

Intrinsically Safe



AST4400 Pressure Transducer / Transmitter



The AST4400 is a stainless steel pressure transducer with a wide variety of options. With its rugged construction and best price-to-performance ratio in the industry, the AST4400 is the solution for pressure measurement in Intrinsically

Benefits

- Class I Div 1 Intrinsically Safe Groups C, D when installed with an approved barrier
- ATEX / IECEx: Class I Zone 0 Exia IIB T4 Ga (Ta = -40°C to +80°C)
- High Strength Stainless Steel Construction
- No Oil, Welds or Internal O-rings
- Wide Operating Temperature
- Pressures up to 20,000 PSI
- Low Static and Thermal Errors
- Unparalleled Price and Performance
- Compatible with Wide Variety of Liquids and Gases

Applications

- Industrial OEM Equipment
- HVAC/R Equipment
- Water Management
- Control Panels
- Pneumatics
- Hydraulic Systems
- Data Loggers

Environmental Data

Temperature

| | |
|-----------|-----------------------------|
| Operating | -40 to 80°C (-40 to 176°F) |
| Storage | -40 to 100°C (-40 to 212°F) |

0-100% relative humidity, non-condensing

Thermal Limits

| | |
|-------------------|-------------------------|
| Compensated Range | 0 to 55°C (32 to 132°F) |
| TC Zero | <±1.5% of FS |
| TC Span | <±1.5% of FS |

Other

| | |
|---------------------|---|
| Shock | EN 60068-2-27 |
| Vibration | EN 60068-2-6, 60068-2-64, and IEC 68-2-32 |
| EMI/RFI Protection: | Yes |
| Rating: | IP-66, min |

For UL certified barrier drawing, see A01657.
For CSA certified barrier drawing, see A08949.

Performance @ 25°C (77°F)

| | |
|-----------------------|--|
| Accuracy* | < ±0.25% BFSL (<±0.5% from 7,500 up to 20,000 PSI) |
| Stability (1 year) | ±0.25% FS, typical |
| Over Range Protection | 2X Rated Pressure |
| Burst Pressure | 5X or 40,000 PSI (whichever is less) |
| Pressure Cycles | > 100 Million |

* Accuracy includes non-linearity, hysteresis & non-repeatability

Electrical Data

| Output | 4-20mA | 1-5VDC, 1-6VDC | 0.5-4.5V Ratiometric |
|-----------------------------|----------------------|--------------------|----------------------|
| Excitation | 10-28VDC | 10-28VDC | 5VDC, regulated |
| Output Impedance | >10k Ohms | <100 Ohms, Nominal | <100 Ohms, Nominal |
| Current Consumption: | 20mA, typical | 5mA, typical | <10mA |
| Bandwidth | (-3dB): DC to 250 Hz | (-3dB): DC to 1kHz | (-3dB): DC to 1kHz |
| Output Noise: | - | <2mV RMS | <2mV RMS |
| Zero Offset: | <±1% of FS | <±1% of FS | <±1% of FS |
| Span Tolerance: | <±2% of FS | <±1.5% of FS | <±1.5% of FS |
| Output Load: | 0-800 Ohms@10-28VDC | 10k Ohms, Min. | 10K Ohms, Min. |
| Reverse Polarity Protection | Yes | Yes | Yes |



Ordering Information

AST4400

A

00500

P

4

L

1

000

-SS

Series Type

Process Connection

A= 1/4" NPT Male I= 1/4" NPT Female**
 B= 1/8" NPT Male* P= 1/2" MNPT**
 C= 1/4" BSPP Male W= F250C Female Autoclave***
 F= 7/16"-20 UNF Male*

*Not available under 50PSI (not available in 316L) **Pressures up to 15,000 PSI
 ***Pressures from 10,000 to 20,000 PSI, not available in 316L

Pressure Measurement

Insert 5-digit code from pressure chart below (example: 0-500 PSI = 00500)

Pressure Unit

B= Bar K= kg/cm² P= PSI

Outputs

1= 0.5-4.5V ratiometric 4= 4-20mA (2 wire loop powered)
 3= 1-5V 6= 1-6V

Electrical

A= 2 ft. (0.6m) F= Packard Metripack 150 3-Pin P= Conduit, Cable 10 ft. (3 m)*
 B= 4 ft. (1.2m) I= DIN 43650A R= 6- Pin Bendix
 C= 6 ft. (1.8m) L= Conduit, Cable 2 ft. (0.6 m)* Y= M12x1
 D= 10 ft. (3.0m) M= Conduit, Cable 4 ft. (1.2 m)* 4 = Mini-Fast (CSA Only)
 E= Mini DIN 43650C N= Conduit, Cable 6 ft. (1.8 m)*

Wetted Material

0= 17-4PH 2= Inconel 718 (consult factory on availability)
 1= 316L 4= Hastelloy C276 (consult factory on availability)

Options

000= No Options 588= 0.5-2.5V non-ratiometric (3-5VDC)

Approval

Insert code from approvals chart below
 [Leave blank for UL ANSI/ISA 12.12.01 Class I Div 1 Intrinsically Safe Groups C, D (formerly UL913)]

Pressure Ranges*

| PSIG Measurement | -14.7 to 25** | Pressure Code | V0025** |
|------------------|---------------|-----------------|---------|
| | 0-25 | | 00025 |
| | 0-50 | | 00050 |
| | 0-100 | | 00100 |
| | 0-150 | | 00150 |
| | 0-200 | | 00200 |
| | 0-250 | | 00250 |
| | 0-500 | | 00500 |
| | 0-1,000 | | 01000 |
| | 0-2,500 | | 02500 |
| | 0-5,000 | | 05000 |
| 0-7,500 | 07500 | | |
| 0-10,000 | 10000 | | |
| CSA ONLY | 0-15,000 | CSA ONLY | 15000 |
| | 0-20,000 | | 20000 |

| BARG Measurement | -1 to 2** | Pressure Code | V0002** |
|------------------|-----------|---------------|---------|
| | 0-2 | | 00002 |
| | 0-5 | | 00005 |
| | 0-7 | | 00007 |
| | 0-10 | | 00010 |
| | 0-20 | | 00020 |
| | 0-35 | | 00035 |
| | 0-50 | | 00050 |
| | 0-100 | | 00100 |
| | 0-250 | | 00250 |
| | 0-350 | | 00350 |
| 0-500 | 00500 | | |
| 0-700 | 00700 | | |

+Typical ranges. All ranges between 0-25 PSI and 0-20,000 PSI available. **Compound ranges up to -14.7 to 500 PSI available. Please consult factory.

Approvals

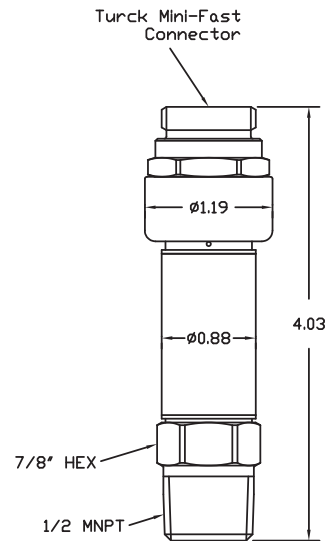
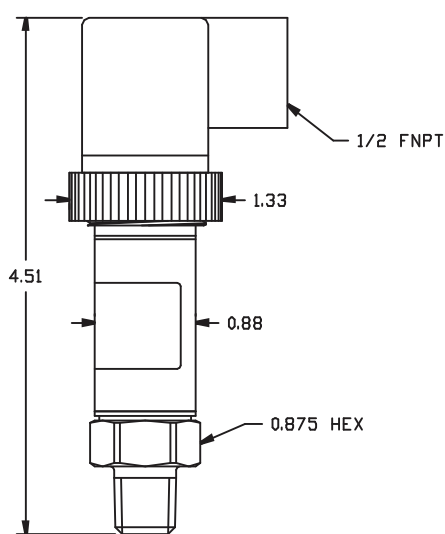
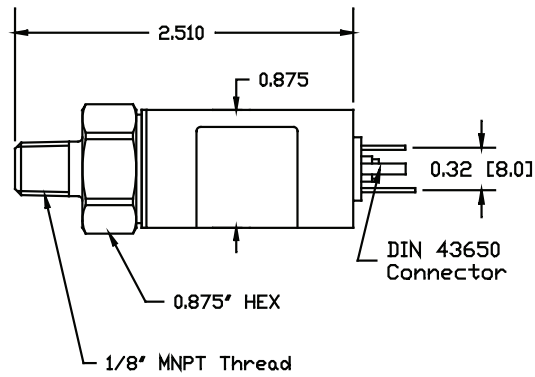
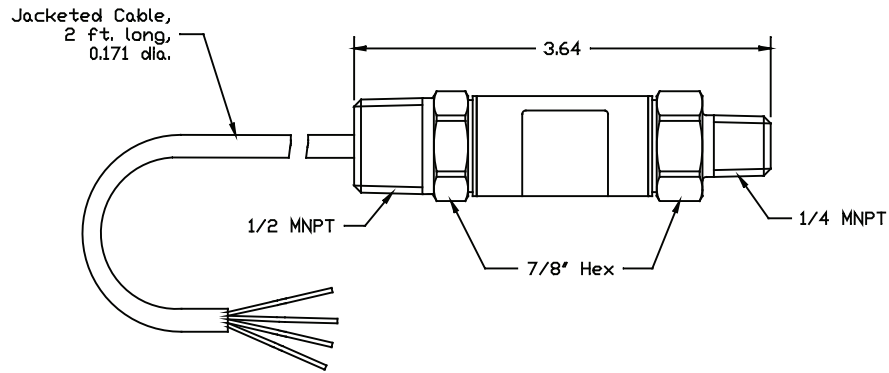
| | |
|-----|---|
| -SL | IEC 61508 - SIL2 (4-20mA only) |
| -SS | CSA157 Class I Div 1 Grps C, D Intrinsically Safe, ANSI/ISA 12.27.01 Single Seal and ATEX/IECEx Exia IIC Class I, Zone 0, T4 |
| -Y | IEC 61508 - SIL2 (4-20mA only) + CRN |
| -Z | CRN Registered to ANSI/ASME B31.3. Contact factory for material, pressure, and process connection options (includes -SS approvals) |

Note: CSA approved products require case/earth ground electrical connection. See wiring installation sheet for further details

Intrinsically Safe



AST4400 Pressure Transducer / Transmitter



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AST4400

Pressure Transducer / Transmitter

UL Approved Barrier Installation / A01657

CSA Approved Barrier Installation / A08949

Class I, Div. 1, Groups C,D
Class I, Zone 0 Ex Ia IIB T4
Class I, Zone 0 AEx Ia IIB T4
OR
Class I, Div. 1, Groups A,B,C,D
Class I, Zone 0 Ex Ia IIC T4
Class I, Zone 0 AEx Ia IIC T4
Hazardous Location

Nonhazardous Location

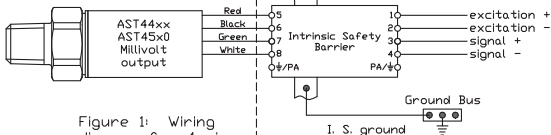


Figure 1: Wiring diagram for 4-wire, mV output

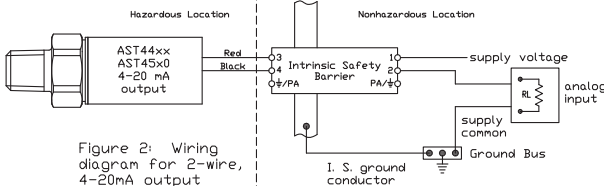


Figure 2: Wiring diagram for 2-wire, 4-20mA output

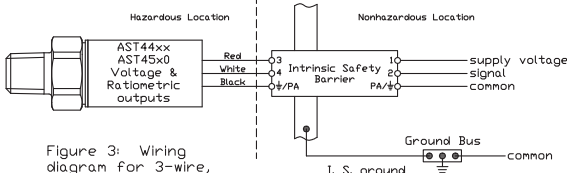


Figure 3: Wiring diagram for 3-wire, Voltage & Ratiometric outputs

The transducers listed below are designed for installation in EITHER Class I, Division 1, Groups C,D; Class I, Zone 0 Group IIB OR Class I, Division 1, Groups A,B,C,D; Class I, Zone 0 Group IIC hazardous locations when connected to Associated Apparatus as described in note 1.

Entity Parameters

Models AST4400, AST44LP, AST4500, AST4510, AST4520
Class I, Div. 1, Groups C,D; Class I, Zone 0 Ex Ia IIB T4; Class I, Zone 0 AEx Ia IIB T4
 $V_{max} = 28V$

Model AST4401
Class I, Div. 1, Groups A,B,C,D; Class I, Zone 0 Ex Ia IIC T4; Class I, Zone 0 AEx Ia IIC T4
 $V_{max} = 14.5V$

| 4-20mA with integral connector | 4-20mA with upto 1000ft of integral cable | All EXCEPT 4-20mA with integral connector | All EXCEPT 4-20mA with upto 150ft of integral cable |
|--------------------------------|---|---|---|
| $P_{max} = 651 mW$ | $P_{max} = 651 mW$ | $P_{max} = 651 mW$ | $P_{max} = 651 mW$ |
| $I_{max} = 93 mA$ | $I_{max} = 93 mA$ | $I_{max} = 93 mA$ | $I_{max} = 93 mA$ |
| $C_i = 0.391 \mu F$ | $C_i = 0.434 \mu F$ | $C_i = 0.643 \mu F$ | $C_i = 0.649 \mu F$ |
| $L_i = 0 \mu H$ | $L_i = 0 \mu H$ | $L_i = 0 \mu H$ | $L_i = 0 \mu H$ |

I_{sc} or I_o is the total current available from the Associated Apparatus under any condition.

1. The following conditions must be satisfied:

- V_{oc} or $U_o \leq V_{max}$
- I_{sc} or $I_o \leq I_{max}$
- $P_o \leq P_i$ (if applicable)
- Total customer cable length for 4-20mA transmitters not to exceed 4000ft.
- Total customer cable length for all other transmitters not to exceed 150ft.
- Where the cable capacitance and inductance per foot are not known, the following values shall be used: $C_{cable} = 60pF/ft$, $L_{cable} = 0.2\mu H/ft$

2. Control Room apparatus shall not generate in excess of 250V (U_{max}).

3. Canadian installations should be in accordance with Canadian Electrical Code, Part I. U.S. installations should be in accordance with Article 504 in the National Electrical Code, ANSI/NFPA 70.

Class I, Div. 1, Groups C,D
EXia IIB, T4
Class I, Zone 0, AExIa IIB, T4
OR
Class I, Div. 1, Groups A,B,C,D
EXia IIC, T4
Class I, Zone 0, AExIa IIC, T4
Hazardous Location

Nonhazardous Location

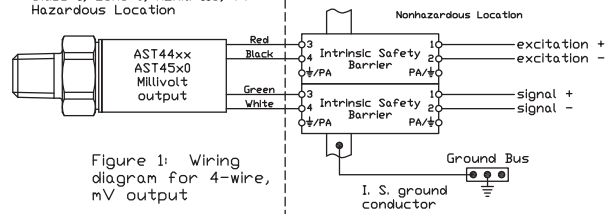


Figure 1: Wiring diagram for 4-wire, mV output

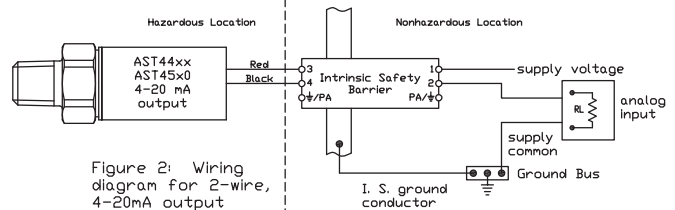


Figure 2: Wiring diagram for 2-wire, 4-20mA output

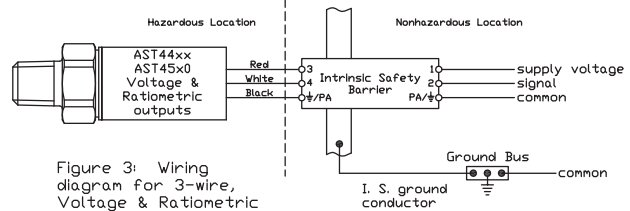


Figure 3: Wiring diagram for 3-wire, Voltage & Ratiometric outputs

Entity Parameters

Models AST4400, AST44LP, AST4500, AST4510, AST4520, AST4530
Class I, Div. 1, Groups C,D; EXia IIB, T4; Class I, Zone 0, AExIa IIB, T4
 $V_{max} = 28Vdc$

Model AST4401
Class I, Div. 1, Groups A,B,C,D; EXia IIC, T4; Class I, Zone 0, AExIa IIC, T4
 $V_{max} = 14.5Vdc$

| 4-20mA with integral connector | 4-20mA with upto 1000ft of integral cable | All EXCEPT 4-20mA with integral connector | All EXCEPT 4-20mA with upto 150ft of integral cable |
|--------------------------------|---|---|---|
| $P_{max} = 625 mW$ | $P_{max} = 625 mW$ | $P_{max} = 625 mW$ | $P_{max} = 625 mW$ |
| $I_{max} = 93 mA$ | $I_{max} = 93 mA$ | $I_{max} = 93 mA$ | $I_{max} = 93 mA$ |
| $C_i = 0.391 \mu F$ | $C_i = 0.434 \mu F$ | $C_i = 0.643 \mu F$ | $C_i = 0.649 \mu F$ |
| $L_i = 0$ | $L_i = 155 \mu H$ | $L_i = 0$ | $L_i = 23.3 \mu H$ |

1. For installation in accordance with Fig 2, barrier must be a CSA Certified, Single Channel grounded Shunt-Diode Zener Barrier or a Single Channel Isolating Barrier.

2. For installations in accordance with Figs. 1 and 3, one dual-channel or two single-channel barriers may be used, where in either case, both channels have been Certified for use together with combined entity parameters.

3. The following conditions must be satisfied:

- V_{oc} or $U_o \leq V_{max}$
- I_{sc} or $I_o \leq I_{max}$
- $P_o \leq P_i$ (if applicable)

4. Maximum non-hazardous area voltage must not exceed 250 V.

5. Canadian installations should be in accordance with Canadian Electrical Code, Part I. U.S. installations should be in accordance with Article 504 in the National Electrical Code, ANSI/NFPA 70.

6. A grounding method is not provided by the manufacturer as part of the integral design of the Transducer. For units which are connected through a grounded shunt diode safety barrier, ensure that the transducer is mounted to a surface which is at the same potential as the barrier ground.

7. See user manual for installation conditions.