

Technical Information

STA800 SmartLine Absolute Pressure Specification 34-ST-03-85, November 2018



Introduction

Part of the SmartLine® family of products, the STA800 and STA80L are high performance absolute pressure transmitters featuring piezoresistive sensor technology combining pressure sensing with on chip temperature compensation capabilities providing high accuracy, stability and performance 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:

- Accuracy up to 0.025 %
- Stability up to 0.01% of URL per year for ten years
- Automatic temperature compensation
- Rangeability up to 100:1
- Response times as fast as 80ms
- Multiple local display capabilities
- External zero, span, & configuration capability
- Polarity insensitive electrical connections
- Comprehensive on-board diagnostic capabilities
- Integral Dual Seal design for safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- Full compliance to SIL 2/3 requirements as a standard.
- Modular design characteristics
- Available with 15-year warranty
- Plugged Impulse Line Detection Option
- Dual/Triple Calibration Option (HART & Fieldbus Only)



Figure 1 – STA800 Absolute 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.

Span & Range Limits:

Model	URL mmHgA (mbarA)	LRL mmHgA (mbarA)	Min Span mm HgA (mbarA)	MAWP mmHgA (mbarA)
STA822/82L	780 (1040)	0 (0)	50 (65)	780 (1040)
Model	psia (barA)	psi (barA)	psi (barA)	psia (barA)
STA840/84L	500 (35)	0 (0)	5 (.35)	500 (35)
STA87L	3000 (210)	0 (0)	30 (2.1)	3000 (210)

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
- Configurable (HART only) and standard (Pa, KPa, MPa, KGcm², Torr, ATM, inH₂O, mH₂O, bar, mbar, inH₂O, inHG, FTH₂O, mmH₂O, 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 and 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.
 - 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

Reference Accuracy:(conformance to +/-3 Sigma)

Model	URL	LRL	Min Span	Maximum Turndown Ratio	Stability (% URL/Year for 10 years)	Reference Accuracy % Span ^{1,2}
STA822	780 mmHgA (1040 mbarA)	0.0 mmHgA (0.0 mbarA)	50 mmHgA (65 mbarA)	15:1	0.010	0.055/0.025%
STA840	500 psia (35 barA)	0.0 mmHgA (0.0 mbarA)	5 psia (0.35 barA)	100:1		
STA82L	780 mmHgA (1040 mbarA)	0.0 mmHgA (0.0 mbarA)	50 mmHgA (65 mbarA)	15:1	0.015	0.055%
STA84L	500 psia (35 barA)	0.0 mmHgA (0.0 mbarA)	5 psia (0.35 barA)	100:1	0.010	0.055/0.025%
STA87L	3000 psi (210 barA)	0.0 mmHgA (0.0 mbarA)	30 psia (2.1 barA)	100:1		

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

Accuracy at Specified Span and Temperature: (Combined Zero & Span, conformance to +/-3 Sigma)

Total Performance (% of Span):

$$\text{Total Performance Calculation: } = \pm \sqrt{(\text{Accuracy})^2 + (\text{Temperature Effect})^2}$$

Standard Accuracy Total Performance Examples (for comparison): @ 5:1 Turndown, +/-50 °F (28°C) shift

STA822 @ 156 mmHgA: 0.256% of span

STA840 @ 100 psia: 0.074% of span

STA82L @ 156 mmHgA: 0.451% of span

STA84L @ 100 psia: 0.081% of span

STA87L @ 600 psia: 0.081% 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), 10 to 55% RH, and 316 Stainless Steel barrier diaphragm.

Plugged Impulse Line Detection:

STA800 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:

STA800 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.

		Accuracy ^{1,2} (% of Span)				Temperature Effect (% Span/50°F)			
	Model	URL		For Spans Below	A	B	C (see URL units)	D	E
Standard Accuracy	STA822	780 mmHgA (1040 mbarA)	8:1	0.015	0.04	90 (120)	0.050	0.040	
	STA840	500 psia (35 barA)	25:1			20 (1.4)	0.025	0.005	
	STA82L	780 mmHgA (1040 mbarA)	5:1			140 (187)	0.050	0.080	
	STA84L	500 psia (35 barA)	25:1			20 (1.4)	0.025	0.007	
	STA87L	3000 psi (210 barA)	10:1			300 (35)	0.025		
High Accuracy Option	STA822	780 mmHgA (1040 mbarA)	50:1	0.015	0.01	90 (120)	0.050	0.040	
	STA840	500 psia (35 barA)	16:1			20 (1.4)	0.025	0.005	
	STA84L	500 psia (35 barA)	10:1			20 (1.4)		0.007	
	STA87L	3000 psi (206.8 barA)	10:1			300 (35)			
				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)	

Operating Conditions – All Models

Parameter	Reference Condition		Rated Condition		Operative Limits		Transportation and Storage							
	°C	°F	°C	°F	°C	°F	°C	°F						
Ambient Temperature¹	25±1	77±2	-40 to 85	-40 to 185	-40 to 85	-40 to 185	-55 to 120	-67 to 248						
Meter Body Temperature²														
STA822/STA82L	25±1	77±2	See Figure 2		See Figure 2		-55 to 125	-67 to 257						
STA840, 84L, 87L	25±1	77±2	-40 to 110	-40 to 230	-40 to 125	-40 to 257	-55 to 125	-67 to 257						
Humidity %RH	10 to 55		0 to 100		0 to 100		0 to 100							
Vacuum Region - Minimum Pressure	See Figure 2. Operate within specifications above 25 mmHgA (33 mbarA). Short term ³ exposure to full vacuum will not result in damage.													
STA822, 82L, 840, 84L, 87L														
Supply Voltage, Current, and Load Resistance (HART & DE)	10.8 to 42.4 Vdc at terminals (IS versions limited to 30 Vdc) 0 to 1,440 ohms (as shown in Figure 3)													
Maximum Allowable Working Pressure (MAWP)^{4,5}	STA822, 82L = 780 mmHgA, 1,040 mbarA STA840, 84L = 500 psia, 35 barA STA87L = 3,000 psi, 210 barA													

¹ LCD Display operating temperature -20°C to +70°C Storage temperature -30°C to 80°C.

² Silicone 704 minimum temperature rating is 0°C (32°F)

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

⁴ Units can withstand overpressure of 1.5 x MAWP without damage

⁵ Consult factory for MAWP of ST 700 transmitters with CRN approval

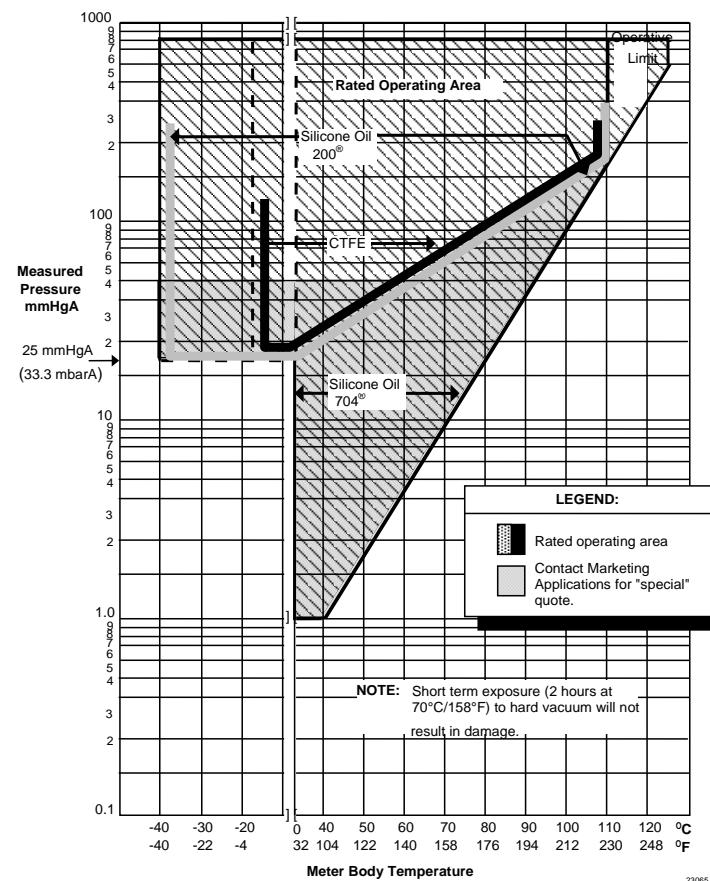


Figure 2 - Measured pressure versus meter body temperature chart for STA722, 72L

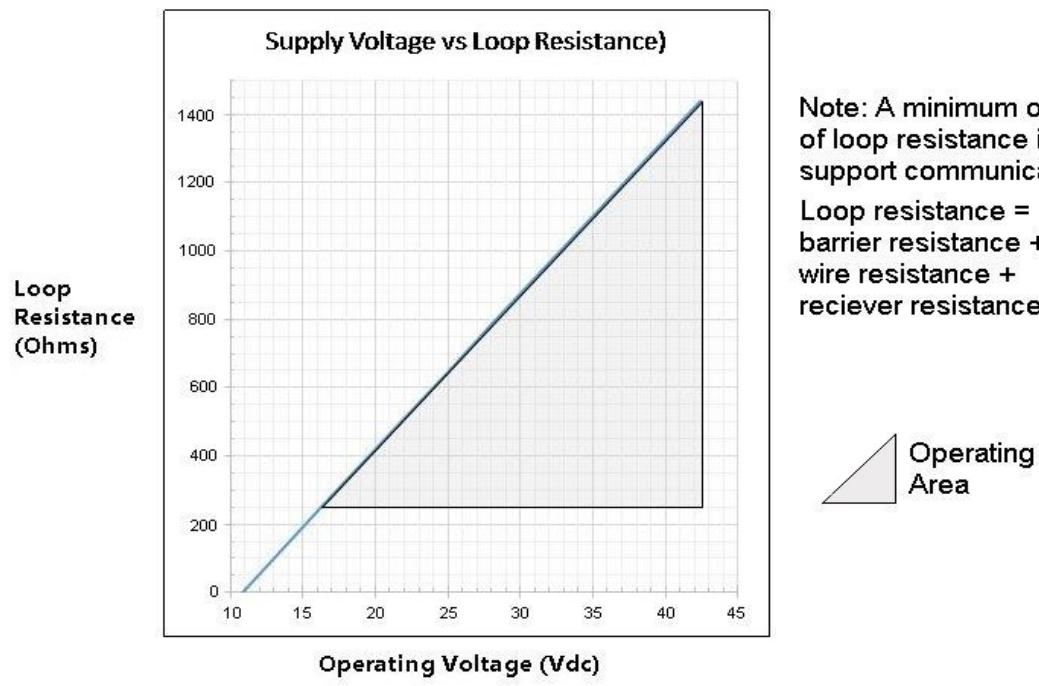


Figure 3 - Supply voltage and loop resistance chart & calculations

Performance Under Rated Conditions – All Models

Parameter	Description	
Analog Output	Two-wire, 4 to 20 mA (HART & DE Transmitters only)	
Digital Communications:	Honeywell Standard: Normal Limits: 3.8 – 20.8 mA Failure Mode: ≤ 3.6 mA and ≥ 21.0 mA	NAMUR NE 43 Compliance: 3.8 – 20.5 mA ≤ 3.6 mA and ≥ 21.0 mA
HART & DE Output Failure Modes (NAMUR for DE Units requires selecting display and configuration buttons or factory configuration)		
Supply Voltage Effect	0.005% of 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 Protocol 80ms	FOUNDATION Fieldbus 150ms (Host Dependant)
Damping Time Constant	HART: Adjustable from 0 to 32 seconds in 0.1 increments. Default Value: 0.5 seconds DE: Discrete values 0, .16, .32, .48, 1, 2, 4, 8, 16, 32 seconds. Default Value: 0.48 seconds	
Vibration Effect	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	Meets IEC61326	
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	STA800: 316L SS, Hastelloy® C-276 ² , Monel® 400 ³ , Tantalum, Gold-plated 316L SS, Gold-plated Hastelloy® C-276, Gold-plated Monel® 400 STA80L: 316L SS, Hastelloy C-276
Process Head Material	STA800: Carbon Steel (Zinc Plated) ⁵ , 316 SS ⁴ , Hastelloy® C-276 ⁶ , Monel® 400 ⁷ STG80L: 316L SS, Hastelloy C-276 ⁶
Vent/Drain Valves & Plugs ¹	STA800: 316 SS ⁴ , Hastelloy C-276 ² , Monel 400 ⁷ STA80L: N/A
Head Gaskets	STA800: Glass-filled PTFE standard. Viton® and graphite are optional. STA80L: N/A
Meter Body Bolting	STA800: Carbon Steel (Zinc plated) standard. Options include 316 SS, NACE A286 SS bolts and nuts or NACE A286 SS bolts and 304 SS nuts STA80L: N/A
Mounting Bracket	Carbon Steel (Zinc-plated) or 304 Stainless Steel or 316Stainless Steel. See Figure 4 & Figure 5
Fill Fluid	Silicone 200, CTFE or Silicone 704
Electronic Housing	Pure Polyester Powder Coated Low Copper (<0.4%)-Aluminum. Meets NEMA 4X, IP66, IP67 and NEMA 7 (explosion proof). All stainless steel housing is optional.
Process Connections	STA800: ½ -inch NPT(female), DIN 19213 (standard) STA80L: ½ -inch NPT(female), ½ -inch NPT male, 9/16 Aminco, DIN19213, G ½ -B Male threaded
Wiring	Accepts up to 16 AWG (1.5 mm diameter).
Dimensions	See Figure 4 & Figure 5
Net Weight	STA800: 8.3 pounds (3.8 Kg). STA80L: 3.6 pounds (1.6 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 42.4 Vdc at terminals

Load: Maximum 1440 ohms See **Figure 3**

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 42.4 Vdc at terminals

Load: Maximum 1440 ohms See **Figure 3**

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

- o NACE MRO175, MRO103, ISO15156

Approval Certifications:

AGENCY	TYPE OF PROTECTION	COMM. OPTION	FIELD PARAMETERS	AMBIENT TEMP (Ta)
FM Approvals™ USA	Explosion proof: Class I, Division 1, Groups A, B, C, D; Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G; T6..T5 Class I, Zone 0/1, AEx db IIC T6..T5 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
	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 FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
		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
Canadian Standards Association (CSA) USA and Canada	Enclosure: Type 4X/ IP66/ IP67	All	All	-
	Explosion Proof: Class I, Division 1, Groups A, B, C, D; Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G; T6..T5 Class I Zone 1 AEx db IIC T6..T5 Ga/Gb Ex db IIC T6..T5 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 Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
		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)

ATEX	Flameproof: II 1/2 G Ex db IIC T6..T5 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 FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
		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	-
IECEx World	Flameproof : Ex db IIC T6..T5 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 FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
		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	-
SAEx South Africa	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 FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
		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	-
INMETRO Brazil	Flameproof: Ex db IIC T6..T5 Ga/Gb Ex tb IIIC T 95°C Db	All	Note 1	50 °C to 85°C
	Intrinsically Safe: Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4 Ga; Ex ic IIC T4 Gc	4-20 mA / DE/ HART	Note 2a	50 °C to 70°C
		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)

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

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:

XXXXXXXX-XXXX, 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:

XXXXXX-XXXX, THE "X" is production related, THE POSITION of the "E" IS THE REVISION.

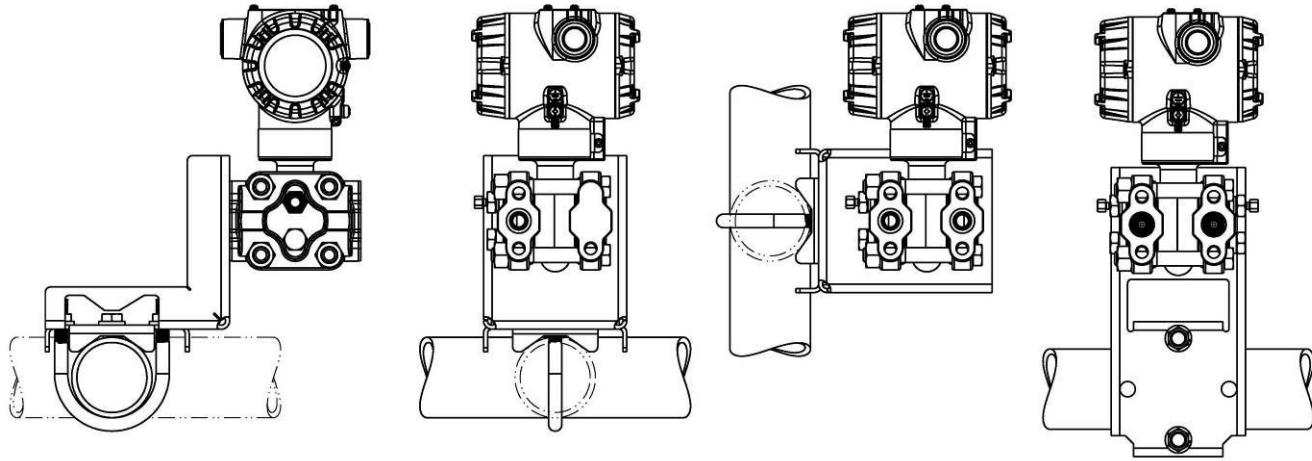
Approval Certifications: (Continued)

Marine Certificates	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 Multivariable 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																
	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 INSTRUMENTS DIRECTIVE (MID) 2004/ 22/ EC	<p>Certificate Issued by NMI Certin B.V. Mechanical Class: M3 Electromagnetic Environment: E3 Ambient Temperature Range: -25 °C to + 55 °C</p> <table border="1"> <thead> <tr> <th>Unit</th><th>Custom Calibration</th></tr> </thead> <tbody> <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> </tbody> </table>	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
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

Reference Dimensions: millimeters
inches

Mounting Configurations (Dual head design)



Dimensions (Dual head design)

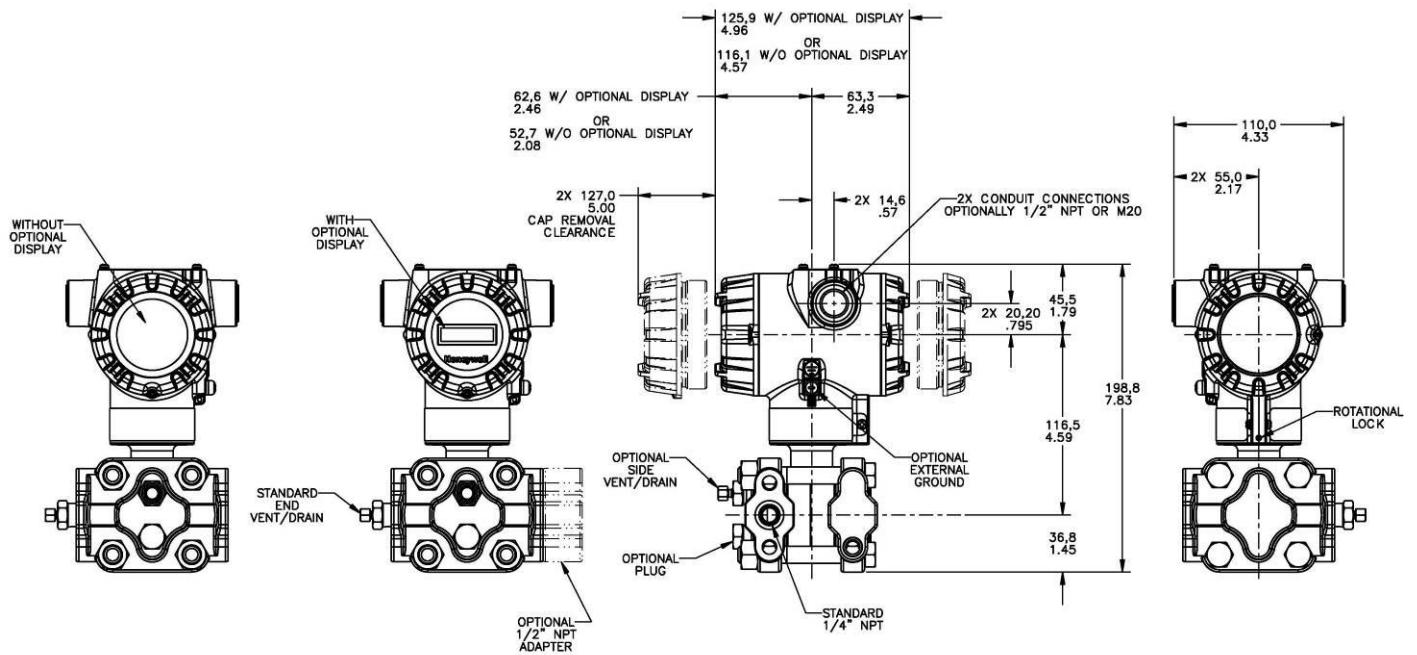
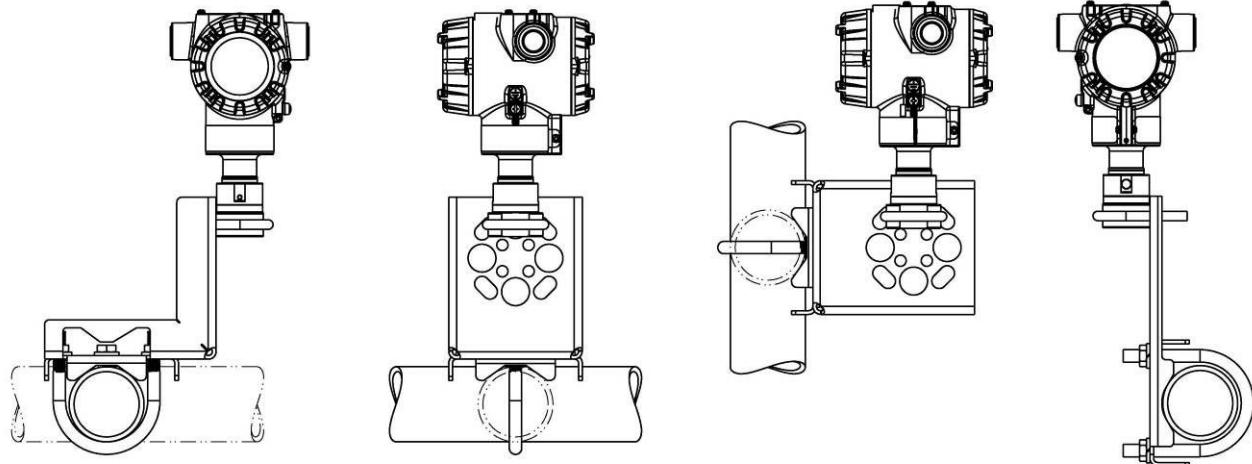


Figure 4 – Typical mounting dimensions of STA822 & STA840 for reference

Reference Dimensions: millimeters
inches

Mounting Configurations (Inline Designs)



Dimension (Inline Design)

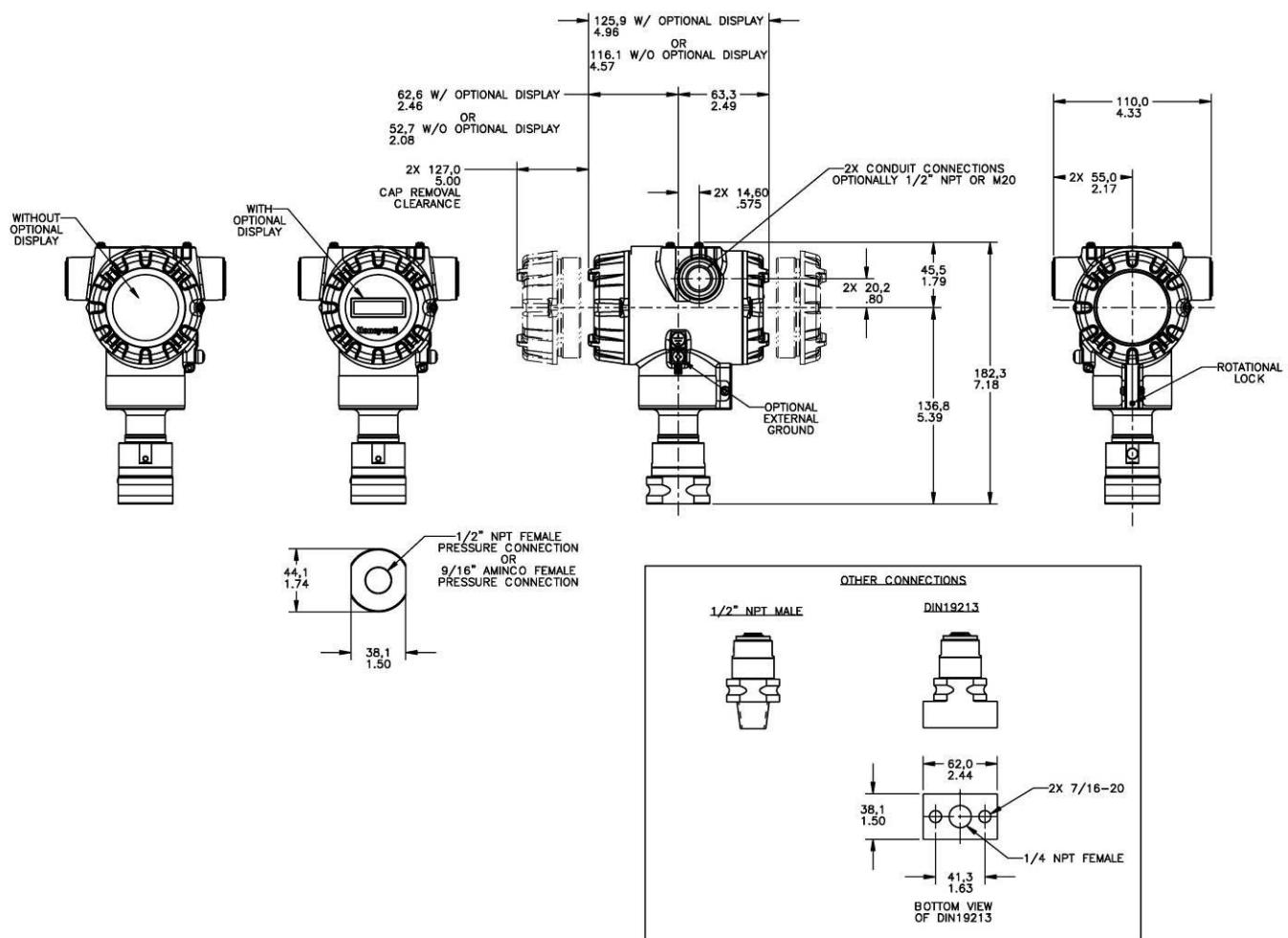


Figure 5 – Typical mounting dimensions of STA82L, STA84L, & STA87L for reference

Model Selection Guide

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

Model STA800 & STA80L Absolute Pressure Transmitters

Model Selection Guide
34-ST-16-85 Issue 19B

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

Key	I	II	III	IV	V	VI	VII	VIII	IX
STA	-	-	-	-	-	-	-	-	0 0 0 0

KEY NUMBER	URL/Max Span	LRL	Min Span	Units
Absolute Dual Head	780 (1040)	0 (0)	50 (65.0)	mm HgA (mbarA)
	500 (35)	0 (0)	5 (.35)	psia (barA)
Absolute In-Line	780 (1040)	0 (0)	50 (65.0)	mm HgA (mbarA)
	500 (35)	0 (0)	5 (.35)	psia (barA)
	3000 (210)	0 (0)	30 (2.1)	psia (barA)

Selection	↓	↓	↓
STA822	↓	↓	↓
STA840	↓	↓	↓
STA82L		↓	↓
STA84L		↓	↓
STA87L		↓	↓

TABLE I		METER BODY SELECTIONS	
Process Head/Reference Head Mat'l ^b		Barrier Diaphragm Material	
a. Process Head & Diaphragm Materials		316L SS Hastelloy® C - 276 Monel 400® Tantalum Gold Plated 316L SS Gold Plated Hastelloy C-276 Gold Plated Monel 400	
		Plated Carbon Steel / Plated Carbon Steel	
		316L SS Hastelloy C - 276 Monel 400 Tantalum Gold Plated 316L SS Gold Plated Hastelloy C-276 Gold Plated Monel 400	
		316 Stainless Steel / 316 Stainless Steel	
b. Fill Fluid		Hastelloy C - 276 / 316 Stainless Steel	
		Monel 400 / 316 Stainless Steel	
c. Process Connection		Monel 400 Same as Process Head	
d. Bolt/Nuts Materials		Silicone Oil 200 Fluorinated Oil CTFE Silicone Oil 704	
e. Vent/Drain Type/Location		Size/Type	
		Material	
f. Gasket Materials		9/16" Aminco 1/2" NPT (female) 1/2" NPT (male) DIN 19213 (1/4" female NPT) G1/2 B Threaded Fitting	
g. Head Material		Same as Process Head Same as Process Head ^a Same as Process Head Same as Process Head Same as Process Head	
h. Vent Material		Same as Process Head	
i. Gasket Material		None Carbon Steel 316 SS Grade 660 (NACE A286) with NACE 304 SS Nuts Grade 660 (NACE A286) Bolts & Nuts Monel K500 Super Duplex B7M	
j. Vent/Drain Type/Location		Head Type	
k. Vent/Drain Type/Location		Vent Type	
l. Vent/Drain Type/Location		Location	
m. Vent/Drain Type/Location		Vent Material	

A	*		
B	*		
C	*		
D	a		
1	*		
2	*		
3	*		
E	*	*	*
F	*	*	*
G	*		
H	a		
4	*		
5	*		
6	*		
J	*	*	*
K	a		
7	*		
L	a		
8	a		
1	*	*	*
2	*	*	*
3	*	*	*

A	*	*	*
G	*	*	*
H	*	*	*
D	*	*	*
B	*	*	*
O		*	*
C	*		
S	*		
N	*		
K	p		
M	p		
D	p		
B	*		

0	*	*	*
1	*		
2	*		
3	t		
4	*		
5	t		
6	*		
0		*	*
A	*		
B	*		
C	*		

^a Except Carbon Steel Heads shall use 316SS Vent/Drain & Plugs

^b STA822,840 supplied via 1/2" flange adapter same material as process head except carbon steel shall use 316 SS

^c Reference head available only with Dual head models. In-line models supplied with process head only

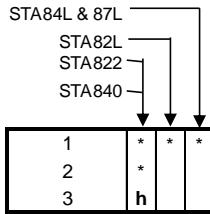


TABLE II Meter Body & Connection Orientation		
Head/Connect Orientation	Standard	High Side Left, Low Side Right ² / Std Head Orientation
Reversed		Low Side Left, High Side Right ² / Std Head Orientation
90/Standard		High Side Left, Low Side Right ² / 90° Head Rotation

TABLE III AGENCY APPROVALS	
Approvals	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 IECEx Explosion proof, Intrinsically Safe & Non-incendive 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 proof, Intrinsically

0	*	*	*
A	*	*	*
B	*	*	*
C	*	*	*
D	*	*	*
E	*	*	*
F	*	*	*
G	*	*	*
H	*	*	*
I	*	*	*

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

A __	*	*	*
B __	*	*	*
C __	*	*	*
D __	*	*	*
E __	*	*	*
F __	*	*	*
G __	*	*	*
H __	*	*	*

_ H _	*	*	*
_ D _	u	u	u
_ F _	*	*	*

-- 0	*	*	*
-- A	f	f	f
-- B	*	*	*
-- C	*	*	*
-- D	*	*	*
-- E	*	*	*
-- H	*	*	*
-- J	*	*	*

TABLE V CONFIGURATION SELECTIONS			
a. App S/W	Diagnostics		
	Standard Diagnostics Advanced Diagnostics (Above with Plugged Impulse Detection PILD)		
b. Output Limit, Failsafe & Write Protect Settings	Write Protect	Fail Mode	High & Low Output Limits ³
	Disabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)
	Disabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)
	Enabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)
	Enabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)
	Enabled	N/A	N/A Fieldbus or Profibus
c. General Configuration	General Configuration		
	Factory Standard		
	Customer Configuration (Unit Data Required)		

1 __	*	*	*
2 __	*	*	*

_ 1 _	f	f	f
_ 2 _	f	f	f
_ 3 _	f	f	f
_ 4 _	f	f	f
_ 5 _	g	g	g
_ 6 _	g	g	g

_ S _	*	*	*
_ C _	*	*	*

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

³ NAMUR Output Limits 3.8 - 20.5mAdc can be configured by the custom

TABLE VI			CALIBRATION & ACCURACY SELECTIONS			
a. Accuracy and Calibration	Accuracy	Calibrated Range	Calibration Qty			
	Standard	Factory Std	Single Calibration			
	Standard	Custom (Unit Data Required)	Single Calibration			
	Standard	Custom (Unit Data Required)	Dual Calibration			
	Standard	Custom (Unit Data Required)	Triple Calibration			
	High Accuracy	Factory Std	Single Calibration			
	High Accuracy	Custom (Unit Data Required)	Single Calibration			
	High Accuracy	Custom (Unit Data Required)	Dual Calibration			
	High Accuracy	Custom (Unit Data Required)	Triple Calibration			

STA84L, 87L			
STA82L			
STA822			
STA840			
A	*	*	*
B	*	*	*
C	*	*	*
D	*	*	*
E	*	*	*
F	*	*	*
G	s	s	s
H	s	s	s

TABLE VII			ACCESSORY SELECTIONS			
a. Mounting Bracket	Bracket Type	Material				
	None	None			0	---
	Angle Bracket	Carbon Steel			1	---
	Angle Bracket	304 SS			2	---
	Angle Bracket	316 SS			3	---
	Marine Approved Bracket	Carbon Steel			8	---
	Marine Approved Bracket (In-Line)	Carbon Steel			9	---
	Marine Approved Bracket	304 SS			4	---
	Marine Approved Bracket (In-Line)	304 SS			A	---
	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	---
c. Unassembled Conduit Plugs & Adapters	Two Wired Stainless Steel Tag (Up to 4 lines 26 char/line)				2	---
	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
	1/2 NPT 316 SS Certified Conduit Plug				A6	n
	M20 316 SS Certified Conduit Plug				A7	m
	Minifast® 4 pin (1/2 NPT) (not suitable for X-Proof applications)				A8	n
	Minifast® 4 pin (M20) (not suitable for X-Proof applications)				A9	m

0	---	*	*	*
1	---	*	*	*
2	---	*	*	*
3	---	*	*	*
8	---	*		
9	---		*	*
4	---	*		
A	---		*	*
5	---	*	*	*
6	---	*	*	*
7	---	*	*	*

0	---	*	*	*
1	---	*	*	*
2	---	*	*	*

-- A0	*	*	*
-- A2	n	n	n
-- A6	n	n	n
-- A7	m	m	m
-- A8	n	n	n
-- A9	m	m	m

TABLE VIII			OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,...))			
Certifications & Warranty	None - No additional options required	Low Temperature Rating (-50 deg C min. ambient operative temperature limit)	NACE MR0175; MR0103; ISO15156 (FC33338) Process wetted parts only	NACE MR0175; MR0103; ISO15156 (FC33339) Process wetted and non-wetted parts	Marine (DNV, ABS, BV, KR, LR)	EN10204 Type 3.1 Material Traceability (FC33341)
						MID Approved Transmitter - Contact Tech Support for specific MID approved ranges
						Certificate of Conformance (F3391)
						Calibration Test Report & Certificate of Conformance (F3399)
						Certificate of Origin (F0195)
						FMEDA (SIL 2/3) Certification (FC33337)
						Over-Pressure Leak Test Certificate (1.5X MAWP) (F3392)
						Cert Clean for O ₂ or Cl ₂ service per ASTM G93
						PMI Certification'
						Extended Warranty Additional 1 year
						Extended Warranty Additional 2 years
						Extended Warranty Additional 3 years
						Extended Warranty Additional 4 years
						Extended Warranty Additional 15 years

00	*	*	*
LT	w	w	w
FG	*	*	*
F7	c	c	c
MT	d	d	d
FX	*	*	*
MD			v
F3	*	*	*
F1	*	*	*
F5	*	*	*
FE	j	j	j
TP	*	*	*
OX	e	e	e
PM	*	*	*
01	*	*	*
02	*	*	*
03	*	*	*
04	*	*	*
15	*	*	*

TABLE IX		Manufacturing Specials			
Factory	Factory Identification	0000	*	*	*

RESTRICTIONS

Restriction Letter	Available Only with		Not Available with	
	Table	Selection(s)	Table	Selection(s)
a			VIII	FG, F7
c	I d	_0,N,K,D,B_	I a	D,H,K,L,8,_
d	IV a	C,D,G,H_	VIIa	1,2,3,5,6,7_
e	lb	_2_		
f			IV b	_F_
g			IVb	_H, D_
h			Ie	4,5,6
			VIIa	1,2,3,4,5,6,7,8_
j	IV b	_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
s	Ia	A,E_		
t			1a	J, K, 7, L, 8
			Va	2
u			VIIa	C,D,G,H
v	IV a	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 ACCESSORY KITS

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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(Sales) 1-800-343-0228

Email: (Sales)

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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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Shanghai, China 20061

Honeywell

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