

ThermoKey®
Heat Exchange Solutions

Technical Manual TC

Adiabatic evaporative panel system
for condensers and dry-coolers v-type series

MT TC R EPS EN 07 2023

THE ORIGINAL VERSION OF THESE
INSTRUCTIONS IS IN ITALIAN

READ CAREFULLY AND ENSURE YOU HAVE FULLY UNDERSTOOD ALL THE INFORMATION CONTAINED IN THIS MANUAL BEFORE PLANNING, AND IN ANY CASE CARRYING OUT ANY OPERATIONS BEFORE HANDLING, UNPACKING, MOUNTING, POSITIONING, AND COMMISSIONING OF THE MODULE. THE MANUFACTURER DENIES ANY RESPONSIBILITY FOR DAMAGES TO PERSONS OR PROPERTY RESULTING FROM FAILURE TO FOLLOW THE INSTRUCTIONS CONTAINED HEREIN.



The original version of this manual is in **Italian**, and it is available on the website:
www.thermokey.com.
The English translation is a true copy of the original document and it is available on the website:
www.thermokey.com.



Translations in other languages may contain errors; if in any doubt, always refer to the original version in Italian or to its translation in English.

The Quality Management System of ThermoKey, in compliance with ISO 9001, is certified by TÜV, while the Environmental Management System, in compliance with ISO 14001, and the Safety Management System, in compliance with OHSAS 18001, are certified by IMQ.



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TC 1. Standard references

The product described in this manual is compliant where required with:

MACHINERY DIRECTIVE 2006/42/EC

LOW VOLTAGE DIRECTIVE 2014/35/EU

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU

PED DIRECTIVE 2014/68/EU

ERP DIRECTIVE 2009/125/EC

TC 2. Hazards



W012

Danger of electrocution. The product is in contact with models equipped with electric fans and control panels and may be equipped with electrical components with a three-phase or single-phase operational nominal low-voltage. The power supply lines must be fitted with protection systems against electric shock and equipment earthing devices as required by law.



W017

Risk of burns. The evaporative module is an accessory of a product with unprotected headers. The surfaces of the collectors can reach high temperatures.



W022

Risk of cutting. In addition to the heat exchanger, an integral part of the model, which consists of metallic fins with unprotected sharp edges, the shell casing of the evaporative module is made of sheet metal components that may in some points present unprotected sharp edges.



W025

Danger of moving parts. The evaporative module is an accessory of a product equipped with electric fans fitted with a protective grid, as provided by law. For some products it could be possible to deliberately access moving parts (motor fan blades) from unprotected areas. Before any access, ensure that moving parts is not dangerous to operators.



W001

Danger of crushing limbs or persons. During all the phases of handling, transportation, installation, operation, and maintenance, pay maximum attention to the indicated weight of each product to avoid them tipping over or falling dangerously onto operators.



W035

Danger of falling objects. The products are supplied with doors, tanks, or sheet metal linings that may be dismantled during installation or maintenance operations by removing the fastening screws supplied, taking the appropriate safety precautions.



W021

Fire Hazard. Do not expose CELdek® evaporative cooling pads to sparks, open flame, welding spatter, temperatures in excess of 180°C (350 °F ca.), or other sources which may ignite the paper.

TC 3. Instruction

TC 3.1

Contents of the Technical Manual of the Product:

GENERAL INSTRUCTIONS FOR SAFE USE (IG)

INSTRUCTIONS FOR HANDLING AND UNPACKING (IM)

INSTRUCTIONS AND TECHNICAL DATA (TC)

SPECIFIC INSTRUCTIONS FOR USE AND MAINTENANCE (IS)

TC 3.2

This manual constitutes the TC section, denominated as INSTRUCTIONS AND TECHNICAL DATA, of the Technical Manual of the product. For any information not covered in this manual refer to the other sections (IG-IM-IS), and if in doubt contact the Manufacturer.

TC 3.3

This manual is an integral part of models equipped with the EPS evaporative panel system, and as such must be retained throughout the operational life of the product.

TC 3.4

Any additional technical documentation relating to non-standard products is attached to this manual, becoming an integral part of it, identified with a specific code indicated on the shipping documents.

TC 3.5

The product described in this manual is considered **accessory**. It is therefore not usable as supplied but as a component for air conditioning and refrigeration systems, and must be installed and commissioned only by qualified operators (see chapter on installation and commissioning).

TC 3.6

Every component is CE marked, where required by relevant legislation.

TC 3.7

Further documentation relating to the product, consisting of catalogues, guides, and technical bulletins, is provided directly by ThermoKey, available on the www.thermokey.com website:

CATALOGUES – www.thermokey.com/en/download/brochure/

MANUALS – www.thermokey.com/en/download/manuals/

TC 4. Intended use

TC 4.1

The adiabatic evaporative panel modules system (EPS) must be used exclusively for the purpose indicated below. Any other use is considered improper and exempts the Manufacturer from any and all liability.

TC 4.2

The EPS system is designed to be used as an **accessory** on dry coolers, condensers, and gas coolers of the V-type series, in all refrigeration and air conditioning applications. The system is composed of evaporative panels that, using water, enable an increase in the specific capacity of the process heat exchangers.

TC 4.3

If in any doubt regarding the intended use of the product, contact the Manufacturer.

TC 5. Inspection, handling and transport

TC 5.1

The components of the EPS system are shipped in a mounting kit. The modules of adiabatic evaporative panels come already pre-assembled (see fig.1).

TC 5.2

Upon receipt of the KIT, check the integrity of the packaging and of the product, immediately notifying the transporter of any damage that occurred. The packaging is made in accordance with the model and the appropriate means of its transportation and handling.

TC 5.3

During the transportation and handling of the packed product, take care to avoid any excessive and improper stress on the packaging, and follow all the indications given on the packaging, always keeping the model in the prescribed position.

TC 5.4

During the handling of the unpacked modules and components for installation, use appropriate means of protection to avoid any injury from sharp edges, such as the metal casing, and do not get the panel material in your eyes, on your skin, or on your clothing and avoid inhaling dust or fumes (see DPI Technical Manual IG, chapter IG6).

TC 5.5

Unpack the kit in a location as close as possible to the installation site (see also the chapter on installation and commissioning). In general, the product should not be transported or handled without its original packaging.

TC 5.6

During the handling of the unpacked modules and components for installation, use appropriate means of protection to avoid any injury from sharp edges, such as the metal casing, **and do not get the panel material in your eyes, on your skin, or on your clothing and avoid inhaling dust or fumes** (see DPI Technical Manual IG, chapter IG6).



fig.1 - Pre-assembled adiabatic evaporative panel module

TC 6. Installation and commissioning

TC 6.1

The installation and commissioning of the modules and the piping of the EPS system must be performed by qualified and experienced personnel. Follow the diagrams and instructions for assembly (see fig. 2, 3).

TC 6.2

Fasten the components to all the points provided for using the screws supplied in the kit (see the chapter on mounting instructions).

TC 6.3

The modules determine an additional static pressure to the ventilation of the model on which they are installed. For proper air circulation, verify that there is an adequate guaranteed volume and passage of air in the area of installation that conforms to the airflow characteristics of the model. If this is not the case, the declared performances cannot be guaranteed, and operating defects may arise. Be careful not to obstruct either the air intake or the discharge of the fan motors and the heat exchanger.

TC 6.4

The modules are not designed to support additional loads. The water distribution piping to the modules is protected with metal casing. It is not permitted to walk on the upper metal casing of the modules or the piping protection. Care must be taken during any maintenance operations that require workers to walk on the model (e.g. for the replacement of fan motors).

TC 6.5

Check if the water supply network is adequate to meet the flow rate and required pressure. The EPS system is designed for connection to the public water supply network.

TC 6.6

Before connecting the components, check the presence of shut-off and sectioning devices on the power supply line, protection against electric shock, protection of the equipment, and anything else required by current legislation. The modules are mounted on models fitted with electric fans and possibly electrical control panels, and may be equipped with low-voltage electrical components such as solenoid valves.

TC 6.7

Access to the installed model, for any type of intervention, must be reserved to qualified and experienced personnel to run the system, according to current regulations.

TC 6.8

Check the chemical and microbiological parameters of the water in the EPS system when first installed as indicated by VDI 2047-2 (see the EPS equipment water supply characteristics chapter).

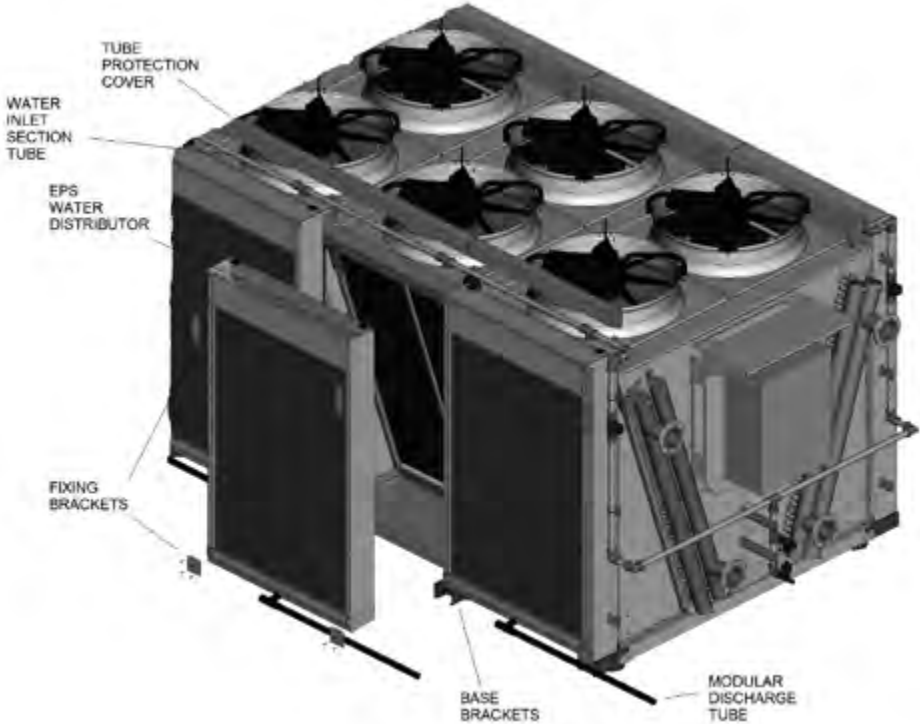


fig.2 - General diagram for mounting of EPS modules

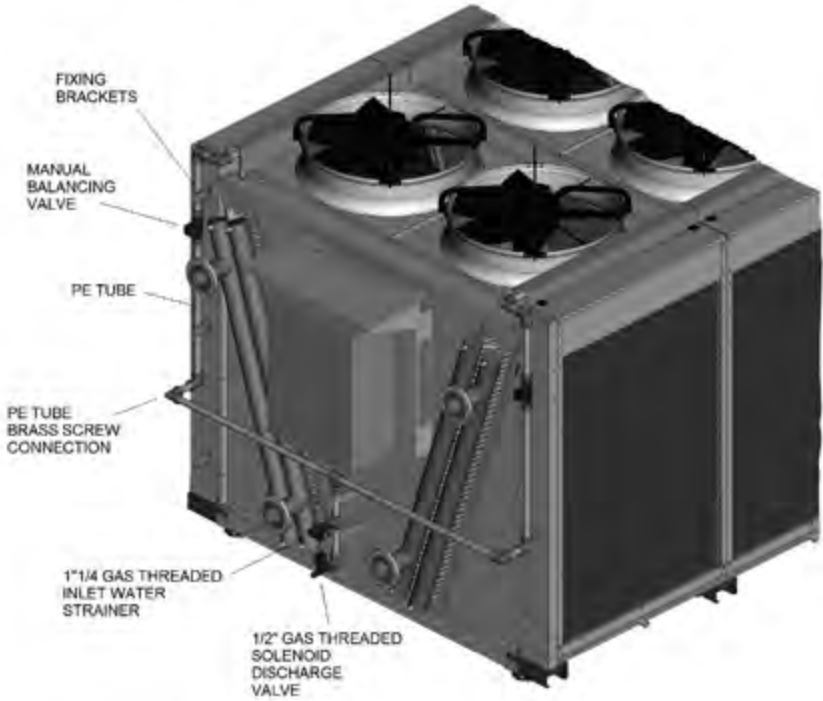
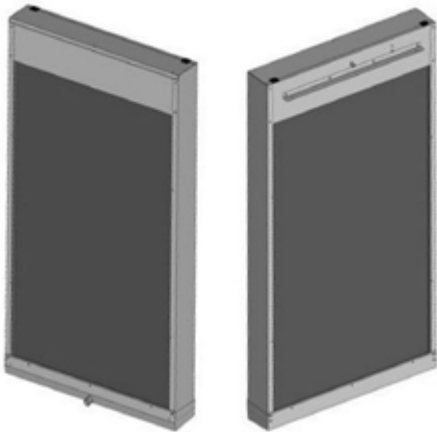


fig.3 - General diagram for connection of the water supply to the EPS system

TC 7. EPS system base equipment (standard option)

TC 7.1
EPS MODULE ASSEMBLY KIT. Stainless steel removable modular frame, treated cellulose evaporative panels, water distributor with full cone nozzles, modular drip tray and drain pipes with fittings type Geberit Silent-PP, drain pipes resistant to low and high temperatures, drain pipes resistant to ultraviolet rays and resistant to aggressive substances with EPDM lamellar seals pre-assembled. Openable top covers for nozzles cleaning. Easy fit nozzles.



Detailed view of discharge side and internal side

TC 7.2
EPS MODEL COVERING PANELS. FeZn vertical panels painted RAL7035, FeZn plenum closing panels (preassembled, see fig. 5), FeZn modules supports and FEZN mounting brackets painted RAL7035. Stainless steel screws.

TC 7.3
EPS WATER DISTRIBUTION PIPING. HD polyethylene pipe, brass fittings, flexible stainless steel connection pipe, FeZn pipe fixing brackets painted RAL7035 (preassembled, see fig. 5). FeZn pipe cover protection panels painted RAL7035. Stainless steel screws.

TC 7.4
WATER SUPPLY CONNECTION. HD polyethylene pipe, brass fittings, ramp manual balancing valves type DANFOSS, solenoid main valve type DANFOSS, solenoid drain valve type CASTEL (preassembled, see fig. 5). Mounting brackets. Stainless steel screws.

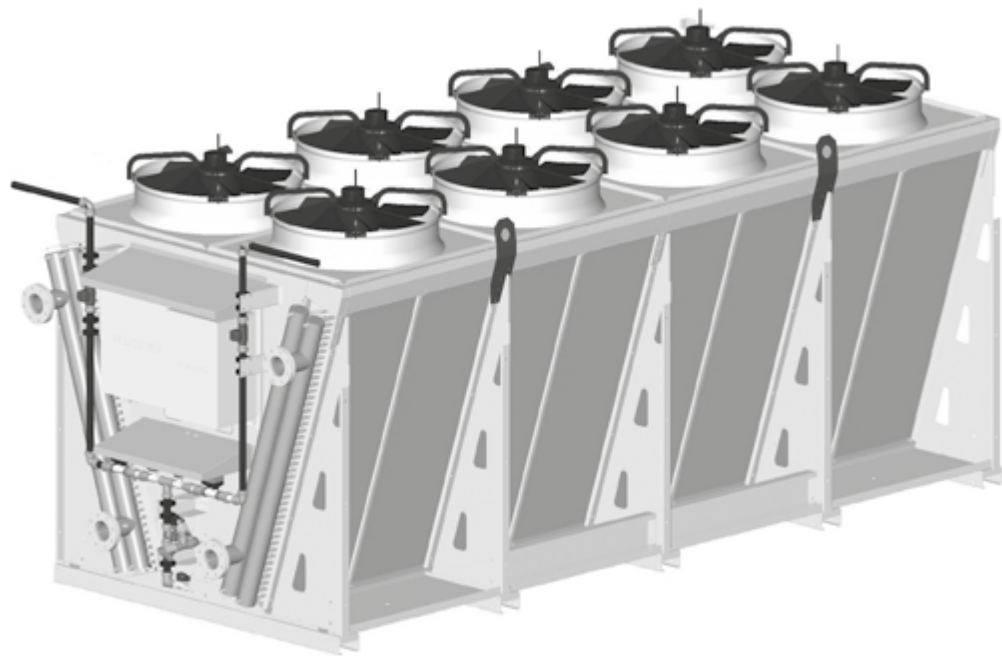


fig.4.1 - Factory pre-assembling JV MODELS

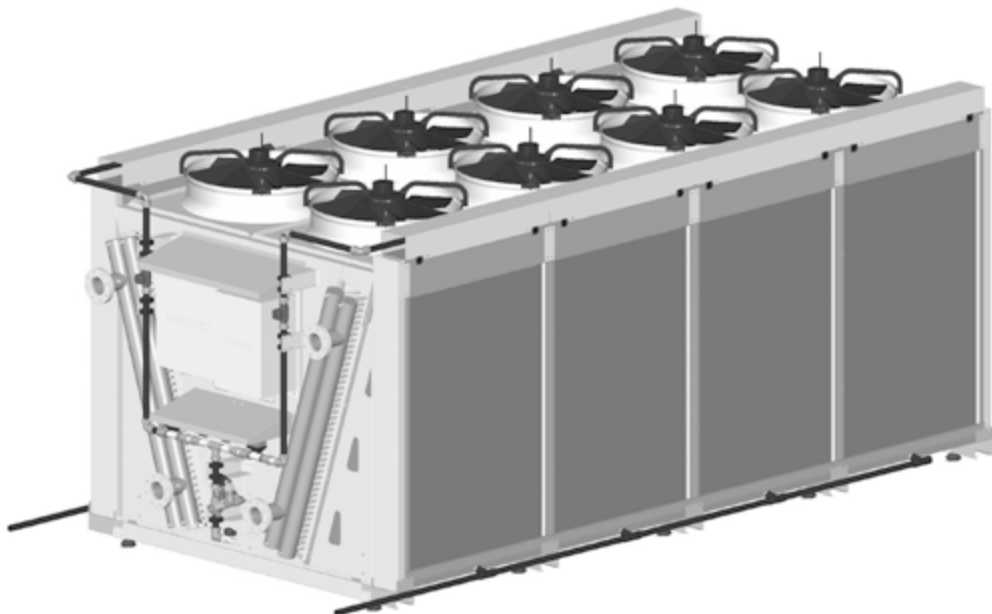


fig.4.2 - Assembling by the installer JV MODELS



fig.5.1 - Factory pre-assembling S
J MODELS

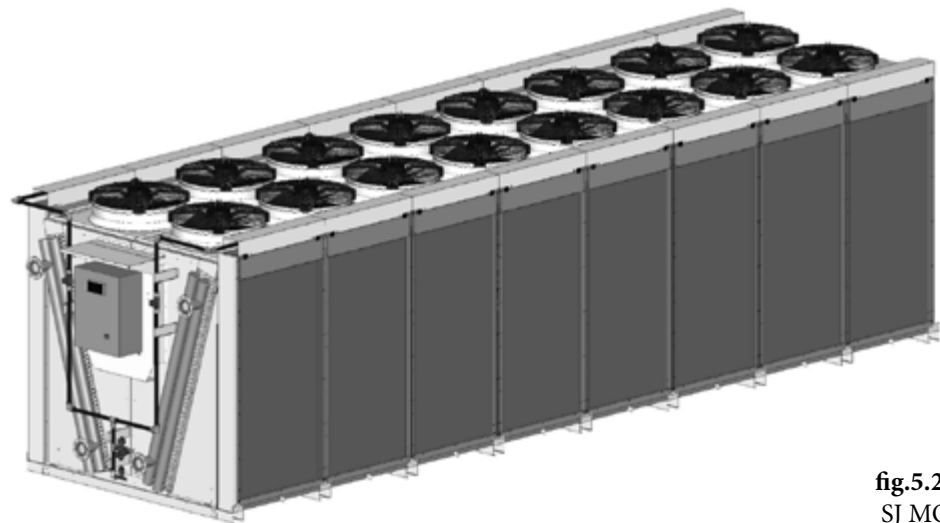


fig.5.2 - Assembling by the installer
SJ MODELS (VERTICAL SYSTEM)

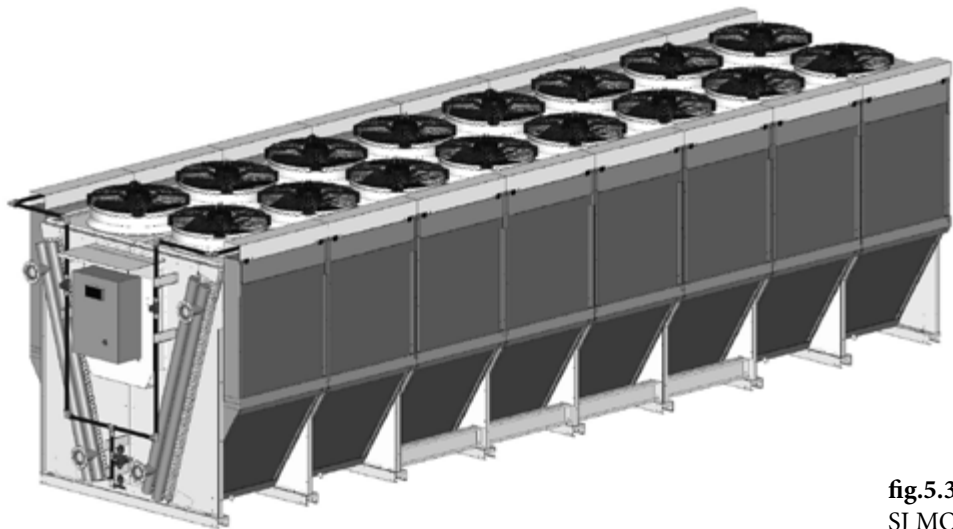


fig.5.3 - Assembling by the installer
SJ MODELS (SLANTED SYSTEM)

TC 8 . General maintenance and control

TC 8.1

Before performing any maintenance work ensure that the power supply of the model has been sectioned: the electrical parts may be connected to automatic controls. All maintenance work should be performed by qualified and experienced personnel.

TC 8.2

The EPS system principally includes evaporative modules, with a supporting frame in stainless steel, a treated cellulose pads, **(do not get the material in your eyes, on your skin, or on your clothing and avoid inhaling dust or fumes)**, a cross connection water distribution, high density polyethylene piping for connection to the water supply, high density polyethylene piping for connection to the wastewater network, and a discharge piping UV resistant polypropylene. **Do not expose evaporative cooling pads to sparks, open flame, welding spatter, temperatures in excess of 180°C (350 °F ca.), or other sources which may ignite the paper.**

TC 8.3

Periodically check the fixing points of the module, the water supply and wastewater connections, and the electrical connections that are found in the required equipment configuration.

TC 8.4

The modules of the EPS system are removable for possible winter storage. Consider, in line with climatic conditions, storing modules during prolonged periods when the adiabatic system is not in use, in order to increase the operative lifetime of the panels. During storage, keep modules in a dry place, protected from dust and direct sunlight, possibly by reusing the original packaging.

TC 8.5

The module frame can be completely disassembled for the programmed replacement of the evaporative panel. The efficiency and lifecycle of the panel material is determined by the mineral characteristics of the water used, the air intake, and the amount of use and possible storage.

TC 8.6

To obtain an optimal operation, the flow of air must be as uniform as possible across all areas of the panel. This has an influence on both the effectiveness of the panel and on the operation of the machine (the vertically mounted panels make the most of this condition). It is advisable to make periodic checks to prevent or remove obstructions to the passage of air.

TC 8.7

Provide inspection and periodic cleaning of the evaporative panel. The correct passage of air and the wettability of the panels must always be ensured. Not doing so may compromise the operative efficiency of the adiabatic system, with a consequent reduction of the performance expected when selecting the product. Perform at least one daily water-wash cycle and one drying cycle of the panels (see chapter on practical conditions of use). Replace the panels when there is an obvious deterioration or when cleaning is no longer effective (5% of the front surface of the panel). **The performance of the heat exchanger is guaranteed only with pads supplied by ThermoKey.**

TC 8.8

Clean the evaporative panels with a soft bristle brush, and then run a cleaning cycle using fresh water.

TC 8.9

Provide periodic inspection and cleaning of the water distribution system. Do not use aggressive detergents, solvents, acid or alkaline solutions containing chlorine or ammonia, or abrasives in general. If sanitising agents must be used, check their compatibility with the materials first. The nozzles are removable for programmed cleaning, and can be washed with substances suitable for removing the deposited limescale. If in any doubt, contact the Manufacturer.

TC 8.10

The frequency of inspection and maintenance operations is dependent on the environmental characteristics and on the specific characteristics of the feed water and any treatments used, and therefore must be defined on an individual basis.

TC 8.11

To guarantee the maximum efficacy of the EPS system, check that the operating parameters, namely the measurements of relative humidity, ambient temperature, and air output temperature from the panel conform to the expected characteristics of the product selected.

TC 8.12

If proceeding with the replacement of worn panels, contact the Manufacturer for replacement materials (see chapter TC15). The evaporative panels are the consumable material of the adiabatic system, ThermoKey reserves its warranty intervention.

TC 8.13

Provide for checking of the chemical and microbiological parameters of the water used in the EPS system before every period of operation, and programme the frequency of inspections so as to maintain the characteristics required as indicated by VDI 2047-2 (see chapter on characteristics of the water).

TC 8.14

For the cleaning of the heat exchangers see the technical manual IS.

TC 8.15

For any operation on the product not described in this manual, contact the Manufacturer.

TC 9. EPS equipment water supply characteristics

TC 9.1

The water used for the adiabatic system with evaporative EPS panel does not require specific treatments. However, for a longer lifespan and more efficient operation of the evaporator panel and reduction of maintenance work, it is suggested to use water with the characteristics indicated in the table.

REFERENCE WATER PARAMETERS FOR EPS SYSTEM (AT 20°C)	
pH (@25°C)	6.5 ... 8.2
Total hardness	< 14 °d (1°d = 17,85 ppm CaCO3, 1°f = 10mg/l = 10 ppm CaCO3)
El. Conductivity (@25°C)	< 1000 µS/cm
Chlorides	< 200.0 mg/l
Sulfates	< 300.0 mg/l
Nitrates	< 50.0 mg/l
Silicon	< 20.0 mg/l
Iron dissolved	< 0.1 mg/l
To avoid spontaneous corrosion and/or incrustation , the Langelier saturation index (IL) and the Ryznar stability index (IR) should be within the following range: IL -1 ... +1 / IR 5.5 ... 6.6	
Colony forming units	< 1000 KBE/ml (20°C)
Legionella	< 100 CFU/100ml
SAC254 (*)	< 20.0 1/m
(*) Spectral absorption coefficient. Indicated in the case of use of UV lamp	

TC 9.2

Water shared by the common water network or water derived from other water resources can be used, possibly to be treated appropriately with the expectations of material durability and cost of treatment, **but measures must be taken or all chemical and microbiological parameters directly related to health in compliance with the current legislation and Directive (UE) 2020/2184. In accordance with what is stated in the use and maintenance manual, the ThermoKey Adiabatic Evaporative System is in compliance with the requirements of VDI 2047-2.**

TC 9.3

The feed water should never get down below the minimum level of pH 5 and overcome the maximum level of pH 9, in order to avoid problems of chemical aggression to the panels. Water hardness should never exceeding 250 ppm CaCO3. In the event that the system is configured to recirculate the water, purging cycles should be performed in order to prevent the salinity level exceeding the acceptable limits.

Acceptable total hardness	< 14 °d (1°d = 17,85 ppm CaCO3, 1°f = 10mg/l = 10 ppm CaCO3)
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TC 9.4

The installer must ensure that the treatments and chemical substances added, in order to respect the parameters indicated, are compatible and do not cause any corrosion and damage to the materials used in the module. If necessary, the water used must be conditioned by the addition of suitable inhibitors of corrosion and incrustation.

TC 9.5

Do not routinely add oxidising agents to the feed water as this can create problems for the cellulose sheet of the panel. If necessary, endeavour to use them only in minimal quantities: max 1 ppm in the case of continued treatment, or max 5 ppm in the case of a one-time treatment.

TC 9.6

Warning! Do not use hot water for feeding or for cleaning, but water at ambient temperature (T max <20°C).

TC 9.7

The values of the water must be tested during the commissioning of the adiabatic system by qualified personnel, and subsequently verified in accordance with the standards in force and the frequency scheduled for the specific application and also of measured values. The results must be documented and recorded. If during the monitoring, the values of the water are found to be non-compliant with the requirements, spraying must be stopped for all the chemical and microbiological parameters directly related to health and appropriate remedial actions undertaken.

TC 9.8

In order to guarantee a safe and efficient functioning of the devices, we recommend the following measures on the system:

- a) Prepare a risk analysis of the entire system.
- b) Documentation of relevant works based on inspection and maintenance planning (inspection, cleaning, ... compliant to VDI2047-2).
- c) Discharging of the adiabatic system water supply line using a fuelling valve on the installation site with a switching-off anddischarging cycle maximum every 7 days.

TC 10. Mounting of the lower closing panels
(If supplied separately)

TC 10.1

Preliminary operations. Position and fix the base of the model to the relative support structure or floor, and proceed with the disassembly of the longitudinal handling and transportation spars (see fig. 7), to allow the positioning of the respective lower casing panels. The spars are all the same, and are fastened with M10 bolts. After having positioned and fastened the lower casing panels, reassemble the spars (the longitudinal spars are provided for the handling and transport of the model).



fig.6 - Longitudinal handling and transportation spars

TC 10.2
Preparing the lower casing panel of the plenum.
Apply approximately 1m of polyurethane strip (roll supplied) on each panel, see fig. 8.

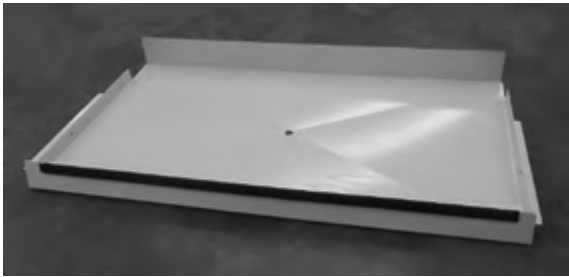


fig.7 - Polyurethane strip positioning

TC 10.3
Positioning the lower panel. Position all of the panels in their respective plenum, resting them between the base crossbeams, see fig. 9. The panels are all the same.



fig.8 - Lower panel positioning

TC 10.4
Fixing the lower panel. Fixing all of the panels in their respective plenum, using the screws supplied (2 x M6 screws with rosette for each panel). The panels are all the same.



fig.9 - Panel fixing

TC 11. Mounting of supports for eps module

TC 11.1
Positioning and fastening the base supports of the EPS module. Position and fasten each bearing support of the EPS module, as shown in the two photos. The supports are all the same, and are fixed to the headboard panels of the base crossbeams. Fasten them with the screws supplied (4 x M6 screws with washer for each support), first on one side and on the one side then the other, see fig. 11-12 to the other.



fig.10 - First side pre-fixing



fig.11 - Second side pre-fixing

TC 11.2
Positioning and fastening the vertical headboard panels. Two vertical panels must be fixed to each headboard panel (one on the right and the other on the left), to enclose the EPS modules. Fasten the panels with the screws supplied (3 x M8 screws with rosette for each panel).



fig.12 - Vertical panel

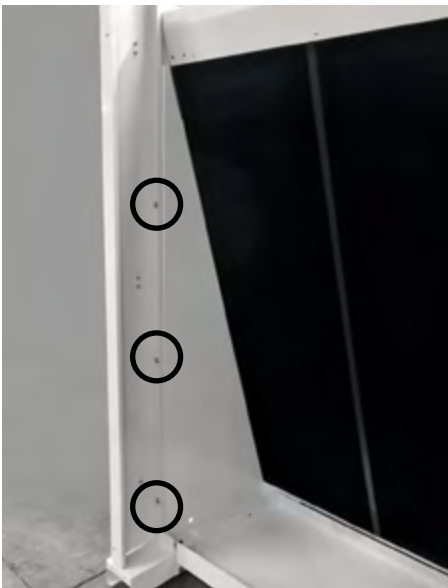


fig.13 - Fastening internal screws

TC 12. Mounting of eps module

TC 12.1

Positioning and fastening of EPS modules. Position the modules on the base supports, also making sure that its rear fixing bar is resting on the upper part of the model. Fasten the rear bar to the model using the screws supplied (2 x M6 screws with washer for each module). Each bar is fixed to its module with screws, and is therefore adjustable for the recovery of backlash. Start the positioning sequence from the headboard panel of the model.

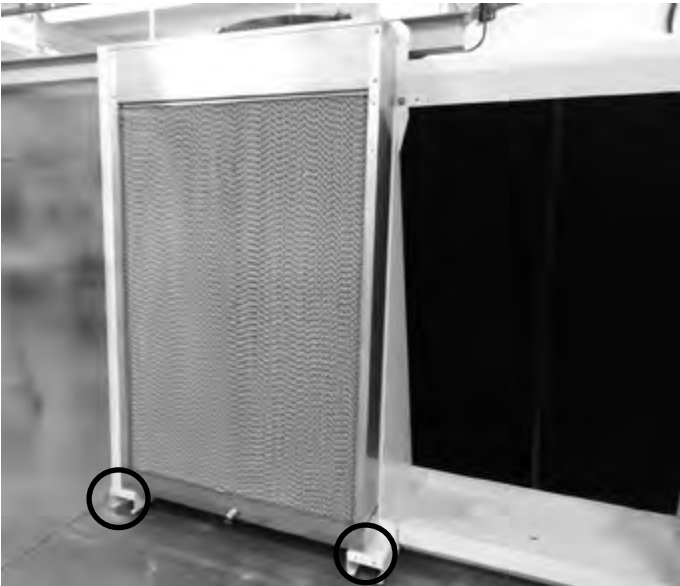


fig.14 - Placement on the lower supports

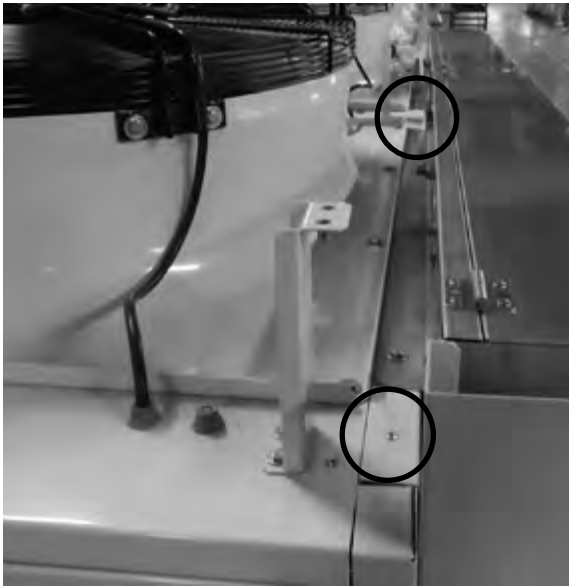
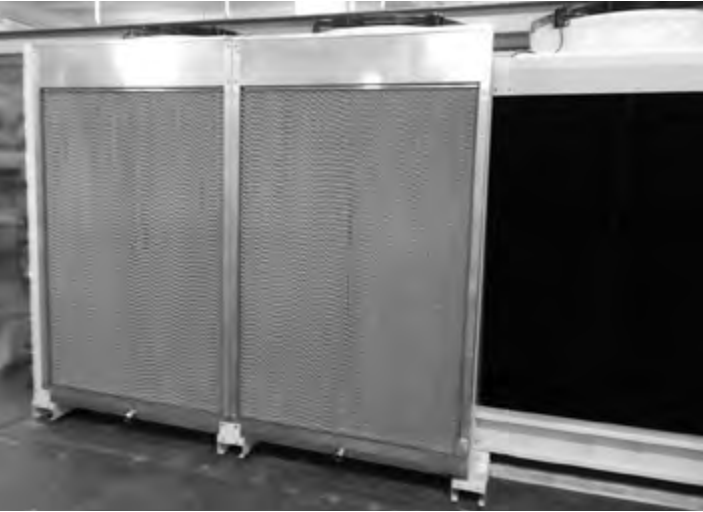


fig.15 - Upper fixing bar

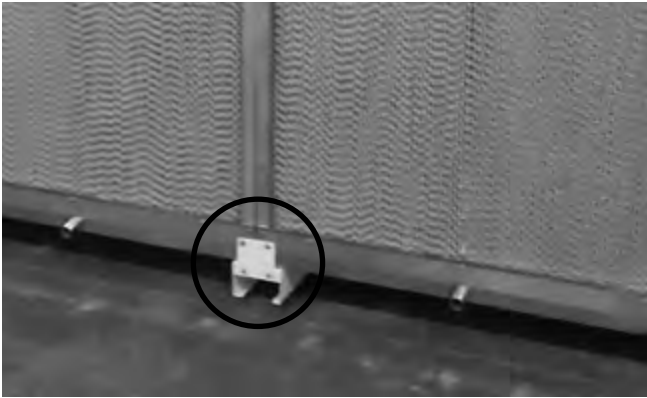
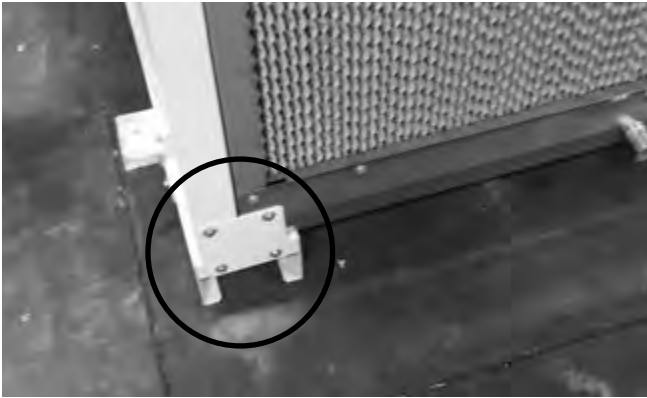


Proceed with the positioning of all the EPS modules and the fastening of the respective rear fixing bars. The EPS modules are all the same. It is advisable to tighten the mounting screws last to recover backlash.

fig.16 - Mounting sequence

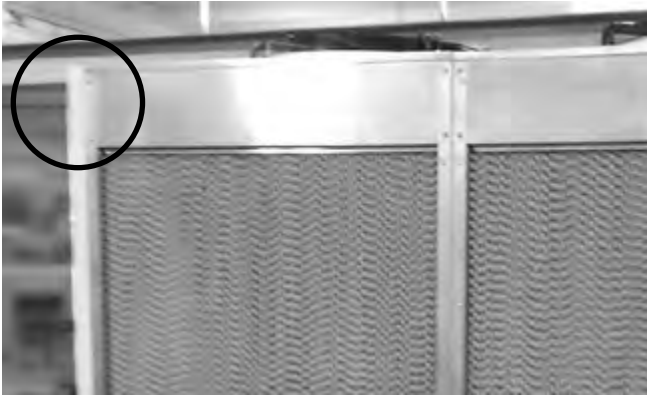
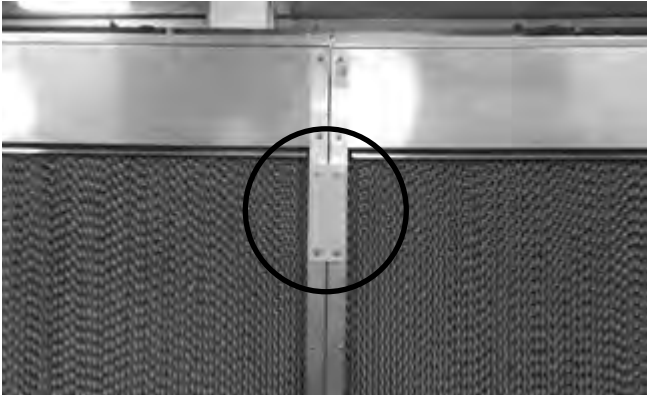
TC 12.2

Mounting the lower platelets. Proceed with the mounting of the lower fixing platelets of the EPS module to the base crossbeams using the screws supplied (4 x M6 screws with washer for each plate). The lower platelets are all the same.



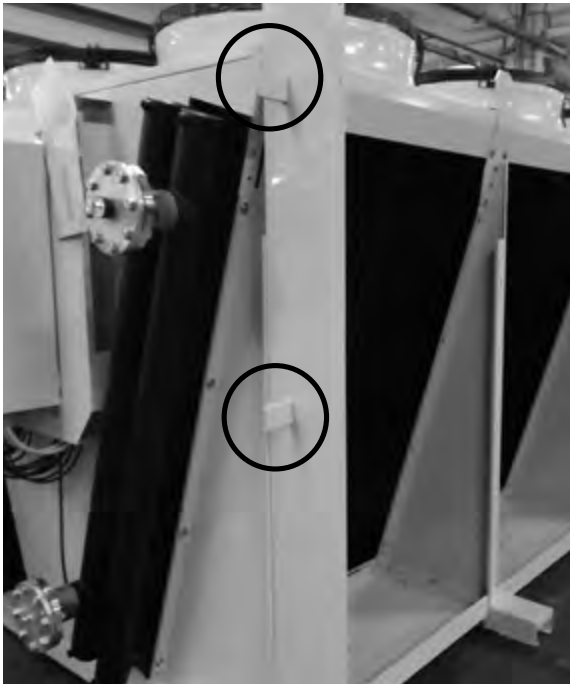
TC 12.3

Mounting the upper platelets. Proceed with the mounting of the upper platelets of the EPS between the EPS modules and between the modules and the vertical headboard panels, using the screws supplied (4 x M6 screws with washer for each plate). The upper platelets are all the same.



TC 13. Mounting of piping (if supplied as a kit)

TC 13.1
Positioning and fastening of piping brackets. Proceed with the mounting of the brackets for fastening the vertical pipes of the water supply piping on the vertical headboard panels using the screws supplied (2 x M6 screws with washer for each bracket). The brackets for the left and right vertical panels are the same.

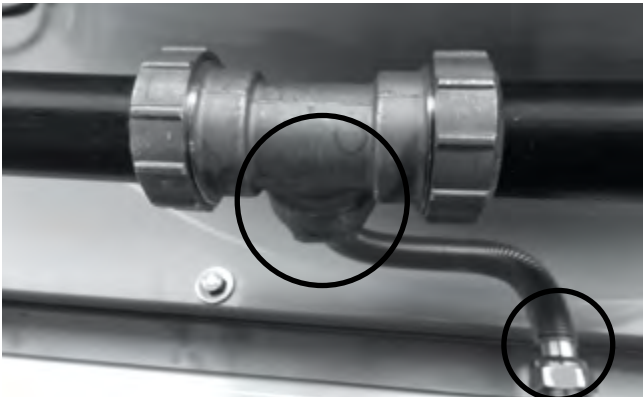


Brackets position view

Proceed with the mounting of the brackets for the fastening of the horizontal distribution piping to the EPS modules on the upper casing of the module, using the screws supplied (2 x M6 screws with washer or each bracket). The brackets for the upper covers for the right and left cylinder bank are the same.



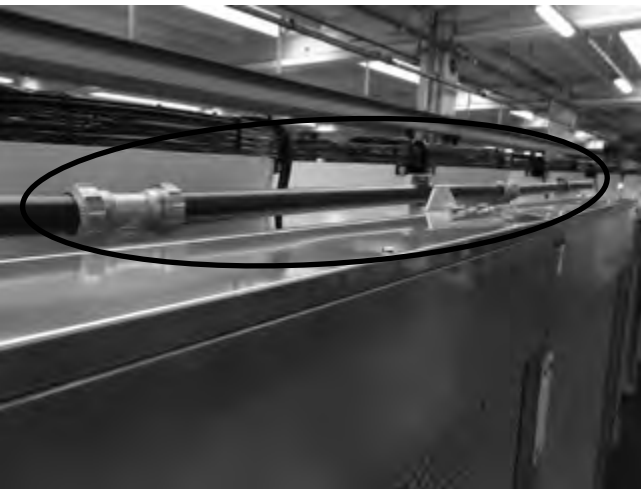
TC 13.2
Water distribution piping to the EPS modules. Connect the intermediate sections of the polyethylene tube with a TEE fitting and the final ones of the two ramps to the elbow fitting, supplied. Each fitting has a threaded 1” 1/4 GAS diameter outlet for feeding each module using the reducer and the flexible stainless steel 1/4” GAS fitting for the connection to the distribution cross connection of the EPS module, also supplied. Fasten the pipes thus prepared to the respective upper fixing brackets using the U-bolts supplied. For the sealing of the threaded fittings (excluding the removable ones equipped with their own seals) it is recommended to use a sealant such as LOCTITE 577, or equivalent.



Water distributor module / ramp connection view



U-bolt pipe fixing view



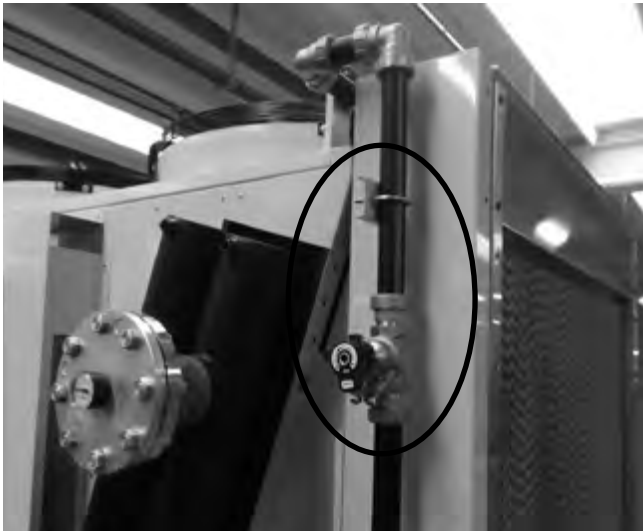
Ramp piping view



Ending ramp view

TC 13.3

Piping connection to the water supply network/tank. Fit the manual or automatic balancing valves to the distribution ramps (right bank and left bank). The valves are supplied in the kit. Complete the connection piping using the pipe sections and the elbow fittings supplied. Fix the pipes with the U-bolts.

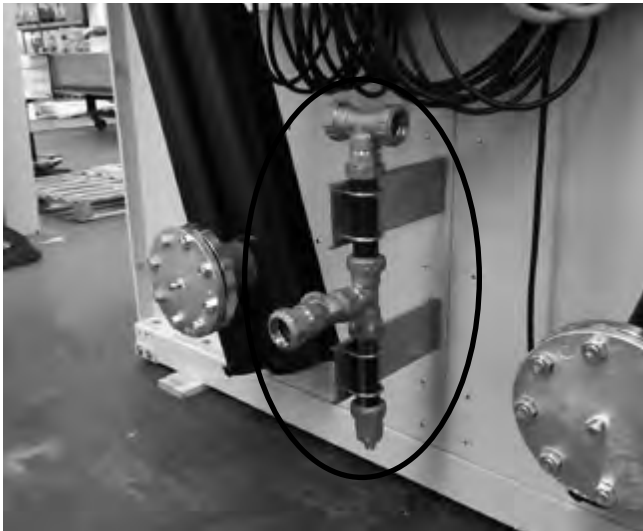


Manual balancing valve view



Valve detail

Mount the support brackets of the connection group. The connection group of the feed piping coming from the water supply network is designed with a reducer fitting for polyethylene 40mm diameter pipe, or a threaded 1" 1/4 connection for attachment directly to the input filter. A solenoid valve with 1/2" threaded attachment is supplied in the kit to use for the possible piping discharge command



Water supply connection group view

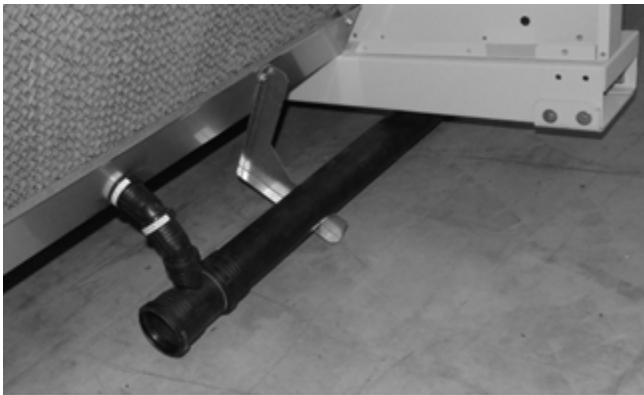
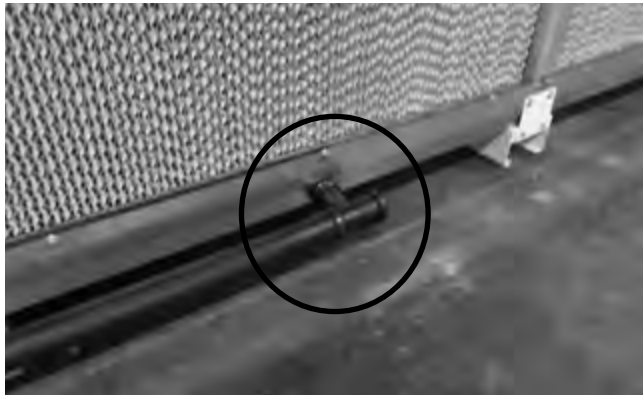
TC 13.4

Upper protection covers. Having completed the installation of the piping, fasten the upper pipe protection covers, using the screws supplied (2 x M6 screws with rosette for each cover). Te protective cover is provided to protect the pipes and for the safety of operators during possible maintenance operations to the upper part of the model.



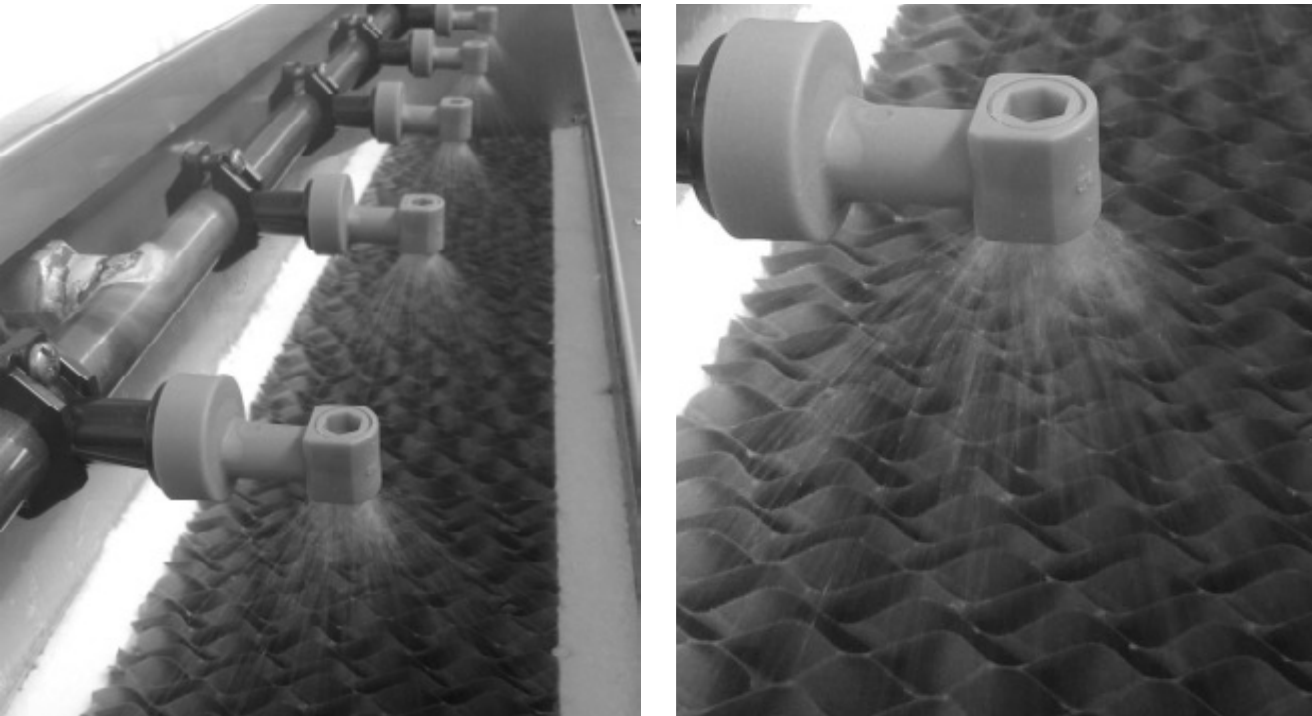
TC 13.5

Discharge pipes. The modular discharge system consists of Geberit Silent-PP pipes and couplings, resistant to low and high temperatures, resistant to ultraviolet rays, and resistant to aggressive substances, and pre-assembled lamellar seals in EPDM. Connect the discharge pipes and the couplings supplied in the kit.



TC 14. Water panel distributor (Standard Option)

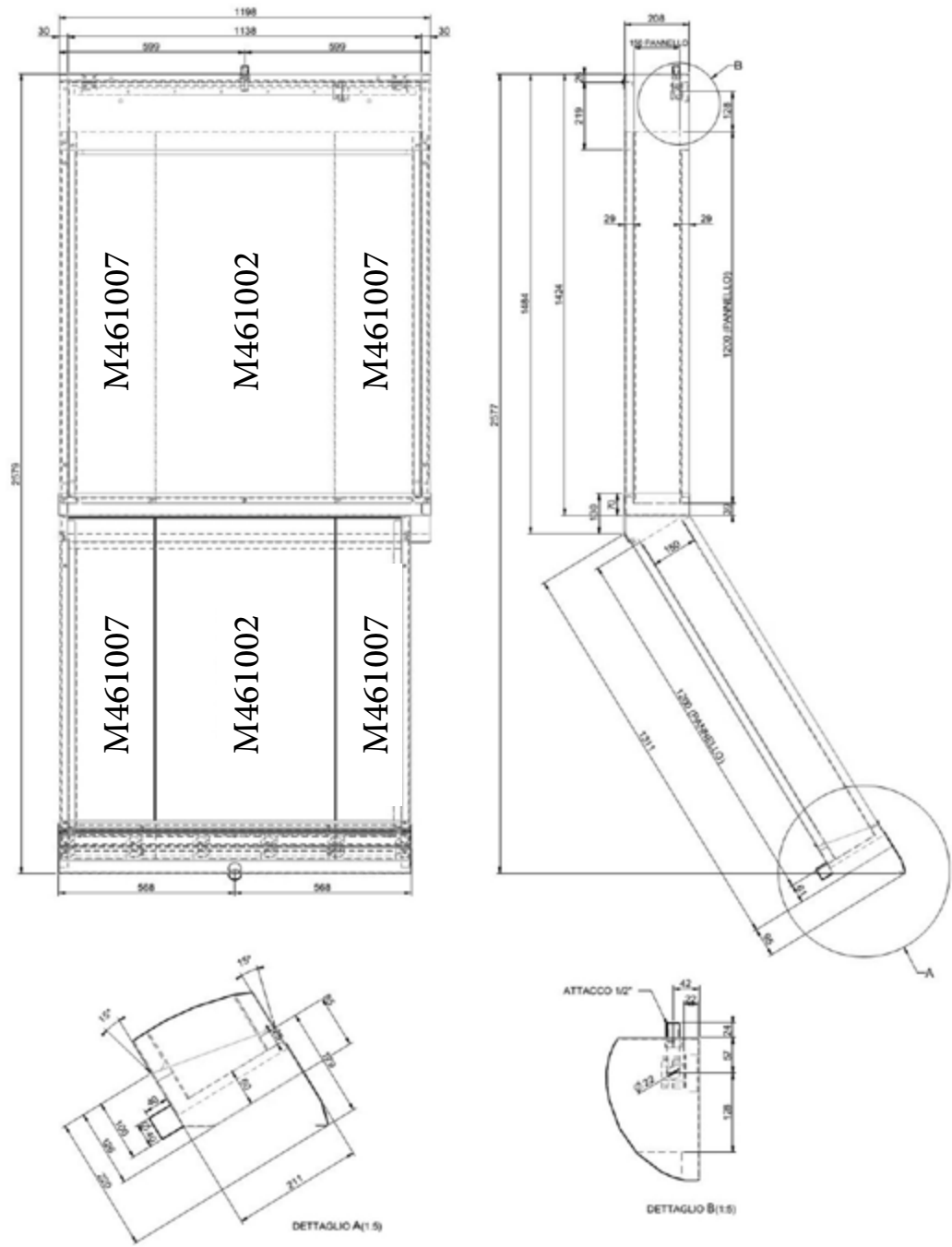
TC 14.1
The water distribution system of each module consists of a cross connection in copper piping with brass fittings complete with Lechler full cone nozzles, for an adjustable flow rate pressure of between 0.5 and 2 bars. In practical terms, the flow rate can be varied from a minimum of 2 l/min up to a maximum of 6 l/min for each evaporative panel, if a water flow regulating system is used. The nozzles can be quickly disassembled for cleaning operations.



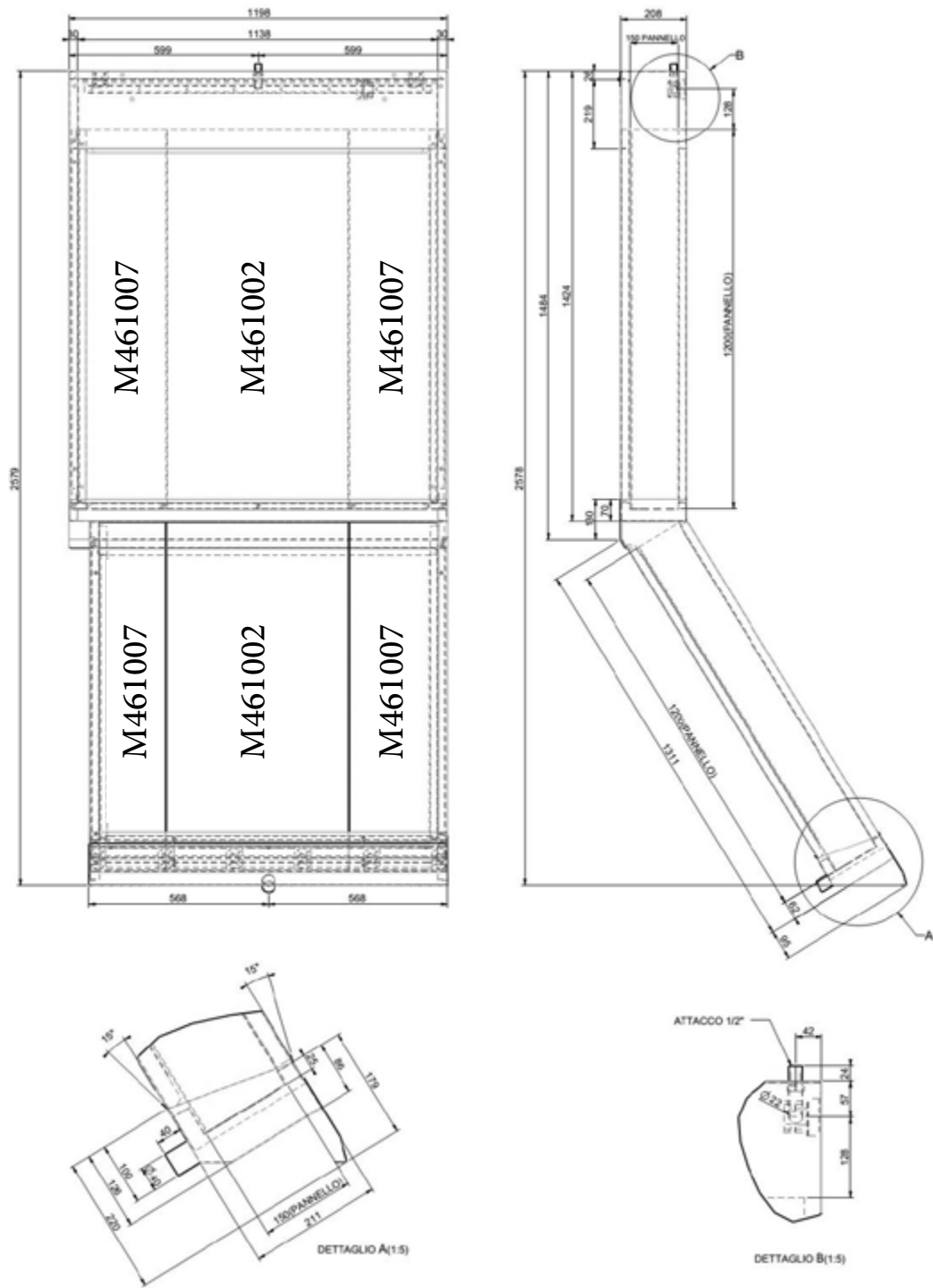
Cross connection of the module with ramp of nozzles Full cone nozzle view

TC 15. Dimensions of EPS evaporative module

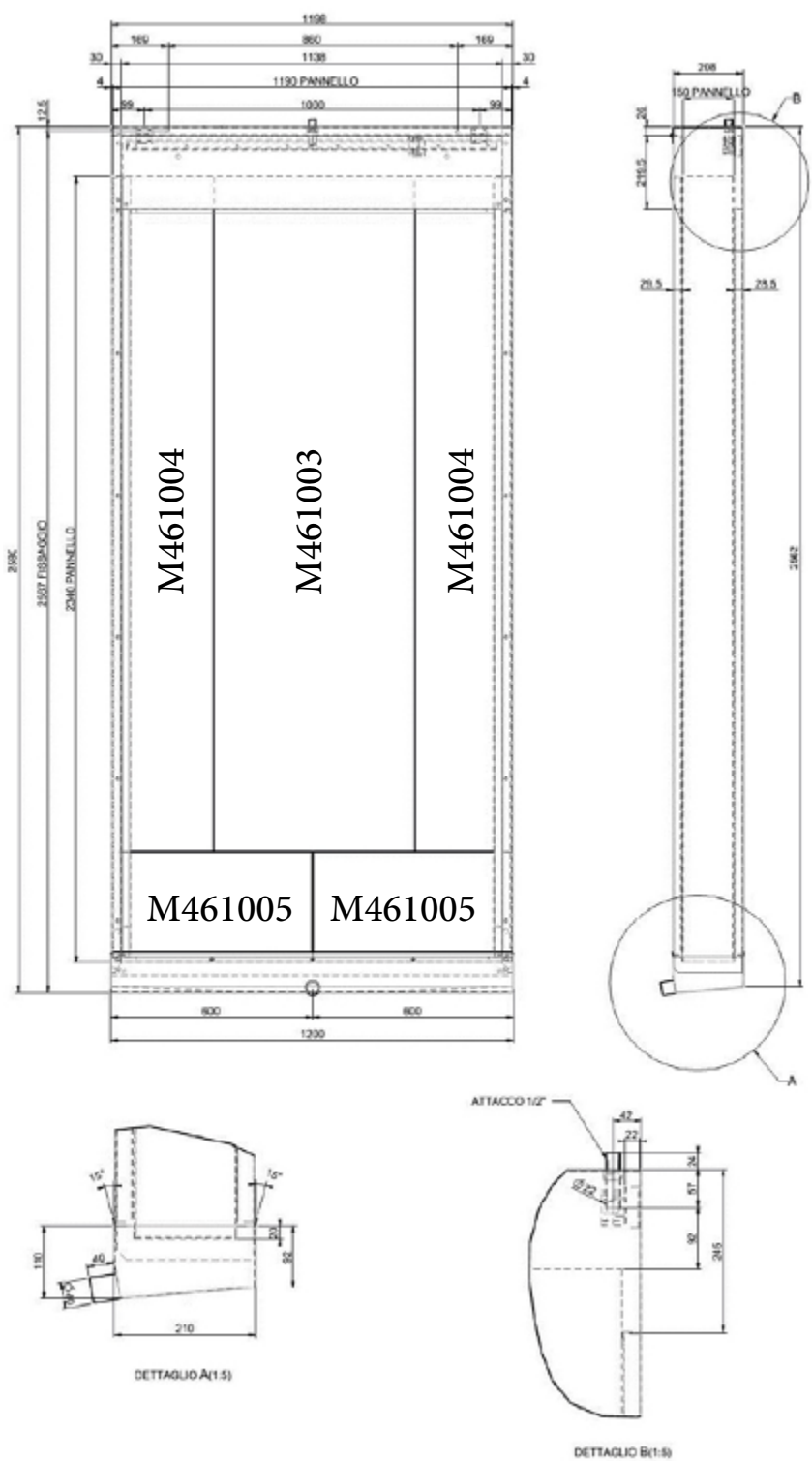
TC 15.1
Left module for Super Jumbo model, EPS Slanted option.



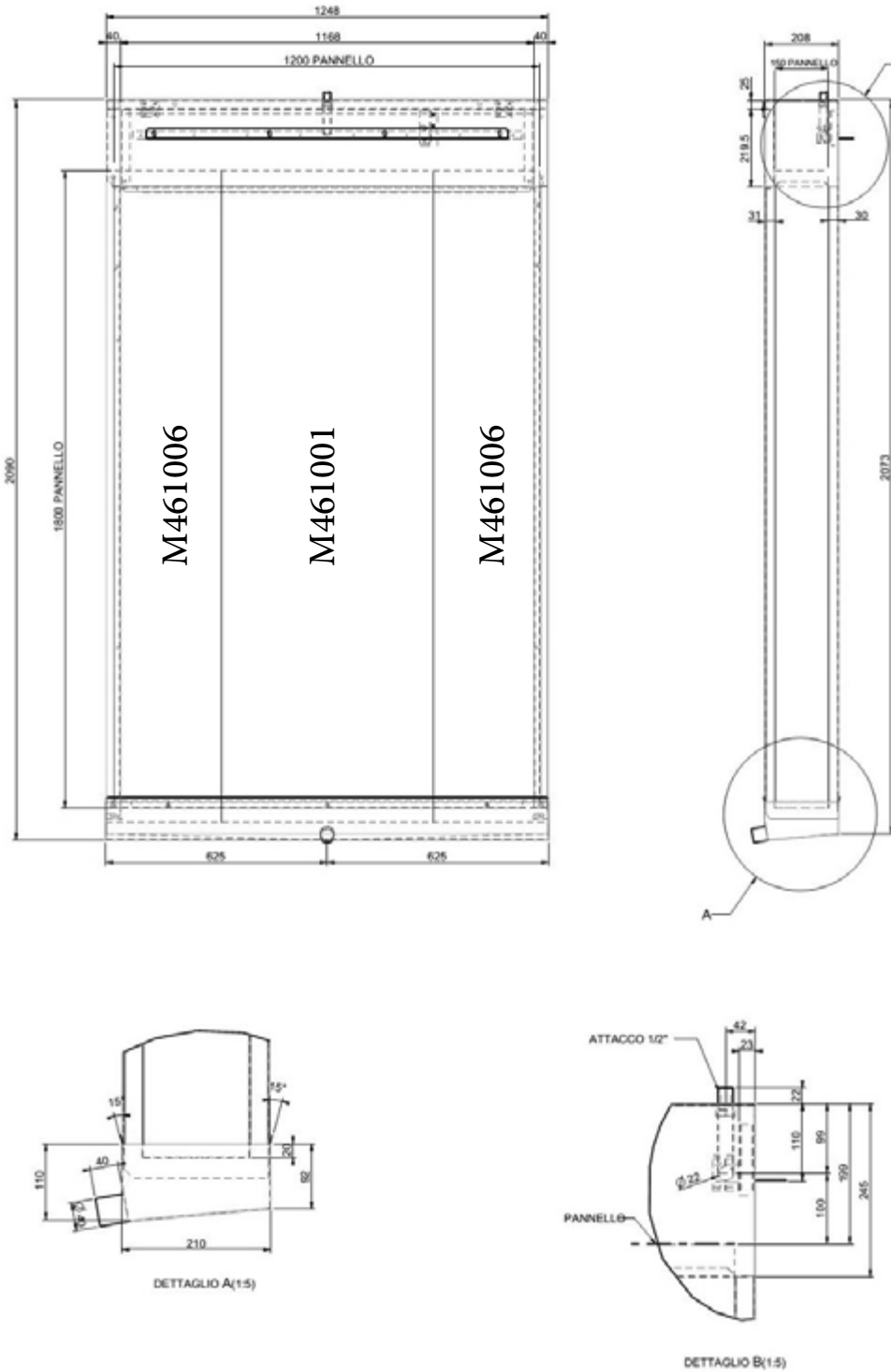
TC 15.2
Right module for Super Jumbo model, EPS Slanted option.



TC 15.3
Module for Super Jumbo model, EPS Vertical option.

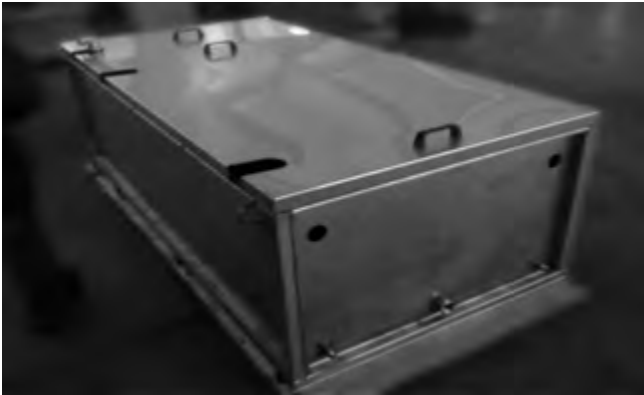


TC 15.4
Module for Jumbo model, EPS Vertical option.



TC 16. Recirculation tank kit (Special Option)

TC 16.1
The EPS system is an open system, in which the water collected in the tanks of the modules is fed into the waste-water network. A kit is available for the transformation of the EPS system to recirculate it instead. **The attached hygienic certification refers to the open EPS system, which is therefore compliant with the reference norms, and not to the special option which comprehends the recirculation tank where the correspondence to the hygienic conformity depends on how the tank is used and therefore checking this point is a customer’s responsibility (e.g. discharge cycles, measurements and potential treatments).** However the tank kit is manufactured with adequate materials and it is equipped with automatic and manual discharge valves which enable the set-up for hygienic conformity. The recirculation kit consists of a double tank in AISI type 316L stainless steel to contain the water and the recirculation pump. The GRUNDFOS or equivalent (non-immersed) type electronic pump and inverter, located in the pump compartment, draws water from the water chamber and addresses it to the piping of the EPS system. Appropriate level gauges regulate the filling of the tank through a solenoid valve connected to the water supply network.



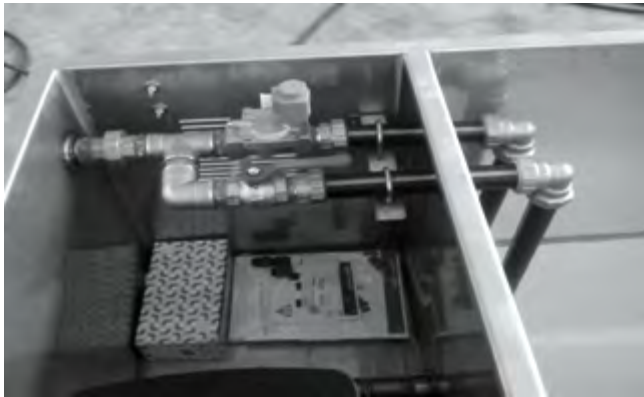
Double compartment tank



Side fixing points for discharge solenoid valve and 1/2” float valve



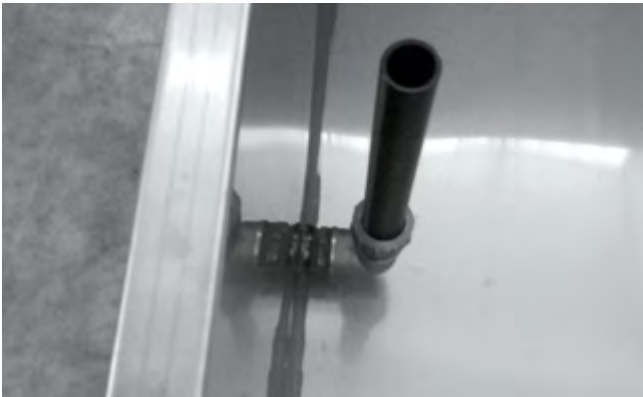
Water intake group. Solenoid valve and float valve for manual filling. Water supply 1” 1/4 GAS female outlet.



Electronic recirculation pump

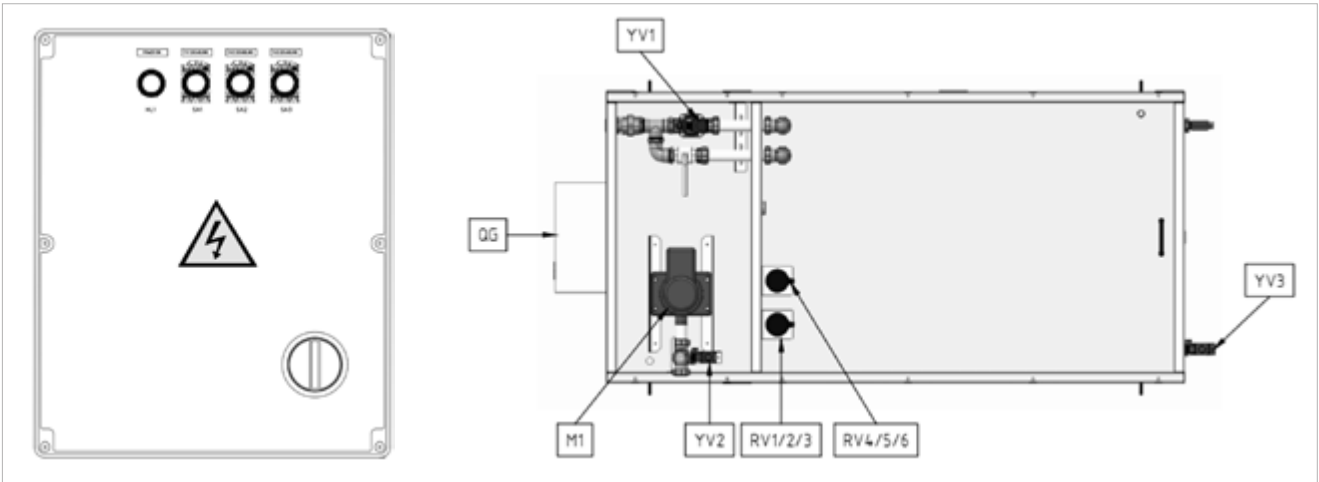


Electrode type level indicators

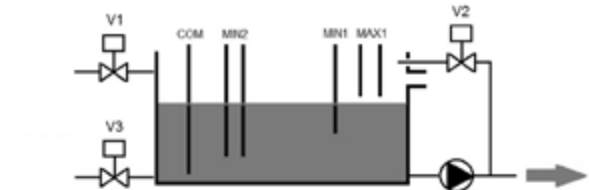


Overflow pipe and discharge plug for cleaning the tank

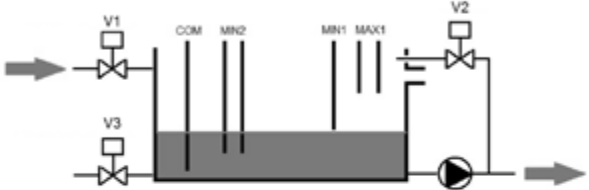
Tank control board for manage water levels



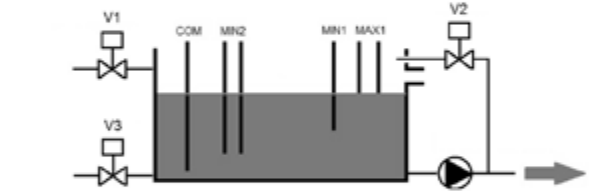
a) Pump start



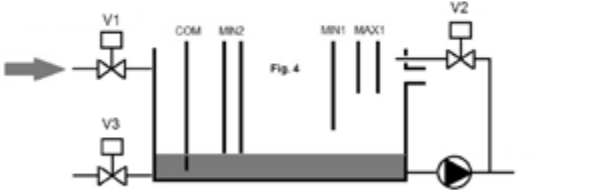
b) Filling Start



c) Filling Stop



d) Pump safety stop



e) Emptying cycle



TC 17. Operational guidelines

TC 17.1

The EPS system is not suitable for operation at ambient temperatures below 3°C. The system is therefore provided with solenoid valves for the discharge of the piping and possibly of the recirculation tank when present. If the ambient temperature falls below the limit specified the operating command is blocked.

TC 17.2

The environmental characteristics of temperature and relative humidity determine the cooling capacity of the evaporative panels. Preset the detection of these parameters for monitoring as provided for by the design.

TC 17.3

Operation for assisting the fan-motor (or water saving): the main parameter that must determine the start up of the EPS system, or the opening of the discharge solenoid valve, or the signal to the recirculation pump in systems with a tank, is the reaching of a programmable temperature or process pressure that the ambient air can no longer control. Shutdown will occur if the detected value falls below of a range that can be programmed to optimise and reduce fluctuations in operation. A control panel must manage the operation of the EPS system (e.g. the consent to the intake and discharge valves, the possible regulation of the water flow rate, the washing cycles, the sanitisation cycles, the reading of the sensors, the ranges of intervention, etc.). If the model is equipped with regulated motorised fans (electronic or inverter) from a dedicated control panel, the fan motor control logic will pilot the control panel of the EPS system.

TC 17.4

Combined operation for the fan-motors (or energy saving): the EPS system can be put into operation to reduce the temperature of the air intake in combination with the operation of the motorised fan for choking the airflow. This function can be used on models equipped with regulated motorised fans. The main parameter that must determine the start up of the EPS system, or the opening of the discharge solenoid valve, or the signal to the recirculation pump in systems with a tank, is the reaching of a programmable speed of the motorised fan. Shutdown will occur if the detected value falls below a range that can be programmed to optimise and reduce fluctuations in operation. A control panel must manage the operation of the EPS system (e.g. the consent to the intake and discharge valves, the possible regulation of the water flow rate, the washing cycles, the sanitisation cycles, the reading of the sensors, the ranges of intervention, etc.) that is piloted by the control panel dedicated to the motorised fan.

TC 17.5

For the setting of the operating parameters, refer to the manual of the electric control panel of the EPS system.

TC 17.6

For the water consumption of the adiabatic system, the following parameters were defined:

MIN = theoretical water consumption referring to technical data

MID = practical working water flow (about 4 l/min of water per panel)

MAX = cleaning water flow (discretionary, about 6 l/min of water per panel)

TC 18. Disposal and recycling

TC 18.1

Disposal must be carried out by qualified and qualified personnel in accordance with the environment as prescribed by current legislation.



Hygiene certificate

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