Tender Specification

SERIES: WQL / WQH / WQRC 20-190

TYPE: Water cooled water chiller, heat pump and condenserless unit

TECHNOLOGY: single / multi-scroll compressors, R410A refrigerant

CAPACITY RANGE:

Cooling → 21-193 [kW]

Heating → 24-211 [kW]

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1 General description

WQL / WQH / WQRC units have been designed and optimized to operate with R410A refrigerant and scroll compressors

Thanks to multi-scroll technology and asymmetric design in tandem configuration, it is possible to reach very high level of seasonal performances (ESEER up to 5.2), in line with Ecodesign requirements

WQL units are available in 14 sizes, with a nominal capacity range from 21 to 193 [kW]

WQH units are available in 14 sizes, with a nominal capacity range from 21 to 185 [kW] in cooling mode and from 24 to 212 [kW] in heating mode

Each unit is equipped with single refrigerant circuit, single hermetic scroll compressor for sizes 20 to 45, and two hermetic scroll compressors (tandem) for sizes 50 to 190

WQL/H/RC can be supplied with two acoustic options:

- Basic Low Noise (BLN): the units are supplied with compressors box to reduce noise emissions

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- Extra Low Noise (ELN): the units are supplied with compressors box and additional insulation panels on the cabinet in order to furtherly reduce noise impact

Desuperheater option is available for sizes 50 to 190: plate type heat exchangers fitted on the compressor discharge line, to recover about 20 % of the total heat rejected to the condenser

Several hydraulic options are available in order to cover a wide range of requirements in terms of pump available static pressure and redundancy both for evaporator and condenser side

2 Key points

- High full load efficiency → EER up to 4.5, COP up to 4.1
- High seasonal performances → ESEER up to 5.1
- Compressor box → Remarkable sound reduction even for the basic low noise version
- Reduced refrigerant charge → less than 10 [kg] per circuit for units up to size 90
- Advanced electronic controller → auto-adaptive function to reduce water content in the piping system
- Condensing pressure control option → suitable for well application
- Wide range of "plug and play" hydrokit → easy hydraulic installation

- DHW (Domestic Hot Water) function available on the controller with 3-way valve available as accessory → integration with plant
- Desuperheater heat exchanger available as option (50-190 sizes) → heating capacity for free thanks to heat recovery

- Several options / accessories provided with standard delivery:
  - Phase sequence control → safe electric installation
  - Control circuit transformer → power supply without neutral
  - Water differential pressure switch → protection against low water flow
  - Double set-point → time scheduling setting according daily request
  - Dynamic set point (Climatic, 4-20 [mA], 0-10 [V], 0-5 [V], 0-1 [V]) → variable set-point according analogue input

3 Cabinet

The cabinet is made of heavy gauge galvanized steel.
All galvanized steel components are individually painted by a special painting process before the assembly of the unit. This painting system performs a homogeneous protection to the corrosion.
The painting is a polyester powder based type, colored in RAL 7040. The units are suitable for outdoor installation, directly on the building roof or at the ground level

4 Compressors

Compressors are of hermetic scroll type and fitted with an electronic control system ensuring protection against high temperature and excessive load.
All compressors have direct-on-line starting and are mounted on rubber vibration isolators in order to minimize noise and vibration transmission

5 Evaporator

Indoor heat exchangers are brazed stainless steel plate type. They are insulated with a 10 [mm] thick closed cell polyethylene foam material and provided with Victaulic connections.
Maximum working pressure is 10 [bar] water side and 45 [bar] refrigerant side

6 Condenser

Outdoor heat exchangers are brazed stainless steel plate type. In case of WQH version they are insulated with a 10 [mm] thick closed cell polyethylene foam material and provided with Victaulic connections.
Maximum working pressure is 10 [bar] water side and 45 [bar] refrigerant side

7 Refrigerant circuit

Refrigerant circuit is equipped with one or two hermetic scroll compressors (depending on the frame), sight glass, filter-drier and mechanical expansion valve (electronic expansion valve is available as an option, std fitted on 170 and 190 sizes).
Heat pump units (WQH) refrigerant circuit is also provided with 4-way reversing valve and check valves system in order to always run liquid line in the same direction (both in cooling and in heating mode).
Remote condenser units (WQRC) refrigerant circuit is supplied without condenser and it is provided with liquid receiver, stop valves both on discharge and liquid lines, solenoid valve on liquid line.

8 Control panel

A new optimized control is supplied on all the units with a simple user interface

(possibility to customize keys functions and to set menus visibility).
In addition to standard features as water temperature control (with possibility to choose between LWT or RWT probe), the control can also manage following functions :

- DHW control with anti-legionella function daily and weekly activated
- Dynamic set point (4-20 [mA], 0-10 [V], 0-5 [V], 0-1 [V])
- Double set point
- OAT compensation
- Boiler/Electrical heater integration
- Condensing control
- Auto adaptive function to reduce the water content of the plant
- Managing of DHW 3-way valve (accessory)
- Advanced pump management (both primary circuit and source side)

A remote keyboard is available as accessory with the possibility to connect (up to 100 m distance) without any serial interface

Unit controller can display all operating parameters such as:

- Evaporator return water temperature
- Evaporator leaving water temperature
- Condenser return water temperature
- Condenser leaving water temperature
- Outdoor ambient temperature (OAT option)
- Refrigerant discharge pressure (CCK option)

Unit controller can display various alarms and operation status:

- Low / High pressure
- Evaporator antifreeze
- Evaporator lack of water flow
- Condenser lack of water flow
- Compressor operation / operating hours and start-up numbers
- Pump operation / operating hours
- Compressor thermal protection
- Faulty sensors

9 Safety and control devices

Each unit is complete with the following safety and control devices

Safety

- Door lock main isolating switch
- Phase sequence control
- High pressure switch with manual reset
- Discharge safety valve
- Low pressure switch with automatic / manual reset
- Anti-freeze probe (leaving water temperature)
- Crankcase oil electric heater
- Water differential pressure switch (source / plant side)

Control

- High pressure transducer (CCK option)
- Low pressure transducer (EEV option)
- Evaporator return water temperature sensor
- Evaporator leaving water temperature sensor (with an antifreeze function)
- Condenser return water temperature sensor
- Condenser leaving water temperature sensor
- Suction temperature sensor (EEV option)
- Outdoor ambient temperature sensor (OAT option)

10 Optional hydro kits

On board mounted and remote hydro-kits are available as option both for indoor and outdoor circuit.
On board hydro kits can be supplied only without buffer tank while remote hydro kits (supplied loose for field installation) are always provided with internal tank.

On board hydro kit are provided with following components:

- Single or double pump with low available static pressure (100 [kPa]) or high available static pressure (200 [kPa])

- Expansion tank for indoor circuit (5 [l] for sizes 20 to 45, 18 [l] for sizes 50 to 190)
- Check valves (in case of 2 pumps)
- Safety valve
- Automatic air vent valve
- Thermal insulation for pipes and water pump(s)

11 Factory installed options

- ModBus protocol kit for BMS
- Compressor soft starter
- Power factor correction capacitors
- Electronic expansion valve (standard for sizes 170 and 190)
- Compressor overload protection (only for sizes 50 to 190)
- Automatic circuit breaker (only for sizes 50 to 190, standard for sizes 20 to 45)
- Condensing control kit
- Electric heater wiring kit
- Additional heating device wiring kit
- Mechanical gauges kit
- Compressor jacket
- On board hydrokit
- Desuperheater (only for sizes 50 to 190)

12 Field installed accessories

- Remote ON-OFF control
- Remote keyboard panel
- Sequencer, up to max four units
- Condensing control kit
- Water temperature sensor for DHW tank
- Outdoor air sensor for weather compensation
- Electric heater wiring kit
- Additional heating device wiring kit
- Pressostatic water valve for well application (only for sizes 20 to 45)
- Compressor jacket
- Water flow switch
- Water pressure switch
- Victaulic to threaded pipe connection
- 3-way valve for DHW production
- Spring type anti-vibration mounts (only for sizes 50 to 190)
- Water filter
- Valves IN/OUT (only for sizes 20 to 45)

13 Conformity with standards

The units are in conformity with the following standards:

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- Machine Directive: 2006/42/EC
- Electromagnetic Compatibility Directive: 2014/30/EU
- Pressure Equipment Directive: 2014/68/EU

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