

March 2014

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.

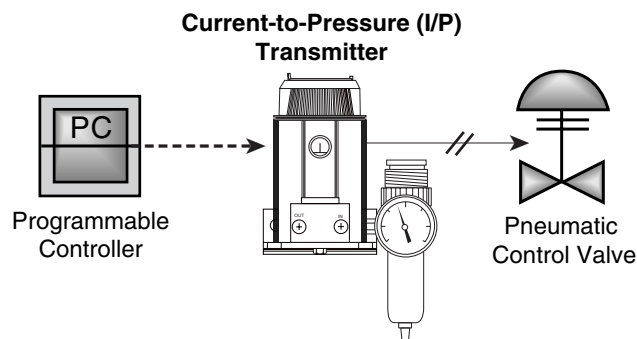
Both units are available with an optional coalescing filter/regulator that combines an air filter and miniature supply line regulator with a pressure gauge that reads in both psig and bars.

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).

Meets the US Environmental Protection Agency (EPA) requirement for the oil and gas industry (New Source Performance Standards Subpart OOOO, EPAHQAR20100505)*.

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



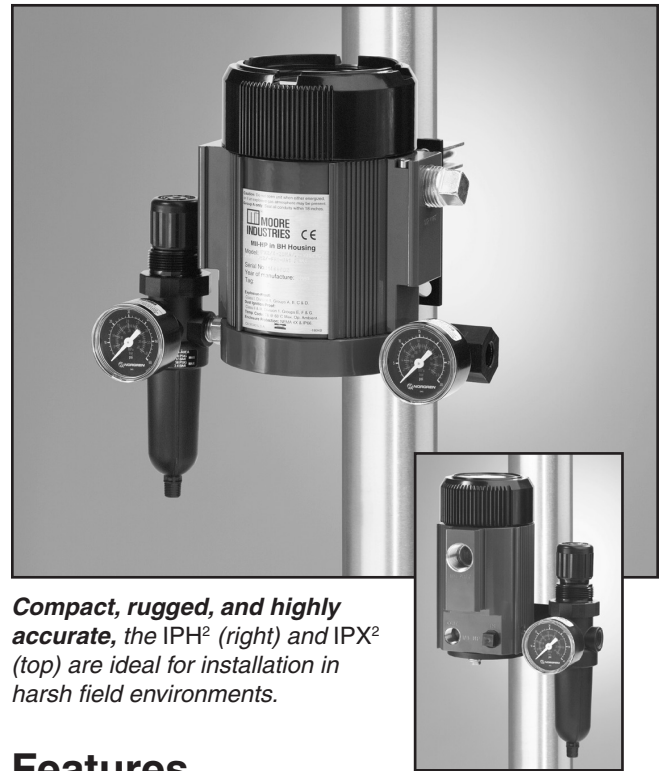
Certifications

ANZEx



Check the listing on Page 4 for full certification details.

*Maximum natural gas bleed rate is less than 6SCFH with a 3-15psi output and 17psi natural gas supply.



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. Reverse output is switch selectable on IPX². Custom ranges are also available.
- **Low air consumption and high output volume.** The IPH² and IPX² output as much as 300SCFH 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.
- **Removable electronics module.** In abnormal conditions where a liquid "slug" is present in the air/gas supply of the IPX², the electronics module can be removed to aid in recovery by allowing accumulated liquid to drain more effectively.
- **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.
Gas Supply with -NG1 or -NG2 Option: 17-40psig. Same cleanliness as instrument air. H₂S not to exceed 20ppm
Maximum Input: 80psig without damage for units with output pressure rating of > 15 psig; 45psig without damage for units with output pressure 15psig

Performance (Continued)
Voltage Drop: 5V, maximum
Air Consumption (Dead-ended):
 At 3-15psig output 20psig supply, average steady state consumption* of 4.7SCFH (min 4.2SCFH @ 3psig, max 5.2SCFH @ 15psig);
 40psig supply, max 9SCFH @ 15psig output;
 40psig supply, max 10SCFH @ 30psig output
Natural Gas Consumption (Dead-ended):
 At 3-15psig output 20psig supply, average steady state consumption* of 5.7SCFH, (min 5.1SCFH @ 3psig, max 6.2SCFH @ 15psig);
 17psig supply, max 5.9SCFH @ 15psig output;
 40psig supply, max 12SCFH @ 30psig output;
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

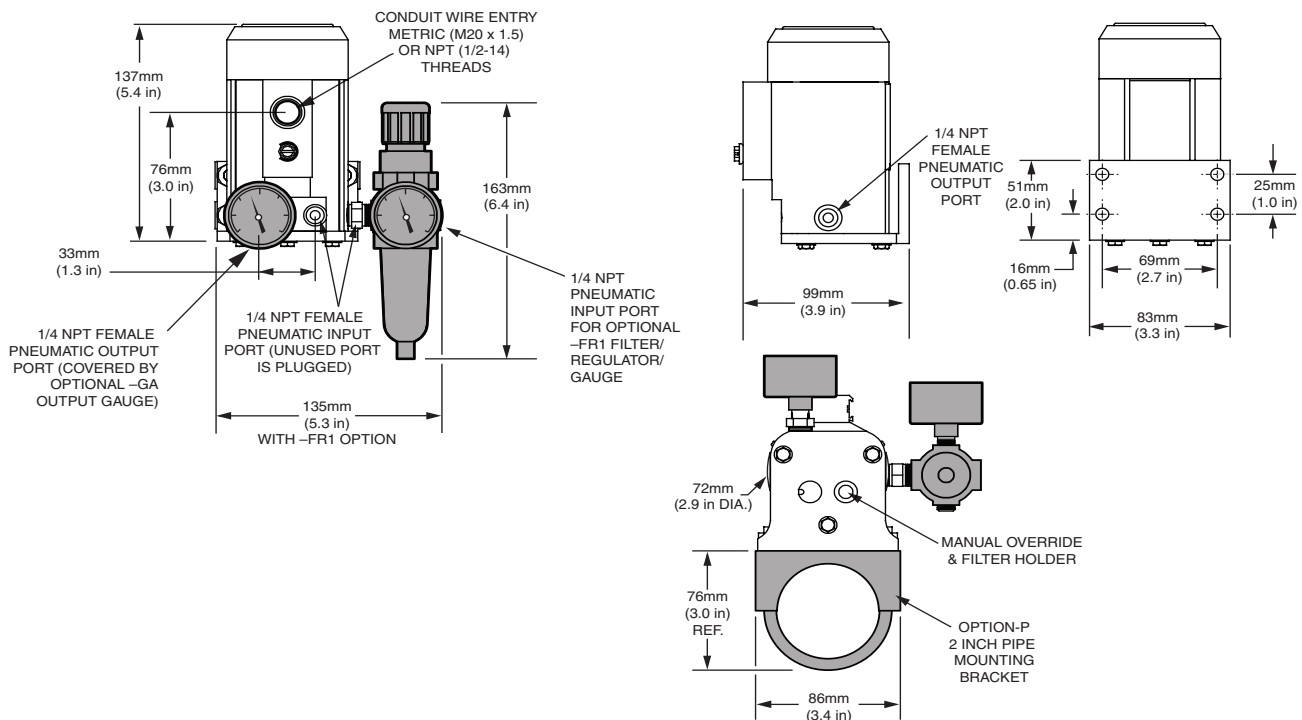
Ambient Conditions
Operating & Storage Range: -40°C to +85°C (-40°F to +185°F)
Ambient Temperature Effect: $\pm 0.025\%$ of span/°C, maximum from -20°C to 80°C; $\pm 0.1\%$ of span/°C, maximum
RF/EMI Effect: $\pm 0.25\%$ of span change at in field strengths of 10V/m @ frequencies of 20-1000MHz
Vibration Effect: Meets ANSI/ISA-75 13.01-1996 (R2007) 5.3.5 as follows:
 5-15Hz, 2mm peak-to-peak;
 15-150Hz, 1g;
 150-2000Hz, 0.5g
Relative Humidity: 0-100%, non-condensing

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

Weight
 IPH²: 1.14kg (2.5 lbs)
 IPX²: 2.4kg (5.3 lbs)

*Average flow rate determined at 9 psig output

Figure 2. IPH² Dimensional Diagram



Ordering Information

Unit	Input	Output*	Supply Pressure**	Options	Housing
IPH² Type 4X Current-to-Pressure Transmitter Custom ranges also available.	4-20MA 4-12MA 12-20MA into 250 ohms maximum	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†: (IPH ² only)			
		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				
IPX² Explosion-Proof and Type 4X Current-to-Pressure Transmitter		*The unit's output must match the supply pressure to its right. **Supply Pressure is typically 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. Switch selectable reverse output is on IPX ² only.		IPX² ONLY: -CAN cCSA approved for Intrinsically-Safe, Explosion Proof, Non-Incendive and General Locations. Includes warnings in French and English. For Canadian institutions only. -ISA ANZEx approved Intrinsically Safe and Type N Note: The standard IPX ² tag includes approval markings for Canada, Europe and US with warnings in English only.	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 *Not available with the -NG Option 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 [EXI]

IPH² & IPX²

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

Certifications (IPH² and IPX²)

ANZEx TestSafe/ANZEz Scheme

Type n (IPX²: Air only)

Ex nA IIC T6@55°C

Intrinsically-Safe

Ex ia IIC T4@85°C /T5@70°C



CE Conformant – EMC Directive 2004/108/EC
EN61326-1

Environmental Protection:

IPH² Type 4X

IPX² (-Air), Type 4X & IP56

IPX² (-NG), Type 4X & IP66

Certifications (IPX² only)



Canadian Standards Association (CSA)

Non-Incendive, Type n (Air only)

Class I, Division 2, Groups A, B, C & D
Ex nA IIC

Temperature Codes: T4/T5/T6

T4@85°C/T5@70°C/T6@55°C

Maximum Operating Ambient

Intrinsically-Safe

Class I, Divisions 1 & 2, Groups A, B, C & D

Class II, Divisions 1 & 2, Groups E, F & G

Class III, Divisions 1 & 2

Ex ia IIC; Zone 0, AEx ia IIC T4/T4A/T5

Explosion/Flame Proof

Class I, Division 1, Groups A, B, C & D

Class II, Divisions 1 & 2, Groups E, F, & G

Class III, Divisions 1 & 2

Ex d IIC; Zone 1, AEx d IIC T4/T4A/T5

Temperature Codes: T4/T4A/T5

T4@85°C/T4A@70°C/T5@55°C

Maximum Operating Ambient



SIRA/ATEX Directive 94/9/EC

Intrinsically-Safe

II 1G Ex ia IIC T4 Ga

Ta = -40°C to +85°C

MII/ATEX Directive 94/9/EC

Type n (Air only)

II 3G Ex nA IIC T6

SIRA/ATEX Directive 94/9/EC

Flame-Proof (Air only)

II 2 G Ex d IIC T4 Gb

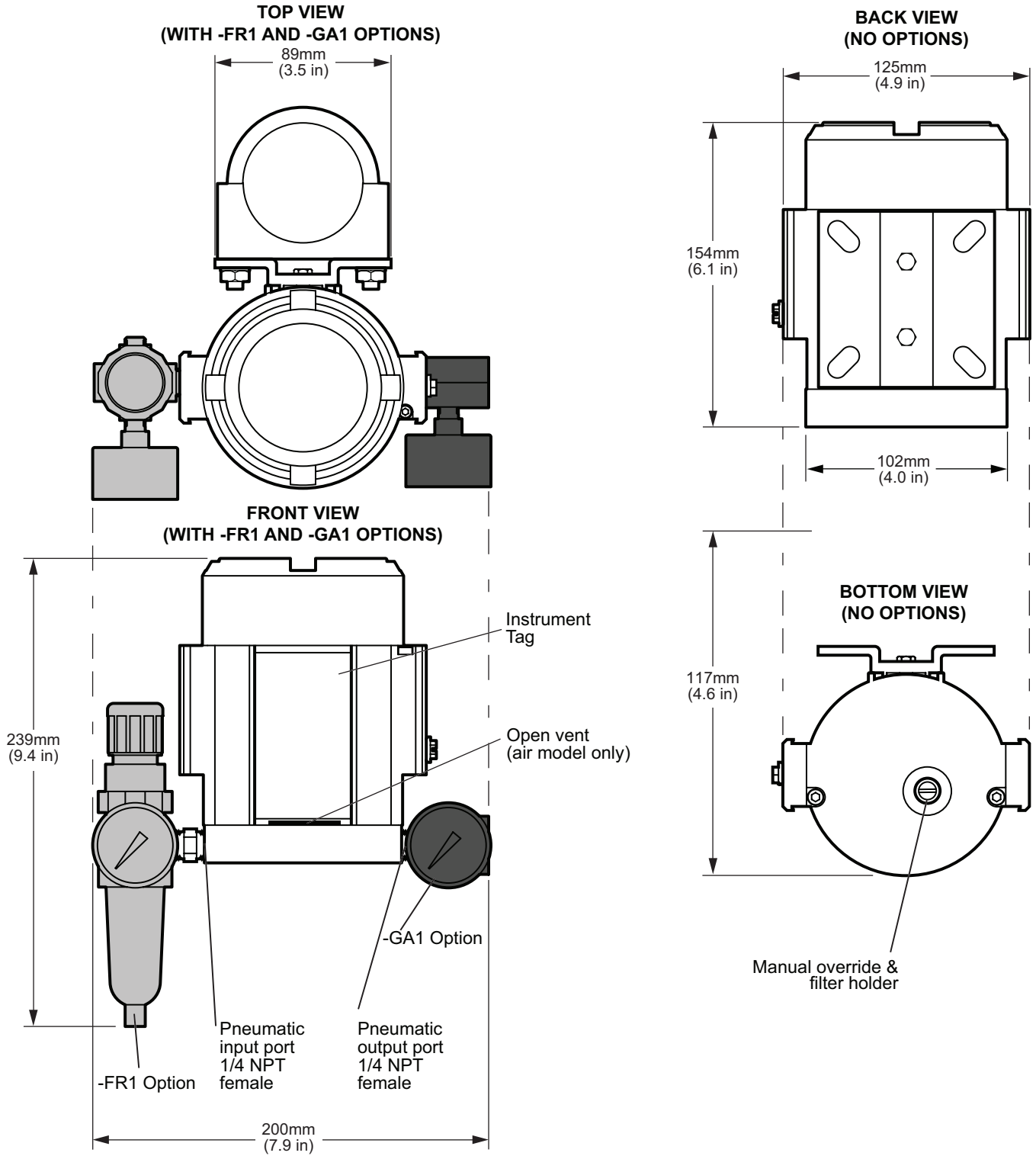
II 2 D Ex tb IIIC, T127°C Db

Ta = -40°C to +85°C

IPH² & IPX²

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

Figure 3. IPX² Dimensional Diagram



IPH² & IPX²

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

Figure 4. IPX² with -NG Option Dimensional Diagram

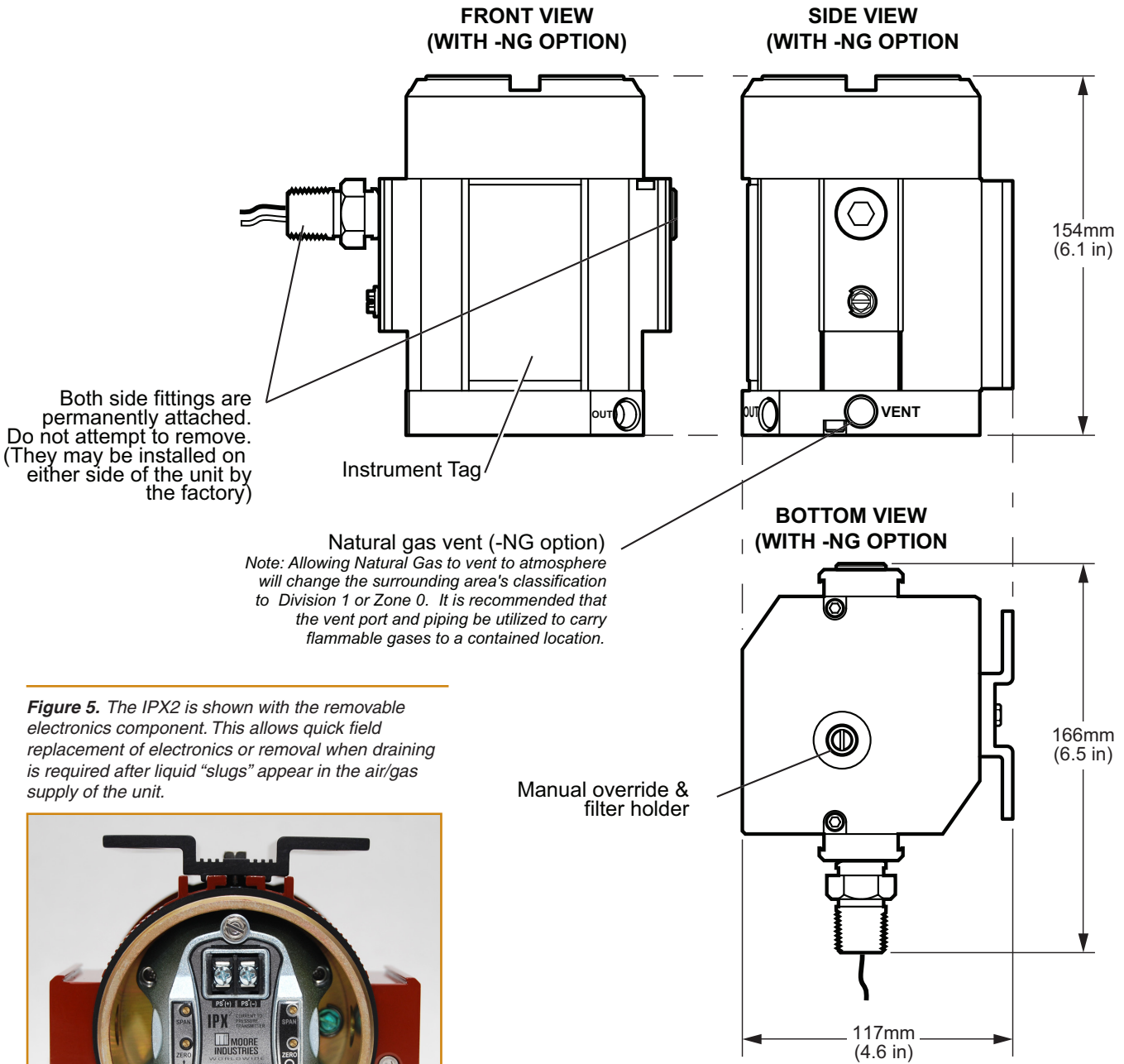


Figure 5. The IPX2 is shown with the removable electronics component. This allows quick field replacement of electronics or removal when draining is required after liquid "slugs" appear in the air/gas supply of the unit.



The Interface Solution Experts • www.miinet.com

United States • info@miinet.com
Tel: (818) 894-7111 • FAX: (818) 891-2816
Australia • sales@mooreind.com.au
Tel: (02) 8536-7200 • FAX: (02) 9525-7296

Belgium • info@mooreind.be
Tel: 03/448.10.18 • FAX: 03/440.17.97
The Netherlands • sales@mooreind.nl
Tel: (0)344-617971 • FAX: (0)344-615920

China • sales@mooreind.sh.cn
Tel: 86-21-62481120 • FAX: 86-21-62490635
United Kingdom • sales@mooreind.com
Tel: 01293 514488 • FAX: 01293 536852