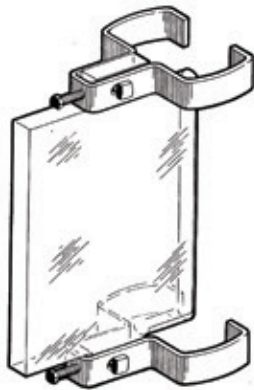




# PENBERTHY FROST PROOF EXTENSION

## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

Before installation these instructions must be read fully and understood



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### PRODUCT WARRANTY

Emerson warrants its Penberthy products as designed and manufactured to be free of defects in the material and workmanship for a period of one year after the date of installation or eighteen months after the date of manufacture, whichever is earliest. Emerson will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship.

Prior to submitting any claim for warranty service, the owner must submit proof of purchase to Emerson and obtain written authorization to return the product. Thereafter, the product shall be returned to Emerson with freight prepaid.

This warranty shall not apply if the product has been disassembled, tampered with, repaired or otherwise altered outside of the Emerson factory, or if it has been subject to misuse, neglect or accident.

The responsibility of Emerson hereunder is limited to repairing or replacing the product at its expense. Emerson shall not be liable for loss, damage or expenses related directly or indirectly to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that Emerson is not responsible for damage or injury caused to other products, buildings, personnel or property, by reason of the installation or use of its products.

*This is Emerson's sole warranty and in lieu of all other warranties, expressed or implied which are hereby excluded, including in particular all warranties of merchantability or fitness for a particular purpose.*

This document and the warranty contained herein may not be modified and no other warranty, expressed or implied, shall be made by or on behalf of Emerson unless made in writing and signed by the company's general manager or director of engineering.

# PENBERTHY FROST PROOF EXTENSION

## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

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### 1 ABOUT THE MANUAL

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This manual has been prepared as an aid and guide for personnel involved in installation or maintenance. All instructions must be read and understood thoroughly before attempting any installation, operation or maintenance.

#### Safety instructions

Emerson does not have any control over the manner in which its frost proof extension is handled, installed or used. Emerson cannot and will not guarantee that a frost proof extension is suitable for or compatible with the user's specific application.

#### CAUTION

*Safety glasses should be worn when installing a frost proof extension. Failure to follow any instruction could possibly result in a malfunction of the frost proof extension resulting in loss of ability to read liquid level, property damage or physical injury.*

### 2 INTRODUCTION

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#### 2.1 Features and specifications

Penberthy frost proof extensions are designed to be mounted readily and able to fit all vision slot lengths of Series L, M, H and LC liquid level gages. Penberthy frost proof extensions will extend the viewing window glass out beyond the range of frost build up.

#### 2.2 Design ratings

Penberthy frost proof extensions are available in three different extension sizes to handle the temperature ranges as listed below:

**TABLE 1 - DESIGN RATINGS**

Temperature range	Extension size
-60°F [-51°C] to 150°F [66°C]	2 inches [51 mm]
-140°F [-96°C] to 150°F [66°C]	4 inches [102 mm]
-220°F [-140°C] to 150°F [66°C]	6 inches [152 mm]

#### 2.3 Application data

**Note:** for specific application data within the design limits stated above, the user should refer to the product proposal or should request the supply of the applicable technical data sheet.

#### WARNING

*Under no circumstances should these design ratings or application data be exceeded. Exceeding design ratings or application data may cause severe physical injury or property damage.*

### 3 INSPECTION AND PERFORMANCE CONFIRMATION

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#### 3.1 Receiving inspection

##### Safety instructions

Exercise care in handling extension parts to avoid scratching, denting or otherwise damaging the polished edge of the extension. Any marks on the polished edge, as well as dirt, paint, or tape, will result in a reduction of ability to read liquid level.

Upon receipt of frost proof extension, check all components carefully for damage incurred in shipping. If damage is evident or suspected, do not attempt installation. Notify the carrier immediately and request a damage inspection.

#### 3.2 User's rating inspection

The user should confirm that:

1. The frost proof extension size and length conform to the description on the user's purchase order.
2. The operating conditions described in the purchase order agree with the actual operating conditions at the installation site.
3. The actual operating conditions at the installation site are within the application data shown on the applicable technical data sheet or product proposal referred to above.
4. The materials of construction of the frost proof extension are compatible with the surrounding atmosphere in the specific application.

# PENBERTHY FROST PROOF EXTENSION

## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

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### 4 INSTALLATION

Installation should only be undertaken by qualified, experienced personnel who are familiar with this equipment and have understood all the instructions in this manual.

#### CAUTION

*Do not proceed with installation of a frost proof extension to a liquid level gage unless the gage has been mounted permanently and tested per the Installation, Operation and Maintenance Instructions included with the gage; and the gage has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature and has been drained or purged of all fluids. Failure to follow these instructions could result in physical injury or property damage.*

The user should refer to the product proposal to obtain dimensional information for the specific size of the frost proof extension.

#### 4.1 Inspection and cleaning of gage glass

Prior to installation of a frost proof extension to a gage, the gage glass should be cleaned and inspected per instruction as follows:

1. Clean glass within the vision slot using a non-abrasive household cleaner. DO NOT use a wire brush, metal scraper, or any device which could scratch the glass.
2. Inspect the surface of the glass for any signs of clouding, etching, scratching, or deep physical damage such as bruises, checks, or corrosion that extends through the outer surface of the glass into the interior. Shining a light at approximately a 45° angle will aid in detecting some of these conditions, which will glisten more brightly than the surrounding glass when reflecting light.

#### 4.2 Use of clear silicone rubber sealant

A tube of clear silicone rubber sealant is supplied to be applied around the exterior of the extension where the extension and the gage glass come in contact. When applied according to these instructions, the sealant will form a barrier against moisture.

Frost proof extension applications where a clear silicone rubber sealant is not used may be subject to partial or total loss of visibility due to freezing of moisture between gage glass and extension.

#### 4.3 Familiarization

Study all the parts and compare them to the exploded view in Figure 1. Notice that the extension is not symmetrical. The extension face with the rounded corners is made to fit into the vision slot of the gage cover.

#### 4.4 Installation of extension to gage

1. When using the silicone rubber sealant, it is recommended that the user follows all directions on the rubber sealant package. Attach the nozzle and prepare for application by cutting the tip at the ¼ mark.
2. Insert end bolt into bracket and thread nut a few turns for both upper and lower brackets.
3. While holding the extension in place to the gage, slip brackets over ends of the gage and hand tighten end bolts to hold the extension in place.
4. Insert through bolts into brackets and hole in extension. Attach nuts and hand tighten.
5. Apply a ¼" (6 mm) wide bead of the clear rubber sealant completely around the extension where the extension and the gage come in contact, making sure there are no gaps.
6. Wrench tighten end bolts one turn beyond hand tight.
7. Wrench tighten through bolts.

#### CAUTION

*Failure to follow any of the above instructions may result in damage to frost proof extension or gage glass breakage with resulting property damage or physical injury.*

# PENBERTHY FROST PROOF EXTENSION

## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

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### 5 OPERATION

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#### 5.1 Pre-operational check

1. Ensure that all installation procedures have been completed.
2. Ensure that the frost proof extension is sufficiently visible over the entire length of the liquid level gage.

#### 5.2 Operating

##### Safety instructions

Liquid level gage assemblies must be brought into service slowly to avoid excessive stress on gage glass caused by hydraulic shock, thermal shock or mechanical loads. The connecting gagecocks must first be opened slightly and the gage pressure and temperature allowed to equalize slowly with the vessel. The connecting gagecocks should then be opened all the way.

### 6 MAINTENANCE

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Maintenance should only be undertaken by qualified, experienced personnel who are familiar with this equipment and have read and understood all the instructions in this manual.

#### 6.1 Preventative maintenance

The user must create maintenance schedules, safety manuals and inspection details for each specific installation of a frost proof extension. On all installations, the following items should be evaluated regularly by the user for purposes of maintenance:

1. Extension, for signs of dirt build up, scratches or breakage.
2. Mounting brackets, for signs of loosening.
3. Build up of frost between gage glass and extension.

The user must determine an appropriate maintenance schedule necessary for his or her own application, upon evaluation of their own operating experience. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

#### 6.2 Preventative maintenance - cleaning of extension

Clean extension with a non-abrasive soap or detergent and water using a soft, grit-free cloth or sponge. When cleaning grease and oil from the extension, use only hexane, kerosene, or aliphatic naphtha (no aromatic content) and a soft, grit-free cloth. DO NOT use solvents such as acetone, benzene, carbon tetrachloride, dry cleaning fluid or lacquer thinners since they will attack the surface of the extension. After the surface has been cleaned and rinsed of all foreign particles it may be dried with a clean, soft, damp chamois or grit-free cloth.

##### Safety instructions

Do not use hard, rough cloths on edge of extension because they will scratch the polished surface. The scratches will result in reduced visibility of the frost proof extension.

### 7 REMOVAL - DISASSEMBLY - REASSEMBLY

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#### CAUTION

*Do not proceed with the disassembly of a frost proof extension unless the liquid level gage to which the frost proof extension is mounted has been mounted permanently and tested per the Installation, Operation and Maintenance Instructions included with the gage; and has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature and has been drained or purged of all fluids. Failure to follow these instructions could result in physical injury or property damage.*

#### 7.1 Disassembly

- a. Loosen and remove bracket through bolts.
- b. Loosen bracket end bolts and remove brackets while holding extension to keep it from falling.
- c. Remove extension.
- d. Remove sealant, if any, from vision slot of gage by pulling out with bare hands or with the aid of a wood scraper.

##### Safety instructions

DO NOT use a wire brush, metal scraper or any device which could scratch the gage glass within the vision slot.

- e. Remove sealant from extension by peeling off with bare hands. DO NOT use any scraping or abrasive device. Clean extension per Section 6.2.

#### 7.2 Reassembly

Refer to Section 4 - Installation and Section 5 - Operation when returning to service.

### 8 DISPOSAL AT END OF USEFUL LIFE

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Penberthy frost proof extensions are used in a variety of fluid applications. By following the appropriate federal and industry regulations, the user must determine the extent of preparation and treatment the frost proof extension must incur before its disposal. A Material Safety Data Sheet (MSDS) may be required before disposal services accept certain components. Metal, glass and polymers should be recycled whenever possible. Refer to order and the applicable technical data sheet for materials of construction

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### 9 TELEPHONE ASSISTANCE

If you are having difficulty with your frost proof extension, contact your local Penberthy distributor. You may also contact the factory direct at (956) 430-2500 and ask for an applications engineer. So that we may assist you more effectively, please have as much of the following information available as possible when you call:

- Model #
- Name of the company from whom you purchased the frost proof extension
- Invoice # and date
- Process conditions (pressure, flow rates, tank shape, etc)
- A brief description of the problem
- Trouble shooting procedures that failed

If attempts to solve your problem fail, you may request to return your frost proof extension to the factory for intensive testing. You must obtain a Return Authorization (R.A.) number from Emerson before returning anything. Failure to do so will result in the unit being returned to you without being tested, freight collect. To obtain an R.A. number, the following information (in addition to that above) is needed:

- Reason for return
- Person to contact at your company
- 'Ship-to' address

There is a minimum charge for evaluation of non-warranty units. You will be contacted before any repairs are initiated should the cost exceed the minimum charge. If you return a unit under warranty, but it is not defective, the minimum charge will apply.

### 10 EXPLODED PARTS DIAGRAM

#### PARTS LIST

Ref #	Item
137	Bolt
4	Nut
137A	Bolt
4A	Nut
73	Bracket
74	Extension

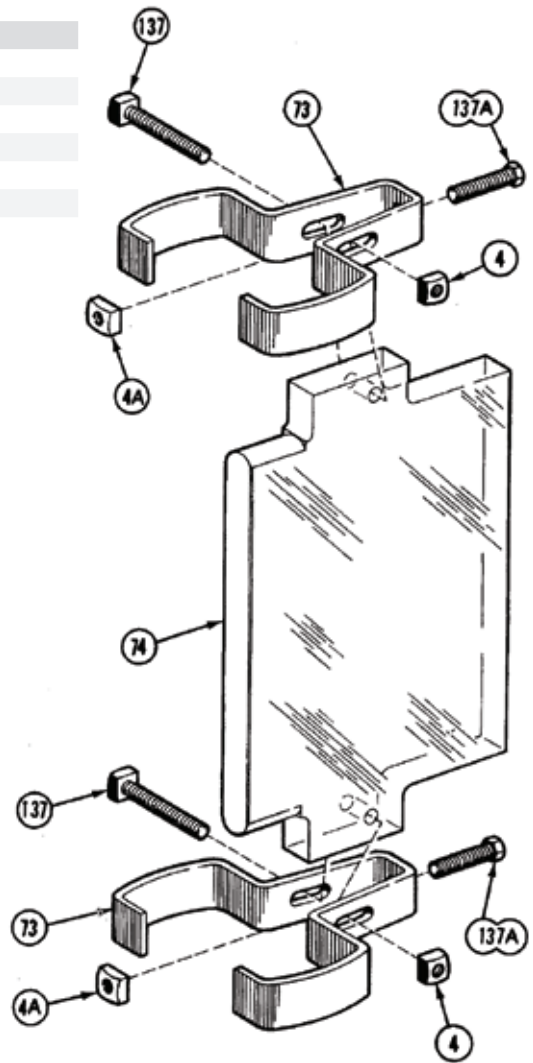


FIGURE 1