


Vibrating level switch



- For universal use as overflow or dry run protection system
- Setup without adjustment
- For food and beverage industry thanks to surface finishing $< 0.8 \mu\text{m}$
- ATEX approvals 

Type 8112 can be combined with...



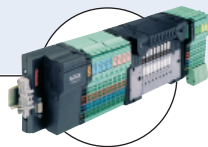
Type 2030

Diaphragm valve



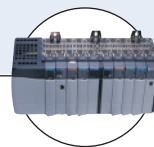
Type 2712

Globe control valve with TopControl



Type 8644

Valve islands with electronic I/O



PLC

The 8112 is a vibrating level switch for liquids, using a tuning fork for level detection.

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

The Type 8112 is available with different sensor length using tube extension. The right length can be adapted thanks to a lock fitting.

Due to the simple and rugged measuring system, the 8112 is virtually unaffected by the chemical and physical features of the liquid. It works even under unfavourable conditions such as turbulence, air bubbles, foam generation, buildup or varying products.

General data

Materials

Housing / Cover / Seal ring	PBT, Stainless steel 316L (1.4404) / PC / EPDM
Wetted parts	
Tuning fork and process fitting	Stainless steel 316L (1.4435)
Extension tube \varnothing 21.3	Stainless steel 316L (1.4435)
Process seal	Klingersil C 4400

Weight approx. 890 g + approx. 110 g/m (tube extension)

Electrical connections 1 or 2 cable glands M20 x 1.5 (depends on output version)

Process fitting Thread G, NPT 3/4", G, NPT 1" or Clamp 2"

Surface finishing quality Ra < 3.2 μm (thread) / Ra < 0.8 μm (Clamp)

Extension tube length 200... 1000 mm

Viscosity dynamic 0.1 up to 10000 mPa.s (requirement: with density 1)

Density 0.5 up to 2.5 g/cm³ (selected by DIP switch) or 0.7 up to 2.5 g/cm³

Fluid temperature -50 up to 150°C (-58 to 302°F)

Fluid pressure -1 to 64 bar (-14.51 to 928.64 PSI)

Accuracy

Hysteresis Approx. 2 mm with vertical installation

Delay time / Frequency Approx. 500 ms / Approx. 1200 Hz

Output Double relay output or Namur output



Environment

Ambient temperature -40 up to +70°C (-40 to 158°F) (Operating);
-40 up to +80°C (-40 to 176°F) (Storage)

Electrical data - Sensor with relay output	
Output	Relay (DPDT), 2 floating spdts
Power supply	20 to 253 V AC, 50/60 Hz or 20 to 72 V DC (at U > 60 V DC the ambient temperature must be max. 50°C (122°F))
Power consumption	1 to 8 VA (AC); approx. 1.3 W (DC)
Turn-on voltage	min.: 10 mV; max.: 253 V AC, 253 V DC
Switching current	min.: 10 µA; max.: 5 A (AC), 1 A (DC)
Breaking capacitance	max. 1250 VA, 50 W
Modes (adjustable)	A = max. detection or overflow protection B = min. detection or dry run protection
Delay time	when immersed: 0.5 s when laid bare: 1 s

Electrical data - Sensor with NAMUR output	
Output	2 wire current modulation according to NAMUR
Power supply	Voltage supply Open-circuit voltage Short-circuit current
Current consumption	Falling characteristic Rising characteristic Fault signal
Necessary processing system	NAMUR processing system acc. to IEC 60947-5-6 (EN50227/DIN19234)
Modes (NAMUR output adjustable to falling or rising characteristics)	Min.: rising characteristics (High current when immersed) Max.: falling characteristics (Low current when immersed)

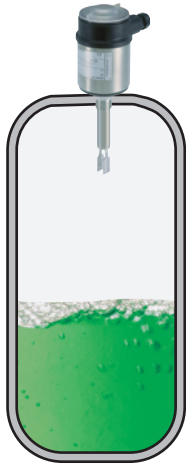
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III
Protection class	I (relay output); II (NAMUR output)
Standards	EMC / Security ATEX ¹⁾ NAMUR
	EN61326 / EN61010-1 EN50014; EN50020; EN50284 IEC 60947-5-6 (EN 50227)

Specifications Ex	
 - Protection	Categories 1/2 G, 2G
 - Certification	Ex ia IIC T6
Conformity specifications¹⁾	Power supply U _i Short circuit rating I _i Power limitation P _i Ambient temperature Internal capacity C _i Internal inductivity L _i
	20 V 103 mA 516 mW -40 up to +85°C (-40 to 185°F) (depend on categories) negligible negligible

1) homologation certificate PTB 07 ATEX 2004X

Target applications with type 8112

Chemical industry - solvents



Beside the continuous level measurement, level detection is a main safety characteristic for storage tanks.

Many modern sensors for continuous level measurement, however, are approved as overflow protection system, but a second, physically different measuring principle offers optimum safety and redundancy.

Thanks to the manifold application possibilities, the Type 8112 vibrating level switch is ideal for all applications concerning stock-keeping of liquids. A number of electrical and mechanical versions ensures simple integration into existing processing systems.

Advantages:

- various electrical versions
- product-independent
- universal level detection for all liquids.

Chemical industry - reactors



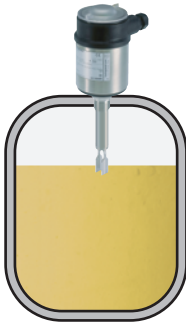
Thanks to the manifold application possibilities, the Type 8112 vibrating level switch is ideal for all applications concerning stock-keeping of liquids.

A number of electrical and mechanical versions ensures simple integration into existing processing systems.

Advantages:

- various electrical versions
- product-independent
- completely gas-tight
- high reliability
- universal level detection for all liquids.

Water/sewage water plants



Chemicals are required for sewage water treatment. They are used for precipitation. Phosphate and nitrate are sedimented and separated. For the sludge treatment and neutralization, acids and solvents are stored apart from lime water and ferric chloride.

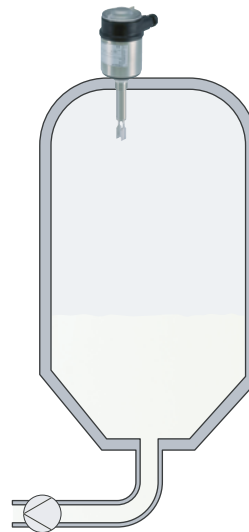
These substances are subject to the regulations for water-endangering substances. Therefore overflow protection systems must be mounted on storage tanks.

To avoid overflowing of vessels with toxic products, sensors for level detection are an important safety element.

Advantages:

- high reproducibility

Food processing industry



The processes in food processing tanks such as e.g. for milk have a high demand to the installed technology. High pressures and temperatures are caused during sterilization and cleaning of the tanks. The installed level sensors must meet the requirements of the hygienic construction. The harmlessness of all wetted materials must be proven and optimum cleanability must be ensured by hygiene-technical design.

The Type 8112 is installed for level detection and as dry run protection system. The tuning fork is highly polished for the use in sensitive foodstuffs such as milk.

Advantages:

- universal level detection for all liquids.
- high resistance sensor materials
- adjustment and maintenance-free

Principle of operation

The tuning fork is piezoelectrically energised and vibrates at its 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.

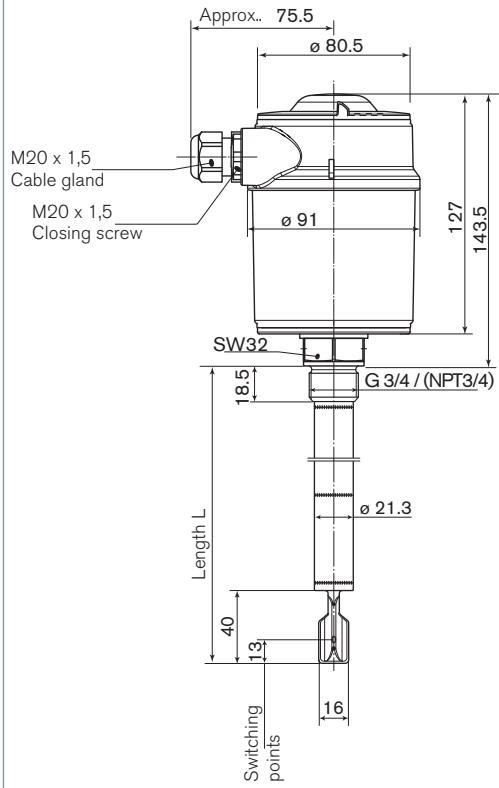
The integrated fault monitoring detects the following faults:

- interruption of the connection cable to the piezoelectric elements
- extreme material wear on the tuning fork
- break of the tuning fork
- absence of vibration.

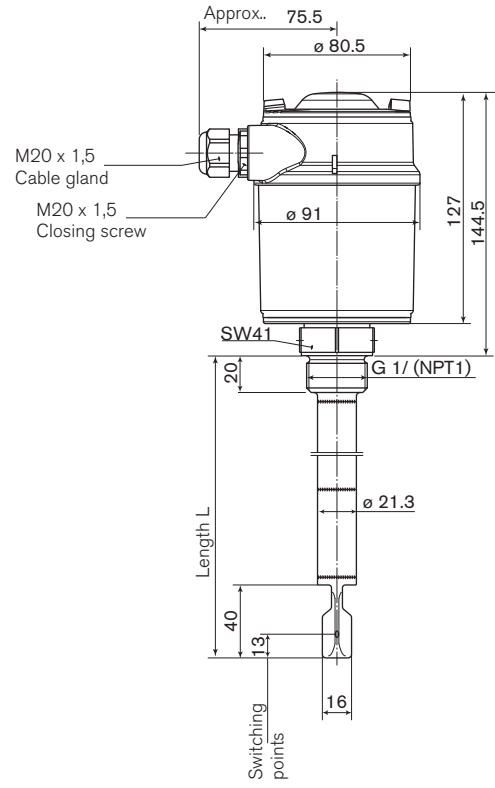
If one of these faults is detected or in case the power supply fails, the electronics takes on a defined switching condition, e.g. the output transistor blocks (safe condition).

Dimensions [mm]

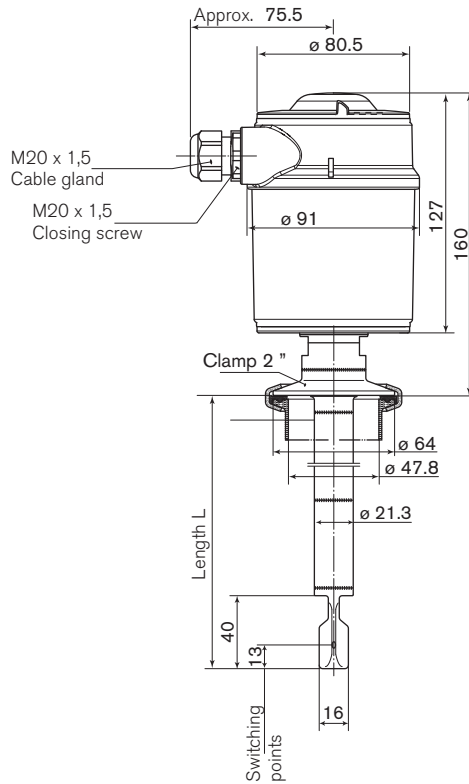
With G or NPT 3/4" connection



With G or NPT 1" connection



With Clamp 2" connection



Ordering chart for the vibrating level switch Type 8112

Output	Power supply	Extension tube length [mm]	Process connection	Electrical connection	Item no.
Double relay (DPDT) , 2 floating spdts	20-72 V DC / 20 - 250 V AC (5 A)	300	G 3/4"	2 cable glands M20 x 1.5	558 119
			NPT 3/4"	2 cable glands M20 x 1.5	558 120
		500	G 3/4"	2 cable glands M20 x 1.5	558 121
			NPT 3/4"	2 cable glands M20 x 1.5	558 122
		1000	G 3/4"	2 cable glands M20 x 1.5	558 123
			NPT 3/4"	2 cable glands M20 x 1.5	558 124
		300	G 1"	2 cable glands M20 x 1.5	558 125
			NPT 1"	2 cable glands M20 x 1.5	558 126
		500	G 1"	2 cable glands M20 x 1.5	558 127
			NPT 1"	2 cable glands M20 x 1.5	558 128
		1000	G 1"	2 cable glands M20 x 1.5	558 129
			NPT 1"	2 cable glands M20 x 1.5	558 130
		300	Clamp 2"	2 cable glands M20 x 1.5	558 131
				2 cable glands M20 x 1.5	558 132
				2 cable glands M20 x 1.5	558 133
Namur signal - Ex version ATEX approval	8.2 V DC - via an intrinsic safety interface with NAMUR input	300	G 3/4"	1 cable gland M20 x 1.5	558 134
			G 1"	1 cable gland M20 x 1.5	558 135
		500	G 3/4"	1 cable gland M20 x 1.5	558 136
			G 1"	1 cable gland M20 x 1.5	558 137
		1000	G 3/4"	1 cable gland M20 x 1.5	558 138
			G 1"	1 cable gland M20 x 1.5	558 139

 Further versions on request


Port connection

Clamp 1"; 1 1/2"
DIN 11851
Flange
SMS;
Neumo BioControl®



Materials

ECTFE, enamel, Hastelloy C4 or PFA for flange connection



Hygienic version

Ra < 0.8 µm for G or NPT threaded connection
Ra < 0.3 µm for Clamp connection



Temperature

-50... 250°C



Additional

up to 6000 m

Ordering chart accessories

Description	Item no.
Set with 2 reductions M20 x 1.5 / NPT1/2" + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 x 1.5	551 782
Lock fitting - only for pressureless handling, -50... 150°C; G1"	558 218
Lock fitting - only for pressureless handling, -50... 150°C; NPT1"	558 219

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