ECO SERIES

HFO 1234ze

HECOCLIMA
Heating & Cooling Solutions

A more sustainable and efficient solution.

The new ***EcoSeries*** is characterized by air-cooled units covering a cooling capacity range from 200 to 600 kW and equipped with the next-generation Danfoss DSG scroll compressors capable of using the greenest refrigerant in the world: HFO-1234ze (GWP<1 according to a 2015 IPCC study), classified as A2L according to ASHRAE 34.

EcoSeries is specifically designed to cool large buildings, infrastructure projects, district cooling/heating and other applications, as a more efficient and sustainable alternative to screw compressor units.

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Name description

Here you can see an example about nomenclature of our units. The name of an air cooled chiller with semi hermetic reciprocating compressors, R290 refrigerant gas, a brazed plate evaporator and EC fans is composed of the following basic abbreviations. All specifications and options are subject to change without notice from the manufacturer.

VHA P2.142.2(25) CH EC BP ZE

ZE: HFO-1234ze

BP: Brazed plate heat exchanger

EC: Inverter fans

CH: Chiller - **HP**: Chiller reversible to heat pump - **4T**: Multiporpose unit for 4 pipes system for simultaneous and independent production of cold and hot water

Power circuit voltage → **no indication**: 400V-3-50Hz - **25:** 230V-3-50Hz - **26**: 208V-3-60Hz - **36**: 380V-3-60Hz - **46**: 460V-3-60Hz - **56**: 575V-3-60Hz

Circuit number, type of compressors, standard power circuit voltage (400V-3-50Hz)

VHA: Air cooled chiller

Available options

Here you can see an example about available options of our units.
If options will be present they are showed under the line of unit's name description.

HR LN EP1 CP1 V T FL RS485 AV1 SP

SP: Special version

AV1: Anti-vibration supports - **AV2**: Anti-vibration supports high performance

RS485: Modbus serial card - **BAC**: Bacnet interface - **LON**: LonWorks interface - **WEB**: Web management

FL: Flowswitch - **MR**: Refrigerant gauges - **MH**: Water gauges - **RIF**: Power factor correction system - **LSC**: Softstarter - **TD7**: Touch screen display 7" - **TD10**: Touch screen display 10" - **PN**: Special painting

T: Inertia tank

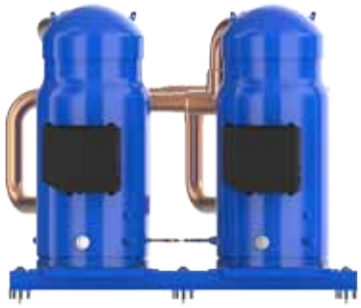
V: Variable speed pump (inverter)

Condenser / Evaporator: **P1**: Single pump low prevalence - **P2**: Double pumps low prevalence - **P3**: Single pump medium prevalence - **P4**: Double pumps medium prevalence - **P5**: Single pump high prevalence (on demand) - **P6**: Double pumps high prevalence (on demand)

LNX: Compressors housing - **XLNX:** Compressors housing with noise insulation

HR: Partial recovery (desuperheater) - **HRT**: Total recovery

MAIN COMPONENTS



Compressors

Compressors are scroll specially special designed for applications with HFO-1234ze.

Scroll compressors provide high efficiency levels (COP) and great reliability, very low noise levels and practically no vibration: all fundamental characteristics in residential installations. The compressors are equipped with a non-return valve on the discharge to prevent dangerous reflux of refrigerant when the compressor is not working, and with an internal overpressure safety valve to prevent dangerous and excessive differences of pressure, which may occur due to accidental causes. A thermostat – or equivalent sensor – provides protection against excessive discharge temperature; the electric engines are protected against the excessive temperatures of the coilers by sensors immersed in the electric motor.

Scroll compressors are characterized by:

- simple, lightweight and compact construction;
- large oil reserve;
- optimized scroll, motor and shell design;
- 100% suction gas cooled and shielded motor;
- large refrigerant capacity.

The main advantages resulting from the use of these compressors are represented by the simple installation and maintenance, the high energy efficiency combined with the low noise levels and the possibility of operation also in high temperature areas.

Microchannel

The exchangers for disposal toward the external air source are built to withstand the stresses of pressure and thermal shocks caused by the refrigeration cycle and are perfectly compatible with HFO-1234ze refrigerant.

The microchannel batteries, painted with epoxy powders, with very low internal volume to minimize the refrigerant charge, and with high heat exchange performaces to maximize the cooling cycle efficiency.

In the case of particularly corrosive atmospheres it is possible to protect the external surface of the batteries with special treatments.

Refrigerant circuit

The refrigeration circuit is completely wired, its connections are made with copper pipes and includes: liquid shut-off valve and solenoid valve, hermetic filter drier, liquid and humidity indicator, electronic thermostatic valve, safety gauges on the high pressure transducer side and low pressure, pressure ports for filling and emptying the refrigerant. In the compressor suction there is a superheater which cools the liquid before reaching the electronic valve.

A liquid receiver allows the correct operation of the circuits in the various configurations of heat pumps and multipurpose units, while a special liquid accumulator protects the compressor against flooding by liquid refrigerant during breaks and/or in the inversions of the cycle for defrosting or in the changes of the multipurpose circuits.

In the case of units with two compressors per circuit there is an oil separator on the common discharge line of the compressors and two solenoid valves complete the oil supply circuit to the individual compressors.

The low pressure side is thermal insulated by a closed cell anticondensate mattress. The safety valves have the drains all conveyed in a single pipe which the user can then easily connect to a conveying pipe to a safe emission point.

Brazed plate heat exchangers

They are specifically designed for high efficiency chillers. Perfectly compatible with the HFO-1234ze, thanks to their compactness and to the optimized design of the profile of the plates as well as to a generous dimensioning, they guarantee very high performances to the refrigeration cycle excellent drainage of the oil from their inside, as well as to reduced pressure losses on the hydronic circuit side reducing to a minimum the energy consumption of the always present water circulation.

Shell and Tube Evaporator

These evaporators are designed to provide the clients with the best performance. They are made up of a bundle of copper pipes put in a steel plate.

The buffles are positioned so as to enable an optimal flow rate compatible with the pressure drop which may occur. Moreover, different distances between the buffles are available.

This ensures strong and vibrationless execution. All evaporators are insulated with thick closed-cell anti-condensation mattress. The choice of the materials used in these evaporators is the result of the strict quality tests carried out in compliance with PED (Dir. 2014/68/UE) and the European norms regulating the construction of pressure vessels.

Hidronic kit

Modules supplied separately from the units, low/medium/high head version, single or double pump both on the evaporator side and on the condenser side, on/off pumps or inverter with automatic speed adjustment to guarantee the prevalence required by the circuits.

All solutions maintain the mandatory constant flow to the chiller heat exchangers. Inertial tanks can be supplied with the volumes suitable for the chillers supplied.

The new Pump energy saving function is available, which allows the pumps to be temporarily stopped when all the primary circuit loads are at zero for a certain time. The unit is able to control remote pumps where not supplied together

Switchboard

The switchboard is completely wired inside a watertight steel box IP54, produced according to the strictest European norms. Power circuit designed for the rated supply indicated in the datasheet, with fuse protection, counters, thermal relays for each compressor. The control circuit includes all control devices, including the thermostatic compressor insertion system. All switchboards are equipped with an IEC socket for service supply on the field. Moreover, the multi-compressor unit is provided with a thermostat-run ventilation and heating system.

Fans

The fans are axial type with inclined blades and directly coupled EC type motor to obtain the maximum average seasonal efficiency, a robust safety grill in galvanized and painted steel completes the equipment.

The electronic control allows a perfect modulation of the fan speed from zero to the maximum speed.

Flammable Gas Sensor

The compressor compartment is monitored by a specially designed sensor capable of monitoring the concentration of R290 in the closed volume. Three levels of intervention guarantee maximum system safety by fan start-up for ventilation of the compressor compartment, machine shutdown and finally the possibility of controlling the opening of a remote switch that turns off the unit in the event of excessively refrigerant leakage that could generate an atmosphere potentially explosive.

Electronic controller

Electronic board for unit management: inlet/outlet water temperatures, cooling and/or heating capacity adjustment, working hours of each compressor, high/low pressure and maximum flow temperature alarms, high and low superheat alarms, condensing pressure regulation/evaporation, evaporator antifreeze protection through double control of the water flow and the minimum flow temperature, self-adaptive defrost (only reversible heat pumps and multi-function units), ON/OFF pump / s control, inverter constant flow pump / s control, pump shutdown function/and with still compressors, and other....

Remote monitoring option

System for remote monitoring via the Internet of chiller operating data. This innovative tool allows you to remotely view how the machine is working, fine-tune the operating parameters and customize them to the specific user system, make software updates when needed.

EcoSeries

Air cooled water chiller with scroll compressors and axial fans.
For outdoor installation.

- Scroll compressors
- Dry expansion BPHE evaporator
- EC axial fans
- HFO-1234ze

General Description

The air-cooled EcoSeries chillers are assembled on a self-supporting metal screwed structure, painted with epoxy powder suitably treated for outdoor installation.

All units are supplied completely wired and ready to be connected to the user's plant.

Before delivery, every machine is submitted to a performance test according to the strictest norms in force, with intervention tests of all the safety systems and components installed.

Each unit is available with low-speed fans and compressor sound insulation kit for installation in areas where noise emission must be extremely limited.

Compressors and components are specially manufactured for applications with HFO-1234ze.

The compressor cabinet is equipped by a leakage gas sensor and an extracting fan to guarantee maximum safety of the system.

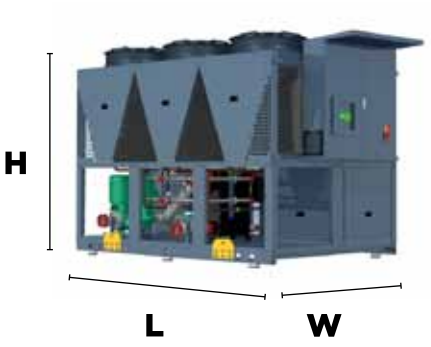
All safety valve outlets are conveyed to a single pipe, and the user can easily connect it to a safe ejection point.

The hydronic kits are made up of constant water flow pumps and inertial tank, into splitted boxes.

For the correct operation of the unit it is mandatory to equip the primary circuit with the necessary inertial water volumes.

Typical units dimensions

Length: from 3800 to 6950 mm
Width : 2110 mm
Height: 2530 mm
Operating Weight: from 2882 kg to 6363 kg



EcoSeries

Air cooled water chiller with semi-hermetic compressors, axial fans, for outdoor installation

SIZE		VHA 2096	VHA 2116	VHA 2152	VHA 2192	VHA 2210	VHA 2228	VHA2288
CHILLER PERFORMANCE								
Nominal cooling capacity (1)	kW	***219***	***270***	***326***	***408***	***446***	***488***	***606***
Nominal power input (1)	kW	63.2	81.9	100	127	142	156	190
Compressor input power	kW	59.3	74.1	94.9	116	129	143	173
E.E.R.	kW/kW	3.47	3.30	3.26	3.21	3.14	3.13	3.19
SEER (2)	kW/kW	5.01	4.85	4.81	4.73	4.65	4.89	4.92
Calculated sound power	dB(A)	85	89	88	90	91	92	93
Sound pressure (EN3744) (3)	dB(A)	53	57	56	58	58	59	60
MAIN COMPONENTS AND ELECTRICAL DATA								
Compressors type	Type	scroll	scroll	scroll	scroll	scroll	scroll	scroll
Compressors number	n°	4	4	4	4	5	6	6
Circuit number	n°	2	2	2	2	2	2	2
Condenser coil type (4)	Type	M	M	M	M	M	M	M
Fans number	n°	6	6	8	8	9	10	12
Evaporator type (5)	Type	BPHE	BPHE	BPHE	BPHE	S&T	S&T	S&T
Refrigerant charge	kg	36	46	48	52	58	64	78
Power circuit voltage	V/Ph/Hz	400-3-50	400-3-50	400-3-50	400-3-50	400-3-50	400-3-50	400-3-50
Total max current	A	185	225	282	342	380	418	514
Max starting current	A	381	441	548	653	691	684	825
DIMENSIONS								
Length with cabinet (6)	mm	3800	3800	4850	4850	5900	5900	6950
Width (6)	mm	2110	2110	2110	2110	2110	2110	2110
Height	mm	2530	2530	2530	2530	2530	2530	2530
Shipping weight (7)	kg	2801	2940	3656	3795	4659	5128	5926
Operating weight (7)	kg	2882	3035	3763	3913	4928	5521	6363

(1) Nominal data for inlet/outlet water temperature 12/7 °C; Outdoor air 35 °C
(2) Index valid only for units with EC fans option.
For more details on Seasonal efficiency indicators ask to manufacturer or see calculation by Hecoselectool
(3) Sound pressure on free field reflecting surface (directivity fact. 2) according to ISO 3744
(4) M: microchannels;
(5) BPHE: Brazed plate heat exchanger; S&T: Shell & Tube
(6) Excluded footprint of hydronic connections and lifting brackets
(7) LN option

All specifications are subject to change without notice from the manufacturer

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