

OEM radar measuring device, for aggressive media level measurement



- For level measurement up to 20 m, 4... 20 mA/Hart - 2 wires
- Adjustable via Display, key operation or PC-Tool with DTM
- ATEX approvals Ex
- Insensitive to variations of temperature, pressure, medium data of the product and gas layers

Type 8136 can be combined with...



Type 8793

Process controller



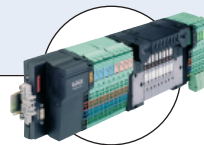
Type 2103

Diaphragm valve



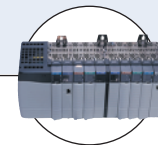
Type 8802-GD

Element control valve system



Type 8644

Valve islands



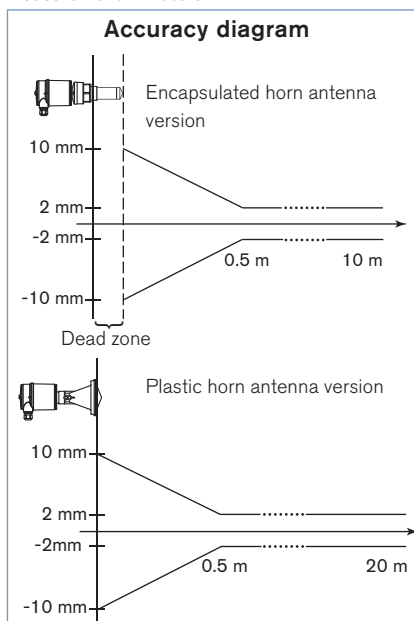
PLC

The Type 8136 is a non-contact radar level measuring device for continuous level measurement.

The unit is available in two versions:

- with encapsulated horn antenna particularly suitable for level measurement of aggressive liquids in small vessels.

- with plastic horn antenna particularly suitable for measurement in open flumes or gauge measurement in waters.



General data

Materials

Housing / Cover
 Seal ring / Ground terminal
 Mounting strap / Fixing screws
 Wetted parts
 Encapsulated horn antenna version
 Process connection / Antenna / Seal
 Plastic horn antenna version
 Process connection
 Horn antenna / Focus lens

PBT, Stainless steel 316L (1.4404) / PC
 NBR / Stainless steel 316Ti/316L (1.4571/1.4435)
 Stainless steel 304 (1.4301) / Stainless steel 316L (1.4435)

PVDF / PVDF (completely encapsulated) / FKM

Stainless steel 316L (1.4435)
 PBT-GF30 / PP

Display*

LCD in full dot matrix (option)

Process connection

Thread G 1½" or NPT 1½" (Encapsulated horn antenna version)
 Mounting strap 170 mm (Plastic horn antenna version)

Max. torque mounting boss

4 Nm (mounting screws - strap on the sensor housing)

Electrical connection

Cable glands M20 x 1.5

Measuring value

Distance between process connection and product surface

Min. dielectric figure

$\epsilon_r > 1.6$

Dead zone

50 mm¹⁾

Measuring range

0.05 to 10 m (Encapsulated horn antenna version)
 0 to 20 m (Plastic horn antenna version)

Process temperature

-40 to +80°C (-40 to 176°F)

Vessel pressure

-1 to 3 bar (-14.51 to 43.53 PSI) (-100 to 300 kPa)

Vibration resistance

Mechanical vibrations with 4 g and 5... 100 Hz

Temperature coefficient

0.03%/10K (Average temperature coefficient of the zero signal - temperature error)

Resolution

max. 1 mm

Frequency

K-band (26 GHz technology)

Interval

approx. 1 s

Beam angle at 3 dB

22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)

Adjustment time

> 1 s (dependent on the parameter adjustment)

Accuracy

± 2 mm (see diagram)

* to be ordered separately

¹⁾ Encapsulated horn antenna version. In products with low dielectric value up to 50 cm.

По вопросам продаж и поддержки обращайтесь:

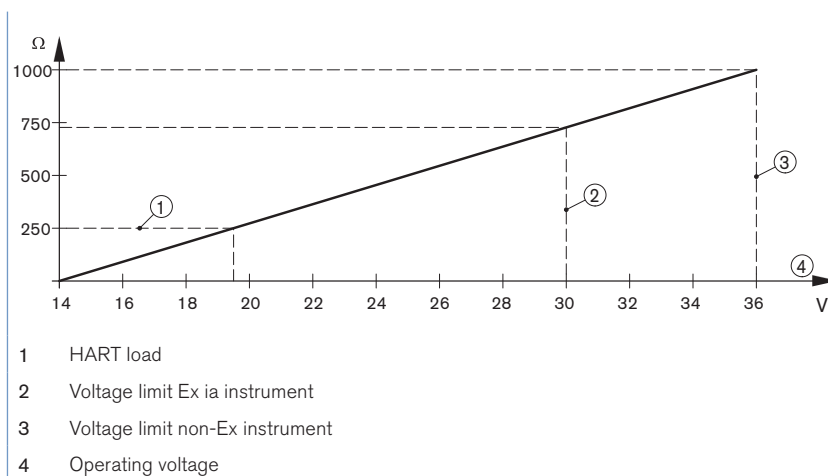
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Астана +7 (7172) 69-68-15	Калуга +7 (4842) 33-35-03	Новосибирск +7 (383) 235-95-48	Ставрополь +7 (8652) 57-76-63
Астрахань +7 (8512) 99-46-80	Кемерово +7 (3842) 21-56-70	Омск +7 (381) 299-16-70	Сургут +7 (3462) 77-96-35
Барнаул +7 (3852) 37-96-76	Киров +7 (8332) 20-58-70	Орел +7 (4862) 22-23-86	Сызрань +7 (8464) 33-50-64
Белгород +7 (4722) 20-58-80	Краснодар +7 (861) 238-86-59	Оренбург +7 (3532) 48-64-35	Сыктывкар +7 (8212) 28-83-02
Брянск +7 (4832) 32-17-25	Красноярск +7 (391) 989-82-67	Пенза +7 (8412) 23-52-98	Тверь +7 (4822) 39-50-56
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Волгоград +7 (8442) 45-94-42	Магнитогорск +7 (3519) 51-02-81	Ростов-на-Дону +7 (863) 309-14-65	Тюмень +7 (3452) 56-94-75
Воронеж +7 (4732) 12-26-70	Москва +7 (499) 404-24-72	Рязань +7 (4912) 77-61-95	Ульяновск +7 (8422) 42-51-95
Екатеринбург +7 (343) 302-14-75	Мурманск +7 (8152) 65-52-70	Самара +7 (846) 219-28-25	Уфа +7 (347) 258-82-65
Иваново +7 (4932) 70-02-95	Наб.Челны +7 (8552) 91-01-32	Санкт-Петербург +7 (812) 660-57-09	Хабаровск +7 (421) 292-95-69
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Иркутск +7 (3952) 56-24-09	Нижневартонск +7 (3466) 48-22-23	Саратов +7 (845) 239-86-35	Челябинск +7 (351) 277-89-65
Йошкар-Ола +7 (8362) 38-66-61	Нижнекамск +7 (8555) 24-47-85	Смоленск +7 (4812) 51-55-32	Череповец +7 (8202) 49-07-18
Казань +7 (843) 207-19-05			Ярославль +7 (4852) 67-02-35

сайт: burkert.pro-solution.ru | эл. почта: btk@pro-solution.ru
телефон: 8 800 511 88 70

Electrical data	
Operating voltage	14 - 36 V DC or 14 - 30 V DC (Ex ia instrument)
Permissible residual ripple	< 100 Hz: $U_{ss} < 1\text{ V}$ 100 Hz... 10 kHz: $U_{ss} < 10\text{ mV}$
Output signal	4... 20 mA/HART
Resolution	1.6 μA
Fault signal	current output unchanged 20.5 mA, 22 mA or < 3.6 mA (selectable)
Current limitation	22 mA
Load	see load diagram
Damping (63% of the input variable)	0... 999 s, adjustable
Environment	
Ambient temperature	-40 to +80°C (-40 to 176°F) (operation and storage)
Relative humidity	80% max; without condensation
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III
Protection class	II
Standard	
EMC	EN61326
Security	EN61010-1
NAMUR	NE 21; NE 43
Approvals	ATEX ²⁾ : EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
Ex - Protection	Categories 1/2G or 2G
Ex - Certification	Ex ia IIC T6
Conformity specifications ²⁾	
Operating voltage U_i	30 V
Short circuit rating I_i	131 mA
Power limitation P_i	983 mW
Ambient temperature	-40 to +55°C (-40 to 131°F) (dependent on categories)
Internal capacity C_i	negligible
Internal inductivity L_i	negligible

2) homologation certificate PTB 08 ATEX 2002X

Load diagram



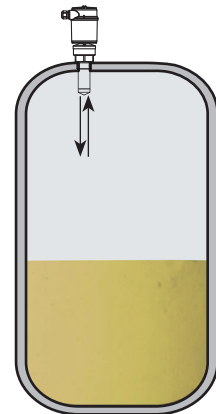
Target applications

■ Dosing and processing systems

Level measurement:

The radar measuring principle is particularly suitable for continuous level measurement of toxic and corrosive substances. The measurement is non-contacting, i.e. there is no direct contact with the medium.

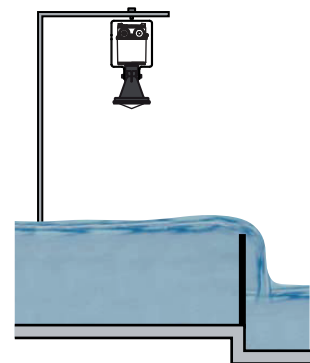
Due to the very small process connection and the PVDF encapsulated antenna, the 8136 radar level measuring device is ideal for this application.



■ Open flumes

Measurement for heavy demands:

Radar level measuring device like the Type 8136 are also suitable for measurement in open flumes. For wastewater treatment in chemical plants, where wastewater temperatures change drastically or where solvents are contained in the wastewater, the use of radar level measuring device is recommended.



Principle of operation

The radar measuring device consists of an electronic housing, a process connection element the antenna and a sensor. The antenna emits short radar pulses with a duration of approximate 1 ns to the medium. These pulses are reflected by the medium surface and received by the antenna as echoes. Radar waves travel at the speed of light. The running time of the radar pulses from emission to reception is proportional to the distance and hence to the level. The determined level is converted into an output signal and transmitted as a measured value.

The measuring device can be adjusted with:

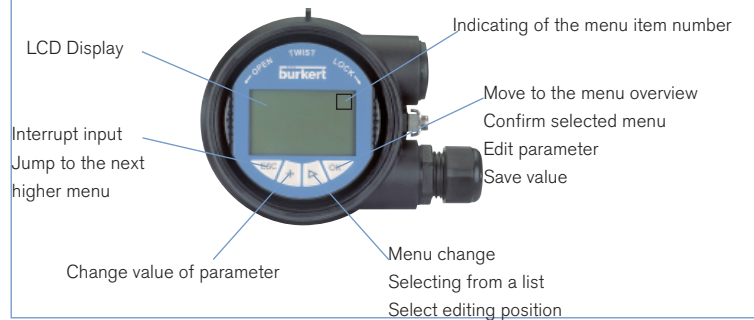
- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC
- a HART handheld

The entered parameters are generally saved in the measuring device Type 8136. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or save in a file by using PACTware™/DTM

► Set up with display/configuration module

The display/configuration module can be inserted into the measuring device and removed again at any time. It is not necessary to interrupt the power supply. The measuring device is adjusted via the four keys of the display/configuration module

Display/configuration module



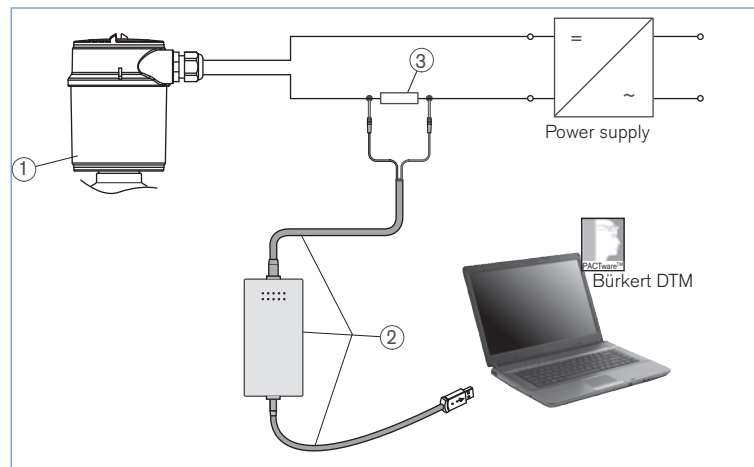
► Set up with PACTware™/DTM and HART communication

Connecting the PC via HART

1. Measuring device 8136
2. HART-USB Modem
3. Resistance 250 Ohms

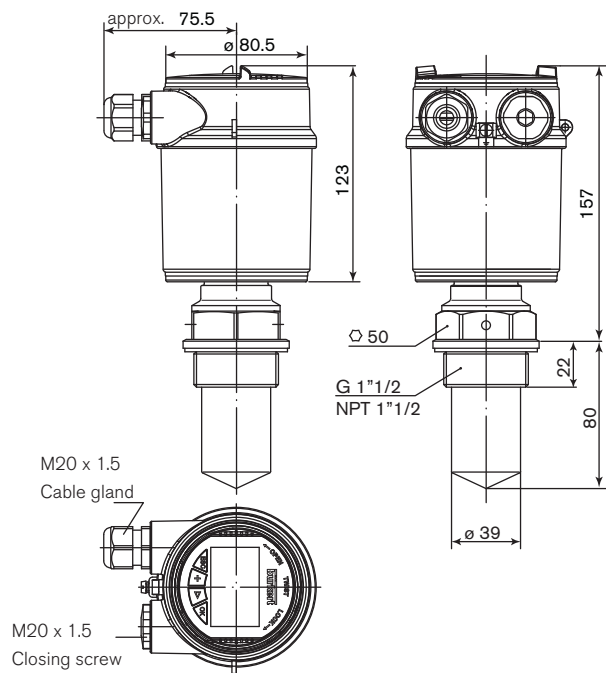
Necessary components:

- Measuring device 8136
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit

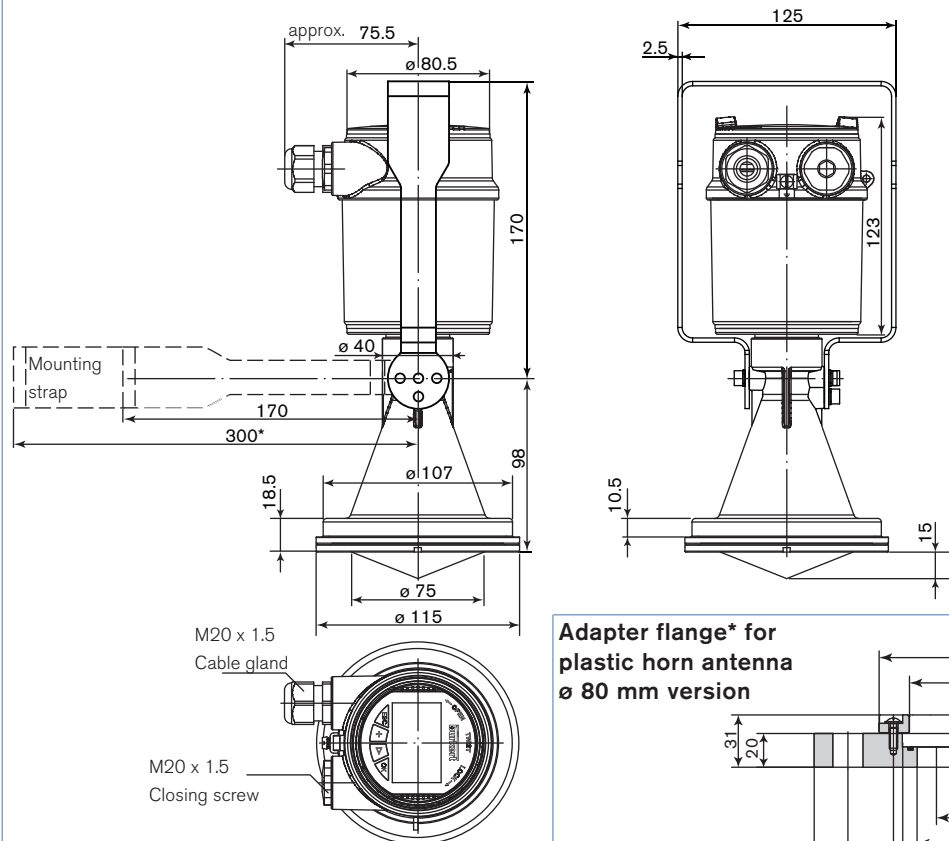
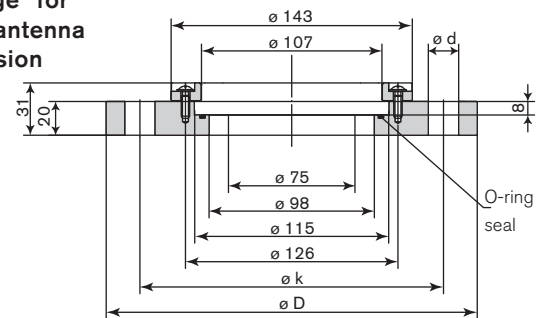


Dimensions [mm]

Encapsulated horn antenna version



Plastic horn antenna version

Adapter flange* for
plastic horn antenna
ø 80 mm version

Flange	ø D	ø k	ø d	Number of hole
DN100 PN16	220	180	18	8 x 45° (=360°)
ASME (ANSI B16.5) 4" 150 psi	228.6	190.5	19.1	8 x 45° (=360°)

* 300 mm strap, adapter flange has to be ordered separately

Ordering chart for compact measuring device Type 8136

Specifications	Operating voltage	Output	Antenna version	Process connection	Electrical connection	Item no. without display / configuration module
Standard version	14 - 36 V DC	4... 20 mA/HART (2 wires)	Encapsulated horn - 40 mm	G1 1/2"	Cable gland M20 x 1.5	560 146
				NPT1 1/2"	Cable gland M20 x 1.5	560 148
			Plastic horn - 80 mm	Mounting strap	Cable gland M20 x 1.5	560 150
Ex version - ATEX approval	14 - 30 V DC	4... 20 mA/HART (2 wires)	Encapsulated horn - 40 mm	G1 1/2"	Cable gland M20 x 1.5	560 147
				NPT1 1/2"	Cable gland M20 x 1.5	560 149
			Plastic horn - 80 mm	Mounting strap	Cable gland M20 x 1.5	560 151



Further versions on request



Process connection

Clamp 2", 3"
 bolting DN50, DN80 PN3, DIN11851 / 316L
 without compression flange,
 with compression flange DN80 PN16, ANSI3", JIS DN80 10K / PPH
 adapter flange DN150 PN16 FKM / PPH
 ANSI4" 150PSI FKM / PPH
 ANSI6" 150PSI FKM / PPH
 JIS DN100 10K FKM / PPH
 JIS DN150 10K FKM / PPH

Please also use the "request for quotation" on page 6

for ordering a customized measuring device. [go to page](#)

Ordering chart - accessories for measuring device Type 8136 (has to be ordered separately)

Specifications	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
Hart-USB Modem	560 177
Set with a display/configuration module, a transparent cover and a seal ring	559 279
Set with a transparent cover and a seal ring	561 006
Mounting strap 300 mm	559 839
Adapter flange DN100 PN16 FKM / PPH	560 437
Adapter flange ASME (ANSI B16.5) 4" 150PSI FKM / PPH	560 436

Customized measuring device Type 8136 - request for quotation

Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Radar level measuring device 8136

Quantity: Desired delivery date:

■ Antenna

☐ Encapsulated horn in PVDF☐ Plastic horn in PP

■ Process connection:

Compression flange

☐ with☐ without

External thread

☐ G 1 1/2"☐ NPT1 1/2"

Clamp

☐ 2" PN3☐ 3" PN3

Bolting

☐ DN50 PN3☐ DN80 PN3

Mounting strap

☐ 170 mm☐ 300 mm

Adapter flange

☐ DN100 PN16☐ ANSI 4"☐ JIS DN100 10K☐ DN150 PN16☐ ANSI 6"☐ JIS DN150 10K

■ Display/configuration module

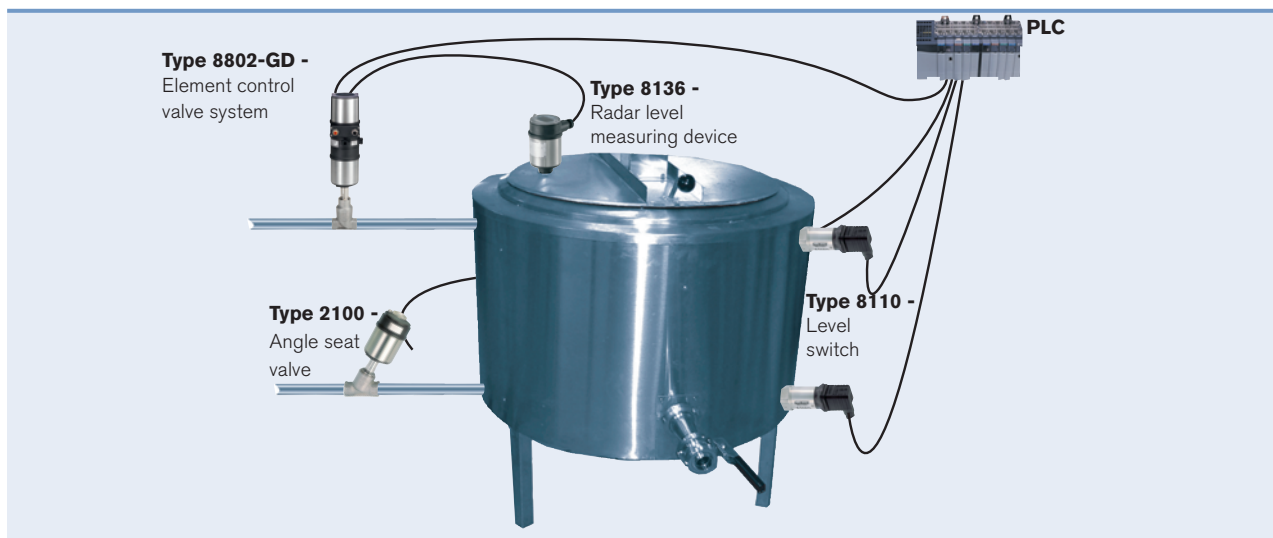
☐ Yes☐ No

■ ATEX approval

☐ Yes☐ No

reset form

Interconnection possibilities with other Bürkert devices



*To find your nearest Bürkert office, click on the orange box →

In case of special application conditions,
please consult for advice.Subject to alteration.
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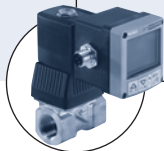
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Ultrasonic level transmitter, non-contact

- Compact for level measurement up to 8 m
- 4...20 mA/Hart - 2 wires
- Suitable for solids
- ATEX approvals 

Type 8177 can be combined with...



Type 8624

PI-controller on valve



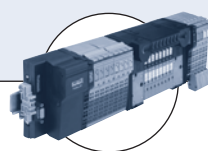
Type 8635

SideControl EEx



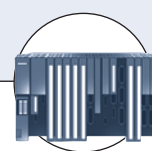
Type 2712 (8630)

Continuous TopControl system



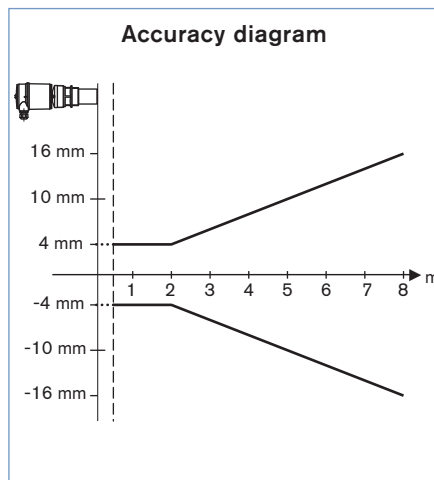
Type 8644

Valve islands



PLC

The Type 8177 is a non-contact ultrasonic level transmitter, designed for continuous level measurement in open or closed vessels. The unit is suitable for liquids, but also for solids, in virtually all industries, particularly in water and waste water management.



General data

Materials

Housing	PBT, Stainless steel 316L (1.4435)
Cover	PC
Seal ring	NBR
Ground terminal	Stainless steel 316Ti/316L (1.4571/1.4435)
Wetted parts	
Process fitting, transducer	PVDF
Process seal	EPDM

Display

LCD in full dot matrix

Process fitting

Thread G 2" A, NPT 2"

Max. torque mounting boss

25 Nm

Electrical connections

Cable gland M20 x 1.5

Measuring type

Distance between lower edge of the transducer and product surface

Dead zone

0.4 m

Measuring range

0.4 up to 8 m (for liquids)
0.4 up to 3.5 m (for solids)

Process temperature

-40 up to 80°C

Vessel pressure

-0.2 up to 2.0 bar (-20...200 kPa)

Vibration resistance

Mechanical vibrations with 4.g and 5...100 Hz

Temperature coefficient

0.06%/10K (Average temperature coefficient of the zero signal - temperature error)

Resolution

max. 1 mm

Ultrasonic frequency

55 kHz

Interval

> 2 s (dependent on the parameter adjustment)

Beam angle at -3 db

5.5 degrees

Adjustment time

> 3 s (dependent on the parameter adjustment)

Accuracy

< 0.2% or ± 4 mm (see diagram)

Electrical data	
Power supply	14 to 36 V DC or 14 to 30 V DC (Ex ia instrument)
Permissible residual ripple	< 100 Hz: $U_{ss} < 1 \text{ V}$ 100 Hz...10 kHz: $U_{ss} < 10 \text{ mV}$
Output signal	4...20 mA/HART
Resolution	1.6 μA
Fault signal	current output unchanged; 20.5 mA; 22 mA < 3.6 mA (adjustable)
Current limitation	22 mA
Load	see load diagram
Integration time (63% of the input variable)	0...999 s, adjustable
Fulfilled NAMUR recommendation	NE 43

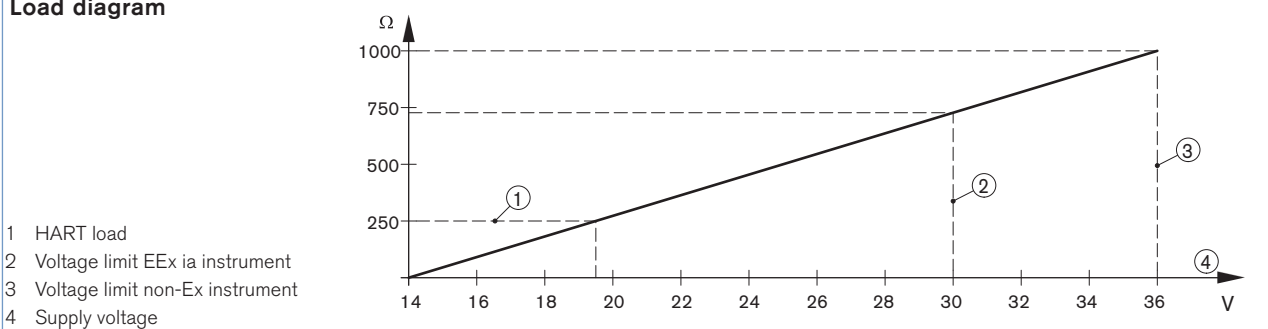
Environment	
Ambient temperature with display, adjustment elements	-20 up to +70°C (operation and storage)
Relative humidity	45-75 %; non condensated

Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III
Protection class	II
Standard	
EMC	EN61326
Security	EN61010-1
ATEX	EN50014; EN50020; EN50284
NAMUR	NE 21; NE 43

Specifications EEx	
Protection	Categories 1/2 G or 2G
Certification	EEx ia IIC T6
Conformity specifications¹⁾	
Power supply U_i	30 V
Short circuit rating I_i	131 mA
Power limitation P_i	983 mW
Ambient temperature	-20 up to +41°C (depend on categories)
Internal capacity C_i	negligible
Internal inductivity L_i	negligible

1) homologation certificate PTB 07 ATEX 2003 X

Load diagram



Principle of operation

The transducer of the ultrasonic sensor emits short ultrasonic pulses, at 55 kHz to the measured product. These pulses are reflected by the product surface and received by the transducer as echoes. The running time of the ultrasonic pulses from emission to reception is proportional to the distance and hence to the level. An integrated temperature sensor detects the temperature in the vessel and compensates the influence of temperature on the signal running time. The determined level is converted into an appropriate output signal and outputted as an measured value.

Target applications with Type 8177

■ Continuous level measuring for fluids and solids.

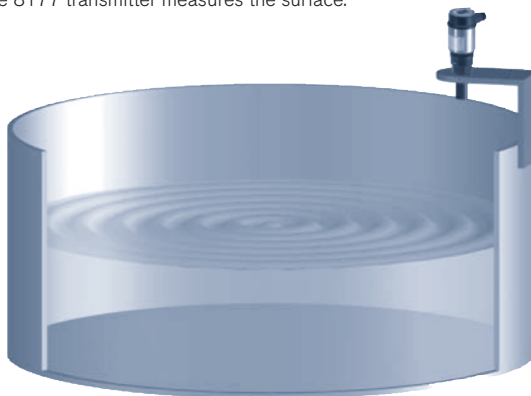


■ Distance measuring.



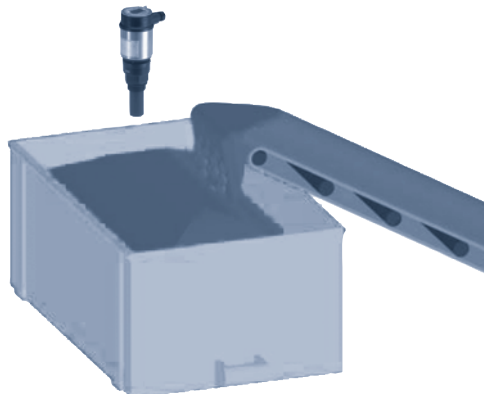
Open basins

A typical application for the 8177 ultrasonic transmitter is level measurement in open basins. Products such as rain water or sewage water, i.e. with impurities. Here is where the advantages of non-contact measurement with the 8177 come into their own: simple and maintenance-free. The degree of pollution of water or an accumulation of mud in the basin is not important, because the 8177 transmitter measures the surface.

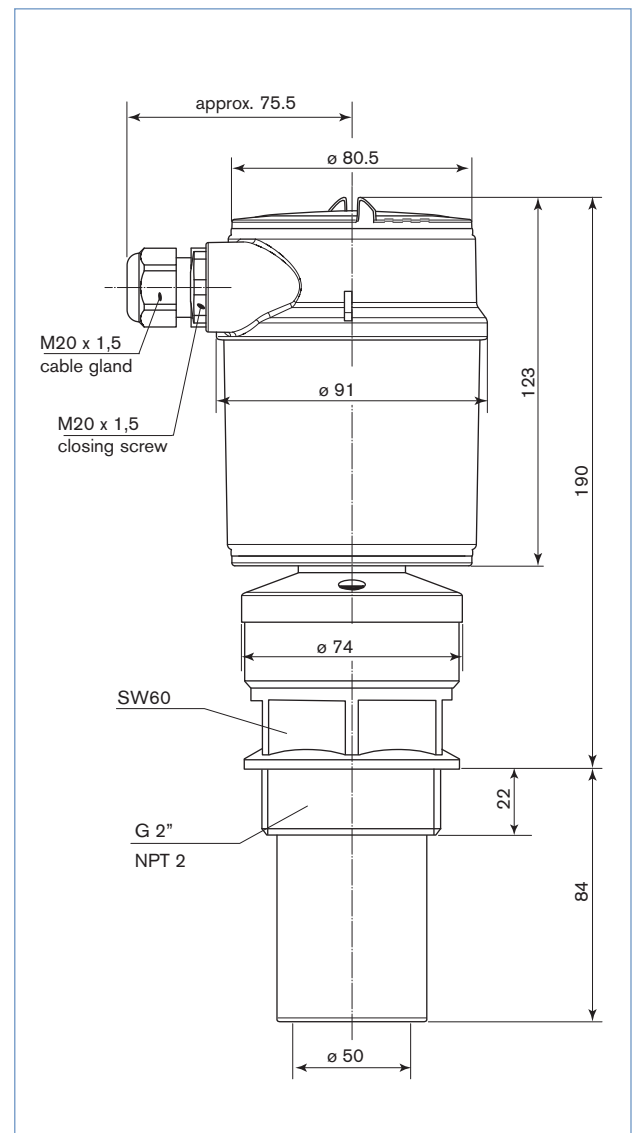


Sludge container

In sewage treatment plants, the accumulated sludge is dewatered and transported via conveyor belts to containers. The 8177 transmitter measures the filling of the container. An empty container can thus be readied in good time before the max. level is reached.



Dimensions [mm]



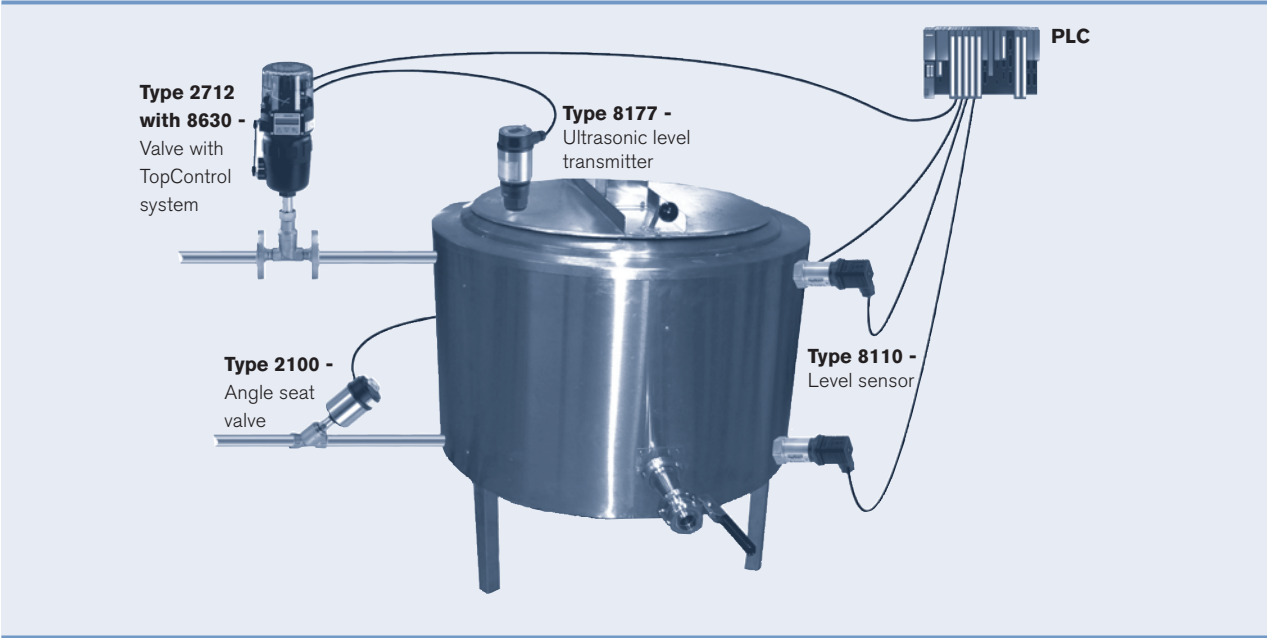
Ordering chart for compact transmitter Type 8177

Specifications	Voltage supply	Output	Electrical connection	Item no.	
				with program module and display	without program module no display
G 2" mounting thread	14-36 V DC	4-20 mA/HART (2 wires)	Cable gland M 20 x 1.5	558 224	559 243
NPT 2" mounting thread	14-36 V DC	4-20 mA/HART (2 wires)	Cable gland M 20 x 1.5	558 225	559 244
EEx version - ATEX approval G 2" mounting thread	14-30 V DC	4-20 mA/HART (2 wires)	Cable gland M 20 x 1.5	558 226	559 245

Ordering chart - accessories for transmitter Type 8177 (has to be ordered separately)

Specifications	Item no.
Set with 2 reductions M 20 x 1.5 / NPT1/2" + 2 neoprene flat seals for cable gland + 2 screw-plugs M 20 x 1.5	551 782
Program module with display	559 279

Interconnection possibilities with other Bürkert devices



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Simple float switch

- Switch for neutral and aggressive liquids
- NO/NC, alternating
- Reed contact
- Vertical or horizontal mounting
- Molded lying leads (Type 8181) or cable (Type TCL001)

Float switch with hermetically sealed reed contacts in a fixed switch part, switching triggered by magnets in floating switch part, reed contact implemented as alternator or normally open/closed; for neutral and aggressive liquids; not sensitive to dirt particles in the medium; cylindrical threading for simple installation in side of container.

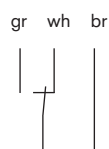
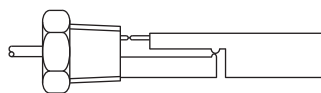
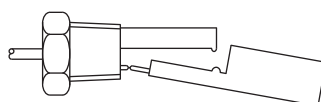
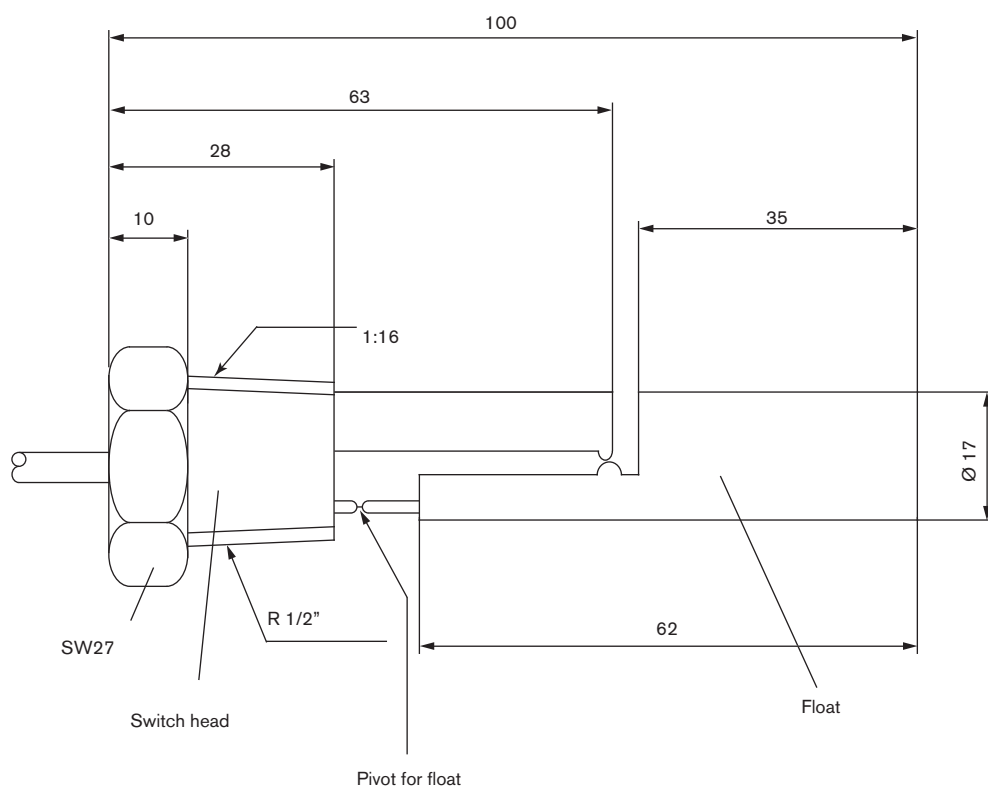
Different versions are available depending on material (PP or stainless steel), mounting position (horizontal or vertical) and equipment (relay).

Technical data - TCL001

Switching point	at tilt of $7^\circ \pm 3^\circ$ (8.5 mm $\pm$ 3 mm)
Switching function	normally closed/open or alternating
Normally closed/open	
Switching voltage	max. 250 V
Switching current	max. 1 A
Contact rating	max. 50 W / VA
Alternating	
Switching voltage	max. 150 V
Switching current	max. 0.25 A
Contact rating	max. 3 W / VA
Electrical connections	PVC cable, 3 m long (other cable lengths on request)
Protection class	IP 67
Operating temperature	-25 up to +105°C
Probe material	PP (PVDF on request)
Mounting position	horizontal
Thread	R 1/2"

Technical data - 8181		
General data	Type 8181 standard	Type 8181 with relay module
Switching point	at tilt of $7^{\circ} \pm 3^{\circ}$ (8.5 mm $\pm$ 3 mm)	at tilt of $7^{\circ} \pm 3^{\circ}$ (8.5 mm $\pm$ 3 mm)
Mounting position	Horizontal or vertical	Horizontal or vertical
Thread	G 1/4" (only for PP-horizontal version) or G1/8" for leads version and G3/4" for cable version	G 3/4"
Materials Housing, cover / Contact Stem, float Circlip (only vertical version) Cable plug, cable gland	- PP or stainless steel 304 (316L on request) PP or stainless steel 304 PA (if one)	PC / AgNi 90/10 PP or stainless steel 304 (316L on request) PP or Stainless steel 304 PA
Float density	approx. 0.7 ¹⁾	approx. 0.7 ¹⁾
Acceptable pressure PP version Stainless steel version	1 bar (vertical or horizontal mounting position) 10 bar (vertical mounting position) 5 bar (horizontal mounting position)	1 bar (vertical or horizontal mounting position) 10 bar (vertical mounting position) 5 bar (horizontal mounting position)
Medium temperature PP version Stainless steel version	-10 to +80°C -40 to +120°C	-10 to +80°C -40 to +120°C
Electrical connection	Leads 300 mm or cable 5m	Positionable M12 and EN175301-803 cable plug
Electrical cable	0.25 mm ² min. cross section leads or PVC covering cable, 0.25 mm ² min. cross section, 2 wires + shielding	-
Electrical data	Type 8181 standard	Type 8181 with relay module
Output type	Reed contact	1 single change-over contact
Switching function	Normally closed/open	Normally closed/open
Voltage	Switching: max. 48 V AC/DC	Max. 250 V AC / 30 V DC
Current	Switching: max. 0.25 A	Max. 3 A
Breaking power	66 VA AC/DC (only for PP-vertical version) 50 VA AC/DC	-
Contact resistance	Max. 150 mΩ Max. 200 mΩ (only for stainless steel horizontal version)	-
Breakdown voltage	min. 310 V AC (only for PP-vertical version) 600 V DC	-
Insulating resistance	Min. 10 MΩ	-
Number of cycles	-	100 000 acc. to standard VDE 0435
Current consumption	-	< 3 mA
Environment	Type 8181 standard	Type 8181 with relay module
Ambient temperature	- 10 to +80°C (operation and storage)	- 10 to +80°C (operation and storage)
Standards, directives and approvals	Type 8181 standard	Type 8181 with relay module
Protection class	IP 65	IP 65
Vibrations and shocks	20G (for stainless steel version)	-

Dimensions [mm] Type TCL001

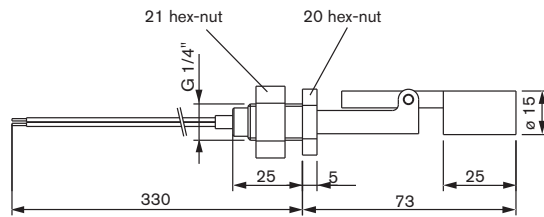


gr = green
wh = white
br = brown

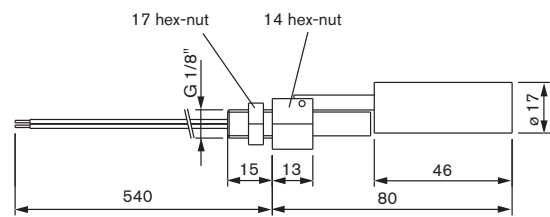
Dimensions [mm] Type 8181

Switch with leads

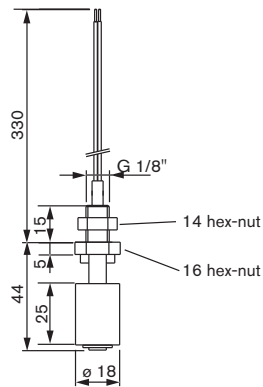
Horizontal, PP version



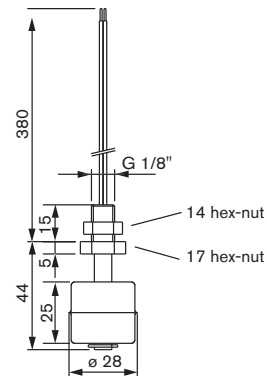
Horizontal, stainless steel version



Vertical, PP version

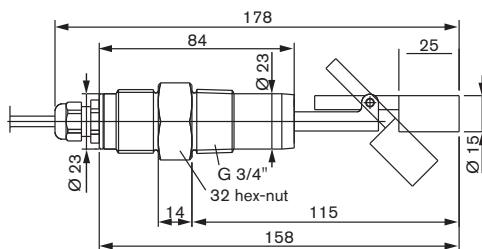


Vertical, stainless steel version

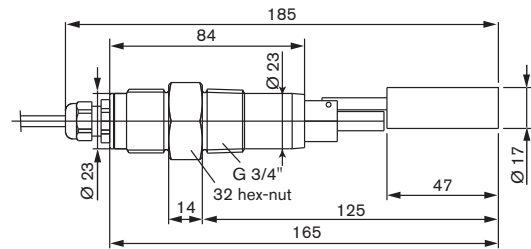


Switch with 5 m cable

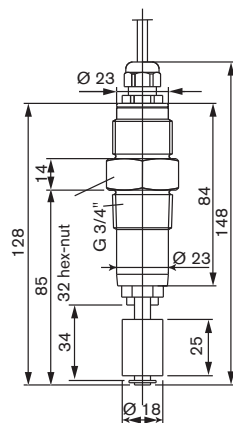
Horizontal, PP version



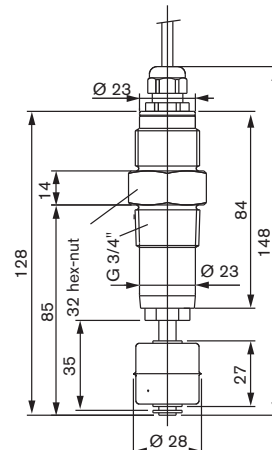
Horizontal, stainless steel version



Vertical, PP version



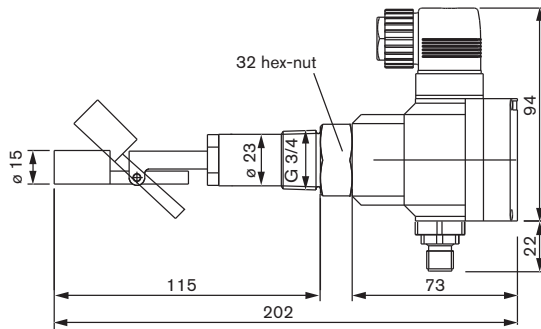
Vertical, stainless steel version



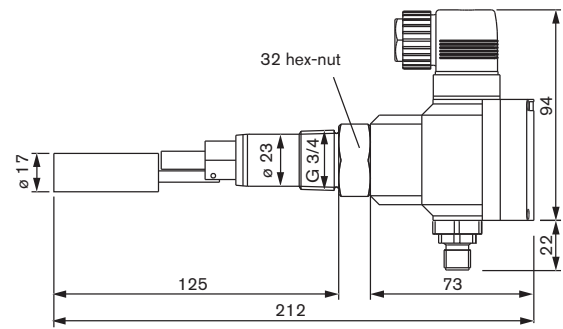
Dimensions [mm] Type 8181

Switch with relay module

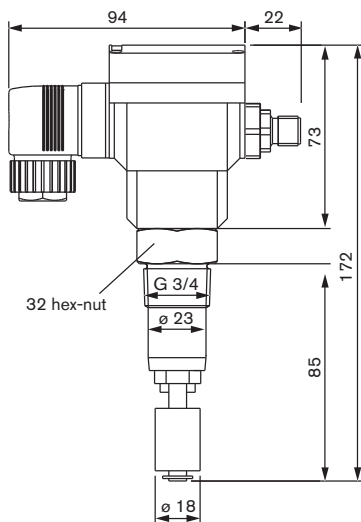
Horizontal, PP version



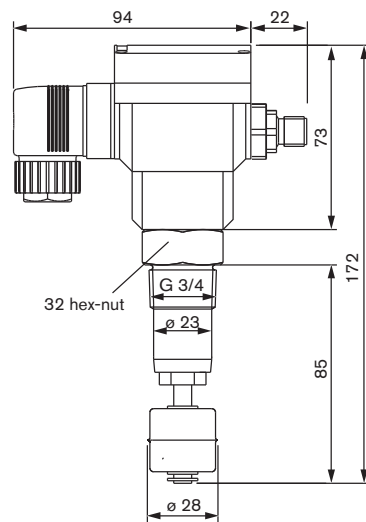
Horizontal, stainless steel version



Vertical, PP version



Vertical, stainless steel version



Ordering chart

Type	Connection	Material	Version	Switching current	Switching voltage	Switching function	Electrical connection	Item no.
TCL001	R1/2	PP	Horizontal	max 1 A	Max 250V	Normally closed/open*	3 m cable	783 793
					Max 150V	Alternating	3 m cable	783 794
8181	G1/4	PP	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 141
		PP	Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 132
		St. St.	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 150
			Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 159
	G3/4	PP	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 496
			Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 502
		St. St.	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 499
			Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 505
8181 with relay module supplied with 24 V DC	G3/4	PP	Horizontal	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 497
			Vertical	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 503
		St. St.	Horizontal	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 500
			Vertical	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 506

*Depending on mounting orientation

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please consult for advice.Subject to alteration.
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Vibrating level switch



- For universal use as overflow or dry run protection system
- Setup without adjustment
- Smallest mounting dimensions

Type 8110 can be combined with...



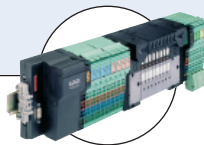
Type 2030

Diaphragm valve



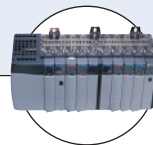
Type 8802-GD

ELEMENT globe control Valve system



Type 8644

Valve islands with electronic I/O



PLC

The 8110 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 small tuning fork (40 mm of length) allows the use in vessels, tanks and pipes.

Due to the simple and rugged measuring system, the 8110 is virtually unaffected by the chemical and physical features of the liquid. It works even under unfavourable conditions such as turbulences, air bubbles, foam generation, buildup or varying products.

i Further versions on request

- Clamp 1", 1 1/2" connection
- DIN 11851 DN25, DN40, DN50 connection
- SMS 1145 DN38 connection
- Quick on connection (IP65)
- Ra < 0.8 µm for G or NPT threaded connection

General data

Materials

Tuning fork and fitting
Process seal / Housing

Stainless steel 316L (1.4435)
Klingsil® C 4400/ Stainless steel 316L and plastic PEI

Weight

Approx. 250 g

Electrical connections

Cable plug acc. to EN 175301-803 or M12 x 1 male fixed connector

Process fitting

Thread G or NPT, 1/2", 3/4" or 1"; clamp 2"

Surface finishing quality

Ra < 3.2 µm (thread) / Ra < 0.8 µm (Clamp)

Dynamic viscosity / Density

0.1...10000 mPa.s / 0.7...2.5 g/cm³

Medium temperature

-40...+100°C (150°C for Clamp process connection)

Medium pressure

-1...64 bar

Accuracy

Hysteresis
Delay time / Frequency

Approx. 2 mm with vertical installation
Approx. 500 ms / Approx. 1200 Hz

Output

Transistor output PNP or contactless electronic switch

Electrical data - Sensor with PNP transistor output

Power supply / power consumption

10...35 V DC / max. 0.5 W

Load current

Max. 250 mA (output - overload and permanently short circuit proof)

Voltage loss

Max. 3 V DC

Turn-on voltage

Max. 34 V DC

Blocking current

<10 µA

Mode

Min./max changeover by electrical connection
Max.: overflow protection - Min.: dry run protection
LED indication: green and red

Electrical data - Sensor with contactless electronic switch output

Power supply

20...253 V AC, 50/60 Hz or 20...253 V DC

Domestic current requirement

Approx. 3 mA (via the load circuit) (Not with PLC)

Load current

Min. 10 mA - Max. 250 mA

Mode

Min./max changeover by electrical connection
Max.: overflow protection - Min.: dry run protection

Environment	
Ambient temperature	Operating
	-40...+70°C
	Storage
	-40...+80°C
Standards and approvals	
Protection class	IP65 with cable plug EN175301-803 mounted and tightened IP66/IP67 with M12 x 1, plug mounted
Standard	
EMC	EN 61326
Security	EN 61010-1

Target applications with type 8110

Chemical industry - solvents

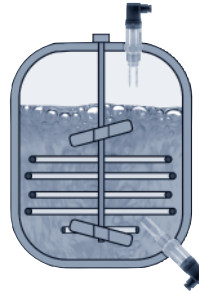


Beside the continuous level measurement, level detection is a main safety characteristics for storage tanks. Many modern sensors for continuous level measurement, however, are approved as overflow protection system, but a second, physically different measuring principle offers optimum safety and redundancy. Thanks to the manifold application possibilities, the Type 8110 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 8110 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



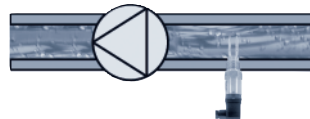
Chemicals are required for sewage water treatment. They are used for precipitation. Phosphate and nitrate are sedimented and separated. For the sludge treatment and neutralization, acids and solvents are stored apart from lime water and ferric chloride. These substances are subject to the regulations for water-endangering substances. Therefore overflow protection systems must be mounted on storage tanks.

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

Advantages:

- high reproductibility

Pipelines



Monitoring of levels is also important in pipelines as dry running often causes damages or failure of the pumps.

The Type 8110 level switch is recommended as dry run protection system, e.g. for drinking water pumps. With a fork of only 40 mm length, this level switch functions reliably - even with small tube diameters.

Advantages:

- universal level detection for all liquids
- 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).

Installation

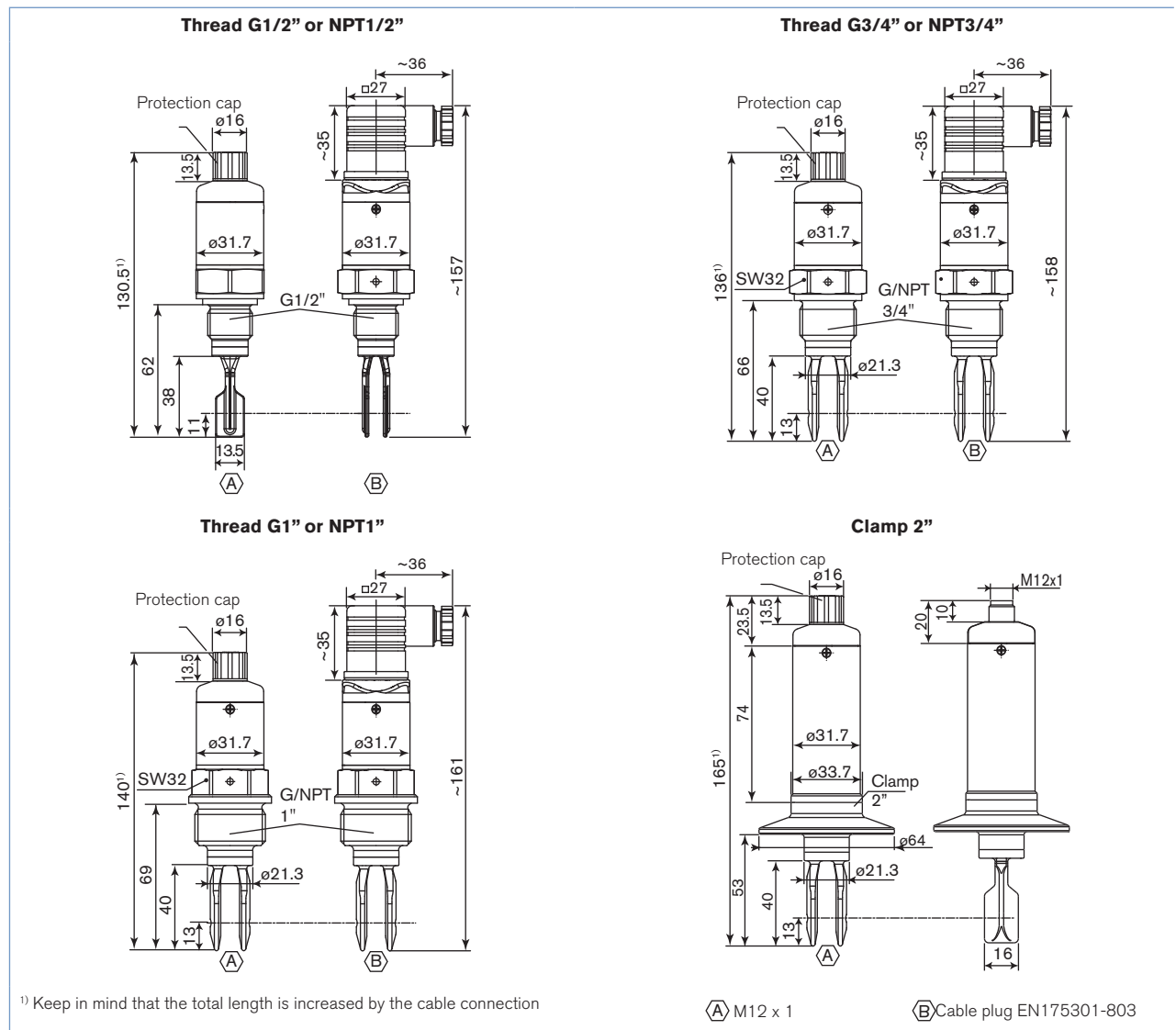
Inflowing material:

If the Type 8110 vibrating level switch is mounted in the filling stream, unwanted switching signals can be generated. Mount the switch at a location in the vessel where no disturbing influence from e.g. filling openings, agitators, etc. can occur.

Flow:

If there is movement within the product, the tuning fork of the switch should be mounted in such a way that the surfaces of the fork are parallel to the product movement.

Dimensions [mm]



Ordering chart for the vibrating level switch Type 8110

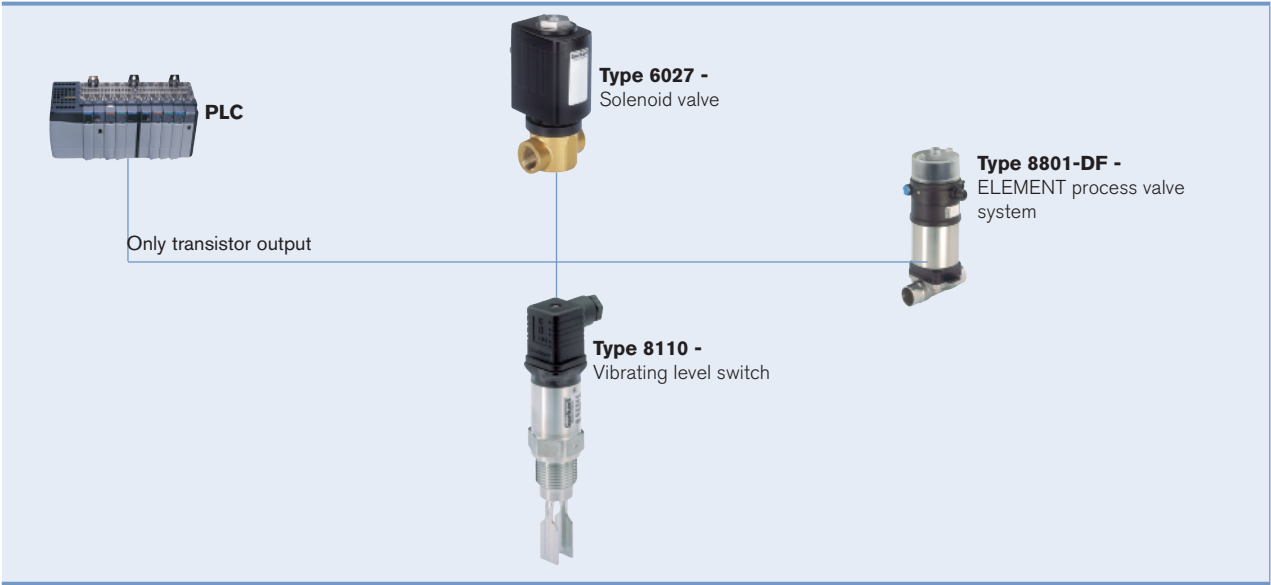
Output	Power supply	Process connection	Electrical connection	Item no.
Transistor PNP	10...35 V DC	G 1/2"	Cable plug EN 175301-803	563 554
			Multipin M12 x 1	563 474
		NPT 1/2"	Cable plug EN 175301-803	563 556
			Multipin M12 x 1	563 555
		G 3/4"	Cable plug EN 175301-803	555 291
			Multipin M12 x 1	555 290
		NPT 3/4"	Cable plug EN 175301-803	560 986
			Multipin M12 x 1	557 154
		G 1"	Cable plug EN 175301-803	555 293
Contactless electronic switch (Not with PLC)	20...253 V AC, 50/60 Hz or 20...253 V DC	G 3/4"	Cable plug EN 175301-803	555 296
			Cable plug EN 175301-803	555 298
		G 1"	Cable plug EN 175301-803	555 296
			Cable plug EN 175301-803	555 298

Other versions on request

Ordering chart for accessories for sensor Type 8110 (to be ordered separately)

Specifications	Item no.
5 pin M12 female connector moulded on cable (2 m, shielded)	438 680
5 pin M12 female cable connector with plastic threaded locking ring	917 116

Interconnection possibilities with other Bürkert devices



Customized sensor Type 8110 - request for quotation

Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Vibrating level switch 8110

Quantity: Desired delivery date:

■ **Process fitting connection:**

External thread ☐ G 1/2" ☐ NPT 1/2"
☐ G 3/4" ☐ NPT 3/4"
☐ G 1" ☐ NPT 1"

Clamp ☐ 1" ☐ 1 1/2" ☐ 2"

DIN 11851 ☐ DN25 ☐ DN40 ☐ DN50

SMS 1145 ☐ DN38

■ **Special rugosity** ☐ No ☐ Yes with Ra ext. = 0.8 µm

■ **Electrical connection** ☐ Cable plug EN175301-803 ☐ Multipin M12 x 1 ☐ Quick On

■ **Output signal and power supply** ☐ Transistor PNP and 10...35 V DC ☐ Contactless electronic and 20...253 V AC/DC

[reset form](#)

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In case of special application conditions,
please consult for advice.

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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 Ex

Type 8111 can be combined with...



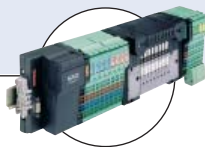
Type 2030

Diaphragm valve



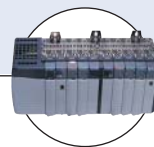
Type 2712

Globe control valve with TopControl



Type 8644

Valve islands with electronic I/O



PLC

The 8111 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.

Depending on the version it is also used for monitoring or control of levels in hazardous environments, even for combustible liquids, gases, fogs 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 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)
Process seal	Klingsil C 4400

Weight

approx. 890 g

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 $< 3.2 \mu\text{m}$ (thread) / Ra $< 0.8 \mu\text{m}$ (Clamp)

Viscosity dynamic

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

Density

0.5... 2.5 g/cm³ (selected by DIP switch) OR
0.7... 2.5 g/cm³

Fluid temperature

-50...+150°C (-58...+302°F)

Fluid pressure

-1...+64 bar (-14.51...+928.64 PSI)

Measurement deviation

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...+70°C (-40...+158°F) (Operating);
-40...+80°C (-40...+176°F) (Storage)

Electrical data - Sensor with relay output	
Output	Relay (DPDT), 2 floating spdts
Power supply	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. 1.3 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	via connection to an interface according to NAMUR
Open-circuit voltage	IEC 60947-5-6, approx. 8.2 V
Short-circuit current	U _o approx. 8.2 V I _u approx. 8.2 mA
Current consumption	
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
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	EN61326
Security	EN61010-1
ATEX ¹⁾	EN50014; EN50020; EN50284
NAMUR	IEC 60947-5-6 (EN 50227)
Specifications Ex	
Ex - Protection	Categories 1/2 G, 2G
Ex - Certification	Ex ia IIC T6
Conformity specifications¹⁾	
Power supply U _i	20 V
Short circuit rating I _i	103 mA
Power limitation P _i	516 mW
Ambient temperature	-40...+85°C (-40...+185°F) (depend on categories)
Internal capacity C _i	negligible
Internal inductivity L _i	negligible

1) homologation certificate PTB 07 ATEX 2004X

Target applications with type 8111

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 8111 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 8111 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.

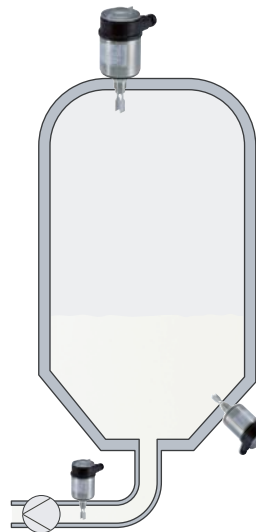
These substances are subject to the regulations for water-endangering substances. Therefore overflow protection systems must be mounted on storage tanks.

To avoid overfilling 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 8111 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.

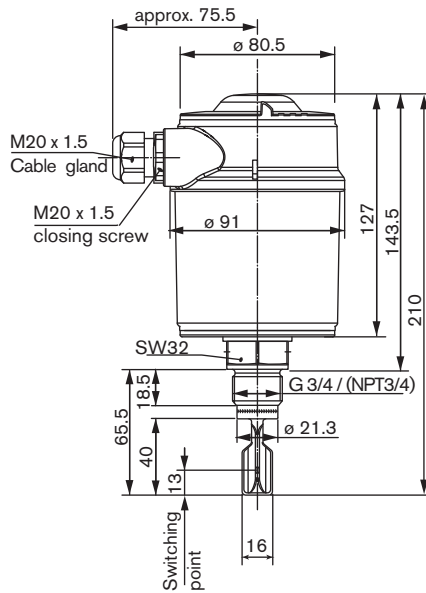
The integrated fault monitoring detects the following faults:

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

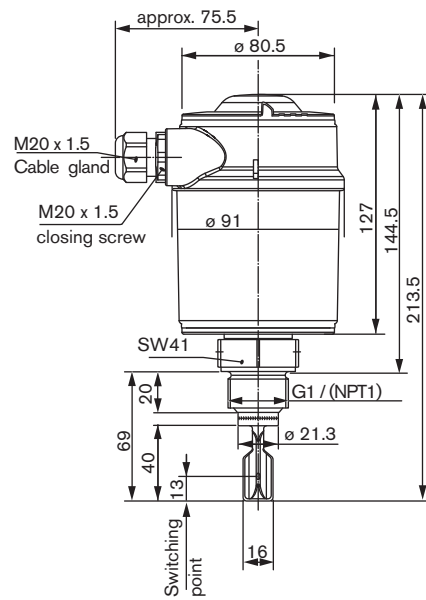
If one of these faults is detected or in case the power supply fails, the electronics takes on a defined switching condition, e.g. the output transistor blocks (safe condition).

Dimensions [mm]

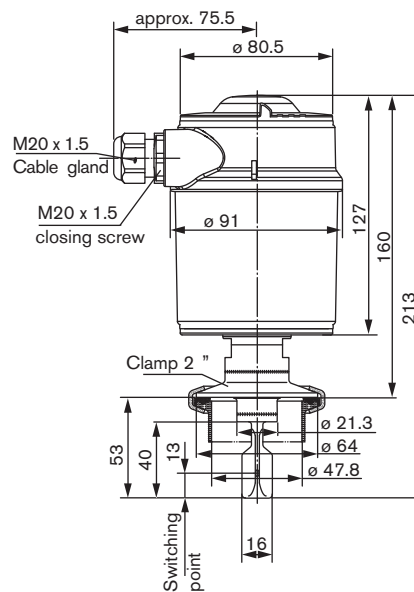
With G or NPT 3/4" connection



With G or NPT 1" connection



With Clamp 2" connection



Ordering chart for the vibrating level switch Type 8111

Output	Power supply	Process connection	Electrical connection	Item no.
Double relay (DPDT) , 2 floating spdts	20...72 V DC / 20...250 V AC (5 A)	G 3/4"	2 cable glands M20 x 1.5	558 110
		NPT 3/4"	2 cable glands M20 x 1.5	558 111
		G 1"	2 cable glands M20 x 1.5	558 112
		NPT 1"	2 cable glands M20 x 1.5	558 113
		Clamp 2"	2 cable glands M20 x 1.5	558 114
Namur signal - Ex version ATEX approval	8.2 V DC - via an intrinsic safety interface with NAMUR input	G 3/4"	1 cable gland M20 x 1.5	558 115
		G 1"	1 cable gland M20 x 1.5	558 116



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

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

Vibrating level switch Type 8111 - request for quotation

Note

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Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Vibrating level switch 8111

Quantity: Desired delivery date:

■ Process fitting connection:

External thread

☐ G 3/4"☐ NPT 3/4"☐ G 1"☐ NPT 1"

Clamp

☐ 1"☐ 1 1/2"☐ 2"

Flange

☐ DN 25☐ DN 40☐ DN 50

DIN 11851

☐ DN 25☐ DN 32☐ DN 40☐ DN 50

SMS 1145

☐ DN 38☐ DN 51

■ Special rugosity

☐ No☐ Yes with Ra ext. = 0.8 µm☐ Yes with Ra ext. = 0.3 µm

■ Output signal and power supply

☐ Double relay and 20...253 V AC - 20...72 V DC☐ NAMUR and 8...15 V DC

■ ATEX approval only with Namur Output

☐ Yes☐ No

reset form

* To find your nearest Bürkert facility, click on the orange box →

In case of special application conditions, please consult for advice.

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1503/11_EU-en_00891981

General purpose high pressure radar level measuring device

- For level measurement up to 30 m
- 4... 20 mA/Hart - 2 wires
- Adjustable via Display, key operation or PC-Tool with DTM
- ATEX approvals 

Type 8137 can be combined with...



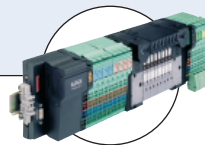
Type 8793
Process controller



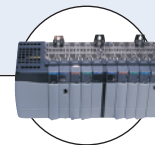
Type 2103
Diaphragm valve



Type 8802-GD
Element
control valve system



Type 8644
Valve islands



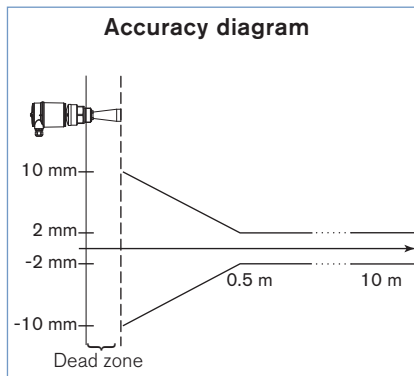
PLC

The Type 8137 is a non-contact radar level measuring device for continuous level measurement.

The unit is available in two versions:

- with thread and horn antenna (ø 40 mm) particularly suitable for use in small tanks and process vessels for measurement of almost any product.

- with flange and horn antenna (ø 40 or 75 mm) particularly suitable for use in storage tanks and process vessels for measurement of media such as solvent, hydrocarbons and fuels under extremely difficult process conditions.



General data

Materials

Housing / Cover	PBT, Stainless steel 316L (1.4404) / PC
Seal ring / Ground terminal	NBR / Stainless steel 316Ti/316L (1.4571/1.4435)
Wetted parts	
Process connection	Stainless steel 316L
Seal (threaded version)	Klingsil C-4400
Antenna	Stainless steel 316L
Antenna cone	PTFE (TFM 1600 PTFE)
Seal (antenna system)	FKM

Display*

LCD in full dot matrix (option)

Process connection

Thread G1½" or NPT1½"
Flange DN50 or 100 DIN2501, 2" or 4" ANSI B16.5

Electrical connection

Cable glands M20 x 1.5

Measuring value

Distance between process connection and product surface

Min. dielectric figure

$\epsilon_r > 1.6$

Dead zone

50 mm

Measuring range

0.05 to 10 m (recommended - antenna with ø 40 mm)
0.05 to 30 m (recommended - antenna with ø 75 mm)

Process temperature

-40 to +130°C (-40 to 266°F)

Vessel pressure

-1 to 40 bar (-14.51 to 580.4 PSI) (-100 to 4000 kPa)
or according to flange rules

Vibration resistance

Mechanical vibrations with 4 g and 5... 100 Hz

Temperature coefficient

0.03%/10K (Average temperature coefficient of the zero signal - temperature error)

Resolution

max. 1 mm

Frequency

K-band (26 GHz technology)

Interval

approx. 1 s

Beam angle at 3 dB

22° (antenna with ø 40 mm)
10° (antenna with ø 75 mm)

Adjustment time

> 1 s (dependent on the parameter adjustment)

Accuracy

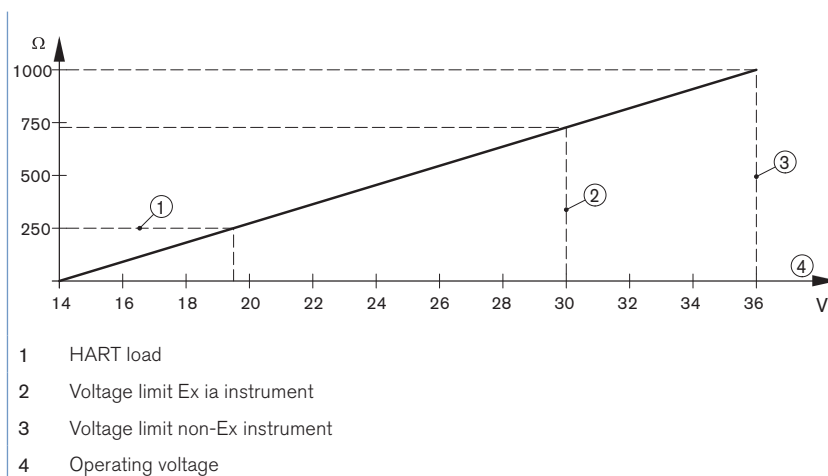
± 2 mm (see diagram)

* to be ordered separately

Electrical data	
Operating voltage	14 - 36 V DC or 14 - 30 V DC (Ex ia instrument)
Permissible residual ripple	< 100 Hz: U _{ss} < 1 V 100 Hz... 10 kHz: U _{ss} < 10 mV
Output signal	4... 20 mA/HART
Resolution	1.6 µA
Fault signal	current output unchanged 20.5 mA, 22 mA or < 3.6 mA (selectable)
Current limitation	22 mA
Load	see load diagram
Damping (63% of the input variable)	0... 999 s, adjustable
Environment	
Ambient temperature	-40 to +80°C (-40 to 176°F) (operation and storage)
Relative humidity	80% max; without condensation
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III
Protection class	II
Standard	
EMC	EN61326
Security	EN61010-1
NAMUR	NE 21; NE 43
Approvals	ATEX ¹⁾ : EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
Ex - Protection	Categories 1/2G or 2G
Ex - Certification	Ex ia IIC T6
Conformity specifications ¹⁾	
Operating voltage U _i	30 V
Short circuit rating I _i	131 mA
Power limitation P _i	983 mW
Ambient temperature	-40 to +55°C (-40 to 131°F) (dependent on categories)
Internal capacity C _i	negligible
Internal inductivity L _i	negligible

1) homologation certificate PTB 08 ATEX 2002X

Load diagram



Target applications

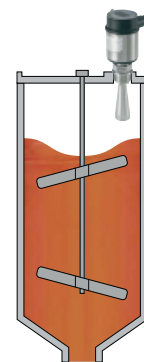
In storage tanks

Lacquers, paints and thinners are stored in tanks up to 15 m high. These substances require no pre-treatment and are fed directly to incinerators via smaller day tanks. Agitators inside the tanks prevent fibrous materials and colour pigments from clumping and settling on the bottom. The 8137 radar measuring device is the ideal solution here for level measurement. The radar measurement is unaffected by ambient conditions, such as strong vapour emission of the waste, and delivers accurate measuring results even when the agitators are in motion.



In the digester, in the decanter

The bauxite is decomposed by adding thinned caustic soda and mixing it thoroughly with the bauxite in the digester. To achieve an optimal utilisation of the process, it is important to regulate the filling level in a fixed range. Contactless radar technology has all the right prerequisites for this measurement task. The 8137 radar measuring device records the current level and passes it on to the control system. Even the rotating agitator blades do not disrupt the measurement. Also in the decanter, which immediately follows the digester, the 8137 reliably performs its service in temperatures up to 200°C and pressures up to 40 bar. The steam atmosphere prevailing in the vessel does not affect the measurement either.



Principle of operation

The radar measuring device consists of an electronic housing, a process connection element the antenna and a sensor. The antenna emits short radar pulses with a duration of approximate 1 ns to the medium. These pulses are reflected by the medium surface and received by the antenna as echoes. Radar waves travel at the speed of light. The running time of the radar pulses from emission to reception is proportional to the distance and hence to the level. The determined level is converted into an output signal and transmitted as a measured value.

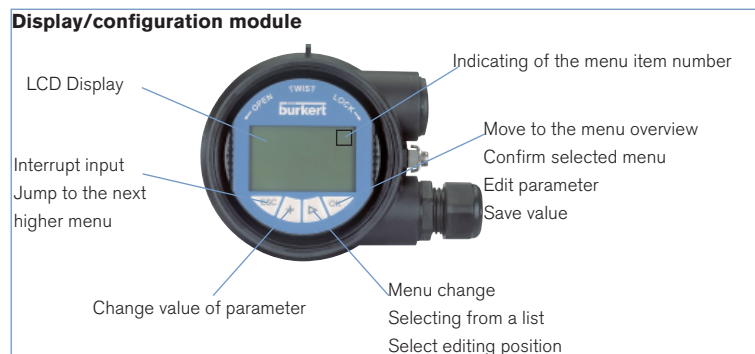
The measuring device can be adjusted with:

- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC
- a HART handheld

The entered parameters are generally saved in the measuring device Type 8137. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or save in a file by using PACTware™/DTM

► Set up with display/configuration module

The display/configuration module can be inserted into the measuring device and removed again at any time. It is not necessary to interrupt the power supply. The measuring device is adjusted via the four keys of the display/configuration module



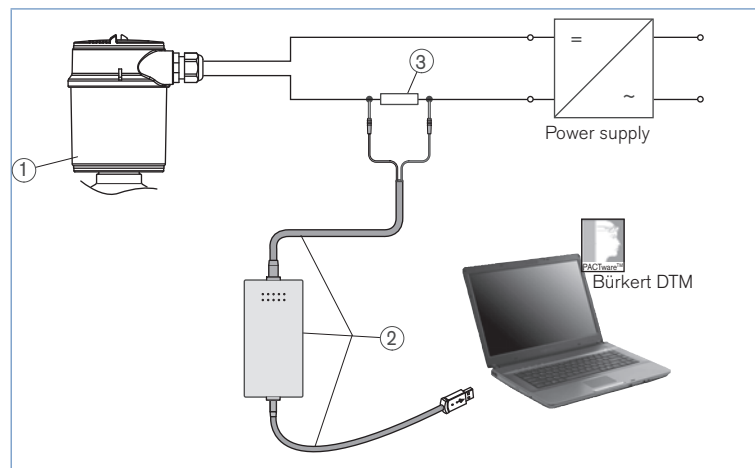
► Set up with PACTware™/DTM and HART communication

Connecting the PC via HART

1. Measuring device 8137
2. HART-USB Modem
3. Resistance 250 Ohms

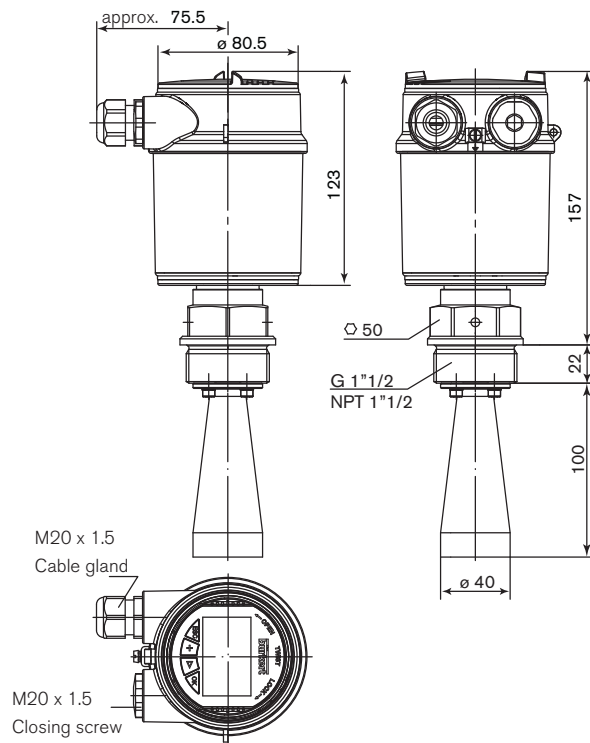
Necessary components:

- Measuring device 8137
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit

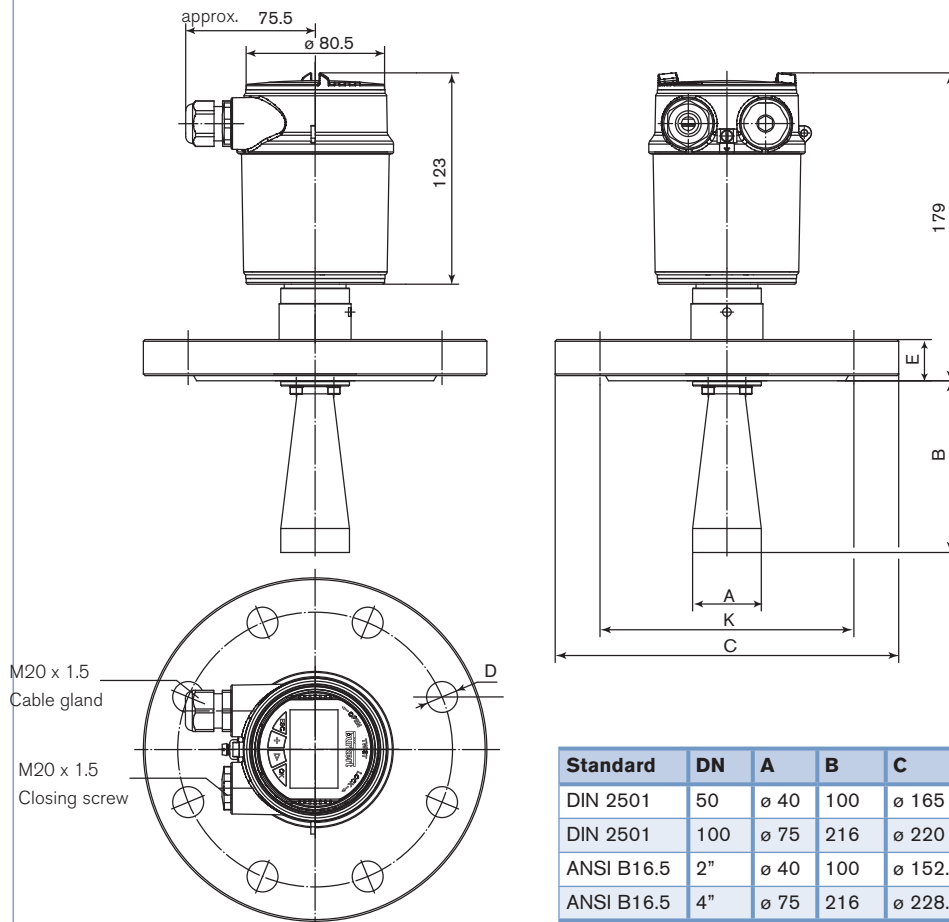


Dimensions [mm]

Thread horn antenna version



Flange horn antenna version



Standard	DN	A	B	C	E	D	K
DIN 2501	50	ø 40	100	ø 165	20	4 x ø18	ø 125
DIN 2501	100	ø 75	216	ø 220	20	8 x ø18	ø 180
ANSI B16.5	2"	ø 40	100	ø 152.4	19.1	4 x ø19.1	ø 120.7
ANSI B16.5	4"	ø 75	216	ø 228.6	23.9	8 x ø19.1	ø 190.5

Ordering chart for compact measuring device Type 8137

Specifications	Operating voltage	Output	Antenna version	Process connection	Electrical connection	Item no. without display / configuration module
Standard version	14 - 36 V DC	4... 20 mA/HART (2 wires)	ø 40 mm	G1 1/2"	Cable gland M20 x 1.5	560 157
				NPT1 1/2"	Cable gland M20 x 1.5	560 159
				Flange DN50 DIN2501 / 40 bar	Cable gland M20 x 1.5	560 161
				Flange 2" ANSI B16.5 / 150 lb RF	Cable gland M20 x 1.5	560 163
			ø 75 mm	Flange DN100 DIN2501 / 40 bar	Cable gland M20 x 1.5	560 165
				Flange 4" ANSI B16.5 / 150 lb RF	Cable gland M20 x 1.5	560 167
Ex version - ATEX approval	14 - 30 V DC	4... 20 mA/HART (2 wires)	ø 40 mm	G1 1/2"	Cable gland M20 x 1.5	560 158
				NPT1 1/2"	Cable gland M20 x 1.5	560 160
				Flange DN50 DIN2501 / 16 bar	Cable gland M20 x 1.5	560 162
				Flange 2" ANSI B16.5 / 150 lb RF	Cable gland M20 x 1.5	560 164
			ø 75 mm	Flange DN100 DIN2501 / 40 bar	Cable gland M20 x 1.5	560 166
				Flange 4" ANSI B16.5 / 150 lb RF	Cable gland M20 x 1.5	560 168



Further versions on request



Process connection

Flange
 DN80 PN40 Form C DIN2501
 DN150 PN40 Form C DIN2501
 DN200 PN40 Form C DIN2501
 3" 150 lb RF; ANSI B16.5
 6" 150 lb RF; ANSI B16.5
 8" 150 lb RF; ANSI B16.5



Additional

Antenna ø 48 mm, 95 mm

Please also use the "request for quotation" on page 6

for ordering a customized measuring device. [go to page](#)

Ordering chart - accessories for measuring device Type 8137 (has to be ordered separately)

Specifications	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
Hart-USB Modem	560 177
Set with a display/configuration module, a transparent cover and a seal ring	559 279
Set with a transparent cover and a seal ring	561 006

Customized measuring device Type 8137 - request for quotation

Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Radar level measuring device 8137

Quantity: Desired delivery date:

■ Antenna

- ☐ Horn ø 40 mm (10 m) ☐ Horn ø 75 mm (30 m) ☐ Parabolic ø 245 mm (35 m)
☐ Horn ø 48 mm (15 m) ☐ Horn ø 95 mm (30 m)

■ Process connection:

External thread

- ☐ G1 1/2" ☐ NPT1 1/2"

Flange

- ☐ DN50 PN40, Form C, DIN2501 ☐ 2" 150 lb RF, ANSI B16.5
☐ DN80 PN40, Form C, DIN2501 ☐ 3" 150 lb RF, ANSI B16.5
☐ DN100 PN40, Form C, DIN2501 ☐ 4" 150 lb RF, ANSI B16.5
☐ DN150 PN40, Form C, DIN2501 ☐ 6" 150 lb RF, ANSI B16.5
☐ DN200 PN40, Form C, DIN2501 ☐ 8" 150 lb RF, ANSI B16.5

■ Display/configuration module

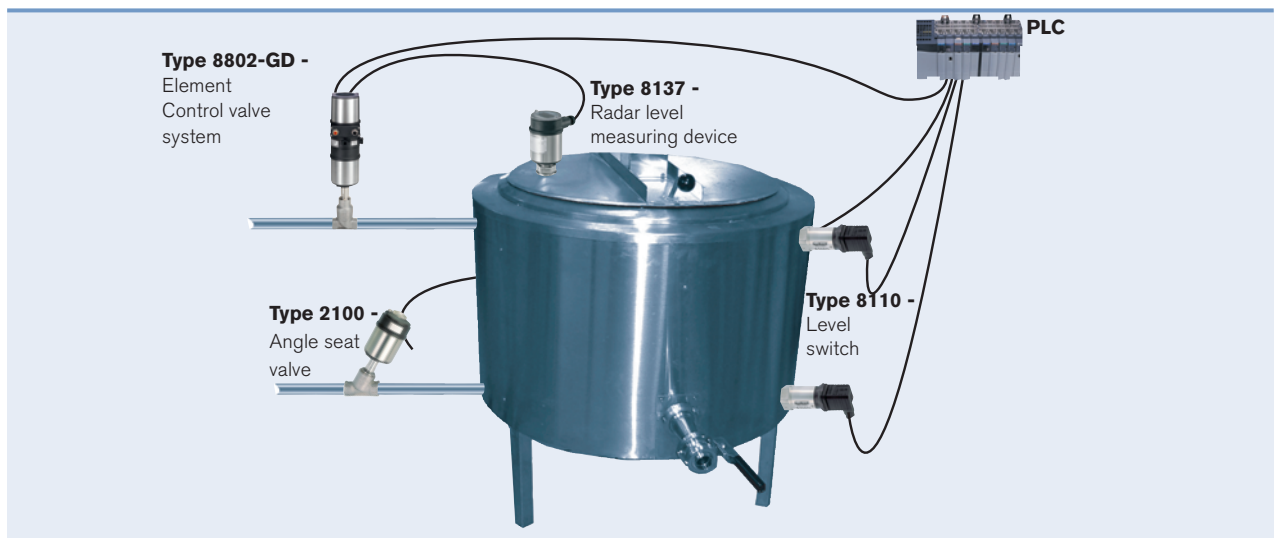
- ☐ Yes ☐ No

■ ATEX approval

- ☐ Yes ☐ No

reset form

Interconnection possibilities with other Bürkert devices



*To find your nearest Bürkert office, click on the orange box →



In case of special application conditions, please consult for advice.

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1412/9_EU-en_00895042



Radar level measuring device for hygienic applications

- For level measurement up to 20 m
- 4... 20 mA/Hart - 2 wires
- Adjustable via Display, key operation or PC-Tool with DTM
- ATEX approvals 

Type 8138 can be combined with...



Type 8793

Process controller



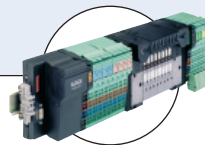
Type 2103

Diaphragm valve



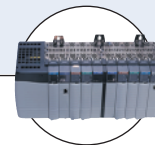
Type 8802-GD

Element
control valve system



Type 8644

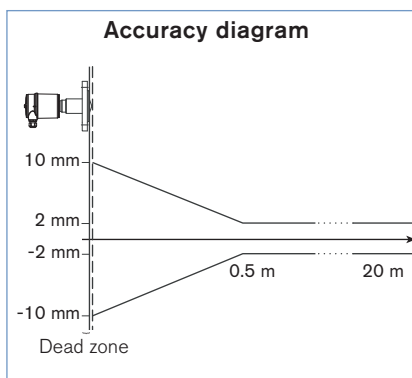
Valve islands



PLC

The Type 8138 is a non-contact radar level measuring device for continuous level measurement.

It is particularly suitable for use in small vessels that contain beverage liquids under sanitary process conditions.



General data	
Materials	
Housing / Cover	PBT, Stainless steel 316L (1.4404) / PC
Seal ring / Ground terminal	NBR / Stainless steel 316Ti/316L (1.4571/1.4435)
Wetted parts	
Process connection / Antenna / Seal	Stainless steel 316L / TFM-PTFE / EPDM
Display*	LCD in full dot matrix (option)
Process connection	Clamp 2", DN25 connection adapted for GEA Tuchenhagen VARIN-LINE process connections, Flange DN50, DN100 DIN2501
Torque of the flange screws	60 Nm
Electrical connection	Cable glands M20 x 1.5
Measuring value	Distance between process connection and product surface
Min. dielectric figure	$\epsilon_r > 1.6$
Dead zone	50 mm (from flange)
Measuring range	0.05 to 10 m (Clamp 2", DN25 connection or flange DN50 version) 0.05 to 20 m (flange DN100)
Process temperature	
with Clamp, flange connection	-40 to +200°C (-40 to 392°F)
with DN25 connection	-40 to +130°C (-40 to 266°F)
Vessel pressure	
with Clamp connection	-1 to 16 bar (-14.51 to 232.16 PSI) (-100 to 1600 kPa)
with DN25 connection	-1 to 10 bar (-14.51 to 145.1 PSI) (-100 to 1000 kPa)
with flange connection	according to flange rules
Vibration resistance	Mechanical vibrations with 4 g and 5... 100 Hz
Temperature coefficient	0.03%/10K (Average temperature coefficient of the zero signal - temperature error)
Resolution	max. 1 mm
Frequency	K-band (26 GHz technology)
Interval	approx. 1 s
Beam angle at 3 dB	18° (Measuring range 0.05 to 10 m) 10° (Measuring range 0.05 to 20 m)
Adjustment time	> 1 s (dependent on the parameter adjustment)
Accuracy	± 2 mm (see diagram)

* to be ordered separately

Electrical data	
Operating voltage	14 - 36 V DC or 14 - 30 V DC (Ex ia instrument)
Permissible residual ripple	< 100 Hz: U _{ss} < 1 V 100 Hz... 10 kHz: U _{ss} < 10 mV
Output signal	4... 20 mA/HART
Resolution	1.6 µA
Fault signal	current output unchanged 20.5 mA, 22 mA or < 3.6 mA (selectable)
Current limitation	22 mA
Load	see load diagram
Damping (63% of the input variable)	0... 999 s, adjustable
Environment	
Ambient temperature	-40 to +80°C (-40 to 176°F) (operation and storage)
Relative humidity	80% max; without condensation
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III
Protection class	II
Standard	
EMC	EN61326
Security	EN61010-1
NAMUR	NE 21; NE 43
Approvals	ATEX ¹⁾ : EN60079-0; EN60079-11; EN60079-26 FDA
Specifications Ex	
 - Protection	Categories 1/2G or 2G
 - Certification	Ex ia IIC T6
Conformity specifications ¹⁾	
Operating voltage U _i	30 V
Short circuit rating I _i	131 mA
Power limitation P _i	983 mW
Ambient temperature	-40 to +55°C (-40 to 131°F) (dependent on categories)
Internal capacity C _i	negligible
Internal inductivity L _i	negligible

1) homologation certificate PTB 08 ATEX 2002X

Target applications

In highly purified water

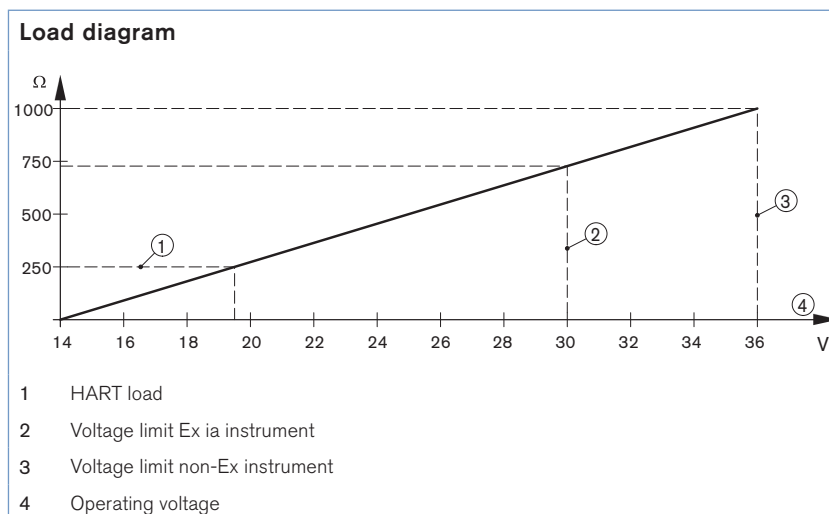
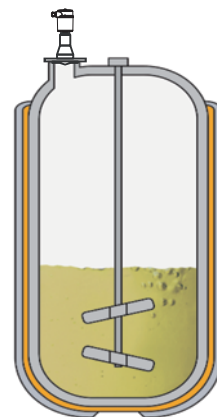
The manufacture of products, which are either injected directly into the bloodstream, or administered as nose or eye drops, requires high purity water (WFI). The measuring device 8138 is especially suitable for level measurement in the WFI storage tank. The contactless measurement is unaffected by pressure or vacuum. The front flush antenna of the Type 8138 guarantees optimum CIP and SIP cleaning results. The antenna is PTFE encapsulated to protect it against highly ionised water.



In the stirring and preparation vessel

Processes like yoghurt production take place in controlled, highly sterile surroundings. They therefore place heavy demands on the cleanliness of all parts that touch the medium. The cleaning processes themselves are correspondingly thorough. Contamination with foreign bacteria would lead to spoilage of the entire batch.

The radar measuring device 8138 lends itself well for reliable level measurement here. The contactless measuring principle is not affected by the density changes in the yoghurt and the abrasiveness of the fruits. The front-flush antenna allows optimal CIP and SIP cleaning, is insensitive to high-pressure water jets and doesn't show thermal shock behaviour.



Principle of operation

The radar measuring device consists of an electronic housing, a process connection element the antenna and a sensor. The antenna emits short radar pulses with a duration of approximate 1 ns to the medium. These pulses are reflected by the medium surface and received by the antenna as echoes. Radar waves travel at the speed of light. The running time of the radar pulses from emission to reception is proportional to the distance and hence to the level. The determined level is converted into an output signal and transmitted as a measured value.

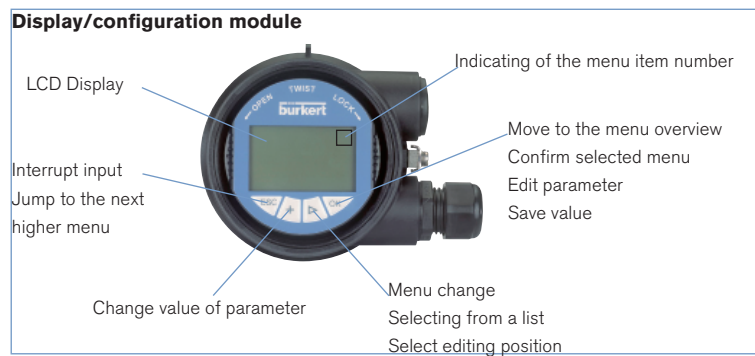
The measuring device can be adjusted with:

- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC
- a HART handheld

The entered parameters are generally saved in the measuring device Type 8138. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or save in a file by using PACTware™/DTM

► Set up with display/configuration module

The display/configuration module can be inserted into the measuring device and removed again at any time. It is not necessary to interrupt the power supply. The measuring device is adjusted via the four keys of the display/configuration module

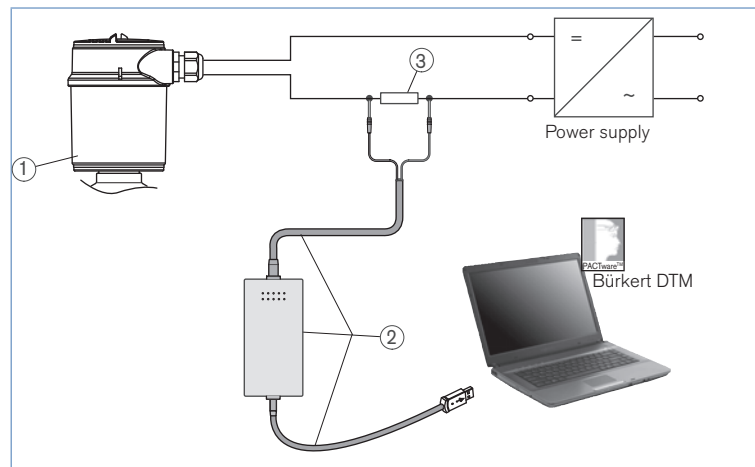


Connecting the PC via HART

1. Measuring device 8138
2. HART-USB Modem
3. Resistance 250 Ohms

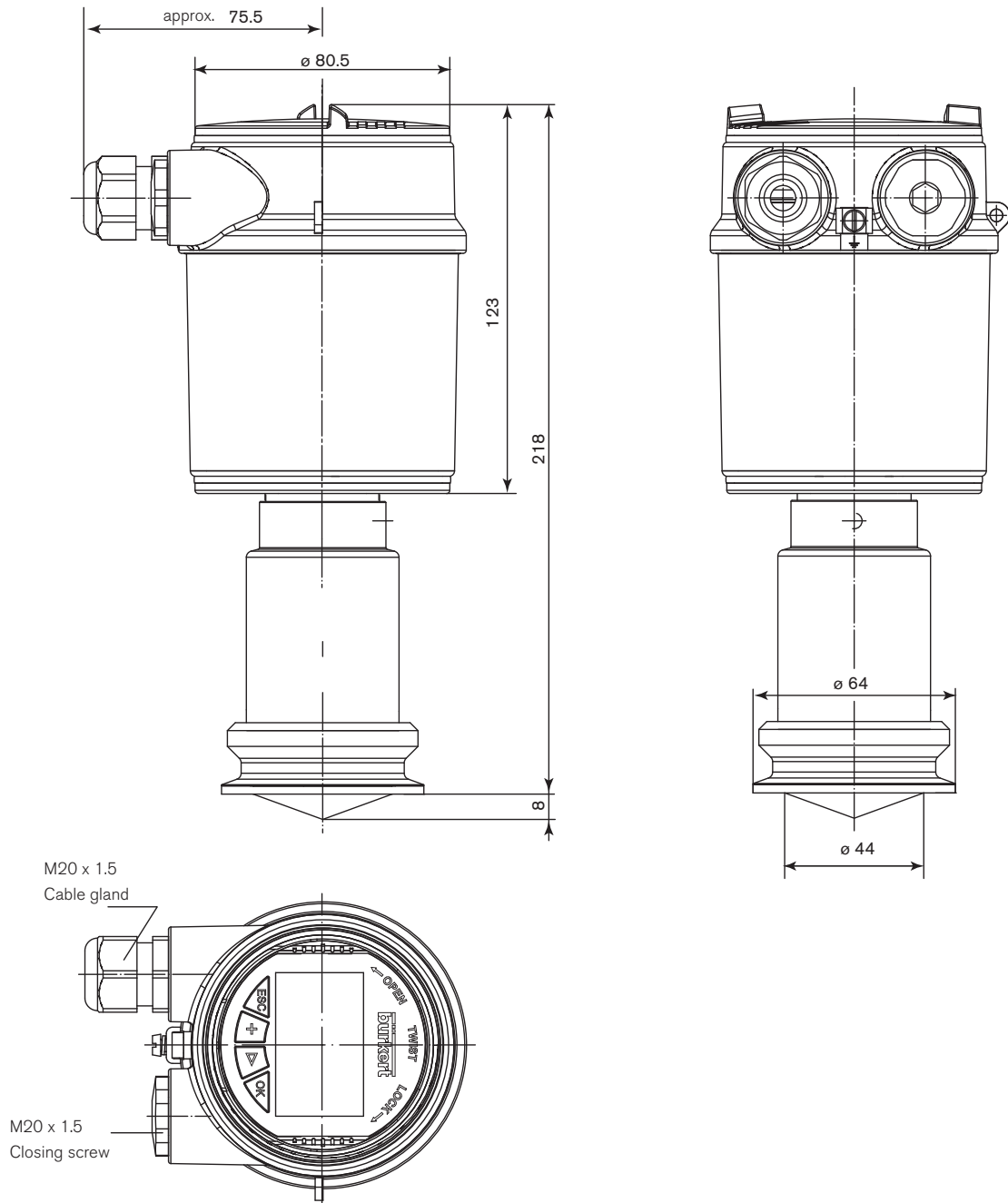
Necessary components:

- Measuring device 8138
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit



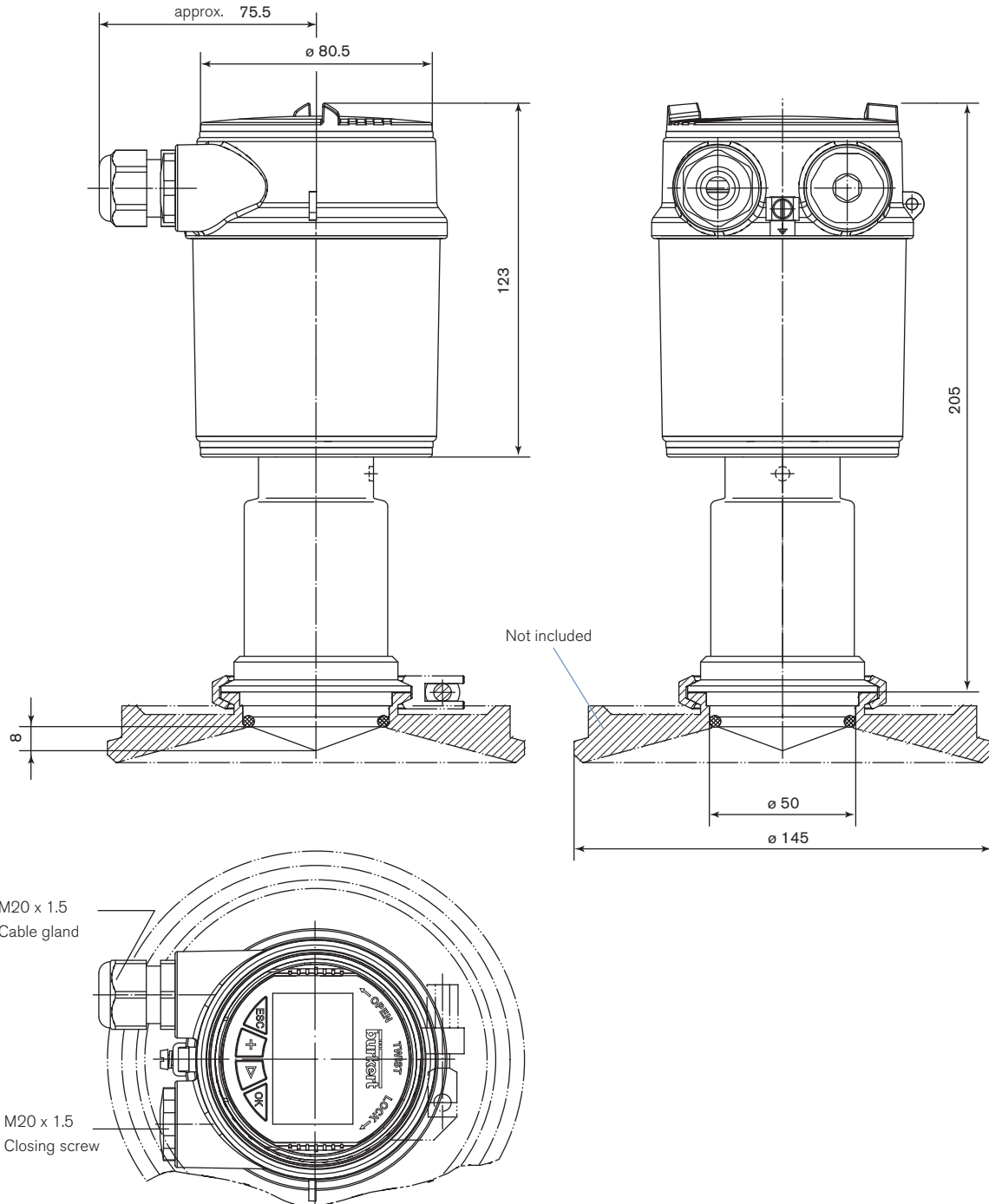
Dimensions [mm]

Clamp connection



Dimensions [mm]

DN25 connection adapted for GEA Tuchenhagen VARINLINE process connections



Flange connection



Ordering chart for compact measuring device Type 8138

Specifications	Operating voltage	Output	Process connection	Electrical connection	Item no. without display/configuration module
Standard version	14 - 36 V DC	4... 20 mA/HART (2 wires)	Clamp 2"	Cable gland M20 x 1.5	560 169
			DN25 connection adapted for GEA Tuchenha- gen VARINLINE process connections	Cable gland M20 x 1.5	560 171
			Flange DN50 DIN2501 / 16 bar	Cable gland M20 x 1.5	560 173
			Flange DN100 DIN2501 / 16 bar	Cable gland M20 x 1.5	560 175
Ex version - ATEX approval	14 - 30 V DC	4... 20 mA/HART (2 wires)	Clamp 2"	Cable gland M20 x 1.5	560 170
			DN25 connection adapted for GEA Tuchenha- gen VARINLINE process connections	Cable gland M20 x 1.5	560 172
			Flange DN50 DIN2501 / 16 bar	Cable gland M20 x 1.5	560 174
			Flange DN100 DIN2501 / 16 bar	Cable gland M20 x 1.5	560 176

 Further versions on request


Process connection

Flange DN80 PN40 Form C DIN2501
 DN150 PN16 Form C DIN2501
 DN150 PN40 Form C DIN2501
 2" 150 lb RF; ANSI B16.5
 3" 150 lb RF; ANSI B16.5
 4" 150 lb RF; ANSI B16.5
 6" 150 lb RF; ANSI B16.5

Clamp 3" ; 4"

Please also use the "request for quotation" on page 8
 for ordering a customized measuring device. [go to page](#)

Ordering chart - accessories for measuring device Type 8138 (has to be ordered separately)

Specifications	Item no.
Set with 2 reductions M20 x 1.5/NPT $\frac{1}{2}$ " + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 x 1.5	551 782
Hart-USB Modem	560 177
Set with a display/configuration module, a transparent cover and a seal ring	559 279
Set with a transparent cover and a seal ring	561 006

Customized measuring device Type 8138 - request for quotation

Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

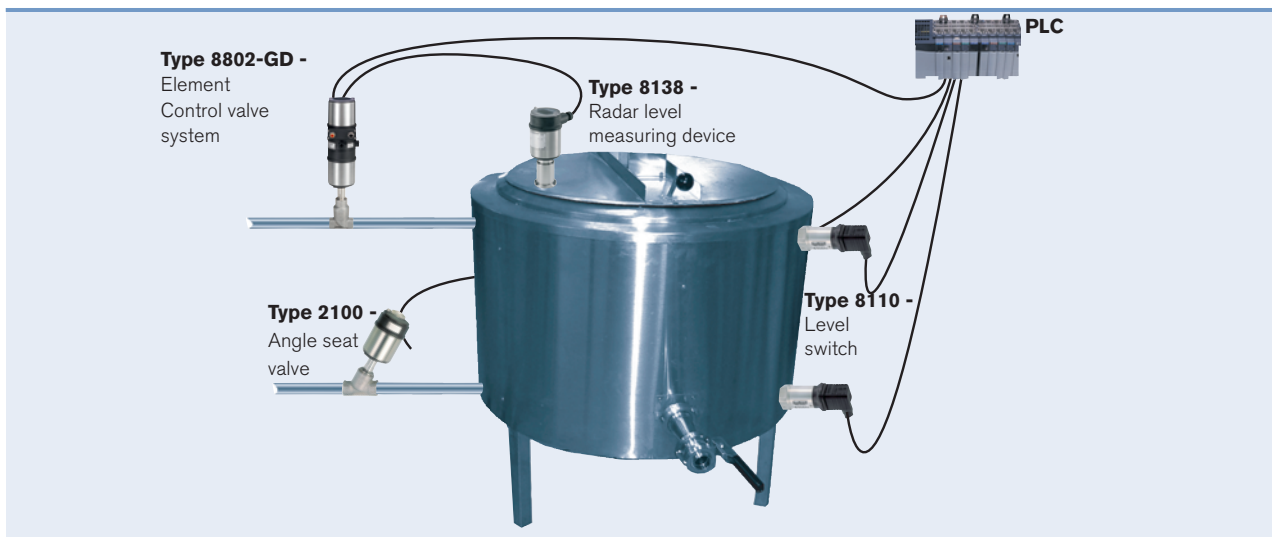
Radar level measuring device 8138

Quantity: Desired delivery date:

■ Antenna		☐ Encapsulated horn (-40... 200°C)	☐ Hygienic encapsulated horn (-40... 130°C)
■ Process connection:			
Clamp	☐ 2"	☐ 2½"	☐ 3" ☐ 4"
Bolting DIN 11851	☐ DN50 PN16,	☐ DN65 PN16	☐ DN80 PN16 ☐ DN100 PN16
Hygienic fitting	☐ with tension flange DN32 PN16		☐ with compression nut F40 PN16
Aseptic Bolting DIN 11864-2-A	☐ DN50 (O-ring at vessel)	☐ DN60 (O-ring at vessel)	☐ DN80 (O-ring at vessel)
SMS 1145	☐ DN51		☐ DN76
Neuno Biocontrol	☐ Size 50 PN16		
Flange	☐ DN50 PN40, Form C, DIN2501		☐ 2" 150 lb RF, ANSI B16.5
	☐ DN80 PN40, Form C, DIN2501		☐ 3" 150 lb RF, ANSI B16.5
	☐ DN100 PN40, Form C, DIN2501		☐ 4" 150 lb RF, ANSI B16.5
	☐ DN150 PN40, Form C, DIN2501		☐ 6" 150 lb RF, ANSI B16.5
	☐ DN200 PN40, Form C, DIN2501		☐ 8" 150 lb RF, ANSI B16.5
DN25 connection adapted for GEA Tuchenhausen VARINLINE process connections	☐ DN25... PN10		
■ Display/configuration module	☐ Yes ☐ No		
■ ATEX approval	☐ Yes ☐ No	■ FDA approval	☐ Yes ☐ No

reset form

Interconnection possibilities with other Bürkert devices



*To find your nearest Bürkert office, click on the orange box →

In case of special application conditions,
please consult for advice.Subject to alteration.
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1412/10_EU-en_00895043

Guided microwave level measurement device

- Universal level measurement device for liquids
- Liquid interface measurement
- Insensitive to dust and steam
- 4... 20 mA/HART - 2 wires, ATEX/IECEx approvals 

Type 8188 can be combined with...



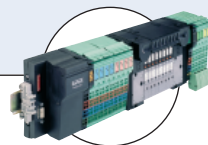
Type 8619
multiCELL
Transmitter/Controller



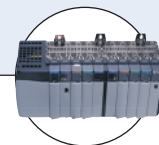
Type 2035
Diaphragm valve



Type 8802-GD
Continuous
TopControl system



Type 8644
Valve islands



PLC

The Type 8188 is a level measurement device with cable, rod, both interchangeable probe or with coax probe, designed for continuous level measurement. The unit is suitable for liquids, for industrial use in all areas of process technology. With a measuring range up to 75 m, the 8188 is best suited for tall vessels.

Even process conditions such as strong steam generation, density fluctuations or changes of the dielectric constant do not influence the accuracy of the measurement.

Build-up or condensation on the probe or vessel wall do not influence the measuring result. A liquid interface measurement is also possible with the Type 8188, typically an oil/water interface.

General data

Materials

Housing / Cover
Seal ring / Ground terminal
Wetted parts
Process fitting
Rod and cable

PBT, Stainless steel 316L (1.4404) / PC
NBR / Stainless steel 316L

Coax-ø 21.3 mm -
Process seal
Inner conductor
(up to the separation cable/rod)
Spacers
Rod-ø 8 mm
Cable-ø 4 mm with gravity weight
Coax-ø 21.3 mm (tube)

Stainless steel 316L* and PPS for version up to 6 bar
Stainless steel 316L* and PEEK for version up to 40 bar
Stainless steel 316L* and PEEK
FKM

Stainless steel 316L*
PFA (only for coax. probe version)
Stainless steel 316L*
Stainless steel 316L*
Stainless steel 316L*

Display

LCD in full dot matrix

Weight

Housing
Rod-ø 8 mm
Cable-ø 4 mm
Coax-ø 21.3 mm
Gravity weight (only with cable version)

890 g
approx. 400 g/m
approx. 60 g/m
approx. 1110 g/m
approx. 200 g

Process fitting

Thread G or NPT - 3/4", 1"

Length

Rod-ø 8 mm
Cable-ø 4 mm
Coax-ø 21.3 mm

0.3... 6 m - Lateral load: 10 Nm
0.5... 75 m - Max. tensile load: 2.5 KN
0.3... 6 m - Lateral load: 60 Nm

Electrical connections

Cable gland M20 x 1.5

Measurement type

Level of liquids

Min. dielectric figure

Rod and cable
Coax-ø 21.3 mm

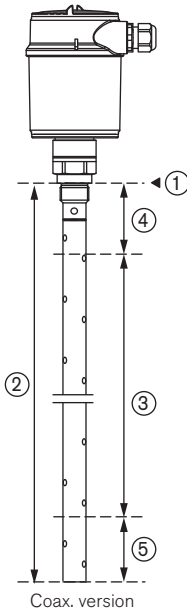
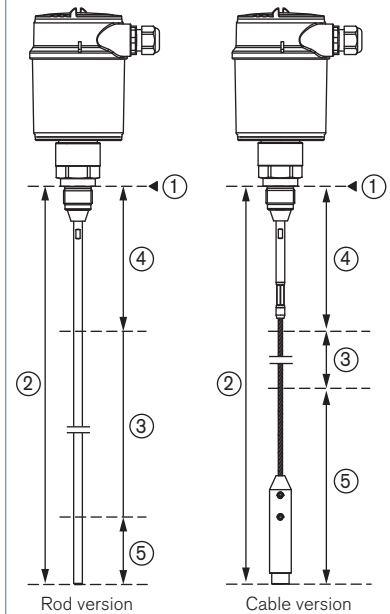
$\epsilon_r > 1.6$
 $\epsilon_r > 1.4$

* (1.4404 or 1.4435)

General data (continued)	
Dead band	
in water	
Rod-ø 8 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
Cable-ø 4 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
Coax-ø 21.3 mm	From top of probe: 30 mm - from bottom of probe: 0 mm
in oil	
Rod-ø 8 mm	From top of probe: 150 mm - from bottom of probe: 50 mm
Cable-ø 4 mm	From top of probe: 150 mm - from bottom of probe: 150 mm
Coax-ø 21.3 mm	From top of probe: 100 mm - from bottom of probe: 50 mm
Measurement range	0.03... 6 m or 0.08... 75 m (see diagram on next pages)
Process temperature	-40 to 150°C (-40 to 302°F) (restricted up to 80°C (176°F) for rod and cable probe version up to 6 bar)
Process pressure (depends on the process fitting)	For process fitting in: stainless steel 316L*/PPS: -1 to 6 bar (-14.5 to 87 PSI) (-100... 600 kPa) stainless steel 316L*/PEEK: -1 to 40 bar (-14.5 to 580.1 PSI) (-100... 4000 kPa)
Temperature drift	0.03%/10K (Relating to the max. measurement range)
Repeatability	< ±1 mm
Deviation	±2 mm (see deviation diagram, on next pages)
Electrical data	
Operating voltage (U_n)	9.6 - 35 V DC or 9.6 - 30 V DC (Ex ia instrument)
Output signal	4... 20 mA/HART [Range of the output signal 3.8... 20.5 mA/HART (default setting)]
Resolution	0.3 µA
Fault signal (adjustable)	Last valid measured value or ≥ 21 mA; ≤ 3.6 mA
Current limitation	21.5 mA (max. output current)
Load	(U _n - U _{min})/0.0215 A
Integration time (63% of the input variable)	0... 999 s, adjustable
Environment	
Ambient temperature with display, adjustment elements	-40 to +80°C (-4 to 176°F) (operation and storage)
Relative humidity	max. 75% (operation), max. 85% (storage); without condensation
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III (IEC 61010-1)
Protection class	III (IEC 61010-1)
Standard	
EMC	EN61326
Safety	EN61010-1
ATEX ¹⁾	EN60079-0; EN60079-11; EN60079-26
NAMUR	NE 21; NE 43
Specifications Ex	
Ⓢ - Protection	Categories 1 G, 1/2 G or 2 G
Ⓢ - Certification	Ex ia IIC T6
Conformity specifications¹⁾	
Operating voltage U _i	30 V
Short circuit rating I _i	131 mA
Power limitation P _i	983 mW
Ambient temperature	-50 to +46°C (-40 to 105.8°F) (depend on categories)
Internal capacity C _i	negligible
Internal inductivity L _i	≤ 5 µH

¹⁾ homologation certificate IECEx TUR 14.0014 X / TÜV 14 ATEX 7490 X

Measurement range diagram

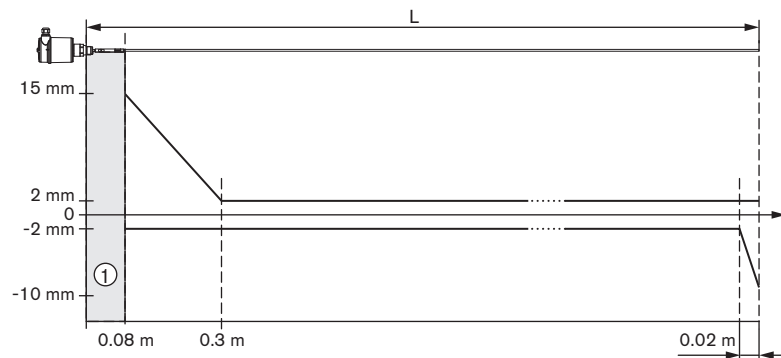


- 1 Reference plane
- 2 Probe length
- 3 Measurement range
- 4 Upper dead band
- 5 Lower dwead band

Deviation diagram

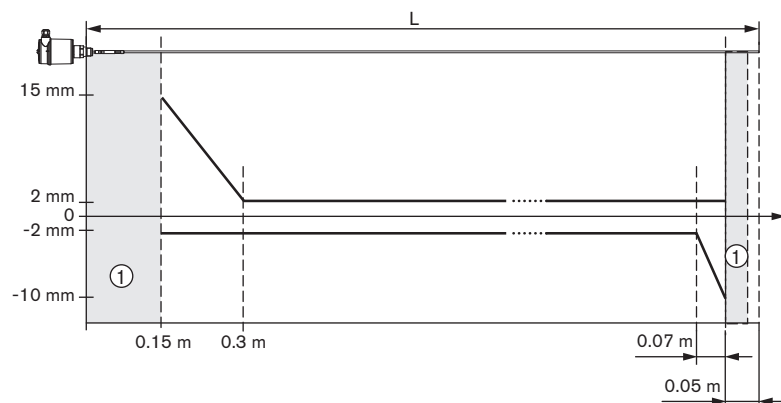
Rod probe version in water

- ① Dead band -
no measurement possible in
this area
- L Probe length



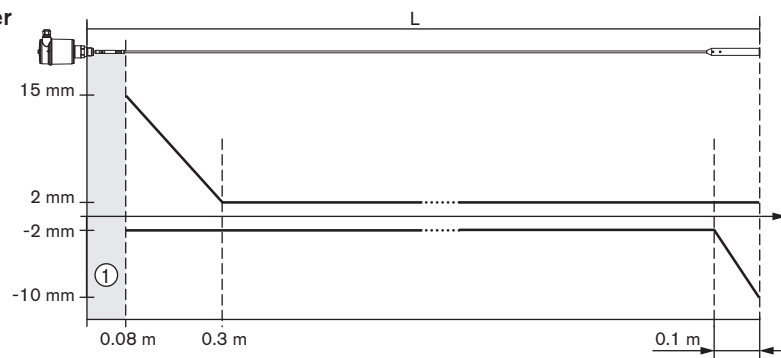
Rod probe version in oil

- ① Dead band -
no measurement possible in
this area
- L Probe length



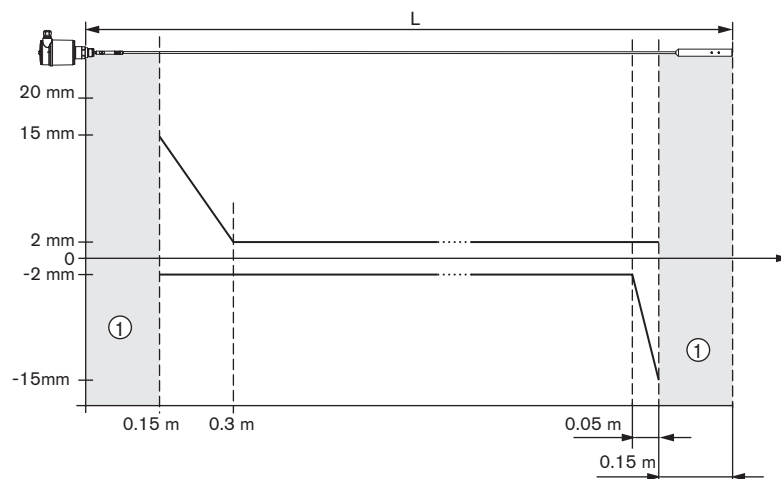
Cable probe version in water

- ① Dead band -
no measurement possible in
this area
- L Probe length



Cable probe version in oil

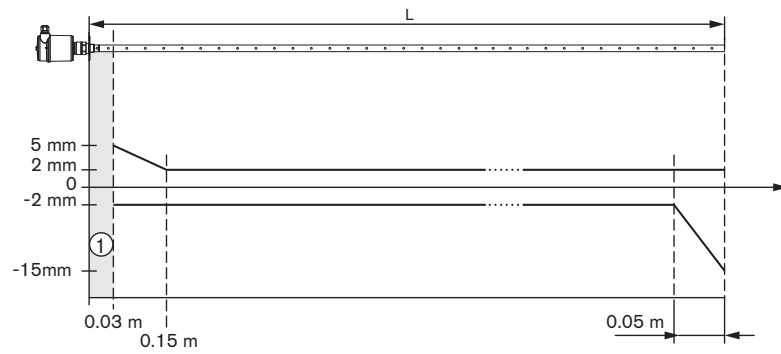
- ① Dead band -
no measurement possible in
this area
- L Probe length



Deviation diagram (continued)

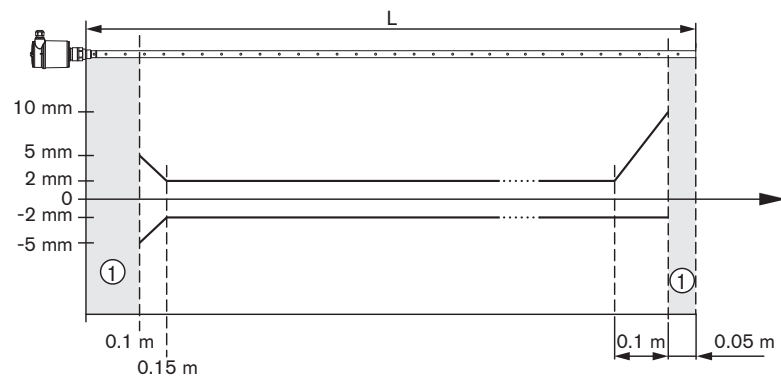
Rod probe version in water

- ① Dead band -
no measurement possible in
this area
- L Probe length



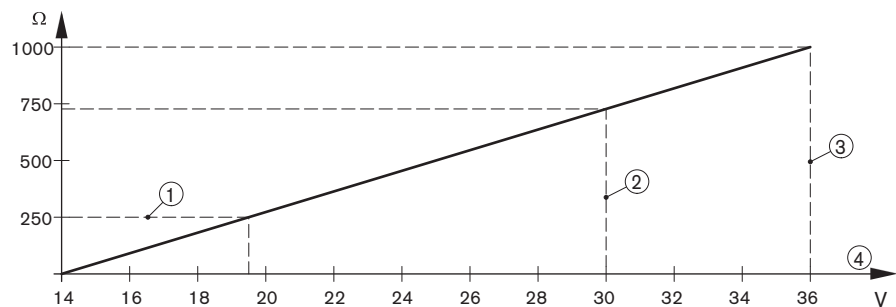
Rod probe version in oil

- ① Dead band -
no measurement possible in
this area
- L Probe length



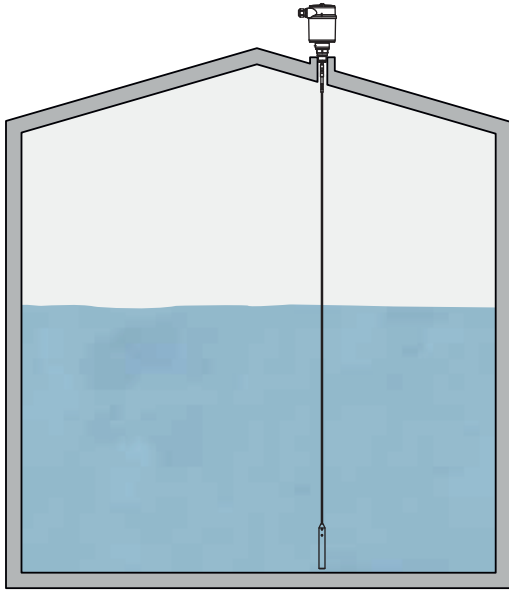
Load diagram

- 1 HART load
- 2 Voltage limit Ex ia instrument
- 3 Voltage limit non-Ex instrument
- 4 Supply voltage



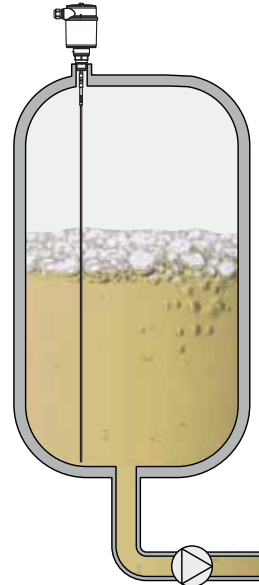
Application examples with Type 8188

Level measurement in



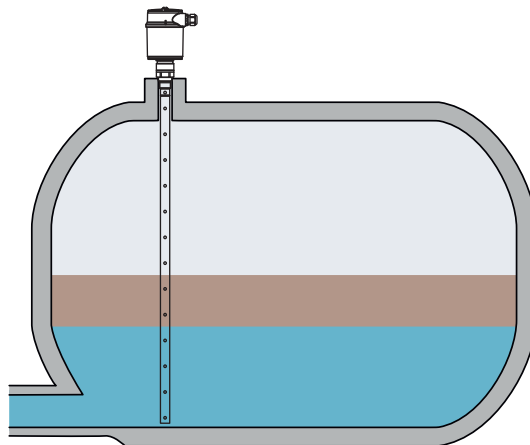
bio-ethanol storage tanks

After running through all process steps, the ethanol is ready for delivery to the consumer and is stored in a tank storage depot. Accurate measurement of the tank contents is a prerequisite for reliable logistics planning and ensures the supply to customers. Since the tanks often cannot be emptied after an initial filling, maintenance-free operation is an important criteria when selecting a suitable measurement technology



volatile and low-viscosity solvents vessels

The very low viscosity solvents diffuse through many plastics. This increases the demands placed on the measurement technology. To protect against overfilling, a separate level detection setup is also recommended. It increases system safety and guarantees protection of human health and the environment.



separating tank, to determine the exact proportion of each substance

Distillation products are often mixed with other substances of varying density and consistency. In the separating tank, for example, water is separated from the hydrocarbons and collected at the bottom of the tank. To determine the exact proportion of each substance, a so-called interface measurement is necessary

Principle of operation

High frequency microwave pulses are guided along a steel cable, a rod or a coax. When they reach the product surface, the microwave pulses are reflected and received by the processing electronics. The running time is valuated by the instrument and outputted as distance. Time consuming adjustment with medium is not necessary. The instruments are preset to the ordered probe length. The shortenable cable, rod and coax. versions can be adapted individually to the local requirements.

The measuring device can be adjusted with:

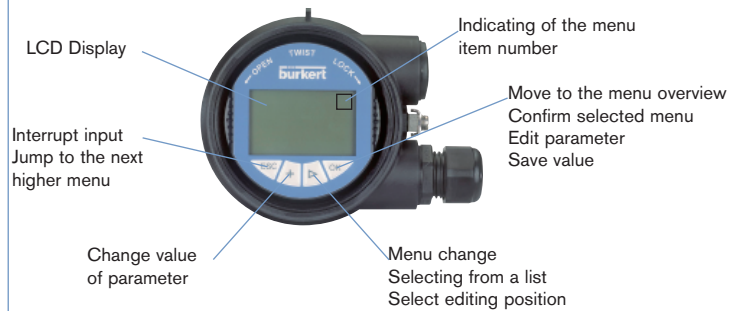
- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC.
- a HART handheld

The entered parameters are generally saved in the measuring device Type 8188. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or in PACTware™

► Set up with display/configuration module

The display/configuration module can be inserted into the measuring device and removed again at any time. It is not necessary to interrupt the power supply. The measuring device is adjusted via the four keys of the display/configuration module

Display/configuration module

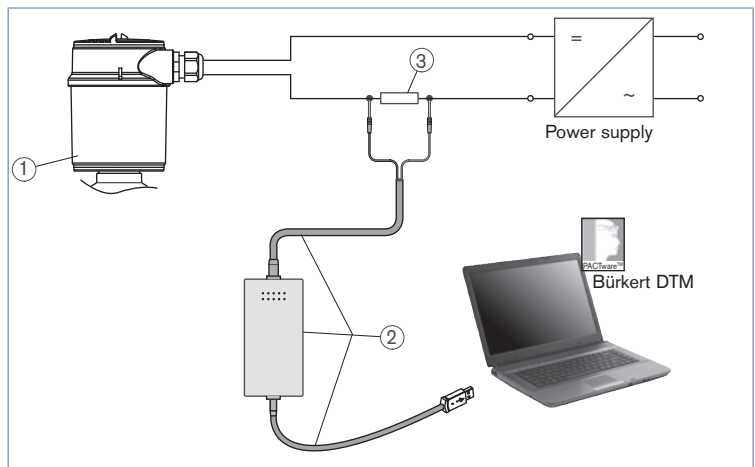


Connecting the PC via HART

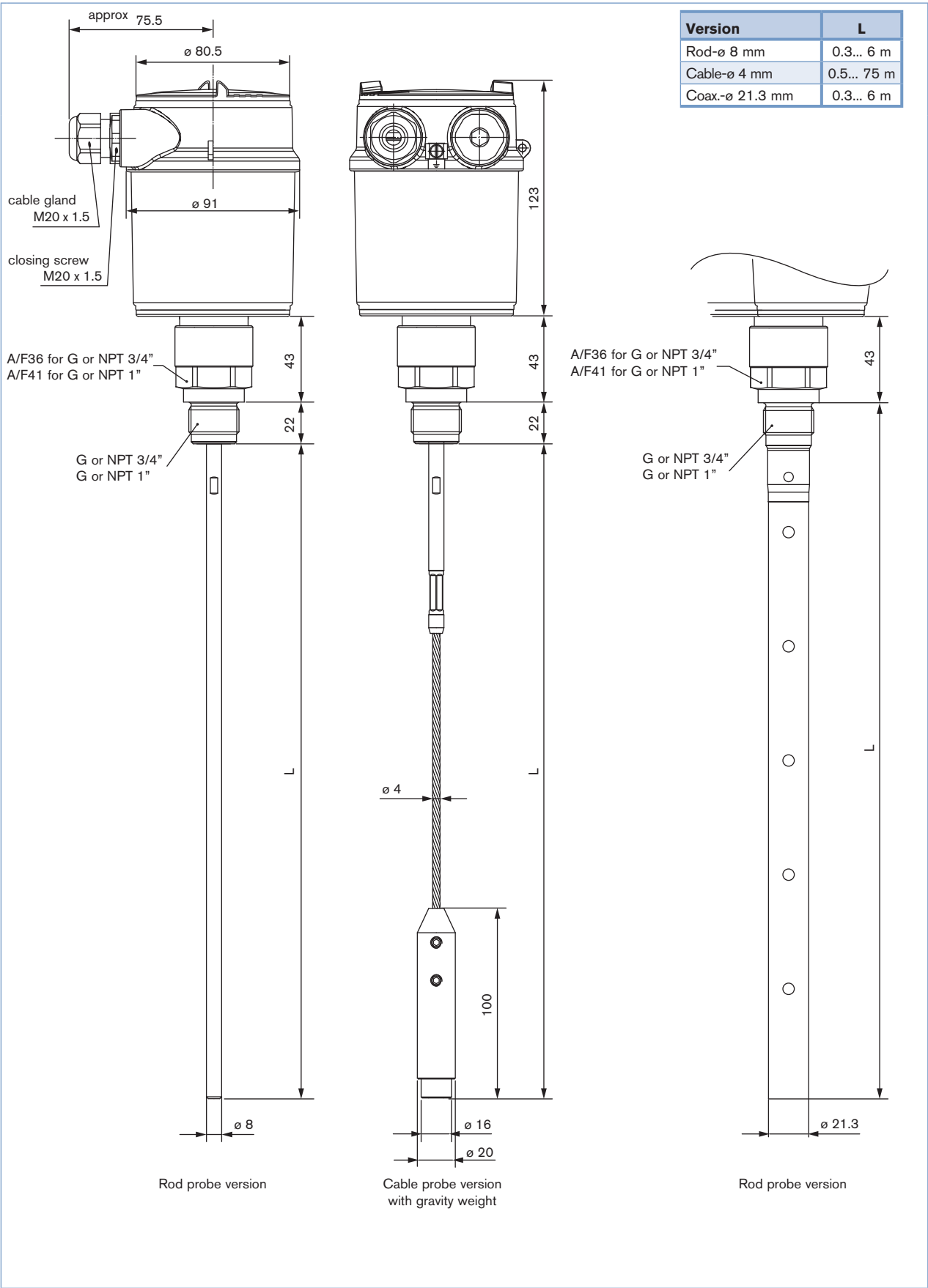
1. Measuring device 8188
2. HART-USB Modem
3. Resistance 250 Ohms

Necessary components:

- Measuring device 8188
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit



Dimensions [mm]



Ordering chart for compact measurement device Type 8188

Specifications	Voltage supply	Output	Probe	Length	Electrical connection	Item no. with display/ configuration module
G 3/4" mounting thread, PN6, temp. max. 80°C	9.6 - 35 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 800
				2 m	Cable gland M20 x 1.5	565 804
			Cable	5 m	Cable gland M20 x 1.5	565 812
				10 m	Cable gland M20 x 1.5	565 816
			Coax.	1 m	Cable gland M20 x 1.5	565 823
				2 m	Cable gland M20 x 1.5	565 824
G 1" mounting thread, PN40, temp. max. 150°C	9.6 - 35 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 802
				2 m	Cable gland M20 x 1.5	565 806
			Cable	5 m	Cable gland M20 x 1.5	565 814
				10 m	Cable gland M20 x 1.5	565 818
			Coax.	1 m	Cable gland M20 x 1.5	565 825
				2 m	Cable gland M20 x 1.5	565 826
NPT 3/4" mounting thread, PN6, temp. max. 80°C	9.6 - 35 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 801
				2 m	Cable gland M20 x 1.5	565 805
			Cable	5 m	Cable gland M20 x 1.5	565 813
				10 m	Cable gland M20 x 1.5	565 817
			Coax.	1 m	Cable gland M20 x 1.5	565 827
				2 m	Cable gland M20 x 1.5	565 828
NPT 1" mounting thread, PN40, temp. max. 150°C	9.6 - 35 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	865 803
				2 m	Cable gland M20 x 1.5	565 807
			Cable	5 m	Cable gland M20 x 1.5	565 815
				10 m	Cable gland M20 x 1.5	565 819
			Coax.	1 m	Cable gland M20 x 1.5	565 829
				2 m	Cable gland M20 x 1.5	565 830

Ordering chart for compact measurement device Type 8188 (continued)

Specifications	Voltage supply	Output	Probe	Length	Electrical connection	Item no. with display/ configuration module
Ex version - ATEX approval - G 3/4" mounting thread, PN6, temp. max. 80°C	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 808
				2 m	Cable gland M20 x 1.5	565 810
			Cable	5 m	Cable gland M20 x 1.5	565 820
				1 m	Cable gland M20 x 1.5	565 831
				2 m	Cable gland M20 x 1.5	565 832
Ex version - ATEX approval - G 1" mounting thread, PN40, temp. max. 150°C	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 809
				2 m	Cable gland M20 x 1.5	565 811
			Cable	5 m	Cable gland M20 x 1.5	565 821
				1 m	Cable gland M20 x 1.5	565 833
				2 m	Cable gland M20 x 1.5	565 834
Ex version - IECEx approval - NPT 3/4" mounting thread, PN6, temp. max. 80°C	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 839
				2 m	Cable gland M20 x 1.5	565 840
			Cable	5 m	Cable gland M20 x 1.5	565 841
				1 m	Cable gland M20 x 1.5	565 835
				2 m	Cable gland M20 x 1.5	565 836
Ex version - IECEx approval - NPT 1" mounting thread, PN40, temp. max. 150°C	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 842
				2 m	Cable gland M20 x 1.5	565 843
			Cable	5 m	Cable gland M20 x 1.5	565 844
				1 m	Cable gland M20 x 1.5	565 837
				2 m	Cable gland M20 x 1.5	565 838

 Further versions on request


Port connection

Thread G or NPT 1/2" (PN40, 150°C), 1"1/2"
Flange DN25, DN40, DN50, DN80, DN100, DN150
Flange 1", 1"1/2", 2", 3", 4", 6"



Additional

Without display

Ordering chart - accessories for measurement device Type 8188 (has to be ordered separately)

Specifica- tions	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
Hart-USB Modem	560 177
Set with a display/configuration module, a transparent cover and a seal ring	559 279
Set with a transparent cover and a seal ring	561 006

Guided microwave level measurement device Type 8188 - request for quotation

Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Guided microwave level measuring device 8188

Quantity: Desired delivery date:

■ Process connection:

External thread

☐ G 3/4", PN6, 80°C☐ G 1"☐ G 1 1/2"☐ G 3/4", PN40, 150°C☐ NPT 3/4", PN6, 80°C☐ NPT 1"☐ NPT 1 1/2"☐ NPT 3/4", PN40, 150°C

Flange

☐ DN25☐ DN40☐ DN50☐ DN80☐ DN100☐ DN150☐ ANSI 1"☐ ANSI 1 1/2"☐ ANSI 2"☐ ANSI 3"☐ ANSI 4"☐ ANSI 6"

■ Sensor version:

Probe

☐ Rod☐ Cable☐ Coax.

Length

☐ 1 m☐ 2 m☐ 5 m☐ 10 m☐ Spec. length mm (multiple of 100 mm between 300 and 6000 mm for Rod version or coax version - multiple of 100 mm between 500 and 75000 mm for cable version)

■ Display/configuration module

☐ Yes☐ No

■ ATEX approval

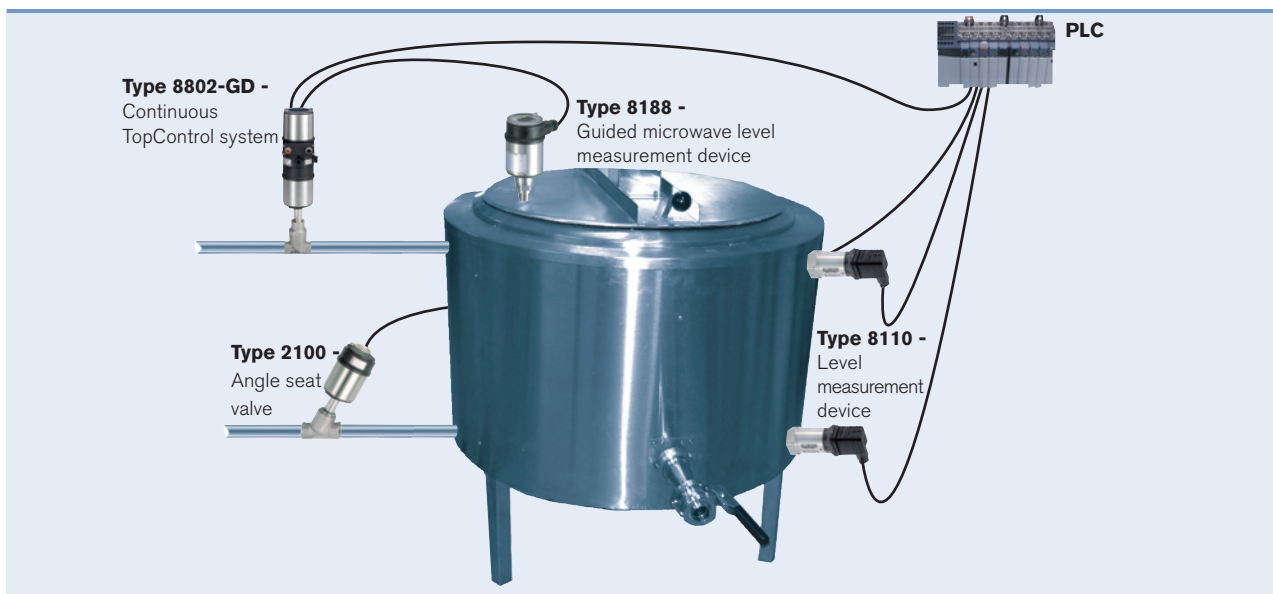
☐ Yes☐ No

■ IECEx approval

☐ Yes☐ No

reset form

Interconnection possibilities with other Bürkert devices



*To find your nearest Bürkert facility, click on the orange box →

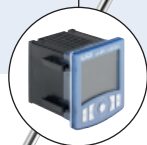
In case of special application conditions,
please consult for advice.Subject to alteration.
© Christian Bürkert GmbH & Co. KG

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Guided microwave level measurement device - sanitary version

- Universal level measurement device for liquids
- Liquid interface measurement
- Insensitive to dust and steam
- 4... 20 mA/Hart - 2 wires, ATEX/IECEx approvals 

Type 8189 can be combined with...



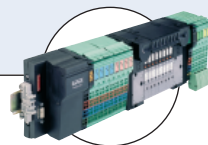
Type 8619
multiCELL
Transmitter/Controller



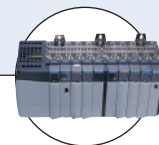
Type 2035
Diaphragm valve



Type 8802-GD
Continuous
TopControl system



Type 8644
Valve islands



PLC

The Type 8189 is a level measurement device with interchangeable rod probe, designed for continuous level measurement. The unit is suitable for liquids, for industrial use in all areas of process technology. But the main application targets are in Food and Beverage (F&B) and pharmaceutical tanks to the new rod in stainless steel 1.4435 with $R_a < 0.76 \mu\text{m}$. For applications with corrosive liquids a PFA coated version is available.

Even process conditions such as strong steam generation, density fluctuations or changes of the dielectric constant do not influence the accuracy of the measurement.

Build-up or condensation on the probe or vessel wall do not influence the measurement result.

General data

Materials

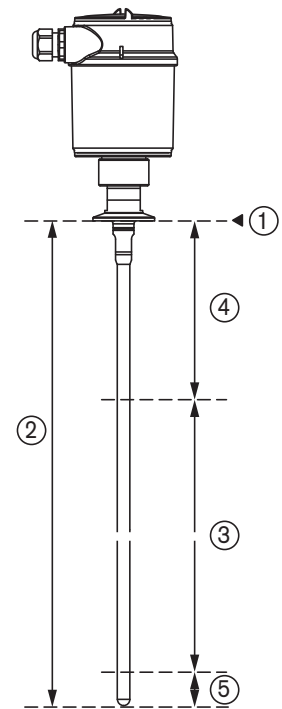
Housing / Cover	PBT, Stainless steel 316L (1.4404) / PC
Seal ring / Ground terminal	NBR / Stainless steel 316L
Wetted parts	
Process fitting / process seal	Stainless steel 316L (1.4404 or 1.4435) and PEEK / EPDM
Rod-ø 8 mm - polished	Stainless steel 316L (1.4435)

Rod surface finish	$R_a < 0.76 \mu\text{m}$ (BN2)
Display	LCD in full dot matrix
Weight	
Housing	890 g
Rod-ø 8 mm	approx. 400 g/m
Process fitting	Clamp 2" or DIN11851 DN50
Length	0.3... 4 m - Lateral load: 10 Nm
Electrical connections	Cable gland M20 x 1.5
Measurement type	Level of liquids
Min. dielectric figure	$\epsilon_r > 1.6$
Dead band	
in water	From top of probe: 80 mm - from bottom of probe: 0 mm
in oil	From top of probe: 150 mm - from bottom of probe: 100 mm
Measurement range	0.08... 4 m (see diagram on next page)
Process temperature	-20 to 150°C (-4 to 302°F)
Process pressure	-1 to 16 bar (-14.51 to 232.16 PSI) (-100... 1600 kPa) (depends on the process fitting)
Temperature drift	0.03%/10K (Relating to the max. measurement range)
Repeatability	$< \pm 1 \text{ mm}$
Deviation	$\pm 2 \text{ mm}$ (see deviation diagram, on next page)

Electrical data	
Operating voltage (U_n)	9.6 - 35 V DC or 9.6 - 30 V DC (Ex ia instrument)
Output signal	4... 20 mA/HART [Range of the output signal 3.8... 20.5 mA/HART (default setting)]
Resolution	0.3 µA
Fault signal (adjustable)	Last valid measured value or ≥ 21 mA or ≤ 3.6 mA
Current limitation	21.5 mA (max. output current)
Load	(U _n - U _{min.})/0.0215 A
Integration time (63% of the input variable)	0... 999 s, adjustable
Environment	
Ambient temperature with display, adjustment elements	-40 to +80°C (-4 to 176°F) (operation and storage)
Relative humidity	max. 75% (operation), max. 85% (storage); without condensation
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III (IEC 61010-1)
Protection class	III (IEC 61010-1)
Standard	EMC / Safety ATEX ¹⁾ NAMUR
Approvals	EN61326 / EN61010-1 EN60079-0; EN60079-11; EN60079-26 NE 21; NE 43 FDA
Specifications Ex	
Ⓢ - Protection	Categories 1 G, 1/2 G or 2 G
Ⓢ - Certification	Ex ia IIC T6
Conformity specifications¹⁾	
Operating voltage U _i	30 V
Short circuit rating I _i	131 mA
Power limitation P _i	983 mW
Ambient temperature	-50 to +46°C (-40 to 105.8°F) (depend on categories)
Internal capacity C _i	negligible
Internal inductivity L _i	≤ 5 µH

1) homologation certificate IECEx TUR 14.0014 X / TÜV 14 ATEX 7490 X

Measurement range diagram

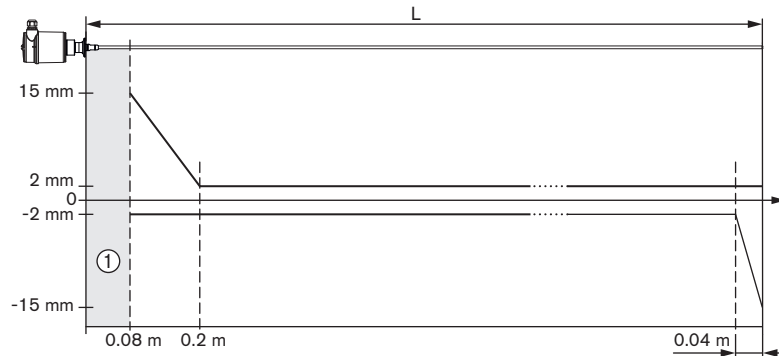


- 1 Reference plane
- 2 Probe length
- 3 Measurement range
- 4 Upper dead band
- 5 Lower dead band

Deviation diagram

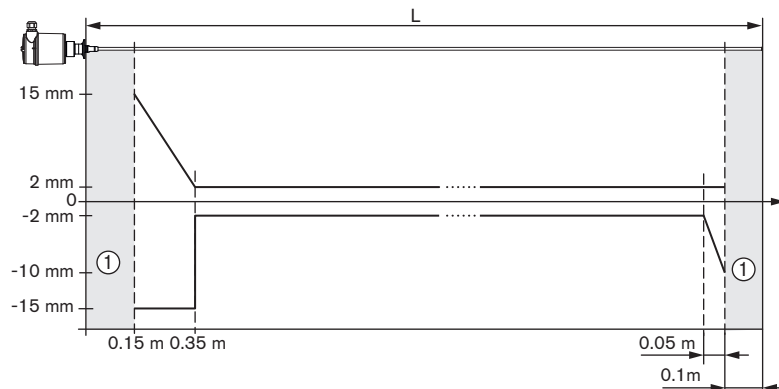
Rod probe version in water

- ① Dead band - no measurement possible in this area
L Probe length



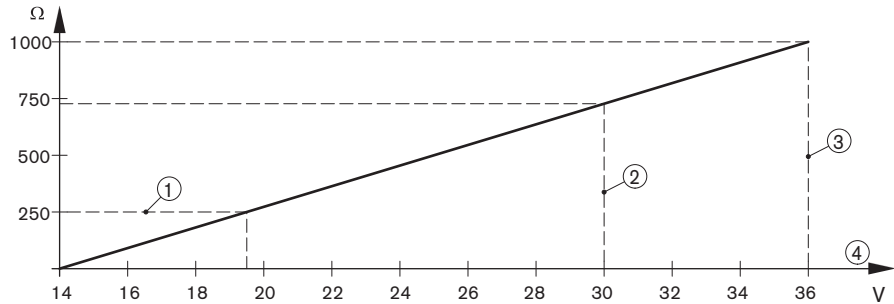
Rod probe version in oil

- ① Dead band - no measurement possible in this area
L Probe length



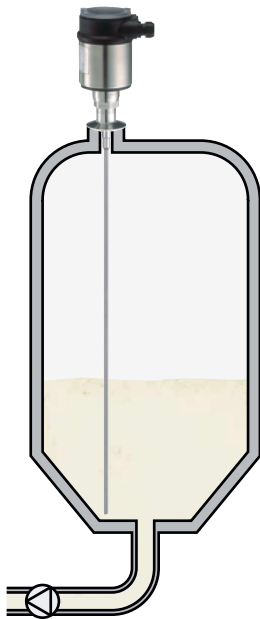
Load diagram

- 1 HART load
- 2 Voltage limit Ex ia instrument
- 3 Voltage limit non-Ex instrument
- 4 Supply voltage

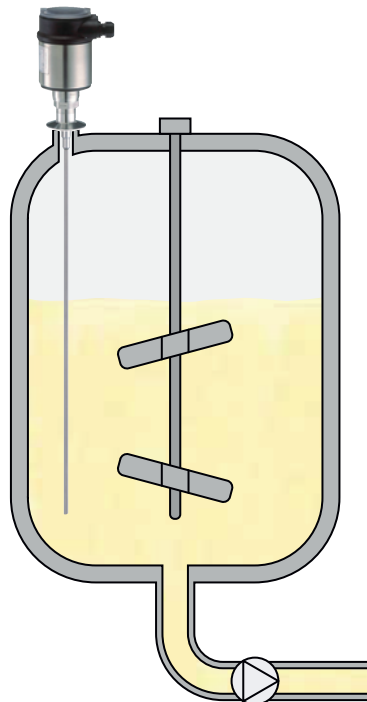
**Target applications with Type 8189****Foodstuffs and animal feed**

Products such as beer, milk, wine, cereals, sugar, flour, coffee, cornflakes, cacao, instant powder, animal feed - liquids or bulk solids levels must be measured everywhere in the food industry.

The microwave principle works independent of products characteristics such as moisture, intense dust or noise generation, density, temperature, over-pressure, foam dielectric value and the shape of the material cone.

Application examples

Level measurement in a milk vessel



Level measurement in an ice cream vessel

Principle of operation

High frequency microwave pulses are guided along a rod. When they reach the product surface, the microwave pulses are reflected and received by the processing electronics. The running time is valued by the instrument and outputted as distance.

Time consuming adjustment with medium is not necessary. The instruments are preset to the ordered probe length.

The shortenable rod versions can be adapted individually to the local requirements.

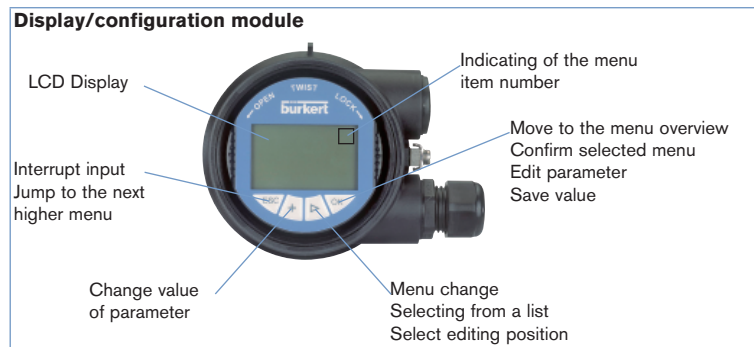
The measuring device can be adjusted with:

- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC.
- a HART handheld

The entered parameters are generally saved in the measuring device Type 8189. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or in PACTware™

► Set up with display/configuration module

The display/configuration module can be inserted into the measuring device and removed again at any time. It is not necessary to interrupt the power supply. The measuring device is adjusted via the four keys of the display/configuration module

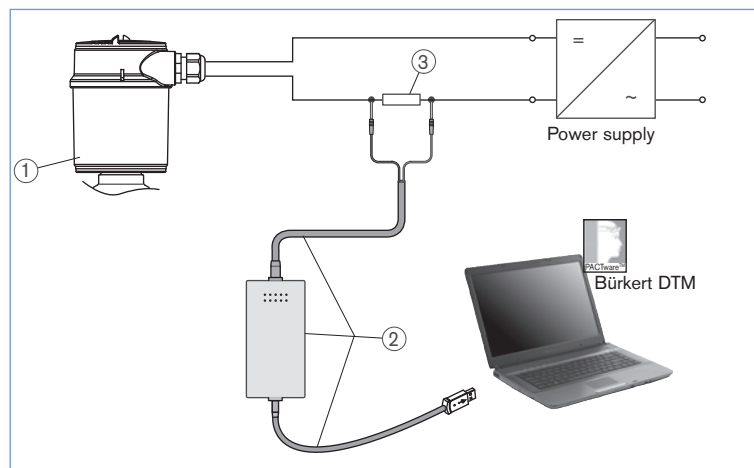


Connecting the PC via HART

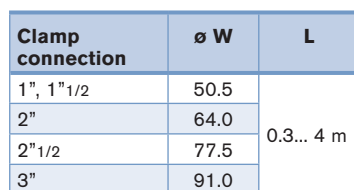
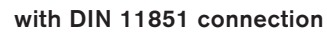
1. Measuring device 8189
2. HART-USB Modem
3. Resistance 250 Ohms

Necessary components:

- Measuring device 8189
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit



with Clamp connection



DIN 11851 connection	ø W	ø X	L
DN32	50.0	Rd 58x1/6	0.3... 4 m
DN40	56.0	Rd 65x1/6	
DN50	68.5	Rd 78x1/6	
DN65	86.0	Rd 95x1/6	

Ordering chart for compact measurement device Type 8189

Specifications	Voltage supply	Output	Probe	Length	Electrical connection	Item no. with display/ configuration module
Clamp 2"	9.6 - 35 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 850
				2 m	Cable gland M20 x 1.5	565 852
DIN11851 - DN50	9.6 - 35 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 851
				2 m	Cable gland M20 x 1.5	565 853
Ex version - ATEX approval - Clamp 2"	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 854
				2 m	Cable gland M20 x 1.5	565 856
Ex version - ATEX approval - DIN11851 DN50	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 855
				2 m	Cable gland M20 x 1.5	565 857
Ex version - IECEx approval - Clamp 2"	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 858
				2 m	Cable gland M20 x 1.5	565 860
Ex version - IECEx approval - DIN11851 DN50	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 859
				2 m	Cable gland M20 x 1.5	565 861



Further versions on request



Port connection

Clamp 1"1/2, 2"1/2, 3"
DIN 11851 DN32, DN40, DN65



Additional

Without display/configuration module

Ordering chart - accessories for measurement device Type 8189 (has to be ordered separately)

Specifications	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
Hart-USB Modem	560 177
Set with a display/configuration module, a transparent cover and a seal ring	559 279
Set with a transparent cover and a seal ring	561 006

Guided microwave level measurement device Type 8189 - request for quotation

Please fill in and send to your local Bürkert Sales Centre* with your inquiry or order.

Note

You can fill out the fields directly in the PDF file before printing out the form.

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

Guided microwave level measurement device 8189

Quantity: Desired delivery date:

■ Process connection:

Clamp ☐ 1"1/2 ☐ 2" ☐ 2"1/2 ☐ 3"

DIN 11851 ☐ DN32 ☐ DN40 ☐ DN50 ☐ DN65

■ Sensor version:

Length ☐ 1 m ☐ 2 m

☐ Spec. length mm (multiple of 100 mm between 300 and 4000 mm for Rod version)

■ Display/configuration module

☐ Yes ☐ No

■ ATEX approval

☐ Yes ☐ No

■ IECEX approval

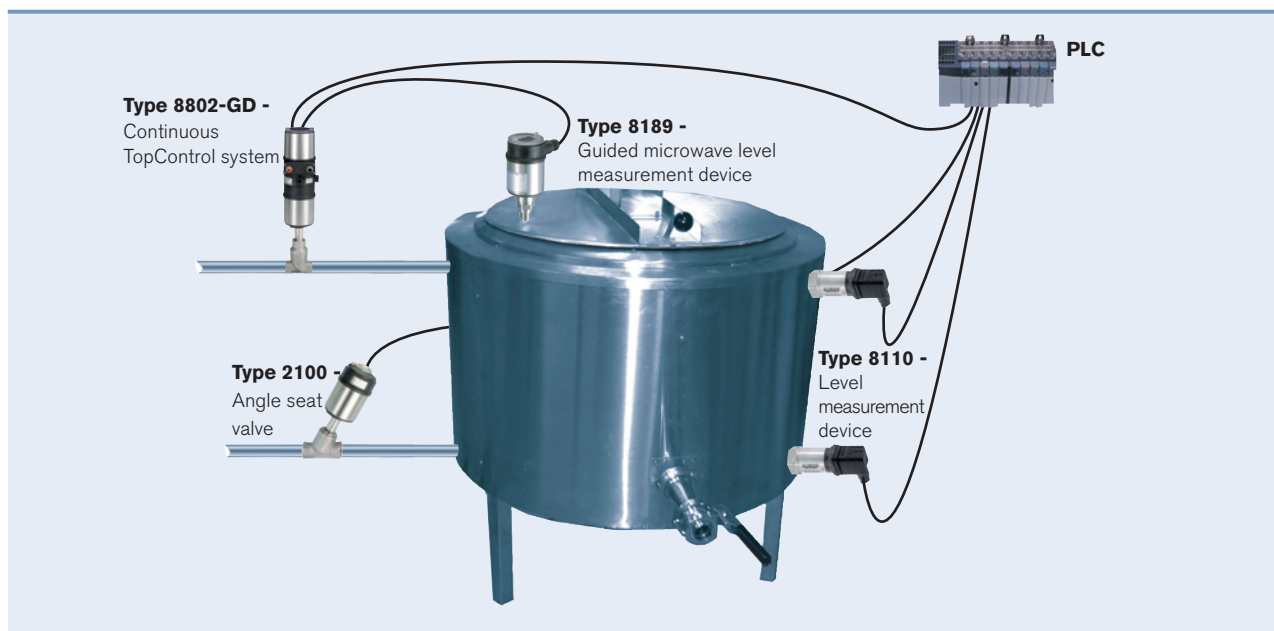
☐ Yes ☐ No

■ FDA approval

☐ Yes ☐ No

reset form

Interconnection possibilities with other Bürkert devices



*To find your nearest Bürkert facility, click on the orange box →

In case of special application conditions,
please consult for advice.Subject to alteration.
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1412/1_EU-en_00895279



Simple float switch

- Switch for neutral and aggressive liquids
- NO/NC, alternating
- Reed contact
- Vertical or horizontal mounting
- Molded lying leads (Type 8181) or cable (Type TCL001)

Float switch with hermetically sealed reed contacts in a fixed switch part, switching triggered by magnets in floating switch part, reed contact implemented as alternator or normally open/closed; for neutral and aggressive liquids; not sensitive to dirt particles in the medium; cylindrical threading for simple installation in side of container.

Different versions are available depending on material (PP or stainless steel), mounting position (horizontal or vertical) and equipment (relay).

Technical data - TCL001

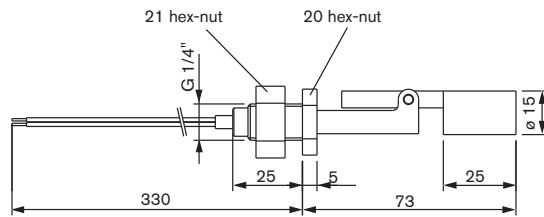
Switching point	at tilt of $7^\circ \pm 3^\circ$ (8.5 mm $\pm$ 3 mm)
Switching function	normally closed/open or alternating
Normally closed/open	
Switching voltage	max. 250 V
Switching current	max. 1 A
Contact rating	max. 50 W / VA
Alternating	
Switching voltage	max. 150 V
Switching current	max. 0.25 A
Contact rating	max. 3 W / VA
Electrical connections	PVC cable, 3 m long (other cable lengths on request)
Protection class	IP 67
Operating temperature	-25 up to +105°C
Probe material	PP (PVDF on request)
Mounting position	horizontal
Thread	R 1/2"

Technical data - 8181		
General data	Type 8181 standard	Type 8181 with relay module
Switching point	at tilt of $7^{\circ} \pm 3^{\circ}$ (8.5 mm $\pm$ 3 mm)	at tilt of $7^{\circ} \pm 3^{\circ}$ (8.5 mm $\pm$ 3 mm)
Mounting position	Horizontal or vertical	Horizontal or vertical
Thread	G 1/4" (only for PP-horizontal version) or G1/8" for leads version and G3/4" for cable version	G 3/4"
Materials Housing, cover / Contact Stem, float Circlip (only vertical version) Cable plug, cable gland	- PP or stainless steel 304 (316L on request) PP or stainless steel 304 PA (if one)	PC / AgNi 90/10 PP or stainless steel 304 (316L on request) PP or Stainless steel 304 PA
Float density	approx. 0.7 ¹⁾	approx. 0.7 ¹⁾
Acceptable pressure PP version Stainless steel version	1 bar (vertical or horizontal mounting position) 10 bar (vertical mounting position) 5 bar (horizontal mounting position)	1 bar (vertical or horizontal mounting position) 10 bar (vertical mounting position) 5 bar (horizontal mounting position)
Medium temperature PP version Stainless steel version	-10 to +80°C -40 to +120°C	-10 to +80°C -40 to +120°C
Electrical connection	Leads 300 mm or cable 5m	Positionable M12 and EN175301-803 cable plug
Electrical cable	0.25 mm ² min. cross section leads or PVC covering cable, 0.25 mm ² min. cross section, 2 wires + shielding	-
Electrical data	Type 8181 standard	Type 8181 with relay module
Output type	Reed contact	1 single change-over contact
Switching function	Normally closed/open	Normally closed/open
Voltage	Switching: max. 48 V AC/DC	Max. 250 V AC / 30 V DC
Current	Switching: max. 0.25 A	Max. 3 A
Breaking power	66 VA AC/DC (only for PP-vertical version) 50 VA AC/DC	-
Contact resistance	Max. 150 mΩ Max. 200 mΩ (only for stainless steel horizontal version)	-
Breakdown voltage	min. 310 V AC (only for PP-vertical version) 600 V DC	-
Insulating resistance	Min. 10 MΩ	-
Number of cycles	-	100 000 acc. to standard VDE 0435
Current consumption	-	< 3 mA
Environment	Type 8181 standard	Type 8181 with relay module
Ambient temperature	- 10 to +80°C (operation and storage)	- 10 to +80°C (operation and storage)
Standards, directives and approvals	Type 8181 standard	Type 8181 with relay module
Protection class	IP 65	IP 65
Vibrations and shocks	20G (for stainless steel version)	-

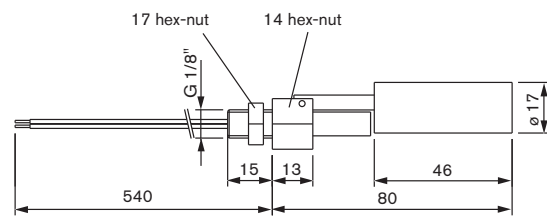
Dimensions [mm] Type 8181

Switch with leads

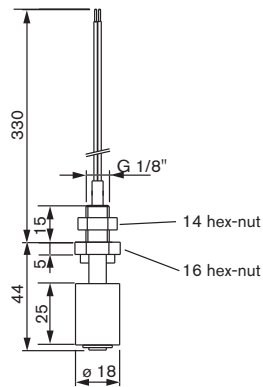
Horizontal, PP version



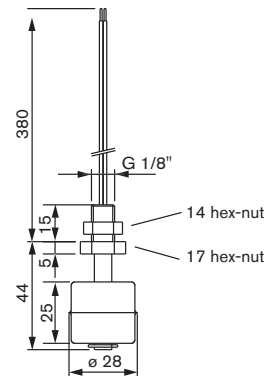
Horizontal, stainless steel version



Vertical, PP version

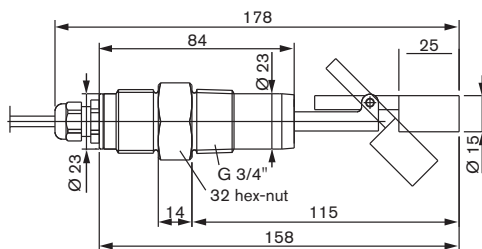


Vertical, stainless steel version

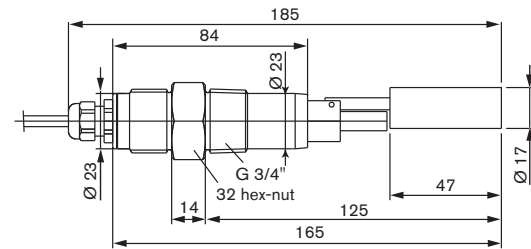


Switch with 5 m cable

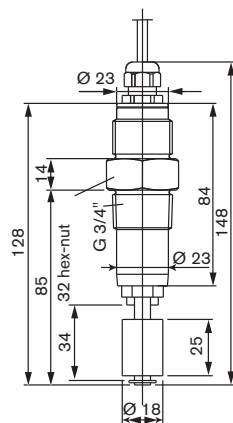
Horizontal, PP version



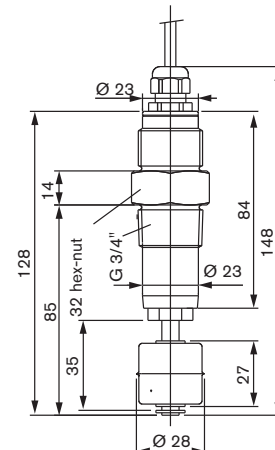
Horizontal, stainless steel version



Vertical, PP version



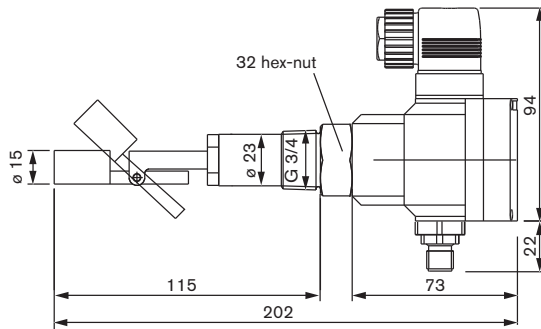
Vertical, stainless steel version



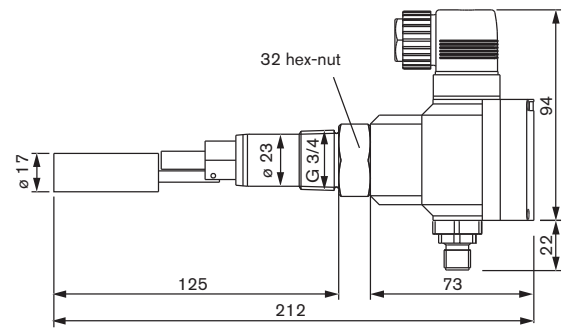
Dimensions [mm] Type 8181

Switch with relay module

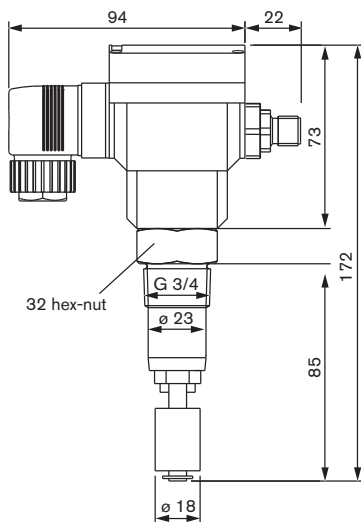
Horizontal, PP version



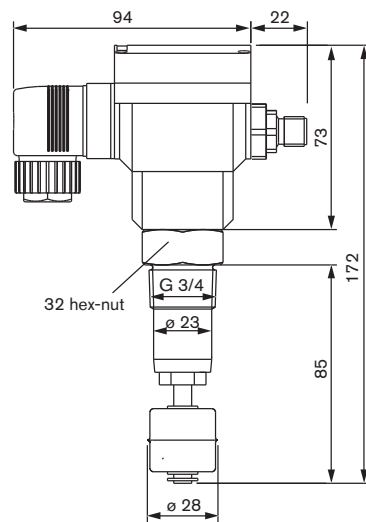
Horizontal, stainless steel version



Vertical, PP version



Vertical, stainless steel version



Ordering chart

Type	Connection	Material	Version	Switching current	Switching voltage	Switching function	Electrical connection	Item no.	
TCL001	R1/2	PP	Horizontal	max 1 A	Max 250V	Normally closed/open*	3 m cable	783 793	
					Max 150V	Alternating	3 m cable	783 794	
8181	G1/4	PP	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 141	
		PP	Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 132	
		St. St.	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 150	
			Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 159	
	G3/4	PP	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 496	
			Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 502	
		St. St.	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 499	
			Vertical	0.5 A	Max 48 V AC/DC	Normally closed/open*	5 m cable	438 505	
	8181 with relay module supplied with 24 V DC	G3/4	PP	Horizontal	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 497
				Vertical	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 503
St. St.			Horizontal	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 500	
			Vertical	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 506	

*Depending on mounting orientation

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