

# Operating Manual

## Electronic Temperature Controller Type TRN, TRN/20, TRM, TRM/20, TRH and TRH /20





**Dear Customer,**

we have made up this operating manual in such a way that all necessary information about the product can be found and understood quickly and easily.

Should you still have any question, please do not hesitate to contact **M&C** directly or go through your appointed dealer. Respective contact addresses are to be found in the annexe to this operating manual.

Please also contact our homepage [www.mc-techgroup.com](http://www.mc-techgroup.com) for further information about our products. There, you can read or download the data sheets and operating manuals of all **M&C** products as well as further information in German, English and French.

This Operating Manual does not claim completeness and may be subject to technical modifications.

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## Head Office

**M&C TechGroup** Germany GmbH ♦ Rehhecke 79 ♦ 40885 Ratingen ♦ Germany

Telephone: 02102 / 935 - 0

Fax: 02102 / 935 - 111

E - mail: [info@mc-techgroup.com](mailto:info@mc-techgroup.com)

[www.mc-techgroup.com](http://www.mc-techgroup.com)

## 1 GENERAL INFORMATION

The product described in this operating manual has been examined before delivery and left our works in perfect condition related to safety regulations. In order to keep this condition and to guarantee a safe operation, it is important to heed the notes and prescriptions made in this operating manual. Furthermore, attention must be paid to appropriate transportation, correct storage, as well as professional installation and maintenance work.

All necessary information a skilled staff will need for appropriate use of this product are given in this operating manual.

## 2 DECLARATION OF CONFORMITY



The product described in this operating manual complies with the following EC directives:

### EMV-Instruction

The requirements of the EC directive 2004/108/EC "Electromagnetic compatibility" are met.

### Low Voltage Directive

The requirement of the EC directive 2006/95/EC "Low Voltage Directive" are met.  
The compliance with this EC directive has been examined according to DIN EN 61010.

### Declaration of conformity

The EU Declaration of conformity can be downloaded from the **M&C** homepage or directly requested from **M&C**.



### 3 SAFETY INSTRUCTIONS

**Please take care of the following basic safety procedures when mounting, starting up or operating this equipment:**

Read this operating manual before starting up and use of the equipment. The information and warnings given in this operating manual must be heeded.

Any work on electrical equipment is only to be carried out by trained specialists as per the regulations currently in force.

Attention must be paid to the requirements of VDE 0100 (IEC 364) when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.

Check the details on the type plate to ensure that the equipment is connected to the correct mains voltage.

Protection against touching dangerously high electrical voltages:

Before opening the equipment, it must be switched off and hold no voltages. This also applies to any external control circuits that are connected.

The device is only to be used within the permitted range of temperatures and pressures.

Check that the location is weather-protected. It should not be subject to either direct rain or moisture.

The device must not be used in hazardous areas.

Installation, maintenance, monitoring and any repairs may only be done by authorized personnel with respect to the relevant stipulations.

### 4 WARRANTY

If the equipment fails, please contact **M&C** directly or else go via your appointed **M&C** dealer.

We offer a one year warranty as of the day of delivery as per our normal terms and conditions of sale and assuming technically correct operation of the device. Consumables are hereby excluded. The terms of the warranty cover repair at the factory at no cost or the replacement at no cost of the equipment free ex user location. Reshipments must be sent in a sufficient and proper protective packaging.

## 5 USED TERMS AND SIGNAL INDICATIONS



**DANGER!**

This means that death, severe physical injuries and/or important material damages **will occur** in case the respective safety measures are not fulfilled.



**WARNING!**

This means that death, severe physical injuries and/or important material damages **may occur** in case the respective safety measures are not fulfilled.



**CARE!**

This means that minor physical injuries **may occur** in case the respective safety measures are not fulfilled.

**CARE!**

Without the warning triangle means that a material damage may occur in case the respective safety measures are not met.

**ATTENTION!**

This means that an unintentional situation or an unintentional status may occur in case the respective note is not respected.



**NOTE!**

These are important information about the product or parts of the operating manual which require user's attention.

**SKILLED STAFF**

These are persons with necessary qualification who are familiar with installation, use and maintenance of the product.

## 6 APPLICATION

The **TR...** series ready-to-plug-in, on - off electronic temperature controllers are especially suitable for controlling electrically heated sample lines **3/4/5-N/H/M** series.

## 7 TECHNICAL DATA

Temperature controller	type	TRN, TRN/20	TRM, TRM/20	TRH, TRH/20
Part No. of standard version	<b>TR.</b> - 10 A	03 B 7000	03 B 7010	03 B 7020
Part No. of version	<b>TR./20</b> - 20 A	03 B 7030	03 B 7040	03 B 7050
Temperature control range		<b>0 - 100°C</b>	<b>0 - 200°C</b>	<b>0 - 250°C</b>
Switching capacity		<b>10 A</b> for <b>TR.</b> standard version with relay contact, <b>20 A</b> for version <b>TR./20</b> with solid state relay		
Control mode		on - off controller		
Temperature sensor input		PT100 DIN; 2-conductor with sensor breakage status		
Ambient temperature		-30°C to +50°C		
Storage temperature		-30°C to +80°C		
Electrical connection for <b>TR.</b> standard version with 10 A relay contact		2.5 m connecting cable 1.5mm <sup>2</sup> with mains plug and 7-pin coupling socket for connection of the heated line: controlled mains voltage ON/OFF and PT100 sensor		
Electrical connection for <b>TR./20</b> version with solid state relay 20A		2.5 m connecting cable 2.5mm <sup>2</sup> for mains power and 5-pin coupling socket for connection of the heated line: controlled mains voltage ON/OFF and PT100 sensor		
Power supply		230V +/-10%, 50/60Hz		
Housing version/ international protection type		Wall-mounting housing IP 66 EN60529		
Housing material		polycarbonate		
Dimensions in mm		see diagram 1		
Weight		1,2 kg		

## 8 DESCRIPTION

The **TR...** series on - off electronic temperature controller is mounted in a wall-mounting housing. The heated sample lines multipole plug with mains and PT100 sensor line is easily connected to the multipole socket in the temperature controller's housing. The temperature controller together with plug-and-socket connection is supplied in two versions. The **TR.** standard controller with relay contact and 7-pin coupling socket can be used up to 10 A and the **TR./20** version with contactless solid-state relay and 5-pin coupling socket up to 20 A. The temperature sensor input is designed for PT-100 sensors and is fitted with a sensor-breakage safety status. Three temperature control ranges are available: **TRN** = 0-100°C, **TRM** = 0-200°C, **TRH** = 0-250°C. The desired operating temperature can be set using the control knob with its graduated scale. The control function is displayed by LED. A clear cover shows the set value and the switch function, thus ensuring that the desired value has not been changed unattended.

## 9 RECEIPT OF GOODS AND STORAGE

- Immediately after arrival, remove the controller and eventual accessories carefully from the packing and check the articles for completeness against the packing list;
- Check the goods for any damage during transportation and, if required, inform your shipping insurance immediately of the damage found.



**NOTE!**

**The controller should be stored in a weather-protected and frost-free area!**

## 10 INSTALLATION INSTRUCTIONS AND DIMENSIONS

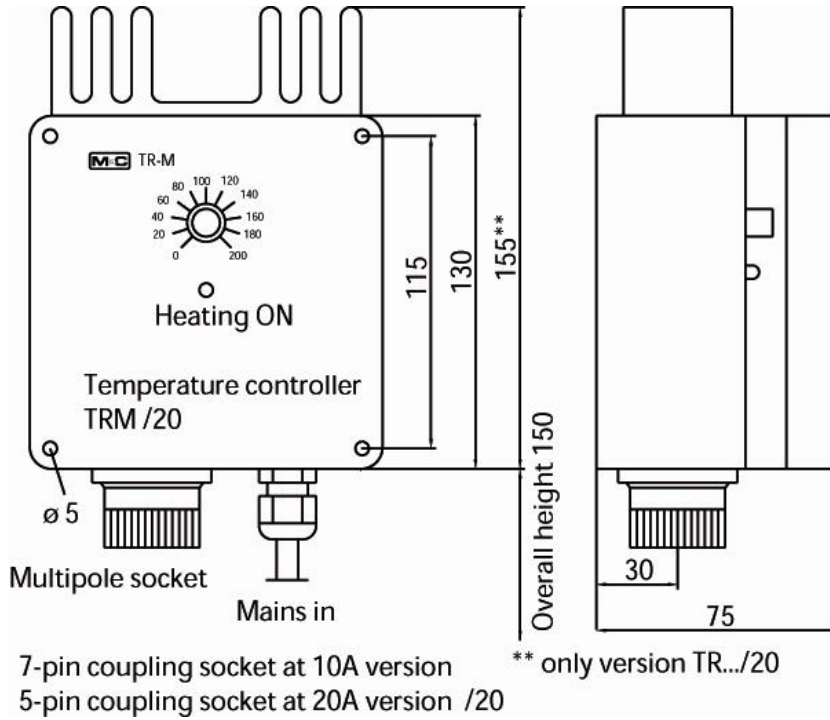


Figure 1 Dimensions TR...



## 11 ELECTRICAL CONNECTIONS



**WARNING!**

A wrong mains voltage can destroy the device. Please ensure that the supply voltage is identical to the indication on the type plate!



**WARNING!**

When setting high-power electrical units with nominal voltages of up to 1000V, attention must be paid to the requirements of VDE 0100 together with the associated standards and stipulations!

A main switch must be provided externally.



The main circuit of the instrument must be equipped with a fuse corresponding to the nominal voltage (over current protection); for electrical details see technical data.

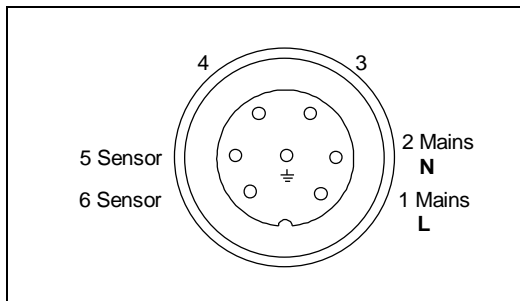
The electrical connection is to be made to the integrated multipole socket (see figure 1).



**WARNING!**

The wattage rating of the connected device may not exceed 2,300 watt in the case of TR N/ M/ H and must be a maximum of 4,600 watt in the case of TR N/ M/ H/ 20.

Temperature controllers **TRN, TRM, TRH** with 7-pin coupling socket 10A



Temperature controllers **TRN/20, TRM/20, TRH/20** with 5-pin coupling socket 20 A

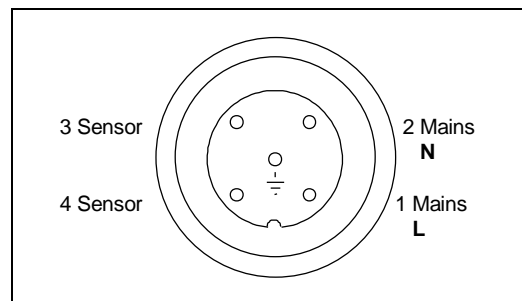


Figure 2 Connector pin assignment of the multipole socket

## 12 INITIAL STARTING

The temperature control device may only be used with the stated PT-100 sensor.

The **TR..** series temperature control devices are easy to mount and are ready for immediate use:

- Connect mains with the multipole plug at the controllers coupling socket. See diagram 2.
- The **TR N /M /H** [10 A] temperature controllers have a 2.5 m long connecting cable 1,5mm<sup>2</sup> fitted with an earthing contact plug, which is connected with an adequately fused socket. The **TR N /M /H /20** [20 A] temperature control devices have a 2.5 m long connecting cable 2.5mm<sup>2</sup>, which is connected to an adequately fused mains supply.
- Select the desired temperature with the control knob on the front panel.

- Check whether the controller is functioning properly:

Set maximum desired temperature ⇒ yellow LED lights up

When the desired temperature is reached ⇒ controller switches heating off, yellow LED goes out.

On installation, the controller should basically be checked to see whether it switches at the set values and reaches the desired operating temperature.

## 13 CLOSING DOWN

No special measures are to be taken for closing down the equipment.

## 14 MAINTENANCE AND REPAIR

The controller **TR...** are working maintenance-free for a long period of time.

In case the controller is defective, please send the device to **M&C** for repair.



**NOTE!**

**The controller is equipped with a sensor break protection that in case of need cuts off the unit as long as the defective sensor has not been exchanged.**

## 15 APPENDIX



Further product documentation can be seen and downloaded from our home page:  
[www.mc-techgroup.com](http://www.mc-techgroup.com)