

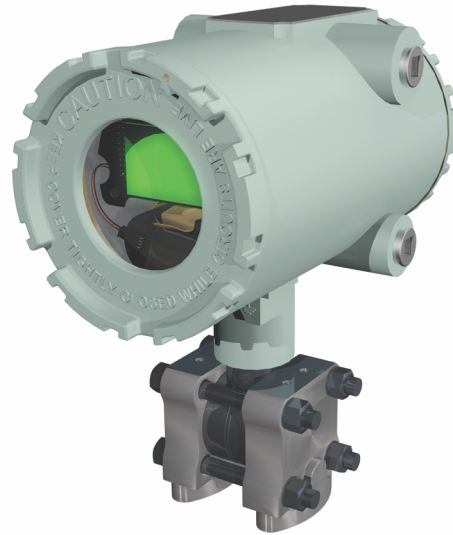
JT400 Multivariable Transmitter

Wireless Ultra Low Power Platform with Integrated, Chart Replacement Data Logging and I/O

The industry's first ultra-low power, multivariable (DP/P/T) transmitter / chart replacement provides best-in-class measurement accuracy, wireless interface, USB, I/O and much more.

UP TO 60% LOWER TCO: The JT400 incorporates the latest advances in low power and wireless technologies. It is very easy to install and startup. No barriers, long conduit runs, trenches or wiring are needed.

BROAD COMPATIBILITY: A variety of interfaces (USB, RS-232, RS-485) and protocols allow the JT400 to readily drop-in to practically any SCADA or natural gas measurement network.



ULTRA LOW POWER

- Industry's lowest current draw, 1 mA at 4.0 Vdc
- Integral battery and solar power system options

High Accuracy for Custody Transfer

- Industry-leading, 0.05% DP measurement accuracy is standard
- Best-in-class static pressure (0.035%) and temperature (0.1°C) measurements
- Best-in-class pressure (0.1%) and temperature (0.125%) effects on DP

API 21 Compliant Data Logging

- Full digital chart-replacement functionality
- Over 35 day capacity with 15-minute averaging

WIRELESS INTERFACE

- Integrated radio and antenna optional

Drop-in Compatibility

- Standard mapping via BSAP and Enron Modbus protocols
- Automatic protocol detection
- Process I/O
- 2 AI, 1 High-speed counter, 4 DI/DO (selectable per-point), 1 HS switch

Hazardous Area Classifications

- Class I, Division 1, Groups C, D Explosion-proof UL/CUL

Simplified User Interface

- Intuitive menu operation, live trending

PHYSICAL OVERVIEW

The JT400 is designed specifically for remote measurement of Differential Pressure, Static Pressure and Temperature with external RTD.

Diaphragm Material: SS316 or Hastelloy C

Flange Material: SS316 or Hastelloy C

Fill Medium: DC 200 Silicone Oil

Process Connections: ¼" NPT on flanges or manifold mount

Electrical Connections: ½" and ¾" NPT conduit connections

Explosion Proof Housing: Low copper aluminum, polyester paint

Local indication: 6- ½ - Digit LCD display selectable engineering units

Process Temperature – RTD Interface, 100 Ohms
A three-wire platinum RTD per DIN 43760 is supported. The temperature, T, in degrees Celsius is calculated using the Calendar Van Dusen Equation according to the DIN EN 60751 standard for Class A & B RTDs.

Auto RTD error detection

The user may enter the coefficients from a custom calibrated RTD.

User connections: Pluggable terminal blocks

POWER SUPPLY INFORMATION

Operating Voltage Range: 4.0 to 30.0 VDC

AVERAGE CURRENT DRAW:

1 mA (typ.)

TURN-ON TIME:

Measured input variables will be within specifications less than two seconds after power is applied to the JT400.

ACCURACY AND PERFORMANCE SPECIFICATIONS

All specifications are for the digital, floating-point signal.

DIFFERENTIAL PRESSURE AND STATIC PRESSURE

Combined effects of nonlinearity, non-repeatability and hysteresis at reference pressure and over the operating temperature range:

DP linear mode: $\pm 0.05\%$ of Calibrated Span or 0.015% of URL, whichever is greater.

Static Pressure $\pm 0.035\%$ of span or 0.015% of URL whichever is greater.

Temperature effect on Differential pressure:
 $\pm 0.21\%$ URL maximum combined shift zero and span with an ambient temperature change of 60°C (108°F).
 $\pm 0.17\%$ URL maximum for Static pressure ranges.

Static pressure effects on Differential pressure:
Zero error: $\pm 0.1\%$ URL max, for a change in static pressure of 1000 PSI
Span error: $\pm 0.1\%$ reading max, for a change in static pressure of 1000 PSI
Static effects may be calibrated out.

Long term stability at constant conditions:
 $\pm 0.05\%$ URL/Year Typical
Mounting position effect: ± 2 in H₂O max, which can be calibrated out
Ripple and noise: Per ISA 50.1 Section 4.6

OVER RANGE CAPABILITY

All sensors remain accurate to $\pm 0.1\%$ while over-pressured up to 133% of URL.

Proof Pressure: $1\frac{1}{2}$ x URL without recalibration

MOUNTING EFFECTS

Mounting torque effects: None
Flow direction change effects: No "oil canning"

PROCESS TEMPERATURE INPUT SPECIFICATIONS

RTD Conversion Accuracy: $\pm 0.1^{\circ}\text{C}$, or $\pm 0.1\%$ of reading, whichever is greater

Ambient temperature effect on RTD measurement:
 $\pm 0.01^{\circ}\text{C} / ^{\circ}\text{C}$ max
Long term stability at constant conditions:
 $\pm 0.25^{\circ}\text{C} / \text{month}$ max

ENVIRONMENTAL SPECIFICATIONS

Temperature limits:
Sensor body: -40 to +80°C
Electronics: -40 to +80°C
With Display: -30 to +60°C
Storage: -40 to +100°C

Humidity limits: When covers are properly installed, unit will withstand 0 to 100% RH (Type 4 enclosure)

Vibration: $\pm 0.1\%$ URL/g max 10-500Hz in any axis per SAMA PMC-33-1C

Electromagnetic compatibility:
Conditions: Twisted pair wires including RTD. Covers installed and wiring run in grounded conduit. 10V/m, 20-500 MHz per SAMA PMC-33-1C

DP and SP: $\pm 0.25\%$ URL
RTD Temperature: $\pm 1^\circ\text{C}$

OPTIONAL LIQUID CRYSTAL DISPLAY (LCD)

The Optional LCD display is configurable for units, variable display sequence and period

USER INTERFACE

With a laptop computer, the JT400 transmitter can be quickly calibrated and configured. The computer interfaces to the USB port and the network port wiring does not need to be disconnected. A variety of communication interfaces are offered for the JT400:

- RS-485
- RS-232
- USB (The JT400 may be powered over USB)
- Radio - optional

COMMUNICATION PROTOCOLS

BSAP
Enron Modbus

ACCESSORIES

The following items are ordered separately:

Manifold adapters (“futchols”)
Three-valve or five-valve manifold
Mounting brackets
Explosion-proof USB connector
Wireless Receiver 2.4 GHz (Gateway)
RTD

FIELD UPGRADEABLE FIRMWARE

Firmware factory updates and added options may be added through the USB port in the field without loss of calibration.

WIRELESS POWER SYSTEM

The JT400 operates on a rechargeable lead acid battery pack with up to a 10-year life in conjunction with the internal solar panel (100 days autonomy) or on a non-rechargeable Lithium Pack with up to 2 years autonomy.

USER CONFIGURABLE I/O

Four digital inputs may be configured as open drain digital outputs.

The high-speed counter’s 10 KHz bandwidth may be filtered to 100 Hz by user selection and may also serve as a digital input.

The high-speed switch (to detect momentary inputs) provides an interrupt to the main processor for accurate time-stamping.

Two 1-5 V analog inputs have a 10% over range capability.

12 Volt output provides power for external devices such as low-power, voltage pressure transmitters.

PRESSURE SENSOR RANGES

Multivariable sensor is available in:

Differential Pressure/Static Pressure
150 in H₂O/1000 PSI
150 in H₂O/2000 PSI
300 in H₂O/1000 PSI
300 in H₂O/2000 PSI
400 in H₂O/2000 PSI

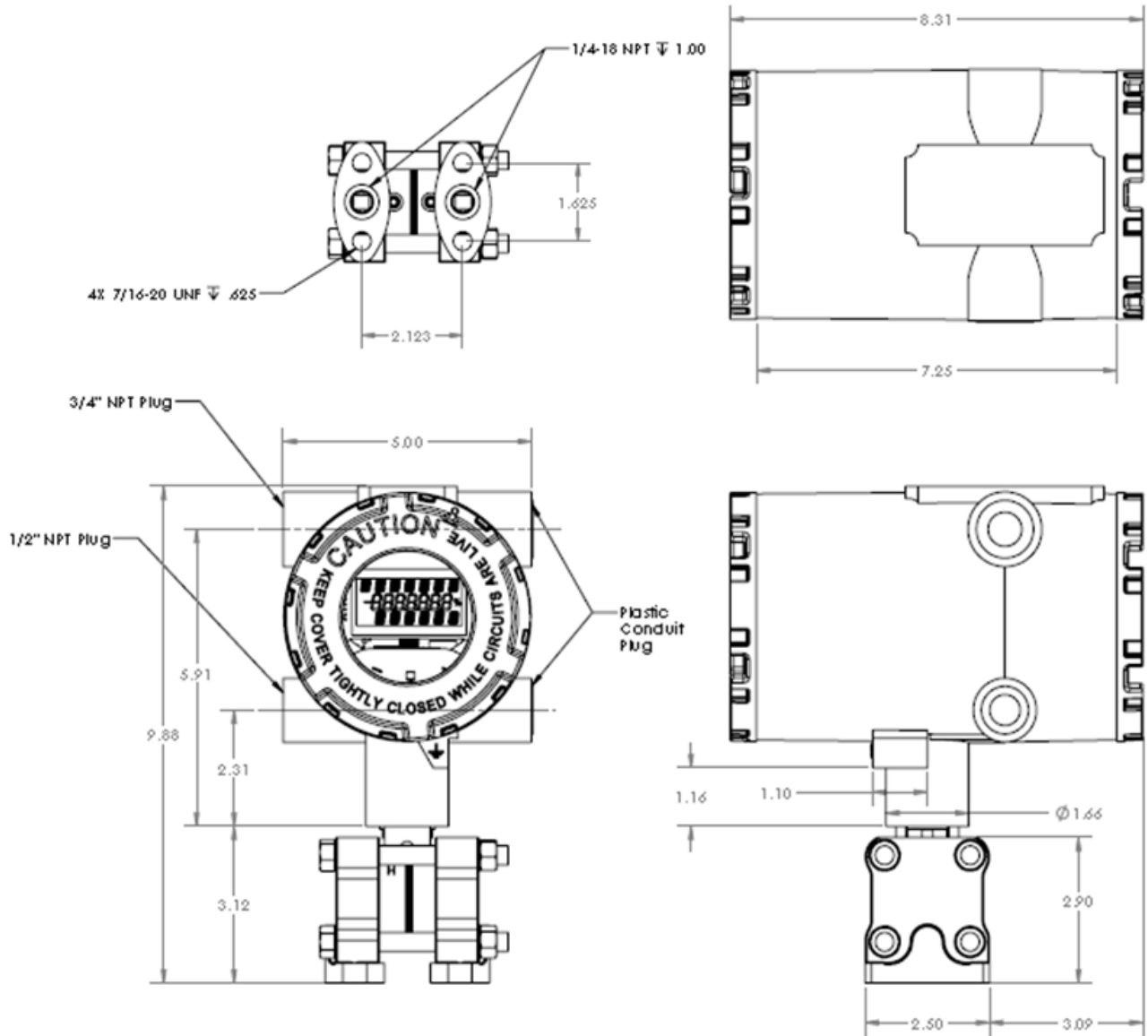
Single Variable Static pressure sensor is available in:

300 in H₂O
25 PSIG, 100 PSIG and 500 PSIG
1000 PSIS and 2000 PSIS

Optional:

3000 PSIS and 5000 PSIS (with indication up to 10,000 PSI)

DIMENSIONS



MODEL STRING JT400-AB-C-D-E-F-G-H-J-K-L-M-N-P-Q-R-S-T			
CODE - AB			NOTES
GP Gauge Pressure Model - Range	300" H2O	01	
	25 PSIG	02	
	100 PSIG	03	
	500 PSIG	04	
	1000 PSIS	05	
	2000 PSIS	06	
	3000 PSIS	07	
	5000 PSIS	08	
CODE - AB			
DP/P Version - DP/P Range	150" / 1000 PSIS	11	
	150" / 2000 PSIS	12	
	300" / 1000 PSIS	13	
	300" / 2000 PSIS	14	
	400" / 2000 PSIS	15	
CODE - C			
Diaphragm Material	316 SS	1	
	Hastelloy C	2	
CODE - D			
Flange/ Process Connection Material	316 SS	1	For GP model material must be the same as C
	Hastelloy C	2	
CODE - E			
Fill Medium	DC200 Silicone Oil	1	
	Other	2	Consult factory
CODE - F			
DP Manifold Adapter ("Futbols")	None	0	Must be same material as D
	316 SS	1	
	Hastelloy C	2	
CODE - G			
Mounting Bracket	None	0	
	DP Flange Bracket	1	
	GP Flange Bracket	2	
CODE - H			
Local Indication	None	0	
	4 ½ Digit LCD	1	

CODE - J			
Internal Power System	None	0	Requires external power source
	Lithium Battery Pack	1	Not available with Code-L = 1
	Lead Acid Battery Pack with Solar Panel and 2nd Glass Window	2	Requires external charging source; not available with Code-L = 1
CODE - K			
Data logging (Chart Replacement)	Off	0	
	On	1	
CODE - L			
Communications	USB/RS232/RS485	0	USB, RS232 and RS 485 are standard (supplied with 6 ft. USB Interface cable, terminal block connectors)
		1	Consult factory
CODE - M			
Flange Orientation		0	Flange faces away from front
		1	Flange faces 90 degrees (down)
CODE - N			
Hazardous Area Approval	UL/CUL CI D1 Explosion-proof	1	
	Other	2	Consult factory
CODE - P			
12 Volt Output	Off	0	
	On	1	Requires battery option.
CODE - Q			
Analog and Digital I/O	Off	0	
	On	1	Supplied with terminal block connector
CODE - R			
Radio Options	None	0	
	900 MHz Transmitter	1	Requires external antenna and battery
	2.45 GHz Transmitter	2	Internal antenna supplied. Requires battery option
CODE - S			
Explosion-Proof Antenna Coupler	None	0	
	Coupler	1	Required if using an external antenna
CODE - T			
External Antenna	None	0	
	Wireless 900 MHz	1	
	Wireless 2.45 GHz	2	



Newgate Instruments, LLC
17 Connecticut South Drive
East Granby, CT 06026

(860) 784-1968

Newgateinstruments.com

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