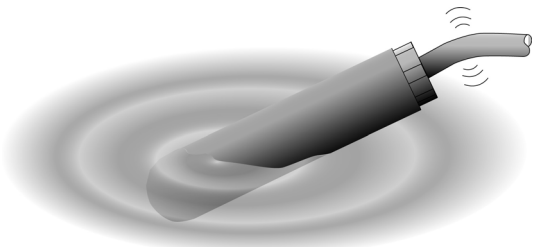
KA180F/00/en/12.06
52010984

Floating Switch
FTS20



Füllstandgrenzschalter
Level Limit Switch
Détecteur de niveau

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Endress + Hauser
The Power of Know How

Safety instructions

The FTS20 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)

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Safety symbols

⚠ 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	Cable length	Type of switch
NAMUR			Initiator with switching ball for use in explosion-hazardous areas 2-wire to EN 60947-5-6 (NAMUR) Use with isolating amplifier; ATEX II 2 G EEx ia IIB T5
	52010119 71035516	5 m 20 m	With PVC cable material (for water, wastewater)
	52010120 71035517	5 m 20 m	With PUR cable material (for fuels and oils)
	52010121 71035518	5 m 20 m	With CSM cable material (for acids and alkalis)
AC / DC			Microswitch with switching ball for standard application, 3-wire, change-over contact for max. 250 V AC / 150 V DC
	52010122 71035520	5 m 20 m	With PVC cable material (for water, wastewater)
	52010123 71035521	5 m 20 m	With PUR cable material (for fuels and oils)
	52010124 71035522	5 m 20 m	With CSM cable material (for acids and alkalis)

Accessories	
Nivotester FTL325N	Isolating amplifier

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52010126	Counter nut G1A, PVC
52010127	Weight (coated with polyamide)

Function

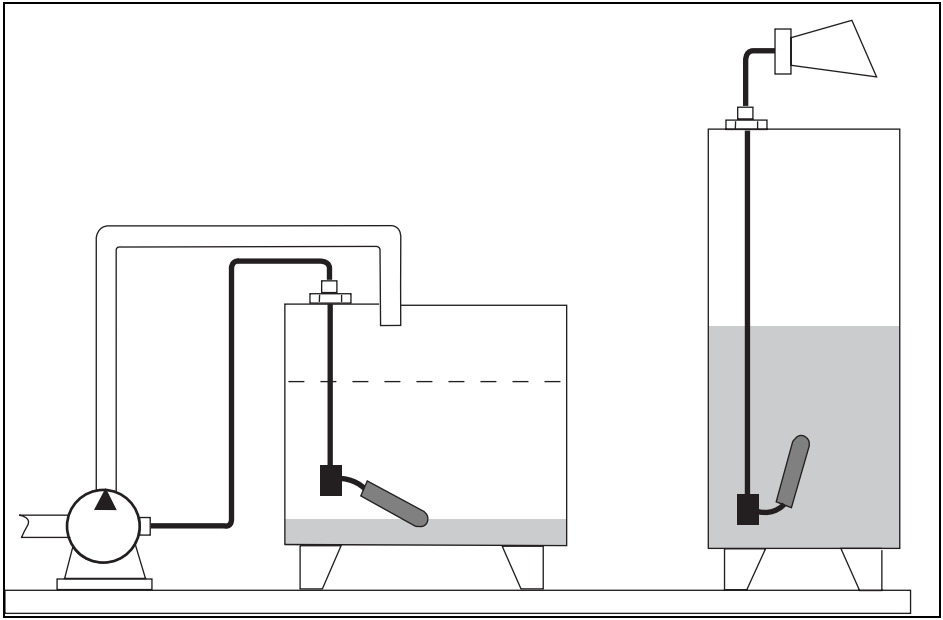
An element built into the floating switch switches when a deviation in the horizontal is detected.
The switching process is triggered by the movement of a steel ball and, depending on the version, is carried out by an inductive initiator or a microswitch.
The inductive initiator acts as a switching output 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



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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.

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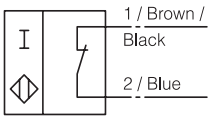
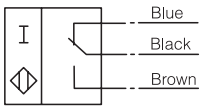
Electrical connection

⚠ Warning!
Note the switch type!

Inductive proximity switch with switching ball **(NAMUR)** Order codes: 52010119, 52010120 52010121, 71035516 71035517, 71035518		Connection indication L+ = black or brown L- = blue (closing when floating)
Change-over contact **(AC/DC)** Order codes: 52010122, 52010123 52010124, 71035520 71035521, 71035522		Cable colours: black + brown = contact open black + blue = contact closed (contact position when floating)

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Technical data FTS20 (NAMUR)

Measuring system	Comprising an FTS20 floating switch and an isolating amplifier, e.g. Endress+Hauser Nivotester FTL325N
Switching element	Inductive proximity switch with switching ball, closed when floating
Power supply	8.2 V ±2 V
Operating current	< 1.2 mA unswitched; > 2.1 mA switched
Reverse polarity protection	Yes
Switching angle	Switching points top/bottom ±12°, measured to the horizontal
Ambient temperature	Dependent on cable material; PVC, PUR and CSM: -20 … +70 °C
Ingress protection	DIN EN 60529, IP68 (immension depth: 20 m / without temporal limit)
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 and 20 m, cross section 2 x 0.75 mm^2 PUR: standard length 5 m and 20 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	⟨Ex⟩ 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

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Standards	EN 60947-5-2, EN 50014:1997, EN 50020:1994

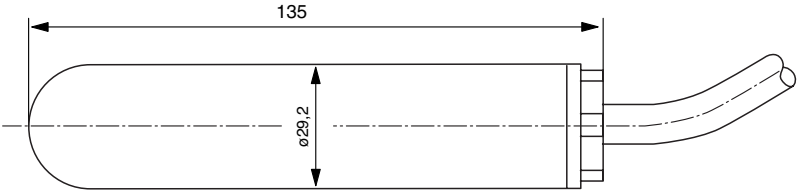
Technical data FTS20 (AC/DC)

Measuring system	Comprising an FTS20 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° ±6° Lower switching point: +14° ±3°, measured to the horizontal
Ambient temperature	Dependent on cable material; PVC: +5 … +70 °C, PUR and CSM: -20 … +85 °C
Ingress protection	DIN EN 60529, IP68 (immension depth: 20 m / without temporal limit)
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 and 20 m, cross section 2 x 0.75 mm^2 PUR: standard length 5 m and 20 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

CE

Dimensions

FTS20 floating switch



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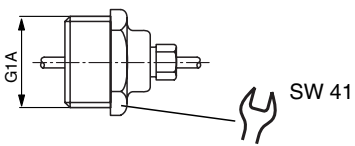
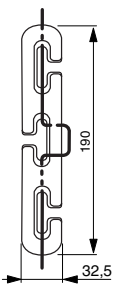
Compression gland weight



Weight



(Dimensions in mm)

Translation

(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

(4)	Equipment or Protective System:	Liquid level switch type FTS 20 (NAMUR)***
(5)	Manufacturer:	Endress+Hauser GmbH & Co.
(6)	Address:	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.

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:

Ex II 2 G EEx ia IIB T5

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Head of the Certification Body

Hannover, 2001-05-18

(13) **SCHEDULE**

(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	I_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

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