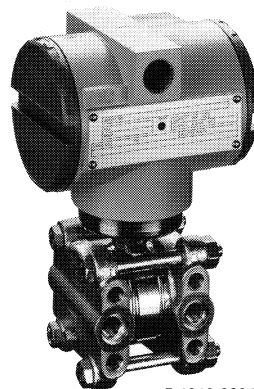


- $\pm 0.2\%$ of span accuracy
- Spans from 5 to 800 inches H₂O
- Outstanding temperature stability
- Rugged, lightweight design
- 7-year warranty

The 500T Series Electronic Differential Pressure Transmitter is a two-wire, 24V dc transmitter with a 4 to 20 mA dc output signal linear to the input pressure (square root extraction for a linearized flow signal is optionally available). The transmitter employs a ceramic capacitance sensor and unique, hermetically sealed, thick-film hybrid circuit. Each hybrid circuit is dynamically laser trimmed to match the performance characteristics



E-1212-292A

of the sensor to create a high-performance, high-reliability transmitter. Combined accuracy, temperature, and pressure stability are unmatched by other electronic pressure transmitters.

SPANS AND RANGES

Transmitter	Span Limits Minimum & Maximum	Range Limits		Overrange and Static Pressure Limits
		Lower	Upper	
504T	5 in. H ₂ O to 30 in. H ₂ O (1.2 kPa) to (7.5 kPa)	-30 in. H ₂ O (-7.5 kPa)	30 in. H ₂ O (7.5 kPa)	Standard: 2,500 psig (17 500 kPa) Optional: 6,000 psig (40 000 kPa)
505T	25 in. H ₂ O to 150 in. H ₂ O (6 kPa) to (38 kPa)	-150 in. H ₂ O (-38 kPa)	150 in. H ₂ O (38 kPa)	
506T	150 in. H ₂ O to 800 in. H ₂ O (38 kPa) to (200 kPa)	-800 in. H ₂ O (-200 kPa)	800 in. H ₂ O (200 kPa)	

Zero Elevation/Suppression: Zero is infinitely adjustable provided that the calibrated range is within the span and range limits above.

Warranty: ABB Instrumentation, Inc., Rochester, NY, warrants the 500T Series Transmitter for 7 years from date of shipment.
Contact ABB Instrumentation Inc., for complete information.

PERFORMANCE SPECIFICATIONS

Electrical Classification

Agency approvals and certifications as listed in Ordering Information. Also see Specification Sheet 12-16.

Temperature Limit

Primary

Silicone¹ Fill-Fluid -40 to 250°F (-40 to 121°C)
 Fluorolube² Fill-Fluid 20 to 250°F (-7 to 121°C)

Primary Peak

275°F (135°C) maximum for 30 minutes

Ambient

Without Digital Output Meter -40 to 185°F (-40 to 85°C)
 With Digital Output Meter -22 to 149°F (-30 to 65°C)

Storage

Without Digital Output Meter -65 to 200°F (-54 to 93°C)
 With Digital Output Meter -65 to 149°F (-54 to 65°C)

PERFORMANCE SPECIFICATIONS (Cont'd)

Operating Voltage (Transmitter)

Maximum

Without Options	45V dc
With Square Root Extraction	45V dc
With Surge Protection	45V dc
With Digital Output Meter	45V dc
With All Options	45V dc

Minimum

Without Options	12V dc
With Square Root Extraction	16.5V dc
With Surge Protection	13.4V dc
With Digital Output Meter	16.0V dc
With All Options	21.9V dc

Load Limitations (For higher load capability, contact ABB Instrumentation Rochester)

Drive Impedance

Supply V dc - Minimum V dc
0.020

Maximum Drive Impedance

Without Options	1650 ohms
With Square Root Extraction	1425 ohms
With Surge Protection	1580 ohms
With Digital Output Meter	1450 ohms
With All Options	1150 ohms

Relative Humidity

0 to 100% RH

Vacuum Service

Full vacuum

Response Time

Normal: 504T, 0.4 second; 505T, 506T, 0.2 second
Damped: 504T, 0.9 second; 505T, 506T, 0.6 second

Service

Liquid, gas, or steam

Accuracy

±0.2% of calibrated span (includes effects of linearity, hysteresis, and repeatability)

Hysteresis and Dead Band Combined

Better than 0.05%

Repeatability

Better than 0.05%

Ambient Temperature Effect per 100°F (56°C) at Maximum Span

On Zero

1.0% (504T)
0.5% (505T, 506T)

Total

2.0% (504T)
1.0% (505T, 506T)

On 504T with Tantalum Diaphragm increase temperature effect to 2% on zero and 4% on total per 100°F (56°C)

Static Pressure Effect, % of Upper Range Limit

On Zero

0.5% per 500 psi change (504T)
0.1% per 500 psi change (505T)
0.05% per 500 psi change (506T)

On Span

0.05% per 500 psi change (504T)
0.025% per 500 psi change (505T)
0.025% per 500 psi change (506T)

Optional Surge Protection

Up to 2500V pulse (5K amp discharge current) of 8 µs rise time and 20 µs decay to half value.

Output Signal

4 to 20 mA dc

Long-Term Stability

Better than ±0.25% of URL after 6 months

Supply Voltage Effect

Less than 0.005% per V dc

Load Effect

None

Mounting Position Effect

No effect if mounted in plane of diaphragm

Vibration Effect

±0.1% URL/2g at 15 to 150 Hz
±0.1% URL/g at 151 to 2,000 Hz

RFI Effect

Meets SAMA Standard PMC 33.1- 1978. Tested over a full frequency range of 20 to 1000 MHz.

Volumetric Displacement

0.02 cubic in. or less

PHYSICAL SPECIFICATIONS

Process Diaphragm

Choice of:
Type 316L SST
Hastelloy C³ alloy
Tantalum
Monel⁴ 400

Process Flanges and Adapters

Choice of:
Type 316 SST
Hastelloy C alloy
Kynar⁵

Flange Bolts

Choice of:
Alloy steel ASTM A354, Grade BD
Custom 450⁶ SST
Carbon steel, SAE J429 GR 2
316 SST Strain Hardened

Fill Fluid

Choice of:
Silicone 200¹ fluid
Fluorolube²; 20 to 250°F (-7 to 121°C) process limit

PHYSICAL SPECIFICATIONS (Cont'd)

Transmitter Housing

Low copper cast aluminum with baked epoxy ester, urea formaldehyde melamine finish; NEMA 4X, CSA Enc 4, IP66 (except SAA IP65)

Flange and Adapter Gasket

Teflon⁷ silicate - ceramic filled

NACE (National Association of Corrosion Engineers)

Interpretation of NACE Specification MR-01-75, latest Revision, is that it applies only to process-wetted parts. Flange bolts, although not process-wetted, are also available in NACE-compatible materials, if required. NACE qualified selections are clearly identified under Ordering Information.

Weight (with Flange Material of)

Carbon Steel

9.9 lb (4.5 kg)

Type 316 SST (2500 psi)

10.5 lb (4.8 kg)

Type 316 SST (6000 psi)

13.3 lb (6.0 kg)

Process Connection

Choice of:

1/4 in. Int. NPT in flange on 2-1/8 in. center

1/2 in. Int. NPT adapters on 2 in., 2-1/8 in., or 2-1/4 in. centers

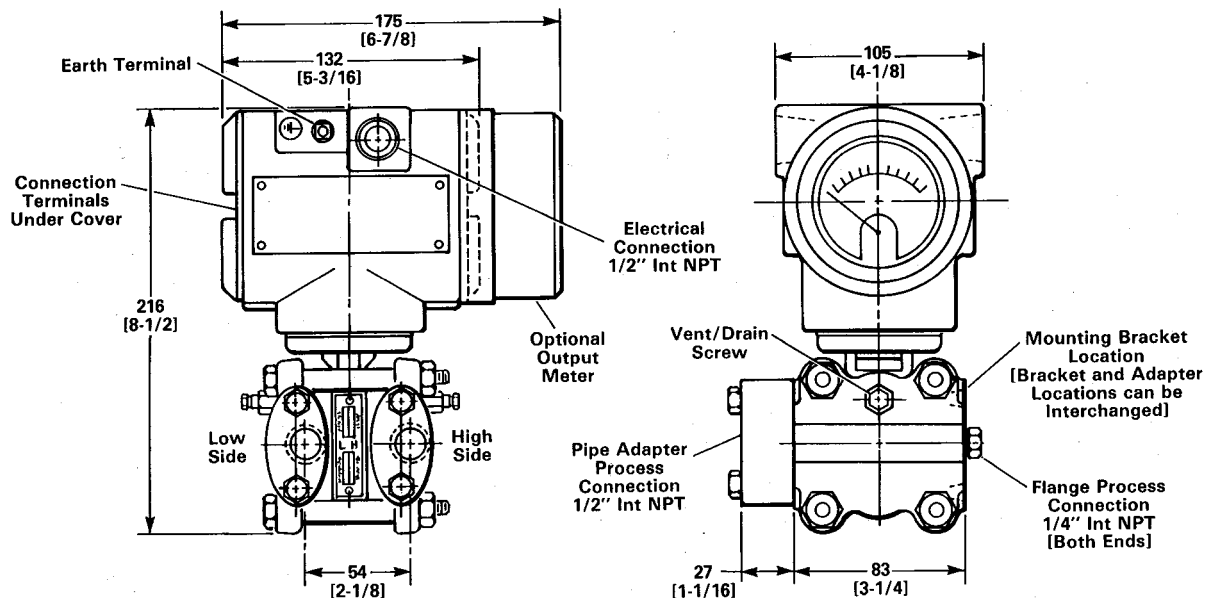
Electrical Connection

1/2 in. Int. NPT

For Electrical Codes 08 and 38 only, 2 each, 1/2 in. NPT male x M20 female adapters are provided.

For Electrical Code 82 only, 2 each environment-resistant circular connectors with angle plug, per MIL-C-5015, are provided.

DIMENSIONS



Note: Dimensions are nominal

8-1212-311A

ORDERING INFORMATION

1. Select one character or set of characters from each category and specify complete catalog number per sample below.
2. Specify tagging if required. Tagging information is provided on the exterior stainless steel data plate to a limit of 40 characters.
3. Specify units for Calibration and Data Tag in inches H₂O or kPa.

Code No.	Description
	BASE NUMBER - 1st thru 4th characters
504T	Electronic Differential Pressure Transmitter, Span adjustable from 5 to 30 in. H ₂ O (1.2 to 7.5 kPa)
505T	Electronic Differential Pressure Transmitter, Span adjustable from 25 to 150 in. H ₂ O (6 to 38 kPa)
506T	Electronic Differential Pressure Transmitter, Span adjustable from 150 to 800 in. H ₂ O (38 to 200 kPa)
	PRIMARY FILL-FLUID AND PROCESS TEMPERATURE RANGE - 5th character
B	Silicone 200 ¹ , -40 to 250°F (-40 to 121°C)
C	Fluorolube ² , 20 to 250°F (-7 to 121°C)
	ELECTRICAL CODE - 6th and 7th characters (also see Specification Sheet 12-16)
01	FM Approved: Non-Incendive (Division 2), Explosionproof (Division 1), Intrinsic Safety (Division 1)
02	BASEEFA Certified: Type N (Zone 2), Intrinsic Safety (Zone 0)
04	CSA Certified: Non-Incendive (Division 2), Explosionproof (Division 1), Intrinsic Safety (Division 1)
08	SAA Certified: Type N (Zone 2), Flameproof (Zone 1), Intrinsic Safety (Zone 0)
10	General Purpose, ABB Instrumentation Standard
31	FM Approved: Non-Incendive (Division 2), Explosionproof (Division 1) (Note 1)
32	BASEEFA Certified: Type N (Zone 2) (Note 1)
34	CSA Certified: Non-Incendive (Division 2), Explosionproof (Division 1) (Note 1)
38	SAA Certified: Type N (Zone 2), Flameproof (Zone 1) (Note 1)
45	BASEEFA Certified: Flameproof (Zone 1)
82	BASEEFA Certified: Intrinsic Safety (Zone 0) (Electrical Connection includes Environment Resistant Circular Connector with Angle Plug per MIL-C-5015)
	DIAPHRAGM MATERIAL - 8th character
2	Type 316L SST - NACE
3	Hastelloy C ³
4	Monel ⁴ (505T and 506T only)
7	Tantalum
	FLANGE MATERIAL AND MAXIMUM WORKING PRESSURE (MWP) - 9th character (Refer to Flow Accessories for possible limitations to MWP)
1	Carbon steel, nickel plated, 2500 psig (17 500 kPa) MWP
3	Hastelloy C; 2500 psig (17 500 kPa) MWP
4	Type 316 SST - NACE; 6000 psig (40 000 kPa) MWP
5	Type 316 SST - NACE; 2500 psig (17 500 kPa) MWP
7	Monel - 2500 psi (17 500 kPa) MWP (505T, 506T only)
8	Kynar ⁵ - 300 psig at 80°F (2 000 kPa at 27°C) and 125 psig at 150°F (850 kPa at 65°C) MWP (Only available with Process Connection 8) (Not available with Flange Bolt Material 1, 2, or 4 or Flow Accessories 1, 2, or 3)
	PROCESS CONNECTION - 10th character
0	Without pipe adapters, 1/4 in. Int. NPT in Flange
2	With 1/2 in. Int. NPT pipe adapters, Type 316 SST - NACE (not available with Flange Material 8)
3	With 1/2 in. Int. NPT pipe adapters, Hastelloy C
8	With 1/2 in. Int. NPT bushings, Kynar (only available with Flange Material 8)
	MODEL - 11th character
A	1st design level
0	UNUSED CHARACTER - 12th character
	MOUNTING BRACKET - 13th character
0	None
1	Bracket for 32 mm to 50 mm (1-1/4 in. to 2 in.) pipe or surface mounting, carbon steel
2	Bracket for 32 mm to 50 mm (1-1/4 in. to 2 in.) pipe or surface mounting, SST (Note 3)

ORDERING INFORMATION (Cont'd)

OUTPUT METER - 14th character

- 0** None
- 1** 0 to 100 Linear Scale
- 2** 0 to 10 Square Root Scale (not available with Options 1 and 4)
- 3** Digital (not available with Electrical Codes 01, 02, 04, 08, or 82)

OPTIONS - 15th character

- 0** None
- 1** Square Root Extractor (see Note 1; not available Output Meter Code 2)
- 2** Surge Protector
- 4** Combination of 1 and 2 (see Note 1; not available with Output Meter Code 2)

- HYPHEN - 16th character

FLANGE BOLT MATERIAL - 17th character

- 1** Alloy steel, ASTM A354, Grade BD bolts
- 2** Custom 450⁶ stainless steel bolts - NACE
- 3** 316 SST strain hardened, ASTM A193, Class 2, Grade B8M
- 5** Carbon Steel, SAE J429 Grade 2 (for use with Flange Material 8)
(Not available with Process Connection 3)

SPECIAL CLEANING - 18th character

- 0** None
- 1** Cleaned for Oxygen Service (not available with Primary Fill-Fluid B or Flange Material 4)

0 UNUSED CHARACTER - 19th character

MOUNTED FLOW ACCESSORIES - 20th character

- 0** None
- 1** 3-Valve Manifolds; not available with Flange Material 8;
refer to Specification Sheet 7-1-6. (Note 2)
- 2** Flow Element Mounted; not available with Flange Material 8; refer to Specification Sheet 4-11 (Integral Orifice) or Specification Sheet 4-23 (Integral Wedge) (Note 2)
- 3** Combination of 1 and 2; not available with Flange Material 8 (Note 2)

504TB01211A0100-1000 SAMPLE CATALOG NUMBER

NOTES:

1. Electrical Codes 10, 31, 32, 34, 38 and 45 are the only valid codes when a digital output meter (14th character 3) and/or square root extractor (15th character 1 or 4) is required.
2. Must be ordered as separate line items.
3. Not available with BASEEFA or SAA electrical code.

¹ Trademark of Dow Corning Company

² Trademark of Occidental Chemical Company

³ Trademark of Haynes International

⁴ Trademark of Inco Family of Companies

⁵ Trademark of Pennwalt Corporation

⁶ Trademark of Carpenter Technology Inc.

⁷ Trademark of E.I. du Pont de Nemours & Co., Inc.



The Company's policy is one of continuous product improvement and the right is reserved to modify specifications contained herein without notice.

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