

INSTRUCTIONS FOR INSTALLATION AND USE OF MTW 11-12.

WIRING DIAGRAM

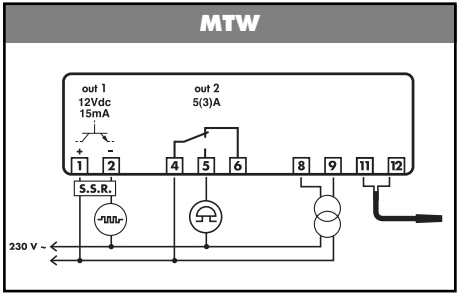


FIG. 1/ BILD 1

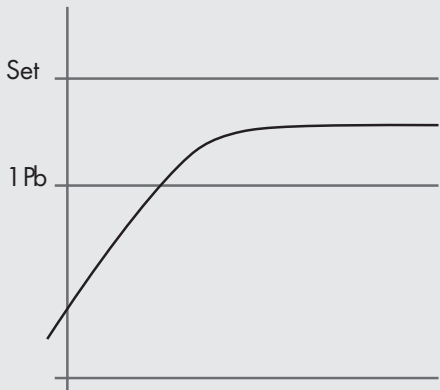


FIG. 2 / BILD 2

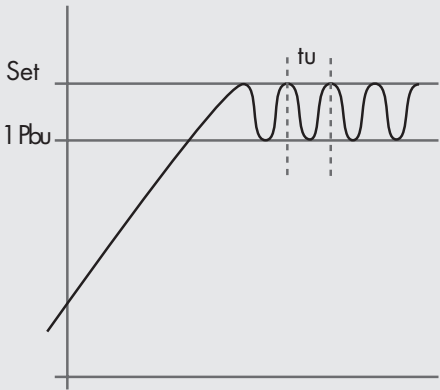
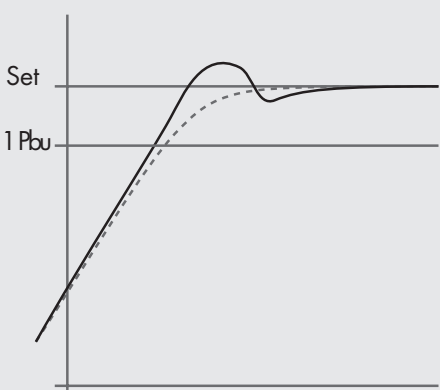


FIG. 3 / BILD 3



TECHNICAL DATA

MTW11/MTW12

Dimensions	75x35x70 mm
Operating temp.	-10°...+50°C
Range	refer to data on unit
Input	refer to data on unit
Relay power rating	refer to data on unit
Connections	screw terminal blocks, Ø 2 mm ²
Supply voltage	12 Vac/dc ±10%
Consumption	2VA
Front panel protection	IP40; opt. IP54
Enclosure inflammability	fire-retardant



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We reserve the right to make modifications without prior notice.

MTW../1 is a controller which allows temperature control in ON/OFF mode with hysteresis or P.I.D. with output activation time modulation. Version **/2** offers a second output, controlled in ON/OFF mode with hysteresis, which is used for alarm, 2nd threshold etc.

1 INSTALLATION

1a The instrument is secured to the panel from the rear by means of the suitable brackets. If using the rubber gasket (vers."S"), this must be interposed between the instrument bezel and the panel, checking the perfect adhesion carefully.

1b For proper functioning, the instrument needs an ambient temperature between -10°...+50°C and 15%...80% relative Humidity. To improve protection of the probe against electro-magnetic interference, which might compromise its function, place its cable and the controller away from power lines.

1c Outputs, power supply and probe must be connected strictly following the diagram on the enclosure, where the maximum switching loads and supply voltage are indicated, too. The probe screen must not be connected to any other leads. If the external transformer is needed, the instrument must be powered by the suitable transformer supplied by LAE (mod. TR...).

CAUTION! If the relay switches a large load frequently, we suggest you contact us to obtain information about the relay contact life.

Caution: where delicate or valuable products have to be maintained in special conditions, the same instrument should not be used for both control and limit functions. In such cases a separate instrument for each function is recommended.

2 FUNCTIONING DESCRIPTION

In the basic functioning, the display shows the temperature measured by the probe and, by means of the respective LED'S, the output status.

2a To display the setpoint assigned to the output "out 1", press key **[1]**; to change its value, while you keep it pressed, push key **[+]** or key **[=]**.

2b To display the setpoint assigned to the output "out 2", press key **[2]** and act as per **2a**.

2c If an overrange or a probe failure occurs, "lor" is displayed and the outputs will work as programmed with the parameters 1PF and 2PF.

3 SETUP

Through the setup it's possible to configure the instrument in such a way as to obtain the desired functioning. Access to it is possible by sequentially pressing keys **[+]****[1]****[+]** and keeping them pressed for 3 seconds.

The available parameters are the following:

1Lo: -199...999°C minimum programmable setpoint for out 1

1hi: 1Lo...999°C maximum programmable setpoint for out 1

1hY: -100...100°K switching hysteresis for out 1

***1Pb:** -125...125°K band of proportional

control for out 1

***1it:** 00...999 sec. integrative action time for out 1

***1dt:** 00...999 sec. derivative action time for out 1

***1Ar:** 00...100% integrative action reset, referred to the Proportional band of out 1

1ct: 01...255 sec. cycling time of out 1

1PF: 00...01 status of out 1 with probe failure or overrange (00=off; 01 =on)

2Lo: -199...999°C minimum programmable setpoint for out 2

2hi: 2Lo...999°C maximum programmable setpoint for out 2

2hY: -100...100°K switching hysteresis for out 2

2ct: 01...255 sec. cycling time of out 2

2PF: 00...01 status of out 2 with probe failure or overrange (00=off 01 =on)

dPS: 00... 01 DON'T CHANGE !

The parameters marked with (*) regard proportional control of out 1; access to them is possible by choosing 00 for 1hY.

3a To select the desired parameter press key **[1]**. To display its value press key **[1]** and if necessary change via key **[+]** or key **[=]**; store it with key **[1]**. No key activation within 10 seconds approx. causes the instrument to switch over to the basic functioning.

3b The parameters 1ct and 2ct allow the programming of the minimum ON/OFF time. Ex. if 1ct = 60 seconds, after the switching of the out 1, this will remain in the new status for at least the programmed time, regardless of the temperature.

3c The positive or negative sign of the parameters 1hY, 1Pb, 2hY determines either heating (-) or cooling (+) control of the respective output.

3d The outputs are switched OFF for an undetermined time, individually or both, by choosing the value 00 for the parameters 1hY and 1Pb (out 1) and/or 2hY (out 2).

3e If the result of values assigned to setpoint and hysteresis (proportional band) exceeds the range of the instrument, the outputs will promptly switch OFF.

Ex. setpoint = -150°C, proportional band = -100°K; or setpoint 990°C with hysteresis = +20°K.

3f The values for the P,I,D actions should be suitably determined in order to minimise deviation between the controlled temperature and the setpoint also in response to alteration occurring within the control loop. There are various ways to calculate them; here below we give you an empirical method which is effective in most cases. Proceed to programming of the following values:

1Pb = a sufficiently wide value (max.)

1it = 1dt = 00

1Ar = 100

1ct = if the system is very quick, set 3-5 sec.

After programming, start control. When temperature stabilises within the proportional band (fig. 1), reduce its value until a regular hunting (Pbu) occurs and take note of the hunting period (tu) (fig. 2). Calculate the value for the parameters P,I,D by applying the

following formula:

1Pb	= Pbu	*1.6
1it	= tu	*2
1dt	= tu	*0.125

In case of a temperature overshoot, reduce the value of 1Ar (fig. 3).

4 CALIBRATION

Should it be necessary to recalibrate the instrument or alter the displayed value, proceed as follows:

4a Switch off the unit; press key **[1]** and **[2]** simultaneously, power the unit again.

4b 0°C calibration: when the temperature of the probe is between -30°...+30°C, press key **[1]** and **[2]**, "0Ad" appears; by keeping key **[1]** pressed, with keys **[+]** or **[=]** change according to necessity.

4c High temperature calibration: when the temperature of the probe is higher than 400°C, press key **[1]** and **[2]**, "SAd" appears; by keeping key **[1]** pressed, with keys **[+]** or **[=]** change according to necessity.

Attention: when this operation is carried out, you must bear in mind that 0°C calibration causes an offset all over the range, while span calibration (high temperature) causes a proportional deviation. Ex. if an offset of -10°C at 0° is set, this will cause a constant deviation all over the range. If a correction of -02°C at 400°C is set, at a temperature of 200°C the deviation will be -01°C.

When the operation is over, switch off the unit.

WARRANTY

LAE electronic Srl warrant that their products are free of any defects in workmanship and materials for a period of 1 (one) year from date of production shown on the enclosure. LAE electronic Srl shall only repair or replace those products of which defects are due to LAE electronic Srl and recognised by their technicians. LAE electronic Srl are not liable for damages resulting from malfunctions of the products.

Defects due to exceptional operating conditions, misapplication and/or tampering will void the warranty.

All transport charges for returning the product to the manufacturer, after prior authorisation by LAE electronic Srl, and for the return to the purchaser are always for the account of the purchaser.

