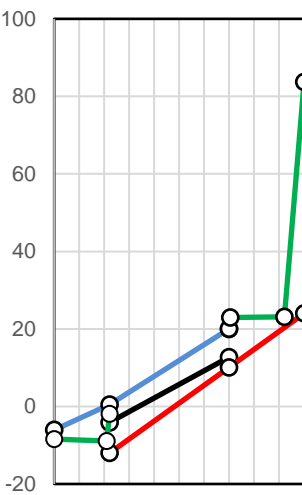
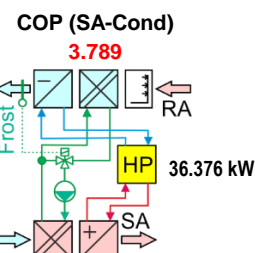


Heat recovering		SA-Heat	SA-Cond	RA-Cool	RA-Evap
Capacity	kW	218.514	137.827	218.514	101.452
Surface reserve	%	0.337	1.466	0.478	0.682
Present surface	m ²	1856.004	922.347	1856.004	922.347
Temp. in	°C	-12.000	10.080	20.000	0.523
Rel. humidity in	%	90.000	15.713	40.000	99.725
Abs. humidity in	g/kg	1.208	1.208	5.858	3.971
Temp. out	°C	10.080	24.000	0.523	-6.067
Rel. humidity out	%	15.713	6.517	99.725	100.000
Abs. humidity out	g/kg	1.208	1.208	3.971	2.278
Velocity	m/s	1.887	1.898	1.698	1.708
Pressure drop	Pa	78.043	43.351	82.435	39.627
Temp. efficiency	%	69.000	---	60.867	---
25 V% Et.glycol		SA-Heat	RA-Co		
Temp. in	°C	12.700	-4.100		
Temp. out	°C	-4.100	12.700		
Volume flow	m ³ /h	12.170	12.176		
Pressure drop	kPa	185.039	187.122		
R410A (0.5 % Oil ISO VG32)		SA-Cond	RA-Evap		
Pressure	bar	15.702	5.947		
Hot gas	°C	83.757	---		
Condensation"	°C	23.100	23.100		
Condensation'	°C	22.982	22.982		
Subcooling	°C	20.100	20.100		
Evaporation"	°C	---	-8.900		
Superheating	°C	---	-1.900		
Mass flow	kg/h	1892.973	1892.918		
Volume flow	m ³ /h	30.390	83.131		
Pressure drop	K	0.438	0.582		
Pressure drop Capillary	bar	---	2.874		
Technical data		SA-Heat	SA-Cond	RA-Cool	RA-Evap
Tubes total	Piece	848	416	848	416
Tubes blank	Piece	8	6	8	6
Int. vent./drains	Piece	7	---	7	---
Tube rows on the depth	Piece	16	8	16	8
Tube rows on the height	Piece	53	52	53	52
Number of circuits (NC)	Piece	28	41	28	41
Volume	l	240	119	240	117
Weight	kg	883	451	883	455
Connections	---	2 ½"	54/54	2 ½"	35/64
RH = Frame height	mm	1900	1900	1900	1900
BT = Frame width	mm	2600	2590	2600	2600
RT = Frame depth	mm	670	330	670	340
LH = Finned height	mm	1855	1820	1855	1820
LB = Finned width	mm	2381	2412	2381	2412
RO = Frame on top	mm	22	40	22	40
RU = Frame on bottom	mm	23	40	23	40
RV = Frame in front	mm	30	30	30	30
RN = Frame on back (-53/53/53/53)	mm	53	53	53	53
AD = Collector covering	mm	166	125	166	135
LT = Fin spacing	mm	2.500	2.500	2.500	2.500
LD = Fin thickness	mm	0.200	0.200	0.200	0.200
DA = Tube diameter	mm	12.400	12.400	12.400	12.400
da = Tube diameter	mm	12.400	---	12.400	---
S = Tube thickness	mm	0.400	0.400	0.400	0.400
S1 = Tube interval on the heig	mm	35.000	35.000	35.000	35.000
S2 = Tube interval on the depi	mm	35.000	35.000	35.000	35.000
Tubes	---	Cu	Cu	Cu	Cu
Tubes	---	smooth	smooth	smooth	smooth
Tubes	---	in line	in line	in line	in line
Collector	---	Cu	Cu	Cu	Cu
Connections	---	Rg7	Cu	Rg7	Cu
Fins	---	Al	Al	Al	Al
Fins	---	smooth	smooth	smooth	smooth
Frame	---	AISI 304	AISI 304	AISI 304	AISI 304
Protection	---	without	without	without	without
Protection	---	---	---	---	---
Price	EUR	12231.00	6232.00	12231.00	6298.00



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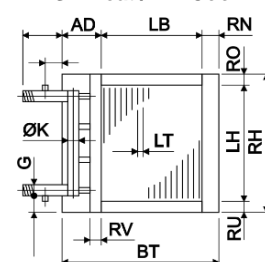


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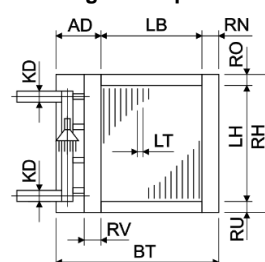
Definition

Height (m)	106.000
Pressure (hPa)	1000.564
Temp. (°C)	20.000
Rel. humidity (%)	40.000
Supply air (m ³ /h)	30000.000
Return air (m ³ /h)	27000.000

SA-Heat / RA-Cool



SA-Cond / RA-Evap Changeover operation



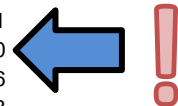
Delivery:	5-6 weeks
Validity:	12 weeks
Condit.:	net, prepaid address
Payment:	30 days net

CC-System in winter		SA-Heat	RA-Cool	Definition
Height over sea level	m			101.452
Pressure	hPa			1001.106
Efficiency	%	61.500	56.471	
Capacity sensible	kW	194.863	162.024	
Capacity latent	kW	---	32.841	
Capacity frost	kW	---	0.000	
Capacity total	kW	194.863	194.866	
Surface reserve	%	0.006	0.048	
Present surface	m2	1856.004	1856.004	

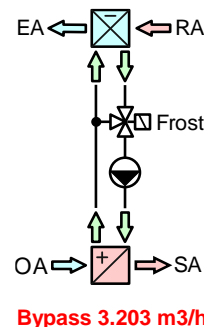
SA-Heat (ff = 0.00005 m2K/W)		Inlet	Outlet	Definition
Temp.	°C	-12.000	7.680	20.000
Rel. humidity	%	90.000	18.470	40.000
Abs. humidity	g/kg	1.208	1.208	5.855
Volume flow humid	m3/h	26527.596	28526.612	30000.000
Velocity	m/s	1.668	1.794	1.887
Pressure drop	Pa		77.588	

RA-Cool (ff = 0.00005 m2K/W)		Inlet	Outlet	Definition
Temp.	°C	20.000	1.929	20.000
Rel. humidity	%	40.000	99.686	40.000
Abs. humidity	g/kg	5.855	4.390	5.855
Volume flow humid	m3/h	27000.000	25276.612	27000.000
Velocity	m/s	1.698	1.590	1.698
Pressure drop wet	Pa		80.472	

25 V% Et.glycol (ff = 0.00005 / 0.00005 m2K/W)		SA-Heat	RA-Cool	
Temp.	in °C	10.065	-4.927	
Temp.	out °C	-4.927	15.397	
Volume flow	m3/h	12.170	8.967	
Velocity	m/s	1.142	0.842	
Reynolds	---	4285.778	3455.847	
Pressure drop	kPa	187.808	107.742	

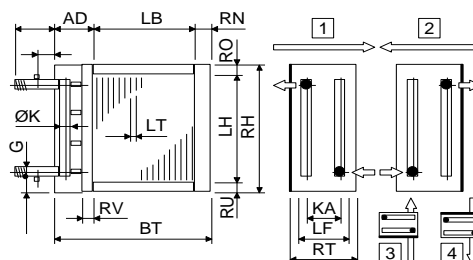


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Technical data		SA-He	RA-Co	SA-He	RA-Co
Tubes total	Piece	848	848	Tubes:	Cu
Tubes blank	Piece	8	8	Tubes:	smooth
Int. vent./drains	Piece	7	7	Tubes:	in line
Tube rows on the depth	Piece	16	16	Tubes:	circular
Tube rows on the height	Piece	53	53	Collectors:	Cu
Tube coupling in series	Piece	30	30	Collectors:	0.83 m/s
Number of circuits (NC)	Piece	28	28	Connections:	Rg7
Volume	l	240	240	Connections:	0.83 m/s
Weight	kg	883	883	Fin:	Al
Connections	G	2 1/2"	2 1/2"	Fin:	smooth
Frame height	RH mm	1900	1900	Frame:	AISI 304
Frame width	BT mm	2600	2600	Air flow direction:	horizontal
Frame depth	RT mm	670	670	Protection:	without
Finned height	LH mm	1855	1855	Protection:	---
Finned width	LB mm	2381	2381		
Finned depth	LF mm	560	560		
Frame on top	RO mm	22	22		
Frame on bottom	RU mm	23	23		
Frame in front	RV mm	30	30		
Frame on back (~53/53mm)	RN mm	53	53		
Collector-Diameter	K mm	76	76		
Collector covering	AD mm	166	166		
Collector distance	KA mm	564	564		
Fin spacing	LT mm	2.500	2.500		
Fin thickness	LD mm	0.200	0.200		
Tube diameter	DA mm	12.400	12.400	Delivery:	5-6 weeks
Tube diameter	da mm	12.400	12.400	Validity:	12 weeks
Tube thickness	S mm	0.400	0.400	Condit.:	net, prepaid address
Tube interval on the height	S1 mm	35.000	35.000	Payment:	30 days net
Tube interval on the depth	S2 mm	35.000	35.000		
SA-Heat: 35/35/12-16R-53T-2381A-2.5PA-28C-Cu/Al/AISI 304				SA-Heat:	EUR 12231.00
RA-Cool: 35/35/12-16R-53T-2381A-2.5PA-28C-Cu/Al/AISI 304				RA-Cool:	EUR 12231.00

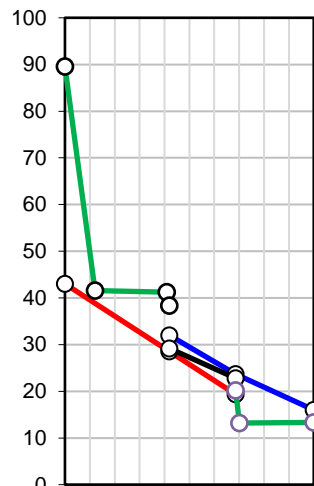


Cold recovery		SA-Cool	SA-Evap	RA-Heat	RA-Cond
Capacity	kW	83.915	98.907	83.915	132.075
Surface reserve	%	0.222	3.737	0.282	2.500
Present surface	m2	1856.004	922.347	1856.004	922.347
Temp. in (26.000)	°C	32.000	23.693	19.356	28.551
Rel. humidity in (54.175)	%	40.000	64.873	100.000	57.628
Abs. humidity in (11.500)	g/kg	12.014	12.014	14.261	14.261
Temp. out	°C	23.693	16.000	28.551	43.013
Rel. humidity out	%	64.873	97.103	57.628	26.042
Abs. humidity out	g/kg	12.014	11.159	14.261	14.261
Velocity	m/s	1.887	1.898	1.698	1.708
Pressure drop	Pa	91.785	48.673	77.539	41.599
Temp. efficiency	%	65.700	---	72.720	---

25 V% Et.glycol		SA-Cool	RA-Heat
Temp. in	°C	22.798	29.196
Temp. out	°C	29.196	22.798
Volume flow	m3/h	12.172	12.170
Pressure drop	kPa	160.387	159.805

R410A (0.5 % Oil ISO VG32)		SA-Evap	RA-Cond
Pressure	bar	11.912	25.140
Hot gas	°C	---	89.573
Condensation"	°C	41.600	41.600
Condensation'	°C	41.483	41.483
Subcooling	°C	38.600	38.600
Evaporation"	°C	13.200	---
Superheating	°C	20.200	---
Mass flow	kg/h	2109.949	2110.085
Volume flow	m3/h	45.627	19.493
Pressure drop	K	0.196	0.421
Pressure drop Capillary	bar	1.928	---

Technical data		SA-Cool	SA-Evap	RA-Heat	RA-Cond
Tubes total	Piece	848	416	848	416
Tubes blank	Piece	8	6	8	6
Int. vent./drains	Piece	7	---	7	---
Tube rows on the depth	Piece	16	8	16	8
Tube rows on the height	Piece	53	52	53	52
Number of circuits (NC)	Piece	28	41	28	41
Volume	l	240	115	240	122
Weight	kg	883	451	883	455
Connections	---	2 ½"	35/54	2 ½"	64/64
RH = Frame height	mm	1900	1900	1900	1900
BT = Frame width	mm	2600	2590	2600	2600
RT = Frame depth	mm	670	330	670	340
LH = Finned height	mm	1855	1820	1855	1820
LB = Finned width	mm	2381	2412	2381	2412
RO = Frame on top	mm	22	40	22	40
RU = Frame on bottom	mm	23	40	23	40
RV = Frame in front	mm	30	30	30	30
RN = Frame on back (~53/53/53/53)	mm	53	53	53	53
AD = Collector covering	mm	166	125	166	135
LT = Fin spacing	mm	2.500	2.500	2.500	2.500
LD = Fin thickness	mm	0.200	0.200	0.200	0.200
DA = Tube diameter	mm	12.400	12.400	12.400	12.400
da = Tube diameter	mm	12.400	---	12.400	---
S = Tube thickness	mm	0.400	0.400	0.400	0.400
S1 = Tube interval on the heig	mm	35.000	35.000	35.000	35.000
S2 = Tube interval on the depi	mm	35.000	35.000	35.000	35.000
Tubes	---	Cu	Cu	Cu	Cu
Tubes	---	smooth	smooth	smooth	smooth
Tubes	---	in line	in line	in line	in line
Collector	---	Cu	Cu	Cu	Cu
Connections	---	Rg7	Cu	Rg7	Cu
Fins	---	Al	Al	Al	Al
Fins	---	smooth	smooth	smooth	smooth
Frame	---	AISI 304	AISI 304	AISI 304	AISI 304
Protection	---	without	without	without	without
Protection	---	---	---	---	---
Price	EUR	12231.00	6232.000	12231.00	6298.000



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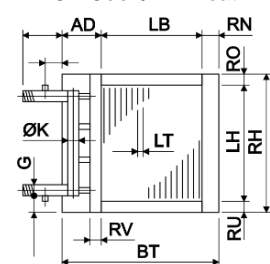
RA
CU 33.168 kW
SA
COP (SA-Evap)
2.982

Software by www.zcs.ch

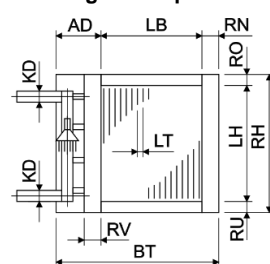
Definition

Height (m)	106.000
Pressure (hPa)	1000.564
Temp. (°C)	20.000
Rel. humidity (%)	40.000
Supply air (m3/h)	30000.000
Return air (m3/h)	27000.000

SA-Cool / RA-Heat



SA-Evap / RA-Cond Changeover operation



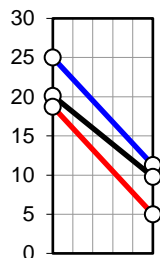
Delivery:	5-6 weeks
Validity:	12 weeks
Condit.:	net, prepaid address
Payment:	30 days net

CC-System (DIN EN 308)		SA-Heat	RA-Cool	Definition
Height over sea level	m			106.000
Pressure	hPa			1000.564
Efficiency	%	68.650	68.635	
Capacity sensible	kW	135.622	135.622	
Capacity latent	kW	---	---	
Capacity frost	kW	---	---	
Capacity total	kW	135.622	135.622	
Surface reserve	%	0.175	0.201	
Present surface	m2	1856.004	1856.004	

SA-Heat (ff = 0.00005 m2K/W)		Inlet	Outlet	Definition
Temp.	°C	5.000	18.730	20.000
Rel. humidity	%	0.000	0.000	40.000
Abs. humidity	g/kg	0.000	0.000	5.858
Volume flow humid	m3/h	28199.517	29591.447	30000.000
Velocity	m/s	1.774	1.861	1.887
Pressure drop	Pa		82.984	

RA-Cool (ff = 0.00005 m2K/W)		Inlet	Outlet	Definition
Temp.	°C	25.000	11.273	20.000
Rel. humidity	%	0.000	0.000	40.000
Abs. humidity	g/kg	0.000	0.000	5.858
Volume flow humid	m3/h	30227.092	28835.462	30000.000
Velocity	m/s	1.901	1.814	1.887
Pressure drop	Pa		85.534	

25 V% Et.glycol (ff = 0.00005 / 0.00005 m2K/W)		SA-Heat	RA-Cool	
Temp.	in °C	20.128	9.782	
Temp.	out °C	9.782	20.128	
Volume flow	m3/h	12.210	12.215	
Velocity	m/s	1.146	1.147	
Reynolds	---	6424.084	6248.009	
Pressure drop	kPa	171.721	172.944	



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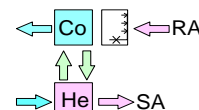
Direct dialing

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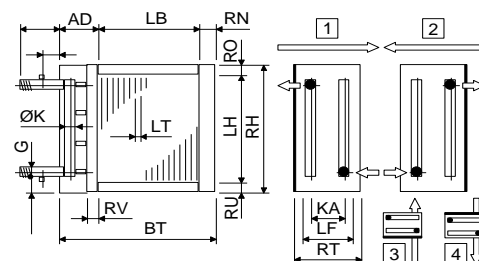
Object

Position



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Technical data		SA-Heat	RA-Cool	SA-He	RA-Co
Tubes total	Piece	848	848	Tubes: Cu	Cu
Tubes blank	Piece	8	8	Tubes: smooth	smooth
Int. vent./drains	Piece	7	7	Tubes: in line	in line
Tube rows on the depth	Piece	16	16	Tubes: circular	circular
Tube rows on the height	Piece	53	53	Collectors: Cu	Cu
Tube coupling in series	Piece	30	30	Collectors: 0.83 m/s	0.83 m/s
Number of circuits (NC)	Piece	28	28	Connections: Rg7	Rg7
Volume	l	240	240	Connections: 0.83 m/s	0.83 m/s
Weight	kg	883	883	Fins: Al	Al
Connections	G	2 1/2"	2 1/2"	Fins: smooth	smooth
Frame height	RH mm	1900	1900	Frame: AISI 304	AISI 304
Frame width	BT mm	2600	2600	Air flow direction: horizontal	horizontal
Frame depth	RT mm	670	670	Protection: without	without
Finned height	LH mm	1855	1855	Protection: ---	---
Finned width	LB mm	2381	2381		
Finned depth	LF mm	560	560		
Frame on top	RO mm	22	22		
Frame on bottom	RU mm	23	23		
Frame in front	RV mm	30	30		
Frame on back (~53/53mm)	RN mm	53	53		
Collector-Diameter	K mm	76	76		
Collector covering	AD mm	166	166		
Collector distance	KA mm	564	564		
Fin spacing	LT mm	2.500	2.500		
Fin thickness	LD mm	0.200	0.200		
Tube diameter	DA mm	12.400	12.400		
Tube diameter	da mm	12.400	12.400		
Tube thickness	S mm	0.400	0.400		
Tube interval on the height	S1 mm	35.000	35.000		
Tube interval on the depth	S2 mm	35.000	35.000		



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

SA-Heat: 35/35/12-16R-53T-2381A-2.5PA-28C-Cu/Al/AISI 304

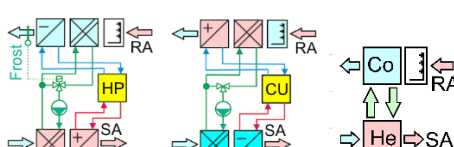
SA-He: EUR 12231.00

RA-Cool: 35/35/12-16R-53T-2381A-2.5PA-28C-Cu/Al/AISI 304

RA-Co: EUR 12231.00

Economy

Base value	Definition
Height over sea level	m 106.000
Pressure	bar 1.001
Volume flow humid at	°C 20.000
Volume flow humid at	% 40.000



CC-System		Winter	Summer	DIN EN 308
Efficiency Supply air	%	69.000	65.700	68.650
Capacity	kW	356.341	182.822	135.622
Surface reserve	%	0.902	1.980	0.175
Present surface	m2	2778.351	2778.351	1856.004

Supply air		Winter	Summer	DIN EN 308
Temp. in	°C	-12.000	32.000	5.000
Temp. out	°C	24.000	16.000	18.730
Volume flow humid	m3/h	30000.000	30000.000	30000.000
Pressure drop	Pa	121.394	140.458	126.334
Fan efficiency	---	0.700	0.700	0.700
Fan power	kW	1.445	1.672	1.504

Return air		Winter	Summer	DIN EN 308
Temp. in	°C	20.000	19.356	25.000
Temp. out	°C	-6.067	43.013	11.273
Volume flow humid	m3/h	27000.000	27000.000	30000.000
Pressure drop	Pa	122.062	119.138	134.456
Fan efficiency	---	0.700	0.700	0.700
Fan power	kW	1.308	1.276	1.601

CC-System: 25 V% Et.glycol		Winter	Summer	DIN EN 308
Volume flow	m3/h	12.170	12.172	12.210
Pressure drop Supply air	bar	1.850	1.604	1.717
Pressure drop Return air	bar	1.871	1.598	1.729
Pressure drop Hydraulics	bar	2.000	2.000	2.000
Pressure drop Total	bar	5.722	5.202	5.447
Pump efficiency	---	0.800	0.800	0.800
Pump power	kW	2.418	2.199	2.309

Refrig. compressor		Winter	Summer	DIN EN 308
Condenser - Evaporator	kW	36.376	33.168	36.376
Efficiency	---	0.800	0.800	0.800
Refrig. compressor	kW	45.470	41.460	45.470

Economy		Winter	Summer	DIN EN 308
Gross useful ratio with CC-System	kW	356.341	182.822	135.622
Need of energy with CC-System	kW	50.641	46.607	50.884
Net useful ratio with CC-System	kW	305.701	136.215	84.738
Coefficient of performance (COP)	---	7.037	3.923	2.665

Economy		Winter	Summer	DIN EN 308
Volume flow humid Total	m3/h	57000.000	57000.000	60000.000
Need of energy total	kW	50.641	46.607	50.884
Specific Recovery Power (SRP)	Ws/m3	3198.351	2943.612	3053.022



Nonsense !!!

Adiabatic return air cooling



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$$E = \frac{B * C}{D * 3600 * 1000}$$

$$I = \frac{F * G}{H * 3600 * 1000}$$

$$N = K + L + M$$

$$P = \frac{J * N * 100000}{O * 3600 * 1000}$$

$$X = \frac{v}{w}$$

$$Q = E + I + P$$

$$R = A - Q$$

$$S = \frac{A}{Q}$$

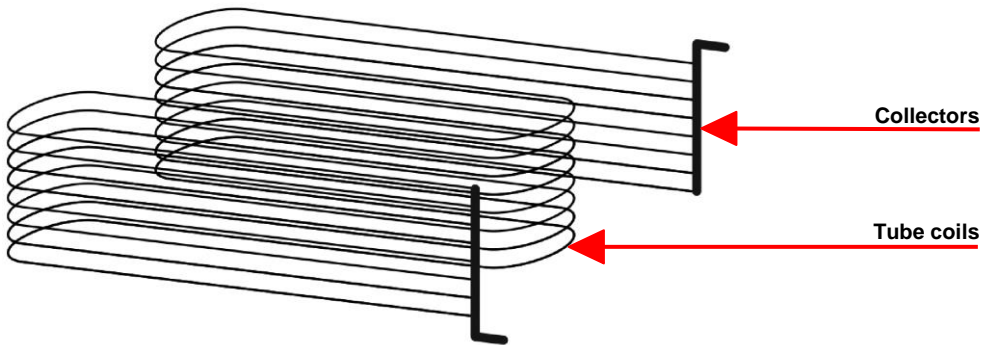
$$T = B + F$$

$$U = \frac{Q * 3600 * 1000}{T}$$

Normally, this value is less than 300 Ws/m3, but in this system more than 10 times what sufficiently says about this system. However, the holder of www.apess.de believes that its 2-stage heat recovery system is optimum among the many different systems. We refer to this system as CCSN Split and appear with the frost protection bypass where the biggest problem is to locate. In addition, you can read at www.apess.de, you can reach 100 % heat recovery with this patented 2-stage system, which reminds of the hair-raising nonsense one perpetuum Mobiles à la Daniel Düsentrrieb. If one believes that some patent attorney has exhibited such a corneal patent, which is easily challenged in court, so it has something good: the patent attorney has Heinz-Dieter Hombücher, the owner of Apess, money, which one only welcomes you can.

Optimal pressure drop distribution on the tube coils and the collectors

With the optimal pressure drop distribution on the tube coils and the collectors, it is important that all tube coils receive the same amount of liquid. This is the only way to achieve optimum performance of the heat exchanger. This can only be achieved if the pressure drop in the tube coils is significantly higher than in the collectors. So it's about the pressure ratio (T/C), see below.

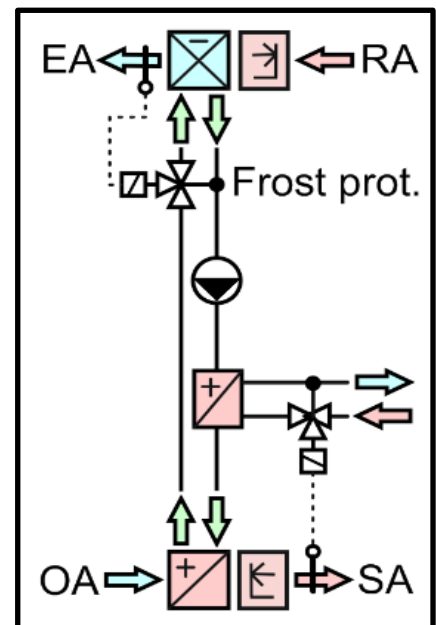
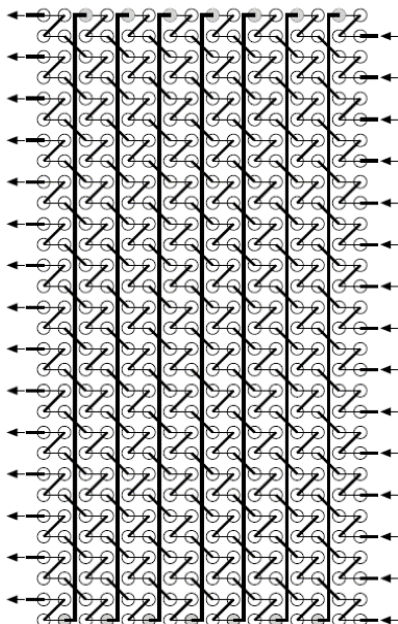


Typical applications			Heater	Cooler	CC-System
Pressure drop total	---	kPa	10.000	40.000	200.000
Coil pressure drop	T	kPa	6.500	33.000	193.000
Pressure drop collectors	C	kPa	3.500	7.000	7.000
Pressure ratio	T/C	---	1.857	4.714	27.571

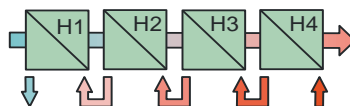
So if you really want to worry about optimal liquid distribution, turn to the air heater and air cooler, but certainly not to the heat exchangers in heat recovery! And yet there are absolute idiots who have applied for patents on an injection for heat recovery, i.e. exactly where it is totally superfluous.

An optimal CC-System must therefore have a pressure drop of 2 bar per heat exchanger in order to achieve maximum performance. In addition, there is the hydraulic system with a further 2 bar pressure drop. In total, a pressure drop of 6 bar is up for debate, which is not a problem when choosing the right pump. Idiots choose centrifugal pumps with a non-linear characteristic. Those familiar with the subject choose gear pumps from www.maag.com with absolutely linear characteristics. This means, for example, that when the speed is reduced to 50 %, the flow rate is exactly 50 %, so regulation is very easy.

www.maag.com



Definition		
Height over sea level	m	106.00
Pressure	hPa	1000.56
Temp.	°C	20.00
Rel. humidity	%	40.00
Air humid	m3/h	30000.00
25 V% Et.glycol	m3/h	12.17



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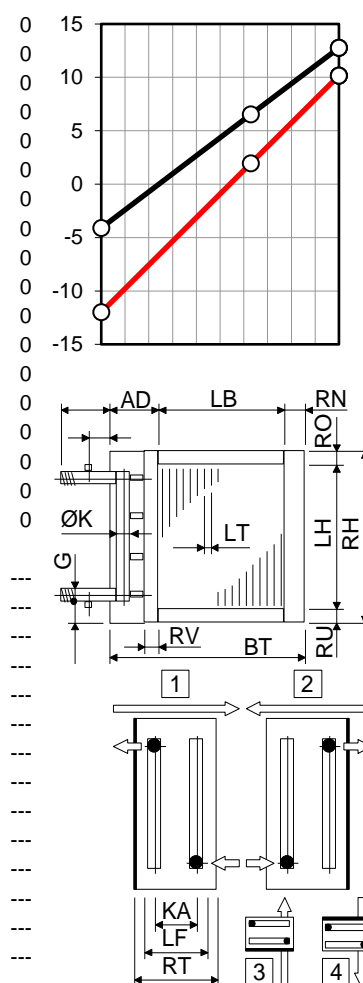
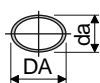
Air humid		Heater 1	Heater 2	Heater 3	Heater 4
Temp. Inlet	°C	-12.00	1.96	10.18	10.18
Rel. humidity Inlet	%	90.00	27.50	15.61	15.61
Temp. Outlet	°C	1.96	10.18	10.18	10.18
Rel. humidity Outlet	%	27.50	15.61	15.61	15.61
Pressure drop (101.52 %)	Pa	38.50	40.72	0.00	0.00

25 V% Et.glycol		Heater 1	Heater 2	Heater 3	Heater 4
Temp. Inlet	°C	6.54	12.77	12.77	12.77
Temp. Outlet	°C	-4.10	6.54	12.77	12.77
Pressure drop (103.13 %)	kPa	115.98	74.84	0.00	0.00

Heat exchanger		Heater 1	Heater 2	Heater 3	Heater 4
Capacity	kW	138.14	81.32	0.00	0.00
Surface reserve	%	0.35	0.42	0.00	0.00
Present surface	m2	928.00	928.00	0.00	0.00
Required surface	m2	924.79	924.11	0.00	0.00
k-coeff.	W/m2K	25.53	26.27	0.00	0.00
Average temp. diff.	K	5.85	3.35	0.00	0.00

Tubes blank	Piece	8	4	0
Int. vent./drains	Piece	3	3	0
Tube rows on the depth	Piece	8	8	0
Tube rows on the height	Piece	53	53	0
Number of circuits (NC)	Piece	26	30	0
Volume	l	128	128	0
Weight	kg	466	466	0
Connections	G	2 1/2"	2 1/2"	0
Frame height	RH	1900	1900	0
Frame width	BT	2600	2600	0
Frame depth	RT	390	390	0
Finned height	LH	1855	1855	0
Finned width	LB	2381	2381	0
Frame on top	RO	22	22	0
Frame on bottom	RU	23	23	0
Frame in front	RV	30	30	0
Frame on back (~53/53/0/0)	RN	53	53	0
Collector covering	AD	166	166	0

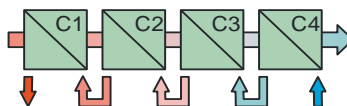
Tubes	Type	circular	circular	---
Tubes	DA / da	12.40 / 12.40	12.40 / 12.40	---
Tubes	S1 / S2	35.00 / 35.00	35.00 / 35.00	---
Tubes	---	in line	in line	---
Tubes	---	Cu	Cu	---
Tubes	---	smooth	smooth	---
Collector	---	Cu	Cu	---
Connections	---	Rg7	Rg7	---
Fins	LT / LD	2.50 / 0.20	2.50 / 0.20	---
Fins	---	Al	Al	---
Fins	---	smooth	smooth	---
Frame	---	AISI 304	AISI 304	---
Protection	---	without	without	---
Protection	---	---	---	---
Air flow direction	---	horizontal	horizontal	---



Heater 1: 35/35/12-8R-53T-2381A-2.5PA-26C-Cu/Al/AISI 304	EUR	6509.00
Heater 2: 35/35/12-8R-53T-2381A-2.5PA-30C-Cu/Al/AISI 304	EUR	6529.00
Heater 3: ---	EUR	0.00
Heater 4: ---	EUR	0.00
Total	EUR	13038.00

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

Definition		
Height over sea level	m	106.00
Pressure	hPa	1000.56
Temp.	°C	20.00
Rel. humidity	%	40.00
Air humid	m3/h	27000.00
25 V% Et.glycol	m3/h	12.18



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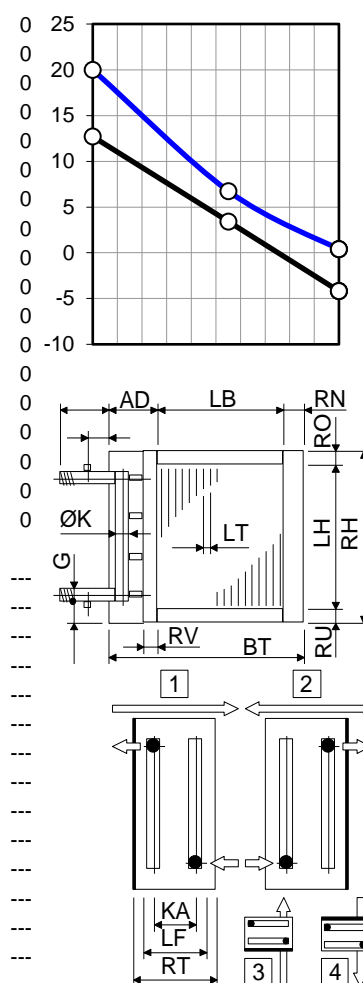
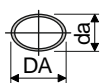
Air humid		Cooler 1	Cooler 2	Cooler 3	Cooler 4
Temp. Inlet	°C	20.00	6.74	0.39	0.39
Rel. humidity Inlet	%	40.00	93.30	99.84	99.84
Temp. Outlet	°C	6.74	0.39	0.39	0.39
Rel. humidity Outlet	%	93.30	99.84	99.84	99.84
Pressure drop	Pa	41.80	51.53	0.00	0.00

25 V% Et.glycol		Cooler 1	Cooler 2	Cooler 3	Cooler 4
Temp. Inlet	°C	3.42	-4.19	-4.19	-4.19
Temp. Outlet	°C	12.70	3.42	-4.19	-4.19
Pressure drop (102.56 %)	kPa	110.84	81.09	0.00	0.00

Heat exchanger		Cooler 1	Cooler 2	Cooler 3	Cooler 4
Capacity	kW	121.20	98.70	0.00	0.00
Surface reserve	%	0.29	0.44	0.00	0.00
Present surface	m2	1031.15	1031.15	0.00	0.00
Required surface	m2	1028.16	1026.63	0.00	0.00
k-coeff.	W/m2K	25.56	26.11	0.00	0.00
Average temp. diff.	K	4.61	3.68	0.00	0.00

Tubes blank	Piece	8	4	0
Int. vent./drains	Piece	3	3	0
Tube rows on the depth	Piece	8	8	0
Tube rows on the height	Piece	53	53	0
Number of circuits (NC)	Piece	26	30	0
Volume	l	128	128	0
Weight	kg	494	494	0
Connections	G	2 ½"	2 ½"	0
Frame height	RH	1900	1900	0
Frame width	BT	2600	2600	0
Frame depth	RT	390	390	0
Finned height	LH	1855	1855	0
Finned width	LB	2381	2381	0
Frame on top	RO	22	22	0
Frame on bottom	RU	23	23	0
Frame in front	RV	30	30	0
Frame on back (~53/53/0/0)	RN	53	53	0
Collector covering	AD	166	166	0

Tubes	Type	circular	circular	---
Tubes	DA / da	12.40 / 12.40	12.40 / 12.40	---
Tubes	S1 / S2	35.00 / 35.00	35.00 / 35.00	---
Tubes	---	in line	in line	---
Tubes	---	Cu	Cu	---
Tubes	---	smooth	smooth	---
Collector	---	Cu	Cu	---
Connections	---	Rg7	Rg7	---
Fins	LT / LD	2.24 / 0.20	2.24 / 0.20	---
Fins	---	Al	Al	---
Fins	---	smooth	smooth	---
Frame	---	AISI 304	AISI 304	---
Protection	---	without	without	---
Protection	---	---	---	---
Air flow direction	---	horizontal	horizontal	---



Cooler 1: 35/35/12-8R-53T-2381A-2.2PA-26C-Cu/Al/AISI 304	EUR	6749.00
Cooler 2: 35/35/12-8R-53T-2381A-2.2PA-30C-Cu/Al/AISI 304	EUR	6769.00
Cooler 3: ---	EUR	0.00
Cooler 4: ---	EUR	0.00
Total	EUR	13518.00

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