Universal Pulse Transmitter (UPT) Installation/Service

Bulletin MN01045 Issue/Rev. 0.7 (11/17)

General

The Smith Meter® Model UPT (Universal Pulse) Transmitter is a photo-electric, dual channel, high resolution, pulse generator that is directly connected to the output shaft of a positive displacement meter.

The UPT Transmitter is installed at the lowest level in the meter accessory stack. It is designed to be mounted directly on the meter dome adaptor and replaces the manual calibrator. If other mechanical stack accessories are required, a calibrator adaptor kit is used for mounting the manual calibrator above the UPT Transmitter.

Reference Publications

Specification Bulletin SS01105

Parts List PO01056 (P0907.05)

Receipt of Equipment

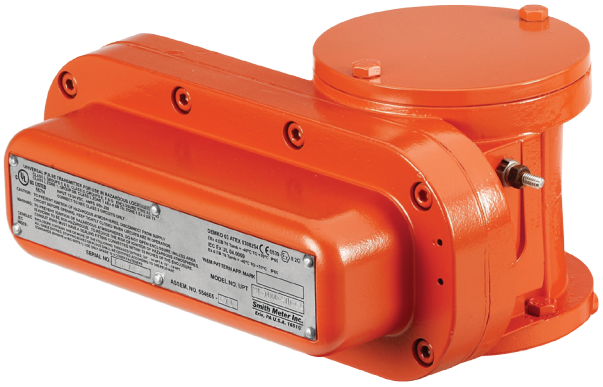
When the equipment is received, the outside packing case should be checked immediately for any shipping damage. If the packing case has been damaged, the local carrier should be notified at once regarding his liability. Carefully remove the unit from its packing case and inspect for damaged or missing parts.

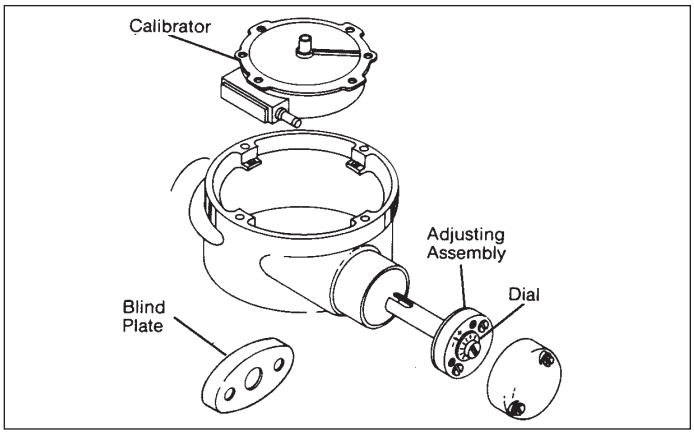
If damage has occurred during shipment or parts are missing, a written report should be submitted to the Inside Sales Department, Measurement Solutions, PO Box 10428, Erie, Pennsylvania 16514.

Prior to installation, the unit should be stored in its original packing case and protected from adverse weather conditions and abuse.

Mechanical Installation

When ordered with a Smith Meter® positive displacement (PD) meter, the Model UPT Transmitter will normally be factory installed directly on the meter. The following steps are required for field mounting the UPT Transmitter to a Smith Meter PD meter:





1. Remove all accessories (counters, mechanical temperature compensators, transmitters, etc.) from the meter.
2. Remove the existing calibrator, located inside the meter dome adaptor.
   a. Remove the cap protecting the external calibrator adjusting stem by removing the two mounting screws.
   b. Indicate the calibrator setting with a line that intersects the calibrator dial and its adjacent part.
   c. Remove the calibrator adjusting assembly by removing the two mounting screws and carefully withdraw the stem assembly from the housing without changing the adjusting screw.
   d. Remove the calibrator from the meter dome adaptor by removing the two small hold-down screws and carefully rotating the calibrator body clockwise.
   e. Attach the blind plate (provided in the adaptation kit) over the calibrator stem assembly hole.

3. Mount the UPT Transmitter onto the meter dome adaptor. A weatherproof gasket and three 3/8" - 16 x 1-1/4" mounting bolts are provided. Care must be taken to properly engage the transmitter coupling or gear to the meter drive coupling or gear.

   For adaptation to old style (single case) PD meter (old style PD meters include Models AB, AS, B, or S-12, 13, 24, 28, 30, 35, 42, 45, 50, 60, 65, 75, and 100), also mount the 5/8" spacer between the UPT Transmitter and meter dome adaptor. An additional weatherproof gasket and longer mounting bolts are provided.

4. If a live calibrator is required to be installed below the UPT Transmitter then a UPT calibrator adapter kit is required P/N 529288011. If a live calibrator is required on top of the UPT Transmitter then a remote calibrator kit is required P/N 529288001.
5. If additional stack accessories are not required, install a blind cover plate (10078-1) on the top of the UPT Transmitter. The manual calibrator and other parts removed in previous steps can be discarded (see note below).
6. If additional stack accessories are required, reinstall the previously removed calibrator and stem assembly into the new calibrator adaptor housing located on top of the transmitter by reversing the removal procedure described in Step 2 above (see note below).
7. Install oiler in calibrator housing (parts provided in the adaptation kit):
   a. Attach tube to oiler.
   b. Insert tube through calibrator housing.
   c. Drive oiler (force fit) into housing.
   d. Attach oiler tube to top of calibrator, just below drive coupling.
8. Reassemble the accessories (counter, mechanical temperature compensator, etc.) onto the calibrator housing.
9. Check the calibrator setting and adjust (if necessary) to the setting recorded in Step 2b. Recalibration of the meter may be required due to breaking of seals on original calibrator adjustment and is recommended to maintain optimum meter accuracy.

   For adaptation to old style PD meters, the meter must be recalibrated because the new factory-installed calibrator is not adjusted.

10. If desired, a seal wire can be installed (like a belt) around the middle of the UPT Transmitter cover and housing to prevent unauthorized tampering with internals.

Note: *With the calibrator removed from the meter, the oiler fitting on the PD meter is no longer needed and should be sealed off.*

ATEX/IECEx Installation

Standards Used:

IEC 60079-0 6th Edition, EN 60079-0: 2012 +A11:2013, UL 60079-0 6th Edition, CAN/CSA C22.2 No. 60079-0:11

IEC 60079-1 7th Edition, EN 60079-1: 2014. UL 60079-1 7th Edition, CAN/CSA C22.2 No. 60079-1:11

Cable entries must be in accordance to EN/IEC 60079-1 section 13.

For wiring systems utilizing cable glands the gland and or thread adaptor must be Ex certified.

The cable end must be securely installed and depending on the cable type be properly protected from mechanical damage.

For wiring systems utilizing conduit, an Ex certified sealing device must be used immediately at the entrance of the enclosure. Any unused entry must be suitably blocked with an Ex db IIB IP65 certified plug for ATEX and IECEx applications.

Equipment bonding shall be provided at the external grounding facility terminal, external connection is not required when using metallic conduit or armored cable. External grounding facility terminal wire range: 10-12 AWG (5.26 sq mm to 3.31 sq mm) wire.

CAUTION: *To prevent ignition of hazardous atmospheres, disconnect from supply circuit before opening. Keep tightly closed when circuits are in operation.*

WARNING: *To prevent ignition of hazardous atmospheres, do not open enclosure unless area is known to be non-hazardous. To reduce the risk of ignition of hazardous atmospheres, conduit runs must have a sealing fitting connected within 18 inches of the enclosure.*

Special Conditions For Safe Use:

- Special Fasteners: Cover Bolts - DIN 912 grade 12.9 (alloy steel) M8 x 1.25, thread tolerance 6g, only replace with this type.

- Select wiring and cable glands suitable for 80°C operation.

- Contact manufacturer at address listed for information on the dimensions of the flameproof joints.

FMC Technologies Measurement Solutions Inc.
1602 Wagner Avenue
Erie, Pennsylvania 16510
USA

CE 0539 Ex II 2G

Marking	Equipment Covered	Certificate
Ex db IIB T6 Tamb = -40°C to 70°C IP65	Model: UPT	DEMKO 03 ATEX 0308254X IEC Ex UL 04.0009X

Wiring Diagram

Function	Color	Standard Version Pin Connections	Rotation of Transmitter Shaft Reference Dimensions Drawing Below	
Electronics Ground	white	[1] ⦸		
Input Power (12-24 Vdc)	brown	[2] ⦸	Counter-Clockwise	Clockwise
Channel "B" Output	grey	[3] ⦸	Leading	Lagging
Channel "$\bar{B}$" Output	pink	[4] ⦸		
Channel "A" Output	green	[5] ⦸	Lagging	Leading
Channel "$\bar{A}$" Output	yellow	[6] ⦸		
Shield	black	[7] ⦸		
Verification Pulse Output	blue	[8] ⦸		
Inverted Verification Pulse	red	[9] ⦸		
(Not used)		[10] ⦸		

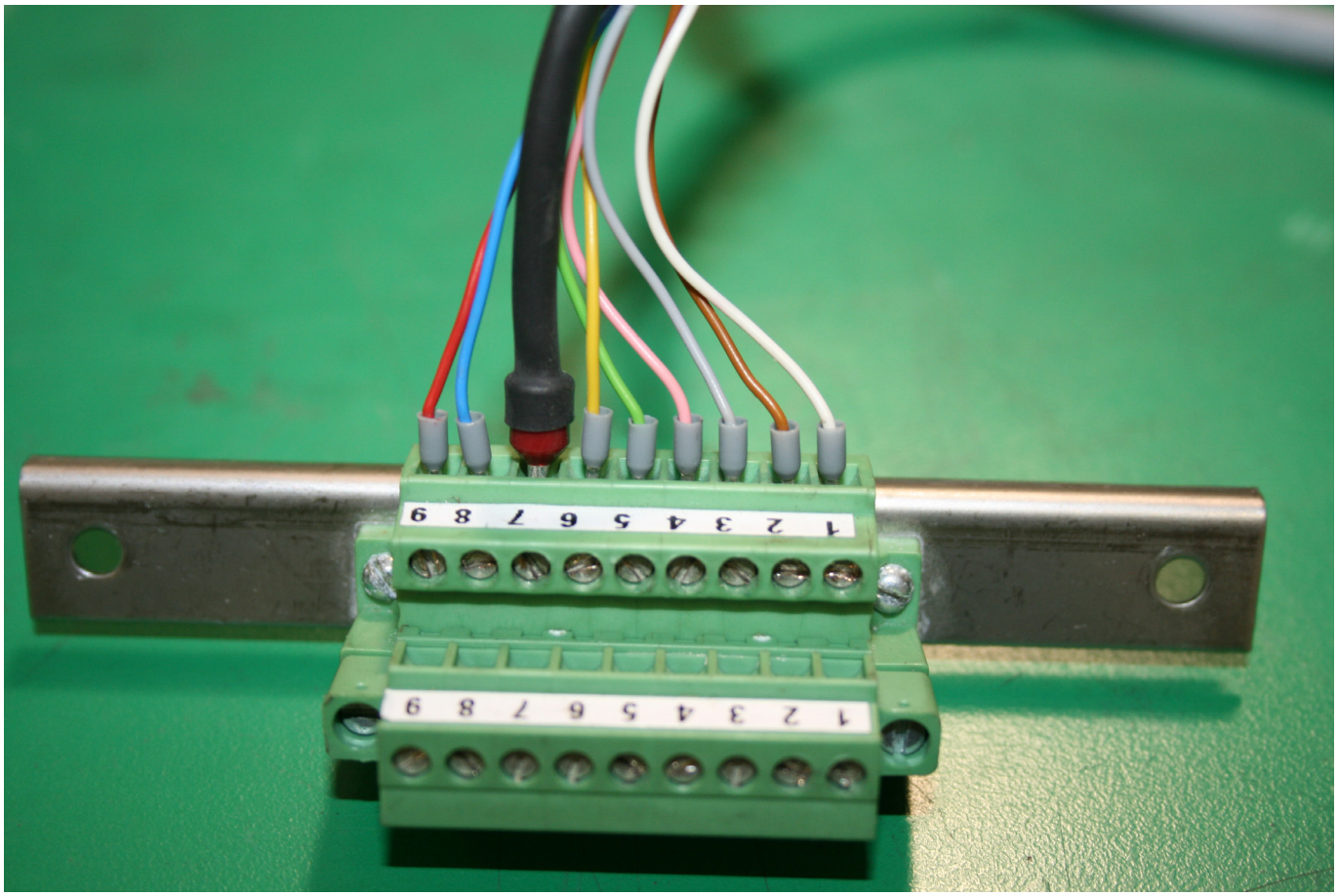


Figure 1 – Terminal Block Wires

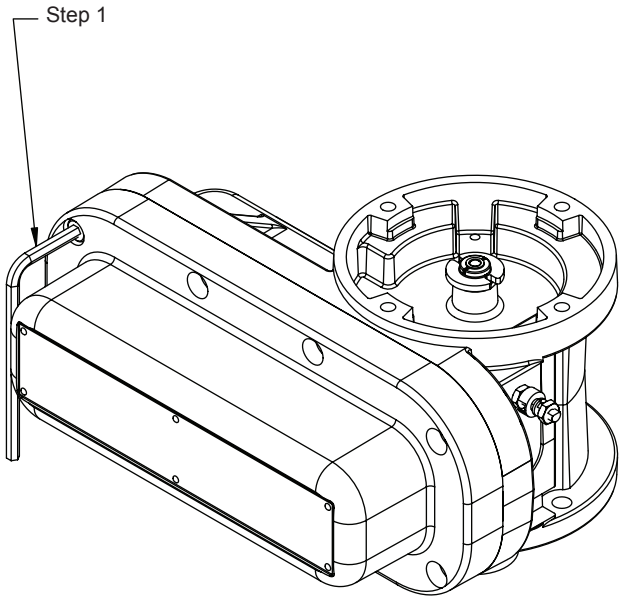
Note: *Picture in color, black and white, follow wire diagram table.*

Maintenance

The UPT Transmitter has all self-lubricating bearings and a sealed transmitter assembly so preventative maintenance is not required.

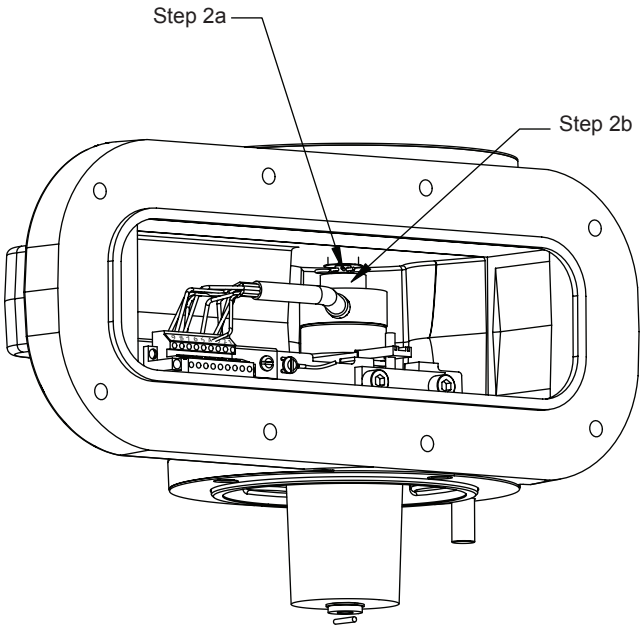
Mechanical Maintenance to Transmitter

Step 1. Remove the eight cover screws and tap the cover to break the seal.

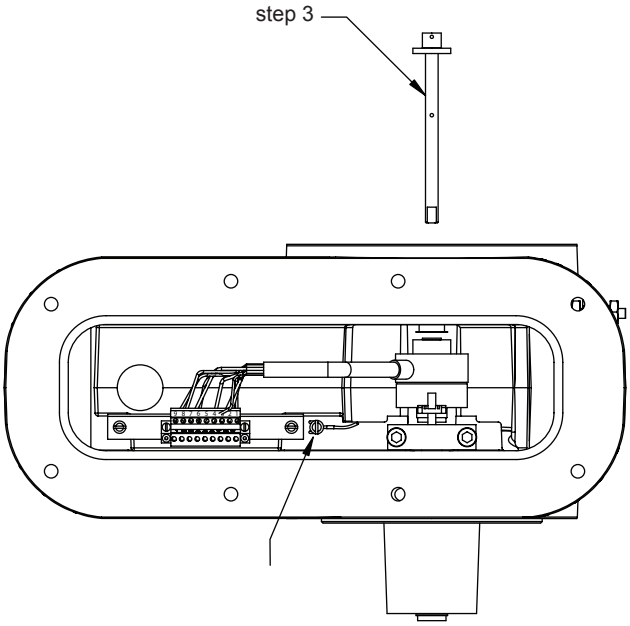


Step 2. a. Remove hairspring cotter pin from the bottom of the shaft.

b. Loosen the set screws at the top of the encoder inside the housing.

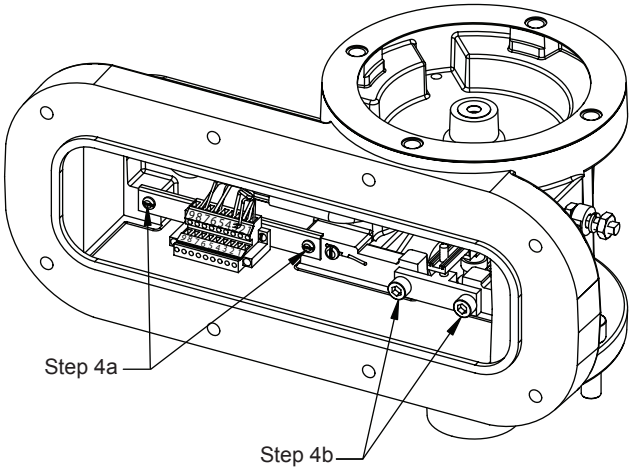


Step 3. Remove the coupling and pull the shaft out.



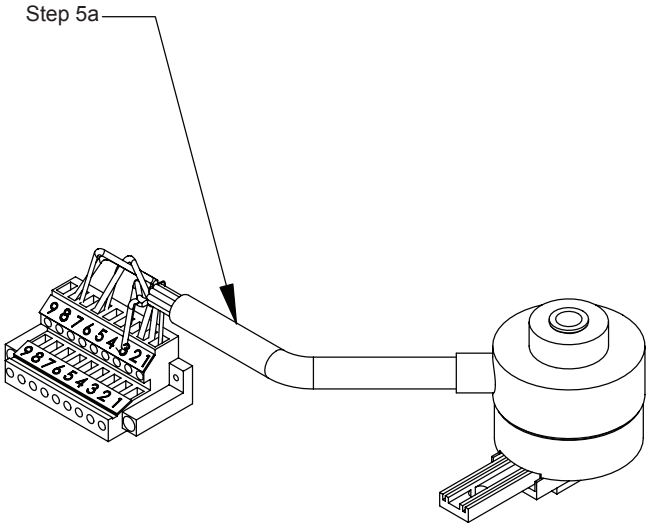
Step 4. a. Remove terminal block bracket from enclosure.

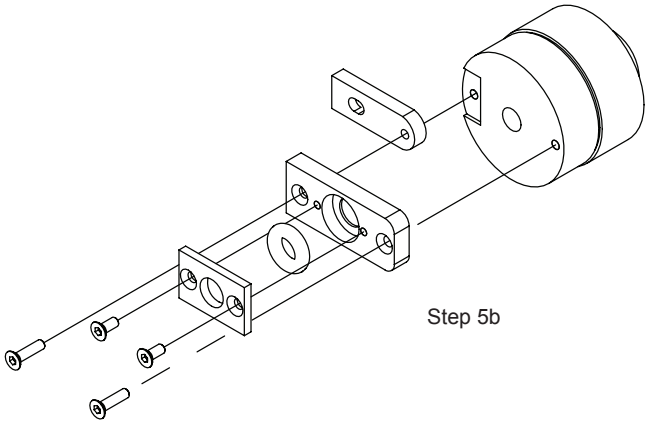
b. Remove screws holding T-Bar in place.



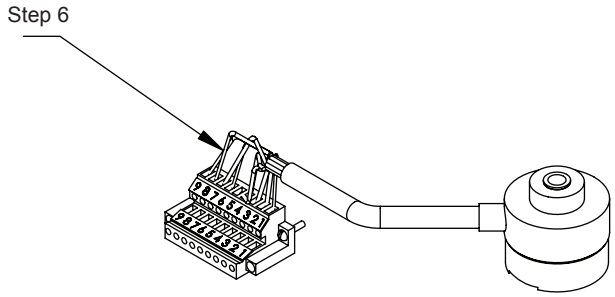
Step 5. a. Remove encoder from housing.

b. Remove longer inside screws followed by shorter inside screws to expose the o-ring. Inspect o-ring, replace if damaged or cracked.





Step 6. Remove encoder wires from terminal block.



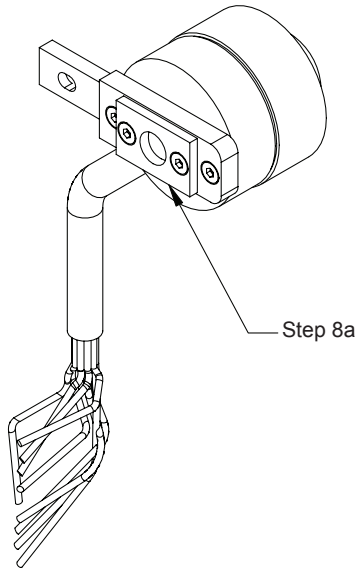
Step 7. Inspect terminal block and encoder for damage, corrosion or wear and replace if needed.

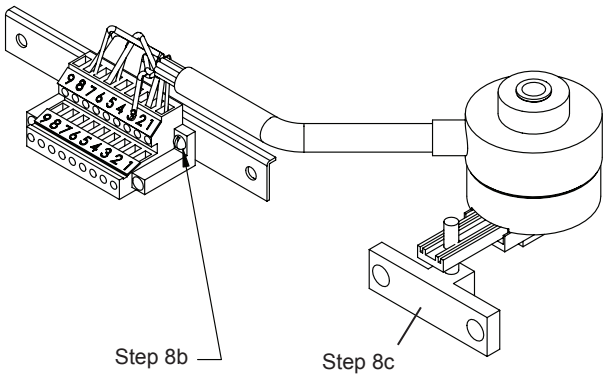
Step 8. a. Re-insert o-ring, tighten cover over o-ring, and then tighten aluminum piece with the torque arm attached to the encoder.

b. Connect wires to specified terminal block numbers (see wiring diagram table and Figure 1).

c. Insert T-Bar pin through the torque arm.

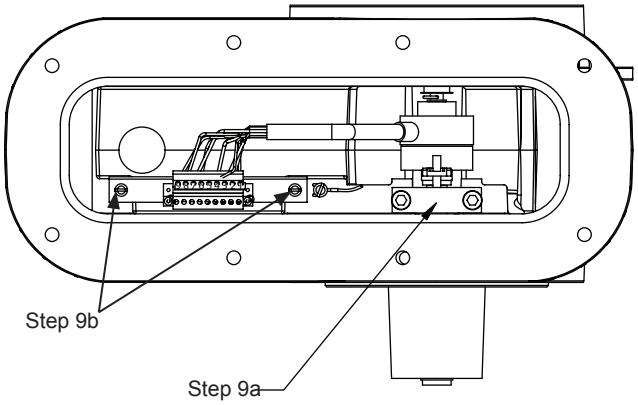
Note: *Apply grease to all o-rings prior to re-installation.*



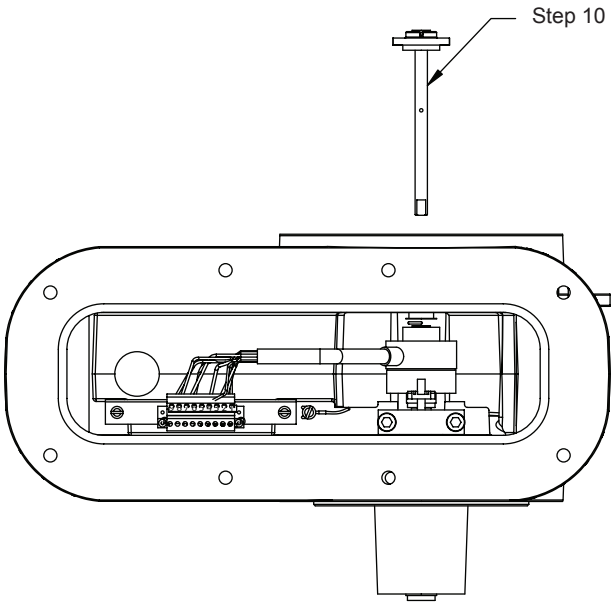


Step 9. a. Tighten T-Bar with the encoder attached onto housing.

b. Tighten terminal block mounting bracket screws.



Step 10. Add thin coat of grease to shaft prior to re-assembly.



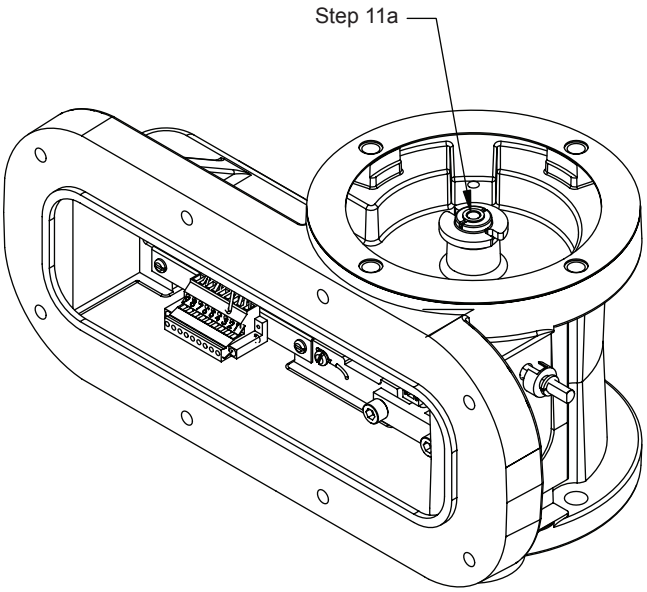
Step 11. a. Insert shaft down through the top and through the encoder.

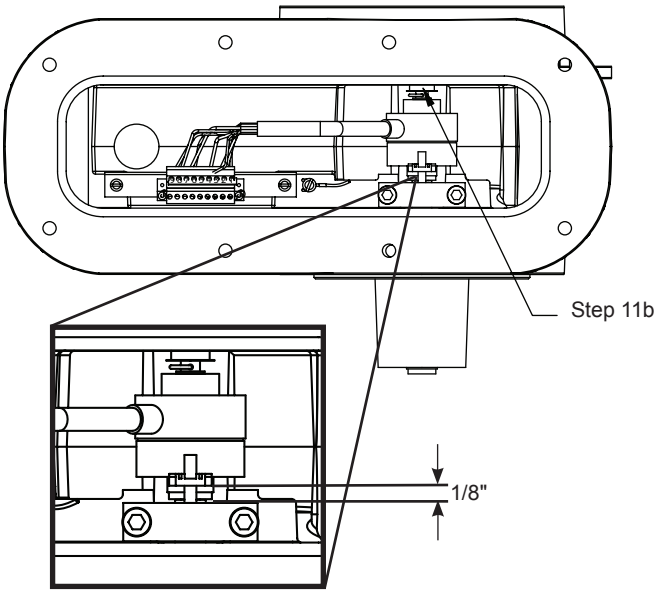
Note: *You may need to tap the shaft until it slides through completely.*

b. Insert the cotter pin and tighten both set screws.

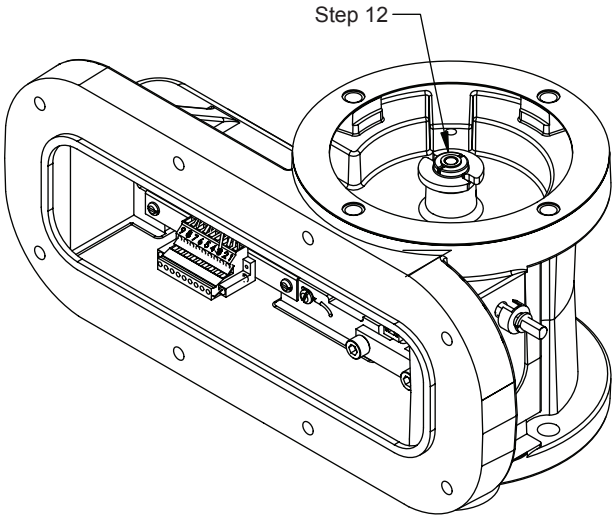
Note: *Make sure that the torque arm is approximately 1/8" above the T-bar base.*

Note: *Ensure that the washer is between the cotter pin and the housing. Apply a light coat of Loctite 222 (included) to the set screw threads prior to tightening. Make certain to not over tighten the set screws to avoid damage to the set screw heads, and the encoder. Rotate the output shaft and check to ensure that the input shaft is rotating as well.*

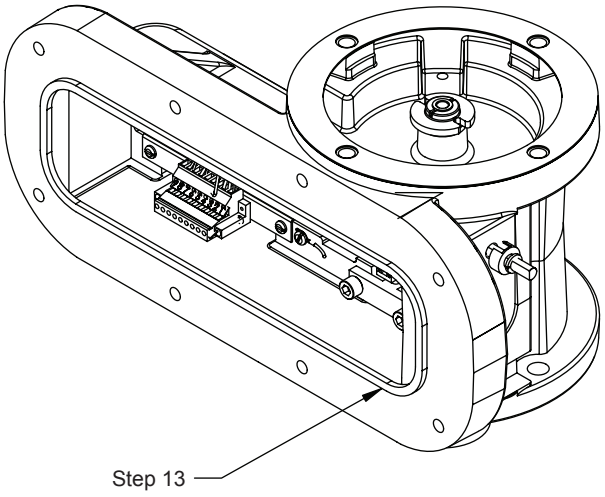




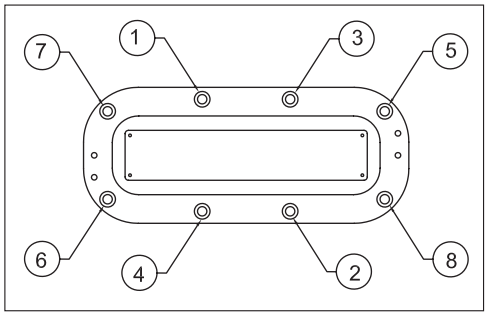
Step 12. Attach the coupling on the end of the shaft and insert hairspring cotter pin.

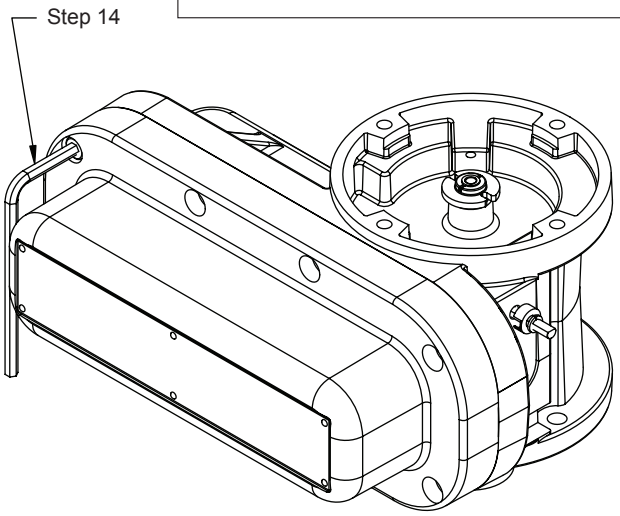


Step 13. Inspect cover and housing flat machined surfaces (flame paths) for any signs of damage. If surfaces are damaged the unit must be replaced as this is part of the (flame proof/explosion proof) protection. Apply a light coating of multi-purpose synthetic grease to the cover o-ring and flame path joint before reattaching the cover to the housing. This helps maintain a water-tight seal and provides additional corrosion protection to the flame path. TechnipFMC synthetic grease P/N 644886401 is recommended. Apply a nickel based anti-size lubricant to all cover fasteners. TechnipFMC P/N 646002401 is recommended.

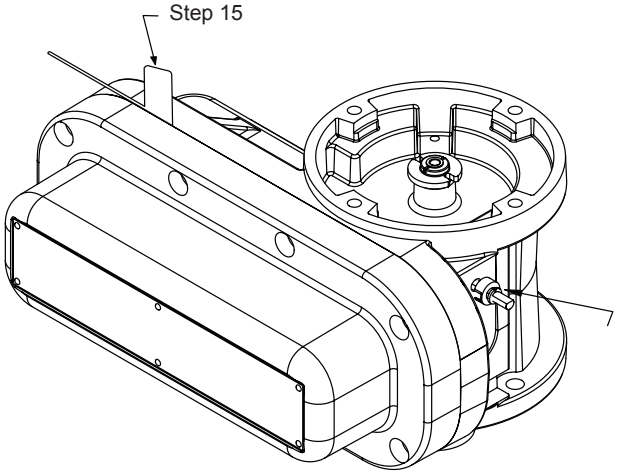


Step 14. Close the cover and tighten the eight cap screws around the perimeter of the cover using the sequence shown. The final torque should be 15 LB-FT / 180 LB-IN (20.3 Nm / 207.4 Kg. cm).





Step 15. After tightening all cover bolts, check the joint with a 0.0015" (0.038 mm) feeler gauge all the way around the outer perimeter of the enclosure. The feeler gauge should not insert more than 0.125" (3.2 mm) at any point. If it does, remove the cover and recheck the cover joint for any foreign objects, reassemble and check again.



Storage Instruction

The presence of moister / water causes excessive corrosion, damage to the electronics and eventually the units to fail. To prevent moisture / water ingress during storage observe the following guidelines:

- Keep units in a dry, protected place
- Avoid storing units outside (if outside is only choice, protect from elements)
- Make sure the conduit port on the back side of the housing is closed with the factory provided 3/4" NPT plug
- Use the factory provided Vapor Desiccant Pack (secured with double-sided adhesive tape) inside the housing
- Keep the covers mounted to the housing to protect the electronics

Note: If units are installed and are awaiting start-up / commissioning observe the following guidelines:

- Use conduit seal-off fitting as per applicable electrical code
- Do Not leave units installed with open seal-off fitting and / or removed covers where moisture can enter into the UPT housing

Revisions included in MN01045 Issue/Rev. 0.7 (11/17):
Step 13 revised; Step 14 revised - tightening order diagram also added.
The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect. Contact information is subject to change. For the most current contact information, visit our website at www.fmctechnologies.com/measurementsolutions and click on the “Contact Us” link in the left-hand column.

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