PROFROID

EcoDesign

QuietCOOL

CO_2 TRANSCRITICAL CONDENSING UNIT

PRODUCERET I SAMARBEJDE MED AHLSELL

ahlsell

ROTARY HERMETIC COMPRESSORS

CO_2 NATURAL REFRIGERANT

LOW NOISE VERSION

AIR COOLED AND WATER COOLED VERSION

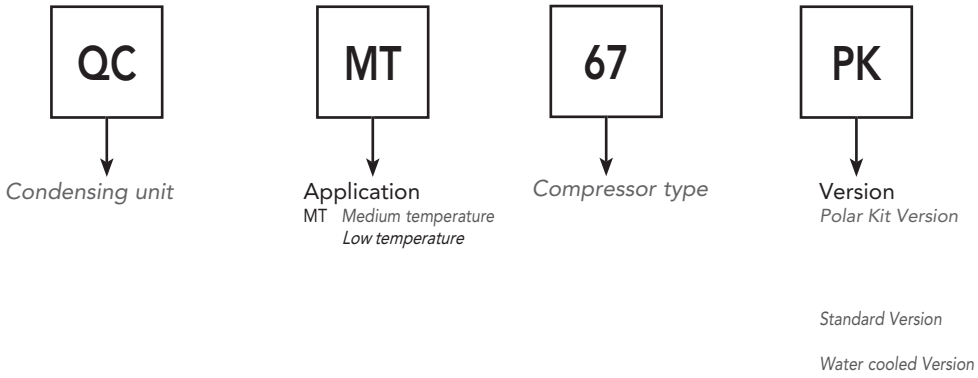
CO_2

Medium temperature application	0,8 -9,7 kW
Low temperature application	1,3 - 6,4 kW

PRESENTATION

- The QuietCO_2OL are condensing units using R744 (CO_2) refrigerant specially designed for small and medium size cold rooms.
- The QuietCO_2OL bears a state-of-art eco-performance without harming the environment.
- Medium and low temperature applications.
- Available in standard version or « Polar Kit » version
- EU Ecodesign Directive compliance.
- CE marked.
- Water cooled version available

MODEL DESIGNATION



CASING

- Frame made of galvanized steel sheet
- Casing finished in oven-baked paint (RAL7035).
- Removable compressor compartment and top panels for easy access to components.
- Acoustical insulation of compressor compartment.

COMPONENTS

- Compressors :
  - 1 or 2 rotary hermetic compressors.
  - Silent blocks.
  - Inverter with each compressor.
- Air cooled gascooler :
  - Copper tubes/aluminium fins coil.
  - 1 or 2 motor fans axial flow 450 or 500 mm diameter.
  - AC fan on standard versions
  - EC fan on Polar Kit versions for a lower sound level and better stability of condensation pressure.
  - Horizontal air flow.
- Water cooled gascooler :
  - Brazed plate heat exchanger. Exchanger and tubing Insulation as an option.
  - Flow control with a motorised 3 ways valve (proportional signal)
  - Intercooler (LT) flow control with a thermostatic valve on the CO_2 outlet temperature

TECHNICAL FEATURES

- *Liquid receiver :*
  - *Complying to PED 2014/68/EU standard.*
  - *2 or 3 2.2L liquid receivers.*
- *Accessories :*
  - *Filter drier.*
  - *Liquid sight glass with moisture indicator.*
  - *Oil separator (LT versions).*
  - *Service valve on the liquid line.*
  - *HP safety pressure switches.*
  - *1 (LT versions) or 2 (MT versions) expansion valves.*
  - *Check valve on the suction line*
- *Polar kit version :*
  - *EC fans*
  - *Heating resistance for the electrical panel*

  Recommendation :

Outside temperature < -15°C Mandatory
Outside temperature < +5°C Recommended

ELECTRICAL PANEL

- *Electrical supply 400V/3ph/50Hz (MT67, MT100, LT112 and LT167 versions) or 230V/1ph/50Hz (other versions).*
- *Short circuit current 10 kA.*
- *Panel complying to EN 60 204-1 standards.*
- *Protection for compressors and fan motors : Circuit breakers.*
- *Electronic controller.*
- *Integrated communication card with Modbus RS485*
- *Evaporator protections: see table page 5.*
- *Heating of the electrical panel for Polar Kit versions.*

CONTROLS

- Compressor, inverter, MP & HP valve management
- Communication with the cold room capability (PROCOLD)
- Extended compressor envelop
- Semi graphic display
- Preset parameters

Option

- PROCOLD + EVD module (Option)
  - Cold room advanced control
  - IP65 enclosure
  - Integrated E2V Electrical Expansion Valve controller
  - Modbus (RS485) for an optimum operation together with the QuietCO_2OL controller
- Suction filter (remote option)
- Insulation on water cooled models

PROCOLD + EVD module

E2V Electrical Expansion Valve

INSTALLATION GUIDANCE

- *Ensure that the electricity supply to the installation is suitable.*
- *Read carefully start-up and operating instructions manual before any intervention.*
- *Install in an adequately ventilated place.*
- *The refrigerating circuit must be perfectly clean, dry and installed according to best refrigeration practice.*
- *The unit must be set on ground or on a mount.*

INSTRUCTIONS FOR INSTALLATION, COMMISSIONING, OPERATING AND MAINTENANCE

Respect the prescriptions mentioned in PROFROID operating instructions. (Available on www.profroid.com)

MEDIUM AND LOW TEMPERATURE APPLICATION

QUIETCO$_2$OL			MT30	MT45	MT67	MT100	LT75	LT112	LT167
Refrigerant						R744 (CO_2)			
Nominal cooling capacity	(1)	kW	2,25	3,17	5,02	6,82	2,04	3,2	4,54
Minimum cooling capacity	(1)	kW	0,8	1,13	1,79	2,43	1,31	2,0	2,92
Maximum cooling capacity	(1)	kW	3,21	4,52	7,18	9,74	2,92	4,64	6,48
Eco-Design	COP		1,76	1,75					
	SEPR				2,48	2,47	1,89	1,84	1,82
Compressor	Number		1	1	1	1	2	2	2
	Type					Rotary hermetic, BLDC motor			
Nominal sound level	(2)	dB(A)	29	31	34	35	32	35	37
Fan motor	No. x diameter	mm	Std 1xØ450 PK 1xØ500	1xØ500	1xØ500	2xØ500	1xØ500	1xØ500	2xØ500
Air flow		m^3/h	2300	3175	3175	5650	3175	5100	8400
Power			230 V/1 Ph/50 Hz +G*	230 V/1 Ph/50 Hz +G*	400 V/3Ph/50 Hz (G+N)*	400 V/3Ph/50 Hz (G+N)*	230 V/1 Ph/50 Hz +G*	400 V/3Ph/50 Hz (G+N)*	400 V/3Ph/50 Hz (G+N)*
Receiver volume		L	2 x 2,2	2 x 2,2	3 x 2,2	3 x 2,2	2 x 2,2	3 x 2,2	3 x 2,2
PS	LP/MP/Receiver/HP	Bar				80 / 80 / 90 / 120			
PED 2014/68/EU Risk Cat.						I			
Evaporator protections			10A Mono	10A Mono	10A Mono	10A Mono	-	10A Tétra	20A Tétra
Number of evaporator protections			2	2	3	3	-	1	1
Connections	Suction		3/8"	3/8"	3/8"	3/8"	3/8"	1/2"	1/2"
	Liquid		3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
View (p. 9)			1	1	1	3	2	4	4
Polar Kit version			X	X	X	X	X	X	X
Weight		kg	125	130	160	185	185	200	210

*G = Ground
N = Neutral

Evaporating range:

MT unit : -18°C à +5°C
LT unit: -32°C à -20°C

Ambient temperature :

-15°C to +43°C Outside temperature < -15°C Polar Kit version mandatory
-30°C to +43°C Outside temperature < +5°C Polar Kit version recommended

ADDITIONAL INFORMATIONS ON THE CONDITIONS OF ANNOUNCEMENT OF TECHNICAL DATA.

(1) Nominal capacities with R744 :
Saturated suction temperature -8°C (MT versions) or -32°C (LT versions).
Ambient air temperature +32°C for the air cooled units.

- The minimum cooling capacity is calculated with the compressor's minimum frequency: 25 Rps (45 Rps for the LT compressors).
- The maximum cooling capacity is calculated with the compressor's maximum frequency: 100 Rps.
We recommend selecting at nominal operating conditions (70 Rps)

(2) The sound pressure levels (in dBA at 10 meters) are mentioned in free field.
Running the equipment in conditions differing from these nominal values may lead to different results.
The results obtained on the installation site may differ from those in this leaflet, due to sound reflections from walls, etc.
The reduction of sound level as a function of distance is theoretical and sound reflection and resonance may alter the results, either on total sound level or on certain frequencies.

Oil and refrigerant charge
The oil and refrigerant charge depend on the evaporator volume and the pipe length.
Please refer to the Installation and Operation Manual for any question on this topic (Available on www.profroid.com)

MEDIUM AND LOW TEMPERATURE APPLICATION

	QUIETCO$_2$OL			MT30	MT45	MT67	MT100	LT75	LT112	LT167
	Refrigerant						R744 (CO_2)			
7°C / 12°C *(Water)*	*Nominal cooling capacity*	(1)	kW	2.70	3.65	6.28	8.52	2.04	3.31	4.54
	Minimum cooling capacity	(1)	kW	1.00	1.3	2.24	3.04	1.31	2.13	2.92
	Maximum cooling capacity	(1)	kW	4.02	5.21	8.97	12.17	2.92	4.73	6.48
	Heating capacity (@70rps)	(1)	kW	3.30	4.56	7.53	10.20	2.90	4.86	6.50
	COP		@ 70 rps	4.04	4.04	4.04	4.04	2.39	2.39	2.39
	Water Flow (m^3/h)		@ 70 rps	0.58	0.78	1.30	1.73	0.47	0.8	1.12
	Presure drop (Water - kPa)		@ 70 rps	4.0	4.4	8.0	10.0	3.0	4.5	7.0
30°C / 35°C (MPG 33%)	*Nominal cooling capacity*	(1)	kW	2,25	3.03	5.02	6,82	2.04	3.31	4,54
	Minimum cooling capacity	(1)	kW	0,80	1.08	1,70	2,40	1,30	2.13	2,90
	Maximum cooling capacity	(1)	kW	3,20	4.33	7,10	9,70	2,90	4.73	6,40
	Heating capacity (@70rps)	(1)	kW	3.27	4.43	7.31	9.92	3.32	5.35	7.42
	COP		@ 70 rps	2.20	2.20	2.20	2.20	1.64	1.64	1.64
	Water Flow (m^3/h)		@ 70 rps	0.54	0.83	1.26	1.69	0.58	1.0	1.26
	Presure drop (Water - kPa)		@ 70 rps	3.0	4.35	7.0	9.5	3.0	5.3	6.9
-8°C / -4°C (MPG 33%)	*Nominal cooling capacity*	(2)	kW	1.5	2.05	3.36	4.56	-	-	-
	Minimum cooling capacity	(2)	kW	0.54	0.73	1.2	1.63	-	-	-
	Maximum cooling capacity	(2)	kW	2.15	2.93	4.8	6.51	-	-	-
	Heating capacity (@70rps)	(2)	kW	2.18	2.97	4.86	6.59	-	-	-
	COP		@ 70 rps	2.24	2.24	2.24	2.24	-	-	-
	Water Flow (m^3/h)		@ 70 rps	0.07	0.1	0.17	0.22	-	-	-
	Presure drop (Water - kPa)		@ 70 rps	0.54	0.7	1.0	1.4	-	-	-

(1) Saturated suction temperature -8°C

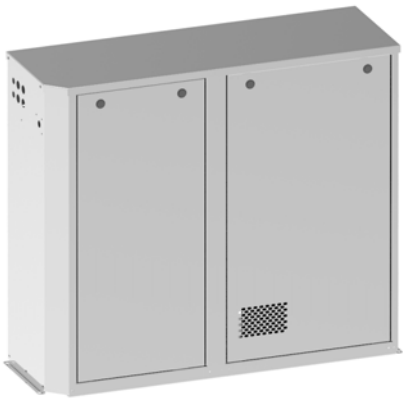
(2) Saturated suction temperature -32°C

Evaporating range:

MT / *MT / NK : -32°C à +5°C*
BT / LT / TK : -32°C à -20°C

Water loop:

Inlet water temperature: -8°C à +35°C
Maximum pressure drop: 100kPa
Max concentration (MEG/MPG): 60%



MEDIUM AND LOW TEMPERATURE APPLICATION

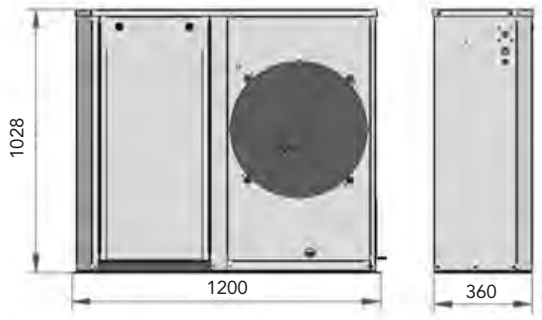
QUIETCO$_2$OL WCO (7°C/12°C)			MT30	MT45	MT67	MT100	LT75	LT112	LT167
Compressor	Number		1	1	1	1	2	2	2
	Type		Rotary hermetic, BLDC motor						
Nominal sound level	(2)	dB(A)	29	31	34	34	31	35	37
Power supply			230 V/1 Ph/50 Hz + G*	230 V/1 Ph/50 Hz + G*	400 V/3Ph/50 Hz (G+N)*	400 V/3Ph/50 Hz (G+N)*	230 V/1 Ph/50 Hz + G*	400 V/3Ph/50 Hz (G+N)*	
Receiver volume		L	2 x 2,2	2 x 2,2	3 x 2,2	3 x 2,2	2 x 2,2	3 x 2,2	
PS	LP/MP/Receiver/HP	Bar	80 / 80 / 90 / 120						
PED 2014/68/EU Risk Cat.			I						
Evaporator protections			10A Mono	10A Mono	10A Mono	10A Mono	-	10A Tétra	20A Tétra
Number of evaporator protections			2	2	3	3	-	1	1
Connections	Suction		3/8"	3/8"	3/8"	3/8"	3/8"	1/2"	1/2"
	Liquid		3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	Hydraulic connection		2 x G 1"	2 x G 1"	2 x G 1"1/4	2 x G 1"1/4	2 x G 1"	2 x G 1"	2 x G 1"
View (p. 9)			5	5	5	5	6	6	6
Weight		kg	175	185	195	210	250	300	300

(2) See page 6

**G = Ground*
N = Neutral

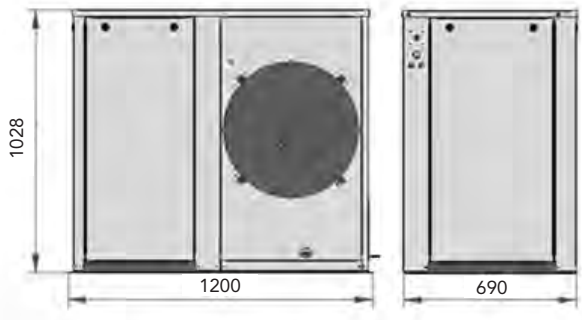
View

-1-



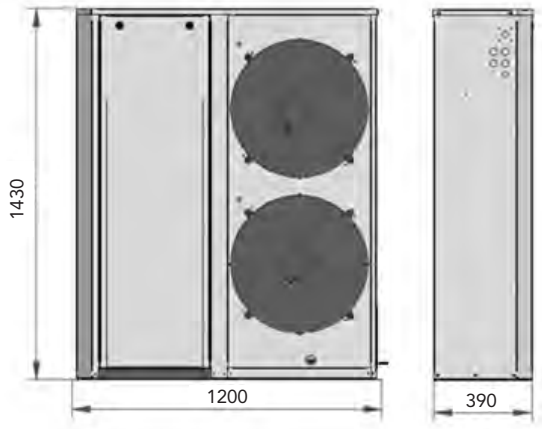
View

-2-



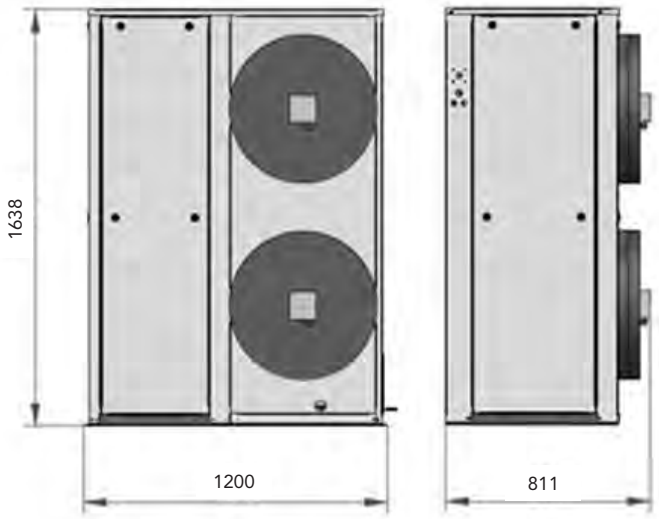
View

-3-



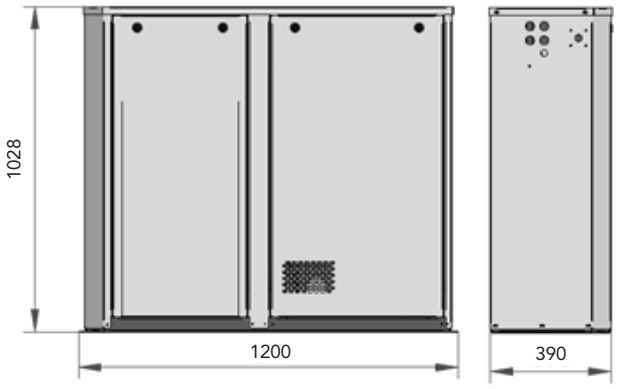
View (Only one fan on LT112)

-4-



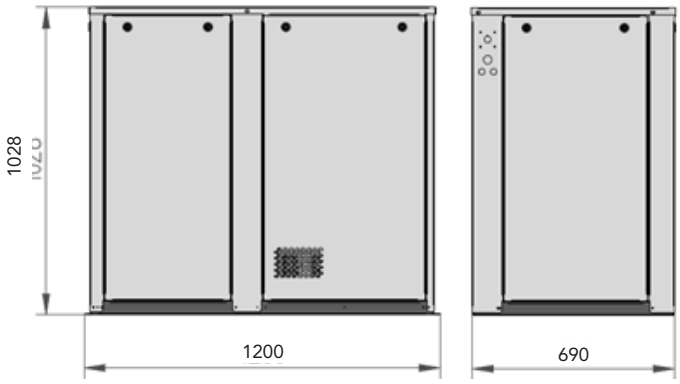
View

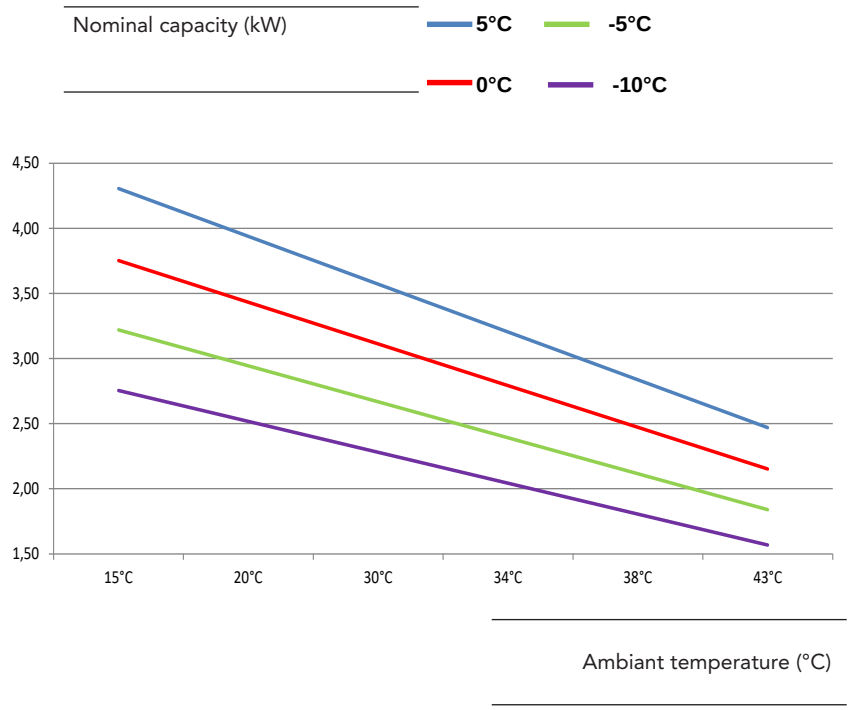
-5-



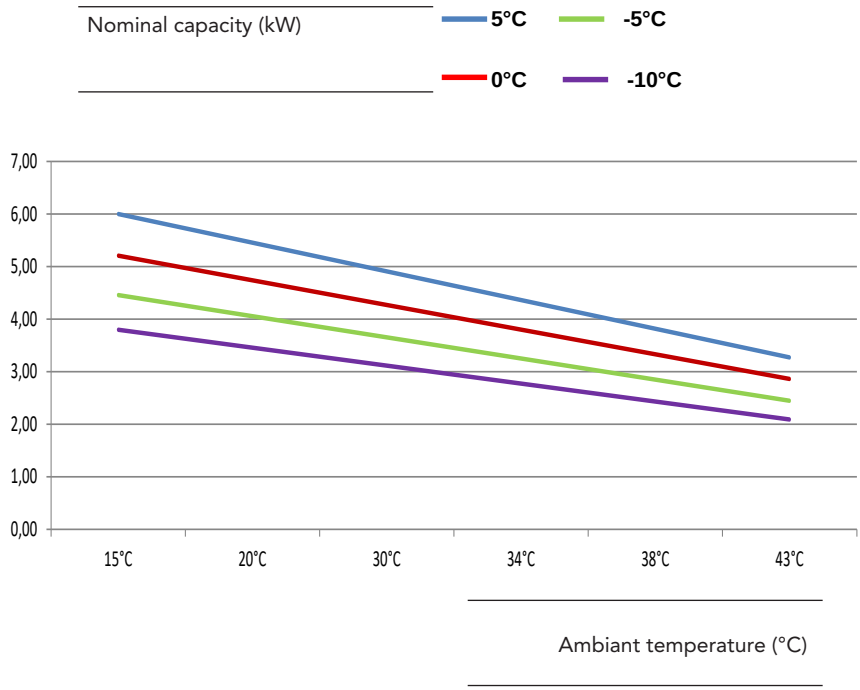
View

-6-

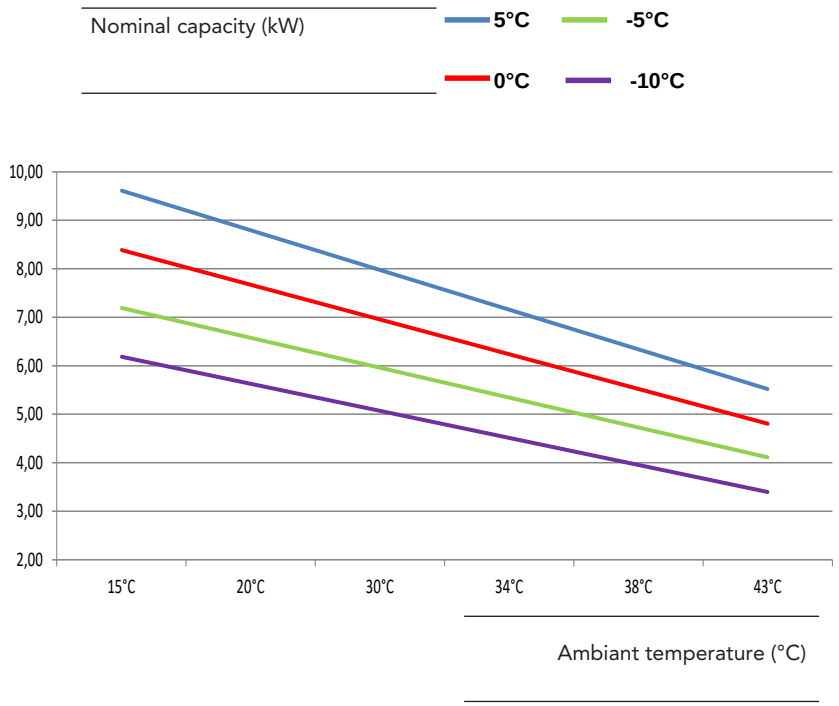




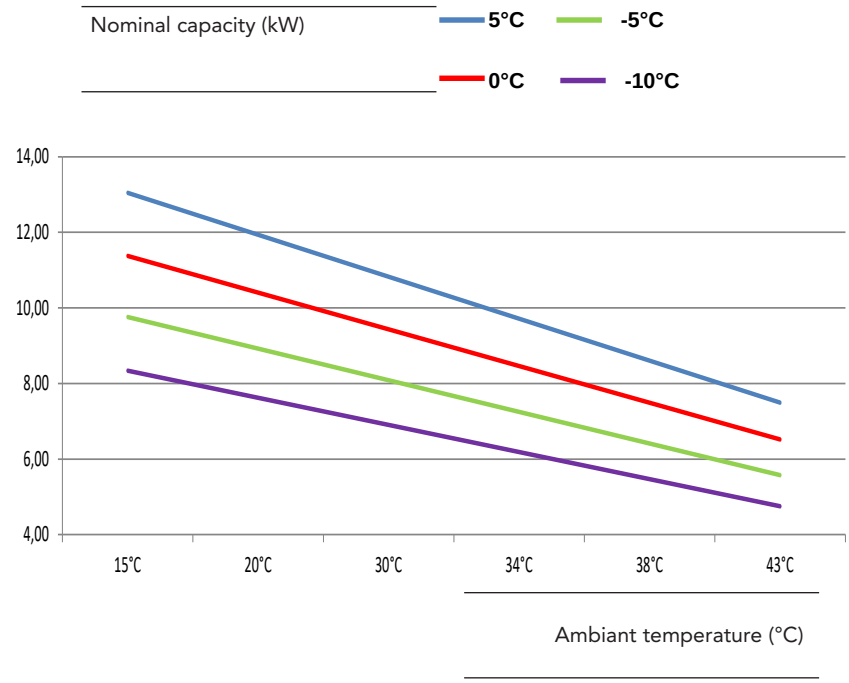
QC MT 30	
Nominal capacity (kW)	2,25
Minimum capacity (kW)	0,8
imum capacity (kW)	3,21
Tevap -8°C / +32°C Tambient / ΔT = 2K	
Rps min/max	25/100



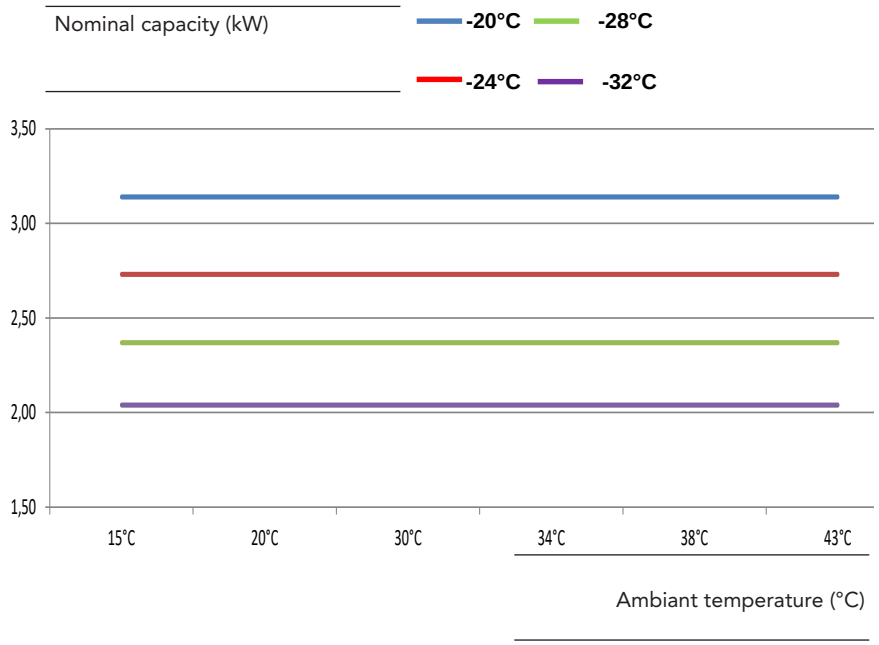
QC MT 45	
Nominal capacity (kW)	3,17
Minimum capacity (kW)	1,13
Maximum capacity (kW)	4,52
Tevap -8°C / +32°C Tambient / ΔT = 2K	
Rps min/max	25/100



QC MT 67	
Nominal capacity (kW))	5,02
Minimum capacity (kW)	1,79
Maximum capacity (kW)	7,18
Tevap -8°C / +32°C Tambient / ΔT = 2K	
Rps min/max	25/100

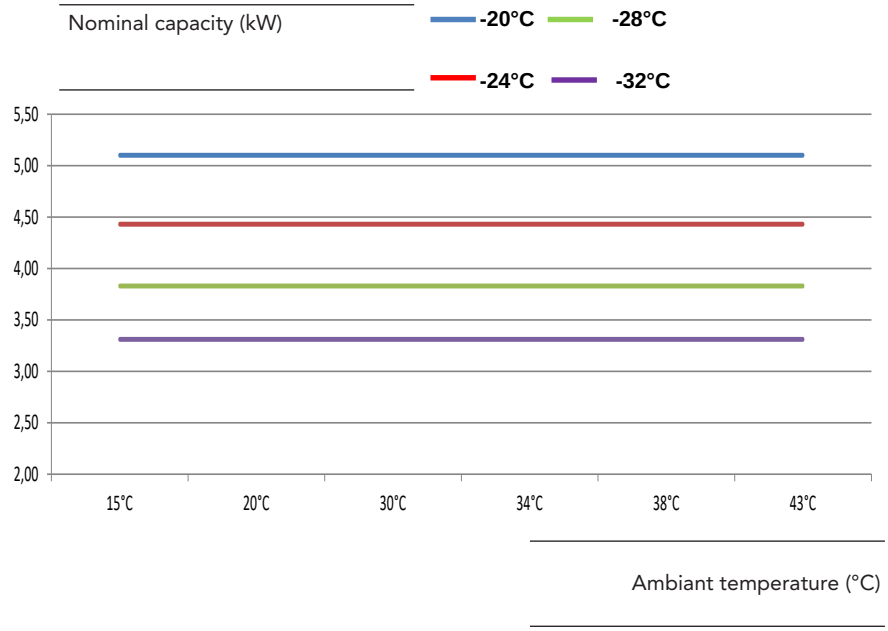


QC MT 100	
Nominal capacity (kW)	6,82
Minimum capacity (kW)	2,43
Maximum capacity (kW)	9,74
Tevap -8°C / +32°C Tambient / ΔT = 2K	
Rps min/max	25/100



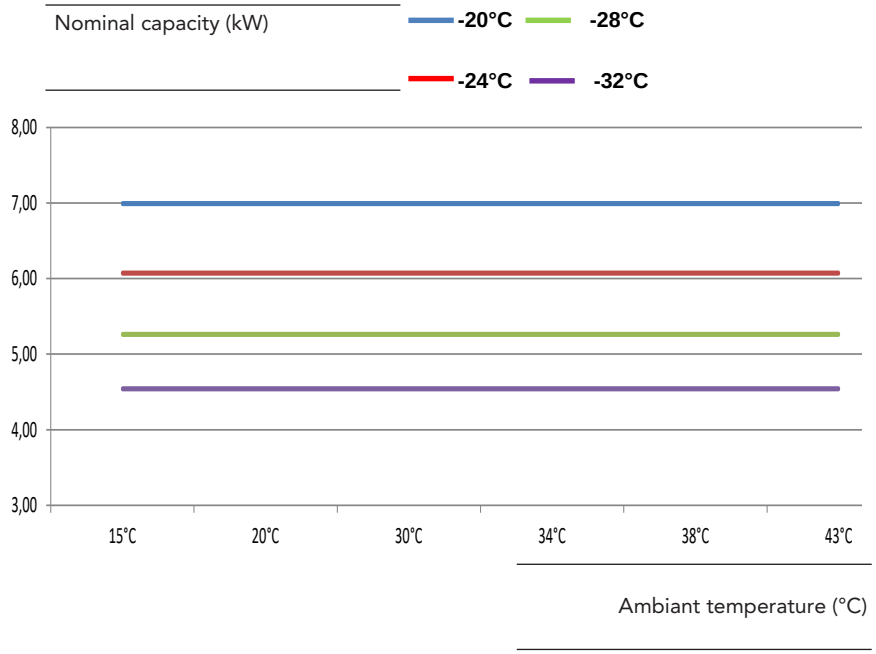
QC LT 75

Nominal capacity (kW)	2,04
Minimum capacity (kW)	1,31
Maximum capacity (kW)	2,92
Tevap -32°C / +32°C Tambient / ΔT = 2K	
Rps min/max	45/100



QC LT 112

Nominal capacity (kW)	3,2
Minimum capacity (kW)	2,0
Maximum capacity (kW)	4,64
Tevap -32°C / +32°C Tambient / ΔT = 2K	
Rps min/max	45/100



QC LT 167

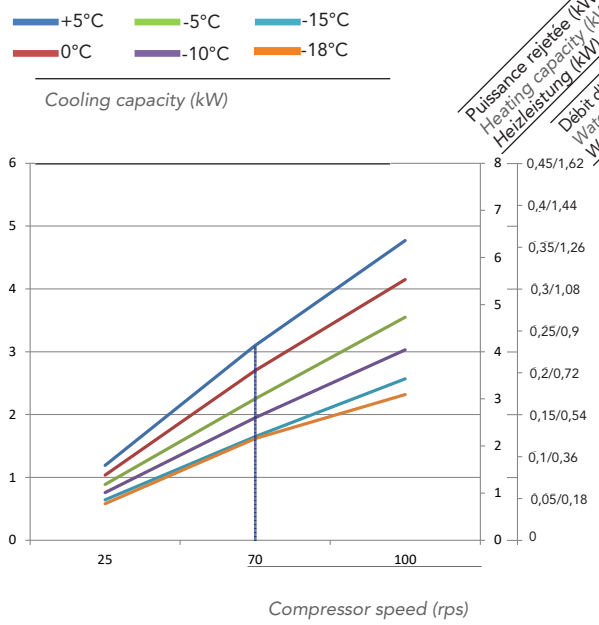
Nominal capacity (kW)	4,54
Minimum capacity (kW)	2,92
Maximum capacity (kW)	6,48
Tevap -32°C / +32°C Tambient / ΔT = 2K	
Rps min/max	45/100

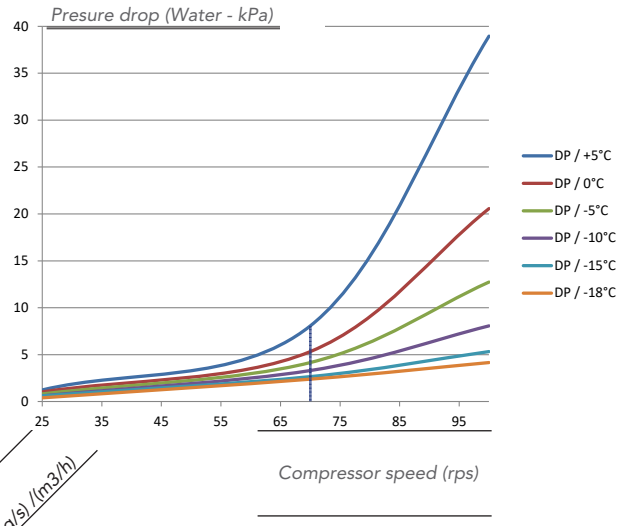
QC MT 30 WCO

Tevap -32°C to +5°C

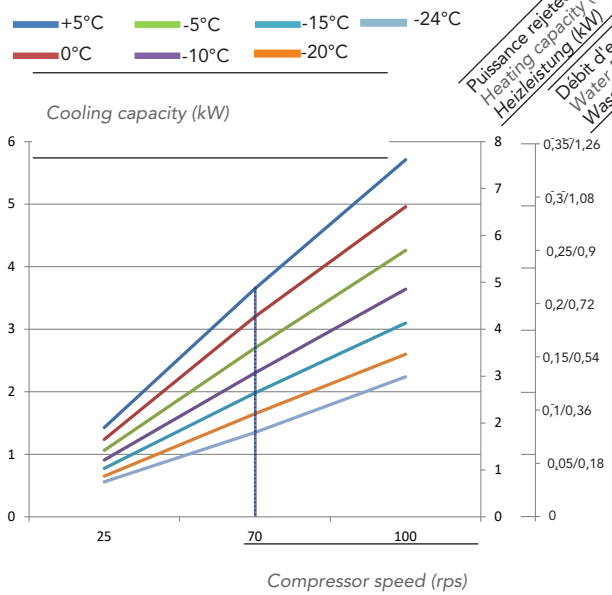
Rps min/max	25/100

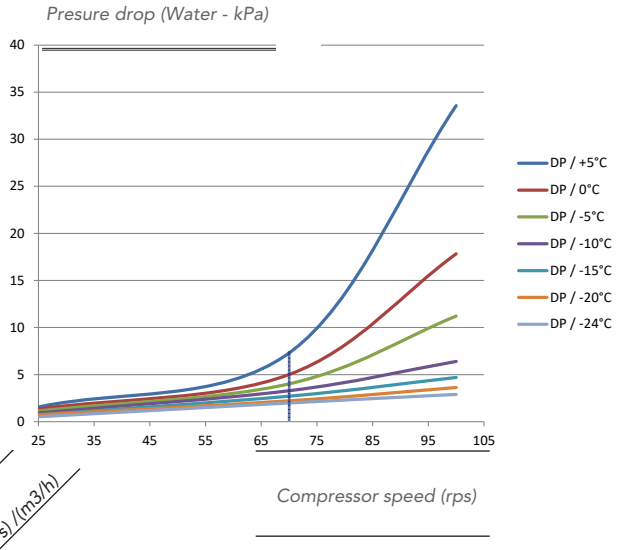
30/35°C MPG (33%)



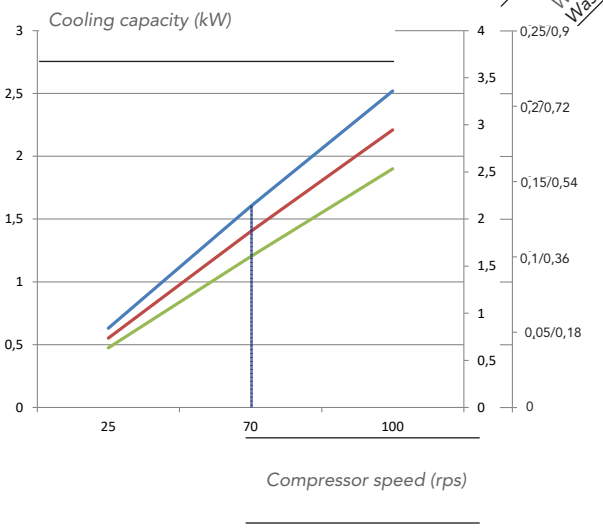


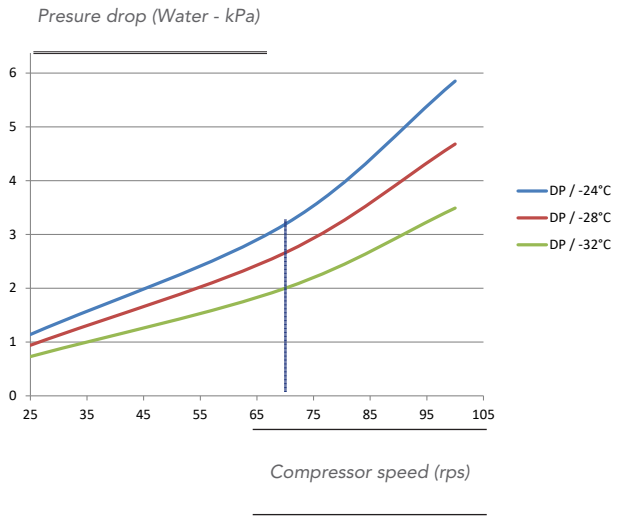
7/12°C *Water*





-8/-4°C *MPG (33%)*



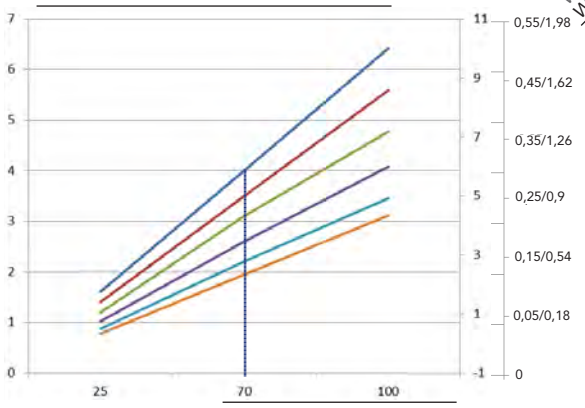


QC MT 45 WCO	
Tevap-32°C to +5°C	
Rps min/max	25/100

30/35°C MPG (33%)

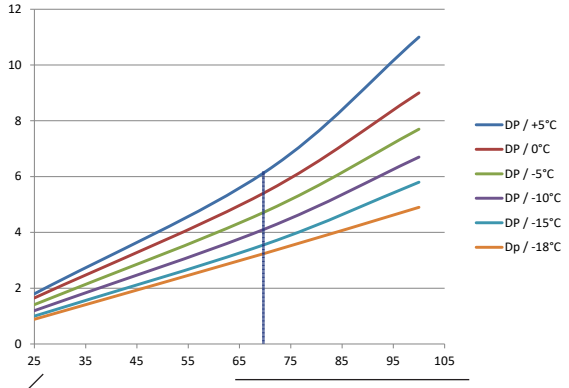
+5°C -5°C -15°C
0°C -10°C -18°C

Cooling capacity (kW)



Compressor speed (rps)

Presure drop (Water - kPa)

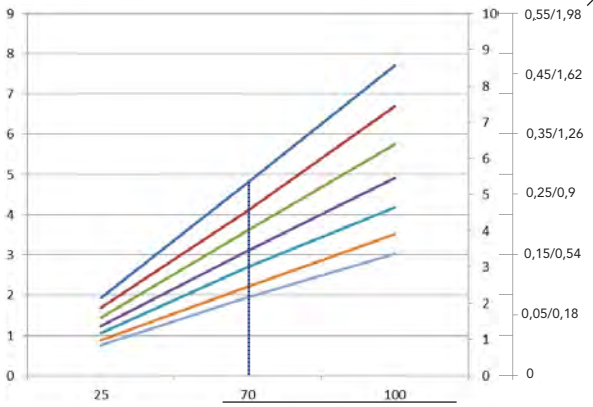


Compressor speed (rps)

7/12°C *Water*

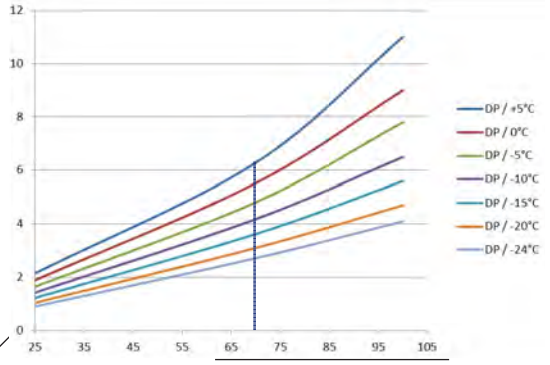
+5°C -5°C -15°C -24°C
0°C -10°C -20°C

Cooling capacity (kW)



Compressor speed (rps)

Presure drop (Water - kPa)

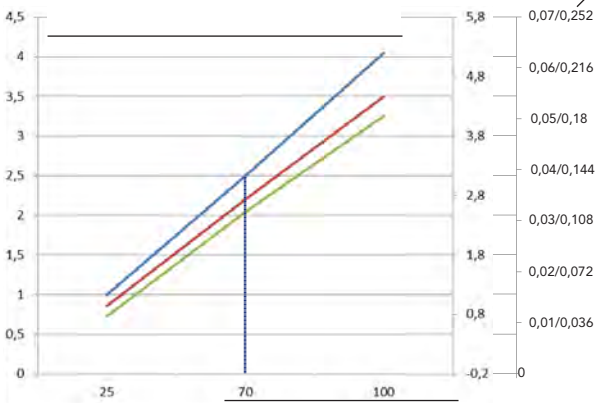


Compressor speed (rps)

-8/-4°C *MPG (33%)*

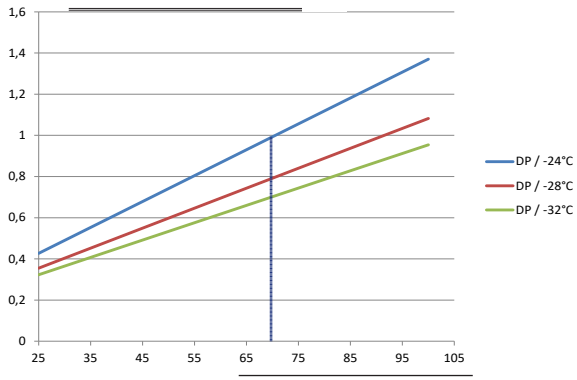
-24°C -32°C
-28°C

Cooling capacity (kW)



Compressor speed (rps)

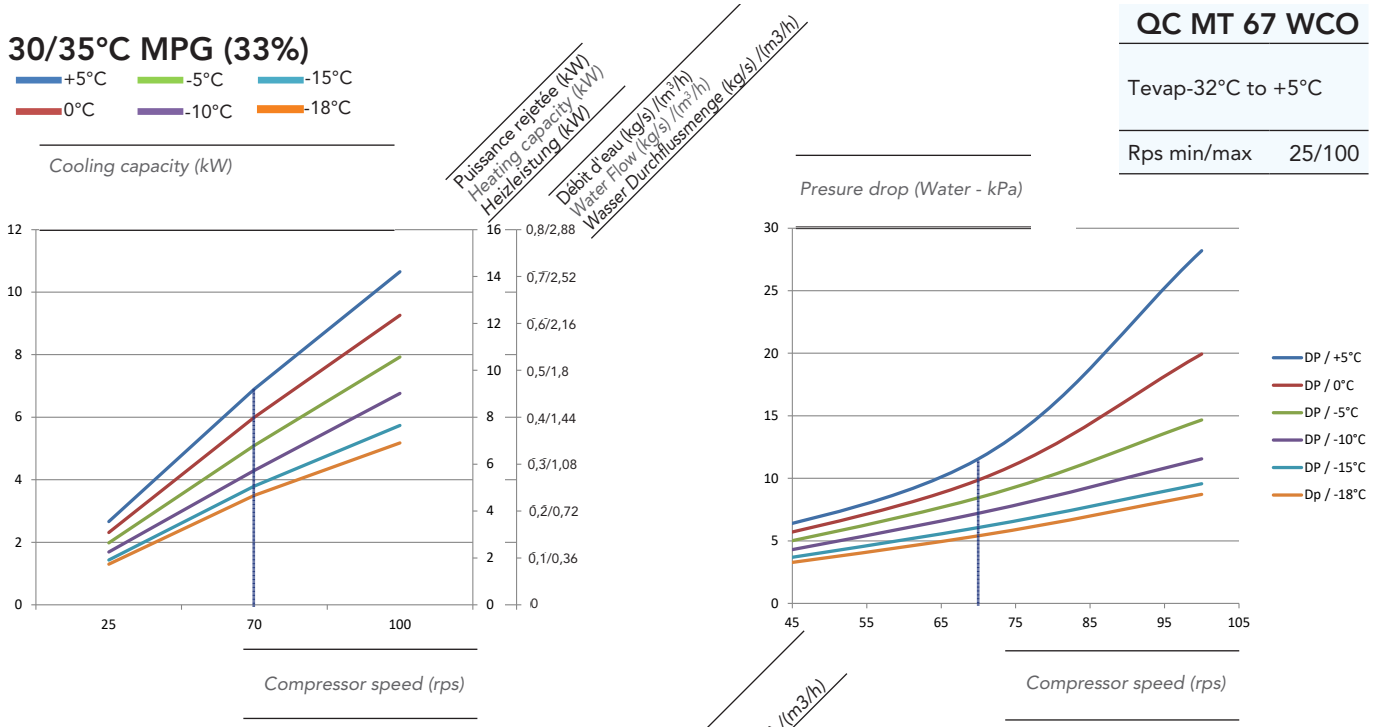
Presure drop (Water - kPa)



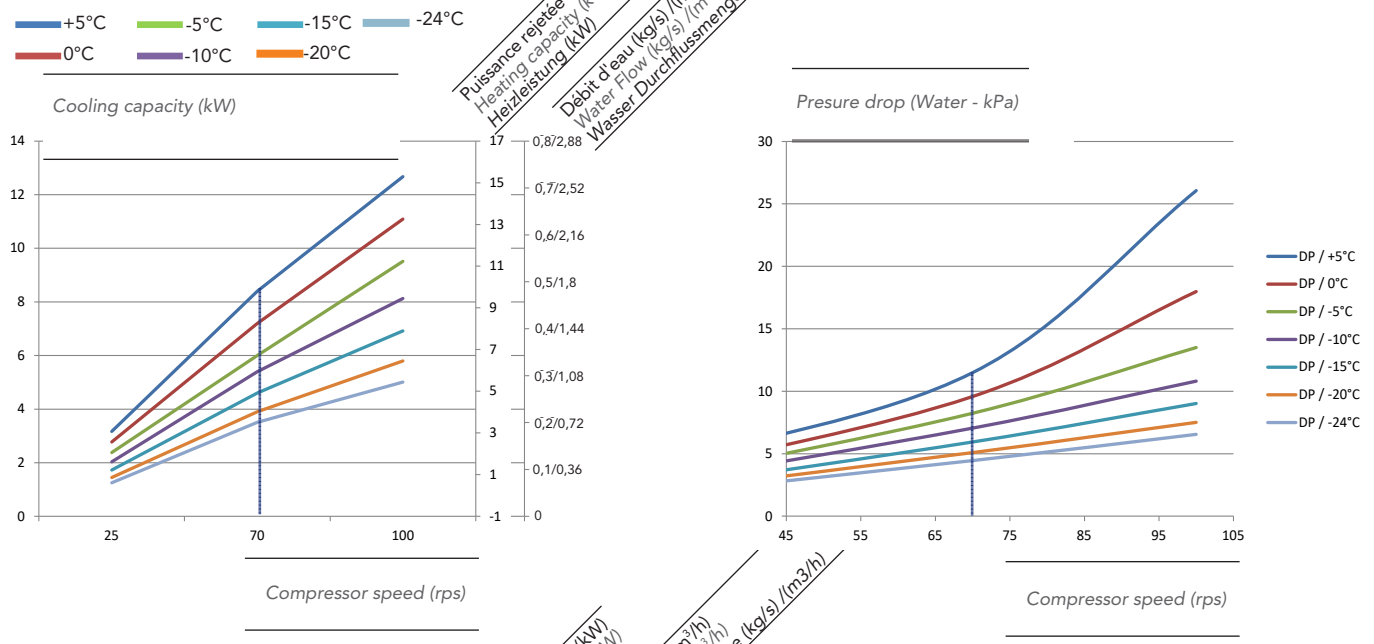
Compressor speed (rps)

QC MT 67 WCO	
Tevap-32°C to +5°C	
Rps min/max	25/100

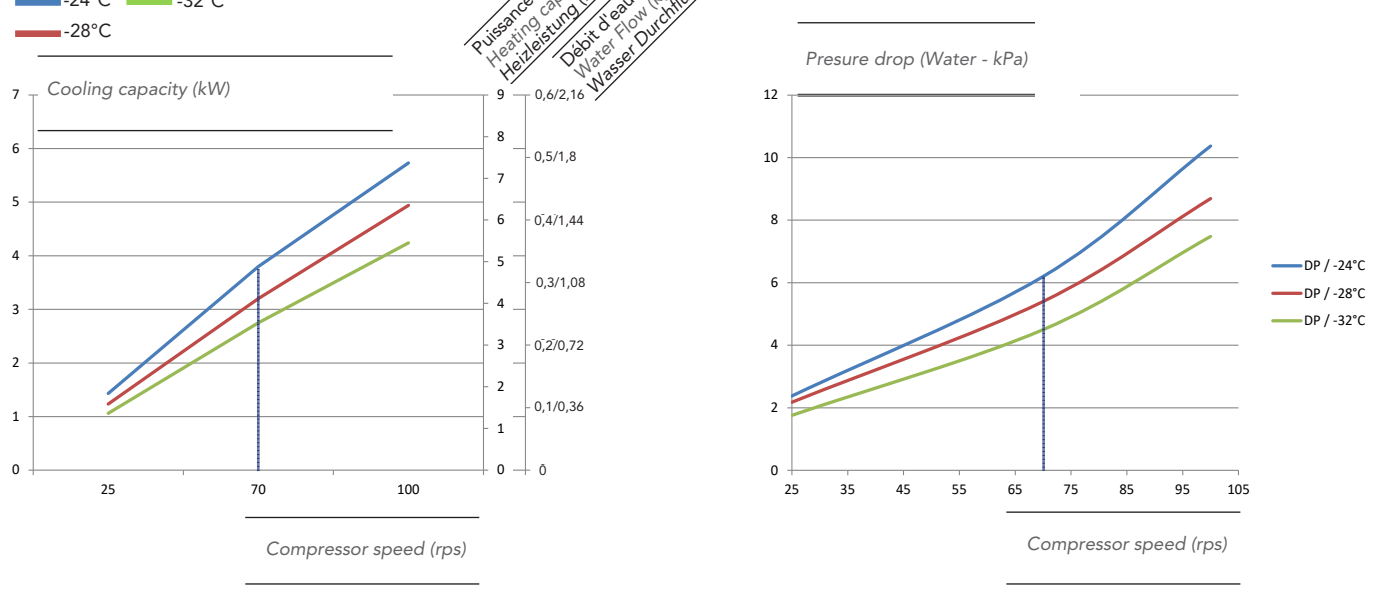
30/35°C MPG (33%)



7/12°C *Water*



-8/-4°C *MPG (33%)*



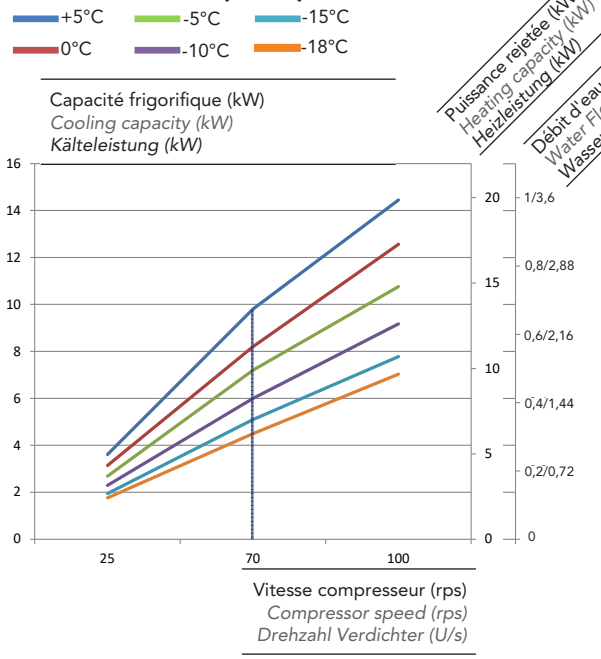
PERFORMANCES VERSION À EAU
PERFORMANCE DATA WATER COOLED VERSION
LEISTUNGSDATEN WASSERGEKÜHLTE VERSION

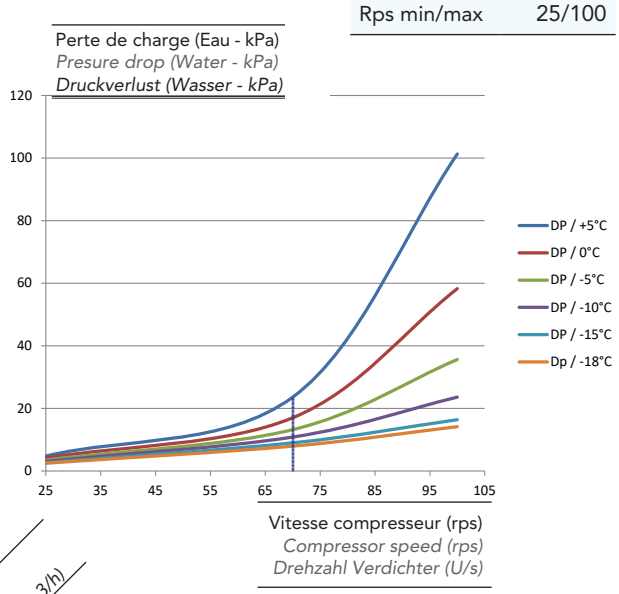
QC MT 100 WCO

Tevap -32°C à +5°C
Tevap-32°C to +5°C
T_0 -32°C bis +5°C

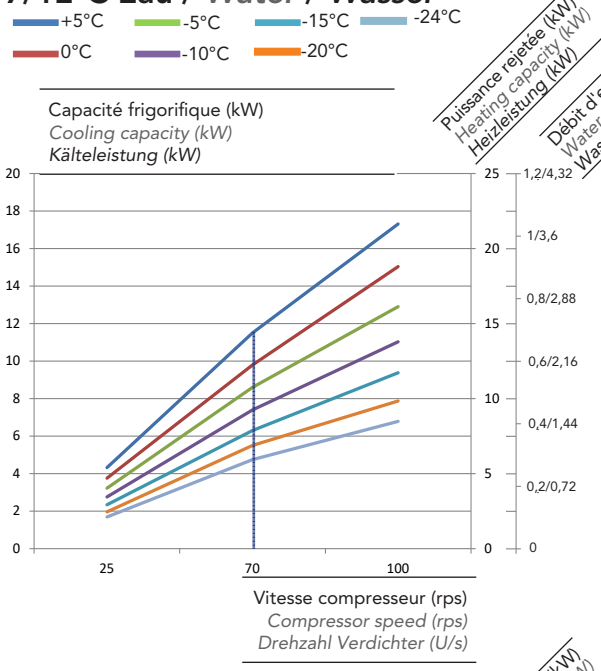
Rps min/max 25/100

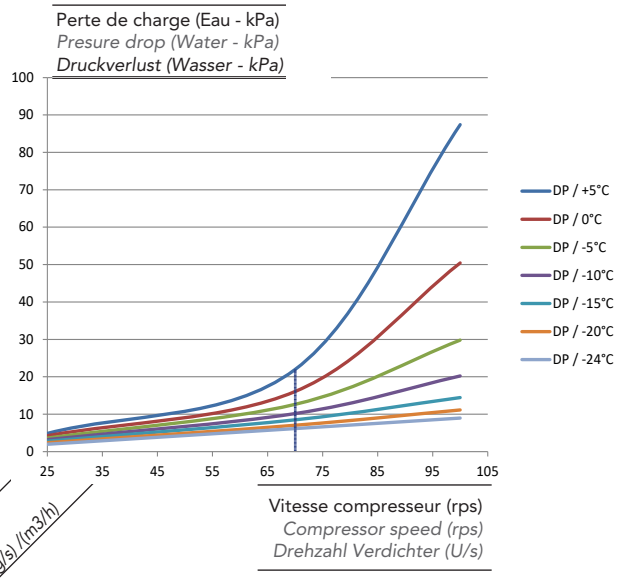
30/35°C MPG (33%)



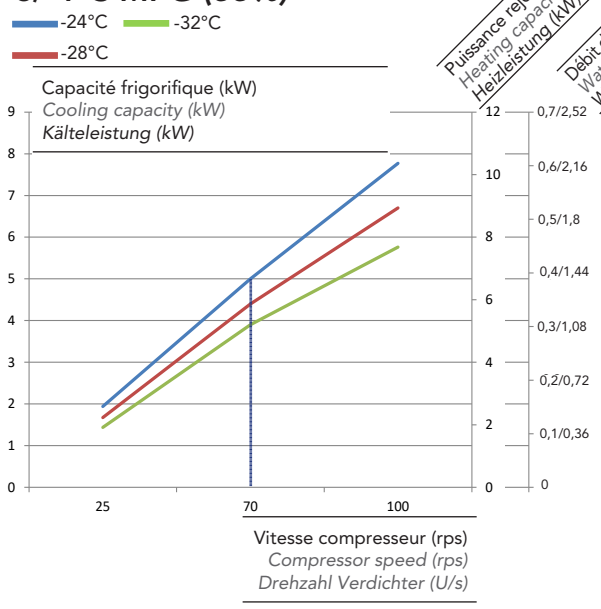


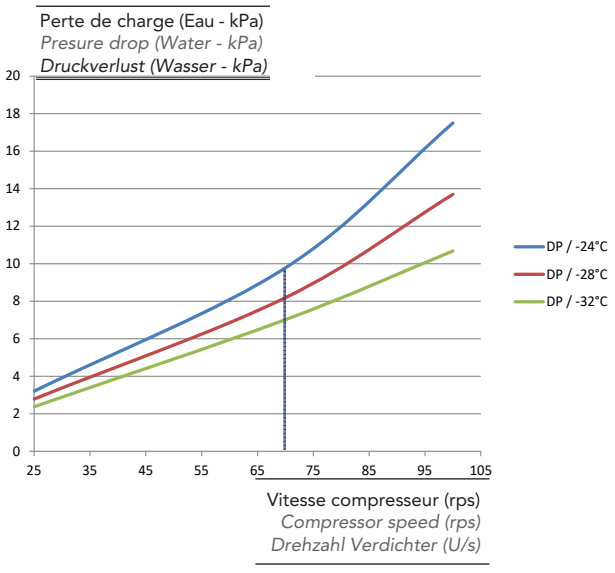
7/12°C Eau / *Water* / *Wasser*





-8/-4°C *MPG (33%)*



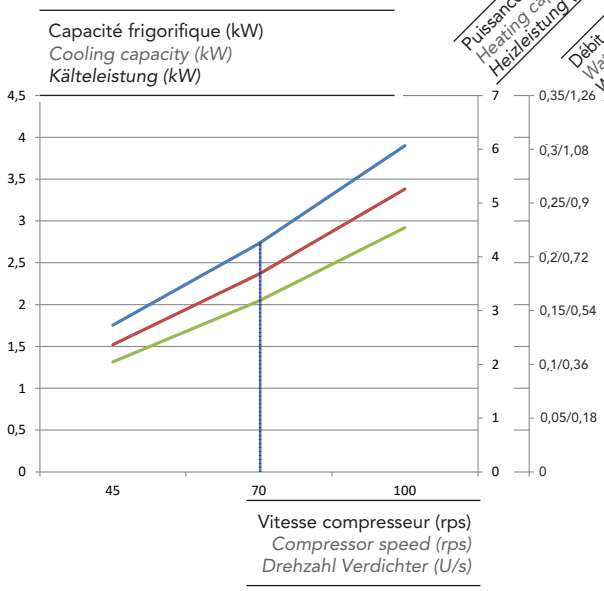


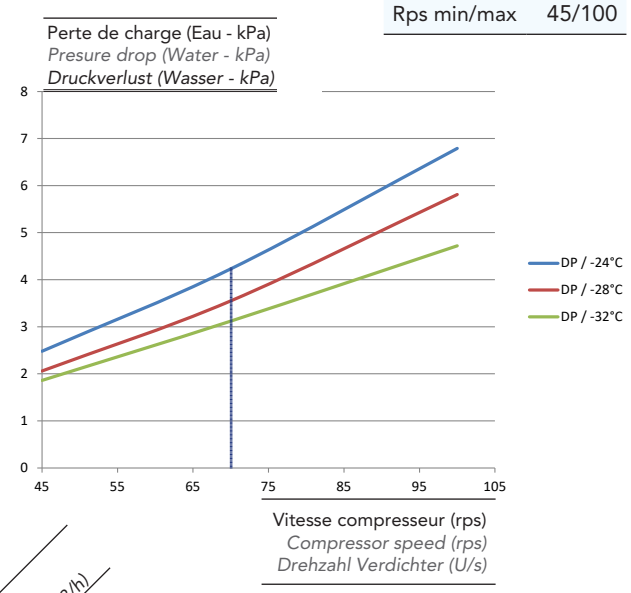
QC LT 75 WCO

Tevap -32°C à -24°C Tevap-32°C to -24°C T_0 -32°C bis -24°C	
Rps min/max	45/100

30/35°C MPG (33%)

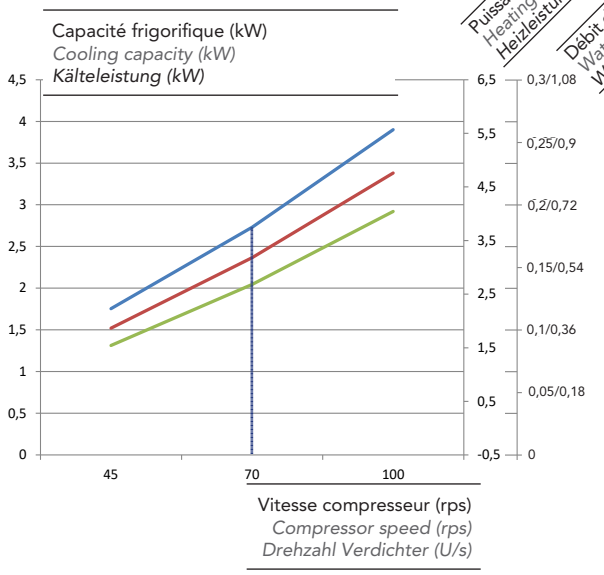
-24°C -32°C
-28°C

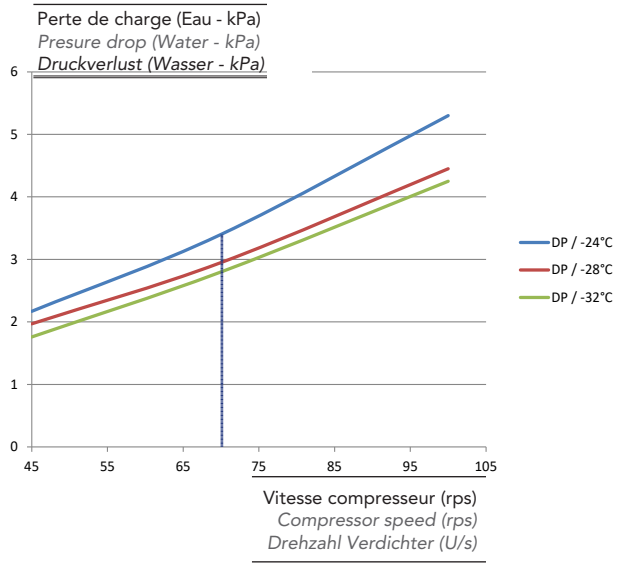




7/12°C Eau / *Water* / *Wasser*

-24°C -32°C
-28°C





PERFORMANCES VERSION À EAU
PERFORMANCE DATA WATER COOLED VERSION
LEISTUNGSDATEN WASSERGEKÜHLTE VERSION

QC LT 112 WCO	
Tevap -32°C à -24°C Tevap-32°C to -24°C T_0 -32°C bis -24°C	
Rps min/max	45/100

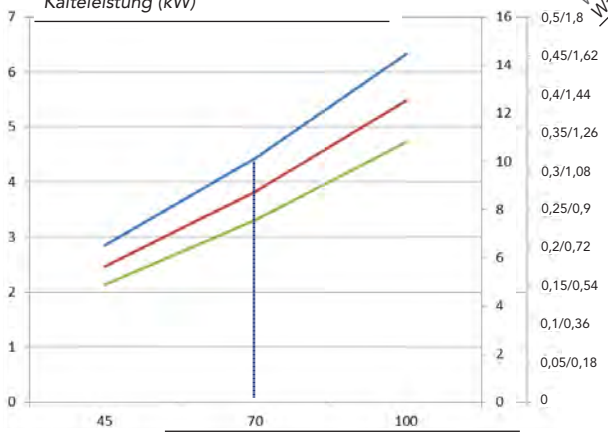
30/35°C MPG (33%)

-24°C -32°C
-28°C

Capacité frigorifique (kW)
Cooling capacity (kW)
Kälteleistung (kW)

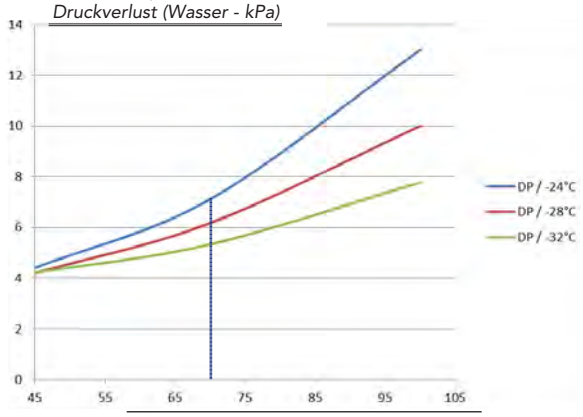
Puissance rejetée (kW)
Heating capacity (kW)
Heizleistung (kW)

Débit d'eau (kg/s) /(m³/h)
Water Flow (kg/s) /(m³/h)
Wasser Durchflussmenge (kg/s) /(m3/h)



Compressor speed (rps)

Perte de charge (Eau - kPa)
Presure drop (Water - kPa)
Druckverlust (Wasser - kPa)



Compressor speed (rps)

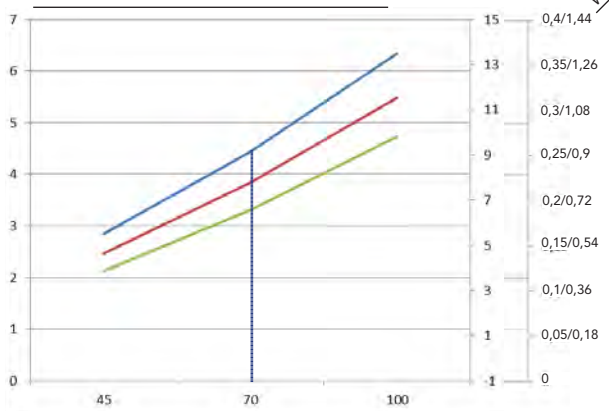
7/12°C *Water*

-24°C -32°C
-28°C

Cooling capacity (kW)

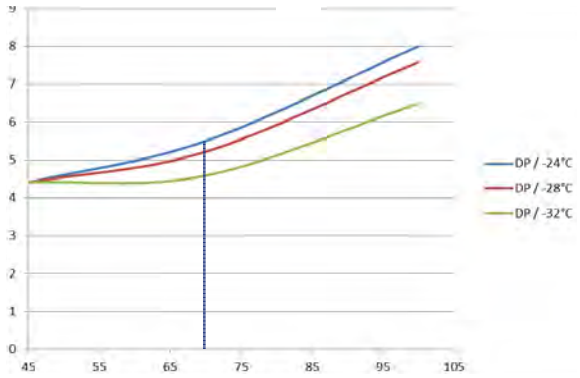
Puissance rejetée (kW)
Heating capacity (kW)
Heizleistung (kW)

Débit d'eau (kg/s) /(m³/h)
Water Flow (kg/s) /(m³/h)
Wasser Durchflussmenge (kg/s) /(m3/h)



Compressor speed (rps)

Presure drop (Water - kPa)

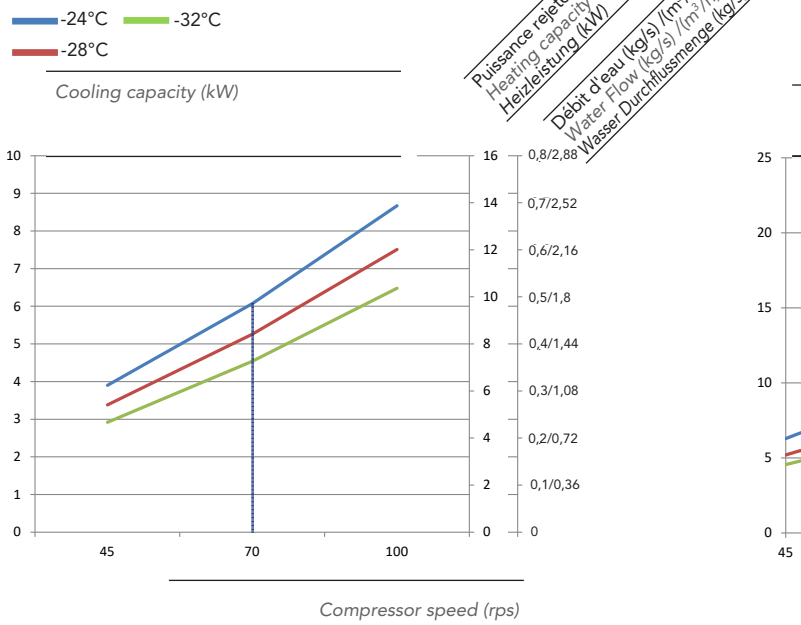


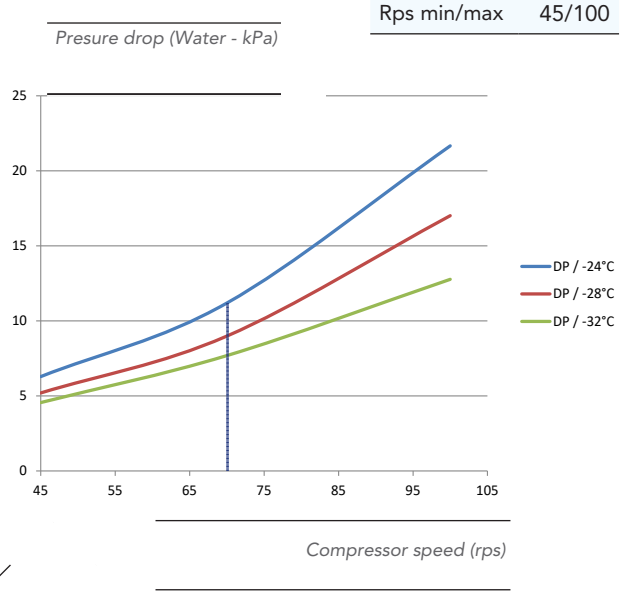
Compressor speed (rps)

QC LT 167 WCO

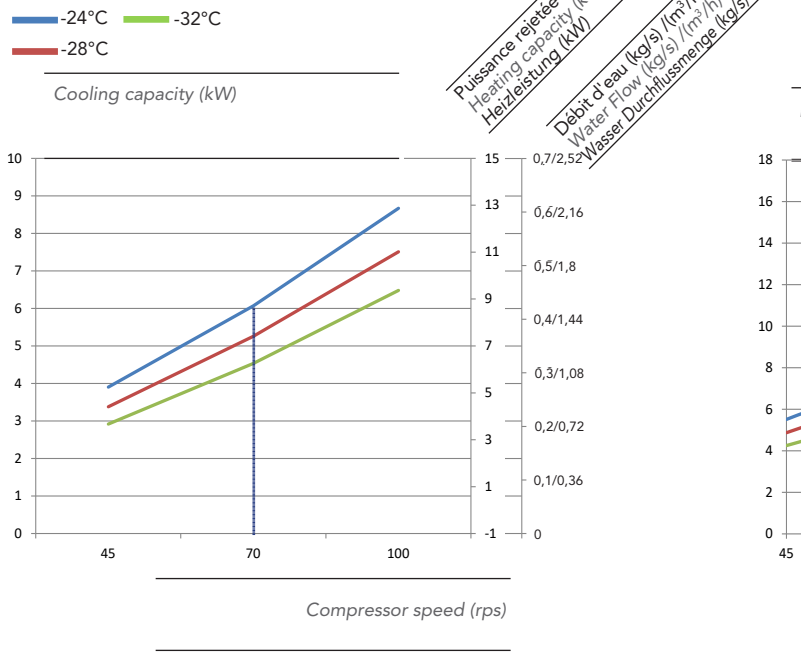
Tevap-32°C to -24°C	
Rps min/max	45/100

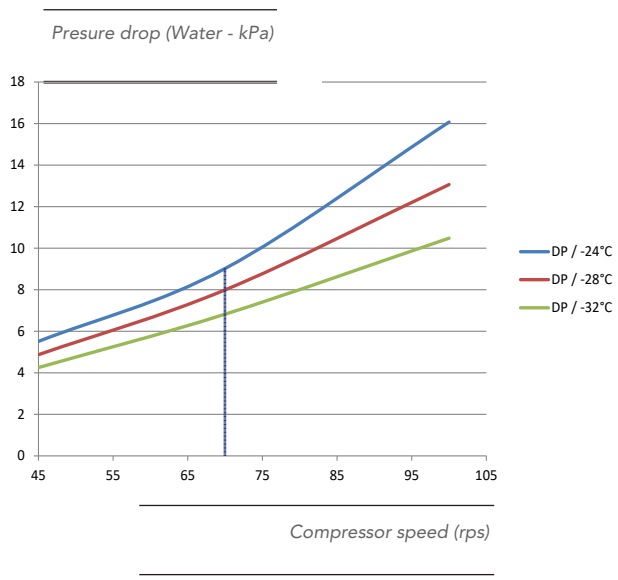
30/35°C MPG (33%)





7/12°C *Water*





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