

PURESTREAM CHILL-CUBE



Air-cooled water chiller

Cooling capacity from 0.5 to 6 tons

R407C Refrigerant

QPS Inspection label certified to CSA standards

2 Year parts warranty

The QBE Chill-Cube Series: Overview

The new **Chill-Cube** range of chillers are specifically designed to meet the stringent cooling requirements of today's advanced equipment and processes. The Chill-Cube provides precise temperature control of chilled water while operating with varying loads in a variety of applications and industries. These chillers are fitted with a precision regulation system to manage outlet water temperature ($\pm 1\text{C}$). The system utilizes Electronic/Mechanical hot gas bypass valves to keep running at low demand and match capacity to actual load.

The range includes 11 models with cooling capacities ranging from .5 to 6 Ton. QBE models 002-007 have been designed to be installed indoors, while the QBE 009-025 models have been designed to be installed in or outdoors (QBE 003-007 models can be installed outdoors as an option). All units are equipped with:

- Rotary or scroll type hermetic compressors
- Environmentally friendly refrigerant R407C
- Microprocessor controller (electronic thermostat for QBE 002)
- Atmospheric inertial water tank
- Hydronic pump
- **Non-ferrous materials for hydronic circuit**
- Mechanical Hot Gas Bypass Valves as standard (Exception: QBE 002)

Compressors

Purestream Chill-Cube chillers utilize rotary and scroll hermetic compressors. These compressors are the industry choice, known for reliability and efficiency through their widespread use in the air conditioning and refrigeration industries. The scroll compressor adds the additional benefits of quiet operation, no vibration and the ability to absorb liquid returns. The compressors are mounted on rubber anti-vibration blocks to reduce noise. The three phase compressors are also protected by an electronic device controlling phase sequences in order to prevent reverse rotation.



Rotary compressor



Scroll compressor

Condenser Fans

The four-pole axial fan motors are complete with external sickle shaped fan blade which is activated by condensing pressure which allows for low operation temperature installations located indoors or outdoors. All fans have a protection grill, thermally protected with automatic reset and class F insulation. (QBE 002 model excluded).

Chill-Cube Evaporators

The QBE 002 thru QBE 007 models is equipped with a copper co-axial evaporator. All other models are equipped with an energy efficient compact stainless steel brazed plate evaporator. The electronic controller's anti-freeze function keeps the evaporator's outlet water temperature controlled in order to prevent freeze ups. For models QBE 009-025 a differential pressure switch protects the evaporator against low water flow.



Co-axial evaporator



Brazed plates evaporator

Refrigerant circuit

The refrigeration circuit is made of high quality materials and assembled by experienced factory professionals which follow rigorous brazing procedures which conform to directive 97/23.

The refrigeration circuit includes:

- Rotary compressors for models QBE 002-012 or scroll compressors for models QBE 014-025.
- Copper coaxial evaporators for models QBE 002-007 and AISI 316 stainless steel brazed plates for models QBE 009-025.
- Microchannel condenser.
- Dehydration filter.
- Sightglass Flow indicator indicating presence of humidity for models QBE 009-025.
- Thermostatic equalization expansion valve for all models excluding model QBE 002.
- Manual reset high pressure switch.
- Automatic reset low pressure switch for models QBE 009-025.
- High and low pressure gauges for models QBE 009-025.
- Refrigerant gauge connections.

Circulation pumps

All models have a high efficiency multistage centrifugal pump with steel impeller. All parts coming into contact with fluid are made of AISI 304 stainless steel, mechanical seal in carbon/ceramic/ EPDM materials as standard. All models can utilize water and ethylene glycol mixtures of up to 30%. The pump motor is 2 pole, self - ventilated class F insulation and IP55 protection level.

QBE 002 model is available with pressure level P2.

QBE 003-007 models are available with pressure levels P3 and P5.

QBE 009-025 models are available with 3 pressure levels P2, P3, P5.

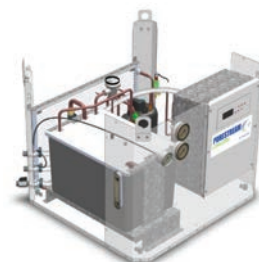


Frame and cabinet covering

All frame and cabinetry material is made from galvanized steel and painted in a powder coat paint finish making it suited for outdoor installation and for protection in harsh environments.

All fasteners are either stainless steel or electro-galvanized.

The Chill-Cube was designed so that all parts, particularly those requiring maintenance and cleaning, are easy to access without interfering with the chiller operation and assuring a safe environment for the technician.



Control panel

The control panel complies with the Canadian electrical code and includes a door lock disconnect (only models with three phase power input) which prevents access to the watertight control panel door when it is powered.

All control panel wires are numbered with identification, allowing for easier trouble shooting and maintenance.

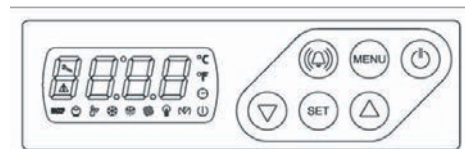
Microprocessor controller

The electronic micro-processor controller optimizes all chiller functions, excluding model QBE 002.

- The controller regulates the water outlet temperature.
- Switches pump on and off.
- Manages compressor's on and off cycles based on water temperature required while guaranteeing minimum operating times to protect the compressor.
- Measurement and display of water temperature.
- Manages the following alarm messages:
 - High and low refrigerant pressure switch.
 - Water differential pressure switch (only QBE 009-014).
 - Thermal protection for electrical motors (only QBE 009-014).
 - Temperature probe failure.
 - Anti-freeze.
- User interface is easy and intuitive.
- The easy-to-follow set up menu allows for easy access to set main operating parameters.
- The integrated display with its clear icons provides a complete real time display of chiller operations and any alarm status.



QBE 002 Electronic thermostat



QBE 003-025 Microprocessor controller

Safety and Protection devices

- Temperature probes that control and display evaporator inlet and outlet water temperature, to prevent the possibility of freezing (model QBE 002 excluded).
- High pressure switch:
Signals the chiller to stop operation if the unit reaches irregular pressures on the refrigerant circuit's high pressure side. Once the problem has been corrected, the unit can be manually reset.
- Low pressure switch on models QBE 002-007:
Designed to stop the chiller if refrigerant pressure is too low.
- Differential water pressure switch:
Stops the chiller if water capacity is too low. (only models equipped with brazed plate evaporator)
- Phase sequence control:
(just models with three phase power input) stops the machine starting if the electric power phase sequence is wrong, to avoid compressors from rotating in the opposite direction to the one set.

Hydraulic circuit

Includes:

- Thermally insulated storage tank, in ABS for models QBE 002-007 and plastic for models QBE 009-025
- Thermally insulated electric pump
- Water by-pass which prevents problems linked to shut-off valves being closed by mistake
- Water differential pressure switch (models QBE 009-025)
- Water gauge
- Water level switch
- Drain valve
- Water filler

The storage tank is on the unit outlet to limit temperature variations due to the compressor being switched on and off. All QBE models are fitted with open hydraulic tank not pressurized. All models have as an option pressurized water circuit with the exception of model QBE 002. **All QBE models have as standard the hydraulic circuit with non-ferrous materials.**

Options for hydraulic circuit

The Chill-Cube series is designed for several options, making it easily adaptable to various operating conditions:

- Pressurized tank in carbon steel
- Pressurized tank in stainless steel
- Pump with high head pressure
- Buffer tank at the machine input
- Only evaporator
- Only evaporator and pump
- Only evaporator and tank
- Additional hydraulic connection at the tank
- Flow stabilizing valve
- Plate heat exchanger
- Plate heat exchanger built entirely in stainless steel

Not all combinations of the options mentioned here are possible, the availability of a combination of accessories must be verified by contacting us.




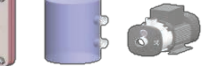

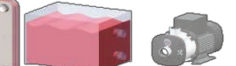








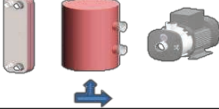
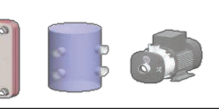




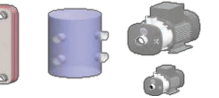
Controls and testing

Each chiller is tested at full load.

The following quality control testing is performed:

- Accurate component assembly
- Double pressing of refrigerating circuit connections and search for leaks using helium leak-detector
- Testing hydraulic circuit seals
- Electrical tests to ensure compliance with electrical standards
- Test to ensure protection and safety components function properly
- Test the electronic controller to ensure proper functioning

Hydraulic circuit option table

	QBE 003-007		QBE 009-025	
	ATMOSPHERIC TANK	PRESSURIZED TANK	ATMOSPHERIC TANK	PRESSURIZED TANK
COLD TANK	STANDARD 		STANDARD 	
WARM TANK				
COLD TANK NO PUMP				
WARM TANK NO PUMP				
DISCONNECT BYPASS				
ONLY PUMP				
ONLY EVAPORATOR				
DOUBLE PUMP				



Coaxial evaporator



Cold atmospheric tank



Cold pressurized tank



Pump



Cold pressurized tank with disconnect



Plates evaporator



Warm atmospheric tank



Warm pressurized tank



Steady evaporator water flow bypass valve

Hot gas bypass valve

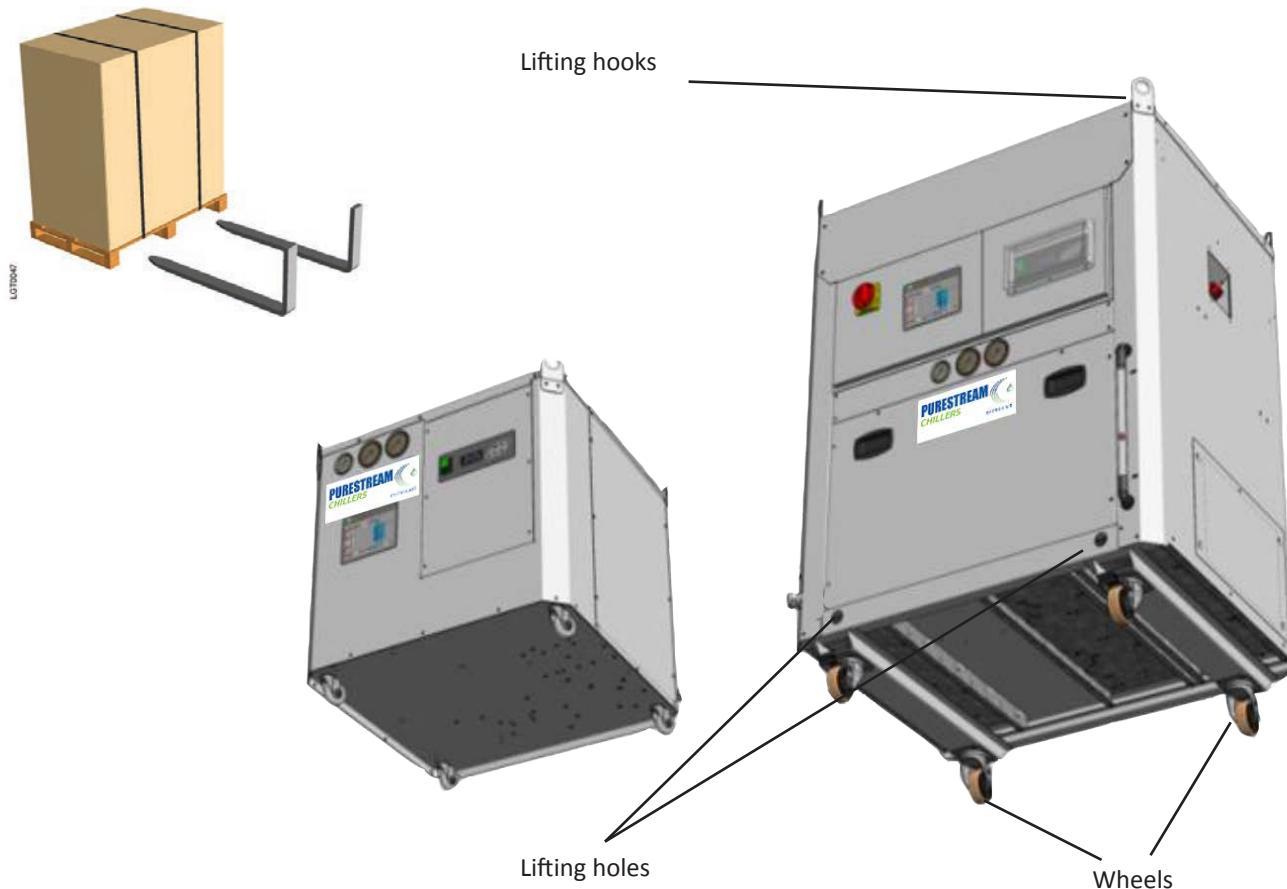
The hot gas bypass valve ensures precision control of outlet water temperature ($\pm 0.5^{\circ}\text{C}$). The valve by-passes part of the refrigerant at a high temperature and a pressure to reduce the thermal load on the evaporator. The valve modulation is achieved due to the temperature probe on the evaporator outlet water by the electronic controller.

Continuous regulation of cooling capacity also avoids stopping the compressor, ensuring continuity of service.

Chillers equipped with hot gas bypass valve are ideal for use with tight tolerances of water temperature ideal for laser cutting machines, welding, profiling, optics, laboratory and many other applications.

Handling

All chillers are supplied packed on pallets so they can be handled using a pallet truck and also making it safe for transporting on transport trucks and sea freight containers. All models are equipped with lifting hooks. QBE 002-007 models are equipped with adjustable supports, and QBE 009-025 models include lifting holes on the base. On request, all models are available with feet and wheels making it easy to move the machine when it has been unpacked.



Applications

- Plastics (injection, blow moulding, extrusion, film extrusion, thermoforming)
- Printing and graphics (manufacture, printing, cardboard, labels, plastic film)
- Medical imaging
- Food (beverage, confectionery, chocolate, processing, storage)
- Lasers (welding, profiling, cutting, optics, medical, marking, aesthetics)
- Mechanical (welding, cutting, profiling, polishing, rolling, grinding)
- Other (wood, ceramics, gold, biogas pharmaceutical, compressed air, textile)
- Hydraulic circuit cooling machine tool
- Paint and finishing
- EDM

Technical data QBE (US Units)

Model	QBE		002-E ⁽⁵⁾	003-E	004-E
Cooling capacity (1)		[Tons]	0.84	0.89	1.17
Compressors power input (1)		[kW]	0.74	0.64	0.93
Total power input (1) (2)		[kW]	1.57	1.47	1.76
Total absorbed current (1) (2)		[A]	8.43	8.01	8.58
EER (pump excluded) (1)		---	10.4	12.2	12.0
Water flow (1)		[gal/min]	2.23	2.38	3.11
Available pressure (1)		[psig]	33.1	50.8	47.8
Maximum power input (total) (2) (3)		[kW]	2.0	2.0	2.4
Maximum absorbed current (total) (2) (3)		[A]	10.6	10.6	10.9
Starting current (2) (3)		[A]	24.1	24.1	35.1
Fan power		[kW]	0.23	0.23	0.23
Fan current		[A]	1.00	1.00	1.00
Number of fans		[#]	1	1	1
P3 Pump power input		[kW]	0.60	0.60	0.60
P3 Pump absorbed current		[A]	4.10	4.10	4.10
Power supply		[V/Ph/Hz]		230/1/60	
IP protection degree		---		IP40	
Refrigerant		---		R407C	
Compressor type		---		Rotary	
Evaporator type		---		Coaxial	
Condenser type		---		Microchannel	
N° of compressors		[#]	1	1	1
N° of refrigerant circuits		[#]	1	1	1
Air flow		[cfm]	1.295	1.295	1.295
Sound pressure level (4)		[dbA]	46	46	46
Water connections diameter		[inch]	1/2"	1/2"	1/2"
Width		[inch]	28.3	28.3	28.3
Depth		[inch]	26.7	26.7	26.7
Height		[inch]	26.3	26.3	26.3
Weight		[lb]	181	187	194
Tank capacity - Option		[gal]	6.6	6.6	6.6
P5 Pump power input - Option		[kW]		0.60	0.60
P5 Pump absorbed current - Option		[A]		4.10	4.10

(1) Data referred to following conditions: water temperature in/out: 68/59°F - ambient air temperature: 77°F

(2) Data referred to unit with pump P3

(3) Data related to most heavy condition allowed by safety devices fitted on the unit

(4) Referred at 10 m and at an height of 1.5 m in free field

(5) Data referred to unit with pump P2

Model	QBE		005-E	006-E	007-E
Cooling capacity (1)		[Tons]	1.39	1.67	2.05
Compressors power input (1)		[kW]	1.12	1.55	2.52
Total power input (1) (2)		[kW]	1.95	2.38	3.35
Total absorbed current (1) (2)		[A]	10.39	12.52	16.74
EER (pump excluded) (1)		---	12.35	11.26	9.0
Water flow (1)		[gal/min]	3.69	4.45	5.46
Available pressure (1)		[psig]	50.2	48.0	44.6
Maximum power input (total) (2) (3)		[kW]	2.7	3.2	4.1
Maximum absorbed current (total) (2) (3)		[A]	13.9	16.3	20.0
Starting current (2) (3)		[A]	40.1	55.1	77.1
Fan power		[kW]	0.23	0.23	0.23
Fan current		[A]	1.00	1.00	1.00
Number of fans		[#]	1	1	1
P3 Pump power input		[kW]	0.60	0.60	0.60
P3 Pump absorbed current		[A]	4.10	4.10	4.10
Power supply		[V/Ph/Hz]		230/1/60	
IP protection degree		---		IP40	
Refrigerant		---		R407C	
Compressor type		---		Rotary	
Evaporator type		---		Coaxial	
Condenser type		---		Microchannel	
N° of compressors		[#]	1	1	1
N° of refrigerant circuits		[#]	1	1	1
Air flow		[cfm]	1.471	1.471	1.471
Sound pressure level (4)		[dbA]	46	46	46
Water connections diameter		[inch]	1/2"	1/2"	1/2"
Width		[inch]	28.3	28.3	28.3
Depth		[inch]	26.7	26.7	26.7
Height		[inch]	26.3	26.3	26.3
Weight		[lb]	203	209	220
Tank capacity - Option		[gal]	6.6	6.6	6.6
P5 Pump power input - Option		[kW]	0.60	0.60	0.60
P5 Pump absorbed current - Option		[A]	4.10	4.10	4.10

(1) Data referred to following conditions: water temperature in/out: 68/59°F - ambient air temperature: 77°F

(2) Data referred to unit with pump P3

(3) Data related to most heavy condition allowed by safety devices fitted on the unit

(4) Referred at 10 m and at an height of 1.5 m in free field

Model	QBE	009-R	012-R	014-R	020-R	025-R
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Cooling capacity (1)	[Tons]	2.64	3.56	4.55	5.44	6.97
Compressors power input (1)	[kW]	1.87	2.68	2.62	3.12	4.98
Total power input (1) (2)	[kW]	2.74	3.55	4.56	5.06	6.92
Total absorbed current (1) (2)	[A]	9.28	10.33	7.91	8.48	11.41
EER (pump excluded) (1)	---	13.9	13.8	14.3	14.7	13.5
Water flow (1)	[gal/min]	7.03	9.47	12.11	14.49	18.56
Available pressure (1)	[psig]	37.6	32.8	39.1	36.0	26.6
Maximum power input (total) (2) (3)	[kW]	3.9	5.2	7.2	7.8	9.9
Maximum absorbed current (total) (2) (3)	[A]	10.9	12.8	11.5	12.4	15.7
Starting current (2) (3)	[A]	38.3	45.3	46.8	55.8	74.8
Fan power	[kW]	0.41	0.41	1.20	1.20	1.20
Fan current	[A]	0.74	0.74	2.00	2.00	2.00
Number of fans	[#]	1	1	1	1	1
P3 Pump power input	[kW]	0.46	0.46	0.74	0.74	0.74
P3 Pump absorbed current	[A]	5.60	5.60	1.80	1.80	1.80
Power supply (All models available in 460/575/3/60)	[V/Ph/Hz]			460/3/60		
IP protection degree	---			IP44		
Refrigerant	---			R407C		
Compressor type	---		Rotary		Scroll	
Evaporator type	---			Brazed plates		
Condenser type	---			Microchannel		
N° of compressors	[#]	1	1	1	1	1
N° of refrigerant circuits	[#]	1	1	1	1	1
Air flow	[cfm]	2.825	2.943	3.237	3.237	3.237
Sound pressure level (4)	[dbA]	48	48	49	49	49
Water connections diameter	[inch]	1"	1"	1"	1"	1"
Width	[inch]	39.5	39.5	39.5	39.5	39.5
Depth	[inch]	29.6	29.6	29.6	29.6	29.6
Height	[inch]	49.5	49.5	49.5	49.5	49.5
Weight	[lb]	529	540	562	562	562
Tank capacity - Option	[gal]	23.8	23.8	23.8	23.8	23.8
P2 Pump power input - Option	[kW]	0.43	0.43	0.43	0.43	0.43
P2 Pump absorbed current - Option	[A]	0.80	0.80	0.80	0.80	0.80
P5 Pump power input - Option	[kW]	0.74	0.74	0.74	0.74	0.74
P5 Pump absorbed current - Option	[A]	1.80	1.80	1.80	1.80	1.80

(1) Data referred to following conditions: water temperature in/out: 68/59°F - ambient air temperature: 77°F

(2) Data referred to unit with pump P3

(3) Data related to most heavy condition allowed by safety devices fitted on the unit

(4) Referred at 10 m and at an height of 1.5 m in free field

Model	QBE		005-R	006-R	007-R
Cooling capacity (1)		[Tons]	1.78	2.01	2.31
Compressors power input (1)		[kW]	1.58	2.17	2.86
Total power input (1) (2)		[kW]	2.27	2.86	3.55
Total absorbed current (1) (2)		[A]	9.26	9.94	11.05
EER (pump excluded) (1)		---	11.8	10.0	9.0
Water flow (1)		[gal/min]	4.75	5.34	6.15
Available pressure (1)		[psig]	47.0	45.0	42.1
Maximum power input (total) (2) (3)		[kW]	2.9	3.7	4.4
Maximum absorbed current (total) (2) (3)		[A]	10.0	11.0	12.2
Starting current (2) (3)		[A]	26.6	22.6	29.6
Fan power		[kW]	0.23	0.23	0.23
Fan current		[A]	1.00	1.00	1.00
Number of fans		[#]	1	1	1
P3 Pump power input		[kW]	0.46	0.46	0.46
P3 Pump absorbed current		[A]	5.60	5.60	5.60
Power supply (All models available in 460/575/3/60)		[V/Ph/Hz]		460/3/60	
IP protection degree		---		IP44	
Refrigerant		---		R407C	
Compressor type		---		Reciprocating	
Evaporator type		---		Coaxial	
Condenser type		---		Microchannel	
N° of compressors		[#]	1	1	1
N° of refrigerant circuits		[#]	1	1	1
Air flow		[cfm]	1.471	1.471	1.471
Sound pressure level (4)		[dbA]	46	46	46
Water connections diameter		[inch]	1/2"	1/2"	1/2"
Width		[inch]	28.3	28.3	28.3
Depth		[inch]	26.7	26.7	26.7
Altezza - Height		[inch]	26.3	26.3	26.3
Weight		[lb]	203	209	220
Tank capacity - Option		[gal]	6.6	6.6	6.6
P5 Pump power input - Option		[kW]	0.74	0.74	0.74
P5 Pump absorbed current - Option		[A]	1.80	1.80	1.80

(1) Data referred to following conditions: water temperature in/out: 68/59°F - ambient air temperature: 77°F

(2) Data referred to unit with pump P3

(3) Data related to most heavy condition allowed by safety devices fitted on the unit

(4) Referred at 10 m and at a height of 1.5 m in free field

Standard equipment and optional components

QBE model	002	003-007	009-025
Atmospheric hydraulic circuit with non-ferrous materials	●	●	●
Hydraulic pressurized circuit with non-ferrous materials (1)	✕	○	○
Water bypass	●	●	●
Pump			
Pump	●	●	●
P2 Head pressure pump	●	✕	○
P3 Head pressure pump	✕	●	●
P5 Head pressure pump	✕	○	○
No pump	✕	○	○
Tanks			
“Cold” atmospheric tank (at the exit of the machine)	●	●	●
“Warm” atmospheric tank (at the inlet of the machine)	✕	✕	○
“Cold” atmospheric tank (at the exit of the machine) – No pump	✕	○	○
Pressurized tanks			
“Cold” pressurized tank (at the exit of the machine) (1)	✕	○	○
“Warm” pressurized tank (at the inlet of the machine) (1)	✕	○	○
“Cold” pressurized tank (at the exit of the machine) – No pump (1)	✕	○	○
“Warm” pressurized tank (at the entrance of the machine) – No pump (1)	✕	○	○
Special tanks			
“Cold” pressurized tank with disconnecter and double pump	✕	✕	○
Storage tank with additional connections (3)	✕	○	○
No tank (1)	✕	○	○
Valves			
Electronic hot gas by-pass valve	✕	○	○
Mechanical hot gas by-pass valve	✕	●	●
Switches			
Water differential pressure switch (4)	✕	○	●
High pressure switch	●	●	●
Low pressure switch	✕	○	●
Gauges			
Refrigerant gauges	✕	○	●
Water gauge (2)	●	●	●
Water level switch	●	●	●
Controls			
Thermostatic valve	✕	●	●
Thermostat unit control	●	✕	✕
Parametric microprocessor controller	✕	●	●
Phase sequence control relay switch	✕	✕	●
Compressor crank case heater	✕	○	○
Condensing control (fan on-off)	✕	●	●
Fan continuous speed control (Low air temperature kit)	✕	✕	○
Outdoor installation setting	✕	○	●
Stainless steel air filters	●	●	●
Wheels	○	○	○
Adjustable supports	●	●	✕

Legend: ✕ not available; ● standard; ○ optional; * contact our company

- (1) Option available only for units with plate heat exchanger
- (2) Water gauge included in all units with pump
- (3) Additional connection included in all units with pressurized tank
- (4) Water differential pressure switch included in all the units with plate heat exchanger

CAG COOLING SOLUTIONS

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