

JT400 Multivariable Transmitter

Ultra-Low Power Platform with Integrated I/O

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

DESIGNED FOR EASE OF USE: The JT400 incorporates the latest advances in low power technology. It is very easy to install and startup. And configuration with the JT400 GUI makes setup straight forward.

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

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

INTERFACE

Drop-in Compatibility

- Standard mapping via BSAP, Enron Modbus and ROC compatible protocols
- Automatic protocol detection
- Process I/O
- 2 AI, 4 DI/DO (selectable per-point)

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-31-1 Sect. 5.3 Cond. 3

Electromagnetic compatibility:
Conditions: Twisted pair wires including RTD. Covers installed and wiring run in grounded conduit. 10V/m, 20-500 MHz per SAMA PMC-33-1 (IEC 801.3)

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)

COMMUNICATION PROTOCOLS

BSAP
Enron Modbus
ROC compatible

ACCESSORIES

The following items are ordered separately:

Manifold adapters (“fubols”)
Three-valve or five-valve manifold
Mounting brackets
Explosion-proof USB connector
RTD

FIELD UPGRADEABLE FIRMWARE

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

USER CONFIGURABLE I/O

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

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

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
- 700 in H₂O / 2000 PSI

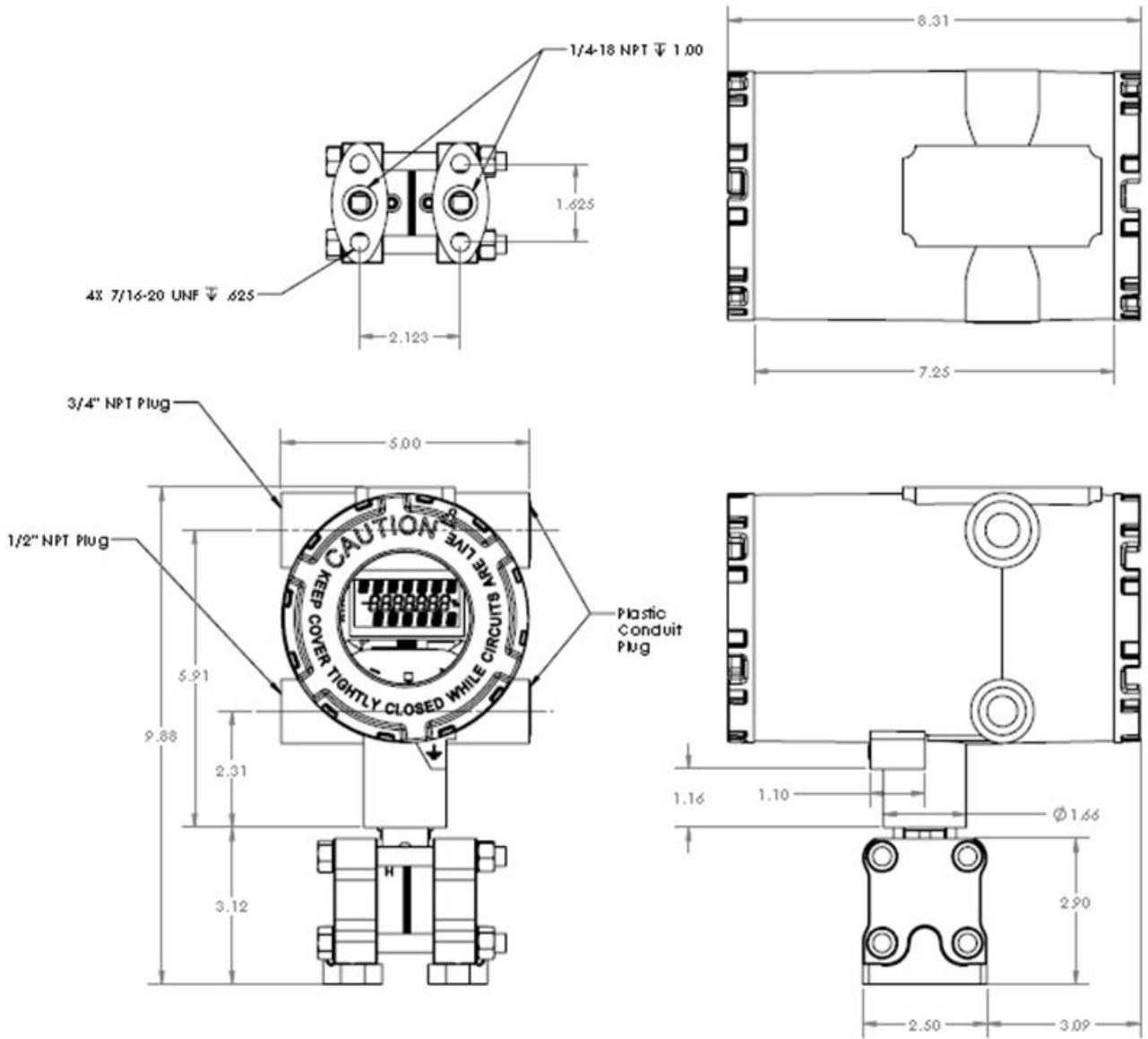
Single Variable Static pressure sensor is available in:

- 25 PSIG, 100 PSIG and 500 PSIG
- 1000 PSIS, 2000 PSIS, 3000 PSIS and 5000 PSIS (with indication up to 10,000 PSI)

Optional:

Dual Single Variable Static pressure sensor version of the JT400 available in the pressure ranges detailed in the Model String table.

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	None	00	Remote I/O JT400 - No Sensor
	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	
	700" / 2000 PSIS	16	
CODE - AB			
Dual GP Gauge Pressure Model - Range	S1: 25 PSIG - S2: 25 PSIG	22	
	S1: 100 PSIG - S2: 25 PSIG	32	
	S1: 100 PSIG - S2: 100 PSIG	33	
	S1: 500 PSIG - S2: 25 PSIG	42	
	S1: 500 PSIG - S2: 100 PSIG	43	
	S1: 500 PSIG - S2: 500 PSIG	44	
	S1: 1000 PSIS - S2: 25 PSIG	52	
	S1: 1000 PSIS - S2: 100 PSIG	53	
	S1: 1000 PSIS - S2: 500 PSIG	54	
	S1: 1000 PSIS - S2: 1000 PSIS	55	
	S1: 2000 PSIS - S2: 25 PSIG	62	
	S1: 2000 PSIS - S2: 100 PSIG	63	
	S1: 2000 PSIS - S2: 500 PSIG	64	
	S1: 2000 PSIS - S2: 1000 PSIS	65	
	S1: 2000 PSIS - S2: 2000 PSIS	66	
	S1: 3000 PSIS - S2: 25 PSIG	72	
	S1: 3000 PSIS - S2: 100 PSIG	73	
	S1: 3000 PSIS - S2: 500 PSIG	74	
	S1: 3000 PSIS - S2: 1000 PSIS	75	
	S1: 3000 PSIS - S2: 2000 PSIS	76	
S1: 3000 PSIS - S2: 3000 PSIS	77		
S1: 5000 PSIS - S2: 25 PSIG	82		
S1: 5000 PSIS - S2: 100 PSIG	83		
S1: 5000 PSIS - S2: 500 PSIG	84		
S1: 5000 PSIS - S2: 1000 PSIS	85		
S1: 5000 PSIS - S2: 2000 PSIS	86		
S1: 5000 PSIS - S2: 3000 PSIS	87		
S1: 5000 PSIS - S2: 5000 PSIS	88		
CODE - C			
Diaphragm Material	316 SS	1	
	HastelloyC	2	Consult factory
CODE - D			
Flange/ Process Connection Material	316 SS	1	For GP model material must be the same as C
	HastelloyC	2	Consult factory

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	
	6 ½ Digit LCD	1	
CODE - J			
Internal Power System (FUTURE)	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) (FUTURE)	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)
	Other	1	Consult factory
CODE - M			
Flange Orientation	Other	0	Consult factory
	Vertical (facing down)	1	
CODE - N			
Hazardous Area Approval	UL/CUL CI D1 Explosion-proof	1	
	Other	2	Consult factory
CODE - P			
12 Volt Output (FUTURE)	Off	0	
	On	1	Requires battery option
CODE - Q			
Analog and Digital I/O	Off	0	
	On	1	Supplied with terminal block connectors
CODE - R			
Radio Options (FUTURE)	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 (FUTURE)	None	0	
	Coupler	1	Required if using an external antenna
CODE - T			
External Antenna (FUTURE)	None	0	
	Wireless 900 MHz	1	
	Wireless 2.45 GHz	2	

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

(860) 784-1968

Newgateinstruments.com

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