



## DESCRIPTION

The TC453 is a thermocouple amplification module for the MC1 signal conditioning system. It is available in a direct-coupled version, or with 100 Vdc of input/output isolation. The TC453 features open thermocouple detection as well as selectable cold junction compensation for thermocouple types E, J, K, R, S, B, and T. The TC453 also features a suppression option so that a selected portion of the thermocouple temperature range may be calibrated as the  $\pm 10$  Vdc output. Test points for the suppression and output signals are accessible on the front panel.

The TC453 is ideal for laboratory applications where thermocouple types and temperature ranges are constantly changing. Thermocouple connections may be made thru a grommated hole or via an optional thermocouple jack mounted on the front panel.

## Specifications

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|------------------------------|---|
| <b>Input Signal Range:</b>   | $\pm 9$ mV to $\pm 100$ mV for $\pm 10$ Vdc full scale output.  |
| <b>Gain Range Selection:</b> | 3-position toggle switch  |
| <b>Gain Adjust:</b>          | 20 turn potentiometer, 35% to 110% of selected range.   |
| <b>Suppression:</b>          | 20 turn potentiometer for $\pm 10$ Vdc output suppression, enabled with In/Out switch.                                  |
| <b>Isolation Option:</b>     | 100 Mohms @ $\pm 100$ Vdc, input to output common. Front panel thermocouple entry allows up to $\pm 200$ Vdc isolation. |

## Features

- Supports Type B, E, J, K, R, S, and T Thermocouples
- Isolated or Direct-Coupled Versions Available
- Output Suppression Allows Calibration Over Desired Temperature Range
- Cold Junction Compensation Included
- Open Thermocouple Detection Provided

## Specifications

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|---|--|
| <b>Direct-Couple Option:</b>                      | $\pm 7.5$ Vdc common-mode range with 1 MO common mode input resistance.  |
| <b>Common Mode Rejection:</b>                     | Direct Coupled or Isolated = 100 db at 60 Hz.  |
| <b>Cold Junction Compensation:</b>                | Jumper selectable for types E, J, K, R, S, B and T.  |
| <b>Cold Junction Compensation Error:</b>          | Front Panel Thermocouple Entry $1^\circ\text{F}$ for $\pm 10^\circ\text{F}$ ambient temperature change. Rear Panel Thermocouple Entry $5^\circ\text{F}$ for $\pm 25^\circ\text{F}$ ambient temperature change. |
| <b>Thermal Effects on DC Amplifier:</b>           | Span 0.005%/°F, typical Zero $0.5\mu\text{V}/^\circ\text{F}$ , referred to input.  |
| <b>Linearity of DC Amplifier:</b>                 | 0.05% of full scale output.  |
| <b>Low Pass Filter:</b>                           | DC to 1, 3, or 10 Hz, Switch Selectable.   |
| <b>Maximum Differential Input Without Damage:</b> | $\pm 20$ V   |
| <b>Open Thermocouple Detection:</b>               | Jumper-selectable open detection causes full scale output.   |
| <b>Remote Thermocouple Junction:</b>              | Jumper selects external 2N2222 transistor to act as thermocouple reference junction temperature sensor.  |
| <b>Output:</b>                                    | $\pm 10$ Vdc @ 10 mA maximum, short-circuit proof, not affected by line capacitance.   |
| <b>Output Resistance:</b>                         | <100   |
| <b>Output Noise:</b>                              | <10mVrms at maximum gain.  |