LEVELSWITCH

CV120/CV130/CV140/CV150

Tough and reliable vibrating level switch for bulk solids.
High versatility: applicable for many materials from styrofoam to cement.

Techtrol

approved to
DIN EN ISO9001:2000

Physikalisch-Technisches Labor Hermann GmbH · Kellermatten 3 · D-79618 Rheinfelden-Eichsel
Tel: + 49-7623-747954 · Fax: + 49-7623-47589 · info@ptl-hermann.com · www.ptl-hermann.com

Description

The **LEVEL SWITCH** is a level control instrument for the detection of minimum and maximum levels in bins, silos and hoppers. It is designed to detect all kinds of grained, granular or powdered bulk solids. Typical applications are overfill protection, high-, mid- or low-level alarm and the detection of settled material in water (special model SEDIMENT).

Advantages

- Vibration technique
  The **LEVEL SWITCH** has a piezo driven vibration technique, that offers many advantages over alternative level sensing technologies:
  - no moving parts: high durability
  - no maintenance required
  - unaffected by environmental changes e.g. temperature, pressure, humidity
  - unaffected by material changes
  - unaffected by dust clouds and agitation
  - no calibration required
  - maximum versatility
  - the vibration has a self cleaning effect

- Single blade design

  - The special design where only one rod comes in touch with the material to be detected prevents material bridging, a failure that is typically associated with the dual blade „tuning fork“ design.
  - Extremely sensitive: the **LEVEL SWITCH** can be used for extremely light material with densities as low as 20 grams / liter.
  - Strong stainless steel construction with patented reenforced membrane makes the **LEVEL SWITCH** tough for the use with heavy materials such as cement.
  - Material build-up on the container wall has no influence on the function of the **LEVEL SWITCH** as only the tip of the vibrating blade is sensitive and not the base.

- Highest quality
  - latest state-of-the-art piezoelectric technology
  - solid stainless steel construction
  - designed and manufactured at PTL in Germany according to DIN EN ISO9001:2000 and with the background of over 20 years of experience in the field of level control.

Function and Application

The vibrating system of the **LEVEL SWITCH** gets forced to vibrate on its resonance frequency by a piezo crystal drive. If filling material, (bulk solids), covers the vibrating blade of the instrument, its vibration gets damped. This is sensed by the electronic circuit and the output relay switches. When the blade gets uncovered due to declining level, the instrument restarts to vibrate and the relay switches back.

Because of its maximum versatility the **LEVEL SWITCH** is ideal for applications where contents changes are common since the instrument must not be calibrated according to the characteristics of the material. In a special model the **LEVEL SWITCH** also can be used for sediment detection e.g. sand in water.

The following list shows some of the materials the **LEVEL SWITCH** has been successfully used for:

powdered milk	tea (leaf)	wood shavings
frozen chips	salt	chalk
beans	flour	styrofoam
sugar	spices	cellulose
sweets	soda	glass ground
coffee beans	pellets	granular plastics
coffee ground	animal food	powdered clay
peanuts	carbon black	polystyrene
tobacco	chemicals	gravel
cement	foundry sand	sawdust

Models

- Standard model: ***LEVELSWITCH CV120***

The CV120 is designed for top- or side-mounting.
It has a fixed insertion length of approx. 173mm.
Connection to the container is made via thread 1 ½“ DIN (equals BSPT) or NPT.

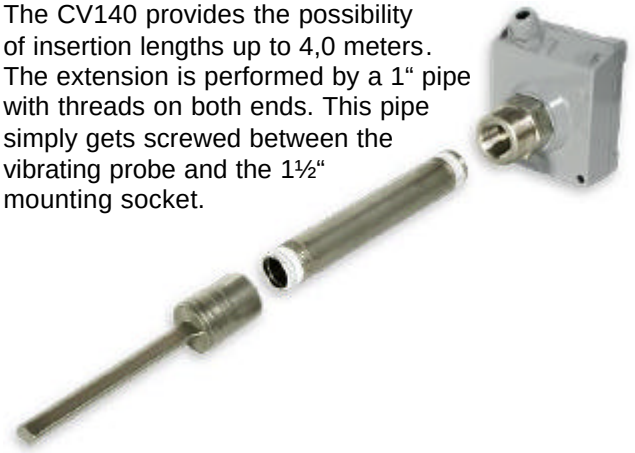
- Pipe extension welded: ***LEVELSWITCH CV130***

If the application requires longer insertion lengths the CV130 is the right choice.
This model offers the possibility to adapt the insertion length exactly to the application by means of a pipe which is welded between the vibrating probe and the 1½“ mounting socket.
Maximum insertion length for CV130 is 2,0 meters.

The CV130 is suitable for top mounting. Side mounting is possible for insertion lengths shorter than 1 meter and if the extension pipe is adequately supported. Connection to the container is made via thread 1 ½“ DIN (equals BSPT) or NPT.

- Extension by threaded pipe: ***LEVELSWITCH CV140***

The CV140 provides the possibility of insertion lengths up to 4,0 meters. The extension is performed by a 1“ pipe with threads on both ends. This pipe simply gets screwed between the vibrating probe and the 1½“ mounting socket.



As no special equipment is necessary for making the extension it is possible that the customer obtains and mounts the extension tube at the site which helps to save costs for equipment and transport. The CV140 is suitable for top mounting. Side mounting is possible for insertion lengths shorter than 1 meter and if the extension pipe is adequately supported. Connection to the container is made via thread 1 ½“ DIN (equals BSPT) or NPT.

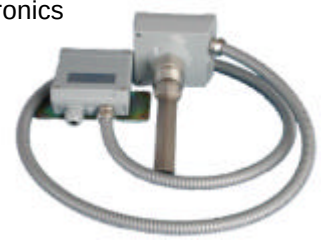
- Flexible cable extension: ***LEVELSWITCH CV150***

The CV150 allows insertion length up to 20 meters. The extension is performed by means of a polyurethane sheathed, steel rope reinforced cable.
The CV150 is for top mounting only. The connection to the container is made by thread 1 ½“ DIN (equals BSPT) or NPT.

The CV150 has not only the advantage that very long insertion lengths can be realized but additionally provides easy transport as it can be shipped in very compact boxes in comparison to the extension tube models CV130 and CV140.

➢ Remote electronics installation
(not in combination with dust-ex)

At some applications it is necessary to keep the electronics separated from the container. This is the case at very high temperatures or heavy vibrations or shocks. The remote electronics installation is possible for all **LEVEL SWITCH** models. The standard length of the cable extension is 2 meters. Longer cables are possible.



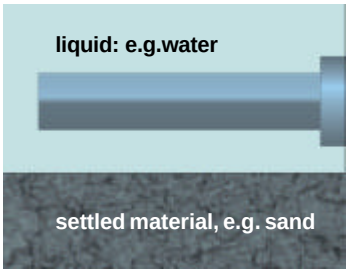
➢ High temperature model

The standard **LEVEL SWITCH** is designed for process temperatures of max. 80°C. At temperatures up to 150°C, the high temperature model must be used which is available for CV120, CV130 and CV140. To protect the electronics from too high temperatures, a temperature insulating tube gets mounted in between the mounting socket and the enclosure. Instead it is also possible to install the electronics at a place with lower ambient temperature by using the remote electronics installation.

➢ special model “Extreme Sensitivity”

This special model is designed for applications where extremely light materials with densities down to 10g/l have to be detected.

➢ special model SEDIMENT



The special model SEDIMENT is designed to detect material that has settled in liquids, e.g. sand and dirt in front of pumping systems. The probe vibrates in the liquid: if the sediment reaches the vibrating blade, it damps the vibration and causes the relay to switch.

Options

The following options are available:

- second cable gland M20 x 1,5
  (not available in combination with remote electronics installation)
- enclosure powder coated grey, blue, orange or beige
- double pole relay DPDT
- externally visible LED for indicating relay status
  (not in combination with dust-ex)
- dust-ex according ATEX directive 94/9/EC for CV120, CV130, CV150

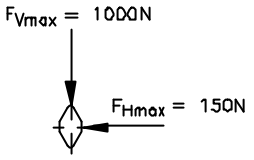
Approvals

- CE-approval for all instruments according to the following directives:
  - EMC-directive 89/336/EEC
  - Low Voltage-directive 73/23/EEC

- Dust-Ex-approval according to ATEX 94/9/EC: equipment group II, Cat. 1/2D for use in zones 20, 21, 22, available for CV120, CV130 and CV150

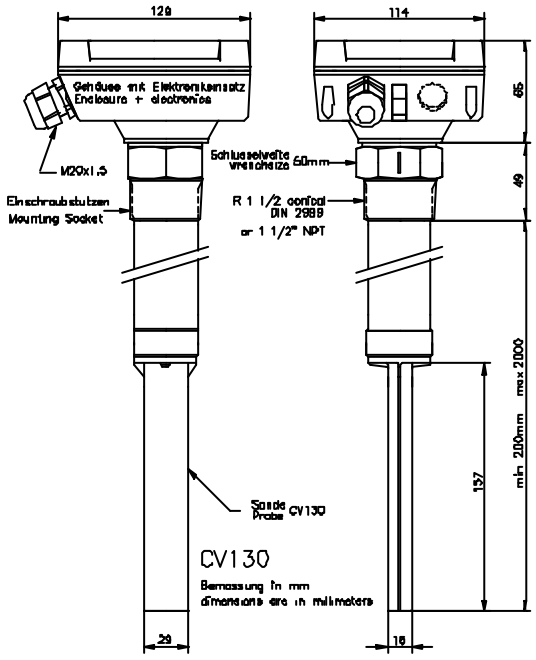
Specifications

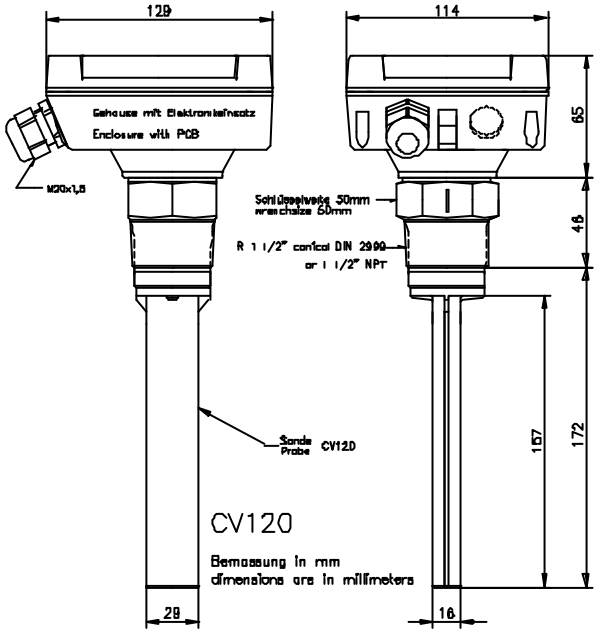
Enclosure:		die cast aluminum, (option powder coated) protection IP 66 and IP 67 (IP65 for remote electronics installation) 1 cable gland M20 x 1,5 (option: second cable gland)
Electronics:	Power Supply:	wide range power supply 20 ... 250V AC/DC
	Power consumption:	3 VA
	Output:	Relay, 1 potential-free change-over contact (SPDT), (option: DPDT) max. switching datas AC: 250V-AC, 8A, 2000VA, cos φ = 1 max. switching datas DC: 8,0A at 24V-DC / 1,5A at 48V-AC min. switching datas DC: 24V / 100mA
	Time Delay:	1 second from stop of vibration 2 to 5 seconds for start of vibration
	Indication:	relay: red LED on PCB (option: externally visible) power: yellow LED on PCB
Probe:	Material:	stainless steel 1.4301 / AISI 304
	connection:	thread 11/2“ DIN 2999 (equals BSPT) or 11/2“ NPT
	resonance frequency:	approx. 285 Hz
	max. horizontal load upon the end of the blade:	150 N
	max. vertical load upon the end of the blade:	1000 N
	max. tensile load of cable CV150:	200 kg



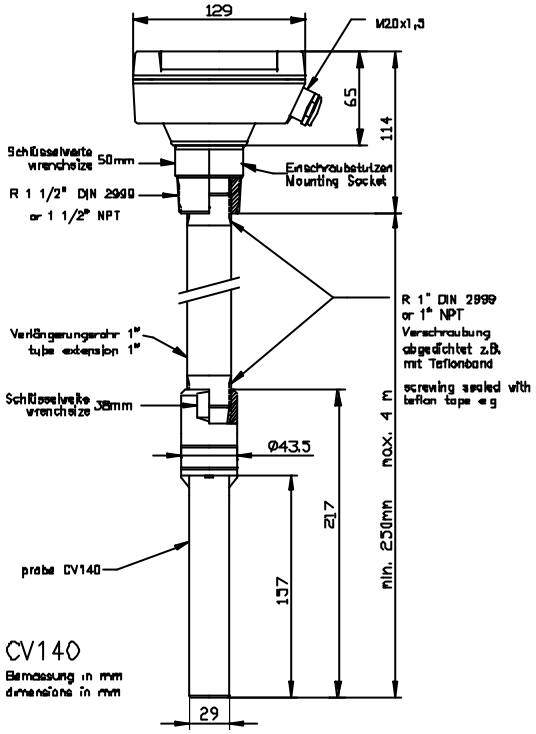
Material to be detected:		non sticky bulk solids min. density 20 grams per litre, with special model as low as 10 g / litre grain size from powder to max. 40mm
max. pressure inside bin:		10 bar
ambient temperature electronics:		-20°C ... + 60°C
process temperatur:	probe:	-20°C ... + 80°C (CV150: max. 70°C)
	probe HT:	-20°C ... + 150°C

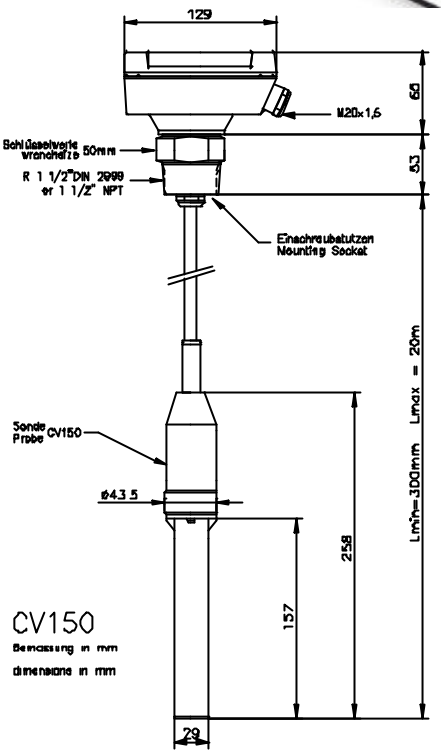
Dimensions



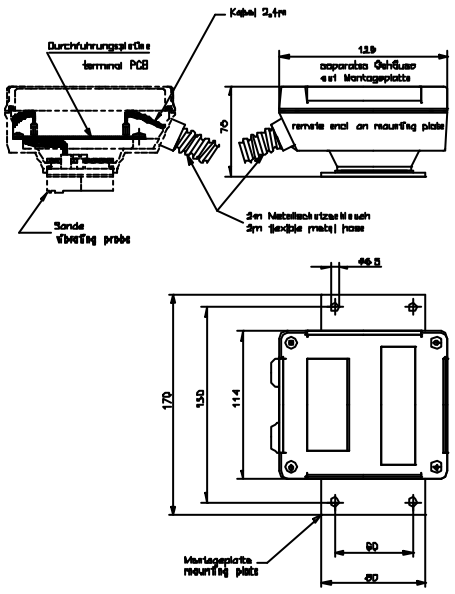


1104

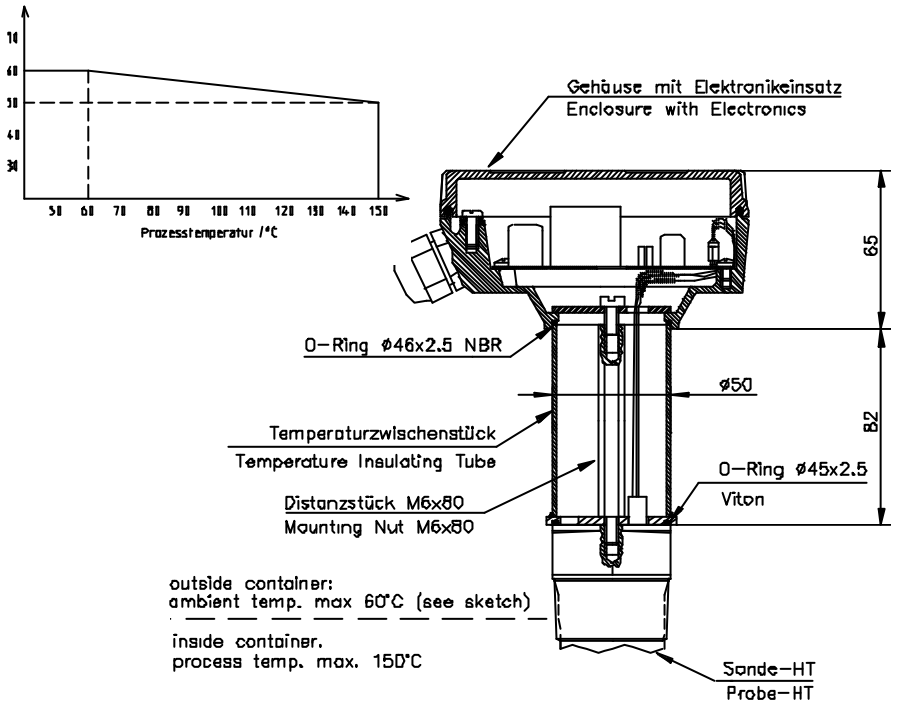




➢ Remote Electronics Installation



Special Model HT with Temperature Insulating Tube



PUNE TECHTROL PVT. LTD. **Works**

'S' 18,MIDC, Bhosari, Pune 411026,India
Tel +91-20-27129298,27128055,27121052
Fax +91-20-27121663
Email : ho@punetechtrol.com
Web : www.punetechtrol.com

Service Centre
20/21. Parshwanath Indl.,
Co-op, Society,
Bhosari, Pune – 411026, India
Tel +91-20-66113565