

Description

These 2-wire (loop-powered) I/P transmitters accept a current signal (such as 4-20mA) from a DCS, PLC or PC-based control system. They convert the current signal to a pneumatic signal (3-15psig, 0.2-1bar, 20-100kPa, etc.) to provide precise, proportional control of valves, actuators and other pneumatically-controlled devices.

The economical IPH² (NEMA 4X) is watertight, dust-protected, and resistant to corrosion and chemicals. In addition to meeting NEMA 4X requirements, the IPX² can be installed in explosion-proof environments.

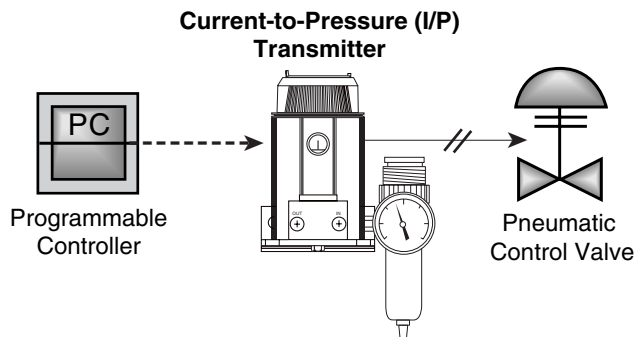
Both units are available with an optional coalescing filter/regulator that combines an air filter and miniature supply line regulator with a pressure gauge that reads in both psig and bars.

Approved for Use with Natural Gas

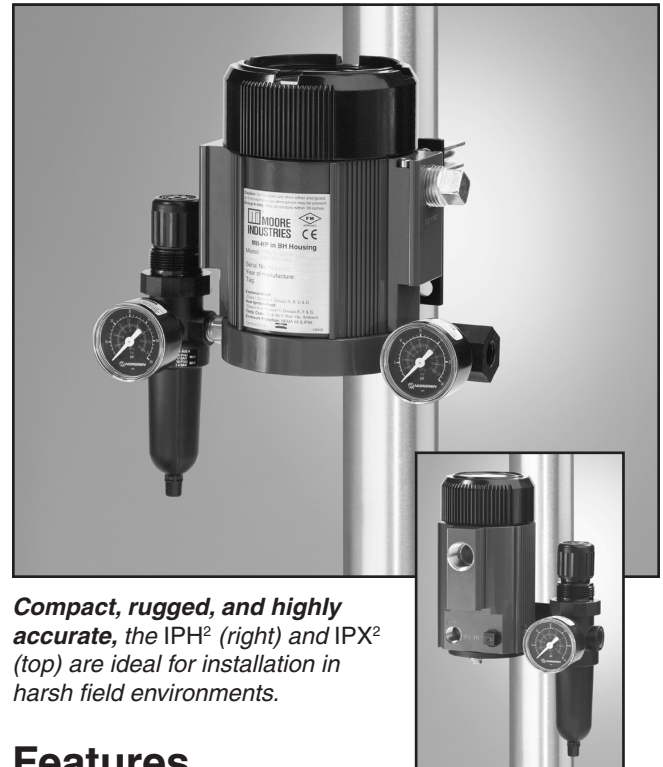
Special design, construction and materials allow the model **IPX² with the -NG1 or -NG2 option** to be used with natural gas as its pneumatic supply (commonly referred to as sweet gas consisting of up to 20ppm of H₂S).

This advantage allows the IPX² to be installed in remote compressor sites where it is too expensive or impossible to run a clean air supply.

Figure 1. I/P transmitters accept a current input and convert it to a proportional pneumatic control signal.



Certifications



Compact, rugged, and highly accurate, the IPH² (right) and IPX² (top) are ideal for installation in harsh field environments.

Features

- Wide variety of input and output choices.**
Available with 4-20mA or split range inputs, and 22 direct and reverse output ranges. Custom ranges are also available.
- Low air consumption and high output volume.**
The IPH² and IPX² output as much as 5SCFM and consume as little as 0.08SCFM.
- Accurate and stable.** Featuring exceptional $\pm 0.25\%$ of span accuracy and six-month stability, they are ideal for precise applications in difficult to access locations.
- Immune to supply pressure variation.** Maintain incredible accuracy even when the supply pressure fluctuates between 20 and 40psig.
- Clog Resistant Filtered Nozzle and Orifice.** A larger orifice, combined with an easily replaceable internal filter protects against clogging caused by debris.
- RFI/EMI protection.** Special circuit and enclosure designs protect against the harmful effects of radio frequency and electromagnetic interference.

IPH² & IPX²

NEMA 4X & Explosion-Proof
Current-to-Pressure (I/P) Transmitters

Specifications

Performance Accuracy: $\pm 0.25\%$ of span including the combined effect of linearity, hysteresis and repeatability (between 0 and 3psig output, error will not exceed $\pm 1.0\%$ of span)

Stability: Not to degrade from stated accuracy for six months

Step Response: < 0.2 seconds into 100ml load (6 in³) from 10% to 90% of span; Not guaranteed below 3psig output

Supply Pressure Effect: Negligible from 20-40psig, steady pressure

Air Capacity: 5.0SCFM minimum (20psig supply, 0psig output)

Relief Capacity: 2.5SCFM minimum (15psig output)

Air Supply: Instrument air only, 20-40psig. (Must be 5psig greater than maximum output)

Gas Supply with -NG1 or -NG2 Option: Same cleanliness as instrument air. H₂S not to exceed 20ppm

(Continued) Air Consumption (Dead-ended):
At 3psig output, 20psig supply, consumes 0.08SCFM (0.14m³/hr), maximum; At 15psig output, 20psig supply, consumes 0.10SCFM (0.17m³/hr), maximum; At 15 psig output, 40psig supply, consumes 0.15SCFM (0.26m³/hr), maximum; At 30psig output, 40psig supply, consumes 0.17SCFM (0.29m³/hr), maximum

Maximum Input: 80psig without damage for units with output pressure rating of > 15 psig; 45psig without damage for units with output pressure 15psig

Voltage Drop: 5V, maximum

Mounting Position Effect: Negligible, unit can be mounted in any position; Should be mounted upright or horizontal to keep water out if it is not in a dry environment

Operating & Storage Range:
-40°C to +85°C (-40°F to +185°F)

Ambient Temperature Effect: $< \pm 0.025\%$ of span/°C, maximum from -20°C to 80°C; $< \pm 0.1\%$ of span/°C, maximum

RF/EMI Effect: $< \pm 0.25\%$ of span change at in field strengths of 10V/m@ frequencies of 20-1000MHz

Shock and Vibration Effect: Meets SAMA PMC 31.1 as detailed in the field mounted category and rated as follows: 5-15Hz, 2mm peak-to-peak; 15-150Hz, 1g; 150-2000Hz, 0.5g

Relative Humidity: 0-100%, non-condensing

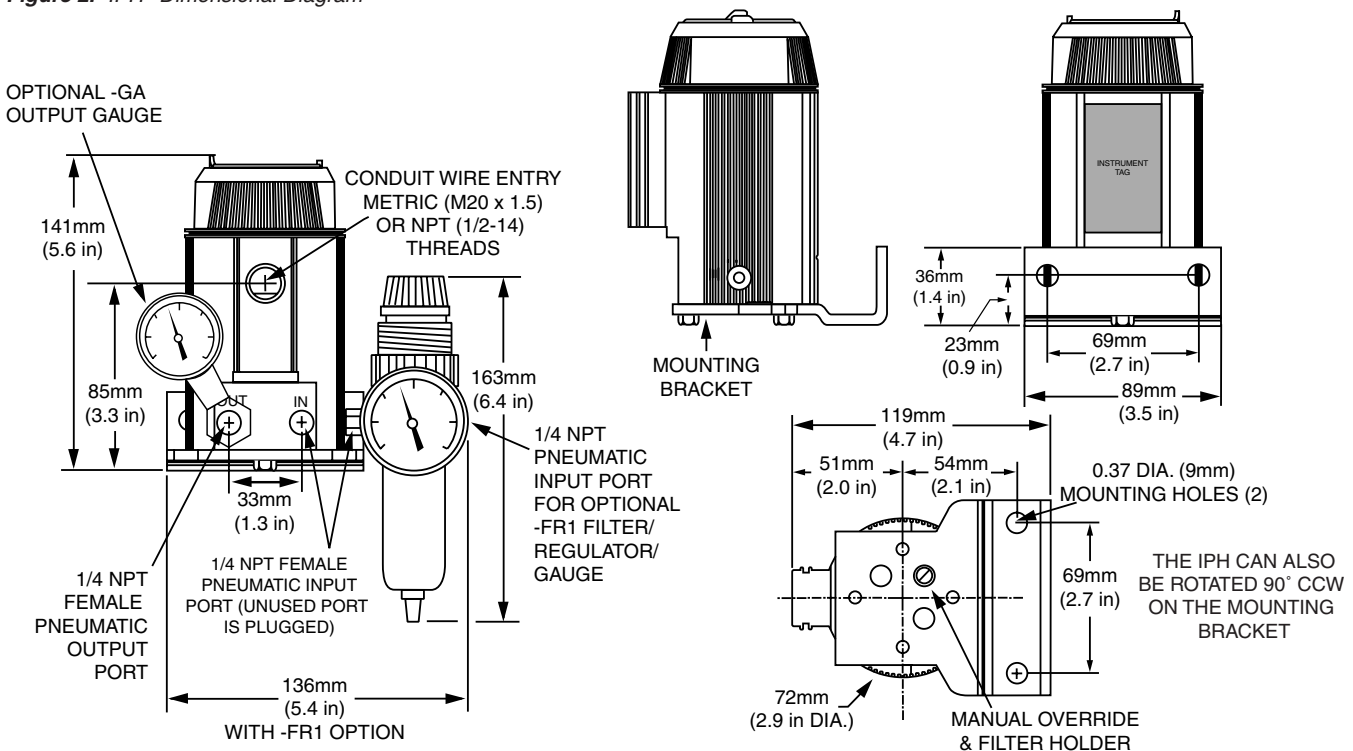
Adjustment

Weight

Zero & Span: Screw adjusts zero or span by $\pm 10\%$ minimum, non-interactive

IPH²: 1.14kg (2.5 lbs)
IPX²: 2.0kg (4.4 lbs)

Figure 2. IPH² Dimensional Diagram



IPH² & IPX²

NEMA 4X & Explosion-Proof
Current-to-Pressure (I/P) Transmitters

Ordering Information

Unit	Input	Output*	Supply Pressure**	Options	Housing
IPH2 NEMA 4X Current-to-Pressure Transmitter	4-20MA 4-12MA 12-20MA into 250 ohms maximum Custom ranges also available.	0-20PSIG	25PSI	-FR1 Coalescing filter, miniature supply line regulator and pressure gauge that reads 0-60psig and 0-4bars -GA1 Output gauge (reads in 0-30psig and 0-2bars -NG1 IPX ² unit equipped with electrical wire seal fitting assembly and vent port <u>on the same side of the unit</u> for using Natural Gas (sweet gas consisting of up to 20ppm H ₂ S) as the pneumatic supply (not available with -FR1 and -GA1 options) -NG2 IPX ² unit equipped with electrical wire seal fitting assembly and vent port <u>on opposite sides of the unit</u> for using Natural Gas (sweet gas consisting of up to 20ppm H ₂ S) as the pneumatic supply (not available with -FR1 and -GA1 options)	IPH² ENCLOSURES: WDNS Aluminum body with PBT polyester cover; NPT pneumatic and NPT electrical entry ports WDNA Aluminum body with aluminum cover; NPT pneumatic and NPT electrical entry ports WDMS Aluminum body with PBT polyester cover; M20 x 1.5 metric, pneumatic and electrical entry ports WDMA Aluminum body with aluminum cover; M20 x 1.5, pneumatic and metric electrical entry ports
		1-17PSIG	22PSI		
		3-15PSIG	20PSI		
		3-16.6PSIG	22PSI		
		3-18PSIG	23PSI		
		3-27PSIG	32PSI		
		6-30PSIG	35PSI		
		.2-1BAR	1.4BAR		
		20-100KPA	140KPA		
		.2-1KGCM2	1.4KGCM2		
		.02-.10MPA	.14MPA		
		Reverse Output†:			
		20-0PSIG	25PSI		
		17-1PSIG	22PSI		
		15-3PSIG	20PSI		
16.6-3PSIG	22PSI				
18-3PSIG	23PSI				
27-3PSIG	32PSI				
30-6PSIG	35PSI				
1-.2BAR	1.4BAR				
100-20KPA	140KPA				
1-.2KGCM2	1.4KGCM2				
.10-.02MPA	.14MPA				
*The unit's output must match the supply pressure to its right.					
**Supply Pressure must be at least 5psi (0.3bar) higher than output pressure.					
†The IPH ² and IPX ² utilize an internal feedback loop to ensure accurate operation. The feedback loop requires power to operate. When input power to the unit is removed, the pneumatic output will be shut off.					
IPX2 Explosion-Proof and NEMA 4X Current-to-Pressure Transmitter					IPX² ENCLOSURES: EXI Explosion-proof housing with ½-inch NPT, female threaded entry port for connecting the input wiring conduit EXIM Explosion-proof housing with M20 x 1.5 metric, female threaded entry port for connecting the input wiring conduit P suffix indicates enclosure comes equipped with base plate and U-bolts for mounting on a 2-inch pipe (i.e. EXIP)

When ordering, specify: Unit / Input / Output / Supply Pressure / Options [Housing]
Model number example: IPH2 / 4-20MA / 3-15PSIG / 20PSI / -FR1 [WDNA]
 IPX2 / 4-20MA / .2-1BAR / 1.4BAR / -NG1 [EXIM]

Certifications (IPX² Only)*



General/Ordinary Locations and Non-Incendive*
 Class I, Division 2, Groups A-D
 Suitable for: Class II & III, Division II, Groups F & G

Explosion-Proof & Dust Ignition-Proof
 Class I, Division 1, Groups A-D
 Class II & III, Division 1, Groups E-G



Non-Incendive, Intrinsically Safe & Explosion-Proof
 Class I, Divisions 1 & 2, Groups A-D
 Class II, Divisions 1 & 2, Groups E-G
 Class III, Divisions 1 & 2

Type n, Intrinsically Safe, Flame-Proof
 Ex nA IIC, Ex ia IIC, Ex d IIC

Temperature Codes (FM and CSA):
 T4 @ 85°C Maximum Operating Ambient

T5 @ 70°C Maximum Operating Ambient
 T6 @ 55°C Maximum Operating Ambient

Environmental Protection:
 NEMA 4X, IP56 (air), IP66 (-NG)



KEMA/ATEX approvals
Intrinsically Safe (IPX² only)
 Ⓜ II 1G EEx ia IIC, T6@55°C / T5@70°C

Flame-Proof (IPX² only)
 Ⓜ II 2GD EEx d IIC, T6@55°C / T5@70°C

Type N (MII Inherent-Air Unit Only)*
 Ⓜ II 3G EEx nA II, T6@55°C / T5@70°C



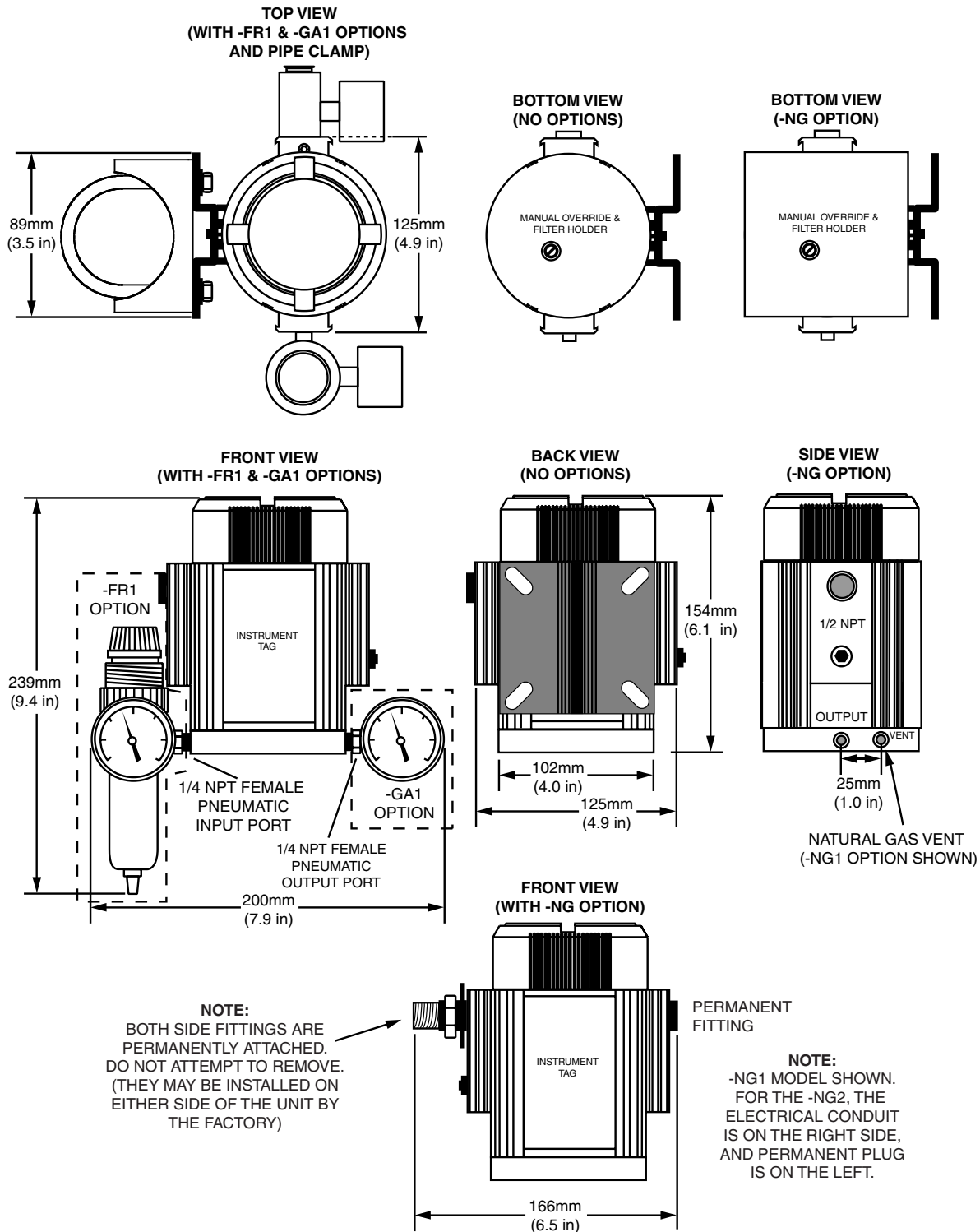
CE Conformant-EMC Directive 89/336/EEC
 EN 61326

*Non-Incendive/Type N apparatus approvals are not available with IPX² -NG option.

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Current-to-Pressure (I/P) Transmitters

Figure 3. IPX² Dimensional Diagram



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