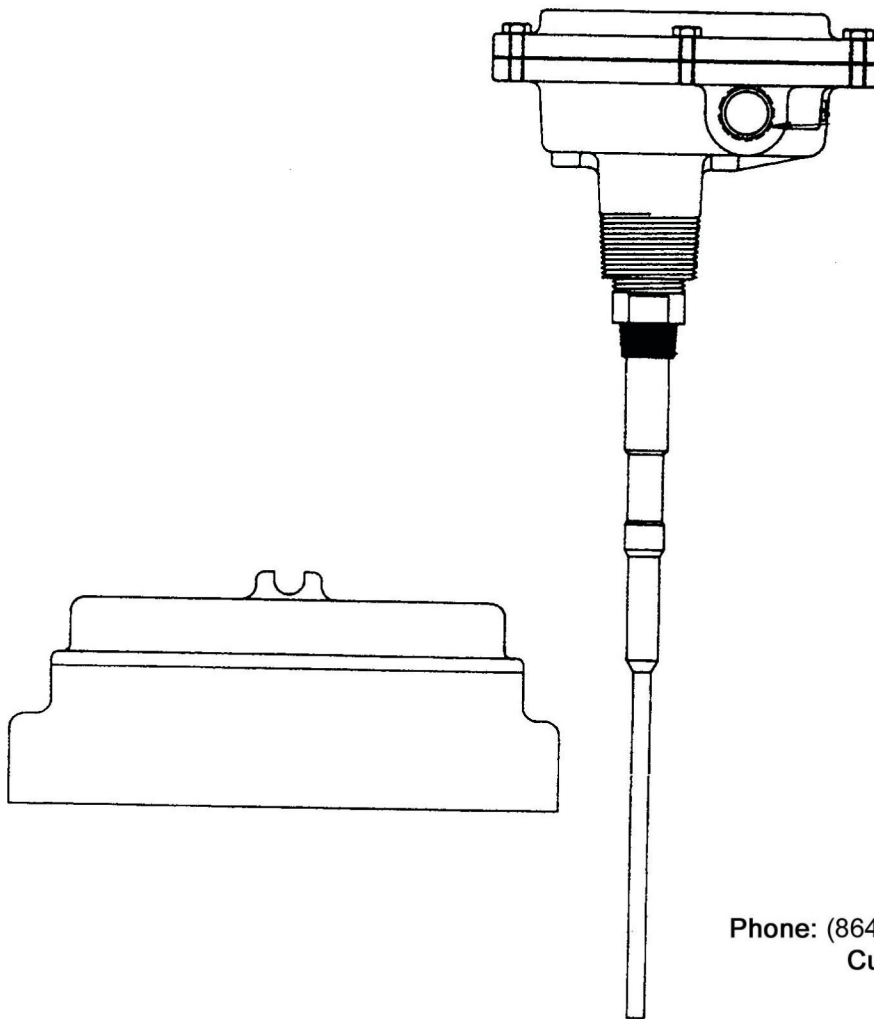


**RF11000/12000®**  
*Remote Radio Frequency Level Probe*  
*w/Design Level 2 Electronics*  
*Installation & Operation Manual*



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## SPECIAL NOTE

The electronics furnished with your RF11000/12000 series level control are a newer design than what you may have purchased in prior years. The new **“Design Level 2” electronics** include the following improvements:

- **DIP switch sensitivity settings**...we now have 8 sensitivity settings versus 3 jumper selections, that were part of the original design. This feature allows you to sense a wider range of materials with one electronic unit.
- **DIP switch time delay settings**... we now have 4 time delay settings versus 3 jumper selections, that were part of the original design. This feature gives you the flexibility to change time delay from 1 second (min.) to 7 seconds (max.), depending on your process.
- **“Latched” internal calibration push-button**...A momentary push of the calibration button now initiates calibration. You no longer have to hold the button down and wait for the calibration light to illuminate.
- **“Euro style” terminal block**...which is capable of terminating two - 14 gauge wires. This “safer design” will help protect your personnel or electricians when connecting power to our unit.
- **Blinking GREEN Calibration Light**... for greater diagnostics and reliable long term calibration.

These features are explained in more detail within this manual.

## 1.0 INTRODUCTION

The RF-11000 and RF-12000 are point level devices used to detect the presence or absence of material at a point inside a tank, bin, or other vessel. The electronic circuitry may be calibrated by an internal push-button. Another method to calibrate the unit is by pressing the external spring-loaded magnet or placing the "fob" over the LED lights.

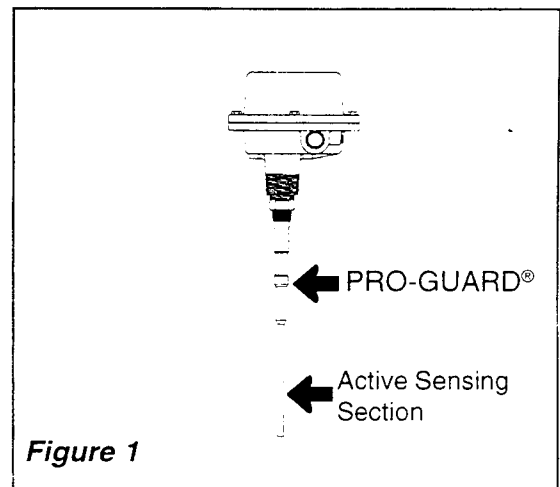
Material coming in contact with the RF probe causes its output relay to change state, thereby indicating material presence to the user.

The RF-11000/RF-12000 utilizes the PRO-GUARD® principle to prevent false indications from material coating. PRO-GUARD® will also prevent alarm errors due to moisture and condensation on the probe. The RF-11000/RF-12000 Series also has the F.E.A.T.™ (Foolproof Externally Activated Tuning) feature which makes calibration easy and accurate.

## 2.0 OPERATING THEORY

The RF-11000/RF-12000 is a relatively low-powered device requiring approximately 4 watts for operation. The power supply can accept 120 VAC or 240 VAC, or 24VDC input power. (All are factory selectable.) A varistor is used to filter out power line transients. A 153.6 KHZ RF oscillator provides the signal which is directed to both the PRO-GUARD and active sensing area of the probe. (See *Figure 1*.)

Detection circuitry compares the signal from the active sensing area to a reference RF signal. Since all materials have dielectric constants (relative permittivity) and conductance values different from air, the impedance of the signal changes when material touches the probe. This change causes a shift in phase of the RF signal. A phase difference between the active signal and reference signal causes output circuitry to operate. An RC-time constant delays the actuation or deactuation of the relay for approximately one second.



*Figure 1*

Sensitivity selection determines how much phase shift is needed before the output relay changes state. Time delay selection determines how much time should elapse after detection until the output relay changes state. Fail-safe selection determines whether the relay energizes or de-energizes when material is present.

## 3.0 SPECIAL FEATURES

The RF-11000 level control has solid-state electronics with an external spring-loaded magnet for calibration. The RF-12000 level sensor uses a "fob" placed over the lights on the lower portion of the electronics enclosure to initiate calibration. When F.E.A.T.™ calibration has been completed, the GREEN "LED" will come ON to verify that proper calibration has taken place. An illuminated RED "LED" indicates that material is at the sensing probe.

Another important feature of the RF-11000 and the RF-12000 is the ability to ignore the effects of coatings that can adhere to the sensing probe. In most applications, a certain amount of the material that is being sensed will adhere to the sensing probe after a period of time. This can be due to the nature of the material itself or to condensed moisture that can cause dry material to bond to the probe's surface.

Bindicator's PRO-GUARD® disregards the effects of probe coating and only indicates that material is present when the actual bulk of material (either dry or liquid) in the bin comes in contact with the probe.

# RF11000/12000 Remote Radio Frequency Probe w/Design Level 2 Electronics

Installation and Operation Manual

4/97 Rev. D LRF180025

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**Important!**

***Do not dispose of the carton or packing material until the unit has been inspected for damage.***

***If the unit is received damaged, notify the carrier or the factory for instructions.***

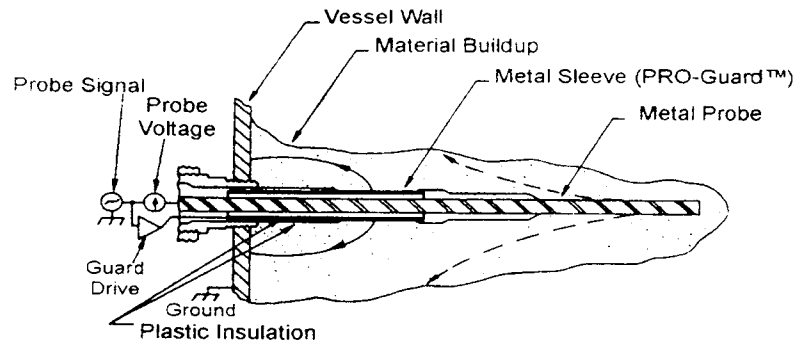
***Failure to do so may void your warranty.***

***Thank you!***



**Figure 2** shows the PRO-GUARD™ probe. The drive current to the PRO-GUARD® electrode is at the same frequency and polarity as the probe. When a coating forms on the probe, the RF current from the PRO-GUARD™ tends to saturate that portion of the built-up material near the wall so that little or no RF current can flow from the probe to the wall. When the actual bulk material in the bin fills to the point where the material is touching the probe, current from the probe will flow around the saturated region and indicate material presence.

**Figure 2**



#### 4.0 SPECIFICATIONS

##### 4.1 Electronics

Line Voltage:	120VAC $\pm$ 15%, 240VAC $\pm$ 15%, 50/60 Hz, 24 VDC
Power:	4 Watts @ 120VAC, 4 Watts @ 24VDC, 5 Watts @ 28VDC
Output Relay:	DP/DT, 5 amps at 115VAC
Temperature Range:	-40° F. to + 160° F. (-40° C. to +71°C.)
Sensitivity Settings:	See section 5.6
Selectable Time Delay:	See section 5.7
Calibration:	F.E.A.T.™ (Foolproof External Activated Tuning)

##### 4.2 Standard Duty Probe

Dimensions:	See Installation Drawing
Mounting:	3/4" NPT - 316 S.S. or 1 1/4" NPT Aluminum
Probe Materials:	316 S. S. and Ryton™*
Probe Temperature:	-100° F. to +450° F. (-73° C. to +232° C.)
Pressure:	150 psi (10.5 Kgs/cm <sup>2</sup> )

\*Trademark of Phillips Chemical Company, Subsidiary Phillips Petroleum

##### 4.3 Heavy Duty Probe

Dimensions:	See Installation Drawing
Mounting:	3/4" NPT - 316 S.S. or 1 1/4" NPT Aluminum
Probe Materials:	316 S. S. and Ryton™ *
Probe Temperature:	-100° F. to + 450° F. (-73° C. to +232° C.)
Pressure:	150 psi (10.5 Kgs/cm <sup>2</sup> )

##### 4.4 Stub Probe

Dimensions:	See Installation Drawing
Mounting:	3/4" NPT - 316 S.S. or 1 1/4" NPT Aluminum
Probe Materials:	316 S. S. and Polysulfone
Probe Temperatures:	-30° F. to +300° F. (-34° C. to +149° C.) Continuous
Pressure:	150 psi (10.5 Kgs/cm <sup>2</sup> )

#### **4.5 Food Grade Probe - Threaded Connector**

Dimensions: See Installation Drawing  
Mounting: 3/4" NPT - 316 S.S. or 1 1/4" NPT Aluminum  
Probe Materials: 316 S. S. with Polysulfone  
Probe Temperatures: -30° F. to + 300° F. (-34° C. to +149° C.) Continuous  
Pressure: 150 psi (10.5 Kgs/cm<sup>2</sup>)

#### **4.6 Food Grade Probe - Sanitary Connector**

Dimensions: See Installation Drawing  
Mounting: Mates with Size 1 Cherry Burrell "S" Line® or Ladish Tri-Clamp®  
Probe Materials: 316 S. S. with Polysulfone  
Probe Temperatures: -30° F. to +300° F. (-34° C. to + 149° C.) Continuous  
Pressure: 150 psi (10.5 Kgs/cm<sup>2</sup>)

#### **4.7 Standard Duty - Kynar® Coated**

Dimensions: See Installation Drawing  
Mounting: 3/4" NPT Teflon® Coated Connector  
Probe Materials: 316 S. S. and Ryton® Coated with Kynar®  
Probe Temperatures: -100° F. to +250° F. (-73° C. to +121° C.)  
Pressure: 50 psi (3 Kgs/cm<sup>2</sup>)

#### **4.8 Heavy Duty - Kynar® Coated**

Dimensions: See Installation Drawing  
Mounting: 3/4" NPT Teflon® Coated  
Probe Materials: 316 S. S. and Ryton® Coated with Kynar®  
Probe Temperatures: -100° F. to +250° F. (-73° C. to + 121° C.)  
Pressure: 50 psi (3 Kgs/cm<sup>2</sup>)

\*Trademark of Pennwalt

\*\*Trademark of DuPont

#### **4.9 Flush Probe/Dome Flush Probe**

Dimensions: See Installation Drawing  
Mounting: 9/32" Dia. Hole on 7 7/16" Bolt Circle - 6 Places  
Probe Materials: 316 S. S. and epoxy  
Probe Temperature: -30° F. to +200° F. (-34° C. to +93° C.) Continuous  
-30° F. to +250° F. (-34° C. to +121° C.) Intermittent  
Pressure: 50 psi (3 Kgs/cm<sup>2</sup>)

**Note: Not for use in liquid service**

#### **4.10 Ceramic Probe**

Dimensions: See Installation Drawing  
Mounting: 1 1/4" NPT  
Probe Materials: 304 S.S. and ceramic  
Probe Temperature: -40° F. to +1000° F. (-40° C. to +537° C.)  
Pressure: 30 psi (2 Kgs/cm<sup>2</sup>)

#### **4.11 UL Listed Explosionproof, FM & CSA Approved Explosionproof**

Dimensions: See Installation Drawings

Various RF models are available which have been "Listed" as complete assemblies by Underwriter Laboratories or FM & CSA approved for use in Class I, Div. I, Groups C & D and Class II, Div. I, Groups E, F, & G atmospheres.



To be Listed by UL and approved by FM & CSA these units must contain special intrinsic safety barriers to limit the amount of energy on the probe itself in the event of a failure in the electronics. UL, FM and CSA also requires a special assembly of the probe to the electronic housing. Because of this special probe seal, the Explosionproof Models are dimensionally different from the General Purpose Units.

The same dimensional difference exists for Coated Standard, Food, Stub, and Coated Heavy Duty. No dimensional difference exists for the Flush Probe units.

**Note:** *On explosionproof units, an approved conduit seal fitting must be installed within 18 inches of conduit opening.*

## **5.0 INSTALLATION**

### **5.1 Probe Location and Mounting**

The probe should be located out of the direct flow of material into the vessel. Protective shields or an offset mounting procedure may be required. Please consult the factory for special mounting problems.

**CAUTION:** *When mounting explosionproof units, never adjust the orientation of the probe or probe housing by turning the housing section. This will break internal wires and permanently damage the probe.*

For tightening units with threaded bin connections, the unit must be positioned by using a wrench on the bin connector. Wrench size required is 1 1/16" with open end.

For "Flush Mount" probe units, the position must be adjusted by removing the mounting bolts and moving the entire probe and housing.

### **5.2 Electronics Location and Mounting**

Field wiring should conform to the requirements of the National Electrical Code and any other agency or authority having jurisdiction over the installation.

**Note:** *Maximum cable distance from electronics to the probe on General Purpose Units cannot exceed 75 feet (23m). Maximum cable distance from electronics to the probe on Explosionproof units cannot exceed 50 feet (15.24m).*

### **5.3 Probe Installation & Hookup**

Field wiring should conform to the requirements of the National Electrical Code and any other agency or authority having jurisdiction over the installation. On multiple installation, the coaxial cable must remain separated in individual conduits and raceways. After mounting probe, make sure there is a good electrical connection between process connection and vessel wall. **Refer to the drawings listed in Section 6.0 for proper installation, hookup and wiring instructions for your unit.**

**Note:** *Use caution when preparing all wires for connection to terminal block. Strip the insulation a maximum of 1/4 inch (6mm) or use insulated ferrules such as Altech 8969.0 or Altech 2206.0 to prevent shorting of conductors. Tighten screws in terminal block to 4 in/lbs.*

### **5.4 Electronics Installation and Hookup**

Refer to Drawings Listed in Section 9.0 for proper wiring and hookup instructions.

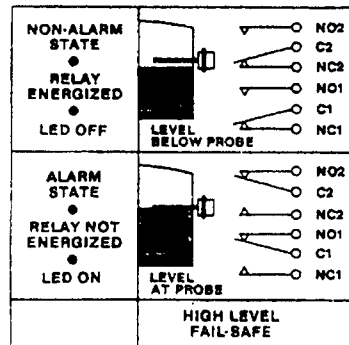
**Note:** *Cut remote cable to appropriate length. Do not coil excess cable. Do not wrap excessive cable around electronics in or out of the enclosure.*

### 5.5 Fail-Safe Selection

The RF-11000/RF-12000 are shipped from the manufacturer in the high level fail-safe condition. High Level Operation - If the electrical power fails, the relay turns off. This indicates material as if the tank were full. **Contact Indicator if Low Level Failsafe is required.**

#### High Level Failsafe

- Material Present - Red Alarm LED Light **ON**  
- Relay Off
- No Material Present - Red Alarm LED Light **OFF**  
- Relay On



### 5.6 Sensitivity Setting

Due to variations in material characteristics, correct sensitivity selection is critical to assure proper unit operation. This can be field programmable to one of the eight predetermined settings. (See **Figure 4**).

- High Sensitivity                      Hard to detect materials such as plastic pellets, light powders, dry grains
- Med. Sensitivity                      Most dry or liquid materials such as cement, petroleum products, flour
- Low Sensitivity                        Most liquid solutions such as aqueous solutions, acids

**Note: The RF-11000/RF-12000 is shipped from the manufacturer in the medium sensitivity condition. Selection is made by changing the Dip Switch settings.**

- Switch 1 off and switch 2 off and switch 3 off = 1.0 pF High
- Switch 1 on and switch 2 off and switch 3 off = 1.5 pF
- Switch 1 off and switch 2 on and switch 3 off = 2.0 pF
- Switch 1 on and switch 2 on and switch 3 off = 3.0 pF Medium
- Switch 1 off and switch 2 off and switch 3 on = 10.0 pF Low
- Switch 1 on and switch 2 off and switch 3 on = 12.0 pF
- Switch 1 off and switch 2 on and switch 3 on = 14.0 pF
- Switch 1 on and switch 2 on and switch 3 on = 15.0 pF Low/Low

### 5.7 Time Delay

When the RF-11000/RF-12000 is used in liquid or agitated material where material movement could cause false or premature level indication, an increased time delay selection may be desirable.

**Note: The RF-11000/RF-12000 is shipped from the manufacturer in the minimum time delay condition. Increased time delay selection is made by changing the Dip Switch setting.**

- Switch 1 off and switch 2 off = 1 second minimum
- Switch 1 on and switch 2 off = 2 seconds
- Switch 1 off and switch 2 on = 4 seconds
- Switch 1 on and switch 2 on = 7 seconds maximum

## 5.8 Calibration

**CAUTION: MATERIAL MUST BE WELL BELOW PROBE BEFORE CALIBRATION PROCEDURE BEGINS.**

- # 1. If external calibration is attempted when material is in contact with the probe, the unit will not calibrate.
- # 2. If the unit is calibrated with the internal calibration button when material is at the probe, the unit will not be able to sense the presence of material.

Prior to operation, the RF-11000/12000 level control must be calibrated without material present in order to match the operating characteristics of the vessel.

The unit may be calibrated at the electronics either by internal or external means.

## 5.9 External Calibration

### RF11000 Electronics Units

The cover should be securely in place on the remote probe, as well as, the electronics and the red LED on the electronics enclosure must be off. (The external calibration feature is disabled if the unit is in the alarm state.) Momentarily depress the external spring-loaded calibration switch so the magnet makes contact with the side of the electronics enclosure for about two seconds, then release the switch.

When calibration is initiated the green LED will go out - if not already out. When calibration is complete the green calibration LED will come on and stay on. If the red LED is on, verify that material is not at the probe and calibrate internally. (**Section 5.10 for Internal Calibration**)

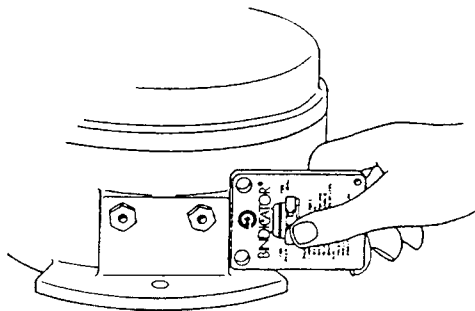
### RF12000 Electronics Unit

The RF-12000 models have a "fob" calibration, simply place the "fob" over the decal labeled "CAL" located on the side of the electronics enclosure for about two seconds, then remove. (See **Figure 3** below)

When calibration is initiated the green LED will go out - if not already out. When calibration is complete the green calibration LED will come on and stay on. If the red LED is on, verify that material is not at the probe and calibrate internally. (**Section 5.10 for Internal Calibration**)

**Figure 3**

(Printed instructions are located on the "fob")



## 5.10 Internal Calibration

The magnetic calibration feature will not allow the sensor to be calibrated when the sensor is in the alarm condition. However, the sensor can be calibrated in the event it is in the alarm condition because of excessive material build up on the sensing probe. To calibrate the sensor in this condition, simply remove the cover and momentarily press the internal calibration button. Immediately upon pushing the button, the **green** calibration LED will go out - if not already out. When calibration is complete, the **green** calibration LED will come on, and stay illuminated. Recalibrate any unit whose green LED is off.

**Note: Calibration for either of the above methods should be completed within 2 to 25 seconds. The unit cannot be considered calibrated if the green led comes on immediately. Consult the factory if calibration is not within the specified time. Red alarm LED should be off when calibration is completed.**

### 5.11 Blinking Green Calibration LED

A new feature of the Design Level 2 (DL2) electronics is the ability to differentiate between a failure in the calibration setting, and a slight change in the sensitivity/calibration that may be caused by changes over time in temperature, material coating, & normal electronics drift.

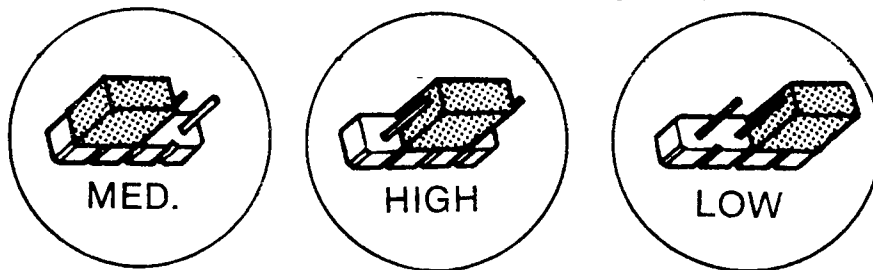
- When the green calibration LED is illuminated continuously, it indicates that the unit is at perfect or near perfect calibration.

**Note:** *The green calibration LED will also remain on if unit has failed in "Failsafe High" mode or whenever unit is in alarm.*

- When the green calibration LED is blinking on & off at approximately 2 times per second, it indicates the unit is no longer at "perfect calibration", but has changed slightly. In most cases, this small change will not effect the ability of the unit to sense the material when it comes in contact with the probe. Recalibrate the unit at a convenient time if desired.
- When the green calibration LED is off - (Non-Illuminated), it either indicates a failure in the calibration, or change in material coating on the probe. Recalibrate the unit as soon as possible. Contact Bindicator if this condition happens periodically.

### 5.11 Function Test

The "Function Test" feature is now standard on all Design Level 2 units. Set the "Function Test" Selection jumper to the same setting as the "Sensitivity Selector". (Example: If the Sensitivity is "High" then position the "Function Test" jumper to the middle position. If the "Sensitivity Selector" was set between High and Medium, then set the "Function Test" in the medium position. If the "Sensitivity Selector" was set between Medium and Low, set the "Function Test" in the Low position. (see **Figure 4**).



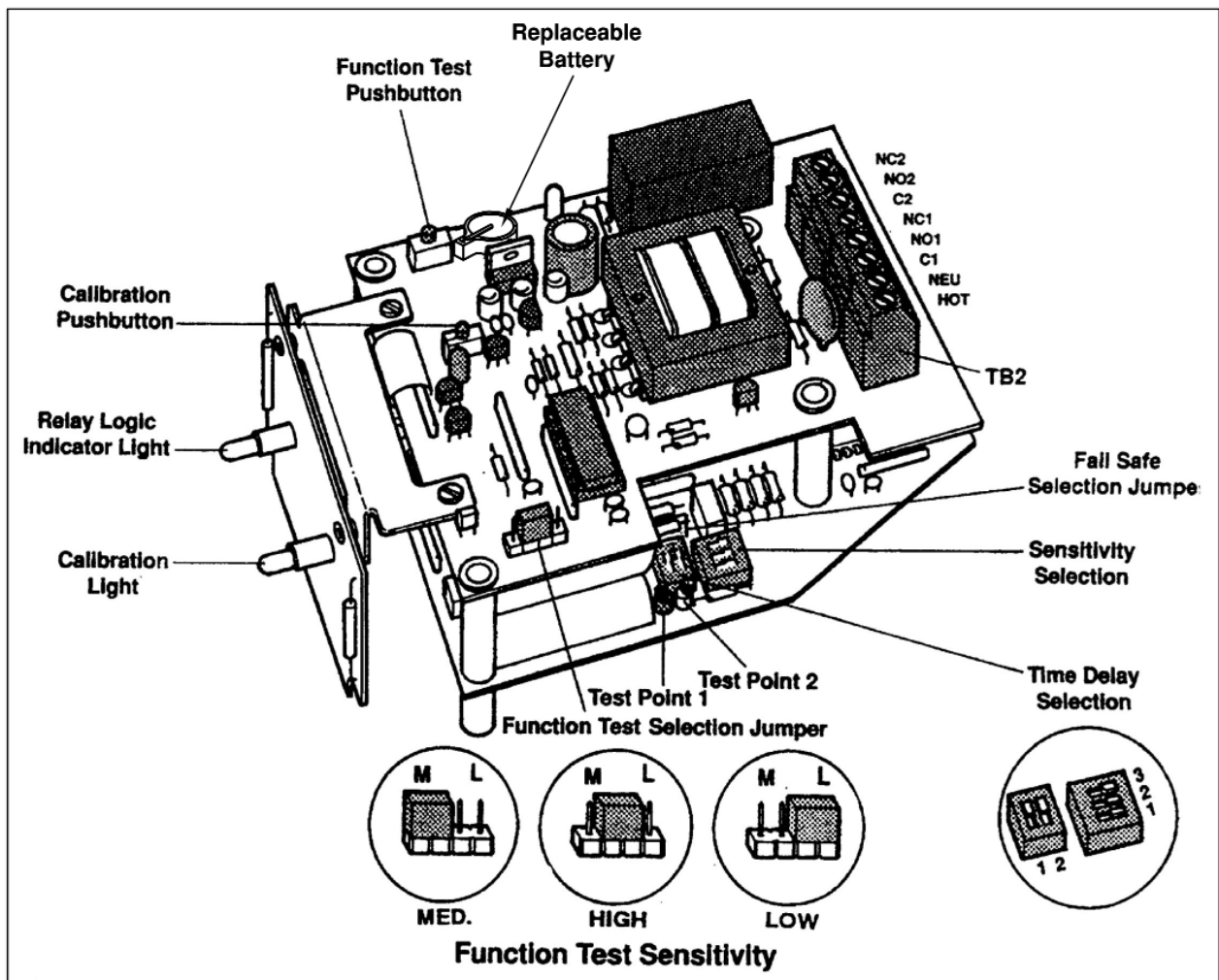
Placing the fob in the test position will initiate a "Function Test" of the unit. This test is only practical when material level is well below the probe.

If the unit is in calibration and capable of sensing material at the probe, the output relay will go into the alarm state and the red LED will light when the fob is placed over the decal labeled "TEST" located on the outside of the enclosure of the electronics unit. This test can also be initiated internally by pushing the "Function Test Push-button". (see **Figure 4**)

## Maintenance Note

A replaceable coin-type lithium battery is used to help maintain calibration data in the RF electronic unit. Recommended maintenance is replacement after every 3 years of operation. The battery is located on the Power Printed Circuit Board Assembly, just under the corner of the Light Printed Circuit Board Assembly. (See Figure #3) To remove, simply lift the edge of the battery and slide it from the holder. To replace, slip the new battery in under the contact arm until the new battery is firmly seated into the holder. As replacement, use ONLY lithium coin-type battery #CR1620 (Bindicator part # LUC036952).

**Figure 4**  
*(Electronic Unit with Function Test)*

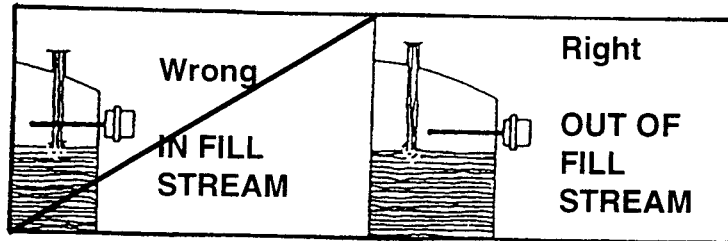


## 6.0 TROUBLE SHOOTING

### 6.1 Installation Errors

Probe should be located out of the direct flow of material while the vessel is being filled. (See **Figure 5**.)

**Figure 5**



Unit should be mounted with the conduit opening down and located, if possible, higher than the conduit raceway. This will eliminate the possibility of moisture settling in the conduit outlet box. If the conduit is higher than the unit, provide a conduit loop under the conduit outlet box with a conduit drain fitting.

Mounting the probe in a nozzle or location where material bridges excessively may cause false indication. The probe should be mounted so material does not buildup excessively over the PRO-GUARD® area of the probe. (See **Figure 1**.) If the probe is mounted in a nozzle or nipple, the PRO-GUARD® area must be inside the vessel.

Vertical mounting reduces bridging problems. If material to be sensed is of a nature where a buildup will continue to grow on the probe, vertical mounting is necessary.

### 6.2 Application Errors

#### A *Extreme Material Buildup*

Use in materials where a continually, growing buildup of a conductive material will occur should be avoided. The PRO-GUARD® will prevent false indication from material coating and condensation, but a continually, increasing buildup will eventually exceed even the PRO-GUARD capability.

#### B *Highly Corrosive Materials*

Wetted probe parts consist of 316 S.S. and Ryton® (or applicable material according to selected probe.) The conduit outlet box is constructed in aluminum. If you believe the materials in contact with the probe or mounting may cause corrosion with aluminum, Ryton or 316 S. S. , consult the factory.

#### C *Extremely Light and Dry Materials*

Use in very light materials (less than 30 lbs./cu. ft.) and very dry, non-conductive materials (less than 3% moisture) may require higher sensitivity electronics or sensitivity attachments to the probe.

## 7.0 FACTORY ASSISTANCE

If attempts to locate any difficulties with the unit fail, notify your local factory representative. To help solve your problem quickly, please have as much of the following information as possible:

- Model Number
- Date Purchased
- Brief application information such as, material to be detected, approximate vessel size and location of unit(s) in the vessel.
- Brief description of the problem such as, fails to detect material, or intermittent false alarms.
- What investigation has been performed by the user and what was discovered.

If your local representative is unable to determine the cause of your difficulty, they will refer you to a factory engineer. Equipment shipped back to the factory without proper authorization will be refused and returned at the shipper's expense.

## 8.0 WARRANTY & PARTS

### 8.1 Warranty

Refer to Manufacturer's General Terms and Conditions of Sale for Warranty information, on the inside back cover of this manual.

### 8.2 Replacement Electronics

Replacement electronics are readily available for your RF model. There are 2 methods to determine the correct part # for the electronic unit.

1. Call Bindicator Customer Service department with the model number of your unit. They will search our computer Database and advise you of the part number.
2. Find the serial number located on the bottom side (where the probe wires connect ) of the electronic unit. The serial number is written with black permanent marker. The first three digits of the serial # are the last three digits of the part #. Just add the prefix LRF110 to these three numbers and you have the part number.

**EXAMPLE:** Serial # reads 302-9326-05 Part Number is LRF110302.

### 8.3 Parts List

The RF-11000/RF-12000 is designed to give years of unattended service. No scheduled maintenance or service parts are required.

## 9.0 DRAWINGS

<u>Drawing No.</u>	<u>Description</u>
LRF110025	Probe Cable Term. Ext/Lag. Assy.
LRF180106	Probe Accessory
LRF180128	GP Remote Probe - Installation and Hookup
LRF180130	Type "S" Mounting
LRF180136	XP Remote Probe - Installation and Hookup
LRF180137	Extended Remote Probe
LRF180138	Probe with Type "A" Mounting
LRF180139	Remote Probe UL XP
LRF180140	UL XP w/type "S" Mounting
LRF180141	Remote Flush GP/XP
LRF180142	Remote Stub Probe GP with Type "A" Mounting
LRF180143	Remote Dome Flush Probe GP & XP
LRF180144	Lagged Remote Probe GP & XP
LRF180145	Dimensions Electronics Enclosure
LRF180146	Remote Ceramic Probe
LRF110028	Remote Cable Termination Assembly

## 10.0 MODEL SELECTION FOR DESIGN LEVEL 2 UNITS

### 10.1 RF-11000 & RF-12000 Remote Unit - Electronics

RF1 - - E - - - -

Voltage  
1 = 120VAC  
2 = 240VAC  
3 = 24VDC  
4 = 12VDC  
5 = 24VAC  
6 = 48VAC

Enclosure Type  
G = General Purpose NEMA 4/5 (See Note 2)  
X = Explosionproof NEMA 7, 9 (See Note 3)  
B = Explosionproof NEMA 7, 9 (See Note 3)

Probe Requirement  
1 = Single Probe  
2 = Dual Probe

Electronics  
C = Standard Sensitivity With Function Test  
D = Sensitivity Modification (.5pF) With Function Test  
K = Standard Sensitivity For Type 7 Probe Only

Electronic Unit (Probe & Cable Are Separate Items)

Type Of Calibration  
1 = External Spring Calibration With Cal. & Alarm LED's  
2 = "Fob" Calibration With Cal. & Alarm LED's (See Note 1)

RF-11000/RF-12000 Radio Frequency Types Series

- Note 1. External calibration "fob" must be ordered as a separate part (LRF130115)
- Note 2. The total length of cable can not exceed 75 feet (23m) from the electronics.
- Note 3. Maximum cable distance between electronics and probe on explosionproof units is 50 feet (15.24m)



## 10.2 RF-11000 & RF-12000 Remote Unit - Probes

RF10 - P - - - - 1 - \_\_\_\_ (See Note 1 Below)

Enclosure Material

1 = Aluminum, Standard

Enclosure Type

G = General Purpose

X = Explosion proof (See Note 5 and 6)

Probes

0 = Standard Probe

1 = Standard Probe - Kynar® Coated

2 = Food Grade Probe

3 = Ceramic Probe (See Note 7)

4 = Stub Probe (See Note 8)

5 = Heavy Duty Probe

6 = Heavy Duty Probe - Kynar® Coated

7 = Dome Flush Probe (Configuration "A" only) (See Note 9)

8 = Flush Mounted Probe (Configuration "A" only)

A = Armored Food Grade (Configuration "A" only)

Configuration

A = Standard with 3/4" and 1 1/4" threaded connector (See Note 4)

B = Pipe Extended Probe - Stainless Steel Parts (See Notes 2 and 4)

C = Pipe Extended Probe - Plated Parts (See Notes 2 and 4)

D = Lagged Probe - St. Connector/Plated Coupling (Note 3 and 4)

S = Sanitary Connector

Remote Probe Assembly (Electronics Are Ordered Separately)

### RF-11000 & RF-12000 Radio Frequency Type Series

- Note 1: For 3A Sanitary Certification add "3A" at the end of the Model Code. Configuration "S" must be used and either Type "2" Food Grade Probe or "Type 4" Stub Probe.
- Note 2: Order Extensions as a separate item.
- Note 3: Order Lagging as a separate item.
- Note 4: Order Remote Cable as a separate item.
- Note 5: Units have been Listed as a complete assembly by UL for use in Class I, Div. 1, Groups E, F, and G. These probes contain intrinsic safety barriers and can only be used with electronics which are designated explosionproof, even if the electronics are in an area that is non-hazardous
- Note 6: Consult factory to see if the specified assembly configuration is included in the agency's Listing or Approval.
- Note 7: Available with "D" configuration only and comes with 7 1/2" lagging only.
- Note 8: Consult factory when using in solid, dry materials where active probe length must be reduced or special configurations are required.
- Note 9: Thickness of probe must be specified: 3/8", 1/2", 5/8" or 3/4" wall thickness.

### 10.3 RF-11000 & RF-12000 Remote Unit - Cable and Lagged Probe Information

Remote Cable Assembly - Factory Assembled

RFC -

Length In Feet

Cable Type

A = High Temperature (+450° F.) (+232° C.)

B = Low Temperature (+160° F.) (+71° C.)

Remote Cable Model Assembly

**Special Note:** Individual conduit is required for each cable. **DO NOT INSTALL MORE THAN ONE CABLE** in a conduit or raceway or along with other conductors. The maximum distance between the electronics and probe on explosionproof units is 50 feet (15.24m) and on general purpose units it is 75 feet (23m).

### 10.4 Bulk Cable - Unterminated

Product Code

Description

LUC035208

Low Temperature (+160° F.) (+71° C.)

LUC035209

High Temperature (+450° F.) (+232° C.)

LRF110039

Termination Kit

### 10.5 Lagging Model Assembly

RFL -

Pipe Lagging Length In INCHES

Material Designation

A = Galvanized Pipe - High Temperature Cable

B = Galvanized Pipe - Low Temperature Cable

Lagging Model Assembly (If over 6" pipe) (15.24 cm pipe)

### 10.6 Probe Extension Information

RFE -

Extension Length In INCHES

Material

A = Galvanized Pipe - High Temperature Cable (+450° F.) (+232° C.)

B = Galvanized Pipe - Low Temperature Cable (+160° F.) (+71° C.)

C = 316 S. S. Pipe - High Temperature Cable (+450° F.) (+232° C.)

D = 316 S. S. Pipe - Low Temperature Cable (+160° F.) (+71° C.)

Extension Model Assembly

Note 1. Max. probe temperature on pipe extended models cannot exceed 300° F. (148° C.)

Note 2. Pipe extended models can mount only in a 1 1/4" NPT coupling.

Note 3. Because the pipe extended unit is mounted in 1 1/4" NPT coupling, the maximum pressure rating is 50 psi (10 Kgs/cm<sup>2</sup>)

FIGURE 1 (BOTH ENDS)

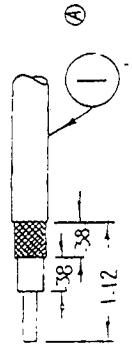


FIGURE 3 (BOTH ENDS)

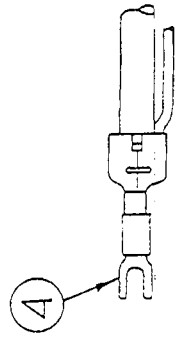


FIGURE 2

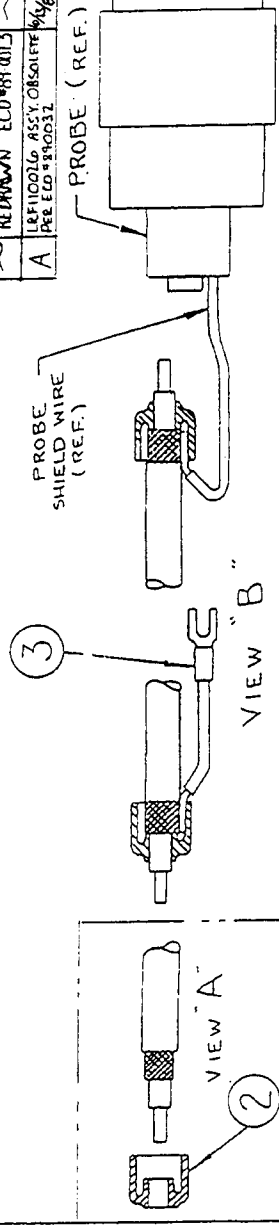
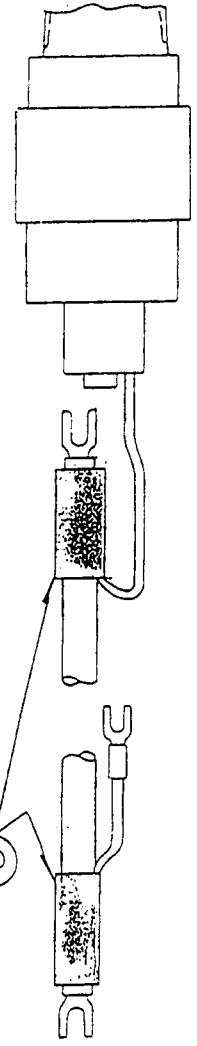


FIGURE 4 (BOTH ENDS)



**INSTRUCTIONS**

- 1) CUT CABLE (ITEM #1 OR #6) TO LENGTH SPEC. ON ORDER.
- 2) STRIP BOTH ENDS OF CABLE AS SHOWN IN FIGURE 1.
- 3) INSERT FERRULE (ITEM #2) ON THE CABLE AS SHOWN IN FIGURE 2, TYP. BOTH ENDS. INSERT SHIELD WIRE ASSY (ITEM #3) ON ONE END OF CABLE. CUT SHIELD WIRE COMING OUT OF PROBE TO 3 1/2" LONG & STRIP END. INSERT THIS WIRE ON OPPOSITE END OF CABLE. CRIMP BOTH ENDS USING AMP TOOL 59500 WITH INSERT 47066-3.
- 4) INSERT TERMINALS (ITEM #4) ON CENTER CONDUCTOR OF CABLE (BOTH ENDS). CRIMP USING HAND CRIMP OR RATCHET TOOL. SEE FIG. 3.
- 5) PLACE SHRINK TUBE (ITEM #5) OVER CABLE ENDS AS SHOWN IN FIGURE 4. HEAT SHRINK AT LESS THAN 250°F FOR AT LEAST 30 SECONDS.

DO NOT SCALE DIMENSIONS ARE IN INCHES

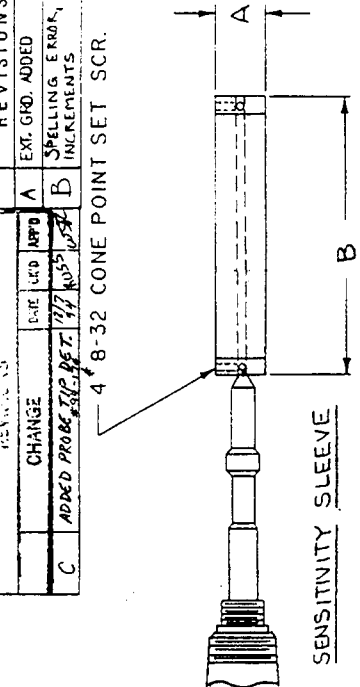
MATERIAL		FINISH		NEXT ASSY.	
BINDERATOR®		PORT HURON, MICHIGAN 48060		TITLE	
PROBE CABLE TERMINATION		EXT. 1-LEG. ASSYS		SCALE	
NONE		NONE		SIZE	
.6		LRF1100 25		PREVIOUS	
LRF1100 25		LRF1100 25		DATE	
8 MAR 69		5 MAR 69		DATE	
MEAL		APPROVED		DATE	
DET. RECD. SHT		DESCRIPTION		MAT. OR PART	
1		A.R. CABLE - COAXIAL		LW032120	
2		FERRULE		LW030340	
3		ASSY - SHIELD WIRE		LW035210	
4		TERMINAL STA-KON		LW035210	
5		SHRINK TUBING 20"		LW035210	
6		CABLE HI STABILITY COAXIAL		LW035209	

ASSY N°	DETAILS	DESCRIPTION
LRF110025	1 THRU 5	CABLE TERMINATION ASSY
LRF110026	2 THRU 6	HI-TEMP CBL. TERM. ASSY.

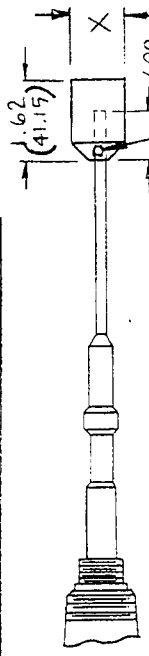
REV.	DESCRIPTION	DATE	APP'D
1	REVISION	ECO # 81 0113	
2	REVISION	ECO # 81 0113	
3	REVISION	ECO # 81 0113	
4	REVISION	ECO # 81 0113	
5	REVISION	ECO # 81 0113	
6	REVISION	ECO # 81 0113	

REVISIONS		EXT. GRD. ADDED	DATE	CHK'D	APP'D
C	ADDED PROBE TIP RET. 1/17/88	A	11/17/88	RL	RL
B	ADDED PROBE TIP RET. 1/17/88	B	11/17/88	RL	RL

4 # 8-32 CONE POINT SET SCR.

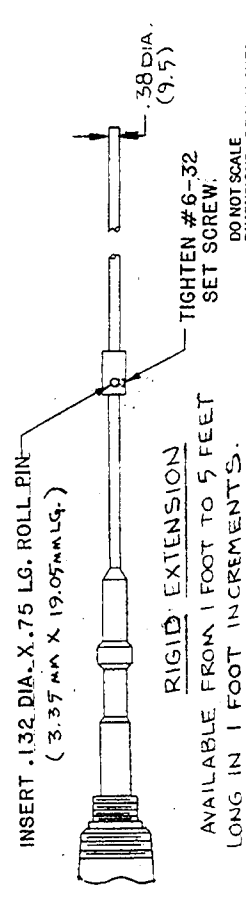
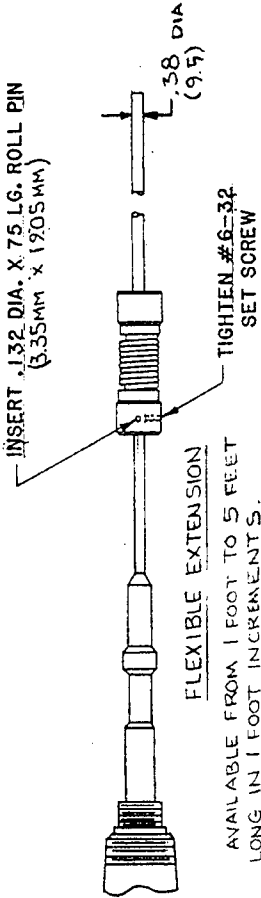
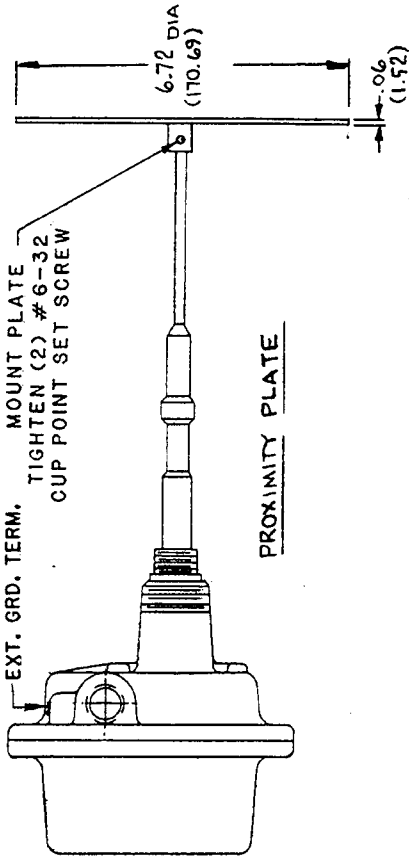


DESCRIPTION	A DIM.	B DIM.
3/4 MOUNT STD. PROBE	.75 (19)	8.31 (211)
1/4 MOUNT STD. PROBE	1.375 (34.92)	8.31 (211)
3/4 MOUNT H.D. PROBE	.75 (19)	7.56 (192)
1/4 MOUNT H.D. PROBE	1.375 (34.92)	7.56 (192)



* X" DIM	3/4 MOUNT	1/4 MOUNT
	.875 (22.22)	1.12 (28.45)

2 # 8-32 CONE POINT SET SCREW



DO NOT SCALE DIMENSIONS ARE IN INCHES

DRAWN		CHECKED		APPROVED		MATERIAL	
DATE	12-11-88	DATE	12-11-88	DATE	12-11-88	SIZE	SCALE
BY	BOB	BY	BOB	BY	RANDY	PART OR DRAWING	PREVIOUS
ANGLES	1/16"	DEBURR & BREAK	EXPIRES	ADJ.	12-11-88	12-11-88	12-11-88
UNSPECIFIED TOL. DECIMALS XX.1				PART OR DRAWING			
MATERIAL				TITLE			
FINISH				MANUAL DRAWING			
MATERIAL				PROBE ACCESSORIES			
MATERIAL				SCALE			
MATERIAL				NONE			
MATERIAL				SIZE			
MATERIAL				B			
MATERIAL				LRF180106			

**BINDICATOR®**  
PORT HURON, MICHIGAN 48130

REF.

10804

REVISIONS		DATE	CHK'D	APP'D
A	NOTE 5 ADDED PER ECO 95-065 AC	6/9 95	WJR	RB
B	GUARD AND GROUND REVERSE PER ECO 95-111 AC	7/96	[Signature]	[Signature]

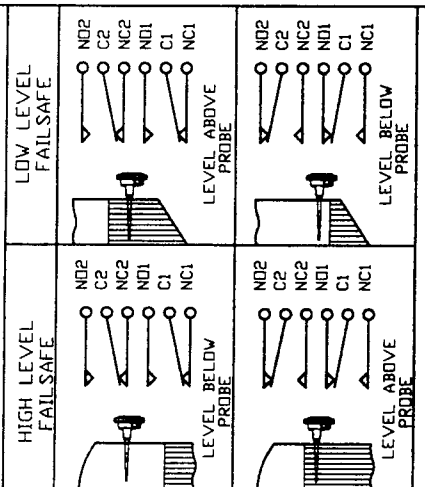
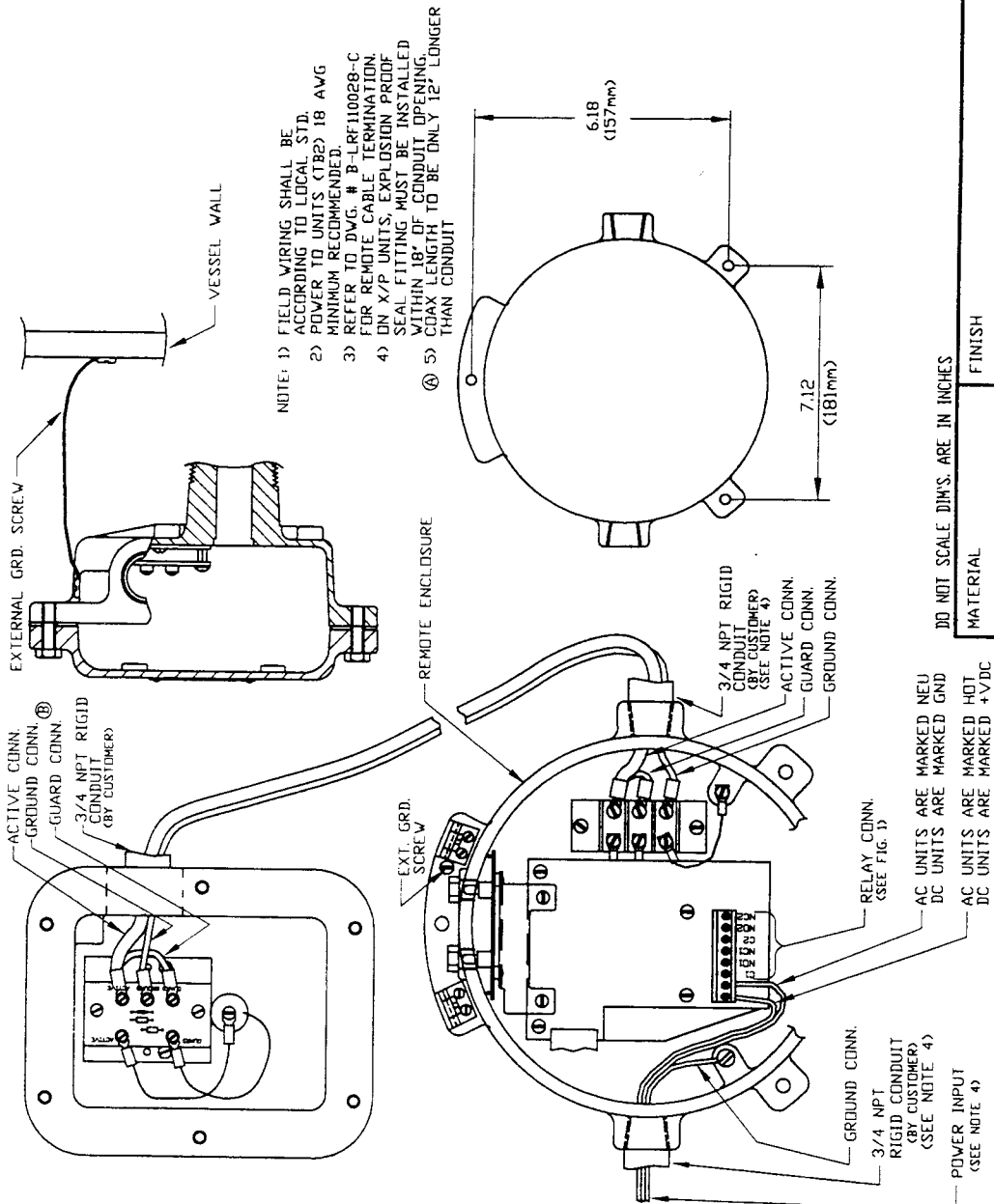


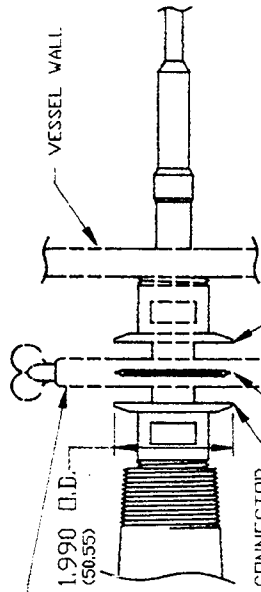
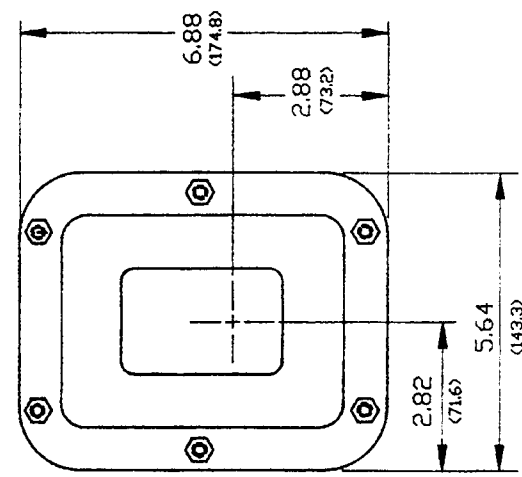
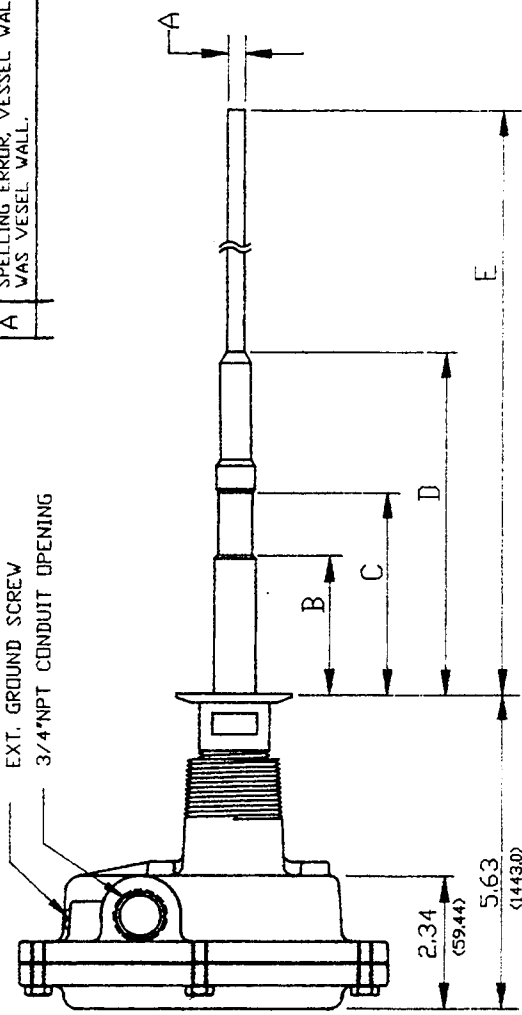
FIGURE 1

DET.	REQD	SHIT	DESCRIPTION		MATERIAL PART	
UNSPECIFIED TO:	DRAWN	CHECKED	HEVELT	APPROVED	PROD:	
DECIMALS 4;	NEAL	RE	RE	RE	RB	
ANGLES XXX.0;	DATE	DATE	DATE	DATE	DATE	
DIMS. 1/16;	2/26/93	1/14/94	1/14/94	1/14/94	1/14/94	
BREAK	SCALE	SIZE	PART OR DRAWING			
EDGES .005	NONE	B	LRF180128			

**BINDICATOR®**  
 PORT HURON, MICHIGAN 48060

TITLE  
 RF11000/12000 GP REMOTE PROBE CUSTOMER  
 INSTALLATION/HOOKUP DWG DL2 E/ZU

REVISIONS		DATE	BY	APP'D
A	SPELLING ERROR, VESSEL WALL WAS VESEL WALL.	11/12/93	TR	[Signature]



13MMHM CAST CLAMP SIZE 1-1/2 CHERRY BURRELL 'S' OR LADISH TRI-CLAMP. (CUSTOMER SUPPLIED)

1.990 O.D. (50.55)

VESSEL WALL

L14AM7 BUTT WELDING FERRULE SIZE 1 X .870 I.D. CHERRY BURRELL 'S' OR LADISH TRI CLAMP. (CUSTOMER SUPPLIED)

40 MP-G TEFLON GASKET SIZE 1 X .875 I.D. CHERRY BURRELL 'S' OR LADISH TRI-CLAMP. (CUSTOMER SUPPLIED)

DO NOT SCALE DIM'S. ARE IN INCHES  
BRACKETED DIM'S ARE IN MM.

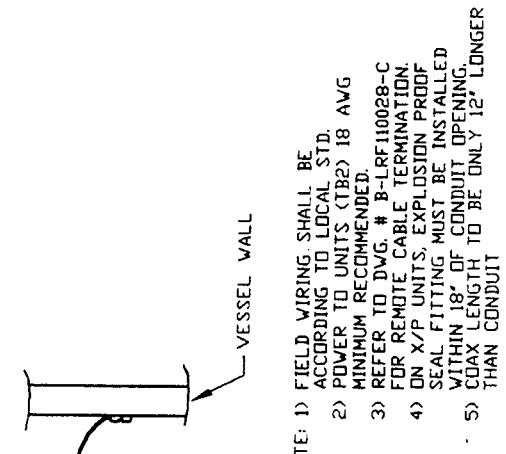
E	14.25 (362)	14.25 (362)	STUB
D	6.00 (152.4)	2.75 (69.9)	
C	3.62 (91.95)	2.00 (50.8)	
B	2.38 (61.5)	1.50 (38)	
A	.31 DIA. (8)	.31 DIA. (8)	
APPROX DIM'S	FODDGRADE		

DET. REQUEST	DESCRIPTION	MATERIAL PART
ISSUED BY: NEAL	CHECKED: RTR	APPROVED: WASHKREYCH RB
DATE: 8/17/93	DATE: 8/18/93	DATE: 8/18/93
SCALE: NONE	SIZE: B	PART OR DRAWING: LRF180130

MATERIAL	FINISH	TITLE	MANUAL DRAWING REMOTE
		PROBE W/TYPE 'S' MOUNTING	

BINDICATOR®  
PORT HURON, MICHIGAN 48060

REVISIONS		DATE	CHK'D	APP'D
A	NOTE 5 ADDED PER ECO 95-065 AC	6/95		



- NOTE: 1) FIELD WIRING SHALL BE ACCORDING TO LOCAL STD. 2) POWER TO UNITS (TB2) 18 AVG MINIMUM RECOMMENDED. 3) REFER TO DWG. # B-LRF110028-C FOR REMOTE CABLE TERMINATION. 4) ON X/P UNITS, EXPLOSION PROOF SEAL FITTING MUST BE INSTALLED WITHIN 18" OF CONDUIT OPENING. 5) COAX LENGTH TO BE ONLY 12" LONGER THAN CONDUIT

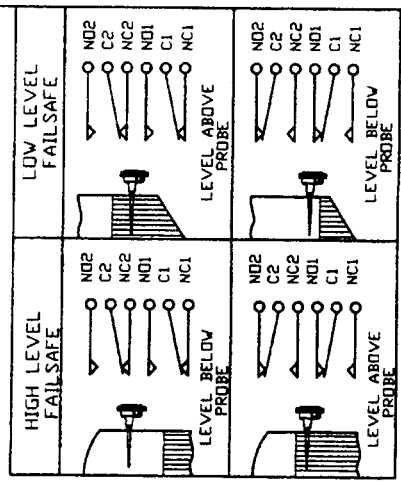
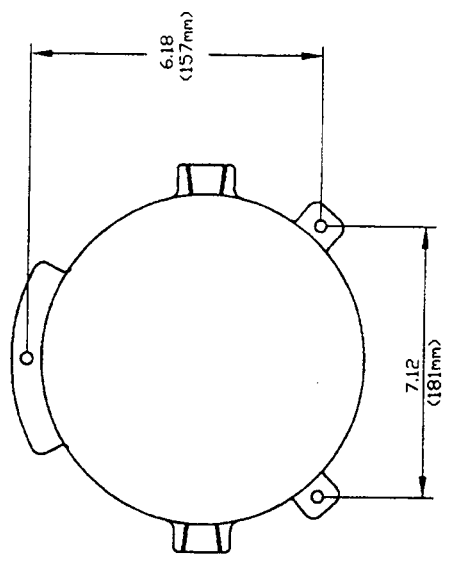
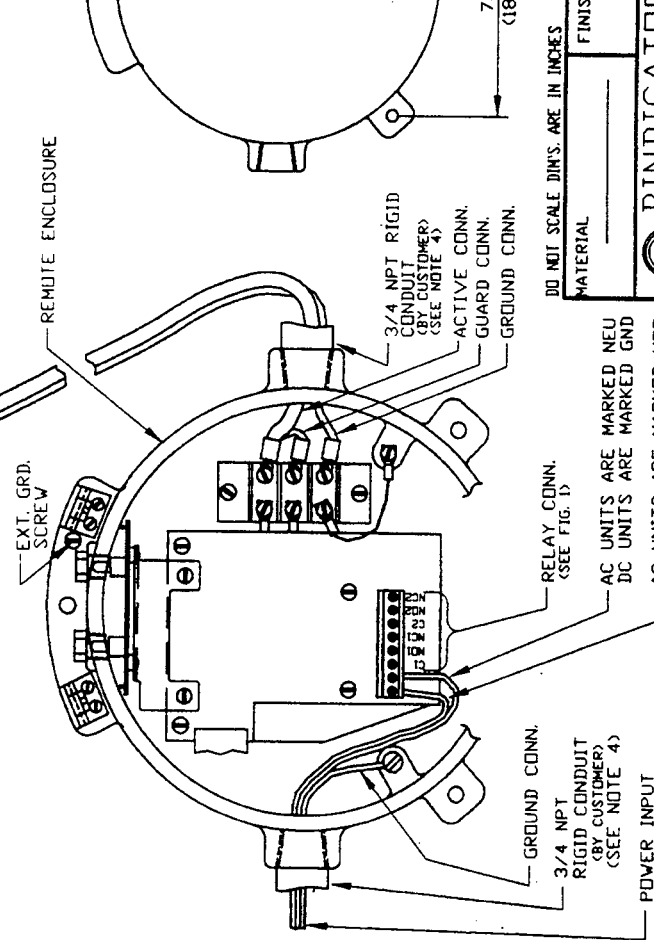
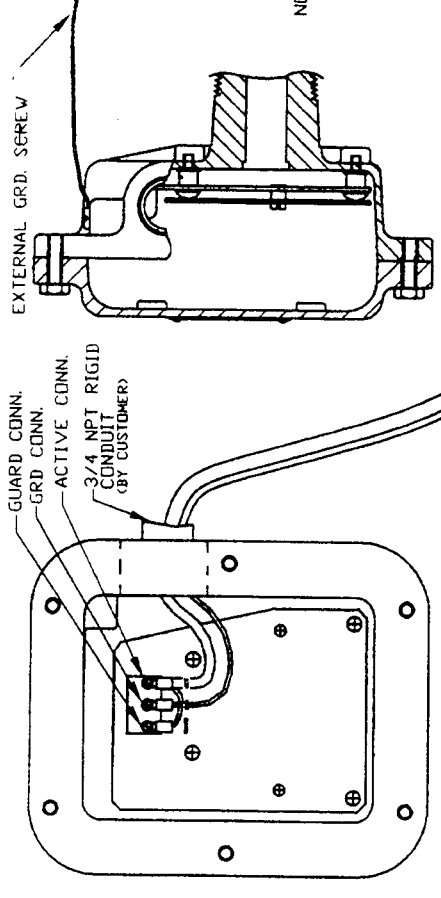


FIGURE 1

DET. REQ. SHIT	DESCRIPTION	MATERIAL	PART
UNSPECIFIED TIL	DRAWN	CHECKED	APPROVED
TECHNICAL SPEC #	NEAL	HEVELL	RE
ANGLES & T/P	DATE	DATE	DATE
EXTERNAL & BREAK	10/27/93	1/14/94	1/14/94
EDGES ARE	SCALE	SIZE	PART OR DRAWING
	NONE	B	LRF180136

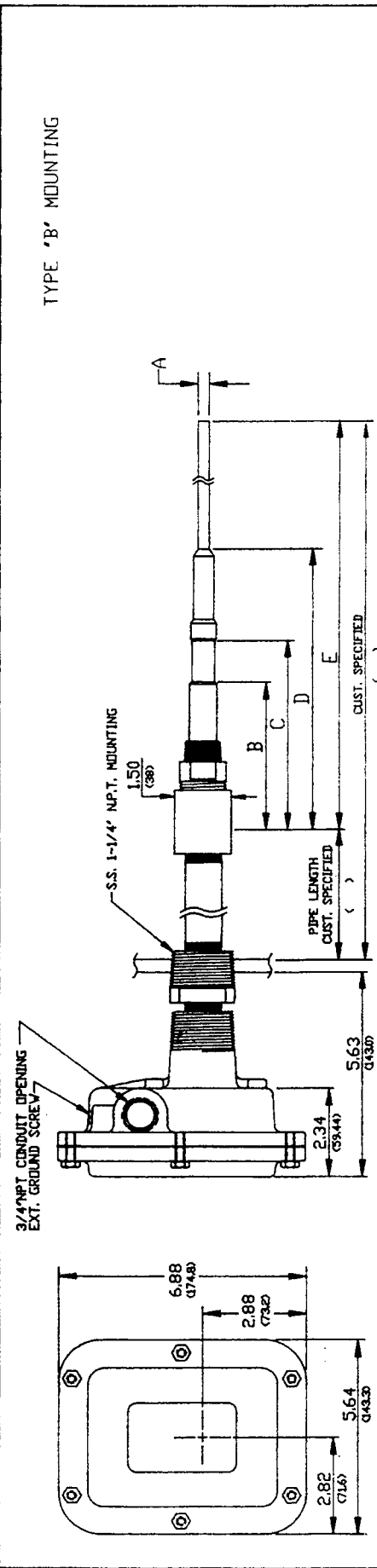
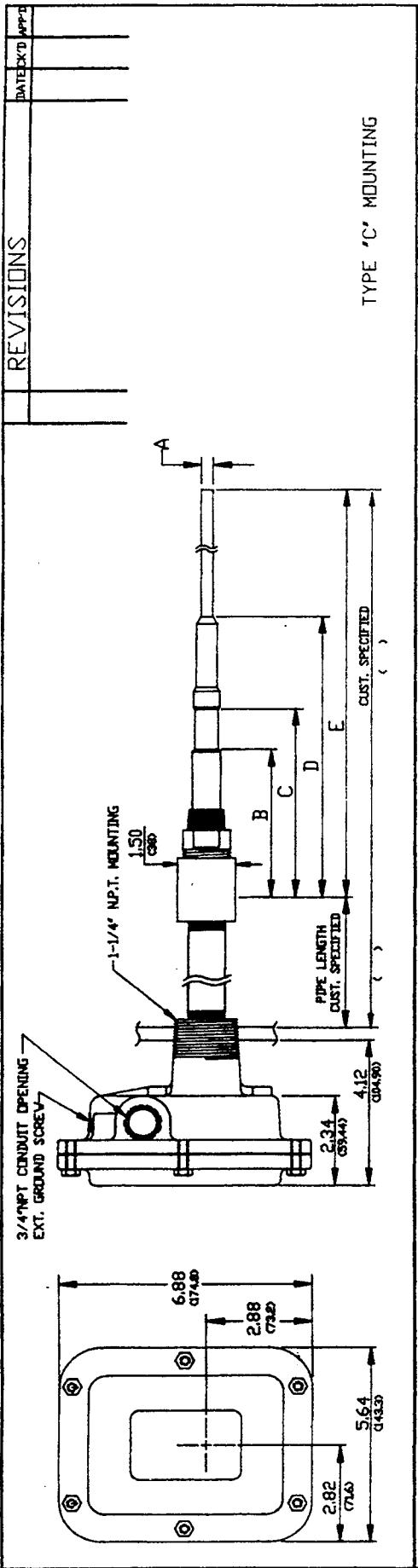
DO NOT SCALE DIMS. ARE IN INCHES

MATERIAL FINISH

TITLE: RFI1000/12000 XP REMOTE PROBE CUSTOMER INSTALLATION/HOOKUP DWG DL2 E2U

PORT: HURON/MICHIGAN 48060

AC UNITS ARE MARKED NEU  
DC UNITS ARE MARKED GND  
AC UNITS ARE MARKED HOT  
DC UNITS ARE MARKED +VDC



DET. REQ'S	DRWN	CHK'D	APPROVED	MATERIAL	SCALE	SIZE	PART OR DRAWING
ISSUED BY: _____	NEAL	R/C	JK		NONE	B	LRF180137
DATE: _____	DATE: 10/27/93	DATE: 11-3-93	DATE: 11-5-93				
ANGLES & 1/2\"/>							
EDGES: R/S							

APPROX DIM'S	STD. & FOODGRADE	H.D.	STD. KYNAR COATED	H.D. KYNAR COATED	STUB
E	16.50 (419)	20.50 (521)	16.88 (428.75)	20.88 (530.35)	16.50 (419)
D	8.50 (216)	13.25 (336.5)	8.50 (216)	13.25 (336.5)	8.50 (216)
C	5.88 (149)	11.50 (292)	5.88 (149)	11.50 (292)	5.88 (149)
B	4.12 (105)	10.00 (254)	4.12 (105)	10.00 (254)	4.12 (105)
A	.31 DIA. (8)	.31 DIA. (8)	.31 DIA. (8)	.38 DIA. (9.5)	.31 DIA. (8)

DO NOT SCALE DIM'S. ARE IN INCHES  
BRACKETED DIM'S ARE IN MM.

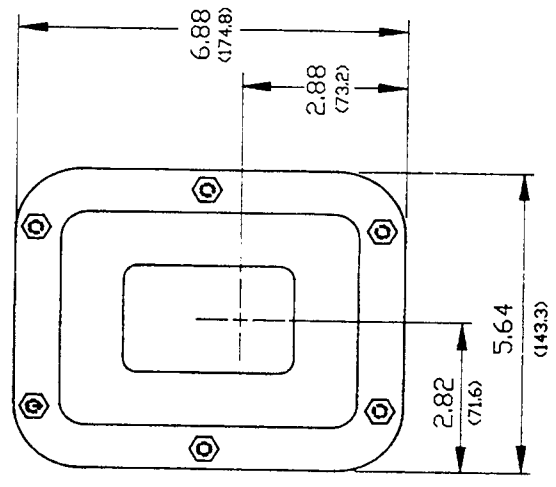
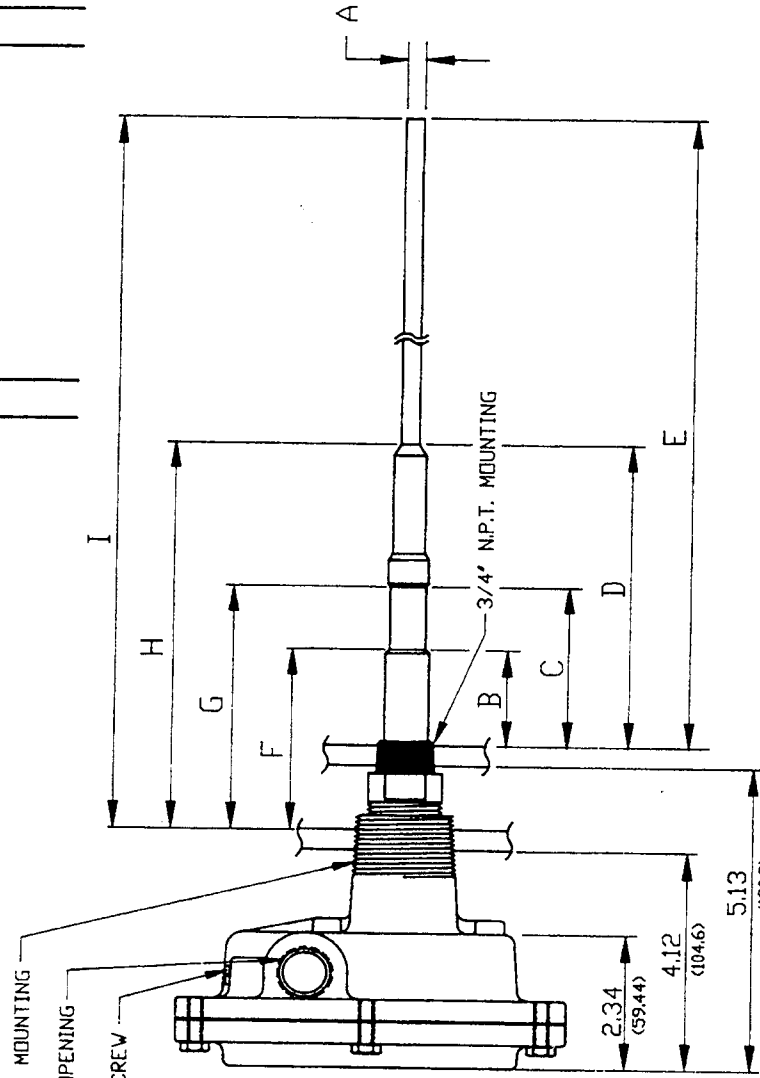
MATERIAL: \_\_\_\_\_ FINISH: \_\_\_\_\_

TITLE: MANUAL DRAWING  
EXTENDED, REMOTE PROBE G/P & X/P

BINDERATOR®  
PORT HURON, MICHIGAN 48060



REVISIONS		DATE	BY	APP'D



APPROX DIM'S	STD. & FINISH	H.D.	STD. KYNAR COATED	H.D. KYNAR COATED
I	15.25 (387.5)	19.25 (489)	15.62 (396.7)	19.62 (498.35)
H	7.00 (178)	11.75 (298.5)	7.00 (178)	11.75 (298.5)
G	4.5 (114.5)	10.00 (254)	4.5 (114.5)	10.00 (254)
F	2.38 (60.5)	8.50 (216)	3.38 (86)	8.50 (216)
E	14.25 (362)	18.25 (463.5)	14.62 (371.4)	18.62 (472.95)
D	6.00 (152.5)	10.75 (273)	6.00 (152.5)	10.75 (273)
C	3.50 (89)	9.00 (228.5)	3.50 (89)	9.00 (228.5)
B	2.38 (60.5)	7.50 (190.5)	2.38 (60.5)	7.50 (190.5)
A	.31 DIA. (7.9)	.38 DIA. (9.5)	.31 DIA. (7.9)	.38 DIA. (9.5)

DO NOT SCALE DIM'S. ARE IN INCHES  
BRACKETED DIM'S ARE IN MM.

MATERIAL		FINISH		TITLE		PROBE G/P W/TYPE 'A' MOUNTING	

DET. REQD SHIT	DESCRIPTION	MATER. PART

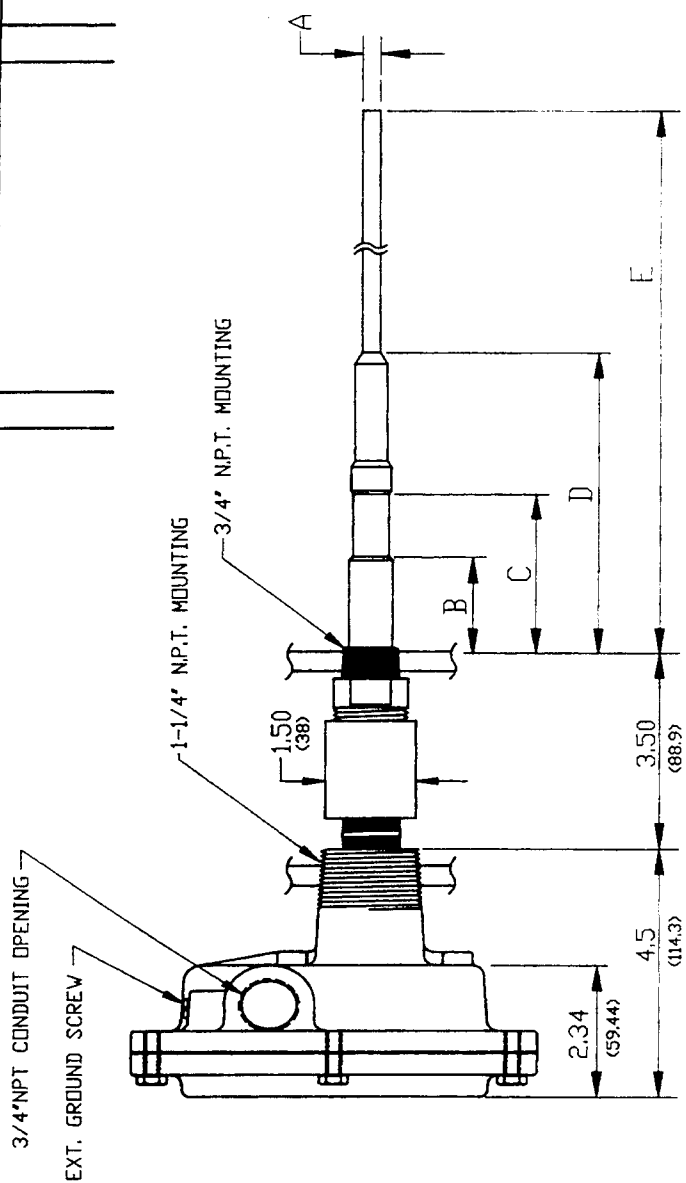
DRAWN	CHECKED	APPROVED	DATE	DATE
NEAL	RJC		10/28/93	11-5-93

SCALE	SIZE	SCALE	SIZE
NONE	B	NONE	B

SCALE: NONE SIZE: B PART NO: DRAWING: LRF180138

REVISIONS

DATE	CHK'D	APPR



**'CAUTION'**  
WHEN MOUNTING EXPLOSION PROOF UNITS, NEVER ADJUST THE ORIENTATION OF THE PROBE OR PROBE HOUSING BY TURNING THE HOUSING SECTION. THIS WILL BREAK INTERNAL WIRES AND PERMANENTLY DAMAGE THE PROBE.  
FOR TIGHTENING UNITS WITH THREADED BIN CONNECTIONS, THE UNIT MUST BE POSITIONED BY USING A WRENCH ON THE BIN CONNECTOR. WRENCH SIZE REQUIRED IS 1-1/16 INCH OPEN END.

DO NOT SCALE DIMS. ARE IN INCHES  
BRACKETED DIMS ARE IN MM.

APPROX DIM'S	STD. & FOODGRADE	H.D.	STD. KYNAR COATED	H.D. KYNAR COATED	STUB
E	14.25 (362)	18.25 (463.5)	14.62 (371.4)	18.62 (472.95)	14.25 (362)
D	6.00 (152.5)	10.75 (273)	6.00 (152.5)	10.75 (273)	6.63 (66.8)
C	3.50 (89)	9.00 (228.5)	3.50 (89)	9.00 (228.5)	2.25 (57.2)
B	2.38 (60.5)	7.50 (190.5)	2.38 (60.5)	7.50 (190.5)	1.75 (44.5)
A	.31 DIA. (8)	.38 DIA. (9.5)	.31 DIA. (8)	.38 DIA. (9.5)	.31 DIA. (8)

DET. REQ'D	DESCRIPTION	MAT. OR PART
DRAWN: NEAL CHECKED: ZK DATE: 10/28/93 DESIGNED: [blank] APPROVED: [blank] DATE: 11-5-93 PART OR DRAWING: LRF180139		

**BINDICATOR®**  
PURT HURONMICHIGAN 48060

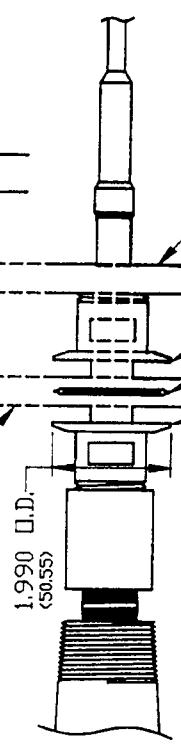
TITLE: MANUAL DRAWING  
REMOTE PROBE UL X/P

SCALE: NONE  
SIZE: B

REVISIONS

DATE	BY	APPROVED

13MMHM CAST CLAMP SIZE 1-1/2 CHERRY BURRELL 'S' OR LADISH TRI-CLAMP. (CUSTOMER SUPPLIED)

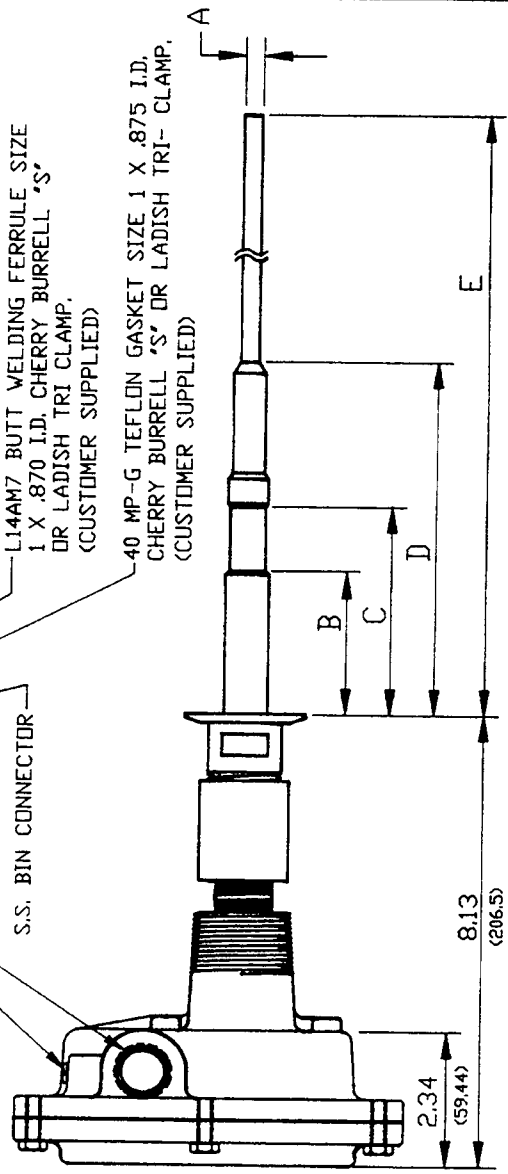
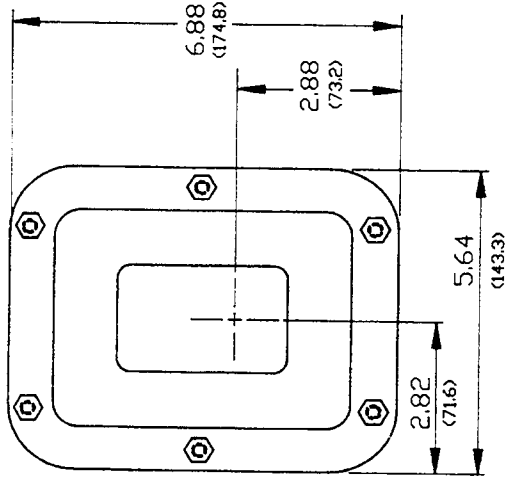


3/4"NPT CONDUIT OPENING  
EXT. GROUND SCREW

S.S. BIN CONNECTOR

L14AM7 BUTT WELDING FERRULE SIZE 1 X .870 I.D. CHERRY BURRELL 'S' OR LADISH TRI CLAMP. (CUSTOMER SUPPLIED)

40 MP-G TEFLON GASKET SIZE 1 X .875 I.D. CHERRY BURRELL 'S' OR LADISH TRI-CLAMP. (CUSTOMER SUPPLIED)



**'CAUTION'**  
WHEN MOUNTING EXPLOSION PROOF UNITS, NEVER ADJUST THE ORIENTATION OF THE PROBE OR PROBE HOUSING BY TURNING THE HOUSING SECTION. THIS WILL BREAK INTERNAL WIRES AND PERMANENTLY DAMAGE THE PROBE.  
FOR TIGHTENING UNITS WITH THREADED BIN CONNECTIONS, THE UNIT MUST BE POSITIONED BY USING A WRENCH ON THE BIN CONNECTOR. WRENCH SIZE REQUIRED IS 1-1/16 INCH OPEN END.

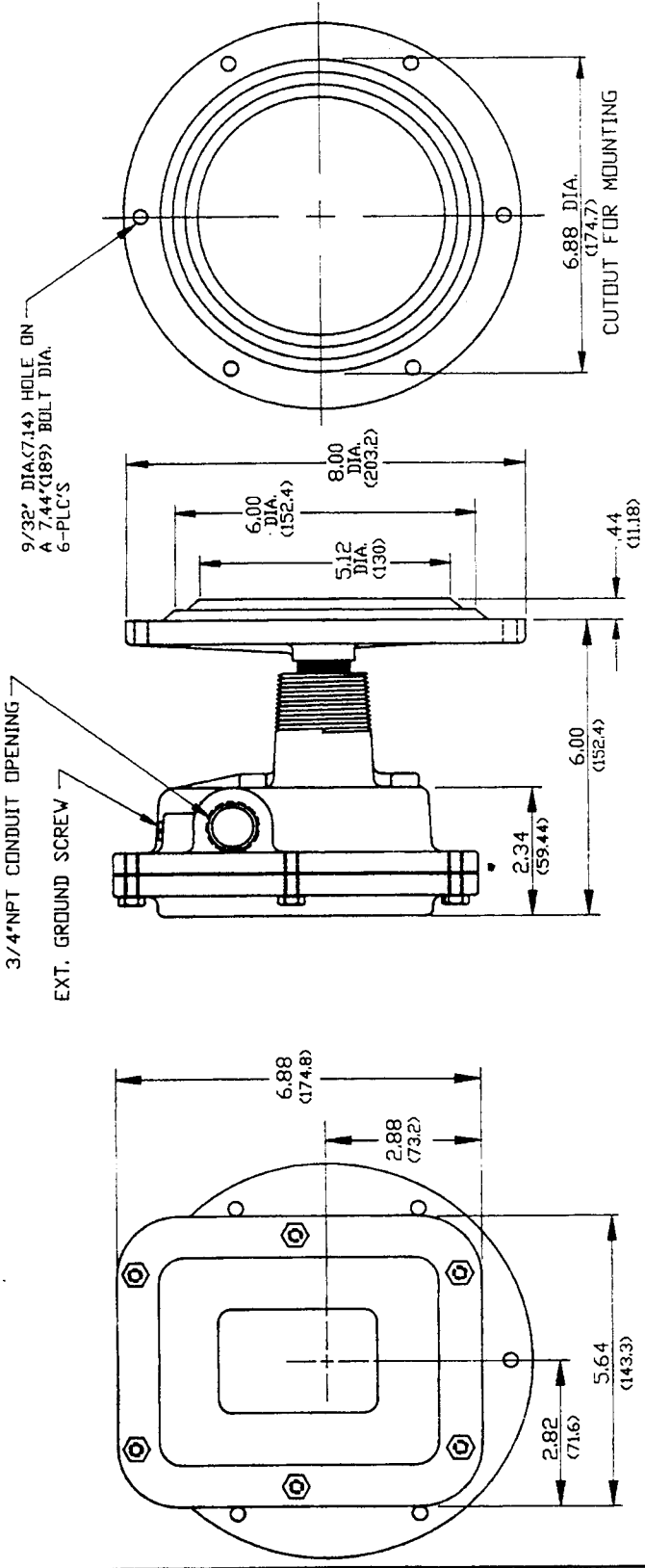
APPROX DIM'S	FOODGRADE	STUB
E	14.25 (362)	14.38 (362)
D	6.00 (152.5)	2.75 (69.9)
C	3.62 (91.95)	2.00 (50.8)
B	2.38 (60.5)	1.50 (38.1)
A	.31 DIA (8)	.31 DIA (8)

DO NOT SCALE DIM'S. ARE IN INCHES  
BRAK'TED. DIM'S ARE IN MM.

DET. REQUEST		DESCRIPTION		MATERIAL	
DESIGNED BY	NEAL	CHECKED BY	RL	APPROVED	RL
DATE	10/28/93	DATE	11-5-93	DATE	11-5-93
WELDED BY		WELDED BY		DATE	11-5-93
EXERCISE NO.		EXERCISE NO.		DATE	11-5-93
MATERIAL		FINISH	SCALE	NONE	SIZE
					B
TITLE		MANUAL DRAWING REMDTE		PART OR DRAWING	
PROBE UL X/P V/TYPE 'S' MOUNTING				LRF180140	

DATE/CD APP'D

REVISIONS



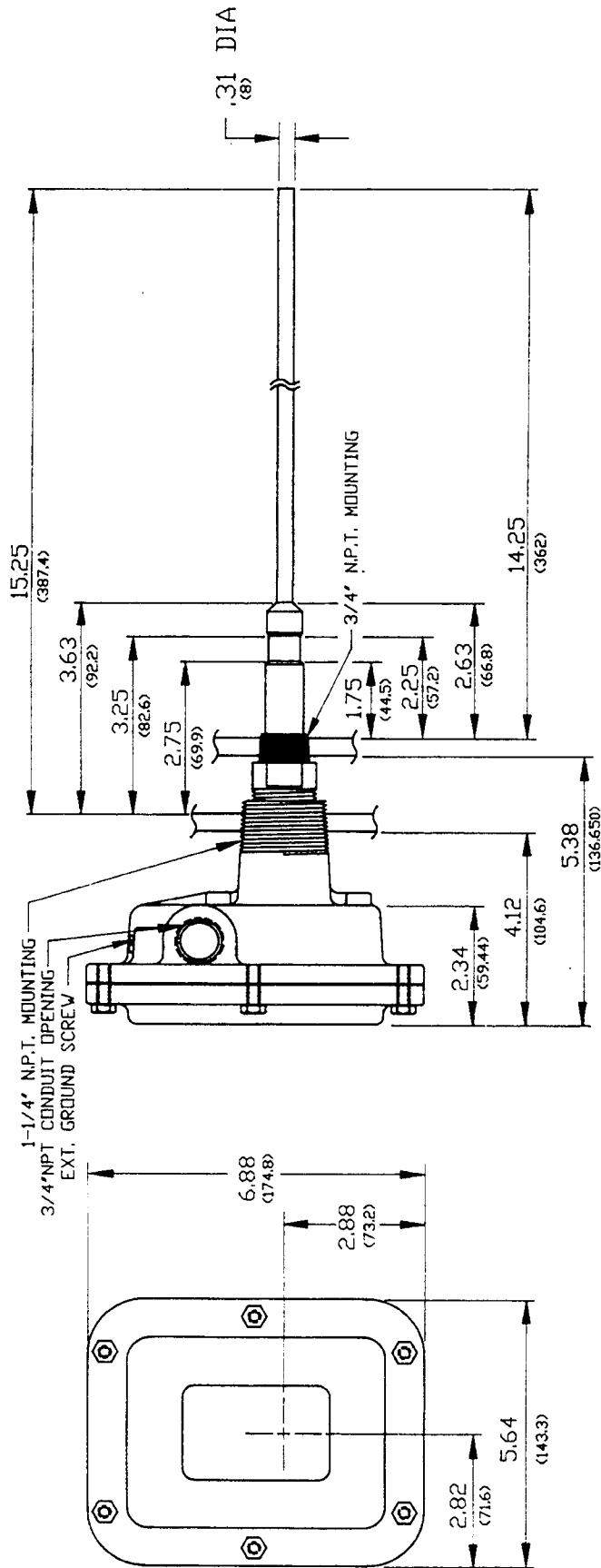
**'CAUTION'**  
WHEN MOUNTING EXPLOSION PROOF UNITS, NEVER ADJUST THE ORIENTATION OF THE PROBE OR PROBE HOUSING BY TURNING THE HOUSING SECTION. THIS WILL BREAK INTERNAL WIRES AND PERMANENTLY DAMAGE THE PROBE.  
THE POSITION MUST BE ADJUSTED BY REMOVING THE MOUNTING BOLTS AND MOVING THE ENTIRE PROBE AND HOUSING.

- MOUNTING SURFACE PREPARATIONS**
1. LAY OUT TWO CONCENTRIC CIRCLES ON BIN WALL AT POINT WHERE THE RF LEVEL CONTROL IS TO BE MOUNTED. ONE CIRCLE TO BE 6-7/8" DIAMETER, THE OTHER 7-7/16" DIAMETER.
  2. CUT OUT 6-7/8" DIAMETER CIRCLE.
  3. LAY OUT SIX EQUALLY SPACED HOLES ON 7-7/16" DIAMETER CIRCLE, DRILL OR TAP FOR 1/4" BOLTS OR CAP SCREWS.

DO NOT SCALE DIM'S. ARE IN INCHES  
BRACKETED DIM'S ARE IN MM.

MATERIAL		FINISH		TITLE		MANUAL DRAWING		SCALE		PART OR DRAWING	
BINDERATOR® PORT HURON, MICHIGAN 48060				REMOTE FLUSH PROBE GP/XP		NONE		B		LRF180141	
DET. REQUEST	DESIGNED BY	CHECKED	APPROVED	DESCRIPTION	MATERIAL	PART	DATE	DATE	DATE	DATE	DATE
	NEAL	BL	BL				11-5-93	11-5-93	11-5-93	11-5-93	11-5-93
	10/28/93	11-5-93	11-5-93								
	10/28/93	11-5-93	11-5-93								

REVISIONS		DATE	BY



DET. REQ'D	SHIT	DESCRIPTION	MATR. PART

DESIGN	DATE	SCALE	SIZE	SCALE	SIZE

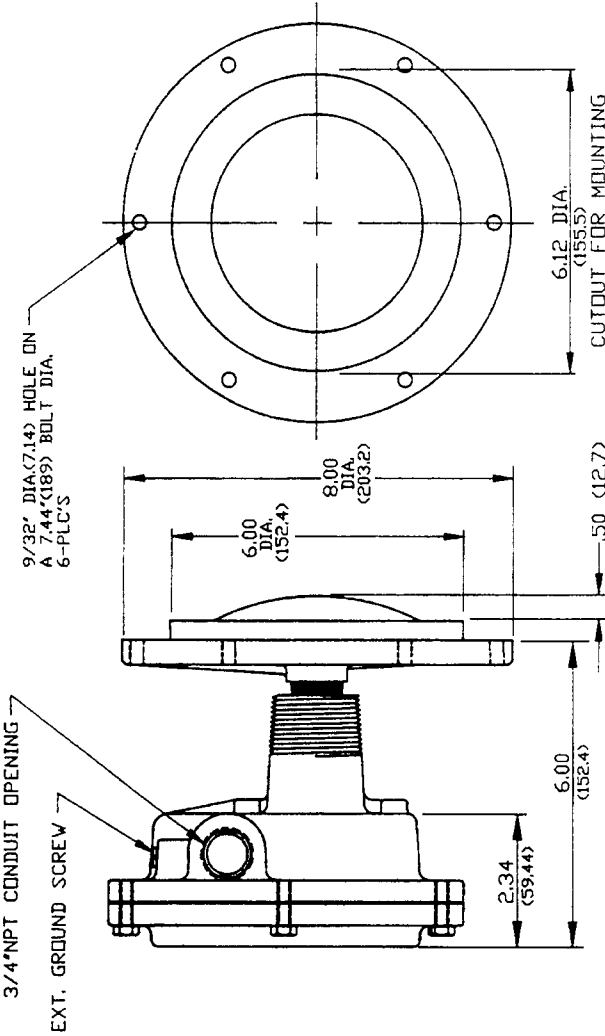
FINISH	TITLE

DO NOT SCALE DIM'S. ARE IN INCHES  
BRACKETED DIM'S ARE IN MM.

**BINDICATOR®**  
PORT HURON, MICHIGAN 48060

SCALE NONE  
SIZE B  
PART OR DRAWING LRF180142

REVISED	DATE	BY	APP'D



3/4"NPT CONDUIT OPENING  
EXT. GROUND SCREW

9/32" DIA.(7.14) HOLE ON  
A 7.44"(189) BOLT DIA.  
6-PLC'S

6.12 DIA.  
(155.5)  
CUTOUT FOR MOUNTING

4 OPTIONS  
CUSTOMER SPECIFIED  
"CAUTION"

WHEN MOUNTING EXPLOSION PROOF UNITS, NEVER ADJUST THE ORIENTATION OF THE PROBE OR PROBE HOUSING BY TURNING THE HOUSING SECTION. THIS WILL BREAK INTERNAL WIRES AND PERMANENTLY DAMAGE THE PROBE.

THE POSITION MUST BE ADJUSTED BY REMOVING THE MOUNTING BOLTS AND MOVING THE ENTIRE PROBE AND HOUSING.

DO NOT SCALE DIMS. ARE IN INCHES  
BRACKETED DIMS ARE IN MM.

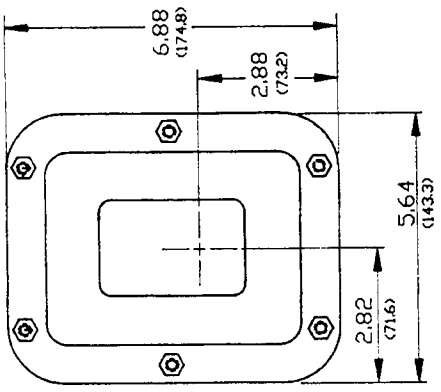
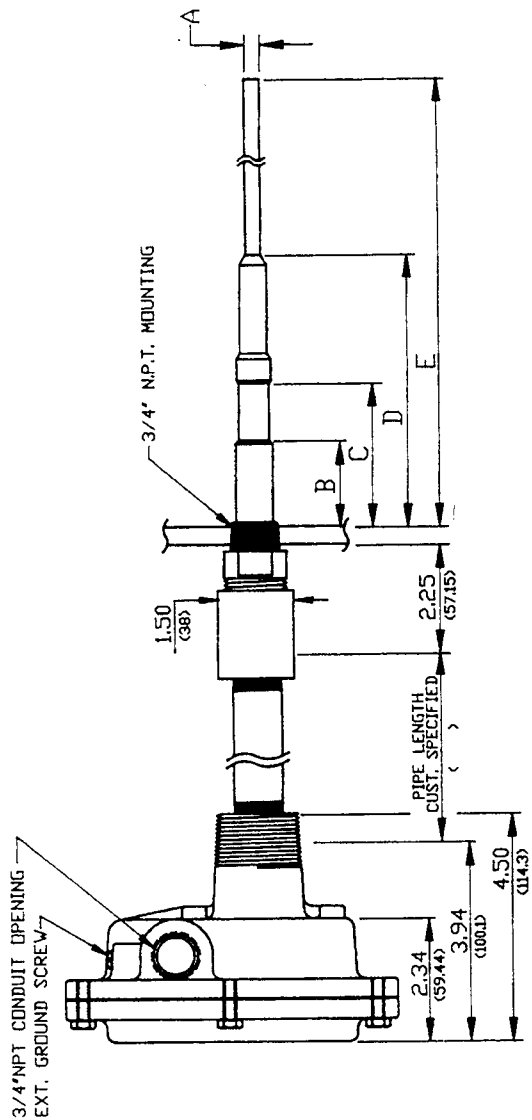
**MOUNTING SURFACE PREPARATIONS**

1. LAY OUT TWO CONCENTRIC CIRCLES ON BIN WALL AT POINT WHERE THE RF LEVEL CONTROL IS TO BE MOUNTED. ONE CIRCLE TO BE 6-1/8" DIAMETER THE OTHER 7-7/16" DIAMETER.
2. CUT OUT 6-1/8" DIAMETER CIRCLE.
3. LAY OUT SIX EQUALLY SPACED HOLES ON 7-7/16" DIAMETER CIRCLE. DRILL OR TAP FOR 1/4" BOLTS OR CAP SCREWS.

DET. REQ'D SHIT	DESCRIPTION	MATERIAL
UNSPECIFIED TEL. DRAWN BY: NEAL	APPROVED BY: [Signature]	FRID.
TECHNICAL SPEC. BY: [Signature]	DATE: 10/28/93	DATE: 11-5-93
ANGLES & 1/2" DIMENSION & BREAK (EXES 20)	SCALE: NONE	SIZE: B
TITLE: REMOTE DOME FLUSH PROBE GP/XP	MANUAL DRAWING	PART OR DRAWING: LRF180143



REVISIONS		DATE	BY	APP'D



APPROX DIM'S	STD. & FOODGRADE	H.D.	STD. KYNAR COATED	H.D. KYNAR COATED	STUB
E	14.25 (362)	18.63 (473.2)	14.63 (371.6)	18.63 (473.2)	14.25 (362)
D	6.00 (152.5)	10.75 (273)	6.00 (152.5)	10.75 (273)	2.63 (66.8)
C	3.5 (89)	9.00 (228.6)	3.50 (89)	9.00 (228.6)	2.25 (57.15)
B	2.38 (60.5)	7.50 (190.5)	2.38 (60.5)	7.50 (190.5)	2.25 (57.15)
A	.31 DIA. (8)	.38 DIA. (9.5)	.31 DIA. (8)	.38 DIA. (9.5)	2.25 (57.15)

DET. REQ'D	REQ'D	DESCRIPTION	MATERIAL	FINISH	SCALE	SIZE	SCALE	SIZE

DATE	BY	APP'D	MATERIAL PART
10/27/93	NEAL	BL	
11-5-93			
11-5-93			

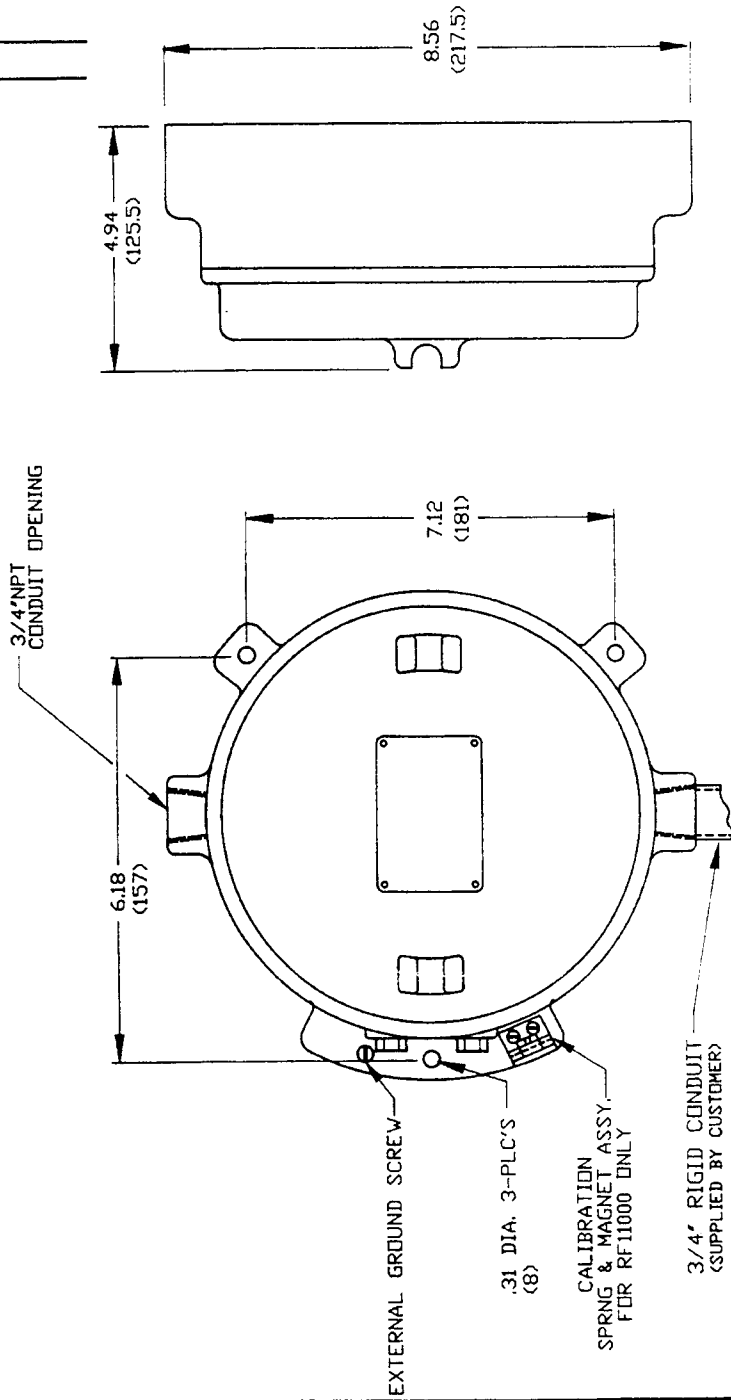
TITLE	MANUAL DRAWING		
Lagged, Remote Probe G/P & X/P			

BINDICATOR®		PORT HURON, MICHIGAN 48060	

REVISED	DATE	BY	APP'D

REVISIONS

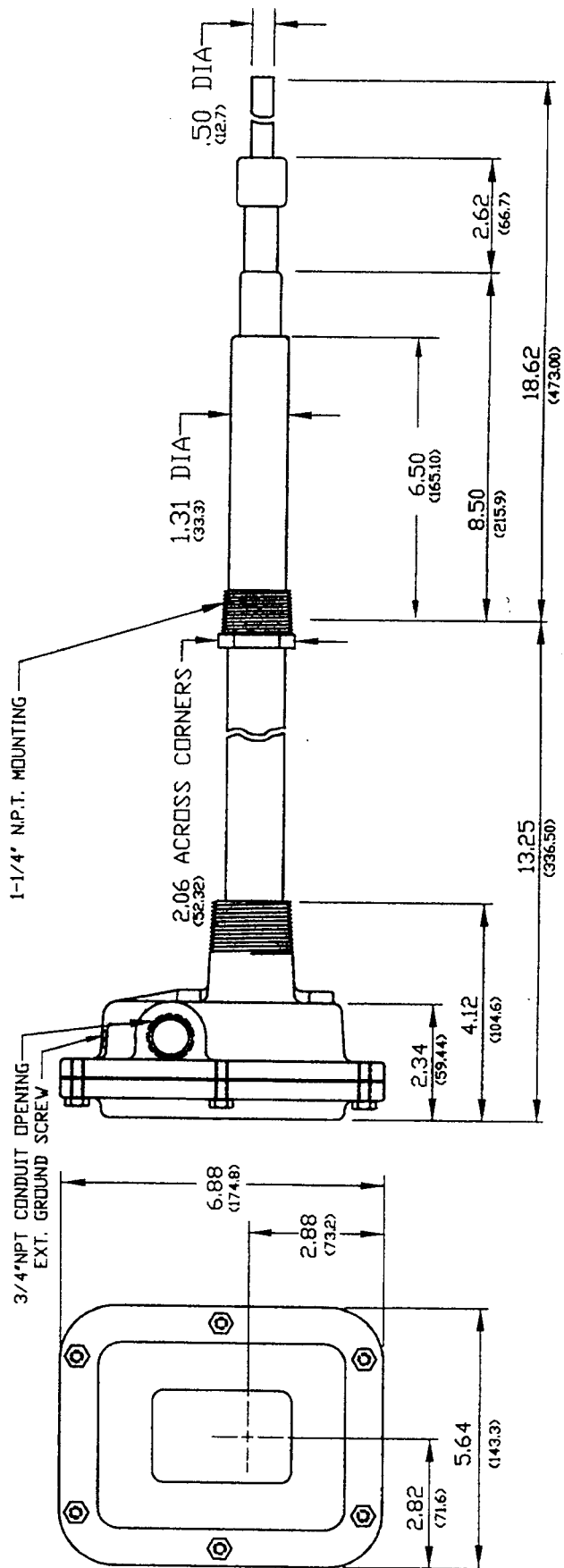


DO NOT SCALE DIM'S. ARE IN INCHES  
 BRACKETED DIM'S ARE IN MM.

MATERIAL	FINISH	DET. REQ'D/SHI	DESCRIPTION	MAT. OR PART
		ISSUED TO: _____	REVISION: _____	PROD: _____
		DESIGNED BY: _____	DATE: _____	DATE: _____
		CHECKED BY: _____	DATE: 12-13-97	DATE: 12-13-97
		APPROVED BY: _____	SCALE: NONE	SCALE: NONE
		DATE: 11/2/93	SIZE: B	PART OR DRAWING: LRF180145
		TITLE: MANUAL DRAWING RF11000/12000 ELECTRONIC ENCLOSURE		
BINDERATOR® PORT HURON, MICHIGAN 48060				



REVISIONS		DATE	BY	APP'D
A	6.50 DIMENSION ADDED PER ECO 94-134	10/20/94	AC	[Signature]
B	METRIC DIA. TO GUARD WAS INCORRECT. IT WAS (2215.9), PER ECD95-113	9/23/95		[Signature]



DET. REQ'D	DESCRIPTION	MAT. OR PART
UNDESIGNED TO REWORKED TO NEAL DATE 10/28/93	DESIGNED RR DATE 11/5/93	PROB RB DATE 11/5/93
ASSEMBLY & LIFE TESTING & BREAK TESTS	SCALE NONE	PART OR DRAWING B LRF180146

TITLE	MATERIAL	FINISH
MANUAL DRAWING REMOTE CERAMIC PROBE	BINDICATOR® PORT HURON, MICHIGAN 48060	

DO NOT SCALE DIM'S. ARE IN INCHES  
BRACKETED, DIM'S ARE IN MM.

REVISIONS		DATE	CHK'D	APP'D
-	REDRAWN PER ECO#94-105	-	-	-
A	INSTR. 1 MODIFIED PER ECO 95-065	6/9 95 AC		

FIGURE 1 <TYP BOTH ENDS>

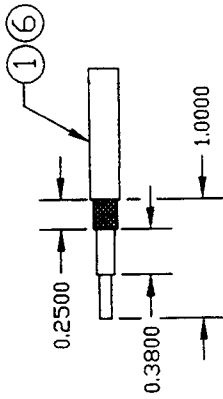


FIGURE 2A <TYP BOTH ENDS>

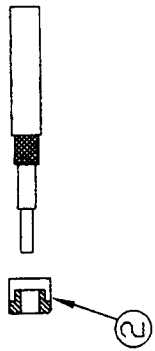


FIGURE 3 <TYP BOTH ENDS>

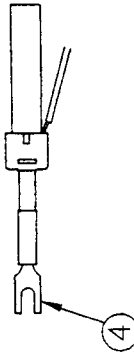


FIGURE 4 <TYP BOTH ENDS>

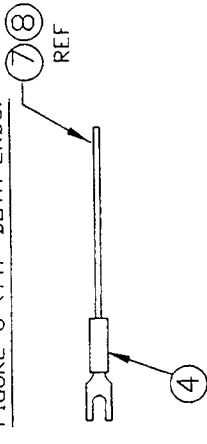


FIGURE 2B <TYP BOTH ENDS>

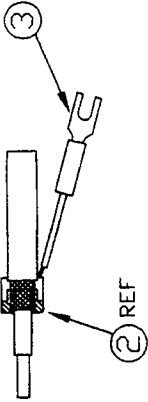


FIGURE 5

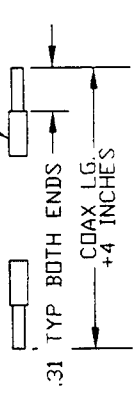
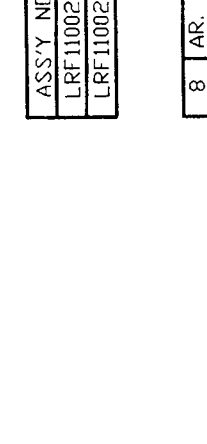


FIGURE 6 <TYP BOTH ENDS>



INSTRUCTIONS

- 1) CUT CABLE (ITEM 1 OR 6) TO LENGTH SPECIFIED ON ORDER. (TO BE ONLY 12" LONGER THAN CONDUIT) (A)
- 2) STRIP BOTH ENDS OF CABLE AS SHOWN IN FIGURE 1.
- 3) INSERT THE FERRULE (ITEM 2) ON THE CABLE AS SHOWN IN FIGURE 2A & INSERT SHIELD WIRE (ITEM 3) AS SHOWN IN FIGURE 2B AND CRIMP AMP. TOOL S9500 WITH INSERT 45066-3.
- 4) INSERT TERMINALS (ITEM 4) ON CENTER CONDUCTOR OF CABLE & CRIMP USING HAND CRIMP DR RACHET (SEE FIGURE 3).
- 5) PLACE SHRINK TUBE (ITEM 5) OVER CABLE END AS SHOWN IN FIGURE 4 & HEAT SHRINK UNTIL SECURE.
- 6) CUT GROUND WIRE ITEM 7 OR 8 4" LONGER THAN YOU CUT CABLE & STRIP BOTH ENDS AS SHOWN IN FIGURE 5.
- 7) INSERT TERMINALS (ITEM 4) & CRIMP USING HANDCRIMP DR RACHET (SEE FIGURE 6).

DO NOT SCALE DIMS. ARE IN INCHES

MATERIAL	FINISH
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BINDICATOR®  
PORT HURON, MICHIGAN 48060

TITLE REMOTE CABLE TERMINATION ASSY

SCALE FULL B LRF110028

ASSY NO.	DETAILS	DESCRIPTION
LRF110028	1 THRU 5 & 8	CABLE TERM. ASSY
LRF110029	2 THRU 7	HI TEMP. CABLE TERM. ASSY

8 AR.	WIRE # 20 AWG GREEN	LUC035661
7 AR.	WIRE TEF GREEN	LUC035351
6 AR.	CABLE HI STABILITY COAXIAL	LUC035209
5 AR.	SHRINK TUBE	LUC035210
4 AR.	TERMINAL STAKON	LUC030340
3 2	ASSY SHIELD WIRE	LBU022140
2 2	FERRULE	LBU032120
1 AR.	FM- 62 COAXIAL CABLE	LUC035208

DET. REQ'D	DESCRIPTION	MAJOR PART
UNSPECIFIED YOL	APPROVED	THROD.
DECIMALS 4	ARIC C. NEAL	W JR
ANGLES 30°/45°	DATE	DATE
TEARRS & BREAK EDGES .005	8/1/94	8/4/94
	SCALE	SIZE
	PART OR DRAWING	

## GENERAL TERMS AND CONDITIONS OF SALE

**1. PAYMENT** Terms of payment are Net 30 days and are effective from the actual date of invoice. If, in the Seller's opinion, the financial condition of the Buyer at any time-or any other circumstances do not justify the incurrence of production costs or shipment on the terms of payment specified, the Seller may require partial or full payment in advance.

**2. F.O.B.** All shipments are F.O.B. Seller's factory in Port Huron, Michigan, unless otherwise stated in the quotation.

**3. QUOTATION AND PRICES** Quoted prices are firm for thirty days and are subject to change without notice after expiration of this period. Orders calling for future deliveries will be invoiced according to prices in effect at the time of shipment.

**4. TAXES** Any applicable sales, use, revenue, excise or other taxes not specifically stated in the quotation are to be remitted by the Buyer directly to the appropriate regulatory agency.

**5. EQUIPMENT WARRANTY/LIMITATION** The following BINDICATOR products are warranted for a period of two years from date of shipment against defective materials and workmanship: RF Series, Mark III Yo-Yo, General Purpose Yo-Yo, Micro-Sonic Series, Eagle, Mach One, Leveldata, Tracker, and Levelite Series. All CELTEK and other Bindicator products are warranted for a period of one year from date of shipment against defective materials and workmanship. WE MAKE NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE FOREGOING IS HEREBY DISCLAIMED AND EXCLUDED FROM THIS CONTRACT. If the products are being acquired for resale, Buyer will make, in connection with any such resale, only those warranties contained herein and will indemnify us against any claims, causes of actions and judgements which arise from any representations, warranties or agreements made by or entered into by Buyer, other than those contained herein.

**6. BUYER'S EXCLUSIVE REMEDY** In the event of any breach of warranty, the sole and exclusive remedy of Buyer (or any person claiming through Buyer) shall be limited to the repair or replacement of defective products or parts, at our plant or at Seller's option, to the refund of the purchase price, provided that notice of such defects is given within six months after shipment. In no event will our liability include any incidental or consequential damages.

**7. DELIVERY** The Seller shall not be liable for loss or damage of any kind resulting from delay or inability to deliver or account of flood, fire, strike, labor troubles, riot, civil disturbances, accidents, acts or orders or regulations of civil or military authorities, shortages of materials, or any other cause or causes (whether or not similar in nature to any of these enumerated) beyond Seller's control.

**8. PRODUCT CHANGES** In keeping with our continuing policy of product improvement, we reserve the right to make changes in our products at any time, without incurring an obligation to change equipment previously shipped.

**9. RETURN OF GOODS** In no case may products or parts be returned without Seller's prior written permission. Products or parts returned under the aforementioned Equipment Guarantee must be shipped with transportation charges prepaid. All other returns must be shipped with transportation charges prepaid and will be subject to a restocking charge. Only products of standard Bindicator manufacture will be accepted for return. Products which are specially modified or produced to the Buyer's specifications will not be accepted for return.

**10. CONTRACT FORMATION** A binding contract shall not be effective until a written purchase order is received at Seller's office in Port Huron, Michigan and accepted in writing by an authorized employee of the Seller at its Port Huron office. The terms and conditions in our quotation or acknowledgment shall govern the contract and any different or additional terms in Buyer's purchase order, unless approved by Seller in writing, are hereby objected to.

**11. CONSTRUCTION** Any agreement arrived at shall be considered to be a Michigan contract and shall be construed under the laws of the State of Michigan.

**12. CANCELLATION** Request for cancellation must be in writing and referred to Bindicator. No orders will be accepted with the understanding that they may later be cancelled. If and when cancellation is approved by Bindicator, it is with the understanding that Bindicator will be fully reimbursed by payment of cancellation charge: which are to be determined by Bindicator.

**13. CERTIFICATION OF NONSEGREGATED FACILITIES** Our firm does not maintain facilities of a segregated nature contrary to the provision of 41 CFR 60-1.8, and further that if we have 50 or more employees and our contractual arrangements of \$50,000 or more we have complied with 41 CFR 60-1.7 concerning the annual filing of a report on Standard Form 100 (EEO-I) and with 41 CFR 60-1.40 by developing a written Affirmative Action Compliance Program.



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