



## *X55-600*

CURRENT TO PRESSURE  
TRANSDUCERS



## *X55-300*

PNEUMATIC PRESSURE  
TRANSMITTERS

ISO 9001  
REGISTERED

**RONAN**



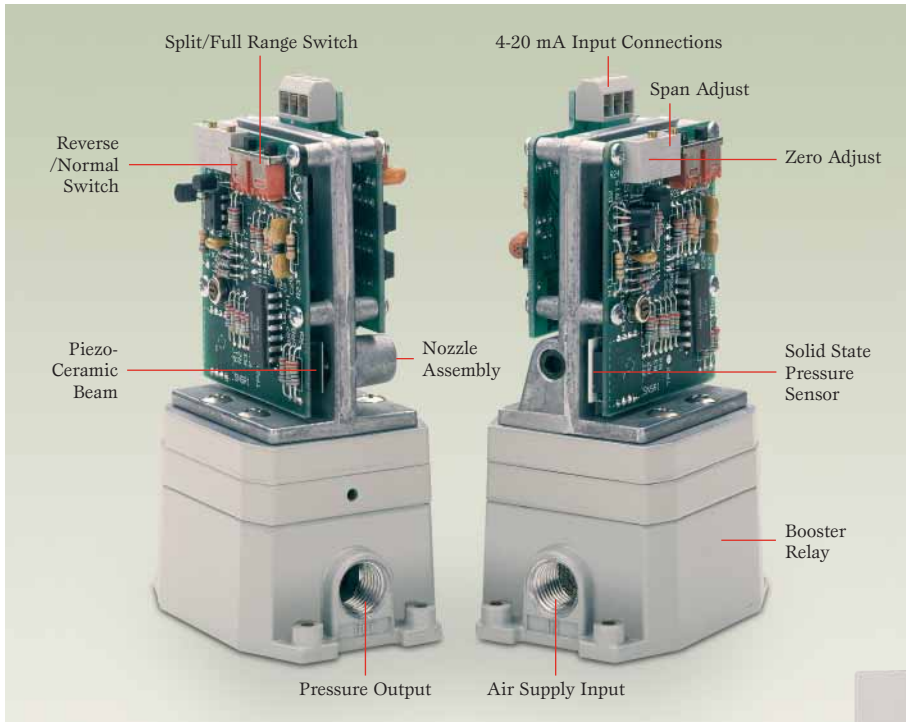
# X55-600

## 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

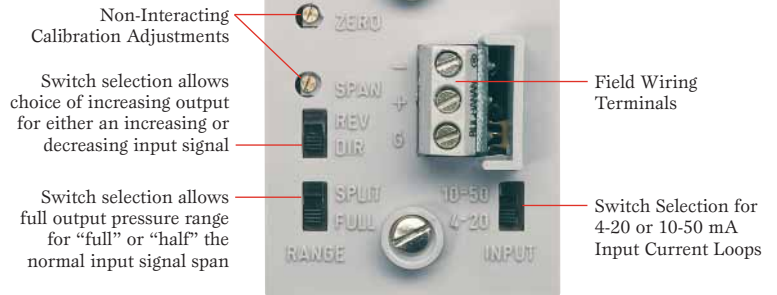


**CONTROLS**

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
Reverse Acting	Split Range	13-20	31-50	3-15	3-27	6-30
		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:** ± 0.20% of span includes linearity, hysteresis, and repeatability  
**Zero and Full Scale Adjustability:** > ± 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:** < ± 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:** ± 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)

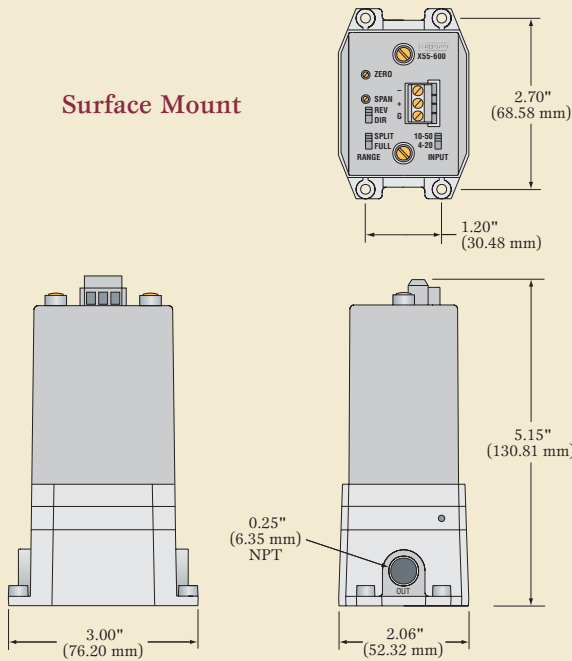


“U” Rail (35 mm x 15 mm)

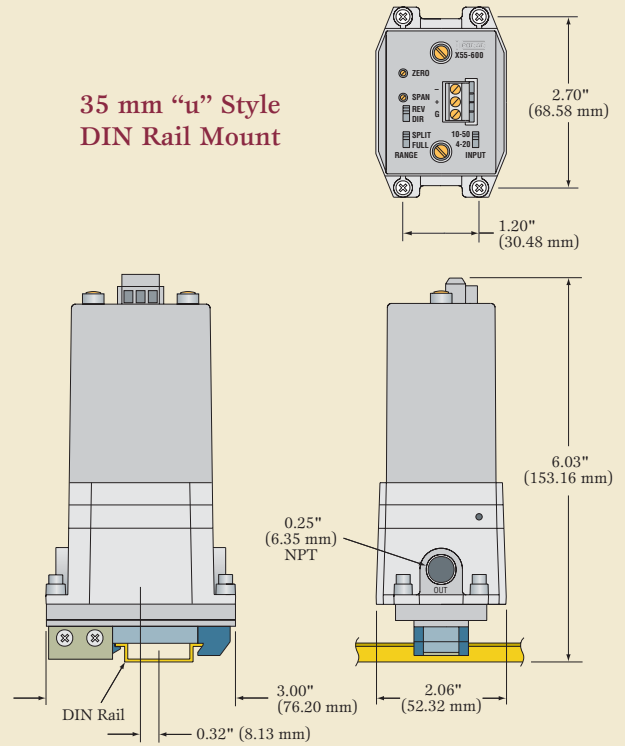
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# GENERAL PURPOSE

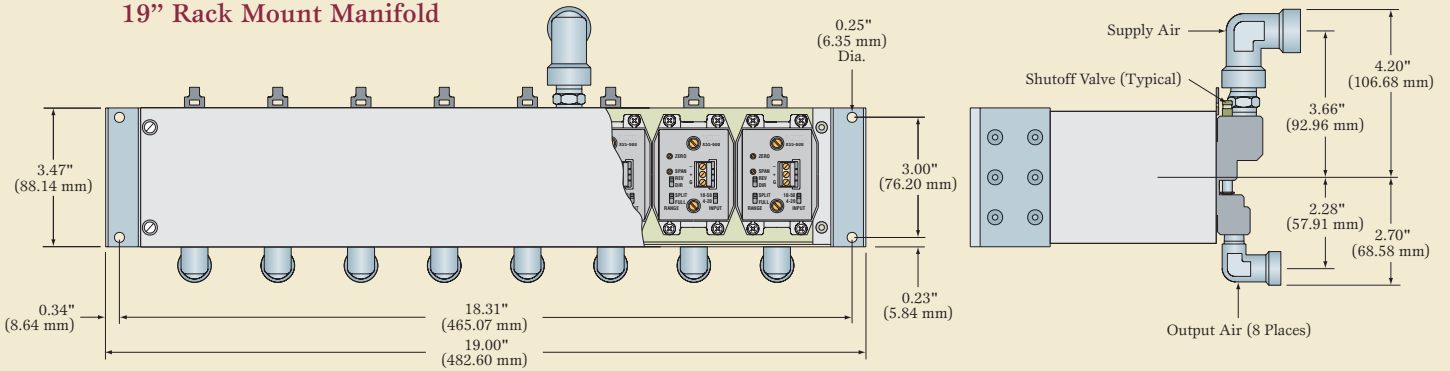
## Surface Mount



## 35 mm "u" Style DIN Rail Mount

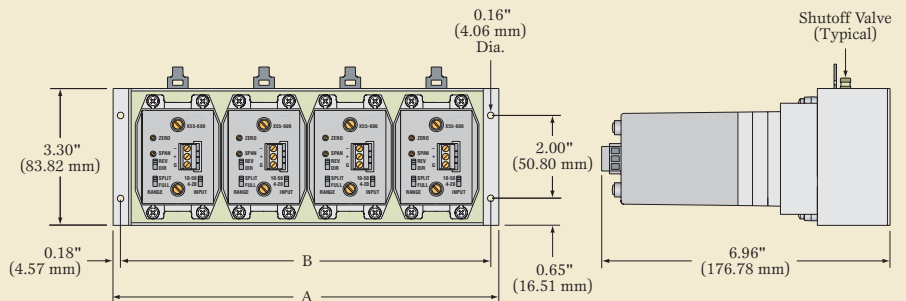


## 19" Rack Mount Manifold



## Surface Mount Manifold

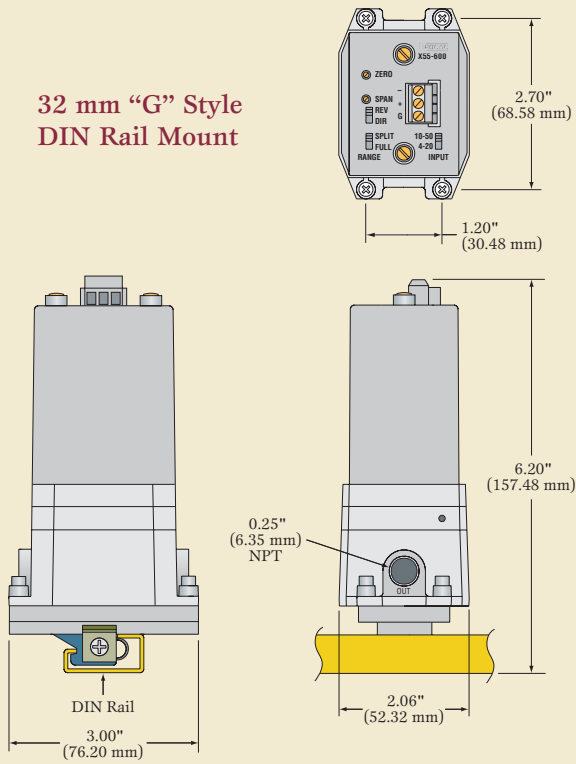
No. of Points	Dimension A		Dimension B	
	Inches	mm	Inches	mm
4	9.25	234.95	8.89	225.81
8	17.57	446.28	17.21	437.13
10	21.73	551.94	21.37	542.80



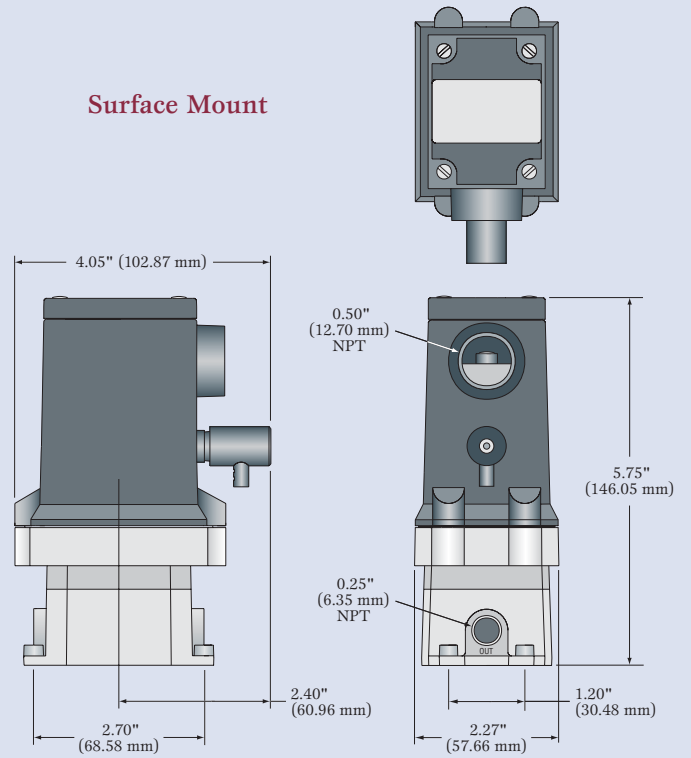


NEMA 4

32 mm "G" Style  
DIN Rail Mount

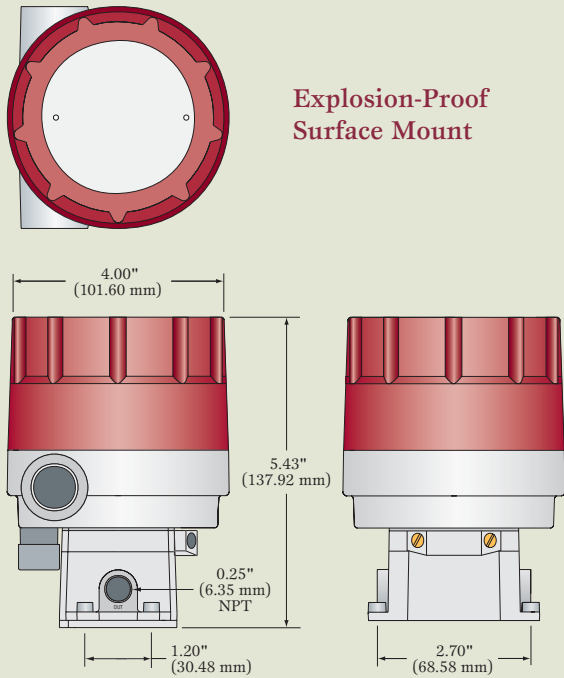


Surface Mount

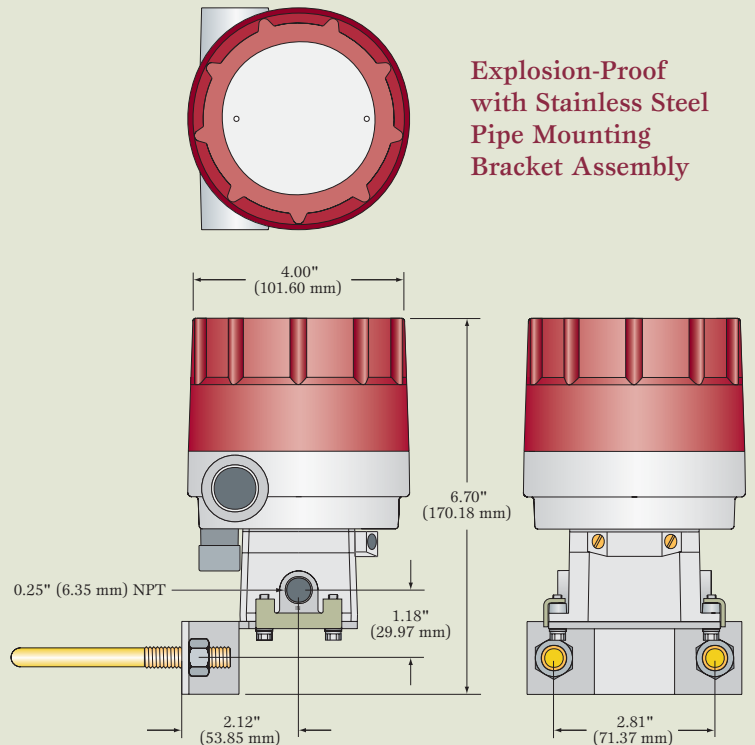


EXPLOSION-PROOF

Explosion-Proof  
Surface Mount

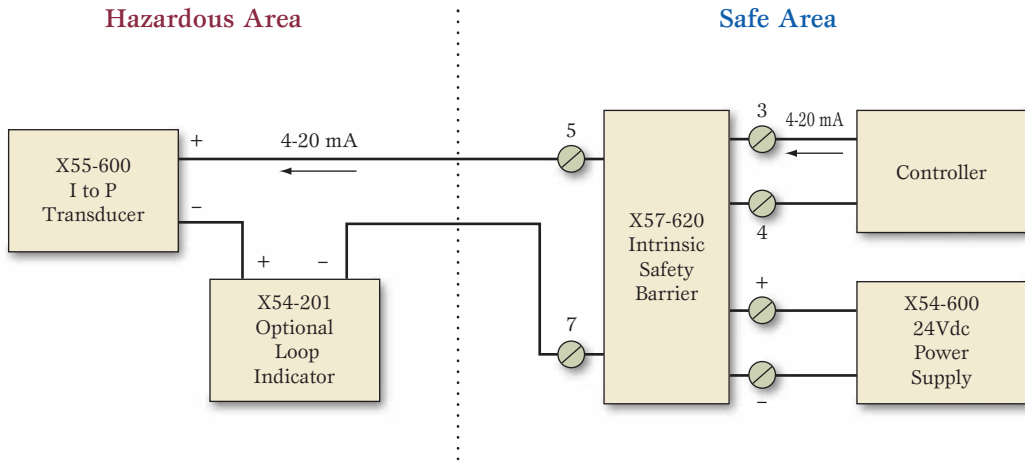


Explosion-Proof  
with Stainless Steel  
Pipe Mounting  
Bracket Assembly

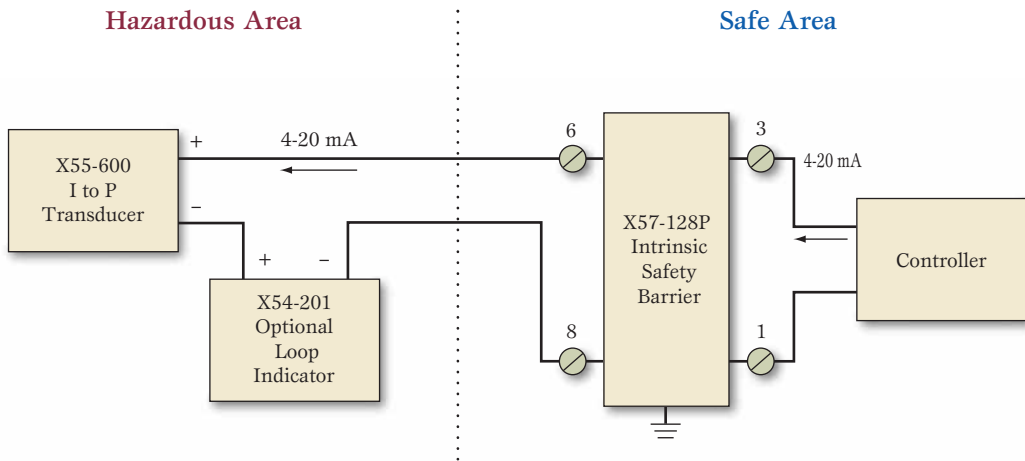


TYPICAL INTRINSICALLY SAFE APPLICATIONS

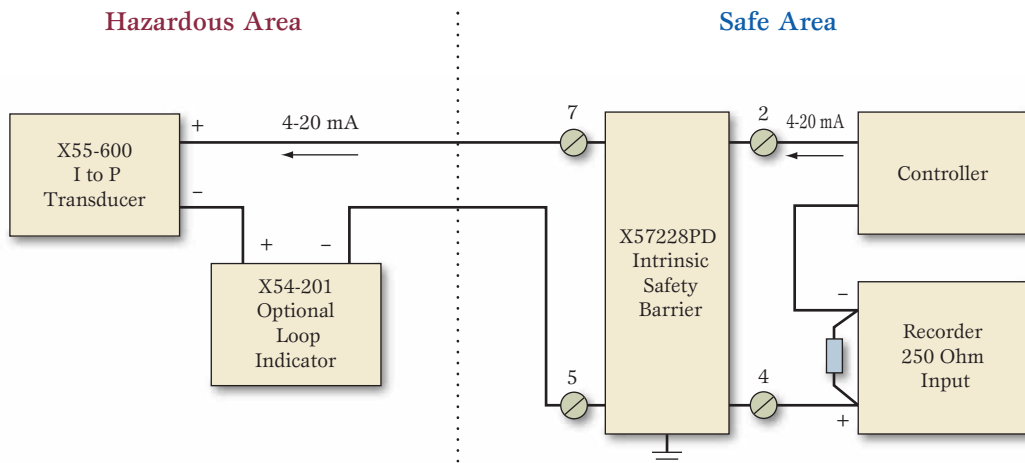
OPTION ONE



OPTION TWO



OPTION THREE



Visit [www.ronan.com](http://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:** ± 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

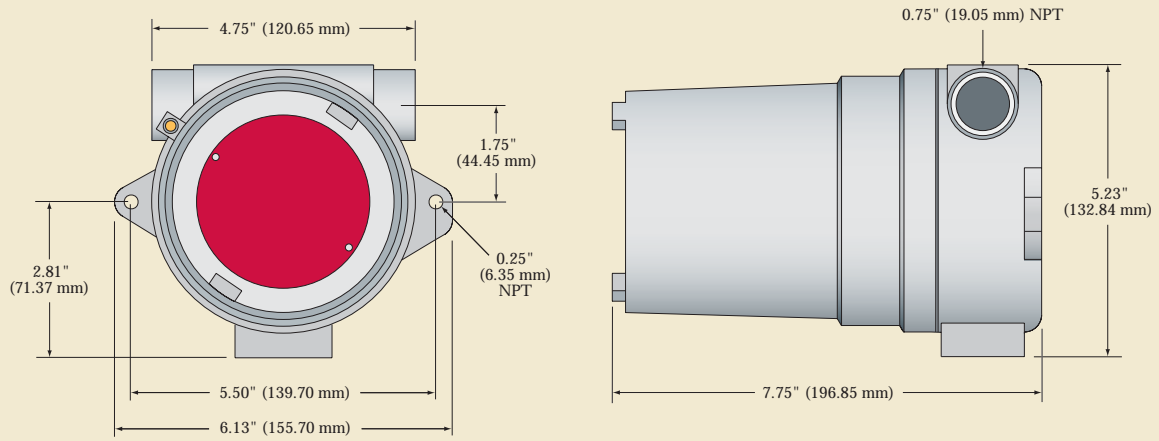
Alarm Option: N = None L = Low Alarm H = High Alarm  
 Output Type: B = 4-20 mA C = 10-50 mA D = 1-5 Vdc E = 2-10 Vdc F = 0-5 Vdc G = 0-10 Vdc H = 0-1 Vdc I = 0-2 Vdc  
 Input Range: 1 = 3-15 PSIG 2 = 3-27 PSIG 3 = 6-30 PSIG 4 = 0-30 PSIG 5 = 0-100 PSIG 6 = 0-6 PSIG

### X55-302/304 Mounting Hardware and Accessories

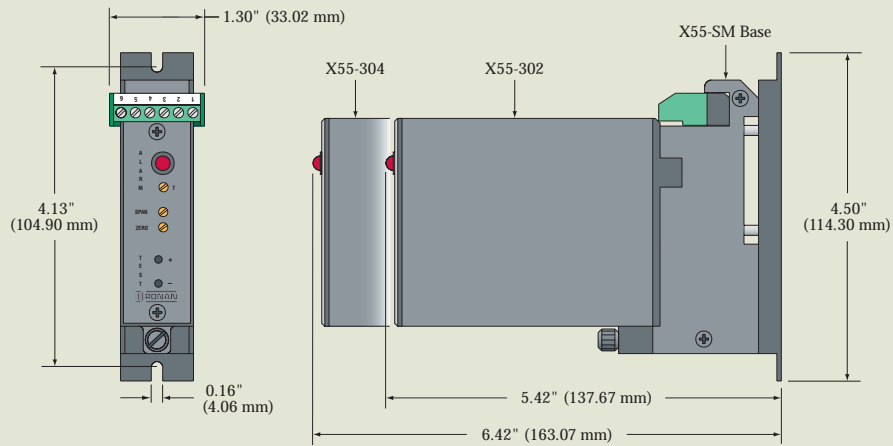
Model	Description	DIN Rail Styles
X55-SM	Replacement Surface Mounting Base	 "G" Rail (32 mm x 15 mm)
X55-DIN	Replacement "G" Rail Mounting Base	
X55-D2	Replacement "U" Rail Mounting Base	 "u" Rail (35 mm x 7.5 mm)
X55-EXP	Replacement Explosion-Proof Housing with Base	
X55-SS TAG	Stainless Steel Tag	 "U" Rail (35 mm x 15 mm)
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	

Specifications subject to change without notice.

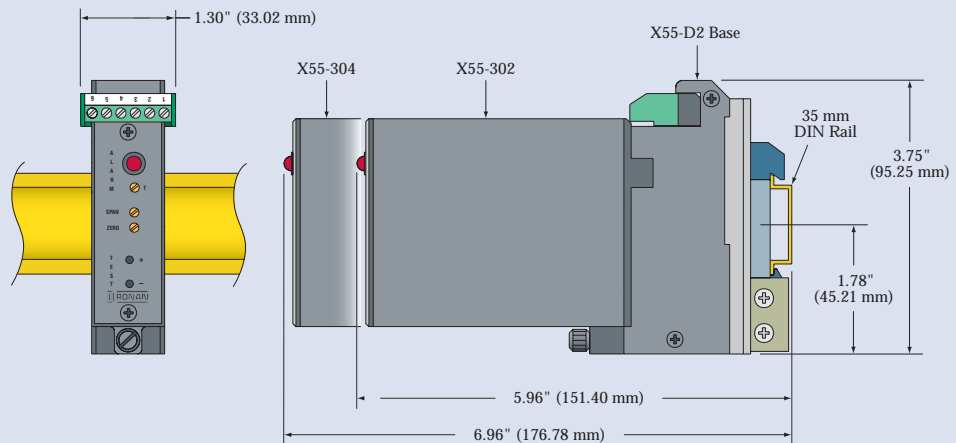
**EXPLOSION-PROOF**  
2-Wire P to I and 4-Wire P to E Convertors



**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.



**RONAN ENGINEERING COMPANY**  
I/O Products Division

21200 Oxnard Street, Woodland Hills, CA 91367 U.S.A. • 800-327-6626 • Fax 818-992-6435  
1 Tilley Road, Crowther Industrial Estate, Washington, Tyne & Wear, U.K., NE38 OAE • 191-416-1689 • Fax 191-416-5856  
32 Bermondsey Road, Toronto, Ontario, Canada M4B 1Z5 • 416-752-0310 • Fax 416-752-8072

<http://www.ronan.com> E-Mail: [sales@ronan.com](mailto:sales@ronan.com)