

# Digital Temperature Indicators



## APPLICATIONS

- Replacement for bimetal, liquid bulb and glass thermometers
- Pharmaceutical
- Food preparation
- Utilities and municipal refineries
- Chemical and petrochemical plants
- Paper mills
- Hydraulics

Thermowells are recommended for pressure, corrosive fluids and high velocity applications, see pages 46-48.

## 820/821 SERIES

- Large 4-digit LED display
- Field re-programmable with optional PC interface module and software
- Software includes a security feature to prevent accidental re-programming
- 4 mA to 20 mA programmable linearized output signal
- Utilizes a self-calibration feature for accurate and stable performance
- Optional fully programmable switch output; relay or transistor
- Utilizes a PT100  $\Omega$  RTD Class A element for temperature sensing
- M12 x 1 (5-pin) plug or 36" integral cable electrical connection
- IP 65 / NEMA 4 rated environmental protection
- All 316 Stainless Steel construction
- Easy installation with various mounting configurations

### SPECIFICATIONS

|                                   |                                                                                                                                                                                                    |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Temperature ranges</b>         | Standard ranges from -325 °F to 1,100 °F (-200 °C to 600 °C) Customer rescalable with optional PC interface and software                                                                           |
| <b>Temperature sensor</b>         | RTD (PT100 DIN EN 60751, Class A)                                                                                                                                                                  |
| <b>Housing material</b>           | 316 Stainless Steel                                                                                                                                                                                |
| <b>Probe material</b>             | 316 Stainless Steel standard                                                                                                                                                                       |
| <b>Maximum pressure</b>           | 500 psig (on probe )                                                                                                                                                                               |
| <b>Power requirement</b>          | 9-36 Vdc, polarity protected                                                                                                                                                                       |
| <b>Supply effect</b>              | 0.005%/V                                                                                                                                                                                           |
| <b>Power consumption</b>          | 15 mA @ 24 Vdc + output current – 950 mW max.<br>20 mA @ 24 Vdc for PNP output – 500 mW max.<br>20 mA @ 24 Vdc + sourcing current for NPN output<br>50 mA @ 24 Vdc for relay output – 1200 mW max. |
| <b>Current output</b>             | 4 mA to 20 mA (3-wire configuration) linear to temperature                                                                                                                                         |
| <b>Max load on current output</b> | (Vsupply-9V ) / 20 mA, $\Omega$                                                                                                                                                                    |
| <b>Optional switching output</b>  | Relay SPDT 0.5A @ 240 Vac or<br>Transistor NPN (max 100 mA source ) or<br>Transistor PNP (max 100 mA sink)                                                                                         |
| <b>Optional switching logic</b>   | N.C. or N.O. software selectable                                                                                                                                                                   |
| <b>Optional switching ranges</b>  | Customer programmable between -325 °F to 1,100 °F (-200 °C to 600 °C)                                                                                                                              |
| <b>Isolation</b>                  | 500 Vdc input /output (between probe and output signal )                                                                                                                                           |
| <b>Electrical connection</b>      | M12 x 1 (5-pin) or integral cable                                                                                                                                                                  |
| <b>Hysteresis</b>                 | 1% of range standard; customer programmable optional                                                                                                                                               |
| <b>Accuracy</b>                   | $\leq 0.22\%$ full scale; $\leq 0.1\%$ full scale optional                                                                                                                                         |
| <b>Open circuit detection</b>     | Upscale (22 mA) or downscale (2.5 mA) current output.<br>Error message on LED display                                                                                                              |
| <b>Warm-up</b>                    | 30 seconds                                                                                                                                                                                         |
| <b>Response time</b>              | 0.5 sec to 30 sec ( software selectable )                                                                                                                                                          |
| <b>Display</b>                    | 4-digit LED, decimal point selectable by software                                                                                                                                                  |
| <b>Display resolution</b>         | $\pm 0.02\%$ F.S. $\pm 1$ digit                                                                                                                                                                    |
| <b>RFI effect</b>                 | 1% or less typical                                                                                                                                                                                 |
| <b>Temperature ranges</b>         | Ambient -40 °F to 176 °F (-40 °C to 80 °C)<br>Effect <0.01% FS/°C<br>Storage -58 °F to 185 °F (-50 °C to 85 °C)                                                                                    |
| <b>Environmental protection</b>   | NEMA 4/ IP 65                                                                                                                                                                                      |



**WARNING:** This product can expose you to chemicals including Chromium (VI) and Nickel, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

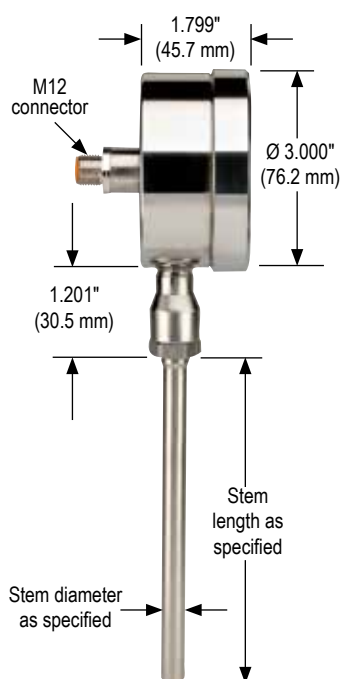
| ORDERING INFORMATION   |         |                    |         |                                                |        |                 |        |                 |
|------------------------|---------|--------------------|---------|------------------------------------------------|--------|-----------------|--------|-----------------|
| SERIES                 | 820     | Bottom connection  | 821     | Back connection                                |        |                 |        |                 |
| ACCURACY               | 1       | ≤0.22% full scale  | 2       | ≤0.1% full scale                               |        |                 |        |                 |
| OUTPUT                 | 1       | 4 mA to 20 mA      |         |                                                |        |                 |        |                 |
| BURNOUT                | U       | Upscale            | D       | Downscale                                      |        |                 |        |                 |
| PROCESS CONNECTIONS    | 0       | None               | 8       | 1/2" NPT Male                                  |        |                 |        |                 |
|                        | 2       | 1/4" NPT Male      | 48      | 1/2" NPT Male w/adjustable compression fitting |        |                 |        |                 |
| TEMPERATURE RANGES     | -50/120 | -50 °F to 120 °F   | -50/400 | -50 °F to 400 °F                               | 32/200 | 32 °F to 200 °F | 32/400 | 32 °F to 400 °F |
|                        | -50/300 | -50 °F to 300 °F   | 32/120  | 32 °F to 120 °F                                | 32/300 | 32 °F to 300 °F |        |                 |
| ELECTRICAL CONNECTIONS | 36      | Integral cable 36" | 48      | M12 x 1 (5-pin)                                |        |                 |        |                 |
| STEM LENGTHS           | 025     | 2.5"               | 060     | 6"                                             | 120    | 12"             | 180    | 18"             |
|                        | 040     | 4"                 | 090     | 9"                                             | 150    | 15"             | 240    | 24"             |
| STEM DIAMETERS         | 2       | 1/4"               | 3       | 3/8"                                           | 4      | 1/2"            | 6      | 6 mm            |

Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

## EXAMPLE

|                             |           |                   |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
|-----------------------------|-----------|-------------------|---|---|---|---|---|---|---|---|--------|---|----|---|-----|---|---|
| EXAMPLE                     | 820       | -                 | 1 | - | 1 | - | D | - | 8 | - | 32/200 | - | 48 | - | 090 | - | 6 |
| Series .....                | 820       | Bottom connection |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Accuracy .....              | ≤0.22%    | full scale        |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Output .....                | 4 mA      | to 20 mA          |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Burnout .....               | Downscale |                   |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Process connection .....    | 1/2"      | NPT Male          |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Temperature range .....     | 32 °F     | to 200 °F         |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Electrical connection ..... | M12 x 1   | (5-pin)           |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Stem length .....           | 9"        |                   |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |
| Stem diameter .....         | 6 mm      |                   |   |   |   |   |   |   |   |   |        |   |    |   |     |   |   |

## 820 Series



## 821 Series

