



Thermocouple Technology, Inc.  
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 Quakertown, PA 18951  
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 www.tteconline.com

**Model 420PRO™**  
**Temperature**  
**Transmitters**

# T-TEC Model 420PRO™ Temperature Transmitter



- Easily programmed for T/C's or RTD's
- 4-20 mA output
- Fully Temperature Linear
- Easy to use Windows based Software
- 11 T/C Types & 2 RTD Types in one unit
- Head Mounted
- Selectable Sensor Fault Mode
- Non Isolated
- 5 Year Limited Warranty

**IN  
 STOCK**

Programming is made simple with T-TEC's  
**420PRO™ Software:**

- Connect leads to 420PRO Transmitter & to your PC
- Select Input  
 RTD: PT100, .00385 or .003916  
 T/C: J, K, T, E, R, S, B, AE, U
- Input Measuring Range (example: Low Range = 100 F  
 Upper Range = 1000 F)
- Select Sensor Failure Detection: Upscale or Downscale

Software package includes communication cable for  
 connecting 420PRO to PC.

**OUTSTANDING VALUE  
 5 YEAR WARRANTY!**



**Software Kit Available  
 for 420PRO™**

## ORDERING INFORMATION

| Item                  | Part Number         |
|-----------------------|---------------------|
| Transmitter           | 420PRO              |
| Software & Cable      | 420PRO SOFTWARE KIT |
| Factory Configuration | 70CAL00001          |
| Surface Mounting Box  | 70ADA00008          |
| Rail Mounting Box     | 70ADA00009          |
| Rail Mounting Kit     | 70ADA00013          |



## Main Features of T-TEC'S 420PRO™

### Measurements with RTDs

420PRO™ accepts inputs from standardized Platinum RTDs, Pt100, acc. to IEC 751 ( $\alpha=0.00385$ ) and Pt100 acc. to JIS 1604 ( $\alpha=0.003916$ ). 3-wire connection is used.

### Measurements with thermocouples

420PRO™ accepts inputs from 11 types of standardized thermocouples. For T/C input, the CJC (cold junction compensation) is fully automatic, by means of an accurate measurement of the terminal temperature. Alternatively, the CJC can be disabled.

### Sensor failure monitoring

420PRO™ monitors sensor break and short-circuit and forces the output signal upscale or downscale (selectable), when any sensor lead is broken, disconnected or short-circuited. The sensor monitoring can be switched off. The monitoring is furnished with a *pulsed excitation current*. This eliminates the voltage drop in the lead wires (giving a measuring error), caused by a standard DC excitation current.

### Power supply

420PRO™ is loop-powered and will work on voltages down to 8 VDC, thus giving good margins for high loads in the current loop. Reversed polarity will not damage the transmitter.

### Warranty

420PRO™ is covered by a 5 year limited warranty.

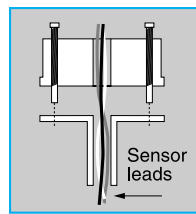
### 420PRO™ Software

420PRO™ Software is used for the configuration of 420PRO™.

- Measurement configuration: Sensor type, range, filter activation, CJC, etc.
- Monitoring of sensor status: Sensor failure upscale or downscale action of the output signal.
- Documentation: Configuration files can be saved for future use.

### 420PRO™ is configured without need for power supply.

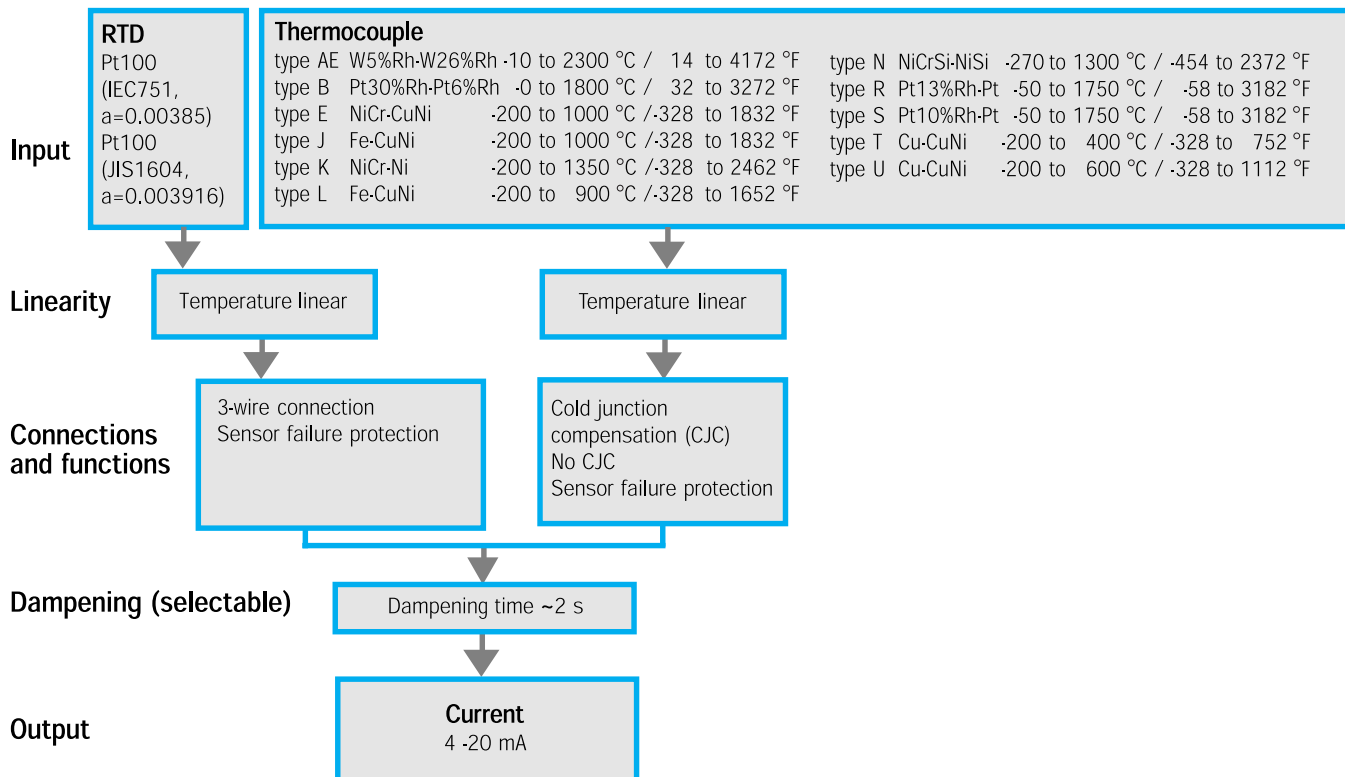
A communication cable is included in the configuration kit, 420PRO™ Software off-line package. 420PRO™ Software is compatible with Windows 3.1, Windows 3.11, Windows 95, Windows 98 and Windows NT Workstation 4.0. The program is menu-driven and extremely easy to use.



### Mounting

420PRO™ is designed to fit inside connection heads type DIN B or larger. The large center hole, dia. 7 mm / 0.28 inch, facilitates the pulling through of the sensor leads or an insert tube, greatly simplifying the mounting procedure.

## 420PRO™ Configuration Scheme





## 420PRO™ Specifications

### Input

|  |  |                                     |
|--|--|-------------------------------------|
| RTD's                                  |  |                                     |
| Pt100 (IEC751, $\alpha = 0.00385$ )    | 3-wire connection                      | -200 to +1000 °C / -328 to +1832 °F |
| Pt 100 (JIS1604, $\alpha = 0.003916$ ) | 3-wire connection                      | -200 to +1000 °C / -328 to +1832 °F |
| Sensor current                         |  | ~ 0.4 mA                            |
| Maximum sensor wire resistance         |  | 25 $\mu$ /wire                      |
| Thermocouples                          |  |                                     |
| Range                                  | Type: AE, B, E, J, K, L, N, R, S, T, U | See Configuration scheme            |
| Input impedance                        |  | >10 M $\Omega$                      |
| Maximum sensor wire resistance         |  | 500 $\mu$ (total loop)              |

### Monitoring

|                           |  |                      |
|---------------------------|--|----------------------|
| Sensor failure monitoring |  | Upscale or downscale |
|---------------------------|--|----------------------|

### Adjustments

|                 |            |                               |
|-----------------|------------|-------------------------------|
| Zero adjustment | All inputs | Any value within range limits |
| Minimum spans   | Pt100      | 10 °C / 18 °F                 |
|                 | T/C        | 2 mV                          |

### Output

|   |                     |                             |
|---|---------------------|-----------------------------|
| Analog                                    |                     | 4-20 mA, temperature linear |
| Resolution                                |                     | 5 $\mu$ A                   |
| Minimum output signal                     | Measurement/Failure | 3.8 mA / 3.5 mA             |
| Maximum output signal                     | Measurement/Failure | 20.5 mA / 21.6 mA           |
| Permissible load, <i>see load diagram</i> |                     | 725 $\mu$ @ 24 VDC, 22 mA   |

### Temperature

|                                |  |                                |
|--------------------------------|--|--------------------------------|
| Ambient, storage and operation |  | -40 to +85 °C / -40 to +185 °F |
|--------------------------------|--|--------------------------------|

### General data

|                           |  |              |
|---------------------------|--|--------------|
| Selectable dampening time |  | ~ 2 s        |
| Update time               |  | ~ 1.5 s      |
| Isolation In - Out        |  | Non isolated |
| Humidity (non-condensing) |  | 0 to 95 %RH  |

### Power supply, polarity protected

|                    |  |                    |
|--------------------|--|--------------------|
| Supply voltage     |  | 8 to 36 VDC 2-wire |
| Permissible ripple |  | 4 V p-p @ 50/60 Hz |

### Accuracy

|  |            |   |
|--|------------|---|
| Typical accuracy                             | RTD        | $\pm 0.2\%$ <sup>1)</sup>   |
|  | T/C        | $\pm 0.3\%$ <sup>1)</sup>   |
| Cold Junction Compensation (CJC)             | T/C        | $\pm 0.5\text{ °C} / \pm 0.9\text{ °F}$   |
| Temperature influence <sup>4)</sup>          | All inputs | Max. of $\pm 0.25\text{ °C} / 25\text{ °C}$ or $\pm 0.25\% / 25\text{ °C}$ <sup>1) 3)</sup> |
|  |            | Max. of $\pm 0.5\text{ °F} / 50\text{ °F}$ or $\pm 0.28\% / 50\text{ °F}$ <sup>1) 3)</sup>  |
| Temperature influence CJC <sup>4)</sup>      | T/C        | $\pm 0.5\text{ °C} / 25\text{ °C} / \pm 1.0\text{ °F} / 50\text{ °F}$                       |
| Sensor wire resistance influence             |            | Negligible <sup>2)</sup>  |
| Load influence                               |            | Negligible  |
| Power supply influence                       |            | Negligible  |
| RFI influence, 0.15 to 1000 MHz, 10 V or V/m |            | $\pm 0.5\%$ <sup>1)</sup> (typical)   |
| Long-term stability                          |            | $\pm 0.2\%$ <sup>1)</sup> /year   |



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# Model 420PRO™ Temperature Transmitters

| Housing                         |                       |  |
|---------------------------------|-----------------------|--|
| Material / Flammability (UL)    |                       | PC + ABS/V0, Polyamide/V2                          |
| Mounting                        |                       | DIN B-head or larger, DIN rail (with mounting kit) |
| Connection                      | Single/stranded wires | -1.5 mm <sup>2</sup> , AWG 16                      |
| Weight                          |                       | 50 g   |
| Protection, housing / terminals |                       | IP 50 / IP 10                                      |

1) Of input span

2) With equal wire resistance for RTD

3) If zero-deflection > 100% of input span: add 0.125% of input span/25 °C  
 or 0.14% of input span/50 °F per 100% zero-deflection

4) Reference temperature 23 °C / 73°F

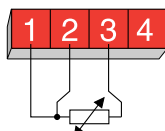


## 420PRO™ Wiring Diagram

### INPUTS

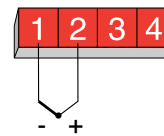
#### RTD

Pt100 (α = 0.00385), Pt100 (α = 0.003916)  
 3-wire connection



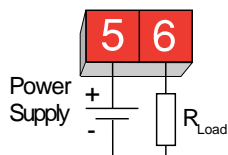
#### Thermocouple

Type: AE, B, E, J, K, L, N, R, S, T, U

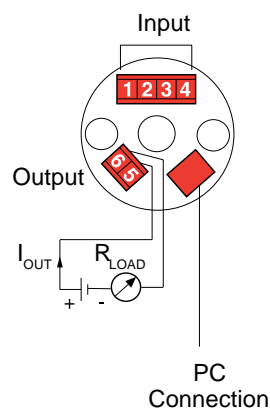


### OUTPUT

#### 4-20 mA Output



#### Connections



#### Dimensions

