

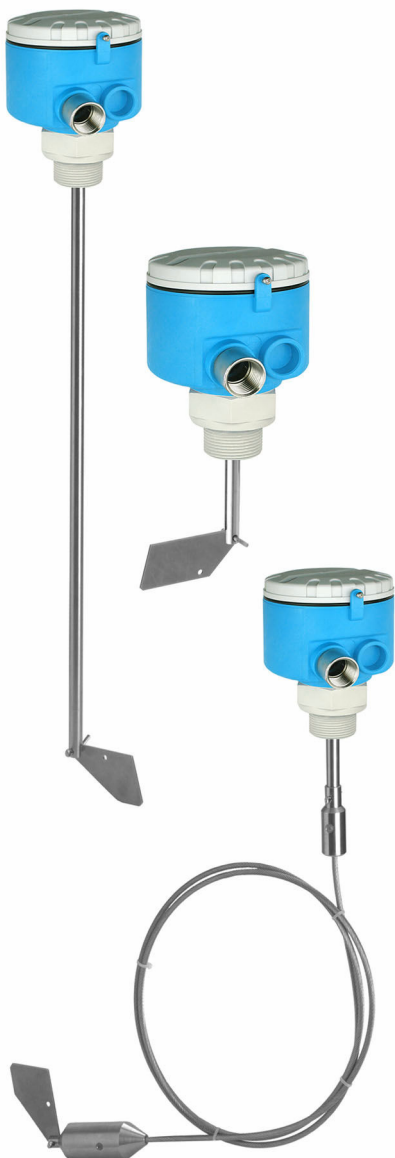
Technical Information

Soliswitch FTE31

Point level switch

Economical rotary paddle point level switch

For use in dust explosive areas



Applications

The universal rotary paddle point level switch is used as a full, empty and demand alarm in bulk solids silos. Its design and materials make the unit suitable for use in the food industry. The device is suitable as a point level switch in potentially explosive dust areas.

Typical applications are level detection in:

- Cereals
- Sugar
- Cocoa
- Animal feeds/Washing detergents
- Chalk
- Dry plaster/cement
- Granulate
- Wood chips/pellets

Your benefits

- Simple operation
- Proven principle
- Slip clutch
- Degree of protection IP 65, NEMA 4x, type 4x

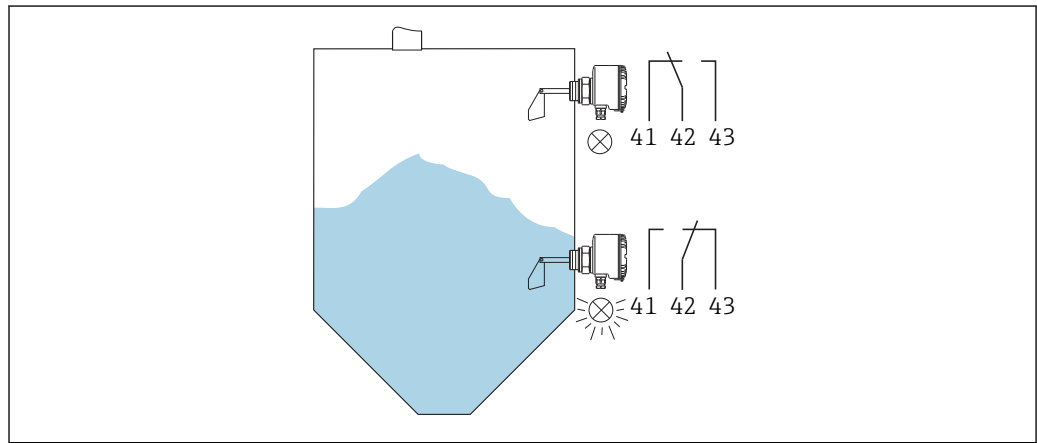
Function and system design

Measuring principle

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

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

Measuring system



1 Level indication

Complete point level switch consisting of a shaft with synchronous motor and slip clutch, and single pole changeover contact. Typical application areas are level detection in cereals, sugar, cacao, animal feeds, washing powders, chalk, dry plaster, cement, granulate and wood chips for example

Input

Measured variable

Level of bulk solids (in line with the orientation and length)

Measuring range

The measuring range depends on the mounting location of the device and the length of the rotating shaft selected.

Output

Output signal

Binary, the contact changes when the solids reach the set level.

Switch output

Potential-free changeover contact

Connectable load

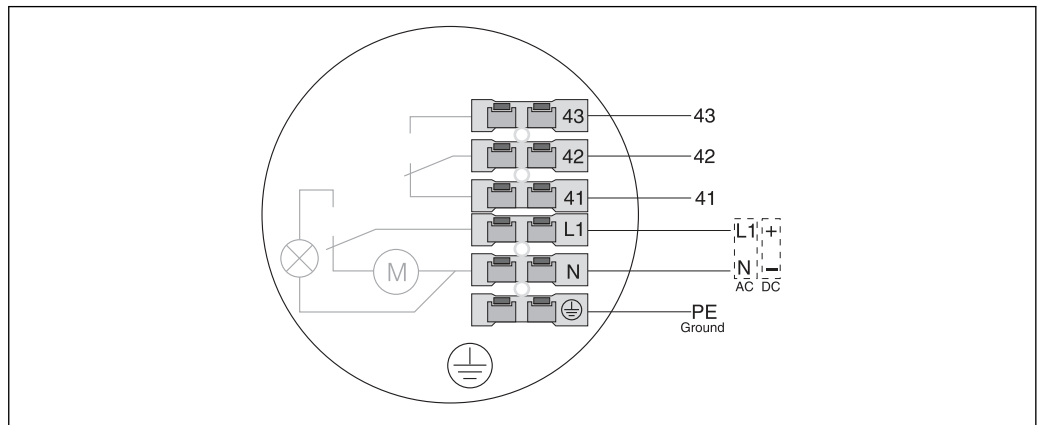
Option: relay 250 V_{AC}	250 V _{AC} , nominal current 10 A, on motor load ≤ 3 A
Option: relay PLC 48 V_{DC}	48 V _{DC} , nominal current 10 to 100 mA
Switching time	2 s

Mechanical operating life

Min. 500,000 switching cycles

Energy supply

Terminal assignment



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2 Terminal assignment of the point level switch

Symbol	Description
⊕	Protective ground
N	Power connection: N (AC), - (DC)
L1	Power connection: L1 (AC), + (DC)
41	Normally closed contact
42	Changeover contact
43	Normally open contact

Supply voltage

- 20 to 28 V_{DC}, I_{max} = 66 mA
- 24 V_{AC} ± 10 %, 50/60 Hz, max. 4.5 VA
- 48 V_{AC} ± 10 %, 50/60 Hz, max. 4.5 VA
- 115 V_{AC} ± 10 %, 50/60 Hz, max. 4.5 VA
- 230 V_{AC} ± 10 %, 50/60 Hz, max. 4.5 VA

Power consumption

AC	P < 4.5 VA
DC	P < 3.5 W

Current consumption

DC	I _{max} ≤ 66 mA
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Cable entries

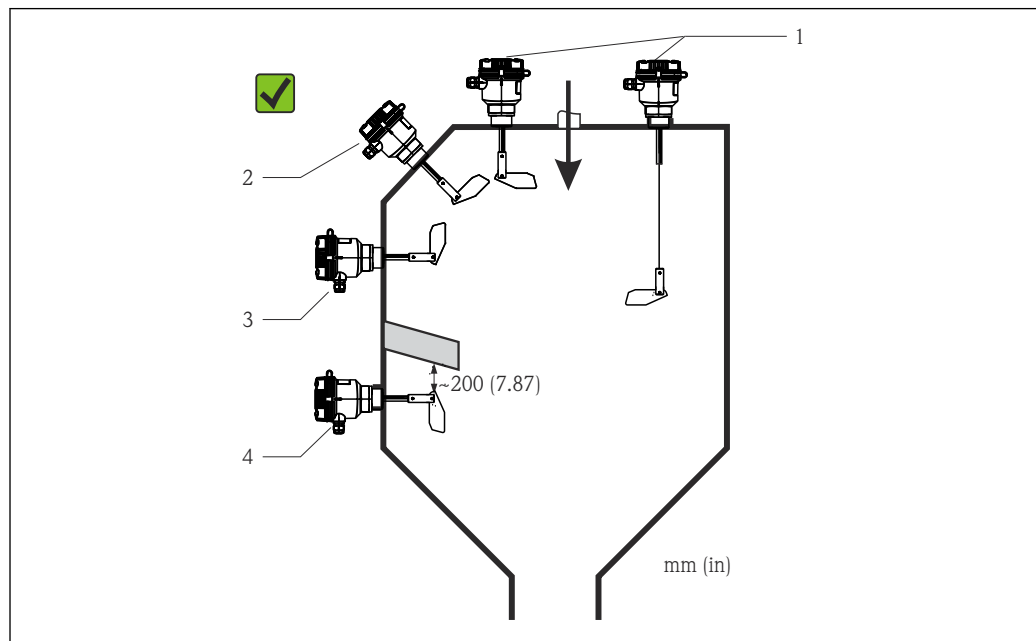
Mounted transition piece from a PG 13.5 threaded hole to a NPT ½" threaded hole

Terminals

- Plug-in terminal 2.5 mm² (14 AWG), solid
- 1.5 mm² (16 AWG) strand with end ferrule

Mounting

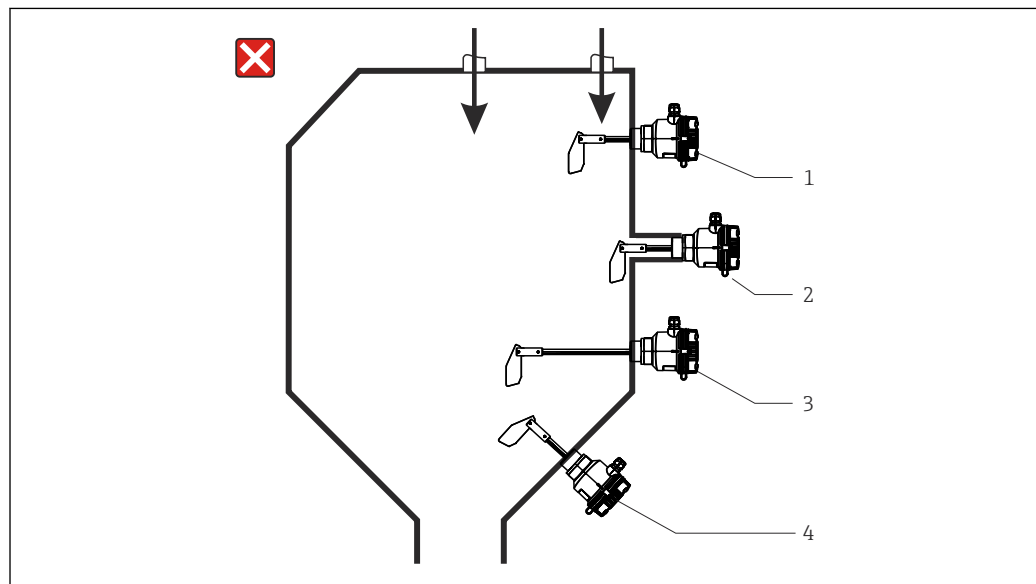
Mounting location



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3 Correct installation positions of the device

- 1 Vertical from the top
- 2 Angled from the top
- 3 From the side
- 4 From the side with protective cover against falling solids



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4 Incorrect installation positions of the device

- 1 In direction of solids flow
- 2 Installation coupling too long
- 3 Horizontal with shaft length > 300 mm (11.8 in)
- 4 Angled from the bottom

Special mounting instructions

Side load on the shaft

- Max. 60 N
- Max. 1 500 N for version with reinforced shaft

Load on the rope

Max. 1 500 N

Environment

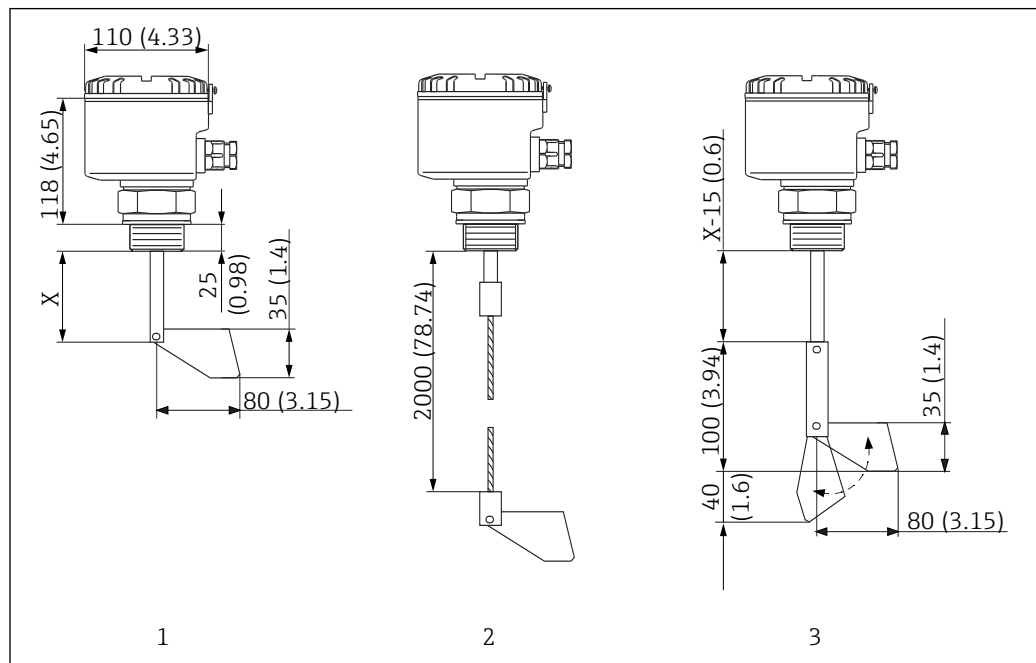
Ambient temperature range	-20 to +60 °C (-4 to +140 °F)
Storage temperature	-20 to +60 °C (-4 to +140 °F)
Altitude	Up to 2 000 m (6 560 ft) above sea level.
Degree of protection	<ul style="list-style-type: none">■ IP 65, NEMA 4x, type 4x with closed cover■ IP 20, NEMA with cover open
Vibration resistance	IEC 654-3, dimension V.S.1 ($v < 3$ mm/s, $1 < f < 150$ Hz)
Electromagnetic compatibility	To EN 61326, Class B
Protection class	I
Measuring category	II
Pollution degree	Pollution degree 2

Process

Medium temperature range	-20 to +80 °C (-4 to +176 °F)
Process pressure range	0.5 to 1.8 bar (7.25 to 26.1 psi) (absolute)
Bulk density	100 g/l
State of aggregation	Solids particle size ≤ 50 mm (1.97 in)

Mechanical construction

Design, dimensions



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- 1 Shaft version
 2 Rope version
 3 Version with hinged rotary paddle

Compact version	Extended version	Reinforced version	Rope version
Shaft length X	Shaft length X	Shaft length X	Rope length approx. 2 000 mm (78.74 in) 2 m (78.74 in), can be shortened
75 mm (2.95 in)	100 mm (3.94 in)	300 mm (11.81 in)	
	200 mm (7.87 in)	500 mm (19.7 in)	
	300 mm (11.81 in)	800 mm (23.6 in)	
	400 mm (15.75 in)		
	500 mm (19.7 in)		
	600 mm (23.6 in)		

Additional equipment

Hinged rotary paddle (optional or can be ordered as an accessory)

The paddle is hinged for easier installation of the device using an installation coupling. Because it is spring loaded, the paddle opens again automatically inside the silo. Removal of the device is always possible. The hinged paddle can be mounted in both the solid shaft and rope extended versions.



The FTE31 can only be installed vertically for a shaft length < 300 mm (11.8 in).

Weight

Compact version approx. 1 kg (2.2 lb)

Materials

Designation	Material
Housing, sealing cover	VALOX 553 polycarbonate with 30% fiberglass
Shaft	1.4435 / 316L
Rope extension	1.4571 / 316Ti
Rope weight	1.4305 / 303
Rotary paddle (standard/hinged)	1.4435 / 316L

Designation	Material
O-ring seal	NBR
Shaft sealing ring	Perbunan NBR
NPT ½" cable gland	Nickel-plated brass
Process connection	1.4435 / 316L

Shaft bearing High performance friction bearing - maintenance free

Shaft speed Approx. 1 revolution per minute

Process connection NPT 1¼" or NPT 1½" thread

Certificates and approvals

Current certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Downloads**.

Ordering information

Detailed ordering information is available from your nearest sales organization www.addresses.endress.com or in the Product Configurator at www.endress.com:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Configuration**.



Product Configurator - the tool for individual product configuration

- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

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.

Device-specific accessories

Accessories	Order number
Hinged rotary paddle as alteration kit	50089768

Supplementary documentation

The following types of documentation are available on the product pages and in the Download Area of the Endress+Hauser website (www.endress.com/downloads) (depending on the selected device version):

Document	Purpose and content of the document
Technical Information (TI)	Planning aid for your device The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.
Brief Operating Instructions (KA)	Guide that takes you quickly to the 1st measured value The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.
Operating Instructions (BA)	Your reference document The Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.
Description of Device Parameters (GP)	Reference for your parameters The document provides a detailed explanation of each individual parameter. The description is aimed at those who work with the device over the entire life cycle and perform specific configurations.
Safety Instructions (XA)	Depending on the approval, Safety Instructions (XA) are supplied with the device. The Safety Instructions are an integral part of the Operating Instructions.  Information on the Safety Instructions (XA) that are relevant for the device is provided on the nameplate.
Supplementary device-dependent documentation (SD/FY)	Always comply strictly with the instructions in the relevant supplementary documentation. The supplementary documentation is an integral part of the device documentation.



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