KOTRON®
R.F. 2-WIRE

Level Transmitter

INSTRUCTION MANUAL AND PARTS LIST

DESCRIPTION

Kotron two-wire level transmitters are designed to measure either liquid or certain dry bulk media. The transmitter is usually mounted integrally with the probe.
The 24 V DC 4 mA base current is the supply to the unit. Changes in the level of the medium change this current between 4 and 20 mA in the two-wire loop.
This transmitter is available with a variety of options including an analog meter and rigid or flexible probes. This instruction manual applies to 24 V DC models only.

OPERATING PRINCIPLE

The amount of capacitance developed in any vessel, is determined by the size (surface area) of the probe, the distance from the probe to its ground reference (e.g. tank wall), and the dielectric of the medium it is measuring.
If the probe's mounting position is fixed, and the dielectric value of the medium is constant, then the amount of capacitance developed in any vessel becomes dependent upon the probe's total surface area.
Adjusting the combination of the probe's diameter and length (and of course its proximity to ground) in any given application can generate the necessary capacitance required by the electronic circuitry.
As media rises and falls in the tank, the amount of capacitance developed between the sensing probe and the ground also rises and falls. This change in capacitance is converted into a pulse wave form, proportional to the change in level. The amplifier then converts the proportional pulse signal into a 4-20 mA output signal.

UNPACKING

Unpack the instrument carefully. Inspect all units for damage. Report any concealed damage to carrier within 24 hours. Check the contents of the packing slip and purchase order. Check and record the serial number for future reference when ordering parts.

AGENCY APPROVALS

Agency	Approval
ATEX	II 1G EEx ia II C T6, Intrinsically safe
FM/CSA	Intrinsically safe: Class I, Div. 1, Groups A, B, C & D; Class II, Div. 1, Groups E, F & G; Class III CSA approval only valid with insulated probes.
CSA①	Explosion proof: Class I, Div. 1, Groups C & D; Class II, Div. 1, Groups E,F & G;

① Consult factory for proper selection data.

MODEL IDENTIFICATION

A complete measuring system consists of:

1. Code for KOTRON® electronics
2. Probe selection; a full range of rigid and flexible probes for conductive and non-conductive media is available (see bulletin BE 50-125)

Code for KOTRON® electronics

0 8 2 - 8 4 24 V DC, 2-wire KOTRON® electronics, intrinsically safe version

TRANSMITTER

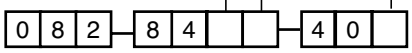
0	Blind transmitter
1	Transmitter with local indicator (Select code 0 or 4 in housing selections)

OUTPUT SIGNAL

3	4 to 20 mA output (direct action)
4	20 to 4 mA output (reverse action)

HOUSING / IP66

0	3/4" NPT cable entry, aluminium (1" NPT with local indicator)
1	M20 x 1,5 cable entry, aluminium (no local indicator available)
2	PG 13,5 cable entry, aluminium (no local indicator available)
3	PG 16 cable entry, aluminium (no local indicator available)
4	3/4" NPT cable entry, stainless steel (1" NPT with local indicator)



complete code for KOTRON® R.F. 2-wire electronics, intrinsically safe version

INSTALLATION

INSTALLATION LOCATION

Kotron transmitters should be located for easy access for service, calibration and monitoring. Transmitters should not be exposed to ambient temperatures below -40°C (-40°F) or above +70°C (+160°F).

Special precaution should be made to prevent exposure to corrosive atmosphere, excessive vibration, shock or physical damage.

It is common practice to use the metal tank wall as the reference electrode (refer to Operating Principle).

In such cases, it is required that the probe housing makes a good electrical connection to the tank wall. If there is any doubt about this connection due to the use of PTFE thread tape, gaskets, paint, rust, or any other reason, a separate strap should be installed between the probe housing and the tank.

CAUTION: This unit contains CMOS electronics which may be damaged by static electricity. Do not touch any semi-conductor devices unless you are properly grounded.

METAL WALLED TANKS

On water based liquids, there should be no problem with sensitivity or linearity. With non-conductive, low dielectric media, sensitivity can be enhanced by locating the probe close to and parallel with the tank wall. If this is not practical, a concentric ground tube, sometimes called a stilling well, may be a solution.

NOTE: These comments are true for glass-lined metal walled tanks also.

Tanks/Silos –
with non-conductive materials of construction

With plastic, concrete, wood, or any other non-conductive walled vessels, the reference electrode mentioned in the "Operating Principle" section on page 1 needs clarification. Most commonly, this electrode will be in the form of a concentric ground tube (i.e. stilling well). Refer to **Figure 1.** In questionable circumstances, consult the Factory. In all cases, a good electrical connection must be made between the ground surface and the probe housing.

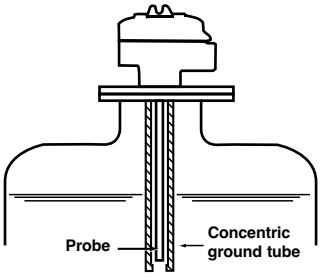


Figure 1

MOUNTING

Two-wire transmitters with probes up to and including 305 mm (12") in length are shipped pre-assembled. Two-wire transmitters with probes over 305 mm (12") in length are shipped unassembled to avoid damage during transit. They must be assembled before mounting. Follow the mounting procedure for your particular case.

MOUNTING PROCEDURE A

Pre-assembled transmitters,
integral mount with rigid probe

1. Thread transmitter assembly into mounting bushing on tank.
2. Tighten securely, being certain that the wrench is applied **ONLY** to the packing gland nut. See **Figure 2**.
3. Proceed to Wiring instructions on page 5.

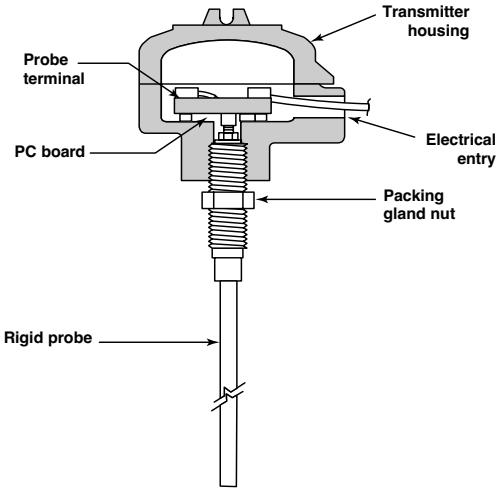


Figure 2
Integral mount models with rigid probe

MOUNTING PROCEDURE B

Unassembled transmitters,
integral mount with rigid probe

1. Thread probe into mounting bushing on tank.
2. Tighten securely, being certain that the wrench is applied **ONLY** to the packing gland nut. See **Figure 3**.
3. Screw the transmitter/probe housing onto the probe. See **Figure 3**. Do not pinch or cut the packing gland.
4. Screw housing on probe until hand tight. Housing can be wrench tightened to align electrical connection. See **Figure 2**.
5. Remove housing cover.
6. Locate the white wire, which is fastened to the (+) Probe Terminal. Connect the free end of this wire to the probe connection screw.
7. Proceed to the "WIRING INSTRUCTIONS" on page 5.

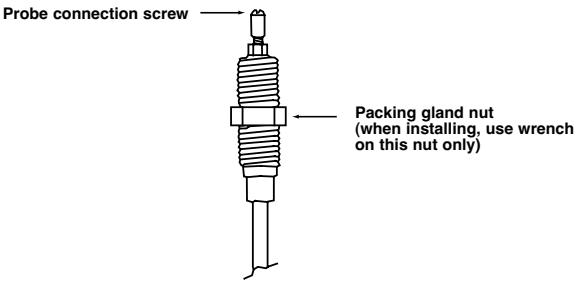


Figure 3 –
Threaded probe

CAUTION: Packing glands used on all Magnetrol rigid probe assemblies have been sealed at the factory under controlled conditions. Care must be exercised when installing probe assemblies to avoid breaking pressure tight gland seal, which destroys the seal.

INSTALLATION (cont.)

MOUNTING PROCEDURE C

**Unassembled transmitters,
integral mount with flexible probe**

> **CAUTION**: Flexible probes are shipped with the cable clamp and the packing gland nut hand tightened. The end of a flexible probe MUST be secured to the bottom of the tank by either attachment to a bracket or to a heavy weight, in order to keep the probe taut. Follow the mounting instructions listed below.

1. Unscrew probe from probe housing. Remove mylar housing insulator located over the clamp. See **Figure 4**.

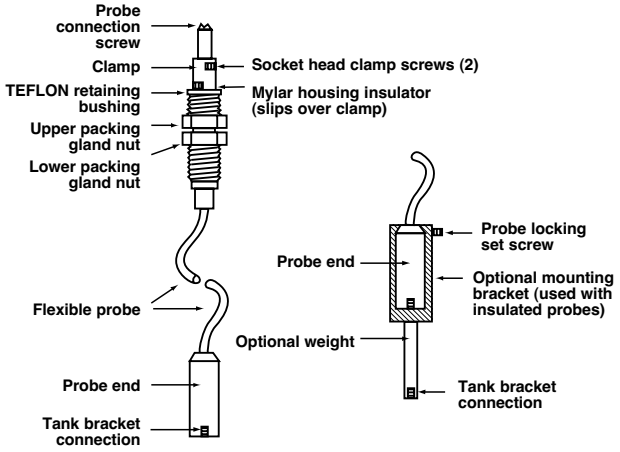


Figure 4
Flexible probe assembly

> **CAUTION:** Do not discard mylar housing insulator.

2. Attach weight (if used) to probe end.
3. Insert probe end through tank mounting bushing and feed cable into the tank. **DO NOT** allow probe to be damaged by scraping against the bushing threads.

> **CAUTION**: Probe cable must not be in contact with anything metallic in its final installation position.

4. Secure lower end of probe (or optional weight) to tank bracket if one is used. See **Figure 4**.
5. Apply thread sealant to mounting nut.
6. Screw mounting nut into tank bushing until tight.

> **CAUTION**:
> Apply wrench to lower packing gland nut only.

NOTE: Do not allow the probe to fall in the tank while following steps 7 through 11.

7. Loosen both socket head clamp screws.
8. Pull clamp and teflon retaining bushing off probe.
9. While holding probe cable, loosen upper packing gland nut.
10. Pull excess cable up through packing gland nut until cable is taut.
11. Tighten the packing gland nut.
12. Cut off cable 35 mm (1.35") above top of packing gland nut and strip off 30 mm (1.25") of insulation.
13. Slide teflon retaining bushing onto cable and seat it into the packing gland nut.
14. Slide clamp onto cable and seat it in the teflon retaining bushing.
15. Tighten both socket head clamp screws to approx. 3.96 Nm (35 in./lb.) torque.
16. Slip mylar housing insulator over clamp.
17. Screw housing onto probe and tighten. Make sure electrical connection is properly aligned for wire entry.
18. Locate the white wire which is fastened to the (+) Probe Terminal. Connect the free end of this wire to the probe connection screw.
19. Proceed to the Wiring Instructions on page 5.

MOUNTING ALL TRANSMITTERS WITH METERS

Follow the mounting procedure for your model as indicated in the Model Identification chart on page 2.
Then proceed to the WIRING INSTRUCTIONS FOR TRANSMITTERS WITH METERS on page 5.

WIRING

TRANSMITTERS WITHOUT METERS

All wiring between the power supply and the transmitter should be done with 18 AWG to 22 AWG shielded twisted pair. The connection is made at the terminal strip within the transmitter enclosure.

> **CAUTION**: Units are designed to operate on 14 to 40 V DC power only. Application of 240/120 V AC will destroy the instrument.

1. Make sure the power source is turned off.
2. Pull power supply wires through electrical connection.
3. Connect the positive supply wire to the (+) terminal, and the negative supply wire to the (-) terminal.

NOTE:
Leave shield unattached at the power source. Attach the ground at the transmitter.

4. Replace the transmitter housing cover until time to calibrate.
5. Connect the positive supply wire to the positive terminal of the power source. See **Figure 5**.

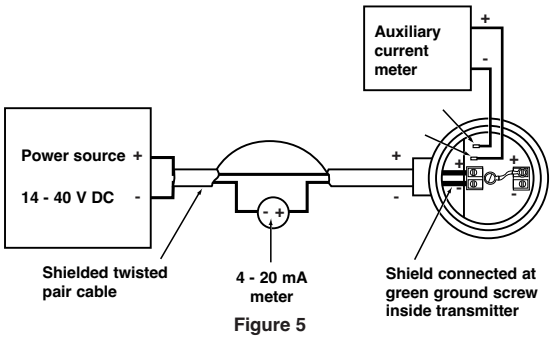
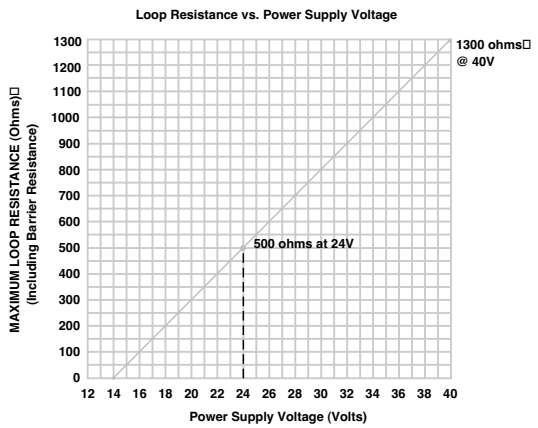


Figure 5

6. Connect the loop current meter in series with the negative supply wire as follows:
   a. Negative transmitter wire to positive meter terminal. See **Figure 5**.
   b. Negative meter terminal to negative power source terminal. See **Figure 5**.

NOTE: This instrument is designed to operate with a maximum total loop resistance up to 1300 Ω at 40 V DC. Refer to **chart 1** to find the maximum allowable loop resistance for the power supply voltage in use. Consult the factory for further information.



7. Turn on the power. The yellow led on the potted module should be on. The meter may read anywhere on the scale, or off the scale at either end. This is normal until calibration has been completed. Proceed to the CALIBRATION INSTRUCTIONS on page 6.

INTEGRAL MOUNT TRANSMITTERS W/METERS

All wiring between the power supply and the transmitter should be done with 18 AWG to 22 AWG shielded twisted pair. The connection is made at the terminal strip within the meter enclosure.

> **CAUTION**: Units are designed to operate on 14 to 40 V DC power only. Application of 240/120 V AC will destroy the instrument.

1. Make sure the power source is turned off.
2. Remove the cover from the meter housing.
3. Remove the two screws in the meter bracket. The meter is attached by two wires to the terminal block underneath it. Pull meter gently out of the housing and lay the meter to one side, being careful not to disturb the wiring. See **Figure 6**.
4. Pull power supply wires through electrical connection on meter housing. Connect the positive supply wire to the (+) terminal and the negative supply to the (-) terminal on the terminal strip under the meter. See **Figure 6**.

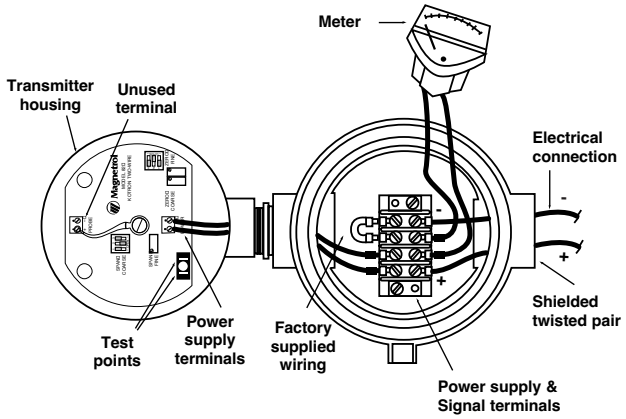


Figure 6

Top view integral mount models with rigid or flexible probe

5. Replace the meter in its housing and replace the meter bracket screws. Be sure the meter wires are not cut when replacing the meter cover on the meter housing. Screw cover clockwise until tight.
6. Replace the transmitter housing cover until time to calibrate.
7. Connect the positive supply wire to the positive terminal of the power source. See **Figure 5**.
8. Connect the negative supply wire to the negative terminal of the power source. Leave shield unattached at transmitter. Attach the ground at the power source.

NOTE: This instrument is designed to operate with a maximum total loop resistance up to 1300 Ω at 40 V DC. Refer to chart 1 to find the maximum allowable loop resistance for the power supply voltage in use. Consult the factory for further information.

9. Turn on the power. The yellow led on the potted module should be on. The meter may read anywhere on the scale, or off the scale at either end. This is normal until calibration has been completed. Proceed to the Calibration instructions on page 6.

CALIBRATION

AUXILIARY CURRENT METER

In order to calibrate the transmitter, you may use either the loop current meter, or a second current meter which has an internal resistance of less than 10 Ω.
It should read currents in the range of 1 to 25 mA, with a resolution of 0.01 mA. Using a meter of less resolution will somewhat reduce the calibration accuracy.
An error of 0.2 mA is equivalent to a 1% error, based on the full scale current of 20 mA.

To calibrate the instrument:

1. Remove transmitter housing cover.
2. Check that the LED is glowing (shadowing the LED by hand may be helpful in brightly lit environments).

NOTE: The LED will glow brighter with increasing signal.

   a. If the LED is lit, continue to step 3.
   b. If the LED isn't lit, check for supply voltage of 14 to 40 V at the terminal strip. Also confirm that the polarity is correct. If LED still does not light, replace the cover and contact factory.

3. Connect the auxiliary meter's positive lead to Test point 1 and its negative lead to Test point 2. See **Figure 7**.

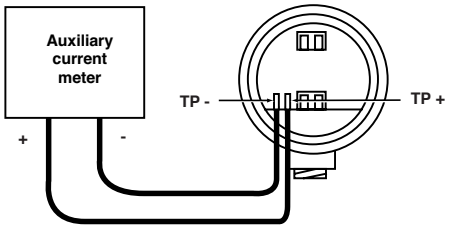


Figure 7

NOTE: This use of TP- and TP+ allows the loop current to be monitored at the location where the adjustments are being made, without removing any wires.

It is not necessary to use this auxiliary meter if another means is available to measure loop current.

   a. If the LED goes completely out, proceed to step 4.
   b. If the LED doesn't go out, check the following:
      - the meter is properly connected.
      - the appropriate meter range has been selected.
      - meter resistance is less than 10 Ω for the selected range.

4. The loop current should now be in the range of 1.5 mA to 38 mA, which is normal at this point.

TWO POINT CALIBRATION - LEVEL INCREASE

Two calibration procedures are described on page 7. Follow the one which fits your application.
Please note the following definitions used in the calibration procedures, referring to **Figure 8**.

L0 = the level of material in the vessel which corresponds to 4.0 mA of loop current, i.e., the 0% level.
L1 = a material level higher than L0.
L2 = a material level higher than L1, but less than L3.
L3 = the level of material in the vessel which corresponds to 20.0 mA of loop current, i.e., the 100% level.

NOTE: To avoid the possibility of a "dead zone", L0 must be at least 50 mm (2") above the end of the probe for conductive media and 100 mm (4") above for non-conductive media.

Calibration A = when material in tank can be set to L0 (0%) and L3 (100%).
Calibration B = when material in tank can be set to L1 (greater than 0%) and L2 (less than 100%).

NOTE: Calibration Procedure A gives the most accurate results and is the recommended procedure in all cases.

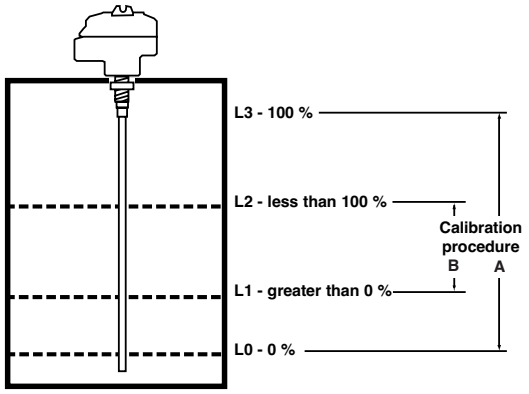


Figure 8

CALIBRATION (cont.)

CALIBRATION PROCEDURE A

1. Move the material in the vessel to its L0 (0%) level.
2. Turn the zero coarse ①, zero fine ② and the fine span ③ calibration controls clockwise (CW) twenty full turns or until ratcheting is heard. Set all the coarse span DIP switches in their OPEN (down) position ④.

   Ensure that the ZERO dip switches 2 and 3 are in open position and ZERO dip switch 1 is in closed position ⑤.
3. Turn the coarse zero control ① CCW until the meter reads close to 4 mA without going under.
4. If the loop current can not be decreased to at least 4.50 mA, turn the Zero Coarse potentiometer fully clockwise, close DIP switch positions “Med” and “High” sequentially (ONLY ONE SWITCH POSITION SHOULD BE CLOSED AT A TIME – THE OTHER TWO POSITIONS MUST REMAIN OPEN). Repeat Step 3.
5. Turn potentiometer Zero Fine ② counterclockwise until the loop output reads exactly 4.00 mA.

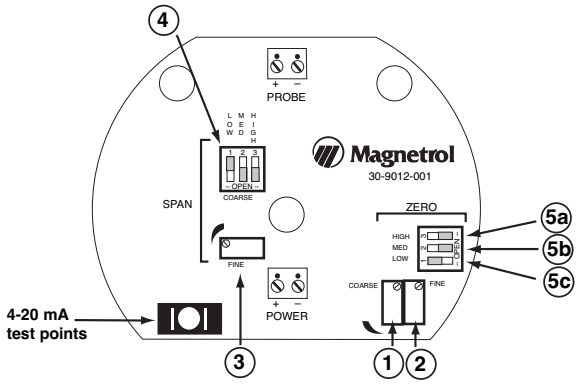


Figure 9

6. Fill the vessel to the desired L3 (100%) level. Ensure that the SPAN DIP switches are still in open position.

NOTE: The loop current may not rise in proportion to the rising material level in the vessel. Instead, the loop current may rise rapidly ahead of the material level.

7. After the vessel has been filled to L3 (100%), in sequence, individually move SPAN COARSE ④ DIP switches 1, 2 and 3 to the CLOSED (up) position until the current output is as close to 20 mA as possible without going under. Only one DIP switch should be CLOSED at any time - the others are to remain OPEN (down).
8. Turn the span fine ③ calibration control CCW until the meter reads exactly 20 mA. Calibration is now complete.

CALIBRATION PROCEDURE B

1. Set the material level in the vessel to L1, some point above 0%. Record the L1 level in mm, cm, inches, feet or percent of span.
2. Turn the coarse zero ①, zero fine ② and the fine span ③ calibration controls clockwise (CW) twenty full turns or until ratcheting is heard. Set all the coarse span DIP switches in their OPEN (down) position ④.

   Ensure that the ZERO dip switches 2 and 3 are in open position and ZERO dip switch 1 is in closed position ⑤. See **Figure 9**.
3. To determine the correct output level at this point, use the following formula:

   $L1_{mA} = (\frac{(L1 - L0)}{(L3 - L0)} \times 16) + 4$
4. Turn the Zero Coarse potentiometer counterclockwise until the loop output is between $L1_{mA}$ and $L1_{mA}$ + 0.5 mA.
5. If the loop current output cannot be decreased to at least $L1_{mA}$ + 0.5 mA, turn the Zero Coarse potentiometer fully clockwise, close Zero Coarse DIP switch positions “Med” and “High” sequentially (ONLY ONE SWITCH POSITION SHOULD BE CLOSED AT A TIME—THE OTHER TWO POSITIONS MUST REMAIN OPEN). Repeat Step 4.
6. Turn potentiometer Zero Fine counterclockwise until the loop output reads exactly $L1_{mA}$.
7. Move the media level in the vessel to the highest level you can set.
8. To determine the correct output level at this point, use the following formula:

   $L2_{mA} = (\frac{(L2 - L0)}{(L3 - L0)} \times 16) + 4$
9. In sequence, individually close Span Coarse DIP switches “Low”, “Med”, and “High”, until the loop current is as close to (and not less than), $L2_{mA}$. (ONLY ONE SWITCH POSITION SHOULD BE CLOSED AT A TIME—THE OTHER TWO POSITIONS MUST REMAIN OPEN).
10. Turn the Span Fine potentiometer counterclockwise until the loop current is exactly $L2_{mA}$.

Calibration is now complete.

TROUBLESHOOTING

Problems which might be encountered during installation, calibration and operation of the Two-Wire Transmitter are listed below with their solutions.

INSTALLATION

LED doesn't light after wiring is completed and power turned on.

a. Wires reversed at supply or transmitter.
b. Wires broken or not connected.
c. Excessive loop resistance. See chart for max. resistance.
d. Power supply not turned on.
e. Insufficient source voltage. 14 V minimum is required at transmitter terminals.
f. Test points jumpered together with current meter. Remove meter.
g. LED is actually on, but very dim. Turn span and zero potentiometers fully clockwise; if LED is now on, proceed with calibration.
h. P.C. board defect. Consult factory for help.

CALIBRATION

1. Test meter connected to calibration points, LED still on.
   a. Wrong test meter mode. Use low resistance current meter.
   b. Test meter resistance is too high. Obtain meter with less than 10 Ω resistance.
   c. Test meter not properly connected to calibration points.
   d. Defective test meter or leads; meter fuse blown.
2. Cannot read loop current at calibration points and LED is off.
   a. Meter set at too high of a range. Maximum loop current is 38 mA (0,038 A).
   b. Calibration points jumpered together. Remove jumper.
   c. No power, or insufficient power at transmitter terminals.
   - Refer to steps “a” through “h” under INSTALLATION section above.
3. Zero point cannot be set to 4 mA at low level.
   a. Wires reversed at supply or transmitter.
   b. Span controls incorrectly set
   - Turn span potentiometers fully clockwise before calibrating zero.
   c. Excessive probe capacitance
   - Maximum zeroing range is:
     450 pf-zero dip switch 1 in closed position
     650 pf-zero dip switch 2 in closed position
     1000 pf-zero dip switch 3 in closed position
   - Decrease length of probe covered at zero level;
   - Use smaller diameter probe; or
   - Remove stilling well; or
   - Increase diameter of stilling well; or
   - Locate probe farther from walls; or
   - Use probe with lower dielectric insulation; or
   - Replace bare probe with insulated probe; or
   - Consult factory.
4. Span point cannot be increased to 20 mA at high level.
   a. Span controls incorrectly set
   - Turn span controls clockwise.
   b. Insufficient probe capacitance
   - Increase span length of probe; or
   - Increase probe diameter; or
   - Locate probe closer to wall(s); or
   - Use probe with higher dielectric insulation; or
   - Install stilling well; or
   - Use smaller diameter stilling well; or
   - Consult factory.
   c. Incorrect transmitter power
   - Refer to steps “a” through “h” under INSTALLATION section above.
   d. Excessive loop resistance
   - See chart 1 on page 5 for maximum allowable loop resistance.
5. Span current cannot be reduced to 20 mA at high level.
   a. Span controls set too high
   - Turn span controls counterclockwise.
   b. Excessive probe capacitance (max. span is 4000 pf)
   - Decrease span length of probe; or
   - Use smaller diameter probe; or
   - Remove stilling well; or
   - Increase diameter of stilling well; or
   - Locate probe farther from walls; or
   - Use probe with lower dielectric insulation; or
   - Replace bare probe with an insulated one; or
   - Consult factory.
   c. Low probe resistance to ground
   - Probe resistance must be more than 10 MΩ.
   - Consult factory.

TROUBLESHOOTING (cont.)

OPERATION

1. Loop current oscillates or hunts.

a. Waves or disturbances in medium
   - Use stilling well; or
   - Use external cage or standpipe for transmitter
   - Correct instability of medium.

b. Probe moving within vessel
   - Improve probe anchoring.

2. Loop current randomly unstable.

a. Disturbances in medium
   - Correct instability of medium.

b. Power supply unstable
   - Repair or replace power supply.

c. Electrical interference (RFI)
   - Consult factory.

3. Loop current exceeds 20 mA.

a. Incorrect calibration
   - Recalibrate unit.

b. Material level above 100%
   - No corrective action needed on transmitter.

c. Extreme material build-up on probe
   - Possible misapplication; consult factory.

d. Shorted or resistive probe
   - Replace (or possible repair) probe. Consult factory for assistance in determining cause.

e. Supply voltage is out of limits at transmitter terminals
   - Allowable voltage between 14 and 40 V DC. See chart 1 on page 5.

f. Excessive temperatures at transmitter electronics
   - Use remote electronics; consult factory.

g. Excessive loop resistance. See chart 1 on page 5.
   - Reduce loop resistance; or
   - Increase supply voltage; consult factory.

4. Loop current less than 4 mA.

a. Incorrect calibration
   - Recalibrate unit.

b. Material level below 0%
   - No corrective action needed on transmitter.

c. Shorted or resistive probe
   - Replace (or possibly repair) probe. Consult factory for assistance in determining cause.

d. Supply voltage out of limits at transmitter terminals
   - Adjust power supply; or
   - Reduce loop resistance.

e. Excessive temperatures at transmitter electronics
   - Use remote electronics; consult factory.

f. Excessive loop resistance.
   - Reduce loop resistance.

5. Non-linear output.

a. Incorrect calibration
   - Recalibrate unit.

b. Excessive loop resistance
   - Reduce loop resistance; or
   - Increase supply voltage.

c. Damaged jacket on insulated probe
   - Identify and eliminate cause of damage, then replace probe.

d. Extreme material build-up on probe
   - Possible misapplication; consult factory.

e. Interfering surfaces too close to probe
   - Mount probe in better location; or
   - Use stilling well; or
   - Use non-metallic brackets and/or standoffs to position flexible or extremely long rigid probes a uniform distance from the tank wall.

f. Curved or non-parallel surfaces near probe
   - Mount probe in better location; or
   - Use stilling well.

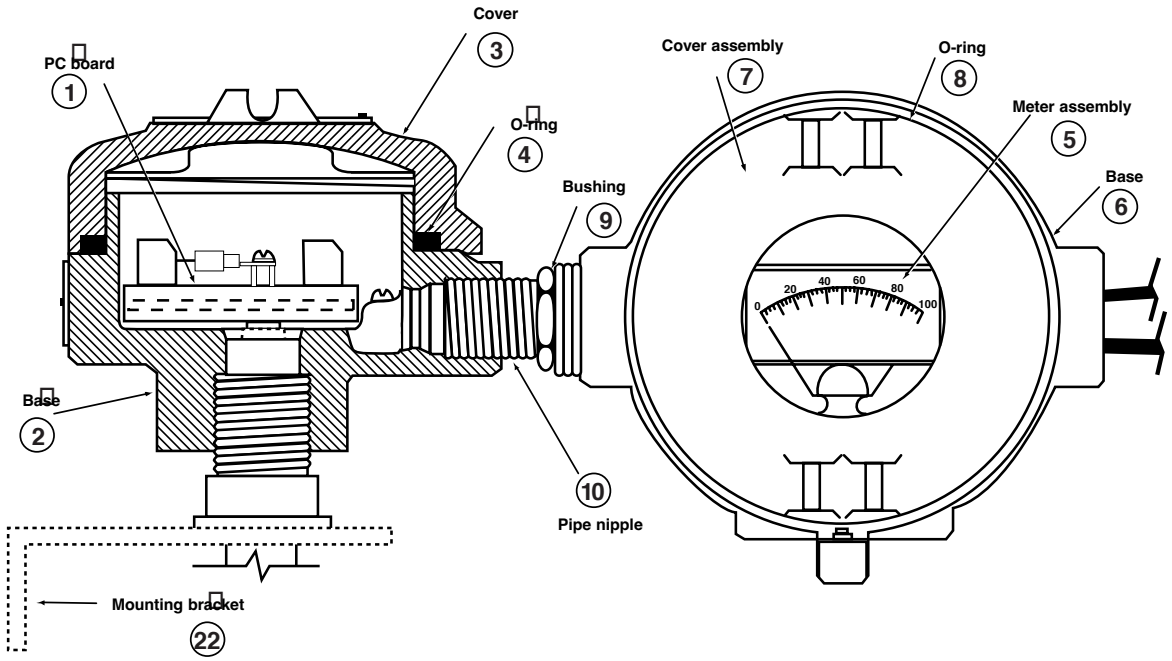
REPLACEMENT PARTS

TRANSMITTER

No.	Description		Part Number
1	P.C. Board	4-20 mA	30-9012-001
		20-4 mA	30-9012-002
2	Base		consult factory
3	Cover		consult factory
4	O-Ring		12-2101-345

METER

No.	Description	Part Number
5	Meter Assembly	37-3145-001
6	Base	04-9112-001
7	Cover Assembly	36-3908-001
8	O-Ring	12-2501-246
9	1” x 3/4” Bushing	04-1739-001
10	1.5" Long, 3/4” NPT Pipe Nipple	11-1105-014



Transmitter **Meter**

ELECTRICAL SPECIFICATIONS

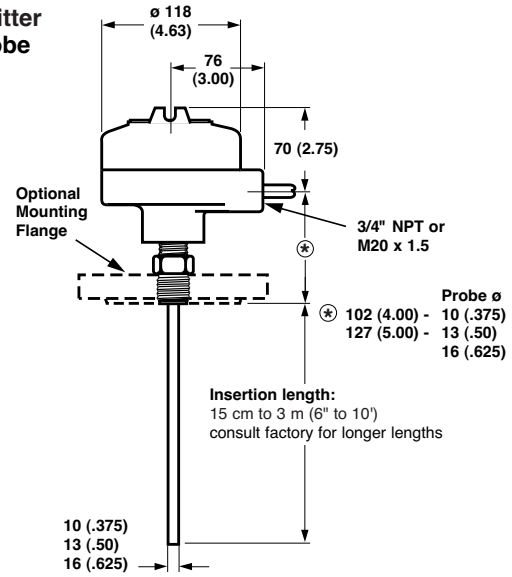
Description	Specification
Supply Voltage	14 to 40 V DC
Current	38 mA max.
Line Variation	Less than ± 0.10%/V, for voltages between 14 to 40 V DC
Ambient Temperature	-40°C to +70°C (-40°F to +160°F)
Zero Range	1000 pF (Max.) 0 pF (Min.)
Span Range	4000 pF (Max.) 40 pF (Min.)
Output Linearity	50- 500 pF ± 1 % of SPAN 501-1500 pF ± 2 % of SPAN 1501-4000 pF ± 1 % of SPAN
Response Time	Less than 0.1 s
Repeatability	Better than ± 1.0%
Temperature Coefficient of Output -40°C to +70°C (-40°F to +160°F)	4000 pF span: Less than 0.063%/°C (0.035%/°F) 1000 pF span: Less than 0.045%/°C (0.025%/°F) 50 pF span: Less than 0.135%/°C (0.075%/°F)

DIMENSIONS in mm

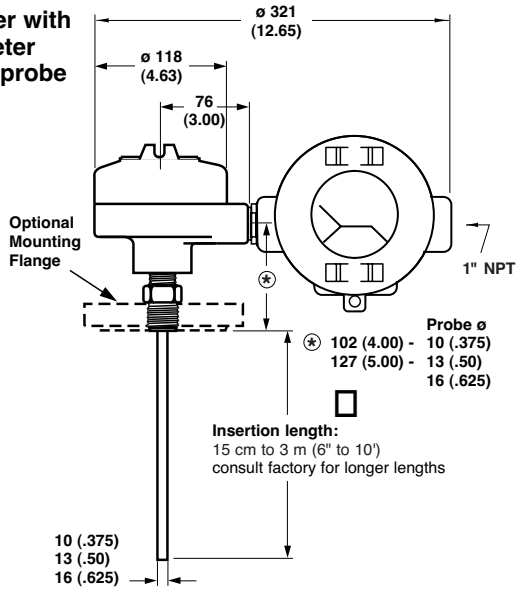
INTEGRAL MOUNT

NOTES: Allow 102 (4.00) overhead clearance for cover removal.

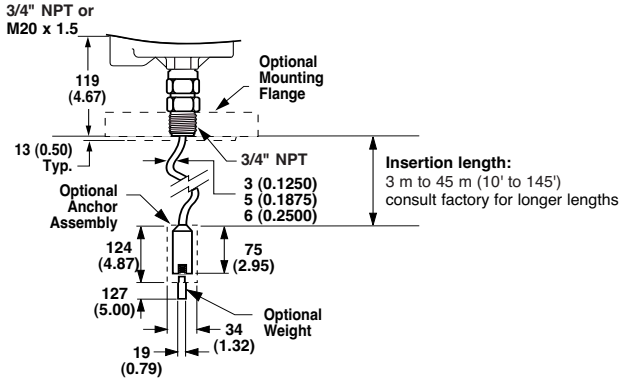
Blind transmitter with rigid probe



Transmitter with analog meter with rigid probe



Blind transmitter with flexible probe



IMPORTANT

SERVICE POLICY

Owners of Magnetrol products may request the return of a control; or, any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Magnetrol International will repair or replace the control, at no cost to the purchaser, (or owner) **other than transportation cost** if:

a. Returned within the warranty period; and,
b. The factory inspection finds the cause of the malfunction to be defective material or workmanship.

If the trouble is the result of conditions beyond our control; or, is **NOT** covered by the warranty, there will be charges for labour and the parts required to rebuild or replace the equipment.

In some cases, it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned, will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labour, direct or consequential damage will be allowed.

RETURNED MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a “Return Material Authorisation” (RMA) form will be obtained from the factory. It is mandatory that this form will be attached to each material returned. This form is available through Magnetrol’s local representative or by contacting the factory. Please supply the following information:

1. Purchaser Name
2. Description of Material
3. Serial Number
4. Desired Action
5. Reason for Return
6. Process details

All shipments returned to the factory must be by prepaid transportation. Magnetrol **will not accept** collect shipments.

All replacements will be shipped FOB factory.

BULLETIN N°: BE 50-613.9
EFFECTIVE: SEPTEMBER 2004
SUPERSEDES: January 1997

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