

Installation Instructions

Retractable Grounding Assembly (RGA)

Rev M, 10/4/10



Manufactured for Lightning Eliminators & Consultants, Inc.
by Conductix, Inc. 10102 F St Omaha, NE 68127.

Introduction

The RGA is designed to create the lowest impedance connection between the roof and shell of a floating roof tank by creating the shortest possible path between the two. This connection is obtained by keeping constant tension on the wide tinned copper braided cable.

The following manual outlines the procedures required for proper installation of an RGA. If a custom installation or installation on a closed roof tank is desired, please contact your LEC Sales Manager or Technical Support.

In many cases, the RGA is sold in conjunction with LEC's Dissipation Array System (DAS). A LEC site supervisor is an important and critical part of the DAS installation. The Supervisor will assist the on-site contractor that will be responsible for installing the DAS. This assistance includes training the contractor in the nuances of the installation and thereby ensuring proper installation. Further, the Supervisor will be available to address any questions that may occur during installation.

Note: Review all documents and drawings prior to commencing work. The RGA can be installed on a tank during maintenance shut downs or while the tank is in service. Follow all plant safety procedures and acquire necessary permits.

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Equipment and Tools Required

Pneumatic or Hand Punch or drill to create 7/16" [11mm] diameter holes

7/16" or Adjustable Wrench

9/16" or Adjustable Wrench x 2

Wire Wheel or Brush

Lectra Shield

Supplied Parts

Part Name	Quantity
1400 Reel	1
RGA Mount	1
1/4" Bolt	4
1/4" Flat Washer	2
1/4" Lock Washer	4
Hold Down Bar	2
864/30 Tinned Braided Copper Cable	PN0008984: 60ft [18.3m] PN0010109: 80ft [24.4m]
Handle	2
Horizontal Bracket	1
12" Tinned Flexible Ground Strap	2
3/8" Stainless Steel Bolt	6
3/8" Stainless Steel Nut	6
3/8" Stainless Steel Flat Washer	12
3/8" Stainless Steel Lock Washer	6
3/8" Bronze Bolt	4
3/8" Bronze Nut	4
3/8" Bronze Flat Washer	8
3/8" Bronze Lock Washer	4
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Preparing Materials

Inspect reel, cable, hardware, grounding straps, mount and wire guide. Do not remove the shrink-wrap from the cable on the reel at this time. Contact your LEC representative or LEC Sales Manager and **DO NOT INSTALL** the RGA if any of the parts is missing or damaged.



Figure 1: Boxed RGA from LEC

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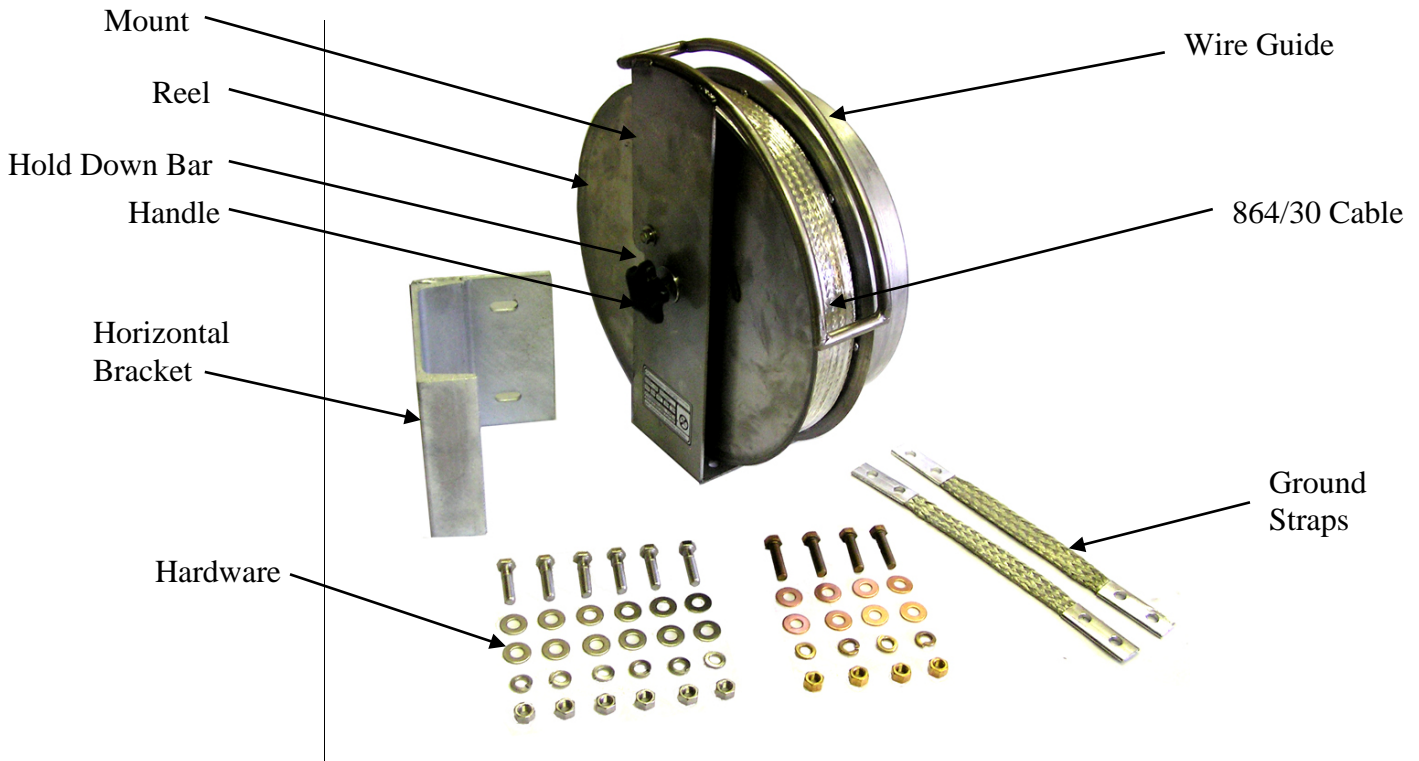


Figure 2: RGA Assembly

Layout and Tank Preparation

If an installation drawing with the RGA quantity and location is provided by LEC, mark the location(s) of where the RGA should be placed in accordance with the print. If a drawing is not provided, the RGAs should be equally spaced from each other (i.e. if 5 RGAs were purchased for one 100ft [30m] diameter tank, each RGA will be placed 72° apart or roughly 61ft - 10in [18.85m] on the circumference of the rim of the tank.). Mark these locations. Ideally, the RGA will be placed on the highest possible location of the tank: the fire suppression/swash plate, because explosive gases must not be present immediately around the reel during regular use. If the RGA cannot be mounted on the fire suppression plate or directly to the tank rim, use the Horizontal Bracket.

Note: Ensure that the RGA will not interfere with the tank roof when fully filled. Finally, if any obstacles or interferences are encountered, contact the LEC Sales Manager for assistance.

Attaching the RGA to the Tank

The RGA can be mounted directly to the fire suppression plate/tank wall or to the tank lip using the supplied Horizontal Bracket. The drawing “RGA Mount”, inserted at the end of this document, illustrates the two mounting methods. This can be used as an aide to assist in determining which mounting option is best suited for your application; directly to the vertical tank wall or utilizing the supplied Horizontal Bracket to mount to the rim of the tank.

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Mounting the RGA directly to the Tank Wall – Remove the Reel from the mount by removing the ¼” bolts attaching the Hold Down Bars. Four (4) 7/16” [11mm] diameter holes need to be made in the field in the tank wall using the RGA Mount as a template. See Figure 3, RGA Mount - Hole Dimensions. Scrape paint and rust from around the drilled holes to bare metal. Apply Lectra Shield to both sides of the hole to prevent rusting. Using the supplied hardware, secure the RGA Mount to the tank wall and apply Lectra Shield to the hardware after assembly, See Figure 4, Mounting the RGA Mount to the Tank Wall.

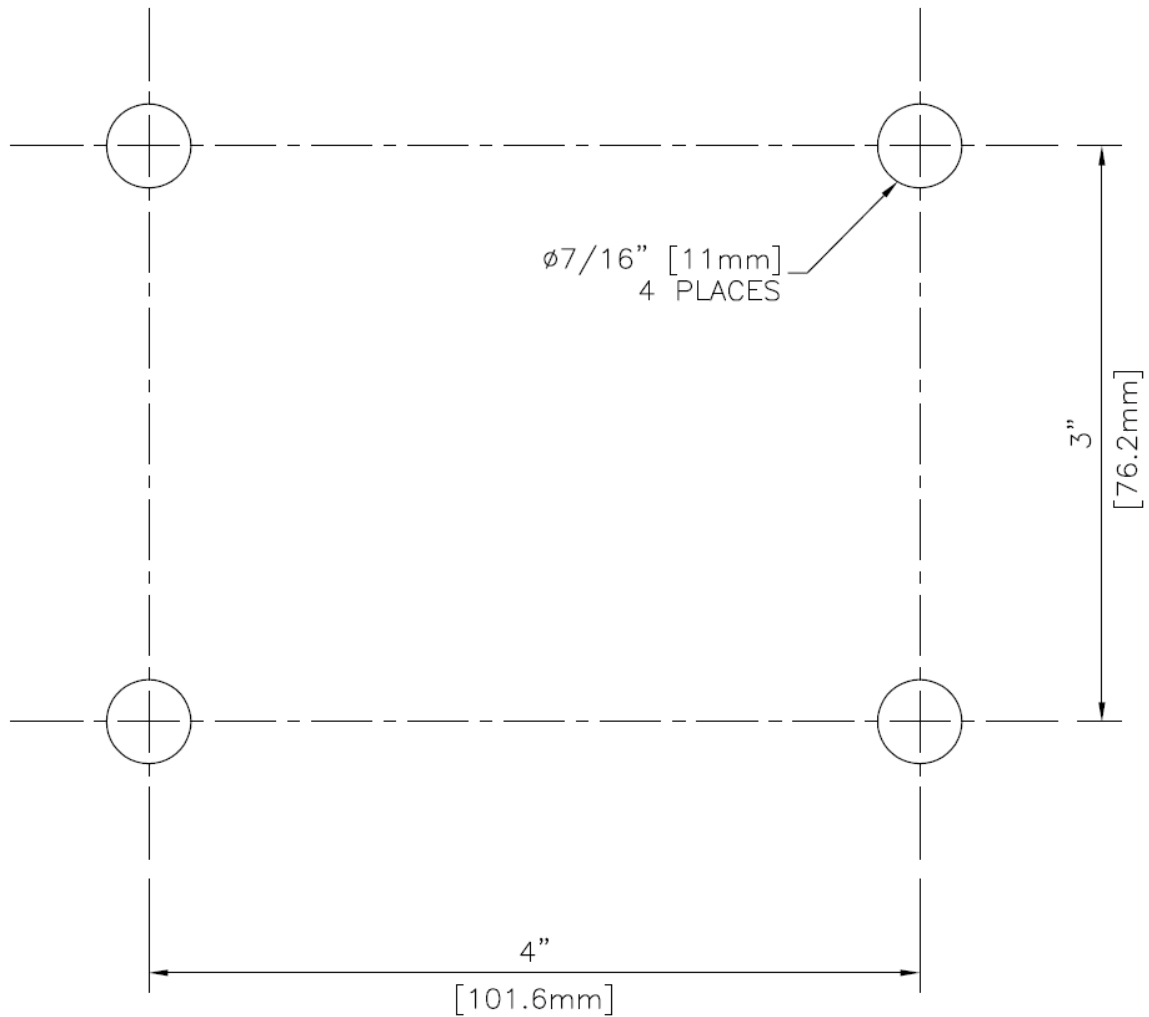


Figure 3: RGA Mount – Hole Dimensions

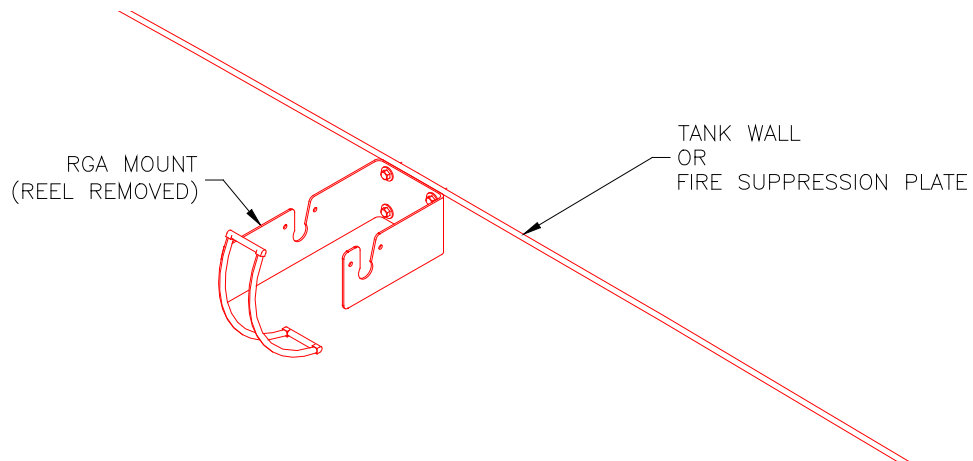


Figure 4: Mounting the RGA Mount to the Tank Wall

Mounting the RGA using the Horizontal Bracket – Two (2) 7/16" [11mm] diameter holes need to be made in the field on the tank lip using the Horizontal Bracket as a template. See Figure 5, Horizontal Bracket - Hole Dimensions. Scrape paint and rust from around the drilled holes to bare metal. Apply Lectra Shield to both sides of the hole to prevent rusting. Using the supplied hardware, secure the Horizontal Bracket to the tank lip and apply Lectra Shield to the hardware after assembly. Attach the RGA Mount to the Horizontal Bracket. See Figure 6, Mounting the Horizontal Bracket to the Tank Lip.

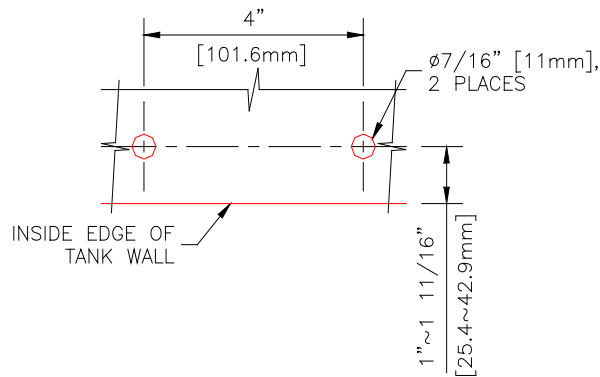
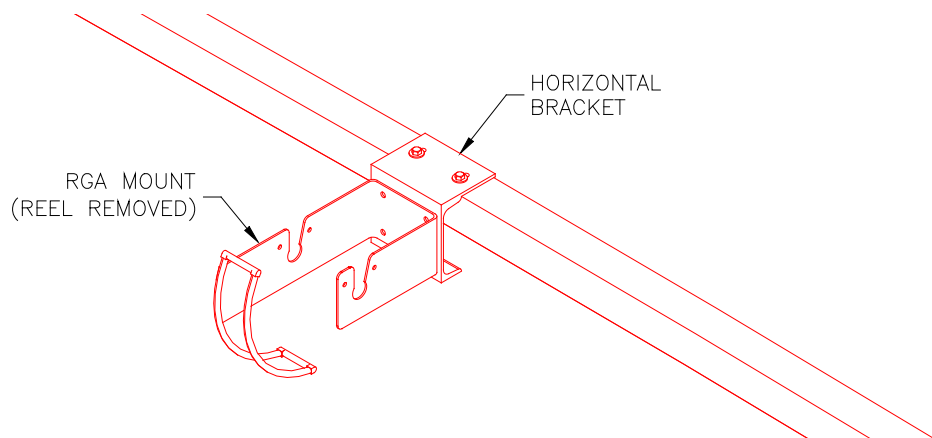


Figure 5: Horizontal Bracket – Hole Dimensions



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Figure 6: Attaching the Horizontal Bracket to Tank Shell

Slide the RGA Reel into the RGA Mount (See Figure 7). Do not remove the clear shrink-wrap.

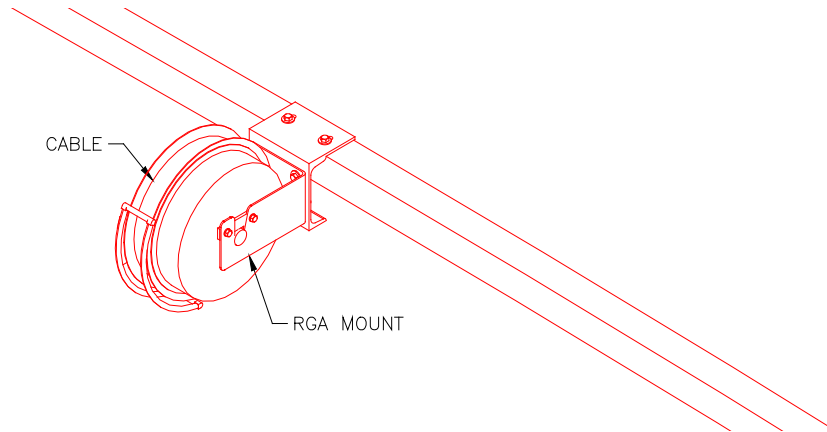
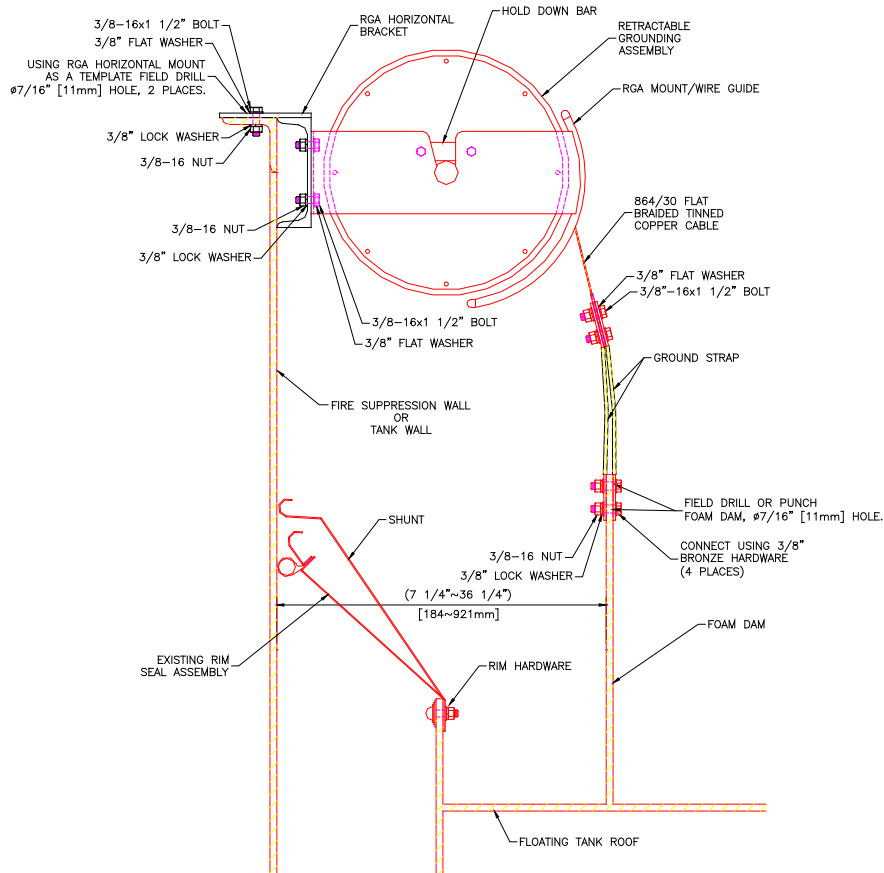


Figure 7: Slide RGA Reel to the RGA Mount

Secure the RGA Reel to the RGA Mount using the two (2) Hold Down Bars and the supplied 1/4" hardware (bolts and washers). The Reel should rotate freely on the RGA Mount.

Grounding and bonding

The Ground Strap is pre-drilled for connection to the tank roof. The RGA will operate properly on roofs where this Ground Strap can be installed directly below the RGA and should be 7 1/4"~36 1/4" [184~921mm] from the tank wall as shown in Figure 8.



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Figure 8: Horizontal Mounting Bracket with RGA Assembly

The attachment point on the floating roof foam dam **must align vertically** with the center of the braided cable wire, as shown in Figure 9. To facilitate vertical alignment, the RGA should be installed when the tank is at its fullest capacity. A ‘plumb bob’ or laser level can be used for best possible results (caution – a ‘plumb bob’ should be utilized when the wind is calm). Maintaining vertical cable alignment within +/- 12” [305mm] will minimize cable wear and maximize cable life. Once you locate the attachment point, create two (2) 7/16” [11mm] diameter holes using the Ground Strap as a template, see Figure 10. Scrape paint and rust from around the drilled holes to bare metal. Apply Lectra Shield to both sides of the holes to prevent rusting.

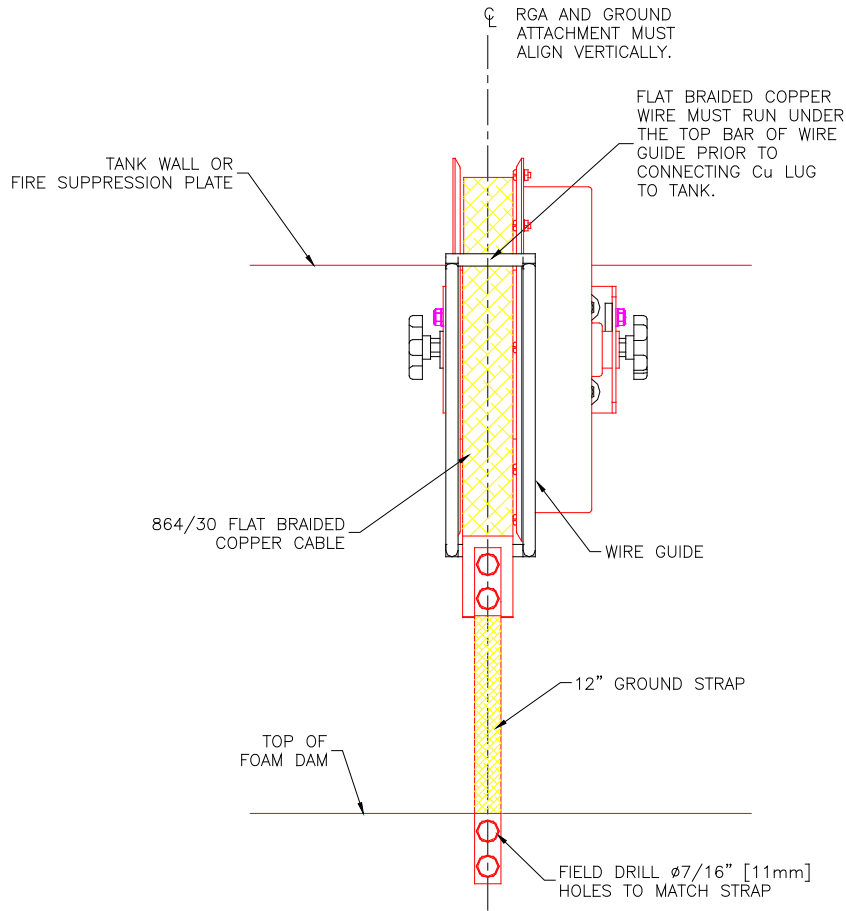
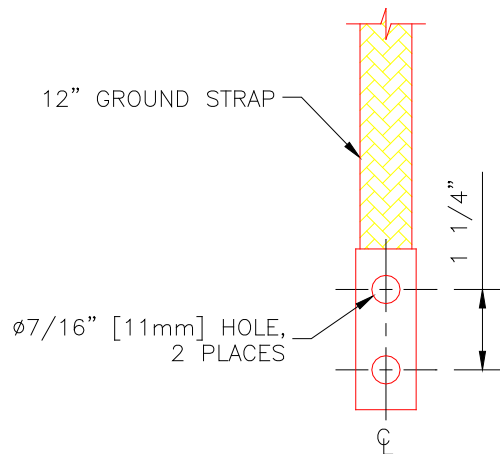


Figure 9: RGA Front View



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Figure 10: 12" Flexible Ground Strap End

Pre-tensioning the RGA

The RGA cable should be tensioned such that when the floating roof is at the top (full) position, a minimum number of pre-tension rotations are applied to the spool. This spring pre-tension will need to be adjusted in the field. To pre-tension the RGA, rotate the RGA as shown in Figure 11 below. See the Pre-tension Chart attachment at the end of this manual to determine the required number of pre-tension turns for your application.

If the tank is not full, the amount of pre-tension rotation to be applied should be enough to re-coil the cable if fully extended (floating roof tank at its empty state).

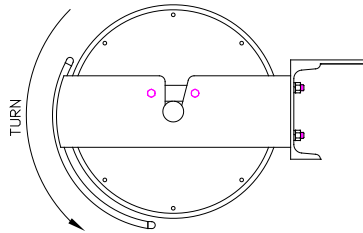
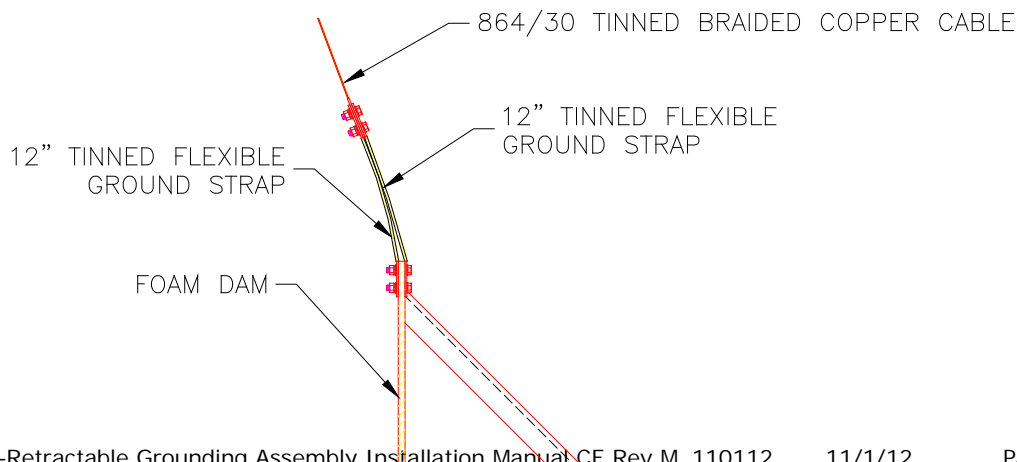


Figure 11: Pre-Tension

When the tank is ready to be placed into service, follow the steps below to pre-tension the RGA:

1. Prior to removing the shrink-wrap from the cable, turn the RGA reel back and forth to make sure that the spring is in its most relaxed state.
2. Rotate the RGA reel against the spring's tension shown above (complete rotations, if 24 required - $24 \times 360^\circ$) to pre-tension the system.
3. Without allowing the spring motor to recoil, carefully remove the shrink-wrap (do not use sharp objects to cut shrink-wrap) and pre-tension tag.
4. Un-reel the RGA cable to the top of the foam dam of the tank.
5. Pull the cable out the intended travel distance and allow it to rewind. This procedure should be repeated five (5) to ten (10) times in order to set the spring. Walk the cable back to the foam dam to set the spring.
6. Secure the supplied Ground Straps to the tank and RGA cable, one on each side of the foam dam and RGA Cable, see Figure 12.
7. Check retraction by pulling the cable out and letting it retract back. Repeat steps 2 and 5, if necessary, to add tension.
8. Verify that all bolts and nuts are mechanically tight with clean electrical contact.



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Figure 12: Ground Straps on Either Side of the Foam Dam

Finally, coat all mechanical ground connections with Lectra Shield. If you encounter any problems, contact the LEC Site Supervisor immediately or the LEC Sales Representative in the absence of a Site Supervisor.

To maximize cable and strap service life, LEC recommends disconnecting the ground straps from the foam dam and allowing the cable to retract if the tank will be out of service for an extended period of time. The RGA Ground Straps should be reconnected before the tank is placed back into service. When reconnecting the Ground Straps remove any rust at the connection point to bare metal and apply Lectra Shield before and after securing the straps.

Welding the Horizontal Bracket

The Horizontal Bracket should be welded onto the tank lip during a maintenance shut down or when feasible to do so.

Corrosion Protection

For the RGA to function properly LEC requires a coating of Lectra Shield, a corrosion inhibitor, to be applied to all mechanical grounding connections as described above. Lectra Shield can be purchased directly from LEC.

- Lectra Shield LEC Part #0000120
 - LEC Approved Alternatives (if Lectra Shield is unavailable):
 - Emerson & Cummings: ECCOCOAT CC 40 A
 - Sanchem Inc.: NO-OC-IC Special

Uninstall

In the event that the RGA must be removed from the tank, the following steps should be followed. The tank should be at its fullest capacity to minimize stored energy in the springs. Unbolt the ground strap from the foam dam wall without allowing the spring motor to recoil. Next, carefully retract the strap to the reel. Secure the strap to the reel with shrink-wrap or heavy-duty tape. In a controlled fashion, carefully allow the RGA to rotate until all stored energy has been removed from the springs and they are in a completely relaxed state. Unbolt the hold down bars and remove the RGA from the mount. The RGA mount and horizontal bracket, if present, may then be unbolted from the tank.

Note: Never remove the reel from the mount if there is tension in the springs as the handles will rotate in and uncontrolled manner.

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Maintenance

RGAs are often installed in corrosive environments. The more corrosive the environment, the more frequently inspection and maintenance must be performed. At a minimum, the following should be performed on an annual basis. LEC recommends an increase in the frequency of inspection/maintenance as conditions require.

- Remove build-up from RGA cable and reel.
- Keep the bearing well lubricated using mineral oil, WD40 or any electrically conductive lubricant.
- Visually inspect the Ground Strap for dirt, corrosion or tearing; if there is a tear in the strap, replace immediately.
- Visually inspect the RGA cable for dirt, corrosion or tear; if there is a tear in the cable, call your LEC Sales Manager immediately.
- Ensure that all Ground Strap, Mount, and Horizontal Bracket nuts and bolts are mechanically tight. Tighten any loose hardware immediately.

Replacement Parts

- 12” Tinned Flexible Ground Strap LEC Part #0008529
- 12” Tinned Flexible Ground Straps (x2) and 3/8” Bronze Hardware LEC Part #0009433
- 60 ft 864/30 Tinned Braided Copper Cable LEC Part #0010424
- 80 ft 864/30 Tinned Braided Copper Cable LEC Part #0004070

ATEX Certification

The CE/Ex markings on the RGA signify the RGA’s compliance with the requirements of Directive 94/9/EC involving potentially explosive atmospheres. The various markings are described below.



- CE** CE Mark
- Ex** Specific mark for explosion protection
- II** Equipment Group II: intended for use above ground, not for use in mines
- 2** Equipment Category 2: the equipment is protected against ignition hazards in normal operation where a gas is likely to occur under normal conditions
- G** Equipment is intended for exposure to explosive gasses and mists only (not protected against explosive dusts)
- T4** In normal operation, the maximum surface temperature of the equipment will not exceed 275 deg. F (135 deg. C).

Technical Support

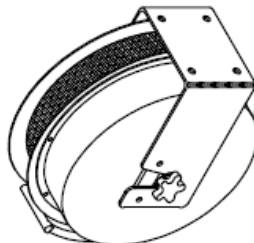
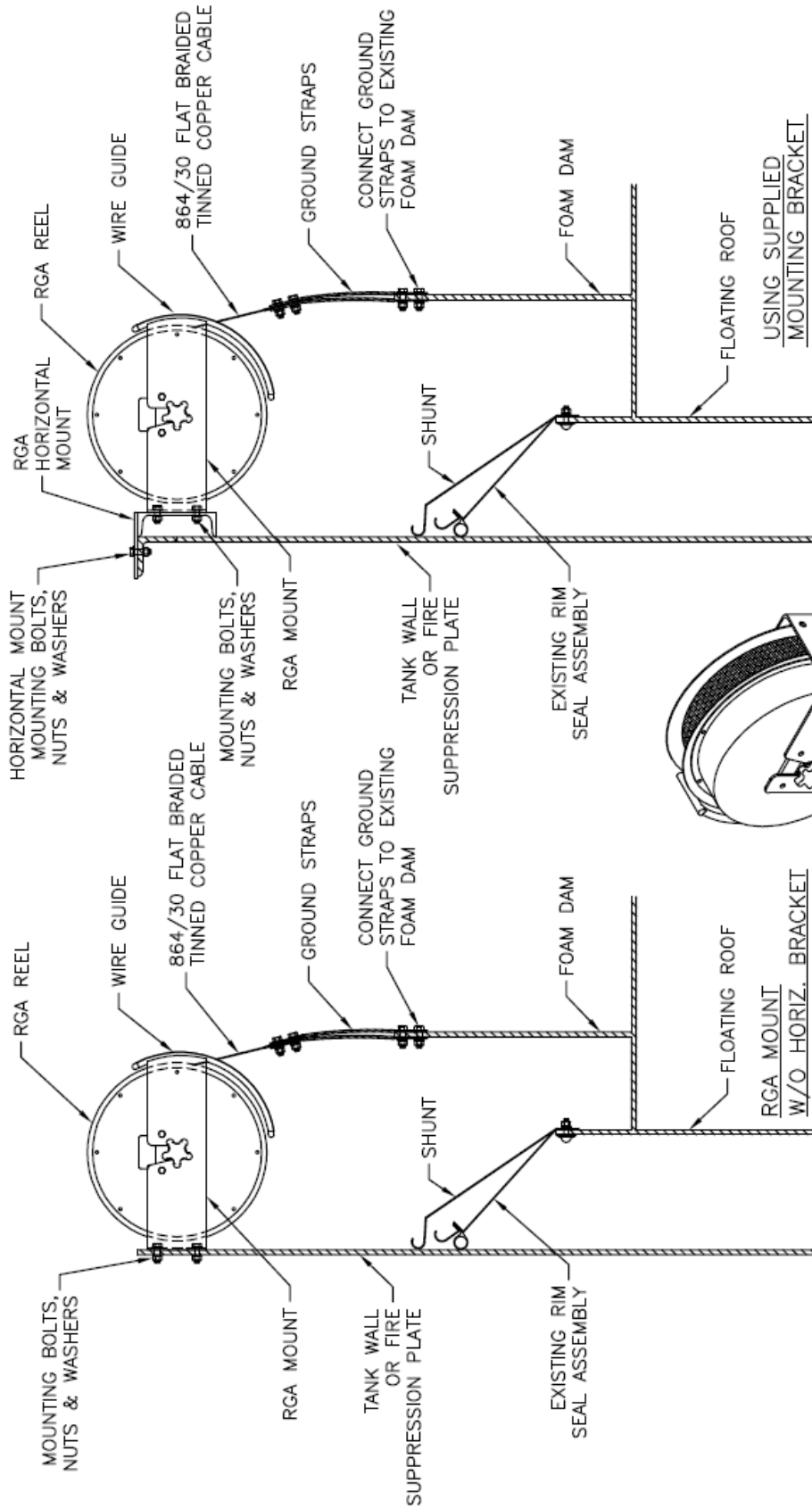
For technical support please contact:

Lightning Eliminators & Consultants, Inc.
6687 Arapahoe Road
Boulder, Colorado 80303 USA
PHONE: (+1)303/447-2828
FAX: (+1)303/447-8122

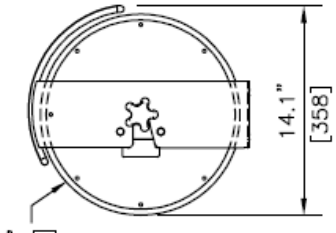
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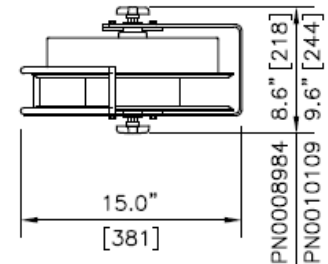
RGA MOUNT.A12



MOUNTING SIDE ISOMETRIC



RGA_DIMENSIONS



PN0008984 8.6" [218]
PN0010109 9.6" [244]

WEIGHT
(INCL. BOX & ALL HARDWARE)
PN0008984: 88 LB. [37 KG.]
PN0010109: 101 LB. [43 KG.]



Lightning Eliminators & Consultants, Inc.
6687 Arapahoe Road
Boulder, Colorado 80303
Phone 303 447-2828

RGA MOUNTING OPTIONS
DRAWING NO. RGA MOUNT