

Technical Information

STD800 SmartLine Differential Pressure Specification 34-ST-03-82, March 2020



Introduction

Part of the SmartLine® family of products, the STD800 is a high performance differential pressure transmitter featuring piezoresistive sensor technology. By combining differential pressure sensing with on chip static pressure and temperature compensation the STD800 offers high accuracy and stability over a wide range of application pressures and temperatures. The SmartLine family is also fully tested and compliant with Experion® PKS providing the highest level of compatibility assurance and integration capabilities. SmartLine easily meets the most demanding application needs for pressure measurement applications.

Best in Class Features:

- Accuracies up to 0.035% standard & 0.025% Opt
- Stability up to 0.01% of URL per year for 15 years
- Automatic static pressure & temperature compensation
- o Rangeability up to 400:1
- o Response times as fast as 90ms
- Multiple local display capabilities
- o External zero, span, & configuration capability
- o Polarity insensitive electrical connections
- o Comprehensive on-board diagnostic capabilities
- Integral Dual Seal design for highest safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- o World class overpressure protection
- o Full compliance to SIL 2/3 requirements.
- o Modular design characteristics
- o Available with 15-year warranty
- Plugged Impulse Line Detection Option
- O Dual/Triple Calibration Option (HART & Fieldbus only)



Figure 1 – STD800 Differential Pressure Transmitters feature field-proven piezoresistive sensor technology

Communications/Output Options:

- o 4-20mA dc
- O Honeywell Digitally Enhanced (DE)
- o HART ® (version 7.0)
- FOUNDATION™ Fieldbus

All transmitters are available with the above listed communications protocols.

Span & Range Limits:

Model	URL	LRL	Max Span	Min Span
	"H₂O (mbar)	"H₂O (mbar)	"H₂O (mbar)	"H₂O (mbar)
STD810	10 (25)	-10 (-25)	10 (25)	0.1 (0.25)
STD820	400 (1000)	-400 (-1000)	400 (1000)	1.0 (2.5)
Model	psi (bar)	psi (bar)	psi (bar)	psi (bar)
STD830	100 (7.0)	-100 (-7.0)	100 (7.0)	1 (0.07)
STD870	3000 (210)	-100 (-7.0)	3000 (210)	30 (2.1)

Description

The SmartLine family of gauge pressure, differential pressure, and absolute pressure transmitters is designed around a high performance piezo-resistive sensor. This one sensor integrates multiple sensors linking process pressure measurement with on-board static pressure (DP Models) and temperature compensation measurements resulting in the best total performance available. This level of performance allows the ST 800 to replace virtually any competitive transmitter available today.

Unique Indication/Display Options

The ST 800 modular design accommodates a basic alphanumeric LCD display or a unique advanced graphics LCD display with many unparalleled features.

Basic Alphanumeric LCD Display Features

- Modular (may be added or removed in the field)
- o 0, 90,180, & 270 degree position adjustments
- Configurable (HART only) and standard (Pa, KPa, MPa, KGcm2, Torr, ATM, inH₂O, mH₂O, bar, mbar, inH₂O, inHG, FTH₂O, mmH₂O, mm HG, & psi) measurement units
- o 2 Lines 16 Characters (4.13H x 1.83W mm)
- Square root output indication (√)

Advanced Graphics LCD Display Features

- Modular (may be added or removed in the field)
- o 0, 90, 180, & 270 degree position adjustments
- o Standard and custom measurement units available.
- Up to eight display screens with 3 formats are possible
 - (Large PV with Bar Graph or PV with Trend Graph)
- o Configurable screen rotation timing (1 to 30 sec)
- Display Square Root capabilities may be set separately from the 4-20mA dc output signal
- Unique "Health Watch" indication provides instant visibility of diagnostics
- Multiple language capability. (EN, DE, FR, IT, ES, RU, TR, CN & JP)

Diagnostics

SmartLine transmitters all offer digitally accessible diagnostics which aid in providing advanced warning of possible failure events minimizing unplanned shutdowns, providing **lower overall operational costs**

Configuration Tools

Integral Three Button Configuration Option

Suitable for all electrical and environmental requirements, SmartLine offer the ability to configure the transmitter and display via three externally accessible buttons when either display option is selected. Zero/span capabilities are also optionally available via these buttons with or without selection of a display option.

Hand Held Configuration

SmartLine transmitters feature two-way communication and configuration capability between the operator and the transmitter. This is accomplished via Honeywell's field-rated Multiple Communication Configurator (MCT404). The MCT404 is capable of field configuring DE and HART Devices and can also be ordered for use in intrinsically safe environments. All Honeywell transmitters are designed and tested for compliance with the offered communication protocols and are designed to operate with any properly validated hand held configuration device.

Personal Computer Configuration

Honeywell's SCT 3000 Configuration Toolkit provides an easy way to configure Digitally Enhanced (DE) instruments using a personal computer as the configuration interface. Field Device Manager (FDM) Software and FDM Express are also available for managing HART & Fieldbus device configurations.

System Integration

- SmartLine communications protocols all meet the most current published standards for HART/DE/Fieldbus.
- Integration with Honeywell's Experion PKS offers the following unique advantages.
 - o Transmitter messaging
 - o Maintenance mode indication
 - o Tamper reporting
 - o FDM Plant Area Views with Health summaries
 - All ST 800 units are Experion tested to provide the highest level of compatibility assurance

Modular Design

To help contain maintenance & inventory costs, all ST 800 transmitters are modular in design supporting the user's ability to replace meter bodies, add indicators or change electronic modules without affecting overall performance or approval body certifications. Each meter body is uniquely characterized to provide in-tolerance performance over a wide range of application variations in temperature and pressure and due to the Honeywell advanced interface, electronic modules may be swapped with any electronics module without losing in-tolerance performance characteristics.

Modular Features

- Meter body replacement
- Exchange/replace electronics/comms modules*
- Add or remove integral indicators*
- Add or remove lightning protection (terminal connection)*
- * Field replaceable in all electrical environments (including IS) except flameproof without violating agency approvals.

With no performance effects, Honeywell's unique modularity results in *lower inventory needs and lower overall operating costs.*

Plugged Impulse Line Detection:

STD800 models are offered with a PILD option which provides indication of a plugged impulse line or process connection. When used in conjunction with a basic or advanced display, a non-critical diagnostic indication appears on the integral display. For units without an integral display, an indication can be seen via the host or hand held device when HART Protocol is utilized.

Dual/Triple Calibration:

STD800 models are optionally offered with multiple calibrations. In lieu of a standard factory calibration, units can be supplied with 1, 2, or 3 customer specified calibrations. These calibrations are stored in the meter body and provide users with factory calibrated performance at up to three different calibrated ranges. This increases application flexibility without requiring any costly recalibration or additional inventory.

Performance Specifications

Reference Accuracy (conformance to +/-3 Sigma)

Table 1

Model	URL	LRL	Min Span	Maximum Turndown Ratio	Stability (% URL/ Yr for 15 years)	Reference Accuracy ^{1,2} (% Span) Std/Opt
STD810	10 in H₂O/25mbar	-10 in H₂O/-25mbar	0.1 in H ₂ O/0.25mbar	100:1	0.015	0.0350%
STD820	400 in H ₂ O/1000mbar	-400 in H ₂ O/-1000mbar	1 in H₂O/2.5mbar	400:1	0.010	0.0375 / 0.025%
STD830	100 psi/7.0 bar	-100 psi/-7.0 bar	1 psi/0.07 bar	100:1	0.020	0.05 / 0.0325%
STD870	3000 psi/210 bar	-100 psi/-7.0 bar	30 psi/2.1 bar	100:1	0.010	0.05 / 0.035%

Zero and span may be set anywhere within the listed (URL/LRL) range limits

Accuracy at Specified Span, Temperature and Static Pressure Effects: (conformance to +/-3)

TABLE II Static Line Pressure Accuracy^{1,2} Temperature Effect **Effect** (% of Span) (%Span/50°F) (% Span/1000psi)3 For Spans С Α D Ε G URL **Below** Model STD810 10 in H₂O/25mbar 0.010 0.025 1 / 2.5 0.070 0.040 0.050 0.075 10:1 400 in H₂O/1000mbar STD820 16:1 0.025 25 / 62.5 0.007 0.007 0.0125 0.025 0.080 Standard Accuracy For Spans Α В С D Ε F G URL **Below** Model 0.010 STD830 100 psi/7.0 bar 6.7:1 15 / 1.03 0.0125 0.0375 0.025 0.075 0.0075 STD870 3000 psi/210 bar 15:1 200 / 14 0.006 For Spans Α С D Ε F G Model URL **Below** High Accuracy Option STD820 400 in H₂O/996.4mbar 0.0125 25 / 62.5 0.007 0.007 16:1 0.0125 0.025 0.080 For Spans С F Α D Ε G В Model URL **Below** STD830 100 psi/7 bar 0.0125 0.010 6.7:1 0.020 15 / 1.03 0.025 0.075 0.0075 0.0150 0.006 STD870 3000 psi/206.8 bar 15:1 0.020 200 / 14 **Turn Down Effect** Temp Effect Static Effect Span Span % Span per 28°C (50°F % Span per 1000 psi % Span

Total Performance = +/- $\sqrt{(Accuracy)^2 + (Temp Effect)^2 + (Static Line Pressure Effect)^2}$

Standard Accuracy Total Performance Examples: (5:1 Turndown, up to 50 °F shift & up to 1000 psi Static Pressure³)

Model	Total Performance	Model	Total Performance
STD810 @ 2"H₂O	0.50% of span	STD830 @ 20 psi	0.144 % of span
STD820 @ 80" H ₂ O	0.135% of span	STD870 @ 600 psi	0.135 % of span

Typical Calibration Frequency: Calibration verification is recommended every four (4) years **Notes:**

- Terminal based Accuracy Incudes combined effects of linearity, hysteresis and repeatability. Analog output adds 0.005% of span
- 2. For zero based spans and reference conditions of 25 °C (77 °F). 0 psig static pressure. 10 to55% RH, and 316 Stainless Steel barrier diaphragm.
- 3. STD810 includes only zero shift with static pressure. Results ar % of span/25 psig.

Operating Conditions – All Models

Parameter		Reference Condition		Rated Condition		Operative Limits		Transportation and Storage	
		°C	°F	°C	°F	°C	°F	°C	°F
Ambient Temperature ¹									
STE	0080	25±1	77±2	-40 to 85	-40 to 185	-40 to 85	-40 to 185	-55 to 120	-67 to 248
Meter Body Temperatur	re²								
STD810, 820, 830,	870	25±1	77±2	-40 to 110 ¹	-40 to 230 ¹	-40 to 125	-40 to 257	-55 to 120	-67 to 248
Humidity %	%RH	10 t	o 55	0 to	100	0 to	100	0 to 100	
Vac. Region – Min. Pressure All Models Except STD810 mmHg absolute inH ₂ O absolute		Atmospheric 25 2 (short term) 3 Atmospheric 13 1 (short term) 3							
Supply Voltage Load Resistance		10.8 to 42.4 Vdc at terminals (IS versions limited to 30 Vdc) 0 to 1,440 ohms (as shown in Figure 2)							
Maximum Allowable		Standard:							
Working Pressure (MA)	NP) ^{4,5}	STD810 = 50 psi, 3.45 bar							
(ST 800 products are rated to M		STD820, STD830 and STD870 = 4,500 psi, 310.2 bar							
Allowable Working Pressure. MAWP depends on Approval Agency and		Optional:							
transmitter materials of const	transmitter materials of construction.)		STD820, STD830, STD870 = 6,000 psi, 420 bar						
s			Static Pressure Limit = Maximum Allowable Working Pressure (MAWP) = Overpressure Limit for ST 800 Differential Pressure Transmitters						

 $^{^1\,}$ LCD Display operating temperature -20°C to +70°C . Storage temperature -30°C to 80°C.

 $^{^{\}rm 5}\,$ Consult factory for MAWP of ST 800 transmitters with CRN approval.

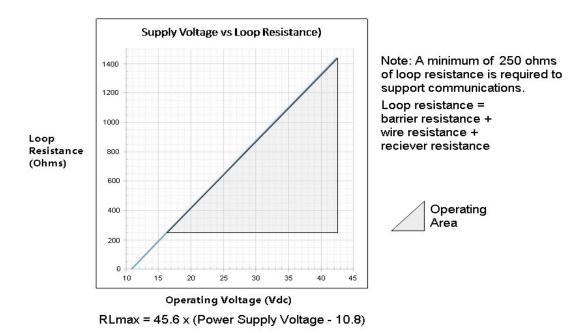


Figure 2 - Supply voltage and loop resistance chart & calculations

Silicone 704 minimum temperature rating is 0°C (32°F). NEOBEE M-20 minimum temperature rating is -15°C (5°F). NEOBEE® is a registered trademark of Stepan Company

³ Short term equals 2 hours at 70°C (158°F)

⁴ MAWP applies for temperatures -40 to 125°C. Static Pressure Limit is de-rated to 3,000 psi for -26°C to -40°C. for all models except STD810. Use of graphite o-rings de-rates transmitter to 3,625 psi. Use of 1/2:" process adaptors with graphite o-rings de-rates transmitter to 3,000 psi.

Performance Under Rated Conditions – All Models

Parameter	Description					
Analog Output	Two-wire, 4 to 20 mA (HART & DE Transmitters only)					
Digital Communications:	Honeywell DE, HART 7 protocol or FOUNDATION Fieldbus ITK 6.0.1 compliant					
	All transmitters, irrespective of protocol have polar	rity insensitive connection.				
HART & DE Output Failure Modes	Honeywell Standard:	NAMUR NE 43 Compliance:				
(NAMUR for DE Units requires	Normal Limits: 3.8 – 20.8 mA	3.8 – 20.5 mA				
selecting display and configuration buttons or factory configuration)	Failure Mode: ≤ 3.6 mA and ≥ 21.0 mA	≤ 3.6 mA and ≥ 21.0 mA				
Supply Voltage Effect	0.005% span per volt.					
Transmitter Turn on Time (includes power up & test algorithms)	HART or DE: 2.5 sec. Foundation Fieldbus: Host dependant					
Response Time	DE/HART Analog Output	FOUNDATION Fieldbus				
(delay + time constant)	90mS	150mS (Host Dependant)				
Damping Time Constant	HART: Adjustable from 0 to 32 seconds in 0.1 inc	rements. Default: 0.50 seconds				
	DE: Discrete values 0, .16, .32, .48, 1, 2, 4, 8, 16,	32 seconds. Default: 0.48 seconds				
Vibration Effect	Less than +/- 0.1% of URL w/o damping					
ST 820, ST 830, ST 870	Per IEC60770-1 field or pipeline, high vibration level (10-2000Hz: 0.21 displacement/3g max acceleration)					
Electromagnetic Compatibility	IEC 61326-3-1					
Lightning Protection Option	Leakage Current: 10uA max @ 42.4VDC 93C Impulse rating: 8/20uS 5000A (>10 strikes) 10000A (1 strike min.)					
	10/1000uS 200A (> 300 str	ikes)				

Materials Specifications (see model selection guide for availability/restrictions with various models)

Parameter	Description
Barrier Diaphragms Material	316L SS, Hastelloy® C-276², Monel® 400³, Tantalum, Gold-plated 316L SS, Gold-plated Hastelloy® C-276, Gold-plated Monel® 400
Process Head Material	316 SS ⁴ , Carbon Steel (Zinc-plated) ⁵ 316 SS ⁴ , Carbon Steel (Zinc-plated) ⁵ , Hastelloy C-276 ⁶ , Monel 400 ⁷
Vent/Drain Valves & Plugs ¹	316 SS ⁴ , Hastelloy C-276 ² , Monel 400 ⁷
Head Gaskets	Glass-filled PTFE standard. Viton® and graphite are optional.
Meter Body Bolting	Carbon Steel (Zinc plated) standard. Options include 316 SS, NACE A286 SS bolts, Monel K500, Super Duplex and B7M.
Optional Adapter Flange and Bolts	Adapter Flange materials include 316 SS, Hastelloy C-276 and Monel 400. Bolt material for flanges is dependent on process head bolts material chosen. Standard adaptor seal material is glass-filled PTFE. Viton and graphite are optional.
Mounting Bracket	Carbon Steel (Zinc-plated) or 304 Stainless Steel or 316 Stainless Steel
Fill Fluid	Silicone Oil 200, Silicone Oil 704, Inert Fluorinated Oil CTFE and NEOBEE® M-20 (Note that STD810 is only available with Silicone Oil 200 and NEOBEE® M-20)
Electronic Housing	Pure Polyester Powder Coated Low Copper (<0.4%)-Aluminum. Meets NEMA 4X, IP66, & P67. All stainless steel housing is optional.
Mounting	Can be mounted in virtually any position using the standard mounting bracket. Bracket is designed to mount on 2-inch (50 mm) vertical or horizontal pipe. See Figure 3.
Process Connections	1/4- NPT or 1/2- NPT with adapter (meets DIN requirements)
Wiring	Accepts up to 16 AWG (1.5 mm diameter).
Dimensions	See Figure 4.
Net Weight	8.3 pounds (3.8 Kg) with Aluminum Housing

¹ Vent/Drains are sealed with Teflon®

² Hastelloy C-276 or UNS N10276

³ Monel 400 or UNS N04400

 $^{^{\}rm 4}\,$ Supplied as 316 SS or as Grade CF8M, the casting equivalent of 316 SS.

⁵ Carbon Steel heads are zinc-plated and not recommended for water service due to hydrogen migration. For that service, use 316 stainless steel wetted Process Heads.

⁶ Hastelloy C-276 or UNS N10276. Supplied as indicated or as Grade CW12MW, the casting equivalent of Hastelloy C-276

Monel 400 or UNS N04400. Supplied as indicated or as Grade M30C, the casting equivalent of Monel 400

Communications Protocols & Diagnostics

HART Protocol

Version:

HART 7

Power Supply

Voltage: 10.8 to 42.4Vdc at terminals Load: Maximum 1440 ohms See figure 2

Minimum Load: 0 ohms. (For handheld communications a

minimum load of 250 ohms is required)

Foundation Fieldbus (FF)

Power Supply Requirements

Voltage: 9.0 to 32.0Vdc at terminals Steady State Current: 17.6mAdc Software Download Current: 27.4mAdc

Available Function Blocks

Block Type	Qty	Execution Time
Resource	1	n/a
Transducer	1	n/a
Diagnostic	1	n/a
Analog Input	1*	30 ms
PID w/Autotune	1	45 ms
Integrator	1	30 ms
Signal Char (SC)	1	30 ms
LCD Display	1	n/a
Flow Block	1	30 ms
Input Selector	1	30 ms
Arithmetic	1	30 ms

^{*} AI block may have two (2) additional instantiations.
All available function blocks adhere to FOUNDATION
Fieldbus standards. PID blocks support ideal & robust PID
algorithms with full implementation of Auto-tuning.

Link Active Scheduler

Transmitters can perform as a backup Link Active Scheduler and take over when the host is disconnected. Acting as a LAS, the device ensures scheduled data transfers typically used for the regular, cyclic transfer of control loop data between devices on the Fieldbus.

Number of Devices/Segment

Entity IS model: 6 devices/segment

Schedule Entries

18 maximum schedule entries

Number of VCR's: 24 max

Compliance Testing: Tested according to ITK 6.0.1

Software Download

Utilizes Class-3 of the Common Software Download procedure as per FF-883 which allows the field devices of any manufacturer to receive software upgrades from any host.

Honeywell Digitally Enhanced (DE)

DE is a Honeywell proprietary protocol which provides digital communications between Honeywell DE enabled field devices and Hosts.

Power Supply

Voltage: 10.8 to 42.4Vdc at terminals Load: Maximum 1440 ohms See figure 2

Standard Diagnostics

ST 800 top level diagnostics are reported as either critical or non-critical and readable via the DD/DTM tools or integral display as shown below.

Critical Diagnostics		
HART DD/DTM tools	Advanced Display	Basic Display
Electronic Module DAC Failure	Electronics Module fault	Electronics Module fault
Meter Body NVM Corrupt	Meterbody fault	Meterbody fault
Config Data Corrupt	Electronics Module fault	Electronics Module fault
Electronic Module Diag Failure	Electronics Module fault	Electronics Module fault
Meter Body Critical Failure	Meterbody fault	Meterbody fault
Sensor Comm Timeout	Meterbody Comm fault	Meterbody Comm fault

Non-Critical Diagnostics		
HART DD/DTM tools	Advanced Display	Basic Display
Display Failure	n/a	n/a
Electronic Module Comm Failure	n/a	n/a
Meter Body Excess Correct	Zero Correct (OK or EXCESSIVE) Span Correct (OK or EXCESSIVE)	n/a
Sensor Over Temperature	Meterbody Temp (OK, OVER TEMP)	n/a
Fixed Current Mode	Analog Out mode (Fixed or Normal)	n/a
PV Out of Range	Primary PV (OK or OVERLOAD)	n/a
No Factory Calibration	Factory Cal (OK, NO FACTORY CAL)	n/a
No DAC Compensation	DAC Temp Comp (OK, NO COMPENSATION)	n/a
LRV Set Error – Zero Config Button	n/a	n/a
URV Set Error – Span Config Button	n/a	n/a
AO Out of Range	n/a	n/a
Loop Current Noise	n/a	n/a
Meter Body Unreliable Comm	Meterbody Comm (OK, SUSPECT)	n/a
Tamper Alarm	n/a	n/a
No DAC Calibration	n/a	n/a
Sensor Supply Voltage Low	Supply Voltage (OK, LOW, or HIGH)	n/a

Refer to ST 800 diagnostics tech note for additional level diagnostics.

Other Certification Options

Materials

NACE MRO175, MRO103, ISO15156

Approval Certifications:

AGENCY	TYPE OF PROTECTION	COMM. OPTION	FIELD PARAMETERS	AMBIENT TEMP (Ta)
	Explosionproof: Class I, Division 1, Groups A, B, C, D; Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G; T6T5 Class I, Zone 0/1, AEx db IIC T6T5 Ga/Gb Class II, Zone 21, AEx tb IIIC T95° Db	All	Note 1	T5: -50 °C to 85°C T6: -50 °C to 65°C
FM Approvals [™] USA	Intrinsically Safe: Class I, II, III, Division 1, Groups A, B, C, D, E, F, G: T4	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
	Class I, Zone O, AEx ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Nonincendive: Class I, Division 2, Groups A, B, C, D locations, T4 Class I, Zone 2, AEx nA IIC T4 Gc	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: Type 4X/ IP66/ IP67	All	All	-
Canadian Standards Association (CSA) USA and Canada	Explosion Proof: Class I, Division 1, Groups A, B, C, D; Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G; T6T5 Class I Zone 1 AEx db IIC T6T5 Ga/Gb Ex db IIC T6T5 Ga/Gb Zone 22 AEx tb IIIC T95° Db Ex tb IIIC T95° Db	All	Note 1	T5: -50 °C to 85°C T6: -50 °C to 65°C
	Intrinsically Safe: Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T4 Class I Zone 0 AEx ia IIC T4 Ga	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
	Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Nonincendive: Class I, Division 2, Groups A, B, C, D; T4 Class I Zone 0 AEx nA IIC T4 Gc Ex nA IIC T4 Gc	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: Type 4X/ IP66/ IP67	All	All	-

Approval Certifications: (Continued)

Approvar ocitino	ations: (Continued)		T	1
	Flameproof: II 1/2 G Ex db IIC T6T5 Ga/Gb II 2 D Ex tb IIIC T95° Db	All	Note 1	T5: -50 °C to 85°C T6: -50 °C to 65°C
	Intrinsically Safe: II 1 G Ex ia IIC T4 Ga	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
ATEX	FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Nonincendive: II 3 G Ex nA IIC T4 Gc	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: IP66/ IP67	All	All	-
	Flameproof: Ex db IIC T6T5 Ga/Gb Ex tb IIIC Db T 95°C Db	All	Note 1	T5: -50 °C to 85°C T6: -50 °C to 65°C
	Intrinsically Safe: Ex ia IIC T4 Ga	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
IECEx World	FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Nonincendive: Ex nA IIC T4 Gc	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: IP66/ IP67	All	All	-
	Flameproof: Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 95°C	All	Note 1	-50 °C to 85°C
	Intrinsically Safe: Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
SAEx South Africa	FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Nonincendive: Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: IP66/ IP67	All	All	-
	Flameproof: Ex db IIC T6T5 Ga/Gb Ex tb IIIC T 95°C Db	All	Note 1	50 °C to 85°C
INMETRO	Intrinsically Safe: Ex ia IIC T4 Ga	4-20 mA / DE/ HART	Note 2a	50 °C to 70°C
Brazil	FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	Foundation Fieldbus	Note 2b	50 °C to 70°C
	Nonincendive: Ex nA IIC T4 Gc	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: IP 66/67	All	All	-

Approval Certifications: (Continued)

	Flameproof: Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 85°C	All	Note 1	-50 °C to 85°C
	Intrinsically Safe: Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
NEPSI China	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Nonincendive: Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 °C to 85°C
	Enclosure: IP 66/67	All	All	-
EAC	Flameproof: 1 Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 85°C	All	Note 1	-50 °C to 85°C
Russia, Belarus and	Intrinsically Safe: 0 Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
Kazakhstan	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 °C to 70°C
	Enclosure: IP 66/67	All	All	
	Flameproof: Ex d IIC T6T5 Ex tD T 95°C	All	Note 1	T6: Ta= -50 °C to 65°C T5: Ta= -50 °C to 85°C
KOSHA Korea	Intrinsically Safe:	4-20 mA / DE/ HART	Note 2a	Ta= -50 °C to 70°C
	Ex ia IIC T4	Foundation Fieldbus	Note 2b and 2c	Ta= -50 °C to 70°C
	Enclosure: IP66/IP67	All	All	-

Notes:

1. Operating Parameters:

Voltage= 11 to 42 V DC Current= 4-20 mA Normal = 10 to 30 V (FF) = 30 mA (FF)

2. Intrinsically Safe Entity Parameters

a. Analog/ DE/ HART Entity Values:

Transmitter with Terminal Block Revision E or Later

Note: Transmitter with Terminal Block Revision E or later

The revision is on the label that is on the module. There will be two lines of text on the label:

• First is the Module Part #: 50049839-001 or 50049839-002

• Second line has the supplier information, along with the REVISION:

XXXXXXX-EXXXX, THE "X" is production related, THE POSITION of the "E" IS THE REVISION.

b. Foundation Fieldbus- Entity Values

Transmitter with Terminal Block Revision F or Later)

Vmax= Ui = 30V Imax= Ii= 225mA Ci =0nF Li = 0 Pi =1 W

FISCO Field Device Imax= Ii= 380 mA Ci = 0nF Li = 0 Pi =5.32 W

Vmax= Ui = 17.5V

Note: Transmitter with Terminal Block Revision F or later

The revision is on the label that is on the module. There will be two lines of text on the label:

- First is the Module Part #: 50049839-003 or 50049839-004
- Second line has the supplier information, along with the REVISION:

XXXXXXX-EXXXX, THE "X" is production related, THE POSITION of the "E" IS THE REVISION.

Approval Certifications: (Continued)

This certificate defines the certifications covered for the ST 800 Pressure Transmitter family of products, including the SMV 800 Smart Multivariable Transmitter. It represents the compilation of the five certificates Honeywell currently has covering the certification of these products into marine applications.

For ST 800 Smart Pressure Transmitter and SMV800 Smart Multivarible Transmitter

American Bureau of Shipping (ABS) - 2009 Steel Vessel Rules 1-1-4/3.7, 4-6-2/5.15, 4-8-3/13 & 13.5, 4-8-4/27.5.1, 4-9-7/13. Certificate number: 04-HS417416-PDA

Marine Certificates

Bureau Veritas (BV) - Product Code: 389:1H. Certificate number: 12660/B0 BV

Det Norske Veritas (DNV) - Location Classes: Temperature D, Humidity B, Vibration A, EMC B, Enclosure C. For salt spray exposure; enclosure of 316 SST or 2-part epoxy protection with 316 SST bolts to be applied. Certificate number: A-11476

Korean Register of Shipping (KR) - Certificate number: LOX17743-AE001

Lloyd's Register (LR) - Certificate number: 02/60001(E1) & (E2)

SIL 2/3 Certification

IEC 61508 SIL 2 for non-redundant use and SIL 3 for redundant use according to EXIDA and TÜV Nord Sys Tec GmbH & Co. KG under the following standards: IEC61508-1: 2010; IEC 61508-2: 2010; IEC61508-3: 2010.

MEASUREMENT INTRUMENTS DIRECTIVE (MID) 2004/ 22/ EC

Certificate Issued by NMI Certin B.V.

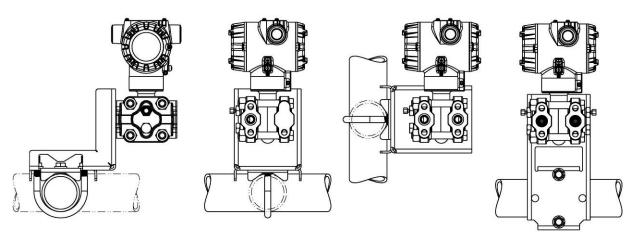
Mechanical Class: M3 Electromagnetic Environment: E3

Ambient Temperature Range: -25 °C to + 55 °C

Unit	Custom Calibration
STD820	0 to 1000 mBar
STD830	0 to 7 Bar
STA84L	0 to 35 Bar A
STG84L	0 to 35 Bar
STD870	0 to 100 Bar
STA87L	0 to 100 Bar A
STG87L	0 to 100 Bar

Mounting & Dimensional Drawings

Mounting Configurations



Dimensions

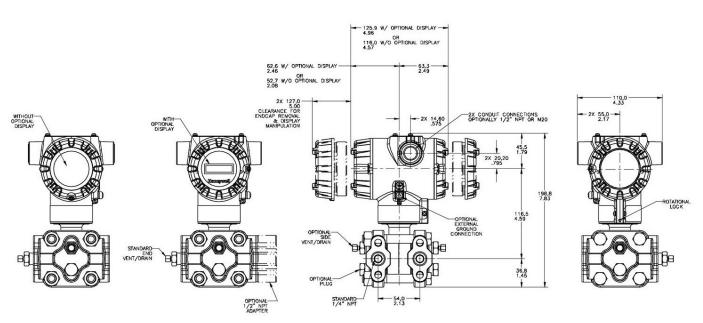


Figure 4 – Typical mounting dimensions of STD810, STD820, STD830 & STD870 for reference

Model Selection Guide

Model Selection Guides are subject to change and are inserted into the specifications as guidance only.

Max Span

10 (25)

Min Span

0.1 (0.25)

Units

" H₂O (mbar)

Selection

STD810

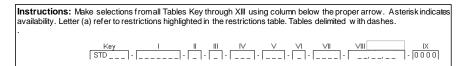
Availability

Model STD800 Differential Pressure Transmitter

10 (25.0)

Model Selection Guide: 34-ST-16-82 Issue 20

KEY NUMBER



-10 (-25.0)

Measurement	400/(1000)	-400/(-1000)	400/(1000)	1.0 (2.5)	" H ₂ O (mbar)	STD82	0	₩		
Range	100 (7.0)	-100 (-7.0)	100 (7.0)	1 (0.07)	psi (bar)	STD83	0		$ \downarrow $	
	3000 (210)	-100 (-7.0)	3000 (210)	30 (2.1)	psi (bar)	STD87	0			\downarrow
						•				
TABLE I			DY SELECTIC							
	Process Hea	d Material		Diaphragm Mater	ial			_	_	_
			316L Stainles			A	*	*	*	*
			Hastelloy® C-276			В		*	*	*
			Monel® 400	C		*	*	*		
	Plated Cart	oon Steel	Tantalum			D		а	а	а
			Gold Plated St	ainless Steel		1	*	*	*	*
				astelloy C-276		2		*	*	*
	Gold Plated Monel 400				3		*	*	*	
a. Process		316L Stainless Steel					*	*	*	*
Wetted Heads			Hastelloy C-27	76		F		*	*	*
& Diaphragm			Monel 400			G		*	*	*
Materials	316 Stainle	ess Steel	Tantalum			H		а	а	а
			Gold Plated St			4	*	*	*	*
				astelloy C-276		5		*	*	*
			Gold Plated M			6		*	*	*
			Hastelloy C-27	76		J		*	*	*
	Hastelloy	C-276	Tantalum			K		а	а	а
			Gold Plated H	astelloy C-276		7		*	*	*
	Monel 400					L		а	а	а
			Gold Plated M	onel 400		8		а	а	а
	Silicone Oil 200					_1	*		*	*
b. Fill Fluid	Fluorinated Oil CTFE					_2		1		
	Silicone Oil 704 NEOBEE® M-20					$-\frac{3}{4}$		*	*	*
c. Process	None	None (1/4" NPTF	famala throad C	+d\		A		*	*	*
Connection	1/2" NPT female	Materials to Match		,	elections 1	A		*	*	*
Connection	Carbon Steel	Iviateriais to iviator	Tricad & ricad	Boit Materials Co	CICCHOTIS	''		*	*	*
	316 SS					s		*	*	*
	Grade 660 (NACE A28	OS) with NACE 201	SS Nutc			3-		*	*	*
d. Bolt/Nut	Grade 660 (NACE A28	•	33 Nuis			N-			ارا	_
Materials	Monel K500	bo) boils & Nuis				K - M	p		p	p
	Super Duplex					D D	p		p	p
	B7M					В В	p) p	p	р *
	Head Type	Vent Type	Location	Vent M	laterial					
	Single Ended	None	None	None		1	*	*	*	*
e. Vent/Drain	Single Ended	Standard Vent	Side	Matches Head I	Material ¹	2	*	*	*	*
Type/Location	Single Ended	Center Vent	Side	Stainless Steel	Only	3	t	t	t	t
i ype/Lucation	Dual Ended	Standard Vent	End	Matches Head I	Material ¹	4	*	*	*	*
	Dual Ended	Center Vent	End	Stainless Steel		5	t	t	t	t
	Dual Ended	Std Vent/Plug	Side/End	Matches Head I	Material'	6	*	*	*	*
f. Gasket	Teflon® or PTFE (Glas						A_ *	*	*	*
Material	Viton® or Fluorocarbor	Elastomer					B_ *	*	*	*
	Graphite						C_ *	*	*	*
g. Static	Standard Static Press		0 bar) except S	TD810: 50 psi (3	.5 bar)		_S *	*	*	*
Pressure	High Pressure 6000 p			Н	k	k	k			

¹Except Carbon Steel Heads shall use 316SS Vent/Drain, Plugs & Adapters when required

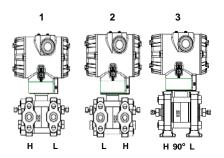


TABLE II		Meter Body & Connection Orientation
Head/Connect	Standard	High Side Left, Low Side Right ² / Std Head Orientation
Orientation	Reversed	Low Side Left, High Side Right ² / Std Head Orientation
Orientation	90/Standard	High Side Left, Low Side Right ² / 90 ⁰ Head Rotation

STD870 STD830 STD820 STD810	
1	* * * *
2	* * * *
3	h h h h

TABLE III	Agency Approvals (see data sheet for Approval Code Details)
	No Approvals Required
	FM Explosion proof, Intrinsically Safe, Non-incendive, & Dustproof
	CSA Explosion proof, Intrinsically Safe, Non-incendive, & Dustproof
	ATEX Explosion proof, Intrinsically Safe & Non-incendive
Ammanala	IECEx Explosion proof, Intrinsically Safe & Non-incendive
Approvals	SAEx/CCoE Explosion proof, Intrinsically Safe & Non-incendive
	INMETRO Explosion proof, Intrinsically Safe & Non-incendive
	NEPSI Explosion proof, Intrinsically Safe & Non-incendive
	KOSHA Explosion proof, Intrinsically Safe & Non-incendive
	EAC Customs Union(Russia,Belarus,Kazakhstan)Ex Approval, Flame pro

0	*	*	*	*
Α	*	*	*	*
В	*	*	*	*
С	*	*	*	*
D	*	*	*	*
E	*	*	*	*
F	*	*	*	*
G	*	*	*	*
Н	*	*	*	*
1	*	*	*	*

TABLE IV	TR	TRANSMITTER ELECTRONICS SELECTIONS					
	Mater	ial	Connection	Lightning Protection			
	Polyester Powder C	oated Aluminum	1/2 NPT	None			
a. Electronic	Polyester Powder C	oated Aluminum	M20	None			
Housing	Polyester Powder C	oated Aluminum	1/2 NPT	Yes			
Material &	Polyester Powder C	oated Aluminum	M20	Yes			
Connection	316 Stainless Stee	I (Grade CF8M)	1/2 NPT	None			
Туре	316 Stainless Steel (Grade CF8M) 316 Stainless Steel (Grade CF8M) 316 Stainless Steel (Grade CF8M)		M20	None			
			1/2 NPT	Yes			
			M20	Yes			
	Analog Output		Digital Protocol				
b. Output/	4-20m/	A dc	HART Protocol				
Protocol	4-20m/	A dc	DE Protocol				
	none			oundation Fieldbus			
	Indicator	Ext Zero, Span & C		Languages			
	Indicator None	_	onfig Buttons				
		Ext Zero, Span & C	config Buttons	Languages			
c. Customer	None	Ext Zero, Span & C	e e oan Only)	Languages None			
c. Customer Interface	None None	Ext Zero, Span & C Non- Yes (Zero/Sp	e oan Only)	Languages None None			
	None None Basic	Ext Zero, Span & C Non- Yes (Zero/Sp Non-	e config Buttons e con Only)	Languages None None English			
Interface	None None Basic Basic	Ext Zero, Span & C Non- Yes (Zero/Sp Non- Yes	config Buttons e e e oan Only) e	Languages None None English English			
Interface	None None Basic Basic Advanced	Ext Zero, Span & C Non- Yes (Zero/Sp Non- Yes Non-	config Buttons e e e e oan Only) e	Languages None None English English EN, GE, FR, IT, SP, RU, TU			

D	*	*	*	*	
E	*	*	*	*	
F	*	*	*	*	
G	*	*	*	*	
H H	*	*	*	*	
_ H _	*	*	*	*	
_ D _	u	u	u	u	
_	*	*			
F	^	^	^	^	
F_	^	^	^	^	
	*	*	*	*	
0	*	*	* f	* f	
0 A	* f *	* f *	* f *	* f *	
0 A B	* f *	* f *	*	*	
0 A	* f	* f			
0 A B	* f *	* f *	*	*	
0 A B C	* f *	* f *	*	*	

TABLE V		CONFIGURAT	TION SELECTIONS
a Application		Dia	gnostics
a. Application Software	Standard Diagnostics		
Soltware	Advanced Diagnostics	(Above with Plugge	ed Impulse Detection PILD)
	Write Protect	Fail Mode	High & Low Output Limits ³
	Disabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)
b. Output Limit, Failsafe &	Disabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)
Write Protect	Enabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)
Settings	Enabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)
Jettings	Enabled	N/A	N/A Fieldbus or Profibus
	Disabled	N/A	N/A Fieldbus or Profibus
c. General	Factory Standard		
Configuration	Custom Configuration	(Unit Data Require	d from customer)

2	*	*	*	*
1	f	f	f	f
2	f	f	f	f
3	f	f	f	f
4	f	f	f	f
5	g	g	g	g
6	g	g	g	g
S	*	*	*	*

² Left side/Right side as viewed from the customer connection perspective

 $^{^3}$ NAMUR Output Limits 3.8 - 20.5mAdc can be configured by the customer or select custom configuration Table Vc

					STD830			٦	
TABLE VI		CALIBRATION & A	ACCURACY SEL	FCTIONS	STD820 STD810				
TABLE VI	Accuracy	Calibrated		Calibration Qty	012010	\downarrow	\downarrow	\downarrow	\downarrow
	Standard	Factory Std	. rango	Single Calibration	A	*	*	*	*
	Standard	Custom (Unit Data	a Required)	Single Calibration	В	*	*	*	*
a. Accuracy	Standard	Custom (Unit Data	•	Dual Calibration	C	*	*	*	*
and	Standard	Custom (Unit Data	• /	Triple Calibration	D	*	*	*	*
Calibration	High Accuracy	Factory Std	a recquired)	Single Calibration	E		s	s	s
	High Accuracy	,		Single Calibration	II F		s	s	s
	High Accuracy	Custom (Unit Data		Dual Calibration	G		s	s	s
	High Accuracy	Custom (Unit Data		Triple Calibration	H		s	s	s
	<u> </u>	()	,						
TABLE VII			RY SELECTION						
		et Type		Material		T			-
	None		None		0	*	*	*	*
	Angle Bracket		Carbon Steel		1	*	*	*	*
	Angle Bracket		304 SS		2	*	*	*	*
a. Mounting	Angle Bracket		316 SS		3	*	*	*	*
Bracket	Marine Approved Bra		Carbon Steel		8	*	*	*	*
	Marine Approved Bra	acket	304 SS		4	*	*	*	*
	Flat Bracket		Carbon Steel		5	*	*	*	*
	Flat Bracket		304 SS		6		*	*	
	Flat Bracket	<u> </u>	316 SS		7		Û		^
h Cuataman	No sustant and a	Custor	mer Tag Type			*	*	*	*
o. Customer	No customer tag	00.17.40		. \	_0		Î	Ĵ	,
Tag		Steel Tag (Up to 4 li			_1	*	*	*	*
		Steel Tag (Up to 4 li							
C.	No Conduit Plugs or		lugs & Auapter	<u> </u>	A0	*	*	*	*
Unassembled	_	NPT Female 316 SS	Cartified Cand	uit Adoptor	A0 A2				n
Conduit	1/2 NPT 316 SS Cer		Certified Corid	un Adapter	A2 A6	n n	n n	n n	
Plugs &	M20 316 SS Certified				A0 A7			m	n
Adapters	Minifast® 4 pin (1/2 N	•	V Droof applied	ations)	A/ A8				
Adapters		(not suitable for X-P			A8	n	n m	n m	n
	IVIINIIast 4 pin (IVIZU)	(not suitable for X-P	1001 application	IS)	^3	1111			
TABLE VIII	OTHER Certifications	& Options: (String i	n sequence co	mma delimited (XX, XX, XX,)					
	None - No additiona	loptions			00	*	*	*	*
	Low Temperature Ra	ating (-50 deg C min	. ambient opera	ative temperature limit)	LT	w	w	w	
	NACE MR0175; MR0)103; ISO15156 (FC3	33338) Process	wetted parts only	FG	*	*	*	*
	NACE MR0175; MR0)103; ISO15156 (FC3	33339) Process	s wetted and non-wetted parts	F7	С	С	С	C
	Marine (DNV, ABS, BV, KR, LR)				MT	d	d	d	С
		Material Traceability (F	,		FX	*	*	*	*
			Support for sp	ecific MID approved ranges	MD		٧	٧	١
	Certificate of Conform	` '			F3	*	*	*	*
Certifications &	•	ort & Certificate of C	onformance (F	3399)	F1	*	*	*	7
Warranty	Certificate of Origin (,			F5	*	*	*	*
wanti	FMEDA (SIL 2/3) Cei				FE	j	j	j	j
		Test Certificate (1.5)	, (2)	TP	*	*	*	*
		CL ₂ service per ASTN	Л G93		OX	е	е	е	e
	PMI Certification ¹				PM	*	*	*	
	Extended Warranty A	•			01	*	*	*	*
	Extended Warranty A	Additional 2 years			02	*	*	*	*
					00	*	*	4	*
	Extended Warranty A	Additional 3 years			03			^	
		Additional 4 years			03 04 15	*	*	*	*

TABLE IX

Factory

Manufacturing Specials
Factory Identification

STD870 ____

0000 | * | * | * | *

MODEL RESTRICTIONS

Restriction	Avai	lable Only with	Not Available with			
Letter	Table	Selection(s)	Table	Selection(s)		
а			VIII	F7, FG		
			la	J,K,7,L,8		
["			lc	H		
k			ld	B,D,M,N,S		
`			le	1, 2, 3, 5, 6		
[III	B- No CRN number available		
			lf	C_		
С	1d	N,K,D,B	la	D,H,K,L,8		
d	IVa	C, D, G, H	VIIa	1,2,3,5,6,7		
е	lb	_2				
f			IVb	_F_		
g			IVb	_ H, D _		
h			le	4, 5, 6		
"			VIIa	1,2,3,4,5,6,7,8		
j	IVb	_H_	Vb	_ 1,2,6 _		
m	IVa	B, D, F, H				
n	IVa	A, C, E, G				
р			III	B- No CRN number available		
t			la	J, K, 7, L, 8		
S	la	A,E				
u			Va	2		
u i			Vla	C,D,G,H		
V	IVa	C, D, G, H	IVb	_D,F_		
w	lb	_1	VIII	FE		
b		Select only one	option from this group			

¹The PM option is available on all Smartline Pressure Transmitter process wetted parts such as process heads, flanges, bushings and vent plugs except plated carbon steel process heads and flanges. PM option information is also available on diaphragms except Gold plated and STG and STA in-line construction pressure transmitters.

FIELD INSTALLABLE REPLACEMENT PARTS

Description	Kit Number
Integrally Mounted Basic Indicator Kit (Compatible with all Electronic Modules)	50049911-501
Integrally Mounted Advanced Indicator Kit (compatible with all Electronic Modules)	50049846-501
Terminal Strip w/o Lightening Protection for HART or DE Modules	50075472-531
Terminal Strip w/Lightning Protection Kit for HART or DE Modules	50075472-532
Terminal Strip w/o Lightening Protection FFB/Profibus Module	50075472-533
Terminal Strip w/Lightning Protection Kit for FFB/Profibus Module	50075472-534
HART Electronics Module	50049849-501
HART Electronics Module w/connection for external configuration buttons	50049849-502
DE Electronics Module	50049849-503
DE Electronics Module w/connection for external configuration buttons	50049849-504
FFB Electronics Module Kit	50049849-507
FFB Electronics Module w/connection for external configuration buttons	50049849-508

Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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or (TAC)

hfs-tac-support@honeywell.com

Specifications are subject to change without notice.

For more information

To learn more about SmartLine Pressure
Transmitters, visit www.honeywellprocess.com
Or contact your Honeywell Account Manager

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