SmartLine

Technical Information

# STA700 SmartLine Absolute Pressure Specification 34-ST-03-100


## Introduction

Part of the SmartLine® family of products, the STA700 and STA70L are suitable for monitoring, control and data acquisition. STA70X 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:**

- Accuracy up to 0.065 % of calibrated span
- Automatic temperature compensation
- Rangeability up to 100:1
- Response times as fast as 100ms
- Alphanumeric display capabilities
- External zero, span, & configuration capability
- Polarity insensitive electrical connections
- 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

**Span & Range Limits:**

| Model | URL mmHgA (mbarA) | LRL mmHgA (mbarA) | Min Span mm HgA (mbarA) | MAWP mmHgA (mbarA) |
|---|---|---|---|---|
| STA722/72L | 780 (1040) | 0 (0) | 50 (65.0) | 780 (1040) |
| **Model** | **psia (barA)** | **psi (barA)** | **psi (barA)** | **psia (barA)** |
| STA740/74L | 500 (35) | 0 (0) | 5 (.35) | 500 (35) |
| STA77L | 3000 (210) | 0 (0) | 30 (2.1) | 3000 (210) |

**Figure 1 – STA700 Absolute Pressure Transmitters feature field-proven piezoresistive sensor technology**

**Communications/Output Options:**

- Honeywell Digitally Enhanced (DE)
- HART ® (version 7.0)
- FOUNDATION™ Fieldbus

All transmitters are available with the above listed communications protocols.

## 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. This level of performance allows the ST 700 to replace most competitive transmitters available today.

## Indication/Display Option

The ST 700 modular design accommodates a basic alphanumeric LCD display.

### 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, in$H_2O$, m$H_2O$, bar, mbar, in$H_2O$, inHG, FT$H_2O$, mm$H_2O$, mm HG, & psi) measurement units
- 2 Lines 16 Characters (4.13H x 1.83W mm)
- Square root output indication (√)

### Simple 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, in$H_2O$, m$H_2O$, bar, mbar, in$H_2O$, inHG, FT$H_2O$, mm$H_2O$, 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 (√) and 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/DE/Fieldbus.
- Integration with Honeywell's Experion PKS offers the following unique advantages.
  - Tamper reporting
  - FDM Plant Area Views with Health summaries
  - 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 via three externally accessible buttons when a display option is selected. Zero/span capabilities are also optionally available via these buttons with or without selection of the display option.

### Internal Two Button Configuration Option

The Simple display has two buttons that can be used for Basic configuration such as re ranging, PV Engineering unit setting, Zero/Span settings and 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

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.

## 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, add indicators or change electronic modules without affecting overall performance or approval body certifications. Each meter body is uniquely characterized to provide in-tolerance performance over a wide range of application variations in temperature and pressure and due to the Honeywell advanced interface, electronic modules may be swapped with any electronics module without losing in-tolerance performance characteristics.

### Modular Features

- Meter body replacement
- Exchange/replace electronics/comms modules*
- Add or remove integral indicator*
- Add or remove lightning protection (terminal connection)*

* Field replaceable in all electrical environments (including IS) except flameproof without violating agency approvals.

With no performance effects, Honeywell's unique modularity results in ***lower inventory needs and lower overall operating costs.***

## Performance Specifications

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

| Model | URL | LRL | Min Span | Maximum Turndown Ratio | Stability (% URL/Year for five years) | Reference Accuracy % Span[1,2] |
|---|---|---|---|---|---|---|
| STA722 | 780 mmHgA (1040 mbarA) | 0.0 mmHgA (0.0 mbarA) | 50 mmHgA (65.0 mbarA) | 15:1 | 0.020 | 0.065% |
| STA740 | 500 psia (35 barA) | 0.0 mmHgA (0.0 mbarA) | 5 psia (0.35 barA) | 100:1 | | |
| STA72L | 780 mmHgA (1040 mbarA) | 0.0 mmHgA (0.0 mbarA) | 50 mmHgA (65.0 mbarA) | 15:1 | | |
| STA74L | 500 psia (35 barA) | 0.0 mmHgA (0.0 mbarA) | 5 psia (0.35 barA) | 100:1 | | |
| STA77L | 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:** (Conformance to +/-3 Sigma)

| | | Accuracy[1,2] (% of Span) | | | | Temperature Effect (% Span/50°F) | |
|---|---|---|---|---|---|---|---|
| Model | URL | Turn downs greater than | A | B | C (see URL units) | D | E |
| STA722 | 780 mmHgA (1040 mbarA) | 8.7:1 | 0.015 | 0.05 | 90(120) | 0.065 | 0.045 |
| STA740 | 500 psia (35 barA) | 25:1 | | | 20(1.4) | 0.050 | 0.010 |
| STA72L | 780 mmHgA (1040 mbarA) | 5.6:1 | | | 140(187) | 0.065 | 0.100 |
| STA74L | 500 psia (35 barA) | 25:1 | | | 20(1.4) | 0.050 | 0.015 |
| STA77L | 3000 psi (210 barA) | 6:1 | | | 500(35) | 0.050 | 0.010 |
| | | **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) | |

**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

**STA722 @ 156 mmHgA:** 0.297% of span

**STA740 @ 100 psia:** 0.119% of span

**STA72L @ 156 mmHgA:** 0.569% of span

**STA74L @ 100 psia:** 0.141% of span

**STA77L @ 600 psia:** 0.119% 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 .005% of span.
2. For zero based spans and reference conditions of: 25 °C (77oF), 10 to 55% RH, and 316 Stainless Steel barrier diaphragm.

## 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 | -40 to 85 | -40 to 185 | -40 to 85 | -40 to 185 | -55 to 120 | -67 to 248 |
| **Meter Body Temperature**[2] | | | | | | | | |
| STA722/STA72L | 25±1 | 77±2 | See Figure 1 | | See Figure 1 | | -55 to 125 | -67 to 257 |
| STA740, 74L, 77L | 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** STA722, 72L, 740, 74L, 77L | 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] | STA722, 72L = 780 mmHgA, 1,040 mbarA<br>STA740, 74L = 500 psia, 35 barA<br>STA77L = 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

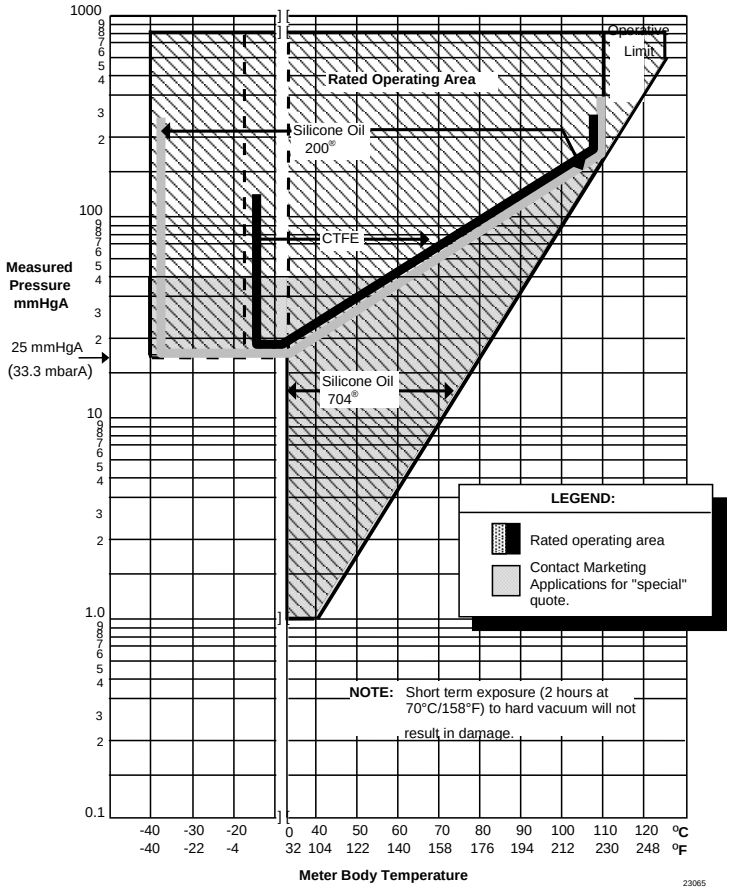
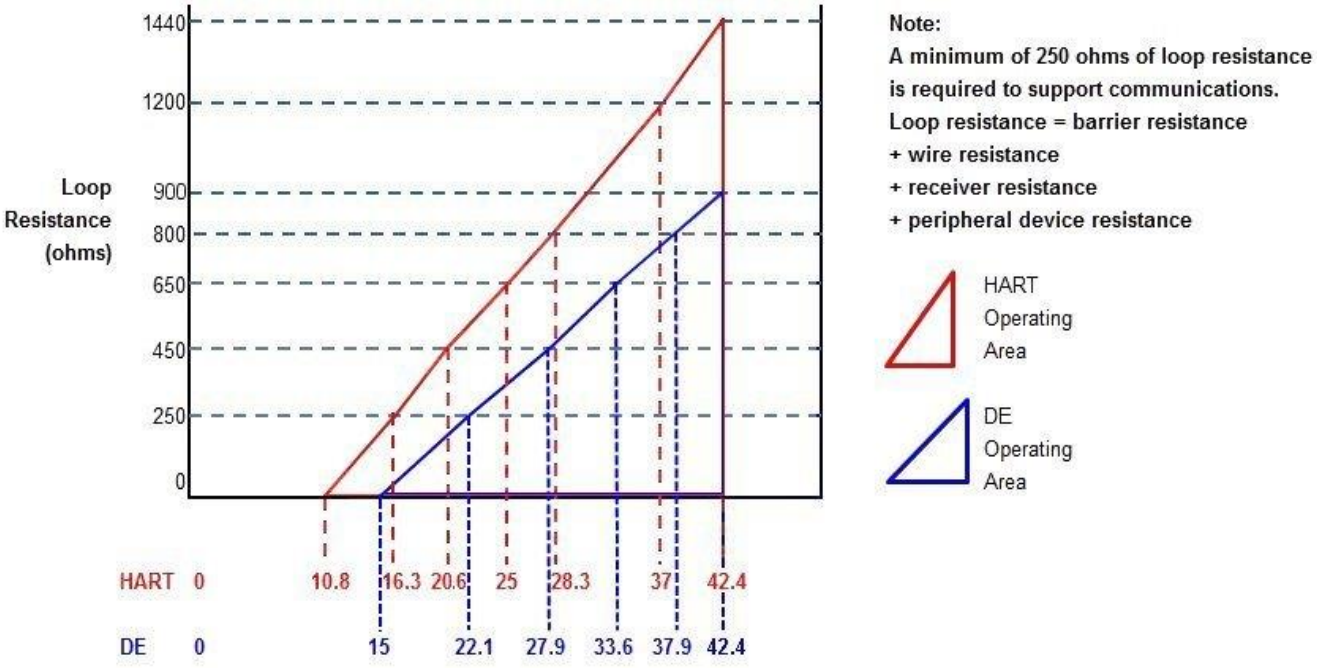



**Figure 2 - Measured pressure versus meter body temperature chart for STA722, 72L**




**For DE,** Rlmax = 35* (Power Supply Voltage-15)
**For HART,** Rlmax = 45.6* (Power Supply Voltage-10.8)

**Figure 2 - Supply voltage and loop resistance chart & calculations**

## Performance Under Rated Conditions – All Models

| Parameter | Description |
|---|---|
| **Analog Output**<br>**Digital Communications**: | Two-wire, 4 to 20 mA (HART & DE Transmitters only)<br>Honeywell DE, HART 7 protocol or FOUNDATION Fieldbus ITK 6.0.1 compliant<br>All transmitters, irrespective of protocol have polarity insensitive connection. |
| **HART & DE Output Failure Modes**<br>(NAMUR for DE Units requires selecting display and configuration buttons or factory configuration) | **Honeywell Standard:** / **NAMUR NE 43 Compliance**:<br>**Normal Limits:** 3.8 – 20.8 mA / 3.8 – 20.5 mA<br>**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**<br>**(includes power up & test algorithms)** | HART or DE: 2.5 sec<br>Foundation Fieldbus: Host dependant |
| **Response Time**<br>(delay + time constant) | **DE/HART Protocol**: 100ms<br>**FOUNDATION Fieldbus**: 150ms (Host Dependant) |
| **Damping Time Constant** | **HART:** Adjustable from 0 to 32 seconds in 0.1 increments. **Default Value:** 0.5 seconds<br>**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<br>Per IEC60770-1 field or pipeline, high vibration level (10-2000Hz: 0.21 displacement/3g max acceleration) |
| **Electromagnetic Compatibility** | Meets IEC61326-3-1 |
| **Lightning Protection Option** | **Leakage Current:** 10uA max @ 42.4VDC 93C<br>**Impulse rating:**<br>8/20uS 5000A (>10 strikes) 10000A (1 strike min.)<br>10/1000uS 200A (> 300 strikes) |

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

| Parameter | Description |
|---|---|
| **Barrier Diaphragms Material** | **STA700**: 316L SS, Hastelloy® C-276[2], Monel® 400[3], Tantalum<br>**STA70L**: 316L SS, Hastelloy C-276 |
| **Process Head Material** | **STA700**: Carbon Steel (Zinc Plated)[5], 316 SS[4], Hastelloy® C-276[6], Monel® 400[7]<br>**STG70L:** 316L SS, Hastelloy® C-276[6] |
| **Vent/Drain Valves & Plugs [1]** | **STA700:**316 SS[4], Hastelloy C-276[2], Monel 400[7]<br>**STA70L:** N/A |
| **Head Gaskets** | **STA700:** Glass-filled PTFE standard. Viton® and graphite are optional. **STA70L:** N/A |
| **Meter Body Bolting** | **STA700:** Carbon Steel (Zinc plated) standard. Options include 316 SS, NACE A286 SS bolts and nuts or NACE A286 SS bolts and 304 SS nuts **STA70L:** N/A |
| **Mounting Bracket** | Carbon Steel (Zinc-plated) or 304 Stainless Steel or 316 Stainless Steel. See Figures 4 & 5 |
| **Fill Fluid** | Silicone 200, CTFE (Chlorotrifluoroethylene) 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** | **STA700:** ½ -inch NPT (female), DIN 19213 (standard)<br>**STA70L:** ½ -inch NPT (female), ½ -inch NPT male, 9/16 Aminco, DIN19213. G½ -B Male Thread |
| **Wiring** | Accepts up to 16 AWG (1.5 mm diameter). |
| **Dimensions** | See Figure 4 & 5 |
| **Net Weight** | **STA700:** 8.3 pounds (3.8 Kg). **STA70L:** 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 42.4Vdc at terminals

Load: Maximum 1440 ohms See figure 2

Minimum Load: 0 ohms. (For handheld communications a minimum load of 250 ohms is required)

### Foundation Fieldbus (FF)

**Power Supply Requirements**

Voltage: 9.0 to 32.0Vdc at terminals

Steady State Current: 17.6mAdc

Software Download Current: 27.4mAdc

**Available Function Blocks**

| Block Type | Qty | Execution Time |
|---|---|---|
| Resource | 1 | n/a |
| Transducer | 1 | n/a |
| Diagnostic | 1 | n/a |
| Analog Input | 1* | 30 ms |
| PID w/Autotune | 1 | 45 ms |
| Integrator | 1 | 30 ms |
| Signal Char (SC) | 1 | 30 ms |
| LCD Display | 1 | n/a |
| Flow Block | 1 | 30 ms |
| Input Selector | 1 | 30 ms |
| Arithmetic | 1 | 30 ms |

* AI block may have two (2) additional instantiations.

All available function blocks adhere to FOUNDATION Fieldbus standards. PID blocks support ideal & robust PID algorithms with full implementation of Auto-tuning.

**Link Active Scheduler**

Transmitters can perform as a backup Link Active Scheduler and take over when the host is disconnected. Acting as a LAS, the device ensures scheduled data transfers typically used for the regular, cyclic transfer of control loop data between devices on the Fieldbus.

**Number of Devices/Segment**

Entity IS model: 6 devices/segment

**Schedule Entries**

18 maximum schedule entries

**Number of VCR's:** 24 max

**Compliance Testing:** Tested according to ITK 6.0.1

**Software Download**

Utilizes Class-3 of the Common Software Download procedure as per FF-883 which allows the field devices of any manufacturer to receive software upgrades from any host.

### Honeywell Digitally Enhanced (DE)

DE is a Honeywell proprietary protocol which provides digital communications between Honeywell DE enabled field devices and Hosts.

**Power Supply**

Voltage: 10.8 to 42.4Vdc at terminals

Load: Maximum 1440 ohms See figure 2

### Standard Diagnostics

ST 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 | Basic Display | Simple Display |
|---|---|---|
| Electronic Module DAC Failure | Electronics module fault | Fault Comm El |
| Meter Body NVM Corrupt | Meter Body fault | Fault Mtrbody |
| Config. Data Corrupt | Electronics module fault | Fault Comm El |
| Electronic Module Diag Failure | Electronics module fault | Fault Comm El |
| Meter Body Critical Failure | Meter Body fault | Fault Mtrbody |
| Sensor Comms Timeout | Meter Body Comm fault | 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 |
| No DAC Compensation |
| LRV Set Error – Zero Config. Button |
| URV Set Error – Zero Config. Button |
| AO Out of Range |
| Loop Current Noise |
| Meter Body Unreliable Comm |
| Tamper Alarm, |
| No DAC Calibration |
| Sensor Supply Voltage Low |

Refer to ST 700 diagnostics tech note for additional level diagnostic information.

## Approval Certifications:

| AGENCY | TYPE OF PROTECTION | COMM. OPTION | FIELD PARAMETERS | AMBIENT TEMP (Ta) |
|---|---|---|---|---|
| **FM Approvals™** | **Explosionproof:**<br>Class I, Division 1, Groups A, B, C, D;<br>**Dust Ignition Proof:**<br>Class II, III, Division 1, Groups E, F, G; T4<br><br>Class I, Zone 0/1, AEx d IIC Ga/Gb<br>Class II, Zone 21, AEx tb IIIC Db T 95°C | All | Note 1 | T5: -50 °C to 85°C<br>T6: -50 °C to 65°C |
| | **Intrinsically Safe:**<br>Class I, II, III, Division 1, Groups A, B, C, D, E, F, G: T4<br><br>Class I, Zone 0, AEx ia IIC Ga T4<br><br>FISCO Field Device (Only for FF Option)<br>Ex ia IIC T4 | 4-20 mA / DE/ HART | Note 2a | -50 °C to 70°C |
| | | Foundation Fieldbus | Note 2b | -50 °C to 70°C |
| | **Nonincendive:**<br>Class I, Division 2, Groups A, B, C, D locations,<br><br>Class I, Zone 2, AEx nA IIC Gc T4 | 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)** | **Explosion Proof:**<br>Class I, Division 1, Groups A, B, C, D;<br>**Dust Ignition Proof:**<br>Class II, III, Division 1, Groups E, F, G; T4<br><br>Ex d IIC Ga<br>Ex tb IIIC Db T 95°C | All | Note 1 | T5: -50 °C to 85°C<br>T6: -50 °C to 65°C |
| | **Intrinsically Safe:**<br>Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T4<br><br>Ex ia IIC Ga T4<br><br>FISCO Field Device (Only for FF Option)<br>Ex ia IIC T4 | 4-20 mA / DE/ HART | Note 2a | -50 °C to 70°C |
| | | Foundation Fieldbus | Note 2b | -50 °C to 70°C |
| | **Nonincendive:**<br>Class I, Division 2, Groups A, B, C, D; T4<br><br>Ex nA IIC Gc T4 | 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:**<br>II 1/2 G Ex d IIC Ga/Gb<br>II 2 D Ex tb IIIC Db T 95°C | All | Note 1 | T5: -50 °C to 85°C<br>T6: -50 °C to 65°C |
| | **Intrinsically Safe:**<br>II 1 G Ex ia IIC Ga T4 | 4-20 mA / DE/ HART | Note 2a | -50 °C to 70°C |
| | FISCO Field Device (Only for FF Option)<br>Ex ia IIC T4 | Foundation Fieldbus | Note 2b | -50 °C to 70°C |
| | **Nonincendive:**<br>II 3 G Ex nA IIC Gc T4 | 4-20 mA / DE/ HART/ Foundation Fieldbus | Note 1 | -50 °C to 85°C |
| | **Enclosure:** IP66/ IP67 | All | All | - |
| **IECEx (World)** | **Flameproof :**<br>Ex d IIC Ga/Gb T4<br>Ex tb IIIC Db T 95°C | All | Note 1 | T5: -50 °C to 85°C<br>T6: -50 °C to 65°C |
| | **Intrinsically Safe:**<br>Ex ia IIC Ga T4 | 4-20 mA / DE/ HART | Note 2a | -50 °C to 70°C |
| | FISCO Field Device (Only for FF Option)<br>Ex ia IIC T4 | Foundation Fieldbus | Note 2b | -50 °C to 70°C |
| | **Nonincendive:**<br>Ex nA IIC Gc T4 | 4-20 mA / DE/ HART/ Foundation Fieldbus | Note 1 | -50 °C to 85°C |
| | **Enclosure:** IP66/ IP67 | All | All | - |
| **SAEx (South Africa)** | **Flameproof :**<br>Ex d IIC Ga/Gb T4<br>Ex tb IIIC Db T 95°C | All | Note 1 | -50 °C to 85°C |
| | **Intrinsically Safe:**<br>Ex ia IIC Ga T4 | 4-20 mA / DE/ HART | Note 2a | -50 °C to 70°C |
| | FISCO Field Device (Only for FF Option)<br>Ex ia IIC T4 | Foundation Fieldbus | Note 2b | -50 °C to 70°C |
| | **Nonincendive:**<br>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:**<br>Ex d IIC Ga/ Gb T4<br>Ex tb IIIC Db T 95°C | All | Note 1 | -50 °C to 85°C |
| | **Intrinsically Safe:**<br>Ex ia IIC Ga T4 | 4-20 mA / DE/ HART | Note 2a | -50 °C to 70°C |
| | FISCO Field Device (Only for FF Option)<br>Ex ia IIC T4 | Foundation Fieldbus | Note 2b | -50 °C to 70°C |
| | **Nonincendive:**<br>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 | - |

## Approval Certifications: (Continued)

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

Notes:

1. Operating Parameters:

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

   = 10 to 30 V (FF)  = 30 mA (FF)

2. Intrinsically Safe Entity Parameters

   a. Analog/ DE/ HART Entity Values:

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

   Transmitter with Terminal Block Revision E or Later

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

   Note : Transmitter with Terminal Block Revision E or later

   The revision is on the label that is on the module. There will be two lines of text on the label:

   - First is the Module Part #: 50049839-001 or 50049839-002
   - Second line has the supplier information, along with the REVISION:

   XXXXXXX-EXXXX, THE "X" is production related, THE POSITION of the "E" IS THE REVISION.

   b. Foundation Fieldbus- Entity Values

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

   Transmitter with Terminal Block Revision F or Later

   Vmax= Ui = 30V  Imax= Ii= 225mA  Ci =0nF  Li = 0  Pi =1 W

   FISCO Field Device  Imax= Ii= 380 mA  Ci = 0nF  Li = 0  Pi =5.32 W

   Vmax= Ui = 17.5V

   Note : Transmitter with Terminal Block Revision F or later

   The revision is on the label that is on the module. There will be two lines of text on the label:

   - First is the Module Part #: 50049839-003 or 50049839-004
   - Second line has the supplier information, along with the REVISION:

   XXXXXXX-EXXXX, THE "X" is production related, THE POSITION of the "E" IS THE REVISION.

## Approval Certifications: (Continued)

| | |
|---|---|
| **Marine Certificates** | This certificate defines the certifications covered for the ST 800 Pressure Transmitter family of products, including the SMV 800 Smart Multivariable Transmitter. It represents the compilation of the five certificates Honeywell currently has covering the certification of these products into marine applications.<br><br>For SmartLine Pressure Transmitter and SMV800 Smart Multivarible Transmitter |
| | **American Bureau of Shipping (ABS)** - 2009 Steel Vessel Rules 1-1-4/3.7, 4-6-2/5.15, 4-8-3/13 & 13.5, 4-8-4/27.5.1, 4-9-7/13. Certificate number: 04-HS417416-PDA |
| | **Bureau Veritas (BV)** - Product Code: 389:1H. Certificate number: 12660/B0 BV |
| | **Det Norske Veritas (DNV**) - Location Classes: Temperature D, Humidity B, Vibration A, EMC B, Enclosure C. For salt spray exposure; enclosure of 316 SST or 2-part epoxy protection with 316 SST bolts to be applied. Certificate number: A-11476 |
| | **Korean Register of Shipping (KR)** - Certificate number: LOX17743-AE001 |
| | **Lloyd's Register (LR)** - Certificate number: 02/60001(E1) & (E2) |
| **SIL 2/3 Certification** | IEC 61508 SIL 2 for non-redundant use and SIL 3 for redundant use according to EXIDA and TÜV Nord Sys Tec GmbH & Co. KG under the following standards: IEC61508-1: 2010; IEC 61508-2: 2010; IEC61508-3: 2010. |

## Other Certification Options

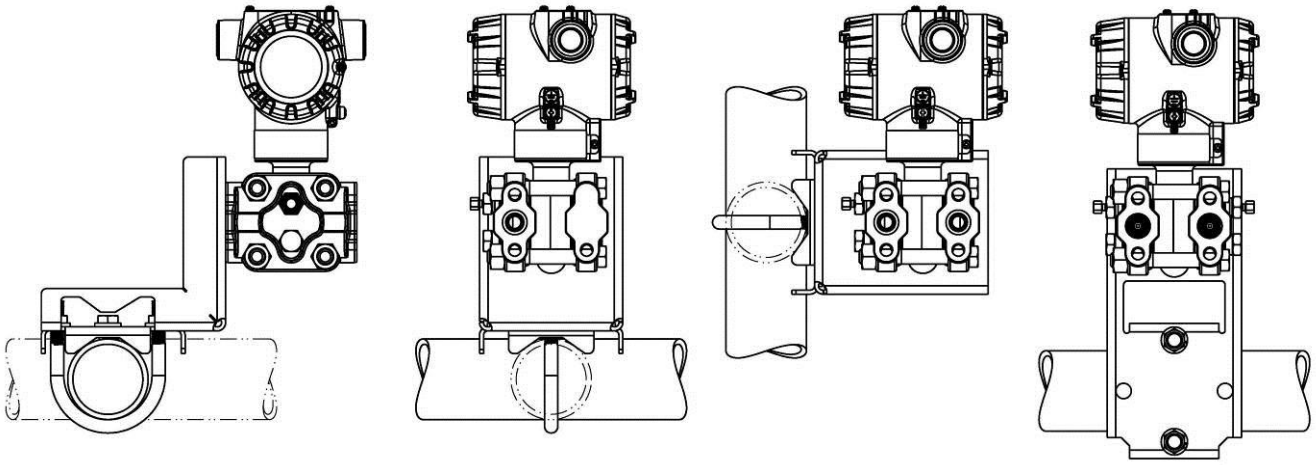
**Materials**

- NACE MRO175, MRO103, ISO15156

## Mounting & Dimensional Drawings)

**Reference Dimensions:** millimeters / inches

### Mounting Configurations (Dual head design)



### Dimensions (Dual head design)

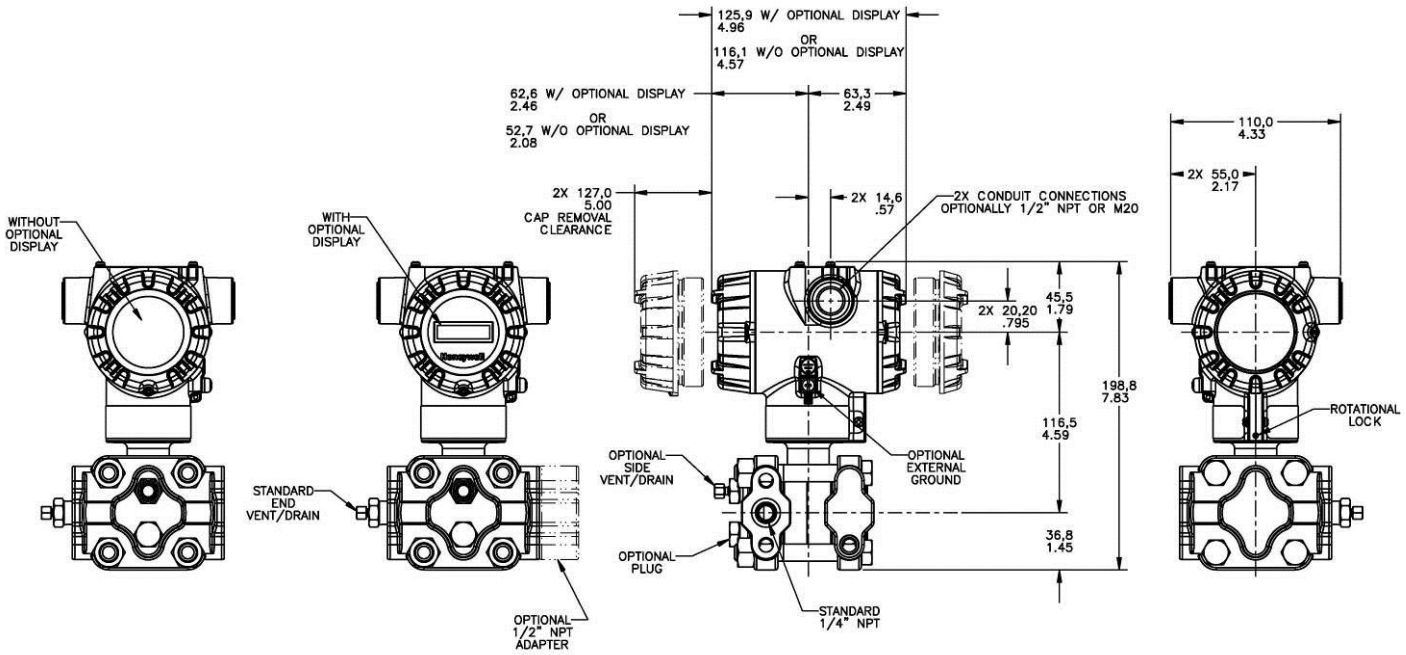
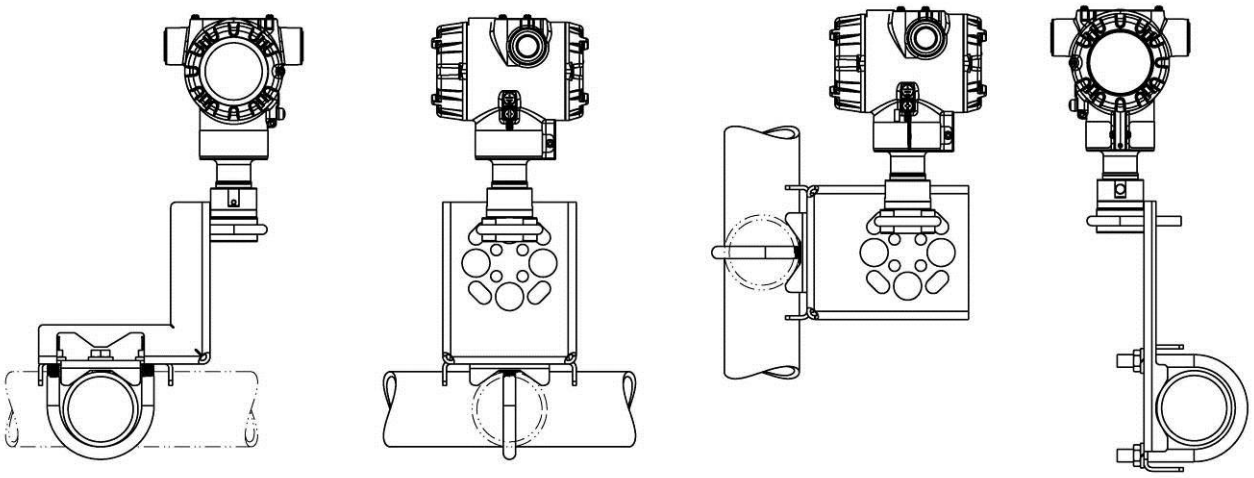



**Figure 4** – Typical mounting dimensions of STA722 & STA740 for reference

**Reference Dimensions:** $\frac{\text{millimeters}}{\text{inches}}$

**Mounting Configurations (Inline Designs)**



**Dimension (Inline Design)**

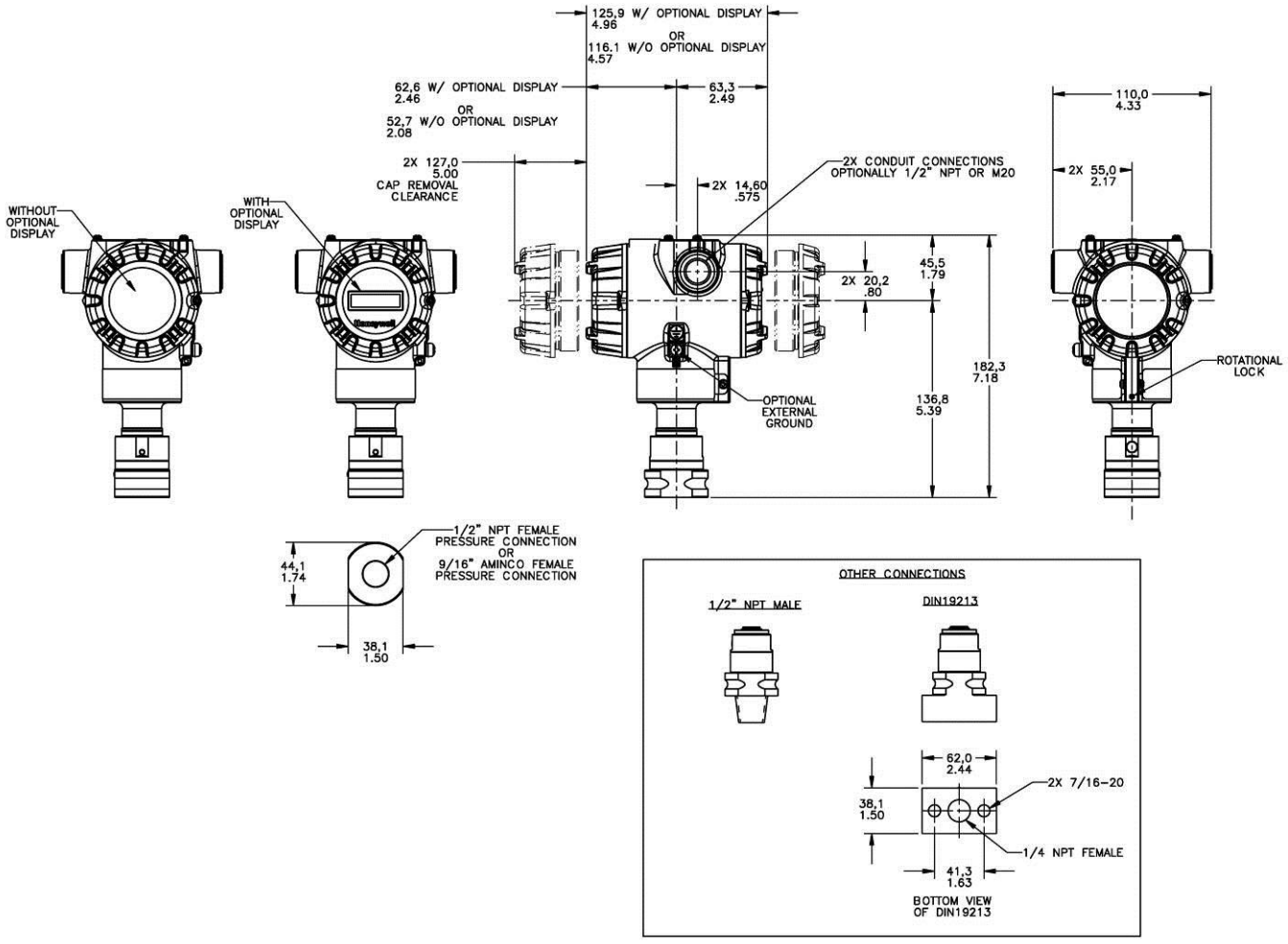



**Figure 5** – Typical mounting dimensions of STA72L, STA74L, & STA77L for reference

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

## Model Selection Guide

# Model STA700 & STA70L
# Absolute Pressure Transmitters

Model Selection Guide
34-ST-16-100 Issue 16

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

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

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

| Selection | | |
|---|---|---|
| STA722 | ↓ | |
| STA740 | ↓ | |
| STA72L | | ↓ |
| STA74L | | ↓ |
| STA77L | | ↓ |

| 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 |
| | 316 Stainless Steel /316 Stainless Steel | 316L SS | E _ _ _ _ _ | * * |
| | | Hastelloy C - 276 | F _ _ _ _ _ | * * |
| | | Monel 400 | G _ _ _ _ _ | * |
| | | Tantalum | H _ _ _ _ _ | a |
| | Hastelloy C - 276 /316 Stainless Steel | Hastelloy C - 276 | J _ _ _ _ _ | * * |
| | | Tantalum | K _ _ _ _ _ | a |
| | Monel 400 /316 Stainless Steel | Monel 400 | L _ _ _ _ _ | 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 _ _ _ | * * |
| | G 1/2 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 | Vent Location | Vent Material |
| | None | None | None | None |
| | Single Ended | None | None | None |
| | Single Ended | Std Vent | Side | Matches Head Material[1] |
| | Single Ended | Center Vent | Side | Stainless Steel Only |
| | Dual Ended | Std Vent | End | Matches Head Material[1] |
| | Dual Ended | Center Vent | End | Stainless Steel Only |
| | Dual Ended | Std Vent/ Plug | Side/End | Matches Head Material[1] |
| f. Gasket Materials | None | | _ _ _ _ 0 _ | * |
| | Teflon® or PTFE (Glass Filled) | | _ _ _ _ 1 _ | * |
| | Viton® | | _ _ _ _ 2 _ | * |
| | Graphite | | _ _ _ _ 3 _ | t |
| | | | _ _ _ _ 4 _ | * |
| | | | _ _ _ _ 5 _ | t |
| | | | _ _ _ _ 6 _ | * |
| | | | _ _ _ _ _ 0 | * |
| | | | _ _ _ _ _ A | * |
| | | | _ _ _ _ _ B | * |
| | | | _ _ _ _ _ C | * |

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

[1a] STA722,740 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 | | STA77L | STA72L | STA74L | STA722 | STA740 |
|---|---|---|---|---|---|---|---|
| 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 | * | * |

| TABLE IV | TRANSMITTER ELECTRONICS SELECTIONS | | | | | |
|---|---|---|---|---|---|---|
| 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 _ | * | * |
| | 4-20mA dc | DE Protocol | | _ D _ | * | * |
| | none | Foundation Fieldbus | | _ F _ | * | * |
| c. Customer Interface Selections | **Indicator** | **Ext Zero, Span & Config Buttons** | **Languages** | | | |
| | None | None | None | _ _ 0 | * | * |
| | None | Yes (Zero/Span Only) | None | _ _ A | f | f |
| | Basic | None | EN | _ _ B | * | * |
| | Basic | Yes | EN | _ _ C | * | * |
| | Simple (w/internal Zero, Span & Conf Buttons) | None | English | _ _ D | **u** | **u** |

| TABLE V | CONFIGURATION SELECTIONS | | | | | |
|---|---|---|---|---|---|---|
| a. App S/W | **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 _ | **f** | **f** |
| | Disabled | Low< 3.6mAdc | Honeywell Std (3.8 - 20.8 mAdc) | _ 2 _ | **f** | **f** |
| | Enabled | High> 21.0mAdc | Honeywell Std (3.8 - 20.8 mAdc) | _ 3 _ | **f** | **f** |
| | Enabled | Low< 3.6mAdc | Honeywell Std (3.8 - 20.8 mAdc) | _ 4 _ | **f** | **f** |
| | Enabled | N/A | N/A Fieldbus | _ 5 _ | **g** | **g** |
| | Disabled | N/A | N/A Fieldbus | _ 6 _ | **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 | | | STA77L | STA72L | STA74L | STA722 | STA740 |
|---|---|---|---|---|---|---|---|---|
| a. 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 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| a. Mounting Bracket | Bracket Type | Material | | | | | | | |
| | None | None | 0 _ _ _ | * | * | | | | |
| | Angle Bracket | Carbon Steel | 1 _ _ _ | * | * | | | | |
| | Angle Bracket | 304 SS | 2 _ _ _ | * | * | | | | |
| | Angle Bracket | 316 SS | 3 _ _ _ | * | * | | | | |
| | Marine Approved Bracket | Carbon Steel | 8 _ _ _ | * | | | | | |
| | Marine Approved Bracket(In-Line) | Carbon Steel | 9 _ _ _ | | * | | | | |
| | Marine Approved Bracket | 304 SS | 4 _ _ _ | * | | | | | |
| | Marine Approved Bracket(In-Line) | 304 SS | A _ _ _ | | * | | | | |
| | Flat Bracket | Carbon Steel | 5 _ _ _ | * | * | | | | |
| | Flat Bracket | 304 SS | 6 _ _ _ | * | * | | | | |
| | Flat Bracket | 316 SS | 7 _ _ _ | * | * | | | | |
| b. Customer Tag | Customer Tag Type | | | | | | | | |
| | No customer tag | | _ 0 _ _ | * | * | | | | |
| | One Wired Stainless Steel Tag (Up to 4 lines 26char/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 | | | | |
| | 1/2 NPT 316 SS Certified Conduit Plug | | _ _ A6 | n | n | | | | |
| | M20 316 SS Certified Conduit Plug | | _ _ A7 | m | m | | | | |
| | Minifast® 4 pin (1/2 NPT) (not suitable for X-Proof applications) | | _ _ A8 | n | n | | | | |
| | Minifast® 4 pin (M20) (not suitable for X-Proof applications) | | _ _ A9 | m | m | | | | |

| TABLE VIII | OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,....) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Certifications & Warranty | None - No additional options | | 00 | * | * | | | | |
| | NACE MR0175; MR0103; ISO15156 (FC33338) Process wetted parts only | | FG | * | * | | | | |
| | NACE MR0175; MR0103; ISO15156 (FC33339) Process wetted and non-wetted parts | | F7 | c | c | | | | |
| | Marine (DNV, ABS, BV, KR, LR) | | MT | d | d | | | | |
| | EN10204 Type 3.1 Material Traceability (FC33341) | | FX | * | * | | | | |
| | Certificate of Conformance (F3391) | | F3 | * | * | | | | |
| | Calibration Test Report & Certificate of Conformance (F3399) | | F1 | * | * | | | | |
| | Certificate of Origin (F0195) | | F5 | * | * | | | | |
| | FMEDA (SIL 2/3) Certification (FC33337) | | FE | 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 | | | | |
| | PMI Certification | | PM | * | * | | | | |

| 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) |
| a | | | VIII | FG, F7 |
| c | I d | _ _ _ 0,N,K,D,B _ _ | I a | D,H,K,L _ _ _ _ _ |
| 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 _ _ _ |
| 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 |
| t | | | 1a | J, K, L _ _ _ _ _ |
| u | IVb | _ H _ | | |
| b | Select Only one option from this group | | | |

## Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

### ASIA PACIFIC

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+44 (0)1344 656000

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**FP-Sales-Apps@Honeywell.com**
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**hfs-tac-support@honeywell.com**

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(Sales) 1-800-343-0228

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(TAC)
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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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34-ST-03-100
March 2016