

Technical Information

Soliswitch FTE30

Level limit switch Economical paddle limit switch



Application

The universal paddle level limit switch FTE 30 is used as a full, empty and demand alarm on silos containing solids. Its construction and materials make the unit suitable for use in the food industry.

Your benefits

- Simple operation
- Proven principle
- Slip clutch
- Ingress protection to IP 65

Function and system design

Measuring principle

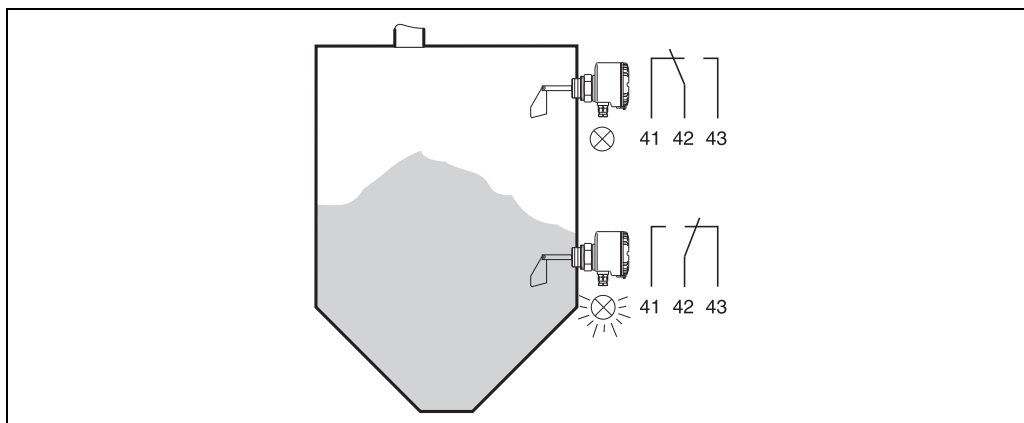


Fig. 1: Level measurement changeover contact

The shaft and paddle are driven via a reduction gear by a synchronous motor. If the paddle is stopped by material covering it, the hinged motor in the housing moves from the rest to the switched position. This movement operates two switch contacts. The first is for external level indication and the second switches power off the motor.

The paddle starts to rotate once the level falls below the paddle level. The hinged motor returns to its rest position and the two contacts switch to the normal operation condition. Intermittent loads that operate against or even in the direction of rotation are evened out by using a slip clutch.

Measuring system

Complete level limit switch consisting of a shaft with synchronous motor and slip clutch, single pole changeover contact. Typical application areas for level detection are:
Cereals, Sugar, Cacao, Animal feeds, Washing powders, Chalk, Dry plaster, Cement, Granulates, Wood chips

Input

Measured variable

Filling height of solids

Measuring range

Variable dependent on the model used by:

- Installation position
- Length of the rotating shaft/rope

Output

Output signal

A contact changes once the solids reach the level limit.

Switching output

Potential free change over contact.

Connectable Load

- Relay: ≤ 250 VAC, nominal current 100 mA...10 A, on motor load ≤ 3 A
- PLC-relay: ≤ 48 VDC, nominal current 10 mA...100 mA

Switch time delay

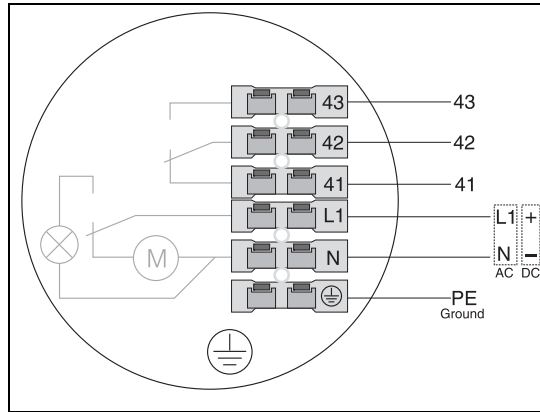
approx. 2 seconds

Mechanical life time

min. 500 000 switch cycles

Power supply

Electrical connection



Terminal layout

PE: Earth (Ground) connection
 N (AC), - (DC): Power connection
 L (AC), + (DC): Power connection
 41: Normally closed contact
 42: Common
 43: Normally open contact

Supply voltage

- 230 VAC 50/60 Hz, ± 10% max. 4.5 VA
- 115 VAC 50/60 Hz, ± 10% max. 4.5 VA
- 48 VAC 50/60 Hz, ± 10% max. 4.5 VA
- 24 VAC 50/60 Hz, ± 10% max. 4.5 VA
- 20 to 28 VDC, $I_{max} = 66 \text{ mA}$

Cable entry

Cable entries PG 13.5

Installation condition

Installation instructions

Orientation

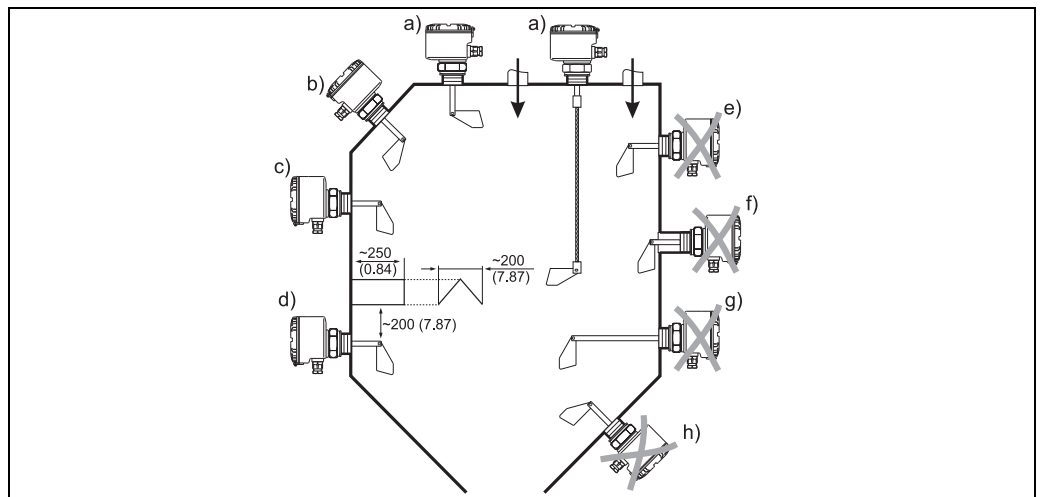


Fig. 2: Installation orientations of the device, dimensions in mm (inch)

Correct installation:	Incorrect installation:
Vertically from top of silo (Pos. a)	In direction of solids flow (Pos. e)
Angled from the top (Pos. b)	Installation coupling too long (Pos. f)
From the side (Pos. c)	Horizontally with shaft length > 300 mm (11.81"); not valid for version with strengthened shaft (Pos. g)

Correct installation:	Incorrect installation:
With protective cover against falling solids (Pos. d)	Angled from below (Pos. h)

Mechanical load on the shaft

- max. 60 N
- max. 1500 N on strengthened shaft

Load on the rope max. 1500 N

Operating pressure (abs.) 0.5 to 1.8 bar (7.25 to 26.1 PSI)

Environmental conditions

Ambient temperature range - 20 °C to + 60 °C (-4 to 140 °F)

Storage temperature - 20 °C to + 60 °C (-4 to 140 °F)

Degree of protection

- IP 65 with closed lid
- IP 20 with open lid

Vibration resistance IEC 654-3, dimension V.S.1 ($v < 3$ mm/s, $1 < f < 150$ Hz)

Protection class I

Measurement category II

Pollution degree 2

Altitude Up to 2000 m (6560 ft) above sea level.

Process conditions

Medium temperature range -20 °C to +80 °C (-4 to 176 °F)

Solids weight 100 g/l

Material grain size Up to 50 mm (1.97")

Mechanical construction

Design, dimensions

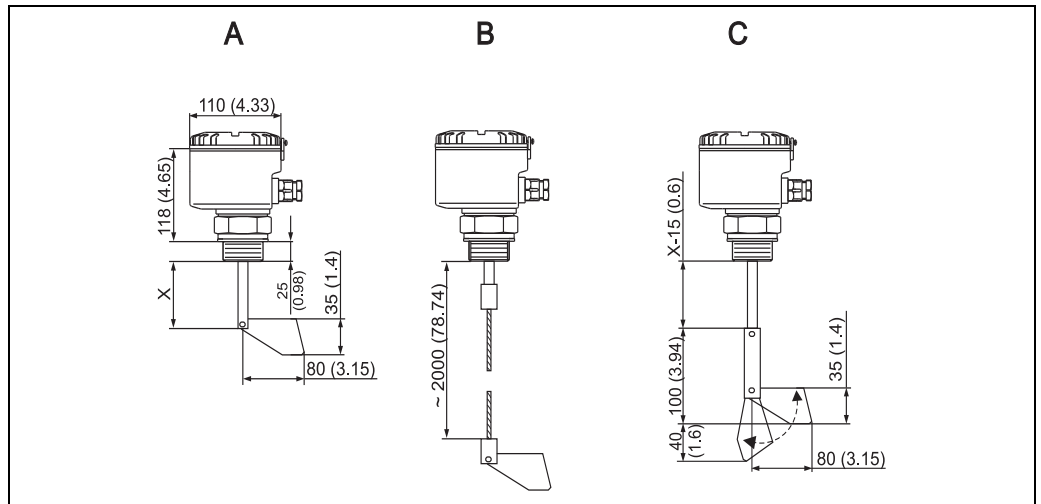


Fig. 3: Dimensions FTE30 in mm (inch)

Pos. A: Solid shaft

Pos. B: Rope extension

Pos. C: FTE30 with hinged paddle as additional equipment or as retrofit kit

Compact version	Extended version	Strengthened version	Rope extension
Shaft length X	Shaft length X	Shaft length X	Rope length of approx. 2000 mm (78.74"), can be shortened
75 mm (2.95")	100 mm (3.94")	300 mm (11.81")	
	200 mm (7.87")	500 mm (19.7")	
	300 mm (11.81")	800 mm (23.6")	
	400 mm (15.75")		
	500 mm (19.7")		
	600 mm (23.6")		

Hinged paddle (optional)

The paddle is hinged so that it can be easily mounted through a threaded mounting coupling. The paddle returns to its normal operating position by means of a built-in spring. Removal of the unit is always possible. The hinged paddle can be mounted to both the solid shaft as well as the rope extended versions.

Protective cover (optional)

When installing the device, the protective cover can simply be mounted at the same time. It protects the device in outdoor use against extreme climatic conditions, e.g. hailstorm when used on the roof of a silo.

Weight

Compact version approx. 1 kg (2.2 lb)

Material

- Housing, lid and process connection: plastic with 30% fibre glass.
- Shaft: Stainless steel 1.4305
- Paddle: Stainless steel 1.4301
- O-ring seal: NBR
- Shaft seal: NBR Perbunan
- Cable entries PG 13.5: for cable diameter 7.0 to 11 mm (0.28 to 0.43") poliamid with neoprene-CR seal
- As option:
 - Process connection: Stainless steel 1.4305

- Rope extension: Stainless steel 1.4401 with stainless steel 1.4305 weight
- Hinged paddle: Stainless steel 1.4435
- Protection tube: Stainless steel 1.4301
- Protective cover: Stainless steel 1.4301

Shaft bearing	High power friction bearing - maintenance free
Shaft rotation	approx. 1 rotation per minute
Process connection	Threaded boss - thread G1½"
Terminals	Plug in screw terminals 2.5 mm ² (14 AWG) solid core, 1.5 mm ² (16 AWG) core with ferrule

Human interface

Display elements	<p>signal lamp (optional) Yellow signal lamp illuminates in alarm condition (shaft stopped). The signal lamp is fitted in the PG cable gland. It indicates the switch condition of the unit:</p> <ul style="list-style-type: none"> ▪ Signal lamp on: Contact 42-43 closed ▪ Signal lamp off: Contact 41-42 closed
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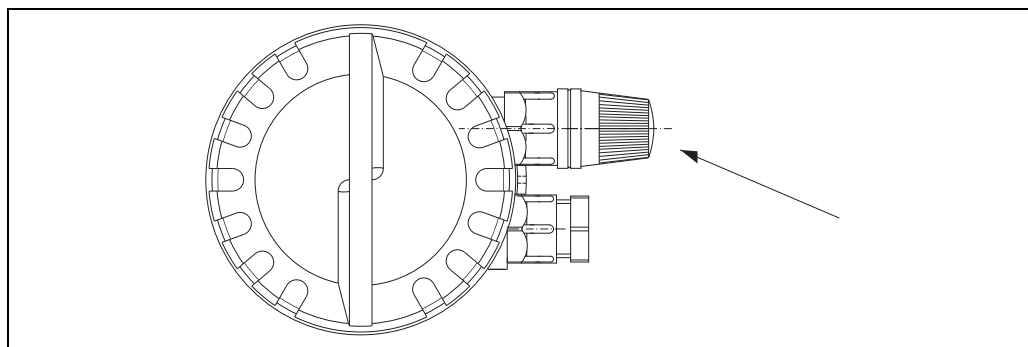


Fig. 4: Signal lamp as option

Certificates and approvals

CE approval	The measurement system fulfils the requirements demanded by the EU regulations. Endress+Hauser acknowledges successful unit testing by adding the CE mark.
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Ordering information

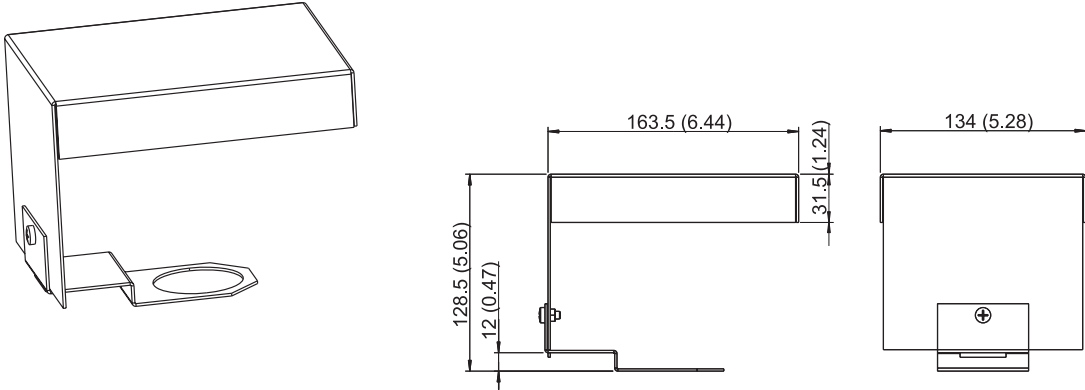
Ordering information	<p>Detailed ordering information is available from the following sources:</p> <ul style="list-style-type: none"> ▪ In the Product Configurator on the Endress+Hauser website: www.endress.com -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator. ▪ From your Endress+Hauser Sales Center: www.addresses.endress.com
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Accessories

Various accessories, which can be ordered with the device or subsequently from Endress+Hauser, are available for the device. Detailed information on the order code in question is available from your local Endress+Hauser sales center or on the product page of the Endress+Hauser website:

www.endress.com

Always quote the serial number of the device when ordering accessories!

Accessory	Order No.
Hinged paddle retro-fit kit	50089768
Protective cover, dimensions in mm (inch) 	51005551
Rope extension 2 m (78.74")	50080209

Documentation

Short operating instructions Level Limit Switch FTE30 (KA00059R09)

www.addresses.endress.com
