Temperature Transmitters

Complete Family of Products

Universal • Din Rail • T/C Head Mount • Complete Assemblies

Models 2500 and 2800 — Formerly Transmation Products

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TM Solutions, inc

Universal Temperature Transmitters —

Which One Is Right For You?

Key Features	2800T	2500T	2700T/ 2750T
Universal Temperature Transmitter (8 thermo-couples, 9 RTD types, plus millivolts and ohms)	✔	✔	✔
Mounting Options:			
Din Rail	✔	✔	
Surface Mount	✔		
NEMA 4X	✔	✔	✔
Explosion Proof	✔		
Mounts Inside Small Temperature Sensor Head			✔
Digital Accuracy	0.05%	0.05%	<0.1°C (Pt100)
Isolation & RFI Protection	✔	✔	✔
Full factory testing over a wide ambient range (-40°C to +85°C)	✔	✔	✔
Integral Five-Digit Display	✔		
Configuration Software (for programming via PC)		✔	✔
Built-In Push Buttons (allows programming without a computer using two front-mounted pushbuttons)	✔		
Five Year Warranty	✔	✔	✔
Hart™ Protocol Available			✔

We offer a complete product line of economical, programmable Temperature Transmitters. The products range in capabilities, so you choose the model that best suits your needs — from the tiny 2700T/2750T that mounts inside the temperature sensor head, to the DIN rail mountable 2500T, to the fully featured 2800T.

All of our Temperature Transmitters combine digital accuracy and unparalleled versatility with a standard 4 to 20 mA output and the most straightforward programming design available on the market today.

Universal Temperature Transmitters

Pyragon Temperature Transmitters can be configured for virtually any application. In addition to millivolts and ohms, they accept both linearized and non-linearized inputs from B, E, J, K, N, R, S, T thermocouples and 2, 3, 4 wire RTD's with DIN 385 curve 100Ω, 200Ω, 500Ω, Pt., Burns 392 curve 100Ω, 200Ω, 500Ω, Pt., Nickel 110Ω, 120Ω, Copper 10Ω and 50Ω Bulbs.

Versatile Mounting & Housing Options

Accessories for our Temperature Transmitters include a wide variety of mountings and housings for ultimate versatility and ease of use in the field. The 2700T and 2750T are specially designed to **mount inside an RTD or thermocouple head**. We can even provide the complete sensor assemblies (contact the factory for details).

Mounting options for the 2500T and 2800T include **DIN Rail non-metallic NEMA 4X,** and **explosion proof housing** for single and multiple units. The NEMA 4X multiple unit housings are available in a variety of sizes and can accommodate up to 24 units.

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Packed with Features for Every Application

Display Provides Information and Indicates Problems

The 2800T Temperature Transmitter has a built-in display with five full digits, providing 0.1° resolution. The display indicates process inputs as well as F, C, Ω, and %. Microprocessor-controlled diagnostics provide warning prompts on the display for a variety of process and internal problems, including reference voltage, cold junction and EEPROM errors; under range, over range and open input conditions; and CPU checks. If there's a problem, you'll know it — and you'll be able to correct it immediately.

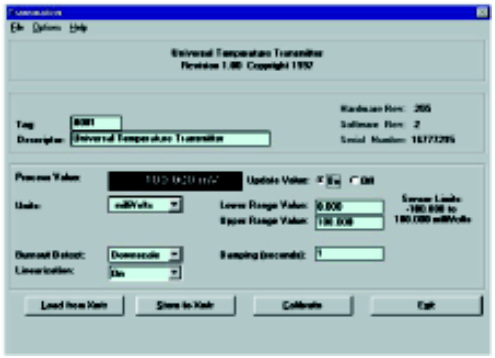
High Accuracy and Field Tough

Our Temperature Transmitters provide outstanding accuracy of ±0.05% of span and 18-bit A/D resolution. Accuracy is maintained over a wide ambient temperature range due to factory testing from -40°C to +85°C (-40°F to +185°F).

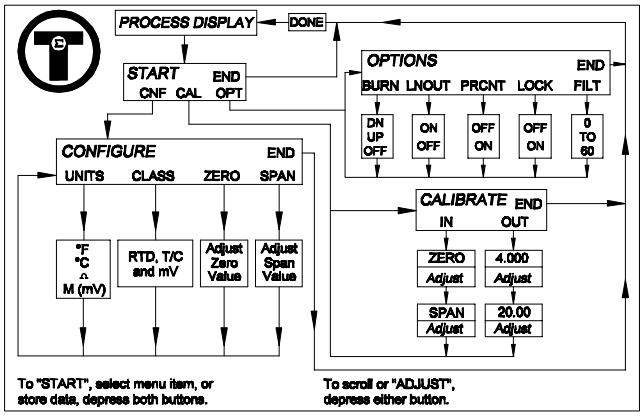
The model 2800 also includes RFI protection and 500 VRMS input-output isolation to maximize reliable signal transmission in field environments.

Simple and Straightforward Programming

Our programming software lets you quickly set up your the 2500T and 2700T/2750T Temperature Transmitters from one computer screen. The 2800T is programmed via the front pushbuttons referring to the simple flow chart on the unit. The 2750T Hart based unit can also configure the parameters as shown in the specifications. With all of our models, you will never have to disassemble the unit to change jumpers or dip switches.



Programming Screen



2800T Programming Flow Chart

Ordering Information

Model #	Description
2500T	TouchTempII™ Universal Temperature Transmitter
2700T	Universal Temperature Transmitter - mounts inside temperature sensor head
2750T	Universal Temperature Transmitter - mounts inside temperature sensor head- with HART® Communications Protocol
2800T	TouchTempII™ Universal Temperature Transmitter with display and pushbuttons
500148-089	Surface Mount Bracket
100665-651 100665-652	32 mm DIN Rail Mounting Bracket[2] 35 mm DIN Rail Mounting Bracket[2]
759257-254	2" Pipe Stand Mounting Kit
Contact Factory*	NEMA 4X Non-Metallic Multiple Unit Enclosure

**Contact factory for information about available NEMA 4X Non-Metallic Multiple Unit Enclosure*

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TouchTempII™ Specifications

Unless otherwise indicated, all specifications are referred to an ambient temperature of 23°C ± 1°C (73°F ± 2°F). All specifications are for Models 2500T and 2800T. Please see insert sheet for specifications for Models 2700T and 2750T.

Table 1.1 Input Types, Range Limits, and Accuracy

Input Type	Range Limits		Digital Accuracy[1]	
	°C	°F	°C	°F
mV	-100 to 100 mV[2]		±0.015 mV	
Ohms/RTD 2 or 3 wire	0 to 1000W		±0.35Ω	
B T/C	250°/1820°C	482°/3308°F	±0.8°C	±1.44°F
E T/C	-200°/1000°C	-328°/1832°F	±0.2°C	±0.36°F
J T/C	-180°/1200°C	-292°/2192°F	±0.3°C	±0.54°F
K T/C	-180°/1372°C	-292°/2501°F	±0.5°C	±0.90°F
N T/C	0°/1200°C	32°/2192°F	±0.4°C	±0.72°F
R T/C	-50°/1768°C	-58°/3214°F	±0.6°C	±1.08°F
S T/C	-50°/1768°C	-58°/3214°F	±0.6°C	±1.08°F
T T/C	-200°/400°C	-328°/752°F	±0.2°C	±0.36°F
Platinum (DIN 43760) 50Ω, 100Ω, or 200Ω	-200°/850°C	-328°/1562°F	±0.2°C	±0.36°F
Platinum (DIN 43760) 500Ω	-200°/260°C	-328°/500°F	±0.2°C	±0.36°F
Platinum (JIS C 1604) 100Ω	-200°/650°C	-328°/1202°F	±0.2°C	±0.36°F
Platinum (Burns 0.003902) 100Ω or 200Ω	-200°/650°C	-328°/1202°F	±0.2°C	±0.36°F
Platinum (Burns 0.003902) 500Ω	-200°/260°C	-328°/500°F	±0.2°C	±0.36°F
Nickel (Bristol's 7NA) 110Ω	-105°/310°C	-157°/590°F	±0.2°C	±0.36°F
Nickel (Minco) 120Ω	-80°/320°C	-112°/608°F	±0.2°C	±0.36°F
Copper (Minco) 10Ω	-200°/260°C	-328°/500°F	±0.3°C	±0.54°F
Copper (China 0.00428) 50Ω	-50°/150°C	-58°/302°F	±0.3°C	±0.54°F

[1]Total digital accuracy for thermocouple only: sum of Digital Accuracy ± 0.3°C (cold junction accuracy).
[2]Range limits for the Model 2800T are -9.999 to 99.999 mV.

Input Types: Configurable to any of the services and ranges indicated in the Table 1.1 above.

Input Span Limits: Any span within range limits

Input Resolution:
Temperature: 0.1°
mV: 1 µV
Ohms: 0.01Ω

Maximum Output Range: 3.7 to 22 mA DC

Calibrated Output Range: 4 to 20 mA DC

Output Resolution: 0.002 mA

D/A Accuracy: ±0.035% of span (Total analog accuracy is the sum of the Digital Accuracy and the D/A Accuracy)

RTD Excitation Current: 200 µA typical

Update Rate: Once per second minimum

Input Impedance: T/C or mV: >10 megohms

Common Mode Rejection: >120 dB @ 50/60 Hz

Normal Mode Rejection: >60 dB @ 50/60 Hz

Input/Output Isolation: 500 VAC

Operating Temperature Range/Humidity: Full factory testing from -40°C to 85°C (-40°F to 185°F); 5% to 95% RH non-condensing

Storage Temperature Range: -50°C to 100°C (-58°F to 212°F)

Temperature Effect:
T/C: ±0.2 µV/°C ± 0.005% of Input Reading/°C ± CJC
mV: ±0.2 µV/°C ± 0.005% of Input Reading/°C
Ohms/RTD: ±0.002Ω/°C ± 0.005% of Input Reading/°C
CJC (Cold Junction Compensation): 0.005°C/°C

Loop Supply Voltage: 13V + (Load Resistance x 20 mA) minimum, 30V maximum

Power Supply Effects: 0.005% of span/volt

Non-Destructive Input: 30 volts peak

RFI Effect: <1% with no abnormal behavior at 10 V/m @ 450 MHz

Stability: 0.1% or 0.1°C, whichever is greater, for six months with constant reference conditions

HART Protocol (2750T only): Supports HART Universal Commands 0, 1, 2, 3, 6, 11-19 as well as Standard Practice Commands 34, 35 and 44.

Approvals: Area Classification: Designed for non-incendive area Class I, Division 2, Group A, B, C, and D hazardous (classified) indoor locations.

Transmitter Housing: Injection molded, high impact, conductive plastic; meets flammability requirements of UL94 V-O, rated for continuous service at 85°C (185°F)

Connectors: 2800T/2850T use 6-place cage-clamp terminal block with non-exposed terminations for 14-24 AWG; 2500T/2550T and 2700/2750T use screw terminations.

Transmitter Dimensions (HWD): 81 mm x 45 mm x 97 mm (3.2" x 1.75" x 3.8"), not including mounting hardware

Weight: 300 gm (8 ounces)

Mounting: surface mount standard

Authorized Distributor:

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TouchTempII™ 2700T/2750TSpecifications

Table 1.2 Input Types, Range Limits and Accuracy

Input Type	Standard	Range	Min. span	Accuracy	Resolution
Pt25 to Pt1000	DIN/EN/IEC 60751	-200 to 850°C*	10°C	0.1°C	0.1°C
Pt25 to Pt1000	a = 0.003902	-200 to 850°C*	10°C	0.1°C	0.1°C
Pt25 to Pt1000	a = 0.003916	-200 to 850°C*	10°C	0.1°C	0.1°C
Ni25 to Ni1000	DIN 43760	-50 to 250°C*	10°C	0.1°C	0.1°C
Cu25 to Cu1000	0.428 Ohm/°C	-50 to 200°C	10°C	0.1°C	0.1°C
B(PtRh30-Pt)	IEC 584	100 to 1820°C	50°C	2°C	0.1°C
E(NiCr-CuNi)	IEC 584	-270 to 900°C	50°C	1°C	0.1°C
J(Fe-CuNi)	IEC 584	-210 to 1200°C	50°C	1°C	0.1°C
K(NiCr-Ni)	IEC 584	-250 to 1370°C	50°C	1°C	0.1°C
L(Fe-CuNi)	DIN 43710	-200 to 900°C	50°C	1°C	0.1°C
N(NiCrSi-NiSi)	IEC 584	-200 to 1300°C	50°C	1°C	0.1°C
R(PtRh13-Pt)	IEC 584	-50 to 1750°C	100°C	2°C	0.1°C
S(PtRh10-Pt)	IEC 584	-50 to 1750°C	100°C	2°C	0.1°C
T(Cu-CuNi)	IEC 584	-250 to 400°C	40°C	1°C	0.1°C
U(Cu-CuNi)	DIN 43710	-200 to 600°C	50°C	1°C	0.1°C
W5-Re (Type C)	ASTM 988	0 to 2300°C	100°C	2°C	0.1°C
W3-Re (Type D)	ASTM 988	0 to 2300°C	100°C	2°C	0.1°C
Lin. Voltage		-10 to 70 mV	2 mV	0.04 mV	0.1 mV
Lin. Voltage		-0.1 to 1.1 V	20 mV	0.4 mV	1 mV
Lin. Resistance		0 to 390 Ohm	5 Ohm	0.05 Ohm	0.01 Ohm
Lin. Resistance		0 to 2200 Ohm	25 Ohm	0.25 Ohm	0.1 Ohm

*The max. temperature is lower for RTD-elements in the range 500 to 1000, i.e. Pt1000 max. 350°C.

INPUT
Digital Accuracy: See Table 1.2
CJC-compensation: Local: < 0.5°C; Remote: < 0.2°C
RTD measuring current: 0.2 Ma, continuously
Cable Resistance:
T > 600°C: Max, 10 Ohm/wire, Configurable
3-/4 wire: T < 600°C: Max, 30 Ohm/wire, Configurable
Protection: ±35Vdc
Suppression: 50 and 60 Hz
Resolution: 16 bit
Repeatability: < 0.05°C

OUTPUT
Signal Span: 4 to 20mA, 2-wire, configurable; 20 to 4 mA, 2-wire, configurable
Accuracy: 0.1% of signal span
Supply range: 8 to 35 Vdc
Ripple Immunity: 3 Vrms
Load Equation: $R_L < (V_{cc} - 8)/23$ [kOhm]
Up/Down Scaling Limits: 23 mA/3.5 mA, configuration
Damping: 0 to 15 sec, configuration
Response Time (t_{90}): Pt100 1.0 sec.; T/C 1.6 sec.
Resolution: 12 bit

HART® DATA
Protocol: HCF standard, Rev. 5
Features (Configurable): Read serial number; read/change user ID; read/change configuration; read input signal value; read output signal value; input signal logging, 2-point sensor-trim; 2-point current-trim

ENVIRONMENTAL CONDITIONS
Operating Temperature: -40 to 85°C
Storage Temperature: -55 to 90°C
Humidity: < 98%RH, condensing
Vibrations: Lloyds Register, test 2

EMC DATA
Immunity: EN 61326
Emission: EN 61326
NAMUR: NE 21

APPROVAL (Demki) Eex ia IIC T5/T6, ATEX II 1G
Supply Range: 8 to 30 Vdc
Internal Inductivity: Li < 15 µH
Internal Capacity: Ci < 5 nF
Barrier Data: U < 30 Vdc; I < 0.1 A; P < 75 W
Temperature Class:
T1 to T5: -40 < T_{amb} < 85°C
T1 to T6: -40 < T_{amb} < 50°C

MECHANICAL DATA
Dimensions: ø44 x 26.3 mm
Protection Class: Housing: IP 55; Terminals: IP 10

OTHER DATA
Isolation: 3.75 Kvac
Temperature Drift: Typ. 0.003% per °C; Max. 0.01% per °C
Power-On Time: 1.8 to 3.9 sec.

TEST CONDITIONS
Configuration: Pt100; 0 to 100°C
Amb. Temperature: 23°C ±2°C

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