

OVER TEMPERATURE & SEAL LEAKAGE

AUTO & MANUAL RESET | TCF SERIES FOR PUMPS USING RESISTANCE SENSING LEAKAGE DETECTION



- ◆ Monitors Submersible Pumps for Over Temperature & Seal Leakage
- ◆ Works with Pumps using Resistance Sensing Leakage Detection
- ◆ Auto & Manual Reset for Over Temperature
- ◆ Flange-enclosure Designed for Deadfront Door-Mounting
- ◆ Two Adjustable Sensitivity Ranges for Seal Leakage
- ◆ Low-Profile Adjustment Knobs & Switch
- ◆ Full Status Indication on Top of Unit for Easy Troubleshooting
- ◆ 11 Pin Back-Mounted Socket Provided with Relay



Macromatic TCF Series products protect submersible pumps against damage from both over temperature and seal leakage. This flexible unit can be connected in one of three ways to monitor for seal leakage: one probe to ground, two probes to ground and probe to probe. These products come with a switch to select either automatic reset or manual reset for an over temperature condition (for automatic reset only in a standard plug-in enclosure, see the TCP Series products).

The flange-enclosure is designed to be deadfront-mounted on an inner door and used with a back-mounted socket (included). Everything needed for setup, use and troubleshooting is on the top of the unit: status LEDs, switch to choose Automatic or Manual Reset mode for temperature, and a pushbutton for Manual Reset of an over temperature condition. They are all visible so that the door need not be opened to see the status of the over temperature or seal leakage condition.

Operation:

Two wires from the relay are connected to a N.C. thermal switch in the windings of the pump motor to monitor for overheating. A low-voltage DC signal is applied to check the status of the thermal switch. Two additional wires are connected to a single or dual resistance-sensing probe and the grounded motor housing, or across two probes to monitor for seal leakage using a low-voltage DC signal. These products have isolated output contact relays, one for over temperature and one for seal leakage. The over temperature set-point is fixed at 5K ohms. Two adjustable seal leakage sensitivity ranges are available: 4.7K-100K ohms and 1K-250K ohms.

With input voltage applied, normal temperature condition (thermal switch closed) and no seal leakage, the over temperature relay is energized and the seal leak relay is de-energized. Both LEDs are Green, indicating normal conditions and input voltage applied. When the motor temperature rises and the N.C. thermal switch opens, the over temperature relay is de-energized, opening a contact that had been closed and turning off the pump contactor. The TEMP LED turns Red. If the over temperature condition is cleared, the unit will reset based on the setting of the Over Temp switch. In the AUTO mode, the unit will reset automatically. In the MANUAL mode, the Over Temp Reset button must be pushed to clear the alarm and reset the relay.

If the seal starts to leak, contaminating fluid enters the pump motor cavity. This lowers the resistance between the internal probe and the common connection. When the resistance drops below the user-adjustable sensitivity set-point of the relay, the output relay energizes and closes a contact, which can be used to give an alarm indication of a leaking seal. The SEAL LED turns Red.

INPUT VOLTAGE	LEAKAGE SENSITIVITY RANGE	CATALOG NUMBER	WIRING/SOCKET
24V AC	4.7K to 100KΩ 1K to 250KΩ	TCF8D100 TCF8D250	<p>11 Pin Octal SR6P-M11G</p> <p>DIAGRAM 202</p>
120V AC	4.7K to 100KΩ 1K to 250KΩ	TCF2D100 TCF2D250	
240V AC	4.7K to 100KΩ 1K to 250KΩ	TCF1D100 TCF1D250	

■ 11 Pin Back-Mounted Socket Provided with Relay

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APPLICATION DATA

Voltage Tolerance:

AC Operation: +10/-15% of nominal at 50/60 Hz.

Load (Burden):

3 VA

Temp & Leakage Voltage:

5V DC Pulsed

Resistance Sensitivity Range (Seal Leakage):

4.7K - 100K Ω or 1K - 250K Ω

Resistance Setting (Over Temperature):

5K Ω

Response Time:

Power-up/Restart Delay (Over Temp Relay Energize)	1 second
Over Temp Fault (Relay De-energize)	1 second
Over Temp Fault Clears-Auto Reset (Relay Energize)	1 second
Over Temp Fault Clears-Manual Reset (Relay Energize)	500ms
Seal Leakage Fault (Relay Energize)	1 second
Seal Leakage Fault Clears (Relay De-energize)	1 second

Temperature:

Operating: -28° to 65°C (-18° to 149°F)

Storage: -40° to 85°C (-40° to 185°F)

Output Contacts:

7A @ 240V AC / 5A @ 28V DC, 1/4HP @ 120V AC (N.O.)

Life:

Mechanical: 10,000,000 operations

Full Load: 100,000 operations

LED Indicator:

Temp: Green ON with input voltage applied, normal temperature condition and relay energized; Red ON when over temperature detected and relay de-energized

Seal: Green ON with input voltage applied and no seal leak; Red ON when seal leak detected and relay energized

Mounting:

For deadfront-mounting on an inner door, use 11 Pin Back-Mounted Socket (IDEC SR6P-M11G which is provided with the relay). For panel-mounting, use industry-standard 11 Pin Octal socket (Macromatic 70170-D or equivalent).

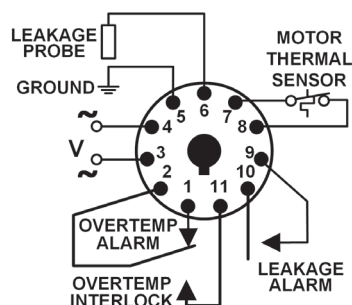
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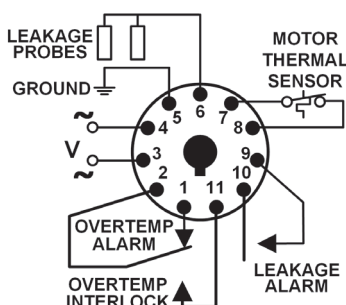
CONNECTION DIAGRAMS

This flexible product offers three options for connection to monitor over temperature and seal leakage:

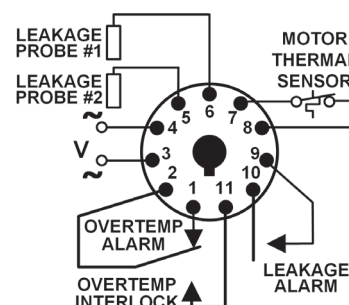
BETWEEN ONE PROBE & MOTOR HOUSING



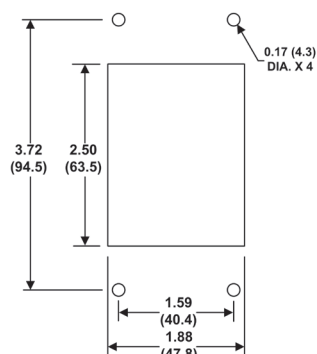
BETWEEN TWO PROBES & MOTOR HOUSING



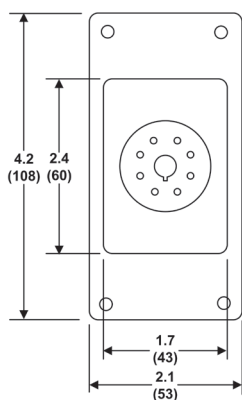
BETWEEN TWO PROBES



DIMENSIONS



Panel Cutout



All Dimensions in Inches (Millimeters)

