TC101 TEMPERATURE CONTROLLER
S-50121 & S-50122

TECHNOLOGIES
PAVING INNOVATION

User Manual

v. G704501

TF-Technologies • Kratbjerg 214 • DK-3480 Fredensborg • +45 4848 2633 • www.tf-technologies.com

Introduction

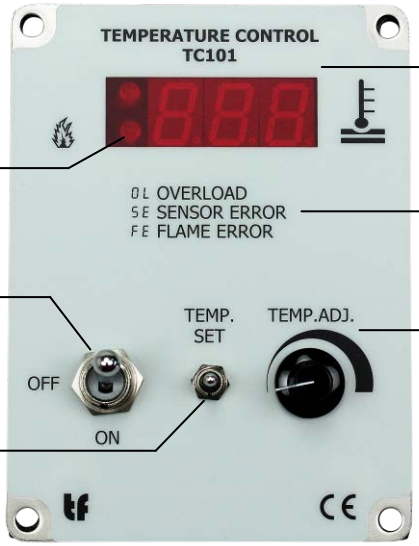
The TC101 is a Temperature Controller, which monitors and maintains a user-defined temperature of material contained in hot-boxes and similar containers. This feature prevents overheating of the material and maintains the optimal temperature for the contained material.

The TC101 Temperature Controller with part numbers S-50121 and S-50122 without automatic re-ignition are specifically designed to comply with the 2006/42/EC Machinery Directive, when installed and used in accordance with the instructions in this manual.

The TC101 Temperature Controller must only be used in systems where the temperature controller itself is not designed to work as a safety device, as the TC101 Temperature Controller is not approved as a safety component

The temperature control system must be configured so that the TC101 Temperature Controller does not control any safety-related functions directly, such as controlling the gas valves. Such functions must be performed by an approved safety component, such as the FCE60 Ignition Box with an EN 298 gas certification.

Front view



1. BURNER LED
2. POWER SWITCH
3. TEMP. SET
4. DISPLAY
5. ERROR CHART
6. TEMP. ADJ.

Back view

7. Mounting screw hole
8. Connector
9. Metal shield

Description

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

2 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.

3 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.

4 Display
This is a 3-digit LED-display, which shows temperature and various error-codes.

5 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).

6 TEMP.ADJ.
This knob adjusts the selected temperature within a range of either 20° C - 90° C (S-50121) or 50° C - 175° C (S-50122). As mentioned it is used in conjunction with the TEMP. SET switch (3).

7 Mounting screws
All mounting screws are 3 x 8 mm

8 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)

9 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) upwards on the front of the module.

Temperature adjustment

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

Temperature preset (cut out temperature).
The temperature adjustment range is from either 20° C - 90° C (S-50122) or 50° C - 175° C (S-50122). To adjust the temperature, ensure power supply is “on” and operate module control switch (2) to “ON” position. **Hold** the TEMP. SET switch (3) upwards and turn “TEMP.ADJ.” turning knob to desired “Cut out” temperature, then release TEMP. SET switch. 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.

Trouble-shooting

1 Instrument fails to startup when power is turned on

- Check for sufficient voltage at the connector. If this is OK, then the module is probably damaged.

2 LED output-indicators show correct operation, but burner and/or blower fails to operate

- Check system wiring and all connectors for correct connections.

3 Instrument shows erratic display but stable temperature

- 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

4 Instrument shows unstable temperature

- Check sensor connectors, if all connections found OK, replace sensor.

5 Display shows error-code "---"

- 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.

6 Display shows error-code "OL"

- This indicates that the actual temperature is higher than the adjustment range. That might happen if the sensor is defective

7 Display shows error-code "SE"

- Sensor is defective, short-circuit
- Sensor is defective, open
- Sensor cable failure

8 Display shows error-code "FE"

- 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

NOTE that the TC101 will deactivate burner outputs and must be re-set (turned off and on) prior to further operation.

9 Display shows error-code "F99"

- This indicates overload of the Temperature Controller's burner output.

10 Display is disturbed when one or more outputs changes state

- 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.

11 Instrument repeatedly resets (shows "8.8.8.")

This indicates some sort of electrical interference, or incorrect wiring.

12 On initial start up the system shuts down after 7-10 seconds

- 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 FCE60 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 (FE60 or similar) must be fitted away from heat source.

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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. 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 FCE60 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	S-50121 S-50122
Power Supply	12/24 Volt System (11-30 VDC)
Power Consumption	Typical at 24 VDC 80 mA Max. 200 mA
Dimensions (LxWxH)	121x90x45mm / 4.8x3.5x1.8in
Weight	350g / 0.8lbs
Storage Temperature	-40°C to 85°C / -40°F to 185°F
Operating Temperature	0°C to 60°C / 32°F to 140°F
Temperature Control Range	20°C to 90°C / 68°F to 194°F (S-50121) 50°C to 175°C / 122°F to 347°F (S-50122)
Auto Mode Available	Yes
Manual Mode Available	No
Burner Output	1x Temperature Controlled Output (max 3.5A)
Input	Pt-100 Temperature Sensor
Resolution	1°C
Connector	BLZ 5.08/7 SN OR

TC101 mounted in a cabinet

v. H815401

TF-Technologies A/S
Kratbjerg 214

DK-3480 Fredensborg
Phone: +45 4848 2633

www.tf-technologies.com
sales@tf-technologies.com