

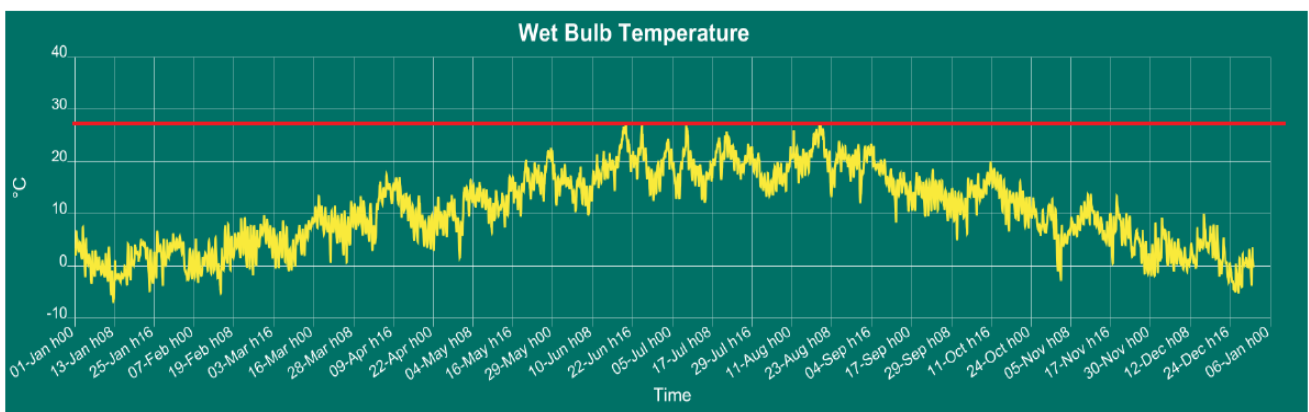
MITA CONTROL SYSTEM - DESCRIPTION

The MITA CONTROL SYSTEM (MCS) is an accessory developed by MITA for regulating cooling tower output.

At the heart of the system lies an inverter, which regulates motor-fan speed according to readings from a temperature probe. The main function of the system is to keep recirculating water outlet temperature under control according to set point.

Cooling towers are sized using design conditions, which are always the worst-case scenario: Maximum heat load at the most demanding ambient conditions (design Wet Bulb Temperature).

In reality these conditions rarely occur:



Wet bulb temperature variation over a year. Red line show design condition.

As operating conditions vary throughout the year, the MCS regulates cooling tower output in order to achieve:

- Electricity savings
- Reduced wear of electromechanical parts resulting in lower maintenance costs
- Reduced water consumption
- Reduced water treatment costs
- Reduced noise emissions

The MCS is a simple, reliable and efficient system that can be installed remotely or fixed directly on the unit

MCS is available for all MITA COOLING TECHNOLOGIES cooling tower range.



**ENERGY
SAVING**



**WATER
SAVING**



**LIMITED
NOISE**



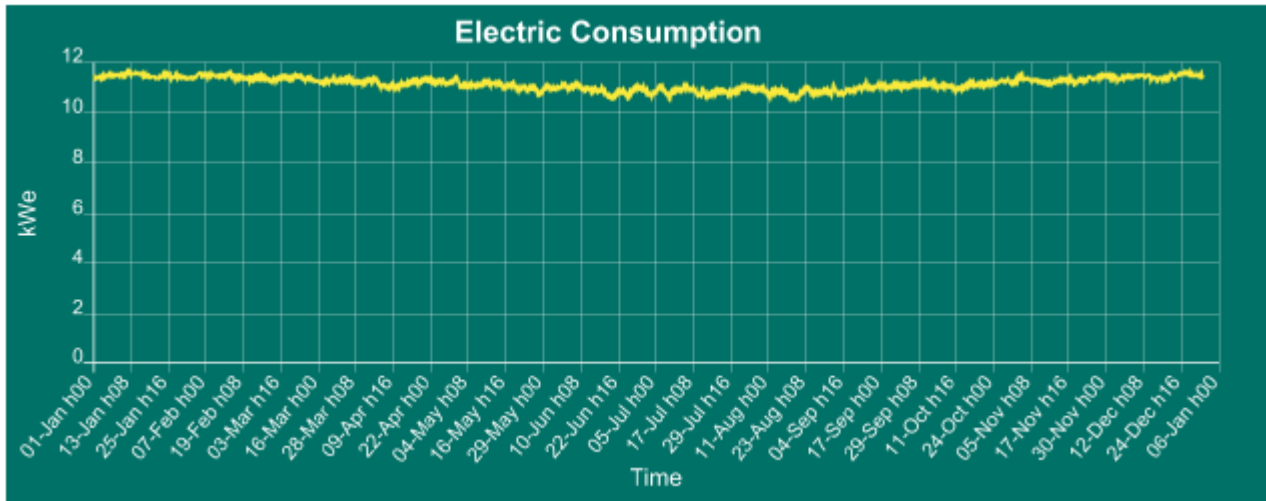
**RELIABILITY ANI
QUALITY**

MITA CONTROL SYSTEM – ENERGY SAVINGS

Data here below shows motor load for a given unit with same operating conditions with and without MCS. The simulation takes into account a full and constant load of 1750kW over a year.

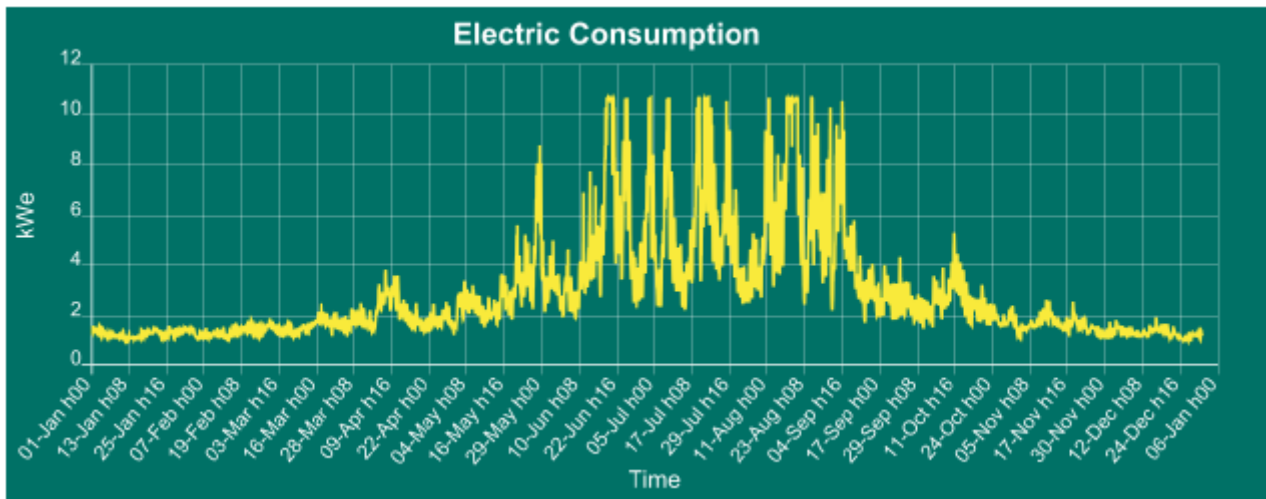
Without MCS:

- 97.690kWh/year resulting in an expense of 11.723€/year
- The only power variations are due to small changes in air density



With MCS:

- 25.156kWh/year resulting in an expense of 3.019€/year
- The power variations are large and due changing ambient conditions.



Annual savings amount to 8.704€/year*

*Energy prices 0.12€/kWh

Simulation executed with MITA ECO COOLER Software. Climatic data provided by METEONORM.

MITA CONTROL SYSTEM - SPECIFICATIONS

IP54 Electric panel with:

- Single or multiple inverters to control electric motors driving the fan(s):
 - o Power outputs from 0.37 to 18,5 kW per motor, 4/6/8/10/12/16 poles, 400V/3ph/50Hz → depending on the selected unit.
 - o Single or multiple (max 3 motors)
 - When controlling multiple motors, a circuit breaker will be installed on each feed line to protect individual electric motors
 - Each circuit breaker is provided with an light indicator showing if it has tripped
 - o Maximum of 75 m between MCS and motor
 - When controlling multiple motors, divide this distance by the number of motors controlled (when limit is exceeded, specific filters must be applied)
- Operating temperature range of use starting from -5 to 40°C
- 3P+N+PE
- PT100 temperature probe, for installation on the cooling tower's outlet piping and connected to the terminal board of the electric panel
 - o 10m or 30m wire
 - o probe diameter ½" G
 - o probe holder length 100 mm
 - o probe holder ½" G
- Programmed MITOS HMI panel, needed to actuate a back-feed PID control on the inverter to keep the temperature read by the probe constant as operating conditions change. The following parameters can be controlled or viewed from the interface:
 - o desired outlet temperature setting
 - o display of actual probe reading
 - o display of actual inverter output frequency
 - o display of actual inverter output voltage
 - o display of actual inverter output electric current
 - o display of actual inverter output current power
- Main cut-out switch
- Emergency button

Wiring diagram included in the supply



MITA CONTROL SYSTEM – OPTIONS & VARIANTS

OPTIONS that can be included with MCS, on request:

- Inverter BY-PASS system (to switch from inverter-controlled operation to DOL direct operation)
 - o Double manual ON/OFF selector switch for inverter + bypass circuit
 - o Double indicator light to show which of the two systems is active
- Electric motors PTC
 - o Light signal showing triggering of PTC (one for each motor)
- Electric motor heaters - system can be switch ON also with motors stopped
 - o Manual on/off selector switch (single)
 - o Light signal indicating its operation (single)
 - o Automatic disconnection system when motor starts up
- Basin heaters and pump connections. Provision of necessary outputs in terminal board, connection materials and accessories not supplied with EP
 - o Power supply and protection for one or two basin heater up to 7.5 kW each, 400V/3ph/50Hz
 - Manual ON/OFF selector switch (single)
 - Light signal indicating its operation (single)
 - o Power supply and protection for one pump up to 5.5 kW, 400V/3ph/50Hz
 - Manual ON/OFF selector switch
 - DOL start up
 - Light signal indicating its operation
 - o Level switch (always present if one of the above options is provided) to protect (switch off) both the previous systems in case of low level (low level = switch open)
- External installation kit:
 - o Canopy
 - o Transparent door
 - o On board installation



MITA CONTROL SYSTEM – SIGNALS & COMMUNICATION

Auxiliary outputs available in terminal board:

SIGNAL	TYPE	NOTES
Inverter fault	On-Off	Potential-free contact Closed=Fault
Circuit breakers	On-Off	Potential-free contact Closed=Motor Ok (if present)
Start inverter	On-Off	Closed=Start
Start Heater	On-Off	Closed=Start (if present)

Communication protocols available:

- Profibus
- Profinet
- Ethernet IP / Modbus TCP
- Device Net
- EtherCat
- CanOpen
- Bacnet