

April 2016

## 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 IPH<sup>2</sup> (Type 4X) is watertight, dust-protected, and resistant to corrosion and chemicals. In addition to meeting Type 3X/4X requirements, the IPX<sup>2</sup> can be installed in explosion-proof environments.

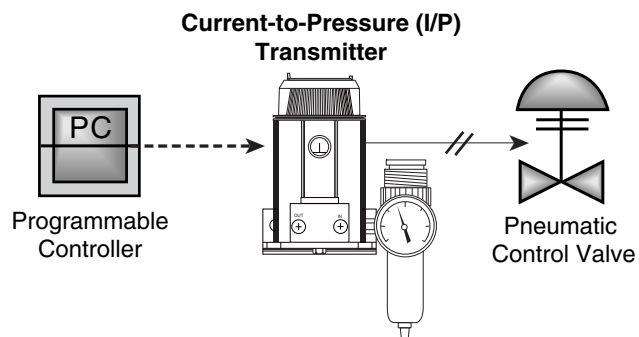
Both units are available with an optional coalescing filter/regulator that combines an air filter and miniature supply line regulator with a pressure gauge that reads in both psig and bars.

### Approved for Use with Natural Gas

Special design, construction and materials allow the model **IPX<sup>2</sup> 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 H<sub>2</sub>S).

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 IPH<sup>2</sup> (right) and IPX<sup>2</sup> (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 IPX<sup>2</sup>. Custom ranges are also available.
- **Low air consumption and high output volume.** The IPH<sup>2</sup> and IPX<sup>2</sup> 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 IPX<sup>2</sup>, 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.

# IPH<sup>2</sup> & IPX<sup>2</sup>

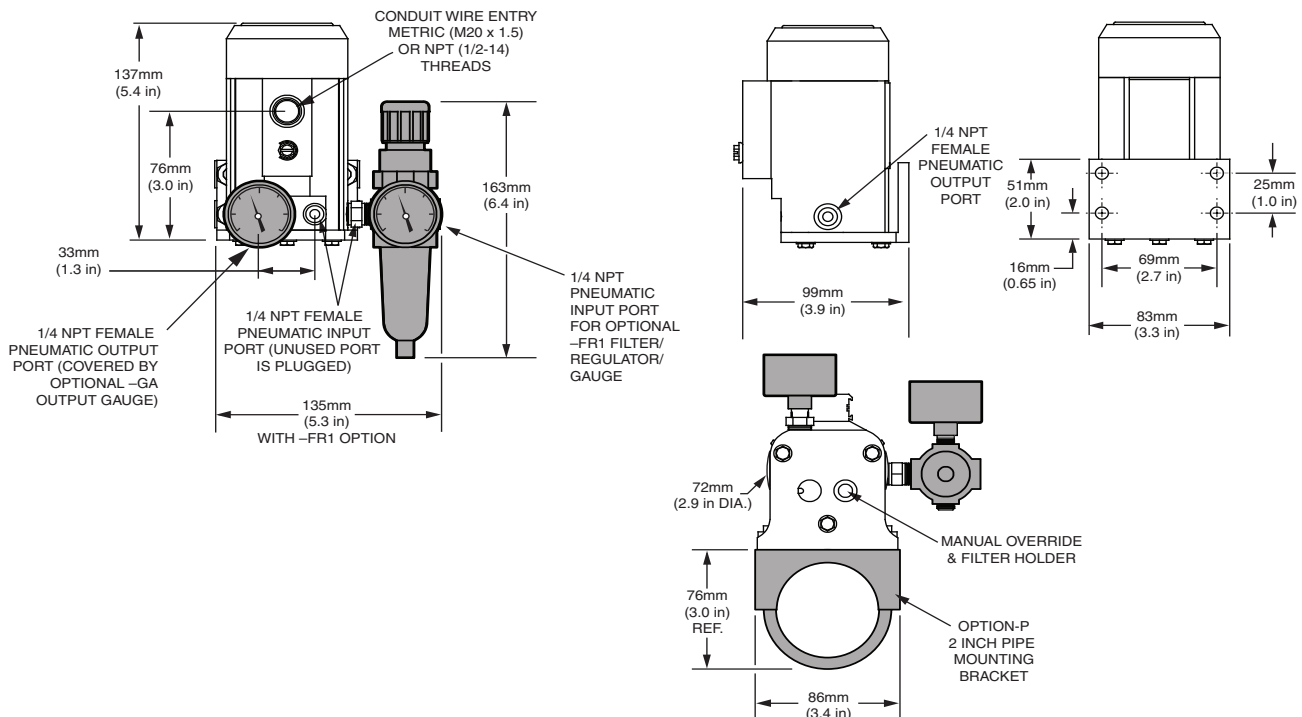
Type 4X & Explosion-Proof  
Current-to-Pressure (I/P) Transmitters

## Specifications

<p><b>Performance</b></p> <p><b>Accuracy:</b> <math>\leq \pm 0.25\%</math> of span including the combined effect of linearity, hysteresis and repeatability (between 0 and 3psig output, error will not exceed <math>\pm 1.0\%</math> of span)</p> <p><b>Stability:</b> Not to degrade from stated accuracy for six months</p> <p><b>Step Response:</b> <math>&lt; 0.2</math> seconds into 100ml load (6 in<sup>3</sup>) from 10% to 90% of span; Not guaranteed below 3psig output</p> <p><b>Supply Pressure Effect:</b> Negligible from 20-40psig, steady pressure</p> <p><b>Air Capacity:</b> 5.0SCFM minimum (20psig supply, 0psig output)</p> <p><b>Relief Capacity:</b> 2.5SCFM minimum (15psig output)</p> <p><b>Air Supply:</b> Instrument air only, 20-40psig.</p> <p><b>Gas Supply with -NG1 or -NG2 Option:</b> 17-40psig. Same cleanliness as instrument air. H<sub>2</sub>S not to exceed 20ppm</p> <p><b>Maximum Input:</b> 80psig without damage for units with output pressure rating of <math>&gt; 15</math>psig; 45psig without damage for units with output pressure 15psig</p>	<p><b>Performance (Continued)</b></p> <p><b>Voltage Drop:</b> 5V, maximum</p> <p><b>Air Consumption (Dead-ended):</b> 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</p> <p><b>Natural Gas Consumption (Dead-ended):</b> 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;</p> <p><b>Mounting Position Effect:</b> Negligible, unit can be mounted in any position; refer to user manual for special conditions of use with natural gas supply or outdoor environments.</p>	<p><b>Ambient Conditions</b></p> <p><b>Operating &amp; Storage Range:</b> -40°C to +85°C (-40°F to +185°F)</p> <p><b>Ambient Temperature Effect:</b> <math>\leq \pm 0.025\%</math> of span/°C, maximum from -20°C to 80°C; <math>\leq \pm 0.1\%</math> of span/°C, maximum</p> <p><b>RFI/EMI Effect:</b> <math>\leq \pm 0.25\%</math> of span change at in field strengths of 10V/m@ frequencies of 20-1000MHz</p> <p><b>Vibration Effect: Meets ANSI/ISA-75.13.01-1996 (R2007) 5.3.5 as follows:</b> 5-15Hz, 2mm peak-to-peak; 15-150Hz, 1g; 150-2000Hz, 0.5g</p> <p><b>Relative Humidity:</b> 0-100%, non-condensing</p> <p><b>Adjustment</b></p> <p><b>Zero &amp; Span:</b> Screw adjusts zero or span by <math>\pm 10\%</math> minimum, non-interactive</p> <p><b>Weight</b></p> <p><b>IPH<sup>2</sup>:</b> 1.14kg (2.5 lbs) <b>IPX<sup>2</sup>:</b> 2.4kg (5.3 lbs)</p>
--	--	--

\*Average flow rate determined at 9 psig output

Figure 2. IPH<sup>2</sup> Dimensional Diagram



## Ordering Information

Unit	Input	Output*	Supply Pressure**	Options	Housing
IPH <sup>2</sup> Type 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 <sup>2</sup> Type 4X 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 <sub>2</sub> S) as the pneumatic supply (not available with -FR1 and -GA1 options) -NG2 IPX <sup>2</sup> Type 4X 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 <sub>2</sub> S) as the pneumatic supply (not available with -FR1 and -GA1 options) -VTD Standard Factory Calibration with NIST Test Data Report	IPH <sup>2</sup> 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†: (IPX <sup>2</sup> 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				
IPX <sup>2</sup> Explosion-Proof and Type 3X* Current-to-Pressure Transmitter		*The unit's output must match the supply pressure to its right.		IPX <sup>2</sup> 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 <sup>2</sup> tag includes approval markings for Canada, Europe and US with warnings in English only.	IPX <sup>2</sup> 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 NC** Replacement electronics module without enclosure  * Not available with the -NG Option. ** Replacement or spare electronic modules must be ordered for specific output ranges (i.e. a 3-15PSIG electronics module cannot be field calibrated for 6-30PSIG). Replacement electronic modules are only available for IPX <sup>2</sup> units with S/Ns greater than 2321590.  P suffix indicates enclosure comes equipped with base plate and U-bolts for mounting on a 2-inch pipe (i.e. EXIP).
		**Supply Pressure is typically 5psi (0.3bar) higher than output pressure.			
		†The IPH <sup>2</sup> and IPX <sup>2</sup> 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 <sup>2</sup> only.			

**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]  
 IPX2 / 4-20MA / .2-1BAR / 1.4BAR / -NG1 [NC]

# IPH<sup>2</sup> & IPX<sup>2</sup>

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

## Certifications (IPH<sup>2</sup> and IPX<sup>2</sup>)

### ANZEx TestSafe/ANZEz Scheme

Type n (IPX<sup>2</sup>: Air only)

Ex nA IIC T6@55°C

### Intrinsically-Safe

Ex ia IIC T4@85°C /T5@70°C



CE Conformant – EMC Directive 2014/30/EU

EN61326-1

### Environmental Protection:

IPH<sup>2</sup> Type 4X

IPX<sup>2</sup> (-Air), Type 3X & IP56

IPX<sup>2</sup> (-NG), Type 4X & IP66

## Certifications (IPX<sup>2</sup> only)



### Canadian Standards Association (CSA)

Non-Incendive, Type n (Air only)

Class I, Division 2, Groups A, B, C & D

Ex nA IIC

### 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/T5/T6

T4@85°C/T5@70°C/T6@55°C

Maximum Operating Ambient

### Temperature Codes: T4/T4A/T5

T4@85°C/T4A@70°C/T5@55°C

Maximum Operating Ambient



### SIRA/ATEX Directive 2014/34/EU

#### Intrinsically-Safe

Ex II 1G Ex ia IIC T4 Ga

Ta = -40°C to +85°C

### MII/ATEX Directive 2014/34/EU

#### Type n (Air only)

Ex II 3G Ex nA IIC T6

### SIRA/ATEX Directive 2014/34/EU

#### Flame-Proof (Air only)

Ex II 2 G Ex d IIC T4 Gb

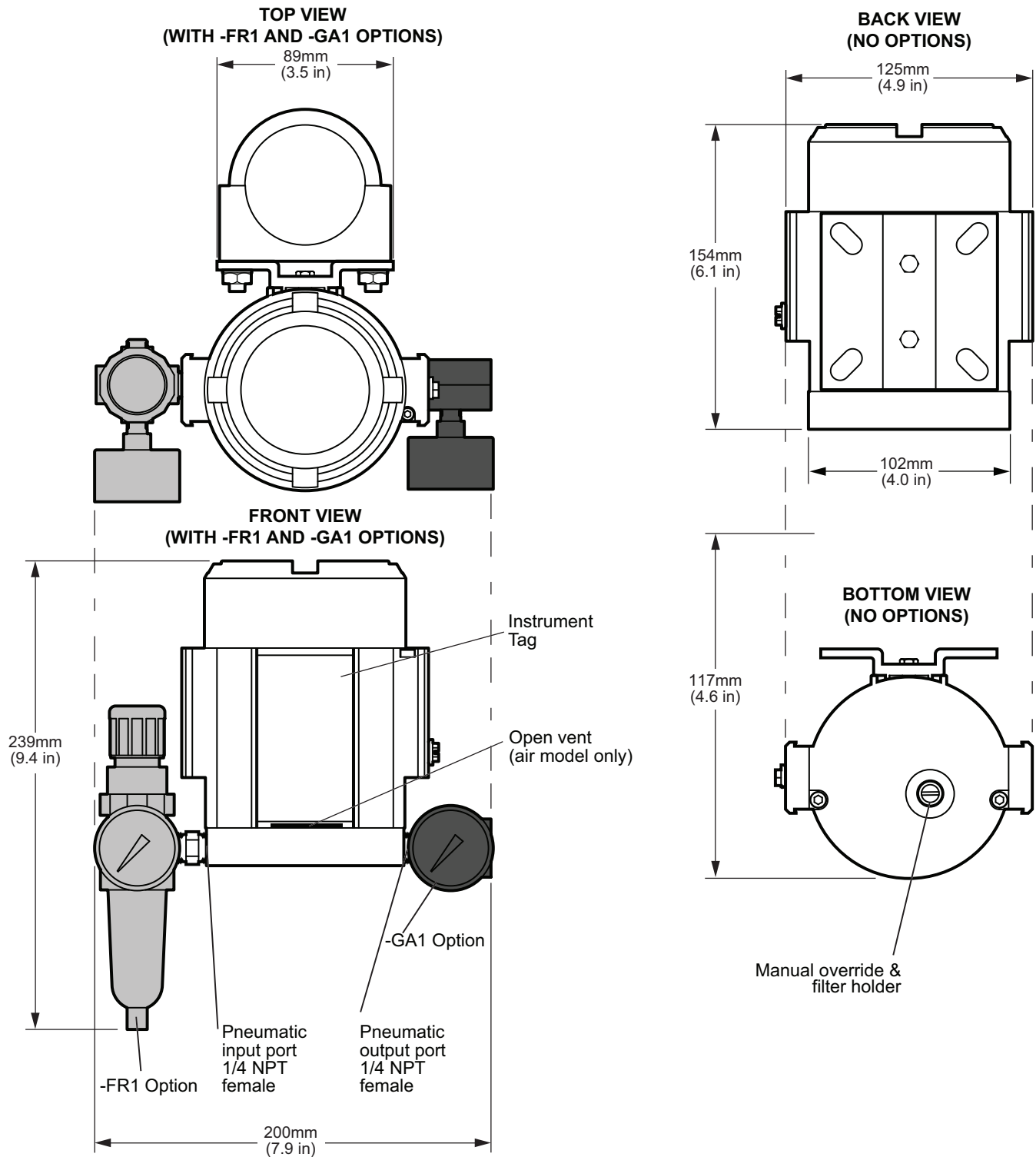
Ex II 2 D Ex tb IIIC, T127°C Db

Ta = -40°C to +85°C

# IPH<sup>2</sup> & IPX<sup>2</sup>

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

Figure 3. IPX<sup>2</sup> Dimensional Diagram



# IPH<sup>2</sup> & IPX<sup>2</sup>

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

Figure 4. IPX<sup>2</sup> with -NG Option Dimensional Diagram

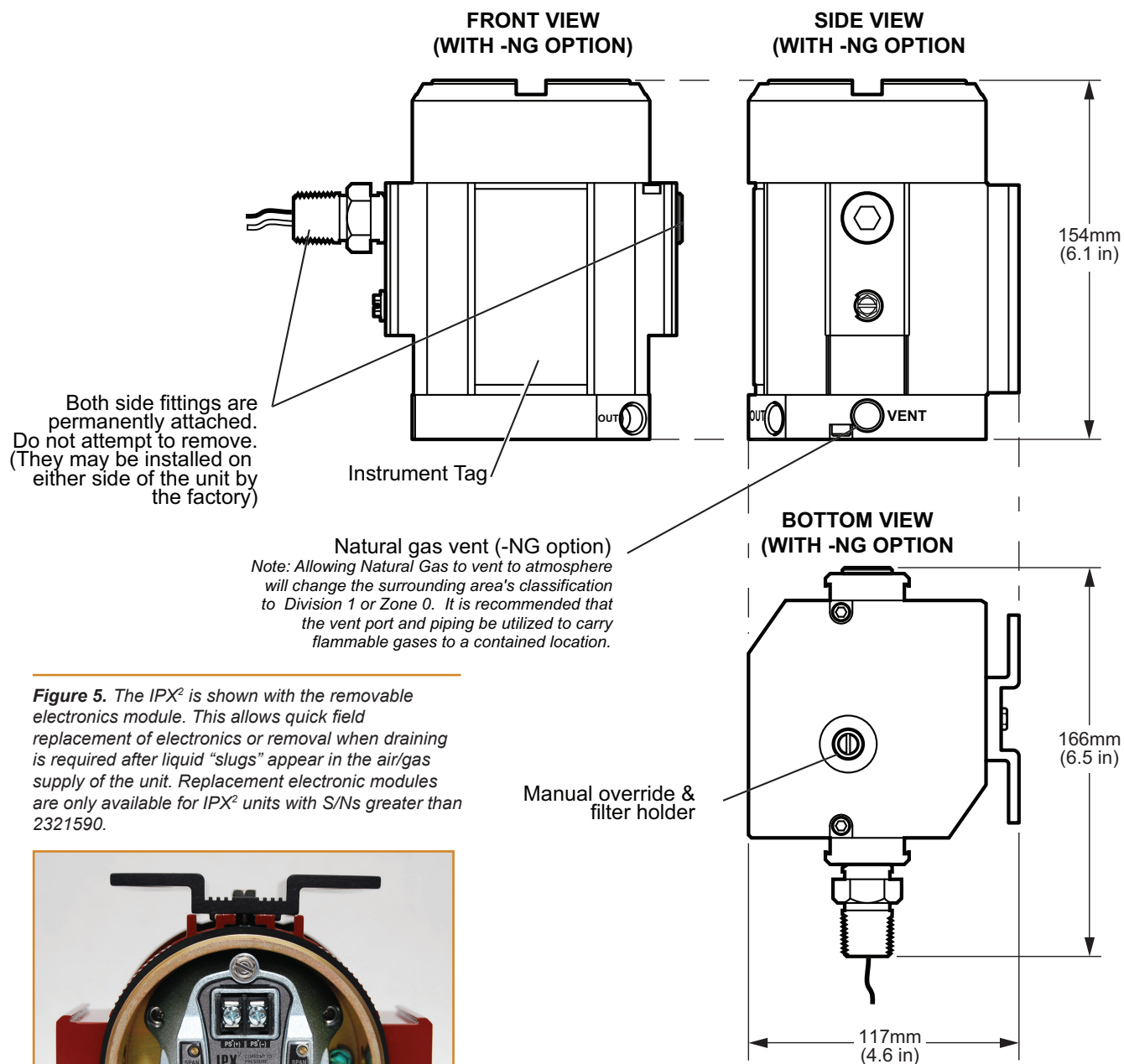


Figure 5. The IPX<sup>2</sup> is shown with the removable electronics module. This allows quick field replacement of electronics or removal when draining is required after liquid "slugs" appear in the air/gas supply of the unit. Replacement electronic modules are only available for IPX<sup>2</sup> units with S/Ns greater than 2321590.



Demand Moore Reliability • [www.miinet.com](http://www.miinet.com)

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

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

China • [sales@mooreind.sh.cn](mailto:sales@mooreind.sh.cn)  
Tel: 86-21-62491499 • FAX: 86-21-62490635  
United Kingdom • [sales@mooreind.com](mailto:sales@mooreind.com)  
Tel: 01293 514488 • FAX: 01293 536852