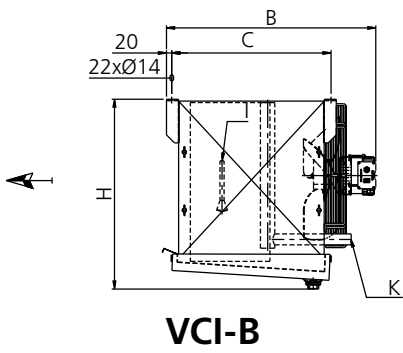
When you select VCI-B with a Ø500 mm fan in an application with a high relative humidity and/or defrost with room air, Goedhart advises the use of a fan with a low pitch angle or the draw-through execution VCI-Z. Thus, you will avoid the risk of moisture carry over from the coil block. The fan with a low pitch angle give a reducing of the capacity of approx. 5% and a reduction of the air volume of approx. 10%.

### Air throw\*\* (only draw-through execution)

The air throw mentioned in the selection table indicated with \*\* is based on an air temperature of 20°C, blowing under a flat ceiling without any obstruction. The height and air circulation fold of the room can influence the air throw. The air speed at the end of the throw-length is 0,25 m/sec

# VCI 8mm Technical data

Type VCI	3x400V-50H-4pole (1500 min <sup>-1</sup> nom.)								Dimensions										Connections			
	R404A			Air volume	LpA @ 3 m (+/- 2 dB(A))*	Surface	Internal volume	Weight	L	B	H	D	E1	E2	E3	D1	D2	Refrigerant				
	DT1 = 10K (SC1) lucht on= 0°C (0/+10)	DT1 = 8K (SC2) lucht on= 0°C (-8/0)	DT1 = 7K (SC3) lucht on= -18°C (-25/-18)															In	Uit	Hot gas	Air throw**	
	kW	kW	kW	m <sup>3</sup> /h	dB(A)	m <sup>2</sup>	dm <sup>3</sup>	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	m
6.1.40.8		4,7	3,5	3361	52	29	9	80	1156	770	620	600		756		578		12	15	19	20	
8.1.40.8		6,0	4,3	3244	52	39	11	94	1156	870	620	700		756		578		12	22	19	20	
1.1.40.8		6,7	4,6	3131	52	49	14	108	1156	970	620	800		756		578		12	22	19	20	
6.1.45.8		7,2	5,1	5090	56	40	12	95	1256	770	720	600		856		628		12	22	19	22,5	
8.1.45.8		8,7	6,3	4902	56	54	16	112	1256	870	720	700		856		628		12	22	19	22,5	
1.1.45.8		9,8	7,0	4730	56	67	19	130	1256	970	720	800		856		628		12	22	19	22,5	
6.1.50.8		9,7	7,0	7236	63	50	15	119	1456	890	720	700		1056		728		12	22	19	25	
8.1.50.8		11,6	8,5	6986	63	67	19	139	1456	990	720	800		1056		728		12	28	19	25	
1.1.50.8		13,3	9,6	6754	63	84	24	159	1456	1090	720	900		1056		728		12	28	19	25	
6.1.56.8		14,1	10,0	10380	63	74	21	162	1556	1010	920	800		1156		778		12	28	19	27,5	
8.1.56.8		16,1	11,0	10096	63	98	28	189	1556	1110	920	900		1156		778		12	28	19	27,5	
1.1.56.8		18,7	13,6	9827	63	123	35	215	1556	1210	920	1000		1156		778		12	35	19	27,5	
6.1.63.8		18,2	13,2	12925	63	101	29	201	1656	1010	1120	800		1256		828		12	28	19	27,5	
8.1.63.8		21,7	15,9	12630	63	134	38	236	1656	1110	1120	900		1256		828		16	35	19	27,5	
1.1.63.8		25,3	18,0	12344	63	168	47	269	1656	1210	1120	1000		1256		828		16	35	19	27,5	
6.2.40.8		10,0	7,1	6716	55	58	17	127	1856	770	620	600		1456		928		12	22	19	20	
8.2.40.8		12,0	8,6	6479	55	78	22	151	1856	870	620	700		1456		928		12	28	19	20	
1.2.40.8		13,4	9,7	6254	55	98	28	173	1856	970	620	800		1456		928		12	28	19	20	
6.2.45.8		14,5	10,2	10173	59	80	23	155	2056	770	720	600		1656		1028		12	28	19	22,5	
8.2.45.8		17,3	12,5	9794	59	107	30	186	2056	870	720	700		1656		1028		16	28	19	22,5	
1.2.45.8		19,6	13,9	9448	59	134	38	214	2056	970	720	800		1656		1028		16	35	19	22,5	
6.2.50.8		19,4	14,0	14463	66	100	29	199	2456	890	720	700		2056		1228		16	35	19	25	
8.2.50.8		23,2	16,9	13960	66	134	38	234	2456	990	720	800		2056		1228		16	35	19	25	
1.2.50.8		26,6	19,1	13496	66	168	47	269	2456	1090	720	900		2056		1228		16	35	35	25	
6.2.56.8		28,3	20,0	20752	66	147	42	274	2656	1010	920	800		2256		1328		16	35	35	27,5	
8.2.56.8		32,8	22,0	20178	66	197	55	322	2656	1110	920	900		2256		1328		16	42	35	27,5	
1.2.56.8		37,7	27,2	19642	66	246	69	369	2656	1210	920	1000		2256		1328		16	42	35	27,5	
6.2.63.8		36,7	26,3	25840	66	201	57	346	2856	1010	1120	800		2456		1428		16	42	35	27,5	
8.2.63.8		43,4	31,7	25249	66	268	75	409	2856	1110	1120	900		2456		1428		22	42	35	27,5	
1.2.63.8		48,8	35,9	24674	66	336	94	471	2856	1210	1120	1000		2456		1428		22	42	35	27,5	
6.3.45.8		21,8	15,4	15256	61	121	34	219	2856	770	720	600		2456		1428		16	35	19	22,5	
8.3.45.8		26,1	18,6	14685	61	161	45	261	2856	870	720	700		2456		1428		16	35	19	22,5	
1.3.45.8		29,5	21,1	14166	60	201	57	302	2856	970	720	800		2456		1428		16	42	35	22,5	
6.3.50.8		29,5	20,9	21690	67	151	43	281	3456	890	720	700	1028		2028	864	1728	16	42	35	25	
8.3.50.8		34,8	25,3	20936	67	201	57	331	3456	990	720	800	1028		2028	864	1728	16	42	35	25	
1.3.50.8		40,1	28,6	20238	67	252	71	382	3456	1090	720	900	1028		2028	864	1728	16	42	35	25	
6.3.56.8		42,7	30,0	31123	67	221	62	386	3756	1010	920	800	1128		2228	939	1878	16	42	35	27,5	
8.3.56.8		51,4	36,7	30261	67	295	83	457	3756	1110	920	900	1128		2228	939	1878	22	54	35	27,5	
1.3.56.8		58,2	42,0	29454	67	369	103	525	3756	1210	920	1000	1128		2228	939	1878	22	54	35	27,5	
6.3.63.8		55,5	38,8	38756	67	302	85	491	4056	1010	1120	800	1228		2428	1014	2028	22	54	35	27,5	
8.3.63.8		67,0	47,1	37867	67	403	113	582	4056	1110	1120	900	1228		2428	1014	2028	22	54	35	27,5	
1.3.63.8		75,9	54,1	37004	67	503	141	672	4056	1210	1120	1000	1228		2428	1014	2028	22	54	35	27,5	
6.4.45.8		29,3	20,8	20337	62	161	45	279	3656	770	720	600	1628		1628	914	1828	16	42	35	22,5	
8.4.45.8		34,5	25,0	19578	61	215	60	335	3656	870	720	700	1628		1628	914	1828	16	42	35	22,5	
1.4.45.8		39,3	28,2	18883	61	268	75	386	3656	970	720	800	1628		1628	914	1828	16	42	35	22,5	
6.4.50.8		38,9	27,9	28916	68	201	57	361	4456	890	720	700	2028		2028		2228	16	42	35	25	
8.4.50.8		46,9	33,7	27911	68	268	75	426	4456	990	720	800	2028		2028	1114	2228	22	42	35	25	
1.4.50.8		53,4	38,1	26979	68	335	94	492	4456	1090	720	900	2028		2028	1114	2228	22	54	35	25	
6.4.56.8		57,2	40,1	41494	68	295	83	498	4856	1010	920	800	2228		2228	1214	2428	22	54	35	27,5	
8.4.56.8		66,8	44,1	40345	68	394	110	589	4856	1110	920	900	2228		2228	1214	2428	22	54	35	27,5	
1.4.56.8		76,7	54,3	39268	68	492	137	677	4856	1210	920	1000	2228		2228	1214	2428	22	54	35	27,5	
6.4.63.8		74,2	52,6	51671	68	402	113	638	5256	1010	1120	800	2428		2428	1314	2628	22	54	35	27,5	
8.4.63.8		86,7	63,4	50486	68	537	150	755	5256	1110	1120	900	2428		2428	1314	2628	28	54	42	27,5	
1.4.63.8		97,7	71,7	49334	68	671	187	871	5256	1210	1120	1000	2428		2428	1314	2628	28	64	42	27,5	
6.5.45.8		36,2	26,0	25420	62	201	57	341	4456	770	720	600	1628		2428	1114	2228	16	42	35	22,5	
8.5.45.8		43,6	31,1	24470	62	268	75	410	4456	870	720	700	1628		2428	1114	2228	16	42	35	22,5	
1.5.45.8		49,3	34,8	23601	62	335	94	476	4456		720	800	1628		2428	1114	2228	22	42	35	22,5	
6.5.50.8		49,1	33,8	36143	69	251	71	442	5456	890	720	700	2028		3028	1364	2728	22	42	35	25	
8.5.50.8		59,4	40,7	34885	69	335	94	523	5456	990	720	800	2028		3028	1364	2728	22	54	35	25	
1.5.50.8		67,3	47,8	33721	69	419	117	603	5456	1090	720	900	2028		3028	1364	2728	22	54	35	25	
6.6.45.8		44,1	30,5	30502	63	241	68	403	5256	770	720	600	2428		2428	1314	2628	16	42	35	22,5	
8.6.45.8		52,7	37,1	29361	63	322	90	486	5256	870	720	700	2428		2428	1314	2628	22	54	35	22,5	
1.6.45.8		59,1	42,2	28318	63	402	113	563	5256	970	720	800	2428		2428	1314	2628	22	54	35	22,5	
6.6.50.8		58,6	41,9	43370	69	302	85	524	6456	890	720	700	2028	2000	2028	1076	2x2152	22	54	35	25	
8.6.50.8		69,7	50,6	41860	69	402	113	619	6456	990	720	800	2028	2000	2028	1076	2x2152	22	54	35	25	
1.6.50.8		80,9	57,1	40463	69	503	141	713	6456	1090	720	900	2028	2000	2028	1076	2x2152	22	54	42	25	
6.7.45.8</																						



# VCI Electrical defrost

Type VC	Light defrost								Heavy defrost*							
	Coil block			Drip tray				Total each air cooler	Coil block			Drip tray				Total each air cooler
	Number	Type of heating element	Total	Number	Type of heating element	Tension	Total		Number	Type of heating element	Total	Number	Type of heating element	Tension	Total	
	n	mm	kW	aantal	mm	V	kW		kW	n	mm	kW	aantal	mm	V	
4.1.40.f	2	1900	1,52	1	2800	230	1,16	2,68	3	1900	2,28	2	2500	200	1,56	3,84
6.1.40.f	2	1900	1,52	1	2800	230	1,16	2,68	4	1900	3,04	2	2500	200	1,56	4,6
8.1.40.f	3	1900	2,28	1	2800	230	1,16	3,44	6	1900	4,56	2	2500	200	1,56	6,12
1.1.40.f	3	1900	2,28	1	3100	230	1,29	3,57	6	1900	4,56	2	2500	200	1,56	6,12
4.1.45.f	2	2200	1,78	1	3100	230	1,29	3,07	3	2200	2,67	2	2800	200	1,76	4,43
6.1.45.f	3	2200	2,67	1	3100	230	1,29	3,96	4	2200	3,56	2	2800	200	1,76	5,32
8.1.45.f	4	2200	3,56	1	3100	230	1,29	4,85	6	2200	5,34	2	2800	200	1,76	7,1
1.1.45.f	4	2200	3,56	1	3400	230	1,42	4,98	6	2200	5,34	2	2800	200	1,76	7,1
4.1.50.f	2	2500	2,04	1	3400	230	1,42	3,46	3	2500	3,06	2	3100	200	1,96	5,02
6.1.50.f	3	2500	3,06	1	3400	230	1,42	4,48	4	2500	4,08	2	3100	200	1,96	6,04
8.1.50.f	4	2500	4,08	1	3700	230	1,55	5,63	6	2500	6,12	2	3100	200	1,96	8,08
1.1.50.f	4	2500	4,08	2	3100	200	1,96	6,04	6	2500	6,12	2	3100	200	1,96	8,08
4.1.56.f	3	2800	3,48	1	3700	230	1,55	5,03	4	2800	4,64	2	3400	200	2,14	6,78
6.1.56.f	4	2800	4,64	1	3700	230	1,55	6,19	6	2800	6,96	2	3400	200	2,14	9,1
8.1.56.f	6	2800	6,96	2	3400	200	2,14	9,1	8	2800	9,28	2	3400	200	2,14	11,42
1.1.56.f	6	2800	6,96	2	3400	200	2,14	9,1	8	2800	9,28	2	3400	200	2,14	11,42
4.1.63.f	5	3100	6,45	1	4000	230	1,68	8,13	6	3100	7,74	2	3700	200	2,34	10,08
6.1.63.f	5	3100	6,45	1	4000	230	1,68	8,13	6	3100	7,74	2	3700	200	2,34	10,08
8.1.63.f	7	3100	9,03	2	3700	200	2,34	11,37	9	3100	11,61	2	3700	200	2,34	13,95
1.1.63.f	7	3100	9,03	2	3700	200	2,34	11,37	9	3100	11,61	2	3700	200	2,34	13,95
4.2.40.f	2	3400	2,84	1	4300	230	1,81	4,65	3	3400	4,26	2	4000	200	2,54	6,8
6.2.40.f	2	3400	2,84	1	4300	230	1,81	4,65	4	3400	5,68	2	4000	200	2,54	8,22
8.2.40.f	3	3400	4,26	1	4300	230	1,81	6,07	6	3400	8,52	2	4000	200	2,54	11,06
1.2.40.f	3	3400	4,26	1	4600	230	1,94	6,2	6	3400	8,52	2	4000	200	2,54	11,06
4.2.45.f	2	3700	3,1	1	4600	230	1,94	5,04	3	3700	4,65	2	4300	200	2,74	7,39
6.2.45.f	3	3700	4,65	1	4600	230	1,94	6,59	4	3700	6,2	2	4300	200	2,74	8,94
8.2.45.f	4	3700	6,2	1	4600	230	1,94	8,14	6	3700	9,3	2	4300	200	2,74	12,04
1.2.45.f	4	3700	6,2	1	4900	230	2,07	8,27	6	3700	9,3	2	4300	200	2,74	12,04
4.2.50.f	2	4600	3,88	1	5500	230	2,13	6,01	3	4600	5,82	2	5200	200	3,34	9,16
6.2.50.f	3	4600	5,82	1	5500	230	2,13	7,95	4	4600	7,76	2	5200	200	3,34	11,1
8.2.50.f	4	4600	7,76	1	5500	230	2,13	9,89	6	4600	11,64	2	5200	200	3,34	14,98
1.2.50.f	4	4600	7,76	2	5200	200	3,34	11,1	6	4600	11,64	2	5200	200	3,34	14,98
4.2.56.f	3	4900	6,21	1	6100	230	2,6	8,81	4	4900	8,28	2	5500	200	3,52	11,8
6.2.56.f	4	4900	8,28	1	6100	230	2,6	10,88	6	4900	12,42	2	5500	200	3,52	15,94
8.2.56.f	6	4900	12,42	2	5500	200	3,52	15,94	8	4900	16,56	2	5500	200	3,52	20,08
1.2.56.f	6	4900	12,42	2	5500	200	3,52	15,94	8	4900	16,56	2	5500	200	3,52	20,08
4.2.63.f	5	5500	11,65	1	6400	230	2,76	14,41	6	5500	13,98	2	6100	200	3,92	17,9
6.2.63.f	5	5500	11,65	1	6400	230	2,76	14,41	6	5500	13,98	2	6100	200	3,92	17,9
8.2.63.f	7	5500	16,31	2	6100	200	3,92	20,23	9	5500	20,97	2	6100	200	3,92	24,89
1.2.63.f	7	5500	16,31	2	6100	200	3,92	20,23	9	5500	20,97	2	6100	200	3,92	24,89
4.3.45.f	2	5500	4,66	1	6400	230	2,76	7,42	3	5500	6,99	2	6100	200	3,92	10,91
6.3.45.f	3	5500	6,99	1	6400	230	2,76	9,75	4	5500	9,32	2	6100	200	3,92	13,24
8.3.45.f	4	5500	9,32	1	6400	230	2,76	12,08	6	5500	13,98	2	6100	200	3,92	17,9
1.3.45.f	4	5500	9,32	1	6400	230	2,76	12,08	6	5500	13,98	2	6100	200	3,92	17,9
4.3.50.f	4	3400	5,68	2	3700	200	2,34	8,02	6	3400	8,52	4	3700	200	4,68	13,2
6.3.50.f	6	3400	8,52	2	3700	200	2,34	10,86	8	3400	11,36	4	3700	200	4,68	16,04
8.3.50.f	8	3400	11,36	2	3700	200	2,34	13,7	12	3400	17,04	4	3700	200	4,68	21,72
1.3.50.f	8	3400	11,36	4	3700	200	4,68	16,04	12	3400	17,04	4	3700	200	4,68	21,72
4.3.56.f	6	3700	9,3	2	4000	200	2,54	11,84	8	3700	12,4	4	4000	200	5,08	17,48
6.3.56.f	8	3700	12,4	2	4000	200	2,54	14,94	12	3700	18,6	4	4000	200	5,08	23,68
8.3.56.f	12	3700	18,6	4	4000	200	5,08	23,68	16	3700	24,8	4	4000	200	5,08	29,88
1.3.56.f	12	3700	18,6	4	4000	200	5,08	23,68	16	3700	24,8	4	4000	200	5,08	29,88
4.3.63.f	10	4000	16,8	2	4300	200	2,74	19,54	12	4000	20,16	4	4300	200	5,48	25,64
6.3.63.f	10	4000	16,8	2	4300	200	2,74	19,54	12	4000	20,16	4	4300	200	5,48	25,64
8.3.63.f	14	4000	23,52	4	4300	200	5,48	29	18	4000	30,24	4	4300	200	5,48	35,72
1.3.63.f	14	4000	23,52	4	4300	200	5,48	29	18	4000	30,24	4	4300	200	5,48	35,72
4.4.45.f	4	3400	5,68	2	4000	200	2,54	8,22	6	3400	8,52	4	4000	200	5,08	13,6
6.4.45.f	6	3400	8,52	2	4000	200	2,54	11,06	8	3400	11,36	4	4000	200	5,08	16,44
8.4.45.f	8	3400	11,36	2	4000	200	2,54	13,9	12	3400	17,04	4	4000	200	5,08	22,12
1.4.45.f	8	3400	11,36	4	4000	200	5,08	16,44	12	3400	17,04	4	4000	200	5,08	22,12
4.4.50.f	4	4300	7,24	2	4600	200	2,92	10,16	6	4300	10,86	4	4600	200	5,84	16,7
6.4.50.f	6	4300	10,86	2	4600	200	2,92	13,78	8	4300	14,48	4	4600	200	5,84	20,32
8.4.50.f	8	4300	14,48	2	4600	200	2,92	17,4	12	4300	21,72	4	4600	200	5,84	27,56
1.4.50.f	8	4300	14,48	4	4600	200	5,84	20,32	12	4300	21,72	4	4600	200	5,84	27,56
4.4.56.f	6	4600	11,64	2	5200	200	3,34	14,98	8	4600	15,52	4	5200	200	6,68	22,2
6.4.56.f	8	4600	15,52	2	5200	200	3,34	18,86	12	4600	23,28	4	5200	200	6,68	29,96
8.4.56.f	12	4600	23,28	4	5200	200	6,68	29,96	16	4600	31,04	4	5200	200	6,68	37,72
1.4.56.f	12	4600	23,28	4	5200	200	6,68	29,96	16	4600	31,04	4	5200	200	6,68	37,72
4.4.63.f	10	5200	22	2	5500	200	3,52	25,52	12	5200	26,4	4	5500	200	7,04	33,44
6.4.63.f	10	5200	22	2	5500	200	3,52	25,52	12	5200	26,4	4	5500	200	7,04	33,44
8.4.63.f	14	5200	30,8	4	5500	200	7,04	37,84	18	5200	39,6	4	5500	200	7,04	46,64
1.4.63.f	14	5200	30,8	4	5500	200	7,04	37,84	18	5200	39,6	4	5500	200	7,04	46,64

f = Fin spacing

\* = Always heavy electric defrost when using cooling mediums.





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