



Instrumentation

Flow Monitors for Weld Tip Protection

- Flow monitors are used in the welding industry to monitor flow of liquids and gases
- Based on the Calorimetric flow principle
- No moving parts

Pressure Sensors for Weld Cell Automation

- Hydraulic or pneumatic monitoring
- Fully programmable output, functionality, scaling, and display
- Stainless steel housing
- Pressure ranges up to 600 Bar

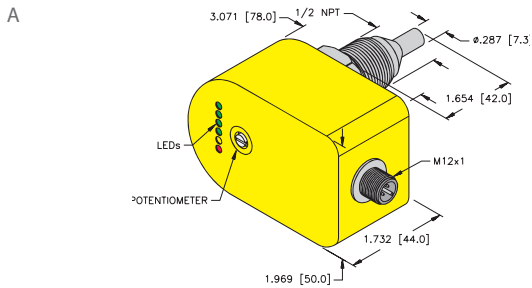
Instrumentation Selection Guide

| | | | |
|----------------|---|--|---|
| |  |  |  |
| Housing | Self-Contained Monitor | Air Flow Monitor | Pressure Sensor |
| Pages | 86 | 86 | 88-90 |

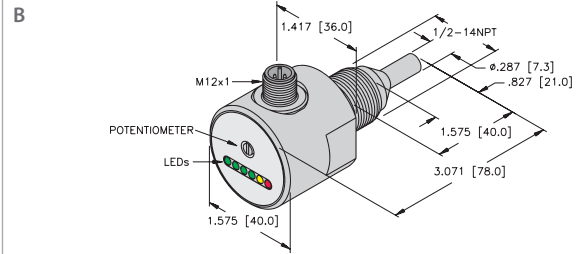
Instrumentation

Flow Sensors

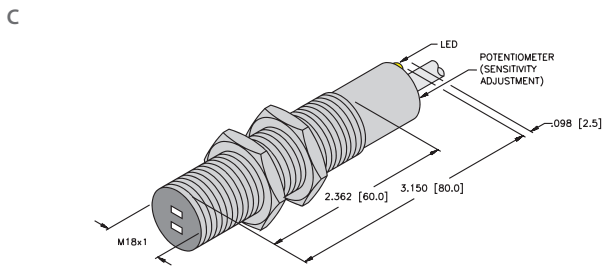
Dimension Drawings



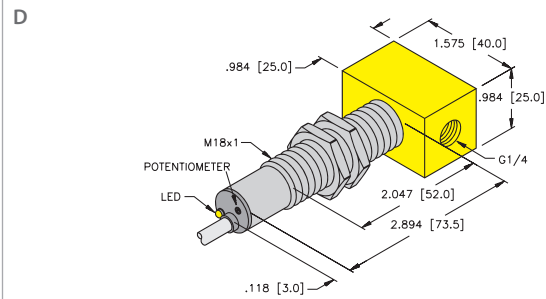
Self-Contained Plastic Housing (PBT)



Self-Contained 316 Stainless Steel Housing

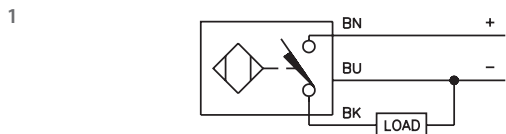


Self-Contained Air Flow Monitor, Nickel Plated Brass Housing

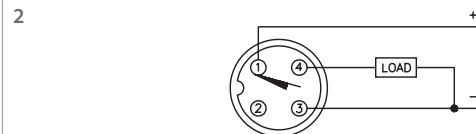


Self-Contained Air Flow Monitor, Delrin/PBT/Nickel Plated Brass Housing

Wiring Diagrams/Mating Cordsets



N.O. PNP



Mating Cordset: RK 4T-*

N.O. PNP

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Instrumentation


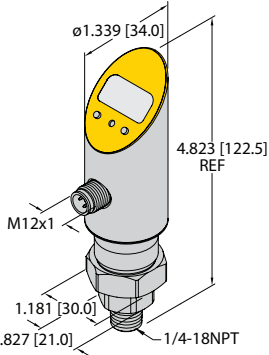
Flow Sensors

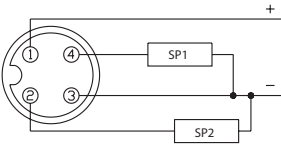
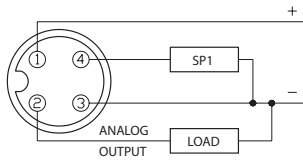
| Part Number/ ID Number | Flow Detection Range (water) | Flow Detection Range (oil) | Flow Detection Range (air) | Voltage | Current Consumption (mA) | Switching Current (mA) | Pressure Rating (psi) | Process Connection | Operating Temp. (°C) (ambient) | Operating Temp. (°C) (fluid) | Protection | Cable Length (mw) | Housing Material | Sensor Material | Dimension Drawings | Wiring Diagrams |
|------------------------------------|---------------------------------|-------------------------------|-------------------------------|------------------|-----------------------------|------------------------|-----------------------|--------------------|-----------------------------------|---------------------------------|------------|-------------------|-------------------------------------|----------------------------------|--------------------|-----------------|
| FCS-N1/2A4P-AP8X-H1141 M6871032 | 1-150 cm/sec. | 3-300 cm/sec. | -- | 19.2-28.8 VDC | ≤60 | ≤400 | 1450 | 1/2 NPT | -25 to +70 | -20 to +80 | IP67 | -- | Plastic, PBT | Stainless Steel, V4A (1.4571) | A | 2 |
| FCS-N1/2A4-AP8X-H1141 M6871004 | 1-150 cm/sec. | 3-300 cm/sec. | -- | 19.2-28.8 VDC | ≤70 | ≤400 | 1450 | 1/2 NPT | -25 to +80 | -20 to +80 | IP67 | -- | Stainless Steel, V4A (1.4571) | Stainless Steel, V4A (1.4571) | B | 2 |
| FCS-M18-AP8X M6870704 | -- | -- | 0.5 - 15 m/sec. | 19.2-28.8 VDC | ≤70 | ≤200 | 145 | M18x1 | -25 to +70 | -25 to +70 | IP67 | 2 | Metal, CuZn | Brass, nickel-plated | C | 1 |
| FCS-M18-AP8X/D041 M6870705 | -- | -- | 0.1 - 15 m/sec. | 19.2-28.8 VDC | ≤70 | ≤200 | 145 | M18x1 | -25 to +70 | -25 to +70 | IP67 | 2 | Metal, CuZn | Brass, nickel-plated | D | 1 |

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Instrumentation

PS500 Programmable Pressure Sensors, Rotatable Housing

| Housing Style | Dimension Drawings |
|---|---|
|  |  |

| Wiring Diagrams/Mating Cordsets | |
|---|---|
| <p>1</p>  <p>Mating Cordset: RK 4.4T-*</p> | <p>2</p>  <p>Mating Cordset: RK 4.4T-*</p> |

Performance Data

| | |
|-----------------------------------|---|
| Analog Accuracy LHR: | ±0.5% of Full Scale (±1% of Full Scale for PS0.25V) |
| Set point Accuracy: | ±0.5% of Full Scale (±1% of Full Scale for PS0.25V) |
| Set Point Hysteresis: | 0.5% of Span |
| Temperature Coefficient: | ≤0.15% of Measuring Range per 10 °C |
| Programmable Analog Start Point: | 0-90% of Measuring Range |
| Programmable Analog End Point: | 10-100% of Measuring Range |
| Switch Point Range: | 1-100% of Pressure Range |
| Reset Point Range: | 0.5-99.5% of Pressure Range |
| Programmable Output for LI2UPN8X: | 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA, 0-5 VDC, 1-6 VDC, 5-0 VDC, 10 VDC, 6-1 VDC and 1X PNP/NPN N.O./N.C or 2X PNP/NPN N.O./N.C |
| Programmable Output for 2UPNX: | 2X PNP/NPN N.O./N.C |

Electrical Data

| | |
|--|-----------|
| Operating Voltage: | 18-30 VDC |
| Current Consumption: | ≤50 mA |
| Voltage Drop: | ≤2 V |
| Analog Load: | ≤500 Ω |
| Switching Frequency: | ≤180 Hz |
| Response Time: | <3 ms |
| Short Circuit/Reverse Polarity Protection: | Yes/Yes |

Environmental Data

| | |
|-----------------------|--|
| Ambient Temperature: | -40 to +80 °C |
| Storage Temperature: | -40 to +80 °C |
| Medium Temperature: | -40 to +85 °C |
| Housing Materials: | Stainless-steel/Plastic, 303 Stainless Steel |
| Wetted Materials: | 303 Stainless Steel, FPM, AL2O3 Ceramic |
| Protection Type: | IP67/IP69K/III |
| Shock Resistance: | 50 g (11 ms), per IEC 61508 |
| Vibration Resistance: | 20 g (9-2000Hz) per IEC 68-2-6 |
| LED Measuring Value: | 4 digit 7 Segment Display |

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Instrumentation

PS500 Programmable Pressure Sensors, Rotatable Housing

| Part Number | Operating Pressure | Over Pressure | Burst Pressure | Wiring Diagram |
|---------------------------------------|------------------------------|------------------------|------------------------|----------------|
| PS0.25V-503-LI2UPN8X-H1141 6833211 | -0.25-0.25 Bar (-1.0 PSIG) | ≤3 Bar (≤43.5 PSIG) | ≥3 Bar (≤43.5 PSIG) | 2 |
| PS01VR-503-LI2UPN8X-H1141 6833280 | -1-0 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 2 |
| PS001R-503-LI2UPN8X-H1141 6832281 | 0-1 Bar (0-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 2 |
| PS001V-503-LI2UPN8X-H1141 6832827 | -1-1 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 2 |
| PS003V-503-LI2UPN8X-H1141 6832828 | -1-3 Bar (-14.5-43.5 PSIG) | ≤12 Bar (≤174 PSIG) | ≥12 Bar (≤174 PSIG) | 2 |
| PS010V-503-LI2UPN8X-H1141 6832829 | -1-10 Bar (-14.5-145 PSIG) | ≤50 Bar (≤725 PSIG) | ≥50 Bar (≤725 PSIG) | 2 |
| PS016V-503-LI2UPN8X-H1141 6832830 | -1-16 Bar (-14.5-232 PSIG) | ≤40 Bar (≤580 PSIG) | ≥40 Bar (≤580 PSIG) | 2 |
| PS025V-503-LI2UPN8X-H1141 6832831 | -1-25 Bar (-14.5-362.5 PSIG) | ≤110 Bar (≤1595 PSIG) | ≥110 Bar (≤1595 PSIG) | 2 |
| PS040V-503-LI2UPN8X-H1141 6832832 | -1-40 Bar (-14.5-580 PSIG) | ≤180 Bar (≤2110 PSIG) | ≥180 Bar (≤2110 PSIG) | 2 |
| PS100R-503-LI2UPN8X-H1141 6832287 | 0-100 Bar (0-1450 PSIG) | ≤420 Bar (≤6092 PSIG) | ≥420 Bar (≤6092 PSIG) | 2 |
| PS250R-503-LI2UPN8X-H1141 6832288 | 0-250 Bar (0-3625 PSIG) | ≤500 Bar (≤7252 PSIG) | ≥500 Bar (≤7252 PSIG) | 2 |
| PS400R-503-LI2UPN8X-H1141 6832289 | 0-400 Bar (0-5800 PSIG) | ≤700 Bar (≤10153 PSIG) | ≥700 Bar (≤10153 PSIG) | 2 |
| PS600R-503-LI2UPN8X-H1141 6832833 | 0-600 Bar (0-8700 PSIG) | ≤900 Bar (≤13053 PSIG) | ≥900 Bar (≤13053 PSIG) | 2 |
| PS0.25V-503-2UPNX-H1141 6833212 | -0.25-0.25 Bar (-1.0 PSIG) | ≤3 Bar (≤43.5 PSIG) | ≥3 Bar (≤43.5 PSIG) | 1 |
| PS01VR-503-2UPNX-H1141 6832658 | -1-0 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 1 |
| PS001R-503-2UPNX-H1141 6832659 | 0-1 Bar (0-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 1 |
| PS001V-503-2UPNX-H1141 6832660 | -1-1 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 1 |
| PS003V-503-2UPNX-H1141 6832661 | -1-3 Bar (-14.5-43.5 PSIG) | ≤12 Bar (≤174 PSIG) | ≥12 Bar (≤174 PSIG) | 1 |
| PS010V-503-2UPNX-H1141 6832662 | -1-10 Bar (-14.5-145 PSIG) | ≤50 Bar (≤725 PSIG) | ≥50 Bar (≤725 PSIG) | 1 |
| PS016V-503-2UPNX-H1141 6832663 | -1-16 Bar (-14.5-232 PSIG) | ≤40 Bar (≤580 PSIG) | ≥40 Bar (≤580 PSIG) | 1 |
| PS025V-503-2UPNX-H1141 6832664 | -1-25 Bar (-14.5-362.5 PSIG) | ≤110 Bar (≤1595 PSIG) | ≥110 Bar (≤1595 PSIG) | 1 |
| PS040V-503-2UPNX-H1141 6832665 | -1-40 Bar (-14.5-580 PSIG) | ≤180 Bar (≤2110 PSIG) | ≥180 Bar (≤2110 PSIG) | 1 |
| PS100R-503-2UPNX-H1141 6832666 | 0-100 Bar (0-1450 PSIG) | ≤420 Bar (≤6092 PSIG) | ≥420 Bar (≤6092 PSIG) | 1 |
| PS250R-503-2UPNX-H1141 6832667 | 0-250 Bar (0-3625 PSIG) | ≤500 Bar (≤7252 PSIG) | ≥500 Bar (≤7252 PSIG) | 1 |
| PS400R-503-2UPNX-H1141 6832668 | 0-400 Bar (0-5800 PSIG) | ≤700 Bar (≤10153 PSIG) | ≥700 Bar (≤10153 PSIG) | 1 |
| PS600R-503-2UPNX-H1141 6832669 | 0-600 Bar (0-8700 PSIG) | ≤900 Bar (≤13053 PSIG) | ≥900 Bar (≤13053 PSIG) | 1 |

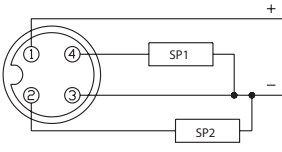
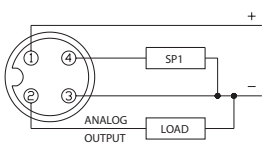
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Instrumentation

Instrumentation

PS300 Programmable Pressure Sensors, Non-Rotatable Housing

| Housing Style | Dimension Drawings |
|---|---|
|  |  |

| Wiring Diagrams/Mating Cordsets | |
|---|---|
| <p>1</p>  <p>Mating Cordset: RK 4.4T-*</p> | <p>2</p>  <p>Mating Cordset: RK 4.4T-*</p> |

Performance Data

- Analog Accuracy LHR: $\pm 0.5\%$ of Full Scale ($\pm 1\%$ of Full Scale for PS0.25V)
- Set point Accuracy: $\pm 0.5\%$ of Full Scale ($\pm 1\%$ of Full Scale for PS0.25V)
- Set Point Hysteresis: 0.5% of Span
- Temperature Coefficient: $\leq 0.15\%$ of Measuring Range per 10 °C
- Programmable Analog Start Point: 0-90% of Measuring Range
- Programmable Analog End Point: 10-100% of Measuring Range
- Switch Point Range: 1-100% of Pressure Range
- Reset Point Range: 0.5-99.5% of Pressure Range
- Programmable Output for LI2UPN8X: 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA, 0-5 VDC, 1-6 VDC, 5-0 VDC, 10 VDC, 6-1 VDC and 1X PNP/NPN N.O./N.C or 2X PNP/NPN N.O./N.C
- Programmable Output for 2UPNX: 2X PNP/NPN N.O./N.C

Electrical Data

- Operating Voltage: 18-30 VDC
- Current Consumption: ≤ 50 mA
- Voltage Drop: ≤ 2 V
- Analog Load: $\leq 500 \Omega$
- Switching Frequency: ≤ 180 Hz
- Response Time: < 3 ms
- Short Circuit/Reverse Polarity Protection: Yes/Yes

Environmental Data

- Ambient Temperature: -40 to +80 °C
- Storage Temperature: -40 to +80 °C
- Medium Temperature: -40 to +85 °C
- Housing Materials: Stainless-steel/Plastic, V2A (1.4305)
- Wetted Materials: 303 Stainless Steel, Plastic
- Protection Type: IP67/IP69K/III
- Shock Resistance: 50 g (11 ms), per IEC 61508
- Vibration Resistance: 20 g (9-2000Hz) per IEC 68-2-6
- LED Measuring Value: 4 digit 7 Segment Display

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Instrumentation

PS300 Programmable Pressure Sensors, Non-Rotatable Housing

| Part Number | Operating Pressure | Over Pressure | Burst Pressure | Wiring Diagram |
|--------------------------------------|------------------------------|------------------------|------------------------|----------------|
| PS01VR-303-LI2UPN8X-H1141 6833402 | -1-0 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 2 |
| PS001V-303-LI2UPN8X-H1141 6833404 | -1-1 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 2 |
| PS003V-303-LI2UPN8X-H1141 6833405 | -1-3 Bar (-14.5-43.5 PSIG) | ≤12 Bar (≤174 PSIG) | ≥12 Bar (≤174 PSIG) | 2 |
| PS010V-303-LI2UPN8X-H1141 6833406 | -1-10 Bar (-14.5-145 PSIG) | ≤50 Bar (≤725 PSIG) | ≥50 Bar (≤725 PSIG) | 2 |
| PS016V-303-LI2UPN8X-H1141 6833407 | -1-16 Bar (-14.5-232 PSIG) | ≤40 Bar (≤580 PSIG) | ≥40 Bar (≤580 PSIG) | 2 |
| PS025V-303-LI2UPN8X-H1141 6833408 | -1-25 Bar (-14.5-362.5 PSIG) | ≤110 Bar (≤1595 PSIG) | ≥110 Bar (≤1595 PSIG) | 2 |
| PS040V-303-LI2UPN8X-H1141 6833409 | -1-40 Bar (-14.5-580 PSIG) | ≤180 Bar (≤2110 PSIG) | ≥180 Bar (≤2110 PSIG) | 2 |
| PS100R-303-LI2UPN8X-H1141 6833410 | 0-100 Bar (0-1450 PSIG) | ≤420 Bar (≤6092 PSIG) | ≥420 Bar (≤6092 PSIG) | 2 |
| PS250R-303-LI2UPN8X-H1141 6833411 | 0-250 Bar (0-3625 PSIG) | ≤500 Bar (≤7252 PSIG) | ≥500 Bar (≤7252 PSIG) | 2 |
| PS400R-303-LI2UPN8X-H1141 6833412 | 0-400 Bar (0-5800 PSIG) | ≤700 Bar (≤10153 PSIG) | ≥700 Bar (≤10153 PSIG) | 2 |
| PS600R-303-LI2UPN8X-H1141 6833413 | 0-600 Bar (0-8700 PSIG) | ≤900 Bar (≤13053 PSIG) | ≥900 Bar (≤13053 PSIG) | 2 |
| PS001R-303-LI2UPN8X-H1141 6833403 | 0-1 Bar (0-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 2 |
| PS01VR-303-2UPNX-H1141 6833414 | -1-0 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 1 |
| PS001R-303-2UPNX-H1141 6833415 | 0-1 Bar (0-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 1 |
| PS001V-303-2UPNX-H1141 6833416 | -1-1 Bar (-14.5-14.5 PSIG) | ≤5.5 Bar (≤80 PSIG) | ≥5.5 Bar (≤80 PSIG) | 1 |
| PS003V-303-2UPNX-H1141 6833417 | -1-3 Bar (-14.5-43.5 PSIG) | ≤12 Bar (≤174 PSIG) | ≥12 Bar (≤174 PSIG) | 1 |
| PS010V-303-2UPNX-H1141 6833418 | -1-10 Bar (-14.5-145 PSIG) | ≤50 Bar (≤725 PSIG) | ≥50 Bar (≤725 PSIG) | 1 |
| PS016V-303-2UPNX-H1141 6833419 | -1-16 Bar (-14.5-232 PSIG) | ≤40 Bar (≤580 PSIG) | ≥40 Bar (≤580 PSIG) | 1 |
| PS025V-303-2UPNX-H1141 6833420 | -1-25 Bar (-14.5-362.5 PSIG) | ≤110 Bar (≤1595 PSIG) | ≥110 Bar (≤1595 PSIG) | 1 |
| PS040V-303-2UPNX-H1141 6833421 | -1-40 Bar (-14.5-580 PSIG) | ≤180 Bar (≤2110 PSIG) | ≥180 Bar (≤2110 PSIG) | 1 |
| PS100R-303-2UPNX-H1141 6833422 | 0-100 Bar (0-1450 PSIG) | ≤420 Bar (≤6092 PSIG) | ≥420 Bar (≤6092 PSIG) | 1 |
| PS250R-303-2UPNX-H1141 6833423 | 0-250 Bar (0-3625 PSIG) | ≤500 Bar (≤7252 PSIG) | ≥500 Bar (≤7252 PSIG) | 1 |
| PS400R-303-2UPNX-H1141 6833424 | 0-400 Bar (0-5800 PSIG) | ≤700 Bar (≤10153 PSIG) | ≥700 Bar (≤10153 PSIG) | 1 |
| PS600R-303-2UPNX-H1141 6833425 | 0-600 Bar (0-8700 PSIG) | ≤900 Bar (≤13053 PSIG) | ≥900 Bar (≤13053 PSIG) | 1 |

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