

Instruction Manual

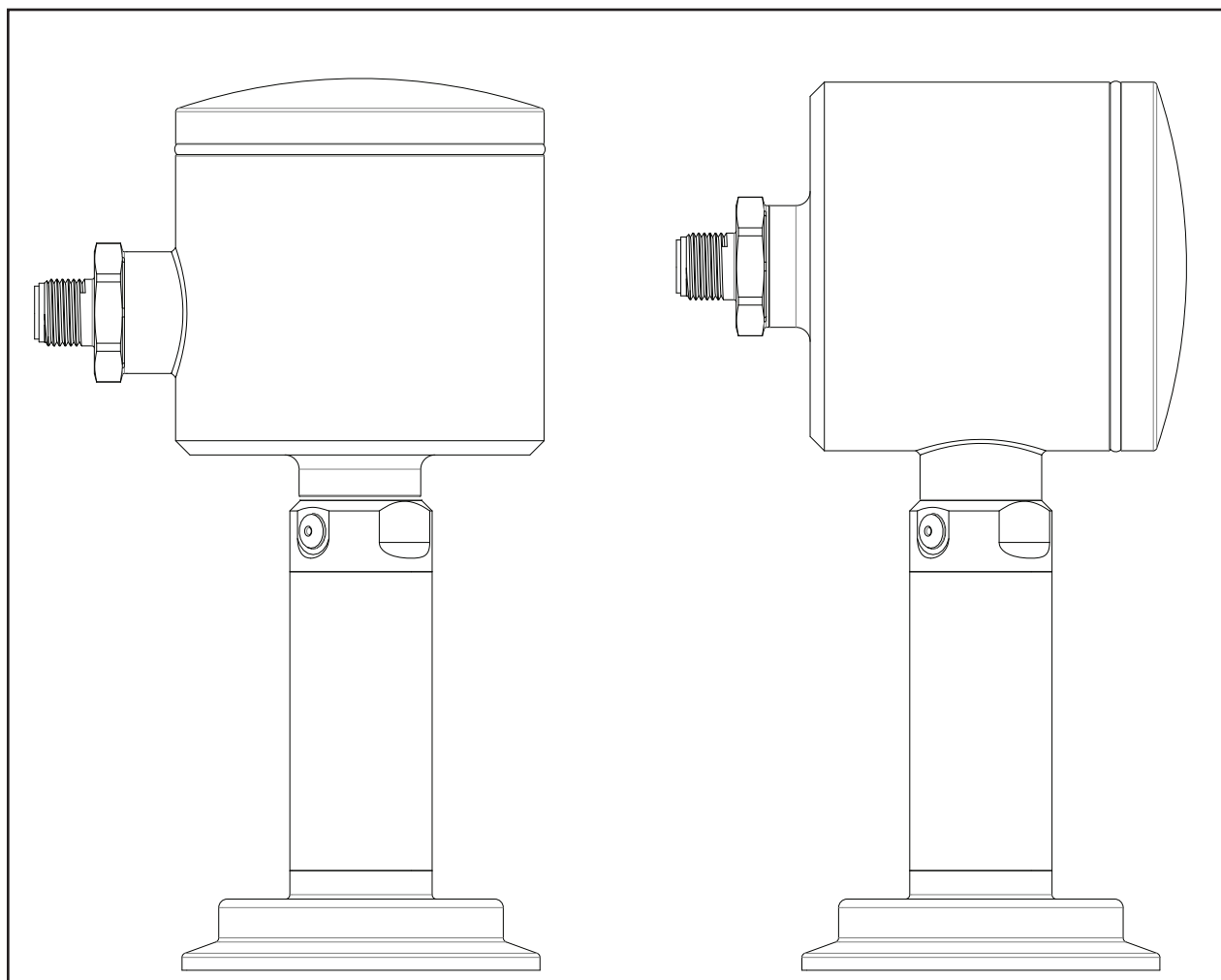


Anderson Instrument Co. Inc.
156 Auriesville Road
Fultonville, NY 12072
1-800-833-0081
Fax 518-922-8997

ANDERSON-NEGELE

Instrument Model Number _____

Instrument Serial Number _____



"MPP" Modular Pressure Transmitter

02072 / 2.2 / BK / NA
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Section 1 - Introduction

1.1 Specifications

PERFORMANCE MECHANICAL & ELECTRICAL:

Calibrated Accuracy:	± 0.07% of calibrated range up to 5:1 turndown (± 0.10% if over 5:1 turndown)
Repeatability:	0.05% as calibrated
Long Term Stability:	0.2% URL for 2 years
Process Temperature Effect:	± 0.1 psi/10°F (5.5°C) typical
Ambient Temperature Effect:	± 0.1 psi/10°F (5.5°C) typical
Over-Range Capability:	30/100/500 psi stem: 1.5x URL no effect on accuracy 2x URL to failure 1000 psi stem: 1.1x URL no effect on accuracy 1.25x URL to failure
Response Time:	<100 Milliseconds
Sampling Rate:	<50 Milliseconds
Damping:	Menu adjustable
Range Turndown Capability:	10 to 1 turn down from URL
Ranges, URL (PSI):	30,100,500,1K compound 30,100,500 absolute
Ranges, URL (BAR):	2,7,35,70 compound 2,7,35 absolute

ENVIRONMENTAL:

Process Temperature Limits:	0 to 350°F (-18 to 177°C) with ambient temperatures to 140°F (60°C) and 0 to 330°F (0 to 70°C) with ambient temperatures to 160°F (70°C)
Ambient Temperature Limits:	32 to 160°F (0 to 70°C)
Enclosure Protection:	NEMA 4X & IP67 IP69K(when equipped with QDR)

CONSTRUCTION / FINISH:

Product Contact:	316L Electropolished and finished to a Max. Ra <8 microinches. Optional: Hastelloy® diaphragm
Non-Product Contact Metal:	316L & 304 finished to a Max. Ra <32 microinches and polished to a high gloss
Non-Product Contact Plastic:	polycarbonate threaded cap. Delrin atmospheric vent
Wiring Connection:	M16 x 1.5 threaded housing electrical entry Equipped with: Standard - replaceable M12 5 pin Eurofast QDR Optional - M16 Cord Grip, M16 x 1.5" NPTF adaptor, Minifast 7/8" 4pin

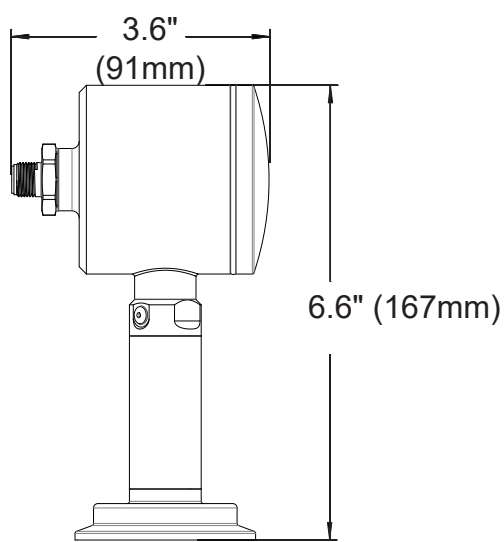
OPERATIONAL:

Internal Fill:	ETR (Extended Temperature Range) FDA approved mineral oil, Optional Neobee 20®
Output:	2 wire user selectable 4-20 mA DC or 20-4 mA HART 7.0 digital communications protocol
Internal Display:	4 digit LED nominally displays loop current. Process variable selectable - PSI or BAR.
Display Interface:	Modular, Field replaceable. 5-digit LED, 170 field of view, Analog bar graph, configurable visible alarm alerts, Selectable display units - Millibar, Torr & Kg/cm2, PSI, BAR, kPA, In H2O, In Hg, mm H2O, mA
Loop Resistance:	0-300 ohms at 24 VDC
Electrical Connection:	screw terminals with a conductor cross section range of 14-26 AWG
Recommended Cable:	Anderson shielded molded cordset, alternatively: 22-24 AWG, foil shielded, 0.17 - 0.26" Cable Sheath OD for use with cord grip or field wiring connector
Electrical Protection:	Voltage spike and reverse polarity
Operating Voltage:	Please refer to control drawing for Intrinsic Safe Application. For everything else, 18-36 VDC (24 VDC Nominal regulated or unregulated) ; 9-32 VDC for FFB
Zero Adjustment:	one touch
Re-Span:	With switch through user interface & with or without a reference pressure source
Electronics Puck:	Modular, field replaceable
Fitting & Sensor Stem:	Modular, field replaceable

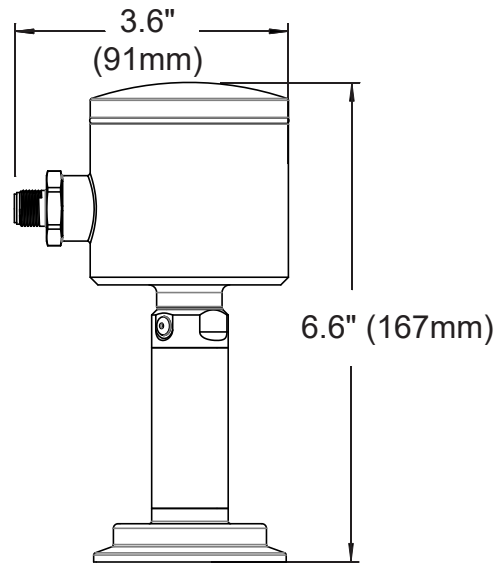
APPROVALS AND DOCUMENTATION

Sanitary:	ASME-BPE 2012 compliant
Compliance:	HART 7.0 Compatible CE compliant* Designed and manufactured to sound engineering practices in accordance with Article 3.3 of the PED 97/23/EC CSA-B51-03 CRN# CSAOF9754.5R1
Warranty:	2 years

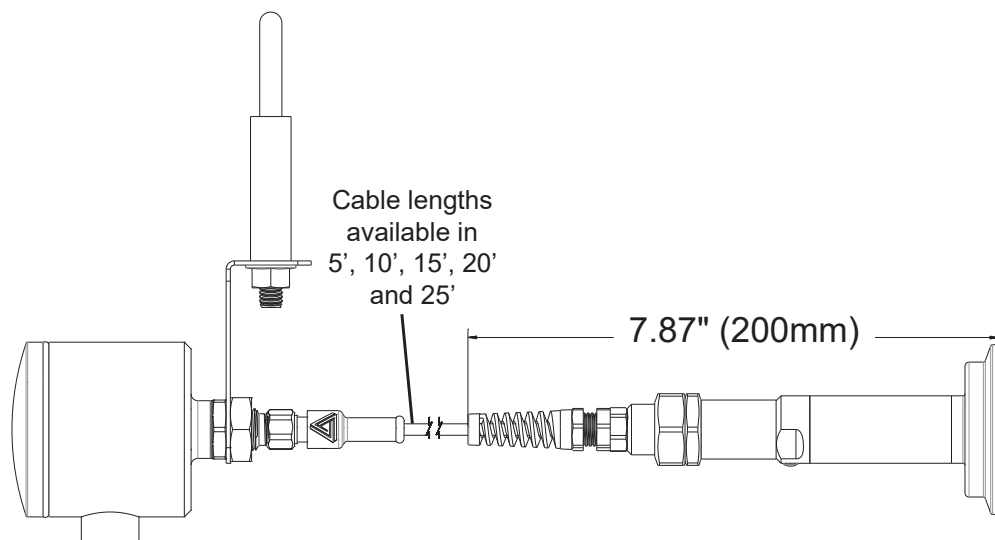
Figure 1.1 - Dimensional Drawings



Horizontal Orientation



Vertical Orientation

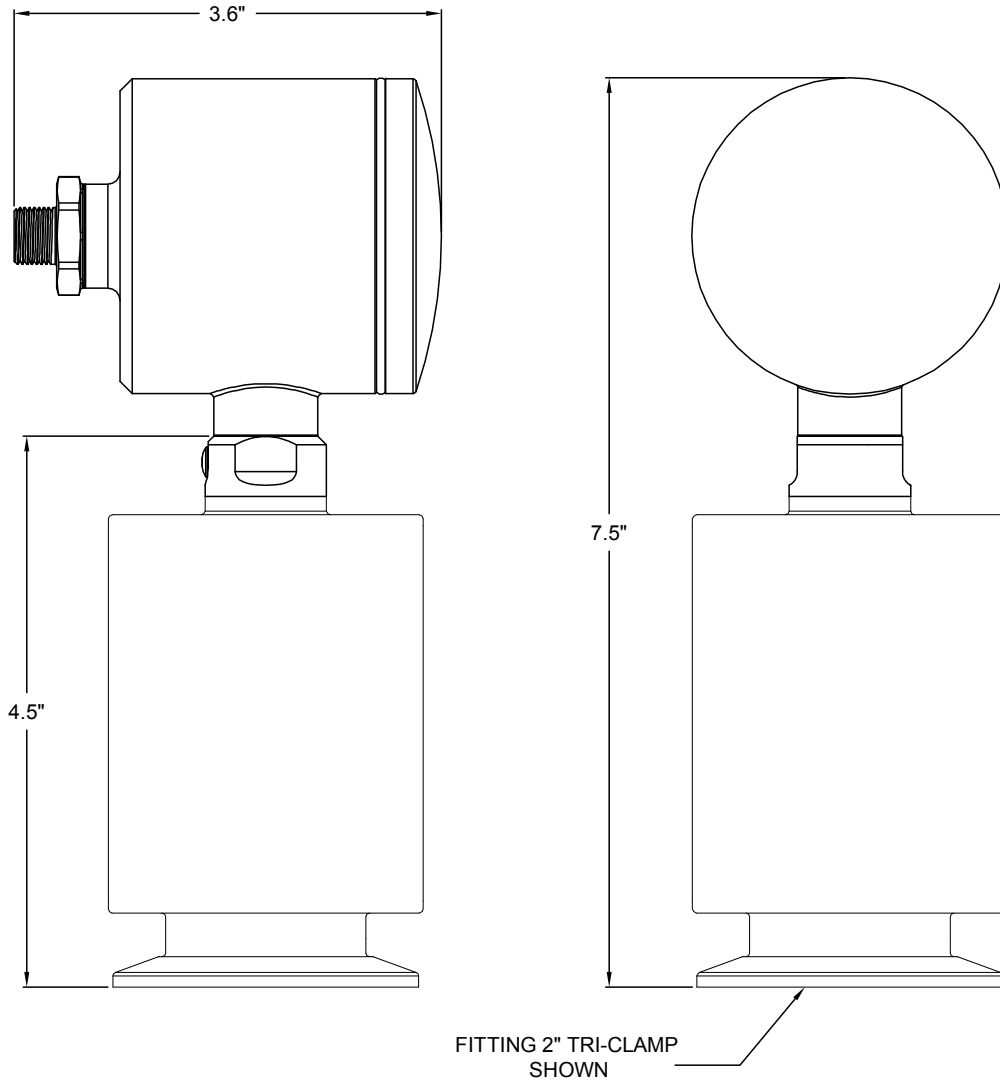


Remote Version

1. 2 Specifications MPP with Sentinel DFI

Measuring range URL [PSI]	Compound and Absolute	30,100,500
Measuring range URL [BAR]	Compound and Absolute	2,7,35
Range Turndown		10 to 1 from URL
Operational Range		Full Scale to -12psi (.17 bar abs)
Over-Range Capability	30/100/500 psi stem	1.5x URL no effect on accuracy 2x URL to failure
Calibrated Accuracy		± 0.10% of Full Scale
Repeatability		± 0.10% of Full Scale
Temperature effect	Process Ambient	± 0.1 psi/10°F (5.5°C) typical ± 0.1 psi/10°F (5.5°C) typical
Temperature range	Process Ambient	0 to 350°F (-18 to 177°C) with ambient temperatures to 140°F (60°C) 0 to 330°F (-18 to 165°C) with ambient temperatures to 160°F (70°C) 32 to 160°F (0 to 70°C)
Response time		<100 Milliseconds
Sample rate		<50 Milliseconds
Materials	Product Contact Optional Plastic cover Non-Product Contact Metal Diaphragm seal/oil filling	316L Electropolished and finished to a Max. Ra <8 microinches C22 all product contact surface Polycarbonate 316L & 304 finished to a Max. Ra <32 microinches polished to high gloss FDA approval mineral oil 21CFR178.3620 Neobee M20 (optional)
Process connection		1-1/2" Tri-Clamp® 2" Tri-Clamp® 1-1/2" CPM Flush Mount
Electric connection	Plug-in connection	M12 Eurofast (5-pin, 1.4305) 1/2" Microfast (4-pin, 1.4305) 1/2" Microfast (5-pin, 1.4305)
Approvals	Sanitary Compliance	ASME-BPE 2016 compliant HART 7.0 Compatible CE compliant Designed and manufactured to sound engineering practices in accordance with Article 3.3 of the PED 97/23/EC NEMA 4X & IP67 IP69K
Display Interface	Internal External User selectable units	4 digit LED nominally displays loop current. Modular field replaceable, 5 digit LED Millibar, Torr & Kg/cm2,PSI,BAR, kPA, In Hg, In Hg, mm H2O, mA
Output	Current output DFI Switched output	2 wire HART 7.0 with user selectable 4-20 mA DC or 20-4 ma DC Passive, 24 VDC(+/- 10%) at 50mA max
Operating Voltage		18-36 VDC (24 VDC Nominal regulated or unregulated)
Warranty		2 years

Figure 1.2 - Dimensional Drawings



Section 2 - Theory of Operation and Description

The Anderson Modular Pressure Transmitter (MPP) may be utilized for applications in which a process variable of pressure must be converted to an electronic signal. This unit utilizes an internal pressure transducer to convert the process measurement into a corresponding mV signal. The mV signal then passes through custom linearization and conditioning circuitry. The resulting signal is an industry standard 4-20 mA or digital signal. This signal is factory set over the specified range of the unit. From here the signal may be sent to an Anderson digital display, microprocessor based controller, chart recorder, or customer supplied instrumentation. An integral diagnostic interface provides menu feedback, visually displays diagnostic error codes and nominally measures and displays either the loop current or process variable in PSI or BAR. In addition, the MPP is also supplied with a modular display interface for readout directly at the process location.

The MPP Transmitter has been specifically designed for use in Life Sciences applications where accurate and repeatable pressure measurement is required. The measurement cell is integral to a welded sanitary diaphragm seal that is available in a variety of industry standard fitting styles and sizes. The process pressure deflects the metal diaphragm, transmitting the pressure to a transducer cell. The output signal, which is proportional to the process pressure, is then measured and processed.

MPP with Sentinel DFI

Once physical installation and wiring of the MPP with DFI is complete, it is now safe to power up the DFI system. Powering up the measurement loop and the DFI switched output the MPP-DFI will take less than 1 second to show a closed switch output which will be maintained closed for 10 to 15 seconds. This closure is not an indication of the diaphragm integrity but will allow the user an opportunity to test their PLC in-pu and confirm wiring. After this power-up sequence, the DFI switch output will then reflect the current state of the diaphragm which will be closed if the diaphragm is intact with <5 PSIA between the inner and outer diaphragms or open if the outer diaphragm is compromised and causes the pressure between inner and outer diaphragm to become >5 PSIA.

Section 3 - Installation

The physical installation is the most important concern with regards to promoting sensor reliability. Sensors must be installed in such a way that the housing and cable is not subject to physical abuse. In addition, moisture or moist air must not be allowed to enter the sensor housing or cable.

NOTE: The installer assumes responsibility for preventing water or water-vapor from entering the sensor housing by proper installation of the cap and appropriate cable preparation. Units equipped with M12 Quick Disconnects are rated to NEMA 4X and IP69X. Cable gland equipped units are rated to NEMA 4X and IP67.

To facilitate electrical connections, your new MPP transmitter may be supplied with a 5pin M12 quick disconnect receptacle, a M16 cable gland, or a ½" NPTF threaded adaptor. If mounted horizontally, the cable connection should point downward. Also, to prevent entry of excessive moisture, it is highly recommended that flexible conduits not be connected directly to the sensor. If conduit is to be run to the sensor, it is preferable that the watertight connector provided with each sensor not be removed from the sensor. Instead, run the flexible conduit as near to the sensor as possible and utilize a seal-tight connector at the end of the conduit. Allow a short amount of cable to run between the sensor and the flexible conduit. This isolates the sensor housing from the conduit system and any moisture it may contain. If the conduit is connected directly to the sensor, the chances are high that the sensor will eventually fail due to excessive water or water vapor entry into the housing.

NOTE: It is recommended that a sensor "ZERO" be performed at time of installation. Refer to section 8.1, page 17 for information on this procedure.

Section 4 - Sensor Wiring

For wet environments requiring IP67 or greater environmental protection Anderson strongly recommends using available Anderson shielded molded cord-sets utilizing 5 pin M12 eurofast design quick disconnect. Anderson supplied cable meets all requirements for shielding and compatibility with MPP quick disconnect receptacle.

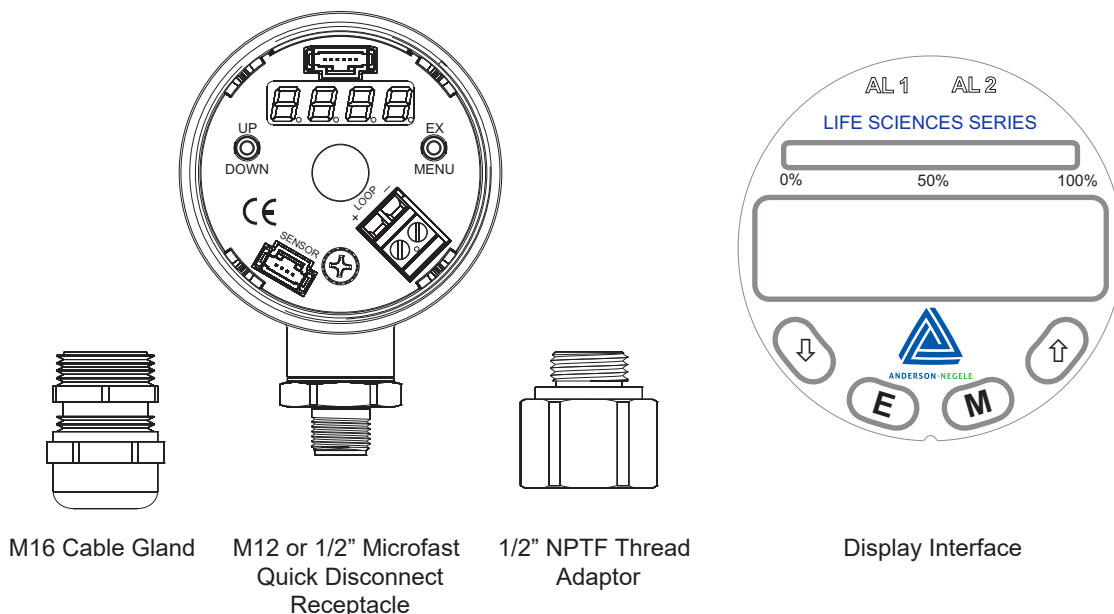
Anderson recommends a cable of 24 gauge, 4 conductor, shielded (Belden #9534) or equivalent. Four conductor cable is utilized because of its roundness, which provides a suitable seal when used with seal-tight connectors, strain reliefs and rubber grommets. Irregular shaped cable does not allow for a watertight seal. If utilizing customer supplied cable, select a round cable with 22-24 AWG wire and a shield. In order for the Anderson provided seal-tight connector to seal on the cable, the O.D. of the cable must be between 3/16" and 1/4". If smaller cable is utilized, a different neoprene bushing must be used (must be customer supplied).

If an alternate seal-tight type connector is going to be used, be absolutely certain that the rubber bushing will adequately seal on the cable. Do not use a connector intended for power cable (large inside diameter) if the sensor cable is only 1/4". Be sure to use Teflon thread tape when attaching the new seal-tight connector.

Wiring to the conduit housing sensors is accomplished as follows:

1. Remove the housing cap and lift out cover plate or display (optional) to expose the wiring terminal block. Exercise care when disconnecting ribbon connectors.
2. Insert the cable through the seal-tight connector, stripping back approximately 2 inches of sheathing to expose the wires.
3. Two wires will be utilized for connections at the transmitter end of the loop. Normal color codes being RED (Loop +) and BLACK (Loop -). Trim off all unused wires, including the bare shield ground wire. To prevent a GROUND LOOP condition, be sure the shield material and the shield ground wire do not touch the sensor housing. Use an insulator such as electrical tape or heat shrink tubing if necessary.
4. Strip the tips of the remaining wires back approximately 3/8 of an inch and twist strands (tinning is highly recommended).
5. Using Figure 2, make the proper connections to the wiring connector (located inside the housing)

Figure 2 - Wiring Terminal Connections



Section 5 - Instrument Wiring

With the proper wiring connections made at the sensor end of the loop, it is now time to make final connections at the instrument end of the loop. The MPP may feed instruments such as Anderson digital display, microprocessor based controllers, chart recorders, or customer supplied instrumentation.

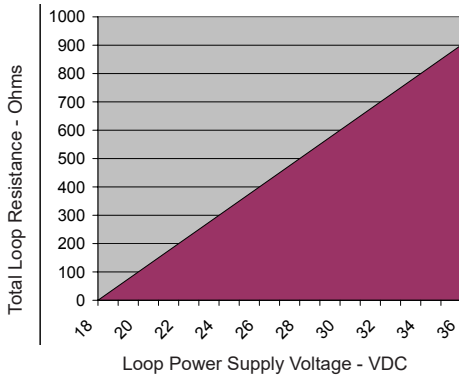
5.1 Loop Power

The Anderson MPP requires loop power for operation. Ratings are as follows:

MPP Transmitter: Please refer to control drawing for Intrinsic Safe Application. For everything else, 18-36 VDC (24 VDC Nominal)

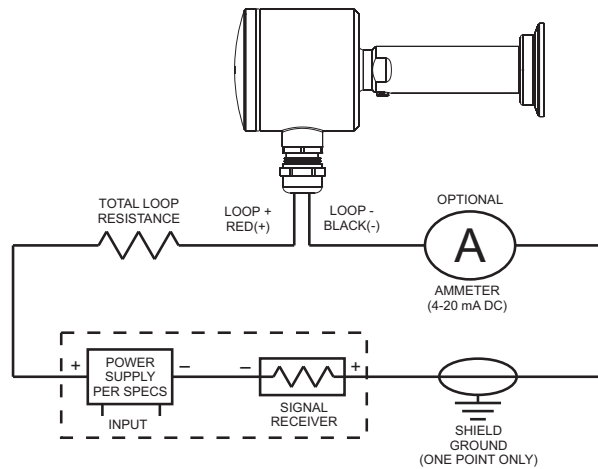
As inherent resistance associated with cable length and signal receiver input may affect operation of the transmitter, Figure 3 shows some guidelines for loop power required.

FIGURE 3 - Loop Power Guidelines



Please consult the Installation/Service Manual that was provided with your receiver for specific wiring instruction. Most Anderson receiver (displays, chart recorders, etc.) are capable of supplying loop power. Typical wiring would be as follows:

FIGURE 4 - Sensor Wiring

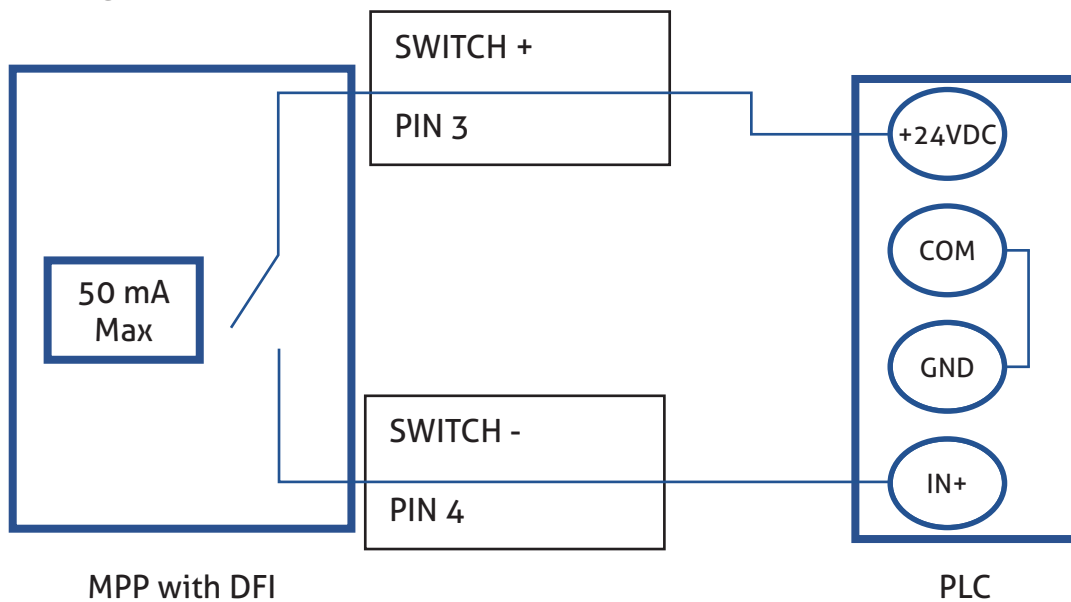


5.2 Switch Output - MPP with Sentinel DFI

Wiring for the DFI digital output is incorporated into the M12 connector that also has the main 4-20mA measurement signal. Designed for a 24VDC signal (+/- 10%) the output can handle up to 50mA current. See figures below for the location on the M12 of the DFI output and a diagram for typical integration of the switched output into the input of a PLC.

Pin #	Standard MPP 5-pin M12	MPP w/ Sentinel DFI 5-pin M12	MPP w/ Sentinel DFI 4-pin 1/2" Microfast	MPP w/ Sentinel DFI 5-pin 1/2" Microfast
1	Loop +	Loop +	Switch +	Switch +
2	Loop -	Loop -	Loop +	Loop +
3	n/c	Switch +	Loop -	Loop -
4	n/c	Switch -	Switch -	Switch -
5	n/c	n/c	n/a	n/c

Typical configuration to PLC



Section 6 - Modular Assembly

The MPP transmitter consists of two distinct sections, enclosure and stem that individually are comprised of one or more components. Field replacement of these components is possible to accommodate orientation reconfiguration and component replacement.

6.1 Electronic puck replacement

Puck replacement may be accomplished at the application site assuming sufficient clearance is available.

1. Remove wire cover plate or if equipped with display squeeze clip connector and remove display ribbon from socket on puck.
2. If equipped with M12 QDR (quick disconnect receptacle) remove conductors from wiring connector and unscrew receptacle from enclosure. Factory torque spec is 20ft-lbs.
3. Squeeze clip connector and remove sensor ribbon from socket on puck
4. Unscrew ground lug, slide puck out of enclosure
5. Reverse to install

6.2 Separation of measurement cell (stem) from enclosure

This proceed will require immobilizing the enclosure. If a vice is used steps should be taken to protect the surface of the enclosure

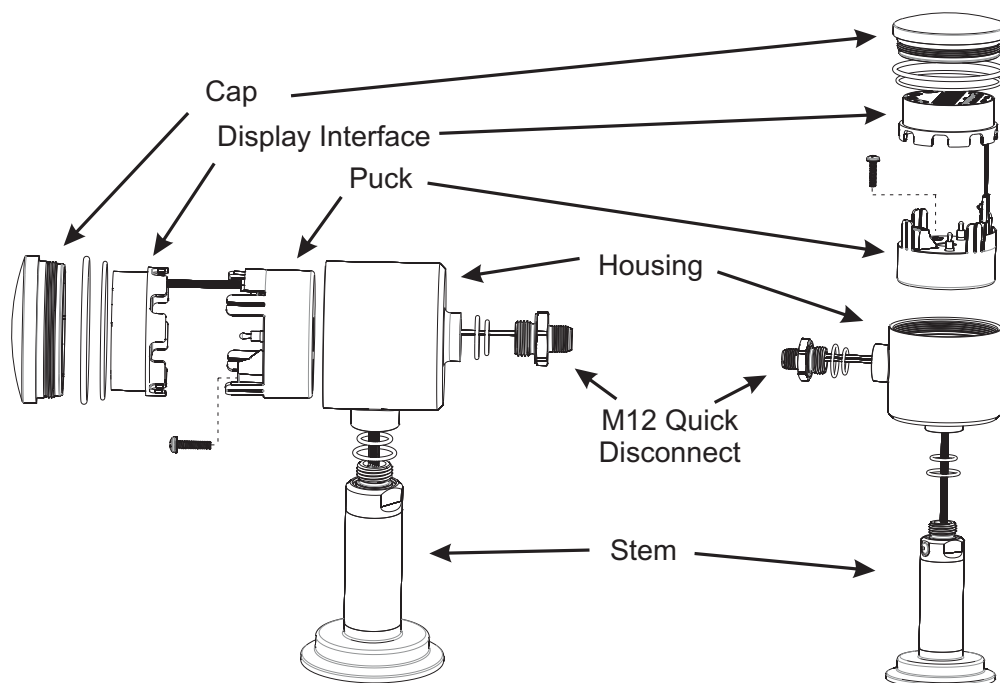
1. Squeeze clip connector and remove sensor ribbon from socket on puck
2. Unscrew stem from enclosure. Factory torque spec is 20ft-lbs.
3. Reverse to install

6.3 Reorientation of enclosure to stem

The threaded penetrations of the enclosure allow orientation in either a horizontal or vertical arrangement.

1. Complete steps 1 - 3 of 6.1 above
2. Unscrew stem from enclosure. Factory torque spec is 20ft-lbs
3. Reassemble stem to desired enclosure penetration. Factory torque spec is 20ft-lbs
4. Connect ribbon cable connector to puck receptacle located next to ground lug.
5. Reassemble M12 QDR (if equipped) to remaining penetration and install conductors. Factory torque spec is 20ft-lbs

FIGURE 5 - Exploded View



6.4 Remote Kit and MPPs equipped with remote configuration

The MPP series may be configured or retrofitted with remote cabling allowing the housing and display (if equipped) to be mounted up to 25 feet from the process connection. The remote cabling preserves the modular design and may be removed or added from the MPP at the user's discretion.

Adding the Remote kit. Refer to Figure 6.

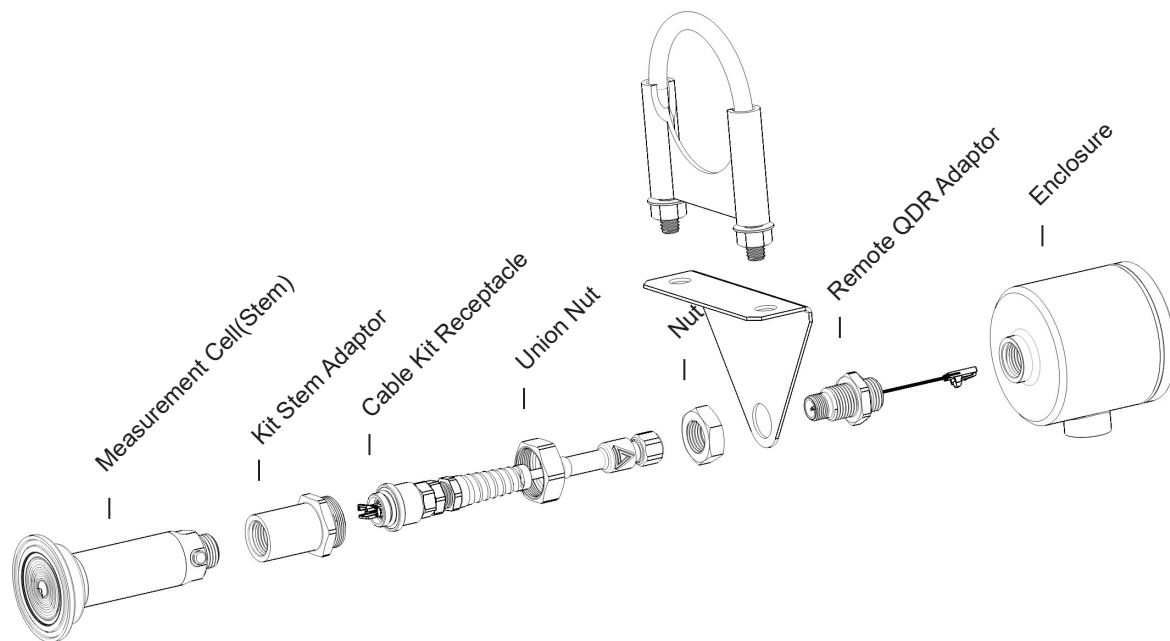
Note: all threaded connections to be torqued to 20ft-lbs

1. Separate the measurement cell (stem) from enclosure
 - a. Remove wire cover plate or if equipped with Display Interface squeeze clip connector and remove display ribbon
 - b. Squeeze clip connector and remove sensor ribbon from socket on puck
 - c. Unscrew stem from enclosure. Utilize care extracting ribbon cable.
2. Attach remote kit cabling to measurement cell stem
 - a. Route stem ribbon cable through kit stem adaptor. Screw on adaptor
 - b. Connect ribbon cable connector to cable kit receptacle and carefully fold excess ribbon cable into stem adaptor
 - c. Insert cable kit fitting into stem adaptor. Secure by threading on union nut
3. Attach remote QDR adaptor to desired enclosure opening
 - a. Carefully insert ribbon cable through enclosure opening
 - b. Screw remote QDR adaptor into place
 - c. Connect ribbon cable connector into sensor receptacle on puck
4. Attach pipe mount adaptor to remote QDR adaptor and secure with nut. Position as required.
5. Attach remote kit M12 plug to remote QDR adaptor

Reverse to un-install.

WARNING – To avoid possible ribbon cable damage, remove union nut and unplug ribbon from socket before removing stem adaptor from stem.

Figure 6 - Remote View

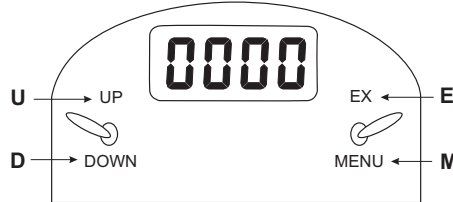


Section 7 - Configuration

7.1 - Configuration (without display) - Native Units, Output, Range, Dampening - HART version only

(See 7.2 for configuration with display interface)

The MPP's menu functions are accessed via the toggle switches on either side of the interface display



“U” up & “D” down are toggle pressed on the left switch, “E” execute & “M” menu are toggle pressed on the right switch

All instructions assume start from “RUN” mode which is default at power on and milliamp output displayed. If multiple configuration changes are desired it is not necessary to exit to “RUN” mode before configuring the next desired operation. Once desired operation configuration is accomplished pressing “M” repeatedly will scroll through operations. Run mode is achieved when milliamp output is displayed.

<u>RUN Mode</u>	<u>SENSOR CONFIG Mode</u>	<u>CALIBRATION Mode</u>
Zero	4-20mA/Process Variable PSIG / BAR 4-20mA / 20-4mA LRV URV Damping Factory Restore	2 Point Cal 4 Point Cal

7.1.1 Display Mode: 4-20mA or Process Variable

1. Press “M” - Sensor displays “COnF”
2. Press “U” & “E” simultaneously for 2 seconds - sensor displays “CvAL” or “PvAL”
3. Press “U” or “D” - Sensor display toggles between “CvAL” or “PvAL”
4. Press “M” to proceed to next operation or if no other operation is to be accessed exit to “RUN”

7.1.2 Native Units: PSI or Bar

1. Press “M” – Sensor displays “COnF”
2. Press “E” – Sensor displays “PSI” or “BAR”
3. Press “U” or “D” – Sensor toggles between “PSI” or “BAR”
4. Press “M” to proceed to the next operation

Note: When changing native units configuring range is now required

7.1.3 Output: 4mA – 20mA or 20mA – 4mA

1. Press “M” – Sensor displays “COnF”
2. Press “E” – Sensor displays “PSI” or “BAR”
3. Press “M” – Sensor displays “4-20” or “20-4”
4. Press “U” or “D” – Sensor toggles between “4-20” or “20-4”
5. If no other operation is to be accessed exit to “RUN” mode via pressing “M” repeatedly

7.1.4 Pressure Range

7.1.41 LRV: Lower range value

Sensors equipped with "Compound" style measurement cells (stem) may configure the LRV. "Absolute" stems are predefined as 0 and are not reconfigurable

1. Press "M" – Sensor displays "CONF"
2. Press "E" – Sensor displays "PSI" or "BAR"
3. Press "M" – Sensor displays "4-20" or "20-4"
4. Press "M" – Sensor displays "LRV"
5. Press "E" – Sensor displays present LRV value – Example: "0"
6. Press "U" or "D" to set desired LRV value– Sensor display increases or decreases accordingly

Note: continue to URV

7.1.42 URV: Upper range value

Note: starting from LRV above

7. Press "M" – Sensor displays "URV"
8. Press "E" – Sensor displays present URV value – Example: "50"
9. Press "U" or "D" to set desired URV value – Sensor display increases or decreases accordingly
10. Press "E" to store displayed value – Sensor displays "URV"
11. If no other operation is to be accessed exit to "RUN" mode via pressing "M" repeatedly

7.1.5 Output Damping

1. Press "M" – Sensor displays "CONF"
2. Press "E" – Sensor displays "PSI" or "BAR"
3. Press "M" – Sensor displays "4-20" or "20-4"
4. Press "M" – Sensor displays "LRV"
5. Press "M" – Sensor displays "URV"
6. Press "M" – Sensor displays "dMPg"
7. Press "E" – Sensor displays current damping value from 0 - 10
8. Press "U" or "D" to display desired damping value– Sensor display increases or decreases accordingly
9. Press "E" to store displayed value – Sensor displays "dMPg"
10. If no other operation is to be accessed exit to "RUN" mode via pressing "M" repeatedly until milliamp output is displayed

7.1.6 Factory configuration reset

Perform if a return to the original factory configuration is desired

1. Press "M" – Sensor displays "CONF"
2. Press "E" – Sensor displays "PSI" or "BAR"
3. Press "M" – Sensor displays "4-20" or "20-4"
4. Press "M" – Sensor displays "LRV"
5. Press "M" – Sensor displays "URV"
6. Press "M" – Sensor displays "dMPg"
7. Press "M" – Sensor display "FrES"
8. Press "E" – Sensor display "nO"
9. Press "U" or "D" to display "YES"
10. Press "E" – Sensor display "FrES"
11. Exit to "RUN" mode via pressing "M" repeatedly until milliamp output is displayed

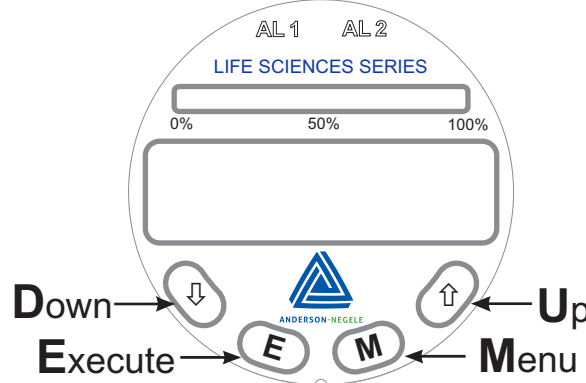
7.1.7 Over Pressure warning latch state

Set the over pressure warning to latch when triggered

1. Press "M" – Sensor displays "CONF"
2. Press "E" – Sensor displays "PSI" or "BAR"
3. Press "M" – Sensor displays "4-20" or "20-4"
4. Press "M" – Sensor displays "LRV"
5. Press "M" – Sensor displays "URV"
6. Press "M" – Sensor displays "dMPg"
7. Press "M" – Sensor displays "FrES"
8. Press "M" – Sensor displays "OVer LAtCH"
9. Press "E" – Sensor displays "OFF"
10. Press "U" or "D" – Sensor displays "On"
11. Exit to "RUN" mode via pressing "M" repeatedly until milliamp output is displayed

7.2 - Configuration (with display interface) - Native Units, Output, Range, Damping, Alarms, Display Units - HART Units

The MPP’s menu functions are accessed via the arrow buttons on either side of the interface display



“U” up & “D” are button presses on the right and left of the display. “E” execute and “M” menu are button presses located between the up and down arrows.

All instructions assume start from “RUN” mode which is default at power on and process value displayed. If multiple configuration changes are desired it is not necessary to exit to “RUN” mode before configuring the next desired operation. Once desired operation configuration is accomplished pressing “M” repeatedly will scroll through operations. Run mode is achieved when process value is displayed.

<u>RUN Mode</u>	<u>SENSOR CONFIG Mode</u>	<u>CALIBRATION Mode</u>
Zero	PSIG/BAR (native units)	2 Point Cal
Adjust Display Decimal	4-20mA / 20-4mA(HART only)	4 Point Cal
Momentarily Display mA Output(HART only)	LRV	
Descriptive Error Message	URV	
	Damping	
	Alarm1	
	Alarm2	
	Display Units	
	Unit Description Scroll	
	Factory Restore	

7.2.1 Run Mode:

- Zero - see section 8.1
- Display Decimal - the number of decimal places displayed may be adjusted by pressing ↑ or ↓
- Momentary mA display - the measured process value may be momentarily displayed by pressing “E”
- Descriptive Error Message - press ↑ for a descriptive error message.

7.2.2 Native Units: PSI or Bar

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “U” or “D” – Sensor toggles between “PSIG” or “BARG”
4. Press “M” once to proceed to the next operation or repeatedly to return to Run Mode

Note: When changing native units configuring range is now required

7.2.3 Output: 4mA – 20mA or 20mA – 4mA - HART only

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “M” – Sensor displays “4-20” or “20-4”
4. Press “U” or “D” – Sensor toggles between “4-20” or “20-4”
5. If no other operation is to be accessed exit to “RUN” mode via pressing “M” repeatedly

7.2.4 Pressure Range**7.2.41 LRV: Lower range value**

Sensors equipped with “Compound” style measurement cells (stem) may configure the LRV. “Absolute” stems are predefined as 0 and are not reconfigurable

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “M” – Sensor displays “4-20” or “20-4” (HART only)
4. Press “M” – Sensor displays “LRV”
5. Press “E” – Sensor displays present LRV value – Example: “0”
6. Press “U” or “D” to set desired LRV value– Sensor display increases or decreases accordingly

Note: continue to URV

7.2.42 URV: Upper range value

Note: starting from LRV above

7. Press “M” – Sensor displays “URV”
8. Press “E” – Sensor displays present URV value – Example: “50”
9. Press “U” or “D” to set desired URV value – Sensor display increases or decreases accordingly
10. Press “E” to store displayed value – Sensor displays “URV”
11. If no other operation is to be accessed exit to “RUN” mode via pressing “M” repeatedly

7.2.5 Output Damping

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “M” – Sensor displays “4-20” or “20-4” (HART only)
4. Press “M” – Sensor displays “LRV”
5. Press “M” – Sensor displays “URV”
6. Press “M” – Sensor displays “DAMP”
7. Press “E” – Sensor displays current damping value from 0 - 10
8. Press “U” or “D” to display desired damping value– Sensor display increases or decreases accordingly
9. Press “E” to store displayed value – Sensor displays “DAMP”
10. If no other operation is to be accessed exit to “RUN” mode via pressing “M” repeatedly until process value is displayed

7.2.6 Setting Alarms – Alarms are visual indication only if MPP is not optioned with relays

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “M” – Sensor displays “4-20” or “20-4” (HART only)
4. Press “M” – Sensor displays “LRV”
5. Press “M” – Sensor displays “URV”
6. Press “M” – Sensor displays “DAMP”
7. Press “M” – Sensor displays “ALRM1”
8. Press “E” – Sensor displays “OFF” or “ON”
9. Press “U” or “D” – Sensor toggles between “ON” or “OFF” set to “ON”
10. Press “E” – Sensor displays “High” or “LOW”
11. Press “U” or “D” – Sensor toggles between “HIGH” or “LOW” Choose either active high or active low
12. Press “E” – Sensor displays “SETPT”
13. Press “E” – Sensor displays set point pressure.
14. Press “U” or “D” repeatedly to select alarm1 pressure
15. Press “E” – Sensor displays “HYST” (allows hysteresis or dead band)
16. Press “E” – Sensor displays “0” or “1” (turns on dead band preset at 1% of set point)
17. Press “U” or “D” – Sensor toggles between “0” or “1”
18. Press “E” – Sensor displays “ALRM1”
19. Press “M” – Sensor displays “ALRM2”
20. Repeat from instruction 8 to set alarm 2 if desired otherwise press “M” to proceed to next operation or repeatedly to exit to “run” mode

7.2.7 Setting display process variable

The following Engineering units may be selected:
Millibar, Torr & Kg/cm², PSI, BAR, kPA, In H₂O, In Hg, mm H₂O, mA

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “M” – Sensor displays “4-20” or “20-4” (HART only)
4. Press “M” – Sensor displays “LRV”
5. Press “M” – Sensor displays “URV”
6. Press “M” – Sensor displays “DAMP”
7. Press “M” – Sensor displays “ALRM1”
8. Press “M” – Sensor displays “ALRM2”
9. Press “M” – Sensor displays currently set engineering unit
10. Press “U” or “D” repeatedly to select the desired engineering unit
11. Press “M” to proceed to next operation or repeatedly to exit to “run” mode

7.2.8 Setting display process variable marquee time.

The display may be set to repeatedly scroll the Engineering unit selected in a marquee style

Note: There is no marquee function if milliamp is selected.

1. Press “M” – Sensor displays “CONF”
2. Press “E” – Sensor displays “PSIG” or “BARG”
3. Press “M” – Sensor displays “4-20” or “20-4” (HART only)
4. Press “M” – Sensor displays “LRV”
5. Press “M” – Sensor displays “URV”
6. Press “M” – Sensor displays “DAMP”
7. Press “M” – Sensor displays “ALRM1”
8. Press “M” – Sensor displays “ALRM2”
9. Press “M” – Sensor displays “UDISP”
10. Press “E” – Sensor displays “OFF” or the current marquee scroll interval
11. Press “U” or “D” repeatedly to select the desired scroll interval
12. Press “E” – to store, sensor displays “UDISP”
13. Press “M” to proceed to next operation or If no other operation is to be accessed exit to “RUN” mode via pressing “M” repeatedly until process variable is displayed

7.2.9 Factory configuration reset

Perform if a return to the original factory configuration is desired

1. Press "M" – Sensor displays "CONF"
2. Press "E" – Sensor displays "PSIG" or "BARG"
3. Press "M" – Sensor displays "4-20" or "20-4" (HART only)
4. Press "M" – Sensor displays "LRV"
5. Press "M" – Sensor displays "URV"
6. Press "M" – Sensor displays "DAMP"
7. Press "M" – Sensor display "FAC"
8. Press "E" – Sensor display "nO"
9. Press "U" or "D" to display "YES"
10. Press "E" – Sensor display "FAC"
11. Exit to "RUN" mode via pressing "M" repeatedly until process value is displayed

7.2.10 Over Pressure warning latch state

Set the over pressure warning to latch when triggered

1. Press "M" – Sensor displays "CONF"
2. Press "E" – Sensor displays "PSIG" or "BARG"
3. Press "M" – Sensor displays "4-20" or "20-4" (HART only)
4. Press "M" – Sensor displays "LRV"
5. Press "M" – Sensor displays "URV"
6. Press "M" – Sensor displays "DAMP"
7. Press "M" – Sensor displays "ALRM1"
8. Press "M" – Sensor displays "ALRM2"
9. Press "M" – Sensor shows display units
10. Press "M" – Sensor displays "UDISP"
11. Press "M" – Sensor displays "OVER LATCH"
12. Press "E" – Sensor displays "OFF"
13. Press "U" or "D" – Sensor displays "ON"
14. Exit to "RUN" mode via pressing "M" repeatedly until milliamp output is displayed

Section 8 - Calibration

The MPP is calibrated at the factory to meet the specified accuracy for any allowable range that may be configured. As general maintenance to the unit, a zero check is recommended at approximately 12 month intervals. Over time errors may be accumulated due to the impact of environment and operation. If you feel that the output of the MPP transmitter is not correct, calibration of the unit may be required. Accumulated offset errors have the greatest impact to accuracy over time. These may easily be addressed in the “field” via the “one touch Zero” function in section 8.1. Further calibration to address possible errors in the range may be addressed in the field but will require analytical caliber equipment to provide accurate pressure standards. The MPP may also be returned to Anderson for a full factory recalibration. 8.2 illustrates the procedures for custom range calibration of the transmitter.

8.1 CALIBRATION – Zero

NOTE – For ABSOLUTE stems zero calibration is disabled as zeroing is not possible in atmospheric conditions.

All instructions assume starting from “RUN” mode which is default at power on and process value displayed. Zeroing the sensor provides the best accuracy when clamped into the application therefore negates possible positioning and clamping errors. Be sure sensor is exposed to zero psig when performing this function.

Units Without Display:

1. Press both “D” and “M” simultaneously for approximately 5 seconds – Sensor displays 4.00 milliamp for gauge, for compound sensor displays appropriate output for set range.

Units with Display Interface:

1. Press both ↵ and “M” simultaneously for approximately 5 seconds.

8.2 CALIBRATION - Range

Field calibration of the MPP results in a “custom calibration” range. This may be desired as it provides (in 4 point calibration mode) the best possible accuracy for a given specific range. Once this procedure is completed care should be taken not to perform any subsequent “configuration” range changes as this will result in returning to the original factory calibration data.

When performing this calibration the range desired must be first set in the “configuration” mode. Refer to 7.1.4 for integral display or 7.2.4 for display interface to set this range.

Equipment required: Pressure suitable standard that can achieve URV, Accurate reference gauge, DC Milliamp Meter (accurate to +/- .005 mA)

The MPP accommodates both 2 point and 4 point calibrations. 4 point calibrations yield the most accurate results and are therefore preferred.

If your unit is calibrated at a “COMPOUND” range, you will not see 4.00 mA at atmospheric zero. As reference, you may use the following chart to determine if your unit may require calibration (most common ranges are shown).

Sensor Range	Sensor Reads at Atmospheric Zero
0-psig - Positive Pressure	4.00 mA
0-psig - 30" Hg	4.00 mA
30" Hg - 15 psig	11.92 mA
30" Hg - 30 psig	9.26 mA
30" Hg - 60 psig	7.15 mA
30" Hg - 100 psig	6.05 mA

The output of a properly calibrated transmitter may be calculated by using the following formula:

$$\text{mA Output} = \left[16 \times \left[\frac{\text{(KNOWN VALUE - LOW END OF RANGE)}}{\text{TRANSMITTER SPAN}} \right] \right] + 4$$

NOTE: For pressure transmitters with compound ranges, the ranges must first be converted to all one type unit of measure. For example, a 30" Hg/0/35 psig unit maybe considered to have a range of -14.7 psig-0-35 psig and a span of 49.7 psig (2.036" Hg = 1 psi). Be careful not to lose the (-) sign while performing the calculation of the proper reading.

If your unit is calibrated at a "ABSOLUTE" range, you will not see 4.00 mA at atmospheric zero. Calibration requires an analytical quality pressure source and reference gauge

NOTE: The transmitter should be wired in a complete loop at this point, or on a test bench and configured per the diagram shown in Figure 4, page 8.

8.21 Custom calibration range – COMPOUND STEM, 4 point

NOTE: For pressure transmitters with compound ranges, the ranges must first be converted to all one type unit of measure. For example, a 30" Hg - 0-30 psig unit may be considered to have a range of -14.7 psig - 0-30 psig and a span of 44.7 psig (2.036" Hg = 1 psi). Be careful not to lose the (-) sign while performing the calculation of the proper reading.

1. Clamp sensor into calibration fitting and expose the transmitter to a known zero reference point.
2. Set meter to DC mA and connect meter in series with loop + .
3. Press "M" – Sensor displays "COntF"
4. Press "M" – Sensor displays "CAL"
5. Press "E" – Sensor displays "CCAL"
6. Press "E" – Sensor displays "2PtS"
7. Press "U" or "D" to set 4 point calibration – Sensor displays "4PtS"
8. Press "E" holding for approximately 2 seconds – Sensor displays "ArEF" ("ATM" with Display Interface)
9. Expose sensor to atmospheric pressure
10. Press "E" – Sensor will store the atmospheric reference and displays "LrV"
11. Press "E" – Sensor display will prompt the desired pressure standard. Press ↓ or ↑ to adjust.
12. Expose sensor to requested pressure
13. Press "E" – Sensor displays "Pt2"
14. Press "E" – Sensor display will prompt the desired pressure standard. Press ↓ or ↑ to adjust.
15. Expose sensor to requested pressure
16. Press "E" – Sensor displays "Pt3"
17. Press "E" – Sensor display will prompt the desired pressure standard. Press ↓ or ↑ to adjust.
18. Expose sensor to requested pressure
19. Press "E" – Sensor displays "UrV"
20. Press "E" – Sensor display will prompt the desired pressure standard.
21. Expose sensor to requested pressure
22. Press "E" – Sensor displays "CCAL"
23. Exit to "RUN" mode via pressing "M" repeatedly until process value is displayed

8.22 Custom calibration range –COMPOUND STEM, 2 point

1. Clamp sensor into calibration fitting and expose the transmitter to a known zero reference point.
2. Set meter to DC mA and connect meter in series with loop + .
3. Press “M” – Sensor displays “CO nF”
4. Press “M” – Sensor displays “CAL”
5. Press “E” – Sensor displays “CCAL”
6. Press “E” – Sensor displays “2PtS”
7. Press “U” or “D” to set 2 point calibration sensor displays “2PtS”
8. Press “E” holding for approximately 2 seconds – Sensor displays “ArEF”(“ATM” with Display Interface)
9. Expose sensor to atmospheric pressure
10. Press “E” – Sensor will store the atmospheric reference and displays “LrV”
11. Press “E” – Sensor display will prompt the desired pressure standard. Press ↓ or ↑ to adjust.
12. Expose sensor to requested pressure
13. Press “E” – Sensor displays “UrV”
14. Press “E” – Sensor display will prompt the desired pressure standard.
15. Expose sensor to requested pressure
16. Press “E” – Sensor displays “CCAL”
17. Exit to “RUN” mode via pressing “M” repeatedly until process value is displayed

8.23 Custom calibration range – ABSOLUTE STEM, 4 point

1. Clamp sensor into calibration fitting and expose the transmitter to a known zero reference point.
 2. Set meter to DC mA and connect meter in series with loop + .
 3. Press “M” – Sensor displays “CO nF”
 4. Press “M” – Sensor displays “CAL”
 5. Press “E” – Sensor displays “CCAL”
 6. Press “E” – Sensor displays “2PTS”
 7. Press “U” or “D” to set 4 point calibration – Sensor displays “4PtS”
 8. Press “E” – holding for approximately 2 seconds – Sensor displays “LrV”
 9. Press “E” – Sensor displays “VAC”. Press ↓ or ↑ to adjust.
 10. Expose sensor to requested pressure
 11. Press “E” – Sensor displays “Pt2”
 12. Press “E” – Sensor display will prompt the desired pressure standard. Press ↓ or ↑ to adjust.
 13. Expose sensor to requested pressure
 14. Press “E” – Sensor displays “Pt3”
 15. Press “E” – Sensor display will prompt the desired pressure standard. Press ↓ or ↑ to adjust.
 16. Expose sensor to requested pressure
 17. Press “E” – Sensor displays “UrV”
 18. Press “E” – Sensor display will prompt the desired pressure standard.
 19. Expose sensor to requested pressure
 20. Press “E” – Sensor displays “CCAL”
- Exit to “RUN” mode via pressing “M” repeatedly until milliamp output is displayed

8.24 Custom calibration range –ABSOLUTE STEM, 2 point

1. Clamp sensor into calibration fitting and expose the transmitter to a known zero reference point.
 2. Set meter to DC mA and connect meter in series with loop + .
 3. Press “M” – Sensor displays “COnF”
 4. Press “M” – Sensor displays “CAL”
 5. Press “E” – Sensor displays “CCAL”
 6. Press “E” – Sensor displays “2PtS”
 7. Press “U” or “D” to set 2 point calibration sensor displays “2PtS”
 8. Press “E” holding for approximately 2 seconds – Sensor displays “LrV”
 9. Press “E” – Sensor displays “VAC”. Press ↓ or ↑ to adjust.
 10. Expose sensor to requested pressure
 11. Press “E” – Sensor displays “UrV”
 12. Press “E” – Sensor display will prompt the desired pressure standard.
 13. Expose sensor to requested pressure
 14. Press “E” – Sensor displays “CCAL”
- Exit to “RUN” mode via pressing “M” repeatedly until milliamp output is displayed

8.3 Calibration –Milliamp Meter - HART Only

The MPP contains circuitry to measure the loop current. This meter may be calibrated to match a users external reference.

1. Press “M” – Sensor displays “COnF”
 2. Press “M” – Sensor displays “CAL”
 3. Press “E” – Sensor displays “CCAL”
 4. Press “M” – Sensor displays “MCAL” (HART only)
 5. Press “E” – Sensor displays “04 mA”
 6. Press “U” or “D” to match external reference to 4 mA.
 7. Press “E” – Sensor displays “20 mA”
 8. Press “U” or “D” to match external reference to 20 mA.
 9. Press “E” – to store values - sensor displays “MCAL” (HART only)
- Exit to “RUN” mode via pressing “M” repeatedly until process value is displayed

Section 9 - Maintenance/Diagnostics

Anderson electronic sensors require very little maintenance, if any. We suggest that the sensor be inspected at 6 month intervals to ensure that they are not being subjected to physically abuse, moisture entering the housing, and that the wiring is sound.

The MPP is equipped with diagnostic routines that monitor the sensor's function. Should an error occur the diagnostic display will flash an error code and the output will be limited to 3.8 mA or less. Errors may be caused by a number of reasons ranging from failed electronic components to user configuration errors. The code appendix below indicates possible codes with actions that should be taken to correct the problem. Error codes may be cleared to facilitate subsequent menu changes, however the output will remain at 3.8 mA or less until error is addressed and the unit repowered. Always record the error code before attempting to clear it.

The display code may be erased as follows:

1. From "RUN" Mode Press "D" or \Downarrow and hold for several seconds. Some error codes will not erase until problem is resolved – Sensor displays current process value.
2. Power cycle by removing power for 10 seconds then reattach power.
3. For units equipped with optional display interface press \Uparrow for a descriptive error message.

Note on firmware incompatibility

When replacing the puck with a new one there will be an issue if an older version of firmware r600 in the AUI is connected to a puck with h916 firmware released on Aug. 1 2020. If the unit is being configured using the AUI there will be a point when the AUI will begin to continuously reboot itself. To solve this issue the AUI will need to be replaced with a newer version that has r603 firmware which has also been released on Aug. 1 2020. Although this reboot will occur during configuration it will not affect the basic operation of the sensor when not being configured and can be recovered from by power cycling the sensor until a replacement AUI can be installed

Error Code	Category	Customer Action
No visible code, 3.8 mA output	Communication	Check Stem ribbon cable connection to puck, power cycle
e700	Internal System Failure	Reset Error and power cycle and if error is persistent replace puck
e701	Internal System Failure	Reset Error and power cycle and if error is persistent replace puck
e702	Internal System Failure	Reset Error and power cycle and if error is persistent replace puck
e500	Communication	Check Stem ribbon cable connection to puck, power cycle
e501	Stem Data Corruption	Replace Stem
e502	Stem Data Corruption	Replace Stem
e503	Stem Data Corruption	Replace Stem
e504	Stem Data Corruption	Replace Stem
e505	Insufficient loop voltage	Check if loop voltage is at least 18V, provide correct voltage then power cycle
e300	Stem Data Corruption	Replace Stem
e301	Stem Data Corruption	Replace Stem
e302	Stem Data Corruption	Replace Stem
e304	Stem Data Corruption	Replace Stem
e405	Puck Data Corruption	Replace Puck
e406	Puck Data Corruption	Replace Puck
e407	Puck Data Corruption	Replace Puck
e600	Puck Data Corruption	Replace Puck
e602	Stem Configuration Error	Reset Error and power cycle and if error is persistent replace Stem
e603	Stem Configuration Error	Reset Error and power cycle and if error is persistent replace Stem
e100	Incompatible Range	1) Reconfigure puck to a range compatible with the stem 2) power cycle 3) Reset Error
e101	Incompatible Range/ range changed	1) Reconfigure puck to a range compatible with the stem 2) power cycle 3) Reset Error
e200	Installation Fault	Power Cycle
e201	Communication	Power Cycle
e202	Communication	Power Cycle
e203	Communication	Power Cycle
e204	Data Corruption	Factory restore
OVER	Warning	Check Process - URV exceeded, cycle power to reset

Feel free to contact Anderson Technical Services Department at 1-800-833-0081 for further assistance with troubleshooting.

Section 10 - HART Communicator Connection & DD (Device Descriptor) Menu Structure

All MPP transmitters are equipped with HART output protocol and may be addressed via an external HART modem or alternatively via a portable HART communicator (HHT) compatible with HART 7.0.

10.1 Attaching HART Communicator

1. Power the MPP Transmitter. The signal loop must have at least 250ohms resistance for HHT function
2. Connect the HHT across the transmitter terminals or the resistor loop
3. Turn on the HHT, wait until communications are established and the Home Menu is displayed

10.2 HART DD Menu Structure

All MPP functions as well as standard HART setup detail may be addressed via the HART DD menu. See following Menu DD for specific required paths.

Home Screen (Level 1)	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Loop Current						
PV Value						
URV						
LRV						
Sensor Value						
Device Specific Error						
Device Specific Error						
Device Specific Error						
Device Specific Error						
Device Specific Error						
Device Setup	Configuration	Loop Direction	4ma to 20mA			
			20mA to 4mA			
		LRV	LRV			
			Change Range			
		URV	URV			
			Change Range			
		Display Units	inH ₂ O			
			inHg			
			mmH ₂ O			
			mmHg			
			PSI			
			BAR			
			mBAR			
			kPA			
			Kg/cm ²			
		Native Units	PSI			
			BAR			
	Alarm 1 (or) Alarm 2	Energized				
		Active High				
		Out of SPAN				
		Enabled				
		Set Point				
		Hysteresis				
Turn On/Off						
Change Type						
Change SP						
Change Hysteresis						
Factory Restore	Yes/No					
Calibration	Meter Calibration	Set 4mA				
		Set 20mA				
	Sensor Calibration	Two Point Calibration	Sensor Type			
Four Point Calibration		PV URV PV LRV Calibration				

Home Screen (Level	Level 2	Level	Level	Level 5	Level
Device Setup	HART Setup	HART Configuration	Number of Response Preambles		
			Loop Current Mode	Enable / Disable	
			Polling Address		
		HART Information	Model		
			Manufacturer		
			Device ID		
			HART Universal Revision		
			Descriptor		
			Message		
			Date		
			Tag		
			Long Tag		
			Final Assembly Number		
		HART Output		PV Pressure Value	
	Review	HART Review	Manufacturer ID		
			Universal Rev		
			Field Device Rev		
			Software rev		
			Hardware Rev		
			Tag		
			Descriptor		
			Message		
			Configuration Change Counter		
		Device Information	PV Native Units		
			PV Display Units		
			PV LRV		
			PV URV		
		PV Pressure USL			
		PV Pressure LSL			
		PV Damping			
		Firmware Rev			
		Serial Number			

Home Screen (Level 1)	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Device Setup	Extended Setup	Clone Instrument Info	HART Variables	Descriptor		
				Message		
				Date		
				Tag		
				Long Tag		
				Final Assembly Number		
				Number of Request Preamble		
				Number of Response Preamble		
			Instrument Parameter	Display Units		
Diagnostics	Loop Test	Choose 4 mA				
		Choose 20 mA				
		Choose other mA value				
	Error Information	Error code with Description				
		Reset Error Codes				
	One Touch Zero	PV Value				
		Loop Value				
		Zero Trim				

Section 11 - Intrinsically Safe Requirements

CAUTION: ALL documented requirements **MUST** be met to meet intrinsically safe requirements

This equipment circuitry references frame ground. It is recommended to use galvanic isolation barriers. Alternatively, if a Zener barrier is used, the installer shall ensure that there are no possibilities of circulating earth currents or a potential difference with the earth that could cause a sparking hazard. Refer to IEC 60079-14 for safe installation guidance.

All sealing devices/connections including cable glands, blanking elements, thread adapters, stopping plugs and connectors shall maintain a minimum degree of protection of IP-67 or IP69K depending on installation and environmental condition.

NOTE: Anderson-Negele does not offer barrier strips for sale. Please see your local electrical component supplier



WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

ATTENTION: TOUTES les exigences documentées **DOIVENT** être satisfaites pour répondre aux exigences en matière de sécurité intrinsèque.

Ce circuit de l'équipement fait référence à la masse du châssis. Il est recommandé d'utiliser des barrières d'isolation galvanique. Alternativement, si une barrière Zener est utilisée, l'installateur doit s'assurer qu'il n'y a pas de possibilité de circulation de courants de terre ou de différence de potentiel avec la terre qui pourrait causer un risque d'étincelles. Se reporter à la norme IEC 60079-14 pour les directives d'installation en toute sécurité.

Tous les dispositifs/raccords, y compris les presse-étoupes, les éléments d'obturation, les adaptateurs filetés, les bouchons d'obturation et les connecteurs, doivent maintenir un degré de protection minimal de IP-67 ou IP69K en fonction de l'installation et des conditions environnementales.

NOTE: Anderson-Negele n'offre pas de bandes barrières à la vente. Veuillez consulter votre fournisseur local de composants électriques.



AVERTISSEMENT - NE PAS OUVRIR EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE

HAZARDOUS AREA
CLASS I DIV 1
GROUPS A, B, C, D
 $T_4, 0^{\circ}C < T_{amb} < +70^{\circ}C$

INTRINSICALLY SAFE
SECURITE INTRINSEQUE

NONHAZARDOUS LOCATION

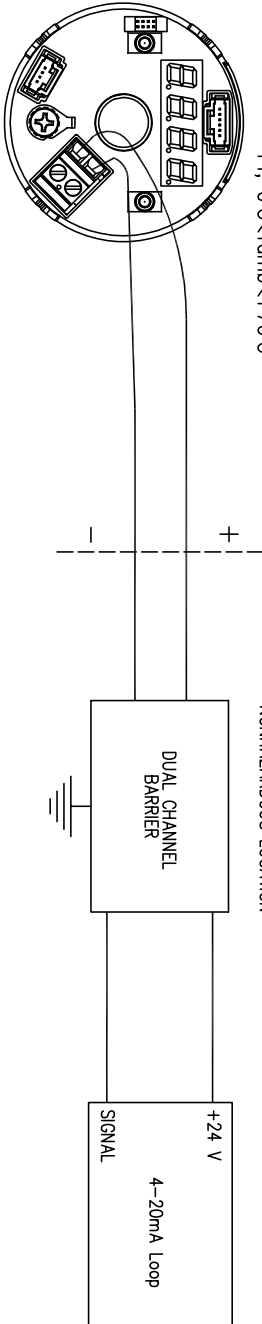


Table 1

Equipment	Barrier
V max	Voc
I max	Isc
C+Cc	Cc
L+Lc	Lc

- NOTES:
- SEE OPERATING INSTRUCTIONS.
 - ASSOCIATED APPARATUS MUST NOT BE CONNECTED IN PARALLEL UNLESS PERMITTED BY THE ASSOCIATED APPARATUS APPROVAL.
 - WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
 - CAPACITANCE AND INDUCTANCE OF FIELD WIRING FROM THE TRANSMITTER TO THE BARRIER SHOULD BE CALCULATED AS ($C_c = 60pf/FT$ AND $L_c = 0.2uh/FT$) AND SHOULD BE INCLUDED IN THE SYSTEM CALCULATIONS.

MODEL NUMBERS

MPXX - X - X - X - X - X - E - X - A - XX - X - X - A
OR
H

NOTES ON BARRIERS

- MAY BE IN A DIVISION 2 LOCATION IF SO APPROVED.
- OUTPUT CURRENT MUST BE LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN CIRCUIT VOLTAGE AND SHORT CIRCUIT CURRENT.
A: $V_{max} < 32V$ DC, $I_{max} < 87.8mA$, $C_c=0uF$, $L_c=0.271mH$, $P_i=1W$
B: $V_{max} < 28V$ DC, $I_{max} < 120mA$, $C_c=0uF$, $L_c=0.271mH$, $P_i=1W$
C: $V_{max} < 24V$ DC, $I_{max} < 174mA$, $C_c=0uF$, $L_c=0.271mH$, $P_i=1W$
Cc = Cable Capacitance
Lc = Cable Inductance
- CABLE CAPACITANCE PLUS INTRINSICALLY SAFE EQUIPMENT CAPACITANCE MUST BE LESS THAN THE MARKED CAPACITANCE (C_0) SHOWN ON ANY BARRIER USED. THE SAME APPLIES FOR INDUCTANCE.
- SELECTED BARRIERS MUST BE THIRD PARTY APPROVED AND HAVE V_{oc} OR I_{sc} NOT EXCEEDING V_{max} AND I_{sc} OR IT NOT EXCEEDING I_{max} AND THE P_{max} OF THE BARRIER MUST BE LESS THAN OR EQUAL TO THE P_{max} OF THE TRANSMITTER AS SHOWN FOR EACH TYPE OF BARRIER IN TABLE 1
- BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURERS CONTROL DRAWING ARTICLE 504 OF NATIONAL ELECTRICAL CODE ANSI/NFPA 70.

NOTES ON CONTROL EQUIPMENT

- MAINS POWER MUST NOT EXCEED 250 VOLTS WITH RESPECT TO EARTH.

REVISIONS

44506R0001

CHANGE NO.	DESCRIPTION	BY	DATE
X02	PRELIMINARY RELEASE	N/W	6/7/2019

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<p>SCALE: NONE</p>	<p>DRAWN BY: N/W</p>
<p>FINISH: -N/A-</p>	<p>CHECKED BY: 5/19/19</p>
<p>*** UNLESS OTHERWISE SPECIFIED ***</p>	<p>ALL DIMS. ARE IN INCHES</p>
<p>ALL SURFACES 3/16 DEC. 1.000</p>	<p>BREAK CORNERS .015 DIA.</p>
<p>2 P.L.C. DEC. 1.000</p>	<p>REMOVE ALL BARRIS</p>
<p>FRACTIONS 1/16</p>	<p>ANDS 1/16</p>
<p>FR & D DIMS INCH.</p>	<p>REV</p>

PRESSURE TRANSMITTER

44506R0001

HAZARDOUS AREA
CLASS I, DIV 1
GROUPS A, B, C, D
T4, 0°C<Tamb<+70°C

INTRINSICALLY SAFE
SECURITE INTRINSEQUE

REVISIONS

44506T0001

NO	CHANGE	DESCRIPTION	BY	DATE
X01	DFI	PRELIMINARY RELEASE	NJW	5/7/2019

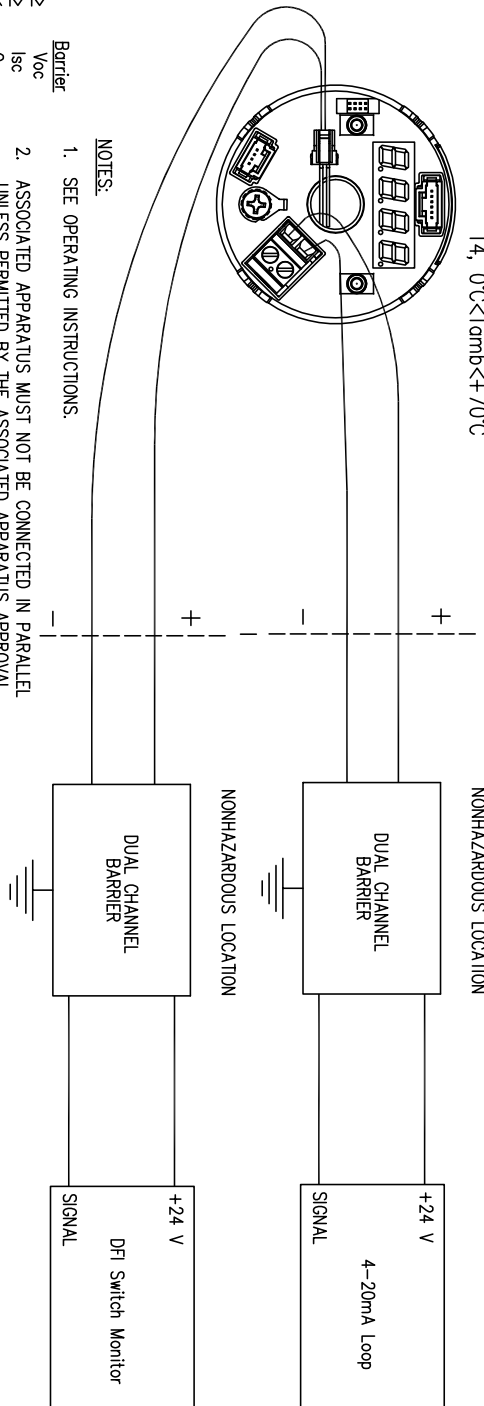


Table 1
Equipment

Barrier	Voc	Isc	Cc	Lc
V max	2	2	2	2
I max	2	2	2	2
C+Cc	2	2	2	2
L+Lc	2	2	2	2

NOTES ON BARRIERS

- MAY BE IN A DIVISION 2 LOCATION IF SO APPROVED.
- OUTPUT CURRENT MUST BE LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN CIRCUIT VOLTAGE AND SHORT CIRCUIT CURRENT.
- CABLE CAPACITANCE PLUS INTRINSICALLY SAFE EQUIPMENT CAPACITANCE MUST BE LESS THAN THE MARKED CAPACITANCE (Cc) SHOWN ON ANY BARRIER USED. THE SAME APPLIES FOR INDUCTANCE.
- SELECTED BARRIERS MUST BE THIRD PARTY APPROVED AND HAVE Voc OR Yi NOT EXCEEDING Vmax AND Isc OR It NOT EXCEEDING Imax AND THE Pmax OF THE BARRIER MUST BE LESS THAN OR EQUAL TO THE Pmax OF THE TRANSMITTER AS SHOWN FOR EACH TYPE OF BARRIER IN TABLE 1
- BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURERS CONTROL DRAWING ARTICLE 504 OF NATIONAL ELECTRICAL CODE (ANSI/NFPA 70).
- BARRIERS FOR BOTH INPUTS MUST HAVE A COMMON GROUND.

- NOTES:
- SEE OPERATING INSTRUCTIONS.
 - ASSOCIATED APPARATUS MUST NOT BE CONNECTED IN PARALLEL UNLESS PERMITTED BY THE ASSOCIATED APPARATUS APPROVAL.
 - WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
 - CAPACITANCE AND INDUCTANCE OF FIELD WIRING FROM THE TRANSMITTER TO THE BARRIER SHOULD BE CALCULATED AS (Cc = 60pf/FT AND Lc = 0.2uh/FT) AND SHOULD BE INCLUDED IN THE SYSTEM CALCULATIONS.

- MODEL NUMBERS
- MPXXX - X - X - X - X - E - X - A - XX - X - X - D
OR
H
- A: Vmax < 32V DC, Imax < 87.8mA, Ci=0uF, Li=0.277mH, Pi=1W
B: Vmax < 28V DC, Imax < 120mA, Ci=0uF, Li=0.277mH, Pi=1W
C: Vmax < 24V DC, Imax < 174mA, Ci=0uF, Li=0.277mH, Pi=1W
Cc = Cable Capacitance
Lc = Cable Inductance

- NOTES ON CONTROL EQUIPMENT
- MAINS POWER MUST NOT EXCEED 250 VOLTS WITH RESPECT TO EARTH.

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CONTROL DRAWING
MPP WITH DFI
PRESSURE TRANSMITTER

44506T0001

REV. X01

Section 12 - Warranty and Return Statement

These products are sold by The Anderson Instrument Company (Anderson) under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to a purchase of these products, as new merchandise, directly from Anderson or from an Anderson distributor, representative or reseller, and are extended only to the first buyer thereof who purchases them other than for the purpose of resale.

Warranty

These products are warranted to be free from functional defects in materials and workmanship at the time the products leave the Anderson factory and to conform at that time to the specifications set forth in the relevant Anderson instruction manual or manuals, sheet or sheets, for such products for a period of two years.

THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTIES HEREIN AND ABOVE SET FORTH. ANDERSON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCTS.

Limitations

Anderson shall not be liable for any incidental damages, consequential damages, special damages, or any other damages, costs or expenses excepting only the cost or expense of repair or replacement as described above.

Products must be installed and maintained in accordance with Anderson instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from corrosion, misapplication, improper specifications or other operating condition beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

This warranty is void if the purchaser uses non-factory approved replacement parts and supplies or if the purchaser attempts to repair the product themselves or through a third party without Anderson authorization.

Returns

Anderson's sole and exclusive obligation and buyer's sole and exclusive remedy under the above warranty is limited to repairing or replacing (at Anderson's option), free of charge, the products which are reported in writing to Anderson at its main office indicated below.

Anderson is to be advised of return requests during normal business hours and such returns are to include a statement of the observed deficiency. The buyer shall pre-pay shipping charges for products returned and Anderson or its representative shall pay for the return of the products to the buyer.

Approved returns should be sent to: ANDERSON INSTRUMENT COMPANY INC.
156 AURIESVILLE ROAD
FULTONVILLE, NY 12072 USA

ATT: REPAIR DEPARTMENT



ANDERSON-NEGELE

ANDERSON INSTRUMENT CO., INC • 156 AURIESVILLE RD. • FULTONVILLE, NY 12072 • USA • 800-833-0081 • FAX 518-922-8997
ANDERSON INSTRUMENT CO. LP • 400 BRITANNIA RD. EAST, UNIT 1 • MISSISSAUGA, ONTARIO L4Z 1X9 • CANADA • 905-603-4358 • FAX 905-568-1652
NEGELE MESSTECHNIK GmbH • RAIFFEISENWEG 7 • D-87743 EGG A. D. GÜNZ • GERMANY • +49 (0) 8333/9204-0 • FAX +49 (0) 8333/9204-49

www.anderson-negele.com