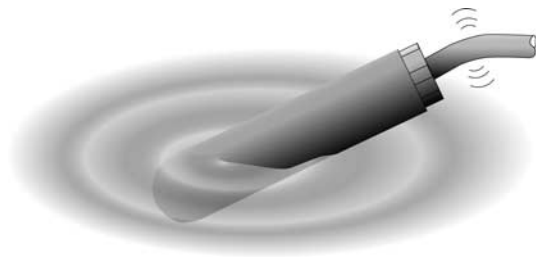


Floating Switch FTS 20



Füllstandgrenzschalter
Level Limit Switch
Détecteur de niveau

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Endress + Hauser

The Power of Know How



Safety instructions

The FTS 20 floating switch may only be used as a level limit switch in suitable liquids. Improper use may cause dangerous situations.

The instrument may only be installed, connected and commissioned by qualified and authorised personnel, paying particular attention to:

- this compact manual
- the appropriate standards
- the statutory regulations and
- certificates (depending on version and application)

Safety symbols

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Warning!

"Warning" indicates an action or procedure which, if not performed correctly, can result in injury or a safety hazard. Read the instructions thoroughly and proceed carefully.



Note!

"Note" indicates processes which – if improperly executed – could affect operation or trigger unexpected instrument actions.

Instrument variants

Order Code	Type of switch
52010119	Initiator with switching ball for use in explosion-hazardous areas 2-wire to EN 60947-5-6 (NAMUR) Use with isolating amplifier; hazardous explosion areas to Zone 1 Cable length 5 m With PVC cable material (for water, wastewater)
52010120	With PUR cable material (for fuels and oils)
52010121	With CSM cable material (for acids and alkalis)
52010122	Microswitch with switching ball for standard application, 3-wire, change-over contact for max. 250 V AC / 150 V DC Cable length 5 m With PVC cable material (for water, wastewater)
52010123	With PUR cable material (for fuels and oils)
52010124	With CSM cable material (for acids and alkalis)

Accessories	
Nivotester FTL 325N	Isolating amplifier
52010125	Compression gland G1A, PVC
52010126	Counter nut G1A, PVC
52010127	Weight (coated with polyamide)

Function

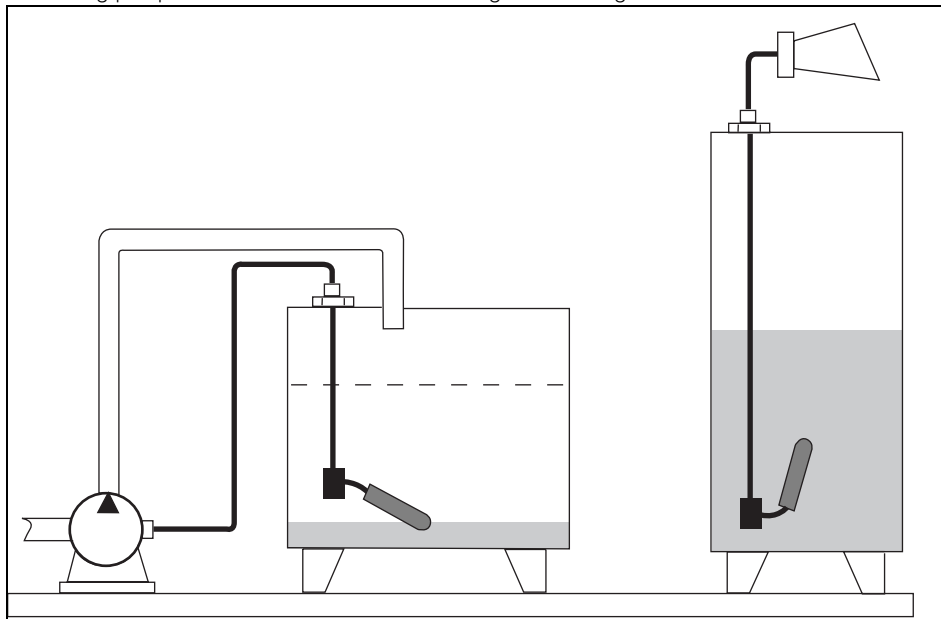
An element built into the floating switch switches when a deviation in the horizontal is detected. The switching process is triggered by the movement of a steel ball and, depending on the version, is carried out by an inductive initiator or a microswitch. The inductive initiator acts as a switching output and provides a switching signal to EN 60947-5-6 (NAMUR). The microswitch version is a two-way switch.

Features

- Reliable level limit detection in liquids
- Electrical connections to NAMUR for hazardous areas (to Zone 1) or change-over contact (AC/DC) for universal standard application
- Different cable materials for different media
- Small diameter for simple installation using tapped hole G1A

Applications

Controlling pumps and valves with one switch or signal level height or limit



Installation

The floating switch can be installed as follows:

- The floating switch can be inserted into the tank – through a tapped hole G1A – and screwed to the compression gland (G1A).
- If it is installed from above, use the weight.



Note!

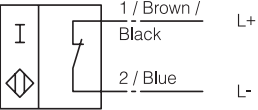
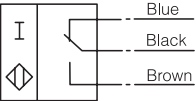
- The fulcrum of the cable should always be horizontal.
- The cable length between the fixture and the floating body is dependent on the cable type (see "Technical data").
- When using the weight, place an extra strain relief (e.g. a knot in the cable) behind the compression gland – on the outside of the tank.

Electrical connection



Warning!

Note the switch type.

Inductive proximity switch with switching ball (NAMUR) Order codes: 52010119 52010120 52010121		Connection indication L+ = black or brown L- = blue (closing when floating)
Change-over contact (AC/DC) Order codes: 52010122 52010123 52010124		Cable colours: black + brown = contact open black + blue = contact closed (contact position when floating)

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Technical data FTS 20 (NAMUR) types: 52010119, 52010120, 52010121

Measuring system	Comprising an FTS 20 floating switch and an isolating amplifier, e.g. Endress+Hauser Nivotester FTL 325N		
Switching element	Inductive proximity switch with switching ball, closed when floating		
Power supply	8.2 V $\pm$ 2 V		
Operating current	< 1.2 mA unswitched; > 2.1 mA switched		
Reverse polarity protection	yes		
Switching angle	Switching points top/bottom $\pm 12^\circ$, measured to the horizontal		
Ambient temperature	dependent on cable material; PVC, PUR and CSM: -20 ... +70 °C		
Ambient pressure	≤ 3 bar		
Density of floating switch	≥ 0.8 g/cm ³		
Floating body material	Polypropylene (PP)		
Cable material	PVC, CSM: standard length 5 m, cross section 2 x 0.75 mm ² PUR: standard length 5 m, cross section 2 x 0.50 mm ²		
Areas of application and minimum cable length between fixing and floating body	PVC: ≥ 50 mm, suitable for water, dirty water, slightly aggressive media PUR: ≥ 100 mm, suitable for fuels, heating oils, liquids containing oil CSM: ≥ 100 mm, suitable for acids and alkalis		
Ex approval	TÜV 01 ATEX 1709		
Ex ingress protection	⊕ II 2G EEx ia II B T5		
Ex data	T5 (T _a = 70 °C)		T4 (T _a = 70 °C)
	Voltage Ci	16 V	16 V
	Current Ii	52 mA	72 mA
	Power Pi	180 mW	242 mW
	Inductance Li	1 mH	1 mH
	Capacitance Ci	153 nF	153 nF
Standards	EN 60947-5-2, EN 50014:1997, EN 50020:1994		



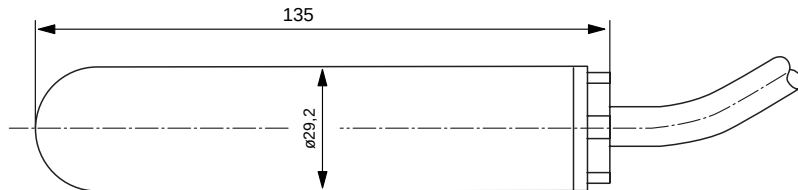
Technical data FTS 20 (AC/DC) types: 52010122, 52010123, 52010124

Measuring system	Comprising an FTS 20 floating switch
Switching element	Microswitch with switching ball
Switching function	Change-over contact
Switching voltage	AC: max. 250 V; DC: max. 150 V
Switching current	Max. 3 A (AC), max. 1 A (DC)
Switching angle	Upper switching point: $+25^{\circ} \pm 6^{\circ}$ Lower switching point: $+14^{\circ} \pm 3^{\circ}$, measured to the horizontal
Ambient temperature	Dependent on cable material; PVC: $+5 \dots +70^{\circ}\text{C}$, PUR and CSM: $-20 \dots +85^{\circ}\text{C}$
Ambient pressure	≤ 3 bar
Density of floating switch	$\geq 0.8 \text{ g/cm}^3$
Floating body material	Polypropylene (PP)
Cable material	PVC, CSM: standard length 5 m, cross section $2 \times 0.75 \text{ mm}^2$ PUR: standard length 5 m, cross section $2 \times 0.50 \text{ mm}^2$
Areas of application and minimum cable length between fixing and floating body	PVC: $\geq 50 \text{ mm}$, suitable for water, dirty water, slightly aggressive media PUR: $\geq 100 \text{ mm}$, suitable for fuels, heating oils, liquids containing oil CSM: $\geq 100 \text{ mm}$, suitable for acids and alkalis

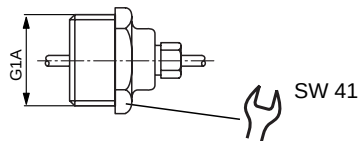
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Dimensions

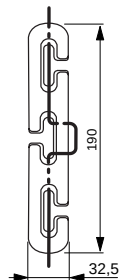
FTS 20 floating switch



Compression gland weight



Weight



(Dimensions in mm)



Translation

EC-TYPE EXAMINATION CERTIFICATE



- (1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment or Protective System intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) EC-Type Examination Certificate Number
TÜV 01 ATEX 1709
Liquid level switch type FTS 20 (NAMUR)***

(4) Equipment or Protective System:
Address:
Endress+Hauser GmbH & Co.
Hauptstr. 1
D-79689 Maulburg

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV CERT-Certification Body, notified body number N° 0032 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

(9) The examination and test results are recorded in confidential report N° 01 PX 11310.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50 014:1997
EN 50 020:1994

(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design and construction of the specified equipment or protective system according to Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and placing on the market of this equipment or protective system.

(12) The marking of the equipment or protective system must include the following:

This certificate may only be reproduced without any change, schedule included. Excerpts or changes shall be allowed by the TÜV Hannover/Sachsen-Anhalt e.V.

SCHEDULE



(13)

(14) EC-TYPE EXAMINATION CERTIFICATE N° TÜV 01 ATEX 1709

(15) Description of equipment

The liquid level switch type FTS 20 (NAMUR)*** is intended for the registration of liquid levels. It may be used within the explosion-hazardous area. The form of the message signal is binary. The maximum permissible ambient temperature is 70°C.

Electrical data

Signal- and supply circuit
(connection cable)

in type of protection "Intrinsic Safety" EEx ia IIB
only for the connection to certified intrinsically safe
circuits

The maximum values for voltage, current and power in dependence of the temperature class have to be taken from the following table:

Temperature class				
T4		T5		
U _i	I _i	P _i	U _i	P _i
16 V	72 mA	242 mW	16 V	52 mA 180 mW

effective internal inductance L_i = 1 mH
effective internal capacitance C_i = 153 nF

(16) Test documents are listed in the test report N° 01 PX 11310.

(17) Special condition for safe use

none

(18) Essential Health and Safety Requirements

no additional ones