SmartLine

Honeywell

Technical Information

STA800 SmartLine Absolute Pressure
Specification 34-ST-03-85, March 2020

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 15 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, 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 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

- o Meter body replacement
- o Exchange/replace electronics/comms modules*
- o Add or remove integral indicators*
- o 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:

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.

Performance Specifications

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

Model	URL	LRL	Min Span	Maximum Turndown Ratio	Stability (% URL/ Year for 15 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):

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

Standard Accuracy Total Performance Examples (for comparison): @ 5:1 Turndown, +/-50 ºF (28ºC) 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 ºC (77oF), 10 to 55% RH, and 316 Stainless Steel barrier diaphragm.

	Model	URL	Accuracy[1,2] (% of Span) For Spans Below	A	B	C (see URL units)	Temperature Effect (% Span/50°F) 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 °C	Reference Condition °F	Rated Condition °C	Rated Condition °F	Operative Limits °C	Operative Limits °F	Transportation and Storage °C	Transportation and Storage °F
Ambient Temperature[1]	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]								
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 STA822, 82L, 840,84L, 87L	See Figure 2. Operate within specifications above 25 mmHgA (33 mbarA). Short term[3] exposure to full vacuum will not result in damage.							
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 psia, 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 0ºC (32ºF

[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

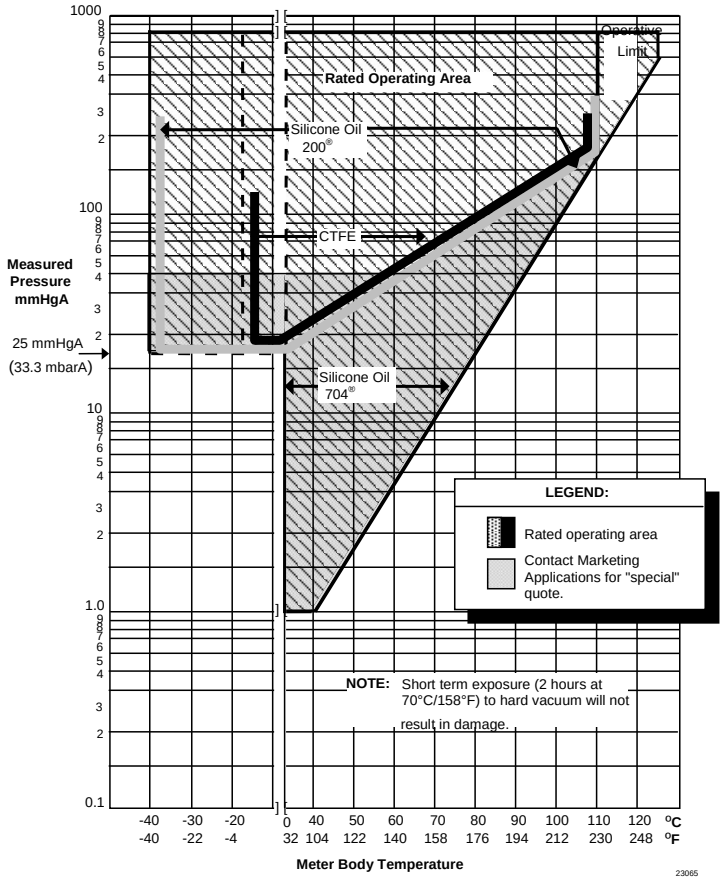


Figure 2 - Measured pressure versus meter body temperature chart for STA722, 72L

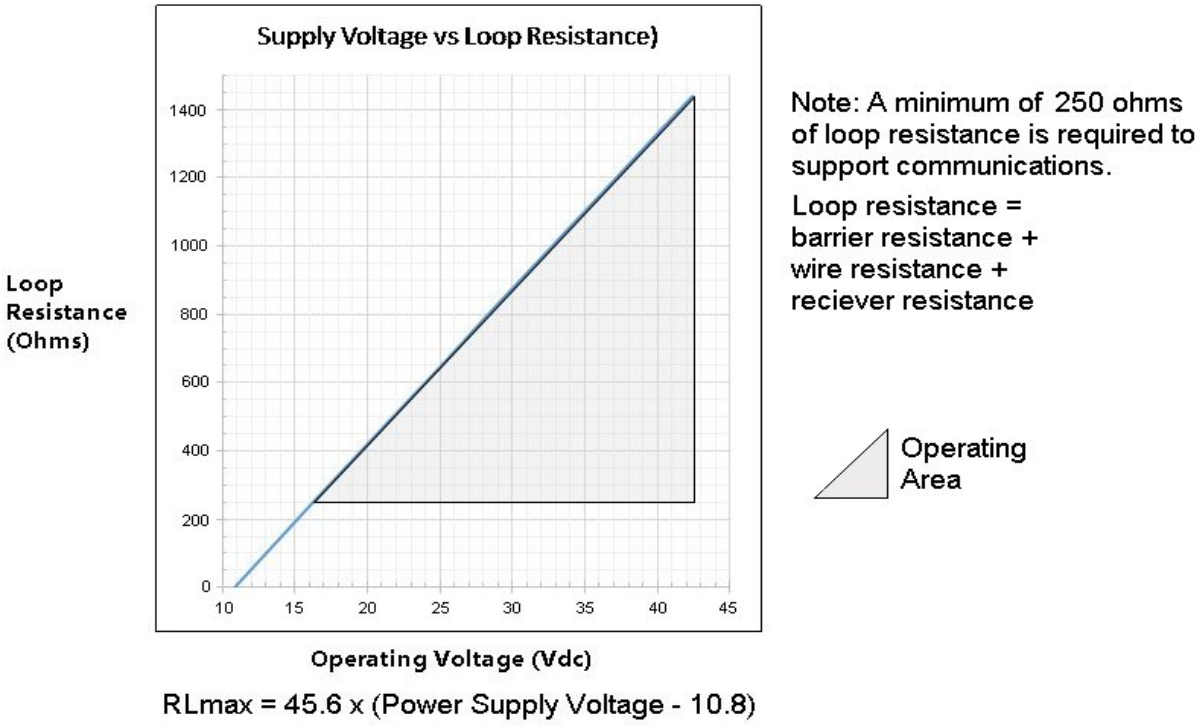


Figure 3 - Supply voltage and loop resistance chart & calculations

Performance Under Rated Conditions – All Models

Parameter	Description
Analog Output **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.
HART & DE Output Failure Modes (NAMUR for DE Units requires selecting display and configuration buttons or factory configuration)	**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% 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

- 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
	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; 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	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
	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 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	4-20 mA / DE/ HART	Note 2a	-50 °C to 70°C
	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	
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:

   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.

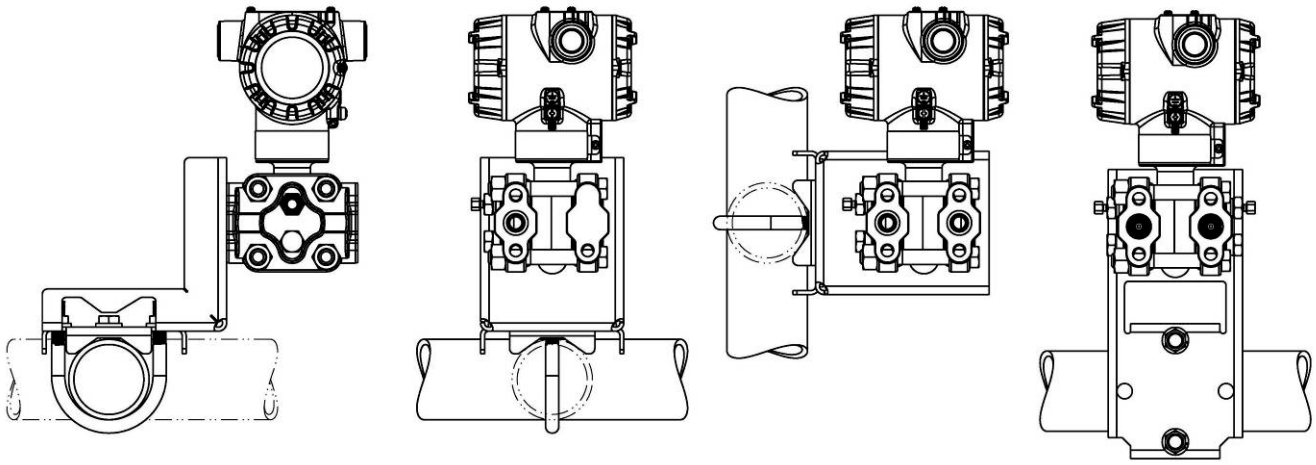
For ST 800 Smart Pressure Transmitter and SMV800 Smart Multivarible Transmitter</td></tr>
<tr><td>American Bureau of Shipping (ABS) - 2009 Steel Vessel Rules 1-1-4/3.7, 4-6-2/5.15, 4-8-3/13 & 13.5, 4-8-4/27.5.1, 4-9-7/13. Certificate number: 04-HS417416-PDA</td></tr>
<tr><td>Bureau Veritas (BV) - Product 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 (Dual head design)



Dimensions (Dual head design)

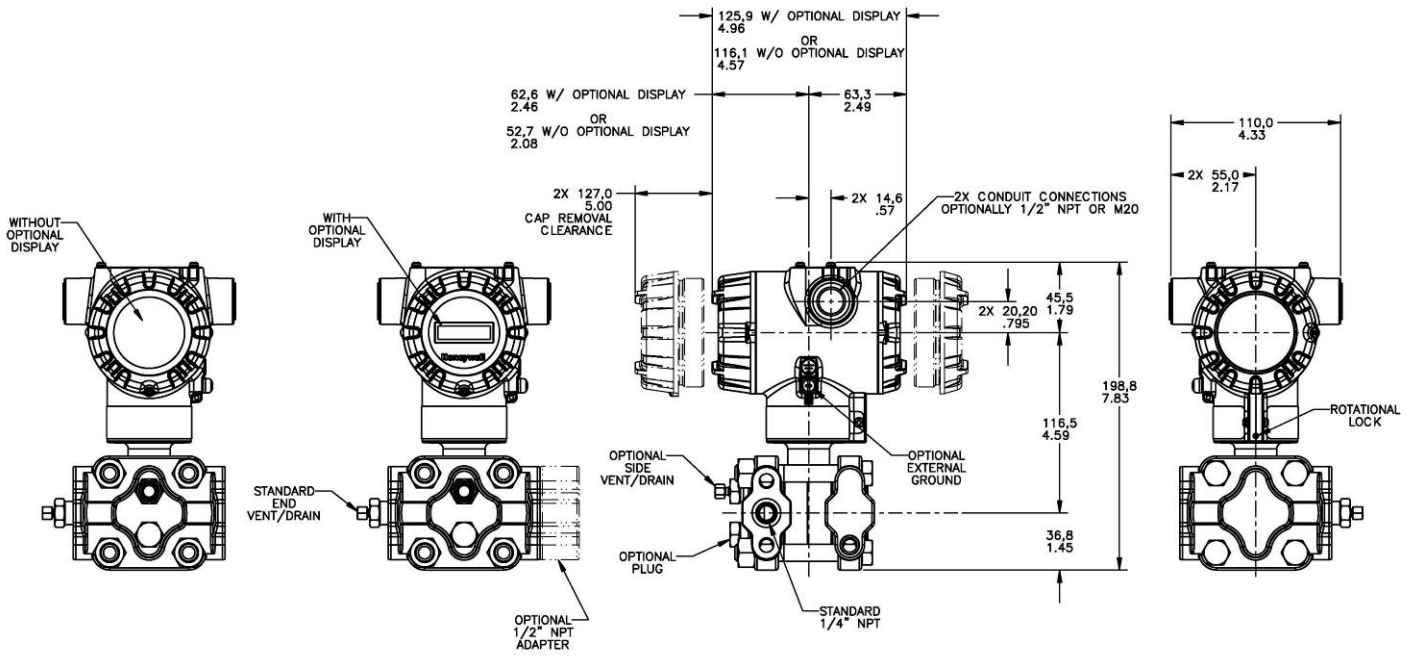
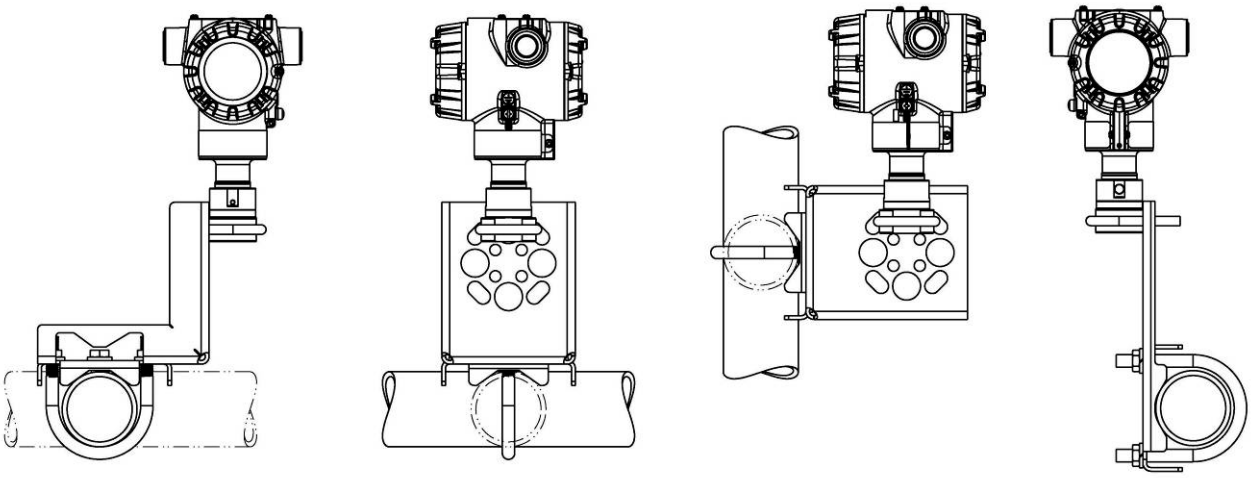


Figure 4 – Typical mounting dimensions of STA822 & STA840 for reference

Reference Dimensions: millimeters / inches

Mounting Configurations (Inline Designs)



Dimension (Inline Design)

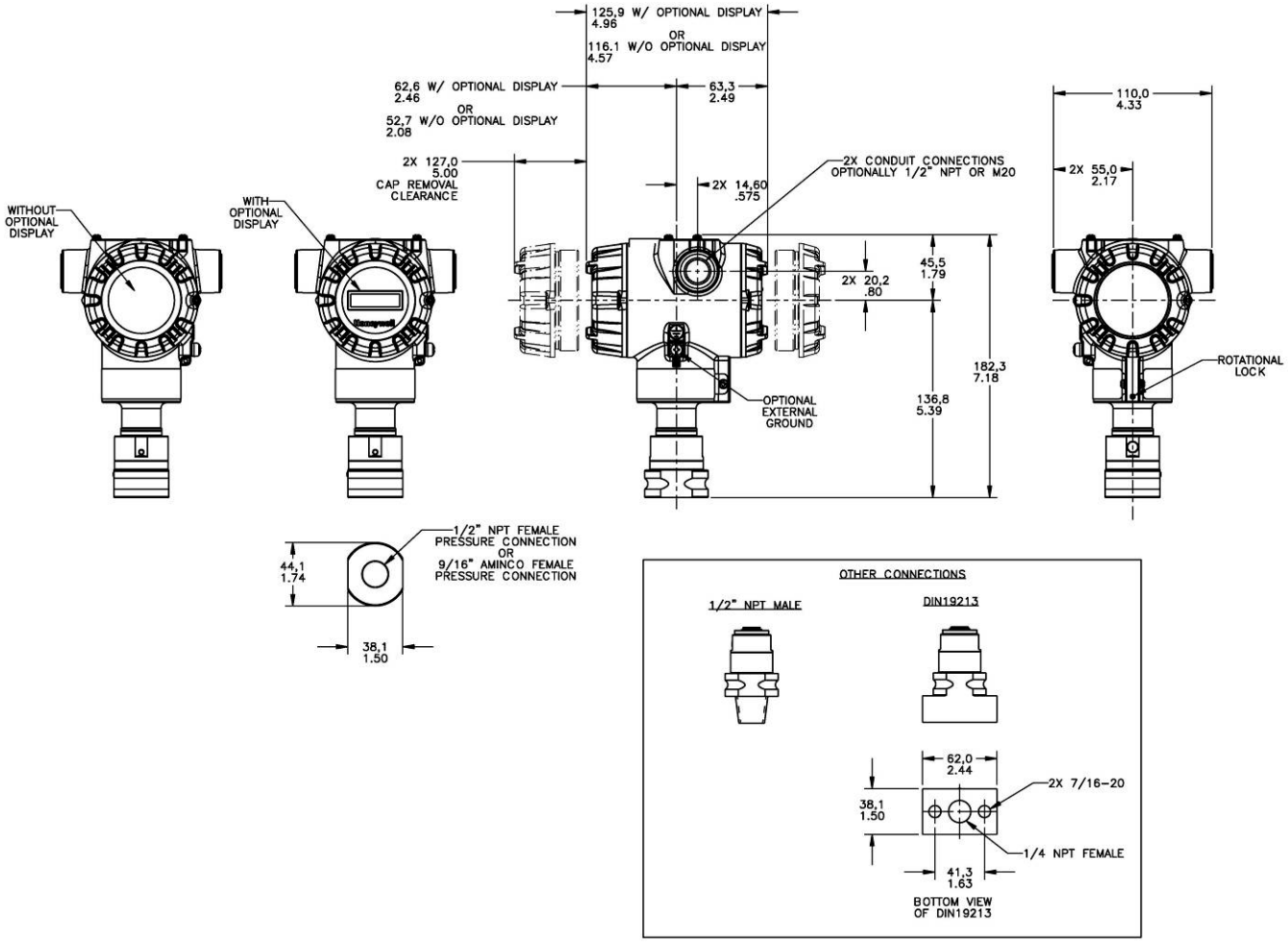


Figure 5 – Typical mounting dimensions of STA82L, STA84L, & STA87L for reference

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: STA ___ - ______ - _ - _ - ___ - ___ - _ - ____ - __.__.__ - 0000

KEY NUMBER	URL/Max Span	LRL	Min Span	Units	Selection
Absolute Dual Head	780 (1040)	0 (0)	50 (65.0)	mm HgA (mbarA)	STA822 ▼
	500 (35)	0 (0)	5 (.35)	psia (barA)	STA840 ▼
Absolute In-Line	780 (1040)	0 (0)	50 (65.0)	mm HgA (mbarA)	STA82L ▼
	500 (35)	0 (0)	5 (.35)	psia (barA)	STA84L ▼
	3000 (210)	0 (0)	30 (2.1)	psia (barA)	STA87L ▼

TABLE I	METER BODY SELECTIONS			
a. Process Head & Diaphragm Materials	Process Head/Reference Head Mat'l[1b]	Barrier Diaphragm Material		
	Plated Carbon Steel / Plated Carbon Steel	316L SS	A_____	*
		Hastelloy® C - 276	B_____	*
		Monel 400®	C_____	*
		Tantalum	D_____	a
		Gold Plated 316L SS	1_____	*
		Gold Plated Hastelloy C-276	2_____	*
		Gold Plated Monel 400	3_____	*
	316 Stainless Steel / 316 Stainless Steel	316L SS	E_____	* * *
		Hastelloy C - 276	F_____	* * *
		Monel 400	G_____	*
		Tantalum	H_____	a
		Gold Plated 316L SS	4_____	*
		Gold Plated Hastelloy C-276	5_____	*
		Gold Plated Monel 400	6_____	*
	Hastelloy C - 276 / 316 Stainless Steel	Hastelloy C - 276	J_____	* * *
		Tantalum	K_____	a
		Gold Plated Hastelloy C-276	7_____	*
	Monel 400 / 316 Stainless Steel	Monel 400	L_____	a
		Gold Plated Monel 400	8_____	a
b. Fill Fluid	Silicone Oil 200		_1____	* * *
	Fluorinated Oil CTFE		_2____	* * *
	Silicone Oil 704		_3____	* * *
c. Process Connection	Size/Type	Material		
	9/16" Aminco	Same as Process Head	__A___	* *
	1/2" NPT (female)	Same as Process Head [1a]	__G___	* * *
	1/2" NPT (male)	Same as Process Head	__H___	* *
	DIN 19213 (1/4" female NPT)	Same as Process Head	__D___	* * *
	G1/2 B Threaded Fitting	Same as Process Head	__B___	* *
d. Bolt/Nuts Materials	None		___0__	* *
	Carbon Steel		___C__	*
	316 SS		___S__	*
	Grade 660 (NACE A286) with NACE 304 SS Nuts		___N__	*
	Grade 660 (NACE A286) Bolts & Nuts		___K__	p
	Monel K500		___M__	p
	Super Duplex		___D__	p
	B7M		___B__	*
e. Vent/Drain Type/Location	Head Type	Vent Type	Location	Vent Material
	None	None	None	None	____0_	* *
	Single Ended	None	None	None	____1_	*
	Single Ended	Standard	Side	Matches Head Material[1]	____2_	*
	Single Ended	Center Vent	Side	Stainless Steel Only	____3_	t
	Dual Ended	Standard Vent	End	Matches Head Material[1]	____4_	*
	Dual Ended	Center Vent	End	Stainless Steel Only	____5_	t
	Dual Ended	Standard/Plug	Side/End	Matches Head Material[1]	____6_	*
f. Gasket Materials	None				_____0	* *
	Teflon® or PTFE (Glass Filled)				_____A	*
	Viton®				_____B	*
	Graphite				_____C	*

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

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

[1b] Reference head available only with Dual head models. In-line models supplied with process head only

TABLE II	Meter Body & Connection Orientation		STA84L & 87L	STA82L	STA822	STA840
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[0] Head Rotation	3	**h**		

TABLE III	AGENCY APPROVALS				
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	*	*	*
	KOSHA Explosion proof, Intrinsically Safe & Non-incendive	H	*	*	*
	EAC Customs Union(Russia,Belarus,Kazakhstan)Ex Approval, Flame proof, Intrinsically	I	*	*	*

TABLE IV	TRANSMITTER ELECTRONICS SELECTIONS						
a. Electronic Housing Material & Connection Type	**Material**	**Connection**	**Lightning Protection**	A _ _	*	*	*
	Polyester Powder Coated Aluminum	1/2 NPT	None	B _ _	*	*	*
	Polyester Powder Coated Aluminum	M20	None	C _ _	*	*	*
	Polyester Powder Coated Aluminum	1/2 NPT	Yes	D _ _	*	*	*
	Polyester Powder Coated Aluminum	M20	Yes	E _ _	*	*	*
	316 Stainless Steel (Grade CF8M)	1/2 NPT	None	F _ _	*	*	*
	316 Stainless Steel (Grade CF8M)	M20	None	G _ _	*	*	*
	316 Stainless Steel (Grade CF8M)	1/2 NPT	Yes	H _ _	*	*	*
	316 Stainless Steel (Grade CF8M)	M20	Yes				
b. Output/ Protocol	**Analog Output**	**Digital Protocol**					
	4-20mA dc	HART Protocol		_ H _	*	*	*
	4-20mA dc	DE Protocol		_ D _	**u**	**u**	**u**
	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
	Basic	None	EN	_ _ B	*	*	*
	Basic	Yes	EN	_ _ C	*	*	*
	Advanced	None	EN, GE, FR, IT, SP, RU, TU	_ _ D	*	*	*
	Advanced	Yes	EN, GE, FR, IT, SP, RU, TU	_ _ E	*	*	*
	Advanced	None	EN, CH, JP	_ _ H	*	*	*
	Advanced	Yes	EN, CH, JP	_ _ J	*	*	*

TABLE V	CONFIGURATION SELECTIONS						
a. App S/W	**Diagnostics**						
	Standard Diagnostics			1 _ _	*	*	*
	Advanced Diagnostics (Above with Plugged Impulse Detection PILD)			2 _ _	*****	*****	*****
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)	_ 1 _	**f**	**f**	**f**
	Disabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 2 _	**f**	**f**	**f**
	Enabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 3 _	**f**	**f**	**f**
	Enabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 4 _	**f**	**f**	**f**
	Enabled	N/A	N/A Fieldbus or Profibus	_ 5 _	**g**	**g**	**g**
	Disabled	N/A	N/A Fieldbus or Profibus	_ 6 _	**g**	**g**	**g**
c. General Configuration	**General Configuration**						
	Factory Standard			_ _ S	*	*	*
	Customer Configuration (Unit Data Required)			_ _ 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 custom

TABLE VI	CALIBRATION & ACCURACY SELECTIONS			STA84L, 87L	STA82L	STA822	STA840
	Accuracy	**Calibrated Range**	**Calibration Qty**				
a. Accuracy and Calibration	Standard	Factory Std	Single Calibration	A	*	*	*
	Standard	Custom (Unit Data Required)	Single Calibration	B	*	*	*
	Standard	Custom (Unit Data Required)	Dual Calibration	C	*	*	*
	Standard	Custom (Unit Data Required)	Triple Calibration	D	*	*	*
	High Accuracy	Factory Std	Single Calibration	E	*	*	*
	High Accuracy	Custom (Unit Data Required)	Single Calibration	F	*	*	*
	High Accuracy	Custom (Unit Data Required)	Dual Calibration	G	s	s	s
	High Accuracy	Custom (Unit Data Required)	Triple Calibration	H	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 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 _ _	*	*	*
	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
	1/2 NPT 316 SS Certified Conduit Plug		_ _ A6	n	n	n
	M20 316 SS Certified Conduit Plug		_ _ A7	m	m	m
	Minifast® 4 pin (1/2 NPT) (not suitable for X-Proof applications)		_ _ A8	n	n	n
	Minifast® 4 pin (M20) (not suitable for X-Proof applications)		_ _ A9	m	m	m

TABLE VIII	OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,....)					
Certifications & Warranty	None - No additional options required	00	*	*	*	
	Low Temperature Rating (-50 deg C min. ambient operative temperature limit)	LT	w	w	w	
	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	
	Marine (DNV, ABS, BV, KR, LR)	MT	d	d	d	
	EN10204 Type 3.1 Material Traceability (FC33341)	FX	*	*	*	
	MID Approved Transmitter - Contact Tech Support for specific MID approved ranges	MD			v	
	Certificate of Conformance (F3391)	F3	*	*	*	b
	Calibration Test Report & Certificate of Conformance (F3399)	F1	*	*	*	
	Certificate of Origin (F0195)	F5	*	*	*	
	FMEDA (SIL 2/3) Certification (FC33337)	FE	j	j	j	
	Over-Pressure Leak Test Certificate (1.5X MAWP) (F3392)	TP	*	*	*	
	Cert Clean for O_2 or CL_2 service per ASTM G93	OX	e	e	e	
	PMI Certification[1]	PM	*	*	*	
	Extended Warranty Additional 1 year	01	*	*	*	b
	Extended Warranty Additional 2 years	02	*	*	*	
	Extended Warranty Additional 3 years	03	*	*	*	
	Extended Warranty Additional 4 years	04	*	*	*	
	Extended Warranty Additional 15 years	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	Ib	_ 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
u			Va	2 _ _
			VIa	C,D,G,H
v	IV a	C,D,G,H _ _	IVb	_ D,F _
w	Ib	_ 1 _ _ _ _	VIII	FE
b	Select Only one option from this group			

[1]The 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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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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