

Automatic Cable Reeler

LINESENSE
Fire Detection Ltd

www.linesense.co.uk



MANUAL
INSTALLATION - COMMISSIONING
OPERATION - MAINTENANCE
Pt. No. 53001-002

Automatic Cable Reeler

| Issue | Change | Date | Remarks |
|-------|--------------------------|----------------|---------|
| 1 | Introduction | August 2016 | |
| 2 | Text amendments | September 2016 | |
| 3 | Pt no. 53001-001 removed | March 2022 | |

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1. - Introduction

Floating roof storage tanks commonly contain highly flammable products with the potential for catastrophic fires. If the fire is not detected early it can cause significant loss of plant, down time of production and in severe situations even risk to life. These can have a large financial or environmental impact.

The main cause of fires is the ignition of flammable vapours leaking from a worn or damaged rim seal. Early detection of the incipient fire is paramount for any fire suppression measures preventing the growth and spread of the fire.

The design and size of storage tanks can differ with each operator and site, requiring a flexible solution to meet individual needs. With its ease of installation and low maintenance Linesense digital Linear Heat Detection (LHD) cable provides a cost effective answer. The LHD cable can be cut to length as required and a single cable can protect the largest of storage tanks.

Linesense Linear Heat Detection cable is a simple and reliable product providing uninterrupted detection along its length ensuring the complete circumference of the rim seal is protected.

The LHD cable installed around the rim seal of a floating roof tank requires an electrical connection between roof level and a junction box at the top of the tank wall. The connecting cable needs to allow for the rise and fall of the floating roof as the tank fills and empties. The cable reeler automatically adjusts for the movements of the roof, dispensing cable out as the level falls and reeling cable back in when the level rises. The Automatic Cable Reeler is installed at the top of the tank wall and provides a four core cable to connect to a junction box located on the tank roof.

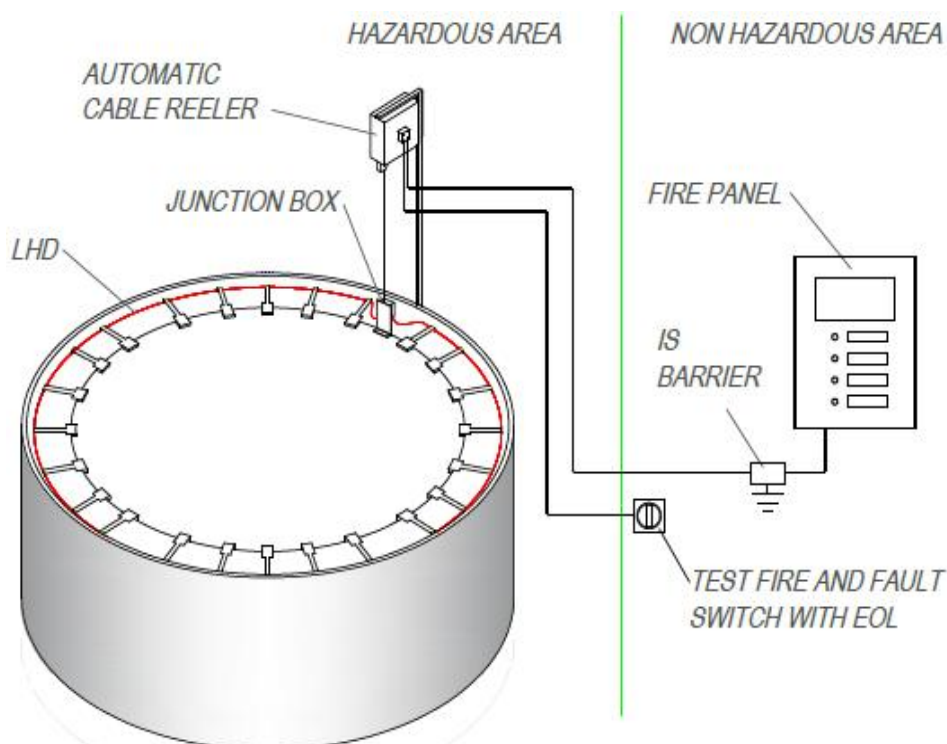


Figure 1.

2. Certifications

The Cable Reeler is supplied with the following certifications.

IECEEx Ex ia IIC T6 Ga/Gb

(Applies for $-40^{\circ}\text{C} \leq T_{amb} +40^{\circ}\text{C}$)

IECEEx Ex ia IIC T4 Ga/Gb

(Applies for $-40^{\circ}\text{C} \leq T_{amb} +60^{\circ}\text{C}$)

ATEX II 1/3G Ex Ia IIC T6 -40°C $T_a \leq 60^{\circ}\text{C}$)

3. Technical Features

Dimensions: H x W x D (mm) 400 x 450 x 150

Weight: ~25Kg

Enclosure Material options:

Stainless Steel AISI 316 (pt. no 53001-002)

Junction Box:

Stainless Steel AISI 316, 150 x 150 x 80mm Ex ia II C certificated

The junction box has a mounting hole suitable for a M20 x 1.5 cable gland

Wiring terminals Quantity 4 x 2.5mm² IECEEx Certified.

Enclosure Ingress rating: IP42

Internal spring: Carbon steel

Internal devices: ABS/Fibre glass

Cable Specifications:

- 4 conductors 1mm²
- Maximum extension length: 23m
- Flame retardant.
- External coating: Santoprene
- Dissipative external covering
- Resistant to chemical agents.
- Operating temperature: -40 to $+60^{\circ}\text{C}$
- Total Resistance: 0.50Ω
- Total Capacitance spec.: 2nF
- Total Inductance spec.: 0.1mH
- External Insulation resistance: $0.035\text{M}\Omega$
- Maximum Operating Voltage: 48V

4. Mechanical Installation.

Installation of the cable reeler requires a suitable mounting/support bracket to be fitted to the top of the tank. With each tank and installation being different there is no standard bracket and it is left to the installation personnel to evaluate the best method of support.

The correct mounting orientation for the reeler has the opening for the connection cable facing directly downward towards the junction box located on the floating roof. See figure 2.

Mechanical details of mounting plate bracket is given in Figure 3.

Note: The connection cable will require the strain taken off it before the point of entry into the junction box on the roof. A short lanyard with a Carabiner at each end fixed above the cable stop can be used to anchor the cable to the tank roof.

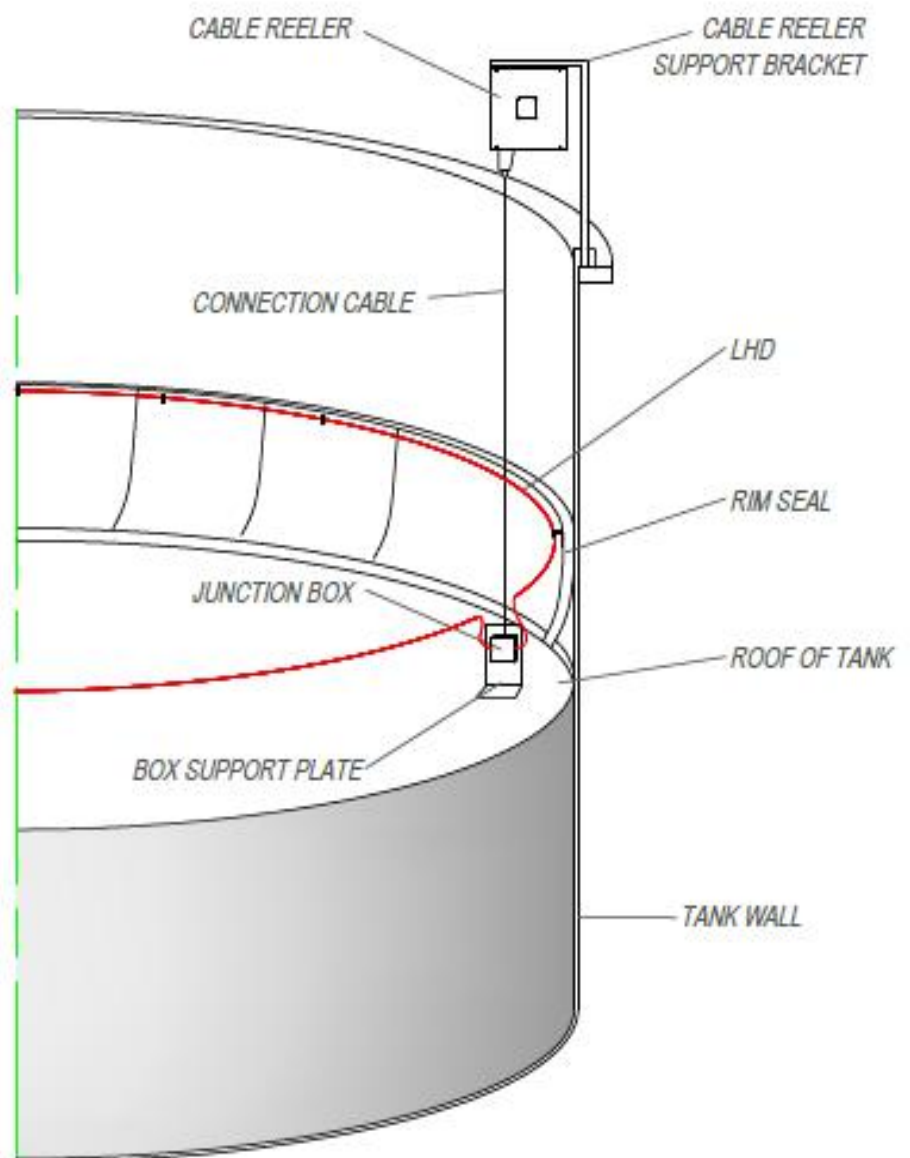


Figure 2. Typical Installation.

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DETAIL OF CONNECTION BETWEEN TURNBUCKLE AND SUPPORT STRUCTURE

SPINARE A FINE REGOLAZIONE
LOCK BY PIN AFTER THE REGULATION

324
250
37
37
37

SUPPORT PLATE INSTALLER'S CARE
(TO BE WELDED ON THE STRUCTURE)

56

FIXING BOLTS FOR "L" PLATE ON TURNBUCKLE

1
2
3
4
5
6

"L" BRACKET INCLUDED ON THE TURNBUCKLE

TYPICAL DWG. FOR SUPPORT STRUCTURE OF TURNBUCKLE

DMCT-001_30

SCALE

| Pos. | Description | u.m. | q.ty | Weight |
|------|---|---------|------|--------|
| 6 | ELASTIC PIN Ø5 x 12 | n° | 1 | - |
| 5 | WASHER Ø 6,4/12,5 x 1,6 | ST. ST. | 4 | - |
| 4 | SCREW M6 x 15 (HEXAGONAL HEAD) - ALREADY INCLUDED | ST. ST. | 8 | - |
| 3 | NUT M6 | ST. ST. | 4 | - |
| 2 | WASHER Ø 8,4/17 x 1,6 | ST. ST. | 4 | - |
| 1 | SCREW M8 x 35 (HEXAGONAL HEAD) | ST. ST. | 2 | - |

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5. Electrical Installation.

The cable reeler junction box provides 4 x 2.5 mm² wiring terminals corresponding to the individual cores of the connecting cable and has a single mounting hole suitable for a M20 x 1.5 cable gland. The connecting cable consists of 4 x 1.0mm² conductors with a maximum extension of 23m.

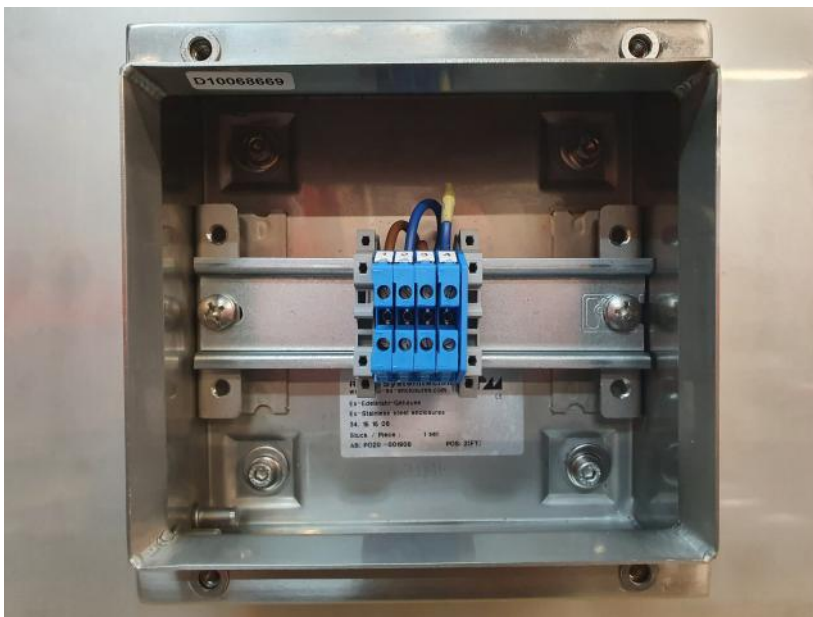


Figure 4. Interior of Junction Box showing terminals.

Connection between the fire alarm panel and the LHD usually requires two of the four conductors leaving two conductors free. End Of Line (EOL) components can either be fitted in the roof top junction box or by using the spare conductors they can be fitted in a junction box away from the area. Alternatively a second LHD cable can be connected via the automatic reeler providing dual redundancy. See figures 6, 7 & 8.

Hazardous area applications.

Note: To limit the electrical energy transmitted to the LHD and ensure the system meets the requirements for hazardous areas, the LHD should be connected via a suitably ATEX / IECEx certified Intrinsically Safe barrier.

Ensure enclosure earth stud is suitably grounded with a recommended minimum 10mm² cable.

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Figure 5.

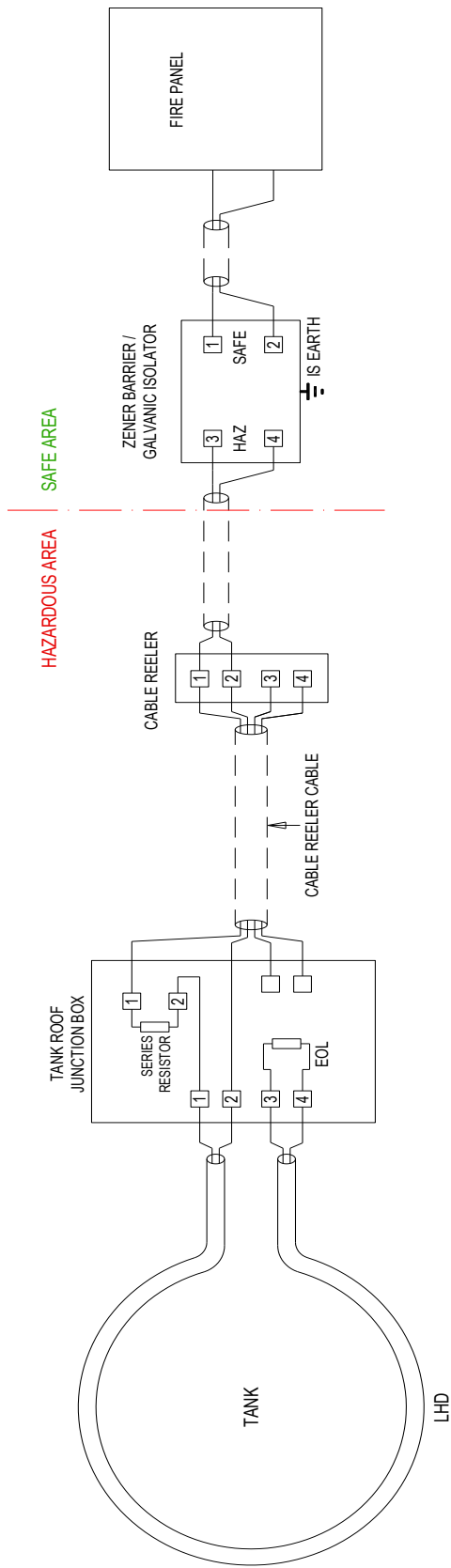
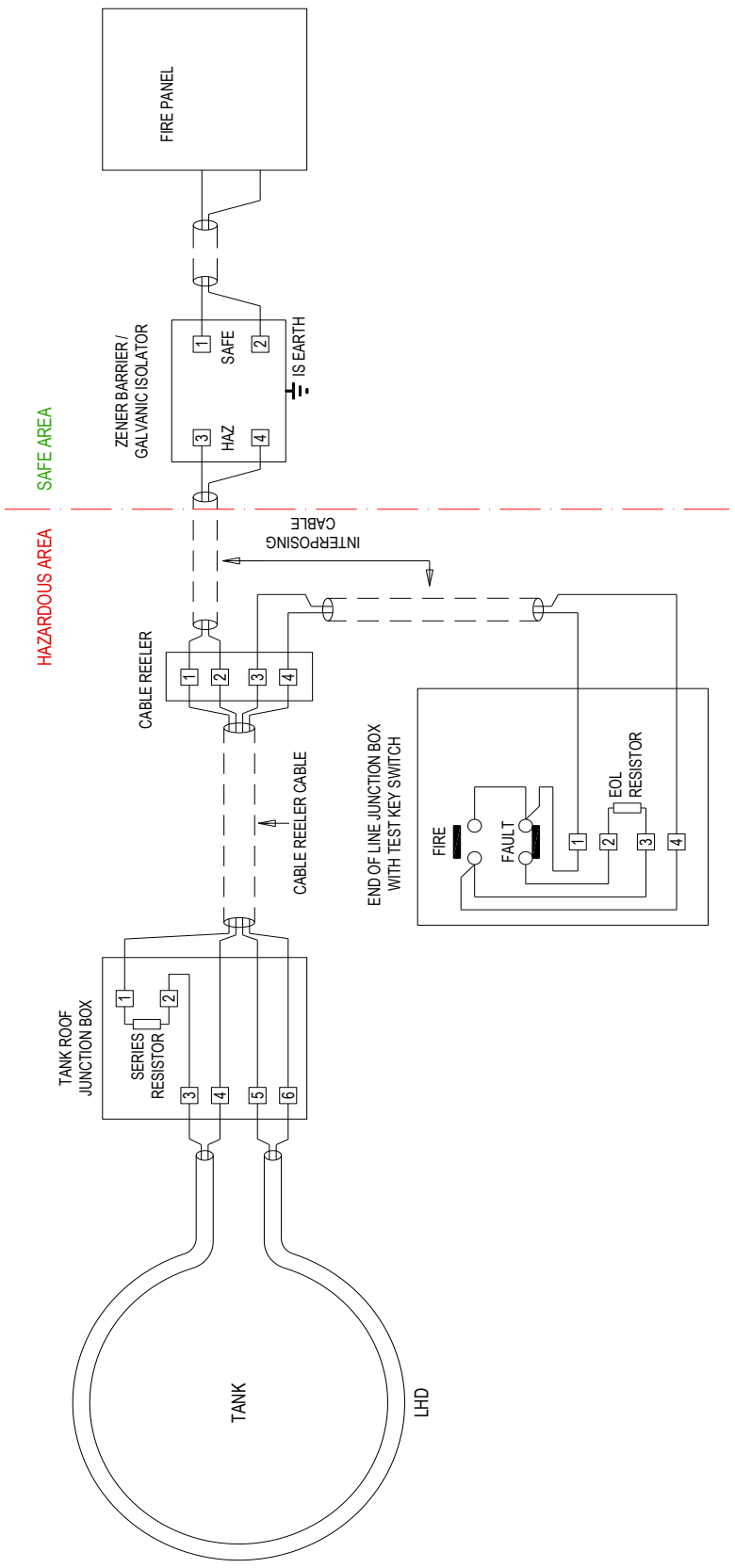
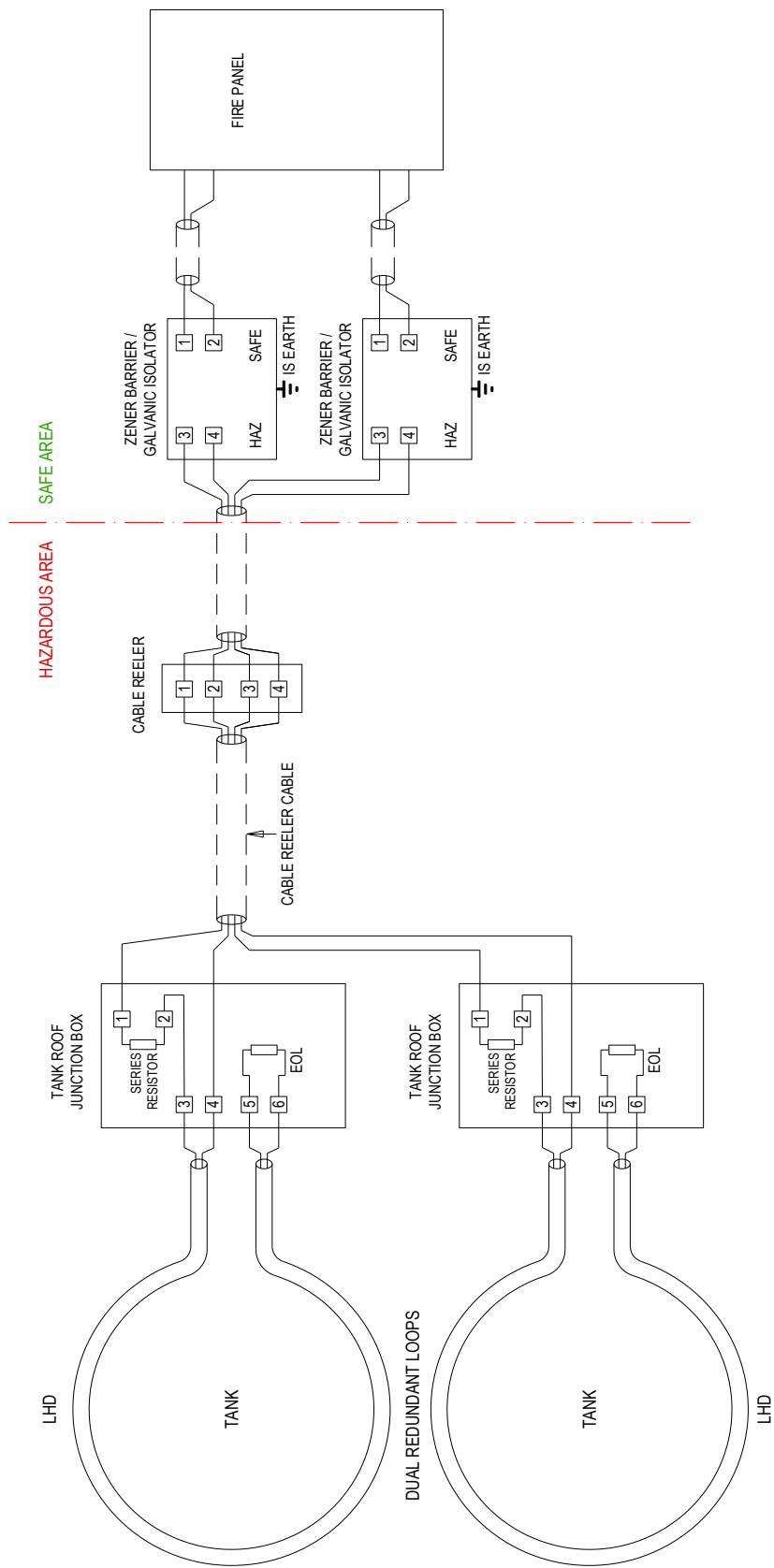


Figure 6.



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Figure 7.



6. Inspection & Maintenance

WARNING: FOR THE SAFETY OF INSTALLATION AND MAINTENANCE STAFF, THE SPRING COVER OF THE REELER MUST NOT BE REMOVED. THE SPRING IS UNDER TENSION AND IF OPENED COULD SEVERLY INJURE ANYONE WORKING ON IT. IF THERE IS REASON TO SUSPECT THE SPRING IS DAMAGED THE COMPLETE CABLE REELER MUST BE REPLACED. UNDER NO CIRCUMSTANCE SHOULD WORK BE CARRIED OUT ON THE SPRING OR ANY OF ITS COMPONENTS.

Note: Power should be removed before carrying out maintenance

It is recommended that during the period immediately after installation, regular inspections (i.e. once a week) are carried out to verify the impact of the environmental conditions on the spring. Thereafter It is essential that a regular maintenance / lubrication schedule is established. The frequency of the maintenance activity is dependent on the local conditions and the operating procedures of the site. Failure to set a maintenance schedule to suit the environmental conditions may cause premature failure of the spring.

The cable reeler is not dust or moisture proof. The spring is made of carbon steel. Although protected it is important to periodically inspect for oil on the spring.

The typical application and function of this equipment expects a very slow movement over time between the sliding electrical contacts, this can lead to a build up of oxide on the contacts. In order to help prevent this it is advisable to carry out a quick “scrolling” on a monthly basis for a period of at least one minute by extracting and releasing the cable out of the cable reel for a length of at least 2 meters.

It is also recommended to inspect the condition of the sliding rollers over which the connection cable passes.

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6.1 Inspection of Spring Pin

A removable plate allows inspection and maintenance of the spring pin without the need to remove the unit. Leaving the cable reeler in the operating position, unscrew the screws of the spring pin inspection cover.

With reference to Figure 8 & 9 verify that the spring pin has been well greased. If required, put grease on both spring pin and inside the cap welded on inspection cover

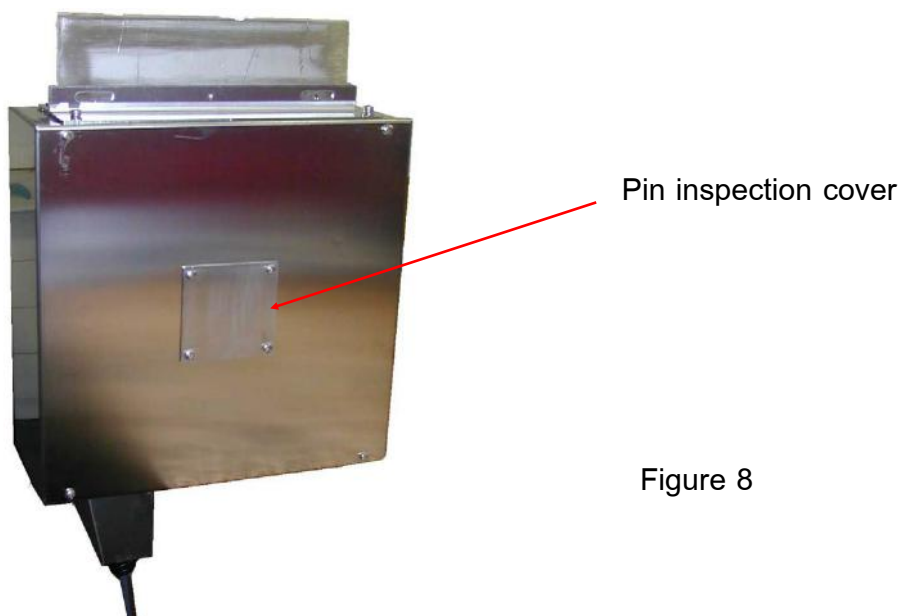


Figure 8

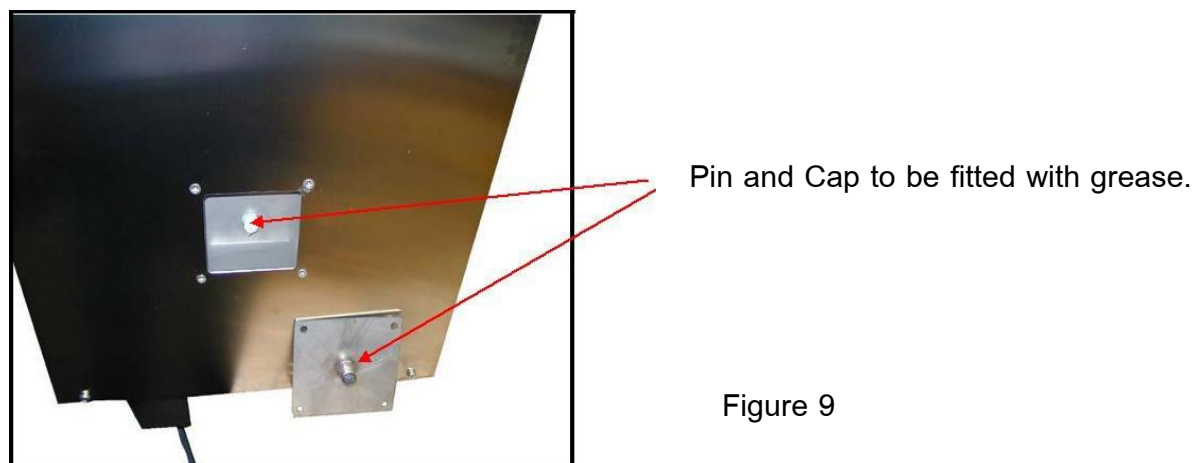


Figure 9

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6.2 Inspection of Spring

Without re-mounting the cover of the spring pin, unscrew the locking screws of the cover to the enclosure and remove according direction indicated in figure 10. It is not necessary to remove the reeler from its support structure to gain access to the internal mechanisms.

It will be possible to access both the connection cable and the internal rollers by removing this cover.

Direction of rotation to open cover

Locking screws for the cover x 4



Figure 10



Spring Cover
DO NOT REMOVE
Figure11

Inspection & lubrication holes

Once the cover is removed it will expose the spring cover. The rewinding spring is fixed on the reverse of the plate. Inspection holes are provided to verify the presence of lubricant on the spring and if required, to apply more lubrication.

WARNING: DO NOT REMOVE THE COVER OF THE SPRING FOR ANY REASON. SERIOUS INJURY COULD OCCUR. IF THERE IS DAMAGE TO THE SPRING IT WILL BE NECESSARY TO REPLACE THE COMPLETE REELER.

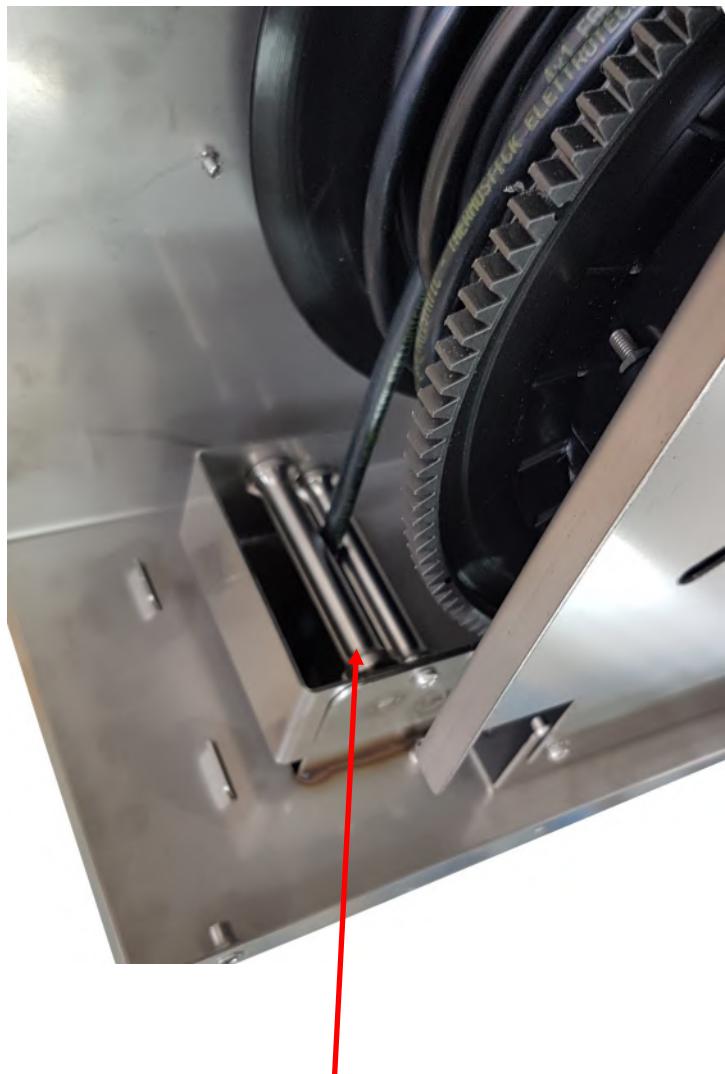
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6.3 Inspection of Connection Cable and Rollers

After confirming that the spring and other grease points have been lubricated, perform a visual inspection of the condition of the electrical connection cable and the cable exit hole and rollers to make sure that the drum and cable can move freely during the winding operation



Connection cable



Cable exit hole and rollers

Figure 12. Inspection of connection cable & rollers