Мультифункциональные воздушные системы HIWARM COMPACT Технические характеристики

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HIGH-EFFICIENCY MULT-PURPOSE MODULATING MONOBLOC UNIT WITH TOTAL RECOVERY

THE SERIES

The Multi-purpose HIWARM COMPACT units fully meet the needs to reduce energy consumption, increase efficiency of chilled water production for air conditioning as well as for the production of domestic hot water, thereby ensuring these processes are performed independently and regardless of the operating season.

HIWARM COMPACT is a so-called «4 connections» machine, hydraulically connected to two separate systems: The first is the building's heating/ air-conditioning system; the second is the hot water production system. Designed for outdoor installation, the Multi-purpose units in the HWMC series can be used in residential and commercial systems.

The range employs the R410A refrigerant, which ensures high performance levels with moderate energy consumption. It consists of 5 models with different power values, from 10 to 29 kW in cooling mode (9-32 kW in heating mode) under normal conditions (ref. EN14511).

BEYOND TRADITIONAL OPERATING LIMITS

The heat exchangers, with AISI316 braze-welded plates and finned pack have been optimised for R410A and allow for a better thermal exchange and optimal operation of the unit.

Their generous size ensures the production of chilled water even with outdoor temperatures of nearly 50°C and ensure on average high efficiency in summer and winter.

ELECTRONIC EXPANSION VALVES

All versions come as standard with an electronic expansion valve to maximise efficiency at partial loads.

The electronic expansion valve has the ability to ensure that the operation of the cooling circuit is highly efficient and reduces the power absorbed by the system

When a sudden change occurs in the thermal load. With a traditional expansion valve there is a transient time of 2 to 3 minutes before a condition of equilibrium is reached.

Proactive action of an Electronic Expansion Valve:

- The electronic driver pre-positions the valve at a point very near the final equilibrium point
- A status of equilibrium is quickly reached with small adjustments.
- The electronic expansion valve becomes an active, rather than passive, component within the system.
- The transient time is greatly reduced
- Overall the system is more efficient, with higher EER and therefore greater savings.

SMART DEFROST SYSTEM

The exclusive defrosting system developed by GALLETTI GROUP can correctly identify when the

external exchanger's performance starts to drop due to the formation of ice and reduces the process time in relation to the unit's regular performance.

Field of application

The Mult-purpose units in the HWMC range are designed for cooling or heating water used in air-conditioning and heating units and for the production of domestic hot water (DHW) for residential or commercial users.

These are "truly" Mult-purpose units with 4 water connections. Here are their operating modes:

1. Production of cold water in summer for the air-conditioning unit (water condensation on the finned pack exchanger).
2. Production of cold water in summer for the air-conditioning system with TOTAL RECOVERY of condensation heat (to produce DHW with a dedicated plate exchanger).
3. Production of hot water in winter for the heating system, like a traditional heat pump (air evaporation on the "coil side" and dedicated water condensation with plates on the system side).
4. Production of domestic hot water in winter by temporarily interrupting the production of water for heating purposes (priority DHW production).
5. Production of domestic hot water only (especially with mild weather, as well as in summer and in winter).

The HWMC series Mult-purpose units can be used in summer, winter and to produce Domestic Hot Water (DHW) 365 days a year.

Caution: when referring to the production of domestic hot water, we mean storing thermal energy in a "technical" water storage tank. Water for domestic use must be heated with a stainless steel coil inside the storage tank or a plate exchanger. This means you do not need to store domestic water and there is no need to provide for the management of an anti-legionella cycle.

Caution: the HWMC units are NOT suitable for use as a "quick" heater.

THE PROS OF INVERTER TECHNOLOGY

The actual thermal load of an air-conditioning unit is, 90% of the time, below 60% of the nominal load.

In installations with low power values, a small number of units and a low water content, operation at partial loads is particularly critical.

To ensure the system works correctly, it is therefore necessary to vary the power generated by the machine.

The inverter control influences the number of rotations of the compression by modulating the refrigerant's mass flow, the cooling capacity and the absorbed power in order to keep the delivery mater at the setpoint value.

As well as adapting the power produced and generated by the compressor to the actual thermal load, the inverter control also allows for a noticeable reduction of the power absorbed when the compressor itself starts up (reduction of start-up currents) and during operation at partial loads.

Hermetic orbiting Scroll compressors (for models from HWMC 13 to HWMC 29) or Twin Rotary ones (for HWMC 10 models) come with a protective device for the motor against overtemperatures and overcurrents.

Mounted on rubber anti-vibration mounts, complete with oil charge and inserted in a soundproof

compartment with sound-absorbing material. They also come with an automatic oil heater to prevent the oil from being diluted by the refrigerant when the compressor stops.

The compressors have a brushless AC motor with permanent magnets controlled by a driver with trapezoidal wave in a frequency range 30 and 110 Hz (BrushLess Direct Current" BLDC Technology). The electronic control is used to automatically adjust the setpoint value in relation to the outdoor temperature to reduce consumption and expand the operating range.

The condensation control adapts the number of rotations of the fan to the actual operating conditions. This results in better operation conditions, lower noise levels at partial loads and operation beyond traditional limits during the cooling phase (up to when the outdoor air temperature reaches -10°C).

The water flow rate's advanced control prevents start-ups with fluid temperatures out of the operating range and protects the compressor during its whole operating life.

In models with a heat pump the exclusive defrosting system can correctly detect worsening in performance of the outdoor exchanger due to the formation of ice and allows you to minimise the process over time in relation to the unit's regular operation.

- SYNCHRONOUS ELECTRIC MOTOR WITH PERMANENT MAGNETS
- LESS MOTOR INERTIA
- SMALLER SIZE
- LESS NOISE EMISSIONS
- NO LOSSES DUE TO CURRENTS IN THE ROTOR AND INDUCTION
- GREATER EFFICIENCY AT PARTIAL LOADS
- GREATER COMPRESSION ISOENTROPIC PERFORMANCE

CONSTRUCTION FEATURES

Galvanised and coated (RAL9002) sheet metal metalwork for an appealing appearance and effective resistance to corrosive agents.

The fixing systems are made with carbon steel materials that are stainless through surface passivation treatments.

The compressor compartment is completely closed on 3 sides by easily removable panels to make maintenance and/or control operations as easy as possible. The compressor compartment can be accessed without having to remove the connections to the hydraulic system.

Acoustic insulation (on request) further reduces the unit's sound emissions.

Customized Hydronic Kits

- High head pump entirely made with stainless steel and already designed for use with water and ethylene glycol mix (up to 35%) and fitted with internal thermal protection.
- Located in the compressor compartment, it can be easily accessed thanks to the removable perimeter panels. The units can be fitted with two circulation pumps, one on the system side and one on the DHW side, both managed by the built-in microprocessor. As an optional feature, the unit can be fitted with an inertial storage tank on the system side. This is particularly useful during the defrosting stage, especially if the unit is coupled with distribution units with low thermal inertia.
- Expansion vessel.
- Safety valve.
- Filling valve (supplied).

- Automatic relief valve.
- Differential water pressure switch and outlet water temperature probe with anti-freeze thermostat function.
- Mechanical Y filter supplied as standard on all versions to protect the evaporator (supplied).

As an optional feature, there are electronic pumps with motors with permanent magnets to further increase efficiency levels and ensure optional modulation across the entire operating range and accurate control of the delivery temperature.

Refrigerant circuit

- Scroll-type compressor with inverter technology, optimised for applications with R410A refrigerant heat pump, housed in a compartment which can be sound insulated.
- Exchange with braze-welded plates made with stainless steel.
- Finned block condenser in 8.0 mm copper tube and aluminium fins, characterized by large heat exchange surfaces.
- Dehydrator filter.
- Sight glass with humidity indicator.
- Electronic thermostatic valves with advanced drivers and built-in MOP function.
- Solenoid valves to manage refrigeration cycles in the various modes.
- Check valves.
- Liquid receiver.
- High and low pressure switches.
- Schrader valves for control and/or maintenance.
- Coolant pressure gauges (optional).

Motor ventilation unit

Electric fan with external 6-pole rotor motor fitted directly to the axial fan, with internal breaker on the windings, complete with protective work-safety grill and dedicated supporting structure.

The fan is housed in the relative nozzle which has a profile designed to maximise aeraulic performance.

The condenser pressure control continuously adjusts the fan speed automatically, further reducing the unit’s noise emission during night-time operation and under partial load.

The pressure control is also active in the DHW production stage , as evaporation control, in order to guarantee optimal operation in all seasons.

As an optional feature, there are electronic EC fans with motors with permanent magnets to further increase efficiency levels and ensure optional modulation across the entire operating range.

The use of large surface area finned coil heat exchangers reduces the air side pressure drop, significantly decreasing the sound level of the unit.

The exchangers are made with copper pipes with a diameter measuring8.0 mm aluminium fins, whose size is designed to ensure top efficiency with the R410A refrigerant.

The particular design criteria of the exchangers speeds up the defrosting phases to the maximum, in the versions with heat pump, with evident advantages in terms of integrated efficiency on the entire cycle.

ELECTRONIC Microprocessor-run control

The electronic control provides complete management over the HWMC units and is easily accessible from a polycarbonate door, with protection level IP65: This is the core of the machine and multipurpose system.

Whatever the configuration of the machine, the control unit manages the most suitable logic for integration with the plant (for example, the plant side circulation pumps and/or DHW side may be inserted inside the machine or installed outside, but always managed by the control logic by means of contacts on the unit's electrical control board). For managing the priorities in DHW production, the machine is equipped with a temperature probe to be inserted in a cockpit of the storage tank. The probe will activate the pump on the DHW side and DHW production whenever the temperature drops below a threshold value which can be set. As an alternative to the temperature probe, the free contact from an external thermostat may be used (connected to the terminal of the cabinet). The reading of the outside air temperature automatically changes the setpoint to adapt to the external load conditions or keep the unit running even in colder winter conditions.

The controller is configurable with a variety of serial boards and supports connection to supervision network.

Main functions:

- Modulation of the cooling/heating capacity from 100% to 20% based on the system's request.
- Control over the outlet water temperature into the heat exchanger system side.
- Control over the outlet water temperature to the heat exchanger DHW side
- Priority DHW production management.
- Actuation control of the DHW side pump (only if necessary, based on the storage temperature).
- Defrosting control.
- Fan speed control.
- Full alarm control.
- Management of the dynamic setpoint based on the air temperature.
- Connection to RS485 serial line for supervision/remote support.
- Possibility to connect an external unit that duplicates control functions.

Machine devices control:

- Compressor
- Fans
- Solenoid valves on cooling circuit
- Water circulation pump/s
- Antifreeze resistors
- Alarm signalling relay

Electrical Control Board

The electrical control board is built and wired in accordance with EEC directive 73/23, directive 89/336 regarding electromagnetic compatibility and with applicable standards. Constructed in metal plate, it is further protected by the machine's outer panels.

Optional features

- Circuit breakers
- Hydraulic options (1 or 2 pumps, on off or modulating with phase cut or EC pumps)
- Storage tank on the system side buil in the unit

- DC Brushless fans
- Antifreeze heaters in the hydraulic circuit
- Silenced execution (acoustic insulation of the CP compartment and/ or CP caps)
- Refrigerant pressure gauges
- Remote microprocessor controls
- Special coils (hydrophilic treatment, copper-copper, cataphoresis, anti-corrosion)
- Coil protection grille
- Power factor condensers
- Soft starter
- RS485 serial boards, Clock, LON

Available Accessories

Base vibration-dampers