Thermocouple Input Signal Conditioner
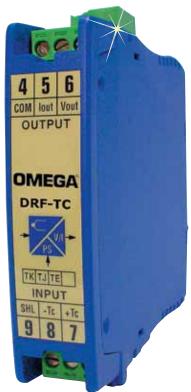
DRF-TC

1 YEAR WARRANTY CE

The DRF-TC thermocouple signal conditioners accept thermocouple input and provide a linearized and isolated 0 to 10 Vdc or 4 to 20 mA output. Models are available with three different power options, 24Vdc, 120 Vac and 240 Vac.

The DRF-TC are ideally suited for industrial applications. All models mount on a standard 35 mm DIN rail and provide galvanic isolation between input, output and power up to 3500 Veff (model specific). To insure maximum measurement accuracy the units feature cold junction compensation, 0.2% linearity and less than 0.1°C/1°C thermal drift due to compensation. Module response time is 250 ms or less.

- ✔ **Models for J, K, E, T, R and S Thermocouples**
- ✔ **Accuracy 0.3%**
- ✔ **250 ms Response Time**
- ✔ **Upscale Break Protection**
- ✔ **Linearized Output**
- ✔ **Galvanic Isolation Between Input, Output and Power**

DRF-TCJ-115VAC-0/400C-4/20, shown larger than actual size

Input Range Table

Range Code	Range	J	K	T	E	R	S
0/100C	0 to 100°C				X		
0/150C	0 to 150°C	X	X				
0/175C	0 to 175°C				X		
0/200C	0 to 200°C			X			
0/250C	0 to 250°C	X	X				
0/300C	0 to 300°C			X	X		
0/400C	0 to 400°C	X	X	X			
0/500C	0 to 500°C				X		
0/700C	0 to 700°C	X	X				
0/800C	0 to 800°C				X		
0/1200C	0 to 1200°C		X				
0/1600C	0 to 1600°C						X
850/1700C	850 to 1700°C					X	
Minimum Span*		85°C	85°C	100°C	85°C	100°C	100°C

* Custom ranges may be obtained by adjusting on-board zero and span potentiometers. The minimum range is limited by the minimum span specification.

Specifications
Accuracy: <0.3% full scale
Linearity: <0.2% full scale
Thermal Drift: <250 ppm/°C typical
Thermocouple CJC Drift: 0.1°C/°C
Response Time: <250mS (90% of signal)
Input Impedance: 1 MΩ
Over Voltage Protection: 10 V

Thermocouple probe types: J, K, E, T, R, S (one model for each thermocouple type

Thermocouple Input

To Order *Visit omega.com/drf_series for Pricing and Details*	
Model No.	**Description**
DRF-TCJ-(*)-(**)-(***)	Signal conditioner for J type thermocouple
DRF-TCK-(*)-(**)-(***)	Signal conditioner for K type thermocouple
DRF-TCT-(*)-(**)-(***)	Signal conditioner for T type thermocouple
DRF-TCE-(*)-(**)-(***)	Signal conditioner for E type thermocouple
DRF-TCR-(*)-(**)-(***)	Signal conditioner for R type thermocouple
DRF-TCS-(*)-(**)-(***)	Signal conditioner for S type thermocouple

* Specify power, "24Vdc" for 24 Vdc power, "115 Vac" for 115Vac power or "230Vac" for 230 Vac power
** Specify range code from the Input Range Table
*** Specify output, "4/20" for 4 to 20 mA output or "0/10" for 0 to 10 Vdc output
Ordering Example: DRF-TCJ-115VAC-0/400C-4/20, *signal conditioner for a J thermocouple with a 0 to 400°C input range, 4 to 20 mA output and 115 Vac power.*

DIN Rail Mount Configurable Signal Conditioners

DRF Series

1 YEAR WARRANTY   CE

✔ **Voltage, Current, Frequency, Resistance, Potentiometer, Thermocouple, RTD and Load Cell Input Modules**

✔ **Field Configurable Signal Ranges**

✔ **Provides up to 3500 Veff Isolation Between Input and Output and Power (Isolation is Model Specific)**

✔ **Compatible with Standard 35 mm DIN Rail**

The DRF series DIN rail signal conditioners are designed to accept a broad range of input signals, such as ac and dc voltage and current, frequency, temperature (thermocouple and RTD), and process transducers, and provide standard process outputs of either 4 to 20 mA, or 0 to 10 Vdc. The DRF series feature a modern housing design, that is easily mounted on standard 35 mm DIN rails. Connections are safely and securely made through pluggable screw terminal connectors, with input and output connections on the opposite sides of the module.

Functionality
The DRF series are designed to maximize functionality. The front door of the housing provides easy access to span and offset potentiometers which may be used to field adjust the input and output signal range.

Isolation
The input, output and power circuits are isolated by 3500 volts of galvanic isolation. The isolation protects against potentially damaging voltages from passing through the signal conditioners into connected systems. The isolation also provides improved measurement accuracy by minimizing the effects of ground loops and electrical noise.

Outputs
Each DRF series signal conditioner is available with current and voltage output (only one may be used at a time). Available output types include 4 to 20 mA or 0 to 10 Vdc. Although pre-configured before shipping from the factory, the output may be changed through an internal jumper change.

Standard outputs are linear and proportional to the signal input. Thermocouple input modules feature special circuitry to linearize the output to the actual temperature rather than the non-linear signal produced by thermocouple sensors.

SPECIFICATIONS
(Common to all Models)

Power: 24 Vdc ±10%, 230 Vac ±10% 50/60 Hz, 115 Vac ±10% 50/60 Hz

Power Consumption: <3.8 VA

Output: 4 to 20 mA and 0 to 10 Vdc
  Maximum Voltage Output: 11 Vdc approx.
  Minimum Voltage Output: -1 Vdc approx.
  Minimum Load Resistance (Voltage): ≥1 KΩ
  Maximum Current Output: 22 mA approx.
  Maximum Current Output: -1.5 mA approx.
  Maximum Load Resistance (current): ≤400Ω

Accuracy: <0.2% or <0.3% depending on model

Linearity: <0.1% or <0.2% depending on model

Thermal Drift: <150 ppm/°C or 250 ppm/°C typical depending on model

Response Time: 70 mS (Process and DC input models); 250 mS (Temperature and AC input models)

Isolation*:
  Input to Output: 3500 Veff
  Power to Input: 3500 Veff
  Power to Output: 3500 Veff (for AC powered models), 1K Veff (for dc powered models)

Electrical Connections: Plug-in screw terminals

Protection: IP-30

MECHANICAL DIMENSIONS

Weight:
  (DC Powered): 120 g (4.2 oz)
  (AC Powered): 200 g (7 oz)

Dimensions:
  (DC Powered Models): 110 H x 22.5 W x 93 mm D (4.3 x 0.9 x 3.7")
  (AC Powered Models):
  110 H x 37 W x 93 mm D (4.3 x 1.46 x 3.7")

Operating Temperature: 0 to 60°C (32 to 140°F)

Storage Temperature: -20 to 70°C (-4 to 158°F)

*Tested True RMS, 60 sec. leak <1 mA