Epsilon REV LN 10

Configured unit accessories

LN - Low noise

1PS - One user-side pump with tank

VEC - EC fans

RA - Anti-freeze heaters

A43N - 400/3+N/50 power supply

SERI - RS485 serial card

AG - Rubber vibration dampers

ALPR - Pre-painted copper/aluminium coils

General description

High efficiency air/water unit with hermetic scroll compressors, plate heat exchangers and axial fans. Refrigerant fluid: R410A.
Chiller.

Refrigerant

The unit is charged with refrigerant R410A, with GWP=2088 (value at 100 years).

SPECIFICATIONS

Structure

The structure of the unit is made of galvanized sheet-iron coated with polyester powder in RAL 5017/7035 at 180°C, which makes it highly resistant to weather conditions. The panels are easy to remove, thus giving full access to rubber components.

LN: low noise unit

The unit featuring the /LN option requires that the compressor be covered with a fully noise-proof shroud made of noise absorbing and self-extinguishing material in expanded polyurethane with a density equal to 30 kg/m3 and a thickness of 13 mm on the compressor side and 5 mm on the sheath side.
A rubber, 2 mm thick noise-insulating sheet is interposed between the two layers of expanded polyurethane. Max. total thickness 20mm

Compressors

Hermetic scroll compressor, complete with thermal overload protection included in the electric motor windings, and rubber vibration damping supports

Source-side heat exchanger

It consists of a coil with copper tubes and aluminium fins having a large exchange surface with fin pitch sized to maximize heat exchange and to reduce the noise impact.
A wire mesh is fitted to protect the finned pack. For installations within a kilometre of the coast, the use of Cu/Al coils with anti-corrosion treatment is strongly recommended.

Fans

featuring an external rotor, protection level IP56 Each fan is housed in shaped nozzles and includes an accident-prevention grid, pursuant to standard UNI EN 294. Units from size 6 through 18 fit fans from the EC series.
Sizes 21 through 37 feature AC fans instead. The fan speed regulator accessory is supplied standardly with the base unit.

User-side heat exchanger

The heat exchanger is made of braze-welded stainless steel AISI 316 plates and it is insulated with a shell of closed-cell foam material that reduces heat losses and
prevents the formation of condensate.
The heat exchanger is provided with a temperature probe for freeze protection, a probe for measuring the temperature of the input and output water and a paddle flow switch that is standardly supplied with it.

Refrigerant circuit

Each refrigerant circuit comprises:
- charging valve
- liquid sight glass
- replaceable solid cartridge dehydrator filter
- thermostatic expansion valve with pressure equalization
- pressure transducer
- high and low pressure switches
- safety valve (with the exception of sizes 6, 8 and 10)

Electrical control panel

The electrical control panel is supplied with a master disconnector switch, a protection for the auxiliary power circuits, a compressor contactor and an electronic controller
for unit registration featuring an interface display that is used to view and to set the machine parameters.
The electrical control panel comprises:
- a master disconnector switch;
- automatic circuit breakers to protect the auxiliary and power circuits (sizes 6, 8 and 10);
- a master disconnector switch and fuses to protect the auxiliary and power circuits (sizes 14 to 37);
- a compressor contactor;
- a fan speed regulator for condensate control;
- pump relays or a motor protector and circuit breaker (sizes 14 through 37, version ST1P or ST1PS);
- general alarm potential free contacts.
- The electronic controller is designed for management of the following functions:
- inlet control for water temperature regulation;
- freeze protection;
- compressor time setting;
- high pressure alert management (in many cases this is useful to prevent the unit from stopping);
- alarm signals;
- alarm resetting;
- self-adjusting control to enable optimal operation even when the water level in the system is low;
- digital input for external ON-OFF switching.
- The display shows the following parameters:
- output water temperature;
- condensation temperature;
- temperature and differential setpoints;
- alarms description.
The unit power voltage is 230V/1~/50Hz for sizes 6 and 8,
and 400V/3N~/50Hz for sizes 10 through 37.

Standard power supply [V/ph/Hz]

230/1~/50 for sizes 6 and 8; 400/3N~/50 for sizes from 10 to 37

Controls and safety devices

All the units are fitted with the following control and safety components:
- Anti-freeze probe causing anti-freeze alarm to trigger (automatic resetting at short intervals)
- High pressure switch (with manual reset)
- Low pressure switch (with automatic reset and limited interventions)
- Mechanical vane type flow switch included in the standard supply
- Condensation pressure control by means of speed regulator for operation at low external temperatures
- High pressure safety valve (with the exception of sizes 6, 8 and 10)
- Protection against compressor overtemperature

TESTING

All the units are factory-tested and supplied complete with oil and refrigerant.

/1PS

with a circulator (sizes 6 to 18) or circulation pump (sizes 20 to 37), insulated storage tank

CONFIGURED UNIT ACCESSORIES DESCRIPTION

VEC - EC fans

The units can be combined with the innovative direct current EC axial fans (Electronically Commutated) with electronically commutated brushless motor. These motors with permanent magnet rotor guarantee very high efficiency levels for every operating condition and
allow a 15% saving per fan to be obtained. Also, through a 0-10V analogue signal sent to each fan, the microprocessor allows condensation control by continuous control of air flow as the external air temperature changes and a consequent reduction in noise emission.

RA_anti - Anti-freeze heaters

This accessory consists of heaters inserted on the user-side heat exchanger to prevent damage to the hydraulic components due to the formation of ice during periods when the machine is stopped. The power of the anti-freeze heaters is only a few tens of watts depending on the model of unit, namely what is sufficient to prevent breakage of the components. The control monitors (even when the unit is on standby) the heat exchanger outlet probe and when this measures a water temperature below or equal to 5°C (or 2°C below the set point temperature, with differential of 1°C), it switches on the pump (if present) and starts the anti-freeze heater. If the temperature of the outgoing water reaches 4°C (or 3°C below the set point) the anti-freeze alarm will also be triggered; this stops the compressor while keeping the heaters active.

SERI - RS485 serial card

RS485 serial card

AG - Rubber anti-vibration mounts

These are supplied as a separate package from the unit and must be installed on site following the assembly diagram supplied. They allow you to reduce the vibrations transmitted from the unit to the surface it is standing on.

CONFIGURED UNIT TECHNICAL DATA		
Unit		Epsilon REV LN
Model		10
Refrigerant fluid		R410A
Minimum partialization of the unit	%	100
Requested partialization	%	100
Cooling conditions		
Fluid - User side		Water
Fouling factor - User side	m² °C/W	0.0000176
Inlet water temperature - User side	°C	15.0
Outlet water temperature - User side	°C	10.0
External air temperature	°C	35.0
Height asl	m	0
Cooling performances		
Cooling capacity	kW	10.9
Compressors absorbed power	kW	3.1
Total absorbed power (A1)	kW	3.3
Flow rate - User side	l/s	0.52
Pressure drops - User side	kPa	20
EER gross (A1)		3.33
Air flow rate	m3/h	3600
Available pressure	Pa	0
Fans absorbed power	kW	0.10
Fans absorbed current	A	0.87
Total Fans absorbed power	kW	0.10
Total Fans absorbed current	A	0.87
Sound levels		
Lw_tot COOLING (4)	dB(A)	66
Lp_tot COOLING (5)	dB(A)	35
Hydaulic module - User side: Cooling mode		
Available pressure	kPa	44.99
Hydraulic circuit pressure drops	kPa	20.33
Pumps absorbed power	kW	0.1
Pumps absorbed current	A	0.7
Performances AHRI 550/590		
IPLV AHRI - VEC (N_AHRI)		0

(A1) Compressor, fans and pumps power

Reference conditions: External air temperature 35°C; user-side heat exchanger inlet-outlet water temperature 12-7°C.

Compressors		
Type		Scroll
Number		1
Refrigerant circuits		1
Total oil charge	kg	1.3
Total Refrigerant charge (R1)	kg	2.3
Fans		
Type		Axial-VEC
Number		1
Rated absorbed power	kW	0.11
Rated absorbed current	A	0.95
Heat exchanger - User side		
Type		Plates
Number		1
Water content	l	0.6
Dimensions		
Length	mm	926
Width	mm	472
Height	mm	1049
Weight		
Net weight	kg	140

(R1) The indicated refrigerant charge is calculated. The refrigerant charge can vary according to different versions/accessories and product updates.

Hydraulic module - User side		
Number of pumps		1
Rated absorbed power	kW	0.10
Rated absorbed current	A	0.7
Maximum pressure hydraulic circuit	kPa	600
Storage tank	l	40.0
ELECTRICAL DATA (Theoretical calculations)		
Power supply	V/ph/Hz	400/3N~/50 ±10%
Control power supply	V/ph/Hz	230/1~/50
Electrical performances		
Maximum absorbed power (E1)	kW	4.50
Maximum starting current - LRA	A	49.7
Full load current - FLA	A	9.7

(E1) Mains power supply to allow unit operation

Technical calculations may change according to calculation methods. Techical data may be revised.

SOUND LEVEL

Sound Level	63 [Hz]	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]		
Lw [dB]	72	69	70	64	60	56	49	42	**Lw_tot dB(A)**	**66**
Lp [dB]	41	38	39	33	29	25	18	11	**Lp_tot dB(A)**	**35**

Reference conditions: external air temperature 35°C; user-side heat exchanger water inlet-outlet temperature 12-7°C; unit operating at nominal operating capacity, without any accessories.

Lw: sound power levels.
Values obtained from measures taken according to standard ISO 3744 and to the Eurovent certification programme where applicable.
Lw_tot is the only binding value.

Lp: sound pressure levels.
Values calculated from sound power levels, referring to distance of 10m from the unit; source installed on a reflective surface in ideal free field conditions with directivity factor Q=2.
None of the Lp values are binding.

The acoustic data relates to the standard conditions described above, in referable and reproducible operating modes.
All data except Lw_tot are given for the mere purpose of example and can not be used for predictive purposes or for the verification of enforced limits.
With specific reference to the acoustic emissions, the Manufacturer commits to their conformity limited to the declared Lw_tot value.
Any liability of the Manufacturer is excluded concerning the impact of such emissions with reference to the location of the plant and to other conditions related to the installation of the unit.
The environment and the installation's characteristics, besides the operating modes, may alter the acoustic emissions.
The overall acoustic evaluation, with regard to site conditions, remains the responsibility of the installer.