



Goedhart VRB / VRZ

Industrial air coolers for cooling & freezing applications
StSt/Al

$\text{NH}_3 - \text{CO}_2$



Goedhart VRB/VRZ

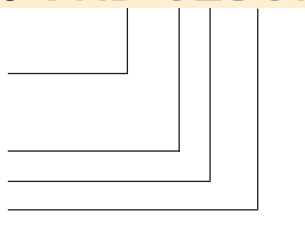
The range Goedhart VRB/VRZ single discharge ceiling mounted industrial air coolers consists of 902 types with capacities between 3,3 and 236,3 kW. The Goedhart VRB/VRZ air coolers are suitable for cooling and freezing applications and with a wide variety of accessories and options available. The coil block is standard build from aluminium end plates, stainless steel 304 tubes and aluminium fins. The fans are arranged for blow-through air configuration for the Goedhart VRB and draw-through for the Goedhart VRZ (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

Goedhart VRB 62567

B=blow through
Z=draw through

Number of rows deep
Number of fans
Fan diameter [cm]
Fins spacing [mm]



Coil block

- Tube pitch : 50x50 mm straight
- Fin spacings : 4, 6, 7, 8, 10 and 12 mm
- Material : 15 mm o.d stainless steel 304 tubes
- : aluminium HT-fins
- 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 hydraulic 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.
- Standard the air coolers are suitable for NH₃-pumpcirculation (ratio 2/4).

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 protection by end covers, easy removed for maintenance
- Defrost by hot gas spiral or electric defrost elements will be fixed to the bottom side of the coil.
- Stainless steel fasteners.

General range features

Capacity

The listed nominal cooling capacities are based on NH₃, DT1, a RH of 85% and 4 pole 3 phase fans connected in D.

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.

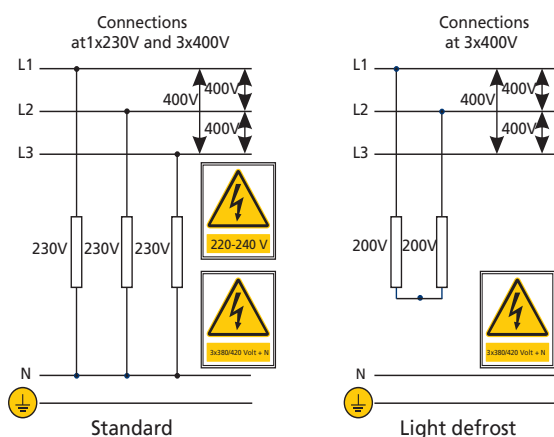
Defrostsystem:

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.

Hotgas defrost:

The coilblock can be made suitable for hotgas. 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 VRB/VRZ air coolers are:

- Electric, hotgas and/or water defrost system.
- Fan periphery heating.
- Hinged drip tray.
- Insulation within the driptray.
- Insulated hygienic polyester driptray.
- Goedhart VRZ supplied with bellmouth connection per fan for a longer air throw
- Goedhart VRB supplied with air diffusor for a longer air throw
- Goedhart VRB 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.

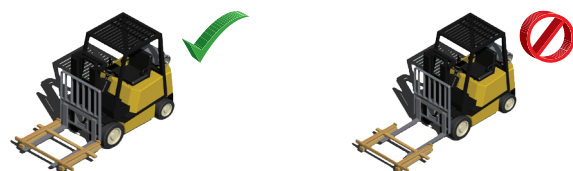
Optional extras:

Various optional extras for the VRB/VRZ are available, price and delivery upon request:

- Insulation discs
- Feet for floor mounting
- Coating of the coilblock
- Fan hood
- 60 Hz motors
- EC-fans
- Single phase motors
- Over heat protection on the motors
- Glycol/water/etc. cooling mediums, NH₃ dx, R22 dx/pump-system.
- Stainless steel casing
- Coupling between hotgas spiral and coilblock
- Other fin spacings
- Stainless steel 316 tubes

Mounting and Maintenance

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



Fans

Because of the flexible construction of the Goedhart VRB/VRZ air cooler, in principle it is possible to deliver with different fans. GEA Goedhart selected a standard fan range of Ziehl Abegg (we reserve the right to alter the manufacturer) which fit perfectly on the Goedhart VRB/VRZ air coolers. The fans can be supplied in both blow-through and draw-through executions. Against an extra price and with extra delivery times stainless steel guards and EC-fans are available.

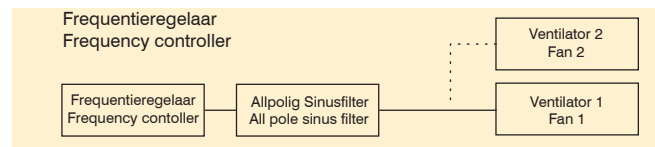
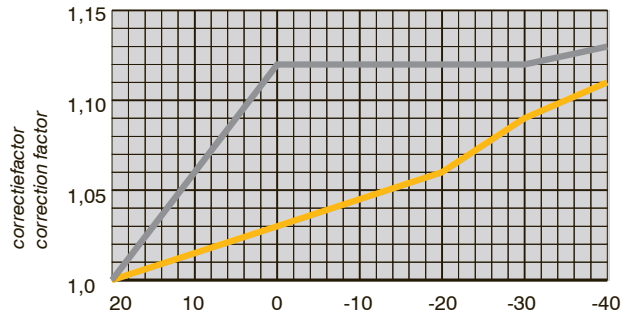
Execution

The fans meet the ErP directive. The fans have very good aerodynamic features because of the special impeller geometry. This special impeller geometry gives the fan a low noise level and an high efficiency.

1x230V fans are suitable for a room temperature till -25°C. 3x400V fans are suitable for a room temperature till -40°C. When lower room temperatures are desired, special fans are need.

- Tension : 3x400V-50Hz-3 phase
: 1x230V-50Hz-1 phase
(60Hz execution on request)
- Protection class : IP44 / IP54
- Color : RAL9005 (black)
- Speed controlling : - 3 Phase motors are suitable for 2-speed regulation by Δ -Y reconnection.
- 3 Phase motors are suitable for frequency controller with all-pole sinus filter.
- 1 Phase motors are suitable for phase control and transformer.

The motors are standard executed with a thermo contact (TB) and must be connected to prevent motor damages. The maximum allowable working data in the table and on the name plate of the fans are to operate in an air temperature of 20 °C (air density of $\rho = 1,2 \text{ kg/m}^3$). For air temperatures lower then +20 °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	Tension V	Δ				Y				Wiring diagram blow-through/ draw-through
		Speed min ⁻¹	Input Watt	FLC A	Sound power indication each fan LwA (+/-2dB(A)) dB(A)	Speed min ⁻¹	Input Watt	FLC A	Sound power indication each fan LwA (+/-2dB(A)) dB(A)	
4 pole (n=1500 min⁻¹ nom.)										
FN040	3x400/690	1370	230	0.44	76	1110	170	0.27	70,5	108B/108A
FN045	3x400/690	1250	350	0.64	78	950	220	0.35	70	108B/108A
FN050	3x400/690	1330	830	1.45	81	940	550	0.97	75	108B/108A
FN056	3x400/690	1280	1050	2.20	85	920	580	1.10	76	108B/108A
FE063	3x400/690	1330	1450	2.60	89	1080	980	1.60	84	108B/108A
6 pole (n=1000 min⁻¹ nom.)										
FN045	3x400/690	860	170	0.39	67	640	100	0.19	61	108B/108A
FN050	3x400/690	870	290	0.74	72	590	150	0.36	64	108B/108A
FN056	3x400/690	870	340	0.70	73	630	210	0.38	65	108B/108A
FN063	3x400/690	900	630	1.25	74	720	440	0.73	69	108B/108A

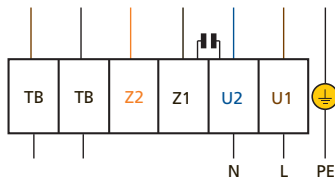
Single phase - 50 Hz

Fan type	Speed min ⁻¹	Input Watt	FLC A	Sound power indication each fan LwA (+/-2dB(A)) dB(A)	Wiring diagram blow-through/ draw-through
4 pole (n=1500 min⁻¹ nom.)					
FN040	1350	240	1.10	76	104B/104A
FN045	1290	390	1.75	80	104B/104A
FN050	1230	750	3.35	81,5	104B/104A
6 pole (n=1000 min⁻¹ nom.)					
FN040	950	130	0.58	68	104B/104A
FN045	860	180	0.82	68,5	104B/104A
FN050	910	300	1.30	71,5	104B/104A

Wiring diagram fans for blow-through air coolers

Ziehl Abegg 1x230V-50Hz (104XB)

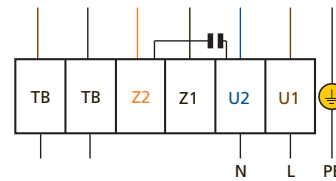
U1 = bruin
 U2 = blauw
 Z1 = zwart
 Z2 = oranje
 TB = wit



Wiring diagram fans for draw-through air coolers

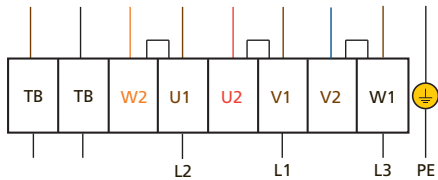
Ziehl Abegg 1x230V-50Hz (104XA)

U1 = bruin
 U2 = blauw
 Z1 = zwart
 Z2 = oranje
 TB = wit



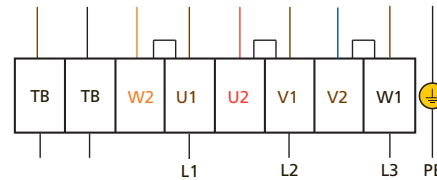
Ziehl Abegg 3x400V (Δ)-50Hz (108XB)

U1 = bruin
 V1 = blauw
 W1 = zwart
 U2 = rood
 V2 = grijs
 W2 = oranje
 TB = wit



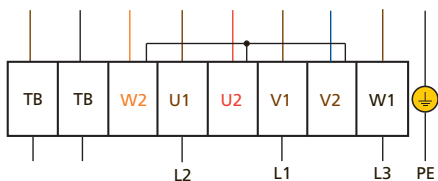
Ziehl Abegg 3x400V (Δ)-50Hz (108XA)

U1 = bruin
 V1 = blauw
 W1 = zwart
 U2 = rood
 V2 = grijs
 W2 = oranje
 TB = wit



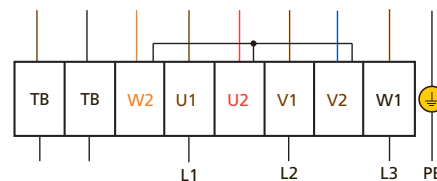
Ziehl Abegg 3x400V (Y)-50Hz (108XB)

U1 = bruin
 V1 = blauw
 W1 = zwart
 U2 = rood
 V2 = grijs
 W2 = oranje
 TB = wit



Ziehl Abegg 3x400V (Y)-50Hz (108XA)

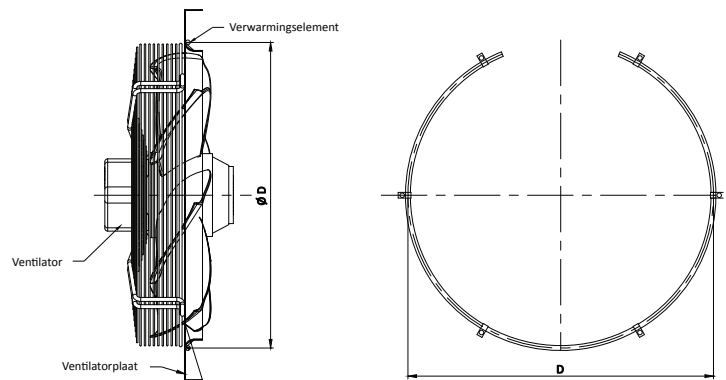
U1 = bruin
 V1 = blauw
 W1 = zwart
 U2 = rood
 V2 = grijs
 W2 = oranje
 TB = wit



Fan heating

To prevent the freezing of the impeller of the fan during the defrost cyclus of the air cooler, a fan heater can be used.

Fan diameter	Diameter element	Power (230V)
mm	D in mm	kW
400	435	0,50
450	485	0,63
500	535	0,63
560	595	0,76
630	665	0,89



Correction factors

Capacities at DT1:

Hereby the capacities are based on NH₃ pump system and DT1. DT1 is the difference between air-on temperature and the evaporation temperature of the cooler. The evaporation temperature is the saturated temperature corresponding to the pressure at the suction outlet of the cooler. The nominal capacities are based on evaporation temperatures of -8°C and DT1=8K and -25°C and DT1=7K and light frosting. Capacities for other mediums and systems are available upon request.

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.

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

NH₃ light frost = 0.2 mm RH = 85%

DT1 K	Evaporation temperature (°C)													
	0	-2,5	-5	-7,5	-10	-12,5	-15	-20	-22,5	-25	-27,5	-30	-32,5	-35
5	1.63	1.69	1.75	1.80	1.85	1.90	1.95	1.48	1.51	1.54	1.57	1.60	1.63	1.65
6	1.29	1.34	1.39	1.43	1.47	1.50	1.54	1.17	1.20	1.22	1.24	1.26	1.29	1.31
7	1.06	1.11	1.14	1.17	1.21	1.24	1.26	0.97	0.99	1.00	1.02	1.04	1.06	1.07
8	0.90	0.94	0.97	1.00	1.02	1.04	1.06	0.82	0.83	0.85	0.86	0.88	0.89	0.91
9	0.78	0.80	0.84	0.86	0.88	0.90	0.92	0.70	0.72	0.73	0.75	0.76	0.77	0.78
10	0.68	0.70	0.74	0.76	0.78	0.79	0.80	0.62	0.63	0.64	0.65	0.66	0.67	0.69
11	0.61	0.63	0.66	0.68	0.69	0.70	0.71	0.55	0.56	0.57	0.58	0.59	0.60	0.60
12	0.54	0.56	0.59	0.60	0.62	0.63	0.64	0.49	0.50	0.51	0.52	0.53	0.54	0.53

 = gerekend zonder berijping

NH₃ normal frost = 0.5 mm RH= 85%

DT1 K	Evaporation temperature (°C)													
	0	-2,5	-5	-7,5	-10	-12,5	-15	-20	-22,5	-25	-27,5	-30	-32,5	-35
5		1.86	1.92	1.98	2.03	2.08	2.13	1.68	1.71	1.73	1.74	1.76	1.79	1.80
6		1.48	1.52	1.57	1.61	1.65	1.68	1.33	1.34	1.35	1.37	1.38	1.39	1.40
7		1.22	1.26	1.29	1.33	1.36	1.39	1.08	1.09	1.10	1.11	1.12	1.13	1.14
8		1.04	1.07	1.09	1.12	1.14	1.16	0.91	0.92	0.93	0.95	0.96	0.97	0.98
9			0.92	0.95	0.97	0.99	1.00	0.79	0.80	0.81	0.81	0.82	0.83	0.84
10			0.81	0.83	0.85	0.86	0.88	0.69	0.70	0.71	0.71	0.72	0.74	0.74
11			0.72	0.74	0.76	0.77	0.78	0.61	0.62	0.63	0.64	0.64	0.65	0.66
12			0.65	0.67	0.68	0.69	0.70	0.55	0.56	0.57	0.58	0.59	0.60	0.61

Attention!




ATTENTION !!!

When making your selection, pay attention to the ratio between the air volume and capacity. A low volume to capacity ratio results in a wide temperature drop across the coil which cause to dry out (especially on coils with a high number of rows deep).

Moisture carry over from the coil block:

When you select VRB 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 VRZ. 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%.

Goedhart VRB/VRZ 8mm

	Type VRB VRZ	3x400V-50H-4polig (1500 min ⁻¹ nom.)				Air volume	LpA @ 3 m (+/- 2 dB(A))*	Surface	Internal volume	Weight	Dimensions								Connections							
		NH3		m ³ /h	dB(A)						m ²	dm ³	kg	L	B	H	C	E1	E2	E3	D1	D2	Refrigerant			
		kW	kW																				I In	K Out	Hot gas	Air throw**
	6.1.40.8	6,9	4,9	3330	54,3	30	8	87	1156	740	620	600	756		578		21,3	21,3	22	20						
	8.1.40.8	8,0	5,6	3183	54,3	39	11	101	1156	840	620	700	756		578		21,3	21,3	22	20						
	1.1.40.8	8,7	6,2	3047	54,3	49	14	115	1156	940	620	800	756		578		21,3	21,3	22	20						
	6.1.45.8	10,1	7,3	5038	56,2	41	11	104	1256	710	720	600	856		628		21,3	26,7	22	22,5						
	8.1.45.8	11,7	8,4	4794	56,2	54	15	120	1256	810	720	700	856		628		21,3	26,7	22	22,5						
	1.1.45.8	12,7	9,1	4575	56,2	68	19	139	1256	910	720	800	856		628		21,3	26,7	22	22,5						
	6.1.50.8	13,7	9,8	7130	59,1	51	14	133	1456	830	720	700	1056		728		21,3	26,7	22	25						
	8.1.50.8	16,0	11,5	6856	59,1	68	19	154	1456	930	720	800	1056		728		21,3	26,7	22	25						
	1.1.50.8	17,6	12,6	6608	59,1	84	23	174	1456	1030	720	900	1056		728		21,3	33,7	22	25						
	6.1.56.8	19,6	14,2	10120	62,8	74	20	177	1556	930	920	800	1156		778		21,3	33,7	22	27,5						
	8.1.56.8	23,1	16,6	9811	62,8	99	27	205	1556	1030	920	900	1156		778		21,3	33,7	22	27,5						
	1.1.56.8	25,3	18,4	9536	62,8	124	34	233	1556	1130	920	1000	1156		778		21,3	33,7	22	27,5						
	6.1.63.8	25,1	18,2	12577	66,6	101	27	228	1656	945	1120	800	1256		828		21,3	33,7	22	27,5						
	8.1.63.8	29,7	21,3	12294	66,6	135	36	264	1656	1045	1120	900	1256		828		21,3	42,2	22	27,5						
1.1.63.8	32,9	23,3	12018	66,6	169	45	300	1656	1145	1120	1000	1256		828		21,3	42,2	22	27,5							
	6.2.40.8	13,8	9,9	6651	57,0	59	16	138	1856	740	620	600	1456		928		21,3	26,7	22	20						
	8.2.40.8	15,9	11,2	6355	57,0	79	21	162	1856	840	620	700	1456		928		21,3	26,7	22	20						
	1.2.40.8	17,3	12,4	6082	57,0	98	27	185	1856	940	620	800	1456		928		21,3	33,7	22	20						
	6.2.45.8	20,1	14,5	10065	58,9	81	22	168	2056	710	720	600	1656		1028		21,3	33,7	22	22,5						
	8.2.45.8	23,3	16,7	9575	58,9	108	29	199	2056	810	720	700	1656		1028		21,3	33,7	22	22,5						
	1.2.45.8	25,0	18,2	9134	58,9	135	36	229	2056	910	720	800	1656		1028		21,3	33,7	22	22,5						
	6.2.50.8	27,3	19,6	14249	61,7	101	27	224	2456	830	720	700	2056		1228		21,3	33,7	22	25						
	8.2.50.8	31,9	23,0	13700	61,7	135	36	261	2456	930	720	800	2056		1228		21,3	42,2	22	25						
	1.2.50.8	35,2	25,1	13203	61,7	168	45	297	2456	1030	720	900	2056		1228		21,3	42,2	22	25						
	6.2.56.8	39,2	28,3	20231	65,4	148	40	300	2656	930	920	800	2256		1328		21,3	42,2	22	27,5						
	8.2.56.8	46,1	33,2	19610	65,4	197	53	351	2656	1030	920	900	2256		1328		26,7	42,2	22	27,5						
	1.2.56.8	50,5	36,7	19057	65,4	247	66	400	2656	1130	920	1000	2256		1328		26,7	42,2	22	27,5						
	6.2.63.8	50,1	36,4	25147	69,2	202	54	397	2856	945	1120	800	2456		1428		26,7	42,2	22	27,5						
	8.2.63.8	59,3	42,6	24579	69,2	269	72	462	2856	1045	1120	900	2456		1428		26,7	48,3	22	27,5						
1.2.63.8	65,8	46,1	24021	69,2	336	90	527	2856	1145	1120	1000	2456		1428		26,7	48,3	33,7	27,5							
	6.3.45.8	30,1	21,8	15091	60,4	121	33	237	2856	710	720	600	2456		1428		21,3	42,2	22	22,5						
	8.3.45.8	34,9	25,1	14355	60,4	162	44	280	2856	810	720	700	2456		1428		21,3	42,2	22	22,5						
	1.3.45.8	38,0	27,3	13694	60,4	202	54	322	2856	910	720	800	2456		1428		21,3	42,2	22	22,5						
	6.3.50.8	40,7	29,4	21370	63,1	151	41	319	3456	830	720	700	2028	2028	864	1728	26,7	42,2	22	25						
	8.3.50.8	47,9	34,5	20544	63,1	202	54	372	3456	930	720	800	2028	2028	864	1728	26,7	42,2	22	25						
	1.3.50.8	52,2	37,9	19798	63,1	252	68	425	3456	1030	720	900	2028	2028	864	1728	26,7	42,2	22	25						
	6.3.56.8	58,6	42,0	30341	66,8	222	60	424	3756	930	920	800	2228	2228	939	1878	26,7	48,3	22	27,5						
	8.3.56.8	68,9	48,7	29410	66,8	296	79	498	3756	1030	920	900	2228	2228	939	1878	26,7	48,3	22	27,5						
	1.3.56.8	76,5	54,9	28579	66,8	370	99	570	3756	1130	920	1000	2228	2228	939	1878	33,7	60,3	33,7	27,5						
	6.3.63.8	75,1	54,6	37717	70,6	303	81	576	4056	945	1120	800	2228	2428	1014	2028	33,7	60,3	33,7	27,5						
	8.3.63.8	88,9	64,1	36863	70,6	403	108	672	4056	1045	1120	900	2228	2428	1014	2028	33,7	60,3	33,7	27,5						
	1.3.63.8	98,6	70,8	36024	70,6	504	135	755	4056	1145	1120	1000	2228	2428	1014	2028	33,7	60,3	33,7	27,5						

Pay attention to the relation capacity / air volume !!

* = Sound pressure indication (LpA) at 3 m distance each air cooler (+/- 2 dB(A)), free field conditions, according EN13487

** = Air throw see remark page 5

For moisture carry over see remark pag 5

Capacities and air volumes with 60 Hz fans on request or in our GPC selection program available.

Goedhart VRB/VRZ Drawing

