

SITRANS P, Series DSIII Transmitters
for
Pressure, Differential Pressure,
Flanged Level, and Absolute Pressure
Model 7MF4*33-...



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Changes for Revision 5, February 2012

Section	Change
Cover	IG revision number and date updated
Customer/Product Support	Support information updated
PMC Process Connection	New section added.




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Scope

This guide provides basic mechanical and electrical installation information for use by experienced installers. Use this guide in conjunction with User's Manual UMSITRPDS3-1 (titled SITRANS P, Series DSIII for Pressure Differential Pressure, Flanged Level and Absolute Pressure Model 7MF4*33-...). The manual is supplied on the Siemens Process Instrumentation User Manual CD, included with a Series DSIII transmitter shipment. The current version of the User's Manual, in Portable Document Format (PDF) can also be downloaded at the Siemens public Internet site. See the Customer/Product Support section of this guide for additional information.

 WARNING		
	Electrical shock hazard Explosion hazard Can cause death or injury	
	<ul style="list-style-type: none"> • Remove power from all wires and terminals before working on equipment. • In a potentially hazardous atmosphere, remove power from equipment before connecting or disconnecting power, signal, or other circuit. • Observe all pertinent regulations regarding installation in a hazardous area. 	

This installation guide can not cover all details or variations in equipment or provide for every possible contingency to be met in connection with installation, operation, or maintenance. Additional information is provided in the User's Manual (UMSITRPDS3-1). Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the support group listed in the Customer/Product Support section of this guide. Also, refer to the Siemens Process Automation catalog: Field Instruments for Process Automation.

Qualified Persons

The described equipment should be installed, configured, operated, and serviced only by qualified persons thoroughly familiar with this guide and User's Manual.

For the purpose of this guide, the manual and product labeling, a qualified person is one who is familiar with the installation, assembly, commissioning, and operation of the product, and who has the appropriate qualifications for their activities such as:

- Training, instruction, or authorization to operate and maintain devices/systems according to the safety standards for electrical circuits, high pressures, and corrosive, as well as, critical media.
- For devices with explosion protection: training, instruction or authorization to work on electrical circuits for systems that could cause explosions.
- Training or instruction according to the safety standards in the care and use of suitable safety equipment.

INTRODUCTION

This installation guide contains an outline of the procedures to be used to mechanically and electrically install Siemens SITRANS™ P Series DSIII Pressure Transmitters. It is intended for use by experienced installers. Detailed information needed to bench test, install, configure, calibrate, and service a transmitter is included in User's Manual UMSITRPDS3-1. Detailed product specifications are also included in the User's Manual.

The User's Manual is supplied on the Siemens Process Instrumentation User Manual CD, included with a Series DSIII transmitter shipment. To access UMSITRPDS3-1 on the supplied Siemens Process Instrumentation User Manual CD, perform the brief procedure below. The manual is in Portable Document Format (PDF). A link for downloading the free Adobe Reader is provided.

1. Insert the Siemens Process Instrumentation User Manual CD into the CD drive in a PC.
2. If autorun is enabled, a menu of available manuals will appear. Click on the link to the desired manual.

If autorun is not enabled, go to **Start > Run** and browse to the CD drive. Double click on **Autorun.exe** and then click **Run** to display the menu of available manuals.

Note

Additional information about transmitters discussed in this guide, and about SITRANS P transmitter models and options not included in this guide, can be found in the Siemens Process Automation catalog: Field Instruments for Process Automation.

Product Description

SITRANS P Series DSIII transmitters provide reliable, accurate, stable, and cost-effective measurement of differential, absolute, and gauge pressure and liquid level.

Figures 1 through 4 show the basic transmitter models and optional mounting bracket kits. Transmitter dimensions are provided in the User's Manual. Measuring cell construction determines a transmitter's physical dimensions and mechanical installation. Note that a given sensor construction can involve one or more measurement methods, as shown in Table 1.

TABLE 1 Measurements, Models and Figure References

Measurement	Model And Measuring Cell Construction	Refer to
Pressure	7MF4033, Gauge Construction	Figure 1
Pressure/Absolute	7MF4133, Gauge Construction	Figure 9
Absolute Pressure	7MF4233, Gauge Construction	Figure 1
Absolute Pressure	7MF4333, Differential Construction	Figure 2
Differential Pressure	7MF4433, Differential Construction	Figure 3
Differential Pressure	7MF4533, Differential Construction	
Liquid Level (Flange)	7MF4633, Flange Construction	Figure 4
Liquid Level (Flange)	7MF4812, Flange	

Transmitters have an intrinsically safe, explosion proof, NEMA 4x (IP67/68), field mountable, hardened enclosure. Electrical conduit connections are 1/2-14 NPT or M20 x 1.5 (user selected when ordering). All process wetted materials are 316 stainless steel or better. The flush-mount process connection of the liquid level model is compatible with standard ANSI and metric flange sizes for tanks and pipes.

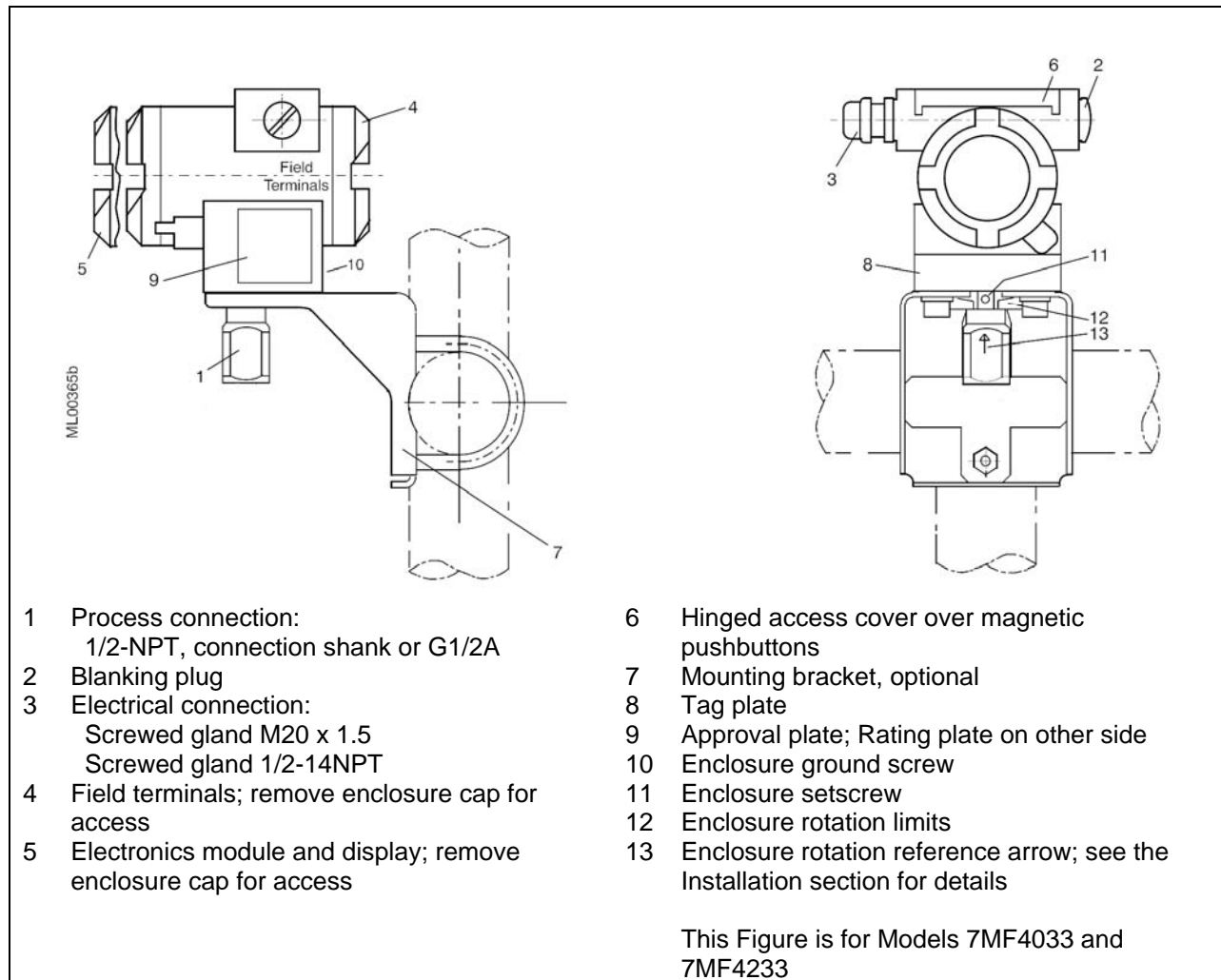


FIGURE 1 Gauge Construction, Pressure and Absolute Pressure Models

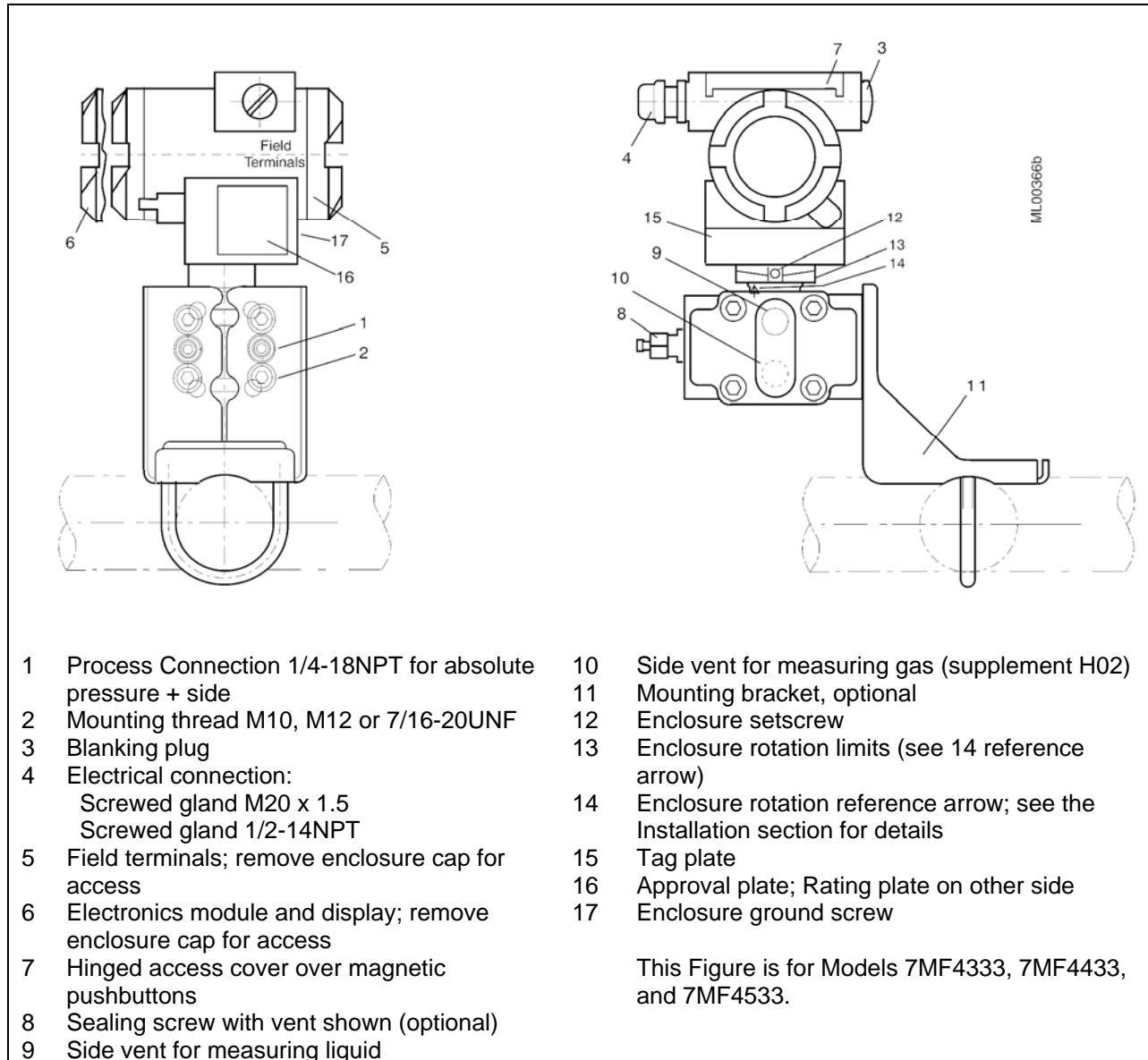


FIGURE 2 Differential Construction; Differential, Flow, and Absolute Models

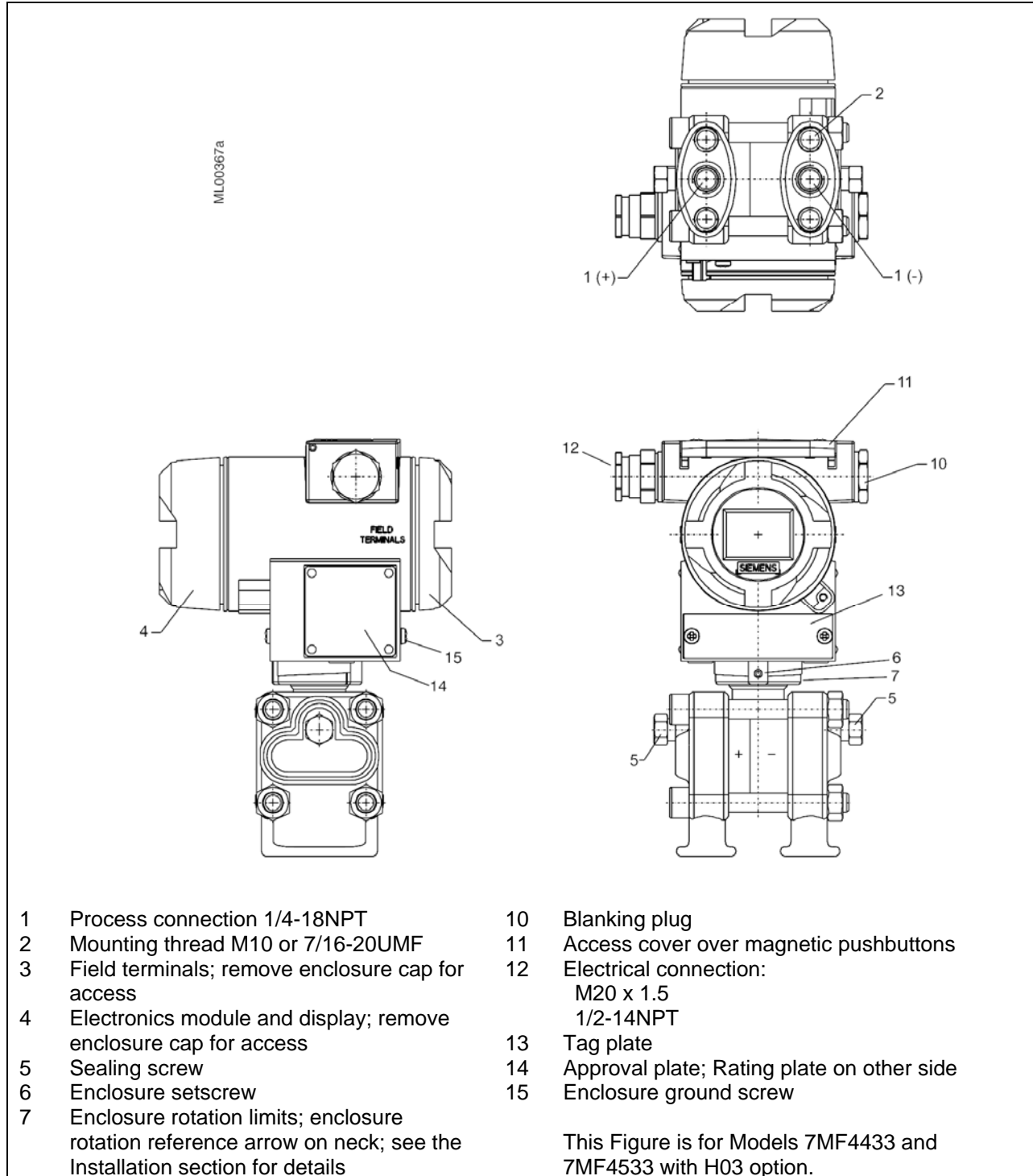


FIGURE 3 Differential Pressure and Flow Models with H03 Option

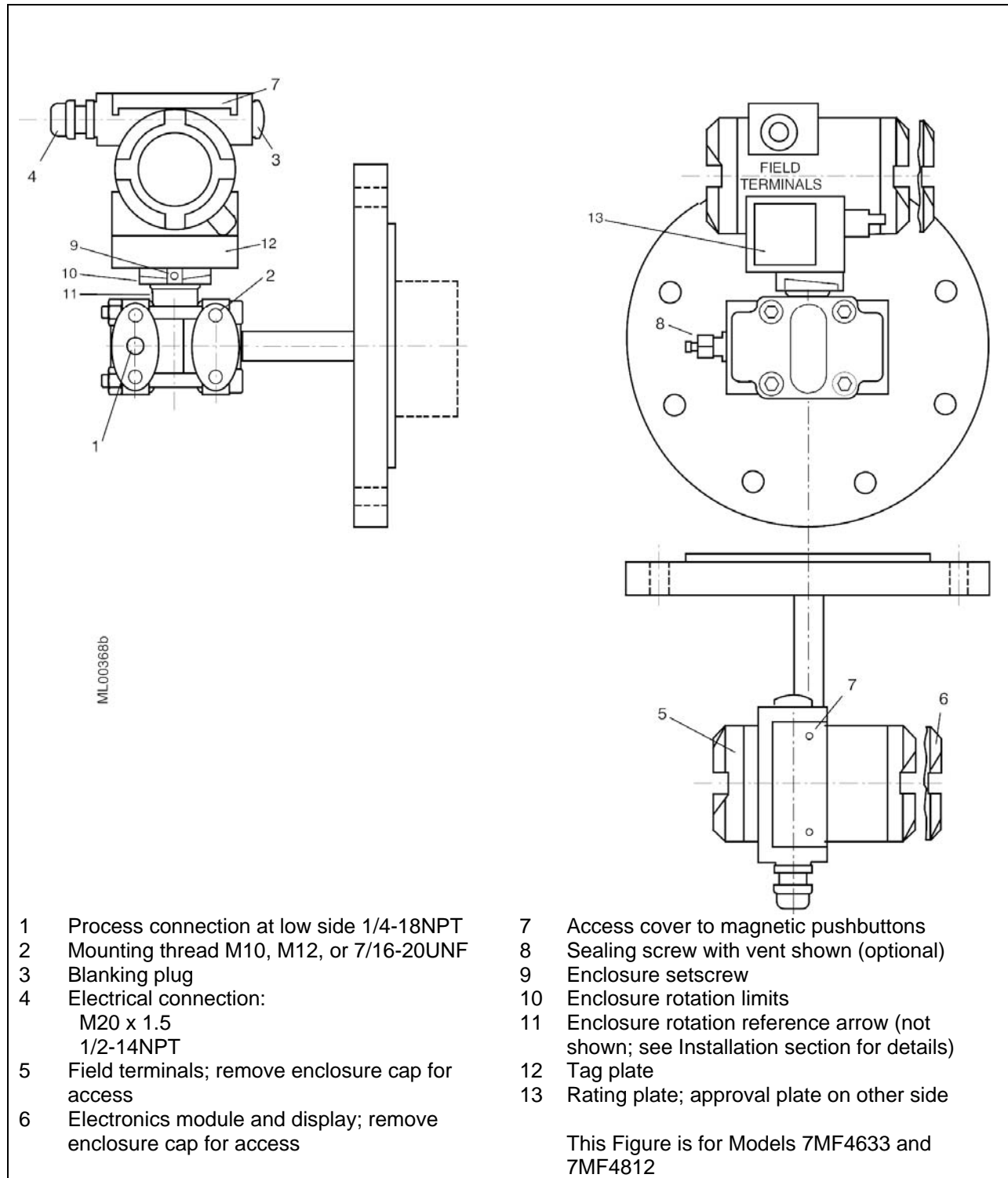


FIGURE 4 Flanged Liquid Level Models

Shown below are the transmitter display and the field (signal) terminals, located at opposite ends of the enclosure. The transmitter enclosure and the display can be rotated for ease of reading regardless of transmitter orientation.

An enclosure ground connection is located on the housing beneath the field terminal enclosure cap. The enclosure should always be grounded by a wire connected from this terminal to an earth ground, even when a ground may be provided by metal conduit protecting the loop wiring.

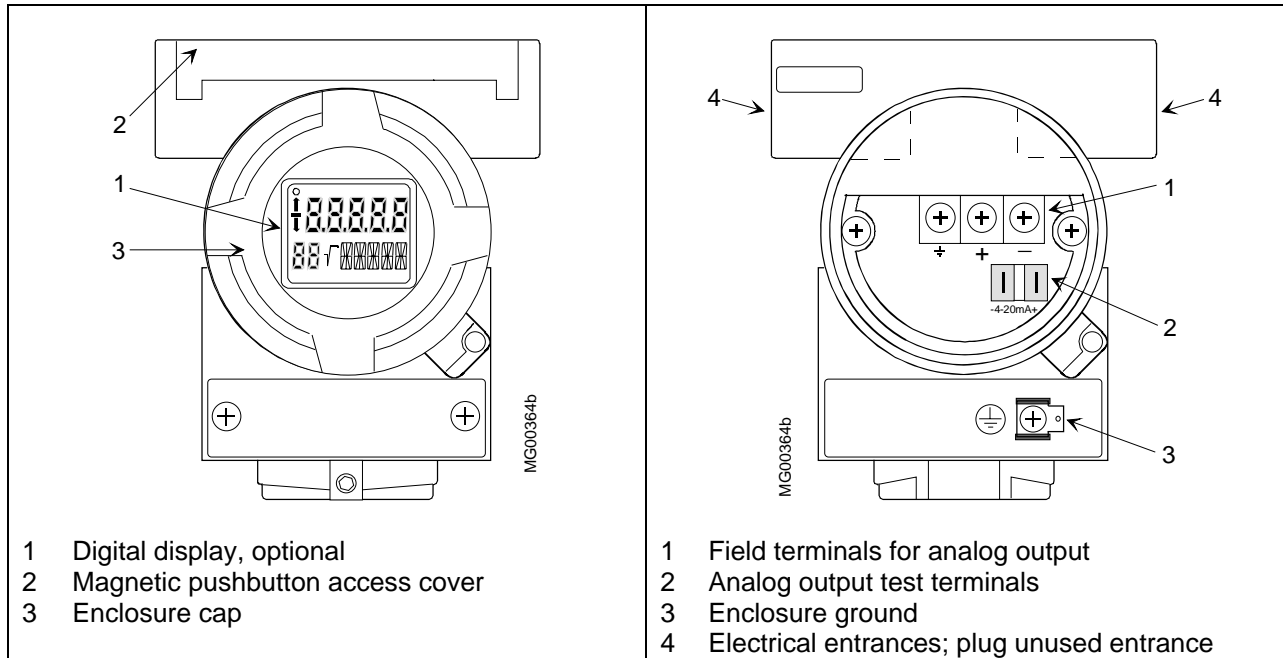


FIGURE 5 Display

FIGURE 6 Field Terminals

Rating, Approval, and Tag Plates

These plates are fastened to the outside of the transmitter enclosure, as shown in Figure 7. The rating plate shows that transmitter’s model number, serial number, and performance data. The approval plate shows that transmitter’s approval and certification data. Always refer to these plates to confirm the model number, performance data and approval and certification data before installing or servicing a transmitter. Representative plates are shown in Figure 8.

The tag plate is fastened with two screws so it can be removed for engraving.

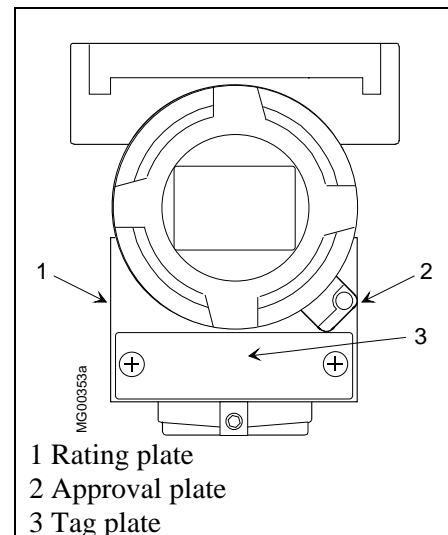


FIGURE 7 Plate Locations

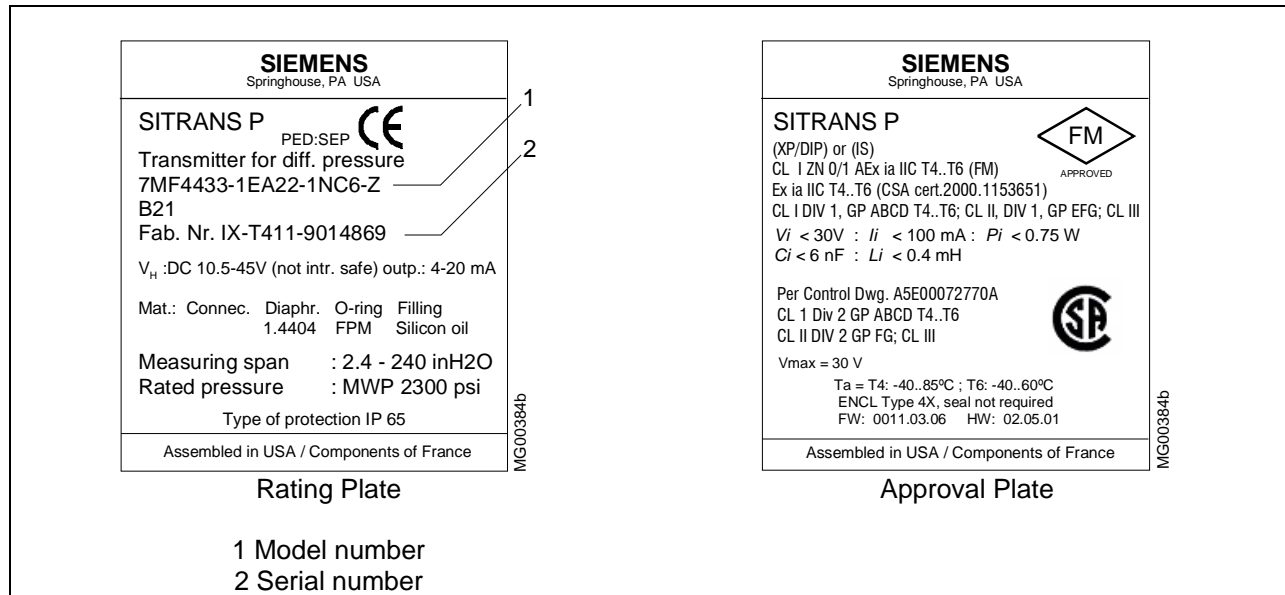


FIGURE 8 Rating and Approval Plates

Customer/Product Support

This section provides the Internet site address, e-mail address, telephone numbers, and related information for customers to access Siemens product support.

IMPORTANT

An instrument must be thoroughly cleaned (decontaminated) to remove any process materials, hazardous materials, or blood-borne pathogens prior to return for repair. Read and complete the Siemens RMA form(s).



For support and the location of your local Siemens representative, refer to the table below for the URL of the Process Instrumentation (PI) portion of the Siemens public Internet site. Once at the site, click **Support** in the right column and then **Product Support**. Next select the type of support desired: sales, technical (see the table below), documentation, or software.

Online Support Request	http://www.siemens.com/automation/support-request
Technical Support	1-800-333-7421; 8 a.m. to 4:45 p.m. eastern time, Monday through Friday (except holidays)
Customer Service & Returns	1-800-365-8766 (warranty and non-warranty)
Public Internet Site	http://www.usa.siemens.com/pi
Technical Publications in PDF	Click the above link to go to the Siemens Internet site and then click Process Instrumentation . In the column to the right, click Support > Manuals . In the column to the left, select the product line (e.g. Pressure or Temperature or Controllers) to open navigation and search panes. Note: Navigation may change as the site evolves.

INSTALLATION

Transmitter mechanical and electrical installation is outlined in this section.

IMPORTANT

Before installing or servicing the transmitter:

- Read the information on the transmitter's rating and approval plates and ensure that the correct model is at hand and that the correct procedures in this guide and User's Manual UMSITRPDS3-1 are followed. Refer to the User's Manual, Section 9.1 Model Designations for an explanation of the model designation alphanumeric sequence shown on the rating plate.
- The installation must conform to the National Electrical Code and all other applicable construction and electrical codes. Refer to the installation drawings in the User's Manual, Appendix B when locating a transmitter in a hazardous area.
- For hazardous area installations, refer to the current revision of the User's Manual. Refer to Section 9.6 Hazardous Area Classifications for approval agency requirements that affect installation and use of the instrument and for additional statements concerning installation in a hazardous environment.
- Refer to Section 2 Installation in the User's Manual for installation diagrams that show suggested mounting locations and pipe runs for various transmitter models, measurement methods, and process fluids. Actual mounting position for a specific application can be important to system performance.

Mechanical Installation

Figures 1 through 4 show the transmitter models and the optional mounting bracket kits. Transmitter dimensions are given in the User's Manual. A gauge or differential transmitter can be mounted with an optional bracket kit or with a user supplied bracket. A gauge transmitter can also be mounted in a PMC-style process connection, as shown in Figures 9 thru 12, and a differential transmitter can be nipple mounted on an orifice flange. A liquid level transmitter can be flange mounted directly on a vessel, at the point of measurement.

Mount a transmitter in any position (orientation). The mounting position can cause a zero shift, however, any zero shift is simply calibrated out with the transmitter installed in its final mounting position. Refer to the User's Manual, Section 7 Calibration and Maintenance for details.

The transmitter enclosure can be rotated relative to the measuring cell to clear an obstruction or to allow viewing the optional display. The display can then be rotated in 90° increments for ease of reading. Refer to the following paragraphs for details.

Standard PMC-Style Process Connection

The Model 7MF4133 gage pressure transmitter is available with a PMC-style process connection.¹ See Figure 9. The provided nipple must be *carefully welded* to the process vessel, the supplied O-ring inserted, the transmitter measuring cell inserted into the nipple and the locking nut tightened.

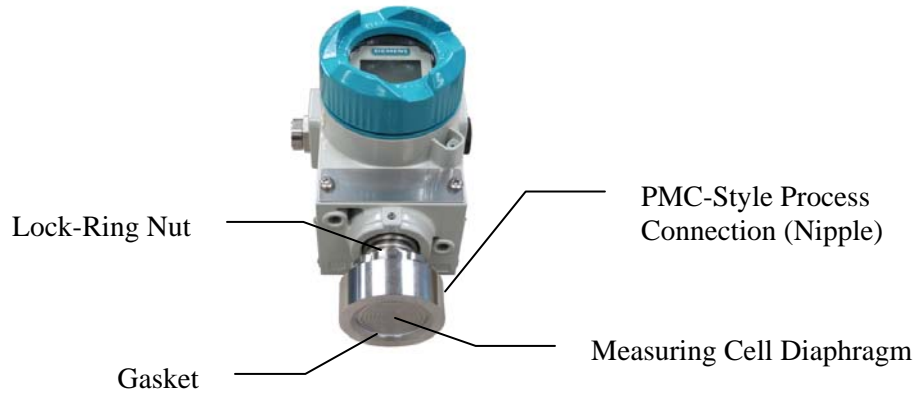


FIGURE 9 Standard PMC-Style Process Connection

IMPORTANT

The transmitter's measuring cell diaphragm is exposed in this model. Do not scratch or otherwise mar the cell diaphragm. If damaged, the cell must be replaced.

IMPORTANT

Installation and welding of a nipple must be done by a trained machinist/welder using heliarc (inert gas welding process). Careless installation can distort the nipple resulting in leakage and/or jammed threads.

Nipple Installation

1. Cut the hole for the nipple to produce a tight fit. An oversize hole will result in distortion of the nipple. See Figure 10.
2. Bevel the edge of the outside face of the hole as shown below.

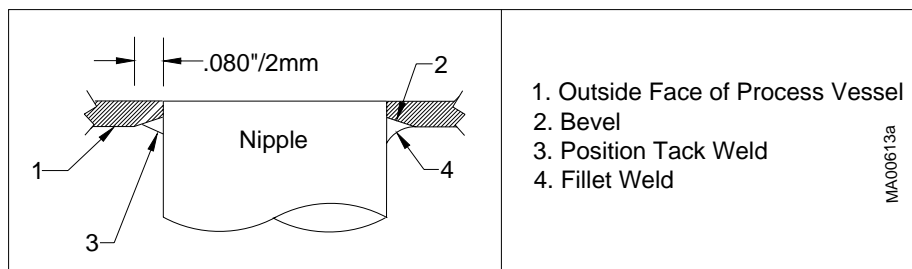


FIGURE 10 Nipple Installation

¹ Other process connections are available, including a PMC-style minibolt weldable socket version (flush front construction). Refer to the Siemens Process Automation catalog: Field Instruments for Process Automation.

- Remove the nipple from the transmitter by unscrewing the lock-ring nut on the transmitter. Save the thin, white Teflon² gasket.
- Screw the dummy plug into the nipple. See Figure 11.

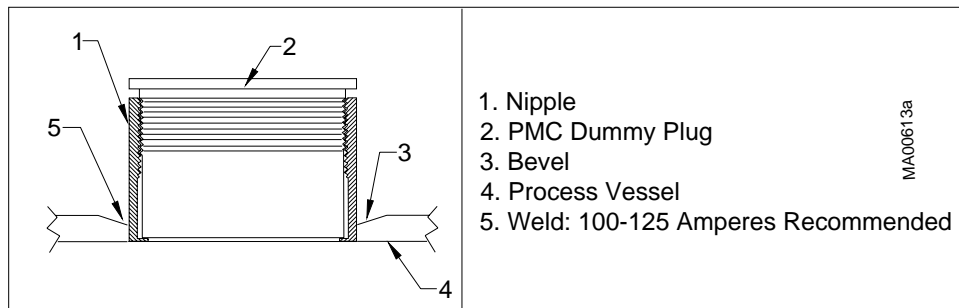


FIGURE 11 PMC Dummy Plug

- Insert the nipple into the vessel and tack weld in place at 6 points.
- Weld the nipple to the process vessel using 0.032"/316 stainless steel rod as filler in the beveled area surrounding the nipple. Adjust amperage for a continuous weld depth of 0.080"/2 mm penetration. The weld sequence is shown in Figure 12.
- Clean and polish the weld to meet process requirements.
- Remove the dummy plug.
- Install the Teflon gasket and transmitter in the nipple. Orient transmitter as required. Tighten the lock-ring nut on the transmitter only enough to ensure a secure, leak-free seal. Do not over tighten. Do not prevent the transmitter from rotating as the lock-ring nut is tightened.

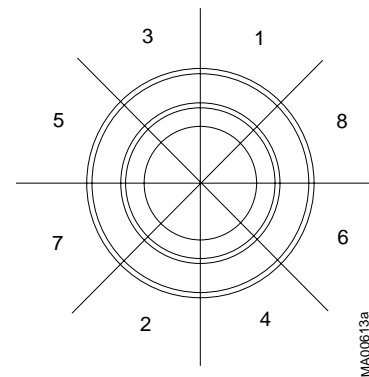


FIGURE 12 Weld Sequence

Enclosure Rotation

- Loosen the enclosure setscrew using a 3/32" Allen wrench. The enclosure can be rotated approximately 135° in either direction from the point where the enclosure rotation arrow points directly at the enclosure setscrew. See Figure 13.

IMPORTANT

If the high end of the ramp-shaped recess in the enclosure neck is rotated past the enclosure rotation arrow on the measuring cell, damage to internal electrical connections can occur, requiring replacement of the measuring cell.

After positioning the enclosure, tighten the enclosure setscrew to between 30.1 in-lbs and 31.9 in-lbs (3.4 N-m and 3.6 N-m).

- Go to the next section to orient the display.

² Teflon® is a registered trademark of E. I du Pont de Nemours and Company

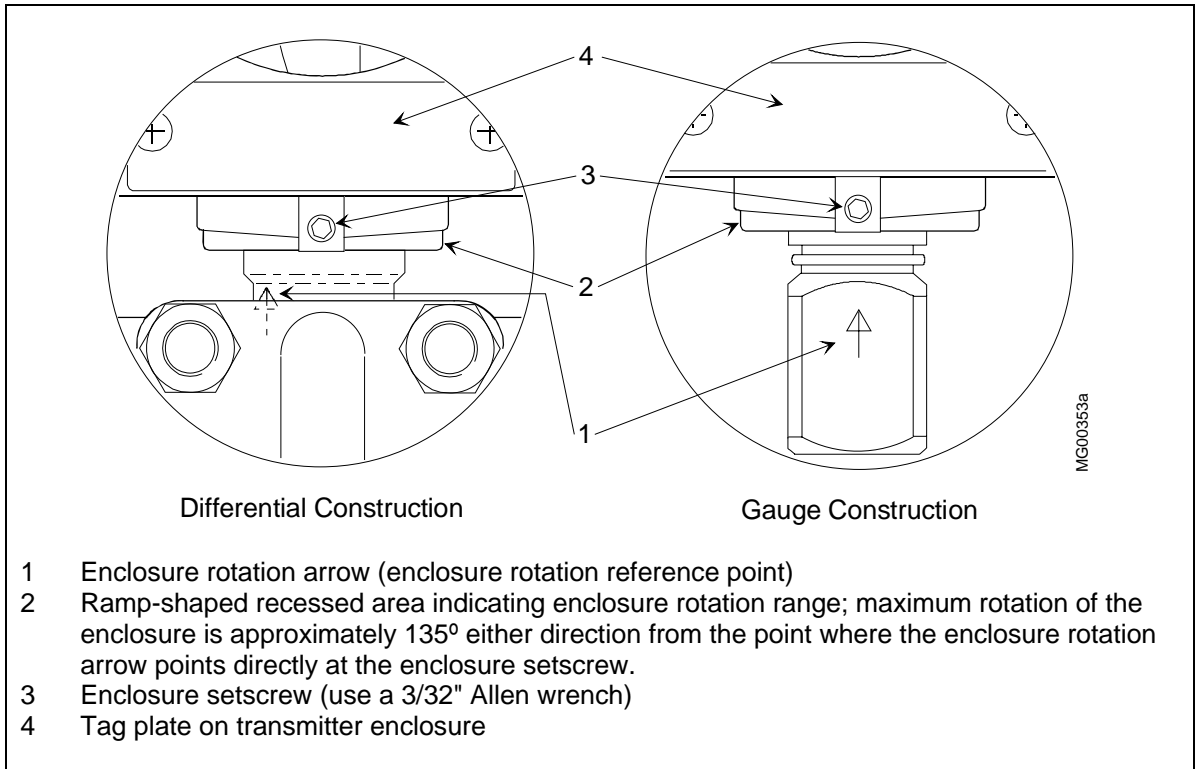


FIGURE 13 Enclosure Rotation Considerations

Display Orientation

As supplied the display is oriented for viewing with the transmitter installed vertically, as shown in Figure 14. When the transmitter is installed in another orientation, perform the following steps to reorient the display for ease of reading.

1. Turn off power to the transmitter.
2. Remove the enclosure cap that has the sightglass by rotating the cap counterclockwise.
3. Fasten an anti-static wrist strap on your wrist and ground it to the transmitter ground screw.
4. Use a Phillips blade screwdriver to remove the two screws holding the display; see Figure 14. The display is electrically connected to the transmitter electronics by the display cable.
5. Hold the display just in front of the transmitter enclosure. Rotate the display in quarter turn increments to find the viewing position where reading is easiest. Four positions, 90° apart, are provided. Do not rotate the display more than 180° in a clockwise or counterclockwise direction.
6. Align the two holes in the display circuit board with the hex standoffs in the enclosure and install the two screws removed above.
7. Install the enclosure cap and remove the anti-static wrist strap.



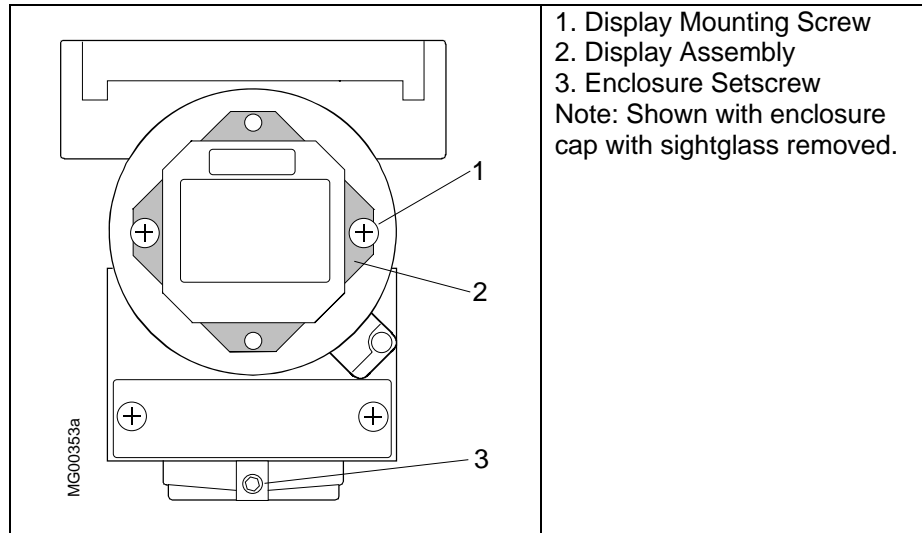


FIGURE 14 Display Removal and Repositioning

Electrical Conduit and Cable Installation

Figure 15 shows conduit connections. Electrical conduit and wiring is supplied by the user. Field terminals are shown in Figure 6. To access the field terminals:

1. Remove the enclosure cap closest to the electrical entrance by turning it counterclockwise. Install conduit as needed. Refer to Electrical Installation to install wiring.
2. Install the enclosure cap by turning it clockwise until the O-ring contact the enclosure. Tighten the cap one additional turn to compress the O-ring.

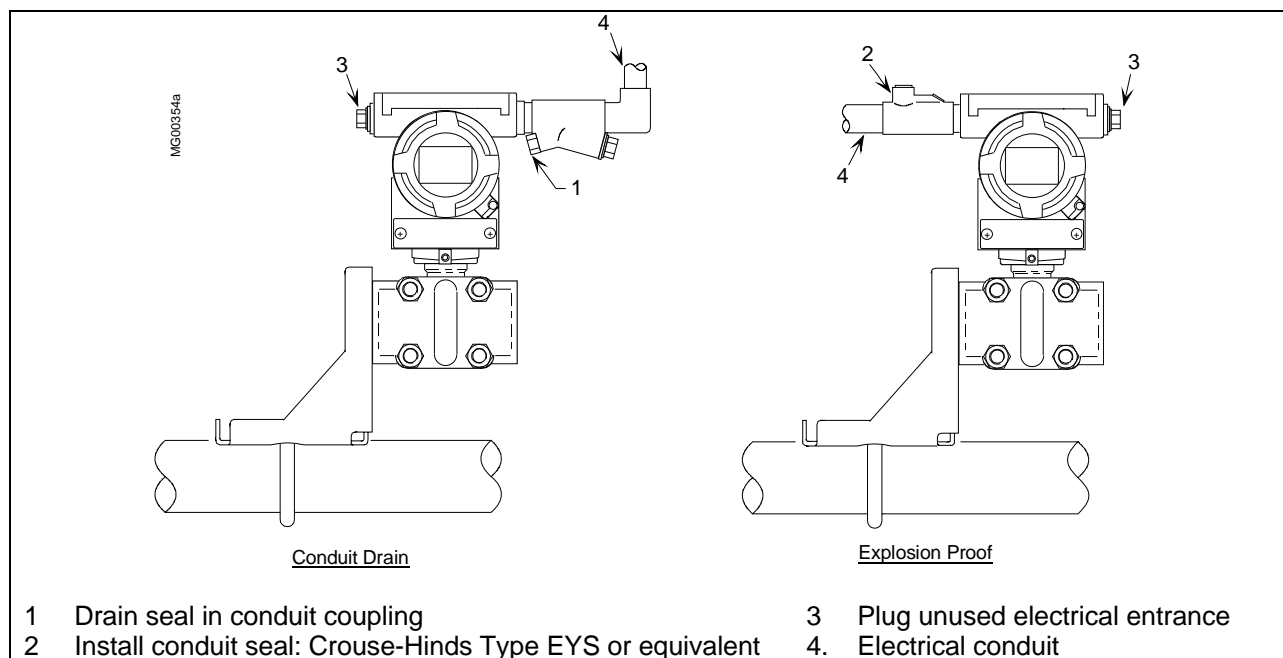
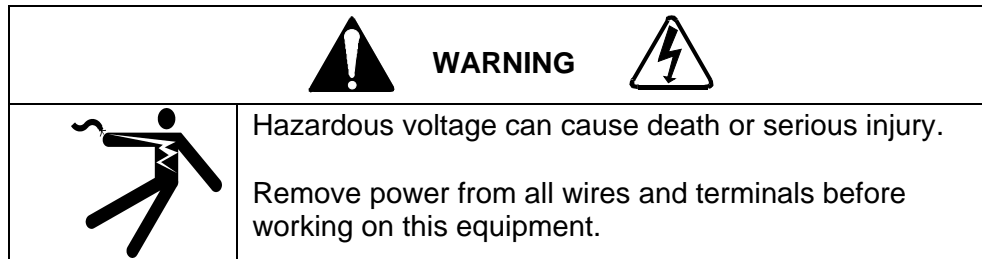


FIGURE 15 Conduit Drain and Explosion Proof Installations

Electrical Installation

This section outlines loop wiring for Point-to-Point and Multi-Drop networks. Refer to User's Manual UMSITRPDS3-1, Section 4 Installation for wiring diagrams and for installation in a hazardous area.



CAUTION

Use supply wires suitable for at least 5°C (10°F) above ambient temperature.

To connect the transmitter to the loop, perform the following steps.

1. Remove power from all involved wires and terminals.
2. Access the transmitter signal terminals (see Figure 6) by removing the enclosure cap nearest to the electrical entrance. Turn the cap counterclockwise.
3. Strip loop cable and conductors. Install ring tongue or spring spade tongue terminals for #8 screws and the cable conductor gauge. If terminals will not be used, tin conductor ends and form a loop.
4. Connect the loop cable to the LOOP (+) and (-) terminals inside the transmitter's enclosure. Terminals will accommodate wire sizes up to 16 AWG (1.3 mm²).
5. Install the enclosure cap by turning it clockwise until the O-ring contacts the enclosure, Tighten the cap one additional turn to compress the O-ring.
6. If one of the two electrical conduit entrances in the housing is not used, it should be plugged; see Figure 15. Refer to the transmitter's rating plate and Section 9, in the User's Manual, to determine whether entrance holes accept 1/2-NPT or M20 x 1.5 fittings.

Seal a 1/2-NPT fitting with Teflon tape; seal an M20 fitting with a soft setting sealing compound rated for at least 105°C (221°F).

7. Ground the enclosure by installing a 16 AWG (1.3 mm²) or larger copper wire between the enclosure ground screw and a low resistance ground, such as a nearby metal cold water pipe.

This completes the physical installation.

