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ДАТЧИКИ ДАВЛЕНИЯ

Технические характеристики
на STA725/72S/74S/745/77S



STA700 SmartLine Absolute Pressure Specification 34-ST-03-120



Introduction

Part of the SmartLine® family of products, the STA700 and STA70L are suitable for monitoring, control and data acquisition featuring piezoresistive sensor technology combining pressure sensing with on chip temperature compensation capabilities providing high accuracy, stability and performance over a wide range of application pressures and temperatures. The SmartLine family is also fully tested and compliant with Experion® PKS providing the highest level of compatibility assurance and integration capabilities. SmartLine easily meets the most demanding application needs for pressure measurement applications.

Best in Class Features:

- Accuracies up to 0.065% of span
- Stability up to 0.020% of URL per year for 10 years
- Automatic 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
- Comprehensive on-board diagnostic capabilities
- Integral Dual Seal design for safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- Full compliance to SIL 2/3 requirements
- Modular design characters
- Available with additional 4-year warranty

Communications/Output Options:

- HART® (version 7.0)



Figure 1 – STA700 InLine and Dual Head Absolute Pressure Transmitters feature field-proven piezoresistive sensor technology

Span & Range Limits:

Model	URL mmHgA (mbarA)	LRL mmHgA (mbarA)	Min Span mm HgA (mbarA)
STA725/72S	780 (1040)	0 (0)	50 (66.7)
Model	psia (barA)	psi (barA)	psi (barA)
STA745/74S	500 (35)	0 (0)	5 (0.35)
STA77S	3000 (210)	0 (0)	30 (2.1)

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, inH₂O, mH₂O, bar, mbar, inHG, FTH₂O, mmH₂O, mm HG, & psi) measurement units.
- 2 Lines 6 digits PV (9.95H x 4.20W mm) 8 Characters
- Write protect Indication
- Built in Basic Device Configuration through Internal or External Buttons – Range/Engineering Unit/Loop Test /Loop Calibration/Zero /Span Setting
- Multiple language capabilities (EN, RU)

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 option for zero/span setting

Suitable for all electrical and environmental requirements, SmartLine offers the ability to configure the transmitter and display, for all 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

Handheld Configuration

SmartLine transmitters feature two-way communication and configuration capability between the operator and the transmitter. All Honeywell transmitters are designed and tested for compliance with the offered communication protocols and are designed to operate with any Standards compliant handheld configuration device.

Personal Computer Configuration

Field Device Manager (FDM) Software and FDM Express are also available for managing HART 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, 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 10 years)	Reference Accuracy ^{1,2} % Span Standard
STA725	780 mmHgA (1040 mbarA)	0.0 mmHgA (0.0 mbarA)	50 mmHgA (66.7 mbarA)	15.6:1	0.02	0.065
STA745	500 psia (35 barA)	0.0 mmHgA (0.0 mbarA)	5 psia (0.35 barA)	100:1		
STA72S	780 mmHgA (1040 mbarA)	0.0 mmHgA (0.0 mbarA)	50 mmHgA (66.7 mbarA)	15.6:1		
STA74S	500 psia (35 barA)	0.0 mmHgA (0.0 mbarA)	5 psia (0.35 barA)	100:1		
STA77S	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)

Table 2

	Model	URL	Accuracy ^{1,2} (% of Span)			Combined Zero & Span temperature Effect (% Span / 28°C(50°F))		
			Reference Turndown	A	B	C (see URL units)	D	E
Standard Accuracy	STA725	780 mmHgA (1040 mbarA)	6.5:1	0.005	0.060	120 (160)	0.075	0.060
	STA745	500 psia (35 barA)	16.7:1			30 (2.1)	0.075	0.015
	STA72S	780 mmHgA (1040 mbarA)	4.3:1			180 (240)	0.075	0.120
	STA74S	500 psia (35 barA)	16.7:1			30 (2.1)	0.075	0.020
	STA77S	3000 psi (210 barA)	5:1			600 (42)	0.075	0.015
Turn Down Effect						Temp Effect		
$\pm [A + B] \text{ if Span} \geq C$ $\pm \left[A + B \left(\frac{C}{\text{Span}} \right) \right] \text{ if Span} < C$						$\pm \left[D + E \left(\frac{\text{URL}}{\text{Span}} \right) \right]$		

Total Performance (% of Span):

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

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

STA725 @ 156 mmHgA: 0.381% of span

STA72S @ 156 mmHgA: 0.679% of span

STA745 @ 100 psia: 0.163% of span

STA74S @ 100 psia: 0.187% of span

STA77S @ 600 psia: 0.163% 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), 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 Temperature¹	25±1	77±2	-40 to 85	-40 to 185	-40 to 85	-40 to 185	-55 to 120	-67 to 248
Meter Body Temperature								
STA725 / STA72S	25±1	77±2	See Figure 2		See Figure 2		-55 to 125	-67 to 257
STA745, 74S, 77S	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 STA725, 72S, 745, 74S, 77S	See Figure 2. Operate within specifications above 25 mmHgA (33 mbarA). Short term ² exposure to full vacuum will not result in damage.							
Supply Voltage, Current, and Load Resistance	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)^{3, 4}	STA725, 72S = 780 mmHgA (1,040 mbarA) STA745, 74S = 500 psia (35 barA) STA77S = 3,000 psia (210 barA)							

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

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

³ Units can withstand overpressure of 1.5 x MAWP without damage.

⁴ Consult factory for MAWP of ST 700 transmitters with CRN approval.

⁵ Silicone minimum temperature rating is -40°C (-40°F). CTFE minimum temperature rating is -40°C (-40°F).

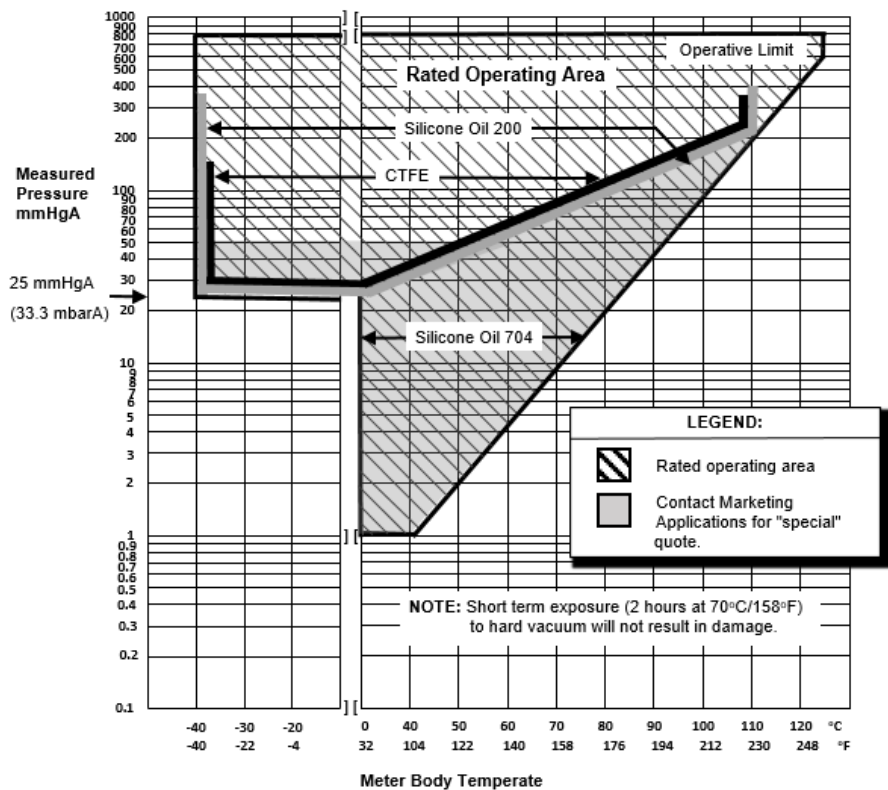
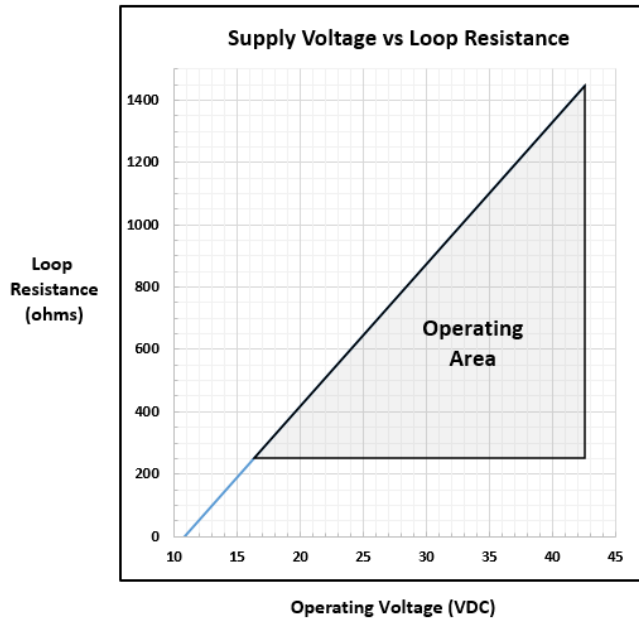


Figure 2 - Measured pressure versus meter body temperature chart for ST 700 Dual Head and Inline models



A minimum of 250 ohms loop resistance is required to support field communicator, where Loop resistance is the summation of barrier resistance, wire resistance and receiver resistance

Maximum loop resistance
 $RL_{max} = 45.6 \times (\text{Power Supply Voltage} - 10.8)$

Figure 3 - Supply voltage and loop resistance chart & calculations

Performance Under Rated Conditions – All Models

Parameter	Description									
Analog Output Digital Communications:	Two-wire, 4 to 20 mA HART 7 protocol									
HART 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% of span per volt.									
Transmitter Turn on Time (includes power up & test algorithms)	2.5 seconds									
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	Meets IEC61326-3-1									
Lightning Protection Option	Leakage Current: 10uA max @ 42.4VDC 93C Impulse rating: <table border="0" style="margin-left: 20px;"> <tr> <td>8/20us</td> <td>5000A (>10 strikes)</td> <td>10000A (1 strike min.)</td> </tr> <tr> <td>10/1000us</td> <td>200A (> 300 strikes)</td> <td></td> </tr> </table>	8/20us	5000A (>10 strikes)	10000A (1 strike min.)	10/1000us	200A (> 300 strikes)				
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