



Vibrating filling level switch

- For universal applications such as filling level detection or dry run protection system
- Installation without adjustment
- Ideal for the food, beverage and pharmaceutical industry with a surface roughness $< 0.8 \mu\text{m}$
- ATEX approvals

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

	Type 2030 Pneumatically operated 2/2 way diaphragm valve CLASSIC with plastic body	▶
	Type 8644 Remote Process Actuation Control System AirLINE	▶
	Type 2301 Pneumatically operated 2 way Globe Control Valve	▶
	Type 8619 multiCELL - Multi-channel and multi-function transmitter/controller	▶

Type description

The Type 8111 is a filling level switch for liquids, using a tuning fork as the sensor element.

It is designed for industrial use in all areas of process technology and can be used in liquids. Typical applications are overflow or dry run protection.

Depending on the version, the devices are also used for monitoring or controlling filling levels in potentially explosive atmospheres, also for combustible liquids, gases, fumes or vapours.

Due to the simple and rugged measuring system, the 8111 is virtually unaffected by the chemical and physical features of the liquid. It also works under unfavourable conditions such as turbulence, air bubbles, foam generation (not suitable for measuring the foam thickness itself), adhesions, strong external vibrations or varying filling materials.

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1. General Technical Data

Note:

The vibrating level switch is available with double relay output or with NAMUR output. The technical data depends on the vibrating level switch version. The common technical data are described in this chapter and detailed information on the specifics can be found in chapter [“2. Product versions” on page 4](#).

Product properties

Material

Please make sure the device materials are compatible with the fluid you are using.

Detailed information can be found in chapter [“4.1. Chemical Resistance Chart – Bürkert resistApp” on page 5](#).

Detailed information about material specifications can be found in chapter [“4.2. Material specifications” on page 6](#).

Dimensions Detailed information can be found in chapter [“5. Dimensions” on page 6](#).

Surface quality Ra < 3.2 µm (thread) / Ra < 0.8 µm (clamp)

Measured variable Limit level of liquids.

Weight Approx. 850 g

Performance data

Dynamic viscosity η 0.1...10000 mPa.s (requirement: with density 1)

Density Selected by DIP switch:

- Standard sensitivity: 0.7...2.5 g/cm³
- High sensitivity: 0.5...2.5 g/cm³

Flow velocity Max. 6 m/s (with a viscosity of 10000 mPa.s)

Measurement deviation ± 1 mm

Repeatability 0.1 mm

Hysteresis Approx. 2 mm with vertical installation

Switching delay Approx. 500 ms (On/Off)

Electrical data

Operating voltage Depending on the device version
Detailed information can be found in chapter [“2. Product versions” on page 4](#).

Power Source (not supplied) Limited power source according to UL/EN 60950-1 standards or limited energy circuit according to UL/EN 61010-1 §9.4

Power consumption Depending on the device version
Detailed information can be found in chapter [“2. Product versions” on page 4](#).

Current consumption Depending on the device version
Detailed information can be found in chapter [“2. Product versions” on page 4](#).

Resonance frequency Approx. 1200 Hz

Output Depending on the device version
Detailed information can be found in chapter [“2. Product versions” on page 4](#).

Media data

Process temperature -50...+150 °C (-58...+302 °F)

Process pressure -1...64 bar/-100...6400 kPa (-14.51...+928.64 PSI)

Process/Port connection & communication

Process connection Thread G or NPT, ¾" or 1"; clamp 2"

Electrical connection Depending on the device version
Detailed information can be found in chapter [“2. Product versions” on page 4](#).

Approvals and certificates

Standards

Degree of protection according to IEC/EN 60529 IP66/IP67 with M20 x 1.5 gland mounted and tightened

Overvoltage category according to IEC 61010-1 Category III

Protection class according to IEC 61010-1 Depending on the device version
Detailed information can be found in chapter [“2. Product versions” on page 4](#).

Directives

CE directives The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable).

NAMUR recommendations IEC 60947-5-6 (EN 50227)

Approvals

ATEX

EN 60079-0, EN 60079-11, EN 60079-26

Detailed information can be found in chapter "3.1. Certification ATEX" on page 5.

Environment and installation

Ambient temperature

- Operating on the housing: -40...+70 °C (-40...+158 °F)
- Storage and transport: -40...+80 °C (-40...+176 °F)

Temperature derating

Detailed information can be found in chapter "6.1. Temperature derating diagram" on page 8.

Relative air humidity

20...85 %, without condensation

2. Product versions**2.1. Vibrating level switch with relay output**

Product details	
Operating modes (adjustable)	<ul style="list-style-type: none"> • A = max. detection or overflow/overfill protection • B = min. detection or dry run protection
Operating voltage	20...253 V AC, 50/60 Hz or 20...72 V DC (at U > 60 V DC the ambient temperature must be max. +50 °C (+122 °F))
Power consumption	1...8 VA (AC); approx. 1.5 W (DC)
Output	Relay (DPDT), 2 floating SPDTs
Switching voltage	Max. 253 V AC/DC
Switching current	Max. 3 A (AC, cos phi > 0.9), 1 A (DC)
Switching power	<ul style="list-style-type: none"> • Min. 50 mW • Max. 750 VA AC, 40 W DC (with U < 40 V DC)
Electrical connection	2 cable glands M20 x 1.5
Protection class according to IEC 61010-1	I

2.2. Vibrating level switch with NAMUR output


Product details	
Operating modes	NAMUR output adjustable to falling or rising characteristics <ul style="list-style-type: none"> • Min.: Rising characteristics (High current when wetted with liquid) • Max.: Falling characteristics (Low current when wetted with liquid)
Operating voltage	<ul style="list-style-type: none"> • Voltage supply: via connection to an amplifier according to NAMUR IEC 60947-5-6, approx. 8.2 V • Open-circuit voltage: U₀ approx. 8.2 V • Short-circuit current: I_{sc} approx. 8.2 mA
Current consumption	<ul style="list-style-type: none"> • Falling characteristic: ≥ 2.2 mA (blade uncovered) / ≤ 1.0 mA (blade covered) • Rising characteristic: ≤ 1.0 mA (blade uncovered) / ≥ 2.2 mA (blade covered) • Fault signal: ≤ 1.0 mA
Output	2 wire current modulation according to NAMUR
Necessary processing system	NAMUR processing system according to IEC 60947-5-6 (EN 50227/DIN 19234)
Electrical connection	1 cable gland M20 x 1.5
Protection class according to IEC 61010-1	II

3. Approvals

3.1. Certification ATEX

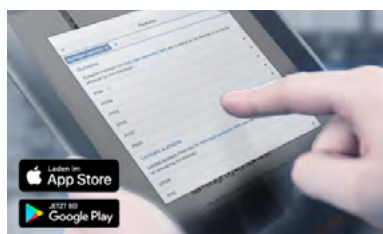
Note:

Devices with Ex certification have different technical data, see **Supplement ATEX Type 8111** ► under user manual.

Certificate	Description
	<p>EU-Type Examination Certificate Number: PTB 07 ATEX 2004X</p> <p>ATEX</p> <ul style="list-style-type: none"> • II 1/2G Ex ia IIC T6 Ga/Gb • II 2G Ex ia IIC T6 Gb <p>Measures to comply with ATEX requirements: refer to the Supplement ATEX Type 8111 ► under user manual. The Ex. certification is only valid if the Bürkert device is used as described in the supplement ATEX. If unauthorized changes are made to the device, the Ex. certification becomes invalid.</p>

4. Materials

4.1. Chemical Resistance Chart – Bürkert resistApp

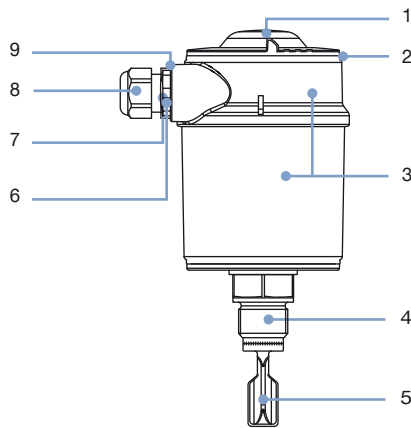


Bürkert resistApp – Chemical Resistance Chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

[Start Chemical Resistance Check](#)

4.2. Material specifications



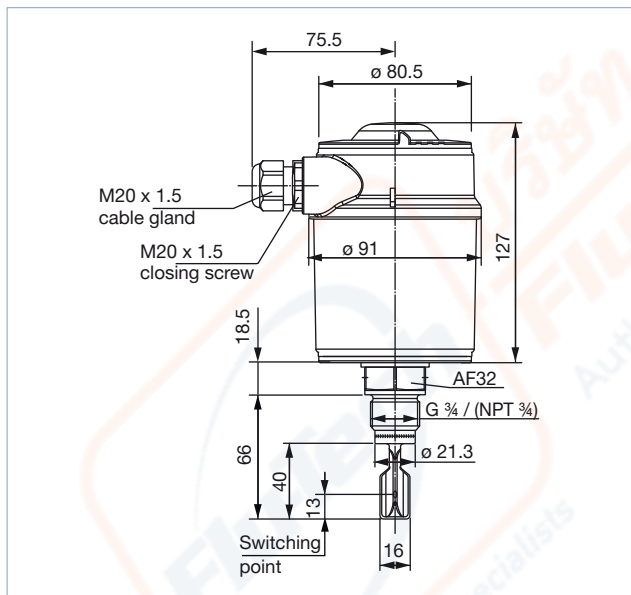
No.	Element	Material
1	Cover	PC
2	Seal between housing and housing cover	EPDM
3	Housing	Plastic PBT (Polyester), PPS and stainless steel 316L (1.4404)
4	Process connection	Stainless steel 316L (1.4435)
5	Tuning fork	Stainless steel 316L (1.4435)
6	Blind plug	PA
7	Ground terminal	Stainless steel 316L
8	Cable gland	PA
9	Cable gland seal	NBR
-	Process seal (not shown)	NBR with aramid fibres

5. Dimensions

5.1. G 3/4" or NPT 3/4" connection

Note:

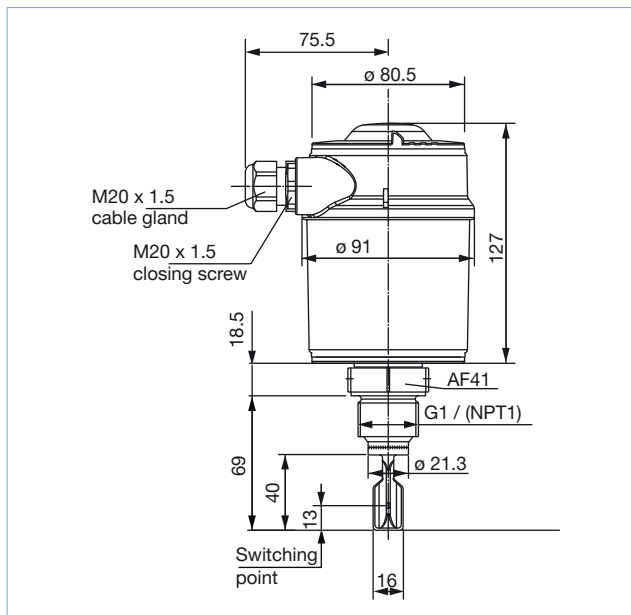
Dimensions in mm



5.2. G 1" or NPT 1" connection

Note:

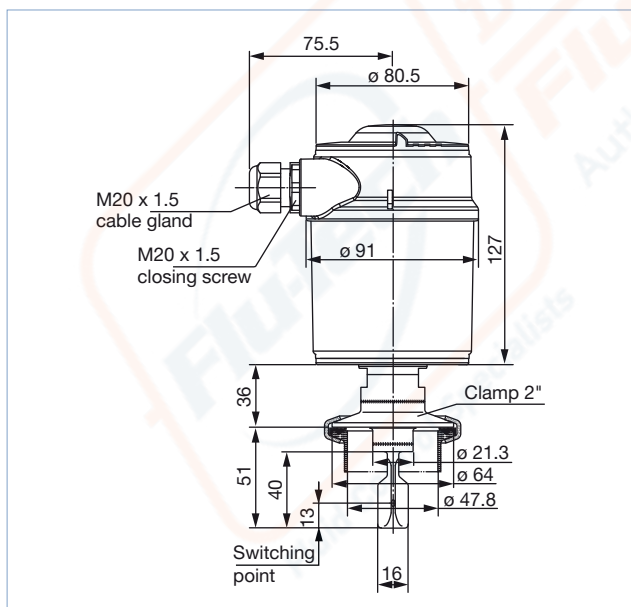
Dimensions in mm



5.3. Clamp 2" connection

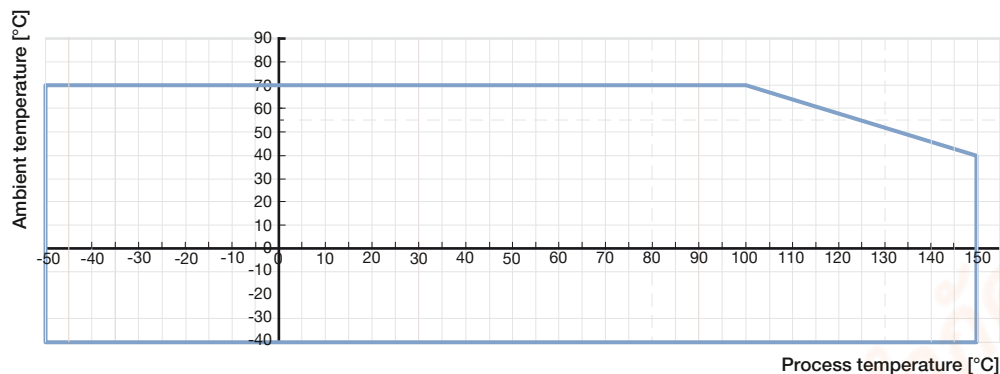
Note:

Dimensions in mm



6. Performance specifications

6.1. Temperature derating diagram



7. Product installation

7.1. Installation notes

The 8111 vibrating level switch can be installed in any position. The instrument only has to be mounted in such a way that the tuning fork is at the height of the desired switching point.

The tuning fork has lateral markings (notches) that indicate the switching point with vertical mounting. The switching point refers to water with the basic setting of the sensitivity switch $\geq 0.7 \text{ g/cm}^3$.

Vertical installation	Horizontal installation
<p>Switching point approx. 13 mm</p> <p>Switching point with higher density</p> <p>Switching point with lower density</p> <p>Switching point approx. 27 mm</p>	<p>Switching point</p> <p>Recommended mounting position, particularly for adhesive products</p> <p>Marking with screwed version on top</p> <p>Switching point</p>

8. Product operation

8.1. Measuring principle

The tuning fork is piezoelectrically energised and vibrates at a mechanical resonance frequency of approx. 1200 Hz. When the tuning fork is submerged in the product, the frequency changes. This change is detected by the integrated oscillator and converted into a switching command.

The integrated fault monitor detects the following faults:

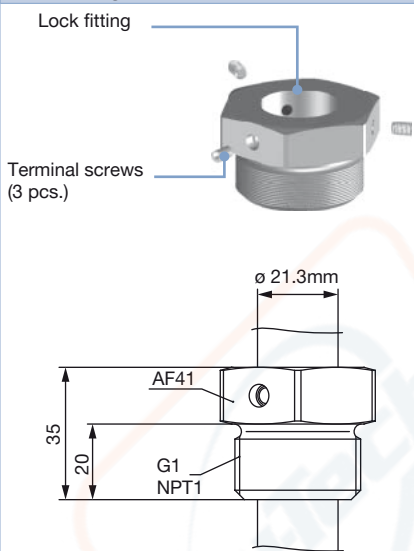
- Interruption of the connection cable to the piezoelectric elements
- Extreme material wear on the tuning fork
- Breakage of the tuning fork
- Absence of vibration.

If one of these faults is detected or in case the power supply fails, the electronic system switches to a defined switching state, e.g. the relay de-energises (safe state).

9. Product accessories

Note:

The accessories must be ordered separately, see **"10.4. Ordering chart accessories"** on page 10.

Lock fitting	Description
 <p>Lock fitting</p> <p>Terminal screws (3 pcs.)</p> <p>ø 21.3mm</p> <p>AF41</p> <p>G1 NPT1</p> <p>35</p> <p>20</p>	<p>The lock fitting is a threaded fitting and can be used together with the vibration level switch Type 8111. It must only be used in unpressurised vessels.</p> <p>The wetted parts of the lock fitting are made of stainless steel (316L).</p> <p>With the lock fittings, sensors with tube extension can be fixed infinitely. The terminal screws protect the tube against sliding through.</p> <p>The following versions are available: Ø 21.3 mm - G 1 or 1 NPT (AF 41)</p>

10. Ordering information

10.1. Bürkert eShop – Easy ordering and quick delivery



Bürkert eShop – Easy ordering and fast delivery

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10.2. Bürkert product filter



Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements? Use the Bürkert product filter and find suitable articles for your application quickly and easily.

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10.3. Ordering chart

Output	Operating voltage	Process connection	Electrical connection	Article no.
Double relay (DPDT), 2 floating SPDTs	20...72 V DC / 20...250 V AC (5 A)	G ¾"	2 cable glands M20 × 1.5	558110
		NPT ¾"		558111
		G 1"		558112
		NPT 1"		558113
		Clamp 2"		558114
NAMUR signal - Ex version, ATEX approval	8.2 V DC - via an isolating amplifier with NAMUR input	G ¾"	1 cable gland M20 × 1.5	558115
		G 1"		558116

Further versions on request			
	Process connection <ul style="list-style-type: none"> Clamp 1"; 1½" DIN 11851 Flange SMS NEUMO BioControl® (a registered Trademark of NEUMO-Ehrenberg Group) 		Hygienic <ul style="list-style-type: none"> Ra < 0.8 µm for G or NPT threaded connection Ra < 0.3 µm for Clamp connection
	Material ECTFE, enamel, Alloy C4 or PFA for flange connection		Temperature -50...+250 °C
	Additional With transistor output		

10.4. Ordering chart accessories

Description	Article no.
Set with 2 reductions M20 × 1.5 / NPT ½" + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 × 1.5	551782
Lock fitting, only for pressureless handling, -50...150 °C; G 1"	558218
Lock fitting, only for pressureless handling, -50...150 °C; NPT 1"	558219