

# Coolselector2

## Project information

Project name:  
 Comments:  
 Created by: Vladimir Beljanski  
 Coolselector2 version: 3.8.4. Database: 60.60.2.25.13.40  
 Printed: 14. 05 .2022.  
 Preferences used: All applications

## Compressors 1

### Operating conditions

Refrigerant:	R22		
Evaporating dew point temperature:	5.0 °C	Condensing temperature:	45.0 °C
Evaporating pressure:	5.836 bar	Condensing pressure:	17.29 bar
Useful superheat:	8.0 K	Subcooling:	2.0 K
Additional superheat:	0 K	Additional subcooling:	0 K
Return gas temperature:	13.0 °C	Total subcooling:	2.0 K
		Liquid temperature:	43.0 °C
<b>Rating conditions:</b>	<i>Custom</i>		
<b>Required cooling capacity:</b>	<i>9.500 kW</i>		

### Selection: HRM040U4, R22

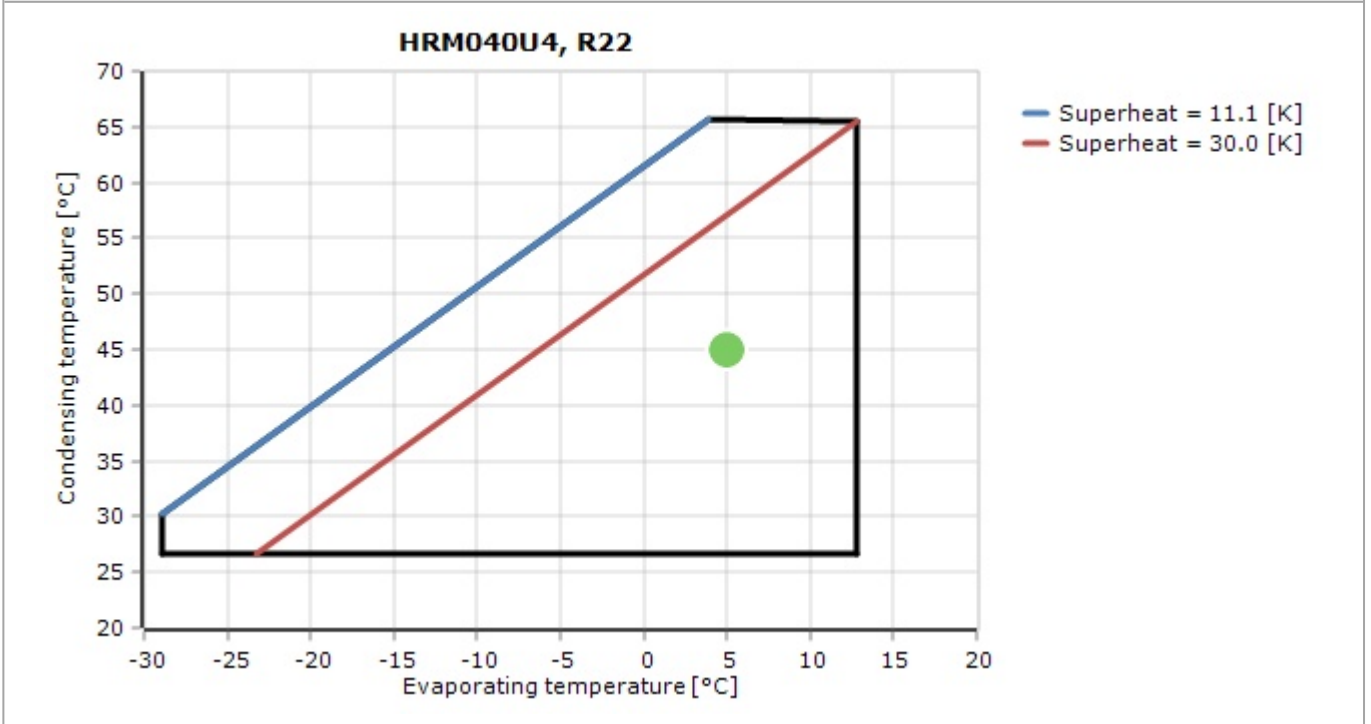
Model	HRM040U4
Technology	Scroll
Configuration	Single
Refrigerant	R22
Capacity control	Fixed speed
Speed [rpm]	2900
Cooling [kW]	9.507
Heating [kW]	11.91
COP cooling [W/W]	3.96
COP heating [W/W]	4.96
Power [kW]	2.402
Current [A]	5.591
Frequency [Hz]	50
Power supply	380 - 400 V (415 V) 3 ph*
Mass flow [kg/h]	214.3

### Selected code number and spare parts

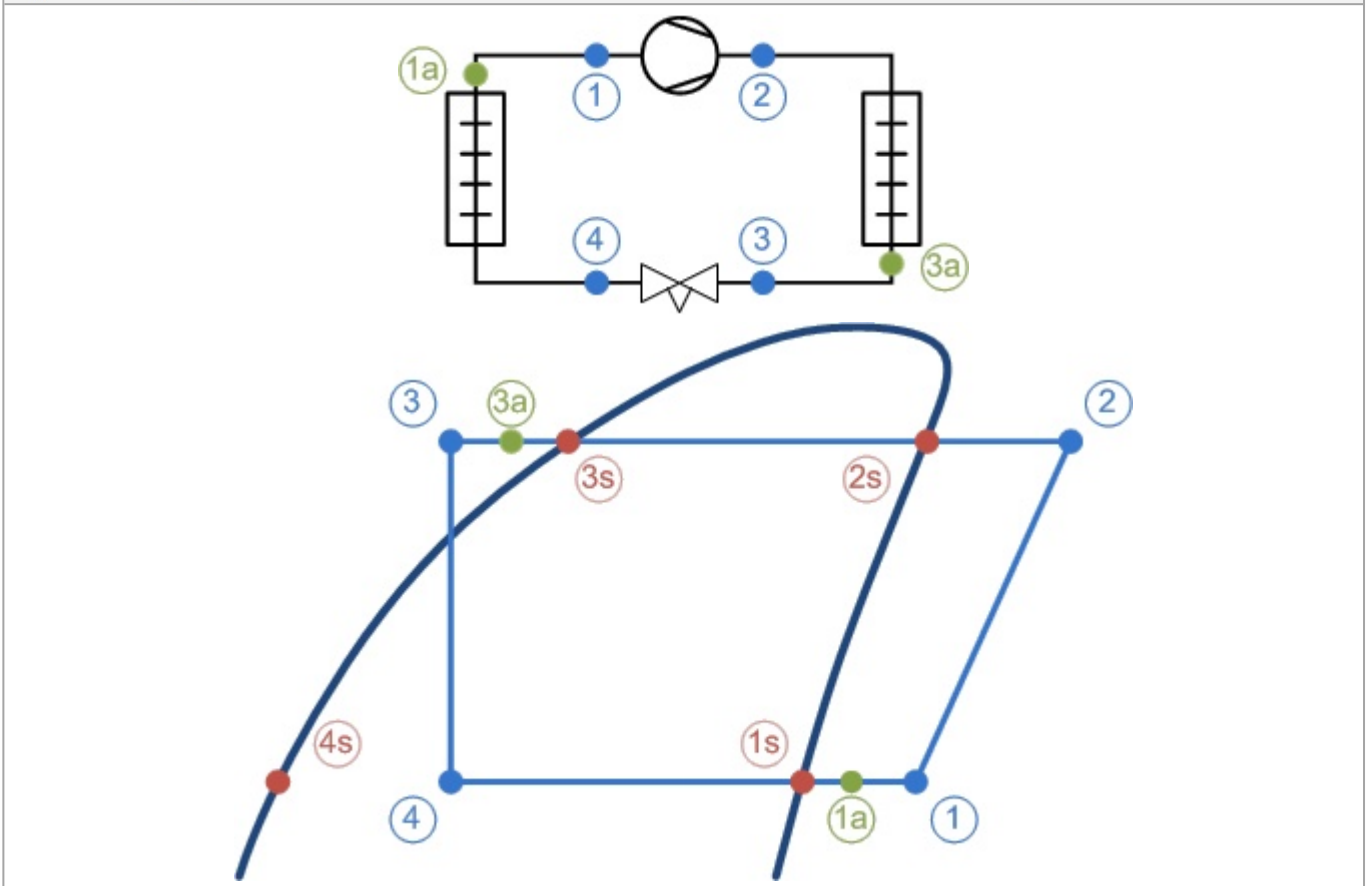
**Code number:** 120U1018. HRM040U4LP6. Min. order quantity: 16 pcs

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## Envelope



## System diagrams



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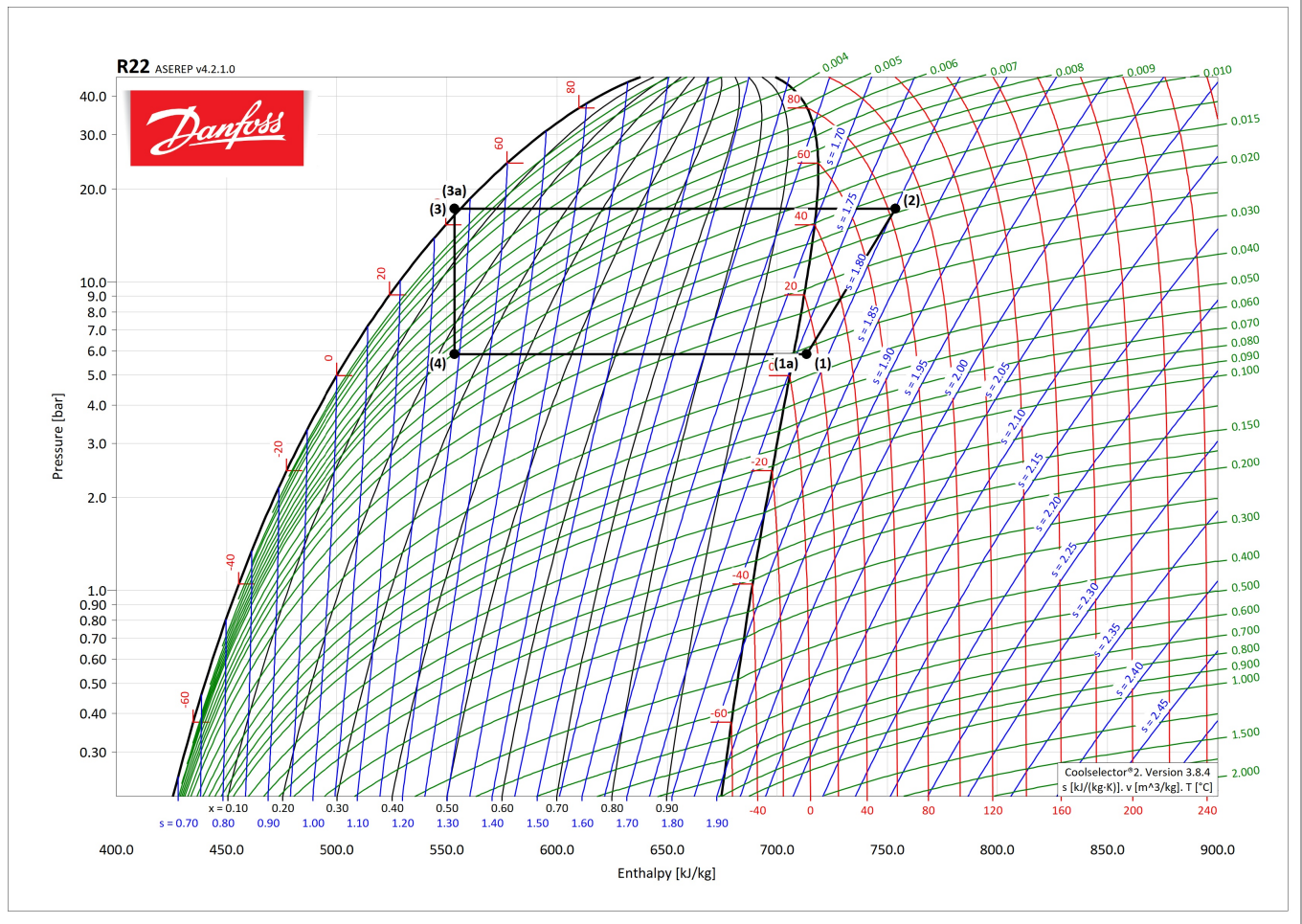
## Mass flows

Mass flow in evaporator: 214.1 kg/h      Mass flow in compressor: 214.1 kg/h

## State points

		Temperature	Pressure	Density	Enthalpy	Entropy
Point	Description	[°C]	[bar]	[kg/m <sup>3</sup> ]	[kJ/kg]	[kJ/(kg·K)]
1	Compressor suction	13.0	5.836	23.72	713.3	1.766
2	Compressor discharge (estimated)	84.0	17.29	59.1	753.6	1.801
2s	Condensation dew point	45.0	17.29	75.02	717.7	1.694
3s	Condensation bubble point	45.0	17.29	1106	556.3	1.187
3a	Condenser out	43.0	17.29	1115	553.6	1.179
3	Including additional subcooling	43.0	17.29	1115	553.6	1.179
4	After expansion valve	5.0	5.836	98.36	553.6	1.193
4s	Evaporation bubble point	5.0	5.836	1264	505.9	1.021
1s	Evaporation dew point	5.0	5.836	24.74	707.3	1.745
1a	Evaporator out	13.0	5.836	23.72	713.3	1.766

## Detailed log(p)-h diagram



## Technical Data

Economizer	No
Capacity control	Fixed speed
Configuration code	Single
Swept volume [cm <sup>3</sup> ]	54.4 cm <sup>3</sup>
Motor protection	Internal overload protector
Refrigerant charge [kg] [Max]	3.63 kg
Rotational speed at 50Hz [rpm]	2900 rpm
Nominal heating capacity at 50Hz	5.7 kW
Brand technique	Scroll compressor
Colour	Black
Rotational speed at 60Hz [rpm]	3500 rpm
IP protection class	IP22
Glass mounting	None
Gauge port LP	None
Gauge port HP	None
Oil equalization	None
Relief valve	Yes

Approval standard	CE;UL
Net weight	31 kg

### Dimensions

Length [mm]	239 mm
Drawing number	0XC6301B-2
Diameter [mm]	165 mm
Width [mm]	239 mm
Total height [mm]	413 mm
Suction connection height [mm]	250 mm
Discharge connection height [mm]	379 mm

### Electrical Specifications

Phase	3
Frequency [Hz]	50/60
Compressor power supply [V/Ph/Hz]	400/3/50 460/3/60
Low value of nominal voltage at 50Hz [V]	380 V
High value of nominal voltage at 50Hz [V]	415 V
Low value of nominal voltage at 60Hz [V]	460 V
High value of nominal voltage at 60Hz [V]	460 V
Low value of voltage range at 50Hz [V]	342 V
High value of voltage range at 50Hz [V]	457 V
Low value of voltage range at 60Hz [V]	414 V
High value of voltage range at 60Hz [V]	506 V
Winding resistance 1-2 [Ohm]	4.66 Ohm
Winding resistance 1-3 [Ohm]	4.66 Ohm
Winding resistance 2-3 [Ohm]	3.42 Ohm
MCC	10 A
RLA	6.4 A
LRA	45 A
Power connections	Spade

### Mechanical Connections

Connection type	Brazed
Suction connection pipe size [in]	3/4 in
Discharge connection size [in]	1/2 in
Suction connection size [in]	3/4 in
Fitting standard	ODF

### Oil Data

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Oil reference	160ABM
Oil type	Alkylbenzene
Oil charge [L]	1.06 L
Viscosity [cP]	32 cP
Shipped oil	Initial oil charge

## Packaging

Packing quantity	16
Shipped instructions	Installation instructions
Shipped mounting	Mounting kit with grommets and sleeves

## PED

Low side max pressure (Ps)	26.2 bar
High side max pressure (Ps)	31.1 bar

## Acoustic power

Sound 1	67 db(A)
Sound 2	62 db(A)

## Polynomials. General information

Compressor performance data according to EN12900/ARI540

Superheat	11.1	K
Subcooling	8.3	K
Q	Cooling capacity	W
P	Power consumption	W
I	Current	A
M	Mass flow	kg/s
Te	Evaporating temperature	°C
Tc	Condensing temperature	°C

$$Y = C0 + C1*Te + C2*Tc + C3*Te^2 + C4*Te*Tc + C5*Tc^2 + C6*Te^3 + C7*Tc*Te^2 + C8*Te*Tc^2 + C9*Tc^3$$

## Polynomials

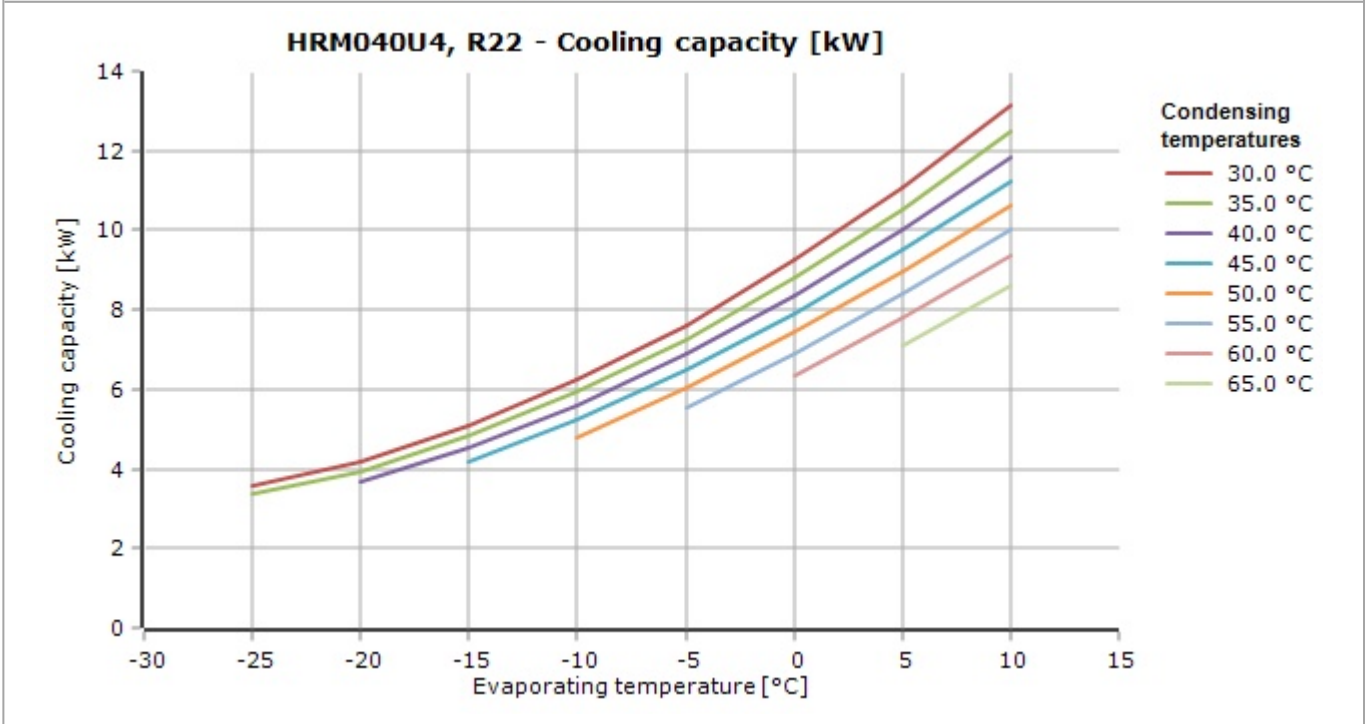
	Q [W]	P [W]	I [A]	M [kg/s]
C0	13510.5060108643	-141.937816619873	3.06892397999764	0.0636793683777442
C1	532.153568116379	-72.1403501272202	-0.114019471406937	0.00248534770287627
C2	-191.599356723404	92.5569077968598	0.0883620718494058	-0.000816365787945499
C3	6.62765333358049	-1.75487954601645	-0.00793673369335011	2.87955271805223E-5
C4	-7.56969183680534	3.23767909526825	0.0052719456050545	-3.44037346626115E-5
C5	2.83868799544573	-1.56163819223642	-0.00176326131331734	1.87703531729418E-5

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C6	-0.0249565885943323	-0.0104762371564284	-0.000121932543406729	-1.6134824575959E-7
C7	-0.0745600146532059	0.0413245196677744	0.000158136484547867	-2.83550879906461E-7
C8	0.0619510089376867	-0.0382859254069626	-6.15665555815212E-5	4.09069894111311E-7
C9	-0.0254181963621229	0.017117829753086	2.36924947603256E-5	-1.69566836149547E-7

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## HRM040U4, R22 - Cooling capacity [kW]



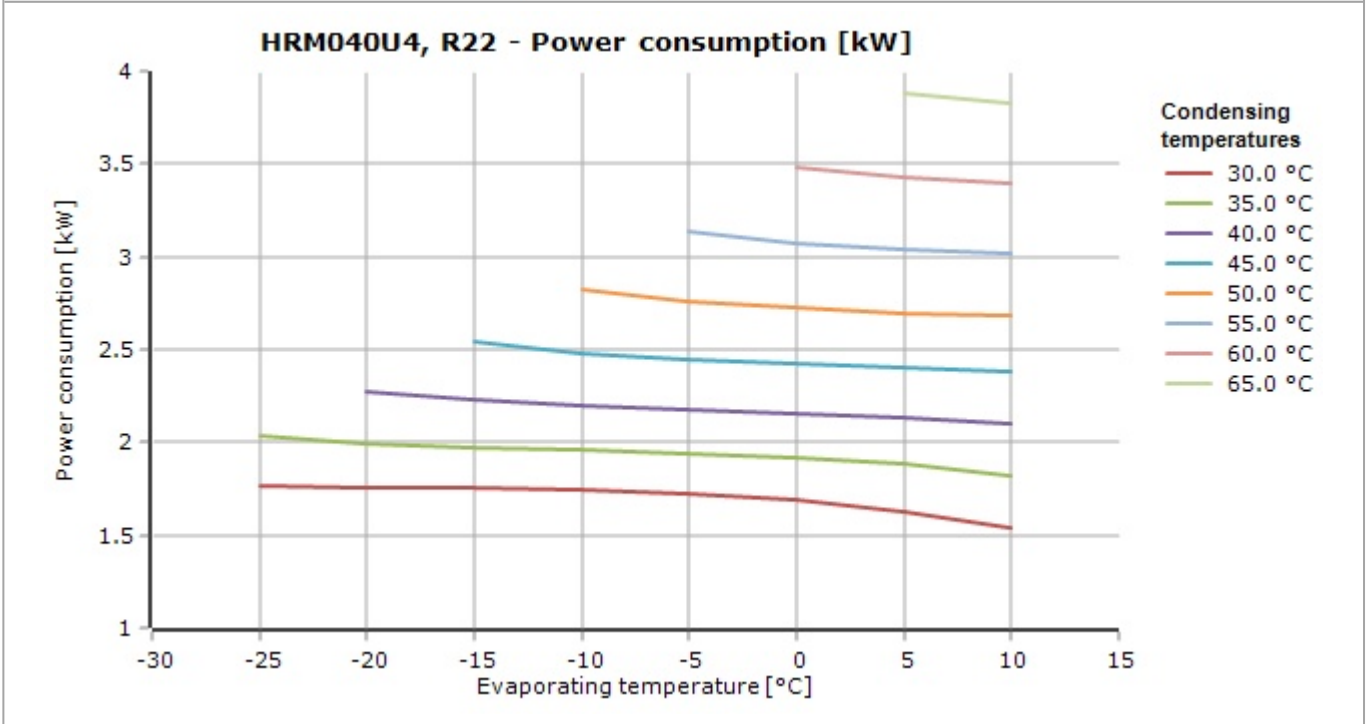
## HRM040U4, R22 - Cooling capacity [kW]

Tc\Te	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0	5.0	10.0	15.0
25.0	-	-	-	-	-	-	-	-	-	-
30.0	-	3.585	4.187	5.072	6.222	7.620	9.249	11.09	13.13	-
35.0	-	3.356	3.951	4.811	5.918	7.254	8.803	10.55	12.47	-
40.0	-	-	3.665	4.514	5.593	6.882	8.365	10.02	11.84	-
45.0	-	-	-	4.164	5.228	6.484	7.917	9.507	11.24	-
50.0	-	-	-	-	4.805	6.044	7.439	8.975	10.63	-
55.0	-	-	-	-	-	5.542	6.915	8.410	10.01	-
60.0	-	-	-	-	-	-	6.327	7.795	9.349	-
65.0	-	-	-	-	-	-	-	7.112	8.634	-
70.0	-	-	-	-	-	-	-	-	-	-



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## HRM040U4, R22 - Power consumption [kW]

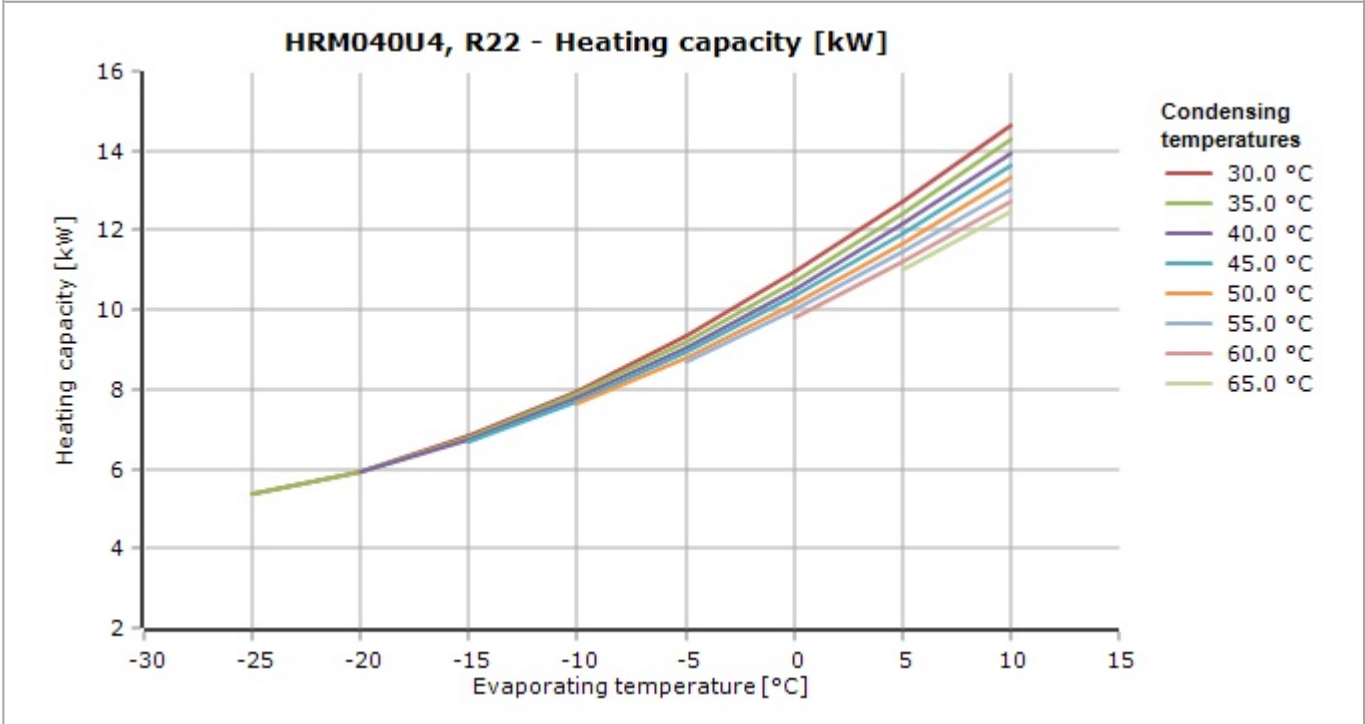


## HRM040U4, R22 - Power consumption [kW]

Tc\Te	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0	5.0	10.0	15.0
25.0	-	-	-	-	-	-	-	-	-	-
30.0	-	1.770	1.759	1.753	1.745	1.727	1.691	1.630	1.535	-
35.0	-	2.032	1.993	1.970	1.955	1.941	1.918	1.881	1.820	-
40.0	-	-	2.278	2.228	2.196	2.175	2.157	2.134	2.098	-
45.0	-	-	-	2.539	2.481	2.444	2.421	2.402	2.381	-
50.0	-	-	-	-	2.823	2.760	2.722	2.698	2.682	-
55.0	-	-	-	-	-	3.136	3.073	3.035	3.015	-
60.0	-	-	-	-	-	-	3.487	3.425	3.392	-
65.0	-	-	-	-	-	-	-	3.882	3.825	-
70.0	-	-	-	-	-	-	-	-	-	-

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## HRM040U4, R22 - Heating capacity [kW]

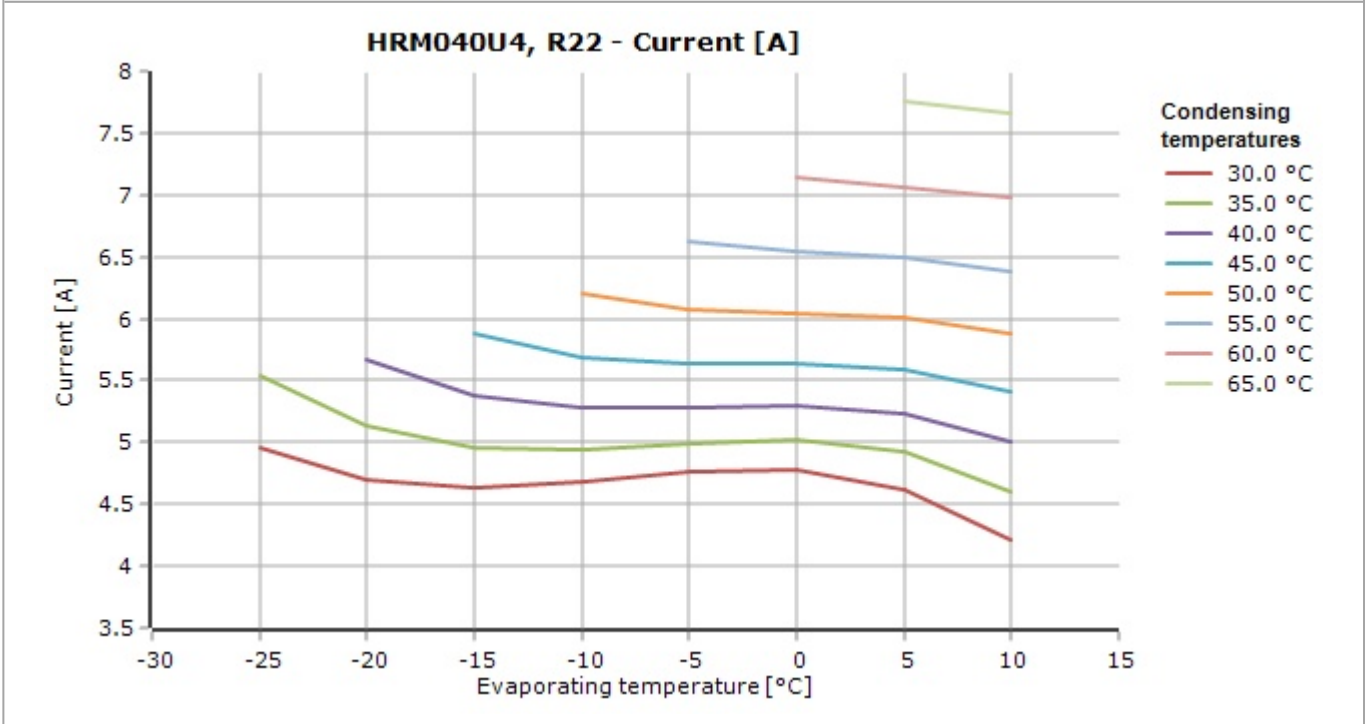


## HRM040U4, R22 - Heating capacity [kW]

Tc\Te	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0	5.0	10.0	15.0
25.0	-	-	-	-	-	-	-	-	-	-
30.0	-	5.355	5.945	6.824	7.967	9.347	10.94	12.72	14.66	-
35.0	-	5.388	5.945	6.781	7.873	9.195	10.72	12.43	14.29	-
40.0	-	-	5.943	6.743	7.789	9.058	10.52	12.16	13.94	-
45.0	-	-	-	6.703	7.709	8.929	10.34	11.91	13.62	-
50.0	-	-	-	-	7.628	8.804	10.16	11.67	13.31	-
55.0	-	-	-	-	-	8.679	9.988	11.44	13.02	-
60.0	-	-	-	-	-	-	9.814	11.22	12.74	-
65.0	-	-	-	-	-	-	-	10.99	12.46	-
70.0	-	-	-	-	-	-	-	-	-	-

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## HRM040U4, R22 - Current [A]

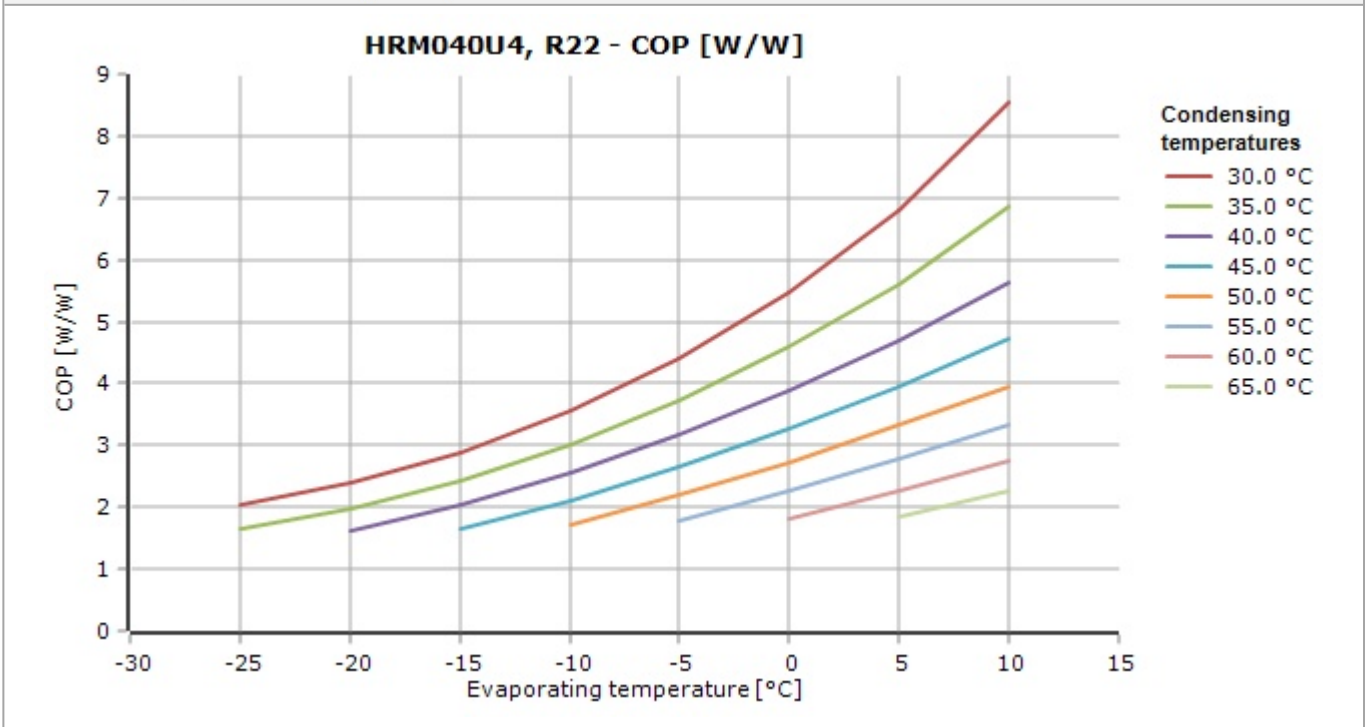


## HRM040U4, R22 - Current [A]

Tc\Te	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0	5.0	10.0	15.0
25.0	-	-	-	-	-	-	-	-	-	-
30.0	-	4.964	4.696	4.635	4.688	4.764	4.773	4.621	4.219	-
35.0	-	5.544	5.131	4.962	4.948	4.997	5.017	4.918	4.606	-
40.0	-	-	5.662	5.372	5.276	5.282	5.299	5.235	4.999	-
45.0	-	-	-	5.882	5.688	5.636	5.634	5.591	5.415	-
50.0	-	-	-	-	6.203	6.077	6.040	6.003	5.872	-
55.0	-	-	-	-	-	6.623	6.537	6.489	6.388	-
60.0	-	-	-	-	-	-	7.140	7.067	6.980	-
65.0	-	-	-	-	-	-	-	7.755	7.667	-
70.0	-	-	-	-	-	-	-	-	-	-

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## HRM040U4, R22 - COP [W/W]

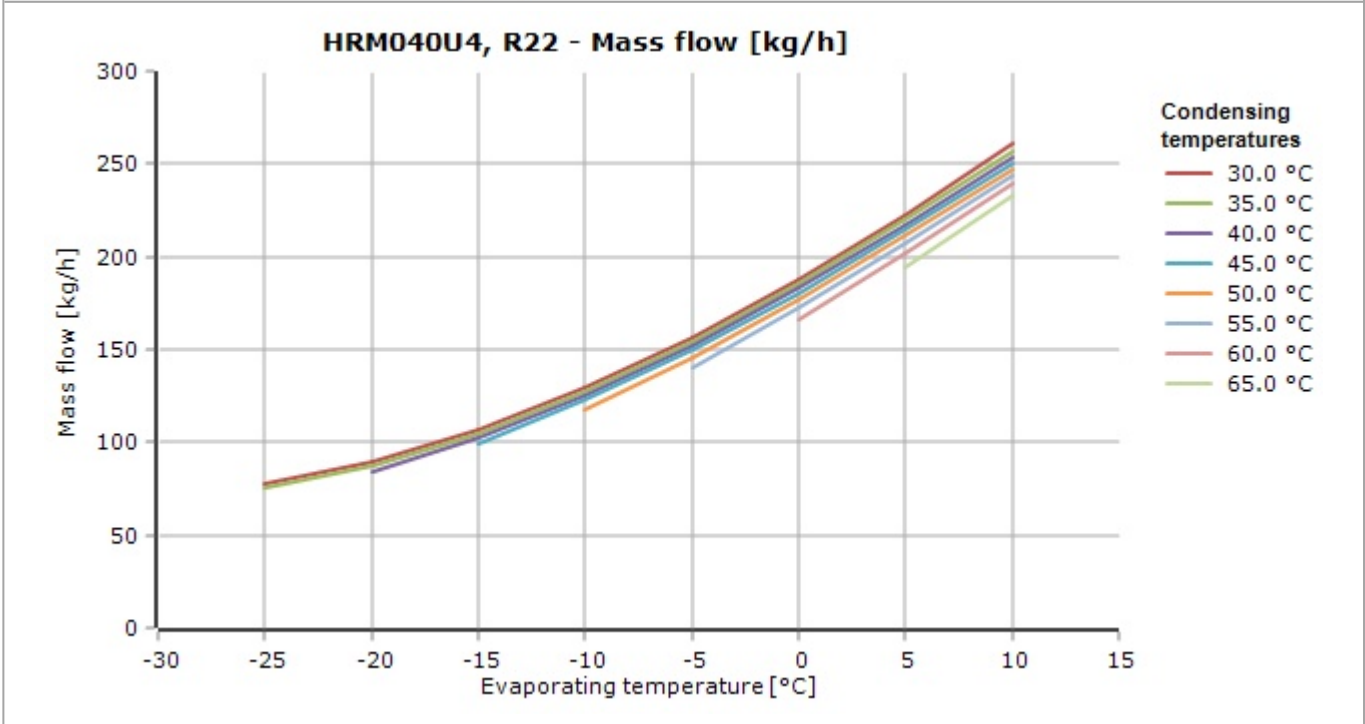


## HRM040U4, R22 - COP [W/W]

Tc\Te	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0	5.0	10.0	15.0
25.0	-	-	-	-	-	-	-	-	-	-
30.0	-	2.03	2.38	2.89	3.56	4.41	5.47	6.80	8.55	-
35.0	-	1.65	1.98	2.44	3.03	3.74	4.59	5.61	6.85	-
40.0	-	-	1.61	2.03	2.55	3.16	3.88	4.70	5.64	-
45.0	-	-	-	1.64	2.11	2.65	3.27	3.96	4.72	-
50.0	-	-	-	-	1.70	2.19	2.73	3.33	3.96	-
55.0	-	-	-	-	-	1.77	2.25	2.77	3.32	-
60.0	-	-	-	-	-	-	1.81	2.28	2.76	-
65.0	-	-	-	-	-	-	-	1.83	2.26	-
70.0	-	-	-	-	-	-	-	-	-	-

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## HRM040U4, R22 - Mass flow [kg/h]



## HRM040U4, R22 - Mass flow [kg/h]

Tc\Te	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0	5.0	10.0	15.0
25.0	-	-	-	-	-	-	-	-	-	-
30.0	-	77.50	89.29	106.8	129.3	156.5	187.8	222.8	260.9	-
35.0	-	75.43	87.58	105.2	127.7	154.7	185.4	219.6	256.8	-
40.0	-	-	84.62	102.8	125.6	152.6	183.2	216.9	253.4	-
45.0	-	-	-	98.94	122.5	149.9	180.6	214.3	250.3	-
50.0	-	-	-	-	117.8	146.1	177.4	211.2	247.2	-
55.0	-	-	-	-	-	140.5	172.8	207.4	243.7	-
60.0	-	-	-	-	-	-	166.4	202.1	239.1	-
65.0	-	-	-	-	-	-	-	194.8	233.1	-
70.0	-	-	-	-	-	-	-	-	-	-