

AUTOMATION PRODUCTS GROUP, INC.

Operator's Manual

PT-400



Automation Products Group, Inc.

APG...Providing tailored solutions for measurement applications

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• Warranty and Warranty Restrictions

APG warrants its products to be free from defects of material and workmanship and will, without charge, replace or repair any equipment found defective upon inspection at its factory, provided the equipment has been returned, transportation prepaid, within 18 months from date of shipment from factory.

THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES NOT EXPRESSLY SET FORTH HEREIN, WHETHER EXPRESSED OR IMPLIED BY OPERATION OF LAW OR OTHERWISE INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No representation or warranty, express or implied, made by any sales representative, distributor, or other agent or representative of APG which is not specifically set forth herein shall be binding upon APG. APG shall not be liable for any incidental or consequential damages, losses or expenses directly or indirectly arising from the sale, handling, improper application or use of the goods or from any other cause relating thereto and APG's liability hereunder, in any case, is expressly limited to the repair or replacement (at APG's option) of goods.

Warranty is specifically at the factory. Any on site service will be provided at the sole expense of the Purchaser at standard field service rates.

All associated equipment must be protected by properly rated electronic/electrical protection devices. APG shall not be liable for any damage due to improper engineering or installation by the purchaser or third parties. Proper installation, operation and maintenance of the product becomes the responsibility of the user upon receipt of the product.

Returns and allowances must be authorized by APG in advance. APG will assign a Return Material Authorization (RMA) number which must appear on all related papers and the outside of the shipping carton. All returns are subject to the final review by APG. Returns are subject to restocking charges as determined by APG's "Credit Return Policy".

• Instructions

All units are factory calibrated prior to shipment.

1. Zero Trimming

If it becomes necessary to re-adjust “zero”, this can be accomplished by adjusting the trimpot marked “Z”. An ideal zero is indicated by an output of 4 mA. (4/20 mA) or 0 (5 VDC, 10 VDC).

- A. Remove the protective screw.
- B. Ensure that the transducer is at 0 psig or 0 psia (vacuum if absolute)
- C. Using a jewelers screwdriver or a suitable instrument, adjust the “Z” pot until you have 4 mA (4/20 mA) or 0 (5 VDC, 10 VDC) output. *Do not make changes to the Span adjustment (the “S” pot to the right) as part of the zero trimming. The Span should only be changed as part of the re-calibration of a gauge with a known pressure source.*

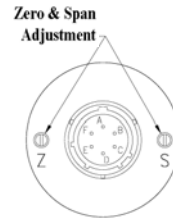
Note: You may also return the transducer to the factory for repair and/or adjustment.

2. Re-calibration

This procedure requires a known pressure source of at least $\pm 0.1\%$ accuracy in order to fully utilize the accuracy potential of the transducer. (If not available, you can return it to the factory for re-calibration.)

Procedure:

- A. Ensure that the transducer is at 0 psig or 0 psia (vacuum if absolute), and adjust zero as per instructions in #1.
- B. Apply full scale pressure to the pressure port and adjust the span (“S”) pot until the full scale signal is reached.
- C. Re-check zero and re-adjust the zero (“Z”) pot if required.
- D. Repeat steps B, and C, until no further adjustment is required.



3. Electrical Information

4/20mA

This device is a 2 wire, loop powered transmitter. A voltage of between 9 and 28 VDC must be maintained at this connection. Completion of the earth or system ground is recommended for proper circuit protection.

Power supply voltage must be sufficient to maintain a minimum of 9 VDC at the transducer/transmitter terminals after “dropping” voltage across RL at full scale current (20 mA), see Figure on page 6. Example: If $RL = 250$ ohm then “drop” is $0.02 \text{ Amps} \times 250 \text{ ohm} = 5 \text{ volts}$. Therefore power supply minimum is $5 \text{ V} + 9 \text{ V} = 14 \text{ V}$

4. Wiring Information

Below, and on the next page, are the pin out diagrams, circuit diagrams, and pin out table for the 4-20 mA, 0-5 VDC and 0-10 VDC circuits, as needed to assist you in wiring your transducer.

PT-400 Pin Out Table

| | | 4-20 mA | 0-5 VDC | 0-10 VDC |
|---------------|-----|--------------|-------------------------|-------------------------|
| 6 Pin Bayonet | A | + Excitation | + Excitation | + Excitation |
| | B | - Excitation | + Output | + Output |
| | C | N/C | - Output | - Output |
| | D | N/C | - Excitation | - Excitation |
| | E | N/C | N/C | N/C |
| | F | N/C | N/C | N/C |
| 4 Pin Bayonet | A | + Excitation | + Excitation | + Excitation |
| | B | - Excitation | + Output | + Output |
| | C | N/C | - Output | - Output |
| | D | N/C | - Excitation | - Excitation |
| 4 Pin M12 | 1 | + Excitation | + Excitation | + Excitation |
| | 2 | - Excitation | + Output | + Output |
| | 3 | N/C | - Output | - Output |
| | 4 | N/C | - Excitation | - Excitation |
| Pigtail | RED | + Excitation | + Excitation | + Excitation |
| | GRN | N/C | + Output | + Output |
| | WHT | N/C | - Output | - Output |
| | BLK | - Excitation | - Excitation | - Excitation |
| DIN 43650 | 1 | + Excitation | + Excitation | + Excitation |
| | 3 | N/C | + Output | + Output |
| | 2 | - Excitation | - Output & - Excitation | - Output & - Excitation |

N/C indicates no connection.

Electrical Cable Specifications

Voltage Outputs

AWG: 22

Stranding: 7/30

Shield: Aluminum foil with drain wire

Jacket: PVC

4/20 mA Output

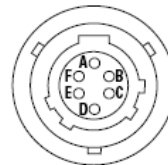
AWG: 18

Stranding: 16/30

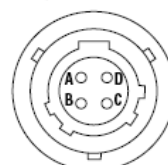
Shield: Aluminum foil with drawin wire

Jacket: PVC

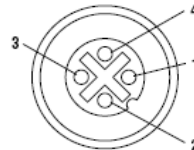
6 Pin Bayonet Connector



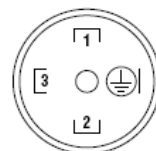
4 Pin Bayonet Connector



4-Pin M12 Micro Connector

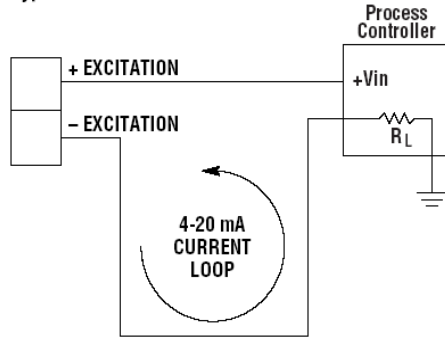


DIN Connector

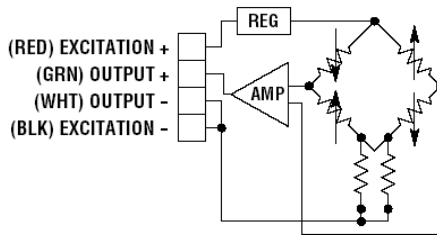


Wiring Information Cont'd

Typical 4-20 mA Circuit



Typical 0-5 and 0-10 VDC Circuit

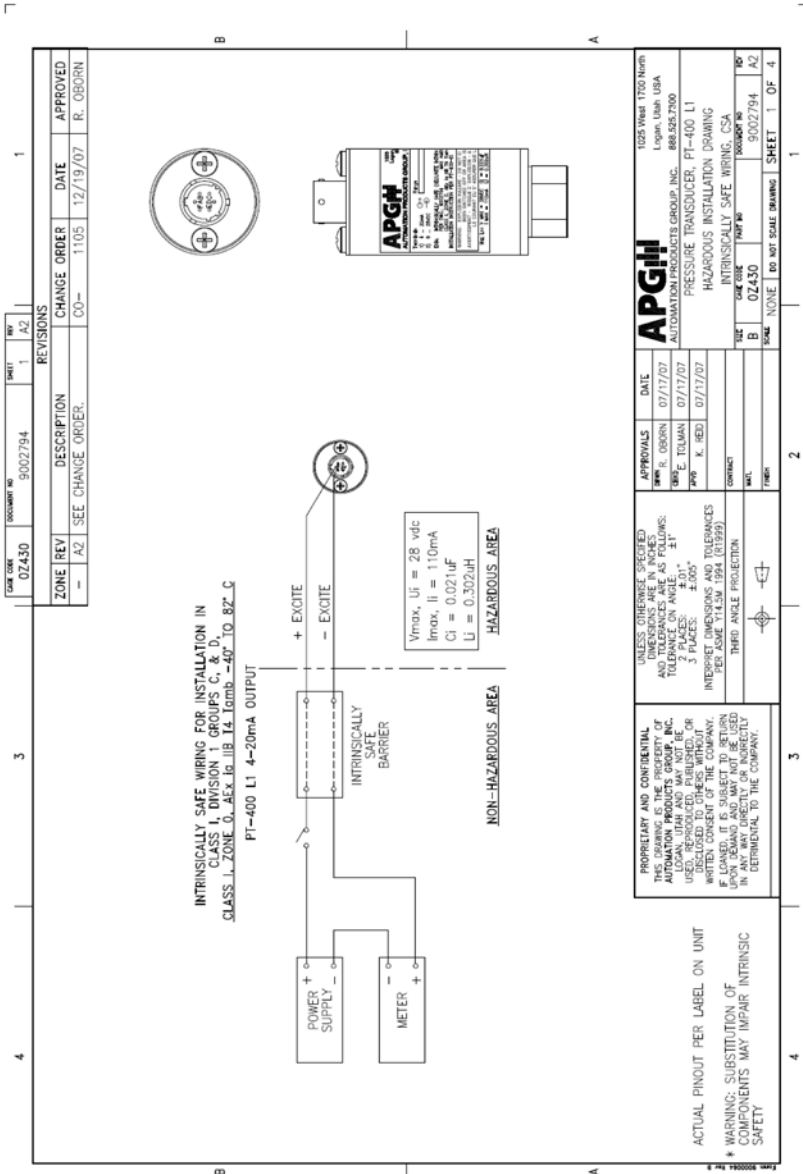


Excitation Voltage

9-28 VDC ; 0-5 VDC

12.5-28 VDC; 0-10 VDC

5. Intrinsically Safe Wiring



| | | | | | | | | | | | |
|--------------------|--|-------------------------|------------|------------|------|------------------|-------------|--------------|----------|-----------|--|
| FORM 800004 Rev. B | | | | | | | | | | | |
| DATE CODE 02430 | | DOCUMENT NO. 9009794 | SHEET 2 | REV. A2 | 1 | | | | | | |
| REVISIONS | | | | | ZONE | REV | DESCRIPTION | CHANGE ORDER | DATE | APPROVED | |
| | | | | | A2 | SEE CHANGE ORDER | CO- | 1105 | 12/19/07 | R. OBRONN | |

NONINDUCIVE WIRING FOR INSTALLATION IN
CLASS 1 DIVISION 2 GROUPS C, & D
CLASS 1, ZONE 2, AEx Ib, IIB, Ia Tamb -40° TO 82°
PT-400 LI 4-20mA OUTPUT

+ EXCITE
- EXCITE

Max. U_i = 28 vdc
 Max. I_i = 170mA
 C_i = 0.021uF
 L_i = 0.302uH

NON-HAZARDOUS AREA

HAZARDOUS AREA

* WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

| | | | | |
|--------------------|-------------------------|----------------------|-----------|----------|
| CASE CODE 0Z430 | DOCUMENT NO. 9002794 | SHEET 3 | REV A2 | 1 |
| ZONE REV | | DESCRIPTION | | DATE |
| - | | A2 SEE CHANGE ORDER. | | 12/19/07 |
| REVISIONS | | CHANGE ORDER | CO- | 1105 |
| | | APPROVED | R. OSBORN | |

NONINCENDIVE WIRING FOR INSTALLATION IN
CLASS 1 DIVISION 2 GROUPS C, & D
CLASS 1, ZONE 2, AEx, Ib, IIB T4, Tamb = 40° TO 82° C
PT-400 L3 0-5WVC VOLTAGE OUTPUT

CERTIFIED ASSOCIATED
NONINCENDIVE
FIELD WIRING

Vmax, Ui = 28 vdc
I_{max}, I_i = 110mA
Ci = 0.021uF
Li = 0.302uH

NON-HAZARDOUS AREA

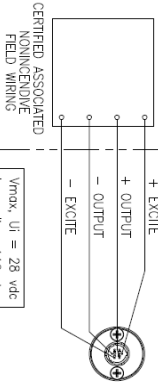
HAZARDOUS AREA

| | | |
|--|--|---|
| <p>UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND DECIMALS THEREOF. TOLERANCES ON ANGLES: 31° ± 0.01° 2 PLACES; 3 PLACES; INTERFERING DIMENSIONS, TOLERANCES REFER TO ASSE 214.1M, 1994 (R1999).</p> | <p>APPROVALS DATE</p> <p>R. OSBORN 07/17/07</p> <p>E. TOLMAN 07/17/07</p> <p>J. K. REDD 07/17/07</p> | <p>1025 West 1700 North Logan, Utah, USA 888-525-7300</p> <p>APG AUTOMATION PRODUCTS GROUP, INC.</p> <p>PRESSURE TRANSDUCER, PT-400 L3 HAZARDOUS INSTALLATION DRAWING NONINCENDIVE WIRING, CSA</p> |
| <p>PROPRIETARY AND CONFIDENTIAL. THIS DRAWING IS THE PROPERTY OF AUTOMATION PRODUCTS GROUP, INC. LOCAL, STATE AND FEDERAL GOVERNMENTS AND AGENCIES ARE NOT TO BE REPRODUCED OR TRANSMITTED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF THE COMPANY. THIS DRAWING IS THE PROPERTY OF APG AND MAY NOT BE USED FOR ANY OTHER PROJECTS WITHOUT THE WRITTEN CONSENT OF APG. RETURN TO THE COMPANY.</p> | | <p>SCALE NONE DO NOT SCALE DRAWING</p> <p>SHEET 3 OF 4</p> |

Form 900004, Rev. B

| DATE CODE | DOCUMENT NO. | SHEET | REV. |
|--------------|--------------|------------------|------|
| 07430 | 9002794 | 4 | A2 |
| REVISIONS | | | |
| ZONE | REV | DESCRIPTION | DATE |
| - | A2 | SEE CHANGE ORDER | |
| CHANGE ORDER | DATE | APPROVED | |
| CO-1105 | 12/19/07 | R. O'BORN | |

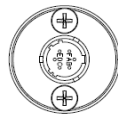
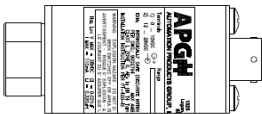
NONHAZARDOUS WIRING FOR INSTALLATION IN CLASS 1 DIVISION 2 GROUPS C, & D
 ZONE 0, AEx Ib IIB 1/4 Tamb -40° TO 82° C
 PT-400 L10 0-10VDC VOLTAGE OUTPUT



NON-HAZARDOUS AREA

CERTIFIED ASSOCIATED NONHAZARDOUS FIELD WIRING

HAZARDOUS AREA



ACTUAL PINOUT PER LABEL ON UNIT
 * WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

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| APPROVALS | DATE |
|------------------------|----------|
| DESIGNED BY: R. O'BORN | 07/17/07 |
| DRAWN BY: E. TOLMAN | 07/17/07 |
| CHECKED BY: K. HEDL | 07/17/07 |
| CONTRACT | |
| DATE | |

APGH
 AUTOMATION PRODUCTS GROUP, INC.
 1025 West 1700 North
 Logan, Utah USA
 888.525.7300

HAZARDOUS TRANSDUCER, PT-400 L10
 HAZARDOUS INSTALLATION DRAWING
 NONHAZARDOUS WIRING, CSA # 9002794

DATE: 07430
 SCALE: NONE DO NOT SCALE DRAWING
 SHEET: 4 OF 4



Certificate of Compliance

| | | | |
|---------------------|---|-------------------------|------------|
| Certificate: | 1984045 | Master Contract: | 237484 |
| Project: | 1984045 | Date Issued: | 2008/03/04 |
| Issued to: | Automation Products Group Inc 1025 West 1700 North Logan, UT 84321 USA Attention: Karl Reid | | |

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'



Issued by: Andrew Redeker

Authorized by: Patricia Pasemko, Operations Manager

PRODUCTS

- CLASS 2258 83** - PROCESS CONTROL EQUIPMENT-Intrinsically Safe and Non-Incendive - Systems-For Hazardous Locations-Certified to U.S. Standards
- CLASS 2258 03** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations
- CLASS 2258 84** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe, Entity - - For Hazardous Locations - Certified to US Standards
- CLASS 2258 04** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe, Entity - For Hazardous Locations

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2004-06-30

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Certificate: 1984045

Master Contract: 237484

Project: 1984045

Date Issued: 2008/03/04

2258 03 - Process Control Equipment - Intrinsically Safe and Non Incendive systems For Hazardous Locations
2258 83 - Process Control Equipment - Intrinsically Safe and Non Incendive – Systems For Hazardous Locations - Certified to US Standards

Class I, Division 2, Groups C and D; Class I, Zone 2, Group IIB; Ex nL IIB T4; $-40^{\circ}\text{C} \leq \text{Ta} \leq +85^{\circ}\text{C}$; AEx nL IIB T4; $-40^{\circ}\text{C} \leq \text{Ta} \leq +85^{\circ}\text{C}$

Model PT-400-xxxx Pressure Transmitter; Rated 9-28VDC, 4-20mA or 0-5V, 20mA or 0-10V, 20mA; Maximum Ambient 85°C; Temperature Code T4; Maximum Working Pressure 10,000 PSI; Non-Incendive with the following Entity Parameters:

Vmax, Ui = 28V; Imax, Ii = 110mA; Pmax, Pi = 0.77W; Ci = 0uF; Li = 0uH

Model PT-500-xxxx Pressure Transmitter, Rated 10-28VDC, 4-20mA; Maximum Ambient 85°C; Temperature Code T4; Maximum Working Pressure 10,000 PSI; Non-Incendive with the following Entity Parameters:

Vmax, Ui = 28V; Imax, Ii = 110mA; Pmax, Pi = 0.77W; Ci = 0uF; Li = 0uH

Notes for Models PT-400, PT-500

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.

2258 04 - Process Control Equipment - Intrinsically Safe, Entity - For Hazardous Locations

2258 84 - Process Control Equipment - Intrinsically Safe, Entity - For Hazardous Locations - Certified to US Standards

Class I, Division 1, Groups C,D; Class I, Zone 0, Group IIB; Ex ia IIB T4; $-40^{\circ}\text{C} \leq \text{Ta} \leq +85^{\circ}\text{C}$; AEx ia IIB T4; $-40^{\circ}\text{C} \leq \text{Ta} \leq +85^{\circ}\text{C}$



Certificate: 1984045

Master Contract: 237484

Project: 1984045

Date Issued: 2008/03/04

Model PT-400-L1xxxx Pressure Transmitter; Maximum Ambient 85°C; Temperature Code T4; Maximum Working Pressure 10,000 PSI; Entropy parameters as follows:

Vmax, Ui = 28V; Imax, Ii = 110mA; Pmax, Pi = 0.77W; Ci = 0.021uF; Li = 0.302uH

Model PT-500-xxxx Pressure Transmitter; Maximum Ambient 85°C; Temperature Code T4; Maximum Working Pressure 10,000 PSI; Entropy parameters as follows:

Vmax, Ui = 28V; Imax, Ii = 110mA; Pmax, Pi = 0.77W; Ci = 0.042uF; Li = 0.320uH

Notes for Models PT-400, PT-500

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.

APPLICABLE REQUIREMENTS

C222 No 0 - M1991 - General Requirements - Canadian Electrical Code Part II.

C222 No 0.4 - M2004 - Bonding and Grounding of Electrical Equipment (Protective Grounding).

C222 No 142 - M1987 - Process Control Equipment.

C222 No 157 - M1992 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations.

C222 No 213 - M1987 - Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations.

CAN/CSA E60079-0:07 - Electrical apparatus for explosive gas atmospheres. PART 0: General requirements.

CAN/CSA E60079-11:02 - Electrical apparatus for explosive gas atmospheres. PART 11: Intrinsic safety "i".

CAN/CSA E60079-15:02 - Electrical apparatus for explosive gas atmospheres. PART 15: Type of protection "n"

UL 508, Seventeenth Edition - Industrial Control Equipment.

UL 913, Seventh Edition - Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, III, Division 1, Hazardous (Classified) Locations.

ANSI/ISA-12.12.01-2007 - Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations

UL 60079-0 Fourth Edition - Electrical apparatus for explosive gas atmospheres. PART 0: General requirements.

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UL 60079-11 Second Edition - Electrical apparatus for explosive gas atmospheres. PART 11: Intrinsic safety "i".

UL 60079-15 First Edition - Electrical apparatus for explosive gas atmospheres. PART 15: Type of protection "n"

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Notes

AUTOMATION PRODUCTS GROUP, INC.

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for measurement applications***



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