

FRIGO TURBO K: Packaged water cooled liquid chillers for indoor installation, equipped with oil-free centrifugal compressors with magnetic levitation bearings and plate heat exchangers
Cooling Capacity: **270 kW**



LOW NOISE
RC Hi-Tech

INVERTER
RC Hi-Tech

frigo turbo K
rcgroupairconditioning



MAIN FEATURES

- Water cooled liquid chiller.
- 1 size designed for installation in parallel.
- EER 4,39.
- ESEER 7,16.
- Oil-free centrifugal compressors with magnetic levitation bearings.
- Inverter driven.
- R134a Refrigerant charge.
- Single refrigerant circuit.
- Electronic expansion valve.
- Plate type heat exchangers.
- Suitable for indoor installation.

MAIN BENEFITS

- Compact version with plate heat exchangers. 270kW at just 1,3m².
- Installation in parallel of many units, to achieve high cooling capacity in reduced spaces.
- No need of power factor correction.
- Minimum starting current (LRA)
- High ESEER.
- Quiet operation.
- Microprocessor control system with 7" touch screen display.
- Extremely easily of maintenance.
- Complete set of components dedicated to the safety of the unity.
- Eurovent Certification.

INDOOR INSTALLATION

The machines are designed for indoor installation.

DESIGNED FOR INSTALLATION IN PARALLEL

MAGNETIC LEVITATION CENTRIFUGAL COMPRESSOR

The TURBO FL liquid chillers are equipped with two-stage centrifugal compressor with variable speed, which is able to follow punctually plant demands, obtaining values of energy efficiency ratio (EER) growing in a narrowing of the cooling load. The compressors of the TURBO FL liquid chillers are equipped with magnetic levitation oil-free bearings which compared to traditional ball bearings, completely eliminate all the maintenance procedures of lubrication.

WORKING LIMITS IN COOLING MODE

Chilled water outlet temperature: 4÷18°C
Condenser outlet water temperature: 20÷52°C

COMPONENTS

FRAMEWORK

- Base and self supporting frame in steel plate with protective surfaces treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and painted with epoxy powders.
- Colour: RAL 9002

COMPRESSORS

- Twin-turbine centrifugal compressor, oil-free type, optimized for R134a refrigerant. The term "oil-free" refers to the total absence of lubricating oil within the compressor
- Magnetic levitation bearings.
- Manometric compression ratio: $1.5 \div 5.0$
- Stepless capacity control through integrated inverter.
- High efficiency permanent-magnet synchronous motor with integrated Soft-Start system (starting current limited to 5A).
- Power factor motor $\cos\phi > 0.9$ for a large part of the operating range
- Motor and electronic power section cooling by liquid refrigerant injection into the integrated cooling circuit.
- Electric motor thermal protection via internal winding temperature sensors.
- Electronic integrated control for operation and alarms status.
- Sensor on refrigerant discharge for temperature monitoring.
- Inner sensors for electronic components and inverter temperature control.
- Security system to protect the crankshaft and magnetic bearings in the event of failure of power supply.
- Degree of protection: IP54.

EVAPORATOR

- Copper brazed plate type with cover plates, plates and connections in AISI 316 stainless steel.
- Anticondensate insulation made of polyurethane.
- Temperature sensors on water inlet and outlet.
- Hydraulic connections with grooved end arranged for flexible joint (the flexible joint and the adapter pipe are optional accessories).

CONDENSER

- Copper brazed plate type with cover plates, plates and connections in AISI 316 stainless steel.
- Anticondensate insulation made of polyurethane.
- Hydraulic connections with grooved end arranged for flexible joint (the flexible joint and the adapter pipe are optional accessories).

REFRIGERANT CIRCUIT

Components for each refrigerant circuit:

- Capacitive level sensor connected to the driver of the expansion valve.
- Electronic expansion valve that allows high performance and system efficiency and for the refrigerant level control in the evaporator.
- Electronic by-pass valve for compressor start.
- Non return valve on by-pass line for compressor start.
- Sight glass.
- Filter dryer on liquid line.
- Service valve on liquid line.
- Service valve on gas discharge.
- Non return valve on gas discharge.
- Safety valve on low pressure side.
- Safety valve on high pressure side.
- Pressure transducers with indication, control and protection functions, on low and high refrigerant pressure.
- High pressure safety switch with manual reset.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line
- Plastic capillary hoses for pressure sensors connection.
- R134a refrigerant charge.

ELECTRICAL PANEL

In accordance with EN60204-1 norms, suitable for indoor installation, complete with:

- Main switch with door lock safety.
- Fuses for compressors.
- Contactors for compressors.
- Transformer for auxiliary circuit and microprocessor supply.
- Panel with machine controls.
- Power supply 400/3/50.

CONTROL SYSTEM

- Microprocessor system with "Touch Screen" graphic display for control and monitor of operating and alarms status. The system includes:
 - Voltage free contact for remote general alarm.
 - Main components hour-meter.
 - Integrated "Data logger" function for the recording of events and alarms.
 - Nonvolatile "Flash" memory for data storage.
 - Menu with protection password.

HYDRAULIC CONNECTIONS OF HEAT EXCHANGERS

- The hydraulic connections with flange (FL) are not supplied with counter flange.
- The hydraulic connections with grooved end are not supplied with flexible joint (optional accessory).

OPTIONAL ACCESSORIES

| FRIGO TURBO K | 270 K T1 |
|--|----------|
| 172 - Rubber support (kit) | • |
| 611 - Noise absorption cap | • |
| Service valve on compressor group suction | • |
| 923 - RC-Com MBUS/JBUS Serial board | • |
| 926 - LON Serial board | • |
| 931 - BACnet Ethernet - SNMP - TCP/IP Serial board | • |
| 932 - BACnet MS/TP Serial board | • |
| 942 - Serial card for GSM Modem | • |
| 889 - Master plant SEQUENCER | • |
| 962 - Kit modem GSM | • |
| 957 - Plantwatch without modem | • |
| 930 - Remote graphic terminal kit | • |

• available accessory; - not available accessory

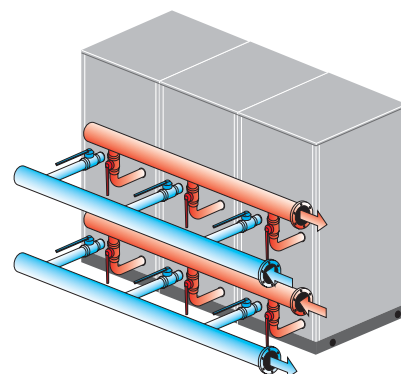
TECHNICAL DATA FRIGO TURBO K

| FRIGO TURBO K | | 270 T1 |
|---------------|---|------------------|
| STANDARD | Cooling capacity (1) | kW 270 |
| | Unit power input | kW 61,5 |
| | Evaporator water flow rate | m³/h 46,4 |
| | Evaporator pressure drop | kPa 23 |
| | Condenser water flow rate | m³/h 56,7 |
| | Condenser pressure drop | kPa 22 |
| | Compressors | centrifugal |
| | Quantity | n. 1 |
| | Capacity control | % 54...100% |
| | Refrigerant | R134a |
| STANDARD | Total refrigerant charge (optional excluded) | kg 35 |
| | Gas circuits | n. 1 |
| | Power supply | V/Ph/Hz 400/3/50 |
| | Max unit operating current (FLA) | A 139,3 |
| | Unit starting current (LRA) | A 5 |
| | EER (1) | kW/kW 4,39 |
| | ESEER | 7,16 |
| | Sound power level [Lw] (2) | dB(A) 90,7 |
| | Average sound pressure level [Lp _m] (3) | dB(A) 72,0 |
| | Net weight | kg 1120 |
| STANDARD | Hydraulic connections | |
| | Evaporator IN/OUT - OD (4) | Ø mm 88,9 |

1. Referred to chilled water temperature 12/7°C and condenser water temperature 30/35°C according to Eurovnt standard
2. Sound power level [Lw] according to ISO EN 9614 - 2
3. Average sound pressure level [Lp_m] 1m far according to ISO EN 3744.
4. Hydraulic connection with grooved end. The flexible joint is an optional accessory.

DESIGNED FOR INSTALLATION IN PARALLEL

The "K" version is designed for installation in parallel, to achieve high cooling capacity in reduced spaces with high silentness need.



DIMENSIONS (mm)

