

Technical Manual Temperature Controller Series

TMD 1000

Nr. 5310777-00/01 E

General Description

The temperature controller of the series TMD 1000 contain a single setpoint or dual setpoint controller with dry relay contacts in a compact DIN-rail-housing. To read actual and setpoint value a digital display can be used. The single stage types allow to adjust the switching hysteresis, the dual stage types allow to adjust the dead band between the stages. These units are suitable for all standard applications. In the table on the right side you will find the exact type numbers.

Function

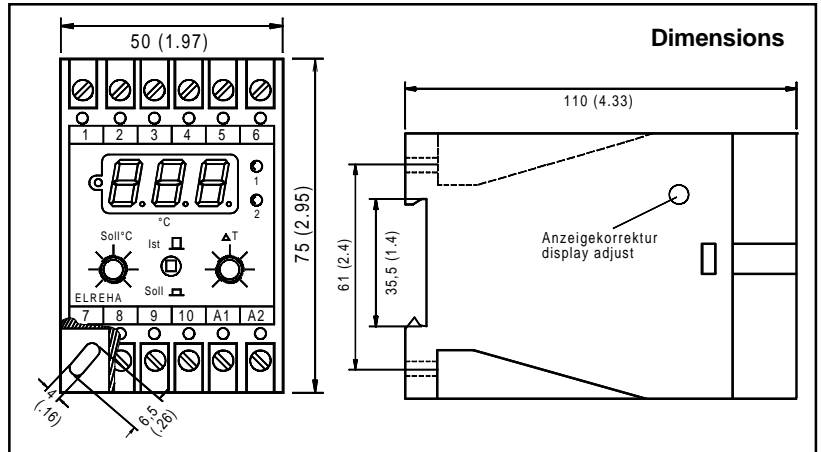
Normally the display shows the actual value measured by the temperature sensor. This actual value will be compared with the setpoint. The output relay will be activated or de-activated depending on the deviation of the two values. The principle is that the pre-set setpoint is the point where function (refrigeration or heating) gets switching off. The relay status is indicated by a LED.

Single setpoint controllers:

The control setpoint and the switching hysteresis can be adjusted, but the hysteresis cannot be displayed.

Dual setpoint controllers:

The control setpoint and the dead band (neutral zone) between the stages can be adjusted. The dead band cannot be displayed. The switching hysteresis of both stages is fixed. If the setpoint is shifted, the switching point of the second stage is shifted in the same way.

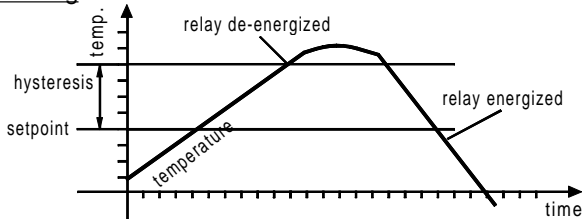


Technical Data

Supply voltage 230V AC / 50...60Hz
Output contacts SPDT, dry, 10A (cos phi 1),
4A inductive / 250V AC
Temperature range see table
Hysteresis (neutral zone
in dual stage types) adjustable 1.....10K
Hysteresis (dual stage types) 0,8K +/- 0,2K fixed
Switching/Display accuracy +/- 1K
Digital Display red, character height 13mm
Power consumption appr. 3VA
Ambient temperature -10.....+60°C
Conformity CE

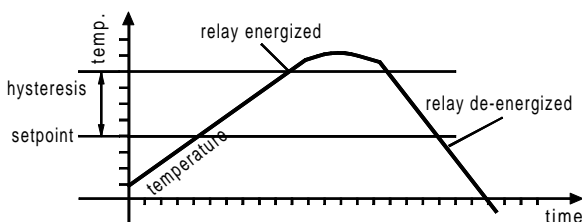
Switching Characteristic

Freezing



Actual > Setpoint plus Hysteresis (fixed hysteresis in dual stage types) = Relay de-activated, LED ON. The load is usually controlled by the N/O contact.

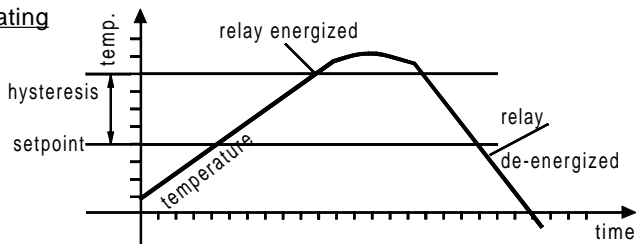
Refrigeration



Actual > Setpoint plus Hysteresis (fixed hysteresis in dual stage types) = Relay activated, LED ON.

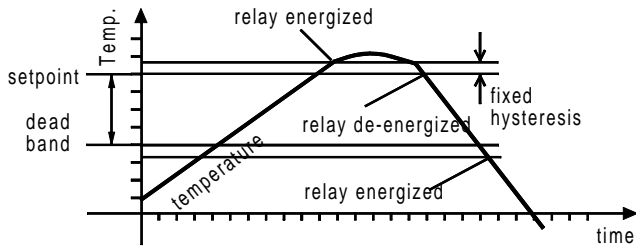
Typ	Reglerart	Anwendung	Relais K1	Relais K2	Sicherheit	Temp.-Bereich
type	configuration	application	relay K1	relay K2	safety behav.	temp. range
TMD 1110	Zweipunkt single setpoint	Tiefkühlen freezing	Tiefkühlen freezing		EIN ON	-40...+50°C
TMD 1120	Zweipunkt single setpoint	Kühlen cooling	Kühlen cooling		AUS OFF	-40...+50°C
TMD 1150	Zweipunkt single setpoint	Heizen heating	Heizen heating		AUS OFF	-40...+50°C
TMD 1153	Zweipunkt single setpoint	Heizen heating	Heizen heating		AUS OFF	0...+100°C
TMD 1210	Dreipunkt dual setpoint	2 x Tiefkühlen 2 x freezing	Stufe 1 (Sollwert) stage 1 (setpoint 1)	Stufe 2 (Schaltabst.) stage 2 (setpoint 2)	EIN / EIN ON / ON	-40...+50°C
TMD 1220	Dreipunkt dual setpoint	2 x Kühlen 2 x cooling	Stufe 1 (Sollwert) stage 1 (setpoint 1)	Stufe 2 (Schaltabst.) stage 2 (setpoint 2)	AUS / AUS OFF / OFF	-40...+50°C
TMD 1230	Dreipunkt dual setpoint	Tiefkühlen / Heizen freezing / heating	Tiefkühlen (Sollwert) freezing (setpoint 1)	Heizen (Schaltabst.) heating (setpoint 2)	EIN / AUS ON / OFF	-40...+50°C
TMD 1240	Dreipunkt dual setpoint	Kühlen / Heizen cooling / heating	Kühlen (Sollwert) cooling (setpoint 1)	Heizen (Schaltabst.) heating (setpoint 2)	AUS / AUS OFF / OFF	-40...+50°C
TMD 1250	Dreipunkt dual setpoint	2 x Heizen 2 x heating	Stufe 1 (Sollwert) stage 1 (setpoint 1)	Stufe 2 (Schaltabst.) stage 2 (setpoint 2)	AUS / AUS OFF / OFF	-40...+50°C
TMD 1253	Dreipunkt dual setpoint	2 x Heizen 2 x heating	Stufe 1 (Sollwert) stage 1 (setpoint 1)	Stufe 2 (Schaltabst.) stage 2 (setpoint 2)	AUS / AUS OFF / OFF	0...+100°C

Heating



Actual < Setpoint minus Hysteresis (fixed hysteresis in dual stage types) = Relay activated, LED ON.

Heating / Refrigeration with neutral zone



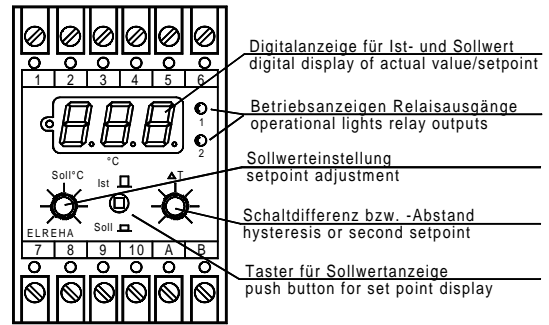
Failure handling

The display flashes and all relays will be de-activated if the temperature sensor is broken or short.

Operating

- Push and hold the button "IST/SOLL" to switch over to the setpoint display.
- Adjust the setpoint now with the potentiometer "Soll°C".
- Adjust the desired hysteresis (resp. dead band, dual stage types) with potentiometer "Schaltdifferenz" resp. "Schaltabstand". The left position of the potentiometer is the lowest value, the right position is the highest value. This value cannot be displayed.

Operating Elements



Installation

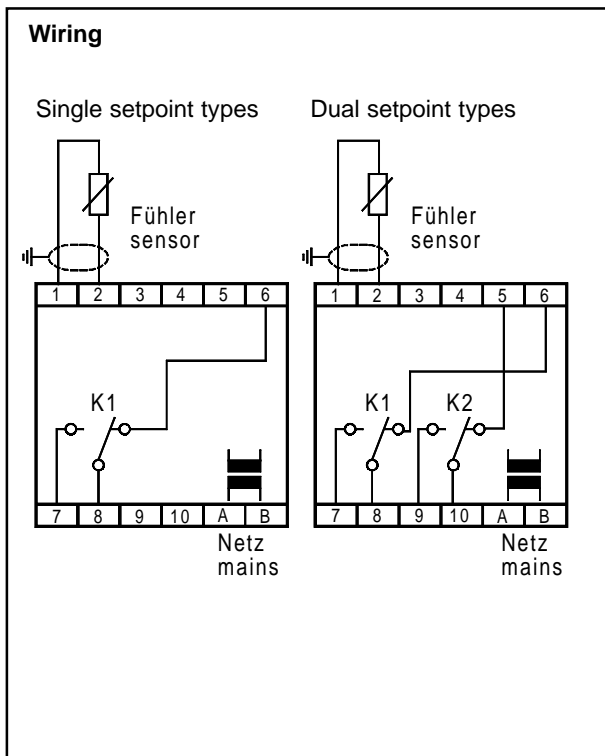
Do not run sensor wires in the same conduit together with high voltage cables (110V or greater). Keep a distance at least 1m from high voltage wiring, transformers, power relays and fluorescent lights to prevent irregular operation caused by electromagnetic interferences. Use shielded cable with one end of the shielding connected to PE. The cross-section of the cable is not critical, all cables > 0,5 sqmm are usable. Please note that the temperature sensors are protected against spraying water but not waterproof for a longer time. In the type table you will find informations how the load will be switched in case of a controller malfunction.

Display adjust

Adjust actual display if nessesary by using the potentiometer on the left side of the housing. Use a screwdriver to adjust.

Accessories (not included)

Temperature sensor TF 201



EG-Statement of Conformity



We state the following: When operated in accordance with the technical manual, the criteria have been met that are outlined in the guidelines of the council for alignment of statutory orders of the member states on electromagnetic consistency (89/336/EWG). This declaration is valid for those products covered by the technical manual which itself is part of the declaration. Following standards were consulted for the conformity testing with regard to electromagnetic consistency :

IEC 1000-4-1, IEC 1000-4-2, IEC 1000-4-3*, IEC 1000-4-4, IEC 1000-4-5, EN 55011 B, EN 50081, Teil 1 und 2; EN 50082, Teil 1 und 2

This statement is made from the manufacturer / importer by:

ELREHA Elektronische Regelungen GmbH
68766 Hockenheim
 (Name / Anschrift / name / adress)

Klaus Birkner,
Development and
leader of the EMC-
Laboratory

Hockenheim..... 9.1.96.....
 Ort/city Datum/date

[Signature]
 Unterschrift/sign

*The conformity with IEC 1000-4-3 is derived from the IEC 1000-4-2 and IEC 1000-4-4 test results. The correlation with IEC 1000-4-3 is based on test results which are located on site at the manufacturer.

This manual has been set up with care and to our best knowledge, but mistakes are still possible. If you have any problems, difficulties or questions please don't hesitate asking our technical support. Technical details can be changed without notice

set up: 26.5.97	by: tsd/jr	checked: 23.6.97	by: ek/al	approved: 23.6.97	by: tl/wr
-----------------	------------	------------------	-----------	-------------------	-----------