ACCESSORIES

REFRION
a better innovation

INDEX

SWITCHES, ELECTRICAL PANELS, WIRING

- Compliant with European Low Voltage Directive 2014/35/EU
- Housing in plastic material, UV-resistant, IP55 degree of protection (EN 60529).
- Mounted and wired
- Operating temperature -25 °C / +60 °C.
- UV resistant electrical cables suitable for outdoor use
- Compliant with Standards EN 60204-1 and EN 61439-1.

Sb
MAIN SWITCH FOR SINGLE PHASE FANS

- Yellow and red colours.
- Can be locked in stop position.

C
WIRING AND JUNCTION BOX

- Motor power terminal blocks.
- Connection of the fan heat-probes to the terminal block (in single-phase models the motor cutout may be directly installed in the power source and is therefore not available for external signals).

T
WIRING AND SWITCHBOARD WITH MOTOR PROTECTION UNITS (1 EACH FAN)

- Lockable yellow/red main switch.
- 3-phase input, nominal voltage 400V (±10%), frequency 50Hz.
- Power line and fans protected from overcurrent by automatic magneto-thermal circuit breaker protecting each single fan. The dimensioning of the panel and protection is optimized for the nominal current drawn by the fans, on the basis of the type of connection (Triangle or Star).
- Power line protected from overcurrent by fuses.
- Overtemperature thermal contact and automatic magneto-thermal circuit breaker signals for each fan connected to terminal block.

Qm
ELECTRICAL PANEL WIRING FOR SINGLE-PHASE MOTORS EI

- Single-phase input, nominal voltage 230V, frequency 50Hz.
- Green power ON indicator.
- Power line protected from overcurrent by automatic magneto-thermal circuit breaker.
- Power line protected from overcurrent by fuses.
- Speed regulator terminal block.
- Volt-free contact for remote ON/OFF command.

Q
ELECTRICAL PANEL WIRING

- Lockable hatch.
- Lockable yellow/red main switch.
- Green power ON indicator.
- Red fault warning light (fan AC motors fault, EC motors regulator fault)
- 3-phase input, nominal voltage 400V (±10%), frequency 50Hz.
- 24V auxiliary circuit input, frequency 50Hz.
- Power line protected from overcurrent (fuses for AC fans, automatic magneto-thermal circuit breaker for EC fans. N.B.: the dimensioning of the AC fans panel and protection is optimized for the nominal current drawn by the fans, on the basis of the type of connection (Triangle or Star).
- Fans protected from overloads (heat-probes for AC fans, built-in fail-safe for EC fans. (In the case of a fault on an AC fan, all the fans will stop; in the case of a fault on an EC fan, only the faulty fan will stop).
- Speed regulator terminal block.
- Power line protected from overcurrent by fuses.
- “By-pass” function (only for EC fans): in the case of a regulator fault, to prevent plant shutdowns, the fans automatically start running at max. speed.
- Volt-free contact for remote ON/OFF command.
- Volt-free contact for additional thermostat (if fitted).
- Volt-free contact for fan fault signal.

E - 1 per fan
E2 - Q for every 2 fans
ELECTRICAL PANEL WIRING WITH BUILT-IN SERVICE SWITCHES

- Lockable hatch.
- Lockable yellow/red main switch.
- Fan enabling buttons with green luminous ON indicator
  - *(E2: 1 for each pair of fans)*
  - *(E: 1 for each fan).*
- Fans rearming button with green luminous power indicator. The rearming button starts the fans enabled.
- Operating/maintenance lockable selector: enables/disables the fans enabling buttons.
- Red fault warning light (fan AC motors fault, EC motors regulator fault).
- UV resistant electrical cables suitable for outdoor use.
- 3-phase input, nominal voltage 400V (±10%), frequency 50Hz.
- 24V auxiliary circuit input, frequency 50Hz.
- Power line protected from overcurrent (fuses for AC fans, automatic magneto-thermal circuit breaker for EC fans). N.B.: the dimensioning of the AC fans panel and protection is optimized for the nominal current drawn by the fans, on the basis of the type of connection (Triangle or Star).
- Fans protected from overloads (heat-probes for AC fans, built-in fail-safe for EC fans. (In the case of a fault, only the two fans where the fault is will stop).
- Speed regulator terminal block.
- Power line protected from overcurrent by fuses.
- "By-pass" function: in the case of a regulator fault, to prevent plant shutdowns, the fans automatically start running at max. speed.
- Volt-free contact for remote ON/OFF command.
- Volt-free contact for ON signal.
- Volt-free contact for fan fault signal.
- Volt-free contact for speed regulator fault signal.
- Volt-free contact to switch out "by-pass" function.

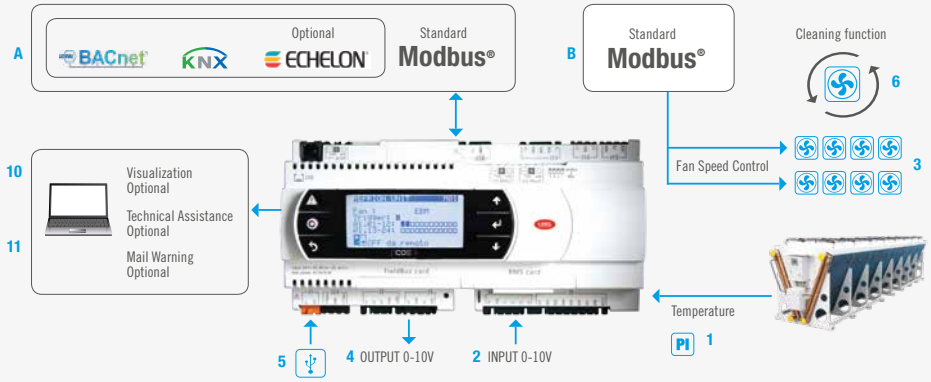
D
DIGITAL INTELLIBOARD

Designed to continuously and homogeneously regulate the speed of EC motors using MODBUS RS485 serial communication protocol, as well as control and run diagnostics on on-board systems (adiabatic systems, pressure, temperature and humidity sensors, UV lamps).
With the technology used on Electronic Commutation (EC) fans, operation is versatile and optimal with the consequent energy savings and noise reduction.
Any faults/anomalies are univocally identified in a detailed way.
The control panel is supplied installed, wired, programmed and ready-to-use.

- CAREL 4.3" colour touchscreen with screen protector.
- CAREL (PLC) programmable logic controller.
- Lockable hatch.
- Lockable yellow/red main switch.
- Operating/maintenance lockable selector: isolates the fan power lines.
- ON/OFF button with green status indicator.
- Red fault indicator.
- Multipole quick-fit (FLEXI) connectors on panel.
- Temperature or pressure sensors installed and wired.
- 3-phase input, nominal voltage 400V (±10%), frequency 50Hz.
- 24V auxiliary circuit input, frequency 50Hz.
- Power line protected from overcurrent by automatic magneto-thermal circuit breaker (for each group of fans).
- Built-in fan overload protection (in the case of a fault, only the faulty fan will stop).
- "By-pass" function: in the case of a communication BUS malfunction, to prevent plant shutdowns, the fans automatically start running at the max. set speed.
- Volt-free contacts for controlling PLC remotely.
- Volt-free contacts for fan malfunction alarm signals.
- Programmable volt-free contacts.
- UL certification, CSA certification available on request.

Connectivity

Full remote control (over 900 parameters available) through field BUS (standard: MODBUS RS485; on request: LonWorks®, BACnetTM, SNMP, Konnex®).



Functions

- Proportional-Integral-Derivative heat regulation.
- For remote control (reference: speed or temperature/pressure setpoint) with 0-10V signal or field BUS.
- Limits fan rotation speed (ex. to limit noise levels during the night).
- Enables anticlockwise fan running to clean finned heat exchangers.
- Sends an analog 0-10V signal proportional to fan speed (0-100%).
- Update software with USB stick, without using a PC.
- Optional: for regulating 2 independent fan banks separately and independently (ex. different rotation speeds).
- Optional: Ethernet connection (ex. control parameters on a web page, remote assistance from the works, software update, etc.).
- Optional: sends an e-mail to max. 10 users for each alarm event (if the e-mail addresses have been registered in the PLC memory and the system is connected to Ethernet).

OPTIONAL COMPONENTS FOR WIRING

- Compliant with European Directives and applicable norms
- Protection class IP55 (IP20 for built in version)
- Factory fitted and wired

S - Inside switches
O - Installed close to the fan

REPAIR SWITCHES

- Power ON/OFF switch per each fan (black handle)
- The selector switch can be locked in the OFF position

DPWS

DUAL POWER SWITCH

Automatically switchs between two power supplies

- Housing in plastic materiale, UV-resistant
- Lockable switch

WARNING:
The power supply must provide for the neutral electrical conductor

MOTOR PROTECTION UNITS WITH THERMOCONTACTS

The motor protection units type S-DT10(E) are specifically designed for the start-up and the protection of single-phase motors with integral thermocontacts. The thermocontact switches automatically OFF in case of motor overheating.

Mm

SINGLE-PHASE FAN MOTORS

- Power supply: 1+N~ 230V (from 60V when voltage control is in use)
- Max. fuse: 10A
- Min. rated current of motors: 0,4A
- Max. rated current of motors: 10A
- Max. adjustable line cross section: 6 mm2 (auxiliary contact: 2,5 mm2)
- Admitted ambient temperatures: -25°C / +55°C

WARNING: thermal bi-metal relays cannot be adjusted to the nominal current of the motors.

M

THREE-PHASE FAN MOTORS

The integral line protection is assured by a thermal over-current sensor and a magnetic short circuit releasing element.

- Line voltage 60 .. 500 V (+6%), 50/60 Hz. Applicable from 60 V when voltage control is in use
- Max. line fuse: 80 A (Ue 415 V + 5 %) / 63 A (Ue 440 V .. 500 V + 6 %)
- Max. rated current of motors: 16A
- Setting range over-temperature sensor: 10 .. 16 A
- Rated Short Circuit Breaking Capacity (IEC 60947-2, EN 60947-2, VDE 0660-101): 6 kA (Ue < 400 V + 5 %) / 3.5 kA (Ue = 415 V .. 440 V) / 2.5 kA (Ue 500 V + 6 %)
- Max. adjustable line cross section: 6 mm2 (auxiliary contact: 2,5 mm2)
- Limit ambient temperatures: -25°C / +55°C

SPEED CONTROLLERS

- Compliant with EC Directives 2014/35/EU LVD and 2004/108 EMC.
- EMC immunity EN 61000-6-2
- EMC emission EN 61000-6-3; EN 61000-3-2
- IP54 degree of protection (EN 60529).
- Factory fitted, wired and pre-programmed ready for use
- Temperature or pressure sensors installed and wired.
- Shielded cables are not required.
- Max. admitted relative humidity to avoid condensation: 85%

Rm
ELECTRONIC 1~ VOLTAGE CONTROLLER (PHASE-CUT)

Continuous regulation of the asynchronous fans speed. The speed controller works on the fans supply voltage and varies their speed according to the input signal and to the settings.
Models: PKE 2,5 (max 2,5) , PKE 6 (max 6A), PKE 10 (max 10A), PKE 14 (max 14A), PKE 16 (max 16A), PKE 20 (max 20A)

- Power supply: 1 phase ~ 230V / 50/60Hz (-15% / +10%)
- TFT temperature probe or pressure (4 • 20mA) probe mounted and wired; in alternative speed control referred to an external 0-10V tension.
- Standard settings: single set point

WARNING: this type of regulator can produce electromagnetic noise due to the control technology used. The sound power level and the sound pressure level of the air-cooled equipment in the specifications do not consider said noise.

R
STANDARD SPEED REGULATOR (TRIAC)

Continuous AC fan speed regulation. The regulator adjusts the fan input voltage to regulate the speed on the basis of the signal sent by the sensor and the settings.

- Multifunction/multilingual LC-Display for simple, fast programming.
- Operating temperature 0 °C / +40 °C (down to -20 °C as long as equipment is connected to power source, up to +55 °C at reduced power).

Technical data
- 3-phase input, nominal voltage 208 / 415V (• 10% / +6%), frequency 50 / 60Hz.
  N.B.: the dimensioning of the panel and the capacity of the regulator is optimized for the nominal current drawn by the fans, on the basis of the type of connection (Triangle or Star).
- Sensors nominal voltage 24V (±20%), max. permitted current 120 mA.
- 2 analog inputs (0-10V, 0-20mA, PTC temperature sensor, pressure transducer).
- 1 programmable analog output (0-10V).
- 2 programmable digital inputs.
- 2 programmable digital outputs: alarm signal, external unit control.
- Full motor protection with thermal contacts or thermistors

Connectivity:
- MODBUS RS485 communication interface.
- Optional: equipped with LON board.

Standard programming:
- Set-point 1: temperature or pressure (dual circuit condensers: adjustment at highest pressure value detected).
- Set-point 2: temperature or pressure.
- Regulator alarm signal.
- Speed limiting.
- Control of machine on-board systems (adiabatic systems).
- Switch out fans being regulated at low speed.
- Other special programming available in relation to regulator's characteristics.

Im
FREQUENCY INVERTER WITH SINUSOIDAL FILTERS INSTALLED 1~ VOLTAGE WITH SINE FILTERS

Designed for a stepless control of fans, generates a 3~ output with variable voltage and frequency from the three-phase mains on the input and therefore assures an absolute parallel control of the fans without risk of damage for the motors. Screened motor cables are not required.
Allows for energy saving and for a considerable reduction of the peaks of noise in part load. This controller is highly recommended in case of low or very low noise limitations (residential areas, hospitals, etc.).

- Integrated Sine filters between phase-to-phase and phase-to-ground
- LCD-Multifunctional display with plain language text
- 2 analog inputs (0-10V, 0-20mA, PTC temperature sensor, pressure sensor)
- 1 output 0-10V, function programmable
- 2 digital inputs, function programmable
- 2 relay outputs, function programmable: fault indication/alarm signal, external group control
- Total protection of the motors by means of thermocontact / thermistor connections
- RS485 Interface for MODBUS networking

Optional (on request)
- LON expansion module
- Power supply: 1~ 208-277V (-15% / +10%), 50/60Hz
- Voltage supply for sensors: +24V +20% (Imax 120mA)
- Max. admitted ambient temperature +40°C (up to +55°C with derating)
- Min. admitted ambient temperature +0°C (-20°C when powered)

Setting modes available:
- Set point 1: fluid out temperature or refrigerant pressure
- Set point 2: fluid out temperature or refrigerant pressure
- Controller alarm
- Min. and max. output voltage, speed limitation (e.g. for night operation)
- External group control (adiabatic cooling system)
- Cut-off of fans in low usage (minimum air volume)
- Other programming modes available on request (e.g. frost protection, heat activation, stalled motor heating, etc.)

NOTE: The controller is designed for the total absorbed fan current, which value depends on the motor windings (Delta or Star)

I
FREQUENCY WITH SINUSOIDAL FILTERS INSTALLED

Continuous AC fan speed regulation. The regulator regulates the fan input frequency and voltage to adjust the speed on the basis of the signal sent by the sensor and the settings.
The inverter speed regulator guarantees substantial energy savings and reduces the noise level of the fans being regulated. The inverter speed regulator is ideal for environments with extremely restrictive noise limits.

- Multifunction/multilingual LC-Display for simple, fast programming.
- Operating temperature 0 °C / +40 °C (down to -20 °C as long as equipment is connected to power source, up to +55 °C at reduced power).

Technical data
- 3-phase input, nominal voltage 208 / 480V (• 15% / +10%), frequency 50 / 60Hz.
  N.B.: electrical systems with NEUTRAL isolated from ground (IT) can only be used on special versions.
  N.B.: the dimensioning of the panel and the capacity of the regulator is optimized for the nominal current drawn by the fans, on the basis of the type of connection (Triangle or Star).
- Sensors nominal voltage 24V (+/-20%), max. permitted current 120 mA.
- Phase/phase and phase/earth omnipolar sinusoidal filters.
- 2 analog inputs (0-10V, 0-20mA, PTC temperature sensor, pressure transducer).
- 1 programmable analog output (0-10V).
- 2 programmable digital inputs.
- 2 programmable digital outputs: alarm signal, external unit control.
- Full motor protection with thermal contacts or thermistors

Connectivity:
- MODBUS RS485 communication interface.
- Optional: equipped with LON board.

Standard programming:
- Set-point 1: temperature or pressure (dual circuit condensers: adjustment at highest pressure value detected).
- Set-point 2: temperature or pressure.
- Regulator alarm signal.
- Speed limiting.
- Control of machine on-board systems (adiabatic systems).
- Switch out fans being regulated at low speed.
- Other special programming available in relation to regulator's characteristics.

U
EC controller

Continuous EC fan speed regulation. The regulator modulates a 0-10V signal on the basis of the signal coming from the sensor and the settings. The signal is reprocessed by the electronics on-board the EC fans that adjust the rotation speed.
The universal control module using EC fan technology guarantees substantial energy savings and reduces the noise level of the fans being regulated. The universal control module is ideal for environments with extremely restrictive noise limits.

- Multifunction/multilingual LC-Display for simple, fast programming.
- Operating temperature 0 °C / +55 °C (down to -20 °C as long as equipment is connected to power source).
- Single-phase input, nominal voltage 230V (-15% / +10%), frequency 50 / 60Hz.
- Sensors nominal voltage 24V (-30% / +20%), max. permitted current 70 mA.
- 2 analog inputs (0-10V, 0-20mA, PTC temperature sensor, pressure transducer).
- 2 programmable analog outputs (0-10V).
- 2 programmable digital inputs.
- 2 programmable digital outputs: alarm signal, external unit control.

Connectivity:
MODBUS RS485 communication interface.

Standard programming:
- Set-point 1: temperature or pressure (dual circuit condensers: adjustment at highest pressure value detected).
- Set-point 2: temperature or pressure.
- Regulator alarm signal.
- Speed limiting.
- Control of machine on-board systems (adiabatic systems).
- Switch out fans being regulated at low speed.
- Other special programming available in relation to regulator's characteristics. Other special programming available in relation to regulator's characteristics.

NOTE: the electrical power line must have a neutral conductor.

ADIABATIC SYSTEMS

- Single-phase input, 230 V, frequency 50 Hz.
- Compliant with Standards EN 60204-1 and EN 61439-1.
- Compliant with European Low Voltage Directive 2014/35/EU.
- Hour counter for monitoring system operating time.
- Safety thermostat for draining the system in winter.
- Actuated valves for supplying and draining the system (the water is drained when the system isn't used).
- UV-resistant plastic housings, IP55 degree of protection (EN 60529).
- Multilayer UV-resistant water supply pipes (PE-Xb / Al / PE-HD)
- SOFTWATER electromagnetic decarbonisation unit to minimize the formation of scale in the finned cor
- Operating temperature: +10°C / +50°C

The adiabatic systems and related on-board equipment are managed by the A.S. Manager: a unique controller for the control and diagnostics.
The adiabatic systems are supplied installed, wired and ready-to-use.
Note: the temperature of the atomized water must be at least 5K lower than the temperature of the process fluid flowing out of the heat exchanger.

B

B-SPRAY ADIABATIC SYSTEMS

Inlet air humidification system through water atomisation. A very thin water mist generated by specific nozzles fills and humidifies the inlet air, thus making it colder, depending on the different working conditions. Adiabatic saturation reduces the air temperature, increasing the efficiency of the heat exchanger.
The system does not recirculate the water and meets the requirements of Standard VDI 2047-2 certified for health and safety by the Johannes Gutenberg University of Magonza.

- Pressure reducer for calibrating the water supply.
- Control pressure switch.
- Polyamide (PA) hollow cone nozzles.

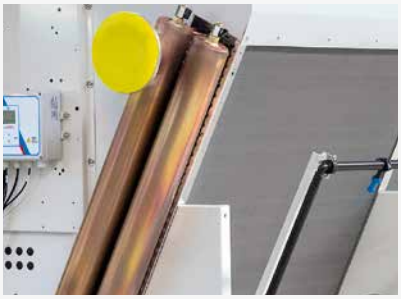
NOTE: the atomizing system must run at a pressure of 2.5 bars to operate properly. Do not use lower pressures.
At a pressure of 2.5 bars, the flow rate of each nozzle is 1.11 litres/minute.

H.S.S. HYBRIS SPRAY SYSTEM

Cooling system of the heat exchange surface of the equipment through a direct water atomisation. Special water diffusing nozzles atomise the water humidifying and cooling the inlet air; the finned-pack heat exchanger releases its sensible heat to the atomized water increasing the thermal heat exchange of the unit even further.
The system does not recirculate the water.

- Pressure reducer for calibrating the water supply.
- Control pressure switch.
- Polyamide (PA) hollow cone nozzles.

NOTE: the atomizing system must run at a pressure of 2.5 bars to operate properly. Do not use lower pressures. At a pressure of 2.5 bars, the flow rate of each nozzle is 1.12 litres/minute.



Z

INDUSTRIAL ADIABATIC SYSTEM (PADS)

Inlet air humidification system by means of special adiabatic panels. The panels, placed in front of the heat exchangers on the air inlet side, are homogeneously soaked through a distribution system with no water recirculation. The air, by passing through the panels, increases its humidity and gets colder depending on the different working conditions.
The system does not recirculate the water and meets the requirements of Standard VDI 2047-2 certified for health and safety by the Johannes Gutenberg University of Magonza. Standard shipment (optimized for common means of ground transportation): the evaporator modules are supplied separately from the air-cooled equipment (only "Combo" and "Superjumbo" models). The industrial adiabatic system is supplied fully installed, wired and ready-to-use.

- Ambient temperature and humidity sensor.
- Flow regulator.
- Aluminum distributor (1050-H24 alloy in compliance with EN 573-3) fully accessible for inspection, painted on request.
- Aluminum self-draining drip tray (1050-H24 alloy in compliance with EN 573-3), painted on request.
- Pure recyclable cellulose humidifier panel, with high power of absorption, impregnated with biocidal and antibacterial agents.
- Pure recyclable cellulose water drop distributor and separator panel.
- Galvanized, arc-welded protective mesh, painted on request.

WATER RECIRCULATION SKID

Designed to minimise water consumption in a closed circuit adiabatic system. The water used to allow the adiabatic saturation of the air is directed into the basin and redirected into the circuit through the recirculation pump. Water consumption is thus limited to the quantity evaporated during the adiabatic process.

- Submersible centrifugal pumps in stainless steel material. Enclosure class: IP 68. (Dual pump available on request).

The dimensioning of the pump size is optimized for the maximum water flow required by the adiabatic system.

- Flow rate gauge with piezoelectric sensor.
- Tank water level transducer.
- Water conductivity meter available on request.

V

ULTRAVIOLET LAMP FOR ADIABATIC COOLING SYSTEM

The UV lamp sterilizes the water in the adiabatic system (UV-C rays = 254 nm) emitting UV rays lethal to pathogens (including Legionella), providing an alternative effective solution to chemical biocides.
Unlike chemical treatments, UV sterilization does not use any harmful substances or add any toxic-noxious component to the water.
The intense biostructural disorder induced by this radiation interferes with the development and the reproductive capacity of every kind of micro-organism, making them inoffensive.

NOTE: the dimensioning of the lamp size is optimized for the maximum water flow required by the adiabatic system.

Additional recommended water quality requirements:
- Fe < 0.3 ppm
- Hardness <12 °f = 6.7°dH = Max. 120 ppm of CaCO3.
- S.A.C. (Spectral Absorption Coefficient) > 20 1/m S.A.C. (Spectral Absorption Coefficient) > 20 1/m

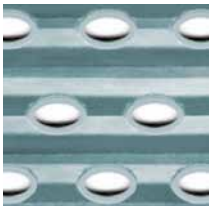
A.S. MANAGER

A unique controller for the control and diagnostics of all Refrion adiabatic systems and related on-board equipment (pressure, temperature and humidity sensors, UV lamps, actuation valves).

Overview:
- Complies with European Directive 2014/30/EU EMC
- Enclosure in UV resistant plastic, protection rating IP54 (IEC Standard 60529).
- Operating temperature -25°C +50°C
- Multifunction LCD Display (resolution 128x64), remote control distance 600m
- 4 control buttons
- Multilanguage menu
- Power supply overcurrent protection using fuse
- USB Host Interface allows flash drive connection to upgrade software and download data logs
- Signal buzzer
- Electromagnetic system for reducing limescale build-up
- Non-volatile memory to retain parameters and event logs
- RTC (Time/Date) with battery backup
- Humidity/temperature sensor
- Input: remote start/stop (clean contact or Modbus)
- Output: operating state (clean contact)
- Output: alarm state (clean contact)
- Output: room thermostat state (clean contact)
- 2 password levels: user/manufacturer

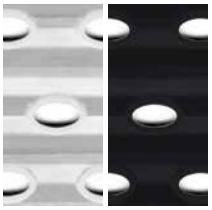
PROTECTION COATINGS

HEAT EXCHANGER PROTECTION TREATMENTS



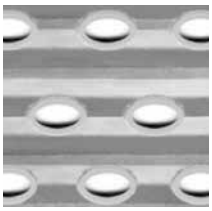
PRE-PAINTED HYDROPHILIC COATING

- High surface tension: it gives the drops of water wetting the fin a flattened shape (contact angle>15°).
- It favours circulation and the adiabatic saturation of the air.
- Corrosion resistance (ASTM B117): 250 hours.



PRE-PAINTED HYDROPHOBIC COATING

- It gives the drops of water wetting the fin a spheroid shape (contact angle>50°) for easier draining.
- Corrosion resistance (ASTM B117): *single layer **1000 hours** (colour grey), double layer **1500 hours** (colour black).*



THERMOGUARD®

- Polyurethane based coating.
- High flexible properties.
- Heat conduction and UV resistant properties.
- Prevents chemical and galvanic corrosion.
- Corrosion resistance (ASTM B117): 3000 hours.

BLYGOLD®

- Heat conductive pigmentation.
- Very high chemical resistance at a low layer thickness.
- Corrosion resistance (ASTM B117): 4000 hours.

ELECTROFIN®

- Water-based, flexible cationic epoxy polymer using an electro-coat process.
- It guarantees complete heat exchanger coverage.
- Corrosion resistance (ASTM B117): 6000 hours.
- C5M & C5I High Durability (ISO 12944).

HERESITE®

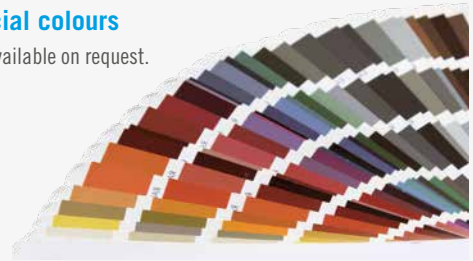
- Suitable for marine and salt air environments.
- Withstand exposure to an extensive variety of corrosive and chemical fumes.
- Corrosion resistance (ASTM B117): 6000 hours.

HEAT EXCHANGER WITH COPPER FINS

SPECIAL COLOURS

Frame special colours

All RAL chart available on request.



USAGE LIMITATIONS

		LIMIT OF USE [HOURS/YEAR]						
	SPRAY ADIABATIC SYSTEM HYBRID SPRAY SYSTEM	**PRE-PAINTED HYDROPHILIC (single layer)**	**PRE-PAINTED HYDROPHOBIC (single layer)**	**PRE-PAINTED HYDROPHOBIC (double layer)**	**THERMOGUARD®**	**BLYGOLD®**	**HERESITE®**	**ELECTROFIN®**
WATER QUALITY	To prevent corrosion: • 6 < pH < 8 • Conductivity <1500 µS/cm • Chlorides < 100 ppm To prevent formation of scale: • Hardness 2-4 °f = Max. 1.1-2.2 °dH = Max. 20-40 ppm of $CaCO_3$	150	300	400	800	1000	1500	1500
WATER QUALITY	To prevent corrosion: • 6 < pH < 8 • Conductivity <500 µS/cm • Chlorides < 50 ppm • Sulphate < 50 ppm To prevent formation of scale: • Hardness 2-4 °f = Max. 1.1-2.2 °dH = Max. 20-40 ppm of $CaCO_3$	300	1000	1200	2400	3000	4000	4000
	INDUSTRIAL ADIABATIC SYSTEM							
WATER QUALITY	To prevent corrosion: • 6 < pH < 8 • Conductivity <1500 µS/cm • Chlorides < 200 ppm To prevent formation of scale: • Hardness <25 °f = 14 °dH = Max. 250 ppm of $CaCO_3$	/	MANDATORY FOR CLOSE CIRCUIT (ZP)	OPTION	OPTION	OPTION	OPTION	OPTION

VIBRATION DAMPERS

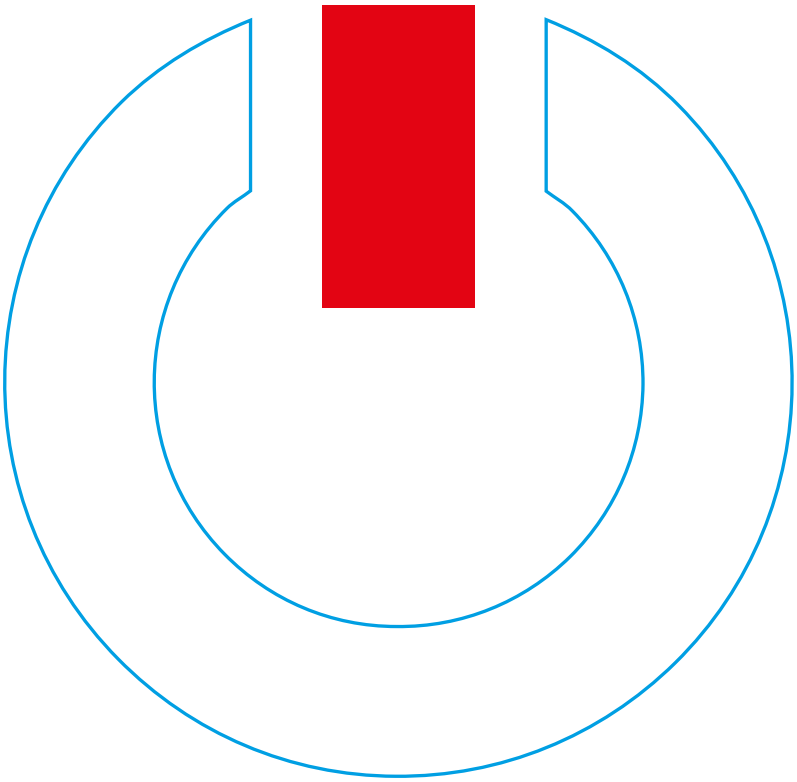
A Simple leaning on the floor

- Loading up between 50 daN and 1500 daN each A.V. Mountings.
- Low height.
- Aluminium cap to shelter the elastomer.
- Rubber components: Vibro stop elastomer.
- Metal components: aluminium alloy.
- Fixing between machine and A.V. mounting.
- Simple leaning to the floor.

F Fixing to the mounting plate

- Load range between 50 to 600 daN.
- Low heigh.
- Cap to shelter elastomer.
- Rubber components: rubber NR.
- Metal components: plated steel.
- Fixing between machinery and A.V. mounting.
- Fixing to the floor.

PUBBLIMARKET 99990102-04



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