

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

CE

User's Guide

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine / Paddlesheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments



<http://www.omega.com>
e-mail: info@omega.com

TX802RTDF-CU10-F-2 SERIES 2 WIRE RTD TRANSMITTER



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WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

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OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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The Proper Installation & Maintenance.

MOUNTING.

- (1) Mount in a clean environment in an electrical cabinet on DIN or EN mounting rail.
- (2) Do not subject to vibration or excess temperature or humidity variations.
- (3) Avoid mounting in cabinets with power control equipment.
- (4) To maintain compliance with the EMC Directives the transmitter must be mounted in a fully enclosed steel cabinet. The cabinet must be properly earthed, with appropriate input \ output entry points, filtering, and cabling.

WIRING.

- (1) All cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- (2) Signal cables should be laid a minimum distance of 300mm from any power cables.
- (3) For 2 wire current loops Austral Standard Cables B5102ES is recommended. For 3 wire transmitters and RTD's Austral Standard Cables B5103ES is recommended.
- (4) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (5) Lightning arrestors should be used when there is a danger from this source.
- (6) Refer to diagrams for connection information.

RTD'S.

- (1) Avoid locating the RTD where it will be in a direct flame.
- (2) Locate it where the average temperature will be measured. It should be representative of the mass.
- (3) Immerse the RTD far enough so that the measuring point is entirely in the temperature to be measured; nine to ten times the diameter of the protection tube is recommended. Heat that is conducted away from the measuring point causes an error in reading.

COMMISSIONING.

- (1) Once all the above conditions have been carried out and the wiring checked apply power to the transmitter loop and allow five minutes for it to stabilize.
- (2) Due to differences in cable resistance in the RTD legs or errors within the RTD itself a small zero error may occur (usually less than 0.5C). To remove this error use a calibration standard RTD at the same immersion depth and adjust the Zero trimpot in the top of the transmitter enclosure with a small screwdriver, until the two levels agree. (Clockwise to increase the output reading and anticlockwise to decrease the output reading)

MAINTENANCE.

- (1) Check RTD's in place - with a calibration RTD at the same immersion depth.
- (2) Do it regularly - at least once every 6 months.
- (3) Replace defective protection tubes - even if they look good they may not be air or gas tight.
- (4) Check cables entering the RTD sensor head.

TX802RTD(F) CU10-F-2 Transmitter.

Isolating Linearised, 3 Wire RTD
Input, to 4~20 Output
Loop Powered Transmitter.

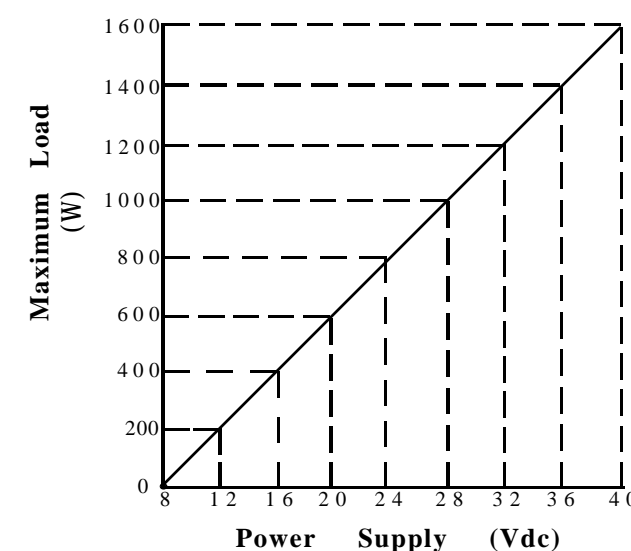


Features.

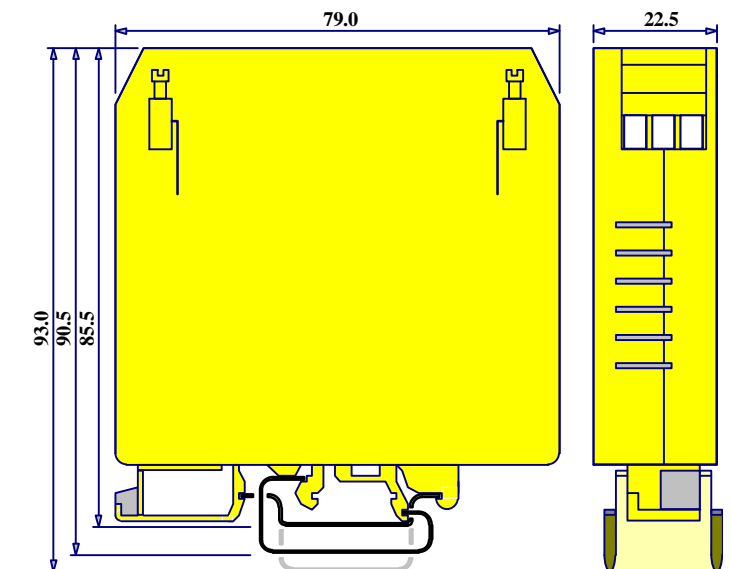
- CU10 input.
- Isolated Input to Output 2.0kV
- Field Programmable Input Ranges. TX802RTD
- High Accuracy.
- Linear With Temperature
- 40~200mV Output Test Signal.
- LED Indication of Loop Current.
- Low Cost.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.
- Reverse Polarity Protection.
- Corrosion Proofed Circuit Board & Components by Isonel 642. (Except Terminals & DIP Switches)



Graph Of Maximum Load
Versus Power Supply.



Enclosure Dimensions.



Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant the long term reliability of the instrument.

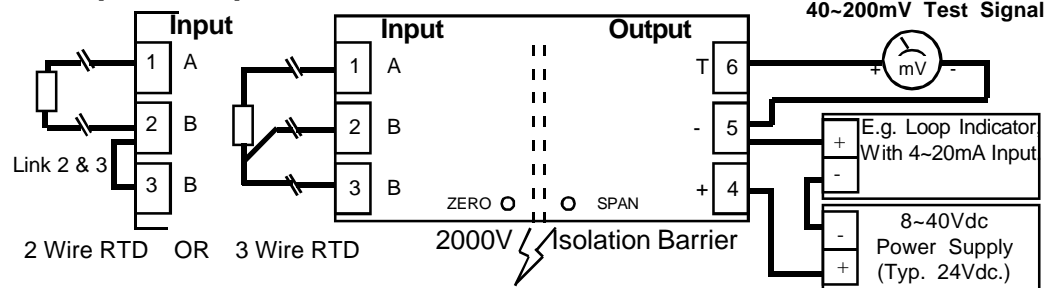
TX802RTD Specifications.

RTD Input	CU10 RTD (3 Wire Type) Standard. Sensor Current = 0.8mA. Lead Wire Resistance = 10Ω/Wire Max. Field Programmable Zero: -200C (-400F) to 200C (400F). (TX802RTD Only.) Field Programmable Span: 20C (40F) to 400C (800F). (TX802 RTD Only.) Suitable for 2 Wire Connection. (Offset Calibration needed.) Other Types of RTD Available. JIS Pt100, Pt250, Pt500, Pt1000, CU10, CU100, Ni100 or specify.
Output	-mA: 2 wire 4~20mA. (Loop Powered.) -mV: 40~200mV μ 4~20mA. (Indicative Test Signal Only.) Other Output Voltages Available. e.g. 1~5V.
Power Supply	8~40Vdc. Supply Voltage Sensitivity <±0.005%/V FSO. Output Load Resistance 800W @ 24Vdc. (50W/V Above 8Vdc.) Maximum Output Current Limited to <28mA. Sensor Fail -Upscale 23mA Min. -Downscale 3.6mA Max.

Accurate to	<±0.1% FSO Typical.
Linearity & Repeatability	<±0.1% FSO Typical.
Ambient Drift	<±0.02%/C FSO Typical.
Noise Immunity	125dB CMRR Average. (2.0kVac RMS Limit.)
R.F. Immunity	<1% Effect FSO Typical.
Isolation Voltage	2.0kVac'dc Input to Output for 60sec.
Response Time	200msec Typical. (10 to 90% 50msec Typical.)
Operating Temperature	0~70C.
Storage Temperature	-20~80C.
Operating Humidity	90%RH Max. Non-Condensing.
Construction	6.6 Polyamide Thermoplastic Rail Mount Enclosure.

Note 1. Specifications based on Standard Calibration Unit, unless otherwise specified.
 Note 2. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. No liability will be accepted for errors, omissions or amendments to this specification.

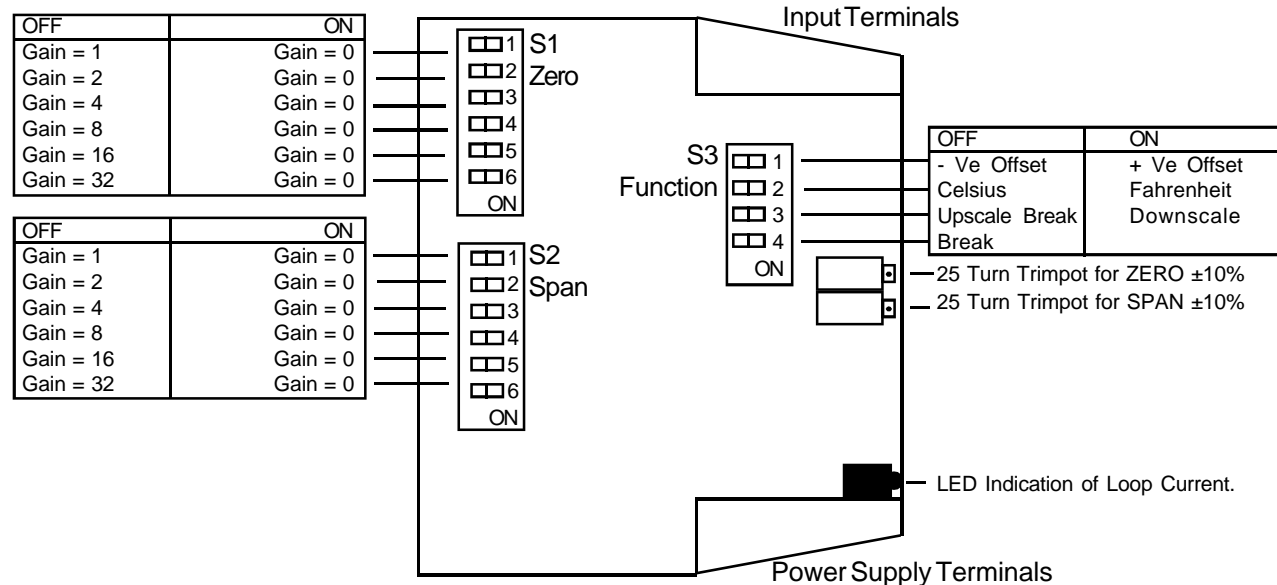
Examples of Input Connection.



Terminations.

Input 1	A
Input 2	B
Input 3	B
Output 4	+mA
Output 5	-mA
Output 6	mV TEST

Plan View of TX802RTD Adjustments (Pt100 only)



Input Programming Pt100 only

If the input range is not listed in the programming table, use the following formulae to work out the Zero and Span DIP switch settings for gain.

$$\text{deg C Span Gain} = \frac{1200}{\text{deg C High} - \text{deg C Low}}$$

$$\text{deg F Span Gain} = \frac{2400}{\text{deg F High} - \text{deg F Low}}$$

$$\text{deg C Zero Gain} = \frac{\text{deg C Low}}{5}$$

$$\text{deg F Zero Gain} = \frac{\text{deg F Low}}{10}$$

Gain Value	1	2	4	8	16	32
DIP Switch No.	1	2	3	4	5	6

If Zero Gain is 1/ +ve Put S3-1 OFF (Positive Offset)
 2/ -ve Put S3-1 ON (Negative Offset)

Note: Enter the Zero or Span gain value into the appropriate Zero or Span DIP switch.

So if a gain value of 28 is required, put DIP switch No's 3, 4, 5 OFF (ie, gains of 4 + 8 + 16 = 28) and all the other DIP switches ON. Dip switches are accessed by separating the two halves of the enclosure

Input Range Programming Table Pt100 only.

Notes: 1/ Switch status 1 = ON, 0 = OFF, X = DON'T CARE.
 2/ Input ranges with "*" beside them require more adjustment by the Span trimpot.

Input Range C (Put S5-2 OFF)	Input Range F (Put S5-2 ON)	S1-Zero						S2-Span						S3-Function				
		1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	
0~20C	0~40F	1	1	1	1	1	1	1	1	0	0	0	0	X				
0~25C	0~50F	1	1	1	1	1	1	1	1	1	1	0	0	X				
0~30C	0~60F	1	1	1	1	1	1	1	1	1	1	0	1	0	X			
0~40C	0~80F	1	1	1	1	1	1	1	1	1	0	0	0	1	X			
0~50C	0~100F	1	1	1	1	1	1	1	1	1	1	0	0	1	X			
0~60C	0~120F	1	1	1	1	1	1	1	1	1	0	1	0	1	X			
0~70C*	0~140F*	1	1	1	1	1	1	1	1	0	1	1	0	1	X			
0~75C	0~150F	1	1	1	1	1	1	1	1	1	1	1	0	1	X			
0~80C	0~160F	1	1	1	1	1	1	1	1	0	0	0	1	1	X			
0~90C*	0~180F*	1	1	1	1	1	1	1	1	0	1	0	0	1	X			
0~100C	0~200F	1	1	1	1	1	1	1	1	1	1	0	0	1	X			
0~110C	0~220F	1	1	1	1	1	1	1	1	0	0	1	0	1	X			
0~120C	0~240F	1	1	1	1	1	1	1	1	1	0	1	0	1	X			
0~125C*	0~250F*	1	1	1	1	1	1	1	1	1	0	1	0	1	X			
0~150C	0~300F	1	1	1	1	1	1	1	1	1	1	1	0	1	X			
0~200C	0~400F	1	1	1	1	1	1	1	1	1	0	0	1	1	X			
0~250C*	0~500F*	1	1	1	1	1	1	1	1	0	1	0	1	1	X			
0~300C	0~600F	1	1	1	1	1	1	1	1	1	1	0	1	1	X			
0~400C	0~800F	1	1	1	1	1	1	1	1	0	0	1	1	1	X			
0~600C	0~1200F	1	1	1	1	1	1	1	1	1	0	1	1	1	X			
-10~10C	-20~20F	1	0	1	1	1	1	1	1	1	1	0	0	0	1			
-10~20C	-20~40F	1	0	1	1	1	1	1	1	1	1	1	0	1	1			
-10~40C	-20~80F	1	0	1	1	1	1	1	1	1	1	1	0	0	1			
-20~20C	-40~40F	1	1	0	1	1	1	1	1	1	0	0	0	1	1			
-20~30C	-40~60F	1	1	0	1	1	1	1	1	1	1	1	0	0	1			
-25~25C	-50~50F	0	1	0	1	1	1	1	1	1	1	1	0	0	1			
-25~50C	-50~100F	0	1	0	1	1	1	1	1	1	1	1	1	0	1			
-30~20C	-60~40F	1	0	0	1	1	1	1	1	1	1	1	0	0	1			
-50~50C	-100~100F	1	0	1	0	1	1	1	1	1	1	0	0	1	1			
-50~100C	-100~200F	1	0	1	0	1	1	1	1	1	1	1	0	1	1			
-50~150C	-100~300F	1	0	1	0	1	1	1	1	1	0	0	1	1	1			
-100~100C	-200~200F	1	1	0	1	0	1	1	1	1	0	0	1	1	1			
-100~200C	-200~400F	1	1	0	1	0	1	1	1	1	1	0	1	1	1			
-200~200C	-400~400F	1	1	1	0	1	0	1	1	0	0	1	1	1	1			
-200~400C	-400~800F	1	1	1	0	1	0	1	1	0	1	1	1	1	1			
20~40C	40~80F	1	1	0	1	1	1	1	1	1	1	0	0	0	0			
50~100C	100~200F	1	0	1	0	1	1	1	1	1	1	1	0	0	1			
50~150C	100~300F	1	0	1	0	1	1	1	1	1	1	0	0	1	1			
100~200C	200~400F	1	1	0	1	0	1	1	1	1	1	0	0	1	1			
100~500C	200~1000F	1	1	0	1	0	1	1	1	0	0	1	1	1	1			

SET TO '0' FOR CELSIUS. SET TO '1' FOR FAHRENHEIT.
 Set to '0' for UPSCALE Sensor Break. Set to '1' for DOWNSCALE Sensor Break.
 Set to '1' for UPSCALE Sensor Break. Set to '0' for DOWNSCALE Sensor Break.