



X55-600

CURRENT TO PRESSURE
TRANSDUCERS



X55-300

PNEUMATIC PRESSURE
TRANSMITTERS

ISO 9001
REGISTERED

RONAN



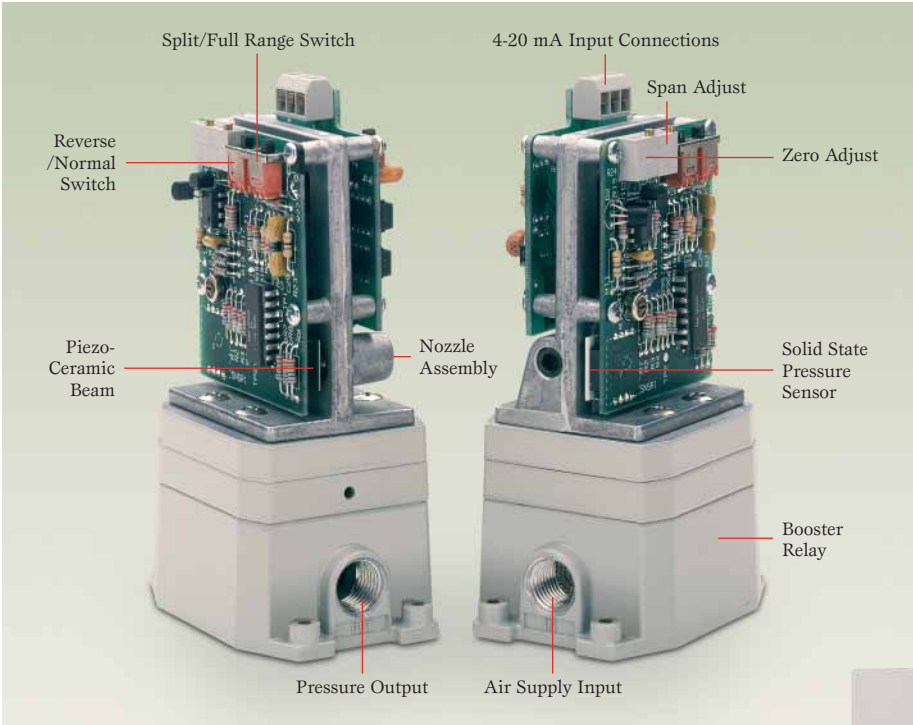
X55-600

CURRENT TO PRESSURE TRANSDUCERS

The Ronan X55-600 Series I to P Transducers are reliable, stable, accurate and versatile. But, more important; they are “Hard to Plug.” The wide dynamic range on the control elements and associated solid-state technology allows the circuitry to compensate, even when passageways become partially obstructed. The technology and the physical design actually allows contaminants to “blow through.” Additional features include, high immunity to shock and vibration, extremely low air consumption, high SCFM output, and high stability over temperature and input pressure changes. All these features make the Ronan I/P the best choice for all applications in any industry.

F E A T U R E S

- Hard-to-Plug Design
- Low Air Consumption (0.002 SCFM)
- No Pre-Regulator Required
- Supply Pressure to 120 PSI
- Vibration and Shock Resistant
- Mount in Any Position
- 0.2 % of Span Accuracy
- Reverse/Direct and Split Range Operation
- -40° to 150°F Operation
- Standard 3-15, 3-27 or 6-30 PSI Ranges
- Non-Standard Ranges Available
- Worldwide Approvals

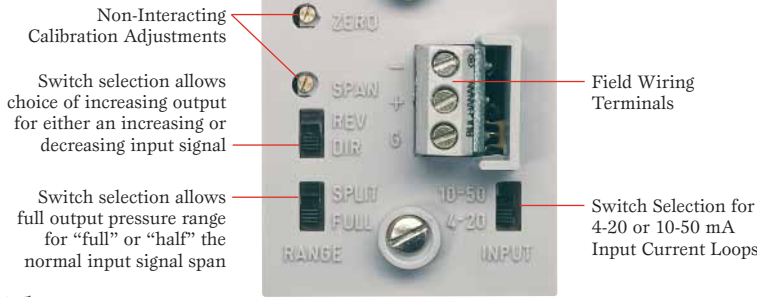


CONTROLS

The field selectable switch options and calibration adjustments make the X55-600 Series one of the most versatile units on the market. The chart below shows a few typical setup configurations. Even greater variations are possible by manipulation of the “Zero” and “Span” adjustments as well as the switches.

PRINCIPLE OF OPERATION

The X55-600 I to P Transducer uses state of the art technology to insure high accuracy and dependability even in the harshest operating environment. The two key elements are the piezo-ceramic beam and the solid state pressure sensor. In a typical setup, the I to P receives a 4-20 mA signal from a controller or similar device. The input is electrically conditioned and used as one input to a circuit which controls the amount of bias voltage applied to the piezo-ceramic beam. As the voltage on the beam varies, the beam will bend either toward or away from the nozzle assembly. This increases or decreases the pressure inside the booster relay, which in turn causes the I to P’s output pressure to change. In order to



maintain close control over wide changes in temperature and supply pressure, the output pressure sensor’s signal is also monitored and applied to the beam bias circuit as a correction factor. This combination of a solid state control element and feedback sensor is what gives the X55-600 its accuracy and dependability.

FIELD SELECTABLE CONFIGURATIONS

| ACTION | RANGE | 4-20mA | 10-50mA | 3-15 PSIG | 3-27 PSIG | 6-30 PSIG |
|----------------|-------------|--------|---------|-----------|-----------|-----------|
| Direct Acting | Full Range | 4-20 | 10-50 | 3-15 | 3-27 | 6-30 |
| Reverse Acting | Full Range | 4-20 | 10-50 | 15-3 | 27-3 | 30-6 |
| Direct Acting | Split Range | 4-12 | 10-30 | 3-15 | 3-27 | 6-30 |
| | | 4-11 | 10-29 | 3-15 | 3-27 | 6-30 |
| | | 12-20 | 30-50 | 3-15 | 3-27 | 6-30 |
| | | 13-20 | 31-50 | 3-15 | 3-27 | 6-30 |
| Reverse Acting | Split Range | 4-12 | 10-30 | 15-3 | 27-3 | 30-6 |
| | | 4-11 | 10-29 | 15-3 | 27-3 | 30-6 |
| | | 12-20 | 30-50 | 15-3 | 27-3 | 30-6 |
| | | 13-20 | 31-50 | 15-3 | 27-3 | 30-6 |



EXPLOSION PROOF AND NEMA 4 WEATHERPROOF

The X55-600-EX unit is well suited for hazardous environments as well as for outdoor locations. The heavy duty aluminum housing has a thick coating of epoxy paint for protection against corrosive environments. Mounting can be standard surface, or optional 2" pipe clamp as shown below. Universal mounting brackets are also available for mounting the X55-600 directly on any standard valve actuator. Because it is also intrinsically safe, the X55-600 provides the ruggedness of a heavy duty cast aluminum housing with the ability to be opened and serviced in a hazardous environment.



NEMA 4 WEATHERPROOF

The X55-600-N4 was designed for NEMA 4 applications where small size is important. The molded plastic top cover, gasketed access lid and epoxy painted base assure long life in the worst environments. Mounting configurations include standard surface mount or DIN rail. Universal actuator and 2" pipe mounting brackets are also available.



STANDARD GENERAL PURPOSE

The X55-600-GP is ideal for control room service, or in NEMA 4 or 12 enclosures where space is limited. Mounting options include surface, DIN rail, or 2" pipe mounting. Air and electrical connections are easily accessible without removing covers or shields. The small footprint of the X55-600-GP saves panel space, and the top access controls make it ideal for retrofit applications.



SURFACE MOUNT MANIFOLDS

The X55-600-M is the best high density system available for easy installation, expansion and maintenance. Surface mount chassis come in 4, 8 or 10 positions. All pneumatic connects are made on the chassis/base assembly. Manual input air shutoff valves at each position allows working on the I/P's air lines, positioners or actuators without disturbing the supply air or other I/Ps. Units can be added or removed without the loss of air pressure. One input air connection is provided for each chassis, thereby minimizing piping connections. The X55-600-M is designed for control room applications, but can also be used in NEMA 4, 7 or 12 enclosures.

19" WIDE RACK MANIFOLD

These units use the same X55-600-M modules used with the surface mount chassis mentioned earlier. Each chassis can hold up to eight I to P modules. The rack mount configuration offers the advantage of front access wiring and rear access pneumatics. The standard 19" width also makes it easy to integrate these I to Ps with other standard 19" rack systems.



SPECIFICATIONS

Air Consumption: 0.002 SCFM
Supply Pressure Effect: None
Supply Pressure: 5-120 PSI (minimum = max. output + 5 PSI)
Loop Voltage Drop: < 6 Vdc (at 4-20 mA input)
Output Ranges: 3-15, 3-27, 6-30, 0-60, 0-100 PSI. For other zero based and high output pressure ranges, contact Ronan
Accuracy: $\pm 0.20\%$ of span includes linearity, hysteresis, and repeatability
Zero and Full Scale Adjustability: $> \pm 12\%$ of span
Input Range: 4-20, 10-50 (switch selectable), 0-10 Vdc available. Contact Ronan
Unit Response Time: 0.6 seconds to 95 % of final value (300 ms is available. Contact Ronan)
Operating Modes: Direct, reverse, split range (switch selectable)
Mounting Position Effect: None
Vibration Effects: $< \pm 1.0\%$ of span at ± 1.0 gs from 5-2 KHz
RFI/EMI Effects: $< 0.8\%$ of range with 5 watt transmitter at 1 meter (20 to 500 MHz)
Shock Effects: $\pm 3\%$ of span at 30 gs
Operating Temperature: -20° to 150°F (-11° to 65°C).
 Operational low temperature version = -40° to 150°F (-40° to 65°C)
Temperature Drift: .01 % of span per °F from 30° to 150°F (0.025 % below 30°F)

Feed Flow (Output) Capacity: 3.0 SCFM at 20 PSI supply, 10.5 SCFM at 100 PSI supply
Bleed Flow (Exhaust) Capacity: 3 SCFM (20 SCFM optional)
Pneumatic Connections: 1/4" NPT
Electrical Connection: Screw compression (#30 to #16 awg wire)
Weight, Sizes and Ratings:

| Model | Rating | Weight (Lbs.) | Size (In.) |
|------------|-----------------|---------------|-----------------|
| X55-600-GP | General Purpose | 1.5 | 3 x 2 x 5.2 |
| X55-600-N4 | NEMA 4 | 1.75 | 3.8 x 2.3 x 6.8 |
| X55-600-Ex | Exp.-Proof | 3.0 | 4 x 4 x 5.4 |

Approvals:

Factory Mutual and CSA

- -EX = Explosion-Proof – Class I, II, III; Division 1; Group B, C, D, E, F, G
- -EX, -N4, -GP = Class I; Division 2; Group A, B, C, D
- -EX, -N4, -GP = Intrinsically Safe – Class I; Division 1; Group A, B, C, D

CENELEC

- -EX = Flame-Proof – Ex d (pending)
- -EX, -N4, -GP = Ex n (pending)
- -EX, -N4, -GP = Intrinsically Safe – Ex ia IIC T4 (Group IIA, IIB, IIC)

ORDERING INFORMATION

I to P Modules

| Model | Description |
|--------------------|---|
| X55-600-GP-()-SM | General Purpose Surface Mount |
| X55-600-GP-()-DIN | General Purpose “G” Rail Mount |
| X55-600-GP-()-M | General Purpose Manifold Mount (without base) |
| X55-600-GP-()-D2 | General Purpose “U” Rail Mount |
| X55-600-N4-()-SM | NEMA 4 Surface Mount |
| X55-600-N4-()-DIN | NEMA 4 “G” Rail Mount |
| X55-600-N4-()-D2 | NEMA 4 “U” Rail Mount |
| X55-600-EX-()-SM | Explosion-Proof Surface Mount |

1 = 3-15 PSI 2 = 3-27 PSI 3 = 6-30 PSI

I to P Manifold Chassis

| Model | Description |
|----------------|---|
| X55-600-SMC-4 | 4 Position Surface Mount Manifold Chassis with Manual Shutoff |
| X55-600-SMC-8 | 8 Position Surface Mount Manifold Chassis with Manual Shutoff |
| X55-600-SMC-10 | 10 Position Surface Mount Manifold Chassis with Manual Shutoff |
| X55-600-RM-8 | 8 Position, 19” Rack Mount Manifold Chassis with Manual Shutoff |

Note: Consult Factory for special ranges, applications, and availability (e.g.: higher and lower pressure ranges, low temperature, and natural gas applications).

I to P Accessories

| Model | Description |
|----------------|--|
| X55-600-UMB | Universal Mounting Bracket (use with surface mount units only) |
| X55-600-UMB-SS | Universal Mounting Bracket (304 stainless steel) |
| X55-600-PMB | 2” Pipe Mounting Bracket (use with surface mount units only) |
| X55-600-PMB-SS | 2” Pipe Mounting Bracket (304 stainless steel) |
| X55-77-4 | Filter/Pre-regulator |
| X55-0-30 | Pressure Gauge (0-30 PSI) |
| X55-0-60 | Pressure Gauge (0-60 PSI) |
| X55-600-MF-D1 | Conversion Kit, SM or “U” Rail to “G” Rail |
| X55-600-MF-D2 | Conversion Kit, SM or “G” Rail to “U” Rail |
| D1-32 x 15 | 32 mm x 15 mm “G” Style Rail |
| D2-35 x 7.5 | 35 mm x 7.5 mm “u” Style Rail |
| D2-35 x 15 | 35 mm x 15 mm “U” Style Rail |
| X55-600-SS TAG | Stainless Steel Tag |

DIN Rail Styles

“G” Rail (32 mm x 15 mm)



“u” Rail (35 mm x 7.5 mm)

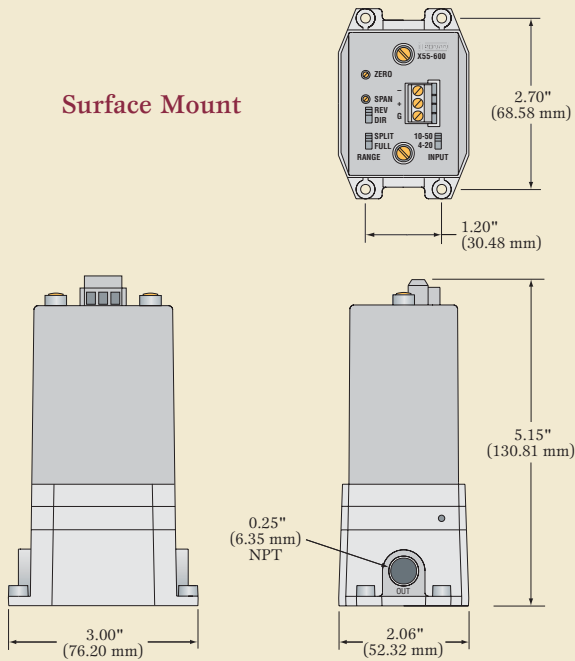


“U” Rail (35 mm x 15 mm)

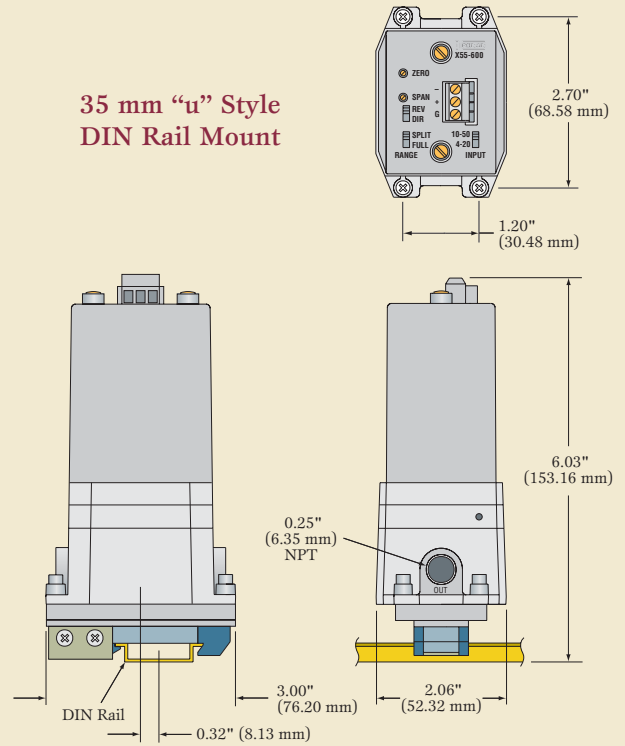
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GENERAL PURPOSE

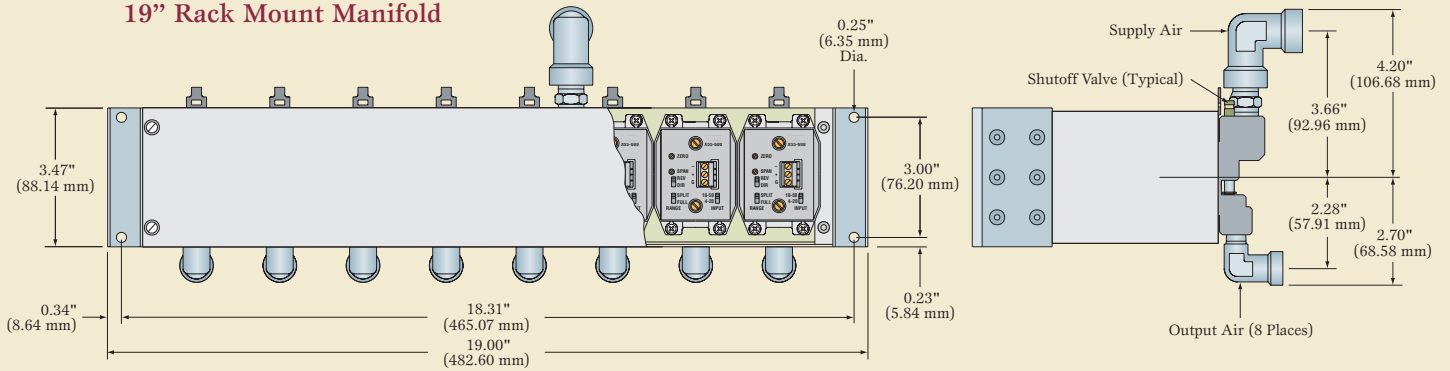
Surface Mount



35 mm “u” Style DIN Rail Mount

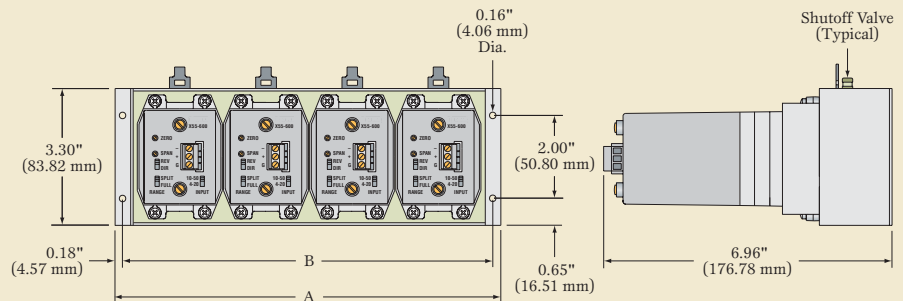


19” Rack Mount Manifold



Surface Mount Manifold

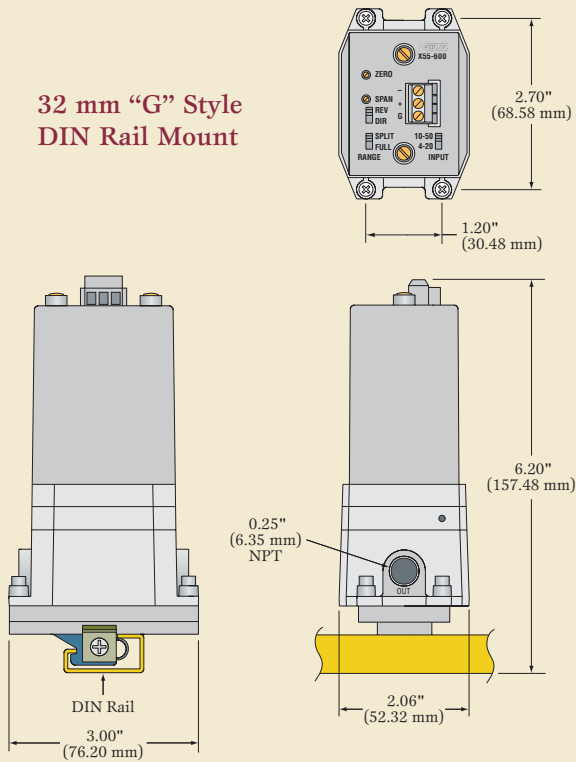
| No. of Points | Dimension A | | Dimension B | |
|---------------|-------------|--------|-------------|--------|
| | Inches | mm | Inches | mm |
| 4 | 9.25 | 234.95 | 8.89 | 225.81 |
| 8 | 17.57 | 446.28 | 17.21 | 437.13 |
| 10 | 21.73 | 551.94 | 21.37 | 542.80 |



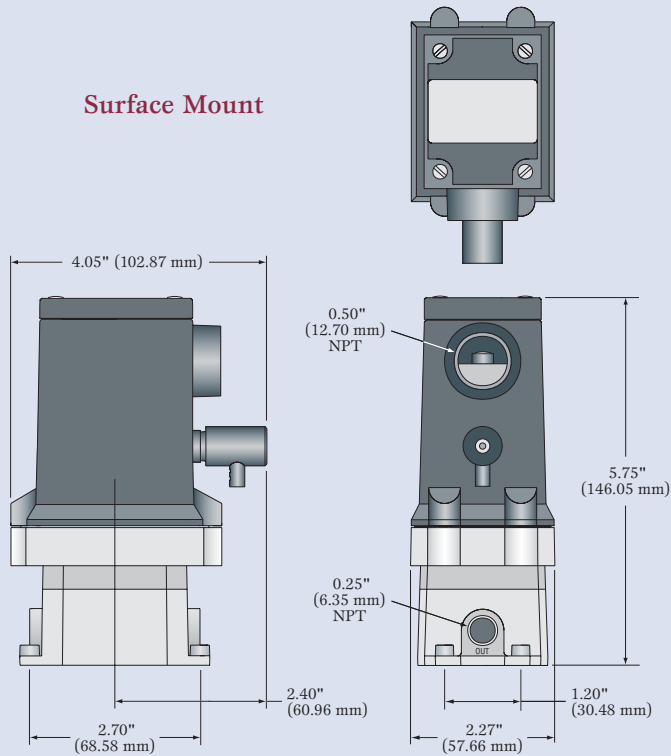


NEMA 4

32 mm “G” Style
DIN Rail Mount

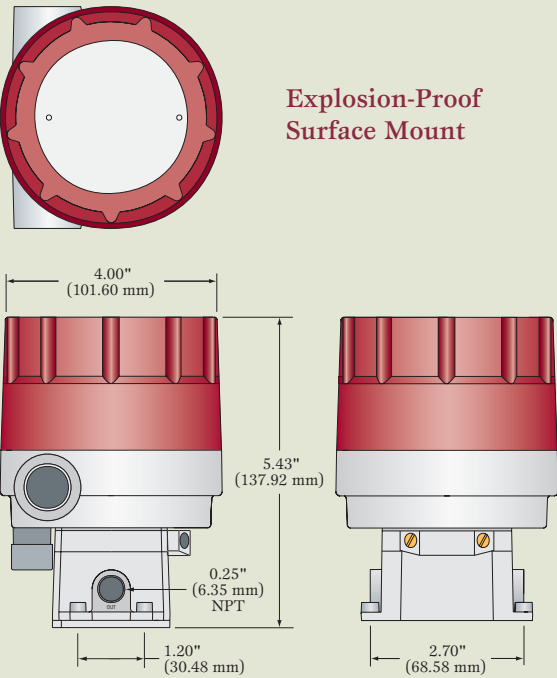


Surface Mount

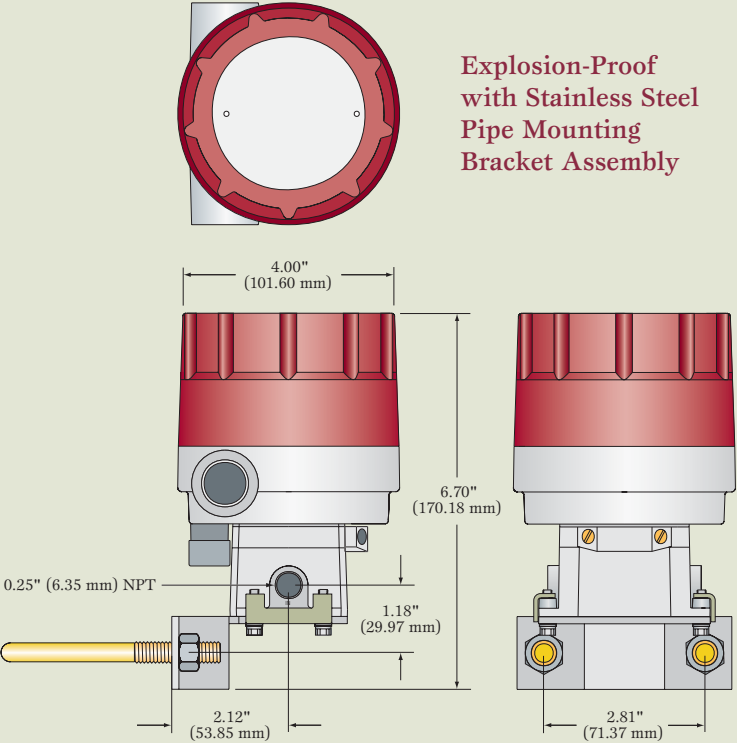


EXPLOSION-PROOF

Explosion-Proof
Surface Mount

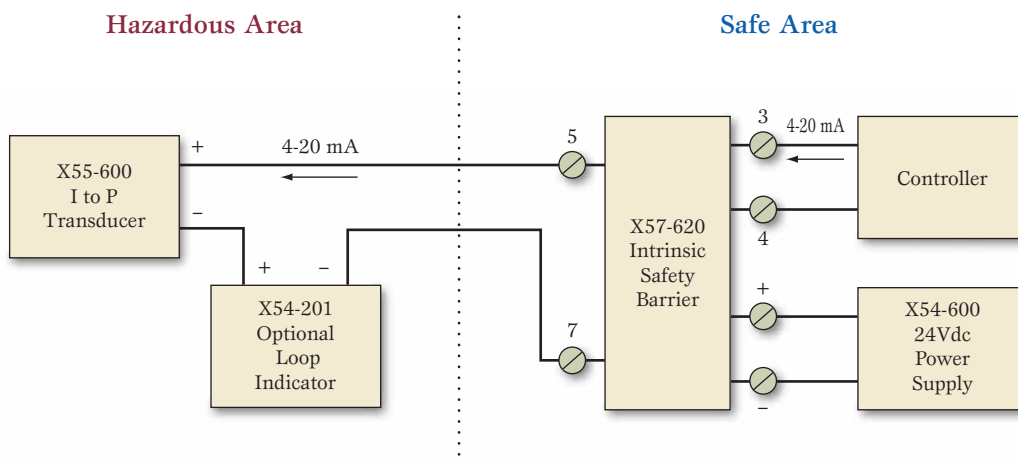


Explosion-Proof
with Stainless Steel
Pipe Mounting
Bracket Assembly

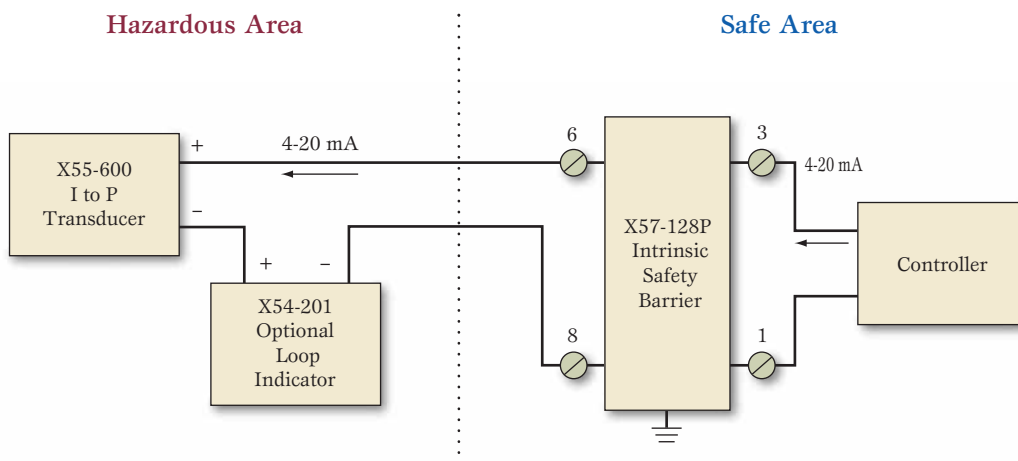


TYPICAL INTRINSICALLY SAFE APPLICATIONS

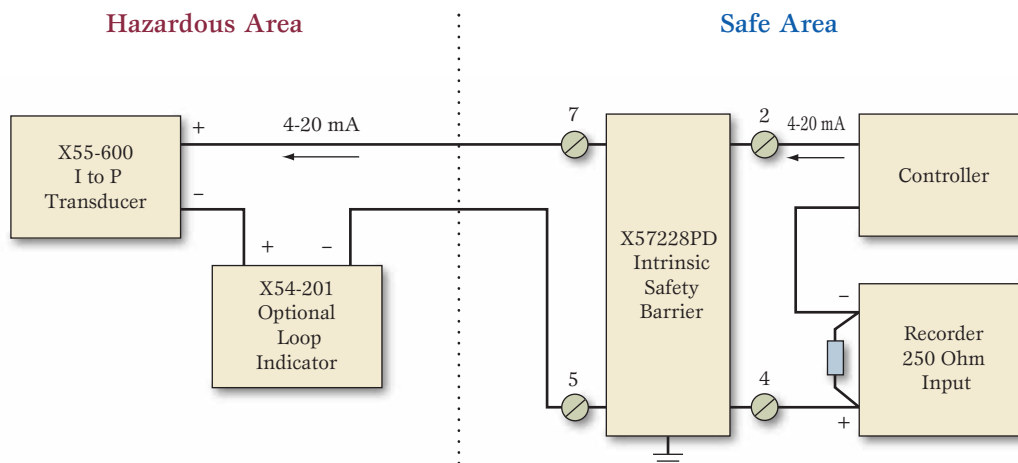
OPTION ONE



OPTION TWO



OPTION THREE



Visit www.ronan.com for other options and application notes.



X55-300

PNEUMATIC PRESSURE TRANSMITTERS

Ronan's Series X55-300 P to I Convertors convert instrument air pressures to analog current or voltage signals. The two and four-wire models are both available with five common input ranges from 3-15 to 0-100 PSIG. A solid-state sensor assures you of outstanding linearity, negligible hysteresis, very fast response times, and excellent temperature stability.

The electronics portion of the P to I Convertor can be removed from the pneumatic base without loss of air pressure, allowing simple calibration and regular maintenance without purging the air lines. The X55-300 is simple to install and easy to maintain.

Ronan's Series X55-300 P to I Convertors provide standard current and voltage signals to instruments and process control computers. Non-standard signal formats are also possible, thereby eliminating costly interface design requirements for special applications.

F E A T U R E S

- 5 Ranges Up to 100 PSIG
- Two or Four-Wire Models
- Fast Responding Solid State Design
- Detachable Electronics with Automatic Pressure Seal
- Insensitive to Vibration
- Front Accessible Zero, Span and Setpoint Adjustments
- Mounts in Any Position
- Front Accessible Output Monitor Test Jacks
- Loss-of-Air Alarm Indicator/Output Signal
- Optional High or Low Pressure Adjustable Setpoint
- 3 Times the Maximum Rated Pressure without Damage

S P E C I F I C A T I O N S

Models: X55-302 (two-wire); X55-304 (four-wire)

Inputs: 3-15, 3-27, 6-30, 0-30, 0-100 PSIG

Maximum Input: 3 times full scale without damage

Outputs: X55-302: 4-20 mA or 10-50 mA

X55-304: 4-20 mA, 10-50 mA, 0-1 Vdc, 0-2 Vdc, 0-5 Vdc,
1-10 Vdc, 1-5 Vdc, 2-10 Vdc

Accuracy: $\pm 0.2\%$ of span (linearity, hysteresis, repeatability)

Response: 1.0 msec (10 to 90% of full scale)

Operating Temperature: -40° to 150°F (-40° to 70°C)

Storage: -58° to 185°F (-50° to 85°C)

Temperature Stability: 0.025% of span per °C for 0 to 50°C

Power Requirements: X55-302: 12 to 55 Vdc

X55-304: 22 to 30 Vdc

Connections: Air, 1/8" NPT (female)

Loop Resistance: (R) Vs. Power Supply Voltage (PSV):

X55-302: 4-20 mA: $R_{max} = PSV - 12 V \div 20 mA$

10-50 mA: $R_{max} = PSV - 12 V \div 50 mA$

X55-304: 4-20 mA: $R_{max} = PSV - 6 V \div 20 mA$;

or 10-50 mA: $PSV - 8 V \div 50 mA$

Output Impedance: Current Outputs: 1 Mohm

Voltage Outputs: 5 V: 250 ohms; 10 V: 500 ohms

Alarm Output: Open collector transistor capable of 50 mA
(maximum leakage = 100 μA at 24 Vdc)

Wiring: Up to 12 AWG

Approvals: Factory Mutual and CSA:

- EXP = Explosion-Proof - Class I, II, III; Division 1;
Group B, C, D, E, F, G

- DIN, -D2-, SM = Class I; Division 2; Group A, B, C, D

O R D E R I N G I N F O R M A T I O N

Two-Wire P TO I Transmitters (Power = .5W at 24 Vdc)

| Model | Description |
|-------------------------|---|
| X55-302-()-()-()-SM | General Purpose Surface Mount (includes transmitter and base) |
| X55-302-()-()-()-DIN | General Purpose "G" Rail Mount (includes transmitter and base) |
| X55-302-()-()-()-EXP | Explosion-Proof Surface Mount (includes transmitter and base) |
| X55-302-()-()-()-D2 | General Purpose "U" Rail Mount (includes transmitter and base) |
| X55-302-()-()-()-LB | Less Base (transmitter only), order parts above for complete system |

Alarm Option: N = None L = Low Alarm H = High Alarm

Output Type: B = 4-20 mA C = 10-50 mA

Input Range: 1 = 3-15 PSIG 2 = 3-27 PSIG 3 = 6-30 PSIG 4 = 0-30 PSIG 5 = 0-100 PSIG 6 = 0-6 PSIG 7 = 0-12 PSIG

Four-Wire P TO I Transmitters (Power = 1 .5W)

| Model | Description |
|-------------------------|---|
| X55-304-()-()-()-SM | General Purpose Surface Mount (includes transmitter and base) |
| X55-304-()-()-()-DIN | General Purpose "G" Rail Mount (includes transmitter and base) |
| X55-304-()-()-()-EXP | Explosion-Proof Surface Mount (includes transmitter and base) |
| X55-304-()-()-()-D2 | General Purpose "U" Rail Mount (includes transmitter and base) |
| X55-304-()-()-()-LB | Less Base (transmitter only), order parts above for complete system |

Alarm Option: N = None L = Low Alarm H = High Alarm

Output Type: B = 4-20 mA C = 10-50 mA D = 1-5 Vdc E = 2-10 Vdc F = 0-5 Vdc G = 0-10 Vdc H = 0-1 Vdc I = 0-2 Vdc

Input Range: 1 = 3-15 PSIG 2 = 3-27 PSIG 3 = 6-30 PSIG 4 = 0-30 PSIG 5 = 0-100 PSIG 6 = 0-6 PSIG

X55-302/304 Mounting Hardware and Accessories

| Model | Description |
|-------------|---|
| X55-SM | Replacement Surface Mounting Base |
| X55-DIN | Replacement "G" Rail Mounting Base |
| X55-D2 | Replacement "U" Rail Mounting Base |
| X55-EXP | Replacement Explosion-Proof Housing with Base |
| X55-SS TAG | Stainless Steel Tag |
| X55-PMB | 2" Painted Pipe Mounting Bracket |
| X55-PMB-SS | 2" 304 Stainless Steel Pipe Bracket |
| D1-32 x 15 | 35 mm "G" Style Rail |
| D2-35 x 7.5 | 35 mm x 7.5 mm "u" Style Rail |
| D2-35 x 15 | 35 mm x 15 mm "U" Style Rail |
| X55-MF-D1 | Conversion Kit, SM or "U" Rail to "G" Rail |
| X55-MF-D2 | Conversion Kit, SM or "G" Rail to "U" Rail |

DIN Rail Styles



"G" Rail (32 mm x 15 mm)



"u" Rail (35 mm x 7.5 mm)

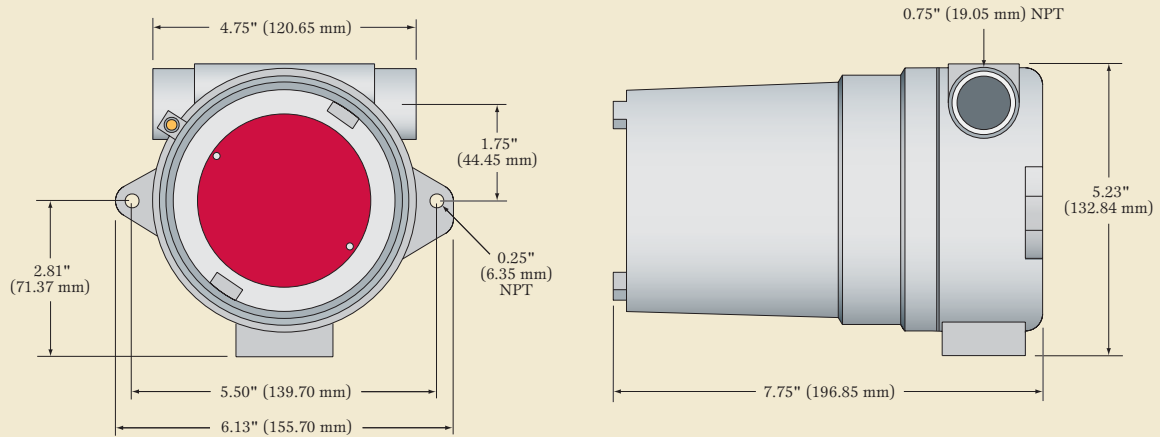


"U" Rail (35 mm x 15 mm)

Specifications subject to change without notice.

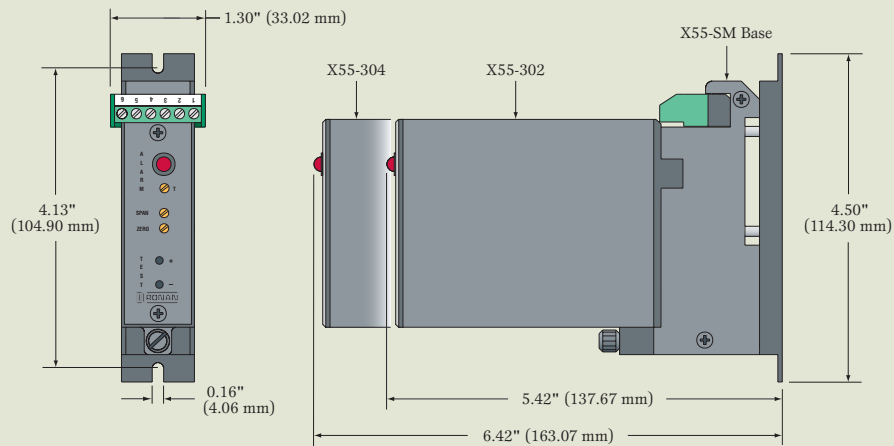
EXPLOSION-PROOF

2-Wire P to I and 4-Wire P to E Convertors



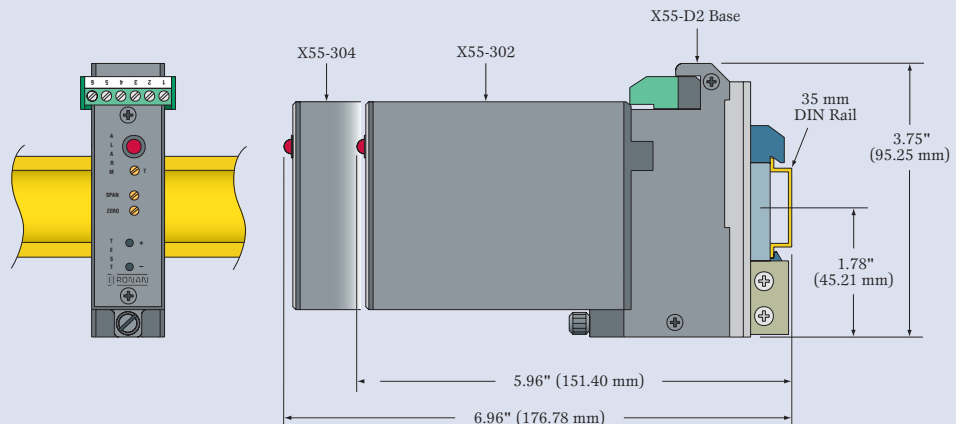
SURFACE MOUNT

2-Wire P to I and 4-Wire P to E Convertors



DIN RAIL MOUNT

2-Wire P to I and 4-Wire P to E Convertors





WARRANTY

Ronan warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will repair or replace any component found to be defective, on its return, transportation charges prepaid, within (1) year of its original purchase. This warranty carries no liability, either expressed or implied, beyond our obligations to replace the unit which carries the warranty.



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I/O Products Division

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