EPPH-IB INSTALLATION

Installation Guidelines

When installing any telephone equipment, please adhere to the following guidelines to ensure the safety of all personnel:

- NEVER install telephone wiring during a lightning storm.
- **Install a UL Listed lightning arrestor** on any phone installed where the phone or phone cable is at risk of being exposed to lightning strikes. The lightning arrestor must be installed as close to the phone as possible to maximize the protection. The lightning arrestor must not be installed within the enclosure supplied with the phone.
- NEVER install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- NEVER touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- USE CAUTION when installing or modifying telephone lines.
- Install UL Listed telephone line suppressor (customer-supplied) on the telephone line.
- Use silicone sealant or equivalent around and inside all conduit entries

INSTALLATION OF THE IBU

The Isolation Barrier Unit provides an intrinsically-safe circuit when connected. It must be installed in a non-hazardous location. See Figure 1 for a typical installation.

The Isolation Barrier Unit interior includes a power switch selector, a ring pitch adjustment, and four troubleshooting LEDs. The IBU housing is composed of two modular subassemblies, the front panel and the rear enclosure assembly, for easy installation and wiring.

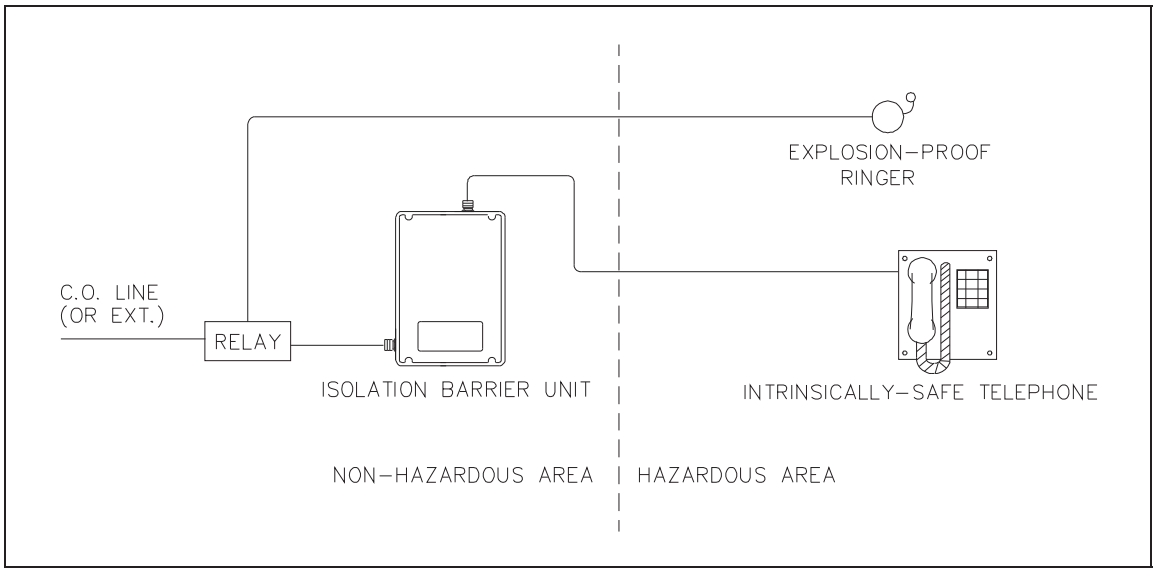


Figure 1. Typical intrinsically-safe installation

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WIRING REQUIREMENTS

Design Limits

In order to be *intrinsically safe*, energy and energy storage must be constrained to "safe" levels in hazardous area apparatus. Wiring inherently has capacitance formed by a dielectric material between two conductors. A buildup of this capacitance can form a surge of electricity, a dangerous situation in a hazardous area.

Intrinsically-safe telephones require cabling that will limit the amount of capacitance formed. The limitation on cable length was set by Underwriter's Laboratory (UL) based on test results. This "worst case" cable available was found to have a capacitance of 60 picofarads/foot. Therefore, UL set the cable limitation at one mile, the length at which this worst-case cable capacitance level was still within acceptable bounds. Cable types with less capacitance have been specified to allow connection distances over one mile.

Shielded Cable

Where multiple I.S. telephone wires are routed together, shielded cable should be used. The use of shielded cable prevents cross-talk from occurring between multiple I.S. telephone circuits. The shield must be grounded to an I.S. ground and connected only at the IBU.

General Wire Types					
	24 AWG	**22 AWG**	**20 AWG**	**19 AWG**	**18 AWG**
Maximum capacitance, C (picofarads/mile)	316,800 pF/mile				
Maximum Resistance (ohms/mile)	271	171	107	85	67
* Ring Signal Loss, Decibels (dB/mile)	-16	-12	-8	-6	-4

* Nominal ring signal is 98 dB @ 10 feet.

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SYSTEM SETUP

Larson Electronics recommends taking the following steps to ensure a safe and trouble-free installation:

1. Install the Isolation Barrier Unit (IBU) and wire it completely, except for the hazardous area signal wires.

   ⚠WARNING⚠ **The unit must be wired in accordance with the Control Drawing to ensure intrinsic safety.**

2. Next, temporarily connect the I.S. telephone to the IBU with a short pair of conductors, and operate the unit by making a test phone call. If any problems are detected, see the Troubleshooting section.
3. Call the I.S. telephone from another telephone, and adjust the RING PITCH (located on the IBU) to the desired pitch. See Figure 2 for location.

4. Disconnect the I.S. telephone and install it in the intended permanent location.

   ⚠WARNING⚠ **The unit must be wired in accordance with the Control Drawing to ensure intrinsic safety.**

5. Make a call from the I.S. telephone. If any problems are detected, see the Troubleshooting section.

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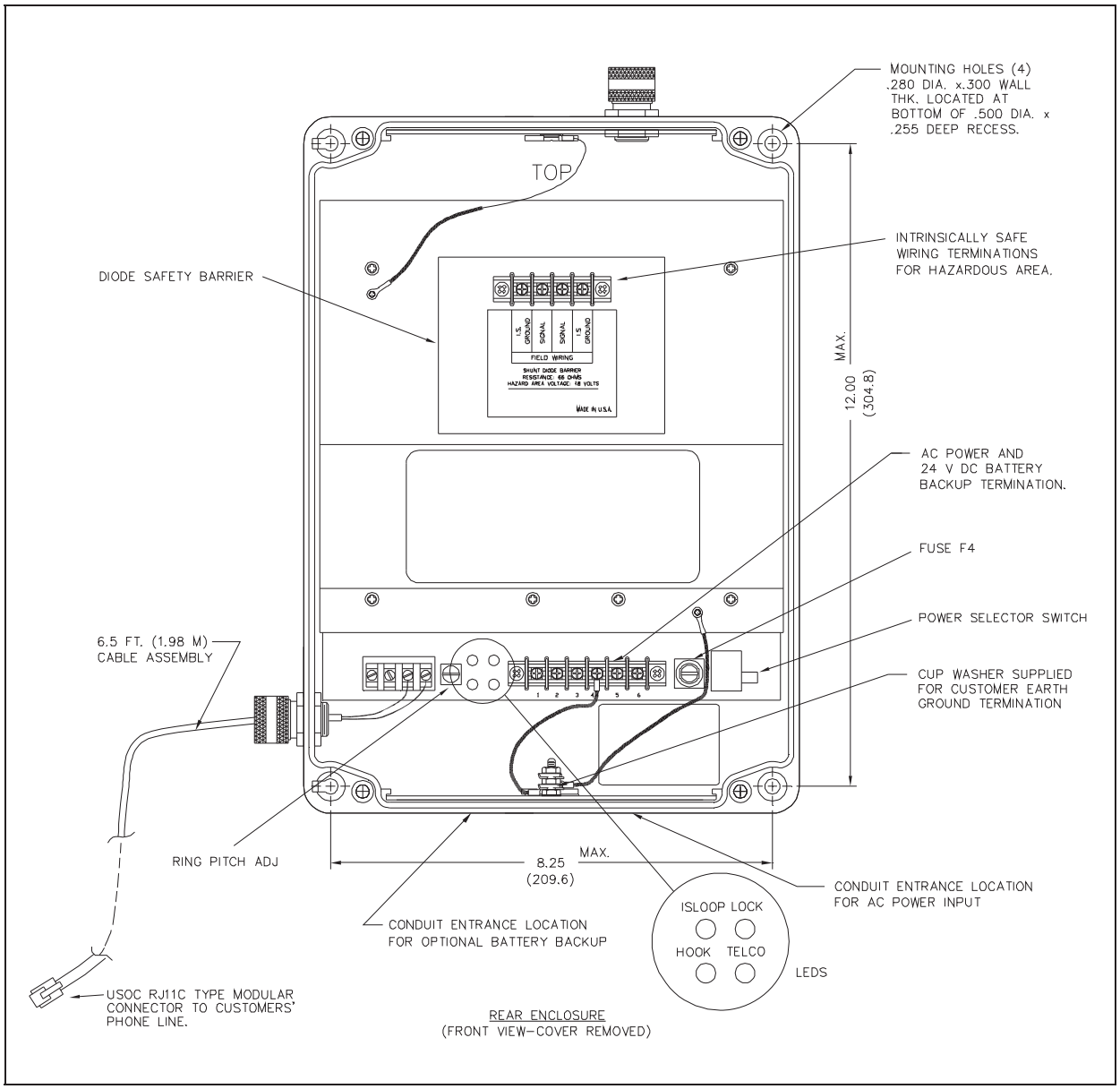


Figure 2. Rear of IBU enclosure with cover removed

MOUNTING

1. Remove the front panel by loosening the four front captive screws.

2. Refer to Figure 3. Determine which of the conduit locations is to be used. Drill spots have been provided for use with a chassis punch or hole saw. Using a hole saw is recommended.

3. One 0.280-inch diameter hole is located in each corner of the rear enclosure. Install the rear enclosure to a wall of an appropriate surface through the supplied mounting holes.

4. Refer to the Control Drawing, for wiring details.
   NOTE: Telephone system wire must be connected to the Isolation Barrier Unit only and not directly to the I.S. telephone. Battery backup connection is not required for operation of the I.S. Phones. If battery backup is desired, please consult the factory for specifications.

5. Apply power and test telephone operation.

6. Refer to the Troubleshooting section of problems are detected.

When proper operation has been verified, replace the cover and secure it by tightening the four captive screws.

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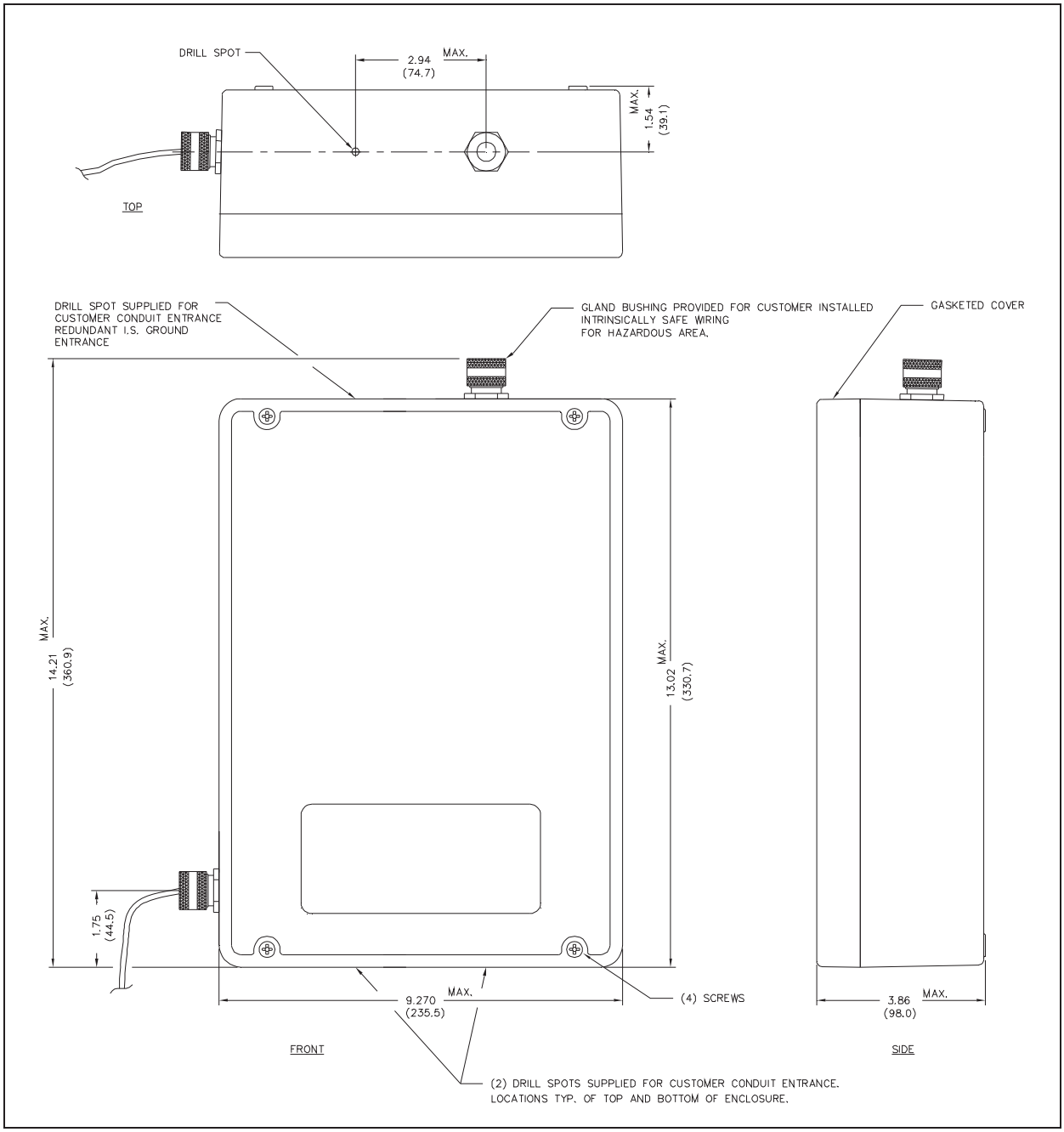


Figure 3. Model 263 Isolation Barrier Unit dimensions

OPERATION

The Isolation Barrier Unit requires no operator intervention for routine functions.

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MAINTENANCE

This section includes two troubleshooting charts designed to quickly pinpoint the source of problems.

TROUBLESHOOTING

NOTE: It may be advantageous to temporarily connect an I.S. telephone panel directly to the output terminals of the IBU when troubleshooting. Then, using the charts below, the cause of the problem should be more easily determined.

Non-Equipment Related Problems

Problem	Solution
The I.S. phone is inactive with no lights on the IBU when the phone is off-hook.	1. Check the ac power to the IBU. 2. Check the ac fuse F4 at the IBU. 3. Ensure there is no wiring open at the I.S. phone.
The I.S. phone has no dial tone.	1. If the I.S. phone has a wiring short, the IBU lights will be lit in the following pattern: ● = On, ❍ = Off ISLOOP ● LOCK ❍ HOOK ❍ TELCO ❍
	2. If the TELCO line has an open, the IBU lights will be lit in the following pattern: ● = On, ❍ = Off ISLOOP ● LOCK ● HOOK ● TELCO ❍
The lights on the IBU flash randomly.	The I.S. phone has an intermittent wiring short. The short may be between the conductors or either/both conductor(s) to ground/shield

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Equipment-Related Problems

Problem	Solution
There is no incoming ring tone.	1. Check the I.S. telephone panel. 2. Check the IBU.
No receiver audio, no sidetone, and cannot hear touch tones when pressed.	1. Check the I.S. telephone panel. 2. Check the IBU. 3. There may be a wiring open or a short in the connecting cable.
Cannot dial out, but can hear touch tones when pressed.	1. Check the IBU. 2. There is no TELCO connection or it is faulty.
I.S. phone appears inactive.	1. Check the I.S. telephone panel. 2. Check the ac fuse F4 at the IBU. 3. Ensure there is no wiring open in the connecting cable or at the I.S. telephone.

⚠ CAUTION ⚠

Any field repairs on the intrinsically-safe design of the phone are strictly prohibited. Any such change will void ALL hazardous approvals.

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LIGHTNING PROTECTION

Telephone lines are susceptible to lightning strikes and must be properly protected and maintained. On-premise line protection is usually provided at the building entrance by the responsible telephone company when it is installed. This protection is often neglected after installation.

Degradation of conventional protection, such as carbon blocks or gas discharge types, will occur with each lightning strike. To ensure safe operation, protective elements should be replaced frequently and checked for proper connection and grounding. Gas discharge types are by far the most robust, cost-effective means of protection.

The registered I.S. equipment meets all isolation and safety requirements of FCC, Part 68, DOC CS-03, UL 913, and CSA C22.2-No. 157. However, lightning strikes are not predictable or considered to be a condition of fault likely to occur in practice as defined by the guidelines for intrinsic safety. Therefore, it is imperative that the user employ and maintain a proper lightning protection scheme. This is true for all hazardous area equipment and all telecommunications equipment subject to lightning.

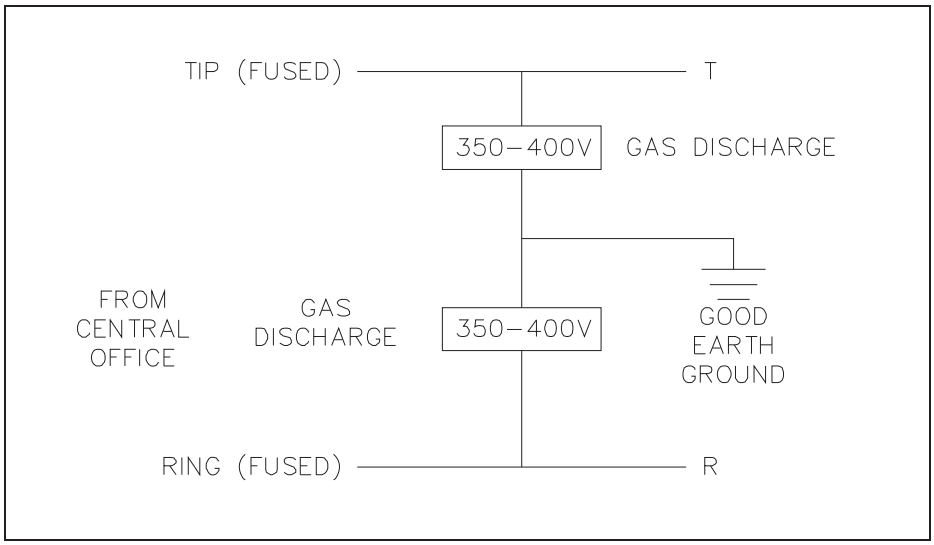


Figure 4. Example of a lightning protection design

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