SmartLine

Honeywell

Technical Information

STG73SP SmartLine Flush Mount Gauge Pressure Specification 34-ST-03-128, November 2016

Introduction

Part of the SmartLine® family of products, the STG73SP is a gauge pressure transmitter with a flush mounted diaphragm. Installed using a 1" sleeve welded to the process piping the diaphragm face may be situated flush with the process piping wall. Typically applied to applications such as head boxes in pulp and paper mills, flush mounting eliminates the possibility of clogging. In addition the transmitter mounting facilitates rapid and trouble free replacement.

Best in Class Features:

- o Flush mounting design.
- o Accuracy up to 0.065 % of calibrated span
- o Stability up to 0.025% of URL per year for five years
- o Automatic temperature compensation
- o Rangeability up to 100:1
- o Response times as fast as 100ms
- o Easy to use and intuitive display capabilities
- o External zero, span, & configuration capability
- o Polarity insensitive electrical connections
- o On-board diagnostic capabilities
- o Integral Dual Seal design for safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- o Full compliance to SIL 2/3 requirements as a standard.
- o Modular design characteristics

Communications/Output Options:

- o HART ® (version 7.0)

Figure 1 – STG73SP Flush Mount Gauge Pressure Transmitters feature field-proven piezoresistive sensor technology

Span & Range Limits:

Model	URL/Max Span psig (barg)	LRL psig (barg)	Min Span	Turn down
STG73P	100 (7.0)	-14.7 (-1.0)	1 (0.07)	100:1

Description

The SmartLine family pressure transmitters are 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..

Indication/Display Option

Standard LCD Display Features

- Modular (may be added or removed in the field)
- Supports HART protocol variant
- 0, 90,180, & 270 degree position adjustments
- Configurable (HART only) and standard (Pa, KPa, MPa, KGcm2, Torr, ATM, inH_2O, mH_2O, bar, mbar, inHG, FTH_2O, mmH_2O, mm HG, & psi) measurement units.
- Supports Flow engineering units
- 2 Lines 6 digits PV (9.95H x 4.20W mm) 8 Characters
- Write protect Indication
- Built in Basic Device Configuration through Internal Buttons – Range/Engineering Unit/Loop Test /Loop Calibration/Zero /Span Setting

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**

System Integration

- SmartLine communications protocols all meet the most current published standards for HART.
- All ST 700 units are Experion tested to provide the highest level of compatibility assurance

Configuration Tools

External Two Button Configuration Option

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

Internal Two Button Configuration Option

The Standard display has two buttons that can be used for Basic configuration such as re ranging, PV Engineering unit setting, Zero/Span settings, Loop testing and calibration functions.

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

Field Device Manager (FDM) Software and FDM Express are also available for managing HART configurations.

Modular Design

To help contain maintenance & inventory costs, all ST 700 transmitters are modular in design supporting the user's ability to replace meter bodies, standard displays or electronic modules without affecting overall performance. Each meter body is uniquely characterized to provide in-tolerance performance over a wide range of application variations in temperature and pressure.

Modular Features

- Meter body replacement
- Add or remove standard displays
- Add or remove lightning protection (terminal connection)

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 five years)	Reference Accuracy[1,2] (% Span)
STG73SP	100 psi (7.0 bar)	-14.7 psi (-1.0 bar)	1.0 psi (0.07 bar)	100:1	0.025%	**0.065%**

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

Accuracy, Span and Temperature Effect: (conformance to +/-3 Sigma)

		Accuracy[1,2] (% of Span)				Combined Zero & Span Temperature Effect (% Span/50°F)	
Model	URL	For Turndowns Greater Then	A	B	C psi (bar)	D	E
STG73SP	100 psi (7.0 bar)	4:1	0.025	0.04	25 (1.7)	0.075	0.065
		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)	

Total Performance (% of Span):

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

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

STG73SP @20 psi: 0.405% of span

Typical Calibration Frequency:

Calibration verification is recommended every two (2) years

Notes:

1. Terminal Based Accuracy - Includes combined effects of linearity, hysteresis, and repeatability. Analog output adds 0 .006% of span.
2. For zero based spans and reference conditions of: 25°C (77°F), for LRV>= 0 psia, 10 to 55% RH.

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]	25±1	77±2	-15 to 65	5 to 149	-15 to 65	5 to 149	-55 to 75	-67 to 167
Process Interface Temperature	25±1	77±2	-15 to 65	5 to 149	-15 to 95[2]	5 to 203	N/A	N/A
Humidity %RH	10 to 55		0 to 100		0 to 100		0 to 100	
Vac. Region – Min. Pressure **mmHg absolute** **inH_2O absolute**	Atmospheric Atmospheric		300 150		2 (short term) [3] 1 (short term) [3]			
Supply Voltage	10.8 to 42.4 Vdc at terminals							
Load Resistance	0 to 1,440 ohms (as shown in Figure 2)							
Maximum Allowable Working Pressure (MAWP)[4, 5] (ST700 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency and transmitter materials of construction.)	STG73SP: 100 psi (7.0 bar)							

[1] LCD Display Storage temperature lower limit is -30˚C.

[2] Process temperatures above 65ºC (149ºF) require a 1:1 reduction in maximum ambient temperature.

[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

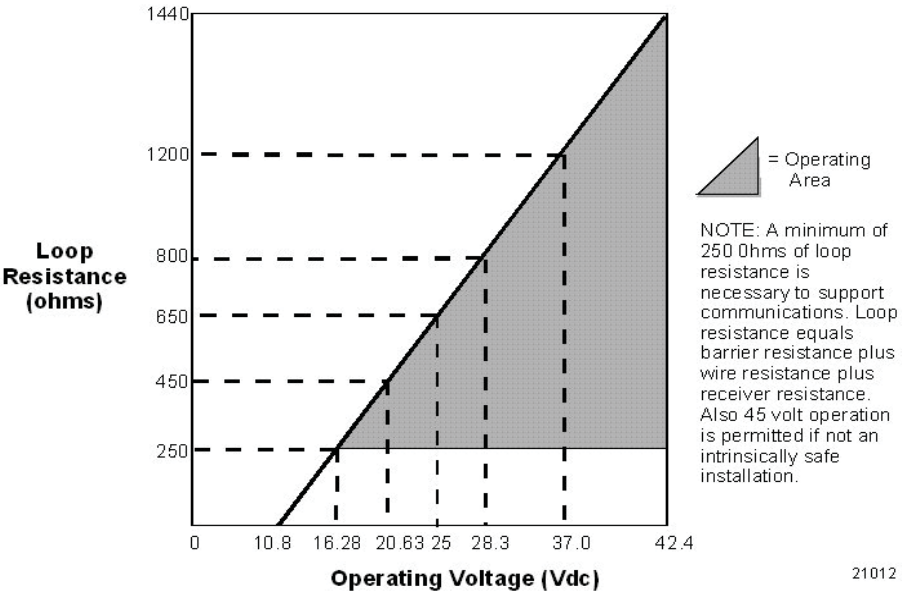

Figure 2 - Supply voltage and loop resistance chart & calculations

Performance Under Rated Conditions – All Models

Parameter	Description
Analog Output **Digital Communications**:	Two-wire, 4 to 20 mA HART 7 protocol
Output Failure Modes (configurable)	**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)**	2.5 sec
Response Time (delay + time constant)	100ms
Damping Time Constant	Adjustable from 0 to 32 seconds in 0.1 increments. **Default Value:** 0.5 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	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
Process Diaphragms (wetted)	Hastelloy ® C-276[2]
Meter Body Materials (wetted)	316L Stainless Steel
Process Seal	Viton® O-ring
Fill Fluid	Silicone oil 200
Mounting Bracket	Carbon Steel (Zinc-Chromate plated) or 304 Stainless Steel or 316 Stainless Steel. See Figures 4 & 5
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 Connection Type	**STG73SP:** Flush mount in 1” sleeve with O-ring and locking bolt.
Wiring	Accepts up to 16 AWG (1.5 mm diameter).
Dimensions	See Figure 3
Net Weight	**STG73SP:** 3.9 pounds (1.8 Kg) with Aluminum Housing

[2] Hastelloy® C-276 or UNS N10276

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)

Standard Diagnostics

ST 700 top level diagnostics are reported as either critical or non-critical and readable via the DD/DTM tools or integral display as shown

Critical Diagnostics

HART DD/DTM Tools	Standard Display
Electronic Module DAC Failure	Fault Comm El
Meter Body NVM Corrupt	Fault Mtrbody
Config. Data Corrupt	Fault Comm El
Electronic Module Diag Failure	Fault Comm El
Meter Body Critical Failure	Fault Mtrbody
Sensor Comms Timeout	Fault Mbd Com

Non-Critical Diagnostics

HART DD/DTM Tools
Display Failure
Electronic Module Comm Failure
Meter Body Excess Correct
Sensor Over Temperature
Fixed Current Mode
PV Out of Range
No Factory Calibration
LRV Set Error – Zero Config. Button
URV Set Error – Zero Config. Button
AO Out of Range
Loop Current Noise
Meter Body Unreliable Comm
No DAC Calibration
Sensor Supply Voltage Low

Refer to ST 700 manuals for additional level diagnostic information.

Approval Certifications:

AGENCY	TYPE OF PROTECTION	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; Class I, Zone 0/1, AEx d IIC Ga/Gb Class II, Zone 21, AEx tb IIIC Db T 95°C	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: Class I, Zone 0, AEx ia IIC Ga		T4: -50 °C to 70°C
	Nonincendive: Class I, Division 2, Groups A, B, C, D Class I, Zone 2, AEx nA IIC Gc	Note 1	T4: -50 °C to 85°C
	Enclosure: Type 4X/ IP66/ IP67	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; Ex d IIC Ga Ex tb IIIC Db T 95°C	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; Ex ia IIC Ga		T4: -50 °C to 70°C
	Nonincendive: Class I, Division 2, Groups A, B, C, D; T4 Ex nA IIC Gc	Note 1	T4: -50 °C to 85°C
	Enclosure: Type 4X/ IP66/ IP67	All	-
ATEX	**Flameproof:** II 1/2 G Ex d IIC Ga/Gb II 2 D Ex tb IIIC Db T 95°C	Note 1	T5: -50 °C to 85°C T6: -50 °C to 65°C
	Intrinsically Safe: II 1 G Ex ia IIC Ga		T4: 50 °C to 70°C
	Nonincendive: II 3 G Ex nA IIC Gc	Note 1	T4: -50 °C to 85°C
	Enclosure: IP66/ IP67	All	-

Approval Certifications: (Continued)

IECEx (World)	**Flameproof :** Ex d IIC Ga/Gb Ex tb IIIC Db T 95ºC	Note 1	T5: -50 ºC to 85ºC T6: -50 ºC to 65ºC
	Intrinsically Safe: Ex ia IIC Ga		T4: -50 ºC to 70ºC
	Nonincendive: Ex nA IIC Gc	Note 1	T4: -50 ºC to 85ºC
	Enclosure: IP66/ IP67	All	-
NEPSI (China)	**Flameproof:** Ex d IIC Ga/Gb Ex tb IIIC Db T 85ºC	Note 1	T5: -50 ºC to 85ºC T6: -50 ºC to 65ºC
	Intrinsically Safe: Ex ia IIC Ga		T4: -50 ºC to 70ºC
	Nonincendive: Ex nA IIC Gc	Note 1	T4: -50 ºC to 85ºC
	Enclosure : IP 66/67	All	-

Notes:

1. Operating Parameters:
   Voltage= 11 to 42 V DC Current= 4-20 mA Normal

Other Certification Options

Materials

o NACE MRO175, MRO103, ISO15156

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.

Dimension (Inline Design)

Reference Dimensions: millimeters / inches

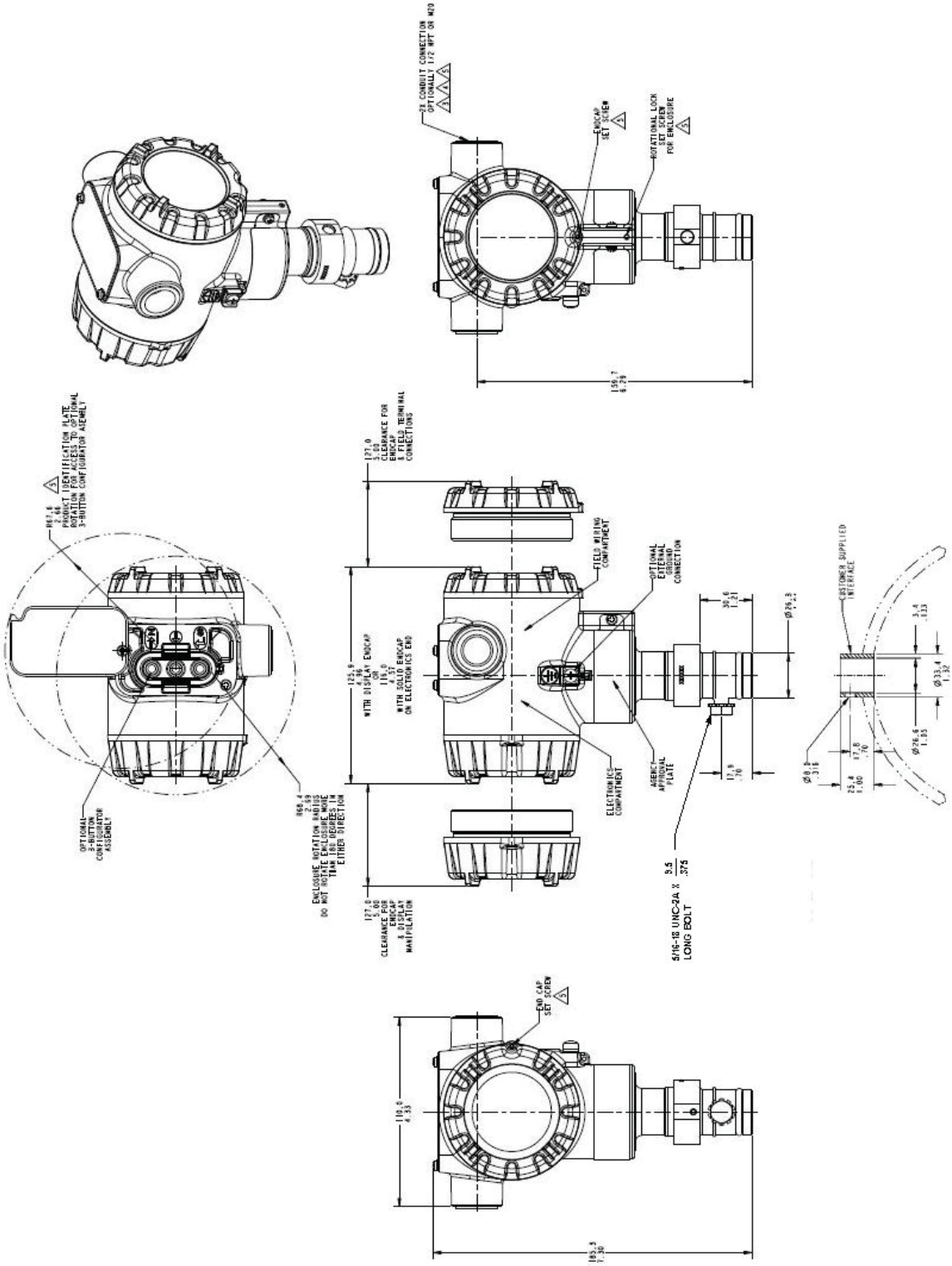

Figure 3 Typical dimensions of STG73SP

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 STG73SP
Flush Mount Pressure Transmitter

Model Selection Guide
34-ST-16-125 Issue 1

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
STG73SP	- _ _ _ _ _ _	-	_	- _	-	_ _ _	- _ _ _	- _	- _ _ _ _	- _ _, _ _, _ _	- 0 0 0 0

KEY NUMBER	URL/Max Span	LRL	Min Span	Units	Selection	Availability
Flush Mount	100 (7.0)	-14.7 (-1.0)	1.0 (0.07)	psi (bar)	STG73SP	↓

TABLE I	METER BODY SELECTIONS			
a. Process Interface & Diaphragm	Process Interface Material: 316L Stainless Steel	Barrier Diaphragm Material: Hastelloy® C - 276[1]	F _ _ _ _ _	*
b. Fill Fluid	Silicone 200		_ 1 _ _ _ _	*
c. Process Connection	1" Slip in with locking screw (sleeve optional see table VIII)		_ _ 1 _ _ _	*
d. Bolt/Nuts	None		_ _ _ 0 _ _	*
e. Vent/Drain	None		_ _ _ _ 0 _	*
f. Gasket/Seal	Viton O-ring		_ _ _ _ _ B	*

[1] Hastelloy® C-276 or UNS N10276

TABLE II	Meter Body & Connection Orientation		
Head/Connect Orientation	None	0	*

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	*
	NEPSI Explosion proof, Intrinsically Safe & Non-incendive	G	*

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	_ H _	*
	4-20mA dc		HART Protocol		
c. Customer Interface Selections	Indicator	Ext Zero,Span & Config Buttons	Languages		
	None	None	None	_ _ 0	*
	None	Yes (Zero/Span Only)	None	_ _ A	*
	Standard(w/Internal Zero,Span & Config Buttons)	None	EN	_ _ S	*
	Standard(w/Internal Zero,Span & Config Buttons)	Yes	EN	_ _ T	*

TABLE V	CONFIGURATION SELECTIONS			STG73SP →
a. Application Software	Diagnostics			
	Standard Diagnostics			1 _ _ *
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 _ *
	Disabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 2 _ *
	Enabled	High> 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 3 _ *
	Enabled	Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	_ 4 _ *
c. General Configuration	General Configuration			
	Factory Standard			_ _ S *
	Custom Configuration (Unit Data Required from customer)			_ _ C *

[3] NAMUR Output Limits are configurable by customer

TABLE VI	CALIBRATION & ACCURACY SELECTIONS			
a. Accuracy and Calibration	Accuracy	Calibrated Range	Calibration Qty	
	Standard	Factory Standard	Single Calibration	A *
	Standard	Custom (Unit Data Required)	Single Calibration	B *

TABLE VII	ACCESSORY SELECTIONS	
a. Mounting Bracket	None(Not required with Flush Mount Unit)	0 _ _ _ *
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	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

TABLE VIII	OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,....)		
Certifications & Warranty	No additional options	00 *	
	NACE MR0175; MR0103; ISO15156 Process wetted parts only	FG *	b
	NACE MR0175; MR0103; ISO15156 Process wetted and non-wetted parts	F7 *	
	EN10204 Type 3.1 Material Traceability	FX *	
	Certificate of Conformance	F3 *	b
	Calibration Test Report & Certificate of Conformance	F1 *	
	Certificate of Origin	F5 *	
	FMEDA TUV (SIL 2/3) Certification	FE j	
	Calibration Fixture (w/1/4" NPT port)	CF *	
	PM Certification[4]	PM *	
	316L Stainless 1" Mounting Sleeve (requires customer installation to process piping)	MS *	
	Extended Warranty Additional 1 year	01 *	
	Extended Warranty Additional 2 years	02 *	b
	Extended Warranty Additional 3 years	03 *	
	Extended Warranty Additional 4 years	04 *	

TABLE IX	Manufacturing Specials	
Factory	Factory Identification	0 0 0 0 *

RESTRICTIONS

Restriction Letter	Available Only with		Not Available with	
	Table	Selection(s)	Table	Selection(s)
j			Vb	_ 1,2_
m	IV a	B,D,F,H _ _		
n	IV a	A,C,E,G _ _		
b	Select Only one option from this group			

[4] 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 STG and STA in-line construction pressure transmitters.

FIELD INSTALLABLE ACCESSORY KITS

Description	Kit Number
Terminal Strip w/Lightning Protection Kit for HART Module	50129832-501
Terminal Strip w/o Lightning Protection for HART Module	50129832-502
HART Electronics Module	50129828-501
HART Electronics Module w/connection for external configuration buttons	50129828-502
Standard Display Module	50126003-501

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
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