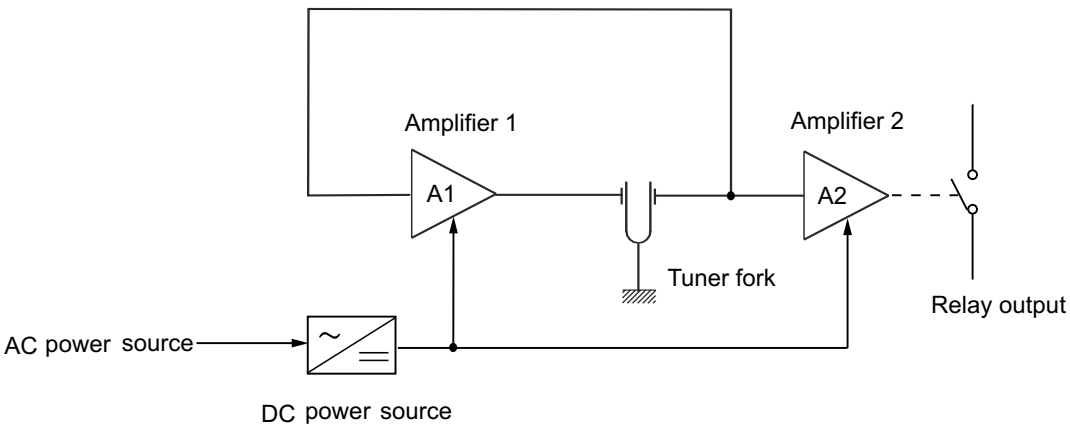
INTRODUCTION

The ZVL piezoelectric vibrating probe level sensor provides an alternative to other level sensor technologies and offers unique advantages all its own. The vibrating probe principle eliminates the problems concerning changes in material density, moisture and composition while providing reliable solid state electronic circuitry that requires no calibration. The ability to detect a great variety of material densities includes extremely light materials, and the versatility offered by different model configurations makes the ZVL an attractive solution to customers' needs for reliable, accurate high or low point level sensing.

PRINCIPLE

A piezoelectric crystal located at the base of the probe driving at a vibrating frequency of 285 Hz when in the free air. The oscillation state will be changed when the filling material is contacted, via the electronic circuit to output the switch signals. The probe is maximally sensitive at the far end and the dimmed sensitivity at base minimize the problem of false signal caused by build-up or draining out of material on the wall of vessel. Another desirable effect of the vibrating probe is in its character to shed off the clinging material when in the free air.



FEATURES

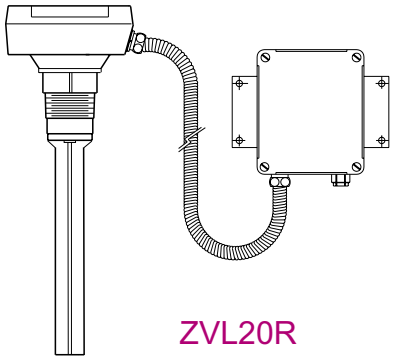
* NO CALIBRATION NEEDED
* NO MECHANICALLY MOVING PARTS
* SHEDS MATERIAL THAT BUILD-UP
* SENSITIVE TO EXTREMELY LIGHT MATERIAL

The ZVL electronic functions are common in all assemblies and configurations. Time delay, Selectable sensitivity and Fail Safe modes are presenting.
Models configurations are available in:

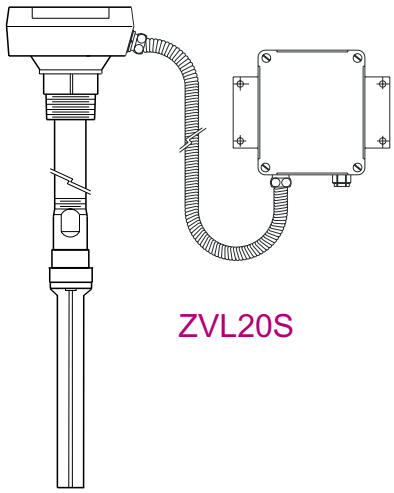
- ZVL20C Standard
- ZVL20E Standard w / solid extension
- ZVL20W Standard w / cable extension
- ZVL20R Hi-Temp / remote electronics
- ZVL20S Hi-Temp w / solid extension

which are great ideal for industrial uses as well as the cost.

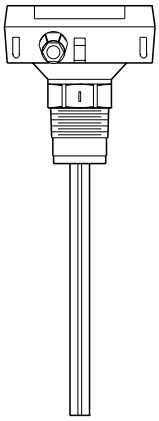
Both Hi-Temp types are remotely mounted in electronic parts.



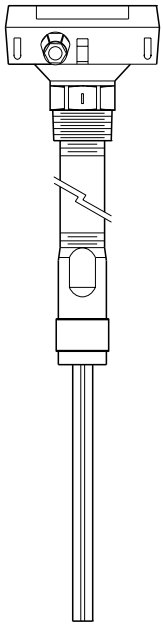
ZVL20R



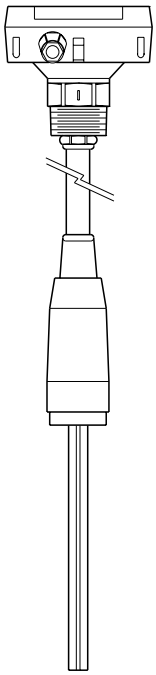
ZVL20S



ZVL20C



ZVL20E

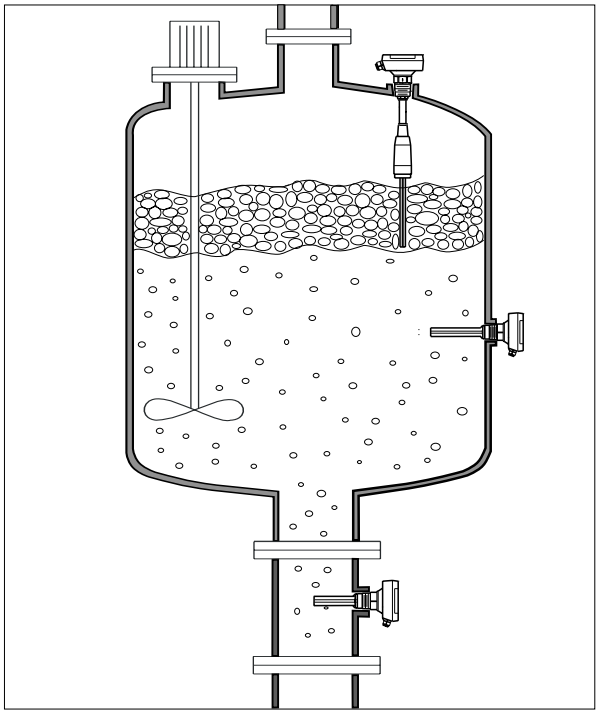


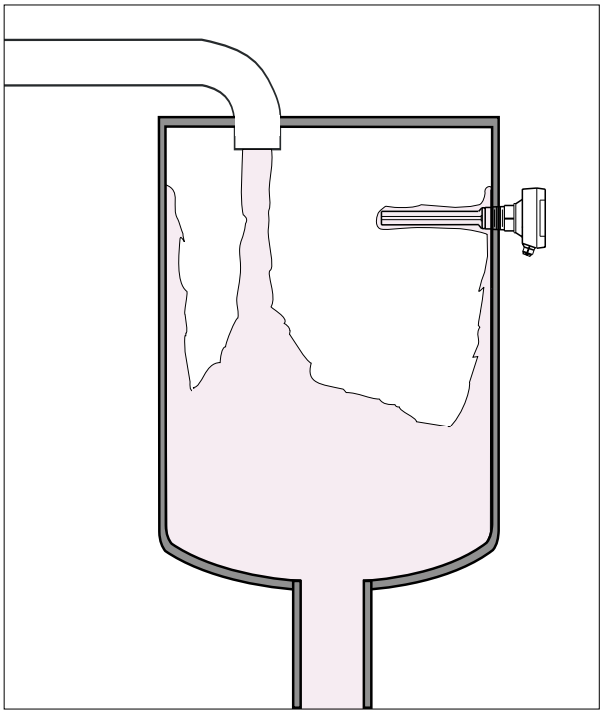
ZVL20W

APPLICATIONS

The ZVL series detects the minimum and maximum level in bins, silos and hoppers, filled with grained or powdered materials. The following list shows some of these materials.

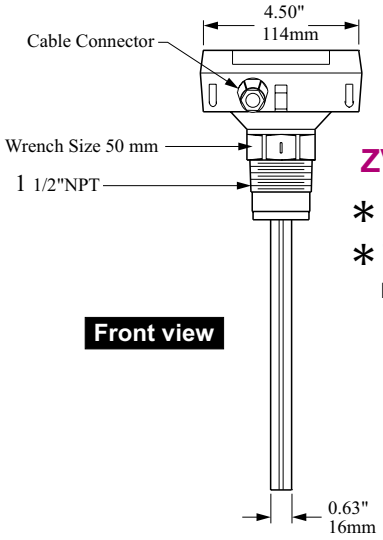
1. Powdered milk
2. Frozen potato chips
3. Beans
4. Sugar
5. Sweets
6. Coffee beans
7. Coffee ground
8. Coffee freeze-dried
9. Tea (leaf)
10. Salt
11. Flour (in a flour mill)
12. Foundry sand
13. Spices
14. Animal food
15. Pellets
16. Peanuts
17. Tobacco
18. Wood shavings
19. Chalk
20. Stearin chips
21. Powdered cellulose
22. Glass finely ground
23. Granular plastics
24. Gravel
25. Powdered clay
26. Polystyrene powder
27. Styrofoam
28. Soda
29. Soot dry





The ZVL series operates even in liquids which are adhesive, causing build-up, agitated, sparkling or foaming.

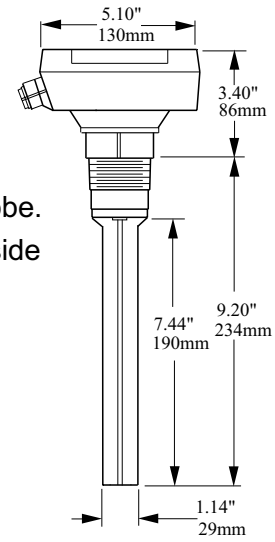
CONSTRUCTIONS AND DIMENSIONS



Front view

ZVL20C STANDARD

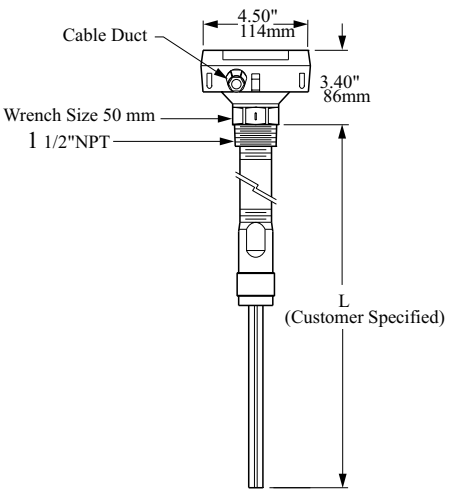
* Seamless welded SUS 304 probe.
* The instrument may be top or side mounted into a bin.



Side view

ZVL20E Standard W/Solid Extension

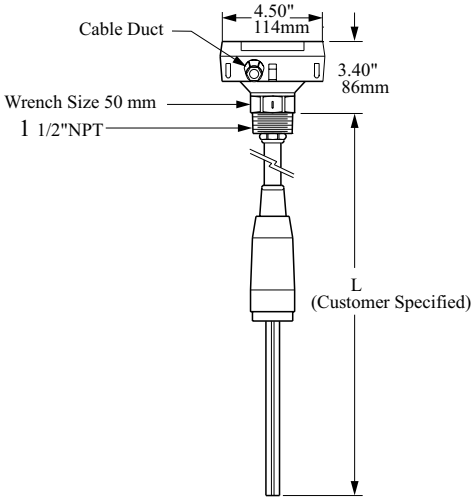
Thus self contained unit extends the detection point beyond the standard length probe. It is applicable to high or low level detection but limited to top mounting only. The 1" NPT stainless steel extension pipe provides structural strength to secure the assembly inside vessel. The length of the extension is from factory size to the customer's specification. Maximum length of the extension pipe is 12ft. (365.76cm)



ZVL20E

ZVL20W Standard W/Cable Extension

This self contained unit extends the detection point beyond the standard length probe. It is applicable to high or low level detection but limited to top mounting only (Consult your manufacturer for recommendations regarding low level detection). The polyurethane jacketed, steel reinforced cable is available in user-specified lengths up to 20ft. (609.60 cm)

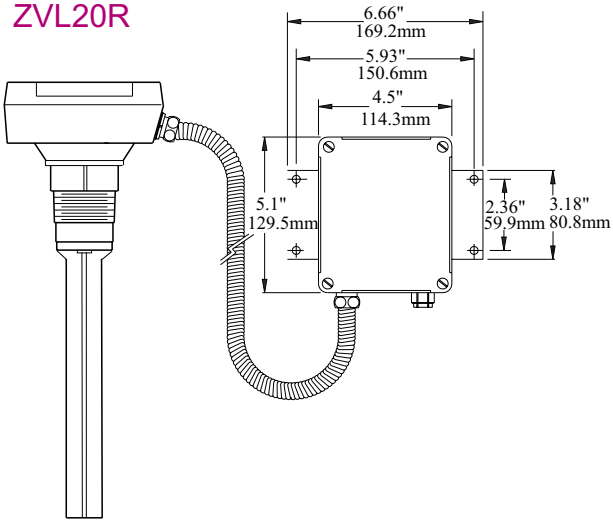


ZVL20W

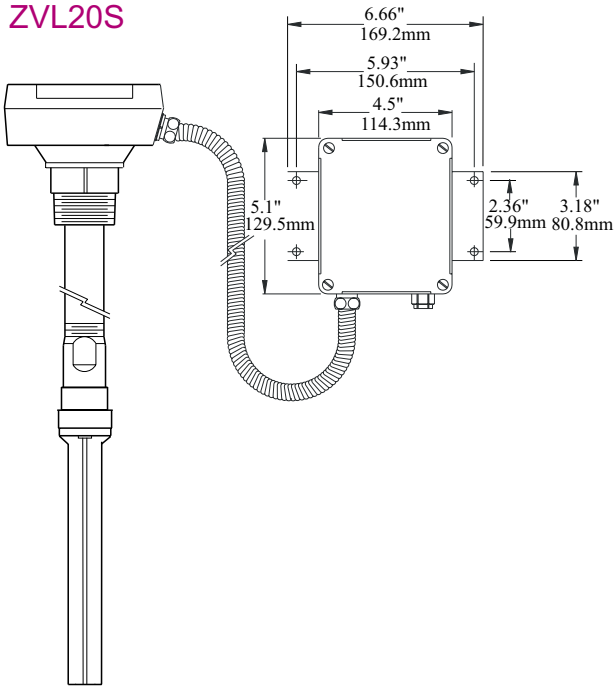
ZVL20R Hi-Temp / Remote Electronics
ZVL20S Hi-Temp W / Solid Extension

Split architecture design removes the electronics from the head to a remote mounting point away from the vessel (primary heat source or vibration source). This configuration makes it possible for the unit to operate reliably at critical temperature and to be used in a vibrating bin that render other detection units unreliable. The solid extension type extra provides extended detection point beyond the standard ones.

ZVL20R



ZVL20S



SIDE MOUNTING

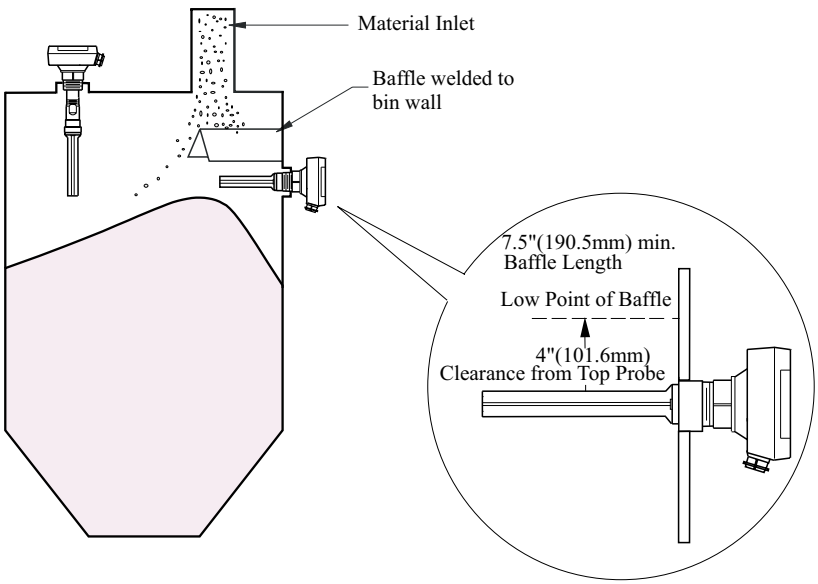
STANDARD & HI-TEMP/REMOTE ELECTRONICS (ZVL20C and ZVL20R) For either high or low level application the instrument should be mounted in a location that is not subject to the direct flow of incoming material. Also, the unit must be mounted with the detecting rod is horizontal, or at a slight downward angle. Other suggestions for a successful installation are:

1. The vibrating probe should not be bent and its dimensions should not be altered. Maximum allowable vertical load on the end of the vibrating probe is 177 in. Lbs. (20Nm).
2. The relatively light load that can be tolerated by end of the probe makes it very important that wherever there is a possibility that the incoming material can strike the probe, it must be protected by a baffle welded to the bin wall (angle iron, a section of pipe, etc.) close enough to protect the probe, but not so close as to interfere natural rise of the material as it's going to surround the probe. (See Fig.1)

* This caution also means that when service inside the bin is being carried out, the probe cannot be used as a step.

3. When the instrument has been tightened into its coupling or flange, the narrow edges of the probe's diamond shape should be in the vertical plane. This is achieved when the slots (grooves) in the hexagonal flats are aligned vertically. When tightening the instrument in its flange/coupling, always use a wrench. Never tighten it in place by turning the housing.

   The cable duct(s) should always be positioned pointing downward to prevent moisture sipping into the housing. If when the probe is screwed tightly into its mounting, the housing is not positioned correctly, it can be adjusted by loosening the screw in the center hole of PCB and re-tighten it after adjustment.



(Fig. 1)

TOP MOUNTING

For all vibrating probe level sensors ZVL20C, ZVL20E, ZVL20W, ZVL20R and ZVL20S

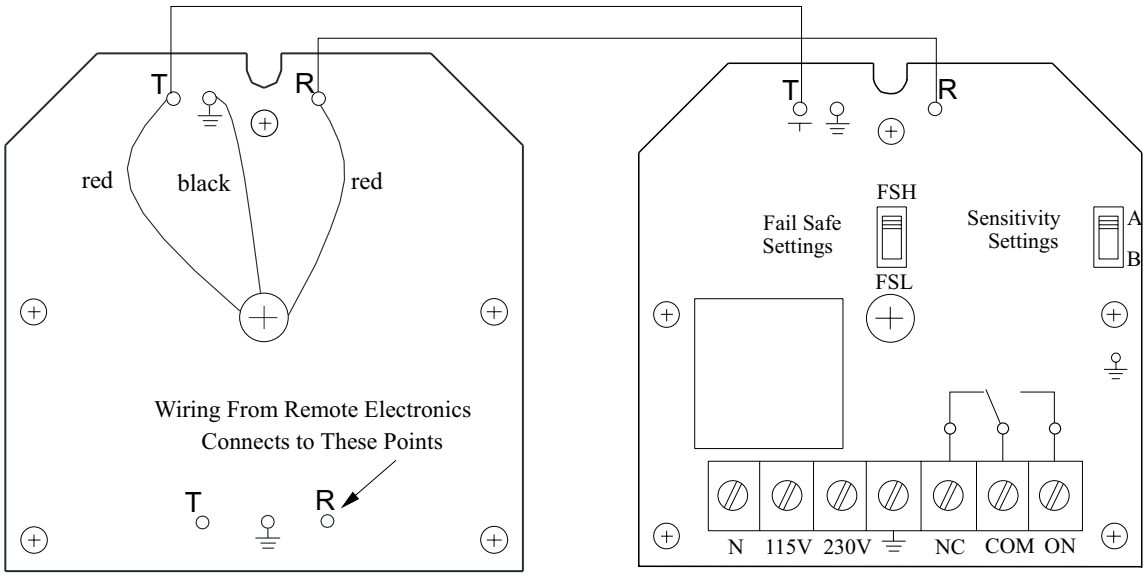
For top mounting installations, the instrument should be located approximately 1/6 of the bin diameter from the outer wall, and out of direct path of incoming material.

If the housing is not positioned correctly when the probe is screwed tightly in place, it can be adjusted by loosening the screw in the center hole of PCB and re-tighten it after adjustment.

WIRE ASSEMBLY

HI-TEMP/HI-TEMP W / SOLID EXTENSION (ZVL20R and ZVL20S)

1. The probe and the electronics are separated by a 6ft. Flexible signal line.
2. Pass the wiring thru the signal line, connecting the probe and the remote housing correspondingly R (receive / input) to R, T (transmit / output) to T and ⏚ (ground). (Fig. 2)
3. Ground wire is in black, The other two are most in red, wiring to R and T is not dependent on their polarities.



(Fig. 2) . Remote housing

There are two slide switches on the ZVL electronic assembly, a sensitivity selector and a fail-safe mode selector (Fig. 3).

SENSITIVITY - The sensor will detect most products with the sensitivity switch in the A position. When the unit is used with a product that may form a heavy deposit on the probe, set the sensitivity switch to the B position.

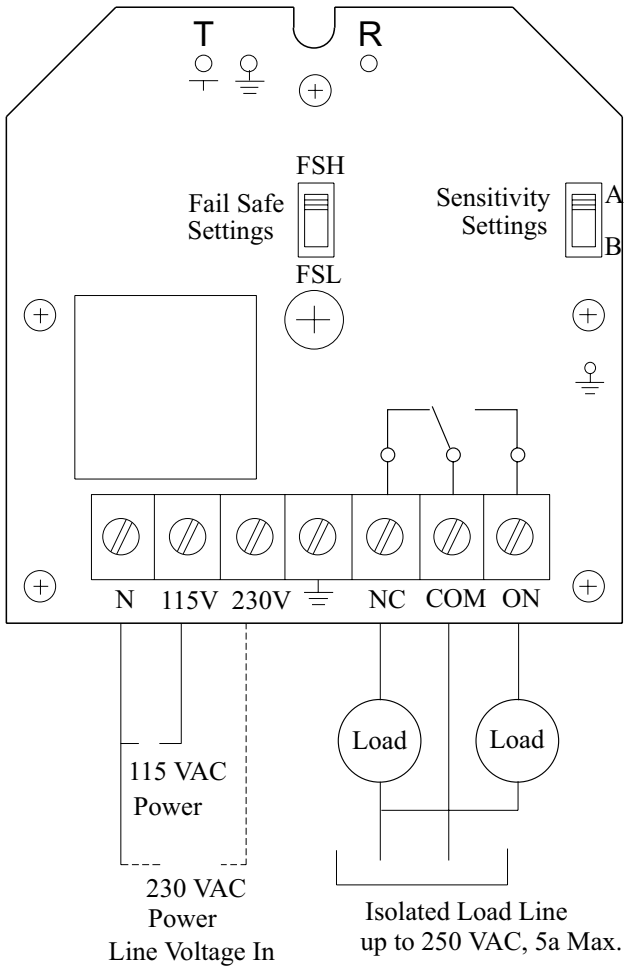
Select Fail-Safe High mode (FSH), or Fail-Safe Low mode (FSL) when setting up the unit.

FSH - in this mode the relay is operated when no material is detected. If material is detected or there is a power failure, the relay is de-energized and the unit sends a high material signal.

FSL - in this mode the relay operates when material is detected. When there is no material surrounding the probe or there is a power failure, the relay is de-energized and a low material signal is given.

WIRING

INPUT, POWER AND OUTPUT
For all vibrating probe level sensors
ZVL20C, ZVL20E, ZVL20W, ZVL20R, ZVL20S
(See Fig.3)



(Fig. 3) Remote housing

STANDARD SPECIFICATIONS

DESCRIPTIONS	ZVL20C(STANDARD)	ZVL20E	ZVL20W	ZVL20R / ZVL20S
LEVEL SENSOR HOUSING	NEMA4,12 / IP65 DIE CAST ALUMINUM	☆	☆	☆
PROBE CONSTRUCTION	SUS304	☆	☆	☆
MOUNTING	1 1/2" NPT	☆	☆	☆
POWER ENTRY	1/2"PT, PG13.5	☆	☆	☆
POWER SUPPLY	115 /230 VAC ± 15% 50 /60Hz	☆	☆	☆
POWER CONSUMPTION	2VA (MAX.)	☆	☆	☆
MIN. MATERIAL DENSITY SENSED	1.87Lbs.Cu.Ft. ($0.03G/cm^3$)	☆	☆	☆
MAX. VERTICAL LOAD ON PROBE	177in.Lbs (20Nm)	☆	☆	☆
OPERATING TEMP. IN AMBIENT AIR	-22°F ~ 140°F -30°C ~ 60°C	☆	☆	☆
OPERATING TEMP. IN BIN	-22°F ~ 176°F -30°C ~ 80°C	☆	☆	-22°F ~ 248°F -30°C ~ 120°C
OPERATING PRESS.	VACUUM ~150 PSI (10BAR)	☆	☆	☆
RELAY OUTPUT	SPDT 5A/250VAC MAX.	☆	☆	☆
TIME DELAY	1 secretary / operate 2-5 sec / reset	☆	☆	☆
EXTENSION MATERIAL/LENGTH	N/A	SUS 304/12Ft. (365.76cm)	POLYURETHANE SHEETH STEEL REINFORCED 20Ft.(609.60cm)	6Ft. Remote+Solid Ext. for ZVL20S
VIBRATING FREQ.	285 Hz	☆	☆	☆
SELECTABLE FAIL-SAFE	HI./ LO.	☆	☆	☆
SELECTABLE SENSITIVITY	HI./ LO.	☆	☆	☆

☆ :STANDARD

HOW TO MAKE YOUR ORDER

ZVL □□□ □□ □□□□

MODEL

20C : STANDARD
20E : STANDARD W/SOLID EXTENSION
20W : STANDARD W/CABLE EXTENSION
20R : HI-TEMP/REMOTE ELECTRONICS
20S : HI-TEMP/REMOTE ELECTRONICS/SOLID EXTENSION

CONNECTING TYPE

E : 1 1/2" (40A)
F : 2" (50A)
G : 2 1/2" (65A)
H : 3" (80A)
I : 4" (100A)
J : 5" (125A)
K : 6" (150A)
S : SPECIAL ORDER

M : 5kg/cm^2
N : 10kg/cm^2
O : 150Lbs
P : 300Lbs
Q : PT
R : PF
S : SPECIAL ORDER
T : BSP
V : NPT
W : PN10 (10BAR)
X : PN16 (16BAR)
Y : PN25 (25BAR)
Z : PN40 (40BAR)

LENGTH (UNIT : mm)

EX : ZVL 20E EV 0300

BEFORE YOU ORDER

1.Please affirm the Voltage.
2.Please affirm the mounting positions.
3.Please affirm the material specific gravity (S.G.) value.
4.Please affirm whether any bridge block or vibrating motor installed onto the silo wall.

* Tolerance of the total product length is ± 5mm
* Characteristics, specifications and dimensions are subject to change without notice.
* Please contact your nearest distributing office for further informations.