



# Heat exchanger-Fan-Intersection point

Do you belong to the companies that manufacture serial air heaters, air coolers, condensers and injection evaporators? Such as:

[www.coolers.co.uk](http://www.coolers.co.uk)

[www.walterroller.de](http://www.walterroller.de)

[www.karyergroup.com](http://www.karyergroup.com)

[www.polarkaeltetechnik.de](http://www.polarkaeltetechnik.de)

By this we mean not only the production of finned heat exchangers, but also compact units consisting of finned heat exchangers, drip pans, boxes, fans and electrical connection boxes.



If you can answer the question above with yes, then you know the associated problem, which the development department has to solve using the following example for complete series of units:

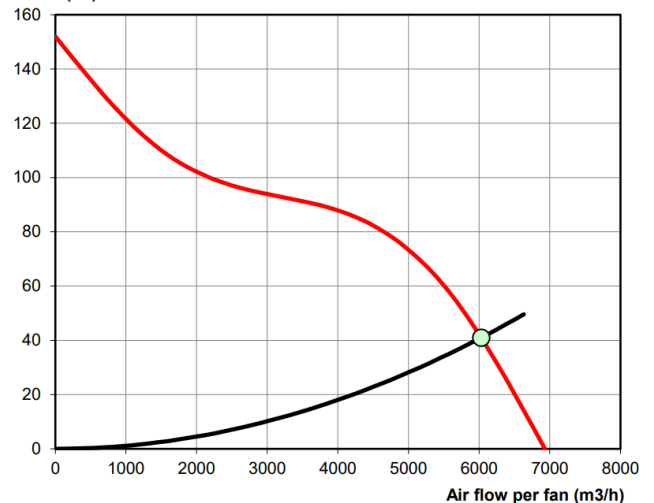
1. First, the finned heat exchanger must be designed for a target air volume of 12,000 m<sup>3</sup>/h.
2. Then 2 suitable axial fans are evaluated, which together have approximately the desired air volume in relation to the pressure of the finned heat exchanger.
3. Finally, the exact point of intersection between the characteristic curves of the fans and the finned heat exchanger must be determined by multiple manual iterations.

If your development engineers are under-employed, you don't need our **HEH-FAN** software, which could do this job in a fraction of the time. Otherwise we recommend that you contact us.

## Static pressure, pressure drop

Product	---	Gebhardt
Type	---	AQA-500-4D-180V (ø500)
Fan	Piece	2.00
Air flow per fan	m <sup>3</sup> /h	6028.12
Air flow total	m <sup>3</sup> /h	12056.25
Static pressure	Pa	40.97
Box	Pa	2.05
Heat exchanger	Pa	38.92
Heat exchanger	%	95.00

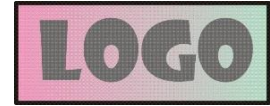
## Pressure (Pa)



In the **HEH-FAN** software, the red characteristic curves for the air volume as a function of the pressure, each with 6 support points, can be stored as the basis for a spline interpolation of more than 60 fans, e.g.:

1. 60 fans with 1 speed
2. 30 fans with 2 different speeds
3. 20 fans with 3 different speeds
4. 15 fans with 4 different speeds
5. 12 fans with 5 different speeds
6. 10 fans with 6 different speeds

The black characteristic curve of the finned heat exchanger results automatically from its calculation, see page 2. The green intersection point is determined within a few seconds using a macro in the Excel-based application, which can be purchased unprotected or protected.



Capacity	kW	58.229	----- sensible:	49.036
Surface reserve	%	0.000	latent:	8.119
Present surface	m2	296.920	frost:	1.074
Required surface	m2	296.920		
k-coeff.	W/m2K	24.350		
Average temp. diff. ( 93.97 % )	K	8.054		

Company  
Branch  
Street  
Country / ZIP / City

Air humid ( ff = 0.00005 m2K/W )		Inlet	Outlet	Definition
Height over sea level	m			0.000
Pressure	hPa			1013.250
Temp.	°C	10.000	-2.133	20.000
Rel. humidity	%	50.000	94.625	40.000
Abs. humidity	g/kg	3.792	2.985	5.784
Density humid	kg/m3	1.244	1.300	1.200
Enthalpy humid	kJ/kg	19.615	5.307	34.805
Volume flow humid	m3/h	11608.064	11096.343	12056.250
Mass flow dry	kg/h	14380.464	14380.464	14380.464
Condensate flow	kg/h		11.604	
Surface temperature	°C	3.423	-5.349	
Velocity	m/s	1.828	1.747	1.899
Pressure drop (dry 37 Pa)	Pa		38.922	

Phone: xxxxxxxxxx  
Fax: xxxxxxxxxx  
E-Mail  
Homepage

City, 4.4.2022  
With the compliments of

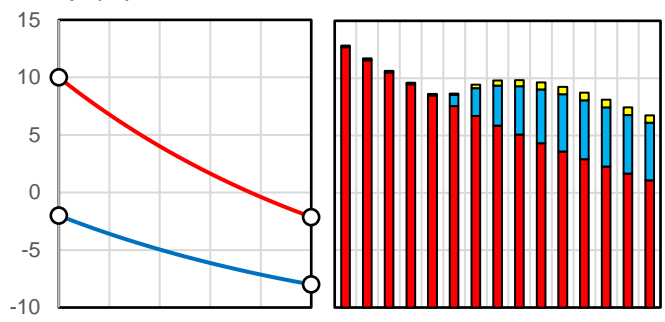
Representative  
Direct dialing  
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Plant  
Object  
Position

25 V% Et.glycol ( ff = 0.00005 m2K/W )

Temp. Inlet	°C	-8.000
Temp. Outlet	°C	-2.000
Temp. Selection	°C	-5.810
Density	kg/m3	1045.326
Spec. heat	kJ/kgK	3.665
Heat cond.	W/mK	0.439
Viscosity	Pas	4.339E-03
Volume flow	m3/h	9.120
Velocity	m/s	0.799
Reynolds	---	2233.087
Pressure drop	kPa	32.408

Temp. (°C)

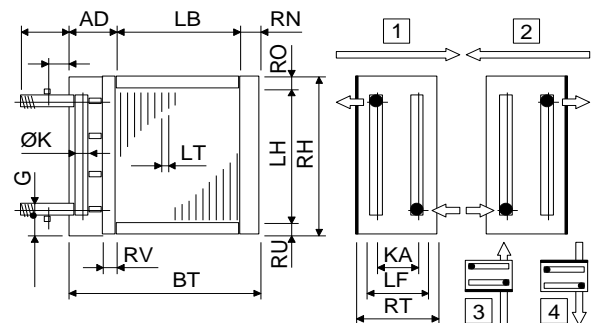


Technical data

Tubes total	Piece	360
Tubes blank	Piece	0
Int. vent./drains	Piece	0
Tube rows on the depth	Piece	10
Tube rows on the height	Piece	36
Tube coupling in series	Piece	12
Number of circuits (NC)	Piece	30
Volume	l	64
Weight	kg	199
Connections	G	2"
Frame height	RH	mm 1340
Frame width	BT	mm 1578
Frame depth	RT	mm 400
Finned height	LH	mm 1260
Finned width	LB	mm 1400
Finned depth	LF	mm 350
Frame on top	RO	mm 40
Frame on bottom	RU	mm 40
Frame in front	RV	mm 30
Frame on back (~53mm)	RN	mm 53
Collector-Diameter	K	mm 54
Collector covering	AD	mm 125
Collector distance	KA	mm 315
Fin spacing	LT	mm 4.000
Fin thickness	LD	mm 0.200
Tube diameter	DA	mm 12.400
Tube diameter	da	mm 12.400
Tube thickness	S	mm 0.400
Tube interval on the height	S1	mm 35.000
Tube interval on the depth	S2	mm 35.000



Tubes:	Cu
Tubes:	smooth
Tubes:	in line
Tubes:	circular
Collectors:	1.24 m/s Cu
Connections:	1.24 m/s Rg7
Fins:	Al
Fins:	smooth
Circulations:	1 Default
Frame:	2.0 mm AISI 304
Protection:	without
Protection:	---
Air flow direction:	horizontal



Delivery:	5-6 weeks
Validity:	12 weeks
Condit.:	net, prepaid address
Payment:	30 days net
Price net:	EUR 3172.00