

General

The TRM-30F voltage protected digital overload relay is designed to protect devices with sensitive operating voltage values from errors that may arise from mains voltage and overload.

Device Usage and Principle of Operation

Make the connections of the device according to the connection diagram. Otherwise, the device may be damaged. Adjust the high current setting of the device according to the operating current values of the load you will use. When the device is energized; During the first one second, the High Current Set value set on the upper display and the Error Waiting Time are displayed on the middle display. Current values drawn from the phases are displayed after one second. The current LEDs (A) light on when the current values are displayed. When the button on the device is pressed once, the voltage values between phase and phase are shown.

With the A> knob (high current) you can make the overload setting. While setting with A> knob, the value set on the upper display is displayed. You can set the error waiting time from the "t" knob. While setting with "t" knob, the value set on the middle display is displayed. When the device is energized, the NO contact is energized and the "NOR" led lights on. When the device goes into an error state, the related error led lights on, "NOR" led turns off, "NO" contact is de-energized and "NC" contact is energized.

Contacts: When the device is not in case of error state, the "NO" contact is energized. When the device is in case of error state, the "NC" contact is energized.

Reset Button: When the device is in error, reset button must be pressed for 3 seconds to restart. After the device is reset, goes out of error state and the related error led goes off. The "NO" contact is energized and the NOR led lights on.

V/A Button: This button should be pressed to switch between the current and voltage values shown on the device screen. Current leds "A" light on while current values are displayed.

Required Settings:

- A> : High Current Set Value can be adjusted with this knob.
- sec. : This knob sets the time to wait before entering the High Current error.

Error Notifications:

V LED: This led lights on when the device enters high/low voltage or voltage asymmetry error.

A LED: This led lights on when the device enters high current or current asymmetry error.

⚡ LED: If the phase sequence is incorrectly connected, this led lights on.

NOR LED: This LED is on when the device is not in error state. "NO" contact is energized.

Contact States	State	NO Contact	NC Contact
According to Error Status	The device is de-energized.	Open Circuit	Closed Circuit
	The device is energized. There is an error.	Open Circuit	Closed Circuit
	The device is energized. No error.	Closed Circuit	Open Circuit

Warnings

- Please use the device according to the manual.
- Don't use the device in wet.
- Include a switch and circuit breaker in the assembly.
- Put the switch and circuit breaker nearby the device, operator can reach easily.
- Mark the switch and circuit breaker as releasing connection for device.

Maintenance

Switch off the device and release from connections. Clean the trunk of device with a swab. Don't use any conductor or chemical might damage the device. Make sure device works after cleaning.

Protection Functions:

High Current Protection - To enter the error state: When the current value drawn from the phases exceeds the high current set value, the device waits for the error waiting time. Then the display group of the phases causing the error starts flashing and the "A" led lights on. In case of error; "NO" contact is de-energized. The "NOR" led turns off and the "NC" contact is energized.

High Current Protection - Exiting the error state: When the current drawn from the phases drops below the high current set value, the display group lights on constantly. When the reset button is pressed for 3 seconds, "A" led turns off. In normal operating condition; "NO" contact is energized, the "NOR" led lights on and the "NC" contact is de-energized.

Current Asymmetry Protection - To enter the error state:When the current difference between the phases exceeds 50%, the device waits for 3 seconds. Then the display group of the phases causing the error starts flashing and the "A" led lights on. In case of error; "NO" contact is de-energized. The "NOR" led turns off and the "NC" contact is energized.

Current Asymmetry Protection - Exiting the error state: When the current difference between the phases drops below 50%, the display group lights on constantly. When the reset button is pressed for 3 seconds, "A" led turns off. In normal operating condition; "NO" contact is energized, the "NOR" led lights on and the "NC" contact is de-energized.

High Voltage Protection - To enter the error state: The device waits for 3 seconds when the voltage value of one or more of the phases exceeds 440V. Then the display group of the phases causing the error starts flashing and the "V" led lights on. In case of error; "NO" contact is de-energized. The "NOR" led turns off and the "NC" contact is energized.

High Voltage Protection - Exiting the error state: 3 seconds after the voltage values are below 435V, the display group lights on constantly. Then the "V" led turns off. In normal operating condition; "NO" contact is energized, the "NOR" led lights on and the "NC" contact is de-energized.

Low Voltage Protection - To enter the error state: The device waits for 3 seconds when the voltage value of one or more of the phases drops below 265V. Then the display group of the phases causing the error starts flashing and the "V" led lights on. In case of error; "NO" contact is de-energized. The "NOR" led turns off and the "NC" contact is energized.

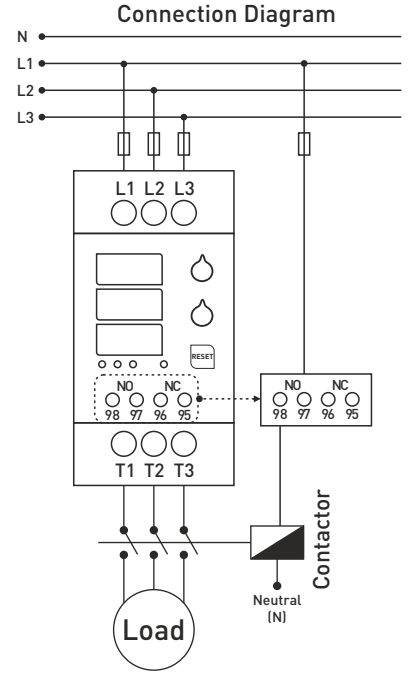
Low Voltage Protection - Exiting the error state: 3 seconds after the voltage value exceed 270V, the display group lights on constantly. Then the "V" led turns off. In normal operating condition; "NO" contact is energized, the "NOR" led lights on and the "NC" contact is de-energized.

Voltage Asymmetry Protection - To enter the error state: The device waits for 3 seconds when the voltage difference between the phases exceeds 30%. Then the display group of the phases causing the error starts flashing and the "V" led lights on. In case of error; "NO" contact is de-energized. The "NOR" led turns off and the "NC" contact is energized.

Voltage Asymmetry Protection - Exiting the error state: 3 seconds after the voltage difference between the phases drops below 30%, the display group lights on constantly. Then the "V" led turns off. In normal operating condition; "NO" contact is energized, the "NOR" led lights on and the "NC" contact is de-energized.

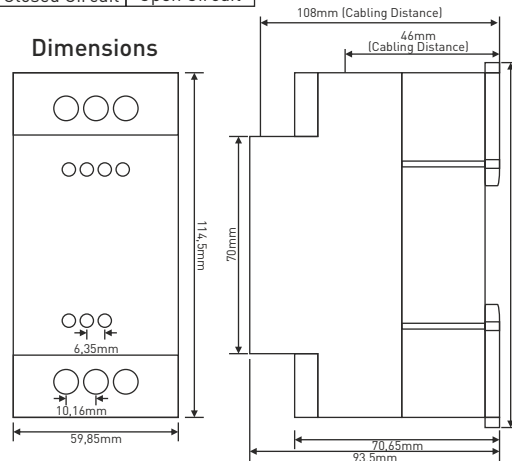
Phase Sequence Protection: If the sequence of the phases connected to the device is wrong, the phase sequence error led (⚡) lights on. In case of error; "NO" contact is de-energized. The "NOR" led turns off and the "NC" contact is energized.

Contact: www.tense.com.tr | info@tense.com.tr



Technical Specifications

- Operating Volt. (Un) : 3x380V AC 50/60Hz.
- Operating Frequency : 50/60 Hz.
- Operating Power : <10VA
- Operating Temp. : -20°C.....+55°C
- Display : 3x3 digit display, 7x LEDs
- H. Current (Overload) : 0,5A - 30A
- Error Waiting (t) : 0sec. - 20 sec.
- Current Asymmetry and Error Waiting : %50(Fixed), 3 sec. delay (Fixed)
- High Voltage : 440V (L-L)(Fixed)
- Low Voltage : 265V (L-L)(Fixed)
- Voltage Asymmetry and Error Waiting : %30(Fixed), 3 sec. delay (Fixed)
- Connection Type : Terminal connection
- Contacts : 3A / 250V AC (Resistive Load)
- Cable Diameter : 2.5mm² (Contacts) 6mm² (Current in & outputs)
- Weight : 380gr.
- Mounting : Assembled on the din rail.
- Operating Altitude : <2000 meters



How Is Asymmetry Calculated?

The device calculates the asymmetry according to the formula below.

$$\text{Voltage Asymmetry} = \frac{(\text{Max. Voltage} - \text{Min. Voltage})}{\text{Max. Voltage}} \times 100$$

Voltage Asymmetry Calculation Example:

$$\frac{(400 - 310)/400}{} \times 100 = \%22,5$$

$$\text{Current Asymmetry} = \frac{(\text{Max. Current} - \text{Min. Current})}{\text{Max. Current}} \times 100$$

Current Asymmetry Calculation Example:

$$\frac{(25 - 15)/25}{} \times 100 = \%40$$

Max. Voltage, Min. Current: Highest voltage or current value in phases.

Min. Voltage, Min. Current: The lowest voltage or current value in phases.