

Specifications

BRH_0011_0121_200909_GB



Series:	BRH
Sizes:	0011 – 0121
Range:	5,5 – 35,1 kW

BRH

Water-cooled liquid chillers

Water cooled chillers The unit is supplied with anti-freeze oil and refrigerant and has been factory tested. On-site installation therefore just involves making connection to the mains power and water supplies. Unit charged with R410A ecological refrigerant.

Supporting frame

Base and frame in thick hot-galvanised shaped sheet steel. All parts polyesters-painted.

Panelling

Panelling made of hot-galvanised sheet steel with a suitable thickness. All the parts are polyesters-painted and built in such a way as to allow total access to internal components. The soundproofing panelling incorporates a layer of open-cell foamed conoid sandwich material on the outside and an intermediate lead sheet with a total thickness of 35 mm.

Compressors

Hermetic scroll compressors complete with an oil sump heater, electronic overheating protection with centralised manual reset and a two-pole electric motor. Soundproof hood in high density rubber.

System side exchanger

AISI 316 steel braze-welded plate exchanger. The heat exchanger is fitted with a condensation-proof lining in closed-cell foamed rubber. When the unit is working, it is protected against lack of flow by a differential pressure switch mounted on the water side. The unit can work with antifreeze mixtures at exchanger outlet temperatures as low as -10°C.

Source-side heat exchanger

AISI 316 steel braze-welded plate exchanger. The heat exchanger is fitted with a condensation-proof lining in closed-cell foamed rubber. The unit can also work with antifreeze mixtures up to a glycol percentage of 40%.

Refrigerant circuit

Main components of the refrigerant circuit:

- dryer filter
- refrigerant line sight glass with humidity indicator
- externally equalised thermostatic valve
- high and low pressure switches
- check valve

System side hydraulic circuit

Main components of the system side hydraulic circuit:

- circulation pump (models FF only)
- expansion tank (models FF only)
- water differential pressure switch
- system vent
- drain taps
- safety valve
- male threaded 3/4" connectors up to size 0031, 1"1/4 from size 0041 to 0121

Source side hydraulic circuit

Main components of the source side hydraulic circuit:

- modulating two-way valve (just FF models)
- drain taps
- male threaded 3/4" connectors up to size 0031, 1"1/4 from size 0041 to 0121

Electric power and control panel

Electric power and control panel, compliant with EN 60204-1/EC 204-1 standards, complete with:

- control circuit transformer
- general door lock isolator
- circuit breakers and contactors for compressors
- remote ON/OFF terminals
- terminals for remote activation of ECONOMY function
- terminals for connection to remote keyboard
- terminals for connecting system and outlet side flow switches
- alarm signal terminals
- terminals for signalling compressor start status
- terminals for external air temperature probe
- electronic controller
- phase-cut board for managing modulating pump (models FF only)
- safety fuses
- compressor start capacitor (single-phase unit only)

- IP54 protection level

Reference regulations

The machine complies with the following directives and their amendments:

- 98/37/EC Machinery Directive
- C.E.D. 89/336/EEC + 2004/108/EC.
- 2006/95/EC Low Voltage Directive.
- 97/23/EC Pressure Equipment Directive. Module A1. TÜVItalia 0948

Control electronics

Control electronics with 4-digit display showing current temperature and pressure values of system and outlet sections, rapid access to adjustment setpoints, password-protected programming menu. Direct display of machine states for system diagnostics by means of illuminated icons on the front of the display. Level of protection of front of the control unit against infiltration of dust and water: IP65. Fitted for connection to external keyboard for the display and remote control of machine states.

Functions

STAND-BY

Activation and deactivation of the unit using the dedicated button on the front of the device, from event in time band, from remote using the voltage-free digital input.

ECONOMY

Function of change of a fixed value to add to the unit operating setpoint, can be activated remotely using the voltage-free digital input. This makes it possible, for example, to raise the unit setpoint from a fixed value during the night to achieve energy saving.

COMFORT

Function of dynamic setpoint change according to the external temperature measured by a special temperature sensor (not included in the supply, available as an accessory). As well as saving electricity, this makes it possible to produce the quantity of cold required to assure conditions of comfort in accordance with the real load and temperature conditions of the external air to the air to be conditioned.

SCHEDULER

Weekly events programmer for differentiated management of operating modes (ON / STAND-BY) and specific unit operating setpoint. Up to 3 daily profiles can be defined for each day of the week. This makes it possible to achieve energy saving (at night, for example), when the energy demand is lower. The scheduler assures observance of the set times thank to a user programmable internal clock.

Standard supplied

- Rubber anti-vibration kit (supplied loose with the unit, to be mounted)
- Vertical water connections (standard)
- Compressor chamber soundproofing
- Electronic controls with temperature display

Accessories

- REMOTE KEYBOARD HSW10 (supplied separately)

HSW remote keyboard with LCD display and 4 buttons. Its pleasant, modern design blends well with all furnishing styles. The HSW remote keyboard faithfully replicates the controller display on the unit and further simplifies all the operations of configuration and control of the applications via the large dual display.

- EXTERNAL AIR PROBE (supplied separately)

The external air probe makes it possible to enable the water setpoint offset for external air temperature, optimising the energy efficiency of the unit according to external conditions. The external air probe must be combined with the remote keyboard HSW12.

- WATER FILTER (supplied separately)

Y-filter designed and built to capture the impurities in the hydraulic circuit. It is fitted with a 0.9 mm stainless steel mesh cartridge, which can be regenerated or replaced without removing the valve body from the piping.

- FLOW SWITCH (supplied separately)

Flow switch for checking the absence or excessive decrease of flow in system pipes for air-conditioning and industrial treatment and cooling systems.

Connectivity

Connections can be made to propriety supervision systems via a serial port with ModBUS-RTU protocol. To connect the unit, an additional serial interface module is used to connect the onboard electronic control unit to an RS485 serial network. The interface module is fitted with a TTL serial input for connection to the unit controller and an output on the optoisolated RS485 screw terminals for connection to the communication network. Signal insulation using optoisolators assures protection against any electromagnetic disturbance in the communication network that could damage the control device and jeopardise the functionality of the conditioning system. The interface module is available in the 3 DIN Rail format for installation on an omega din guide, with IP40 front protection.

Electronic controller

The HSW12 device is the new Climaveneta controller for the management of air-cooled units. The new 4-digit display offers clear reading of the variables in play, while the 14 symbols give an immediate view of machine states for system diagnostics. The 4 keys can be used to navigate the tree menu, access to which is password-protected for maximum security. The controller integrates the Full Floating function which allows the units to be used even in the absence of inertial storage boilers. The algorithm, in fact, assures ideal operating conditions by modifying the control parameters, thus varying the speed of the system pump and the aperture of the outlet valve, as well as the temperature setpoint of the unit. The latter characteristic can be used to adapt operating conditions in order to reduce the frequency of compressor start-ups during the periods in which the heat demand from the rooms to condition is limited. As a result, the presence of inertial storage boilers becomes superfluous and it is therefore possible to eliminate the direct purchase and installation cost, thus limiting the size of the system.

The electronics also incorporates a series of protection algorithms in order to prevent damage being done to the main system components. The most important include parameters concerning compressor start-up times in order to prevent over-frequent starting times (minimum delay after last stop and minimum delay after last start). To prevent the water inside the plate exchanger from freezing and breaking it, the control electronics also blocks the compressor if the temperature of the water measured by the probe leaving the exchanger is lower than a protection setpoint (anti-freeze setpoint). There is also a water flow alarm activated by differential pressure switches installed standard on the unit, or by optional flow switches that can be added to the system during installation. Condensation control is managed by modulating the water flow through the exchanger on the outlet side by means of a 2-way modulating valve. There are also two energy-saving functions (ECONOMY and COMFORT) that manage a temperature setpoint either in a fixed way, or dynamically according to the temperature of the water produced on the system side. To enable this function, connect an additional temperature probe to the unit, position it in the external air (accessory) and also the relative configuration parameters of the control algorithm. This function can also be used to improve the level of comfort by continually optimising the ambient according to external environmental conditions.

Heat adjustment

Temperature adjustment is based on the water returning from the system. The setpoints refer to the temperature of the return water. The temperature of the delivery water depends on the difference between the inlet and the outlet water. This is generally the rated difference of 5°C. The thermal head can change depending on the type of hydraulic system. The controller is fitted with Full Floating technology which, after the scanning period, optimises the water setpoint in relation to compressor operating time and water temperature.

Compressor start delay

Two functions have been introduced to avoid over-frequent compressor start-ups:

- minimum delay after last stop 3 minutes.
- minimum delay after last start 5 minutes.

System-side circulation pump (FF models)

The electronic board has an output for managing the circulation pump. This is always active. The pump switches off 1 minute after the unit switches off (stand-by). After 1 minute of pump operation, when the water flow reaches full capacity, the water flow alarm functions are activated (differential pressure switch and flow switch). The FFT models (circulation pump not included) are provided contacts (on the electrical board terminal block) for the management of an external pump.

Modulating valve

The electronic board has a 0-10V output for the management of a 2-way modulating valve. The modulating valve is opened before the compressor starts and closed a few seconds after the compressor stops. When the compressor stops the valve remains closed.

Antifreeze alarm

The anti-freeze function is active even if the controller is on stand-by. To prevent the plate exchanger from breaking due to the water inside it freezing, the microprocessor blocks the compressor and starts the plate exchanger heater if the temperature detected by the temperature probe of the water leaving the exchanger is less than +4°C. This set anti-freeze temperature can only be changed by an authorised assistance centre and only after checking that there is an anti-freeze solution in the hydraulic circuit. If this alarm trips, it blocks the compressor and not the pump which remains active. To resume normal operation, the temperature of the outlet water must rise by over +7°C. Reset is automatic. If the number of anti-freeze interventions is more than 3 in an hour, reset becomes manual.

Comfort function

Dynamic setpoint change function according to the external temperature measured by a special temperature sensor (not included in the supply, available as an accessory). As well as saving electricity, it makes it possible to produce the quantity of cold required to assure conditions of comfort in accordance with the real load and external air temperature conditions to the air to be conditioned. The unit must be fitted with an external air temperature sensor that can be directly connected to the unit or remote keyboard. The setpoint modification function must be enabled from the parameter, see table.