



Coefficient in the AHH Mollier-HX-Diagram

Coefficient: $C = \frac{Q}{\Delta t_m} = kA$

Using the example, which can be found on **pages 2-5**, we recommend, what we consider to be the correct procedure in the **AHH software**. Under Options/Air flow inlet, select the unit of measurement m³/h related to 20°C/40% and thus obtain the **air volume in kg/h, which remains constant throughout all processes**.

Process 1: Definition of the air volume = 30,000 m³/h

Now select the unit of measurement kg/h under Options/Air flow inlet and use it to calculate all subsequent processes.

Process 2: Heat recovery in winter

Process 3: Supply air reheating in winter

Process 4: Supply air humidification in winter

Process 5: Exhaust air humidification in summer

Process 6: Cold recovery in summer

Process 7: Supply air recooling in summer

Process 8: Supply air reheating in summer

In the processes for heating and cooling air, the temperatures for the liquid medium, such as water or brines, must be entered. From these values, the mean logarithmic temperature difference is calculated. If you divide the capacity by the mean logarithmic temperature difference, you get a coefficient.

For the k-value, values between 30 and 60 W/m²K, i.e. 0.03 to 0.06 kW/m²K, apply, whereby these depend primarily on the permissible pressure drops. Now we know, what surface area is needed for the heat exchangers. If you also know the specific costs from experience, you can estimate, how much these heat exchangers are likely to cost.

Example for a heater (3)

Capacity Q = 275.389 kW
 Mean log. temp. diff. Δt_m = 24.355 K
 Coefficient C = 275.389 / 24.355 = 11.307 kW/K
 k-Value = 30 W/m²K = 0.03 kW/m²K
 Heater surface A = 11.307 / 0.03 = 376.910 m²
 Specific costs S = 10 CHF/m²
 Heater price = 10 x 376.910 = CHF 3'769

Example for a cooler (7)

Capacity Q = 303.500 kW
 Mean log. temp. diff. Δt_m = 8.406 K
 Coefficient C = 303.500 / 8.406 = 36.103 kW/K
 k-Value = 60 W/m²K = 0.06 kW/m²K
 Cooler surface A = 36.103 / 0.06 = 601.753 m²
 Specific costs S = 10 CHF/m²
 Cooler price = 10 x 601.753 = CHF 6'018

Example for a HR-System (2)

Capacity Q = 203.784 kW
 Mean log. temp. diff. Δt_m = 11.178 K
 Coefficient C = 203.784 / 11.178 = 18.231 kW/K
 2 Heat exchanger on the HR-System
 Coefficient C = 2 x 18.231 = 36.462 kW/K
 Per heat exchanger on the HR-System
 k-Value = 30 W/m²K = 0.03 kW/m²K
 HE-Surface A = 36.462 / 0.03 = 1215.400 m²
 Specific costs S = 10 CHF/m²
 HE-Price = 10 x 1215.400 = CHF 12'154
 2 Heat exchanger total CHF 24'308

Of course, you can use the **HES software** to correctly calculate all these heat exchangers and compare up to 40 different geometries. Anyone can download and install the HES software from www.zcs.ch and use it as a trial, free of charge for 30 days without any restrictions.

Page 6: Heat recovery in winter

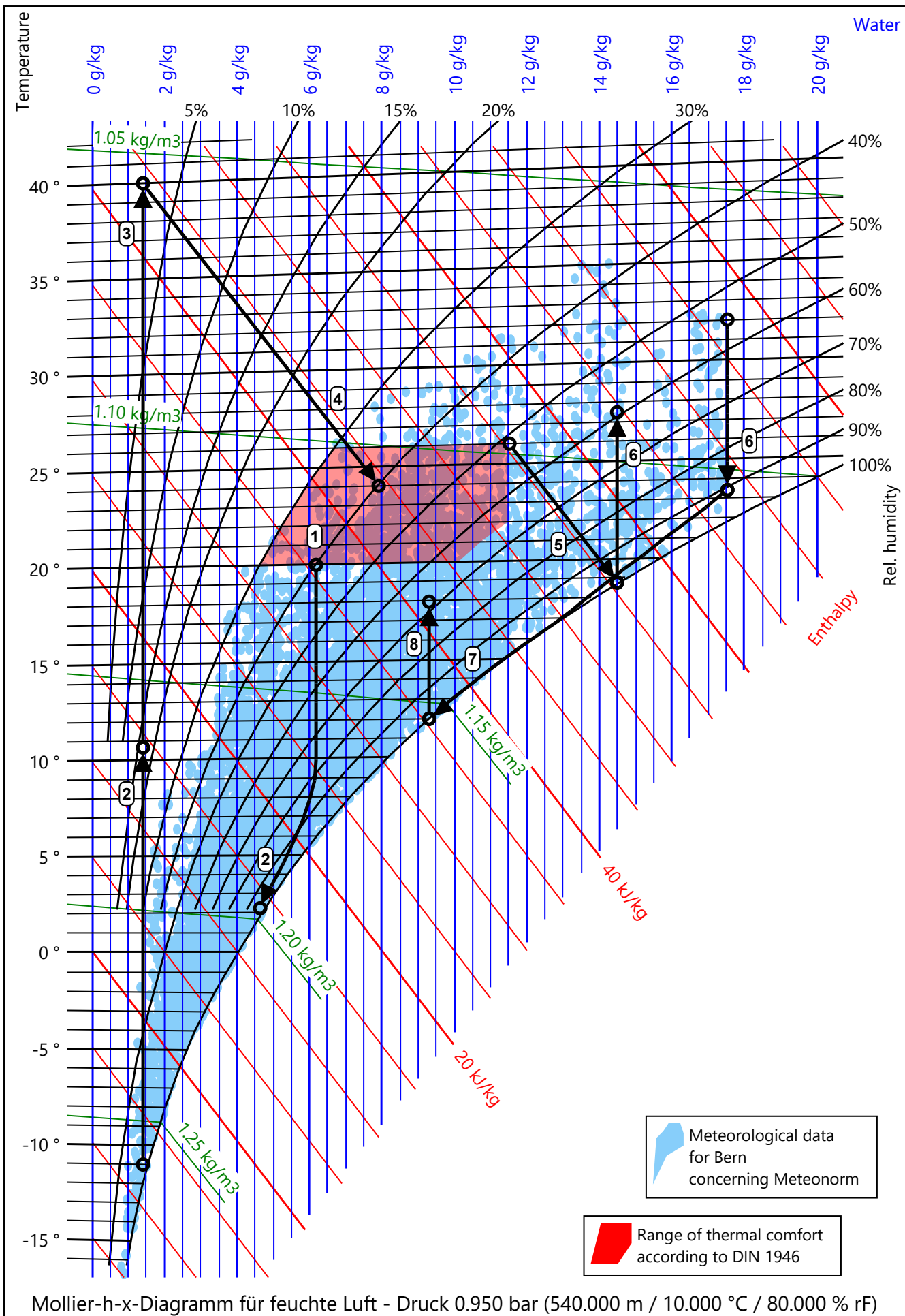
Page 7: Cold recovery in summer

Page 8: Recovery according to DIN EN 308

Page 9: Supply air reheating in winter

Page 10: Supply air recooling in summer

Page 11: Supply air reheating in summer



1) Point

Air

Temperature	°C	20.000
Rel. humidity	%	40.000
Abs. humidity	g/kg	6.174
Density humid	kg/m³	1.124
Enthalpy humid	kJ/kg	35.794
Volume flow humid	m³/h	30000.000
Massflow dry	kg/h	33514.704

2) Heat recovery - Circuit connect-system - Surface relation hot/cold 1.000 - Partition of fins (2.5 - 3.5 mm)

Efficiency temperature	%	70.000
Efficiency hygroscopic	%	0.000
Efficiency humid	%	0.000
Capacity	kW	203.784
Mean temp.diff.	K	11.178
Coefficient	kW/K	18.231

		Cold air In	Cold air Out	Hot air In	Hot air Out
Temperature	°C	-11.000	10.700	20.000	2.293
Rel. humidity	%	90.000	16.506	40.000	97.174
Abs. humidity	g/kg	1.394	1.394	6.174	4.631
Density humid	kg/m³	1.261	1.164	1.124	1.197
Enthalpy humid	kJ/kg	-7.610	14.280	35.794	13.904
Volume flow humid	m³/h	26623.555	28827.282	30000.000	28118.748
Massflow dry	kg/h	33514.704	33514.704	33514.704	33514.704
Condensed water	kg/h		0.000		51.725
Surface temperature	°C				-2.625

Danger of FREEZING!

3) Heating

Capacity	kW	275.389
Mean temp.diff.	K	24.355
Coefficient	kW/K	11.307

Heating medium In	°C	60.000
Heating medium Out	°C	40.000

		Air In	Air Out
Temperature	°C	10.700	40.000
Rel. humidity	%	16.506	2.890
Abs. humidity	g/kg	1.394	1.394
Density humid	kg/m³	1.164	1.055
Enthalpy humid	kJ/kg	14.280	43.861
Volume flow humid	m³/h	28827.282	31802.844
Massflow dry	kg/h	33514.704	33514.704

4) Moistening of air with water

Capacity	kW	3.773
Moistening flow	kg/h	218.044
Moistening temperature	°C	15.000
Moistening enthalpy	kJ/kg	62.302

		Air In	Air Out
Temperature	°C	40.000	24.008
Rel. humidity	%	2.890	40.000
Abs. humidity	g/kg	1.394	7.900
Density humid	kg/m³	1.055	1.108
Enthalpy humid	kJ/kg	43.861	44.266
Volume flow humid	m³/h	31802.723	30493.646
Massflow dry	kg/h	33514.704	33514.704

5) Moistening of air with water

Capacity	kW	1.740
Moistening flow	kg/h	100.531
Moistening temperature	°C	15.000
Moistening enthalpy	kJ/kg	62.302

		Air In	Air Out
Temperature	°C	26.000	18.785
Rel. humidity	%	51.450	100.000
Abs. humidity	g/kg	11.504	14.504
Density humid	kg/m³	1.098	1.123
Enthalpy humid	kJ/kg	55.488	55.675
Volume flow humid	m³/h	30874.563	30271.828
Massflow dry	kg/h	33514.704	33514.704

6) Heat recovery - Circuit connect-system - Surface relation hot/cold 1.000 - Partition of fins (2.5 - 3.5 mm)

Efficiency temperature	%	65.580
Efficiency hygroscopic	%	0.000
Efficiency humid	%	0.000
Capacity	kW	83.397
Mean temp.diff.	K	4.573
Coefficient	kW/K	18.235

		Cold air In	Cold air Out	Hot air In	Hot air Out
Temperature	°C	18.785	27.452	32.000	23.384
Rel. humidity	%	100.000	59.287	55.000	90.876
Abs. humidity	g/kg	14.504	14.504	17.552	17.552
Density humid	kg/m³	1.123	1.091	1.073	1.104
Enthalpy humid	kJ/kg	55.674	64.632	77.138	68.180
Volume flow humid	m³/h	30271.826	31170.431	31793.609	30895.912
Massflow dry	kg/h	33514.704	33514.704	33514.704	33514.704
Condensed water	kg/h		0.000		0.000
Surface temperature	°C				21.682

7) Cooling of air - Partition of fins (2.5 - 3.5 mm)

Capacity	kW	303.500
Mean temp.diff.	K	8.406
Coefficient	kW/K	36.103

Coolant In	°C	6.000
Coolant Out	°C	12.000

		Air In	Air Out
Temperature	°C	23.384	12.000
Rel. humidity	%	90.876	100.000
Abs. humidity	g/kg	17.553	9.318
Density humid	kg/m³	1.104	1.153
Enthalpy humid	kJ/kg	68.182	35.581
Volume flow humid	m³/h	30895.914	29327.381
Massflow dry	kg/h	33514.704	33514.704
Condensed water	kg/h		275.979
Surface temperature	°C		7.560

8) Heating

Capacity	kW	57.185	
Mean temp.diff.	K	34.528	
Coefficient	kW/K	1.656	
Heating medium In	°C	60.000	
Heating medium Out	°C	40.000	
		Air In	Air Out
Temperature	°C	12.000	18.000
Rel. humidity	%	100.000	68.032
Abs. humidity	g/kg	9.318	9.318
Density humid	kg/m ³	1.153	1.130
Enthalpy humid	kJ/kg	35.581	41.723
Volume flow humid	m ³ /h	29327.381	29944.455
Massflow dry	kg/h	33514.704	33514.704

CC-System in winter		SAHe	RACo	Definition
Height over sea level	m			540.000
Pressure	hPa			949.653
Efficiency	%	70.000	57.171	
Capacity sensible	kW	203.795	167.491	
Capacity latent	kW	0.000	35.367	
Capacity frost	kW	---	0.936	
Capacity total	kW	203.795	203.795	
Surface reserve	%	1.268	0.250	
Present surface	m ²	1481.025	1295.897	

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SAHe		Inlet	Outlet	Definition
Temp.	°C	-11.000	10.700	20.000
Rel. humidity	%	90.000	16.506	40.000
Abs. humidity	g/kg	1.394	1.394	6.174
Volume flow humid	m ³ /h	26623.555	28827.290	30000.000
Velocity	m/s	1.768	1.915	1.993
Pressure drop	Pa		116.882	

Representative

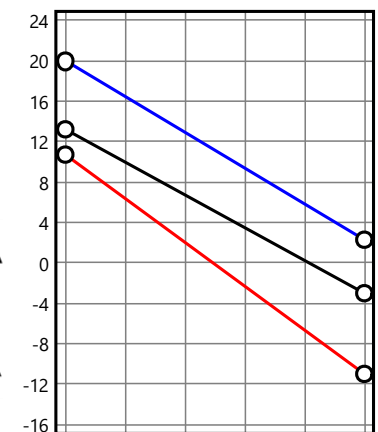
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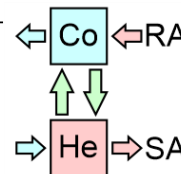
Position

RACo		Inlet	Outlet	Definition
Temp.	°C	20.000	2.277	20.000
Rel. humidity	%	40.000	98.246	40.000
Abs. humidity	g/kg	6.174	4.676	6.174
Volume flow humid	m ³ /h	30000.000	28119.171	30000.000
Velocity	m/s	1.993	1.868	1.993
Pressure drop	Pa		117.849	

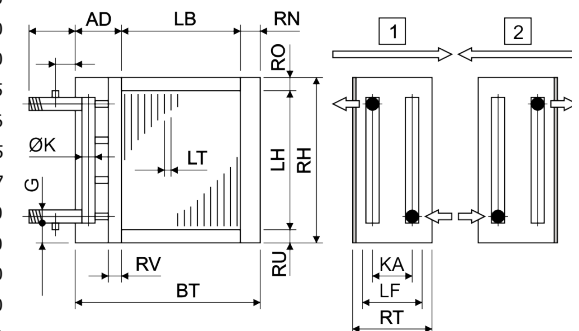
Temperature (°C)



25 V% Et.glycol		SAHe	RACo
Temp.	in °C	13.202	-3.015
Temp.	out °C	-3.015	13.202
Volume flow	m ³ /h	11.755	11.759
Velocity	m/s	1.132	1.132
Reynolds	---	5838.383	5703.739
Pressure drop	kPa	196.387	173.126



Technical data		SAHe	RACo	
Tubes total	Piece	816	714	Tubes: Cu Cu
Tubes blank	Piece	0	0	Tubes: smooth smooth
Int. vent./drains	Piece	7	6	Tubes: staggered staggered
Tube rows on the depth	Piece	16	14	Tubes: circular circular
Tube rows on the height	Piece	51	51	Collectors: Cu Cu
Tube coupling in series	Piece	48	42	Collectors: 0.80 m/s 0.80 m/s
Number of circuits (NC)	Piece	17	17	Connections: Rg7 Rg7
Volume	l	320	283	Connections: 0.80 m/s 0.80 m/s
Weight	kg	762	673	Fins: Al Al
Connections	G ---	2 1/2"	2 1/2"	Fins: ribbed ribbed
Frame height	RH mm	2100	2100	Frame: AISI304 AISI304
Frame width	BT mm	2300	2300	Frame: 2.00 m/s 2.00 mm
Frame depth	RT mm	670	600	Protection: without without
Finned height	LH mm	2040	2040	Protection: --- ---
Finned width	LB mm	2050	2050	
Finned depth	LF mm	560	490	
Frame on top	RO mm	30	30	
Frame on bottom	RU mm	30	30	
Frame in front	RV mm	30	30	
Frame on back	RN mm	65	65	
Collector-Diameter	K mm	76	76	
Collector covering	AD mm	185	185	
Collector distance	KA mm	567	497	
Fin spacing	LT mm	2.900	2.900	
Fin thickness	LD mm	0.200	0.200	
Tube diameter	DA mm	15.400	15.400	
Tube diameter	da mm	15.400	15.400	
Tube thickness	S mm	0.350	0.350	
Tube interval on the height	S1 mm	40.000	40.000	
Tube interval on the width	S2 mm	35.000	35.000	



SAHe: 40/35/15-16R-51T-2050A-2.9PA-17C-Cu/Al/AISI304
RACo: 40/35/15-14R-51T-2050A-2.9PA-17C-Cu/Al/AISI304

SAHe: EUR 12578.00
RACo: EUR 11105.00

CC-System in summer		RAHe	SACo	Definition
Height over sea level	m			540.000
Pressure	hPa			949.653
Efficiency	%	67.975	67.592	
Capacity sensible	kW	86.450	86.450	
Capacity latent	kW	0.000	0.000	
Capacity frost	kW	---	0.000	
Capacity total	kW	86.450	86.450	
Surface reserve	%	0.008	0.808	
Present surface	m ²	1295.897	1481.025	

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RAHe		Inlet	Outlet	Definition
Temp.	°C	18.785	27.768	20.000
Rel. humidity	%	100.000	58.202	40.000
Abs. humidity	g/kg	14.503	14.503	6.174
Volume flow humid	m ³ /h	30271.763	31203.199	30000.000
Velocity	m/s	2.011	2.073	1.993
Pressure drop	Pa		115.932	

Representative

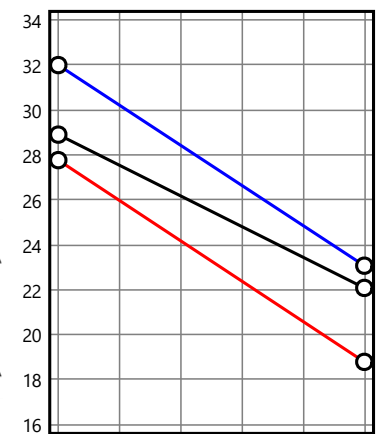
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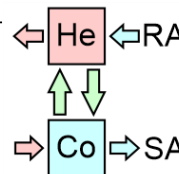
Position

SACo		Inlet	Outlet	Definition
Temp.	°C	32.000	23.068	20.000
Rel. humidity	%	55.000	92.623	40.000
Abs. humidity	g/kg	17.552	17.552	6.174
Volume flow humid	m ³ /h	31793.563	30862.940	30000.000
Velocity	m/s	2.112	2.050	1.993
Pressure drop	Pa		135.469	

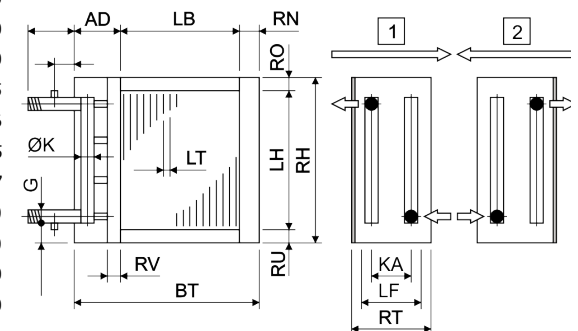
Temperature (°C)



25 V% Et.glycol		RAHe	SACo
Temp.	in °C	28.904	22.078
Temp.	out °C	22.078	28.904
Volume flow	m ³ /h	11.755	11.757
Velocity	m/s	1.132	1.132
Reynolds	---	10586.114	10426.296
Pressure drop	kPa	151.480	173.407



Technical data		SAHe	RACo	
Tubes total	Piece	714	816	Tubes: Cu Cu
Tubes blank	Piece	0	0	Tubes: smooth smooth
Int. vent./drains	Piece	6	7	Tubes: staggered staggered
Tube rows on the depth	Piece	14	16	Tubes: circular circular
Tube rows on the height	Piece	51	51	Collectors: Cu Cu
Tube coupling in series	Piece	42	48	Collectors: 0.80 m/s 0.80 m/s
Number of circuits (NC)	Piece	17	17	Connections: Rg7 Rg7
Volume	l	283	320	Connections: 0.80 m/s 0.80 m/s
Weight	kg	673	762	Fins: Al Al
Connections	G ---	2 1/2"	2 1/2"	Fins: ribbed ribbed
Frame height	RH mm	2100	2100	Frame: AISI304 AISI304
Frame width	BT mm	2300	2300	Frame: 2.00 m/s 2.00 mm
Frame depth	RT mm	600	670	Protection: without without
Finned height	LH mm	2040	2040	Protection: --- ---
Finned width	LB mm	2050	2050	
Finned depth	LF mm	490	560	
Frame on top	RO mm	30	30	
Frame on bottom	RU mm	30	30	
Frame in front	RV mm	30	30	
Frame on back	RN mm	65	65	
Collector-Diameter	K mm	76	76	
Collector covering	AD mm	185	185	
Collector distance	KA mm	497	567	
Fin spacing	LT mm	2.900	2.900	
Fin thickness	LD mm	0.200	0.200	
Tube diameter	DA mm	15.400	15.400	
Tube diameter	da mm	15.400	15.400	
Tube thickness	S mm	0.350	0.350	
Tube interval on the height	S1 mm	40.000	40.000	
Tube interval on the width	S2 mm	35.000	35.000	



RAHe: 40/35/15-14R-51T-2050A-2.9PA-17C-Cu/Al/AISI304
SACo: 40/35/15-16R-51T-2050A-2.9PA-17C-Cu/Al/AISI304

RAHe: EUR 11105.00
SACo: EUR 12578.00

CC-System - (DIN EN 308)		SAHe308	RACo308	Definition
Height over sea level	m			540.000
Pressure	hPa			949.653
Efficiency	%	66.973	66.958	
Capacity sensible	kW	125.513	125.513	
Capacity latent	kW	0.000	0.000	
Capacity frost	kW	---	0.000	
Capacity total	kW	125.513	125.513	
Surface reserve	%	0.003	0.508	
Present surface	m ²	1481.025	1295.897	

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SAHe		Inlet	Outlet	Definition
Temp.	°C	5.000	18.395	20.000
Rel. humidity	%	0.000	0.000	40.000
Abs. humidity	g/kg	0.000	0.000	6.174
Volume flow humid	m ³ /h	28185.284	29542.527	30000.000
Velocity	m/s	1.872	1.962	1.993
Pressure drop	Pa		122.188	

Representative

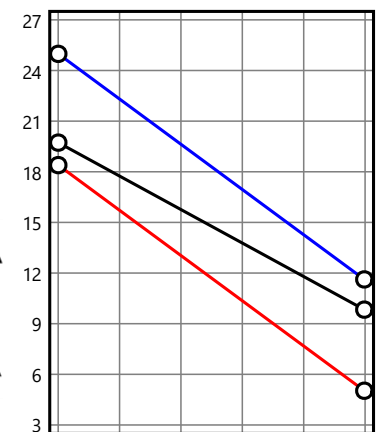
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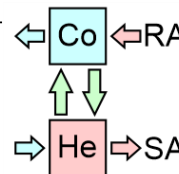
Position

RACo		Inlet	Outlet	Definition
Temp.	°C	25.000	11.608	20.000
Rel. humidity	%	0.000	0.000	40.000
Abs. humidity	g/kg	0.000	0.000	6.174
Volume flow humid	m ³ /h	30211.836	28854.901	30000.000
Velocity	m/s	2.007	1.917	1.993
Pressure drop	Pa		109.825	

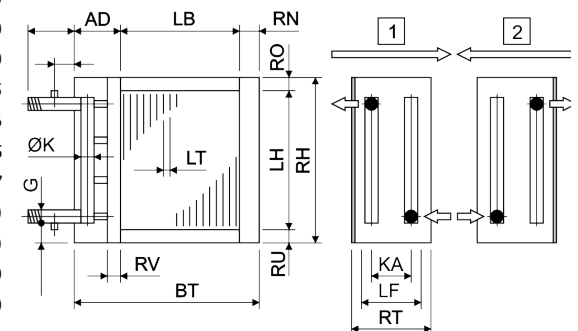
Temperature (°C)



25 V% Et.glycol		SAHe308	RACo308
Temp.	in °C	19.731	9.815
Temp.	out °C	9.815	19.731
Volume flow	m ³ /h	11.791	11.795
Velocity	m/s	1.135	1.136
Reynolds	---	8021.451	7828.253
Pressure drop	kPa	184.558	162.759



Technical data		SAHe	RACo		
Tubes total	Piece	816	714	Tubes:	Cu Cu
Tubes blank	Piece	0	0	Tubes:	smooth smooth
Int. vent./drains	Piece	7	6	Tubes:	staggered staggered
Tube rows on the depth	Piece	16	14	Tubes:	circular circular
Tube rows on the height	Piece	51	51	Collectors:	Cu Cu
Tube coupling in series	Piece	48	42	Collectors:	0.80 m/s 0.80 m/s
Number of circuits (NC)	Piece	17	17	Connections:	Rg7 Rg7
Volume	l	320	283	Connections:	0.80 m/s 0.80 m/s
Weight	kg	762	673	Fins:	Al Al
Connections	G ---	2 1/2"	2 1/2"	Fins:	ribbed ribbed
Frame height	RH mm	2100	2100	Frame:	AISI304 AISI304
Frame width	BT mm	2300	2300	Frame:	2.00 m/s 2.00 mm
Frame depth	RT mm	670	600	Protection:	without without
Finned height	LH mm	2040	2040	Protection:	--- ---
Finned width	LB mm	2050	2050		
Finned depth	LF mm	560	490		
Frame on top	RO mm	30	30		
Frame on bottom	RU mm	30	30		
Frame in front	RV mm	30	30		
Frame on back	RN mm	65	65		
Collector-Diameter	K mm	76	76		
Collector covering	AD mm	185	185		
Collector distance	KA mm	567	497		
Fin spacing	LT mm	2.900	2.900		
Fin thickness	LD mm	0.200	0.200		
Tube diameter	DA mm	15.400	15.400		
Tube diameter	da mm	15.400	15.400		
Tube thickness	S mm	0.350	0.350		
Tube interval on the height	S1 mm	40.000	40.000		
Tube interval on the width	S2 mm	35.000	35.000		



SAHe308: 40/35/15-16R-51T-2050A-2.9PA-17C-Cu/Al/AISI304

SAHe308: EUR 11105.00

RACo308: 40/35/15-14R-51T-2050A-2.9PA-17C-Cu/Al/AISI304

RACo308: EUR 12578.00

Cooler: 40/35/15-8R-51T-2041A-3.4PA-50C-Cu/Al/AISI304

Capacity sensible	kW	108.516
Capacity latent	kW	195.001
Capacity frost	kW	0.000
Capacity total	kW	303.518
Surface reserve	%	0.049
Present surface	m ²	634.765
Required surface	m ²	634.455
k-coeff.	W/m ² K	57.185
Average temp. diff. (99.51 %)	K	8.366

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Air humid		Inlet	Outlet	Definition
Fouling outside	m ² K/W			5.000E-05
Height over sea level	m			540.000
Pressure	mbar			949.653
Temp.	°C	23.384	12.000	20.000
Rel. humidity	%	90.876	100.000	40.000
Abs. humidity	g/kg	17.552	9.318	6.174
Density humid	kg/m ³	1.104	1.153	1.124
Enthalpy humid	kJ/kg	68.181	35.580	35.793
Volume flow humid	m ³ /h	30895.907	29327.367	30000.000
Mass flow dry	kg/h	33516.594	33516.594	33516.594
Condensate flow	kg/h		275.991	
Surface temperature	°C	14.570	7.354	
Velocity	m/s	2.061	1.957	2.001
Pressure drop dry	Pa		65.657	
Pressure drop wet	Pa		92.306	

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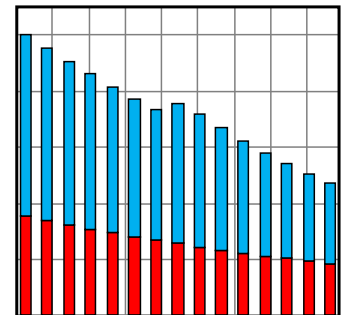
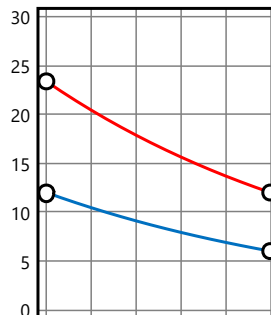
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Object
Position

Here you have the option of entering any text with automatic line wrapping.

Water

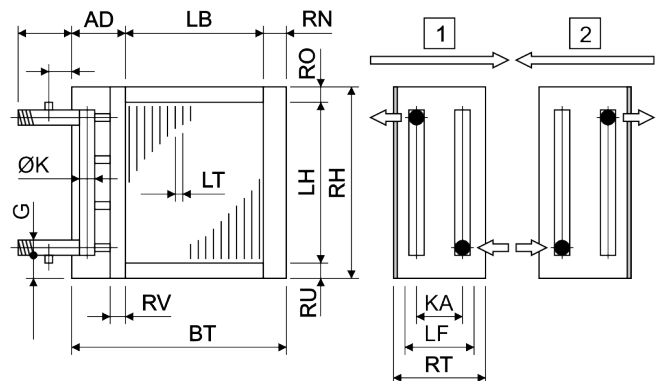
Fouling inside	m ² K/W	5.000E-05
Temp. Inlet	°C	6.000
Temp. Outlet	°C	12.000
Temp. Selection	°C	8.190
Density	kg/m ³	999.850
Spec. heat	kJ/kgK	4.196
Heat cond.	W/mK	0.577
Viscosity	Pas	1.378E-03
Volume flow	m ³ /h	43.409
Velocity	m/s	1.421
Pressure drop (Factor T/C)	---	6.212
Pressure drop	kPa	46.493

Temperature (°C)



Technical data

Tubes total	Piece	408	Tubes:	Cu	
Tubes blank	Piece	8	Tubes:	smooth	
Int. vent./drains	Piece	0	Tubes:	staggered	
Tube rows on the depth	Piece	8	Tubes:	circular	
Tube rows on the height	Piece	51	Collectors:	Cu	
Tube coupling in series	Piece	8	Collectors:	1.45 m/s	
Number of circuits (NC)	Piece	50	Connections:	Rg7	
Volume	l	187	Connections:	1.45 m/s	
Weight	kg	393	Fin:	Al	
Connections	G	---	Fin:	ribbed	
Frame height	RH	mm	2100	Frame:	AISI304
Frame width	BT	mm	2300	Frame:	2.00 mm
Frame depth	RT	mm	380	Protection:	without
Finned height	LH	mm	2040	Protection:	---
Finned width	LB	mm	2041		
Finned depth	LF	mm	280		
Frame on top	RO	mm	30		
Frame on bottom	RU	mm	30		
Frame in front	RV	mm	30		
Frame on back	RN	mm	65		
Collector-Diameter	K	mm	108		
Collector covering	AD	mm	194		
Collector distance	KA	mm	245		
Fin spacing	LT	mm	3.400		
Fin thickness	LD	mm	0.200		
Tube diameter	DA	mm	15.400		
Tube diameter	da	mm	15.400		
Tube thickness	S	mm	0.350		
Tube interval on the height	S1	mm	40.000		
Tube interval on the width	S2	mm	35.000		



Price net: EUR 6714.00

Heater: 40/35/15-4R-51T-2050A-2.8PA-34C-Cu/Al/AISI304

Capacity	kW	275.404
Surface reserve	%	2.155
Present surface	m ²	382.757
Required surface	m ²	374.684
k-coeff.	W/m ² K	31.404
Average temp. diff. (96.10 %)	K	23.405

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Air humid	Inlet	Outlet	Definition
Fouling outside	m ² K/W		5.000E-05
Height over sea level	m		540.000
Pressure	hPa		949.653
Temp.	°C	10.700	40.000
Rel. humidity	%	16.506	2.890
Abs. humidity	g/kg	1.394	1.394
Density humid	kg/m ³	1.164	1.055
Enthalpy humid	kJ/kg	14.280	43.861
Volume flow humid	m ³ /h	28827.291	31802.842
Mass flow dry	kg/h	33516.594	33516.594
Velocity	m/s	1.915	2.112
Pressure drop	Pa		33.882

25 V% Et.glycol

Fouling inside	m ² K/W	5.000E-05
Temp. Inlet	°C	60.000
Temp. Outlet	°C	40.000
Temp. Selection	°C	49.665
Density	kg/m ³	1024.795
Spec. heat	kJ/kgK	3.807
Heat cond.	W/mK	0.504
Viscosity	Pas	9.693E-04
Volume flow	m ³ /h	12.705
Velocity	m/s	0.612
Pressure drop (T/C)	---	2.221
Pressure drop	kPa	8.924

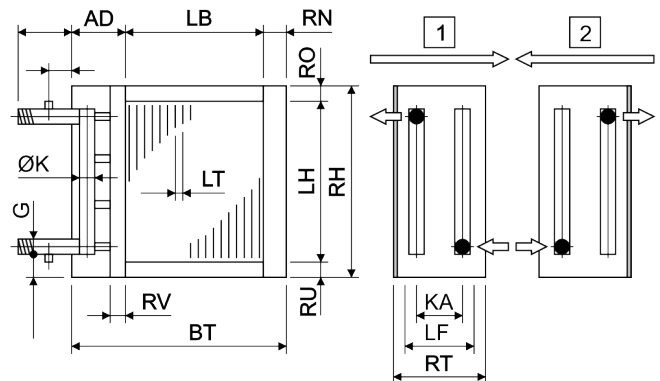
Temperature (°C)



Technical data

Tubes total	Piece	204
Tubes blank	Piece	0
Int. vent./drains	Piece	1
Tube rows on the depth	Piece	4
Tube rows on the height	Piece	51
Tube coupling in series	Piece	6
Number of circuits (NC)	Piece	34
Volume	l	94
Weight	kg	235
Connections	G ---	2 1/2"
Frame height	RH mm	2100
Frame width	BT mm	2300
Frame depth	RT mm	250
Finned height	LH mm	2040
Finned width	LB mm	2050
Finned depth	LF mm	140
Frame on top	RO mm	30
Frame on bottom	RU mm	30
Frame in front	RV mm	30
Frame on back	RN mm	65
Collector-Diameter	K mm	76
Collector covering	AD mm	185
Collector distance	KA mm	147
Fin spacing	LT mm	2.800
Fin thickness	LD mm	0.200
Tube diameter	DA mm	15.400
Tube diameter	da mm	15.400
Tube thickness	S mm	0.350
Tube interval on the height	S1 mm	40.000
Tube interval on the width	S2 mm	35.000

Tubes:	Cu
Tubes:	smooth
Tubes:	staggered
Tubes:	circular
Collectors:	Cu
Collectors:	0.86 m/s
Connections:	Rg7
Connections:	0.86 m/s
Fins:	Al
Fins:	ribbed
Frame:	AISI304
Frame:	2.00 mm
Protection:	without
Protection:	---



Price net: EUR 3869.00

Heater: 40/35/15-4R-51T-2095A-3.5PA-17C-Cu/Al/AISI304

Capacity	kW	57.188
Surface reserve	%	42.836
Present surface	m ²	317.063
Required surface	m ²	221.977
k-coeff.	W/m ² K	28.623
Average temp. diff. (91.24 %)	K	9.001

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Object
Position

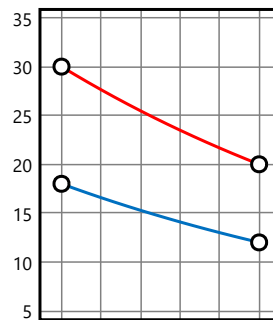
Here you have the option of entering any text with automatic line wrapping.

Air humid	Inlet	Outlet	Definition
Fouling outside	m ² K/W		5.000E-05
Height over sea level	m		540.000
Pressure	hPa		949.653
Temp.	°C	12.000	18.000
Rel. humidity	%	100.000	68.032
Abs. humidity	g/kg	9.318	6.174
Density humid	kg/m ³	1.153	1.124
Enthalpy humid	kJ/kg	35.580	41.722
Volume flow humid	m ³ /h	29327.367	29944.438
Mass flow dry	kg/h	33516.594	33516.594
Velocity	m/s	1.906	1.946
Pressure drop	Pa		27.533

25 V% Et.glykol

Fouling inside	m ² K/W	5.000E-05
Temp. Inlet	°C	30.000
Temp. Outlet	°C	20.000
Temp. Selection	°C	24.847
Density	kg/m ³	1035.831
Spec. heat	kJ/kgK	3.744
Heat cond.	W/mK	0.480
Viscosity	Pas	1.654E-03
Volume flow	m ³ /h	5.309
Velocity	m/s	0.511
Pressure drop (T/C)	---	4.668
Pressure drop	kPa	12.633

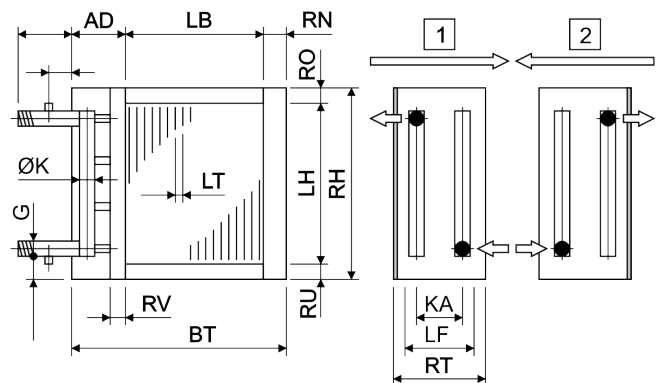
Temperature (°C)



Technical data

Tubes total	Piece	204
Tubes blank	Piece	0
Int. vent./drains	Piece	0
Tube rows on the depth	Piece	4
Tube rows on the height	Piece	51
Tube coupling in series	Piece	12
Number of circuits (NC)	Piece	17
Volume	l	86
Weight	kg	199
Connections	G ---	2"
Frame height	RH mm	2100
Frame width	BT mm	2300
Frame depth	RT mm	190
Finned height	LH mm	2040
Finned width	LB mm	2095
Finned depth	LF mm	140
Frame on top	RO mm	30
Frame on bottom	RU mm	30
Frame in front	RV mm	30
Frame on back	RN mm	65
Collector-Diameter	K mm	54
Collector covering	AD mm	140
Collector distance	KA mm	105
Fin spacing	LT mm	3.500
Fin thickness	LD mm	0.200
Tube diameter	DA mm	15.400
Tube diameter	da mm	15.400
Tube thickness	S mm	0.350
Tube interval on the height	S1 mm	40.000
Tube interval on the width	S2 mm	35.000

Tubes:	Cu
Tubes:	smooth
Tubes:	staggered
Tubes:	circular
Collectors:	Cu
Collectors:	0.72 m/s
Connections:	Rg7
Connections:	0.72 m/s
Fin:	Al
Fin:	ribbed
Frame:	AISI304
Frame:	2.00 mm
Protection:	without
Protection:	---



Price net: EUR 3311.00