



Level



Pressure



Flow



Temperature



Liquid Analysis



Registration



Systems Components



Services



Solutions

# Temperature sensor with integrated transmitter easytemp™ TSM470G

## E-direct

www.e-direct.us



- Highly accurate all-in-one system
- Sensor and electronics potted to protect against condensation (NEMA 6)
- 4 to 20 mA loop-powered signal reduces expensive wiring costs
- M12 plug-in microconnector simplifies installation
- Threaded process connections

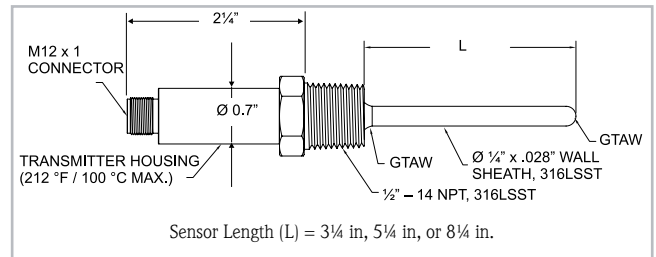
### Application

The easytemp TSM470G compact thermometer is intended for simple measuring tasks from -60 to +320 °F. The ideal operating location is in tanks and pipes that are not exposed to any high pressures or extreme temperatures.

### Measurement principle

The compact thermometer consists of a complete 4-wire Pt 100, Class A sensor, a NPT process connection, with built-in electronics and an M12 x 1 microconnector.

### Dimensions in inches

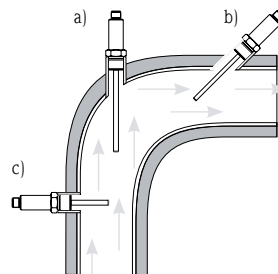


|                                                   |                           |
|---------------------------------------------------|---------------------------|
| <b>Sensor and electronics in one compact unit</b> |                           |
| <b>Approval:</b><br>UL Recognized                 | <b>Output:</b><br>4-20 mA |

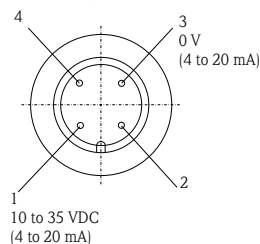
### Mounting location

Pipe installation

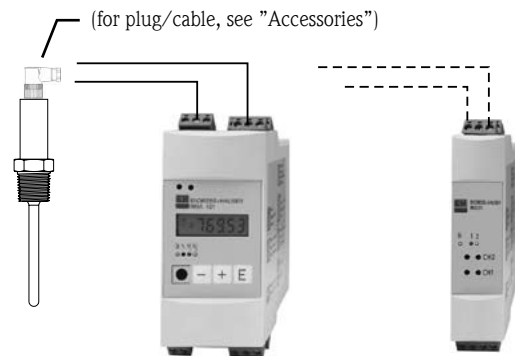
- At angle sections, against the direction of flow
- In smaller pipes, turned against the direction of flow
- Perpendicular to the direction of flow



### Electrical connection



### Measurement system



Connect to an Endress+Hauser RMA421 to supply loop power, provide local display, and retransmit signal to a higher level controller. For power supply only, use Endress+Hauser RNS221.

# easytemp™ TSM470G

## Technical data

### Sensor

- Sensing element 1 x Pt100, 4-wire connection
- Tolerance Class A to IEC 751
- Process temperature -60 to +320 °F
- Material 316L
- Sensor diameter Ø ¼" sheath

### Process connection

- Version ½", 14 NPT, 316L

### Transmitter housing

- Degree of protection NEMA 6P Rated
- Electrical connection M12 x 1 plug-in microconnector (Use TSM 470A-VN plug connector, or 52010285 cable with plug)
- Material Stainless steel

### Output values

- Output signal Analog 4 to 20 mA, 20 to 4 mA
  - Undershooting measuring range: linear decrease to 3.8 mA
  - Exceeding measuring range: linear increase to 20.5 mA
  - Sensor break; Sensor short-circuit: ≤ 3.6 mA or ≥ 21.0 mA
- Load max. (V<sub>power supply</sub> -10 V) / 0.022 A
- Induced current requirement ≤ 3.5 mA

### Measuring range

| Code | Measuring range | Code | Measuring range | Code | Measuring range |
|------|-----------------|------|-----------------|------|-----------------|
| AA   | 0 to 100 °F     | AE   | -40 to +200 °F  | BH   | -20 to +60 °C   |
| AB   | 0 to 200 °F     | BB   | -40 to +60 °C   | BI   | -10 to +40 °C   |
| AC   | 0 to 300 °F     | BC   | -30 to +60 °C   | BK   | 0 to 50 °C      |
| AD   | -40 to +140 °F  | BD   | -30 to +150 °C  | BL   | 0 to 100 °C     |
|      |                 | BE   | -30 to +70 °C   | BM   | 0 to 150 °C     |
|      |                 | BG   | -20 to +20 °C   |      |                 |

please add to order code

\*1 please add code for measuring range

- Current limitation ≤ 23 mA
- Switch-on delay 2 s

### Power supply

- Supply voltage U<sub>b</sub> = 10 to 35 V
- Residual ripple Permitted residual ripple U<sub>ss</sub> ≤ 3 V at U<sub>b</sub> ≥ 13 V, f<sub>max</sub> = 1 kHz


### Accuracy

- Response time 1 s
- Reference operating conditions 73.4 °F, ±9 °F
- Measuring error 0.1 K or 0.08 %
- Influence of supply voltage ≤ ±0.01 %/V deviation from 24 V
- Influence of ambient temperature (temperature drift) T<sub>d</sub> = ±(15 ppm/K \* (full scale value + 200) + 50 ppm/K \* of set measuring range) \* Δθ  
Δθ = deviation of ambient temperature from the reference operating condition
- Long term stability ≤ 0.1 K/year or 0.005 %/year
- Influence of load ≤ ± 0.02 %/100 Ω

### Environmental conditions

- Ambient temperature -40 to +185 °F
- Storage temperature -40 to +212 °F
- Climate class as per EN 60 654-1, Class C
- Condensation permitted
- Shock resistance 4 g/2 to 150 Hz as per IEC 60 068-2-6
- Electromagnetic compatibility (EMC) Shock resistance and interference emission as per IEC 1326 and NAMUR NE 21

### Certification

- UL Recognized UL 3111-1 

Many other models, versions and options are available. Please contact Endress+Hauser for more information.

| Product     | Version                                              | Order no.           | Price/piece in \$ |          |          | we hereby order: | total price: |
|-------------|------------------------------------------------------|---------------------|-------------------|----------|----------|------------------|--------------|
|             |                                                      |                     | 1 to 5            | 6 to 15  | 16 to 35 |                  |              |
| TSM470G     | 3¼" insertion length                                 | TSM470G-AA1A_ _ *1K | \$232.00          | \$209.00 | \$188.00 | pcs              | \$           |
|             | 5¼" insertion length                                 | TSM470G-AA1B_ _ *1K | \$236.00          | \$213.00 | \$192.00 | pcs              | \$           |
|             | 8¼" insertion length                                 | TSM470G-AA1C_ _ *1K | \$242.00          | \$218.00 | \$196.00 | pcs              | \$           |
| Accessories | Cable, 15 ft. PVC with M12x1 connector plug          | 52010285            |                   | \$11.50  |          | pcs              | \$           |
|             | Connector, unshielded, angled M12 w/4-wire terminals | TSM470A-VN          |                   | \$20.50  |          | pcs              | \$           |
|             | Configuration kit for USB interface                  | TXU10-BA            |                   | \$185.00 |          | pcs              | \$           |

Net excluding cost of shipping and taxes.  
Acceptance per our Standard Terms and Conditions (find at [www.e-direct.us](http://www.e-direct.us)).

### Total price:

FOB Greenwood, IN; shipped pre-paid; shipping charges and applicable taxes added to invoice.

\$ \_\_\_\_\_

E-direct catalog (free)

Shipping method  Ground  Priority One Day  Priority Two Day



(For customers in the USA only)

Online Shop [www.e-direct.us](http://www.e-direct.us)

Order: by phone 888-EH DIRECT (343-4732)

by fax 800-321-7754

For special requests, e-mail us: [e-direct@us.endress.com](mailto:e-direct@us.endress.com)

E-direct  
Endress+Hauser, Inc.  
2350 Endress Place  
Greenwood, IN 46143

### Warranty

Should an instrument fail during the 1 year warranty period, a replacement unit will be provided.

### Delivery

Shipment from receipt of order for quantities 1-3 within 2 business days.

**Endress+Hauser** 

People for Process Automation