

# TEMPERATURE TRANSMITTERS

## TTR200 and TTC200

- RTD / SLIDE WIRE / OHMS or THERMOCOUPLE / mV INPUTS
- CONFIGURATION USING USB PORT POWERED CONFIGURATOR
- CUSTOM SENSORS ACCOMMODATED
- 22 SEGMENT USER LINEARIZATION FOR INPUT
- SENSOR OFFSET AND OUTPUT ALIGNMENT
- PROGRAMMABLE SENSOR BURNOUT
- HIGH LONG TERM STABILITY
- INTRINSICALLY SAFE VERSIONS AVAILABLE



## INTRODUCTION

The TTR200 & TTC200 are cost effective “smart” in head temperature transmitters that accept RTD/Slide Wire or Thermocouple/mV inputs and converts them to a standard loop powered industrial 4 to 20mA transmission signal over a user programmed range. Two versions are available; standard and ATEX/IECEX approved for hazardous areas.

A more flexible approach has been taken with this design, the linearization correction data is loaded into the transmitter during user configuration as opposed to being stored on the transmitter. This allows the linearization data to be updated any time in the future simply by reconfiguring the device with the latest configuration software. This flexibility also allows for custom sensors to be accommodated. It is also possible to generate your own linearization curve (22 point interpolation) for resistance, slide wire, thermocouple or mV inputs.

PC configuration allows the user to select Input Type, Range, Filter, Units, Linearization, and Burnout Direction without requiring calibration equipment. Configuration is performed quickly by simply connecting our new USB port driven configurator to the TTR200 or TTC200 and using our free software. Additionally the user may read live process data when connected to the PC, this allows for sensor offset, and output alignment calibration, where the user can enter values to match the actual process and therefore reducing system errors.

If required, the desired range can be specified at the time of order, removing the need for user configuration. If the range is not specified then the TTR200 will be shipped set to Pt100 0 to 100°C and the TTC200 will be shipped set to Type K thermocouple 0 to 1000°C.

## TTR200 INPUTS

Process Sensor	Range	Accuracy
Pt100 IEC 0.003851	-328 to 1,562°F	±0.36°F + (±0.05% of Rdg) <b>Note 2</b>
Pt100 IPTS-68 0.00391	-328 to 1,166°F	
Pt100 IPTS-68 0.00392		
Ni 100 DIN 0.00618	-76 to 356°F	
Ni 120 0.00672	-112 to 500°F	
Cu 100 0.00427	-58 to 356°F	±0.36°F + (±0.05% of Rdg) <b>Note 2</b>
Cu 53		
<b>BMS/HVAC Sensors</b>		
Pt 1000 IEC	-328 to 1,112°F	±0.36°F + (±0.05% of Rdg) <b>Note 2</b>
Pt 500 IEC	-328 to 1,382°F	
Ni 1000	-26 to 356°F	
Ni 1000 TK5000	-58 to 302°F	
Cu 1000	-112 to 500°F	
Ni 507.5	-112 to 680°F	
Ni 604	-328 to 392°F	
<b>Resistance</b>		
10 to 500 Ω	Auto	±0.055 Ω
500 to 2500 Ω	Auto	±0.5 Ω
2500 to 10500 Ω	Auto	±10.0 Ω

## TTR200 INPUTS

BMS/HVAC Silicon Sensors	Range	Accuracy
KTY81-110 KTY81-120	-67 to 347°F	±0.36°F + (±0.05% of Rdg) <b>Note 2</b>
KTY81-121 KTY81-122		
KTY81-150 KTY81-210		
KTY81-220 KTY81-221		
KTY81-222 KTY81-250		
KTY82-110 KTY82-120		
KTY82-121 KTY82-122		
KTY82-150 KTY82-210		
KTY82-220 KTY82-221		
KTY82-222 KTY82-250		
KTY81-151 KTY82-151	-40 to 572°F	±0.36°F + (±0.05% of Rdg) <b>Note 2</b>
KTY83-210 KTY83-220		
KTY83-250 KTY83-121		
KTY83-222		
KTY84-130 KTY84-150		
<b>Slide Wire</b>		
1 KΩ to 100 KΩ <b>Note 3</b>	0 to 100%	0.1%

## TTC200 INPUTS

Sensor	Range	Accuracy
K	-328 to 2,498°F	±0.1% of F.S. ±0.9°F (plus sensor error)
J	-148 to 2,192°F	
E	-328 to 1,832°F	
N	-292 to 2,372°F	
T	-328 to 752°F	±0.2% of F.S. ±0.9°F (plus sensor error)
R	14 to 3,200°F	±0.1% of F.S. ±0.9°F over the range 1,472 to 2,912°F (plus sensor error)
S		
L	-148 to 1,112°F	±0.1% of F.S. ±0.9°F (plus sensor error)
U	32 to 1,112°F	
B	32 to 3,272°F	
C(W5)	32 to 4,172°F	
D(W3)		
G(W)		
<b>Millivolts</b>		
mV	-100 to 200 mV	±0.02% of full scale

**Key: Rdg = Reading; FS = Full Scale**

**Note 1** Any span may be selected, full accuracy is only guaranteed for spans greater than the minimum recommended.

**Note 2** Basic measurement accuracy includes the effects of calibration, linearization and repeatability.

**Note 3** Slide wire end to end resistance, range 0 to 100% represents end to end travel.

**Note 4** Data files are available for °F °C

## SPECIFICATIONS @ 68°F

### RTD INPUT

RTD Connection	2 or 3 wire screw terminals
Slide Wire	Pot Range 1 to 100KΩ, Signal 0 to 100%
	Accuracy 0.1%
Thermal Drift	0 to 500Ω - 0.013Ω/°C
	500 to 2500Ω - 0.063Ω/°C
	2500 to 10500Ω - 0.27Ω/°C
Excitation Current	less than 200μA
Lead Resistance Effect	0.0036°F/Ohms
Maximum Lead Resistance	20 ohms per leg

### THERMOCOUPLE INPUT

Sensor Burnout	Either up or down scale output
Cold Junction	Range -40 to 185°F; Accuracy ±0.09°F
Thermal Drift	Offset 0.18°F/°F
	Span 0.09°F/°F

### OUTPUT

Output Type	Two wire 4 to 20mA current loop
Output Range	4.0 to 20.0mA
Maximum Output	21.5mA (in high burnout condition)
Minimum Output	3.8mA (in low burnout condition)
Accuracy	(mA output / 2000) or 5μA (which ever is greater)
Loop Voltage Effect	±0.2μA / V
Thermal Drift	0.6 μA/°F
Maximum Output Load	[(Vsupply - 10) / 20] K ohms (Example: 700 ohms @ 24 VDC)

### GENERAL

Update time	160mS
Response Time	0.5 seconds
Start Up Time	5 seconds (Current out less than 4mA during start up)
Warm Up Time	2 minutes to full accuracy
Connections	2.5mm Screw Terminal
Power Supply	10 to 30VDC, <1W Full Power

### USER INTERFACE

Type	USB 2.0
Baud Rate	1200 baud
Equipment	PC running XP or later, USB Configuration Kit

### USER INTERFACE FUNCTIONS

Scaling	User signal to process value scaling, for simplified setup.
Filter	Adjustable time constant 0 to 100 Seconds.
User Linearization (Profile)	2 to 22 segments: <ul style="list-style-type: none"><li>• ohms to process on TTR200</li><li>• mV to process on TTC200</li><li>• temperature units cannot be linearized.</li></ul>
Process Units	4 Characters (signal input only).
Temperature Units	°C or °F (RTD inputs only).
Tag Number	20 Characters
Process Output	Range in process units.
Signal Output	Select type, signal range and (temperature only) error signal.
User Offset	Enter sensor offset (temperature only).
Active Scaling	Set output process range against active sensor input.

### ISOLATION

Input/Output Isolation	500VDC (T/C version only)
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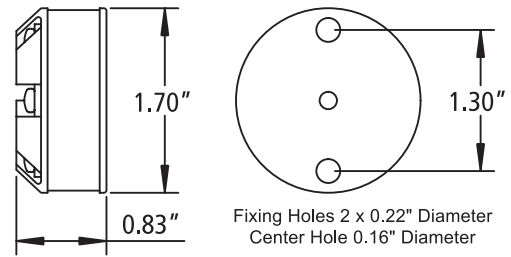
### ENVIRONMENTAL

Ambient Operating Temp. (ATEX models refer to manual)	-40 to +185°F
Ambient Storage Temp.	-58 to +194°F
Ambient Humidity	10 to 90% Non Condensing
Configuration Ambient	50 to 86°F

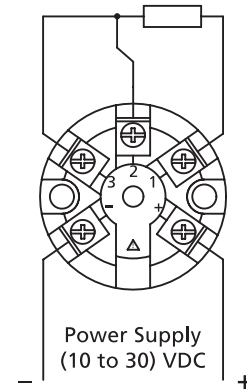
### APPROVALS

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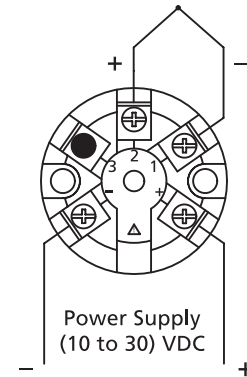
## PHYSICAL DIMENSIONS



TTR200  
Wiring Diagram



TTC200  
Wiring Diagram



## ORDER CODES:

TTR200 RTD INPUT/SLIDE WIRE/RESISTANCE TRANSMITTER  
TTR200X RTD INPUT/SLIDE WIRE/RESISTANCE TRANSMITTER  
(ATEX APPROVED INTRINSICALLY SAFE)

TTC200 THERMOCOUPLE/MV INPUT TRANSMITTER  
TTC200X THERMOCOUPLE/MV INPUT TRANSMITTER  
(ATEX APPROVED INTRINSICALLY SAFE)

Accessories  
USB KIT  
USB SPEED LINK SOFTWARE

## Local Representation



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