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TC101 TEMPERATURE CONTROLLER

User Manual

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About TC101 Temperature Controller User Manual

Content and structure

This User Manual for TC101 Temperature Controller covers specific part numbers *S-50153* and *S-50168* has been developed to the operator to provide necessary information to operate the TC101 Temperature Controller.

The User Manual is a practical guide for the operation of TC101 Temperature Controller. This manual has been dived-ed into colour-coded sections, enabling the user easily look up the potential subject of interest.

TC100 Temperature Controller
S-50153 & S-50168

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TC101 Temperature Controller

The TC101 is a Temperature Controller, which monitors and maintains a user defined temperature of material contained in hot-boxes and similar containers. This feature prevents overheating of the material and maintains the optimal temperature for the contained material.

These part numbers have a built-in "Restart" feature, should the burner flame be extinguished or not light on with the initial system start up. Ignition will restart on a continuous 3 minute time cycle, until the burner in question re-lights or the "OFF" button is operated.

These part numbers are former versions of the TC101 Temperature Controller and do not comply with the 2006/42/EC Machinery Directive (MD). Please refer to part numbers S-50121 and S-50122 with additional safety features and without automatic re-ignition for MD compliance.

Symbol overview

This user manual uses a range of symbols and warning notifications throughout the manual to make the operator aware of important safety measures or information regarding operation. The following symbols are used in this manual:

Step-by-step instructions

Indicates a step-by-step instruction, where a particular order of actions is required or recommended

Operation

- Burner LED

This LED indicates that the "BURNER" output is driven to ground(/turned on)

- Power switch

The power switch has two positions. In the middle position (OFF), power is turned off, and no outputs are active. In the lower position (ON), power is on, and outputs are controlled by the electronics

- TEMP. SET

This switch determines what information is displayed. When held upwards (TEMP. SET position), the selected temperature is displayed and during this mode it is also possible to select/reselect a material temperature by turning the TEMP.ADJ. turning knob

In the middle position, the current material temperature is displayed

- Display

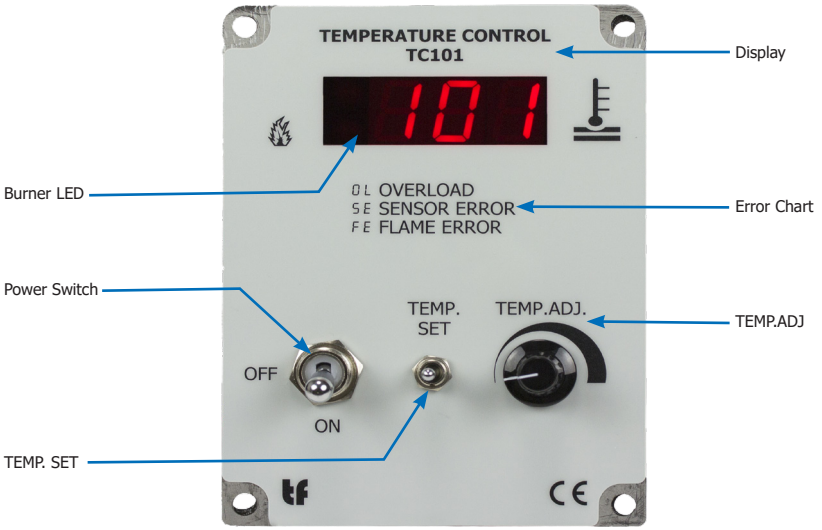
This is a 3 digit LED display, which shows temperature and various error codes

- Error chart

This is just a printed error chart, which shows possible error-codes. All error codes will flash in the display to attract attention. (See troubleshooting section for full explanation)

- TEMP.ADJ.

This knob adjusts the selected temperature within a range of either 20° C - 90° C (S-50153) or 50° C - 175° C (S-50168). As mentioned it is used in conjunction with the TEMP. SET switch (3)



- Mounting screws

All mounting screws are 3 x 8 mm

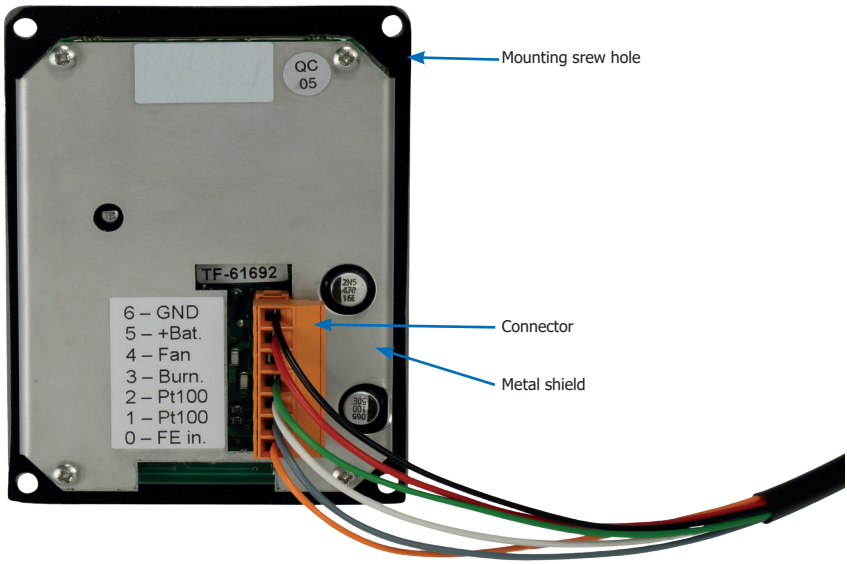
- Connector

This is the Temperature Controller's only international connector. The pin assignment is as follows:

0. Flame error input.
1. Sensor input.
2. Sensor input.
3. Burner output.
4. Not connected
5. + 12 Volts DC.
6. 0 Volts (Ground)

- Metal Shield

This reduces electrical interference.



Description of operation

When powered up and the control switch is in the "ON" position, the display will read 8.8.8. for approximately one second, then 1.01 followed by 0.02 (or similar digits). The current screed temperature will then be displayed.

The state of the burner output is indicated by the burner LEDs (1) in the display. When the preset temperature is reached, the module (Micro Processor) will deactivate burner output.

It is possible to view the preset temperature setting, at any time by switching the TEMP. SET switch (3)

Fig. 3 - TC101 Temperature Controller in a box

Temperature adjustment

The system is designed for simple operation, and only one adjustment is required, the temperature setpoint setting.

Step-by-step instruction for Temperature preset (cut out temperature)

1.
2.
3.

1 The temperature adjustment range is from either 20° C - 90° C (S-50153) or 50° C - 175° C (S-50168). To adjust the temperature, ensure power supply is "on" and operate module control switch (2) to "ON" position

2 Hold the TEMP. SET switch (3) upwards and turn "TEMP.ADJ." turning knob to desired "Cut out" temperature, then release TEMP. SET switch.

3 The system will now operate automatically and burners will deactivate at the new preset temperature. Burners will reactivate when the temperature has dropped 2° C below the setpoint.r with 4mm or 5/32 inch screws

Trouble-Shooting

Symptom	Probable Cause	Appropriate Action
Fails startup	Damaged	• Check connector for sufficient coltage at the connector. If this is OK, then the module is probably damaged.
Failes in operation	Connection	• Check system wiring and all connectors for correct connections.
Erratic display	Sensor type	• Incorrect sensor type used. Replace sensor with proper PT-100 type. • If displayed temperature is higher than actual temperature, some unwanted resistance is connected in series with the sensor. This could be the use of very thin cables or bad connections on the sensor cable. Recommended cables should be no less than 0.75 mm^2
Unstable temperature	Sensor connection	• Check sensor connectors, if all connections found OK, replace sensor.
Display shows error-code "---"	Low voltage	• This indicates low supply voltage. Check the battery voltage. This should be above 11 Volts. • Low voltage can also be caused by two loads sharing the same small cable. (High resistance). Generally this instrument should be directly connected to the battery to avoid electrical interference and voltage drop.
Display shows error-code "OL"	Sensor	• This indicates that the actual temperature is higher than the adjustment range. That might happen if the sensor is defective
Display shows error-code "SE"	Sensor/cable	• Sensor is defective, short-circuit • Sensor is defective, open • Sensor cable failure
Display shows error-code "FE"	Ignition system	• This flame-error code indicates that the Temperature Controller has received error-input on connector-pin 0. (Probably because one of the connected ignition-boxes cannot detect any flame). • Check the ignition system
Display shows error-code "F99"	Overload	• This indicates overload of the Temperature Controller's burner output.

Symptom	Probable Cause	Appropriate Action
Display is disutbed	*TC101*	• *This is probably because the TC101 and one or more of the gas-valves that it controls share a common power supply cable. As mentioned earlier the TC101 should have its own large cables directly connected to the battery*
Instrument resest, shows "8.8.8"	*Electrical interference*	• *This indicates some sort of electrical interference, or incorrect wiring*
Shuts down after 7 sec.	*Condensation*	• *This is the most common problem experienced with the system, and in general is caused by condensation built up on the "HT" leads, after an overnight machine shut down. The problem can be rectified by wiping the "HT" leads.*
		If the fault persists check the following: • *One person needs to turn on the TC101 system, while another person observes the yellow led indicators on the FCB24/FCE24 (or similar TF-Technologies) ignition boxes.* • *The indicators should be on and "STEADY", if one or more of the yellow indicators are flickering it indicates a possible problem in the area of that specific burner, check the following:* *1.Gas pressure (As per machine manufacturers specifications)* *2. Spark plug gap (Approx. 3-4mm)* *3. Spark plug electrode position (Earth electrode must face flame direction* *4. Air to gas ratio* *NOTE: Ignition boxes (FCB24/FCE24 or similar) must be fitted away from heat source.*

Technical Specification (data sheets)

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TC101 Temperature Controller
1 Channel Temperature Controller for Gas Heating

The TC101 Temperature Controller is the user-interface for the TC101 temperature control systems. It is designed to automatically maintain the correct operating temperature of asphalt containers/ hotboxes or other related equipment throughout operation without overheating the bitumen.

The TC101 Temperature Controller provides the ability to adjust the temperature to the desired temperature on the turning knob. Once the desired temperature is set, the TC101 Temperature Controller automatically maintains this temperature. As a safety measure, to prevent accidental overheating of the bitumen, the user is not able to manually override the temperature set, but the system can be turned on/off on the switch.

The TC101 Temperature Controller is a single channel system monitoring the temperature via one connected Pt-100 temperature sensor. It regulates the temperature to the level set by the operator by turning the connected FC824/FCE24 ignition box controlling the gas valve of the burner on/off.

TC101

TC101 Temperature Controller Specifications	
Part Number	[illegible] [illegible]
Power Supply	12/24 Volt System (11-30 VDC)
Power Consumption	Typical at 24 VDC 60 mA Max. 200 mA
Dimensions (LxWxH)	[illegible]
Weight	[illegible]
Storage Temperature	-40°C to 85°C
Operating Temperature	0°C to 50°C
Temperature Control Range	60°C to 170°C ([illegible]) 30°C to 60°C ([illegible])
Auto Mode Available	Yes
Manual Mode Available	No
Burner Output	1x Temperature Controlled Output (max 1.0A)
Input	Pt-100 Temperature Sensor
Resolution	1°C
Connector	BLZ 5.08/7 SN OR

TC101 mounted in a cabinet

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The TC101 Temperature Controller provides the ability to adjust the temperature to the desired temperature on the turning knob. Once the desired temperature is set, the TC101 Temperature Controller automatically maintains this temperature. It is not possible to manually override the temperature set, but the system can be turned on/off on the switch.

The TC101 Temperature Controller is a single channel system monitoring the temperature via one connected Pt-100 temperature sensor. It regulates the temperature to the level set by the operator by turning the connected FC660 Ignition Box ON/OFF. The ignition box controls the gasflow to maintain the desired temperature.

This version without automatic re-ignition is specifically designed to comply with the 2006/42/EC Machinery Directive.

TC101

TC101 Temperature Controller Specifications	
Part Number	[illegible] [illegible]
Power Supply	12/24 Volt System (11-30 VDC)
Power Consumption	Typical at 24 VDC [illegible] mA Max. 200 mA
Dimensions (LxWxH)	[illegible]
Weight	[illegible]
Storage Temperature	[illegible]
Operating Temperature	[illegible]
Temperature Control Range	[illegible] ([illegible]) [illegible] ([illegible])
Auto Mode Available	Yes
Manual Mode Available	No
Burner Output	[illegible]
Input	Pt-100 Temperature Sensor
Resolution	1°C
Connector	[illegible]


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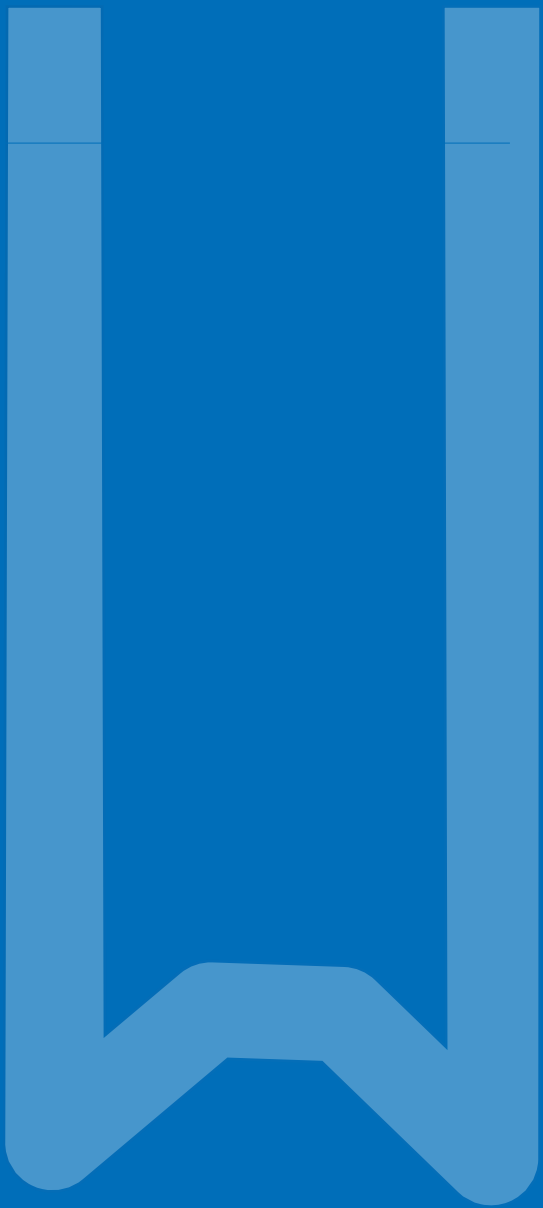

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