

STF700 SmartLine Flange Mounted Level Specification 34-ST-03-123, November 2016



Introduction

Part of the SmartLine® family of products, the STF700 is suitable for monitoring, control and data acquisition. STF700 products feature 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:

- Accuracies up to 0.065% standard
- Stability up to 0.025% of URL per year for five years
- Automatic static pressure & temperature compensation
- Rangeability up to 100:1
- Response times as fast as 100ms
- Easy to use and intuitive display capabilities
- Intuitive External zero, span, & configuration capability
- On-board diagnostic capabilities
- Integral Dual Seal design for highest safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- World class overpressure protection
- Full compliance to SIL 2/3 requirements.

Communications/Output Options:

- HART® (version 7.0)



Figure 1 – STF700 Flanged Level Transmitters feature field-proven piezoresistive sensor technology

Span & Range Limits:

| Model | URL "H ₂ O (mbar) | LRL "H ₂ O (mbar) | Max Span "H ₂ O (mbar) | Min Span "H ₂ O (mbar) |
|--------|------------------------------------|------------------------------------|---|---|
| STF725 | 400 (1000) | -400 (-1000) | 400 (1000) | 4.0 (10.0) |
| STF72P | 400 (1000) | -400 (-1000) | 400 (1000) | 4.0 (10.0) |
| Model | psi (bar) | psi (bar) | psi (bar) | psi (bar) |
| STF735 | 100 (7.0) | -100 (-7.0) | 100 (7.0) | 1 (0.07) |
| STF73P | 100 (7.0) | -100 (-7.0) | 100 (7.0) | 1 (0.07) |

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, mH₂O, bar, mbar, inH₂O, inHG, FTH₂O, mmH₂O, mm HG, & psi) measurement units.
- Supports Flow engineering units
- 2 Lines 6 digits PV (9.95H x 4.20W mm) 8 Characters
- Square root output indication ($\sqrt{\quad}$) and Write protect Indication
- Built in Basic Device Configuration through Internal or External 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 Three 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 three 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)

Table 1

| Model | URL | LRL | Min Span | Maximum Turndown Ratio | Stability (%URL/Year for five years) | Reference Accuracy ^{1,2} (% Span) |
|--------|----------------------------------|------------------------------------|--------------------------------|------------------------|--------------------------------------|--|
| STF725 | 400 in H ₂ O/1000mbar | -400 in H ₂ O/-1000mbar | 4 in H ₂ O/10.0mbar | 100:1 | 0.025% | 0.065% |
| STF72P | 400 in H ₂ O/1000mbar | -400 in H ₂ O/-1000mbar | 4 in H ₂ O/10.0mbar | 100:1 | 0.025% | 0.065% |
| STF735 | 100 psi/7.0 bar | -100 psi/-7.0 bar | 1 psi/0.07 bar | 100:1 | 0.03% | 0.065% |
| STF73P | 100 psi/7.0 bar | -100 psi/-7.0 bar | 1 psi/0.07 bar | 100:1 | 0.03% | 0.065% |

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

Accuracy, Span, Temperature and Static Pressure Effect: (Conformance to +/-3 Sigma)

Table 2

| Model | URL | Turn down greater than | Accuracy ^{1,2} (% of Span) | | | Temperature Effect (% Span/50°F) | | Static Line Pressure Effect (% Span/300psi) | |
|--------|------------------------------------|------------------------|--|--------|-------------------|--|-------|--|--------|
| | | | A | B | C (see URL Units) | D | E | F | G |
| STF725 | 400 in H ₂ O(1000mbar) | 16:1 | 0.0125 | 0.0575 | 25 (62.5) | 0.280 | 0.045 | 0.110 | 0.0125 |
| STF72P | 400 in H ₂ O (1000mbar) | | | | | 0.055 | 0.025 | 0.030 | 0.007 |
| Model | URL | Turn down greater than | A | B | C (see URL Units) | D | E | F | G |
| STF735 | 100 psi (7.0 bar) | 4:1 | 0.0125 | 0.0575 | 25 (1.7) | 0.080 | 0.080 | 0.110 | 0.0125 |
| STF73P | 100 psi (7.0 bar) | | | | | 0.070 | 0.015 | 0.032 | 0.005 |
| | | | Turn Down Effect $\pm \left[A + B \left(\frac{C}{\text{Span}} \right) \right]$ % Span | | | Temp Effect $\pm \left[D + E \left(\frac{\text{URL}}{\text{Span}} \right) \right]$ % Span per 28°C (50°F) | | Static Effect $\pm \left[F + G \left(\frac{\text{URL}}{\text{Span}} \right) \right]$ % Span per 300 psi | |

Total Performance (% of Span):

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

Total Performance Examples: (5:1 Turndown, up to 50 °F shift & up to 300 psi Static Pressure)

STF725 @ 80" H₂O: 0.538

STF735 @ 20 psi: 0.514

STF72P @ 80" H₂O: 0.202

STF73P @ 20 psi: 0.169

Typical Calibration Frequency:

Calibration verification is recommended every two (2) years

Notes:

1. Terminal Based Accuracy – Includes effects of linearity, hysteresis and repeatability. Analog output adds 0.006% of span
2. For zero based spans and reference conditions of 25°C, 0 psig static pressure, 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 | 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 | 25±1 | 77±2 | -40 to 110 | -40 to 230 | -40 to 125 | -40 to 257 | -55 to 120 | -67 to 248 |
| Process Interface Temp. STF725, STF735 only | 25±1 | 77±2 | -40 to 110 | -40 to 230 | -40 to 175 ¹ | -40 to 350 ¹ | -55 to 125 | -67 to 257 |
| Humidity %RH | 10 to 55 | | 0 to 100 | | 0 to 100 | | 0 to 100 | |
| Minimum Pressure mmHg absolute inH ₂ O absolute | atmospheric atmospheric | | 25 13 | | 2 (short term ²) 1 (short term ²) | | | |
| Supply Voltage Load Resistance | 10.8 to 42.4 Vdc at terminals 0 to 1,440 ohms (as shown in Figure 2) | | | | | | | |

¹ For CTFE fill fluid, the maximum temperature rating is 150°C (300°F)

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

Maximum Allowable Working Pressure (MAWP) ^{4,5}

(ST 700 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency and transmitter materials of construction.)

| STF725 & STF735 | Flange Material | Ambient Temperature -29 to 38°C [-20 to 100°F] | Max Meterbody Temperature 125°C [257°F] | Process Interface Temperature 175°C [350°F] |
|--|----------------------|--|--|--|
| ANSI Class 150 psi [bar] | Carbon Steel | 285 [19.6] | 245 [16.9] | 215 [14.8] |
| | 304 S.S. | 275 [19.0] | 218 [15.0] | 198 [13.7] |
| | 316 S.S. | 275 [19.0] | 225 [15.5] | 205 [14.1] |
| ANSI Class 300 psi [bar] | Carbon Steel | 740 [51.0] | 668 [46.0] | 645 [44.5] |
| | 304 S.S. | 720 [49.6] | 570 [39.3] | 518 [35.7] |
| | 316 S.S. | 720 [49.6] | 590 [40.7] | 538 [37.1] |
| DN PN40 psi [bar] | Carbon Steel | 580 [40.0] ³ | 574 [39.6] | 559 [38.5] |
| | 304 S.S. | 534 [36.8] ³ | 419 [28.9] | 385 [26.5] |
| | 316 S.S. | 534 [36.8] ³ | 434 [29.9] | 399 [27.5] |
| STF72P & STF73P ANSI Class 150 psi [bar] | 316L Stainless Steel | 230 [15.9] | 185 [12.8] | No rating at this temp |

³ Ambient Temperature for DN PN40 is -10 to 50°C [14 to 122 F]

⁴ MAWP applies for temperature range -40 to 125°C. However, Static Pressure Limit is de-rated to 3,000 psi from -26°C to -40°C.

⁵ Consult factory for MAWP of ST 700 transmitters with CSA approval.

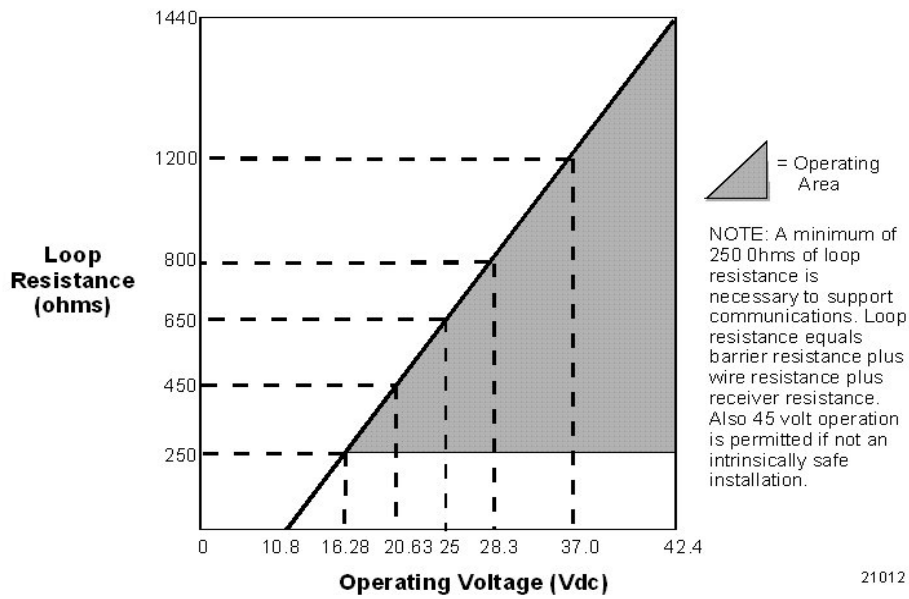


Figure 2 - Supply voltage and loop resistance chart & calculations

Performance Under Rated Conditions – All Models

| Parameter | Description | | | | | | | | | |
|--|---|--------------------------------|----------------------------|--------------------------------|-----------------------|---------------|---------------|----------------------|------------------------|------------------------|
| Analog Output | Two-wire, 4 to 20 mA | | | | | | | | | |
| Digital Communications: | Honeywell HART 7 protocol | | | | | | | | | |
| Output Failure Modes | <table border="0"> <tr> <td></td> <td style="text-align: center;">Honeywell Standard:</td> <td style="text-align: center;">NAMUR NE 43 Compliance:</td> </tr> <tr> <td>Normal Limits:</td> <td style="text-align: center;">3.8 – 20.8 mA</td> <td style="text-align: center;">3.8 – 20.5 mA</td> </tr> <tr> <td>Failure Mode:</td> <td style="text-align: center;">≤ 3.6 mA and ≥ 21.0 mA</td> <td style="text-align: center;">≤ 3.6 mA and ≥ 21.0 mA</td> </tr> </table> | | 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 |
| | 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: 0.50 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 |
|---|---|
| Barrier Diaphragms Material | 316L SS, Hastelloy® C-276 ² |
| Process Head Material | 316 SS ⁴ , Carbon Steel (Zinc-plated) ⁵ , Hastelloy® C-276 ⁶ |
| Vent/Drain Valves & Plugs ¹ | 316 SS ⁴ , Hastelloy® C-276 ² |
| Gasket Ring Material (Wetted) | 316/316L SS, Hastelloy® C-276 ^{*2} |
| Extension Tube Material | 316 SS ⁴ |
| Head Gaskets | Glass-filled PTFE standard. Viton® optional. |
| Meter Body Bolting | Carbon Steel (Zinc plated) standard. Options include 316 SS, NACE A286 SS bolts. |
| Optional Adapter Flange and Bolts | Adapter Flange materials include 316 SS ⁴ , Hastelloy® C-276 ⁶ Bolt material for flanges is dependent on process head bolts material chosen. Standard adaptor seal material is glass-filled PTFE. Viton optional. |
| Mounting Flange STF725, STF735 STF72P, STF73P | Flush or Extended Diaphragm: Zinc Chromate plated Carbon Steel ⁵ , 304 SS, or 316 SS ⁴ . 316L SS (<i>NOTE: Mounting Flange is process wetted.</i>) |
| Fill Fluid | Silicone 200, CTFE |
| Electronic Housing | Pure Polyester Powder Coated Low Copper (<0.4%)-Aluminum. Meets NEMA 4X, IP66, & P67. All stainless steel housing is optional. |
| Mounting | See Figure 3 for typical flange mounting arrangement. |
| Process Connections All Models STF725, STF735 STF72P, STF73P | Process Head: 1/4-inch NPT; 1/2-inch NPT with adapter and DIN, standard options. Flange: 2, 3 or 4-inch Class 150 or 300 ANSI; DN50-PN40, DN80-PN40 or DN100-PN40 DIN flange. Extended Diaphragm: 2, 4, or 6 inches (50, 101, 152 mm) long. 2 or 3-inch, Class 150 ANSI flange. |
| Wiring | Accepts up to 16 AWG (1.5 mm diameter). |
| Dimensions | See Figure 4 , Figure 5 & Figure 6 |
| Net Weight | STF72P, STF73P: 14-19 pounds (6.4 - 8.7Kg) with Aluminum Housing STF725, STF735: 18-32 pounds (8.2 - 14.5Kg) with Aluminum Housing |

¹ Vent/Drains are sealed with Teflon®² Hastelloy® C-276 or UNS N10276⁴ 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

* Flush design only.

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 below.

Critical Diagnostics

| HART DD/DTM Tools | Standard Display |
|--------------------------------|------------------|
| Electronic Module DAC Failure | Fault Comm EI |
| Meter Body NVM Corrupt | Fault Mtrbody |
| Config. Data Corrupt | Fault Comm EI |
| Electronic Module Diag Failure | Fault Comm EI |
| 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 95°C | Note 1 | T5: -50 °C to 85°C T6: -50 °C to 65°C |
| | Intrinsically Safe: Ex ia IIC Ga | | T4: -50 °C to 70°C |
| | Nonincendive: Ex nA IIC Gc | Note 1 | T4: -50 °C to 85°C |
| | Enclosure: IP66/ IP67 | All | - |
| NEPSI (China) | Flameproof: Ex d IIC Ga/Gb Ex tb IIIC Db T 85°C | Note 1 | T5: -50 °C to 85°C T6: -50 °C to 65°C |
| | Intrinsically Safe: Ex ia IIC Ga | | T4: -50 °C to 70°C |
| | Nonincendive: Ex nA IIC Gc | Note 1 | T4: -50 °C to 85°C |
| | Enclosure : IP 66/67 | All | - |

Notes:

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

Other Certification Options**Materials**

- 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. |
|------------------------------|---|

Dimensional Drawings

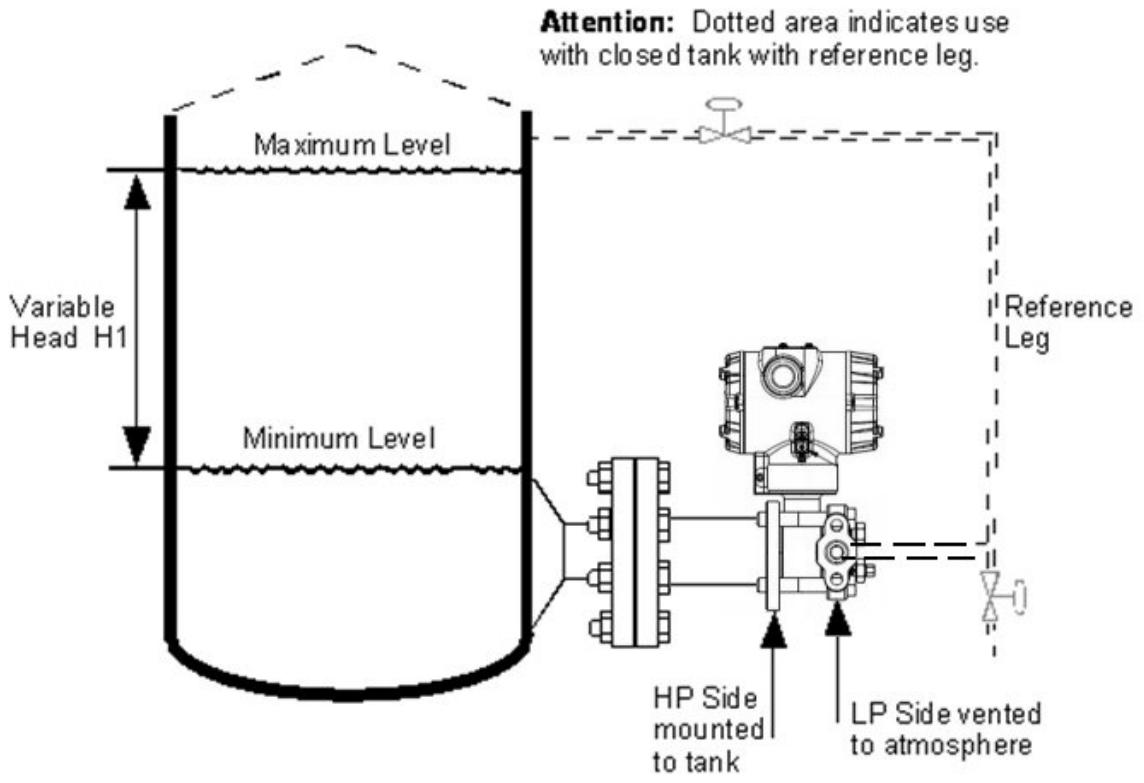


Figure 3 – Typical mounting for flange mounted level transmitter

Dimensional Drawings (con't)

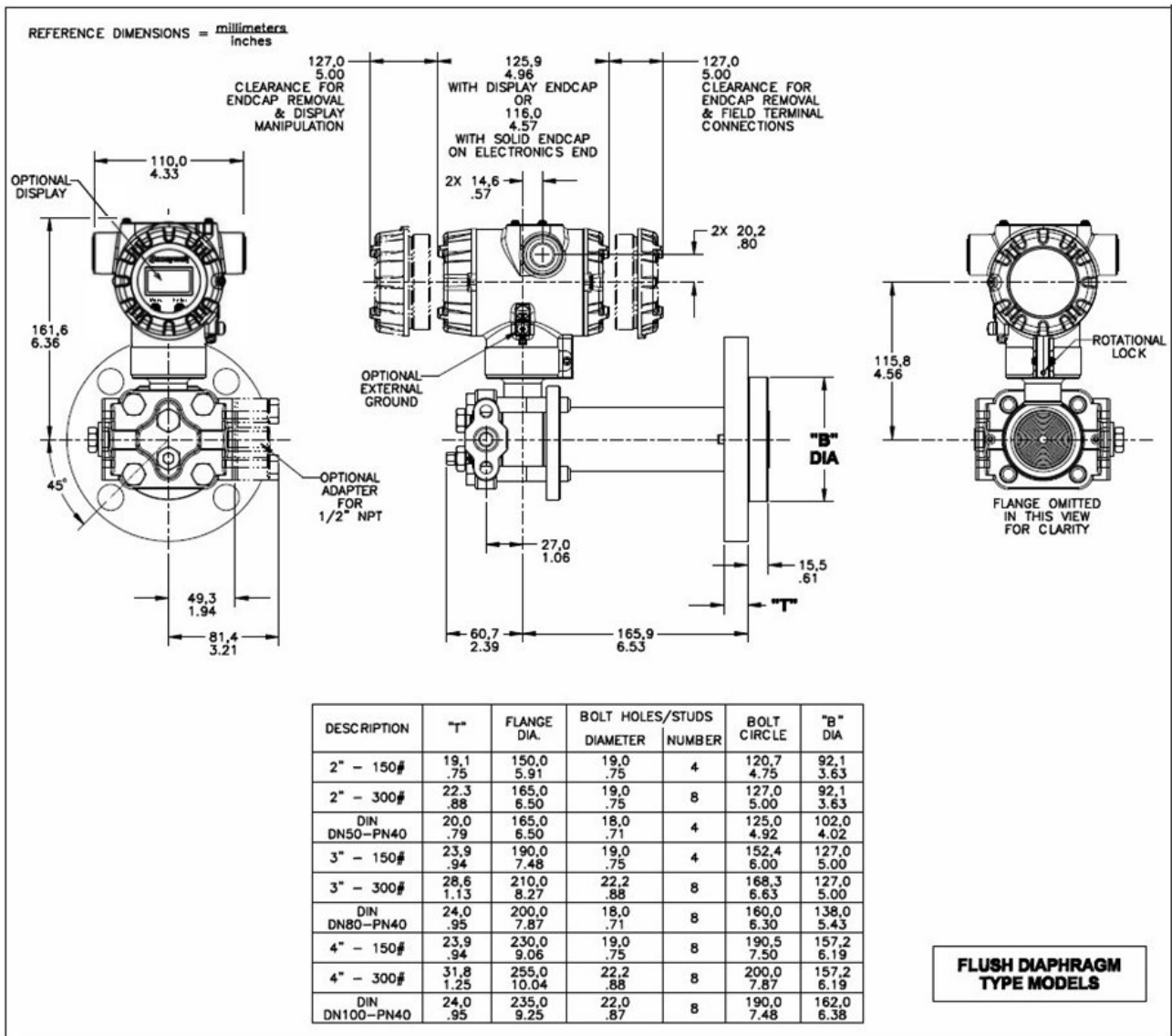


Figure 4 – Typical mounting dimensions for flush diaphragm type models STF725 and STF735.

Dimensional Drawings (con't)

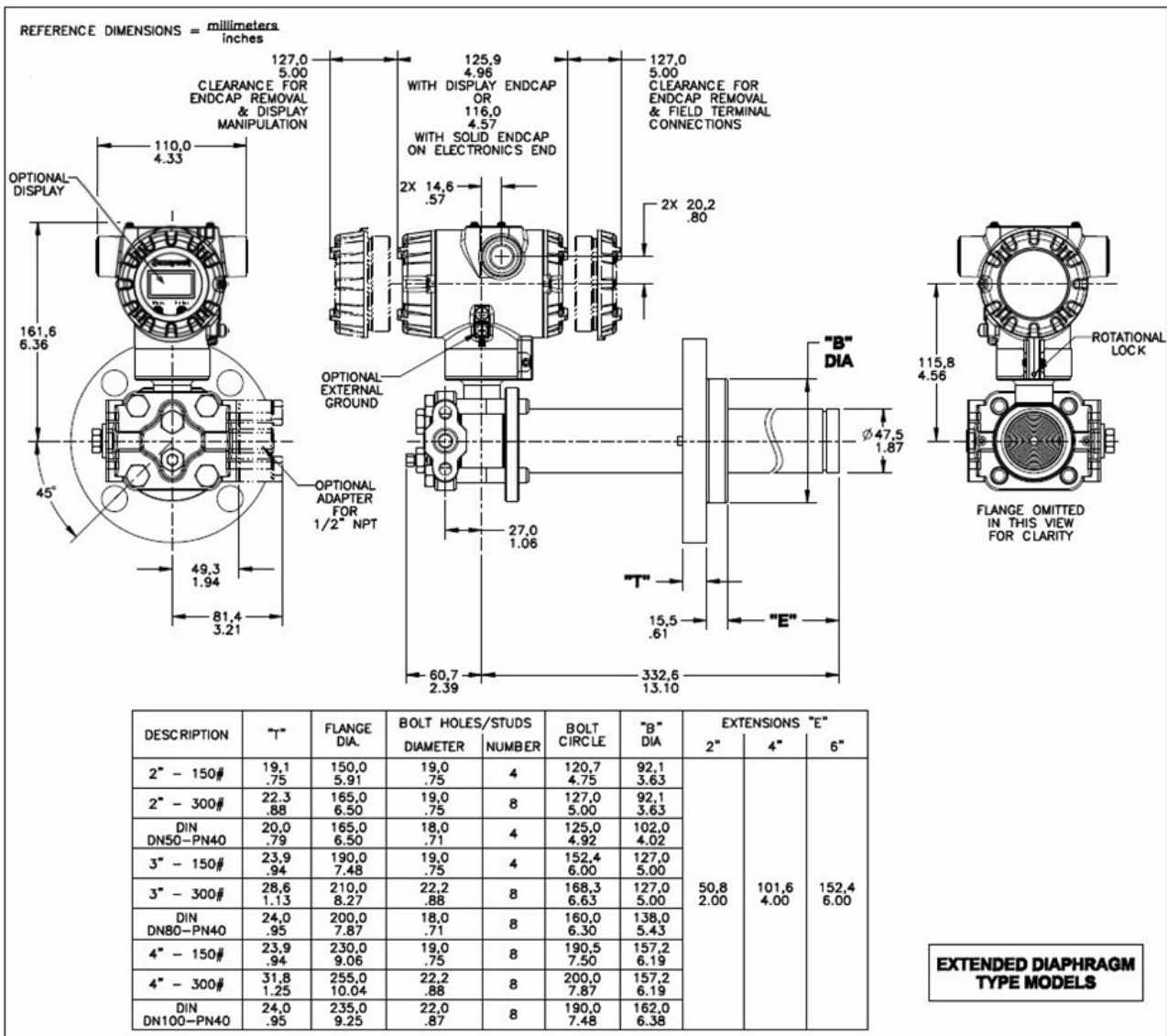


Figure 5 – Typical mounting dimensions for extended diaphragm type models STF725 and STF735.

Dimensional Drawings (con't)

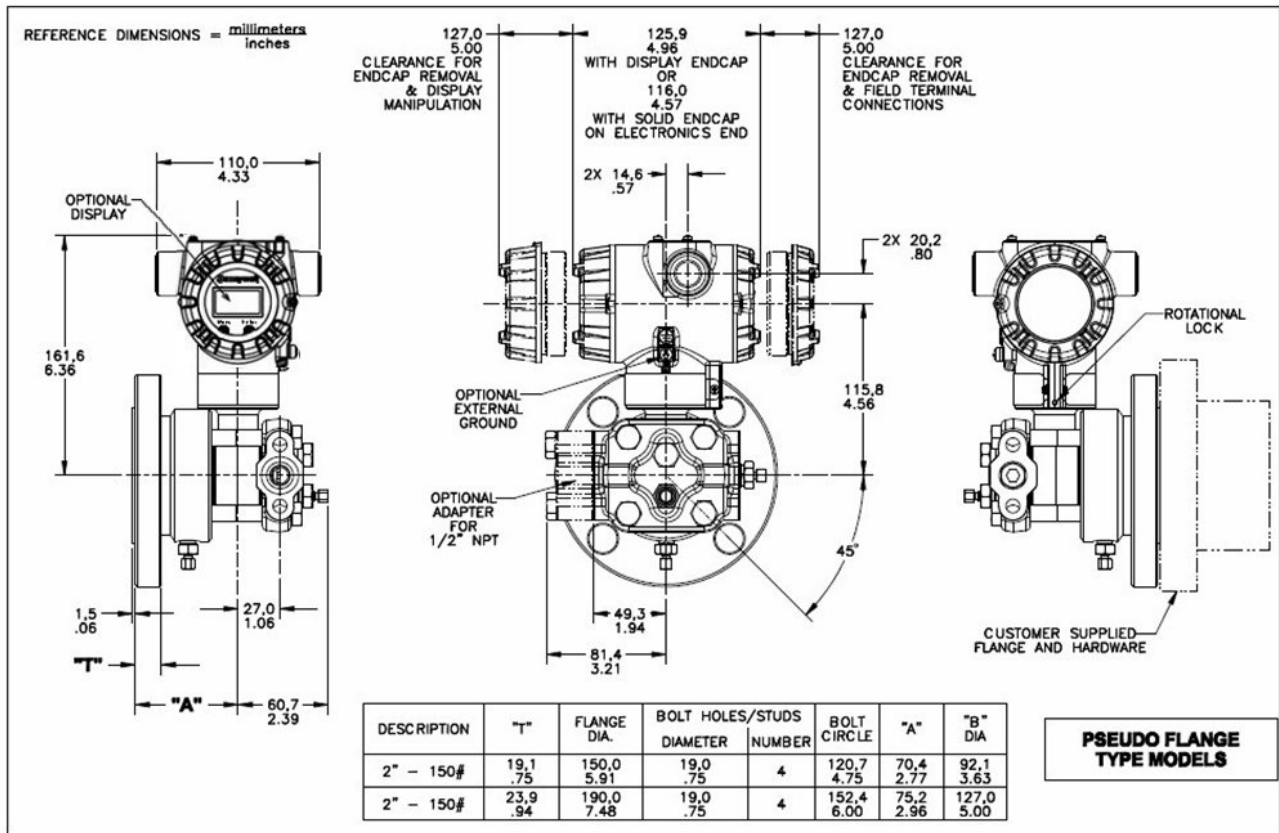


Figure 6 – Typical mounting dimensions for pseudo flange type models STF72P and STF73P

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 STF700 Flange Mounted Liquid Level Transmitter

Model Selection Guide
34-ST-16-123 Issue 1

Instructions

- Select the desired Key Number. The arrow to the right marks the selection available.
- Make one selection from each Table (I, II and IX) using the column below the proper arrow.
- A(●) denotes unrestricted availability. A letter denotes restricted availability.
- Restrictions follow Table IX.

Key Number I II III IV V VI VII VIII IX

STF7 ___ - [] - [] - [] - [] - [] - [] - [] - [] + [] [] [] []

| KEY NUMBER | URL | LRL | Max Span | Min Span | Units | Selection | Availability |
|--------------------|------------|--------------|------------|----------|---------------------------|-----------|--------------|
| Measurement | 400 (1000) | -400 (-1000) | 400 (1000) | 4 (10) | " H ₂ O (mbar) | STF725 | ↓ |
| | 100 (7) | -100 (-7) | 100 (7) | 1 (0.07) | psi (bar) | STF735 | ↓ |
| Range Std Accuracy | 400 (1000) | -400 (-1000) | 400 (1000) | 1 (2.5) | " H ₂ O (mbar) | STF72P | ↓ |
| | 100 (7) | -100 (-7) | 100 (7) | 1 (0.07) | psi (bar) | STF73P | ↓ |

| TABLE I | Materials of Construction | Design | Ref. Head | Vent Drain Valve on Ref. Head ² | Barrier Diaphragm. (wetted) | Diaphragm. Plate (wetted) | Extension (wetted) | Sel. | | | |
|----------------------------|---|----------------------|--|---|-----------------------------|---------------------------|--------------------|------|---|---|--|
| Meter Body & Flange Design | a. Process Wetted Heads & Diaphragm Materials | Flush | Carbon ¹ Steel | 316 SS | 316L SS | 316L SS | N/A | A | • | | |
| | | | 316 SS ⁵ | | Hast C ³ | 316L SS | | W | • | | |
| | | | Hast C ^{3,6} | | Hast C ³ | Hast C ³ | | B | • | | |
| | | Extended | Carbon ¹ Steel | 316 SS | 316L SS | 316L SS | 316L SS | E | • | | |
| | | | 316 SS ⁵ | | Hast C ³ | 316L SS | | X | • | | |
| | | | Hast C ^{3,6} | | Hast C ³ | Hast C ³ | | F | • | | |
| | | Pseudo Flange | Carbon ¹ Steel | 316 SS | 316L SS | 316L SS | N/A | N/A | J | • | |
| | | | 316 SS ⁵ | | Hast C ³ | Hast C ³ | | | M | • | |
| | | | | | 316L SS | 316L SS | | | N | • | |
| | | | Hast C ³ | | Hast C ³ | R | | | • | | |
| | b. Fill Fluid (Meter Body & Flange) | | | Silicone Oil 200 | | | | 1 | • | | |
| | | | | Fluorinated Oil CTFE | | | | 2 | • | | |
| | c. Process Connection | Reference Head | | 1/4 NPT | | Flange | | Sel. | | | |
| | | | | | | High Pressure Side | | A | • | | |
| | | | | | | Low Pressure Side | | C | • | | |
| | d. Bolts for Process Heads | Carbon Steel Bolts | | 1/2 NPT Adapter - material matches head material and head bolt material ¹¹ | | High Pressure Side | | H | • | | |
| | | 316 SS Bolts | | | | Low Pressure Side | | K | • | | |
| | | A286 SS (NACE) Bolts | | | | | | C | • | | |
| | e. Vent/Drain Type/Location | Ref. Head Type | Vent Type | Location | Vent Material | | Sel. | | | | |
| | | Single Ended | None | None | None | | 1 | • | • | | |
| Single Ended | | Std | Side | Matches Head Material ¹¹ | | 2 | • | • | | | |
| Single Ended | | Ctr | Side | Stainless Steel Only | | 3 | t | t | | | |
| Dual Ended | | Std | End | Matches Head Material ¹¹ | | 4 | • | • | | | |
| Dual Ended | | Cnr | End | Stainless Steel Only | | 5 | t | t | | | |
| Dual Ended | | Vent/Plug | Side/End | Matches Head Material ¹¹ | | 6 | • | • | | | |
| f. Gasket Material | | | Teflon [®] or PTFE (Glass Filled) | | | | A | • | | | |
| | | | Viton [®] or Fluorocarbon Elastomer | | | | B | • | | | |

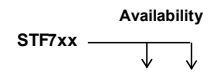
¹ Carbon Steel heads are zinc-plated and not recommended for water service due to hydrogen migration. For that service, use the 316 stainless steel Wetted Reference Head.
² Vent/Drains are Teflon or PTFE coated for lubricity.
³ Hastelloy[®] C-276 or UNS N10276
⁴ Supplied as 316 SS or as Grade CF8M, the casting equivalent of 316 SS.
⁵ Supplied as indicated or as Grade CW12MW, the casting equivalent of Hastelloy[®] C-276
¹¹ Except Carbon Steel Heads shall use 316SS Vent/Drain, Flugs & Adapters when required

| TABLE II | | Flange Material | Threaded Nut Ring Material | Selection | Availability | | |
|--------------------------------------|--|------------------------|------------------------------|------------------------------|--------------|----|--|
| | | | | | 25 | 2P | |
| | | | | | 35 | 3P | |
| Flange Assembly | a. Flange (ANSI Flanges have 125-500 AARH Surface Finish) | 3" ANSI Class 150 | Carbon Steel (non-wetted) | Carbon Steel (non-wetted) | 1__ | • | |
| | | 3" ANSI Class 300 | | | 2__ | • | |
| | | DN80-PN40 DIN | | | 3__ | • | |
| | | 4" ANSI Class 150 | | | 4__ | • | |
| | | 4" ANSI Class 300 | | | 5__ | • | |
| | | DN100-PN40 DIN | | | 6__ | • | |
| | | 2" ANSI Class 150 | | | 7__ | • | |
| | | 2" ANSI Class 300 | | | 8__ | • | |
| | | DN50-PN40 DIN | | | 9__ | • | |
| | 3" ANSI Class 150 | 304 SS (non-wetted) | 304 SS (non-wetted) | A__ | • | | |
| | 3" ANSI Class 300 | | | B__ | • | | |
| | DN80-PN40 DIN | | | C__ | • | | |
| | 4" ANSI Class 150 | | | D__ | • | | |
| | 4" ANSI Class 300 | | | E__ | • | | |
| | DN100-PN40 DIN | | | F__ | • | | |
| 2" ANSI Class 150 | Q__ | | | • | | | |
| 2" ANSI Class 300 | U__ | | | • | | | |
| DN50-PN40 DIN | V__ | | | • | | | |
| 3" ANSI Class 150 | 316 SS (non-wetted) | 304 SS (non-wetted) | H__ | • | | | |
| 3" ANSI Class 300 | | | J__ | • | | | |
| DN80-PN40 DIN | | | K__ | • | | | |
| 4" ANSI Class 150 | | | L__ | • | | | |
| 4" ANSI Class 300 | | | M__ | • | | | |
| DN100-PN40 DIN | | | N__ | • | | | |
| 2" ANSI Class 150 | | | W__ | • | | | |
| 2" ANSI Class 300 | | | X__ | • | | | |
| DN50-PN40 DIN | | | Z__ | • | | | |
| Pseudo Flange on Standard DP | | | | Sel. | | | |
| 2" ANSI Class 150 without Vent/Drain | | 316L SS (wetted) | Not Applicable | S__ | | • | |
| 2" ANSI Class 150 with Vent/Drain | | | | T__ | | • | |
| 3" ANSI Class 150 without Vent/Drain | | | | P__ | | • | |
| 3" ANSI Class 150 with Vent/Drain | | | | R__ | | • | |
| b. Gasket Ring (wetted) | No Selection | | | _0_ | | • | |
| | Flush Design | | 316L SS | _1_ | s | | |
| | Extended Design | | Hastelloy® C ³ | _2_ | s | | |
| c. Extension (wetted) | | | 316L SS | _5_ | v | | |
| | No Selection | | | _0_ | | • | |
| | Flush | | | _F_ | w | | |
| | Diameter | | Length | Sel. | | | |
| | 1.87 Inches (for 2", 3" or 4" spud) ¹³ | | 2 inches | _C_ | v | | |
| | | 4 inches | _D_ | v | | | |
| | | 6 inches | _E_ | v | | | |

³ Hastelloy® C-276 or UNS N10276

¹³ For part numbers and pricing information on Tank Spuds refer to page ST-91 (Supplementary Accessories & Kits).

| TABLE III | Agency Approvals (see data sheet for Approval Code Details) | Selection | | |
|-----------|---|-----------|---|---|
| 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 | | | | Selection | 25 35 | 2P 3P |
|--|---|---------------------------------|----------------------|-----------|----------|----------|
| a. Electronic Housing Material & Connection Type | Material | Connection | Lightning Protection | | | |
| | Polyester Powder Coated Aluminum | 1/2 NPT | None | A__ | * | * |
| | Polyester Powder Coated Aluminum | M20 | None | B__ | * | * |
| | Polyester Powder Coated Aluminum | 1/2 NPT | Yes | C__ | * | * |
| | Polyester Powder Coated Aluminum | M20 | Yes | D__ | * | * |
| | 316 Stainless Steel (Grade CF8M) | 1/2 NPT | None | E__ | * | * |
| | 316 Stainless Steel (Grade CF8M) | M20 | None | F__ | * | * |
| | 316 Stainless Steel (Grade CF8M) | 1/2 NPT | Yes | G__ | * | * |
| 316 Stainless Steel (Grade CF8M) | M20 | Yes | H__ | * | * | |
| b. Output/ Protocol | Analog Output | | Digital Protocol | | | |
| | 4-20mA dc | | HART Protocol | _H_ | * | * |
| 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 | English | __S | * | * |
| | Standard (w/Internal Zero, Span & Config Buttons) | Yes | English | __T | * | * |

| TABLE V CONFIGURATION SELECTIONS | | | | Selection | | |
|--|---|-----------------|---------------------------------------|-----------|---|---|
| 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 | Factory Standard | | | __S | * | * |
| | Custom Configuration (Unit Data Required from customer) | | | __C | * | * |

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

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

| TABLE VII ACCESSORY SELECTIONS | | | | Selection | | |
|---|---|--|--|-----------|---|---|
| a. Mounting Bracket | None (not required with flange mount unit) | | | 0__ | * | * |
| b. Customer Tag | No customer tag | | | _0__ | * | * |
| | One Wired Stainless Steel Tag (Up to 4 lines 26 char/line) | | | _1__ | * | * |
| c. 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 |
| | 1/2 NPT 316 SS Certified Conduit Plug | | | __A6 | n | n |
| | M20 316 SS Certified Conduit Plug | | | __A7 | m | m |

| TABLE VIII OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,....)) | | | | Selection | | |
|---|---|--|----|-----------|---|---|
| Certifications & Warranty | None - No additional options | | | 00 | * | * |
| | NACE MR0175; MR0103; ISO15156 Process wetted parts only | | | FG | * | * |
| | NACE MR0175; MR0103; ISO15156 Process wetted and non-wetted parts | | | F7 | c | c |
| | EN10204 Type 3.1 Material Traceability | | | FX | * | * |
| | Certificate of Conformance | | | F3 | * | * |
| | Calibration Test Report & Certificate of Conformance | | | F1 | * | * |
| | Certificate of Origin | | | F5 | * | * |
| | FMEDA (SIL 2/3) Certification | | | FE | j | j |
| | Over-Pressure Leak Test Certificate (1.5X MAWP) | | | TP | * | * |
| | Cert Clean for O ₂ or CL ₂ service per ASTM G93 | | | OX | e | e |
| | PMI Certification ¹ | | | PM | * | * |
| | Extended Warranty Additional 1 Year | | | 01 | * | * |
| | Extended Warranty Additional 2 Year | | | 02 | * | * |
| Extended Warranty Additional 3 Year | | | 03 | * | * | |
| Extended Warranty Additional 4 Year | | | 04 | * | * | |

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

MODEL RESTRICTIONS

| Restriction Letter | Available Only with | | Not Available with | |
|--------------------|--|--------------------|--------------------|--------------|
| | Table | Selection(s) | Table | Selection(s) |
| b | Select only one option from this group | | | |
| c | ld | ___N__ | | |
| e | lb | _2_____ | | |
| j | | | Vb | _1,2_ |
| m | IVa | B,D,F,H__ | | |
| n | IVa | A,C,E,G__ | | |
| s | la | A,W,B,E,X,F,J_____ | | |
| t | | | la | J_____ |
| v | la | M,N,R,S_____ | | |
| w | | | la | M,N,R,S_____ |
| | | | lb | _5_ |

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 STG and STA in-line construction pressure transmitters.

FIELD INSTALLABLE REPLACEMENT PARTS

| Description | Kit Number |
|---|--------------|
| Terminal Strip w/Lightning Protection Kit for HART | 50129832-501 |
| Terminal Strip w/o Lightning Protection for HART Modules | 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.

ASIA PACIFIC

Honeywell Process Solutions,
(TAC) hfs-tac-support@honeywell.com

Australia

Honeywell Limited
Phone: +(61) 7-3846 1255
FAX: +(61) 7-3840 6481
Toll Free 1300-36-39-36
Toll Free Fax:
1300-36-04-70

China – PRC - Shanghai

Honeywell China Inc.
Phone: (86-21) 5257-4568
Fax: (86-21) 6237-2826

Singapore

Honeywell Pte Ltd.
Phone: +(65) 6580 3278
Fax: +(65) 6445-3033

South Korea

Honeywell Korea Co Ltd
Phone: +(822) 799 6114
Fax: +(822) 792 9015

EMEA

Honeywell Process Solutions,
Phone: + 80012026455 or
+44 (0)1344 656000

Email: (Sales)

FP-Sales-Apps@Honeywell.com

or

(TAC)

hfs-tac-support@honeywell.com

AMERICA'S

Honeywell Process Solutions,
Phone: (TAC) 1-800-423-9883 or
215/641-3610
(Sales) 1-800-343-0228

Email: (Sales)

FP-Sales-Apps@Honeywell.com

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

Process Solutions

Honeywell
1250 W Sam Houston Pkwy S
Houston, TX 77042

Honeywell Control Systems Ltd
Honeywell House, Skimped Hill Lane
Bracknell, England, RG12 1EB

Shanghai City Centre, 100 Jungi Road
Shanghai, China 20061

www.honeywellprocess.com



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