

## SHT120/130/140

Vibrating Level Switch for  
hot bulk solids up to 250°C



For all applications where conventional level switches cannot be used  
due to high process temperatures.

## Description

The **SHT120** is a piezoelectric driven vibration type level switch that detects the minimum and maximum level in bins, silos and hoppers, filled with grained or powdered materials, (bulk solids). The unit can be used as overflow protection, for high-, mid-, or low level alarm. A patented special piezo system enables the SHT to withstand high process temperatures up to 250°C.

## How it works

The signal from the electronic circuit of the **SHT120** excites the blade of the instrument to vibrate on its resonance frequency of 285 Hz. When material covers the blade of the probe, the vibration stops. This is sensed by the electronic circuit which forces its output signal to switch. When the blade gets uncovered the vibration restarts and the output signal switches back.

## Models

Additional to the *SHT120* two models with tube extension are available:

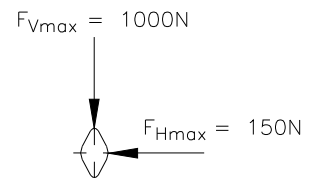
- *SHT130*      model with welded tube extension, insertion length up to 2,0m
- *SHT140*      model with threaded tube extension, insertion length up to 4,0m

## Advantages

- easy installation and setup: - no calibration required
- no subsequent costs:      - no readjustment required: unaffected by environmental changes e.g. temperature, pressure, humidity
- high durability:      - no moving parts hence no wear-out  
   - high mechanical toughness due to the patented reinforced membrane and a patented special piezo system  
   - habitual high PTL-quality: development and production at PTL in Germany according to DIN EN ISO9001:2008
- high performance:      - single blade construction eliminates the bridging problem typical for the „tuning fork“ design  
   - fail-safe-function: the instrument switches into alarm condition when power supply fails
- maximum versatility:      - applicable for very light materials with densities down to 20 grams/litre as well as for heavy materials, for powders as well as for materials with grain sizes up to 40mm

## Specifications

<i>Enclosure:</i>	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)
<i>Electronics:</i>	<p><b>Wide range power supply 20 ... 250V AC/DC with relay output:</b> two potential-free change-over contacts (DPDT) max. switching datas AC: 250V-AC, 8A, 2000VA, <math>\cos\varphi = 1</math> max. switching datas DC: 8,0A at 24V-DC / 1,5A at 48V-AC min. switching datas DC: 24V / 100mA Power consumption: &lt; 3 VA</p> <p>or: <b>power supply 24V-DC with transistor output (3-wire):</b> potential free, NPN or PNP type 350mA @ 24V-DC, shorttime max. 1A, max. power 20W power loss max. 3V, max. leakage current 100µA; short circuit proof power consumption at blocked transistor: &lt; 1 W</p> <p>or: <b>power supply 20...30V-DC with 8/16mA-output (2-wire):</b> power consumption: &lt; 0,5 W The probe can be supplied by the supply and analyzing unit CV2000AE e.g.</p> <p>Time Delay:                   1 second from stop of vibration                                       2 to 5 seconds for start of vibration</p> <p>Indication:                    LED on PCB (option: externally visible)</p>
<i>Probe:</i>	<p>Material:                      stainless steel 1.4301 / AISI 304</p> <p>connection:                  - thread 1-1/2" EN10226 (equals BSPT) or 1-1/2" NPT                                       - process connection "Tri-Clamp" according to DIN32626                                       (for SHT130 only)</p> <p>resonance frequency:      approx. 285 Hz</p> <p>max. horizontal load upon the end of the blade: 150 N</p> <p>max. vertical load upon the end of the blade: 1000 N</p>
<i>Material to be detected:</i>	<p>non sticky bulk solids min. density 20 grams per liter, grain size from powder to max. 40mm</p>
<i>Ambient conditions:</i>	<p>max. pressure inside bin:                   10 bar</p> <p>ambient temperature electronics:       -20°C ... + 70°C</p> <p>process temperature probe:               -20°C ... + 250°C</p>
<i>CE-Conformity:</i>	<p>- EMC-directive 2004/108/EG - Low Voltage-directive 2006/95/EG</p>



## Options

- remote electronics installation, to be used if ambient temperature near the container wall exceeds 70°C or if container is exposed to high vibrations
- second cable gland (not available in combination with remote electronics)
- enclosure powder coated grey, blue, beige or orange
- externally visible LED for relay status

**CV2000AE[Exi]**

The CV2000AE is a supply and analysing unit for the vibration type level switches SHT120/130/140 with 8/16mA output.

**Function:**

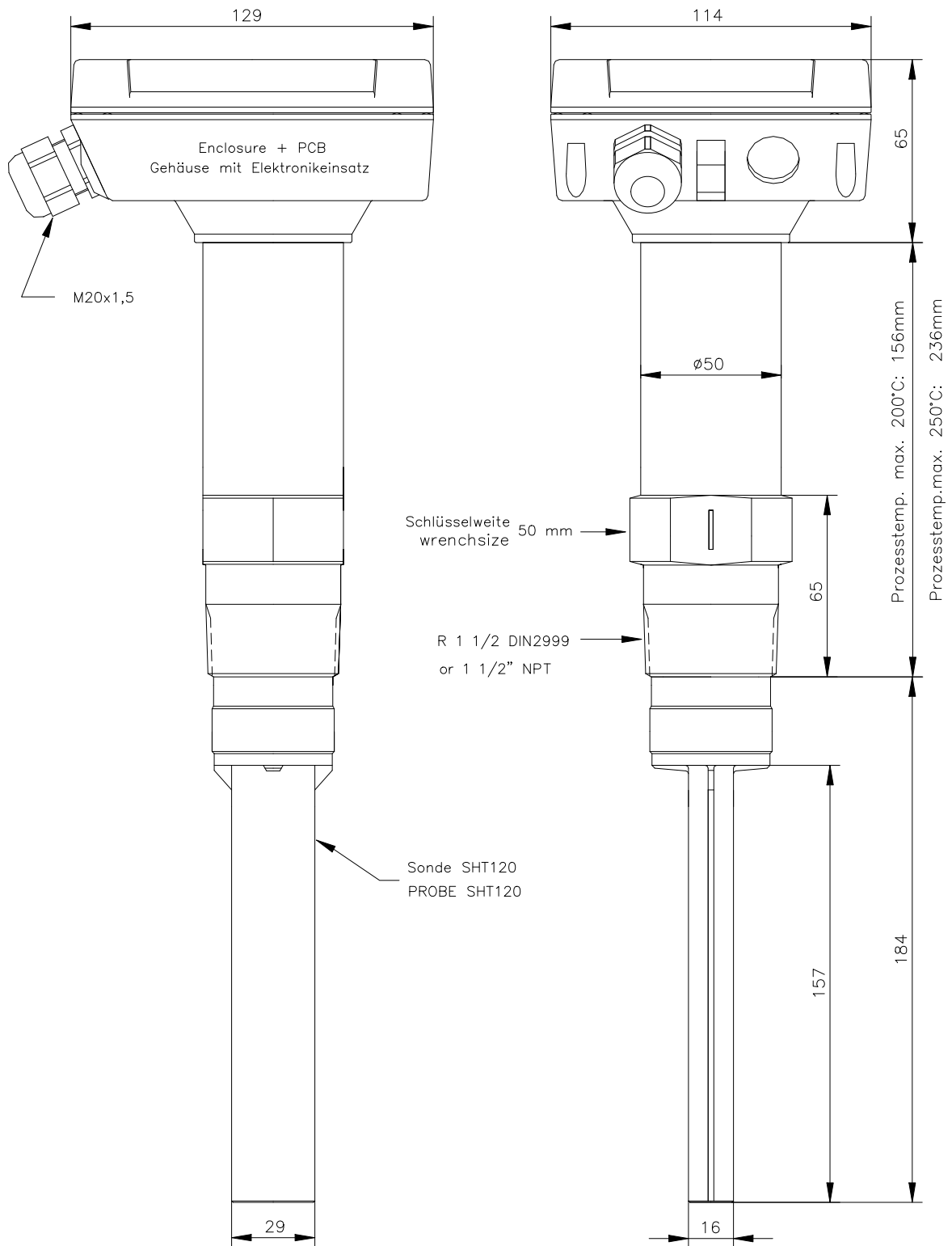
The CV2000AE supplies the connected vibration type level switch with a DC voltage. Depending on the level inside the bin, (probe covered with filling material or not), the electronics of the probe takes more or less current. This current change is sensed by the CV2000AE and gets converted into a relay output. The interconnecting cable between probe and CV2000AE gets monitored permanently for short circuit and line break. In case of short circuit or line break an additional relay output switches.

**Technical Data:**

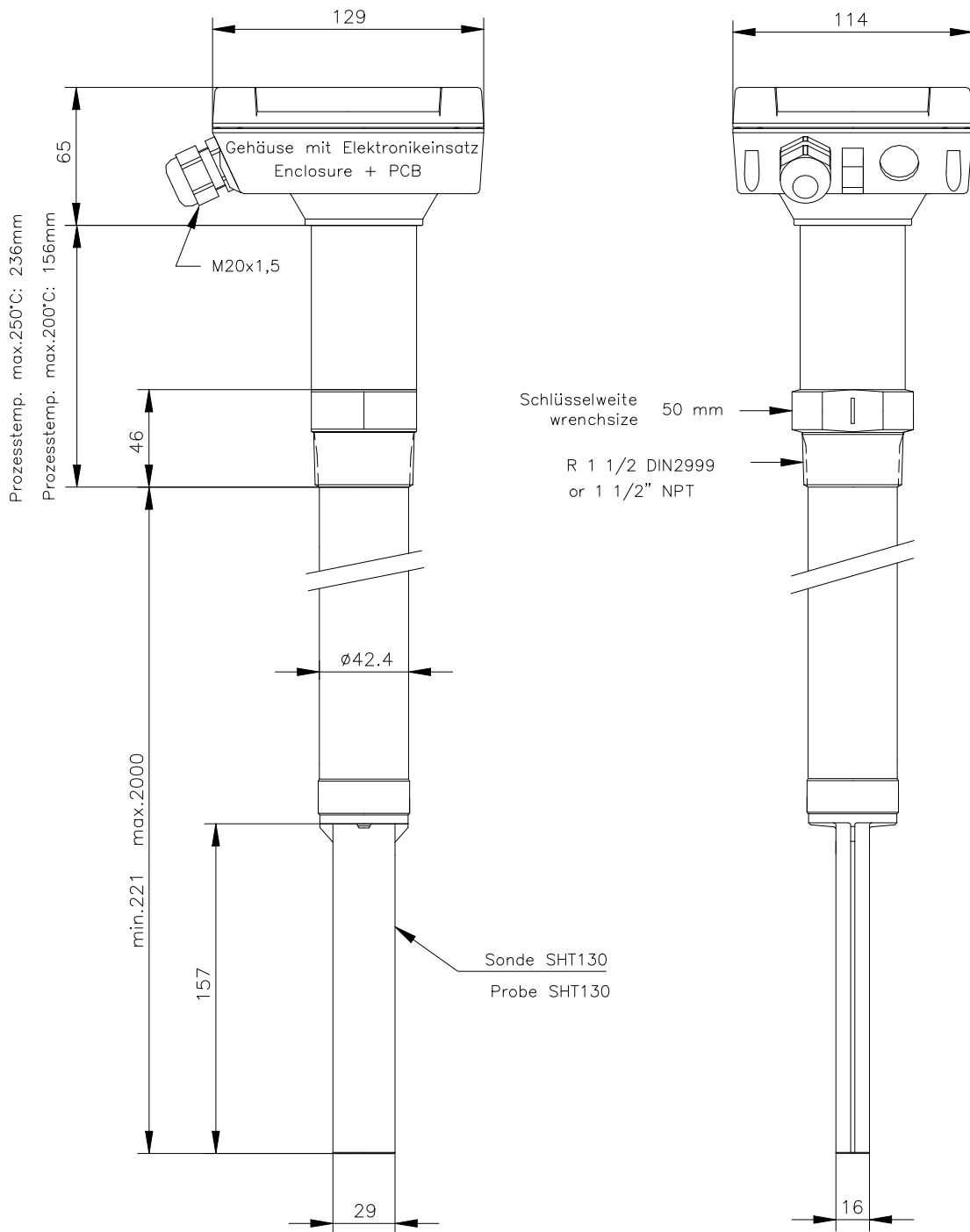
Enclosure:	Polyamid enclosure for carrier rail mounting 35mm according to EN50022 dimensions 114x35x99mm; protection IP20		
Electronics:	Power Supply:	20...250V AC/DC; max. 3VA	
	Output power supply for probe:	20V-DC (without load)	
	Relay Output:	one potential free change over contact (SPDT), max. 5A/250V	
	Failure indication:	detection of line break and short circuit by add. relay max. 5A/250V	
	Connection cable to probe:	2-wire, max. 35 Ohms per wire	
Indication:	yellow LED:	power supply	
	green LED:	relay status	
	red LED:	failure indication (line break and short circuit)	
Temperature:	-20°C ... + 60°C		

**Dimension**

➤ SHT120

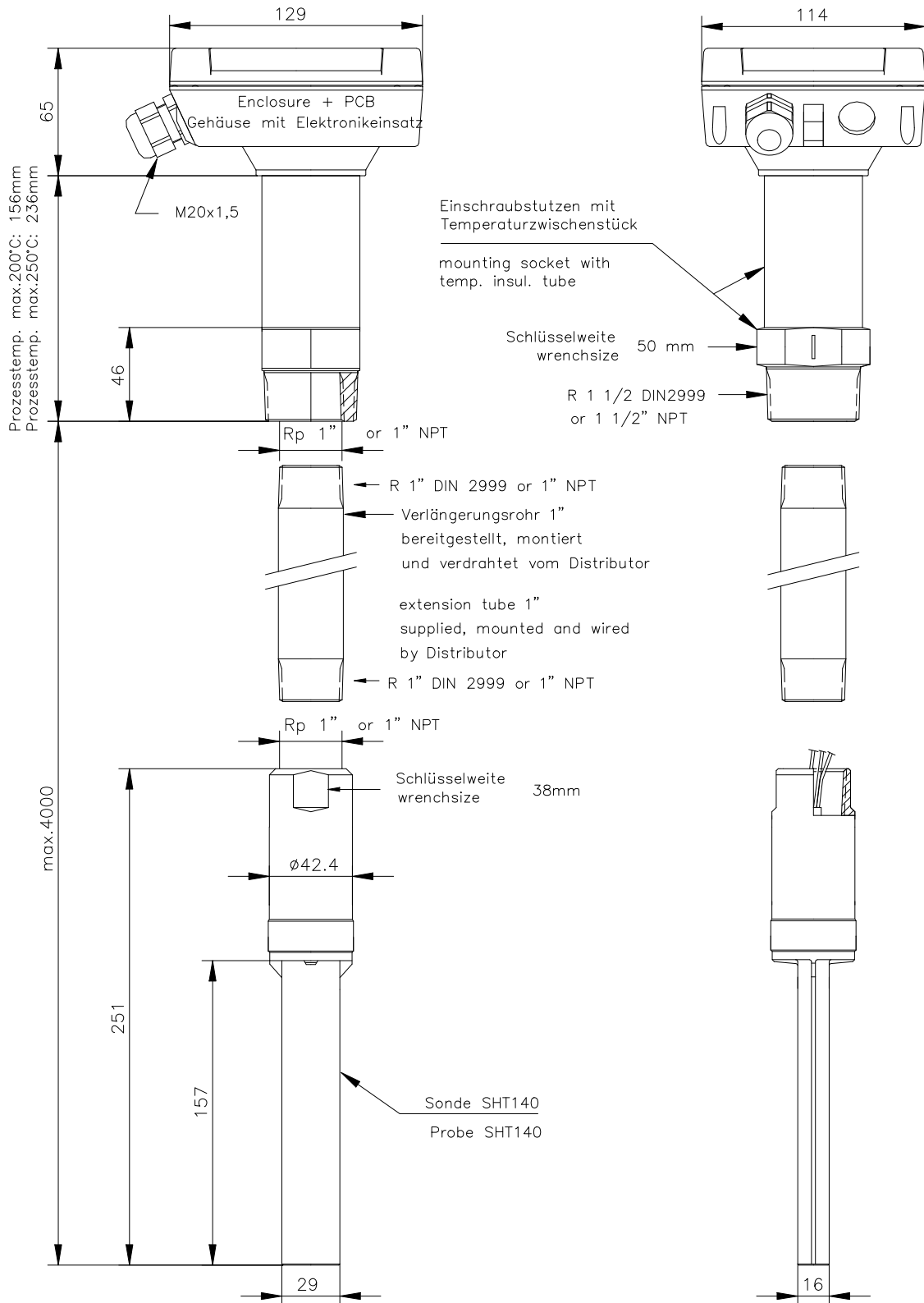


➤ SHT130



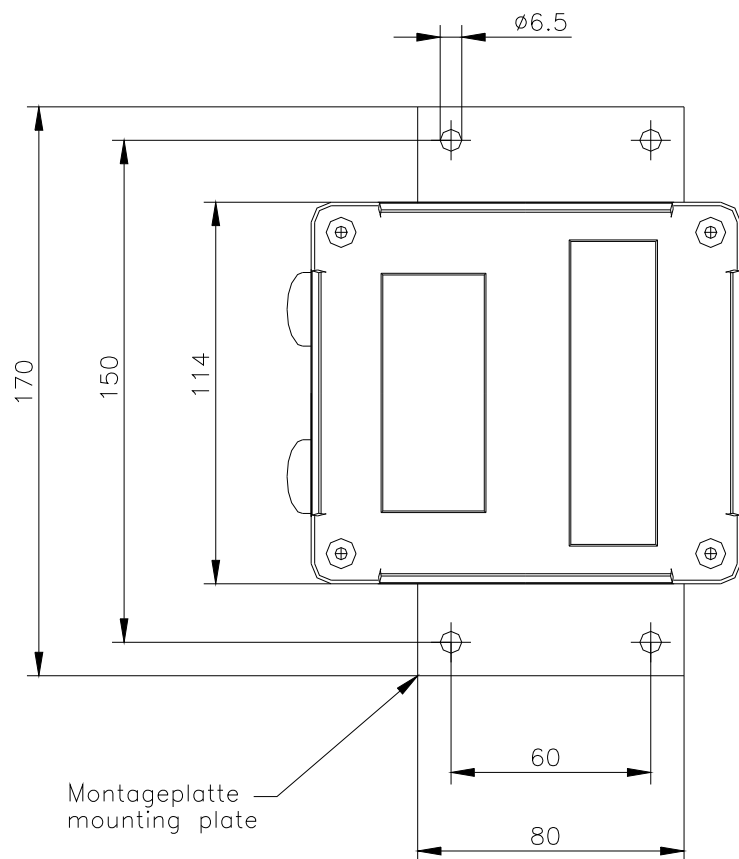
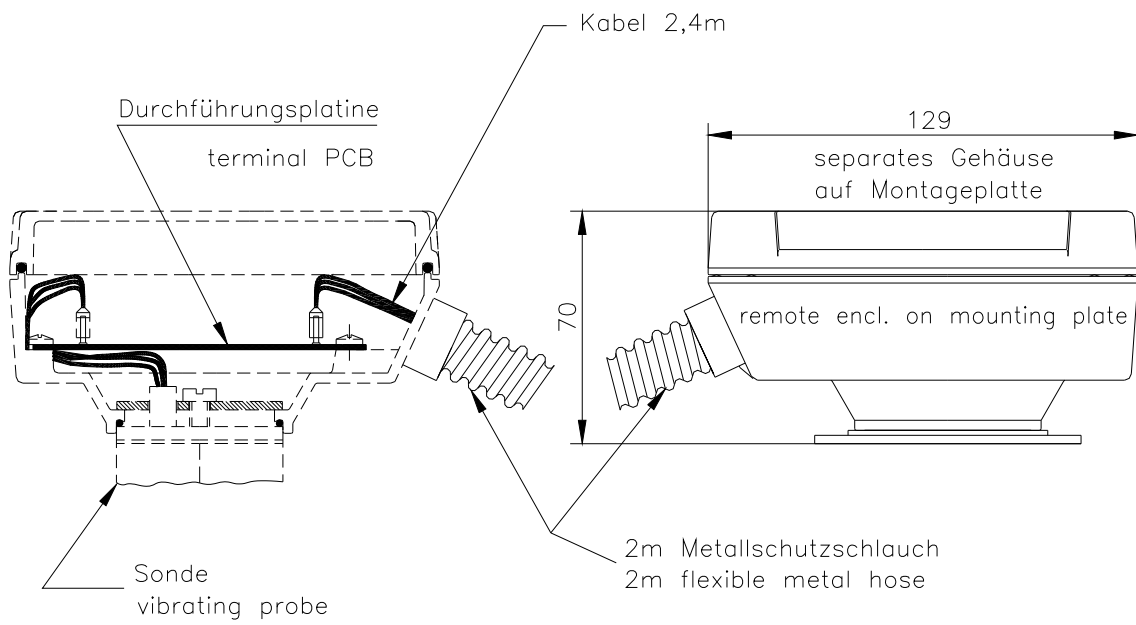
Bemassung in mm wenn nicht anders angegeben  
all dimensions are in millimeters unless otherwise stated

➤ SHT140



Bemassung in mm wenn nicht anders angegeben  
all dimensions are in millimeters unless otherwise stated

➤ remote electronics installation





➤ CV2000AE

