Industrial air cooler DVS

Cooling and working rooms

Cu/Al - R404A

Goedhart

Goedhart DVS

The Goedhart DVS range of dual discharge ceiling mounted air coolers consists of 162 types with capacities between 3,1 and 151.7 kW. The aircoolers are especially suitable for cooling and working room applications. The height of the aircooler is low, so the maximum space in the chill room can be utilised. The coil block is standard build from aluminium end plates, copper tubes and aluminium fins. The fans are arranged for blow-through or draw-through air configuration (please state which is required when ordering).The modular design incorporates 5 different sizes of fan, with model options of up to 6 fans per cooler.

Type description

DVS 66457

- 6 — Number of rows deep
- 4 — Fin spacing
- 6 — Number of fans
- 57 — Fan diameter in cm

Coil execution

- Tube pitch : 50x50 mm straight
- Fin spacings : 4, 7, 10 mm
- Material : 15 mm o.d. copper tubes
- : aluminium HT-fins
- Goedhart DVS coil blocks have copper tubes mechanically expanded into fully collared aluminium fins, providing excellent thermal contact. All evaporator coils are pressure tested to 30 bars (lower by coolants) and supplied with a light overpressure charge.
- The coolers are suitable for the most commonly used refrigerants/coolants with the exception of NH3.

Casing

- Construction for ceiling mounting
- Casing material of galvanized sheet steel
- Finishing is standard white epoxy spray (RAL 9003)
- Bend/header protection by end covers, easy removed for maintenance
- 2 Hinged drip trays underneath each coil block.
- Defrost by hot gas spiral or electric defrost elements will be fixed to the bottom side of the coil.

Capacity

The listed nominal cooling capacities are are based on R404A , DT1 and DTM and a RH of 85%.

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.

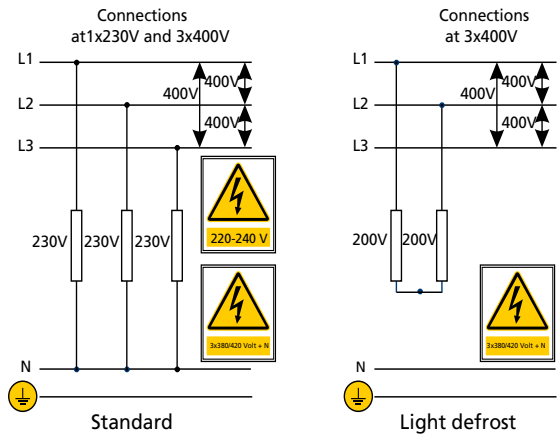
Sound data

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.

Defrost systems

For room temperatures where ice-build up can be expected and where the coil can not be defrosted by the room air, electric or hot gas defrost is necessary

Electrical defrost
On request Goedhart DVS can be provided with electrical defrost. The stainless steel heating elements are fitted in the coil block within aluminium tubes, which forms a highly conductive medium between the heaters and the fins. In the drip tray heater elements are fitted to the underside of the aluminium inner tray. The elements are rated for 220/240 V and are connected (IP55) for 380/415 V (with neutral) supply. The heater elements in the coil block are removable from the bend side, whilst the tray heater elements can be removed once the outer tray has been removed.



Hot gas defrost
The coil block is suited for hot gas defrost (hot gas supply through the suction header). The drip tray can be provided with a copper hot gas spiral. This is enclosed in aluminium profiles that are rigidly secured to the under side of the aluminium inner drip tray

Accessories:

Standard accessories for the Goedhart DVS aircoolers are:
-electric, hotgas defrost system.
-insulation in the space between the inner and outer drip tray.
-insulated hygienic polyester drip tray.
-insulated fanplate
-hinged fan plate
-single phase motors

The accessories are included in the price list.

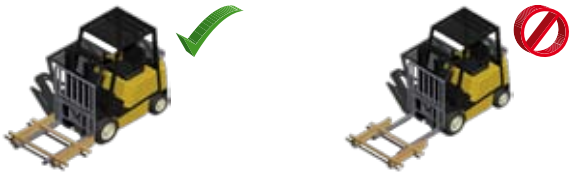
Optional extras:

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

-insulation discs
-60 Hz motors
-water defrost system
-glycol/water/etc. cooling mediums
-stainless steel casing
-other fin spacings
-other fans (when external pressure is requested)

Mounting and Maintenance

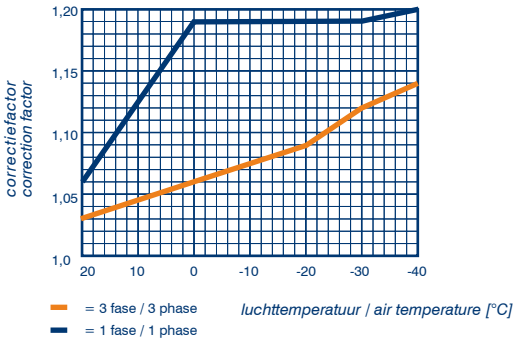
Goedhart DVS is delivered on a wooden frame. When on the frame, Goedhart DVS can be handled by forklift truck, which makes positioning and installation simple. Refer to our maintenance and installation manual.



Fans

The manufacturer of the fans is Süd Electric (we reserve the right to alter the manufacturer). The fans have glass fibre reïnforced 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 D-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 transformator. The motors are standard executed with a thermo contact. The fans are suitable for operation in air temperature applications between -40 oC and +45 oC. When the air temperature is lower then -40 °C , special fans are needed. These speciale 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 then +40 oC, 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	Δ				Y			Protection class*	Fan heating
		Speed	Input	FLC	Sound power indication each fan LwA (+/-2dB(A))	Speed	Input	FLC		
	V	min-1	Watt	A	dB(A)	min-1	Watt	A		Watt (230V)
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

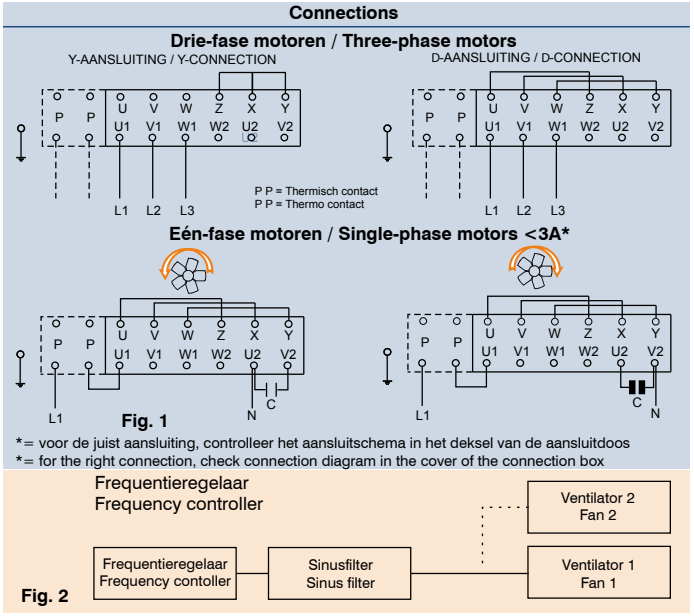
Single phase - 50 Hz

Ventilatortype	Speed	Input	FLC	Protection class*
	min-1	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

Capacities at DTM:

The capacities are based on R404A direct expansion and the difference between the mean air temperature and the evaporation temperature (DTM).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 -5 °C, a DTM of 7 K and light frosting. Capacities for other mediums and systems are available upon request.

Correction factors for various mean air temperatures and evaporation temperatures (DTM) are as indicated in the tables below. The requested capacity must be multiplied by a correction factor from one of these tables.

Q nominal = factor x Q requested

Capacities at DT1:

Hereby the capacities are based on R404A direct expansion 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 light frosting. Capacities for other mediums and systems are avalable 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 nominal = factor x Q requested

R404A light frost = 0.2 mm RH = 85%

DTM	Evaporation temperature (°C)						
K	0	-2,5	-5	-7,5	-10	-12,5	-15
6	1.20	1.23	1.26	1.28	1.31	1.32	1.33
7	0.96	0.98	**1.00**	1.03	1.04	1.07	1.08
8	0.79	0.82	0.84	0.85	0.87	0.88	0.88
9	0.68	0.70	0.71	0.72	0.75	0.77	0.77
10	0.58	0.59	0.62	0.64			

Prices on request due to divergent circuits

= calculated without frosting

DT1	Evaporation temperature (°C)						
K	0	-2,5	-5	-7,5	-10	-12,5	-15
6	1.40	1.43	1.45	1.48	1.51	1.54	1.56
7	1.12	1.15	1.18	1.20	1.22	1.24	1.25
8	0.93	0.95	0.97	1.00	1.01	1.03	1.05
9	0.78	0.81	0.83	0.85	0.87	0.88	0.89
10	0.68	0.70	0.72	0.74	0.75	0.76	0.78
11	0.60	0.62	0.63	0.65			

Prices on request due to divergent circuits

= calculated without frosting

R404A normal frost = 0.5 mm RH= 85%

DTM	Evaporation temperature (°C)						
K	0	-2,5	-5	-7,5	-10	-12,5	-15
6		1.37	1.41	1.43	1.46	1.47	1.49
7		1.10	1.13	1.15	1.17	1.19	1.20
8		0.92	0.94	0.96	0.98	0.99	1.00
9			0.80	0.82	0.83	0.84	0.88
10			0.69	0.71	0.74	0.74	0.75
11			0.62	0.63	0.64		

Prices on request due to divergent circuits

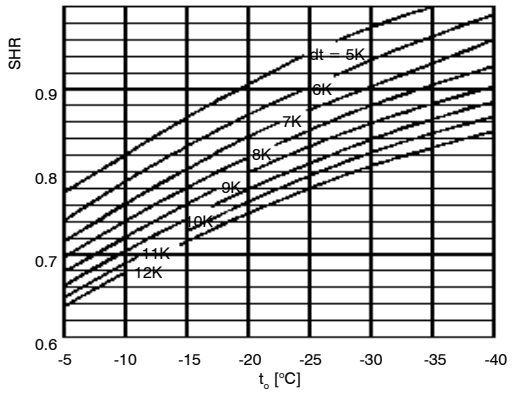
DT1	Evaporation temperature (°C)						
K	0	-2,5	-5	-7,5	-10	-12,5	-15
6		1.57	1.59	1.62	1.64	1.67	1.69
7		1.26	1.28	1.31	1.33	1.35	1.37
8		1.05	1.07	1.09	1.11	1.13	1.14
9			0.91	0.93	0.95	0.96	0.97
10			0.79	0.81	0.82	0.84	0.85
11			0.70	0.71	0.82	0.74	0.75
12			0.62	0.64	0.65		

Prices on request due to divergent circuits

ATTENTION !!!

When making your selection, pay attention to the ratio between the airvolume 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).

The correction factors on this page have been calculated using a varying SHR (ratio of sensible heat load / total heat load). The chart left indicates the SHR values used in the calculations. in which dt is the difference between the air and evaporation temperatures. The SHR values have been based on entering air with a relative humidity of 85%.

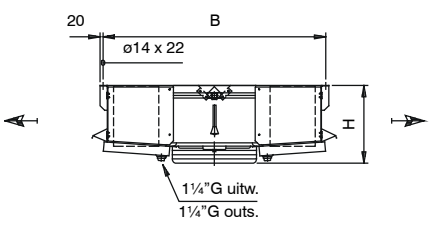


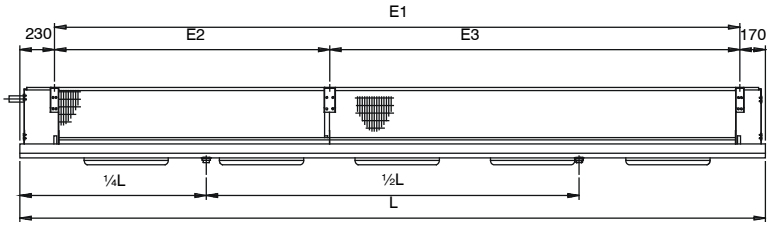
Example:

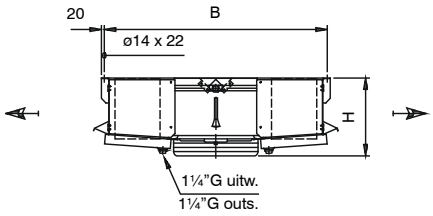
t_o= -10 °C and dt = 10 K resultant SHR value is 0.70
t_o= -10 °C and dt = 5 K resultant SHR value is 0.82
t_o= -30 °C and dt = 10 K resultant SHR value is 0.84
t_o= -30 °C and dt = 5 K resultant SHR value is 0.98

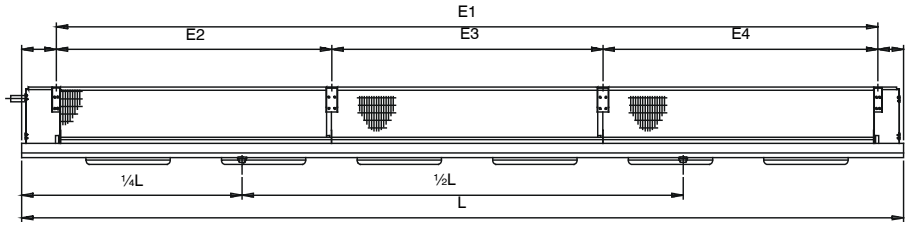
DVS 7mm Technical data

Type DVS	3x400V-50H-4pole (1500 min⁻¹ nom.)				3x400V-50H-6pole (1000 min⁻¹ nom.)				Surface	Internaly volume	Weight	Dimensions							Connections			
	R404A				R404A														Refrigerant			
	DTM = 7K Air mean = +2°C	DT1 = 8K (SC2) Air on = 0°C	Air volume	LpA @ 3 m (+/-2 dB(A))**	DTM = 7K Air mean = +2°C	DT1 = 8K (SC2) Air on = 0°C	Air volume	LpA @ 3 m (+/-2 dB(A))**				L	B	H	E1	E2	E3	E4	in	out	Hot gas	Drain
	kW	kW	m³/h	dB(A)	kW	kW	m³/h	dB(A)	m²	dm³	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	NW"
3.4.45.7	18,3	18,1	21047	62	15,5	14,8	13459	53	91	24	244	2856	1130	520	2456				28	16	4x19	2x1¼"
4.4.45.7	21,5	21,2	20551	62	19,0	17,1	13124	53	121	30	274	2856	1230	520	2456				35	16	4x19	2x1¼"
6.4.45.7	35,1	30,4	19624	62	29,1	23,5	12467	52	182	46	338	2856	1430	520	2456				42	16	4x19	2x1¼"
8.4.45.7	40,3	33,5	18791	62	34,6	26,4	11859	52	243	60	400	2856	1630	520	2456				42	16	4x19	2x1¼"
3.4.50.7	27,3	27,0	30388	68	23,5	22,3	20233	64	136	34	348	4056	1180	520	3656	1828	1828		35	16	4x19	2x1¼"
4.4.50.7	36,2	34,0	29926	68	30,9	27,7	19898	64	182	46	395	4056	1280	520	3656	1828	1828		42	16	4x19	2x1¼"
6.4.50.7	52,9	45,6	29029	68	44,6	35,9	19259	64	273	68	485	4056	1480	520	3656	1828	1828		42	22	4x19	2x1¼"
8.4.50.7	68,2	54,4	28174	68	56,8	41,8	18666	64	365	90	576	4056	1680	520	3656	1828	1828		54	22	4x19	2x1¼"
3.4.56.7	38,0	38,2	42869	68	30,9	29,9	27329	58	190	48	428	4456	1240	620	4056	2028	2028		42	22	4x19	2x1¼"
4.4.56.7	49,5	46,5	42282	68	42,3	37,7	26949	58	253	64	485	4456	1340	620	4056	2028	2028		42	22	4x19	2x1¼"
6.4.56.7	73,4	63,4	41159	68	61,2	49,5	26210	58	380	94	604	4456	1540	620	4056	2028	2028		54	22	4x35	2x1¼"
8.4.56.7	93,8	76,0	40100	68	78,1	57,8	25502	58	507	126	720	4456	1740	620	4056	2028	2028		54	22	4x35	2x1¼"
3.4.63.7	46,0	46,2	52361	68	40,8	39,3	38505	63	228	58	472	4456	1310	720	4056	2028	2028		42	22	4x35	2x1¼"
4.4.63.7	60,7	58,0	51660	68	53,8	49,0	37951	63	304	76	539	4456	1410	720	4056	2028	2028		54	22	4x35	2x1¼"
6.4.63.7	88,7	76,9	50266	68	78,2	65,0	36847	63	456	114	674	4456	1610	720	4056	2028	2028		54	22	4x35	2x1¼"
8.4.63.7	114,6	92,0	48914	68	100,2	76,6	35776	63	608	150	807	4456	1810	720	4056	2028	2028		64	28	4x35	2x1¼"
3.5.50.7	34,5	34,2	37985	69	29,3	28,0	25291	65	171	44	423	4956	1180	520	4556	1828	2728		42	16	4x35	4x1¼"
4.5.50.7	42,4	39,7	37406	69	37,4	33,6	24871	65	228	58	480	4956	1280	520	4556	1828	2728		42	16	4x35	4x1¼"
6.5.50.7	66,6	57,3	36283	69	55,6	44,5	24074	65	342	86	591	4956	1480	520	4556	1828	2728		54	22	4x35	4x1¼"
8.5.50.7	80,0	65,6	35215	69	68,9	52,2	23330	65	456	114	704	4956	1680	520	4556	1828	2728		54	22	4x35	4x1¼"
3.5.56.7	47,8	48,0	53583	69	40,5	38,3	34161	59	237	60	520	5456	1240	620	5056	2028	3028		42	22	4x35	4x1¼"
4.5.56.7	63,4	60,2	52853	69	51,7	46,6	33686	59	316	78	593	5456	1340	620	5056	2028	3028		54	22	4x35	4x1¼"
6.5.56.7	92,8	80,1	51447	69	77,2	62,0	32761	58	475	118	738	5456	1540	620	5056	2028	3028		54	22	4x35	4x1¼"
8.5.56.7	119,9	94,8	50121	69	95,3	70,4	31875	58	633	156	881	5456	1740	620	5056	2028	3028		64	28	4x35	4x1¼"
3.5.63.7	57,7	56,8	65451	69	51,7	49,7	48132	63	285	72	575	5456	1310	720	5056	2028	3028		54	22	4x35	4x1¼"
4.5.63.7	76,3	71,9	64572	69	68,1	62,1	47436	63	380	94	657	5456	1410	720	5056	2028	3028		54	22	4x35	4x1¼"
6.5.63.7	111,7	97,0	62829	69	99,0	81,8	46055	63	570	142	823	5456	1610	720	5056	2028	3028		64	28	4x35	4x1¼"
8.5.63.7	144,5	116,4	61137	69	126,8	96,0	44717	63	760	188	989	5456	1810	720	5056	2028	3028		64	28	4x35	4x1¼"
3.6.50.7	40,3	40,1	45579	69	35,2	33,2	30348	65	205	52	498	5856	1180	520	5456	1828	1800	1828	42	16	4x35	4x1¼"
4.6.50.7	51,5	49,9	44887	69	41,6	38,5	29844	65	273	68	564	5856	1280	520	5456	1828	1800	1828	42	22	4x35	4x1¼"
6.6.50.7	78,0	67,5	43540	69	66,8	54,2	28887	65	410	102	698	5856	1480	520	5456	1828	1800	1828	54	22	4x35	4x1¼"
8.6.50.7	96,7	76,2	42255	69	76,4	59,9	27995	65	547	136	830	5856	1680	520	5456	1828	1800	1828	54	28	4x35	4x1¼"
3.6.56.7	57,5	57,5	64300	69	48,7	46,1	40993	59	285	72	617	6456	1240	620	6056	2028	2000	2028	54	22	4x35	4x1¼"
4.6.56.7	76,0	72,1	63421	69	64,1	57,2	40422	59	380	94	703	6456	1340	620	6056	2028	2000	2028	54	22	4x35	4x1¼"
6.6.56.7	111,3	96,4	61735	69	92,8	74,5	39311	59	570	142	874	6456	1540	620	6056	2028	2000	2028	64	28	4x35	4x1¼"
8.6.56.7	144,0	115,5	60143	69	118,3	86,5	38248	59	760	188	1046	6456	1740	620	6056	2028	2000	2028	64	28	4x35	4x1¼"
3.6.63.7	69,2	69,7	78539	70	60,2	59,2	57758	64	342	86	683	6456	1310	720	6056	2028	2000	2028	54	22	4x35	4x1¼"
4.6.63.7	82,2	87,3	77485	70	79,3	73,1	56923	64	456	114	780	6456	1410	720	6056	2028	2000	2028	54	22	4x35	4x1¼"
6.6.63.7	133,7	115,7	75393	70	115,1	95,7	55265	64	684	170	978	6456	1610	720	6056	2028	2000	2028	64	28	4x35	4x1¼"
8.6.63.7	172,6	136,6	73362	69	147,0	113,9	53658	64	912	226	1174	6456	1810	720	6056	2028	2000	2028	76	28	4x35	4x1¼"









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

Goedhart standard aircooler overview

VCI

DVS/DRS/DZS

ZGB/ZGZ

PAC

FC38

ZFB/ZFZ

Goedhart air cooler for every application

For Contractors and Original Equipment Manufacturers (OEM) related to the industrial refrigeration industry, GEA Goedhart B.V. offers an unlimited range of air coolers and air cooled condensers in several configurations.

Depending on the application, the optimum configuration will be selected in close cooperation with our customers.

Configurations
The following material combinations are available in various tube pitches and various fin spacing:

Tube material	Tube configuration	Fin material
Copper (Cu)	38x33, 50x50, 60x60	Aluminium (Al)
Stainless steel (Stst)	38x33, 50x50, 60x60	Aluminium (Al)
Stainless steel (Stst)	50x50	Stainless steel (Stst)
Aluminium (Al)	60x60	Aluminium (Al)
Hot dipped galvanized steel (FeZn)	60x60, 75x75	Hot dipped galvanized steel (FeZn)

Options on aluminium fins
- Goldlack coated fins
- Seawater resistant aluminium fins (AlMg)

Applications

Cooling	Freezing
Cold stores / Distribution centres	Cold stores / Distribution centres
Food processing rooms	Tunnel / spiral freezers
Fruit storage	Slaughter houses
Banana ripening storage	Automotive testing rooms
Greenhouse conditioning	Ski domes

Pressure Equipment Directive (P.E.D.)
All aircoolers produced by Goedhart comply with the Pressure Equipment Directive 97/23/EC. PED certificates can be downloaded from www.goedhart.nl.

GEA Heat Exchangers

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03.01.2.009.dok 2010-01 / Subject to modification