

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



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

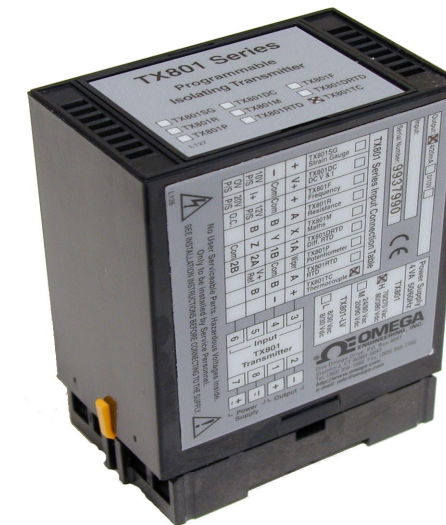
- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

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

TX801TC SERIES THERMOCOUPLE TRANSMITTER

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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

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

WARRANTY/DISCLAIMER

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.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

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:

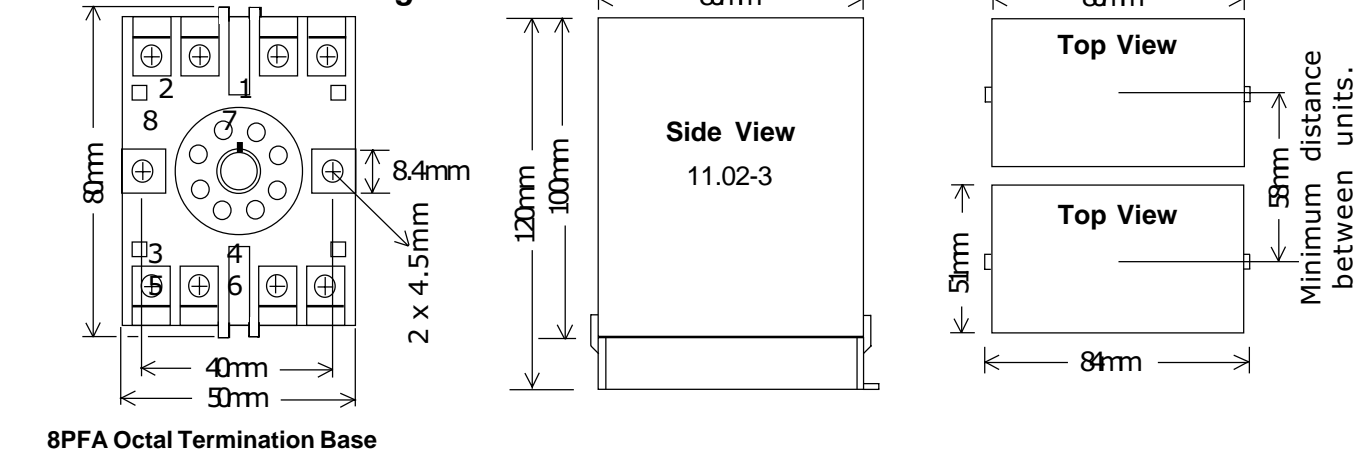
1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

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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Dimensions and Mounting.



The Proper Installation & Maintenance of TX801TC.

MOUNTING.

- (1) Mount in a clean environment in an electrical cabinet on 35mm, symmetrical, mounting rail.
- (2) Do not subject to vibration or excess temperature or humidity variations, and avoid mounting in cabinets with power control equipment.
- (3) To maintain compliance with the EMC Directives the TX801TC must be mounted in a fully enclosed steel cabinet. The cabinet must be properly earthed, with appropriate input / output entry points and cabling.

WIRING.

- (1) A readily accessible disconnect device and overcurrent device must be incorporated in the the power supply wiring.
- (2) All output cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only. (eg. Austral Standard Cables B5102ES.)
- (3) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (4) Lightning arrestors should be used on inputs and outputs when there is a danger from this source.

THERMOCOUPLES.

- (1) Avoid locating the thermocouple where it will be in a direct flame.
- (2) Never insert a porcelain or refractory tube suddenly in a hot area. Pre-heat gradually while installing.
- (3) Locate it where the average temperature will be measured. It should be representative of the mass.
- (4) Immerse the thermocouple enough so that the measuring junction 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 junction causes an error in reading.
- (5) If the thermocouple is mounted horizontally and the temperature is above the softening point of the tube, a support should be provided to prevent the tube sagging. Otherwise install the tube vertically.
- (6) Keep the junction head and cold junction in the approximation of the ambient temperature. Especially in the Noble Metal Class.

EXTENSION WIRE.

- (1) Use the correct thermocouple extension or compensation cable. i.e. Thermocouple type, insulation type, correct colour coding.
- (2) If possible install extension or compensation cable in a grounded conduit. Never run electrical wires in the same conduit.
- (3) All wires that must be spliced should be soldered, or the correct termination block used.

COMMISSIONING.

- (1) Once all the above conditions have been met and the wiring checked apply power to the TX801TC and allow five minutes to stabilize.
- (2) If the input range has been altered from factory setting, the TX801TC should be re-calibrated.
- (3) Due to the limits of error in a standard thermocouple probe and extension wire, an error can occur. (eg. For Type K an error of 2.2C or 0.75% of Span can occur. (which ever is greater)) To remove this error use a calibration standard thermocouple at the same immersion depth and adjust the Zero trimpot on the top of the TX801TC enclosure with a small screwdriver until the two levels agree. (Clockwise to increase the output reading and anti-clockwise to decrease the output reading.)

MAINTENANCE.

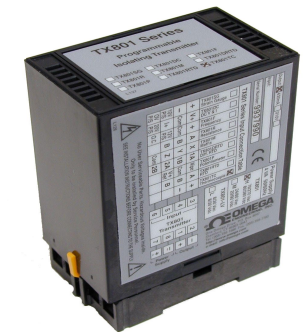
- (1) Replace defective protection tubes.
- (2) Check out extension and compensating cable circuits.
- (3) Repeat (3) of Commissioning.
- (4) Do it regularly - at least once every 6 months.

TX801TC Programmable Isolating Thermocouple Transmitter

Programmable Isolating Thermocouple Input to DC Current or DC Voltage Output Transmitter.

Features

- Available for J, K, N, R, S, & T Thermocouples.
- Field Programmable Input and Output Ranges.
- Bi-Polar Input and Output Ranges.
- Isolated Input to Output 1.6kV.
- High Accuracy.
- Linear With Temperature.
- Internal Cold Junction Compensation.
- Universal AC/DC Power Supply.
- Compact DIN Rail Mount Enclosure.
- Available Standard or Special Calibration.



TX801TC Specifications.

Input

Note 1: The input range must be within the specified **min / max range** of the thermocouple type

Note 2: Each TX801TC is only rangeable within the specified 'Thermocouple Type'.

Type	Thermocouple Type		Field Programmable Input Ranges								Linearity and Accuracy: %, ±1C (±2F)
	Specification Range (C)	Specification Range (F)	Zero Offset				Span (Max. In - Zero)				
			Min.(C)	Max.(C)	Min.(F)	Max.(F)	Min.(C)	Max.(C)	Min.(F)	Max.(F)	
J	0~800	0~1500	0	600	0	1100	200	800	400	1500	0.25
K	0~1200	0~2200	0	1000	0	1800	200	1200	400	2200	0.25
N	0~1200	0~2200	0	1000	0	1800	200	1200	400	2200	0.25
R	400~1700	750~3100	0	1300	0	2400	400	1700	750	3100	0.5
S	400~1700	750~3100	0	1300	0	2400	400	1700	750	3100	0.5
T	-100~200	-150~400	-100	100	-150	200	100	300	200	550	0.5

	- Impedances	1MΩ Min. Input Impedance. 100Ω Max. Thermocouple Lead Resistance.
Output	- Voltage	Field Programmable From ±500mVdc to ±12Vdc. Maximum Output Drive = 10mA.
	- Current	Field Programmable From ±1mAdc to ±20mAdc. Maximum Output Drive = 10Vdc. (500Ω @ 20mA.)
Universal P/S	-Standard High (H)	70~270Vac and 80~380Vdc; 50/60Hz; 4VA.
	-Standard Mid (M)	24~80Vac and 20~90Vdc; 50/60Hz; 4VA.
	-Low Voltage (L)	8~30Vac and 8~30Vdc; 50/60Hz; 4VA.
	-Circuit Sensitivity	<±0.001%/V FSO Typical.
	Cold Junction Compensation Accuracy.	<0.03C/C (0.06F/F) Typical.
	Repeatability	<±0.1% FSO Typical.
	Ambient Drift	<±0.01%/C FSO Typical.
	Noise Immunity	125dB CMRR Average. (1.6kV Peak Limit.)
	R.F. Immunity	<1% Effect FSO Typical.
	Isolation Voltage	1.6kVac/dc Input to Output for 60sec.
	Response Time	200msec Typical. (From 10 to 90% 50msec Typical.)
	Operating Temperature	0~70C.
	Storage Temperature	-20~80C.
	Operating Humidity	90% Max. RH Non-Condensing.
	Construction	Socket Plug-In Type With Barrier Terminals.
	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.

Quality Assurance Programme.

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

