

## Features

- ▶ Lightweight, compact and all-welded rugged stainless steel construction
- ▶ High performance sensors for high accuracy
- ▶ Optional HART® communication protocol with diagnostics & field calibration, reducing maintenance time and cost; and 10:1 turndown ratio for re-ranging, maintaining high accuracy and allowing one part number for multiple pressure ranges
- ▶ High accuracy:  $\pm 0.1\%$  and  $\pm 0.25\%$  FSO, (L,H,R)
- ▶ cULus, ATEX, IECEx and Single Seal certifications
- ▶ Explosion proof enclosure with IP66 & IP67 and NEMA 4X, 7 & 9 ratings
- ▶ CE, CRN, and NACE compliant and superior EMI/EMC protection
- ▶ Factory sealed, environment friendly, halogen free wires and cable
- ▶ RoHS & REACH Compliant

## Applications

- ▶ Production Control Systems
- ▶ Chemical Injection Systems
- ▶ Oil & gas pipelines
- ▶ Petrochemical plants
- ▶ Refineries
- ▶ Coal and oil fired power plants
- ▶ Hydraulic Power Units
- ▶ Gas transfers for fuel systems



## General Specifications\*

Accuracy including Linearity, Hysteresis and Repeatability: at 75°F, Typical	$\pm 0.1\%$ of Calibrated FSO (Option [-A1]) $\pm 0.25\%$ of Calibrated FSO (Standard) $\pm 0.5\%$ of Calibrated FSO (Vacuum only [-23])	Dynamic Response Time: H455X: 455X & 452X:	<70 milliseconds <50 milliseconds
Temperature Shift:	Zero & Span: 0.0125% Per °F over the compensated temperature range	Enclosure:	All welded 300 series stainless steel. IP66 & IP67 and NEMA 4X rated. 316 Stainless Steel (optional)
Long Term Stability:	$\pm 0.2\%$ FSO/year of calibration curve	Wetted Parts: Sensor:	17-4 PH Stainless steel (more than 10k psi) 316L Stainless steel (up to 10k psi) 17-4 PH Stainless Steel for -UL option (10k psi)
Typical Life Cycle:	100 million cycles	Fitting:	17-4 PH Stainless steel (all ranges) 316L Stainless steel (optional: up to 10k psi)
Proof Pressure:	2X range for up to 7500 psi models 1.5X range for 7500 - 30000 psi models	Media General:	Gas, vapor, liquid and viscous fluids [-Z17]
Input: H455X: 455X*: 452X*:	Excitation voltage: 9 to 30 VDC Excitation voltage: 9 to 30 VDC Excitation voltage: 9 to 30 VDC * (SELV, PELV), Class II Power Supply	Corrosive and Acidic: (up to 10,000 psi)	316L Stainless Steel, NACE [-SS]
Supply Current:		Pressure Connection:	13 available options. Refer to product configurator for available connections and ranges. 3 and 4 pin Deutsch connector (optional)
H455X & 455X:	20 mA max.	Electrical Connection:	3 conductors for voltage output series and 2 conductors for current output series, 18 AWG, 80" (2 m) long with integral strain relief and case ground (standard). Jacketed cable (optional). Halogen free wires and cable.
452X:	20 mA max.	Temperature Ranges: Operating (Ambient): Compensated: Media: Storage:	-40 to +176 °F (-40 to +80 °C) 0 to +165 °F (-18 to +74 °C) -40 to +176 °F (-40 to +80 °C) -40 to +185 °F (-40 to +85 °C)
Output: H455X:	Output: 4–20 mA with HART® Protocol Full Scale Output: 20 mA $\pm 1\%$ Zero output: 4 mA $\pm 1\%$	Vibration:	10 g's, 10-500 Hz, MIL-STD 202, Method 204, Cond A.
455X:	Output: 4–20 mA Full Scale Output: 20 mA $\pm 1\%$ Zero output: 4 mA $\pm 1\%$	Shock:	50 g's, 11 mS, MIL-STD 202 Method 213, Cond. G.
452X:	Output: 1–5 VDC Full scale output: 5.0 VDC $\pm 1\%$ Zero output: 1.0 VDC $\pm 1\%$		

\* See product configurator for additional options.

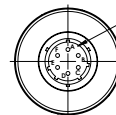
## General Specifications\* cont.

Approvals: UL:	cULus approved as telemetering equipment for use in hazardous locations (UL File E146589, WYMV, WYMV7) factory sealed, Type 4X, as follows: Class I, Div. 1, Groups A, B, C & D Class II, Div. 1, Groups E, F & G	Compliances:	CE, CRN (refer to drawing # 272479 for applicable models) NACE (316L SS wetted material)
Single Seal:	CSA C22.2 No. 61010-1 Certified ANSI/ISA 12.27.01 Certified (for ranges up to 6,800 PSI)	Electromagnetic Compatibility (EMC)	
ATEX/IECEX:	CE 0081 CE I 2 G D Ex db IIC T5 Gb Ex tb IIIC T81°C Db, IP66 & IP67 -40 °C ≤ Tamb ≤ +80 °C DEMKO 18 ATEX 2084 IECEX UL 18.0090	IEC/EN 55011:	Emission & radiated emission for class A limits
HART® Protocol:	HART® 7.6	IEC/EN 61000-4-2:	Electrostatic discharge (ESD) test - contact discharge +/-4 kV, Air discharge +/-8 kV
Turndown Ratio:	10:1 (Full scale output rangeability)	IEC/EN 61000-4-3:	Radiated RF, EM field immunity 80mhz-1ghz, 3v/M
Analog Output Calibration:	Adjustable zero and span of 4-20mA. Full scale range must be ≥ (calibrated span / 10)	IEC/EN 61000-4-4: H455X:	EFT (Burst) Test, +/-2 kV
Sensor Trim:	Sensor zero and full scale trim	455X & 452X:	EFT (Burst) Test, +/-1 kV
Diagnostics:	Transmitter failure indicated by off-scale analog signals to alarm the user  See HART Installation and Operation Manual 272438 for detailed information	IEC/EN 61000-4-5: H455X:	Surge Test, +/-1kV between line and earth ground
		455X & 452X:	Surge test not applicable; Class II power supply used at input of the device
		IEC/EN 61000-4-6:	RF Immunity, 150 kHz – 80 MHz, 3V
		Weight:	16 Ounces (453 grams)
		Warranty:	1 Year warranty

\* See product configurator for additional options.

## Wiring Code

TABLE 1. FREE LEAD WIRE CONNECTIONS				
MODEL NO.	RED	BLACK	GREEN	WHITE
H455X	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455X	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452X	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT



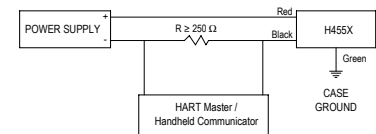
\* 'A' TO 'F' ARE PINS FOR CONNECTION REFER TABLE 1.

TABLE 2. JACKETED CABLE WIRE CONNECTIONS (-J Option)				
MODEL NO.	WHITE	BROWN	GREEN	YELLOW
H455X	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
455X	+ EXCITATION	- EXCITATION	EARTH GROUND	NOT INCLUDED
452X	+ EXCITATION	- EXCITATION	EARTH GROUND	VOLTAGE OUTPUT

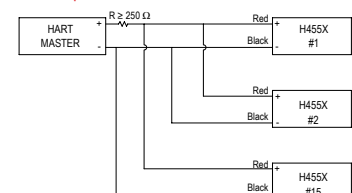
TABLE 3. DEUTSCH CONNECTOR PIN CONNECTIONS (-D3 & -D4 Option)					
MODEL NO.	CONNECTOR	PIN A/1	PIN B/2	PIN C/3	PIN D/4
CURRENT	D3	+ EXCITATION	- EXCITATION	EARTH GROUND	N/A
VOLTAGE	D3	+ EXCITATION	- EXCITATION	VOLTAGE OUTPUT	N/A
CURRENT	D4	- EXCITATION	+ EXCITATION	EARTH GROUND	N/A
VOLTAGE	D4	- EXCITATION	+ EXCITATION	VOLTAGE OUTPUT	EARTH GROUND

### CONFIGURATION WITH HART

Point to Point



Multi Drop



## Technical Drawings

**FACTORY SEALED HALOGEN FREE 18 AWG LEADS 80 INCHES (2 METERS) REFER TABLE 1 & 2. OPTIONAL: JACKETED CABLE**

**STD: 1/2"-14 NPT MALE CONDUIT THREADS**  
**OPTIONAL: T6: M20X1.5 THD**

Dimensions:  $1/4"$  [6],  $4 53/64"$  [123],  $5 21/64"$  [135],  $\phi 1 3/8"$  [35],  $.40$  [10],  $\phi .030$  [0.762] OR  $\phi 3/16$  [4.76] PRESSURE PORT OPENING,  $1/4$  NPT FEMALE THD (-P6 SHOWN), A/F  $1"$  or  $1 1/8"$  [25.4] or [28.6]

**MAXIMUM RESISTANCE**

**LOOP RESISTANCE REQUIRED (OHMS)**

**EXCITATION VOLTAGE (volts DC)**

**OPERATING BAND**

**Process Connections**

AUTOCLAVE 1/4" TUBE F. (9/16-18 UNF-2B) -P15	1/4 NPT M. BLANK	1/2 NPT M. -P4	1/2 NPT F. -P5	G 1/4 M. -P10	G 1/4 F. -P12
G 1/2 M. -P11	G 1/2 F. -P13	7/16-20. W/ 37° Flared. M. -P3	7/16-20. W/ 37° Flared. F. -P1	7/16-20. SAE #4. ORB. M. -P2	7/16-20. SAE #4. ORB. F. -P14

DIMENSIONS IN BRACKET ARE IN MM



## Product Configurator

Example:	H455X	T6	-29	BA	-P15	-Z17-A1-Z123
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### Base Model

H455X	4 - 20 mA Output with HART® Comm. Protocol
455X	4 - 20 mA Output
452X	1-5 VDC Output

### Electrical Connection

Blank	1/2"-14 NPT Male conduit
T6	M20 x 1.5 Male conduit

### Pressure Range

-23*	0-29.9" of Hg	0 to -1 Bar
-01	0-15 psi	0-1 Bar
-21	0-30 psi	0-2 Bar
-03	0-50 psi	0-3 Bar
-22	0-60 psi	0-4 Bar
-04	0-100 psi	0-7 Bar
-05	0-150 psi	0-10 Bar
-06	0-200 psi	0-15 Bar
-07	0-300 psi	0-20 Bar
-08	0-500 psi	0-40 Bar
-10	0-1,000 psi	0-70 Bar
-11	0-1,500 psi	0-100 Bar
-12	0-2,000 psi	0-150 Bar
-13	0-3,000 psi	0-200 Bar
-14	0-4,000 psi	0-300 Bar
-15	0-5,000 psi	0-350 Bar
-16	0-6,000 psi	0-400 Bar
-17	0-7,500 psi	0-500 Bar
-18 <sup>1</sup>	0-10,000 psi	0-700 Bar
-29 <sup>3</sup>	0-15,000 psi	0-1,000 Bar
-30 <sup>3</sup>	0-20,000 psi	0-1,400 Bar
-31 <sup>3</sup>	0-22,000 psi	0-1,500 Bar
-32 <sup>3</sup>	0-25,000 psi	0-1,700 Bar
-33 <sup>3</sup>	0-30,000 psi	0-2,000 Bar

\* Vacuum

### Pressure Unit & Type

Blank	PSI - Sealed gage pressure (standard)
A	PSI - Absolute pressure (Not applicable with "-23" range)
B	Bar - Sealed gage pressure
BA	Bar - Absolute Pressure (ranges start from -1 Bar) (Not applicable with "-23" range)

### Options

-ZVxx	Custom voltage output (Available on 452X only). Up to 10VDC. Consult Factory.
-Z17 <sup>1</sup>	Larger orifice; without pressure surge protector
-SC <sup>4</sup>	316 Stainless steel enclosure
-SS <sup>3,4</sup>	316L Stainless steel wetted material (NACE)
-UL <sup>5</sup>	cULus in addition to ATEX & IECEx approvals for -18 range (10k psi) only
-A1	Accuracy BFSL 0.1% FSO, typical (LHR) at 75°F (Consult factory on vacuum [-23] models)
-ZXXY	Special pressure ranges XX - significant digits Y - number of trailing zeros Example: 130 psi calibration: add -Z131
-JXXX	Jacketed cable (in inches)
-WXXX	Custom length of free leads (in inches)
-D3 <sup>6</sup>	3 Pin deutsch connector DT04-3P
-D4 <sup>6</sup>	4 Pin deutsch connector DT04-4P

### Process Connection

Blank <sup>3</sup>	1/4-18 NPT male (standard)
-P6 <sup>3</sup>	1/4" NPT female
-P4 <sup>3</sup>	1/2" NPT male
-P5 <sup>3</sup>	1/2" NPT female
-P10 <sup>3</sup>	G 1/4, washer seal, male
-P12 <sup>3</sup>	G 1/4, washer seal, female
-P11 <sup>3</sup>	G 1/2, washer seal, male
-P13 <sup>3</sup>	G 1/2, washer seal, female
-P3 <sup>3</sup>	7/16-20, with 37° flared, male
-P1 <sup>3</sup>	7/16-20, with 37° flared, female
-P2 <sup>3</sup>	7/16-20, SAE #4, ORB, male
-P14 <sup>3</sup>	7/16-20, SAE #4, ORB, female
-P15	HF4 Autoclave, 1/4" tube, female (9/16-18 UNF-2B THD)

### Notes

- All pressure ranges have built-in pressure surge protector. Add "-Z17" suffix for no snubber; for use with high viscosity media. Refer to sales drawing for orifice sizes.
- Ranges with more than 10k psi are available only with "-P15" Process Connection
- Available up to 10,000 psi
- SS option is included in -SC option. -SC does not include material of electrical connection. "-UL" option and more than 10k psi ranges only with 17-4PH SS wetted material.
- UL option only available for 10,000 PSI range. No cULus approval for 10,000 psi range without -UL option. cULus approval standard for all other ranges. ATEX & IECEx approvals standard for all ranges. "-UL" only with 17-4 PH SS wetted material
- Connected to factory sealed halogen free, 18 AWG free leads 12" (.3m). Also available with -WXXX and -JXXX options.

## Additional Documents and Accessories

Title	Reference Number
Installation and Maintenance Instructions	272439
HART Installation and Operation Manual	272438
Certificate of Compliance (Found on back of packing slip)	Use Document Title in purchase order. Only available at the time of order.
Certificate of Compliance (Signed document)	
Test Report	
Calibration Test Sheet (Included in product package)	
Material Certification	
Paper Tag	
Metal Tag	