Rotating Vane
Level Monitor

KOBOLD

- Easy to install
- Suited for universal use
- Up to density 2.5 kg/dm^3
- Self-cleaning
- Versatile service

Model:
ND-

Areas of Application

KOBOLD rotating vane level monitors serve as limit switches for dusty, powdery, granulated and grainy bulk materials.
They are suitable for use with bulk material weights from 0.3 to 2.5 t/m^3 and particle sizes up to 50 mm.
Different installation positions (horizontal, vertical, inclined) as well as a broad range of models allow the use of KOBOLD rotating vane level monitors for almost all applications.

Method of Operation

A synchronous motor which pivots around a certain angle in a shaft extension is held to an end stop by a spring.
The motor drives a rotating vane protruding into a vessel by means of a shaft. As soon as the fill reaches the blade, its rotation is hindered and arrested.
The reaction torque twists the motor and operates a micro-switch (N/O contact).
The motor is switched off with a second switch. If the level sinks, the rotating vane is released and the motor is drawn back to its original position by the spring.
This switches the motor on once again and the contact is switched back.

- Reliable with two switches
- Floating contact
- Internally flush mounted
- Various methods of fixing
- Small insertion hole
- Delivery with seal
- Maintenance-free

Design

The basic unit comprises the control heads ND-R and ND-D where all functional items are mounted.

Model NDR: Reasonably-priced plastic housing, protection 54

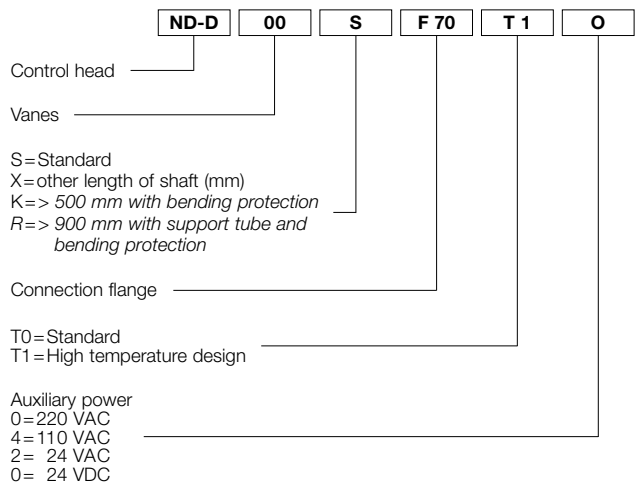**Model ND-D:** Robust cast aluminium housing, protection IP 65
Z10 bus no.: StEx 5/87

Various mounting flanges can be bolted onto the R 1/4" thread situated on the control head. A variety of blades and extensions can be attached to the shaft end.

Electrical details

Connection voltage:	220/110 VAC/24 VAC/24 VDC
Connected load:	3.8 W
Switch-in delay:	2 s
Contact:	floating changeover contact
	15 A at 250 VAC (model ND-D)
	6 A at 150 VAC (model ND-R)

Type codes

	ND-D	00	S	F 70	T 1	O

Control head ⎯

Vanes ⎯

S = Standard
X = other length of shaft (mm)
K = > 500 mm with bending protection
R = > 900 mm with support tube and bending protection

Connection flange ⎯

T0 = Standard
T1 = High temperature design

Auxiliary power
0 = 220 VAC
4 = 110 VAC
2 = 24 VAC
0 = 24 VDC

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Model ND-R: reasonably-priced
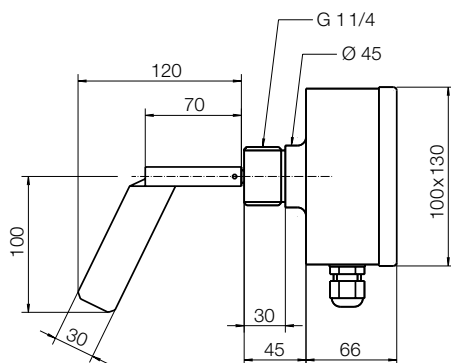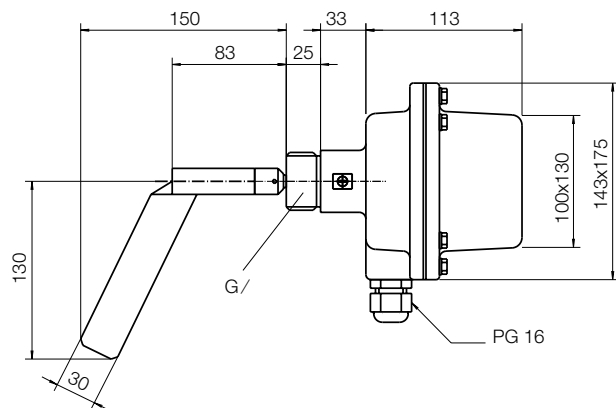
Application

Bulk materials max. grain size:	50 mm
Filling level above vanes:	5 m (for bulk density to 0.6 t/m³)
Bulk material weights:	0.2 to 2.5 t/m³
Shaft extended to:	500 mm

Technical Details

Materials:	housing of strengthened plastic vane and shaft in st. steel (1.4301) connection screwing in plastic
Connection:	R 1 1/4" external thread
Installation position:	any
Cable entry fitting:	conduit thread 11 screw gland
Weight:	0.77 kg
Protection:	IP 54
Temperature range:	-20°C to +80°C
Pressure range:	-0.5 to 1 bar
Contact:	floating changeover contact 250 VAC/6 A
Operate delay:	approximately 1–2 s
Auxiliary power:	230 VAC/110 VAC/24 VAC/24 VDC

Dimensions

Model ND-D: robust

Application

Bulk materials max. grain size:	50 mm
Filling level above vanes:	5 m (for bulk density to 0.6 t/m³)
Bulk material weights:	0.2 to 2.5 t/m³
Shaft extended to:	500 mm (special version to 6000 m)

Technical Details

Materials:	housing of cast aluminium, hammer finish vane and shaft in st. steel (1.4301) connection screwing in cast aluminium
Connection:	R 1 1/4" external thread
Installation position:	any
Cable entry fitting:	conduit thread 16 screw gland
Weight:	2.3 kg
Protection:	standard IP 65 Z 10 BUS no. StEx 5/87
Temperature range:	-20°C to +80°C
Pressure range:	-0.5 to 6 bar
Contact:	floating changeover contact 250 VAC/15 A
Operate delay:	approximately 1–2 s
Auxiliary power:	230 VAC/110 VAC/24 VAC/24 VDC

Dimensions

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Flange connection
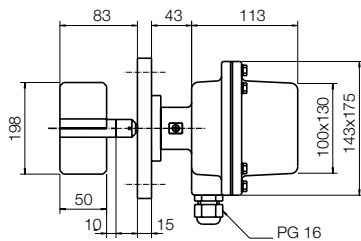
We recommend a flange connection in the following cases:

● When the shaft is extended to securely fix the instrument.

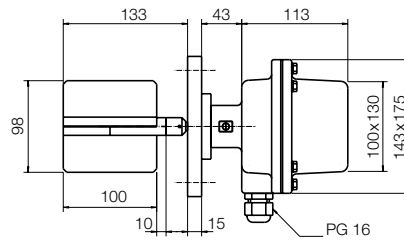● When using a cruciform vane for installation and removal without dismantling the vane.

F70: Alu
(Code: F70)

F100: Alu
(Code: F14)

F200: Enamelled steel
(Code: F24)
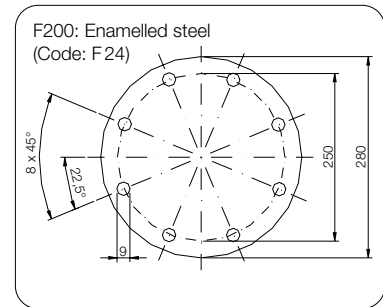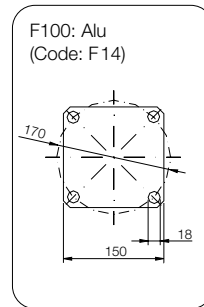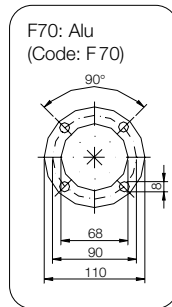
Rotating vane

The standard rotating vane can be replaced with a cruciform vane so as to detect the dumping height for low weights.

Type X-50 (Code: 50)
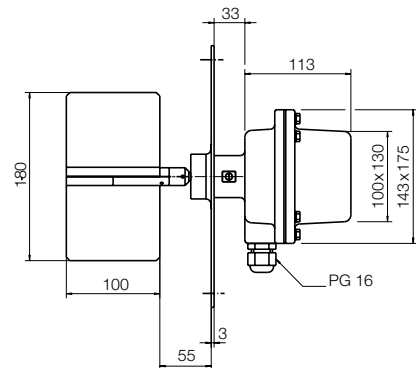
Bulk density:	0.2 - 1.5 t/m³
Fill height horizontal installation	1.5 m
Fill height vertical installation:	6 m

Type X 100 (Code: 14)

Bulk density:	0.1 - 1.5 t/m³
Fill height horizontal installation:	1.5 m
Fill height vertical installation:	6 m

**Type X 200 (Code: 24)**

Bulk density:	> 0.1 t/m³
Fill height horizontal installation:	1.5 m
Fill height vertical installation:	6 m

Shaft extension

The shaft should normally only be extended beyond 500 mm with vertical instrument installation.
The shaft should always be secured mechanically with a bending protection device.

A flange with support tube should be used in addition to the bending protection device for lengths greater than 900 mm.
A support tube is also recommended for heavy or coarsely-grained bulk materials.
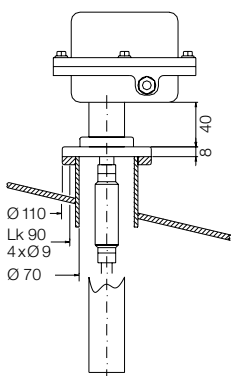
Strengthened bearing arrangement

A strengthened bearing assembly is required for the drive shaft for fill heights over the vanes from 5 m to max. 10 m (piled density max. 2.5 t/m³).
The strengthened bearing can only be used with flange FL 70 or FL 100.
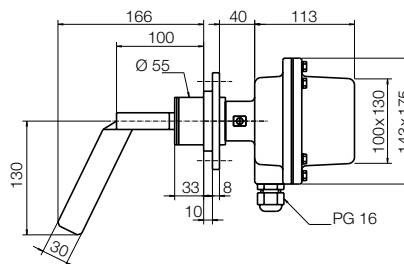
High temperatures (T1)

(For model ND-DS only)

The instruments can also be used at high temperatures by installing a spacer (T1) between motor and process connection. Side installation is possible up to 150°C. Bearing ring and sealing washer may come into contact with the fill. Installation can only be carried out from the top for bulk material temperatures in the 150–350°C range (type T3). The fill should not come into contact with the bearing (that is, do not fill the bulk material up to the top of the vessel). If this cannot be avoided, the flanged socket should be increased in length by approximately 250 mm.

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