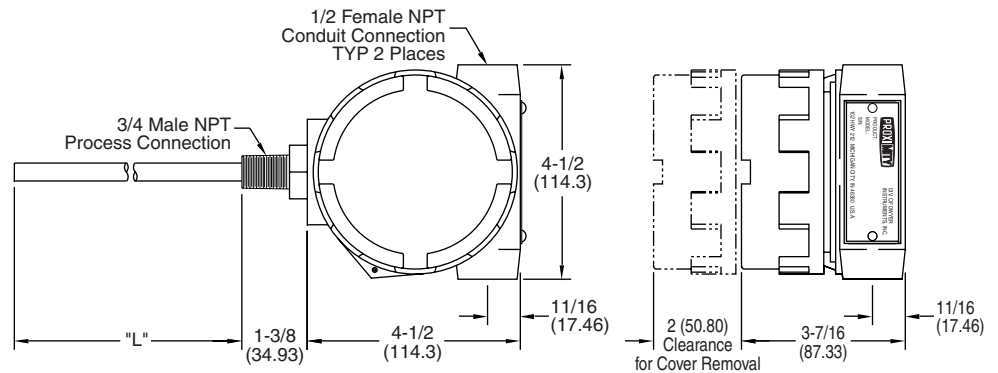




Series CRF Continuous Level Transmitter

Specifications – Installation and Operating Instructions



INTRODUCTION

The two-wired, loop-powered Series CRF continuously monitors the level of liquids or slurries using RF Admittance technology. The unit delivers a 4-20 mA isolated output signal proportional to the height of material in a tank or holding vessel. The CRF is mounted vertically in the process media. Operation involves the probe and vessel wall (or grounding rod/cable) acting as a capacitor. A change in the material level produces a proportional change in the capacitance between the probe and the vessel wall (or grounding rod/cable). This change in capacitance is converted to a 4-20 mA output signal.

SPECIFICATIONS

Wetted Materials: 316 SS, Teflon. Units with attached grounding rod have PVC spacers between the rods. PVC on units with PVC flange.

Accuracy: 0.1% of full range repeatability, 0.3% of full range linearity.

Temperature Limits: -10 to 180° F (-23 to 82° C).

Pressure Limit: 100 psig (6.89 bar).

Power Requirements: 18 to 30 VDC.

Output Signal: 4 to 20 mA, 2 wire, isolated.

Zero Adjustment: 0 to 500 pF.

Span Adjustment: 25 to 2200 pF.

Loop Resistance: 600 ohms at 24 VDC.

Power Consumption: 0.6 VA.

Electrical Connection: Screw Terminal.

Process Connection: See model chart.

Enclosure Rating: Weatherproof NEMA 4 and Explosion-proof NEMA 7 & 9: Class I, Groups B, C, and D; Class II, Groups E, F, and G.

Mounting Orientation: Vertical.

Weight: 7.25 lb. (3.29 kg.) with 6' rod and NPT connection.

Example	CRF	TR	0	34T	072	CRF-TR0-34T-072 level transmitter; rigid rod, no ground rod, 3/4" male NPT mounting, and 72" probe length.
Construction	CRF					Weatherproof and Explosion-proof Enclosure: NEMA 4, 7 and 9
Probe Type		TR				Rigid Rod, 3/8" (9.525 mm) diameter Flexible Cable, 3/8" (9.525 mm) diameter
Ground Rod			A			Attached Ground Rod (Only available with 3" or 4" flange mounting type)
			U			Unattached Ground Rod
			0			No Ground Rod
Mounting Type				21S		2" 150 lb. Stainless Steel Flange
				31S		3" 150 lb. Stainless Steel Flange
				41S		4" 150 lb. Stainless Steel Flange
				21P		2" 150 lb. PVC Flange
				31P		3" 150 lb. PVC Flange
				41P		4" 150 lb. PVC Flange
				34T		3/4" male NPT
				1SA		1-1/2" Sanitary Clamp (Only available with rigid rod and without ground rod, Model TR0)
				2SA		2" Sanitary Clamp (Only available with rigid rod and without ground rod, Model TR0)
Probe Length					XXX	Probe Length in Inches. Rigid rod is available from 12 to 144" and flexible cable is available from 24 to 240". Must be three digits, for example a 12" rod will be a model code 012

Mechanical Installation

In all applications, the probe must be mounted vertically in the tank or holding vessel. The rod probe is preferred, however, if the space above the tank is limited and a rigid rod can not be installed, a cable probe is acceptable. A cable probe must be used if the length requirement is greater than 12 feet (356.8 cm). Due to the weight attached to the cable, there is a 7 inch (17.8 cm) dead-zone at the bottom of the cable. See *figure 1*. The probe with attached ground rod is only available with the 3 or 4 inch flange options.

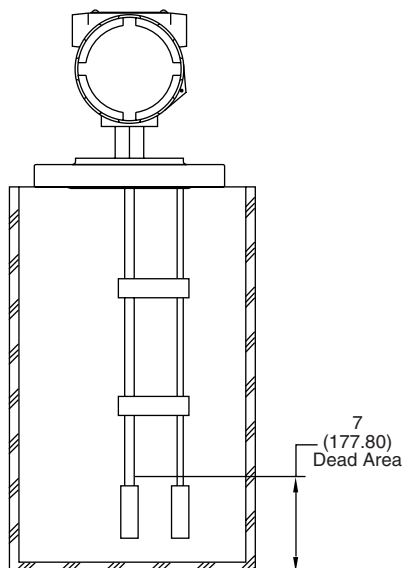
Probe stabilization is required if the probe is longer than 8 feet (243.8 cm) in length, or turbulent agitation occurs in the tank. The probe should be braced against the wall using PVC or other nonmetallic materials. See *figure 2*. When using a cable probe, stabilization can be provided by tying the weight to the bottom of the tank or braced as shown in figure 2. There is a hole drilled in the bottom of the weight for easy tie-down. The weight is isolated from the probe therefore it is acceptable to use a metallic material for tie-down.

For proper function, the installation procedure must ensure a consistent gap between the probe and ground. The minimum acceptable gap is 2 inches (5.1 cm). Since material build up can potentially reduce the effective probe-to-ground spacing, a 5 inch (12.7 cm) gap is recommended. The maximum probe to ground spacing is 6 inches (15.2 cm). See *figure 2*.

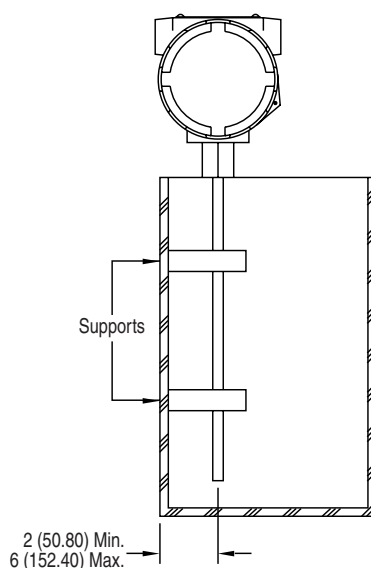
In metal vertical walled tanks, the wall can act as the ground if the minimum and maximum spacing requirements can be met (min. = 2 inches [5.1 cm], recommended = 5 inches [12.7 cm]; max. = 6 inches [15.2 cm]). Therefore, installation in metal tubes less than 4 inches in diameter is not acceptable. If the wall is greater than 6 inches (15.2 cm) away from the probe, a ground rod/cable must be used.

In nonmetallic tanks, or any metallic application where the probe to wall distance is not constant (horizontal tank), a grounding rod/cable is necessary. The probe and grounding rod/cable need to be parallel, equal length, and satisfy the minimum and maximum spacing requirements. If an attached grounding rod/cable is purchased, spacers are used to ensure a consistent gap between the probe and ground. See *figure 3*.

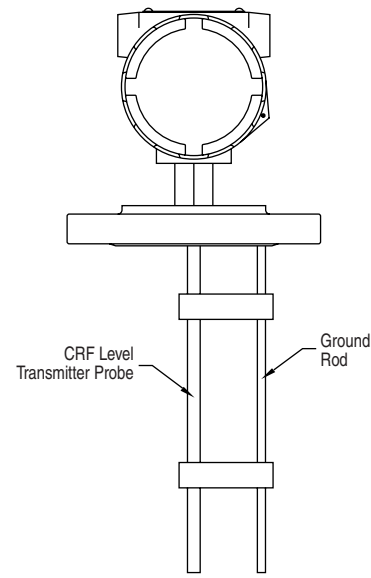
Dead Zone - Fig. 1



Probe Stabilization - Fig. 2



Grounding Rod - Fig. 3



Electrical Installation - See figure 4

The Series CRF Continuous Level Transmitter is a loop-powered device. The two output signal wires also carry the power needed to run the unit. A 18 to 30 VDC power source capable of providing 20 mA must be used in series with the CRF transmitter and the display or other device being used for level monitoring. Shielded 18 AWG wire is recommended for all wiring. DO NOT run the transmitter wire in the same conduit as any AC power or near any source of AC interference. See figure 4 for wiring connections.

Operation - See figure 4

1. Connect a loop calibrator or milli-ammeter to the probe output or refer to the display device being used.
2. Drain the tank until the level in the tank is at the corresponding 4 mA level. Use a screw driver to adjust the pot marked "Zero Coarse" (R2) until the output is close to 4 mA (or the display is close to zero). Adjust the pot marked "Zero Fine" (R9) until the output reads exactly 4 mA. Clockwise rotation of the pot increases the output.
3. Fill the tank until the level in the tank is at the corresponding 20 mA level. Adjust the pot marked "Span Coarse" (R7) until the output is close to 20 mA (or the display is close to maximum). Adjust the pot marked "Span Fine" (R8) until the output reads exactly 20 mA. Clockwise rotation of the pot increases the output.
4. The zero and span settings are interactive so repeat steps 2 and 3 as required until both readings are satisfactory.
- 5. The trim pot marked R3 is factory preset and should not be adjusted.**
6. The probe must be recalibrated if the material being measured is different from the material used in the initial calibration.

Maintenance

Periodic checks of connections and calibration are recommended. Check for, and clean any material build-up occurring between the probe and tank wall. Units are not field serviceable and should be returned to the factory, freight prepaid, if repair is necessary. If the CRF is altered in any way (internally or externally), the warranty may be void.

If there are any problems with this product, please consult the factory. Be sure to include a complete description of the application and problem.

Proximity Controls
 Division of Dwyer Instruments Inc.
 Attn: Repair Deptment
 102 Highway 212
 Michigan City, IN 46360

Electrical Wiring and Trimpots - Fig. 4

