



BINMASTER Vibrating Rod Level Control Instrument



Installation and Operation Instructions
Please Read Before Installing Equipment

Distribué par :



2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel : 03 26 82 49 29

Email : hvssystem@hvssystem.com
Site web : www.hvssystem.com

TABLE OF CONTENTS

SAFETY SUMMARY	3
1.0 APPLICATIONS	4
2.0 OPERATION	4
2.1 General	4
2.2 Sensitivity.....	4
2.3 Fail-safe High / Low	5
3.0 SPECIFICATONS.....	6
4.0 VERSIONS.....	6
4.1 VR21	7
4.2 VR41	8
4.3 VR51	9
5.0 OPTIONS	10
6.0 INSTALLATION	10
6.1 General	10
6.2 Side Mounting.....	11
6.3 Top Mounting	12
6.4 Electrical Wiring	12
7.0 CONNECTION	13
8.0 HANDLING / CAUTION.....	14
9.0 APPENDIX	15
DECLARATION OF CONFORMITY	16

SAFETY SUMMARY

Review the following safety precautions to avoid injury and prevent damage to the equipment.

The product should be installed, commissioned, and maintained by qualified and authorized personnel only.

Install according to installation instructions and comply with all National and Local codes.

Use electrical wire that is sized and rated for the maximum voltage and current of the application.

Properly ground the enclosure to an adequate earth ground.

Observe all terminal and relay contact ratings as called out on the nameplate and in the installation manual.

Insure that the enclosure cover is in place and secured tightly during normal operation.

In potentially wet environments thoroughly seal all conduit entries.

If this product is used in a manner not specified by the manufacturer the safety protection could be compromised.

Safety Terms and Symbols



WARNING: Warning statements identify conditions or practices that could result in injury or loss of life. Risk of electrical shock.



CAUTION: Caution statements identify conditions or practices that could result in damage to this product or other property.

The BinMaster vibrating level switches are sensitive sensors which need to be handled with care. Never expose these instruments to mechanical loads and temperature higher than indicated in the technical data. Do not make any changes on these instruments.

1.0 SPECIFICATIONS

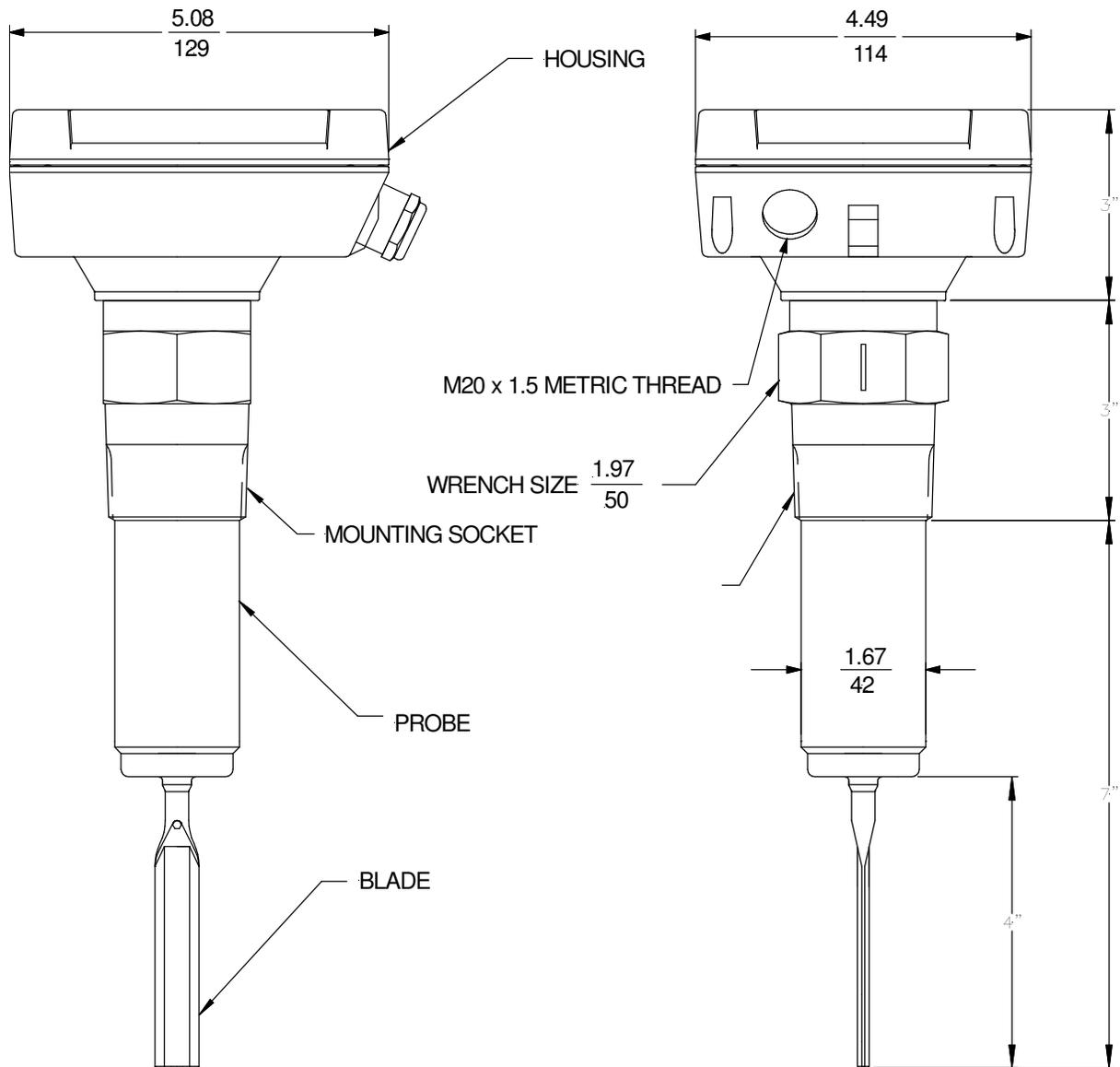
Enclosure:	Diecast Aluminium. Type 4 (IP 66) 1 cable gland M20 x 1.5 (metric thread)
Power Supply:	wide range power supply 20...250V AC/DC
Power consumption:	3 VA
Relay:	1 potential-free change-over contact (SPDT) (2 contacts, DPDT, optional) Maximum switching voltage: 250V-AC Maximum switching current: 8A Maximum switching power: 2000 VA Cos φ = 1;
Time Delay:	1 second from stop of vibration 2 to 5 seconds for start of vibration
Probe:	Stainless steel 1.4301 / AISI 304. Type 4 Thread 1 1/2" conical DIN 2999 or 1 1/2" NPT Resonance frequency 290 Hz Maximum vertical and horizontal load upon the end of the blade: 100 N = 22.5 Lbs. Maximum tensile load of cable VR51: 440lbs (200kg)
Indication:	LED on PCB Flashing when Relay de-energized LED on PCB On solid when Relay is energized
Minimum Density of Material to be Monitored:	20 g / liter non-sticky bulk solids
Maximum Pressure Inside Bin:	6 bar
Ambient Temperature:	- Electronic: -4°F ... +140°F (-20 °C ... + 60 °C) - Probe: -4°F ... +176°F (-20 °C ... + 80 °C) - Probe HT: -4°F ... +302°F (-20 °C ... + 150 °C)

2.0 VERSIONS

The BINMASTER VR is available in 3 different versions:

- VR21 Standard Insertion Length 7.36 in. (187 mm)
- VR41 Insertion Length extended from 14" up to 13 feet by a tube which is screwed between the vibrating probe and the mounting socket.
- VR51 Insertion Length extended from 18" up to 19.5 feet by a cable extension.

2.1 Binmaster VR21

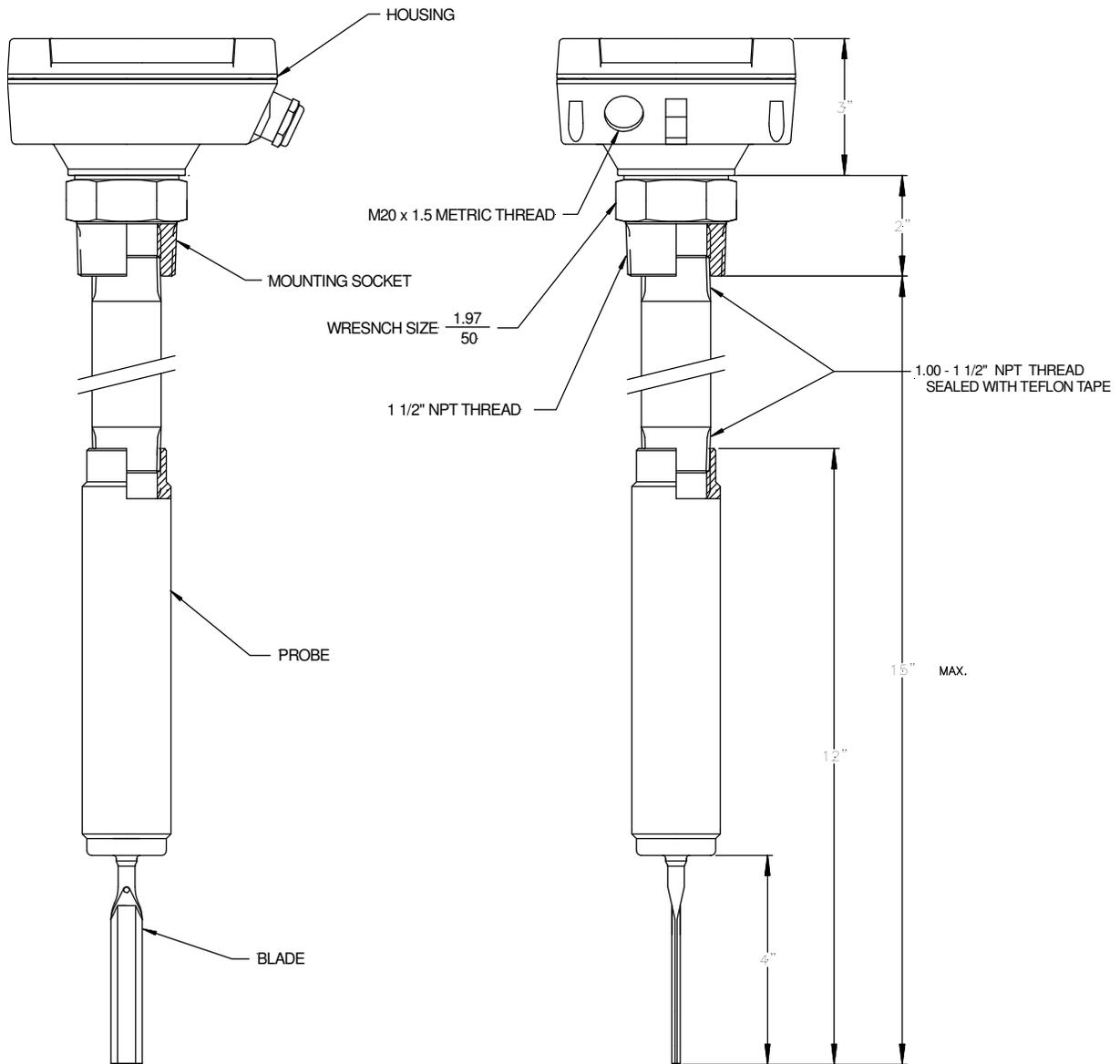


Insertion Length: 187 mm = 7.36"

Installation: Top and Side Mounting

Weight: 2.3 kg = 5.07 Lbs.

2.2 Binmaster VR41

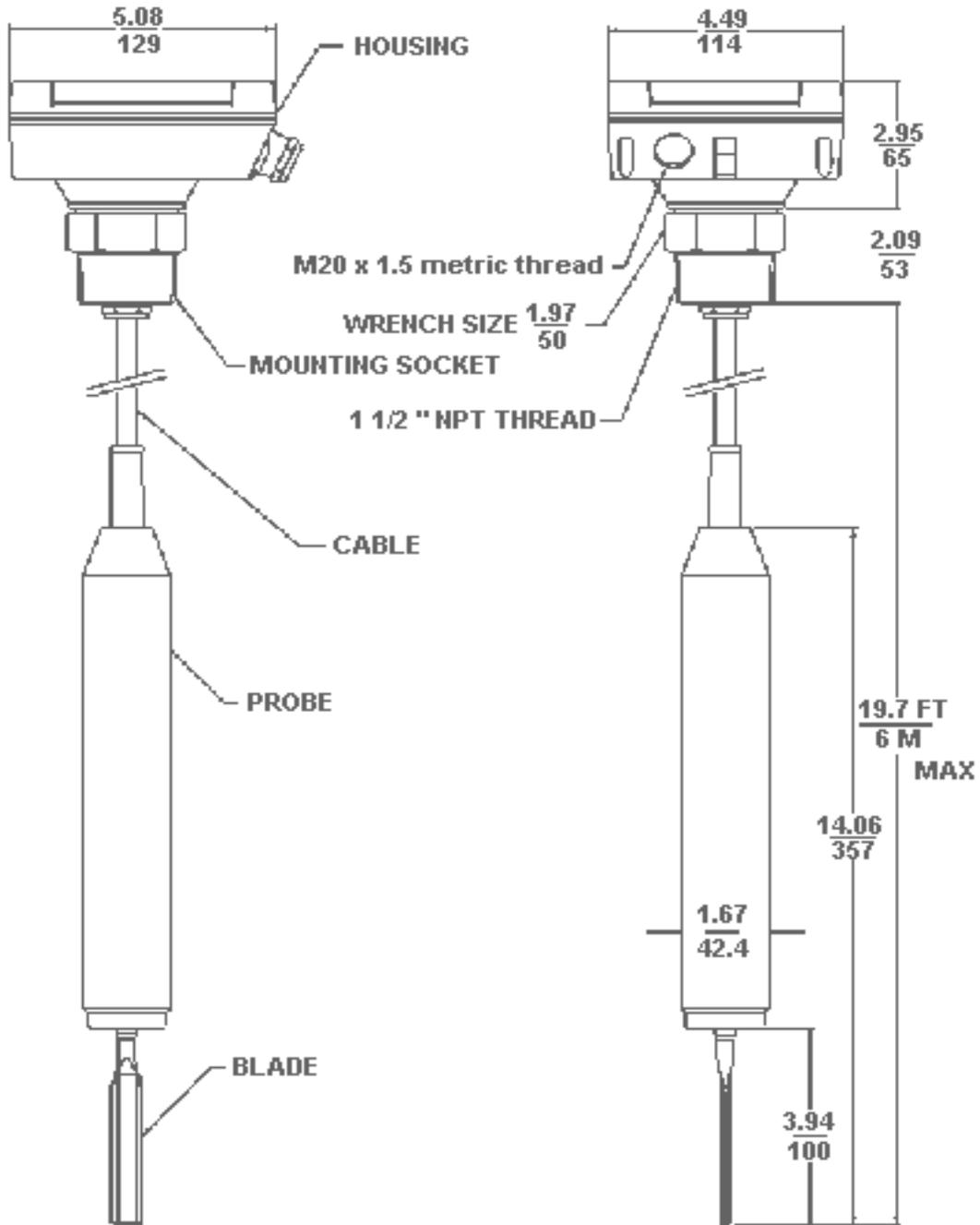


Insertion Length: Minimum 14 in., Maximum 13 ft.

Installation: Top mounting
(Side mounting for short extensions possible)

Weight: Maximum 28.7 lb. with maximum insertion length of 13 ft.

2.3 Binmaster VR51



Insertion Length: Maximum 19.5 ft.

Installation: Top mounting

Weight: Maximum 7.7 lb. with max. insertion length of 19.5 ft.

3.0 OPTIONS

Besides the above standard versions the following options are available:

- HT-version for high temperatures in the bin up to 285°F (not for VR51)
- Separate housing installation for PCB which is necessary for HT-version and in case of heavy, continuous vibration of the bin, see Section 9.1
- Relay with two potential-free change over contacts (DPDT)

4.0 INSTALLATION

4.1 General

Figure 4.1 shows typical installation possibilities of the BINMASTER VR.

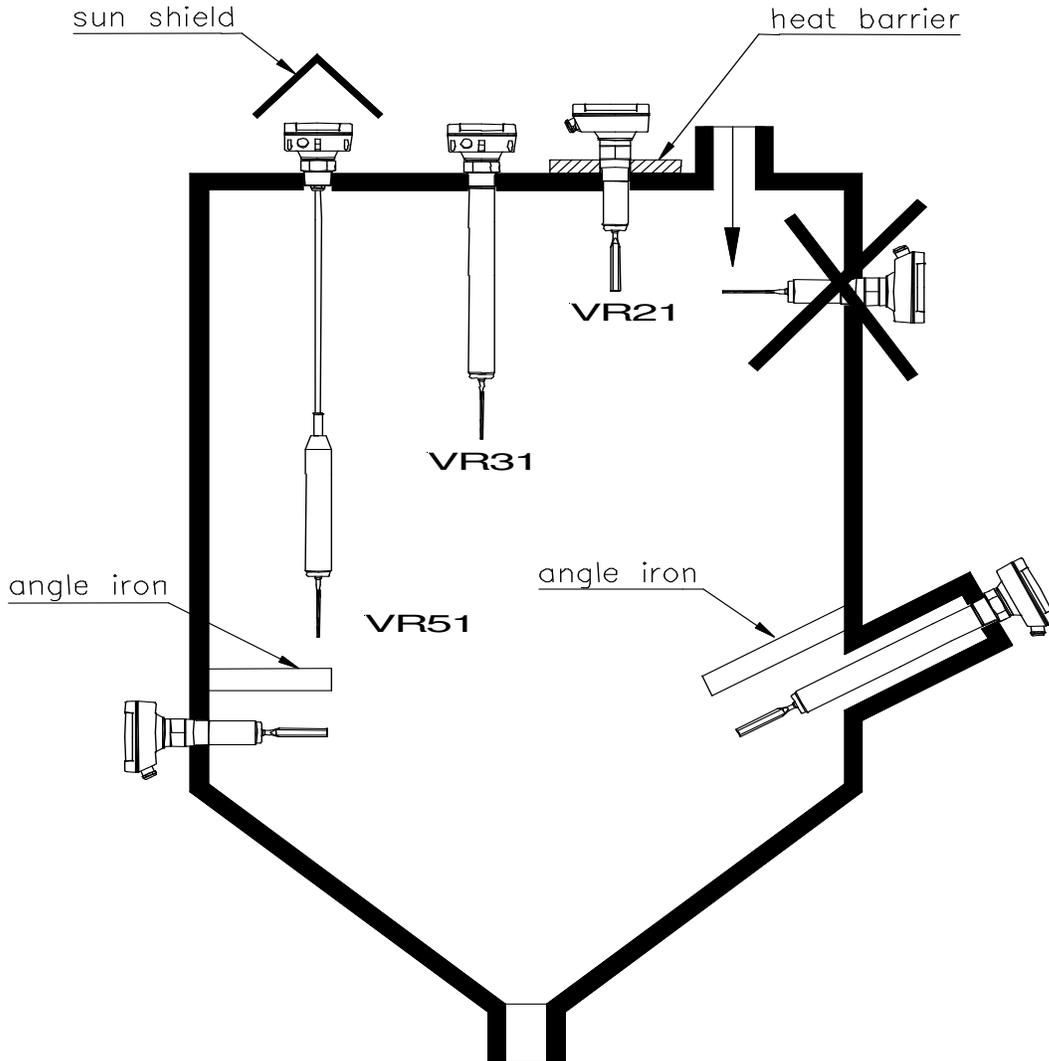


Figure 4.1

The BINMASTER VR gets installed by screwing the mounting socket of the instrument into the bin wall by means of a 50mm open-end wrench.



WARNING:

Do not screw the unit in by turning the housing! Turning the housing can result in damage to the internal wiring! Use a wrench on the hex fitting.

The conduit entry 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
- Loosen the screw in the center of the PCB
- Turn the housing into the correct position (cable ducts pointing downwards)
- Tighten the screw in the center of the PCB
- Replace the cover of the housing.

In order to keep the ambient temperature of the PCB within the allowed range of -4 to +140°F the housing should be protected from direct sunlight by installing a sun shield.

A heat barrier has to be installed between the housing and the bin wall in cases the temperature of the material inside the bin exceeds 140°F. Instead it also is possible to install the PCB in a separate housing up to 6.5 feet away from the bin, see Section 9.1

In cases where continuous vibrations of the bin are present, the PCB must be installed in a separate housing apart from the vibrations, see Section 9.1

4.2 Side Mounting

VR21

The VR21 is normally screwed into the bin wall at the level to be monitored in horizontal direction or with the blade pointing slightly downwards.

The probe must be kept out of the path of falling material to avoid damage. If this is not possible a shield, for example an angle iron, must be installed over the blade as shown in Figure 6.1 Such a shield should always be installed when the instrument is used for low level indication.

When the probe is inserted horizontally into the bin, it must be turned until the blade is vertically oriented, so that material can flow freely over the blade and does not rest on it causing false alarm. Alignment of the blade is verified by the two slots in the mounting socket. These will be facing up and down when the orientation of the blade is correct, see Figure 4.2

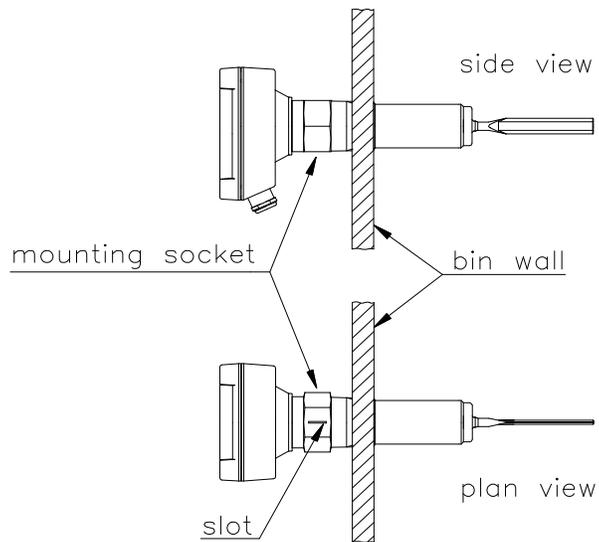


Figure 4.2 Orientation of the blade at horizontal installation

VR41

The rigid extended versions are designed for top mounting. Side mounting of this version is possible for short extensions if the probe as well as the protection shield over the blade are supported adequately.

4.3 Top Mounting

Top mounting is possible for all versions of the BINMASTER VR. The VR51 is designed for top mounting **only** and should never be installed within the path of falling material which might damage the cable.

4.4 Electrical Wiring



The electrical wiring should conform to any National and local codes. When installing electrical conduit connection to the housing in environments where moisture or moist air can enter the enclosure thru the conduit, use a duct seal putty to seal the conduit opening.

Before opening the cover make sure that the power supply to all wires has been switched off.

See Figure 5.2 on the following page for the power supply and relay contact wiring connections.

5.0 CONNECTION

Figure 5.1 shows how the probe, housing and PCB are assembled.

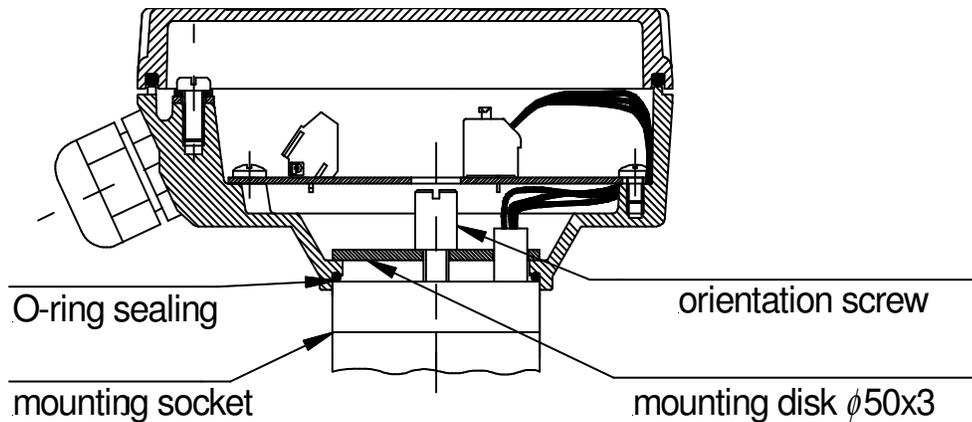


Figure 5.1 Assembly of probe, housing and PCB

The orientation screw must be tightened firmly.

The standard PCB is suitable to all versions of the BINMASTER VR probes, but the PCB-HT (for high temperature probe) must be used for HT - probes only and vice versa.

Non-standard PCBs are marked with a label: **Special Model HT**

The probe is connected to the PCB by the 3 leads as shown in Figure 5.2

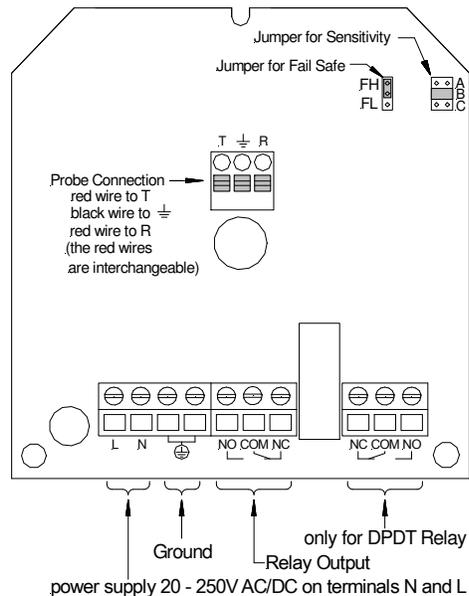


Figure 5.2 Wide Range Power Supply PCBs

The terminals on the PCB for power supply and control circuit wires allows a maximum conductor size of 14 AWG.



6.0 APPLICATIONS

The BINMASTER VR is a vibration type point level control that detects the high and low material level in bins, silos and hoppers, filled with grained or powdered materials. The following list shows some of these materials:

powdered milk	peanuts
frozen potato chips	tobacco
beans	wood shavings
sugar	chalk
sweets	stearine chips
coffee beans	powdered cellulose
coffee ground	glass finely ground
coffee freeze-dried	granular plastics
tea (leaf)	gravel
salt	powdered clay
flour (in a flour mill)	polysterene powder
foundry sand	styrofoam
spices	soda
animal food	soot dry pellets

Important: The instrument can not be used for detecting sticky materials and materials which tend to hang up.

7.0 OPERATION

7.1 General

The signal from the electronic circuit of the BINMASTER VR excites the blade of the instrument to vibrate on its resonance frequency of 290 Hz. When material covers the blade of the probe, the vibration stops. This is sensed by the electronic circuitry which forces its relay to switch. When the blade gets uncovered, the vibration will restart and the relay will switch back. As only the end of the vibrating blade is sensitive and not the base, build-up on the container wall has no influence on the function of the instrument. The shape of the blade and its vibration have a self-cleaning effect.

7.2 Sensitivity

There are 2 sensitivity settings which can be selected by the sensitivity switch on the circuit board, see Figure 5.2, page 11.

Position A: High Sensitivity: Light, fluffy material

Position B: Medium Sensitivity: Standard setting

Position C: Low Sensitivity: For materials which may form a deposit on the vibrating blade (dense material)

As the sensitivity of the instrument is low at position B, extremely light material such as expanded styrofoam can not be detected at this setting.

7.3 Fail-safe high (FSH) / Fail-safe low (FSL)

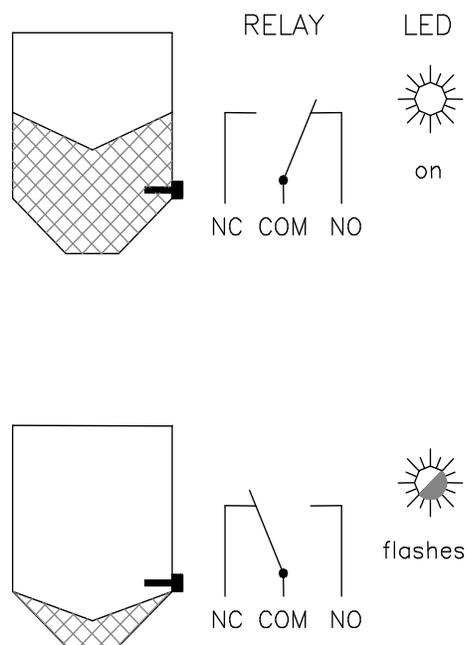
The BINMASTER VR operates in either fail-safe high (FSH) or fail-safe low (FSL) mode.

The fail-safe mode is selected by switch on the PCB. The relay status is indicated by the red LED (D6) on the circuit board.

FSH: For High Level Alarm: The relay is de-energized and the Red LED flashing, when the blade is covered by material.

FSL: For Low Level Alarm: The relay is de-energized and the Red LED flashing, when the blade is free (not covered by material).

Low Level Alarm FSL



High Level Alarm FSH

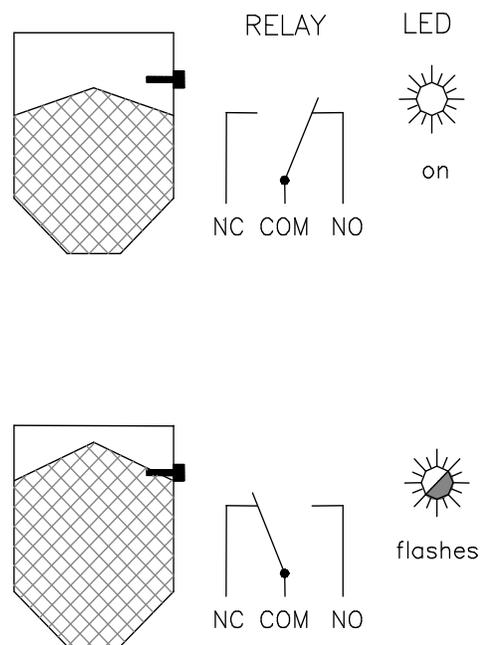
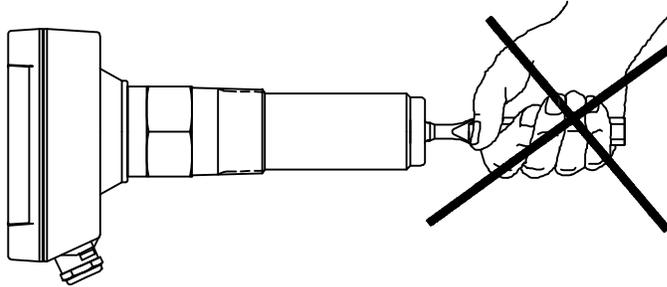


Figure 7.1: Fail-safe Low / Fail-safe High

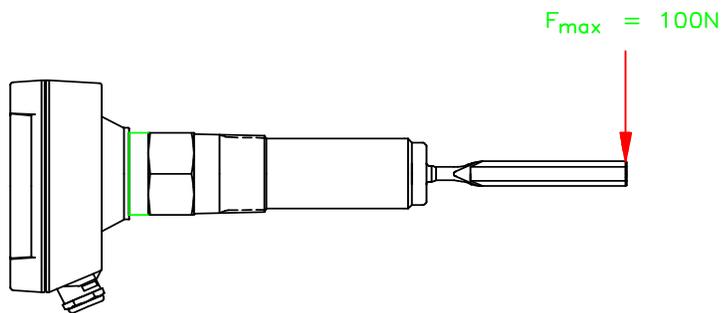
8.0 HANDLING / CAUTION

² The BINMASTER VR must never be handled by the blade



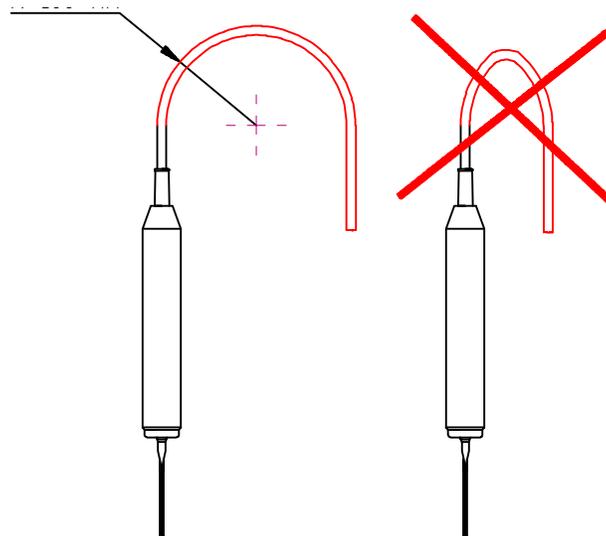
² The blade must not be bent and its dimensions must not be altered.

² The maximum vertical and horizontal load upon the end of the blade must not exceed 100N (10kp)



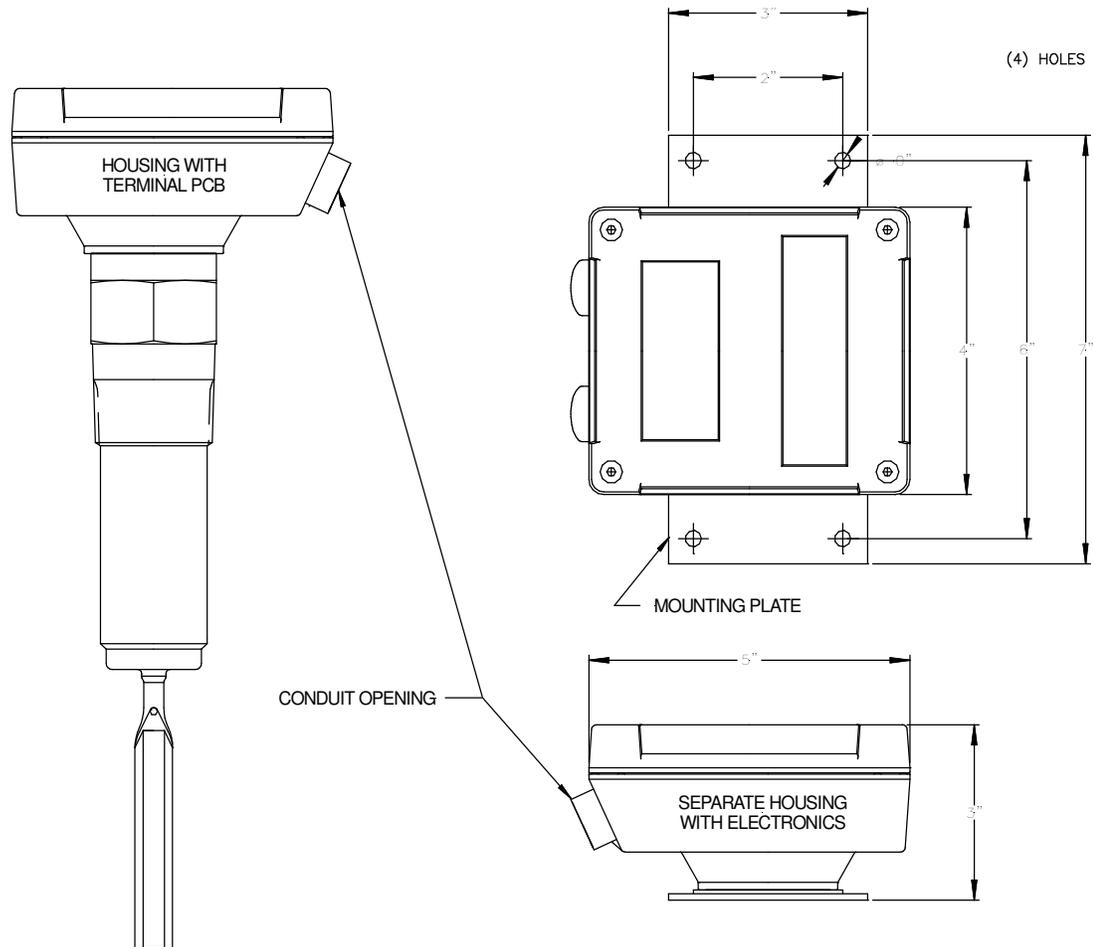
² The cable of the VR51 must not be bent with a bending radius smaller than 4 inches.

²



9.0 APPENDIX

9 1 Separate Housing Installation



The drawing shows a separate housing installation of the VR21. Separate housing installation is also possible for VR41 and VR51.

If the temperature outside the bin near the bin wall exceeds the maximum ambient temperature of the PCB, (140°F), it is necessary to install the PCB in a separate housing apart from the bin where the temperature is in the allowed range. Separate housing installation is also necessary in case of heavy vibrations of the bin. In this case the separate housing has to be installed at a place apart from the vibrations.

PCB and probe get connected by a shielded cable via the terminal PCB which is located inside the housing on top of the mounting socket of the probe. A metal hose which is screwed between the separate housing and the housing that contains the terminal PCB is protecting the cable. The separate housing can be installed by means of the mounting plate.

Declaration of Conformity

BinMaster Level Controls
7201 North 98th Street
Lincoln, NE 68507-9741
Phone: 402-434-9100, Fax: 402-434-9133

BinMaster declares that all models of the VR21, VR41 and VR51 level control devices as listed below comply with the following directives and harmonized standards. This product if installed, operated and maintained as described in this manual will provide a safe and reliable point level control device for bulk solid materials.

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

The following standards are applied:

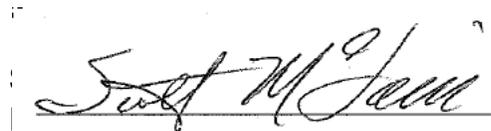
EN 61326-05.04
EN 61010-1

Product: Vibrating Rod level control device

Models: VR21, VR41, and VR51

All test reports and documentation are held and can be obtained from BinMaster.

Manufacturing Location: PTL LTD, Eichsel, Germany



3/25/2008

9250160 Rev C

Distribué par :

HVS
PRECONISATEUR DE SOLUTIONS DEPUIS 1986

2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel : 03 26 82 49 29

Email : hvssystem@hvssystem.com
Site web : www.hvssystem.com