

# OVER TEMPERATURE & SEAL LEAKAGE

**AUTO & MANUAL RESET | TCF-A SERIES**

**RETROFIT FLYGT CONTROLS FOR PUMPS WITH 3-WIRE SENSING**



- ◆ Monitors Submersible Pumps for Over Temperature & Seal Leakage
- ◆ Retrofits Flygt controls for pumps with 3-wire sensing
- ◆ Auto & Manual Reset for Over Temperature
- ◆ Flange Enclosure for Door-Mounting
- ◆ DIN-Rail mounting available using 70170-D socket
- ◆ Low-Profile Adjustment Switch & Reset Button
- ◆ Full Status Indication on Top of Unit for Easy Troubleshooting
- ◆ 11 Pin Back-Mounted Socket Provided with Relay



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Macromatic TCF-A Series products monitor for over temperature and seal leakage on submersible pumps with 3-wire sensing (resistive seal, N.C. over temp). Product can be installed in place of existing Flygt MiniCAS with minimal rewiring. These units come with a switch to select either automatic reset or manual reset for an over temperature condition.

The flange-enclosure is designed to be mounted on an inner door and used with a back-mounted socket (included). Product can also be DIN-rail mounted using socket 70170-D (not 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:**

A normally closed thermal switch in the windings of the pump motor is connected to the TEMP input to monitor for overheating of the pump. A low-voltage DC signal is applied to monitor the thermal switch. The pump seal leakage sensor(probes) are connected to the LEAK input to monitor for seal leakage using a low-voltage DC signal. Isolated output contact relays are provided, one for over temperature and one for seal leakage. The over temperature trip point is fixed at 5K ohms. Adjustable seal leakage sensitivity range is 4.7K-100K ohms.

With input voltage applied, normal temperature condition (thermal switch closed) and seal leakage above the sensitivity set-point, 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 motor temperature rises and the N.C. thermal switch opens, the over temperature relay is de-energized opening the contact that had been closed 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 AUTO-MANUAL RESET 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. (Note: If fault still exists when the Over Temp Reset button is depressed, it will not reset.)

If the shaft seals start to leak, contaminating fluid enters the pump motor cavity. This lowers the resistance of the lubricant inside the pump. 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 LEAK LED turns Red. If the seal leak condition is cleared, the unit will reset automatically.

If either a TEMP or SEAL leak alarm has been automatically cleared, a cleared fault indication is displayed by flashing the corresponding Red TEMP LED or Red SEAL LED. The flashing indication may be reset by pressing the Over Temp Reset button.

CONTROL VOLTAGE	CATALOG NUMBER	WIRING/SOCKET
24V AC/DC	TCF7A	<p>11 Pin Octal <b>SR6P-M11G</b> ■</p> <p>DIAGRAM 237</p>
120V AC	TCF2A	<p>11 Pin Octal <b>SR6P-M11G</b> ■</p> <p>DIAGRAM 227</p>

■ 11 Pin Back-Mounted Socket Provided with Relay

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## AUTO & MANUAL RESET | TCF-A SERIES RETROFIT FLYGT CONTROLS FOR PUMPS WITH 3-WIRE SENSING

### APPLICATION DATA

#### Voltage Tolerance:

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

#### Load (Burden):

3 VA

#### Response Time:

Power-up/Restart Delay	100 ms
Over Temp Fault (Relay De-energize)	3 seconds
Over Temp Fault Clears-Auto Reset (Relay Energize)	3 seconds
Over Temp Fault Clears-Manual Reset (Relay Energize), Hold reset switch	> 500 ms
Seal Leakage Fault (Relay Energize)	3 seconds
Seal Leakage Fault Clears (Relay De-energize)	3 seconds

#### Resistance Sensitivity Range (Seal Leakage):

4.7 - 100 K $\Omega$

#### Temperature:

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

Storage: -40° to 85°C (-40° to 185°F)

#### Output Contacts:

7A @ 240V AC / 7A @ 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; Red Flashing when over temperature condition has been cleared in AUTO mode

Seal: Green ON with input voltage applied, no seal leak and relay de-energized; Red ON when seal leak detected and relay energized; Red Flashing when seal leakage condition has been cleared

#### Mounting:

For mounting on an inner door, use 11 Pin Back-Mounted socket (IDEC SR6P-M11G, which is provided with the relay).

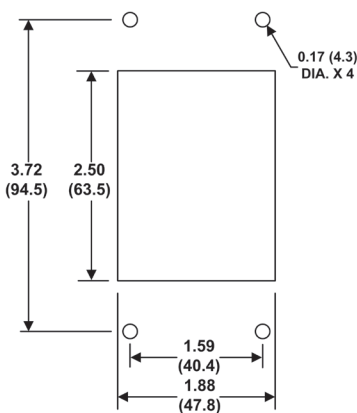
For DIN-Rail or panel-mounting, use industry-standard 11 Pin Octal socket (Macromatic 70170-D or equivalent).

#### Approvals:

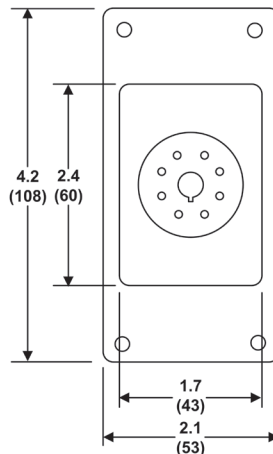


with appropriate socket

### DIMENSIONS



Panel Cutout



All Dimensions in Inches (Millimeters)

