

MITA SYSTEM B COOLING STATION

The MITA SYSTEM B cooling stations are designed as an integrated solution to manage cooling systems by means of cooling towers. The structure, consisting of a concrete monolith, integrates tanks, technical room and can be used as the support surface for the cooling tower (ceiling slab). This solution therefore integrates all the main components making up the system in a single preassembled block, ready to be connected to the customer's hydraulic and electric system.

Utility pumps and fans are controlled by an inverter to guarantee flexibility of use, adaptability to thermal load, energy-savings, management safety and lower noise.

Cooling water quality is crucial for maximum efficiency in production plants. Our stations are designed to independently manage water chemical-physical properties, giving the option of managing it through inductive conductivity measurements.

Main advantages

- Tested solutions and guaranteed result
- Easy design for the customer
- Very high energy efficiency
- Easy to manage
- Optimisation of spaces
- Optimisation and standardisation in the choice of components
- Reduction of operating costs
- Reduction of installation and testing costs
- Investment protection: the plant can easily be removed and transferred

The station is also provided with electric services, such as automatic lighting, electric service sockets and antifreeze protection by means of electric heaters



TECHNICAL DESCRIPTION OF THE SUPPLY

Station:

The station is made of a monolithic concrete structure including two external tanks with a technical room between them to house the equipment.

It can be entered through a door with an anti-panic opening. The ceiling slab is sized to support the cooling tower.

The two tanks provide a thermal flywheel with temperature stability and a good amount of autonomy should the water supply be missing temporarily.

There is a manhole at the top of each tank for inspection and cleaning.

Utilities circulation unit

Water circulation in the utilities is provided by a group of pumps designed for use in cooling systems.

The unit is supplied already assembled, inserted in the system and mounted on a sturdy painted sheet metal base, provided with adjustable feet for levelling.

The delivery and intake manifolds, sized to reduce flow turbulence to a minimum, the use of antivibration joints and the stiffness of the manifold-frame system frees the plant of vibrations and resonances.

Maintenance interventions are facilitated by the complete disassembly of all components, assembled by means of galvanised screws and bolts.

Each electric pump is equipped with an anti-vibration joint in EPDM, with butterfly shut-off valves and a check valve.



TECHNICAL DESCRIPTION OF THE SUPPLY

The use of centrifugal, normalised, monobloc electric pumps, with direct motor-pump coupling, with main sizes and performance as per EN 733, guarantees constant reliability and interchangeability over time.

The use of the inverter to manage the pumps stabilises pressure in respect to flow rate variations in system and adapts the characteristic curve of the pump to the actual curve of the system, so as not to waste energy.

The characteristic curves of the electric pumps were chosen with special care, to achieve the maximum performance at the operating conditions for which they were designed.

Tower pump

Water circulation in the tower is provided by a pump designed for use in cooling systems. The pump is supplied already assembled, inserted in the system and mounted on a sturdy painted sheet metal base, provided with adjustable feet for levelling.

Maintenance interventions are facilitated by the complete disassembly of all components, assembled by means of galvanised screws and bolts.

The electric pump is equipped with an anti-vibration joint in EPDM, with butterfly shut-off valves and a pressure gauge to control operation.

The use of centrifugal, normalised, monobloc electric pumps, with direct motor-pump coupling, with main sizes and performance as per EN 733, guarantee constant reliability and interchangeability over time.



TECHNICAL DESCRIPTION OF THE SUPPLY

Control panel

The station is managed by an electric control and power panel, designed to automatically manage the typical functions of cooling circuits with a cooling tower.

The operating logic managed by a touch screen PLC provides maximum control safety in the system, incorporating all the functions and reducing the electric components to a minimum. The main functions can be programmed on the colour touch screen operator panel.

The equipment is stored in a sturdy metal cabinet protected with anti-corrosion coating.

The controls and signals necessary to easily verify the conditions of the system are applied on the front part.

The system can be managed and operation set on the touch screen display. All alarms are signalled by means of a flashing indicator light, while the PLC display shows the type of alarm, including its history.

The panel can be remote-controlled by a start/stop command. There is also a general alarm signal contact.

The motors of the utility pumps and fans are controlled by an inverter, thus guaranteeing:

- consistent energy-saving
- flexibility and adaptability to the loads
- reduced maintenance
- the motor is extremely silent thanks to the high switching frequency and the waveform of the almost sinusoidal current
- Integrated EMC/RFI filter
- IP 54 protection rating



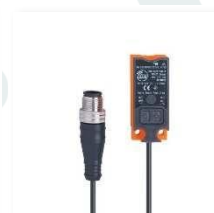
Utilities	Logic	Type of control	Adjustment parameter
Utility pump no. 1	Operation	Inverter management	Pressure
Utility pump no. 2	Spare	Inverter management	Pressure
Tower pump	Operation	Direct start-up	Fixed flow rate
Fan	Operation	Inverter management	Temperature

TECHNICAL DESCRIPTION OF THE SUPPLY

Sensors

The temperatures are controlled by high precision 4-20 mA probes and regulate the plant according to the required thermal output. Pressure is controlled by high precision 316 stainless steel 4-20mA sensors for inverter control and regulation.

The water level is controlled by a 4-20mA sensor coupled to a capacitive safety digital sensor which stops the pumps if water is missing. The system includes a transparent piping to view the water level.



TECHNICAL DESCRIPTION OF THE SUPPLY

Water treatment

The water in the circuit is managed by a combination of devices which prevent organic build ups and pollution, keeping quality constant.

The main functions are:

- control of water level in the tanks
- dosage of descaling-anticorrosive-anti-algae additives
- salinity control by means of concentration ratio

The main advantages are:

- optimisation of system parameters
- automatic adaptation to production loads
- elimination of dosage and purging waste
- pre-mounted and assembled components

A level sensor detects the amount of water in the collection tank and manages its topping up to keep the level within certain limits. The amount of water topped up is processed by the dosage which optimises use of the additives to maintain the preset parameters.

The additives are injected by an electronic dosing pump, installed on a transparent polyethylene graduated container, complete with minimum level switch.

Purging is carried out by a motorised valve with spring-operated closing and manual control. The water is topped up by means of a self-actuated solenoid valve with anti-water hammer device and manual control.

Both circuits are controlled by totaliser counters.

The system is equipped with filters, check valves and sampling cocks and is capable of automatically adapting to production loads, eliminating dosage and purging waste.



TECHNICAL DESCRIPTION OF THE SUPPLY

Water softening

The duplex column exchange volumetric water softener is ideal for 24-hour production cycles.

It was designed to dispense softened water, non-stop, even during the regenerating phases. It guarantees continuous dispensing of calcium and magnesium salts free water which are most responsible for scaling in cooling systems.

It saves on management as regeneration only takes place when the regenerative capacity has actually finished.

Before entering the circuit, feed water is filtered and treated on a bed of strong cationic resins to prevent scaling effects due to the presence of salts.

The electronically controlled valve provides high flexibility and precision in programming the cycle and managing the water softener. The display shows the residual capacity and the column in operation.

The choice of food grade ion exchange resins, with homogeneous calibration, guarantees a constant supply of softened water over time.



TECHNICAL DESCRIPTION OF THE SUPPLY

The resins are contained in columns made of an internal one-piece thermoplastic blow moulded shell, with suitable food grade materials and an external sturdy laminate covering, consisting of glass wool filaments and epoxy resin.

The large capacity of the column allows for homogeneous mixing and rinsing of the resins.

Regeneration of the column is managed by an electronic counter which controls the valve.

The large sized container, in white polyethylene, provides a considerable charge autonomy and an ideal solution for brine.

The level indicator printed on the tank allows you to precisely regulate the brine.

Two-piece safety filter with body and discs in washable polypropylene.



TECHNICAL DESCRIPTION OF THE SUPPLY

Assembly

All of the equipment is hydraulically and electrically connected inside the station.

The pipe connections, in black steel with an appropriate diameter, are implemented by means of submerged arc welding and self-centring connection joints with groove locking and sealed with EPDM gaskets. The galvanised pipes or smaller than 2" are connected by UNI ISO 7/1 thread with workable galvanised cast iron fittings.

The pipes will be complete with brackets, two piece collars, elbows, flanges, antivibration joints, special fittings and fixed to the structure of the station by 40 x 40 galvanised profile brackets.

The electrical connections from the control panel to the equipment of the station are implemented by means of multi-core cables, double insulation, laid in conduits and visible tubes with an IP 55 protection rating. The cables are sized according to IEC-UNI standards.

The station is provided with lighting systems by means of sensor-controlled lamps.

Heating system by means of electric stove controlled by ambient temperature thermostat. 220Vac service sockets for small maintenance jobs. Electric services distribution panel complete with circuit breaker switches.

Equipment installed:

- tower circulation pump
- utilities circulation unit
- water treatment
- water softening
- electric panel
- station services

If the tower is installed on the station roof, hydraulic delivery pipes to the tower and relative electrical connections (custom-made) will be supplied.



TECHNICAL DESCRIPTION OF THE SUPPLY

Arrangements by the customer

The user must set up the base to position the system and take care of the hydraulic and electric connections.

The external hydraulic and electric connections of the cooling tower and of the tank are already set up and must be connected, if necessary making small adjustments due to misalignments.



MITA
cooling technologies

TECNICA SPECIFICATIONS

Thermal capacity	kW	925
User flow rate	m ³ /h	200
User water pressure	bar	3,0
Total water consumption (at max capacity)	Lt/h	2.000
Installed electrical power	kW	55
Max electrical power in use	kW	33
Voltage/Phase/Frequency	Volt AC	400/3/50
POTENZA QUADRO PRESE DI SERVIZIO	kW	6
TENSIONE ALIMENTAZ. QUADRO PRESE DI SERVIZIO	Volt AC	220/50
TENSIONE AUSILIARI/ELETTROVALVOLE	Volt	24
TENSIONE PLC	Volt	24
ACQUA ALIMENTAZIONE A 3÷5 BAR	mc/h	6
DUREZZA MAX	°F	35
SALINITA' MAX	µS	1.000
TORBIDITA' MAX	NTU	3
FERRO MINORE	mg/l	0,1
MANGANESE MINORE	mg/l	0,4
SOLIDI IN SOSPENSIONE	Assenti	
UTENZE	DN	150
ALIMENTAZIONE	"	1
DIAMETRO CONNESSIONE SCARICO (PVC)	Ø mm	50
dimensioni indicative		
LUNGHEZZA	mm	6.000
PROFONDITA'	mm	2.500
ALTEZZA	mm	2.560
TORRE)	kg	23.500