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**Единый адрес:** [bta@nt-rt.ru](mailto:bta@nt-rt.ru) **Веб-сайт:** [www.binmaster.nt-rt.ru](http://www.binmaster.nt-rt.ru)

**Вибрационный стержень CVR-625 BinMaster**



# CVR-625

## Compact Vibrating Rod Instruction Manual



# TABLE OF CONTENTS

SAFETY ..... 3

TECHNICAL..... 4

1.0 INTRODUCTION..... 5

2.0 MOUNTING ..... 5

3.0 SIDE MOUNTING..... 6

4.0 ADJUSTMENT ..... 8

5.0 SPECIAL MODELS ..... 9

6.0 MAINTENANCE ..... 10

7.0 DIMENSIONS .....11

WARRANTY..... 12

# SAFETY

## CVR-625 Compact Vibrating Rod

### IMPORTANT

For safety and proper function of the instrument, please carefully read this instruction manual before installation!

### Application

The CVR-625 is a vibration type level control instrument that detects the minimum and maximum level in bins, silos and hoppers, filled with granular materials. Typical product applications are plastic granules, feed pellets, raw grains, etc.

### IMPORTANT

The instrument cannot be used for detecting materials which are sticky and tend to build a deposit on the probe! The CVR-625 is not recommended for detecting powdered materials.

### General Notes

- Installation and maintenance must be performed by qualified technical personnel only.
- The CVR-625 must be used only in the manner outlined in this instruction manual.
- The CVR-625 vibrating level switches are sensitive devices which need to be handled with care.
- Never expose this instrument to mechanical loads and temperatures higher than indicated in the technical data. It may only be serviced by qualified personnel.

### Function

The signal from the electronic circuit of the CVR-625 excites the rod of the instrument to vibrate on its resonance frequency of approximately 460 Hz. When material covers the rod of the probe, the vibration stops. This is sensed by the electronic circuitry which forces an output relay to switch. When the blade is uncovered, the vibration will restart and the relay will switch back.

# TECHNICAL

<b>Enclosure:</b>	Die cast aluminium, powder coated Protection IP 66 1 cable gland M16 Suitable for cable diameters 0.177 to 0.394 inches
<b>Probe:</b>	Stainless steel 1.4301 / AISI 304 Resonant frequency approximately 460 Hz
<b>Mounting:</b>	1.25" NPT
<b>Power Supply:</b>	Wide range power supply 20...250V AC/DC
<b>Power consumption:</b>	3 VA
<b>Relay:</b>	1 SPDT Maximum switching voltage 250V-AC Maximum switching current 5A Maximum switching power 1250 VA $\cos \varphi = 1$ ; 150 Watt for DC
<b>Time Delay:</b>	1 second from stop of vibration 2 to 5 seconds for start of vibration
<b>Indication:</b>	Relay: red LED on PCB Power: yellow LED on PCB

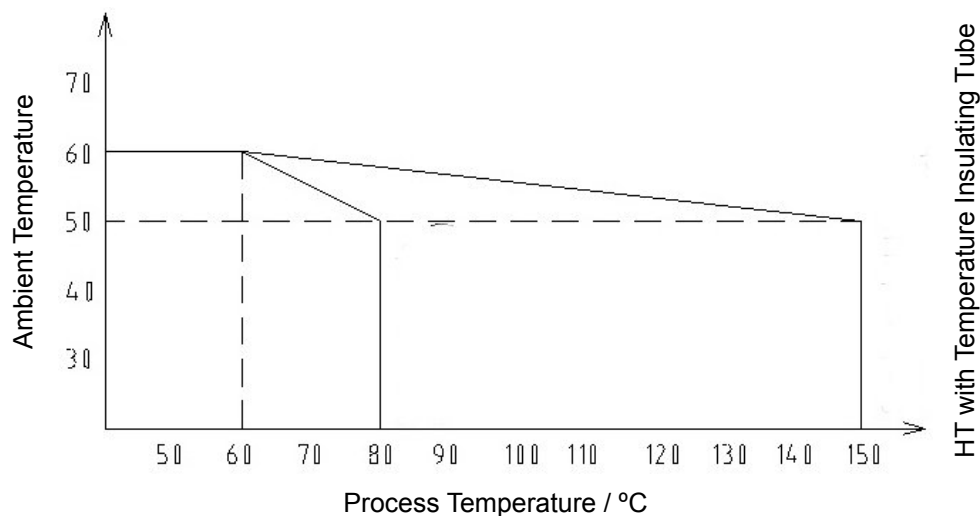
Minimum density of material to be monitored: 3.12 lb. / cu. ft. (50 g / liter)

Maximum vertical and horizontal load upon the end of the blade: 80 N

Maximum pressure inside bin: 10 bar

Temperatures (see also following sketch):

- Ambient temperature for electronics: -4°F to +140°F (-20°C to +60°C)
- Process temperature for standard probe: -4°F to +176°F (-20°C to +80°C)
- Process temperature for probe HT: -4°F to +302°F (-20°C to +150°C)  
(special model for high temperatures)



# INTRODUCTION

## 1.0 CE-CONFORMITY

The vibration type level switch CVR-625 meets the requirements of the following regulations:

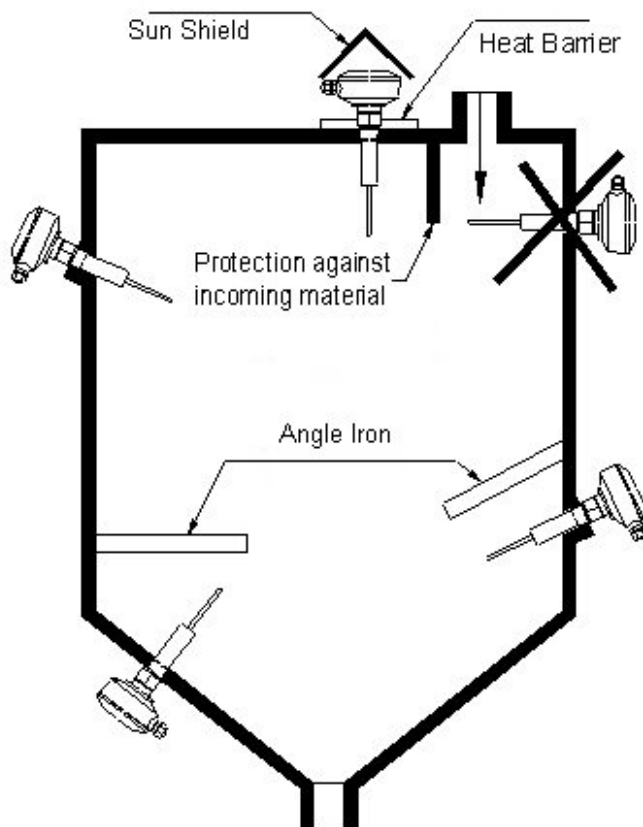
- EG-EMC-directive 89 / 336 / EWG
- EG-Low Voltage Directive 73 / 23 / EWG

Applied standards: EN 61326-1, EN 61326 / A1, EN 61010 T1

## 2.0 MOUNTING

The following has to be considered when mounting the CVR-625:

- The switching point of the CVR-625 depends on the density of the material. For heavy materials, only a few millimeters of the vibrating rod have to be covered for damping the vibration. For light materials, the material must cover the vibrating rod completely in order to damp its vibration.
- The CVR-625 must not be mounted in or near the path of incoming material. The falling material could damage the probe.
- In order to keep the ambient temperature of the PCB within the allowed range of  $-4^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$  the housing should be protected from direct sunlight by installing a sun shield.
- A heat barrier has to be installed between the enclosure and the bin wall when the temperature of the material inside the bin exceeds  $140^{\circ}\text{F}$  ( $60^{\circ}\text{C}$ ). Alternatively, it also is possible to use a temperature insulating tube which must be mounted between mounting socket and enclosure, (see chapter *Special Models*).



### 3.0 SIDE MOUNTING OR VERTICAL MOUNTING

- The CVR-625 can be mounted either from the side or vertical, from the top or the bottom.
- For side mounting, it is recommended to screw the CVR-625 into the bin wall with the vibrating rod pointing slightly downwards (approximately 20°), so that material can more easily flow and does not rest on the vibrating rod.
- The CVR-625 must not be mounted in or near the path of incoming material. If this cannot be avoided a protective shield, for example an angle steel with side length of approximately 2 inches, must be installed approximately 6 inches over the probe. A protective shield is also necessary for low level detection in order to protect the probe against falling material.
- The CVR-625 gets installed by screwing the mounting socket of the instrument into the bin wall by means of a 46 mm open end wrench.
- A suitable sealing, (like Teflon tape), must be applied onto the thread.

**IMPORTANT: Do not screw in the CVR-625 by turning the housing body!**

#### Orientation of the cable glands:

The cable glands must always point downwards to prevent moisture seeping inside the housing. If the housing is not in the correct position after the probe has been firmly screwed into the bin wall, proceed as follows:

- Remove the cover of the housing, using a 4mm hexagon socket screw key, (Allen key)
- Use a 10mm wrench to loosen the mounting nut in the center of the enclosure
- Turn the housing into the correct position so that the cable glands are pointing downwards
- Tighten the mounting nut, torque 3 to 4 Nm
- Close the cover of the housing (torque 3 Nm)

**Cable glands which are not used must get sealed!**

#### Wiring

##### **Safety Guidelines:**

- Wiring of these instruments must only be performed by qualified technical personnel.
- Before opening the cover and beginning wiring, make sure that power supply on all wires has been switched off.
- According to DIN EN 61010-1, a main switch for this instrument has to be installed nearby the instrument with which power supply for this instrument and its relay output can be switched off. This switch must be marked as main switch of the instrument.
- For power supplies Ø 50V, protective earth has to be connected to the terminal on the enclosure.
- If power supply and relay signal do not have the same source, the connecting wires of the power supply have to be separated from the connecting wires of the relay by means of wire fasteners. This prevents the connecting wires of the power supply getting in touch with the relay terminals and vice versa, which might be possible in case of an error, such as a break of a wire.

The cables for the power supply and relay must be connected to the terminals according to the following diagrams.

This is also printed on the PCB.

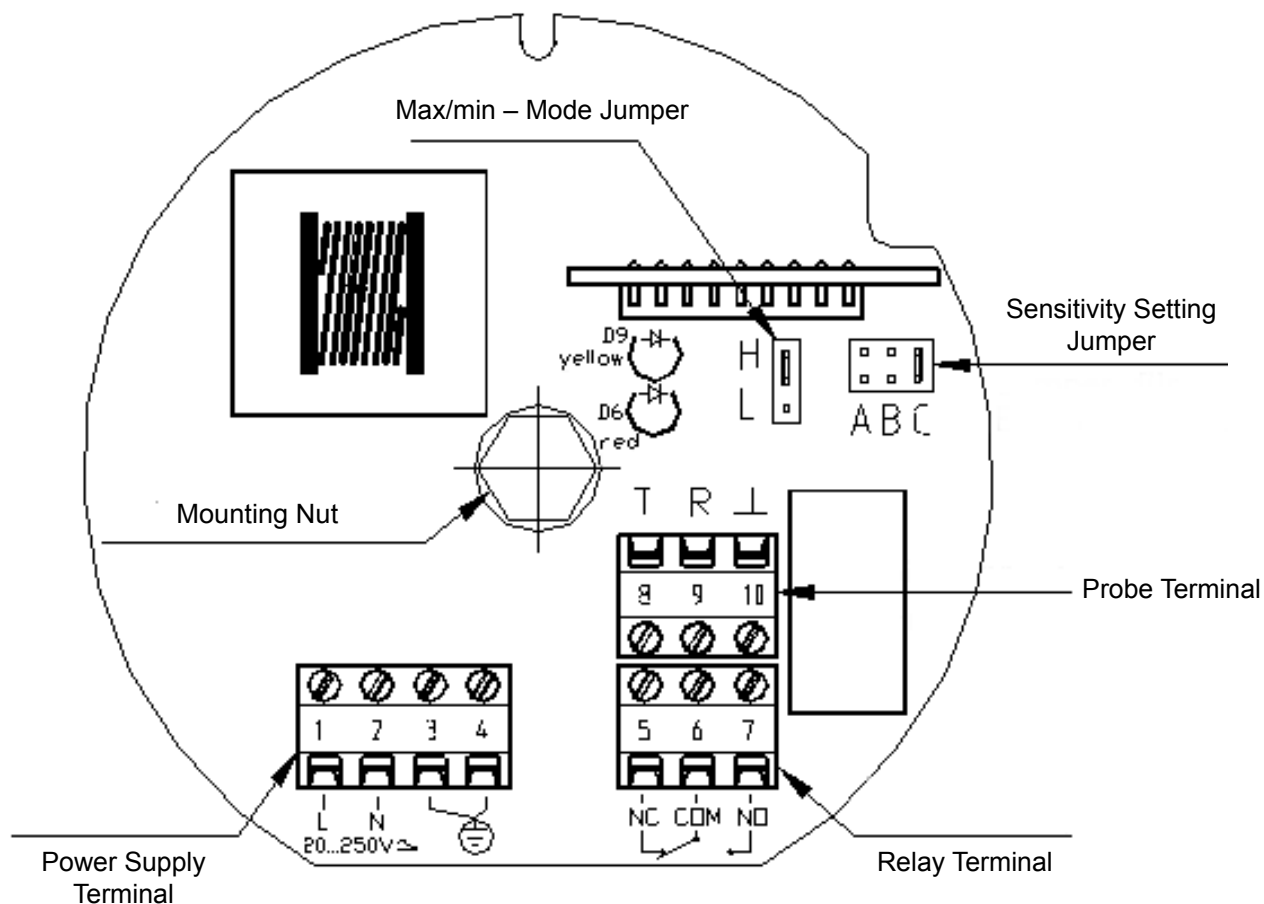
Terminal for power supply: 1 = L  
2 = N } 20...250V AC/DC  
3 = protective earth  
4 = protective earth

Terminal for output relay: 5 = NC  
6 = COM  
7 = NO

The maximum wire size for power supply and relay is 14 AWG.

The probe is connected to the PCB by the three leads of the probe:

Terminal probe: 8 = T (red lead)  
9 = R (yellow lead)  
10 = I (black lead)





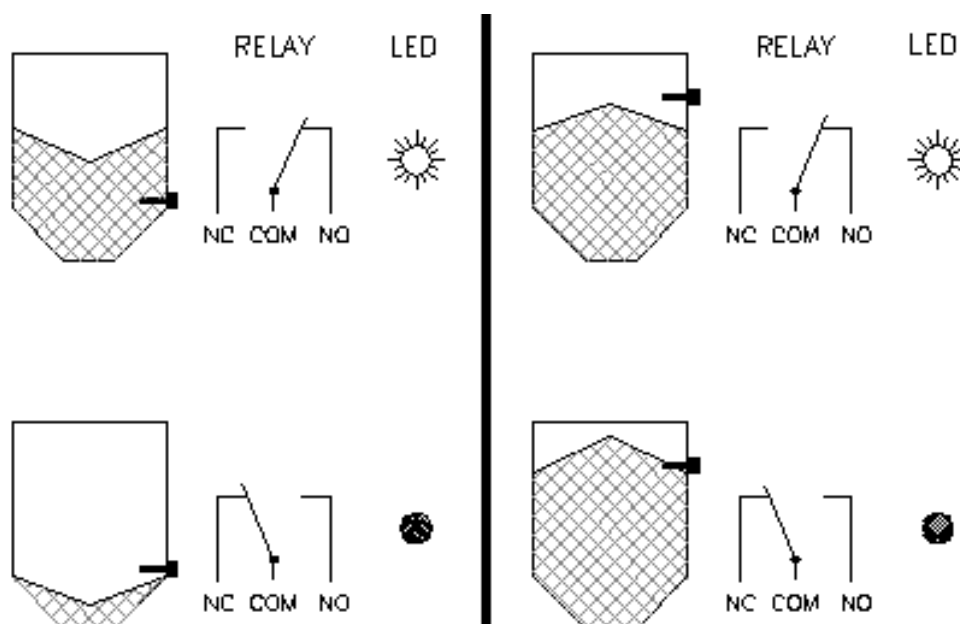
## 4.0 ADJUSTMENT

### Fail-Safe High ( H ) / Fail-Safe Low ( L ):

Switching Logic: See following sketch.

**Fail-Safe High:** Jumper in position H: for high level alarm:  
The relay is de-energized (position NC, red LED off), when the blade is covered by material or power has failed.

**Fail-Safe Low:** Jumper in position L: low level alarm:  
The relay is de-energized (position NC, red LED off), when the blade is not covered by material, or power has failed.



### Sensitivity:

Selectable by jumper:

- Pos. A: Use this setting only for light material with densities down to 3 lb./cu.ft. or 50g/l. The sensitivity is high at this setting.
- Pos. B: Standard setting, sufficient for most materials.
- Pos. C: For heavy materials with high densities, which may form a deposit on the vibrating rod. As the sensitivity of the instrument is low at position C, light materials can not be detected at this setting!

## 5.0 SPECIAL MODELS

- **Special model for high temperatures:**

Can be used for process temperatures up to 302°F (150°C).

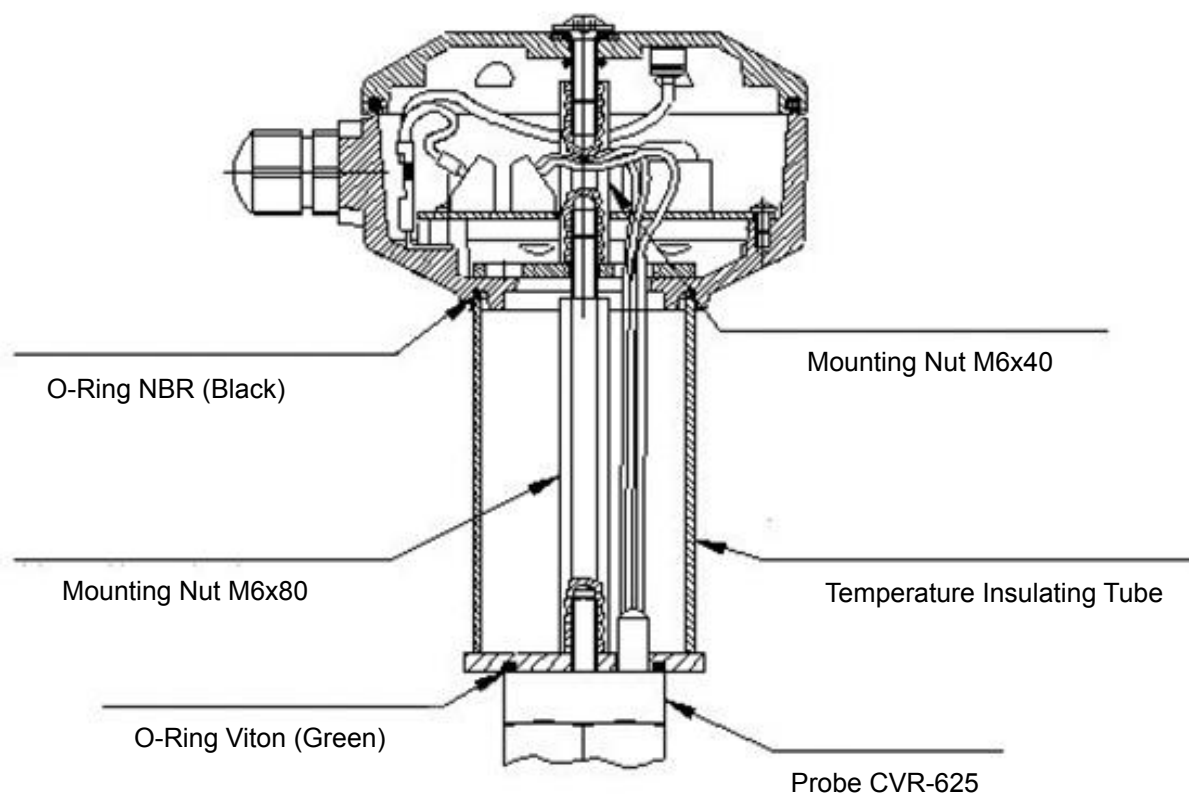
**Important:** the instruments are similar to standard instruments, except they are marked with a “*Special Model HTL*” label and the serial numbers of probes and electronics do have the suffix “-HTL”.

**Special model probes must only be used with special model electronics!**

In order to ensure that the ambient temperature of the electronics (140°F or 60°C), will not be exceeded due to thermal conduction via the probe, a temperature insulating tube has to be mounted between probe and the enclosure or the electronics have to be installed at a remote location (see following chapters).

- **Temperature Insulating Tube (see sketch below):**

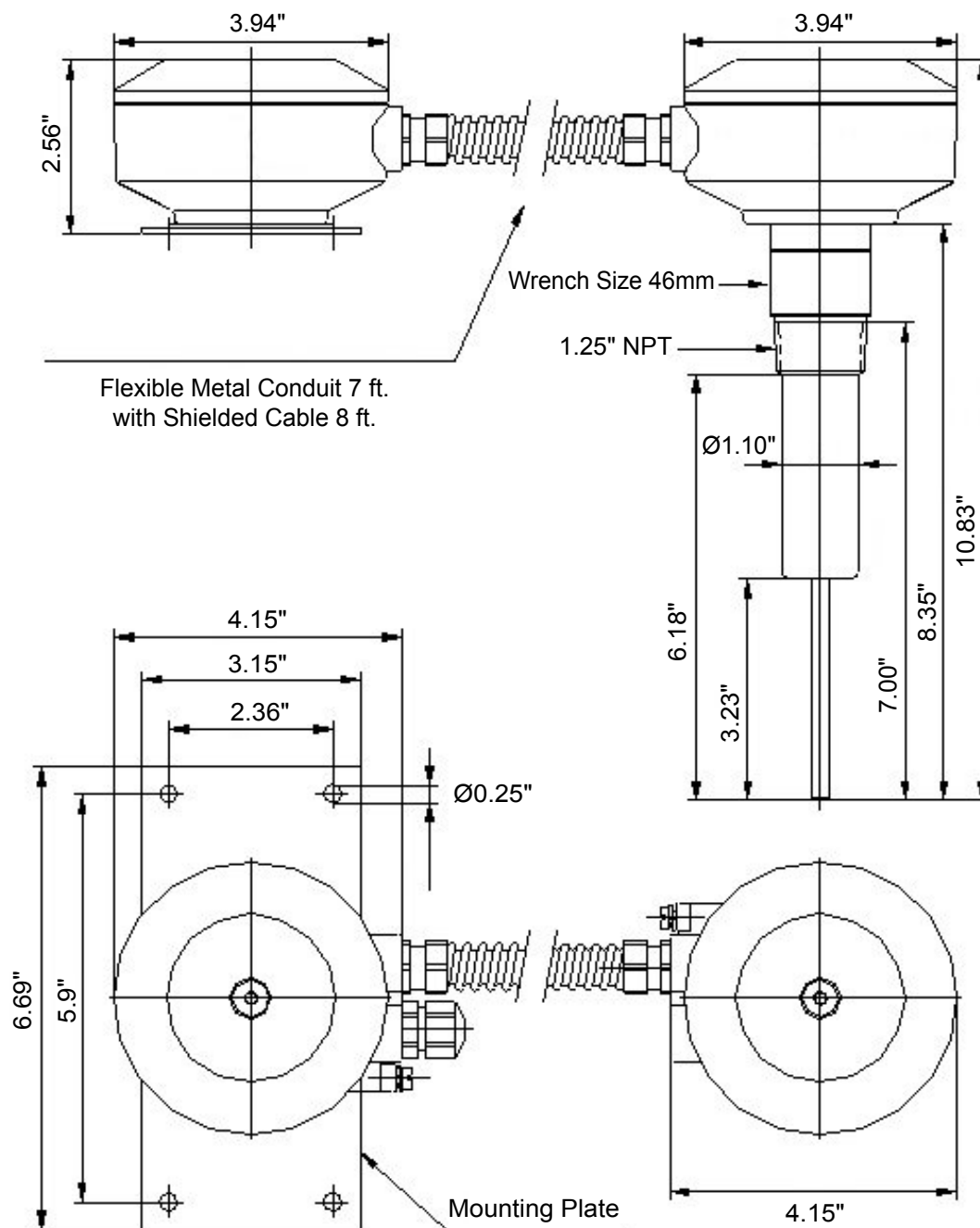
The temperature insulating tube consists of a stainless steel tube Ø50mm which is welded onto a stainless steel plate. The tube gets fixed onto the mounting socket of the probe by means of an 80mm long mounting nut M6. The enclosure gets fixed onto the tube by means of a washer Ø50x3 and the mounting nut M6x40. The green O-Ring (Viton), must be located between the mounting socket and tube and the black standard O-Ring must be located between tube and enclosure. Use a torque of 3 to 4 Nm for the mounting nuts.



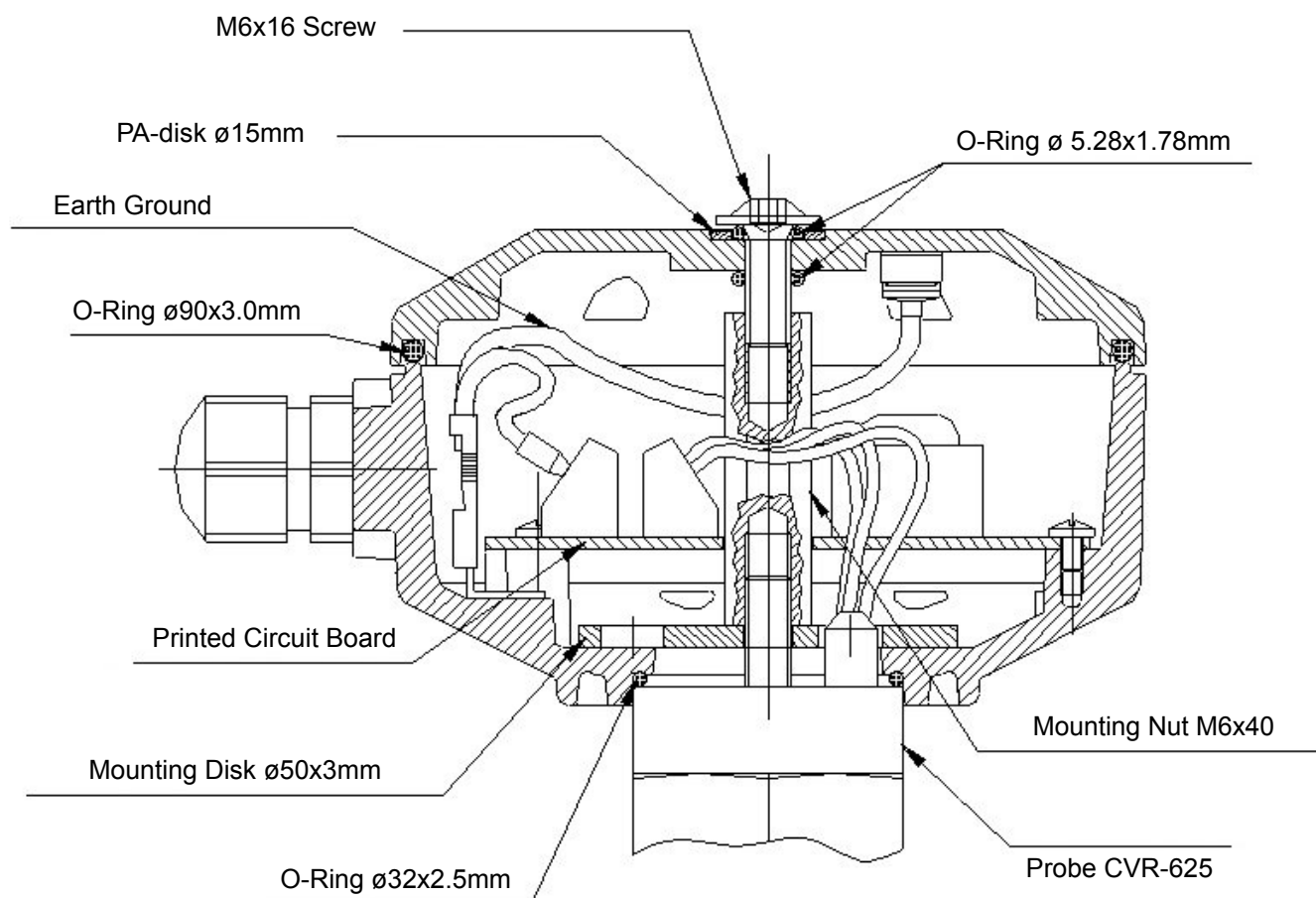
### • Remote Electronics Installation

If the temperature outside the bin near the bin wall exceeds the maximum ambient temperature of the PCB (140°F or 60°C), it is necessary to install the PCB in a remote enclosure apart from the bin where the temperature is within the allowed range. Remote electronics installation is also necessary in the case of heavy vibration in the bin. In this case, the remote enclosure has to be installed at a place away from the vibration.

The PCB and probe get connected by a shielded cable via the terminal PCB, which is located inside the enclosure fixed on top of the mounting socket of the probe. A metal hose, which is screwed between the remote enclosure and the enclosure that contains the terminal PCB, is protecting the cable. The remote enclosure can be installed by means of the mounting plate. The cable and metal hose can withstand temperatures up to 176°F (80°C). Protection of the remote electronics installation is rated at IP65.



Assembling of probe, enclosure and electronics must be done according the following sketch.



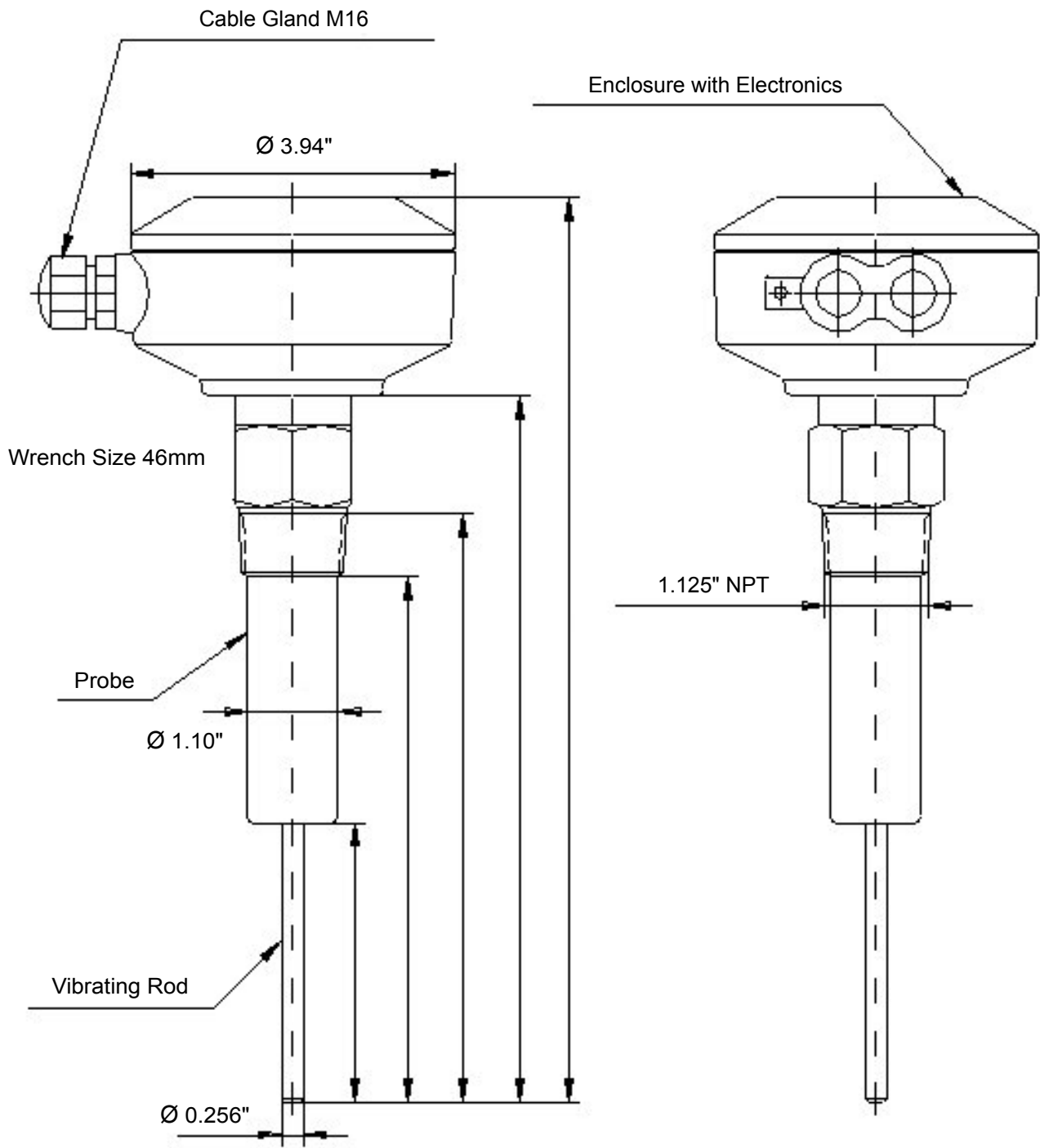
Note the following:

- Assembling must be done by qualified personnel only
- All O-Ring seals must sit in its appropriate position according to the sketch
- Apply torque 3 to 4 Nm for the mounting nut M6x40
- Apply torque 3 m for the screw M6x16
- Apply torque 3 Nm for the cable gland
- If special versions are being used, do not mix different version probes with electronics

## 6.0 MAINTENANCE

The CVR-625 vibrating type level switches require minimal maintenance. For applications with materials that are sticky, we recommend cleaning the vibrating blade of the instrument periodically. If the instrument is operating in a corrosive atmosphere, the probe and enclosure must be inspected periodically for corrosion.

7.0 DIMENSIONS



## LIMITED WARRANTY

The manufacturer warrants this equipment for two (2) years according to the following terms:

- 1.) This warranty extends to the original purchaser only and commences on the date of original purchase. The original purchaser must mail to the manufacturer the "Warranty Registration" card to confirm the equipment purchase. Failure to do so may void the warranty.
- 2.) The manufacturer will repair or replace any part of this equipment found to be defective, provided such part is delivered prepaid to the factory. Manufacturer's obligation is limited to the cost of material and labor to repair or replace and does not include transportation expenses.
- 3.) This warranty shall not apply to any product that has, in manufacturer's judgment, been tampered with, altered, subject to misuse, neglect or accident. In addition, the warranty does not extend to repairs made necessary by normal wear.
- 4.) This warranty is in lieu of all other warranties, expressed or implied.

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