

| MODEL | DESCRIPTION |
|----------|--|
| W500T | Digital temperature controller P or P+I - 230 Vac |
| W500T4 | Digital temperature controller P or P+I - 24 Vac |
| W500TMB | Digital temperature controller P or P+I with Real Time Clock and RS485 Bus - 230 Vac |
| W500TMB4 | Digital temperature controller P or P+I with Real Time Clock and RS485 Bus - 24 Vac |



DESCRIPTION

Digital temperature controller (P or P+I) with main sensor, limit sensor and compensation sensor inputs.

APPLICATION AND USE

W500T controllers are employed in conditioning, thermoventilation and heating plants for temperature control (air and heat conductor fluids).

OPERATION

The controller is provided with two 0-10Vdc outputs and two relay outputs, which operate on the same temperature sensor.

The 4 outputs can operate in 4 different ways:

- Mode 1: Heating action
- Mode 2: Cooling action
- Mode 3: Heating/Cooling action (S/W changeover through digital input)
- Mode 4: Heating/Cooling sequence (output 1-5, 6-9) for analogue loops.
Timed output (on/off switching) for relay outputs.

Main function

With main temperature sensor:
it enables control for the 2 analogue outputs and 2 relay outputs.

Compensation function

With compensation sensor:
it enables the compensation curves setting in order to state the compensated Operating set.

Limit function

With Limit sensor:
it enables the min. and/or max. limit setting.
If the limit and compensation sensors are not connected, the functions are automatically disabled, unless such values are communicated by LinkBus. The sensors connected by LinkBus can be selected, if present, from the suitable menu.

The different functions will be enabled only if the relevant sensors are present.

The outputs have direct and reverse action (Mode 1 and 2) and give the possibility to carry out a heat/cool changeover sequence (Mode 3), even on only one analogue output, by using actuator sequence fields (1-5Vdc and 6-9Vdc fields, Mode 4). In this case, it will be possible to perform H+C+Reheat control with two analogue outputs only.

Real Time Clock (RTC) function (W500TMB/TMB4 only)

In case of RTC, it will be possible a time start according to a daily schedule with 4 time changeovers and a weekly schedule, which will enable the daily programme or one of the three possible fixed modes (Stop, Comfort, Reduced).

Connection to supervision centre (W500TMB/TMB4 only)

W500TMB controller can be connected to a supervision centre through serial RS485, with RTU MODBUS protocol.
The database is available on request.

Data display

Information viewing during the navigation will be subordinate to the sensor presence and to the various enabled functions.

Navigation is subdivided into 2 steps:

Step 1 : viewing and setting of the values related to the enabled functions.

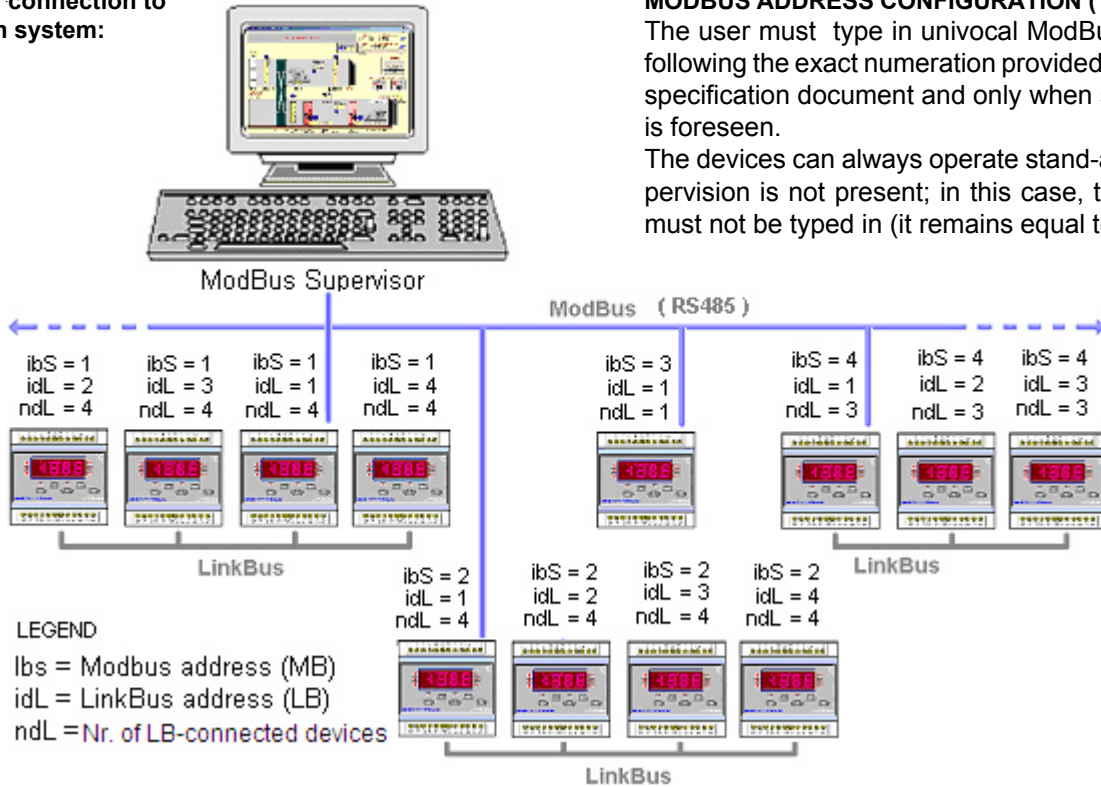
Step 2: definition of the operating mode and function enable.

LINK BUS

All models are provided with an internal communication bus, called "Link", for value interchange. It enables sensor saving on field (example: only one external compensation sensor).

It is possible to interconnect up to 4 controllers max.
All sensors are PTC-type and they can share data between the controllers connected via LinkBus.

Example of connection to supervision system:



MODBUS ADDRESS CONFIGURATION (“ibS”)
 The user must type in univocal ModBus address, following the exact numeration provided in the plant specification document and only when supervision is foreseen.
 The devices can always operate stand-alone, if supervision is not present; in this case, the address must not be typed in (it remains equal to 1).

“LINK BUS” ADDRESS CONFIGURATION (“idL” - Nr. 4 max)

The device must be configured as number and position, in order to be able to operate together with the others: the Number is the number of devices connected to the LinkBus, while Position indicates the device location between the *n*.

MAX. SYSTEM CONFIGURATION

- ModBus address 1 to 255 shared by the device with ModBus board (W500TMB/TMB4)
- LinkBus address 1 to 4 univocal for each device (ModBus board must have idL = 1)
- 3060 sensors, 2040 digital inputs, 2040 analogue outputs, 2040 relay outputs for a total of 9180 points.

| | | |
|--|----------------|--|
| Sensors connected to W500T (See data sheet) | Terminal board | screw terminals for max 2,5 mm ² leads. |
| SPTC-C pipe (water) | Inputs | 3 inputs PTC 1K |
| SPTC-CR immersion with stick enclosed | Outputs | 2 digital inputs |
| SPTC-D duct (air) | | 2 SPDT relay outputs 8(3)A |
| SPTC-E outside | | 250 Vac (W500T/TMB models) |
| SPTC-F strap-on | | 24 Vac (W500T4/TMB4 models) |
| SPTC-V duct (air) | Data display | on 3 1/2-digit display with digit 12,5 mm high |
| SPTC-A room | Data storage | on EEPROM |
| SPTC-A5 room with set point adjustment | | |

MANUFACTURING CHARACTERISTICS

The electronic board is inserted in a thermoplastic shock-proof case, for DIN rail assembly.

TECHNICAL CHARACTERISTICS

| | |
|-------------------------------------|--|
| Supply | 230 Vac (W500T/TMB models) 24 Vac (W500T4/TMB4 models) 50/60Hz ± 10% |
| Consumption | 3 VA |
| Material | ABS (UL94-V0 flame class) |
| Dimensions | 70x85x61 mm. |
| Protection degree | IP 20 |
| Mounting | DIN rail or on wall |
| Weight | 300 gr. |
| Operating room temp | T50 °C |
| Storage temperature | -25T70 °C |
| Operating room and storage humidity | 0...95% UR non-condensing |

Communication with supervisor:

| | |
|------------------------|--|
| Interface | RS485 |
| Communication protocol | Modbus RTU |
| Max cable length | 1Km |
| Internal Communication | LinkBus (max length 10m) (up to 4 controllers) |

Product conforms with EMC89/336 directive according to the following standards:

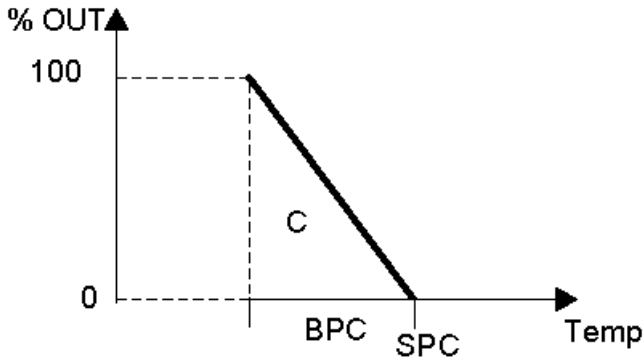
- for emission EN50081-1
- for immunity EN50082-1

Product in compliance with LVD directive, according to: EN 60730

OPERATING MODE DIAGRAMS

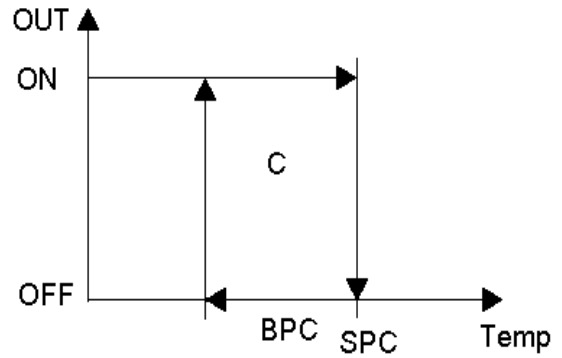
Heating Loop (analogue outputs)

Operating mode 1



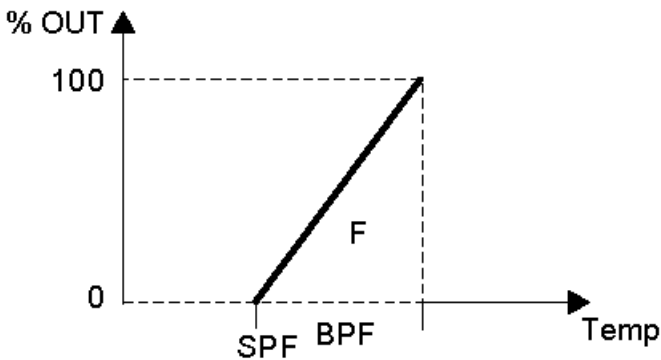
Heating hysteresis (Relay outputs)

Operating mode 1



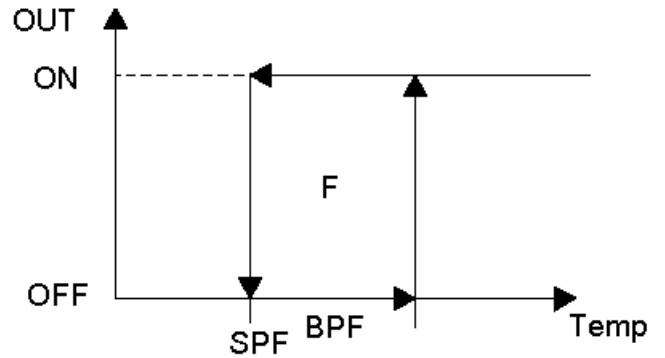
Cooling Loop (analogue outputs)

Operating mode 2



Cooling hysteresis (Relay outputs)

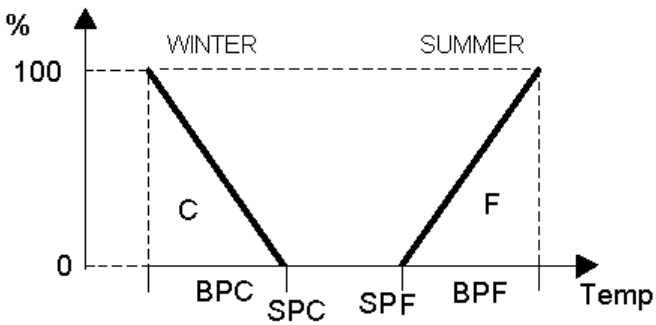
Operating mode 2



Heating/Cooling Loop (analogue outputs)

With S/W changeover from digital input 2

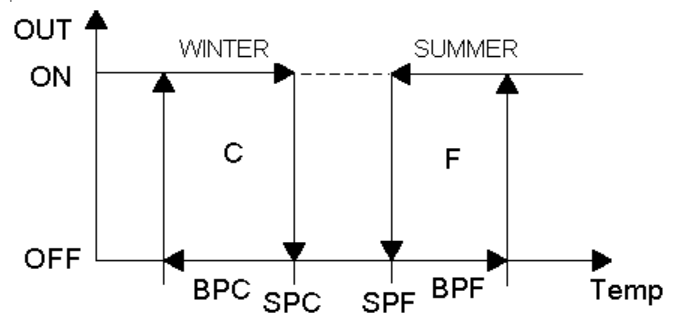
Operating mode 3



Heating/Cooling hysteresis (relay outputs)

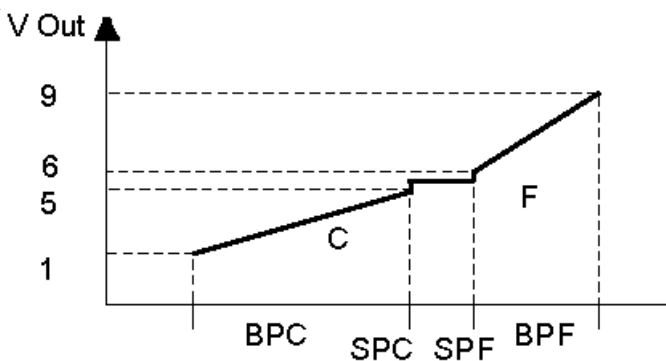
With S/W changeover from digital input 2

Operating mode 3



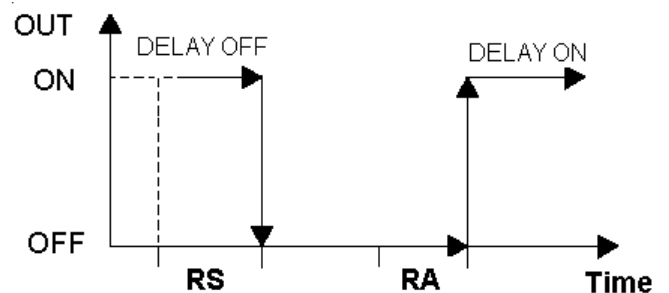
Heating/Cooling sequence (analogue outputs)

Operating mode 4



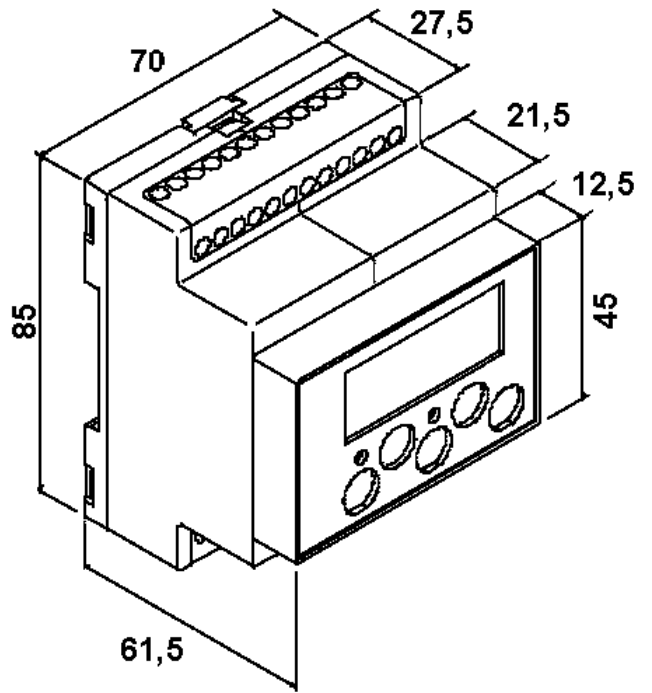
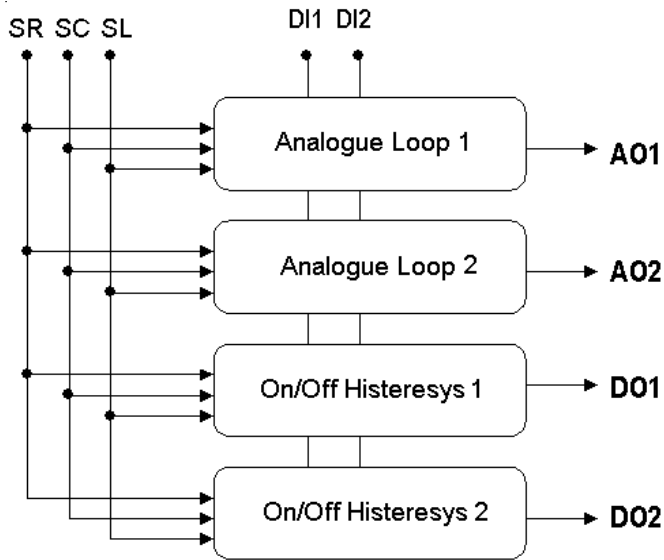
On/off delays (relay outputs)

Operating mode 4



OPERATING DIAGRAMS

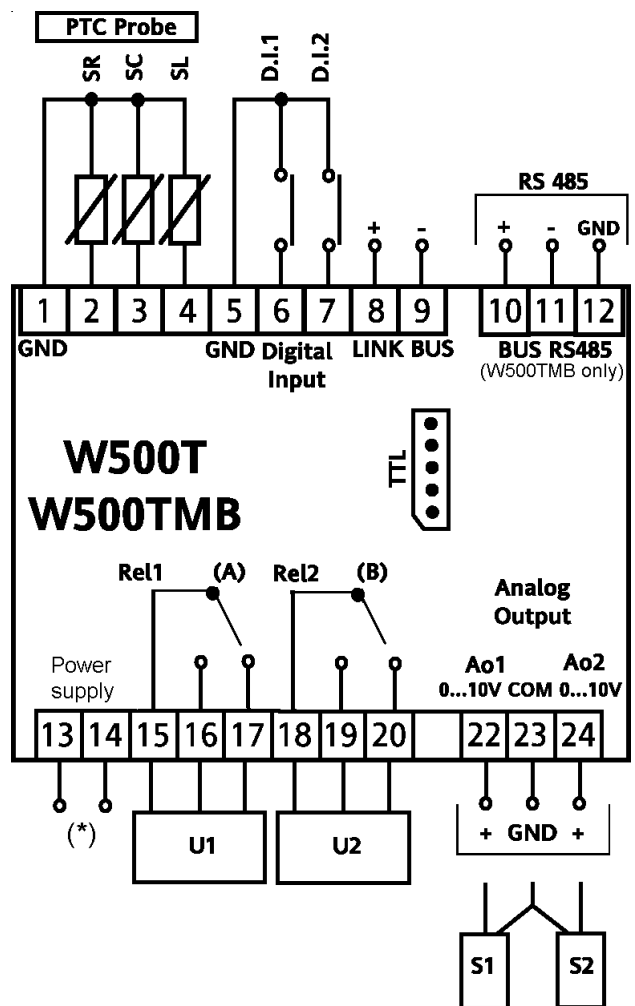
OVERALL DIMENSIONS (mm)



ELECTRICAL CONNECTIONS

Legend

- 1 GND
- 2 Control sensor "SR"
- 3 Compensation sensor "SC"
- 4 Limit sensor "SL"
- 5 GND
- 6 Digital input 1
- 7 Digital input 2
- 8 Link Bus +
- 9 Link Bus -
- 10 RS485 +
- 11 RS485 -
- 12 GND 485
- 13 | Power supply: 230 Vac (W500T/TMB)*
- 14 | 24 Vac (W500T4/TMB4)*
- 15 Common
- 16 NO contact | Relay 1 (230 Vac - W500T/TMB)
- 17 NC contact | (24 Vac - W500T4/TMB4)
- 18 Common
- 19 NO contact | Relay 2 (230 Vac - W500T/TMB)
- 20 NC contact | (24 Vac - W500T4/TMB4)
- 22 0..10V output Ao1
- 23 Common
- 24 0..10V output Ao2



The performances stated in this sheet can be modified without any prior notice due to design improvements.



Automatic control systems for:
air conditioning/heating/industrial thermal process.