SmartLine

Honeywell

Technical Information

STD800 SmartLine Differential Pressure Specification 34-ST-03-82

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 0.0375% standard & 0.025% Opt
- Stability up to 0.01% of URL per year for ten years
- Automatic static pressure & temperature compensation
- Rangeability up to 400:1
- Response times as fast as 90ms
- Multiple local display capabilities
- External zero, span, & configuration capability
- Polarity insensitive electrical connections
- Comprehensive on-board diagnostic capabilities
- Integral Dual Seal design for highest safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- World class overpressure protection
- Full compliance to SIL 2/3 requirements.
- Modular design characteristics
- Available with 15 year warranty

Span & Range Limits:

Model	URL “H_2O (mbar)	LRL “H_2O (mbar)	Max Span “H_2O (mbar)	Min Span “H_2O (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)

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

Communications/Output Options:

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

All transmitters are available with the above listed communications protocols.

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 actually 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)
- 0, 90,180, & 270 degree position adjustments
- Pa, KPa, MPa, KGcm2, Torr, ATM, inH_2O, mH_2O, bar, mbar, inH_2O, inHG, FTH_2O, mmH_2O, mm HG, & psi measurement units
- 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)
- 0, 90, 180, & 270 degree position adjustments
- 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)
- 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, GE, FR, IT, SP, 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 (MCT202).
The MCT202 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.
  - Transmitter messaging
  - Maintenance mode indication
  - Tamper reporting
  - 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.***

Performance Specifications[1]

Reference Accuracy [2] (conformance to +/-3 Sigma)

Table 1

Model	URL	LRL	Min Span	Maximum Turndown Ratio	Stability (% URL/ Yr for ten years)	Reference Accuracy[1] (% Span) Std/Opt
STD810	10 in H_2O/25mbar	-10 in H_2O/-25mbar	0.1 in H_2O/0.25mbar	100:1	n/a	0.075%
STD820	400 in H_2O/1000mbar	-400 in H_2O/-1000mbar	1 in H_2O/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	0.040	0.05 / 0.0325%
STD870	3000 psi/210 bar	-100 psi/-7.0 bar	30 psi/2.1 bar	100:1	0.030	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

			Accuracy[1] (% of Span)				Temperature Effect (%Span/50°F)		Static Line Pressure Effect (%Span/1000psi)[3]	
	Model	URL	For Spans Below	A	B	C	D	E	F	G
Standard Accuracy	STD810	10 in H_2O/25mbar	10:1	0.025	0.050	1 / 2.5	0.070	0.040	0.050	0.075
	STD820	400 in H_2O/1000mbar	16:1	0.0125	0.025	25 / 62.5	0.025	0.007	0.080	0.007
	Model	URL	For Spans Below	A	B	C	D	E	F	G
	STD830	100 psi/7.0 bar	6.7:1	0.0125	0.0375	15 / 1.03	0.025	0.010	0.075	0.0075
	STD870	3000 psi/210 bar	15:1			200 / 14		0.006		
High Accuracy Option	Model	URL	For Spans Below	A	B	C	D	E	F	G
	STD820	400 in H_2O/996.4mbar	*16:1*	*0.0125*	*0.025*	*25 / 62.5*	*0.025*	*0.007*	*0.080*	*0.007*
	Model	URL	For Spans Below	A	B	C	D	E	F	G
	STD830	100 psi/7 bar	*6.7:1*	*0.0125*	*0.020*	*15 / 1.03*	0.025	*0.010*	*0.075*	*0.0075*
	STD870	3000 psi/206.8 bar	*15:1*	*0.0150*	*0.020*	*200 / 14*		*0.006*		
			Turn Down Effect $\pm\left[A + B\left(\frac{C}{Span}\right)\right]$ % Span				Temp Effect $\pm\left[D + E\left(\frac{URL}{Span}\right)\right]$ % Span per 28°C (50°F)		Static Effect $\pm\left[F + G\left(\frac{URL}{Span}\right)\right]$ % Span per 1000 psi	

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

Standard Accuracy Total Performance Examples: (5:1 Turndown, up to 50 °F shift & up to 1000 psi Static Pressure[3])

Model	Total Performance	Model	Total Performance
STD810 @ 2"H_2O	0.51% of span	**STD830 @ 20 psi**	0.144 % of span
STD820 @ 80" H_2O	0.135% of span	**STD870 @ 600 psi**	0.135 % of span

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

Notes:

1. Terminal Based Accuracy - Includes 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 to 55% RH, and 316 Stainless Steel barrier diaphragm.
3. STD810 Includes only zero shift with static pressure. Results are % 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] STD800	25±1	77±2	-40 to 85	-40 to 185	-40 to 85	-40 to 185	-55 to 120	-67 to 248
Meter Body Temperature[2] 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 to 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 Atmospheric		25 13		2 (short term)[3] 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 Working Pressure (MAWP)[4,5] (ST 800 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency and transmitter materials of construction.)	**Standard:** STD810 = 50 psi, 3.45 bar STD820, STD830 and STD870 = 4,500 psi, 310.2 bar **Optional:** STD820, STD830, STD870 = 6,000 psi, 420 bar 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.

2 For CTFE fill fluid, the rating is -15 to 110°C (5 to 230°F)

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.

5 Consult factory for MAWP of ST 800 transmitters with CRN approval.

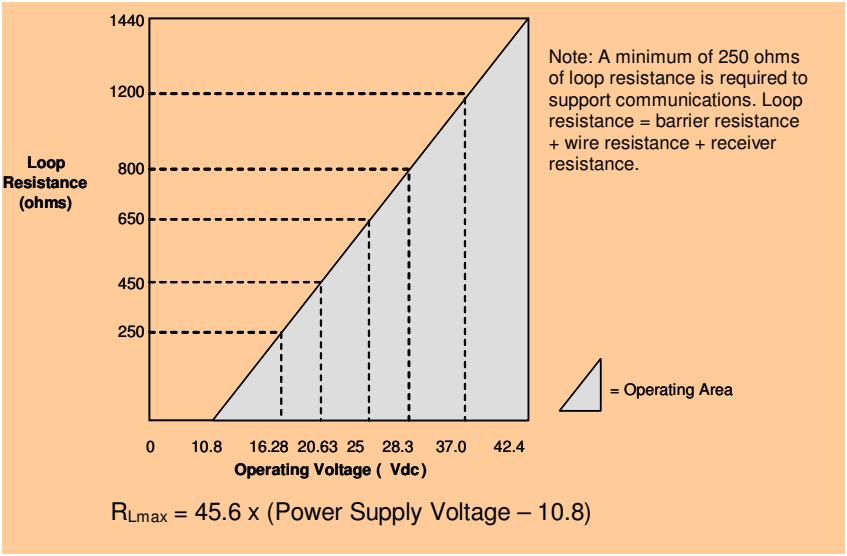


Figure 2 - Supply voltage and loop resistance chart & calculations

Performance Under Rated Conditions – All Models

Parameter	Description
Analog Output **Digital Communications**:	Two-wire, 4 to 20 mA (HART & DE Transmitters only) Honeywell DE, HART 7 protocol or FOUNDATION Fieldbus ITK 6.0.1 compliant All transmitters, irrespective of protocol have polarity insensitive connection.
Output Failure Modes	**Honeywell Standard:** / **NAMUR NE 43 Compliance**: **Normal Limits:** 3.8 – 20.8 mA / 3.8 – 20.5 mA **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 (delay + time constant)	**DE/HART Analog Output**: 90mS **FOUNDATION Fieldbus**: 150mS (Host Dependant)
Damping Time Constant	**HART:** Adjustable from 0 to 32 seconds in 0.1 increments. **Default:** 0.50 seconds **DE:** Discrete values 0, .16, .32, .48, 1, 2, 4, 8, 16, 32 seconds. **Default:** 0.48 seconds
Vibration Effect **ST 820, ST 830, ST 870**	Less than +/- 0.1% of URL w/o damping 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 strikes)

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

Parameter	Description
Barrier Diaphragms Material	316L SS, Hastelloy® C-276[2], Monel® 400[3], 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 o-ring 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 DC® 200 oil or CTFE (Chlorotrifluoroethylene). Note that Model STD810 is only available with silicone fill fluid.
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
[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
[7] 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)	n/a
	Span Correct (OK or EXCESSIVE)	
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)
FM Approvals™	**Explosionproof:** Class I, Division 1, Groups A, B, C, D; **Dust Ignition Proof:** Class II, III, Division 1, Groups E, F, G; T4 Class I, Zone 0/1, AEx d IIC Ga/Gb T4 Class II, Zone 21, AEx tb IIIC Db T 95°C	All	Note 1	-50 ºC to 85ºC
	Intrinsically Safe: Class I, II, III, Division 1, Groups A, B, C, D, E, F, G: T4 Class I, Zone 0, AEx ia IIC Ga T4 FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
		Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Nonincendive: Class I, Division 2, Groups A, B, C, D locations, Class I, Zone 2, AEx nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure: Type 4X/ IP66/ IP67	All	All	-
Canadian Standards Association (CSA)	**Explosion Proof:** Class I, Division 1, Groups A, B, C, D; **Dust Ignition Proof:** Class II, III, Division 1, Groups E, F, G; T4 Ex d IIC Ga T4 Ex tb IIIC Db T 95°C	All	Note 1	-50 ºC to 85ºC
	Intrinsically Safe: Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T4 Ex ia IIC Ga T4 FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
		Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Nonincendive: Class I, Division 2, Groups A, B, C, D; T4 Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure: Type 4X/ IP66/ IP67	All	All	-

Approval Certifications: (Continued)

ATEX	**Flameproof:** II 1/2 G Ex d IIC Ga/Gb T4 II 2 D Ex tb IIIC Db T 95°C	All	Note 1	-50 ºC to 85ºC
	Intrinsically Safe: II 1 G Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Nonincendive: II 3 G Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure: IP66/ IP67	All	All	-
IECEx (World)	**Flameproof :** Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 95°C	All	Note 1	-50 ºC to 85ºC
	Intrinsically Safe: Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Nonincendive: Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure: IP66/ IP67	All	All	-
SAEx (South Africa)	**Flameproof :** Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 95°C	All	Note 1	-50 ºC to 85ºC
	Intrinsically Safe: Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Nonincendive: Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure: IP66/ IP67	All	All	-
INMETRO (Brazil)	**Flameproof:** Ex d IIC Ga/ Gb T4 Ex tb IIIC Db T 95°C	All	Note 1	T5 Ta = –50 to 93ºC
	Intrinsically Safe: Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	T4 Ta = –50 to 93ºC
	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	T4 Ta = –50 to 70ºC
	Nonincendive: Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure : IP 66/67	All	All	-

Approval Certifications: (Continued)

NEPSI (China)	**Flameproof:** Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 85°C	All	Note 1	T5 Ta = –50 to 93ºC
	Intrinsically Safe: Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Nonincendive: Ex nA IIC Gc T4	4-20 mA / DE/ HART/ Foundation Fieldbus	Note 1	-50 ºC to 85ºC
	Enclosure : IP 66/67	All	All	-
GOST	**Flameproof:** 1 Ex d IIC Ga/Gb T4 Ex tb IIIC Db T 85°C	All	Note 1	-50 ºC to 85ºC
	Intrinsically Safe: 0 Ex ia IIC Ga T4	4-20 mA / DE/ HART	Note 2a	-50 ºC to 70ºC
	FISCO Field Device (Only for FF Option) Ex ia IIC T4	Foundation Fieldbus	Note 2b	-50 ºC to 70ºC
	Enclosure : IP 66/67	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:

   Vmax= Ui = 30V Imax= Ii= 105mA Ci = 4.2nF Li =984 uH Pi =0.9W

   Transmitter with Terminal Block Revision E or Later)

   Vmax= Ui = 30V Imax= Ii= 225mA Ci = 4.2nF Li = 0 Pi =0.9W

   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

   Vmax= Ui = 30V Imax= Ii= 180mA Ci = 0nF Li = 984 uH Pi =1W

   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)

<table>
<tr><td rowspan="6">Marine Certificates</td><td>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.

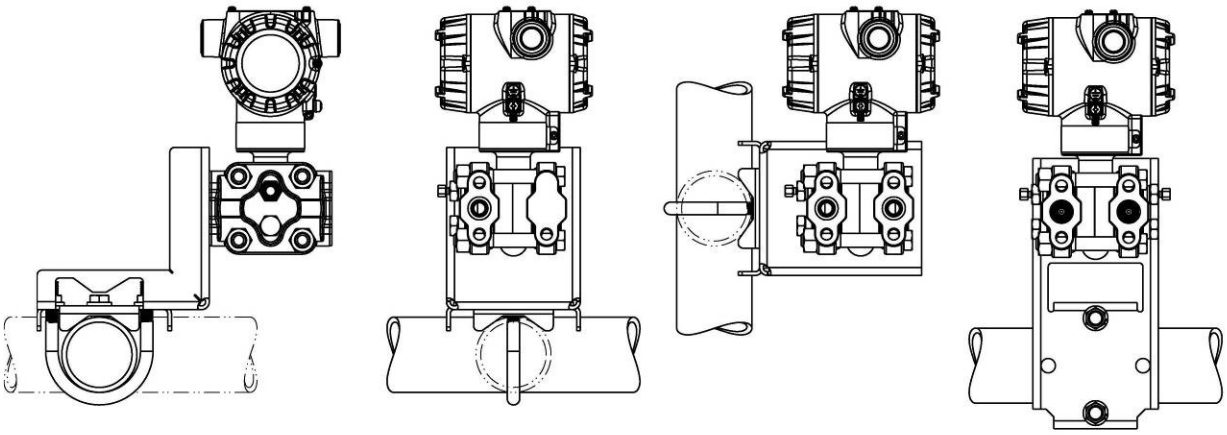
For ST 800 Smart Pressure Transmitter and SMV800 Smart Multivarible Transmitter</td></tr>
<tr><td>American Bureau of Shipping (ABS) - 2009 Steel Vessel Rules 1-1-4/3.7, 4-6-2/5.15, 4-8-3/13 & 13.5, 4-8-4/27.5.1, 4-9-7/13. Certificate number: 04-HS417416-PDA</td></tr>
<tr><td>Bureau Veritas (BV) - Product Code: 389:1H. Certificate number: 12660/B0 BV</td></tr>
<tr><td>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</td></tr>
<tr><td>Korean Register of Shipping (KR) - Certificate number: LOX17743-AE001</td></tr>
<tr><td>Lloyd's Register (LR) - Certificate number: 02/60001(E1) & (E2)</td></tr>
<tr><td>SIL 2/3 Certification</td><td>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.</td></tr>
<tr><td>MEASUREMENT INTRUMENTS DIRECTIVE (MID) 2004/ 22/ EC</td><td>Certificate Issued by NMI Certin B.V.
Mechanical Class: M3 Electromagnetic Environment: E3
Ambient Temperature Range: -25 °C to + 55 °C

<table>
<tr><th>Unit</th><th>Custom Calibration</th></tr>
<tr><td>STD820</td><td>0 to 1000 mBar</td></tr>
<tr><td>STD830</td><td>0 to 7 Bar</td></tr>
<tr><td>STA84L</td><td>0 to 35 Bar A</td></tr>
<tr><td>STG84L</td><td>0 to 35 Bar</td></tr>
<tr><td>STD870</td><td>0 to 100 Bar</td></tr>
<tr><td>STA87L</td><td>0 to 100 Bar A</td></tr>
<tr><td>STG87L</td><td>0 to 100 Bar</td></tr>
</table>
</td></tr>
</table>

Mounting & Dimensional Drawings

Reference Dimensions: millimeters / inches

Mounting Configurations



Dimensions

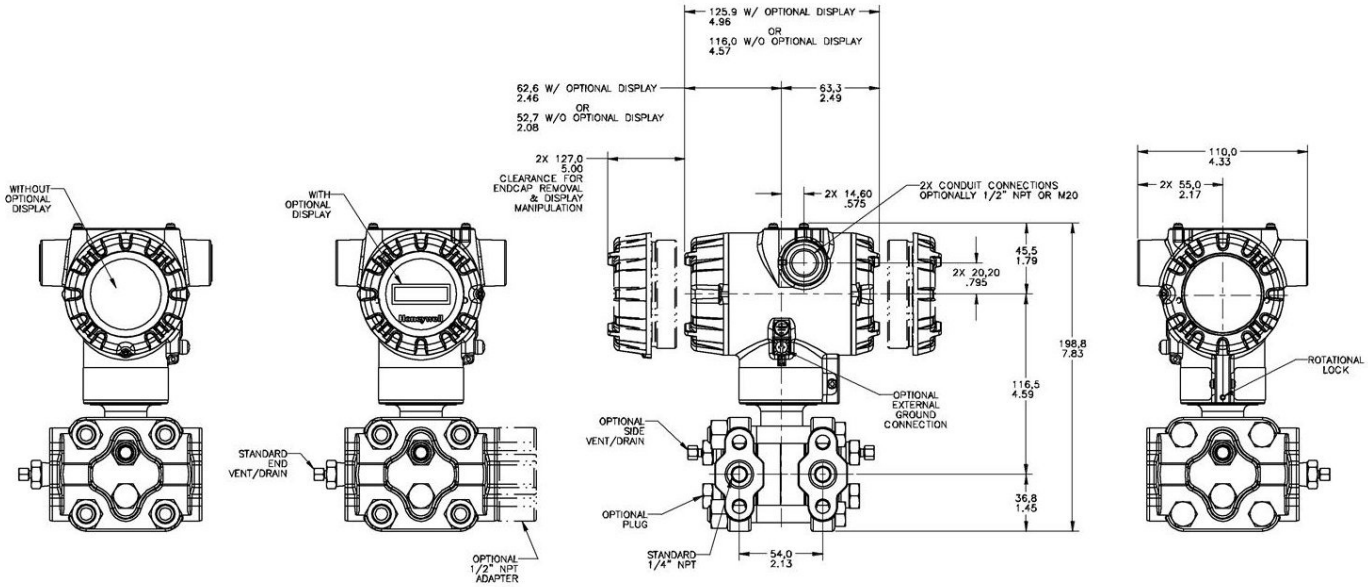


Figure 4 – Typical mounting dimensions of STD810, STD820, STD830 & STD870 for reference

Model Selection Guides are subject to change and are inserted into the specifications as guidance only.
Prior to specifying or ordering a model check for the latest revision Model Selection Guides which are published at:
www.honeywellprocess.com/en-US/pages/default.aspx

Model Selection Guide

Model STD800
Differential Pressure Transmitter

Model Selection Guide:
34-ST-16-82 Issue 6a

Instructions: Make selections from all Tables Key through XIII using column below the proper arrow. Asterisk indicates availability. Letter (a) refer to restrictions highlighted in the restrictions table. Tables delimited with dashes.

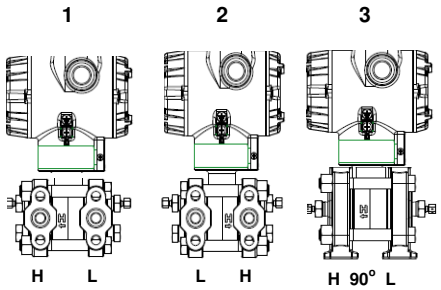
Key	I	II	III	IV	V	VI	VII	VIII	IX
STD ___ -	_ _ _ _ _ _ _ -	_ -	_ -	_ _ _ -	_ _ _ -	_ -	_ _ _ _ -	_ _ _ _ _ _ -	0 0 0 0

KEY NUMBER	URL	LRL	Max Span	Min Span	Units
Measurement Range	10 (25.0)	-10 (-25.0)	10 (25)	0.1 (0.25)	" H_2O (mbar)
	400/(1000)	-400/(-1000)	400/(1000)	1.0 (2.5)	" H_2O (mbar)
	100 (7.0)	-100 (-7.0)	100 (7.0)	1 (0.07)	psi (bar)
	3000 (210)	-100 (-7.0)	3000 (210)	30 (2.1)	psi (bar)

Selection	Availability			
STD810	↓			
STD820		↓		
STD830			↓	
STD870				↓

TABLE I	METER BODY SELECTIONS								
a. Process Wetted Heads & Diaphragm Materials	Process Head Material	Diaphragm Material							
	Plated Carbon Steel	316L Stainless Steel	A_____	*	*	*	*
		Hastelloy® C-276	B_____		*	*	*
		Monel® 400	C_____		a	a	a
		Tantalum	D_____		a	a	a
		Gold Plated Stainless Steel	1_____	*	*	*	*
		Gold Plated Hastelloy C-276	2_____		*	*	*
		Gold Plated Monel 400	3_____		a	a	a
	316 Stainless Steel	316L Stainless Steel	E_____	*	*	*	*
		Hastelloy C-276	F_____		*	*	*
		Monel 400	G_____		a	a	a
		Tantalum	H_____		a	a	a
		Gold Plated Stainless Steel	4_____	*	*	*	*
		Gold Plated Hastelloy C-276	5_____		*	*	*
		Gold Plated Monel 400	6_____		a	a	a
	Hastelloy C-276	Hastelloy C-276	J_____		*	*	*
		Tantalum	K_____		a	a	a
		Gold Plated Hastelloy C-276	7_____		*	*	*
	Monel 400	Monel 400	L_____		a	a	a
		Gold Plated Monel 400	8_____		a	a	a
b. Fill Fluid	Silicone Oil 200		_1____	*	*	*	*
	Fluorinated Oil CTFE		_2____		*	*	*
c. Process Connection	None	None (1/4" NPTF female thread Std)	__A___	*	*	*	*
	1/2" NPT female	Materials to Match Head & Head Bolt Materials Selections[1]	__H___	*	*	*	*
d. Bolt/Nut Materials	Carbon Steel		___C___	*	*	*	*
	316 SS		___S___	*	*	*	*
	Grade 660 (NACE A286) with NACE 304 SS Nuts		___N___	*	*	*	*
	Grade 660 (NACE A286) Bolts & Nuts		___K___	p	p	p	p
	Monel K500		___M___	p	p	p	p
	Super Duplex		___D___	p	p	p	p
	B7M		___B___	*	*	*	*
e. Vent/Drain Type/Location	Head Type	Vent Type / Location / Vent Material					
	Single Ended	None / None / None	____1__	*	*	*	*
	Single Ended	Standard Vent / Side / Matches Head Material[1]	____2__	*	*	*	*
	Single Ended	Center Vent / Side / Stainless Steel Only	____3__	t	t	t	t
	Dual Ended	Standard Vent / End / Matches Head Material[1]	____4__	*	*	*	*
	Dual Ended	Center Vent / End / Stainless Steel Only	____5__	t	t	t	t
	Dual Ended	Std Vent/Plug / Side/End / Matches Head Material[1]	____6__	*	*	*	*
f. Gasket Material	Teflon® or PTFE (Glass Filled)		_____A_	*	*	*	*
	Viton® or Fluorocarbon Elastomer		_____B_	*	*	*	*
	Graphite		_____C_	*	*	*	*
g. Static Pressure	Standard Static Pressure - 4500 psig (315 bar) except STD810: 50 psi (3.5 bar)		______S	*	*	*	*
	High Pressure 6000 psi		_____H		k	k	k

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



	STD870	STD830	STD820	STD810

TABLE II	Meter Body & Connection Orientation				
Head/Connect Orientation	Standard	High Side Left, Low Side Right[2] / Std Head Orientation	1	*	*	*	*
	Reversed	Low Side Left, High Side Right[2] / Std Head Orientation	2	*	*	*	*
	90/Standard	High Side Left, Low Side Right[2] / 90° Head Rotation	3	h	h	h	h

TABLE III	Agency Approvals (see data sheet for Approval Code Details)					
Approvals	No Approvals Required	0	*	*	*	*
	FM Explosion proof, Intrinsically Safe, Non-incendive, & Dustproof	A	*	*	*	*
	CSA Explosion proof, Intrinsically Safe, Non-incendive, & Dustproof	B	*	*	*	*
	ATEX Explosion proof, Intrinsically Safe & Non-incendive	C	*	*	*	*
	IECEx Explosion proof, Intrinsically Safe & Non-incendive	D	*	*	*	*
	SAEx/CCoE Explosion proof, Intrinsically Safe & Non-incendive	E	*	*	*	*
	INMETRO Explosion proof, Intrinsically Safe & Non-incendive	F	*	*	*	*
	NEPSI Explosion proof, Intrinsically Safe & Non-incendive	G	*	*	*	*

TABLE IV	TRANSMITTER ELECTRONICS SELECTIONS							
	Material	Connection	Lightning Protection					
a. Electronic Housing Material & Connection Type	Polyester Powder Coated Aluminum	1/2 NPT	None	A _ _	*	*	*	*
	Polyester Powder Coated Aluminum	M20	None	B _ _	*	*	*	*
	Polyester Powder Coated Aluminum	1/2 NPT	Yes	C _ _	*	*	*	*
	Polyester Powder Coated Aluminum	M20	Yes	D _ _	*	*	*	*
	316 Stainless Steel (Grade CF8M)	1/2 NPT	None	E _ _	*	*	*	*
	316 Stainless Steel (Grade CF8M)	M20	None	F _ _	*	*	*	*
	316 Stainless Steel (Grade CF8M)	1/2 NPT	Yes	G _ _	*	*	*	*
	316 Stainless Steel (Grade CF8M)	M20	Yes	H _ _	*	*	*	*
b. Output/ Protocol	Analog Output	Digital Protocol						
	4-20mA dc	HART Protocol		_ H _	*	*	*	*
	4-20mA dc	DE Protocol		_ D _	*	*	*	*
	none	Foundation Fieldbus		_ F _	*	*	*	*
c. Customer Interface Selections	Indicator	Ext Zero, Span & Config Buttons	Languages					
	None	None	None	_ _ 0	*	*	*	*
	None	Yes (Zero/Span Only)	None	_ _ A	f	f	f	f
	Basic	None	English	_ _ B	*	*	*	*
	Basic	Yes	English	_ _ C	*	*	*	*
	Advanced	None	EN, GE, FR, IT, SP, RU, TU	_ _ D	*	*	*	*
	Advanced	Yes	EN, GR, FR, IT,SP, RU, TU	_ _ E	*	*	*	*
	Advanced	None	EN, CH, JP	_ _ H	*	*	*	*
	Advanced	Yes	EN, CH, JP	_ _ J	*	*	*	*

TABLE V	CONFIGURATION SELECTIONS							
a. Application Software	Diagnostics			1 _ _	*	*	*	*
	Standard Diagnostics							
	Write Protect	Fail Mode	High & Low Output Limits[3]					
b. Output Limit, Failsafe & Write Protect Settings	Disabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 1 _	f	f	f	f
	Disabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 2 _	f	f	f	f
	Enabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 3 _	f	f	f	f
	Enabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 4 _	f	f	f	f
	Enabled	N/A	N/A Fieldbus or Profibus	_ 5 _	g	g	g	g
	Disabled	N/A	N/A Fieldbus or Profibus	_ 6 _	g	g	g	g
c. General Configuration	Factory Standard			_ _ S	*	*	*	*
	Custom Configuration (Unit Data Required from customer)			_ _ C	*	*	*	*

[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

TABLE VI	CALIBRATION & ACCURACY SELECTIONS			STD870	STD830	STD820	STD810
	Accuracy	**Calibrated Range**	**Calibration Qty**				
a. Accuracy and Calibration	Standard	Factory Std	Single Calibration	A	*	*	*	*
	Standard	Custom (Unit Data Required)	Single Calibration	B	*	*	*	*
	High Accuracy	Factory Std	Single Calibration	E		**s**	**s**	**s**
	High Accuracy	Custom (Unit Data Required)	Single Calibration	F		**s**	**s**	**s**

TABLE VII	ACCESSORY SELECTIONS						
	Bracket Type	**Material**					
a. Mounting Bracket	None	None	0 _ _ _	*	*	*	*
	Angle Bracket	Carbon Steel	1 _ _ _	*	*	*	*
	Angle Bracket	304 SS	2 _ _ _	*	*	*	*
	Angle Bracket	316 SS	3 _ _ _	*	*	*	*
	Marine Approved Angle Bracket	304 SS	4 _ _ _	*	*	*	*
	Flat Bracket	Carbon Steel	5 _ _ _	*	*	*	*
	Flat Bracket	304 SS	6 _ _ _	*	*	*	*
	Flat Bracket	316 SS	7 _ _ _	*	*	*	*
b. Customer Tag	**Customer Tag Type**						
	No customer tag		_ 0 _ _	*	*	*	*
	One Wired Stainless Steel Tag (Up to 4 lines 26 char/line)		_ 1 _ _	*	*	*	*
	Two Wired Stainless Steel Tag (Up to 4 lines 26 char/line)		_ 2 _ _	*	*	*	*
c. Unassembled Conduit Plugs & Adapters	**Unassembled Conduit Plugs & Adapters**						
	No Conduit Plugs or Adapters Required		_ _ A0	*	*	*	*
	1/2 NPT Male to 3/4 NPT Female 316 SS Certified Conduit Adapter		_ _ A2	**n**	**n**	**n**	**n**
	1/2 NPT 316 SS Certified Conduit Plug		_ _ A6	**n**	**n**	**n**	**n**
	M20 316 SS Certified Conduit Plug		_ _ A7	**m**	**m**	**m**	**m**
	Minifast® 4 pin (1/2 NPT) (not suitable for X-Proof applications)		_ _ A8	**n**	**n**	**n**	**n**
	Minifast® 4 pin (M20) (not suitable for X-Proof applications)		_ _ A9	**m**	**m**	**m**	**m**

TABLE VIII	OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,....)						
Certifications & Warranty	None - No additional options		00	*	*	*	*	
	NACE MR0175; MR0103; ISO15156 (FC33338) Process wetted parts only		FG	*	*	*	*	b
	NACE MR0175; MR0103; ISO15156 (FC33339) Process wetted and non-wetted parts		F7	**c**	**c**	**c**	**c**	b
	Marine (DNV, ABS, BV, KR, LR) (FC33340)		MT	**d**	**d**	**d**	**d**	b
	EN10204 Type 3.1 Material Traceability (FC33341)		FX	*	*	*	*	
	MID Approved transmitter - Contact Tech Support for specific MID aproved ranges		MD		*	*	*	
	Certificate of Conformance (F3391)		F3	*	*	*	*	b
	Calibration Test Report & Certificate of Conformance (F3399)		F1	*	*	*	*	b
	Certificate of Origin (F0195)		F5	*	*	*	*	b
	FMEDA (SIL 2/3) Certification (FC33337)		FE	**j**	**j**	**j**	**j**	b
	Over-Pressure Leak Test Certificate (1.5X MAWP) (F3392)		TP	*	*	*	*	b
	Cert Clean for O_2 or CL_2 service per ASTM G93		OX	**e**	**e**	**e**	**e**	b
	Extended Warranty Additional 1 year		01	*	*	*	*	
	Extended Warranty Additional 2 years		02	*	*	*	*	
	Extended Warranty Additional 3 years		03	*	*	*	*	b
	Extended Warranty Additional 4 years		04	*	*	*	*	
	Extended Warranty Additional 15 years		15	*	*	*	*	

TABLE IX	Manufacturing Specials					
Factory	**Factory Identification**	0000	*	*	*	*

MODEL RESTRICTIONS

Restriction Letter	Available Only with		Not Available with	
	Table	Selection(s)	Table	Selection(s)
a			VIII	F7, FG
k			Ia	J,K,7,L,8 _ _ _ _ _ _
			Ic	_ _ H _ _ _ _
			Id	_ _ _ B,D,M,N,S _ _ _
			Ie	_ _ _ _ 1, 2, 3, 5, 6 _ _
			III	B- No CRN number available
			If	_ _ _ _ _ C_
c	1d	_ _ _ N,K,D,B _ _ _	Ia	C,D,3,G,H,6,K,L,8 _ _ _ _ _ _
d			VIIa	1,2,3,5,6,7 _ _ _
e	Ib	_ 2 _ _ _ _ _		
f			IVb	_ F _
g			IVb	_ H, D _
h			Ie	_ _ _ _ 4, 5, 6 _ _
			VIIa	1,2,3,4,5,6,7 _ _ _
j	IVb	_ H _	Vb	_ 1,2,6 _
m	IV a	B, D, F, H _ _		
n	IV a	A, C, E, G _ _		
p			III	B- No CRN number available
t			Ia	J, K, 7, L, 8
s	Ia	A,E _ _ _ _ _ _		
b	Select only one option from this group			

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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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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