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Installation and Operating Instructions

Series 506-3000
Multipoint II Level Controller
using 406-3000 Electronics

+ 215-674-1234 Outside North America
1-800-553-9092 US and Canada
www.drexelbrook.com
drexelbrook.service@ametek.com

EDO 8-99-243
506-3000-LM

Series 506-3000
Multipoint II Level Controller
using 406-3000 Electronics

AMETEK®
DREXELBROOK

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Table of Contents

SECTION 1 - INTRODUCTION

1.1 General Description

This manual includes instructions for the Drexelbrook Multipoint II 506-3000 Series two- and three-point RF Admittance Level Controller.

The Multipoint II level control is a liquid level-to-relay controller with 2 or 3 independent and non-interacting setpoints along a single sensing element. There are no moving parts to break or wear out, and systems include CoteShield™ circuitry to ignore the effects of buildup or coatings on the sensing element.

The 506-3000 Series Multipoint II consists of a 406-3000 series electronic unit and a 700 Series sensing element. The standard control is integrally mounted (electronics and sensing element are together). For an optional remote configuration, where the electronics and sensing element are separated, a 380 Series connecting cable is also provided.

1.2 Models Available

System Model Number is 506-3XXX. Electronic Unit model number is 406-3XXX. Sensing Element is 700-X-XX.

4 0 6 - 3 X X X - 0 0 X Multipoint II

Power:
0 = 120 Vac
3 = 240 Vac

Phasing:
0 = insulating material
3 = conductive material

Relays:
2 = 2
3 = 3

Housing:
1 = No Housing
4 = Remote 5" Standard Finish Explosionproof Condulet
6 = Remote 5" Explosionproof Condulet with Drexelcote™ corrosion-resistant coating
7 = Remote Nema 4X
8 = Integral 5" Standard Finish Explosionproof Condulet with Drexelcote™ corrosion-resistant coating and 3/4" NPT
9 = Integral 5" Standard Finish Explosionproof Condulet with 3/4" NPT
D = Integral 5" Standard Finish Explosionproof Condulet with 1" NPT
E = Integral 5" Standard Finish Explosionproof Condulet with Drexelcote™ corrosion-resistant coating and 1" NPT

SECTION 2 - INSTALLATION

2.1 Unpacking

Carefully remove the contents of the shipping carton and check each item against the packing list before destroying any packing material. If there is any shortage or damage, report it immediately to the factory (1-800-527-6297).

2.2 Mounting

The Multipoint II electronic unit was designed for field mounting, but it should be mounted in a location as free as possible from vibration, corrosive atmospheres, and any possibility of mechanical damage. For convenience at start-up, place the instrument in a reasonably accessible location. (See Figure 2-1 for mounting integral units and 2-2a and 2-2b for mounting remote units.) Ambient temperatures at the electronic unit should be between -40°F and 140°F (-40°C to 60°C).

Water damage is the leading cause of equipment failure. Make sure water and corrosive fumes cannot enter the conduit, electronic unit, or housings. If a vertical run of conduit is necessary, install a drip loop and breather drain to purge any accumulated moisture. If extreme wash-downs are expected or flooding is possible, consult the factory for special coax and housing sealing instructions.

2.2.1 Installation of the Sensing Element

These items should be taken into consideration when mounting the sensing element. See Figure 2-3.

- If the vessel is agitated, the sensing element may require support. Consult the factory at 1-800-527-6297.
  - —for rod style probes, insulated support bushings are available.
  - —for flexible cable style sensing elements, flexible bottom anchors are available.

- It is not recommended to mount the sensing element inside a pipe.

- The sensing element should be installed parallel to the wall of the tank (or as vertical as practical).

- Take care that the sensor is not scratched or cut when inserting it into the tank.

- Ensure that there are no obstructions or agitator blades in the way of the sensor.

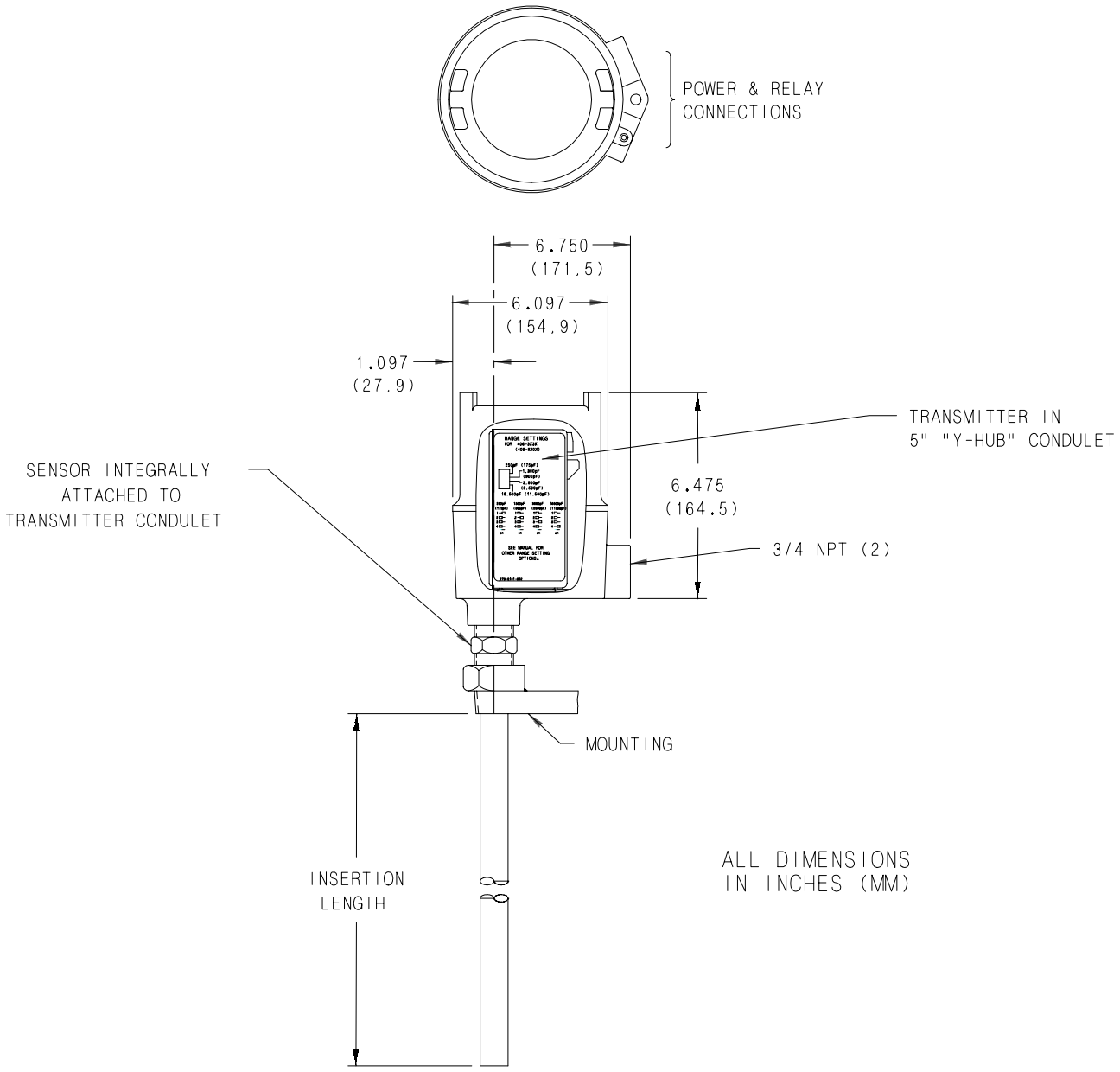


Figure 2-1
Mounting of Integral Unit
with Explosionproof Housing
406-3XXX-009

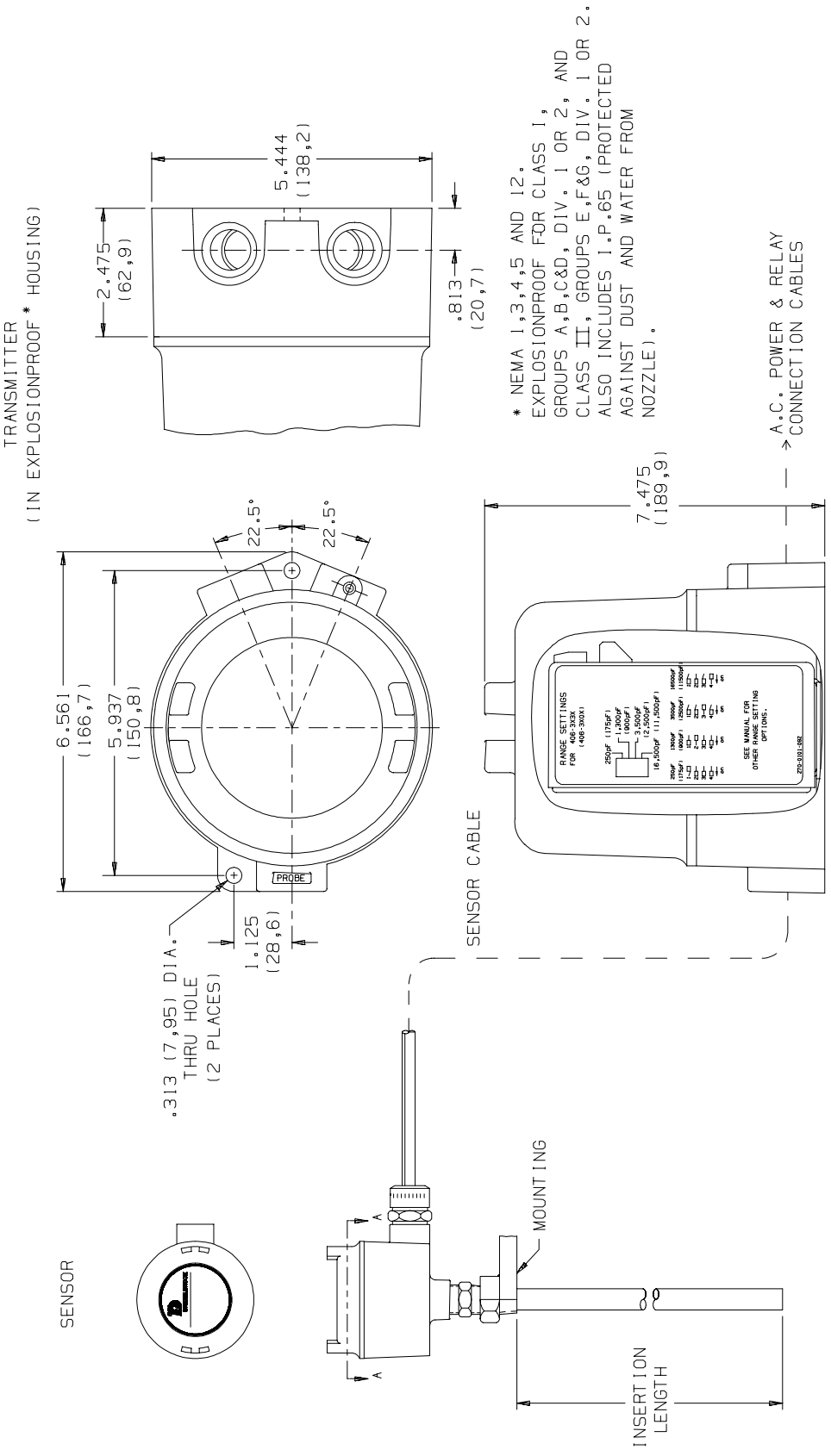


Figure 2-2a
Mounting of Remote Unit with Explosionproof Housing
406-3XXX-004

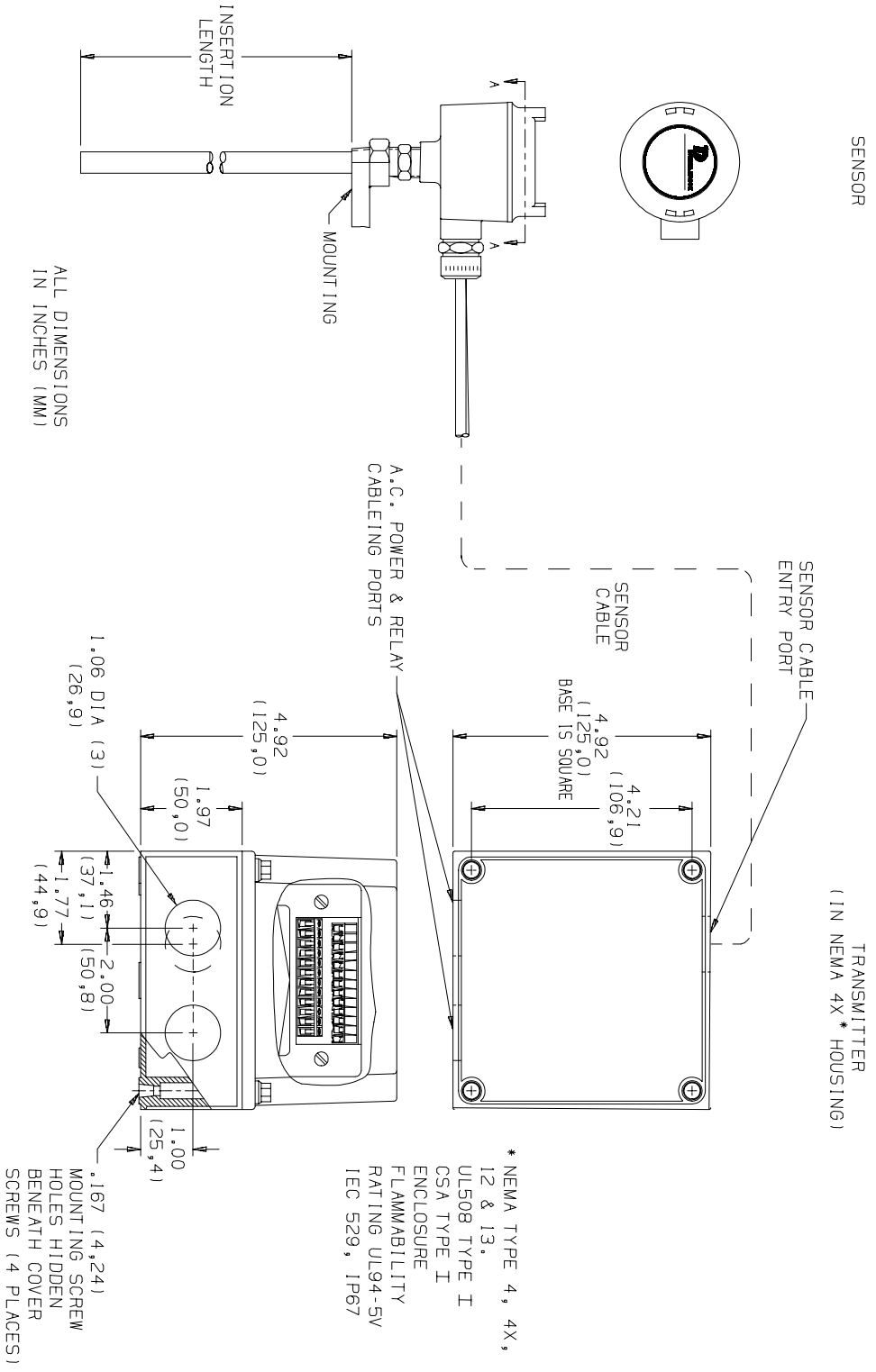


Figure 2-2b
Mounting of Remote Unit with NEMA 4X Housing
406-3XXX-007

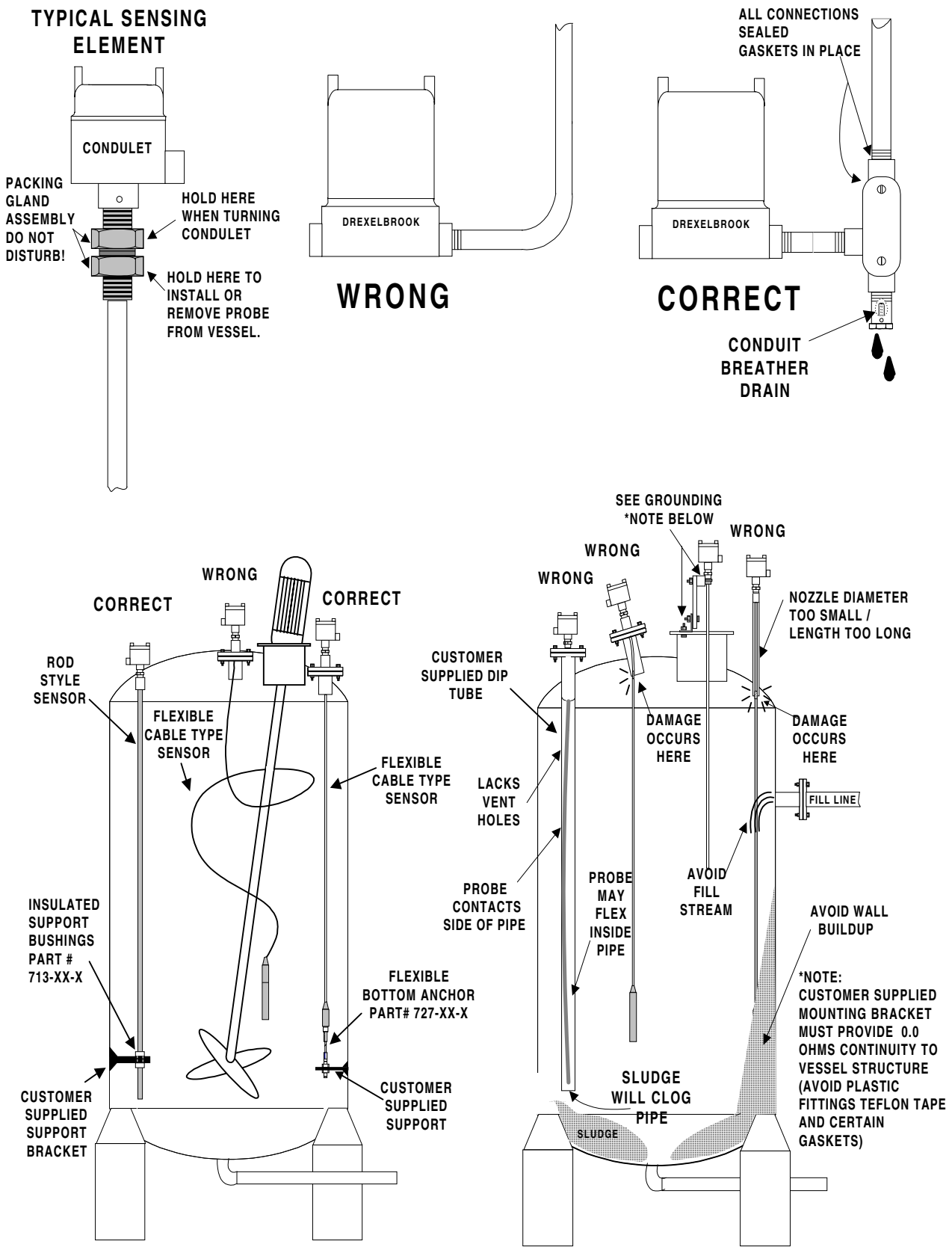


Figure 2-3
Installation Guidelines

2.2.2 Non-metallic Tanks—Using a Ground Reference

When installing the sensing element in a non-metallic tank, use a Drexelbrook sensing element with a factory-installed ground reference. See Figure 2-4. If necessary, a site-fabricated ground reference can be used. See Figure 2-5. An optimal ground reference provides a large surface area and should be relatively close and parallel to the sensing element.

Operating a Multipoint II control without a proper ground reference will result in drift and poor performance. A ground reference is not the same as an earth ground derived from a driven ground rod. A ground reference is a return path to the transmitter. The Multipoint II sends a radio frequency signal down the metal rod of the sensing element. This signal then seeks a return path to the transmitter. The path usually is from the sensing element to the metal wall of the tank, from the metal wall through the coax ground, back to the transmitter. The tank wall is part of the return path and is called the ground reference. When installed in a non-metallic vessel without a ground reference, there is no return path for the sensing element signal, resulting in poor performance.

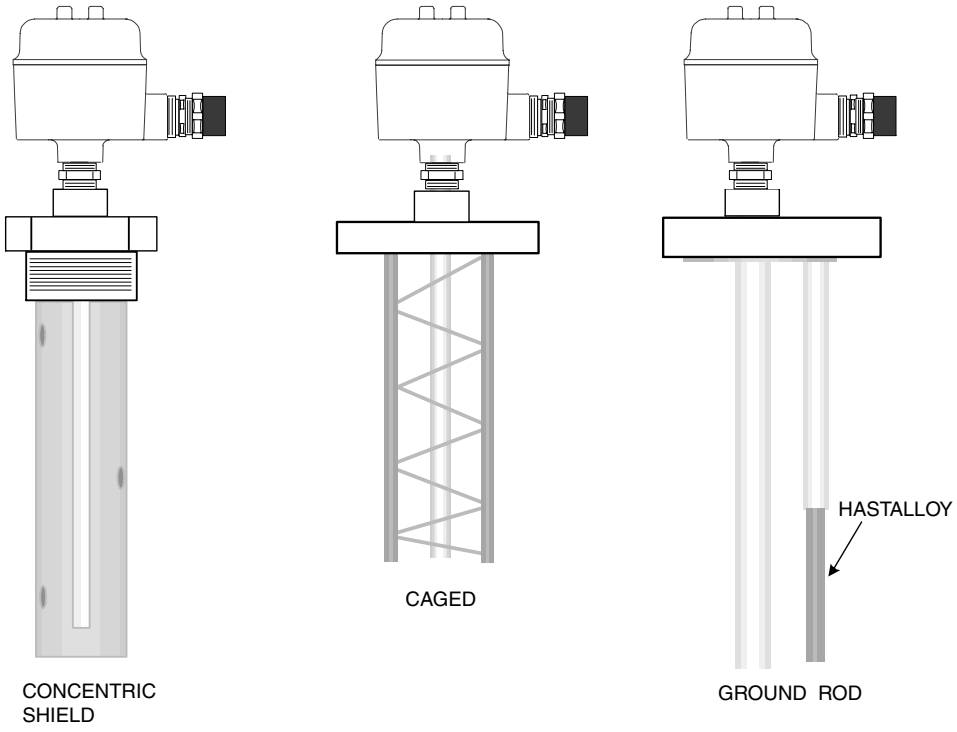
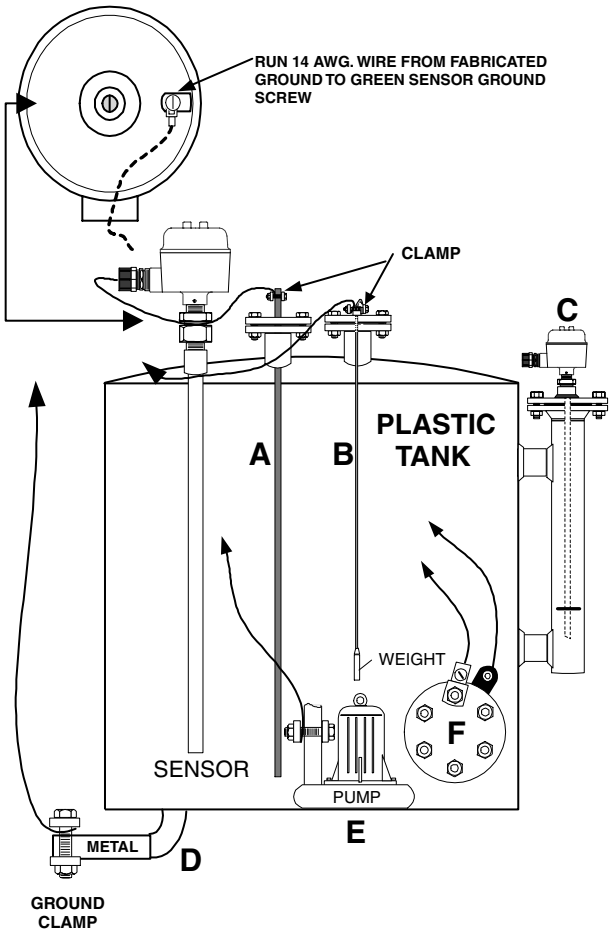


Figure 2-4
Ground-Referenced Sensing Elements



A

GROUND ROD
A ground rod can be fabricated out of any metal compatible with the process. Use material that is at least 3/8inch dia. such as pipe, All-Thread, or tubing. The ground rod must be parallel and relatively close to the sensor.

B

GROUND WIRE
1/4 inch or larger dia. stainless steel rope that is anchored or weighted can be used.

C

MOUNT SENSOR IN METAL PIPE
Mounting the level sensor inside a metal pipe provides an excellent ground reference. *Use only if the process material is greter than 1000 uMHOS/cm such as acids and caustic.*

D

METAL PIPING
Metal piping that connects to the tank bottom can be used as a ground reference. *Use only if the process material is greter than 1000 uMHOS/cm such as acids and caustic.*

E

SUBMERGED METAL STRUCTURE
Use any constantly submerged metal object such as: pumps, agitators, or thermowells.

F

METAL FLANGE
A submerged metal flange or orifice plate can be used.
Use only if the process material is greater thatn 1000 uMHOS/Cm. such as acids and caustic.

Figure 2-5
Customer-Fabricated Ground References

2.3 Wiring

2.3.1 Electronics

Ensure that all wiring, electrical fittings and conduit connections conform to your local electrical codes for the location and environment of use.

CAUTION

If the Multipoint II is located in a hazardous environment, do not open the enclosure cover or make/break any electrical connections without first disconnecting electrical power at the source.

Refer to Figure 2-6 and use the following steps to wire the Multipoint II unit:

a. Ensure that the power to the wiring is off.

b. Remove the cover.

c. Make all electrical connections to the electronics per the wiring diagram in Figure 2-6, using 12-28 gauge wiring. All connections are made to the terminal strip.

d. Review Checklist:
   - ☐ Wiring correct.
   - ☐ Proper input voltage used.
   - ☐ Proper output connections.

e. Replace cover prior to restoring power if in hazardous area.

f. Turn power on.

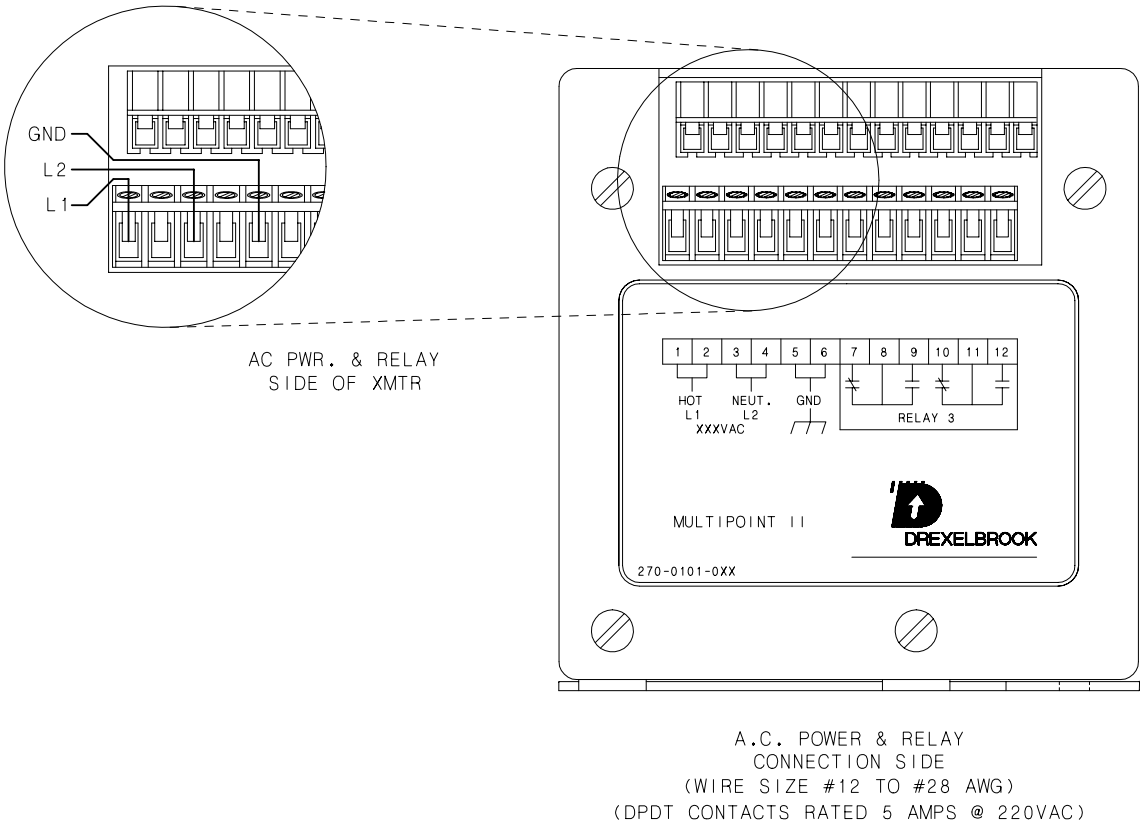


Figure 2-6
Wiring, Multipoint II

2.3.2 Sensing Element Wiring (Remote-mounted Units)

If the Multipoint II controller has the electronic module mounted in the same housing as the sensor (integral mount), the sensor is prewired at the factory.

When installing a remote-mount system, you must use the Drexelbrook supplied coaxial cable. The cable can be a maximum of 150 feet. Termination kits are available to shorten the cable if necessary. Following are recommendations for wiring the sensing elements. See Figure 2-7.

CAUTION

When pulling the cable through the conduit, do not use pulling lubricant. Pulling lubricant changes the electrical characteristics of the cable

- The remote-mount sensing element cable connections are made to the sensing element after it has been installed in the vessel, with the condulet attached.

- For two-terminal sensing elements, the shield connection at the condulet must be clipped and insulated so that it cannot short circuit.

- If necessary, shorten the coax cable at the sensing element end. Termination at the sensing element end is less complicated because the sensing element usually does not require termination of the shield wire.

- Always terminate and use the shield pigtail wire at the electronics' end.

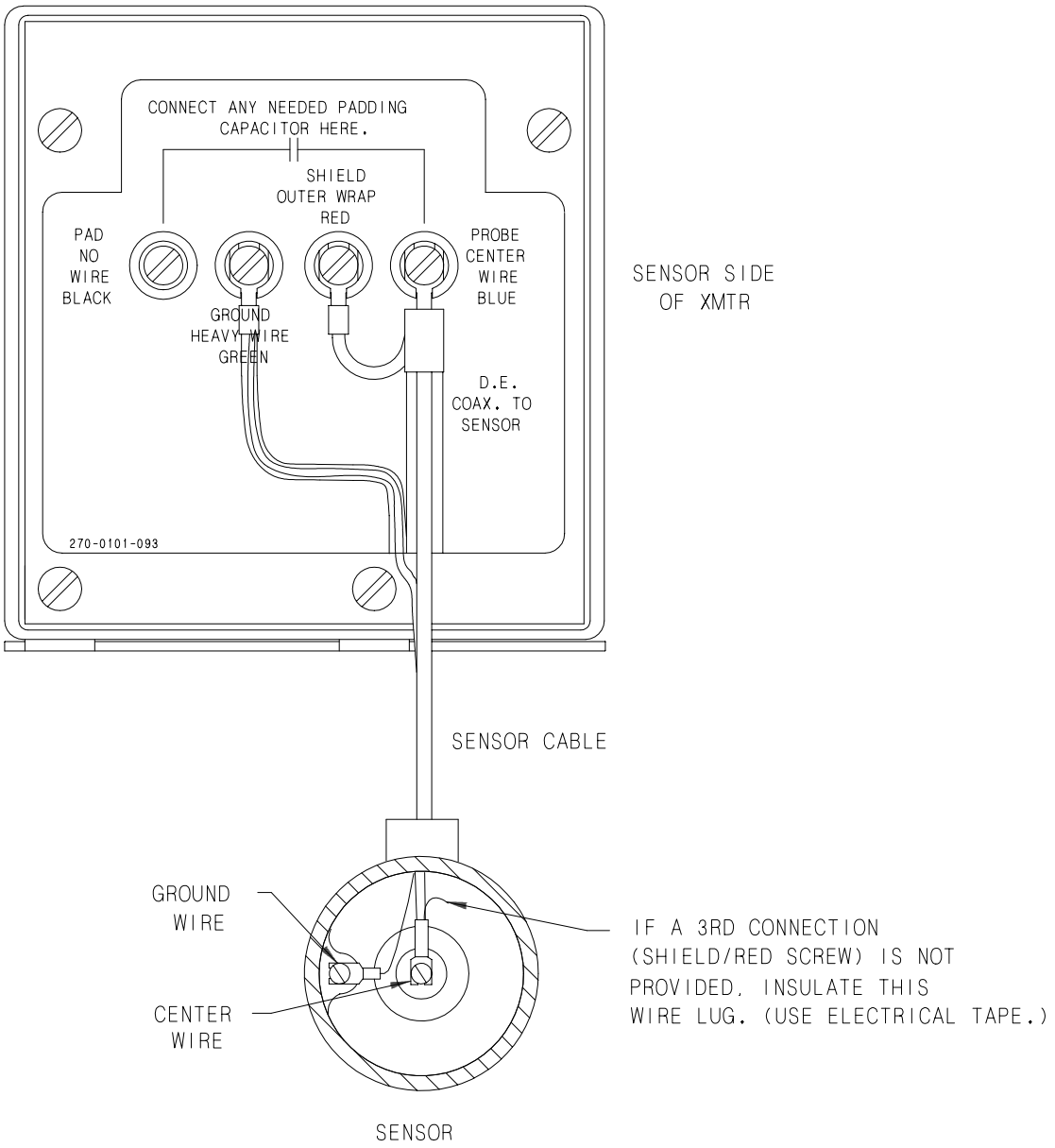


Figure 2-7
Two-Terminal Sensing Element Wiring

2.3.3 Relay Wiring

The relays are wired in various positions, depending on the fail-safe state of the channel and the selected relay operation. Typical relay wiring is:

Relay 1 — used for high level.
Relay 2 — used for differential.
Relay 3 — used for low level.

Failsafe is defined as: ***the condition in the vessel that will de-energize the relay***.

When level exceeds a setpoint set to HLFS, the relay will de-energize and the green LED is not lit.

When level falls below a setpoint set to LLFS, the relay will de-energize and the green LED is not lit.

Figure 2-8 shows the relay wiring for the different relay conditions. Relay 1 is shown. Terminal numbers change with relays.

Call 1-800-527-6297 for service assistance.

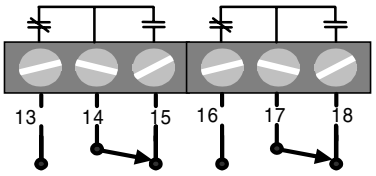
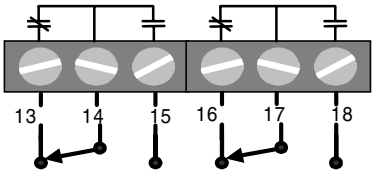
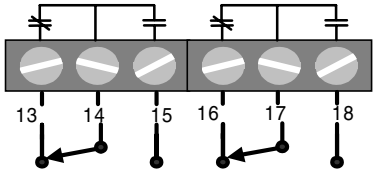
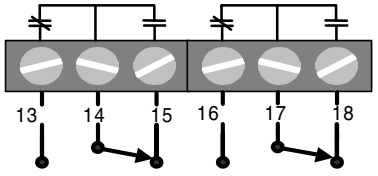
Selected Fail Safe	*Tank Level*	*LED Output*	*Relay Condition*	Relay 1 is shown. Terminal numbers change for Relay 2 and Relay 3.
HLFS	Below Trip Point	ON	Energized (Non Alarm)	
HLFS	Above Trip Point	OFF	De-energized (Alarm)	
LLFS	Below Trip Point	OFF	De-energized (Alarm)	
LLFS	Above Trip Point	ON	Energized (Non Alarm)	

Figure 2-8
Relay Wiring

SECTION 3 - CALIBRATION

3.1 Span Selection

Before calibrating the Multipoint II, the proper span range must be selected. It is important to select the correct range switches to ensure maximum sensitivity, repeatability, resolution, and ease of calibration.

Four factors determine the correct span range:

1. The type of product that is being measured (conductive or insulating).
2. The sensing element model number.
3. The chassis model number.
4. The distance in feet from the tip of the sensing element to the maximum trip point.

Table 3-1 shows the maximum number of feet measured from the sensing element tip to the highest trip point for each range of the instrument. The seven most common models are listed.

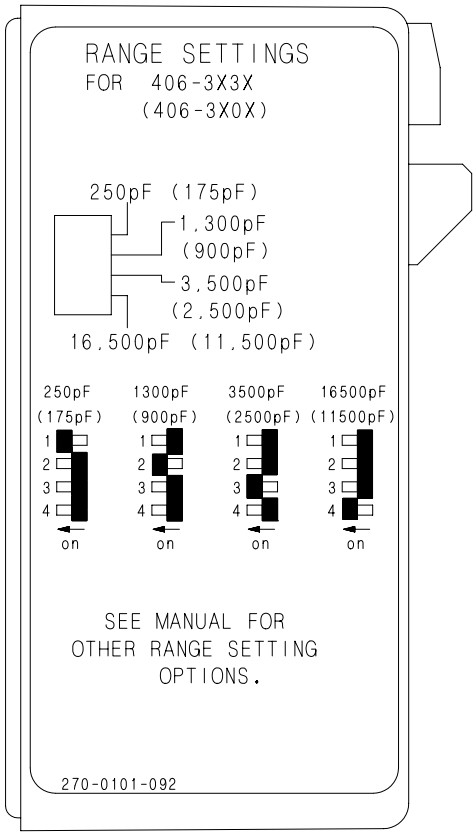


Figure 3-1
Span Selection Settings

3.1 Span Selection (cont.)

Step 1: Find the span range value (pF) for your sensing element using Table 3-1.

506-3X3X-00X SYSTEM
CHASSIS NUMBER 406-3X3X-00X

For use with conductive liquids such as:
acid, caustic, beer or any substance containing water.

System Model #	Sensing Element Model #	Number of Feet (max.) from Bottom of Sensing Element to Highest Trip Point					
506-3X3X-1	700-1-22	4.6	20	20	NA	NA	NA
506-3X3X-2	700-1-24	4	20	20	NA	NA	NA
506-3X0X-7	700-2-27	1.1	6	15.5	20	20	NA
506-3X3X-6	700-2-37	0.1	0.7	1.8	2	9	10
506-3X3X-4	700-2-57	0.9	5.2	13.7	18	20	NA
506-3X3X-8	700-5-18	1.2	7.3	19	25	90	105
506-3X3X-5	700-5-54	6.6	36.4	94	124	442	519
	RANGE (pF) =	250	1300	3500	5050	16500	21550

506-3X0X-00X SYSTEM
CHASSIS NUMBER 406-3X0X-00X

For use with insulating liquids such as:
vegetable oil, gasoline, all hydrocarbons, asphalt, etc.

This table assumes dielectric constant = 2 (all hydrocarbons)
and assumes vessel I.D. = 60 inches

System Model #	Sensing Element Model #	Number of Feet (max.) from Bottom of Sensing Element to Highest Trip Point			
506-3X0X-1	700-1-22	20.0	NA	NA	NA
506-3X0X-2	700-1-24	14.3	20.0	NA	NA
506-3000-7	700-2-27	NOT RECOMMENDED		NA	NA
506-3X0X-6	700-2-37	NOT RECOMMENDED		NA	NA
506-3X0X-4	700-2-57	NOT RECOMMENDED		NA	NA
506-3X0X-5	700-5-54	33.3	175.5	489.2	NA
	RANGE (pF) =	175	900	2500	3575

Table 3-1
Span Range Value (pF) Selection Table

3.1 Span Selection (cont.)

Step 2: Set the span range switches using Table 3-2.

Dip Switch Settings for 406-3X*3*X Transmitters

SWITCH				
#1	#2	#3	#4	SPAN
On	Off	Off	Off	250
Off	On	Off	Off	1300
On	On	Off	Off	1550
Off	Off	On	Off	3500
On	Off	On	Off	3750
Off	On	On	Off	4800
On	On	On	Off	5050
Off	Off	Off	On	16500
On	Off	Off	On	16750
Off	On	Off	On	17800
On	On	Off	On	18050
Off	Off	On	On	20000
On	Off	On	On	20250
Off	On	On	On	21300
On	On	On	On	21550

Dip Switch Settings for 406-3X*0*X Transmitters

SWITCH				
#1	#2	#3	#4	SPAN
On	Off	Off	Off	175
Off	On	Off	Off	900
On	On	Off	Off	1075
Off	Off	On	Off	2500
On	Off	On	Off	2675
Off	On	On	Off	3400
On	On	On	Off	3575
Off	Off	Off	On	11500
On	Off	Off	On	11675
Off	On	Off	On	12400
On	On	Off	On	12575
Off	Off	On	On	14000
On	Off	On	On	14175
Off	On	On	On	14900
On	On	On	On	15075

Table 3-2
Span Range Switch Selection Tables

3.2 Calibration Procedure

Before applying power to the electronic unit, check the wiring connections. (See section 2.3). Figure 3-2 shows the failsafe switches and setpoint relay pots.

Typical calibration setpoints are:

Relay 1—used for high level
Relay 2—used for differential control
Relay 3—used for low level

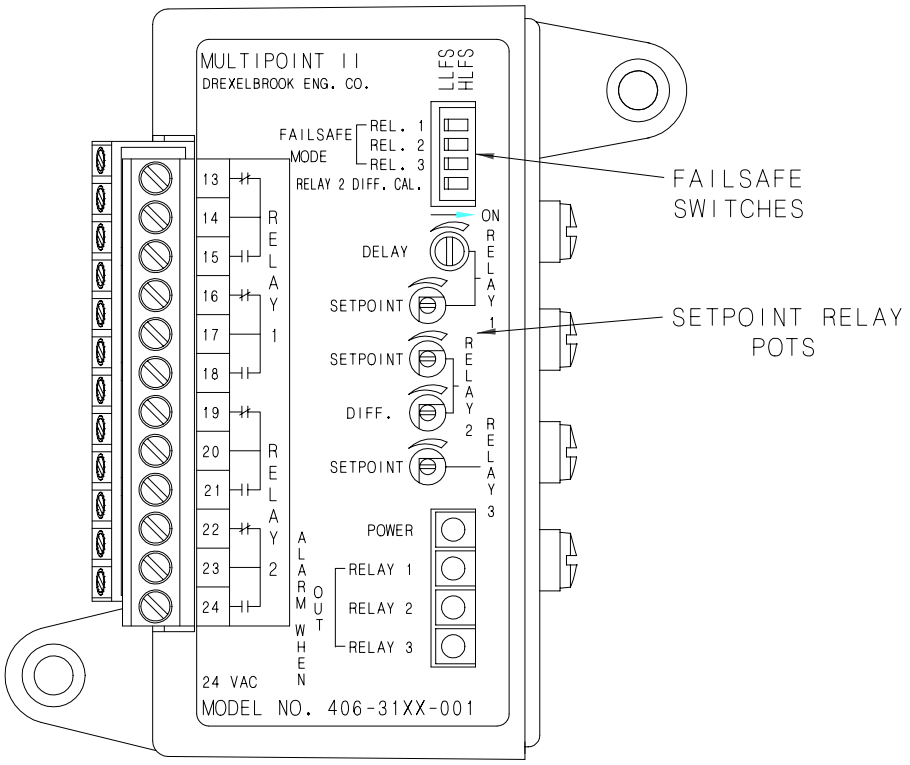


Figure 3-2
Failsafe Switches and Setpoint Relay Pots

3.2 Calibration Procedure (cont.)

The following steps outline the calibration procedure.

1. Select proper fail-safe. Set fail-safe mode for each relay to its appropriate setting: high-level fail-safe (HLFS) or low-level fail-safe (LLFS).

2. Switch the *Relay 2 Diff Cal* dip switch to the OFF position.

CAUTION
The *Delay* pot is a 2/3 turn device. Do not turn past its mechanical stops or damage could occur to the unit.

3. Turn the *Relay 1 Delay* pot fully counterclockwise.

4. Turn each *Relay Setpoint* pot fully counterclockwise This is approximately 32 turns. There is no mechanical stop. A slight clicking may be heard or felt when the pot is fully counterclockwise. Also turn the *Delay* and *Relay 2 Diff* pots to the full counterclockwise positions.

5. Set the *Span Range* switches to the appropriate position (as explained in Section 3.1).

6. Turn on power to the Multipoint II controller. The red power LED should illuminate.

7. Raise the material to the level where the first relay is to activate. See Figure 3-3. If you cannot raise or lower the level in your vessel, go to section 3.3 for an alternative calibration method.

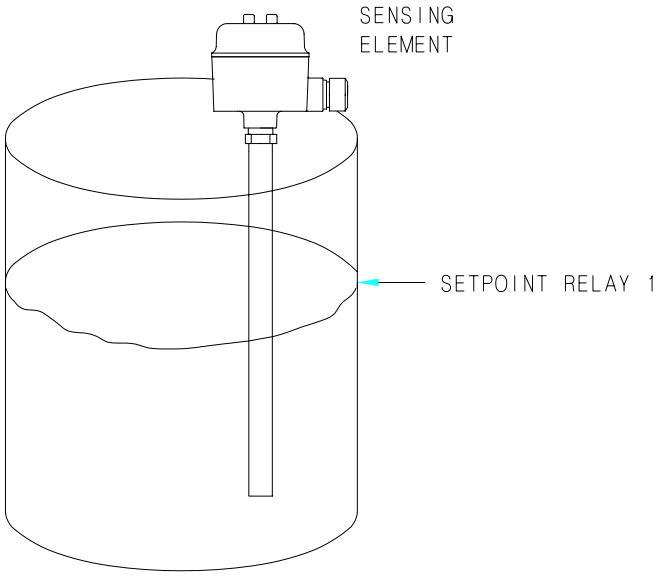


Figure 3-3
Setpoint Relay 1

3.2 Calibration Procedure (cont.)

8. Then adjust the *Setpoint Relay 1* pot (turn clockwise) until the LED just changes state. The setpoint is now adjusted. See Figure 3-4.

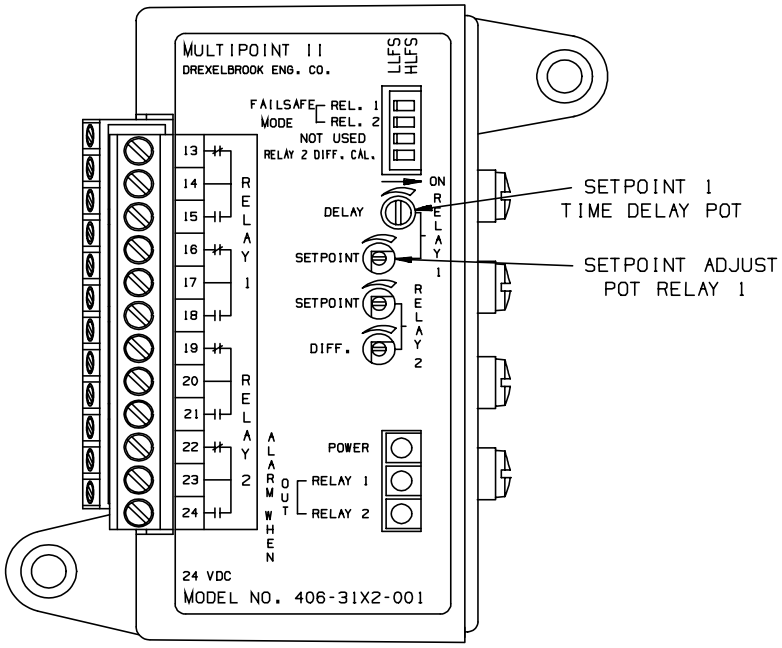


Figure 3-4
Setpoint Relay 1 and Delay Pot

9. Relay 1 has a time delay option. If time delay is used, turn the *Delay* pot of Setpoint 1 clockwise to increase the delay (0-120 second range). The fully clockwise position (2/3 turn) produces a 120-second time delay. The delay interval begins upon recovery from alarm.

10. Raise or lower the material to the low setpoint of *Relay 2*. See Figure 3-5.

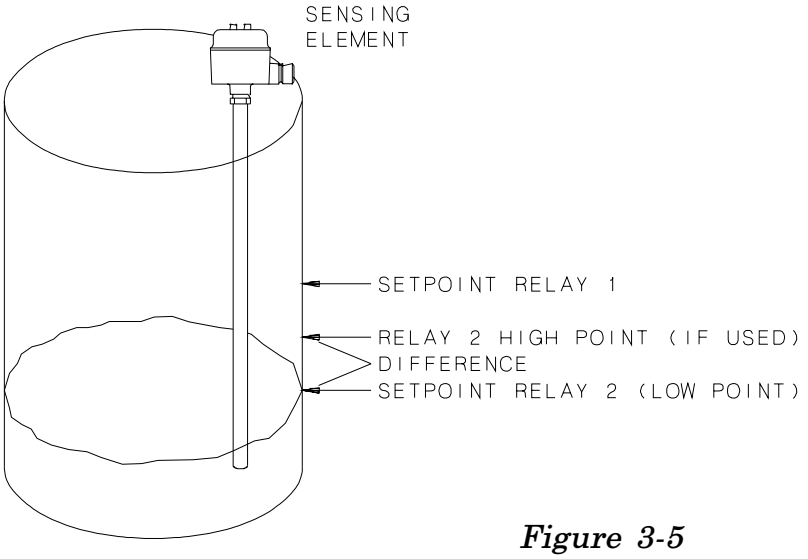


Figure 3-5
Setpoint Relay 2

3.2 Calibration Procedure (cont.)

11. Make sure the *Relay 2 Diff Cal* switch is off and the *Setpoint* pot of Relay 2 is in the full CCW position. Then adjust the *Setpoint* pot of Relay 2 until the LED changes state.

NOTE

At this point, calibration is complete for two setpoints. If you want to use the adjustable differential feature (deadband), proceed to step 12. If you want to calibrate a third setpoint, proceed to step 15.

12. Raise the material to the level of the high point of relay 2. See Figure 3-6.

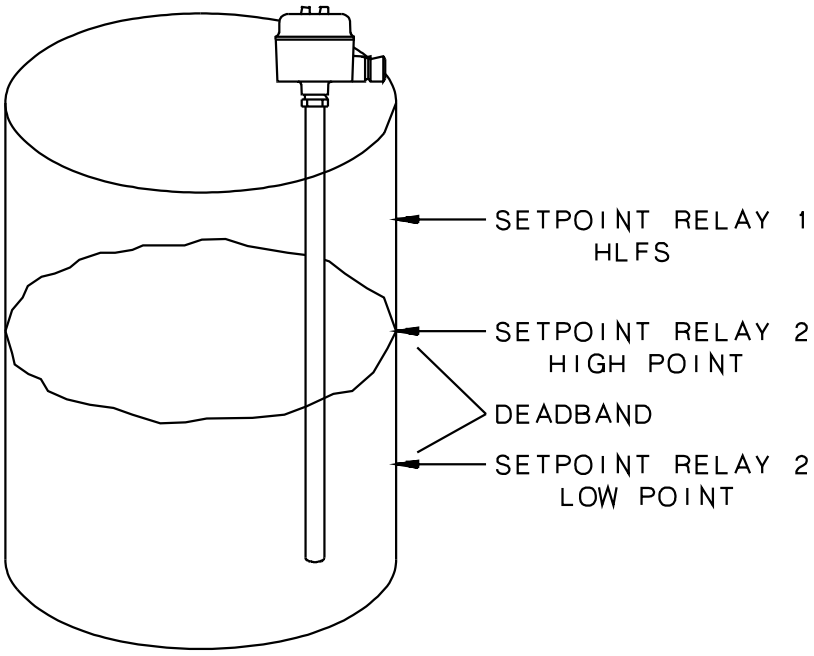


Figure 3-6
Setpoint Relay 2
with Deadband

3.2 Calibration Procedure (cont.)

13. Turn *Relay 2 Diff Cal* switch on. Then adjust the *Diff* pot on relay 2 clockwise (CW) until the LED changes states. See Figure 3-7. Turn *Relay 2 Diff Cal* switch off.

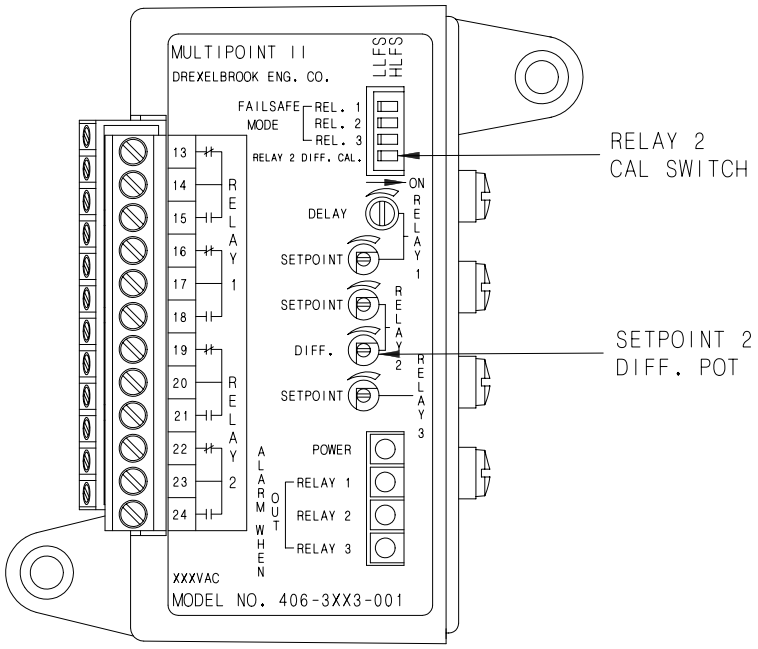


Figure 3-7
Relay 2 Diff Cal Switch with Deadband

14. A two-point Multipoint II controller with adjustable differential is now calibrated. If your system has three points, continue with step 15.

3.2 Calibration Procedure (cont.)

15. Raise or lower the material to the level where Relay 3 will change state.

16. Adjust the *Setpoint* pot for Relay 3 (turning clockwise) until the LED changes state. See Figure 3-8.

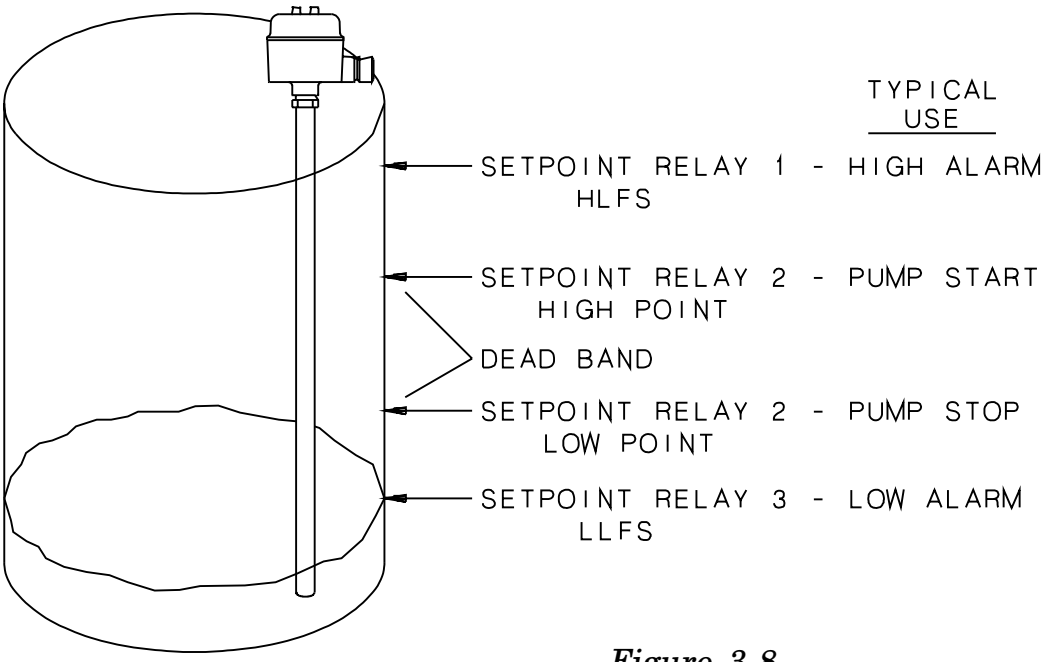


Figure 3-8
Three-point Relay Calibration

17. Calibration is now complete. Test the entire set-up by raising or lowering the material level through all of the setpoints to ensure proper operation.

18. It is recommended to use a 401-6-81 calibrator (section 3.3), to record calibration data.

3.3 Secondary Calibration Standard

NOTE

If the level cannot be moved, call the factory service department at 1-800-527-6297 or fax them at 215-443-5117 with the following information:

sensor and chassis model number
- sensor insertion length
- material being measured
- type of vessel
- desired activation levels

In some applications, it is difficult or even impossible to completely fill, empty, or change the level in a vessel. In such a case, it is desirable to have a secondary calibration standard such as the Drexelbrook model 401-6-81 C-Box (Capacitance Box) level simulator, which can be used to simulate the capacitance of an empty or full vessel. The following procedure permits calibration of an instrument without changing the level in the vessel.

Start by setting up the instrument as described under Calibration (section 3.2, steps 1-6). Then, do the following:

A. If it is an integral system, disconnect the white coax wire from chassis and go to step B. If it is a remote system, disconnect the coax center, shield, and ground wires from the sensing element. (Be sure the wires do not short to anything.)

B. Connect the calibration standard to the instrument in parallel with existing cable connections, ground, center wire and shield. See Figure 3-10. Also refer to the 401-6-8 Capacitance Box Manual for more information.

C. Follow the calibration instructions (section 3.2, steps 7-17). Instead of raising or lowering level, adjust the calibrator to generate the appropriate number of picofarads for each setpoint.

D. The calibrator can be used to record the number of picofarads for each setpoint on a system that was previously calibrated by emptying and filling the tank.

E. Record the calibration data and save it.

When replacing a malfunctioning electronic unit, the replacement chassis can be calibrated on the bench by the preceding method and then installed in the field.

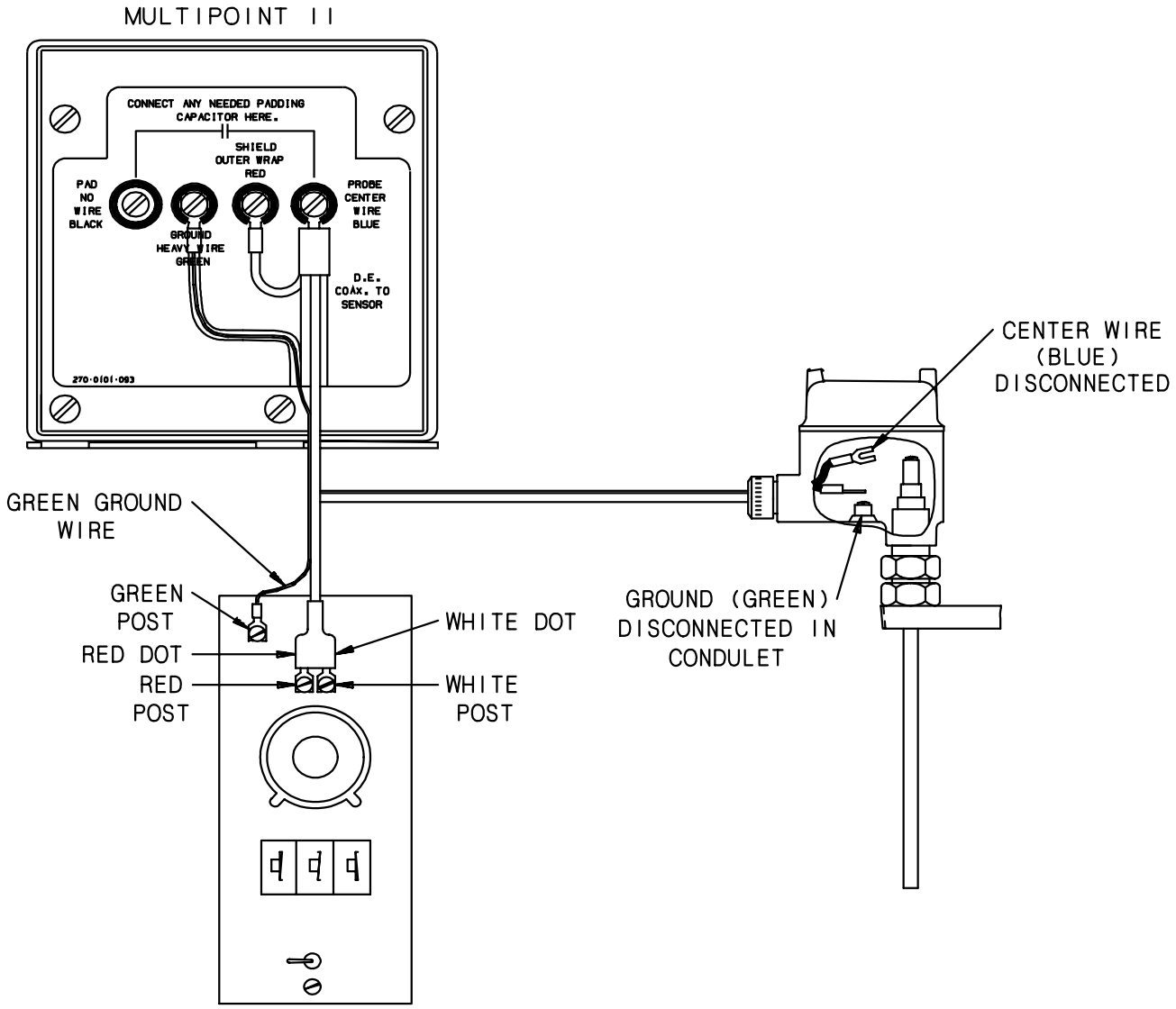


Figure 3-10
Secondary Calibration Standard

SECTION 4 - TROUBLESHOOTING

The Multipoint II is a solid-state device with no moving parts other than its relays, and requires no maintenance or adjustments. The units are designed to give years of unattended service.

A spare electronic chassis is recommended for every 10 units so that, in case of a failed unit, a critical application will not be held up while the unit is returned to the factory for repair.

Use the following troubleshooting procedures to check out the Multipoint II level control. If attempts to locate the difficulty fail, notify your local Drexelbrook representative, or call the factory direct at 1-800-527-6297.

Before removing the instrument from service, determine whether the malfunction is due to a problem with the sensing element or the process conditions.

4.1 Electronic Unit Checkout

Use the following steps to check out the electronic unit:

A. See Figure 4-1. Disconnect the cable from the probe center wire (blue), shield outer wrap (red), and ground heavy wire (green) terminals at the instrument. Leave the power connected. Place all *Failsafe* switches to the HLFS position, and the *Relay 2 Diff Cal* switch to the OFF position.

B. Turn *Relay 2 Diff Cal* pot fully CCW.

CAUTION

The *Time Delay* pot is a 2/3 turn device. Do not turn past its mechanical stops or damage could occur to the unit.

NOTE

If the instrument has the time delay option, turn the *Time Delay* control to the full counterclockwise (CCW) position (no time delay).

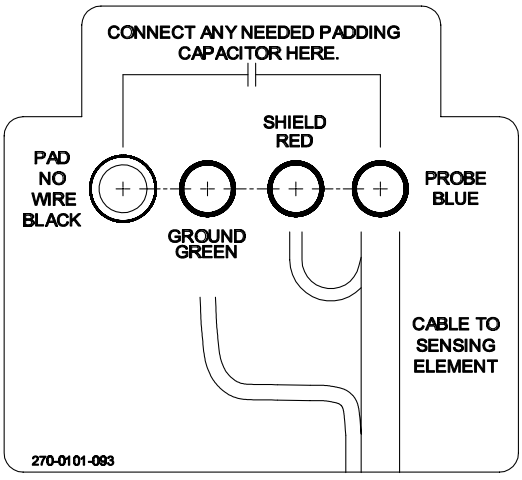


Figure 4-1
Electronic Unit Checkout

4.1 Electronic Unit Checkout (cont.)

C. Attach a 10-100 pF load capacitor between the sensing element center wire and ground terminals.

D. See Figure 4-2. Starting with the *Setpoint Relay* pot for channel 1 in the full counterclockwise (CCW) position, turn the adjustment slowly clockwise (CW) until the relay just operates.

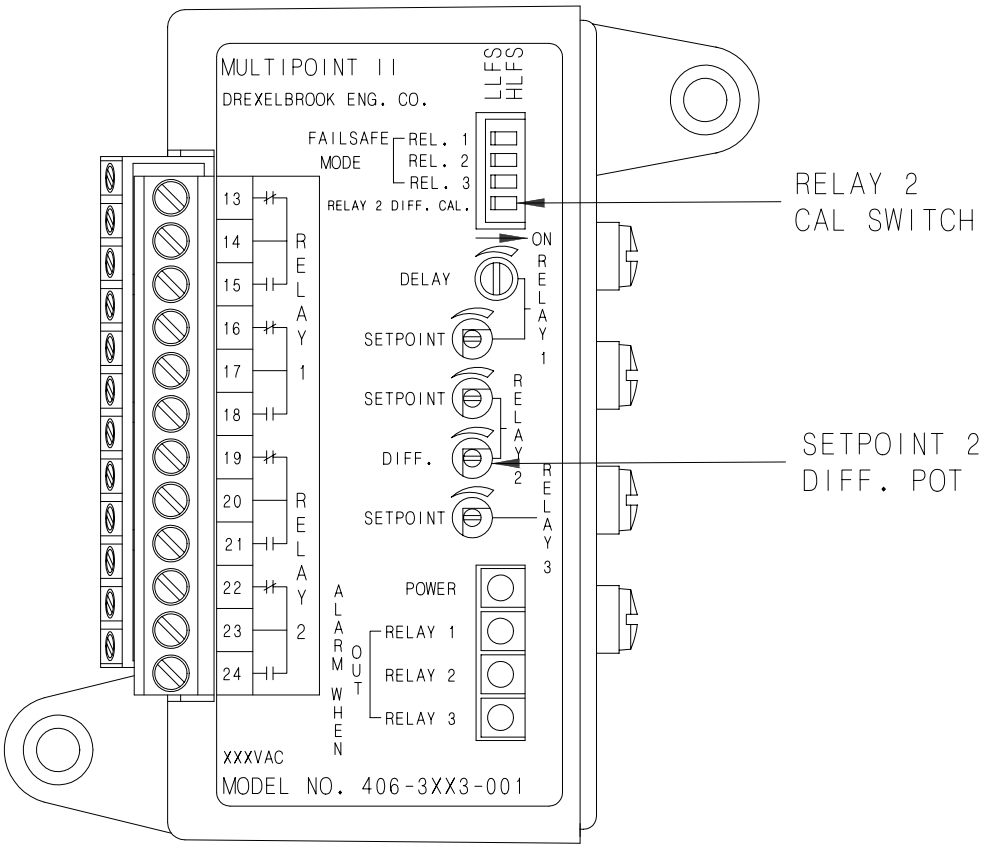


Figure 4-2
Setpoint Relay

E. Rotate the adjustment slowly back and forth about this point, observing the travel required between relay pull-in and relay drop-out. Repeat for each channel. The pointer should travel less than 1 turn to operate the relay. If so, the instrument is working properly.

F. If the instrument does not function properly, consult the factory service department for assistance.

4.2 Relay Circuit Checkout

Use the following steps to check out the relay circuits:

A. The relay circuits consist of double-pole double-throw relay contacts brought out to terminal strips. When the relays are operating properly, two (and three) pairs of contacts will be open with high or low level, and two (or three) pairs will be closed with high or low level. See Figure 4-3.

Selected Fail Safe	*Tank Level*	*LED Output*	*Relay Condition*
HLFS	Below Trip Point	ON	Energized (Non Alarm)
HLFS	Above Trip Point	OFF	De-energized (Alarm)
LLFS	Below Trip Point	OFF	De-energized (Alarm)
LLFS	Above Trip Point	ON	Energized (Non Alarm)

Relay 1 is shown. Terminal numbers change for Relay 2 and Relay 3.

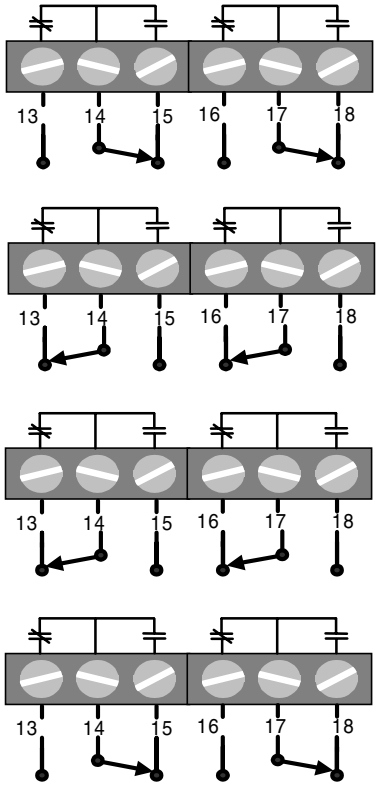


Figure 4-3
Relay Circuit Operation

B. Adjust the instrument as described in the electronics checkout section 4.1.

4.2 Relay Circuit Checkout (cont.)

C. Relay operation may generally be heard as an audible click when the background noise is not too high. Use one of the methods shown in Figure 4-4 to determine if the relay contacts are switching.

D. Difficulty in calibration can often be traced to improper wiring of the relay terminals to an annunciator or other panel device. Check the wiring against the relay chart in Figure 4-3. Be sure to use the diagram for the fail-safe in which the channel is configured.

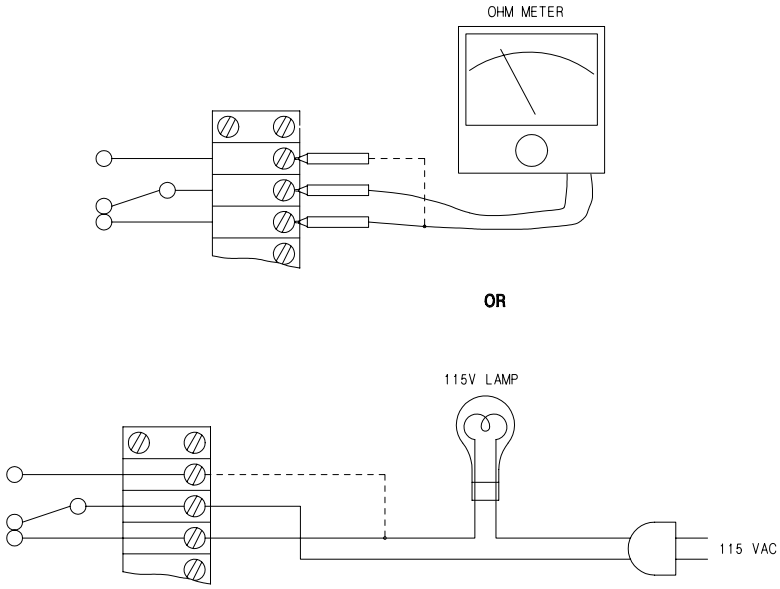


Figure 4-4
Relay Circuit Wiring

4.3 Sensing Element Checkout

NOTE

The sensing element is intrinsically safe. Therefore, when using this product it is recommended that all service activity comply with appropriate guidelines

1. Use an analog ohmmeter[1] and set it to **R x 10K**.

2. With the ***process material covering the sensing element***, check the resistance between the sensing element center and ground terminals by measuring from the sensing element center rod (blue screw) to ground (green screw).

3. A functional sensing element should measure infinite ohms (open circuit).

- Low resistance may be caused by a crack or pinhole in the sensing element insulation or a problem in the condulet/packing nut area. Continue with step 4.

4. To determine if the low resistance reading is a result of punctured insulation or a fouled condulet, ***lower the process material*** below the sensing element and measure the resistance again.

- If the resistance reading changes to infinite when the process material is below the sensing element, the sensing element insulation has failed. The sensing element needs to be rebuilt or replaced. Contact the factory.

- If the resistance reading is still less than one megohm when the material is below the sensing element it is possible that process material, condensation or contamination has entered the sensing element condulet housing and seeped into the packing gland. Sometimes this contamination can be cleaned and removed with contact cleaner and dry compressed air. A heat gun can be used to gently heat the packing gland area to evaporate any moisture. Continue with step 5.

5. Clean the packing gland and condulet area and measure the resistance again. If the resistance reading is still less than one megohm, the sensing element needs to be rebuilt or replaced. Contact the factory.

[1]Use an analog ohmeter because the ohms/volt rating is lower and it therefore provides more current to measure the resistance. A digital meter does not measure resistance in the same way.

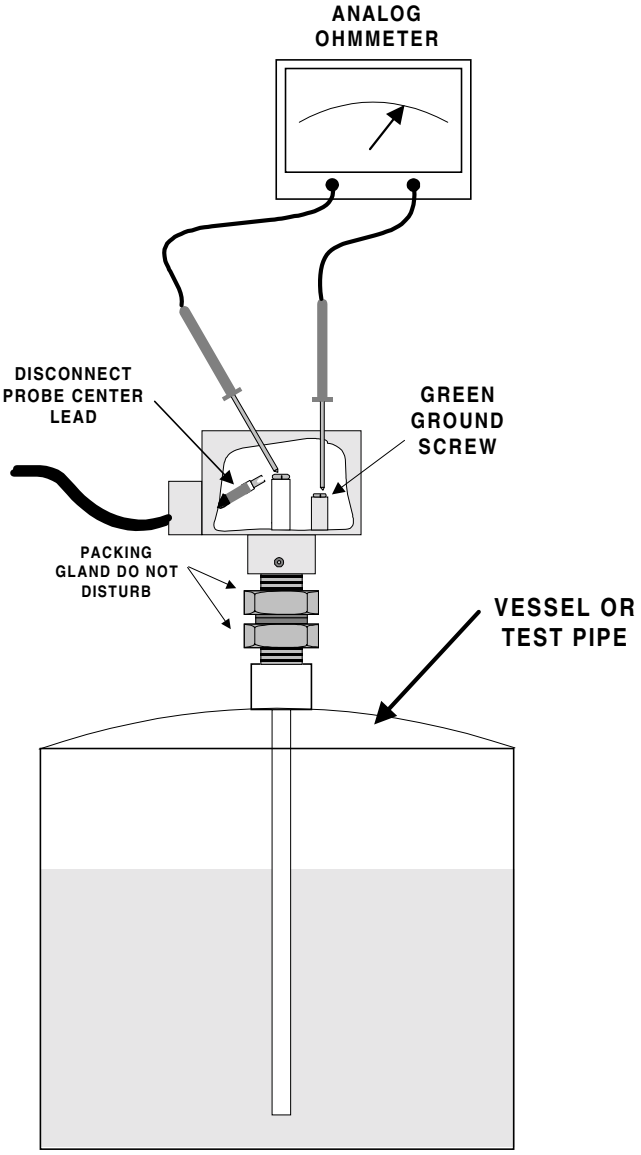


Figure 4-5
Checking the Sensing Element

4.4 Cable Checkout

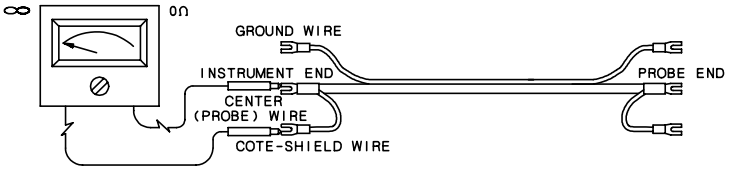
Troubleshoot the cable using the following steps.

NOTE

If there is water or other conductive material in the conduit, it could cause the instrument to fail. If this is the case, it may not be detected by the following test.

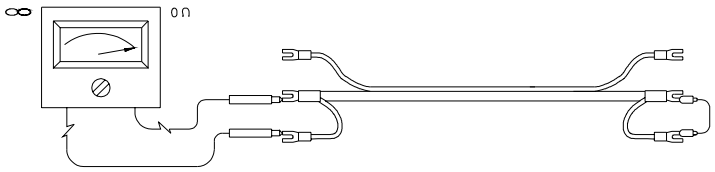
1. Disconnect cable at both ends. Ensure all terminals are standing clear.

2. Measure resistance from center wire to cote-shield using an analog ohmeter set to R x 10K scale. Resistance should be infinity (open circuit).

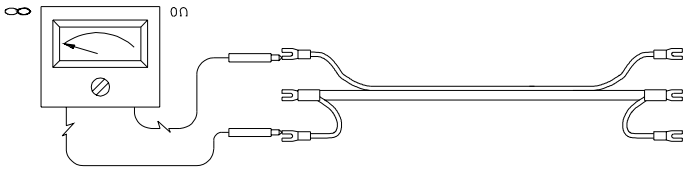


3. Short probe and cote-shield terminals together at one end.

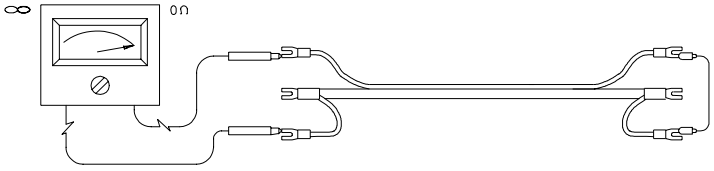
4. Measure resistance from probe to cote-shield terminals at other end. Resistance should be near zero ohms (short circuit).



5. Repeat steps 1 and 2 for cote-shield and ground terminals. Resistance should be infinity (open circuit).



6. Repeat steps 3 and 4 for cote-shield and ground terminals. Resistance should be near zero ohms (short circuit).



4.5 Telephone Assistance

If you are having difficulty with your Drexelbrook equipment, and attempts to locate the problem have failed, notify your local Drexelbrook representative, or call the factory toll free 1-800-527-6297. Drexelbrook Engineering Company is located at 205 Keith Valley Road, Horsham, PA 19044.

To help us solve your problem quickly, please have as much of the following information as possible when you call:

Instrument Model # _____
P.O. #_____
Date_____
Insertion Length_____
Application_____
Material being measured_____
Temperature_____
Pressure_____
Agitation_____
Brief description of the problem _____
Checkout procedures that failed _____

4.6 Equipment Return

Do not return equipment without first contacting the factory for a return authorization number. Any equipment being returned must include the following information in addition to the above.

Reason for Return_____
Return Authorization # _____
Person to contact at your company_____
"Ship To" address_____

If available, please also include the original P.O. number and the original Drexelbrook order number.

To keep the paperwork in order, you must include a purchase order with returned equipment, even though it may be coming back for warranty repair. You will not be charged if the equipment is covered under warranty. Please return your equipment with freight charges prepaid. We regret that we cannot accept collect shipments. Drexelbrook usually has exchange units available for faster turnaround of repair orders. If you prefer your own unit repaired rather than exchanged, please mark clearly on the return unit, "Do Not Exchange".

Spare instruments are generally in factory stock. If the application is critical, a spare chassis should be kept on hand.

4.7 Field Service

Trained field servicemen are available on a time-plus-expense basis to assist in start-ups, diagnosing difficult application problems, or in-plant training of personnel. Contact the service department for further details.

4.8 Customer Training

Periodically, Drexelbrook instrument training seminars for customers are held at the factory. These sessions are guided by Drexelbrook engineers and specialists, and provide detailed information on all aspects of level measurement, including theory and practice of instrument operation. For more information about these valuable workshops, write to Drexelbrook Engineering, attention: Communications/ Training Group, or call direct (215) 674-1234.

SECTION 5 - SPECIFICATIONS

5.1 Electronic Specifications

NOTE
The differential, once set, remains constant even when the setpoint is moved.

—Power Requirements
95-145 Vac, 50-60 Hz
205-255 Vac, 50-60 Hz
Maximum power, 3.5 watts

—Level Output
Two-point unit: (2) DPDT relays,
406-3XX2 one with 0-120 second time delay
one with adjustable differential

Three-point unit: (3) DPDT relays,
406-3XX3 one with 0-120 second time delay
one with adjustable differential
one standard on/off

—Contact Ratings (DPDT)
250 Vac, 5A Resistive Load
30 Vdc, 5A Resistive Load
250 Vac, 2A Inductive Load
30 Vdc, 3A Inductive Load

—Operating Temperature
-40°F to 140°F (-40°C to 60°C)

—Ambient Temperature Effect on Operating Point
1% per 54°F (30°C)

—Sensitivity
2% on all ranges

—Operating Point Range
0-200 feet (depending on sensing element).
Range selection includes four selectors in a “dip” switch with 16 combination ranges available.

—Fail-safe
Field selectable high-level fail-safe (HLFS) or low-level fail-safe (LLFS) for each relay.

—Connecting Cable (Remote Units only)
3-terminal coaxial up to 150 feet (45.7m).
For greater lengths, consult factory.
Rated at 160°F (70°C) standard, to 450°F (230°C) optional

—Housing
5-inch integral explosionproof, standard
5-inch remote explosionproof, optional
Nema 4X remote housing, optional
Drexelcote™ corrosion-resistant, optional

5.2 Sensing Element Specifications

The following sensing elements are most often recommended for use with the 506-3000 Series Multipoint II. They are specified according to the application requirements. The sensing element model is indicated by the last digit of the system number. For identification, the last two digits of the sensing element model number are tagged on the mounting gland or flange of the sensing element. This listing does not include all of the sensing elements available for use with the Multipoint II. If you have additional questions about sensing elements, contact your local representative or the factory.

Model Number (Sensing Element)[1]	Process Pressure/ Temperature	Applications	Sensing Element Dimensions	Standard Mounting[2]	Materials of Construction	Capacitance (pF) per Foot
506-3X00-Y01 (700-1-22)	1000psi @100°F (70 BAR @ 38°C) 500 psi @300°F (34 BAR @149°C)	Light or non-coating conductive liquids	.375 in (9.5mm) O.D. 20 ft (6m) maximum length	¾ inch NPT	TFE insulated metal rod	78 pF
506-3X00-Y02 (700-1-24)	1000psi @100°F (70 BAR @ 38°C) 500 psi @300°F (34 BAR @149°C)	Insulating liquids	.375 in (9.5mm) O.D. center rod 1.66 in (42 mm) O.D. Concentric shield 20 ft (6m) maximum length	1½ inch NPT	TFE insulated metal center rod with concentric shield	78 pF
506-3X00-Y04 (700-2-57)	1000psi @100°F (70 BAR @ 38°C) 500 psi @250°F (34 BAR @120°C)	For strength and modest conductive coatings	.84 in (21.3mm) O.D. 20 ft (6m) maximum length	1 inch NPT	"X" insulated metal rod	350 pF ±10%
506-3X00-Y05 (700-5-54)	500 psi @300°F (34 BAR @149°C)	Longer lengths in water-like liquids without agitation	.093 in (2.4mm) O.D. 400 ft (122m) maximum length	¾ inch NPT	PFA insulated cable	48 pF
506-3X00-Y06 (700-2-37)	1000psi @100°F (70 BAR @ 38°C) 500 psi @250°F (34 BAR @149°C)	Best conductive coating rejection	.54 in (13.7mm) O.D. 12 ft (3.65m) maximum length	¾ inch NPT	"X" insulated metal rod	2400 pF
506-3X00-Y07 (700-2-27)	1000psi @100°F (70 BAR @38°C) 500 psi @300°F (34 BAR @120°C)	Modest conductive coatings	.56 in (13.7mm) O.D. 15 ft (4.7m) maximum length	¾ inch NPT	FEP insulated metal rod	300 pF
506-3X00-Y09 (700-1-26)	1000psi @100°F (70 BAR @38°C) 500 psi @300°F (34 BAR @149°C)	Insulating liquids	.375 in (9.5mm) O.D. center rod 1.625 in (41 mm) O.D. Concentric shield 20 ft (6m) maximum length	1½ inch NPT	TFE insulated metal center rod with concentric shield	78 pF

[1]X = 0 for two-point models; X = 1 for three-point models.
Y = 0 for integral mount; Y = 7 for remote mount.
[2]Flange mountings available.

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