

2. Installation

Receiving/Inspection

- Unpack carefully.
- Verify that all items in the packing list are received and are correct.
- Inspect all instruments for damage or contaminants prior to installation.

If the above three items are satisfactory, proceed with the installation. If not, then stop and contact a customer service representative.

Packing/Shipping/Returns

These issues are addressed in Appendix C - Customer Service

Required Materials

Appropriate wire, cable, conduit, and a mating flange on the vessel.



Note: Potting Y's for all the interconnecting wires are recommended when installing the instrument. Other requirements may vary based on local wiring codes. An appropriate mating surface on the vessel is also required.

Pre-Installation Procedure



Warning: Only qualified personnel should install this instrument. Install and follow safety procedures in accordance with the current National Electrical Code. Ensure that power is off during installation. Any instances where power is applied to the instrument will be noted in this manual. Where the instructions call for the use of electrical current, the operator assumes all responsibility for conformance to safety standards and practices.



Caution: The instrument is not designed for weld-in-place applications. Never weld to process connection or a structural support.

Damage resulting from moisture penetration of the local or remote (optional) enclosure is not covered by product warranty.

The control circuit contains electrostatic discharge (ESD) sensitive devices. Use standard ESD precautions when handling the control circuit. See below for ESD details.

Use Standard ESD Precautions

Use standard ESD precautions when opening an instrument enclosure or handling the level transmitter. FCI recommends the use of the following precautions: Use a wrist band or heel strap with a 1 megohm resistor connected to ground. If the instrument is in a shop setting there should be static conductive mats on the work table and floor with a 1 megohm resistor connected to ground. Connect the instrument to ground. Apply antistatic agents to hand tools to be used on the instrument. Keep high static producing items away from the instrument such as non-ESD approved plastic, tape and packing foam.

The above precautions are minimum requirements to be used. The complete use of ESD precautions can be found in the U.S. Department of Defense Handbook 263.

Verify Serial Numbers (For Remote Applications Only)

Verify that the flow element serial number matches the control circuit serial number. A tag indicating the serial number is located on the local and remote enclosures. The serial number is also found on the control circuit.

Verify Installation Location

Prepare the vessel for installation, or inspect the already prepared location to ensure that the instrument will fit into the system. Prepare the necessary sealants or gaskets to provide a leakproof installation for the application if required. The location that should have been prepared at the time of order should be at least 20 pipe diameters downstream and 20 pipe diameters upstream from any bends or interference in the process pipe or duct to achieve the greatest accuracy.

Flow Element Installation

Install the flow element in the process piping at the desired location. FCI recommends that the A side of the flow element be placed so it is on the up-stream side of the normal flow direction. Verify that the flat area machined into the flow element is flat, up and level. The flat is machined on the flow element near where it is screwed into the enclosure. "FLAT UP & LEVEL" is also etched on the flat surface.

Threaded Mounting

Apply a lubricant/sealant compatible with the process to all threads. Use a pipe wrench for 1-1/4 inch (32mm) NPT and larger connections (including exotic materials of construction), or an open-end wrench for 1-1/4 inch (32mm) NPT and smaller connections. All connections should be tightened firmly. To avoid leaks, do not over-tighten or cross-thread connections. The figures in Appendix A and Figure 2-1, show this configuration.

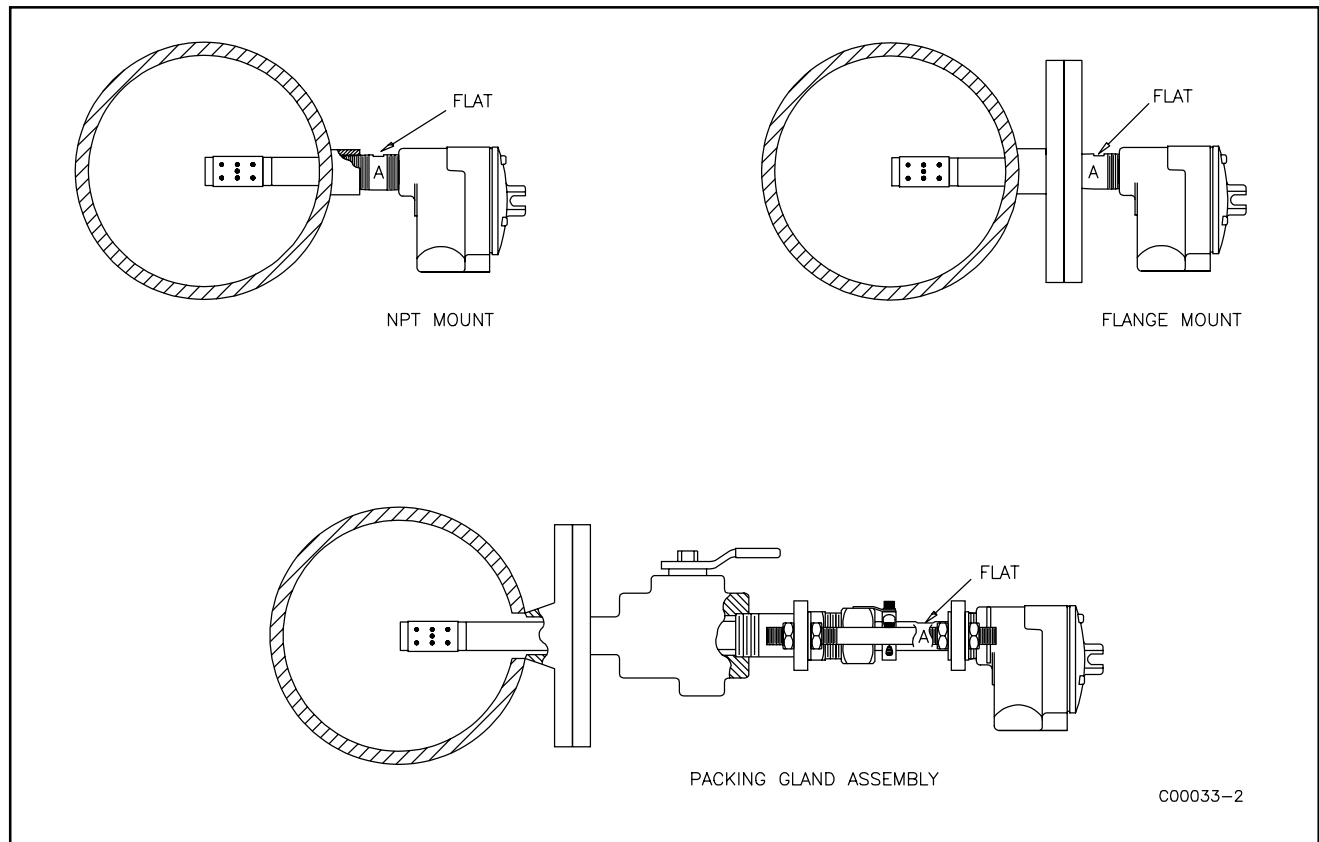


Figure 2-1. Pipe, Flange and Packing Gland Assemblies

Flanged Mounting

As appropriate, use flange-face gaskets and sealants that are compatible with the process. Use the correct size mounting bolts and tighten firmly. See Figures 2-1 and Appendix A for the mounting details.

Packing Gland Assembly

If used, the customer supplies a ball valve with the appropriate connection. Follow the threaded or flanged mounting procedure as applicable.

Hand tighten the packing nut until the internal packing material is tight enough to prevent process media leakage, but not enough to prevent the flow element shaft from sliding.

If used, open the valve. Check for process media leakage. Push or jack the flow element into the process pipe. Tighten the packing nut 1/2 to 1 turn, torque to approximately 65 - 85 ft-lbs (88 to 115 N-m).

Rotate the split-ring locking collar to lineup with the connecting strap welded to the packing nut. Tighten two 1/4-28 hex socket cap screws on the split-ring locking collar. See Figures 2-1 and Appendix A for mounting details.

Control Circuit Installation

The standard configuration (see Appendix A, Figure A-7) of the instrument is with the control circuit already installed in the local enclosure (the control circuit is physically mounted with the flow element). If the application requires an optional remote operation (an operation where the control circuit is mounded separately from the flow element), then continue with the following instructions.

Select a location for the remote enclosure within a 1000 feet (305 m) of the flow element. This location should be easily accessible with enough room to open the remote enclosure. Secure the remote enclosure solidly to a vertical surface capable of providing support. Use appropriate hardware to mount the remote enclosure. The outline dimensions of a typical remote enclosure is shown in Appendix A.

Wiring Installation

Conduit Routing

All socket and/or terminal block connections are to be made through the 1 inch female NPT openings in the enclosure(s). FCI strongly recommends that all electrical cables be run through an appropriate conduit for the protection of the instrument and personnel.

Protection of the control circuit from moisture is an important consideration. Keep the entry of the conduit into the enclosures in the downward direction so condensed moisture that collects in the conduit will not drain into the enclosure. The local enclosure may be turned not more than 180° using the threads on the flow element stand pipe to gain an acceptable orientation. In addition, FCI recommends sealing off the conduit with a potting Y or other sealing method to prevent moisture from entering the enclosure.

Minimum Wire Size

Table 2-1 shows the smallest (maximum AWG number) copper wire that is to be used in the electrical cables used for connecting the instrument to the customer alarms and power. Use a lower gauge of wire for less of a voltage drop. Contact FCI concerning greater distances than those listed in the table.

Table 2-1. Interconnecting Cable Size (AWG)

Connection	Maximum Distance for AWG					
	10 ft. (3m)	50 ft. (15m)	100 ft. (31m)	250 ft. (76m)	500 ft. (152m)	1000 ft. (305m)
AC Power	22	22	22	20	18	16
Relay (2A)	28	22	20	16	12	10
Relay (10A)	22	16	12	8	6	Not Recommended
Flow Element Wires for Remote Option*	24	24	24	22	22	18
*Requires a shielded cable which is connected to the control circuitry terminal block.						

Cable Connections



Caution: In order to prevent circuit or component damage, remove the signal conditioner from the remote enclosure (if present) prior to the pulling of conduit wire.



Note: The installation of an AC line switch between the AC power source and the instrument is recommended. This facilitates easy power disconnection and is an added safety feature.

Connect the cable wires per the applicable wiring diagram in Appendix A. Use the tag found on the instrument or packing list to match the control circuit description with the modules that call out the wiring diagrams. The modules are also found in Appendix A. The part of the tag description that denotes the control circuit is found between two forward slashes (/...../) and starts with a circuit board name, e.g. /0018-...../. The code that follows corresponds to the modules. The lack of a full code denotes that the control circuit has a standard configuration. Standard configurations are denoted on the modules with the abbreviation STD.

The cable used to connect the flow element to the control circuit must be shielded. The shield drain wire is terminated at the control circuit socket (terminal 7). The other end of the shield is left floating (no connection to the terminal block). The standard cable provided has a shield and is 22 AWG wire.

Connect the relay outputs to the customer alarms. Also connect the power to the instrument power input. See Appendix A for the appropriate connection information.