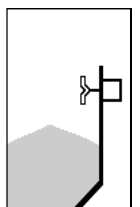
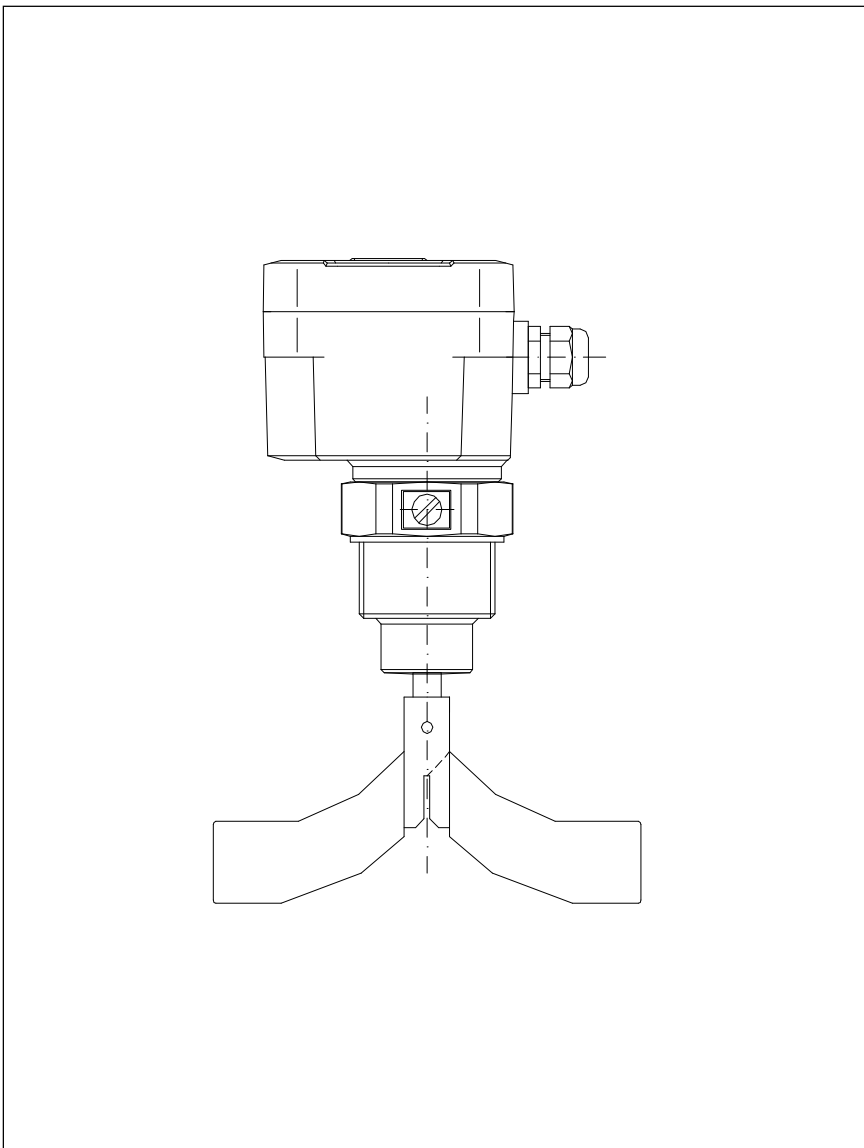


Technical informations

Rotating paddle level limit switch for bulk products

VEGAPAL RN 4001

Plastic housing, process connection and paddle



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Subject to technical change

All dimensions in mm.

All units of this information are **CE**–certificated.

Introduction

- The **VEGAPAL RN 4001** is an economical electromechanical level-limit-switch and is used for level monitoring of bulk goods. It is used wherever
 - dustlike
 - powdery
 - granulated
 - granular media are handled.

Mainly it is used in easy applications with little mechanical loads.

- Designed to the modular system, the **VEGAPAL** level limit switch is used as
 - full detector
 - demand detector
 - empty detector

at

- silos
- hoppers
- storage containers
- small containers
- bunkers
- weigher containers
- discharge pipes

- The **VEGAPAL RN 4001** level limit switch is

- compact
- robust
- no maintenance
- simple
- reliable
- insensitive to environmental influences

- Thousands of **VEGAPAL** level limit switches has stood the test in several applications like

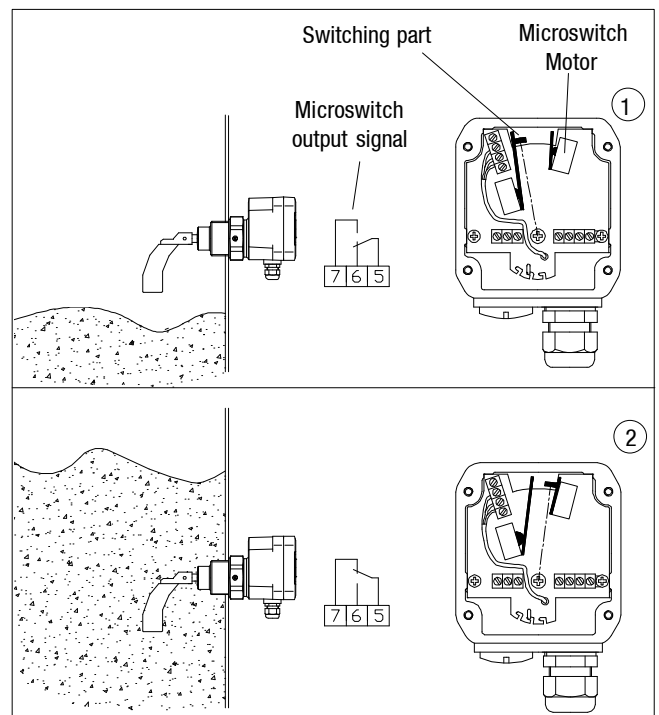
- chemical industry
- wood industry
- building materials industry
- food processing industry
- mechanical engineering
- plastics industry

Operation

A low revolution synchronized gear motor drives a rotating measuring vane, which is for example mounted at a container (picture 1).

As soon as the material level, which is to be checked, reaches the measuring vane, it is handicapped in his rotation. The motor is freely suspended within the housing. The caused reaction torque is used to operate a micro switch giving a suitable electrical signal and to stop the motor (picture 2).

When the vane becomes free again due to the drop in material level, a spring draws the motor back into his operating position, the micro switch returns to his initial position and the motor is switched on. The electrical output signal is then switched over (picture 1).



Approvals

For the **VEGAPAL RN 4001** the approvals for the hazardous locations (dust explosion) category 1/3 D (zone 20/22) according directive 94/9/EG are available.

CE EMC EN61326/A1
Gen. purpose EN61010-1

Mechanical data

Housing:	die-casted housing plastic PA6 with fiberglass; RAL 5012 blue
Enclosure:	IP 66 to EN 60529
Process connection:	1" 1/2 G
Material process connection:	plastic PA6 with fiberglass black; version approvals according to ATEX 1/3 D (zone 20/22) : aluminium
Material vane shaft:	stainless steel (14305/303) / L = 150 mm
Material measuring vane:	plastic PP, black
Tolerance length "L":	±10mm (pendulum shaft or rope extension)
Bearing:	slide bearing, high-grade
Sealing:	radial rotary shaft sealing DIN 3760
Material:	NBR (Acrylnitril-Butadien- Kautschuk)
Friction clutch:	protection of the gear against impacts of the measuring vane
Pickup delay:	approx. 1,3sec
Sensitivity:	adjustable via reset force of spring or geometry of measuring vane
Speed of measuring vane:	1 1/min

Electrical data

Mains voltage:	220..230V 50-60Hz
Installed load:	3VA (3W)
Connection terminal:	1x max. 1,5mm ²
Screwed cable gland:	1 x M20x1,5 (option 2x M20x1,5)
Signal output:	floating microswitch AC max. 250V, 2A, 500VA (cosφ = 1) DC max. 300V, 2A, 60W
Connection diagram:	inside of cover, datasheet
Protection class:	I

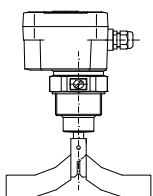
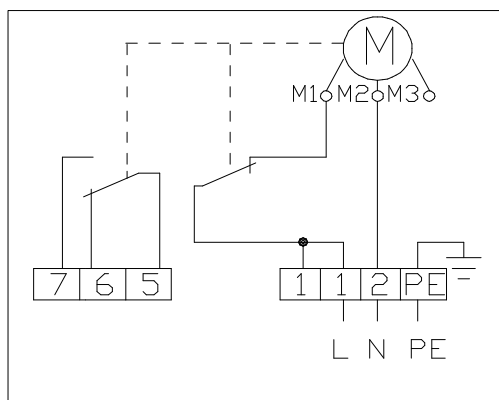
Operating conditions

Container overpressure:	-0,5bar ... +0,8bar
Powerdensity:	min. 100g/l
Feature of bulk material:	dustlike, powdery, granulated, granular
Maintenance:	not required
Temperature inside container:	-20°C upto +80°C
Ambient temperature of the housing:	-20°C upto +60°C

Max. surface temperature for use in hazardous locations (dust explosion) according to ATEX 100a: see page 7

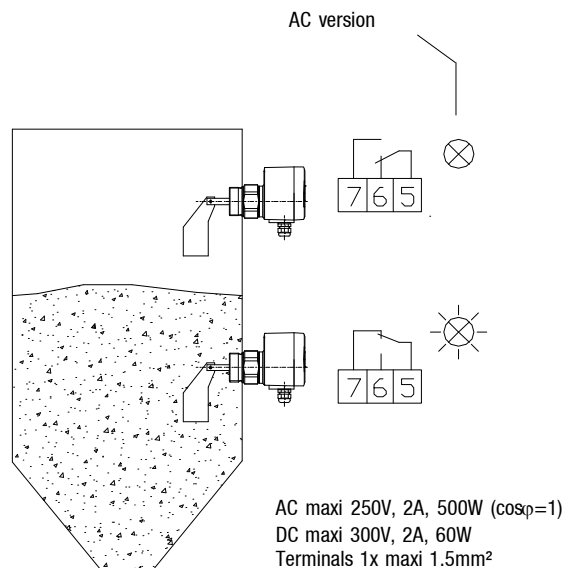
Electrical connection

AC design



external equipotential bonding terminal
For hazardous areas ATEX 1/3 D (zone 20/22): connect with equipotential bonding of the plant

Switching logic



Safety items

- Installation, maintenance and commissioning may be accomplished only by qualified technical personnel.
- For devices to use in hazardous locations (dust explosion) zone 20/22 the requirements of the EN 50281-1-2 (e. g. regarding dust deposits and temperatures) must be observed.
- Switch off the mains voltage before opening the housing. Dangerous voltage!
- Set into operation only with closed lid of the housing.
- Use a fuse for the mains voltage (max. 4A).
- A voltage disconnecting switch must be provided near the switch. A RCCB protection switch is necessary.
- Compare the mains voltage applied with the specifications given on the label before switching the device on.
- For terminal connection of the device, the local regulations or VDE 0100 (regulations of German electrotechnical engineers) must be observed.
- In the case of inexpert handling or handling malpractice, the electric safety of the device cannot be guaranteed.
- For devices to use in hazardous locations (dust explosion) zone 20/22 the respectively valid installation regulations must be observed.
- Isolating signal output – mains voltage: 3kV~
- Provide protection for relay contacts to protect the device against spikes, if inductive loads are connected.

Mounting

The unit must be mounted with the thread or the flange on the container. Mounting may be vertical, oblique or horizontal.

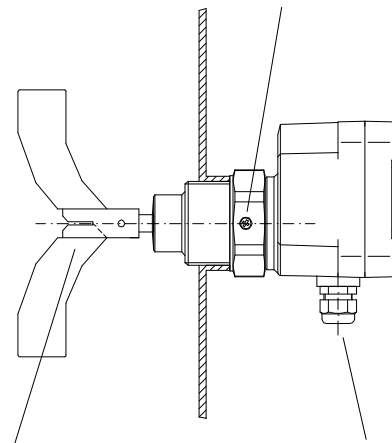
The electrical connections are made in accordance with the connection diagram. Make sure, that the cable in the screwed cable gland is seated tightly without fail. For models according to ATEX 1/3D a pull relief must be provided for the connection cables.

After mounting, turn the housing in the right direction. The screwed cable gland must show downwards (see drawing right hand). This makes sure, that the unit works fine and protects, that water enters into the housing through the screwed cable gland.

When the unit is used outside, we recommend to use the weather-protection-cover. It protects the unit against moisture, heat, cold and prevents the formation of condensation water in the interior of the housing.

Adjusting the unit on site is not required.

Fix the screw after turning the housing in the right direction



cut one side of the universal vane:
 – in case of empty or demand detector at any rate;
 – to lead the vane through the mounting hole

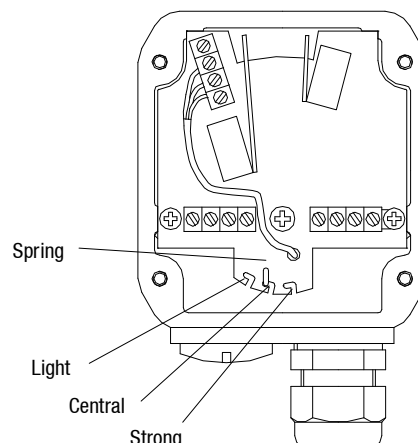
right mounting:
 screwed cable gland shows downwards

Adjustment of the spring

The spring is adjustable in 3 positions. It should be changed only if necessary.

"light": for light material;
 "central": suitable for nearly every material;
 "strong": for strong caking material;
 Factory setting is "central".

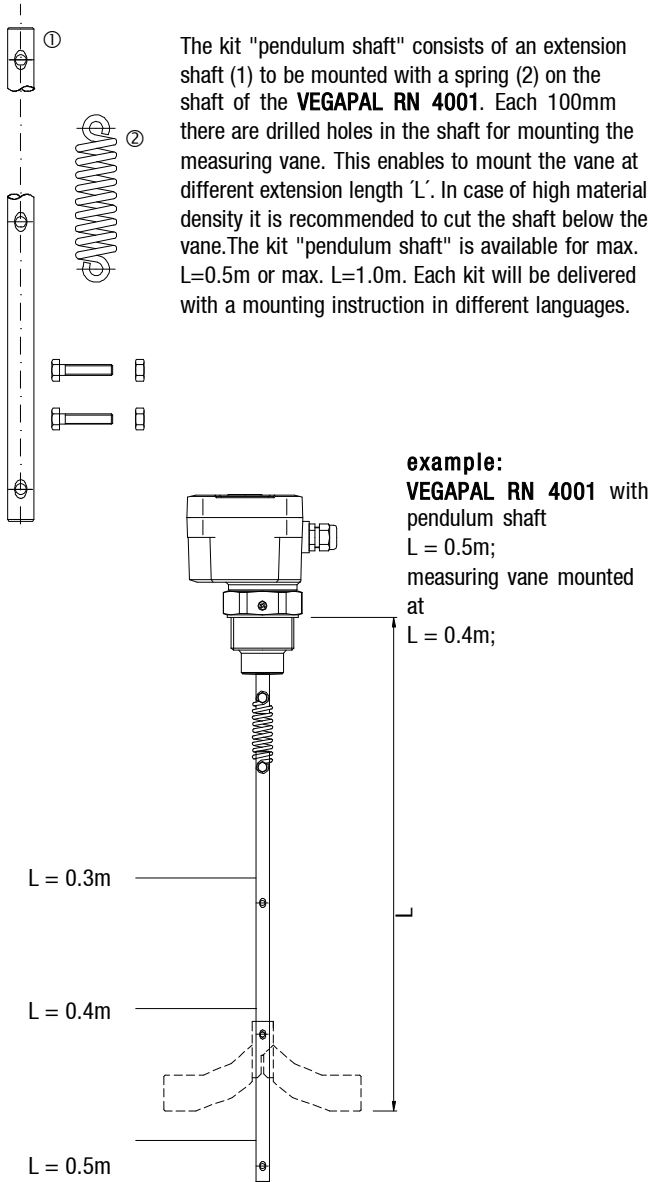
The spring can be changed via a small plier.



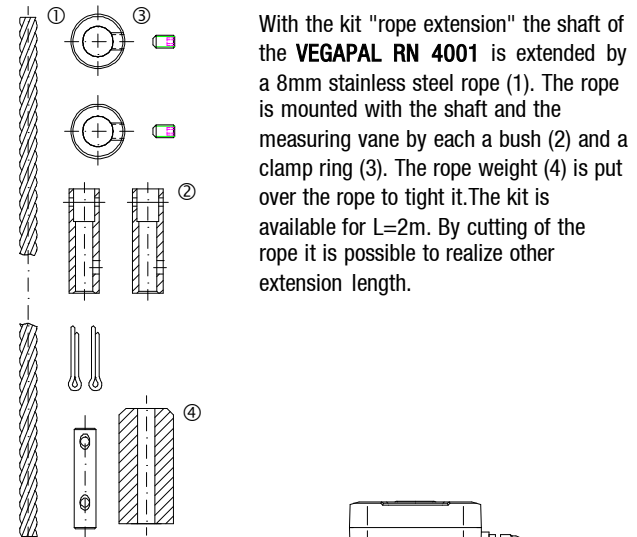
Shaft extensions (option)

There are two different shaft extensions available: Either upto 1m with the kit "pendulum shaft" or more robust upto 2m with the kit "rope extension". The rope can be cut to the desired length.

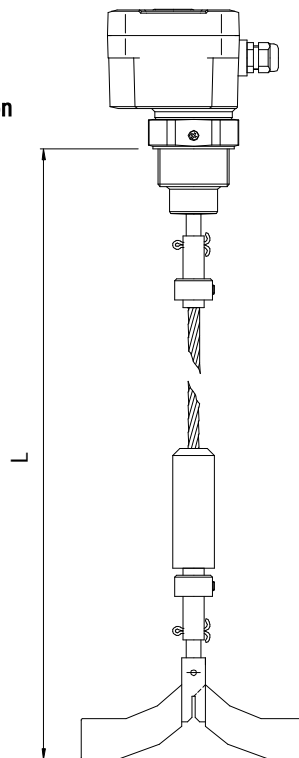
kit "pendulum shaft"



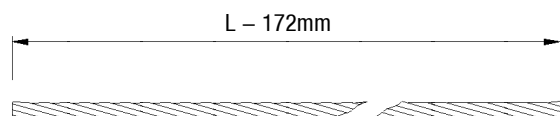
Kit "rope extension"



VEGAPAL RN 4001 with rope extension



Length of the rope:



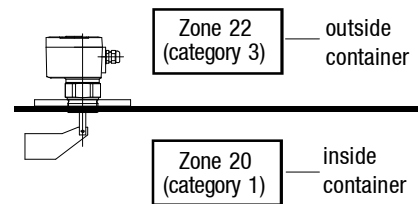
Use in hazardous locations (dust explosion) accord. to ATEX 100a

Zone classification

The approval according to ATEX 100a (directive 94/9/EC) for the hazardous areas (dust explosion) category 1/3 D (zone 20/22) determines the following classification:

device category to 94/9/EG	usable in zone
1 D	20, 21, 22
3 D*)	22

*) in case of conductive dust additional demands for the installation are possible.



Marking

Devices with ATEX approval are specially marked on the type plate

Electrical connection

- Power supply: **"Take note of the power voltage information on the type plate !"**
- Cable glands, that are not used, have to be locked with a closing element. Due to protection against explosion it is necessary to use original parts from the manufacturer.

Operating conditions

Pressure information:

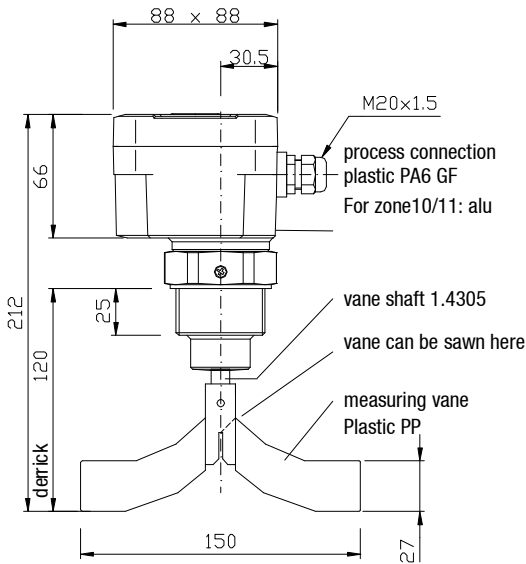
The device construction allows over-pressure upto 0.8 bar (see type plate). These pressure is allowed for test purposes. The definition of the ATEX is only valid for a container-over-pressure between $-0.2..+0.1$ bar. For higher or lower pressures the approval is not valid.

Maximum operating temperature

The following information show the maximum surface temperature at the warmest part of the unit which can happen in failure case (according to ATEX definition).

maximum surface temperature in °C	ambient temperature in zone 22 in °C	medium temperature in zone 20 in °C
95	60	80
85	50	70
75	40	60

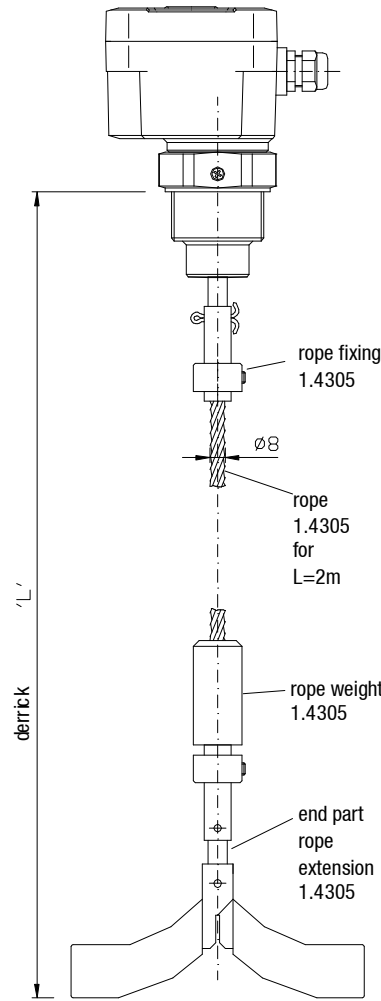
Type standard



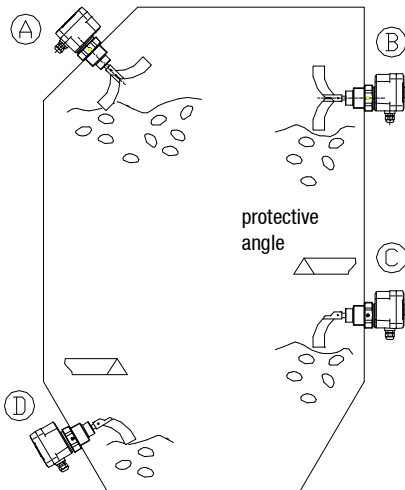
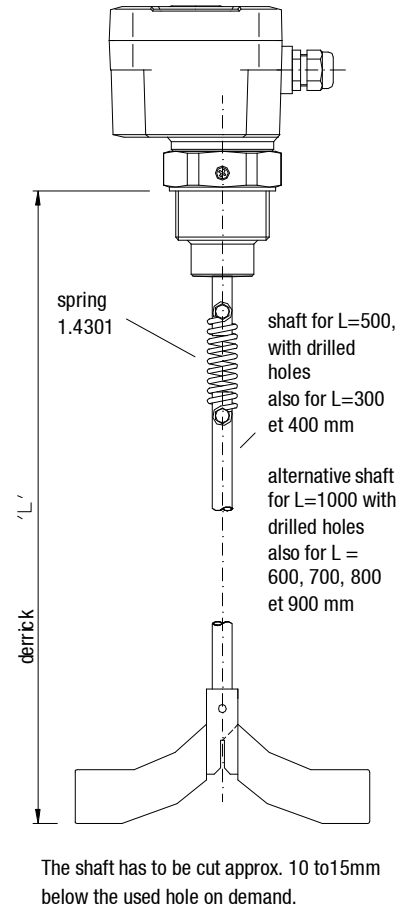
Application:

- A full detector vertical and oblique from the top
- B full detector horizontal
- C empty or demand-detector horizontal, protective angle, vane one side
- D empty detector oblique from the bottom protective angle, vane one side rope
- E full detector with pendulum shaft
- F full detector with rope extension

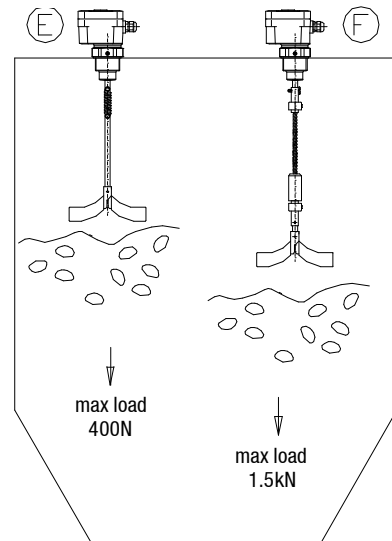
With option „rope extension“
(for mounting on site)



With option „pendulum shaft“
(for mounting on site)



In case empty detection, it is recommended to saw one side of the measuring vane. This prevents an excessive load due to the material.



Level measurement
Switching - Pressure

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