TECHNICAL DETAILS

COMPRESSORS

Hermetic, rotary and scroll representing the highest level of technology in this product range.
They are extremely reliable, efficient and widely used in the air conditioning sector. The scroll compressor is known for its quietness, the almost total absence of vibration and having no problems with liquid return. They are also protected by an electronic device which controls the sequence of phases (only in three-phase models), to avoid the possibility of reversed rotation.

FANS

Axial with sickle-shaped blades directly coupled to external rotor motors. They are equipped with internal thermal protection.

CONDENSER

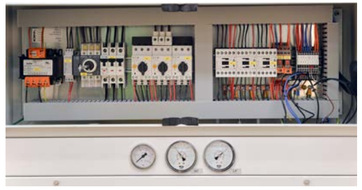
This compact and efficient, aluminium micro-channel condenser enables a more compact design, better performance and lighter units. This type of condenser, allows a significant reduction in refrigerant costs (-35% compared to units with traditional solutions). All QBE's condensers are protected by an epoxy coating that ensures a high degree of resistance to corrosion even in aggressive environments. The aluminium structure makes these condensers free from galvanic corrosion risks. From the QBE008 model, the condenser is protected by a air filter and washable (optional for the other models).

EVAPORATOR

For the QBE002 ÷ 007 models the evaporator is a coaxial type made of copper, which is effective reliable even when dealing with contaminated fluids. For models (QBE008÷025) the evaporator is made from brazed plate AISI 316 stainless steel. They are compact, with a highly efficient heat exchange between refrigerant and the fluid to be cooled. The antifreeze function of the electronic controller continuously measures the water temperature at the evaporator outlet to prevent the evaporator freezing. For QBE008÷025 models, a differential pressure switch protects the evaporator from a lack of water flow

ELECTRICAL PANEL

Manufactured according to the EN 60204 standard, the cabinet is made of galvanized steel with a polyester powder coated surface. It includes: main switch with door-lock (QBE008÷025) (which prevents access to the panel when it is under voltage) and watertight door to access the electronic control. The cables inside the cabinet are numbered.



OPTIONS:

Leaving water temperature stability (+/- 0,1 K) electronic hot gas by-pass valve	VBE
Leaving water temperature stability (+/- 1 K) mechanical hot gas by-pass valve	VBM
Automatic water bypass	BA
Refrigerant Gauges	GR
Compressor(s) cranckase heater(s)	RC
External Installation	FE
Single P3 Pump	P3
Single P5 Pump	P5
Without Pump	P0
Pressurized water tank with brazed plates evaporator	TP EXP
Non ferrous pressurized water tank with brazed plates evaporator (stainless steel tank)	TPI EXP
Open circuit kit (Additional Water Tank)	TA [1]
Without tank with brazed plates evaporator	T0 EXP
Without tank & without pump with brazed plates evaporator	P0 T0 EXP
Continuos fan(s) speed control - phase cut type (minimum ambient temperature -8.0°C)	CA
Continuos fan(s) speed control - electronic fan(s) (minimum ambient temperature -10.0°C)	CE
Water heaters	RH [1]
Water pre-heating setting	PH [2]
Condenser air filters	FP
Wind baffles kit	FWB
Wheels kit	FW
RS485 Serial Port	EMB
Wooden Crate	PWC

- [1] Only combined with pressurized water tank (TP/TPI).
- [2] Available only with VBE - Leaving water temperature stability (+/- 0,1 K) electronic hot gas by-pass valve

SOME OTHER UNITS AVAILABLE FROM OUR PREMIUM LINE

DRYCOOLERS

LIQUID COOLERS
FROM 300 TO 1200 KW

CWT

LIQUID CHILLERS
FROM 7 TO 128 KW

CWE/HWE

LIQUID CHILLERS/HEAT PUMPS
FROM 13 TO 140 KW

CWB/CWB FC

LIQUID CHILLERS
FROM 80 TO 570 KW

FRIULAIR Chillers

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QBE

INDUSTRIAL LIQUID CHILLERS

FROM 2 TO 25 KW

INDUSTRY Ready 4.0

QBE

OZONE FRIENDLY R407C

DESCRIPTION

The new range of QBE chillers has been designed specifically to meet industrial requirements and provide accurate control of the chilled water temperature with the absolute reliability of continuous operation (with the option of hot bypass valve). It is particularly suitable for process cooling during the moulding and extrusion of plastic, laser cutting, precision engineering, pharmaceutical and food industry etc.
The range consists of 12 models with cooling capacities from 2÷25 kW and is designed for outdoor installation (QBE002 excluded and QBE003÷007 optional). All units are equipped with:

- Hermetic rotary or scroll compressors
- Microprocessor controller (electronic thermostat for QBE002)
- Atmospheric pressure tank
- Water pump

STRUCTURE AND MAINTENANCE

The unit frame and panels are externally powder coated steel, making QBE suitable for external and weather-proof installations (degree of protection to IP44 as standard only on QBE008÷025 models). All fasteners are stainless steel or electro-galvanized. The panels are easily removed, allowing access inside the unit for maintenance and repair.
The clear arrangement of the components, the simple composition of the refrigerant and hydraulic circuit and the electrical system's cable numbering, assist the users normal operation. All models are equipped with lifting hooks. The QBE008÷025 models are equipped with lifting holes on the base.
Wheels for all models are available on request and allow for easy movement of the machine even when unpacked.

COOLING CIRCUIT

Manufactured of high quality materials by skilled personnel according to strict procedures of brazing, and conforms to Directive 2014/68/EU. It comprises of:

- Rotary (QBE002÷012 models) or scroll (QBE014÷025 models) compressor
- Copper Coaxial evaporator or stainless steel brazed plate
- Micro channel condenser in aluminium with epoxy coating
- Filter dryer
- Flow sight glass with moisture indicator (QBE008÷025 models)
- External equalisation thermostatic expansion valve (except QBE002 model)
- High pressure switch with manual reset
- Low pressure switch with manual reset
- High and low pressure gauges (QBE008÷025 models)
- Pressure connections for checks and maintenance

HYDRAULIC CIRCUIT

- Atmospheric pressure collection tank, thermally insulated manufactured from ABS (QBE002÷007) and PVC (QBE008÷25)
- Water manometer
- Drain valve
- Calibrated water bypass (prevents incidents caused by the erroneous closure of the stop valves)
- Filling unit
- Electric pump, thermally insulated, made with non-ferrous materials (steel, brass or plastic material, mechanical seals NBR or EPDM depending on the model)
- Water pipes in copper and PVC
- Water differential pressure switch (QBE008÷ 025 models)

All models of the QBE range have for standard an hydraulic circuit made of non-ferrous materials, which is necessary for industrial applications. All units in the range can be used with mixtures of water and ethylene glycol up to 30%.

MICROPROCESSOR CONTROLLER

The microprocessor controller manages and optimizes all components and functions of the QBE chillers (QBE002 excluded, which has an electronic thermostat). It also:

- Adjusts the water temperature at the evaporator outlet
- Controls the compressor On and Off cycles depending on the water temperature and simultaneously ensures the minimum operating times to protect the compressor
- Measures and displays the water temperature
- Prevents the evaporator freezing
- Turns the pump on and off with suitable delay for the compressor

The integrated display, with icons, provides a complete visualisation of the parameters of the machine' s operation and any alarm conditions.

ALARM CONTROL

- High and low refrigerant pressure switch
- Water differential pressure switch (QBE008÷QBE025 models)
- Level switch
- Thermal electric motors protections (only QBE008÷QBE025)
- Temperature failure probe
- Anti-Freeze

CHECKS AND TESTING

Each QBE unit is subjected to an end-of-line full load testing; During the test phase the following checks are performed:

- Correct component assembly
- Pressurisation of the cooling circuit and leak detection using a helium leak detector
- Pressurisation of the hydraulic circuit
- Electrical tests according to the EN60204 standard
- Check of correct protection and safety operation
- Check of correct electronic controller operation
- Performance and electrical data measurement

HOT GAS BYPASS VALVE FOR "PRECISE" CONTROL OF WATER OUTLET TEMPERATURE

The QBE range is provided with a precise adjustment system for the outlet water temperature using a hot gas bypass valve. This configuration provides a VERY precise control of thermal loads that are less than the minimum capacity of the compressor itself.
They are set so as to minimize the fluctuations of the outlet water temperature, with very high degrees of precision, comprised between ±0.1K of the water set-point under nominal operating conditions.

		QBE002	QBE003	QBE004	QBE005	QBE006	QBE007	QBE005	QBE006	QBE007	QBE008	QBE009	QBE012	QBE014	QBE020	QBE025
PERFORMANCES [1]																
Cooling capacity	[kW]	2,68	2,90	3,71	4,46	5,44	6,14	5,40	6,27	7,23	8,55	10,49	13,19	16,99	20,61	22,79
Compressors power input	[kW]	0,52	0,53	0,72	0,88	1,32	1,74	1,23	1,72	2,30	1,59	2,31	3,05	2,72	3,85	4,90
Total power input	[kW]	0,86	1,06	1,25	1,41	1,85	2,27	1,79	2,28	2,86	2,90	3,62	4,36	4,49	5,96	7,01
Total absorbed current	[A]	4,76	5,70	6,69	7,51	9,65	11,42	4,23	4,83	6,03	5,65	6,74	8,11	8,42	11,07	13,05
Energy efficiency (pump excluded)	EER/COP	3,95	4,22	4,21	4,31	3,68	3,23	3,81	3,28	2,90	4,51	4,01	3,92	4,87	4,46	4,02
Seasonal energy performance ratio [*]	SEPR	4,41	4,67	4,33	4,73	4,87	4,59	4,63	4,29	4,1	5,41	4,79	5,4	5,58	5,53	4,33
Water flow	[l/h]	461,83	498,43	637,81	767,44	935,74	1.055,29	929,08	1.078,70	1.242,86	1.470,26	1.804,74	2.268,97	2.921,59	3.545,69	3.919,42
Available pressure	[kPa]	132,4	293,1	265,0	252,9	218,0	192,9	219,3	188,0	153,2	231,5	205,6	218,7	180,4	220,4	203,4
ELECTRICAL DATA [2]																
Maximum power input (total)	[kW]	1,37	1,56	1,7	2,1	2,6	3,2	2,4	3,1	3,8	4,0	5,0	6,6	7,4	9,0	9,0
Maximum absorbed current (total)	[A]	7,01	7,91	9,5	11,7	13,8	15,0	5,0	6,0	7,4	7,3	9,2	10,7	11,3	16,8	19,3
Starting current	[A]	20,4	21,3	25,3	32,8	37,8	52,8	21,5	21,5	24,5	33,7	40,2	48,7	62,7	78,2	89,2
Fan power	[kW]	0,16	0,16	0,16	0,16	0,16	0,16	0,19	0,19	0,19	0,31	0,31	0,31	0,77	0,77	0,77
Fan current	[A]	0,80	0,80	0,80	0,80	0,80	0,80	0,40	0,40	0,40	0,70	0,70	0,70	1,70	1,70	1,70
Number of fans	[#]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Standard pump type	[#]	P2	P3	P3	P3	P3	P3	P3	P3	P3	P2	P2	P2	P2	P2	P2
Pump power input	[kW]	0,18	0,37	0,37	0,37	0,37	0,37	0,37	0,37	0,37	1,00	1,00	1,00	1,00	1,34	1,34
Pump absorbed current	[A]	1,60	2,50	2,50	2,50	2,50	2,50	1,15	1,15	1,15	2,00	2,00	2,00	2,00	2,50	2,50
Power supply	[V/Ph/Hz]	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
IP protection degree	---	IP40	IP40	IP40	IP40	IP40	IP40	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44	IP44
TECHNICAL DATA																
N° of compressors	[#]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N° of refrigerant circuits	[#]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Air flow	[m^3/h]	2.200	2.200	2.200	2.500	2.500	2.500	2.500	2.500	2.500	4.800	4.800	5.000	5.500	5.500	5.500
Sound pressure level at 10 m in free field [3]	[dbA]	46	46	46	46	46	46	46	46	46	49	49	49	49	49	49
Water connections size	[inch]	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1"	1"	1"	1"	1"	1"
Tank capacity	[dm^3]	25	25	25	25	25	25	25	25	25	90	90	90	90	90	90
Width	[mm]	720	720	720	720	720	720	720	720	720	1004	1004	1004	1004	1004	1004
Depth	[mm]	670	670	670	670	670	670	670	670	670	753	753	753	753	753	753
Height	[mm]	680	680	680	680	680	680	680	680	680	1257	1257	1257	1257	1257	1257
Weight	[kg]	82	85	88	92	95	100	92	95	100	235	240	245	255	255	255

- [*] Data reported here are in accordance with European Regulation (EU) 2016/2281for eco-design requirements of cooling products and high temperature process chillers.
- [1] Data referred to: water temp. in/out: 20/15°C - ambient air temp. 25°C
- [2] Data related to most heavy condition allowed by safety devices
- [3] Referred at 10 m and at an height of 1,5 m in free field