





Type 8793



Process controller Diaphragm valve

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.



# 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 8802-GD Element control valve system





FLUID CONTROL SYSTEMS

Valve islands

PLC

MaterialsPBT, Stainless steel 316L (1.4404) / PCNear J Ground terminalPBT, Stainless steel 316L (1.4404) / PCNear J Ground terminalNBR / Stainless steel 304 (1.4301) / Stainless steel 316L (1.4435)Mounting strap / Fixing screwsPVDF / PVDF (completely encapsulated) / FKMPhocess connection / Antenna versionPVDF / PVDF (completely encapsulated) / FKMPlastic horn antenna versionStainless steel 316L (1.4435)Process connectionStainless steel 316L (1.4435)Horn antenna / Focus lensStainless steel 316L (1.4435)Process connectionStainless steel 316L (1.4435)Horn antenna / Focus lensThread G 1½" or NPT 1½" (Encapsulated hom antenna version)Max. torque mounting boss4 Nm (mounting strap 170 mm (Plastic horn antenna version)Max. torque mounting bosInterad G 14½" or NPT 1½" (Encapsulated hom antenna version)Max. torque mounting bossIostance between process connection and product surfaceMeasuring valueDistance between process connection and product surfaceMin. dielectric figures > 1.6Dead zoneSoft 10 m (Encapsulated horn antenna version)Process temperature-040 to +80°C (40 to 176°F)Vessel pressure-110 3 bar (14.51 to 43.53 PS) (100 to 300 kPa)Piration resistanceNax. 1 mmFrequencyKohanl (26 GHZ technology)Interval030%/10K (Average temperature coefficient of the zero signal - emperature errolResolutionmax. 1 mmFrequencyKohanl (26 GHZ technology)Interval3 dBAljustment time </th <th>General data</th> <th></th>	General data	
Housing / Cover Seal ring / Ground terminal Mounting strap / Fixing screws Wetted parts Encapsulated hom antenna version Process connection / Antenna / Seal Plastic horn antenna version Process connection / Antenna / Seal Plastic horn antenna version Horn antenna / Focus lensPVDF / PVDF (completely encapsulated) / FKMDisplay*LCD in full dot matrix (option)Process connection Horn antenna / Focus lensAttantas steel 316L (1.4435) PBT-GF30 / PPDisplay*LCD in full dot matrix (option)Process connection Horn antenna / Focus lensA Nm (mounting screws - strap on the sensor housing)Display*LCD in full dot matrix (option)Process connectionCable glands M20 x 1.5Measuring valueDistance between process connection and product surface sr > 1.6Dead zone50 mm1Measuring range0.05 to 10 m (Encapsulated horn antenna version) o to 20 m (Plastic horn antenna version) o 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 PS) (-100 to 300 kPa)Vibration resistance merature error)Mechanical vibrations with 4 g and 5 100 HzResolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Interval approx. 1 sapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna versi.) - 10° (Plastic horn antenna versi.)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Materials	
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Mounting strap / Fixing screws Wetted parts Encapsulated hom antenna version Process connection / Antenna / Seal Plastic horn antenna version Horn antenna / Focus lensStainless steel 316L (1.4435)PvDF / PVDF (completely encapsulated) / FKMDisplay*LCD in full dot matrix (option)Process connection Horn antenna / Focus lensDisplay*LCD in full dot matrix (option)Process connection Horn antenna / Focus lensDisplay*LCD in full dot matrix (option)Process connection Mounting strap 170 mm (Plastic horn antenna version) Mounting strap 170 mm (Plastic horn antenna version)Max. torque mounting boss4 Nm (mounting screws - strap on the sensor housing)Electrical connectionCable glands M20 x 1.5Measuring valueDistance between process connection and product surface for 0.05 to 10 m (Encapsulated horn antenna version) 0 to 20 m (Plastic horn antenna version) 0 to 20 m (Plastic horn antenna version)Process temperature temperature coefficientVibration resistanceMechanical vibrations with 4 g and 5 100 HzTemperature coefficient temperature error)ResolutionResolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Interval Beam angle at 3 dB22° (Encapsulated hor antenna vers) - 10° (Plastic horn antenna vers)Adjustment time > 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Seal ring / Ground terminal	NBR / Stainless steel 316Ti/316L (1.4571/1.4435)
Wetted parts Encapsulated horn antenna version Process connection / Antenna / Seal Plastic horn antenna version Horn antenna / Focus lensPVDF / PVDF (completely encapsulated) / FKMDisplay*LCD in full dot matrix (option)Process connection Horn antenna / Focus lensDistanless steel 316L (1.4435) PBT-GF30 / PPDisplay*LCD in full dot matrix (option)Process connection Mounting strap 170 mm (Plastic horn antenna version) Mounting strap 170 mm (Plastic horn antenna version)Max. torque mounting boss4 Nm (mounting screws - strap on the sensor housing)Electrical connectionCable glands M20 x 1.5Measuring valueDistance between process connection and product surfaceMin. dielectric figurear > 1.6Dead zone50 mm <sup>11</sup> Measuring range.005 to 10 m (Encapsulated horn antenna version) 0 to 20 m (Plastic horn antenna version) 0 to 20 m (Plastic horn antenna version)Vibration resistanceMechanical vibrations with 4 g and 5 100 HzVibration resistance0.03%/10K (Average temperature coefficient of the zero signal - temperature error)Resolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Intervalapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna versi) - 10° (Plastic horn antenna versi)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Mounting strap / Fixing screws	Stainless steel 304 (1.4301) / Stainless steel 316L (1.4435)
Encapsulated horn antenna version Process connection / Antenna / Seal Plastic horn antenna version Process connection Horn antenna / Focus lensPVDF / PVDF (completely encapsulated) / FKMDisplay*LCD in full dot matrix (option)Process connection Horn antenna / Focus lensThread G 1/2" or NPT 11/2" (Encapsulated horn antenna version) Mounting strap 170 mm (Plastic horn antenna version) Mounting strap 170 mm (Plastic horn antenna version)Max. torque mounting boss4 Nm (mounting screws - strap on the sensor housing)Electrical connectionCable glands M20 x 1.5Measuring valueDistance between process connection and product surface sr > 1.6Dead zone50 mm <sup>1)</sup> Measuring range.0.05 to 10 m (Encapsulated horn antenna version) o to 20 m (Plastic horn antenna version) o 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 resistanceMechanical vibrations with 4 g and 5 100 HzTemperature coefficient.0.03%/10K (Average temperature coefficient of the zero signal - temperature error)Resolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Intervalapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Wetted parts	
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Max. torque mounting boss4 Nm (mounting screws - strap on the sensor housing)Electrical connectionCable glands M20 x 1.5Measuring valueDistance between process connection and product surfaceMin. dielectric figuresr > 1.6Dead zone50 mm <sup>1)</sup> Measuring range0.05 to 10 m (Encapsulated horn antenna version) 0 to 20 m (Plastic 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 resistanceMechanical vibrations with 4 g and 5 100 HzTemperature coefficient0.03%/10K (Average temperature coefficient of the zero signal - temperature error)Resolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Intervalapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)		Mounting strap 170 mm (Plastic horn antenna version)
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Min. dielectric figuresr > 1.6Dead zone50 mm <sup>1)</sup> Measuring range0.05 to 10 m (Encapsulated horn antenna version) 0 to 20 m (Plastic horn antenna version)Process temperature-40 to +80°C ( <i>40 to 176°F</i> )Vessel pressure-1 to 3 bar ( <i>14.51 to 43.53 PSI</i> ) (100 to 300 kPa)Vibration resistanceMechanical vibrations with 4 g and 5 100 HzTemperature coefficient0.03%/10K (Average temperature coefficient of the zero signal - temperature error)Resolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Intervalapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Measuring value	Distance between process connection and product surface
Dead zone50 mm1Measuring range0.05 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 resistanceMechanical vibrations with 4 g and 5 100 HzTemperature coefficient0.03%/10K (Average temperature coefficient of the zero signal - temperature error)Resolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Intervalapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Min. dielectric figure	εr > 1.6
Measuring range0.05 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 resistanceMechanical vibrations with 4 g and 5 100 HzTemperature coefficient0.03%/10K (Average temperature coefficient of the zero signal - temperature error)Resolutionmax. 1 mmFrequencyK-band (26 GHZ technology)Intervalapprox. 1 sBeam angle at 3 dB22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)Adjustment time> 1 s (dependent on the parameter adjustment)Accuracy± 2 mm (see diagram)	Dead zone	50 mm <sup>1)</sup>
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)	Measuring range	0.05 to 10 m (Encapsulated 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)		0 to 20 m (Plastic horn antenna version)
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)	Process temperature	-40 to +80°C (-40 to 176°F)
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)	Vessel pressure	-1 to 3 bar (-14.51 to 43.53 PSI) (-100 to 300 kPa)
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)	Vibration resistance	Mechanical vibrations with 4 g and 5 100 Hz
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)	Temperature coefficient	0.03%/10K (Average temperature coefficient of the zero signal -
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)		temperature error)
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)	Resolution	max. 1 mm
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)	Frequency	K-band (26 GHZ technology)
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)	Interval	approx. 1 s
Adjustment time     > 1 s (dependent on the parameter adjustment)       Accuracy     ± 2 mm (see diagram)	Beam angle at 3 dB	22° (Encapsulated horn antenna vers.) - 10° (Plastic horn antenna vers.)
Accuracy ± 2 mm (see diagram)	Adjustment time	> 1 s (dependent on the parameter adjustment)
	Accuracy	± 2 mm (see diagram)

\* to be ordered separately

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

#### По вопросам продаж и поддержки обращайтесь:

Архангельск +7 (8182) 45-71-35 Астана +7 (7172) 69-68-15 Астрахань +7 (8512) 99-46-80 Барнаул +7 (3852) 37-96-76 Белгород +7 (4722) 20-58-80 Брянск +7 (4832) 32-17-25 Владивосток +7 (4232) 49-26-85 Владимир +7 (4922) 49-51-33 Волгоград +7 (8442) 45-94-42 Воронеж +7 (4732) 12-26-70 Екатеринбург +7 (343) 302-14-75 Иваново +7 (4932) 70-02-95 Ижевск +7 (3412) 20-90-75 Иркутск +7 (3952) 56-24-09 Йошкар-Ола +7 (8362) 38-66-61 Казань +7 (843) 207-19-05

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#### 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: Uss < 1 V 100 Hz 10 kHz: Uss < 10 mV
Output signal	4 20 mA/HART
Resolution	1.6 μΑ
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	I
Standard EMC Security NAMUR Approvals	EN61326 EN61010-1 NE 21; NE 43 ATEX <sup>2)</sup> : EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
🖾 - Protection	Categories 1/2G or 2G
🖾 - Certification	Ex ia IIC T6
Conformity specifications <sup>2)</sup> Operating voltage Ui Short circuit rating li Power limitation Pi Ambient temperature Internal capacity Ci Internal inductivity Li	30 V 131 mA 983 mW -40 to +55°C (-40 to 131°F) (dependent on categories) negligible negligible
Ambient temperature Internal capacity Ci Internal inductivity Li 2) homologation certificate PTB 08 ATEX	-40 to +55°C (-40 to 131°F) (dependent on categories) negligible negligible 2002X

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## **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.



Ω 1000 750 3 500-2 (1)250 4 14 16 18 20 22 32 34 36 24 26 28 30 ν HART load 1 2 Voltage limit Ex ia instrument З Voltage limit non-Ex instrument Operating voltage 4

Load diagram





#### 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



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<sup>™</sup> and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit





## Dimensions [mm]





#### Ordering chart for compact measuring device Type 8136

Specifications	Operating voltage	Output	Antenna version	Process connection	Electrical connection	ltem no. without display/ configuration module
Standard version	14 - 36 V DC	4 20 mA/HART	Encapsulated horn	G1½"	Cable gland M20 x 1.5	560 146
		(2 wires)	- 40 mm	NPT11/2"	Cable gland M20 x 1.5	560 148
			Plastic horn - 80 mm	Mounting strap	Cable gland M20 x 1.5	560 150
Ex version -	14 - 30 V DC	4 20 mA/HART	Encapsulated horn	G1½"	Cable gland M20 x 1.5	560 147
ATEX approval		(2 wires)	- 40 mm	NPT11/2"	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 botting DINSO, DINSO PINS, DINT 1851 / 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	ltem 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 d	evice Type 8136 - requ	lest for quotation		Note
Please fill in and send to your local	l Bürkert Sales Centre* with yo	ur inquiry or order.		You can fill o
Company:	Сс	ntact person:		in the PDF fi
Customer No.:	De	partment:		out the form
Address:	Те	l. / Fax.:		Cart
Postcode / Town:	E-	mail:		
Radar level measuring device 8136	3			
Quant	ity:	Desired del	ivery date:	
Antenna	Encapsulated hor	n in PVDF	Plastic horn in PP	
Process connection:				
Compression flange	with	without		
External thread	G 11/2"	NPT11/2"		
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	

🗌 No

🗌 No

## Interconnection possibilities with other Bürkert devices

🗌 Yes

🗌 Yes

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

Display/configuration module

ATEX approval

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1411/8\_EU-en\_00895041







# 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 8624 PI-controller on valve

Type 8635 SideControl EEx

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.



Continuous

G

TopControl system









Type 8644 Valve islands



Company data	
General data	
Materials Housing Cover	PBT, Stainless steel 316L (1.4435) PC
Seal ring Ground terminal Wetted parts Process fitting, transducer	NBR Stainless steel 316Ti/316L (1.4571/1.4435) 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 (-20200 kPa)
Vibration resistance	Mechanical vibrations with 4.g and 5100 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 (EEx ia instrument)
Permissible residual ripple	< 100 Hz: U s<1 V 100 Hz10 kHz: U s<10 m V
Output signal	420 mA/HART
Resolution	1.6 μΑ
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)	0999 s, adjustable
Fulfilled NAMUR recommendation	NE 43
Favirenment	
Environment	
Ambient temperature	
with display, adjustment elements	-20 up to +70°C (operation and storage)
Relative humidity	45-75 %; non condensated
Standards and approvals	
Standards and approvals	IP66/IP67 with M00 x 1.5 gland mounted and tightened
	IF 66/IF 67 with W20 x 1.5 gland mounted and tightened
Divervoltage category	
Standard	
FMC	EN61326
Security	EN61010-1
ATEX	EN50014: EN50020: EN50284
NAMUR	NE 21; NE 43
Specifications EEx	
$\langle \widehat{\mathfrak{t}_{\mathbf{x}}} \rangle$ - Protection	Categories 1/2 G or 2G
(Fix) - Certification	EEx ia IIC T6
<b>Conformity specifications</b> <sup>1)</sup> Power supply Ui Short circuit rating li Power limitation Pi Ambient temperature Internal capacity Ci Internal inductivity Li	30 V 131 mA 983 mW -20 up to +41°C (depend on categories) negligible pendicible
	าเวลแล้เกเต

1) homologation certificate PTB 07 ATEX 2003 X



## 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.



#### 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

				Iter	n no.
Specifications	Voltage supply	Output	Electrical connection	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	ltem 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



To find your nearest Bürkert facility, click on the orange box  $\rightarrow$ 

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

We reserve the right to make technical changes without notice. @ Christian Bürkert GmbH & Co. KG

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## TCL001/8181





# 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° ±3° (8.5 mm ±3 mm)
Switching function	normally closed/open or alternating
Normally closed/open Switching voltage Switching current Contact rating	max. 250 V max. 1 A max. 50 W / VA
Alternating Switching voltage Switching current Contact rating	max. 150 V max. 0.25 A 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"

#### TCL001/8181

# Technical data - 8181

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General data	Type 8181 standard	Type 8181 with relay module
Switching point	at tilt of <b>7° ±3°</b> (8.5 mm ±3 mm)	at tilt of <b>7° ±3°</b> (8.5 mm ±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 <sup>1)</sup>	approx. 0.7 <sup>1)</sup>
Acceptable pressure PP version Stainless steel version	<ol> <li>bar (vertical or horizontal mounting position)</li> <li>bar (vertical mounting position)</li> <li>bar (horizontal mounting position)</li> </ol>	<ol> <li>bar (vertical or horizontal mounting position)</li> <li>bar (vertical mounting position)</li> <li>bar (horizontal mounting position)</li> </ol>
<b>Medium temperature</b> 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 <sup>2</sup> min. cross section leads or PVC covering cable, 0.25 mm <sup>2</sup> min. cross section, 2 wires + shielding	-
Electrical data	Type 8181 standard	Type 8181 with relay module
Electrical data Output type	Type 8181 standard Reed contact	Type 8181 with relay module           1 single change-over contact
Electrical data Output type Switching function	Type 8181 standard Reed contact Normally closed/open	Type 8181 with relay module           1 single change-over contact           Normally closed/open
Electrical data Output type Switching function Voltage	Type 8181 standard Reed contact Normally closed/open Switching: max. 48 V AC/DC	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC
Electrical data Output type Switching function Voltage Current	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A
Electrical data Output type Switching function Voltage Current Breaking power	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for PP-vertical version)         600 V DC	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         -
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for PP-vertical version)         600 V DC         Min. 10 MΩ	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         -         -         -         -         -         -         -         -
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for PP-vertical version)         600 V DC         Min. 10 MΩ	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         100 000 acc. to standard VDE 0435
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)         600 V DC         Min. 10 MΩ         -	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)         600 V DC         Min. 10 MΩ         -         -         Type 8181 standard	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA         Type 8181 with relay module
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment Ambient temperature	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)         600 V DC         Min. 10 MΩ         -         -         Type 8181 standard         - 10 to +80°C (operation and storage)	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment Ambient temperature Standards, directives and approvals	Type 8181 standardReed contactNormally closed/openSwitching: max. 48 V AC/DCSwitching: max. 0.25 A66 VA AC/DC (only for PP-vertical version)50 VA AC/DCMax. 150 m $\Omega$ Max. 200 m $\Omega$ (only for stainless steel horizontal version)60 V DCMin. 10 M $\Omega$ Type 8181 standard- 10 to +80°C (operation and storage)Type 8181 standard	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA         Type 8181 with relay module         - 10 to +80°C (operation and storage)         Type 8181 with relay module
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment Ambient temperature Standards, directives and approvals Protection class	Type 8181 standardReed contactNormally closed/openSwitching: max. 48 V AC/DCSwitching: max. 0.25 A $66$ VA AC/DC (only for PP-vertical version) $50$ VA AC/DCMax. 150 mΩMax. 200 mΩ (only for stainless steel horizontal version) $600$ V DCMin. 10 MΩType 8181 standard- 10 to +80°C (operation and storage)Type 8181 standardIP 65	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         100 000 acc. to standard VDE 0435         < 3 mA         Type 8181 with relay module         - 10 to +80°C (operation and storage)         Type 8181 with relay module         IP 65



# Dimensions [mm] Type TCL001



Ø 23

25.

Ø 18

G 3/4

85 ,32 hex-nut

34

128



148

Ø 23

27

Ø 28

hex-nut IG 3/4"

85 32

35

128

## Dimensions [mm] Type 8181





# Dimensions [mm] Type 8181

#### Switch with relay module



Horizontal, stainless steel version



Vertical, PP version



Vertical, stainless steel version



# burkert

## 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													
	G1/8	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	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													
module supplied																Vertical	3 A	Max. 250 V AC / 30 V DC	Normally closed/open*	Positionable M12 and EN175301-803 cable plug	438 503
with 24 V DC		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

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

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

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1511/3\_EU-en\_00895087







# Vibrating level switch

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

PLC

Type 8110 can be combined with...





**Type 2030** Diaphragm valve

Type 8802-GD ELEMENT globe control Valve system

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 overfill or dry run protection.

The small tuning fork (40  $_{\rm mm}$  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.

#### 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  $\mu$ m for G or NPT threaded connection



**Type 8644** Valve islands with electronic I/O

General data	
Materials	
Tuning fork and fitting	Stainless steel 316L (1.4435)
Process seal / Housing	Klingersil <sup>®</sup> 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	0.110000 mPa.s / 0.72.5 g/cm <sup>3</sup>
Medium temperature	-40+100°C (150°C for Clamp process connection)
Medium pressure	-164 bar
Accuracy	
Hysteresis	Approx. 2 mm with vertical installation
Delay time / Frequency	Approx. 500 ms / Approx. 1200 Hz
Output	Transistor output PNP or contactless electronic switch
Electrical data - Sensor with PN	P transistor output
Electrical data - Sensor with PN Power supply / power consumption	P transistor output 1035 V DC / max. 0.5 W
Electrical data - Sensor with PN Power supply / power consumption Load current	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof)
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA Min./max changeover by electrical connection Max.: overfill protection - Min.: dry run protection LED indication: green and red
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode Electrical data - Sensor with con	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA Min./max changeover by electrical connection Max.: overfill protection - Min.: dry run protection LED indication: green and red mtactless electronic switch output
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode Electrical data - Sensor with con Power supply	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA Min./max changeover by electrical connection Max.: overfill protection - Min.: dry run protection LED indication: green and red mtactless electronic switch output 20253 V AC, 50/60 Hz or 20253 V DC
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode Electrical data - Sensor with con Power supply Domestic current requirement	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA Min./max changeover by electrical connection Max.: overfill protection - Min.: dry run protection LED indication: green and red mtactless electronic switch output 20253 V AC, 50/60 Hz or 20253 V DC Approx. 3 mA (via the load circuit) (Not with PLC)
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode Electrical data - Sensor with con Power supply Domestic current requirement Load current	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA Min./max changeover by electrical connection Max.: overfill protection - Min.: dry run protection LED indication: green and red mtactless electronic switch output 20253 V AC, 50/60 Hz or 20253 V DC Approx. 3 mA (via the load circuit) (Not with PLC) Min. 10 mA - Max. 250 mA
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode Electrical data - Sensor with con Power supply Domestic current requirement Load current Mode	P transistor output 1035 V DC / max. 0.5 W Max. 250 mA (output - overload and permanently short circuit proof) Max. 3 V DC Max. 34 V DC <10 μA Min./max changeover by electrical connection Max.: overfill protection - Min.: dry run protection LED indication: green and red matcless electronic switch output 20253 V AC, 50/60 Hz or 20253 V DC Approx. 3 mA (via the load circuit) (Not with PLC) Min. 10 mA - Max. 250 mA Min./max changeover by electrical connection
Electrical data - Sensor with PN Power supply / power consumption Load current Voltage loss Turn-on voltage Blocking current Mode Electrical data - Sensor with con Power supply Domestic current requirement Load current Mode	P transistor output         1035 V DC / max. 0.5 W         Max. 250 mA (output - overload and permanently short circuit proof)         Max. 3 V DC         Max. 34 V DC         <10 μA         Min./max changeover by electrical connection         Max.: overfill protection - Min.: dry run protection         LED indication: green and red         matcless electronic switch output         20253 V AC, 50/60 Hz or 20253 V DC         Approx. 3 mA (via the load circuit) (Not with PLC)         Min. 10 mA - Max. 250 mA         Min./max changeover by electrical connection         Max.: overfill 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 overfill 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 stockkeeping 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.

#### 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 overfill 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

#### **Chemical industry - reactors**



#### Advantages:

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

#### 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
- adjustement and maintenance-free

Thanks to the manifold application possibilities, the Type 8110 vibrating level switch is ideal for all applications concerning stockkeeping of liquids. A number of electrical and mechanical versions ensures simple integration into existing processing systems.



#### 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
- abscence 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]

#### 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.





## Ordering chart for the vibrating level switch Type 8110

Output	Power supply	Process connection	Electrical connection	ltem no.
Transistor PNP	1035 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
			Multipin M12 x 1	555 292
		NPT 1"	Multipin M12 x 1	557 155
		Clamp 2"	Multipin M12 x 1	555 294
Contactless electronic switch	20253 V AC, 50/60 Hz or	G 3/4"	Cable plug EN 175301-803	555 296
(Not with PLC)	20253 V DC	G 1"	Cable plug EN 175301-803	555 298

Other versions on request

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

Specifica- tions	ltem 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





Note

|--|

## Customized sensor Type 8110 - request for quotation

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

					in the PDP
Company:			Contact person:	out the form	
Customer No.:			Department:	- Our	
Address:			Tel. / Fax.:		
Postcode / Town:			E-mail:		
Vibrating level switc	h 8110				
	Quantity:		Desired deliv	very date:	
Process fitting con	nection:				
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		$\Box$ Yes with Ra ext. = 0.8 $\mu$ m		
Electrical connectio	n 🗌 Cable plug EN17530	1-803	Multipin M12 x 1	Quick On	
Output signal and power supply	Transistor PNP and 1035 V DC		Contactless electronic and 20253 V AC/DC		

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

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

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1510/10\_EU-en\_00891794





# Vibrating level switch

- For universal use as overfill or dry run protection system
- Setup without adjustment
- For food and beverage industry thanks to surface finishing < 0.8 μm</li>
- ATEX approvals (Ex)







**Type 2030** Diaphragm valve

Globe control valve with TopControl

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 overfill 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.



**Type 8644** Valve islands with electronic I/O

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	Klingersil 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 $\mu$ m (thread) / Ra < 0.8 $\mu$ m (Clamp)
Viscosity dynamic	0.110000 mPa.s (requirement: with density 1)
Density	0.5 2.5 g/cm <sup>3</sup> (selected by DIP switch) or
	0.7 2.5 g/cm <sup>3</sup>
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 rel	ay output
Output	Relay (DPDT), 2 floating spdts
Power supply	20253 V AC, 50/60 Hz or 2072 V DC
	(at U > 60 V DC the ambient temperature must be max. 50 °C (122°F))
Power consumption	18 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 overfill protection
	B = min. detection or dry run protection
Delay time	when immersed: 0.5 s
	when laid bare: 1 s
Electrical data - Sensor with NA	MUR output
Output	2 wire current modulation according to NAMUR
Power supply	
Voltage supply	via connection to an interface according to NAMUR
0 11 3	IEC 60947-5-6, approx. 8.2 V
Open-circuit voltage	U <sub>o</sub> approx. 8.2 V
Short-circuit current	I <sub>u</sub> approx. 8.2 mA
Current consumption	
Falling characteristic	$\geq 2.2~\text{mA}$ (blade uncovered) / $\leq 1.0~\text{mA}$ (blade covered)
Rising characteristic	$\leq$ 1.0 mA (blade uncovered) / $\geq$ 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	Min.: rising characteristics (High current when immersed)
falling or rising characteristics)	Max.: falling characteristics (Low current when immersed)
Standards and approvals	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	Ш
Protection class	I (relay output); II (NAMUR output)
Standards	
EMC	EN61326
Security	EN61010-1
ATEX <sup>1)</sup>	EN50014; EN50020; EN50284
NAMUR	IEC 60947-5-6 (EN 50227)
Specifications Ex	
🐼 - Protection	Categories 1/2 G, 2G
⟨s⟩ - Certification	Ex ia IIC T6
Conformity specifications <sup>1)</sup>	
Power supply Ui	20 V
Short circuit rating li	103 mA
Power limitation Pi	516 mW
Ambient temperature	$-40+85^{\circ}C(-40+185^{\circ}E)$ (depend on categories)
Internal capacity Ci	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 overfill 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.

#### 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 overfill 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

#### **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.

#### 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





## Ordering chart for the vibrating level switch Type 8111

Output	Power supply	Process connection	Electrical connection	ltem no.
Double relay (DPDT) ,	2072 V DC /	G 3/4"	2 cable glands M20 x 1.5	558 110
2 floating spdts	20250 V AC (5 A)	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	8.2 V DC - via an intrinsic safety interface with NAMUR input	G 3/4"	1 cable gland M20 x 1.5	558 115
ATEX approval		G 1"	1 cable gland M20 x 1.5	558 116



#### Ordering chart accessories





Vibrating level s	switch Type 8	111 - request	for quotation	Note	e
Please fill in and sen	d to your local Bür	kert Sales Centre*	with your inquiry or order.	You of the fit in the	can fill o elds di e PDF f
Company:			Contact person:	out t	the forr
Customer No.:			Department:		
Address:			Tel. / Fax.:		
Postcode / Town:			E-mail:		
Vibrating level switc	h 8111				
	Quantity:		Desired del	ivery date:	
Process fitting con	nection:				
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		$\Box$ Yes with Ra ext. = 0.8 $\mu$ m	$\Box$ Yes with Ra ext. = 0.3 $\mu$ m	
Output signal and power supply	Double relay a 20253 V AC	nd - 2072 V DC	NAMUR and 815 V DC		
ATEX approval only with Namur Output	☐ Yes		No		

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

8111

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 8802-GD Element control valve system

**General data** 

Type 8644 Valve islands



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

Type 2103

Diaphragm valve

The unit is available in two versions:

Type 8793

Process controller

- 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.



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)	Klingersil 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 G11/2" or NPT11/2"
	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	εr > 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: Uss < 1 V 100 Hz 10 kHz: Uss < 10 mV
Output signal	4 20 mA/HART
Resolution	1.6 μΑ
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
Approvais	ATEX": EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
🐵 - Protection	Categories 1/2G or 2G
🐵 - Certification	Ex ia IIC T6
Conformity specifications <sup>1)</sup>	
Operating voltage Ui	30 V
Short circuit rating li	131 mA
Power limitation Pi	983 mW
Ambient temperature	-40 to +55°C (-40 to 131°F) (dependent on categories)
Internal capacity Ci	negligible
Internal inductivity Li	negligible
1) homologation certificate PTB 08 ATEX	2002X

#### Load diagram



# burkert

#### **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<sup>™</sup> and suitable Bürkert DTM

HART-USB Modem

Resistance approx. 250 Ohms

Power supply unit







## Dimensions [mm]





#### Ordering chart for compact measuring device Type 8137

Specifications	Operating voltage	Output	Antenna version	Process connection	Electrical connection	ltem no. without display/ configuration module
Standard version	14 - 36 V DC	4 20 mA/HART	ø 40 mm	G1½"	Cable gland M20 x 1.5	560 157
		(2 wires)		NPT11/2"	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 -	14 - 30 V DC	4 20 mA/HART	ø 40 mm	G1½"	Cable gland M20 x 1.5	560 158
ATEX approval		(2 wires)		NPT11/2"	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



Please also use the "request for quotation" on page 6 for ordering a customized measuring device. go to page

Additional Antenna ø 48 mm, 95 mm

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

Specifications	ltem 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 T	ype 8137 - r	equest for quotation		Note
Please fill in and send to your local Bürkert	Sales Centre* wit	h your inquiry or order.		You can fill of
Company:		Contact person:		in the PDF fil
Customer No.:		Department:		before printing
Address:		Tel. / Fax.:		
Postcode / Town:		E-mail:		
Radar level measuring device 8137				
Quantity:		Desired delivery	date:	
Antenna	Horn ø 40 m	nm (10 m) 🗌 Horn ø 75 mm (30 m)	Parabolic ø 245 mm	ı (35 m)
	🗌 Horn ø 48 m	nm (15 m) 🗌 Horn ø 95 mm (30 m)		
Process connection:				
External thread	G11/2"	NPT11/2"		
Flange	DN50 PN40	), Form C, DIN2501	2" 150 lb RF, ANSI E	316.5
	DN80 PN40	), Form C, DIN2501	🗌 3" 150 lb RF, ANSI I	316.5
	DN100 PN4	10, Form C, DIN2501	4" 150 lb RF, ANSI E	316.5
	DN150 PN4	10, Form C, DIN2501	6" 150 lb RF, ANSI 6	316.5
	DN200 PN4	40, Form C, DIN2501	8" 150 lb RF, ANSI B	316.5
Display/configuration module	Yes	No		
ATEX approval	Yes	No		

## Interconnection possibilities with other Bürkert devices



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

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 8802-GD Element control valve system

**General data** 

Materials

Type 8644



Valve islands

	Housing / Cover	PBT, Stainless steel 316L (1.4404) / PC
	Seal ring / Ground terminal	NBR / Stainless steel 316Ti/316L (1.4571/1.4435)
els	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	εr > 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	
<b>→</b>	with Clamp, flange connection	-40 to +200°C (-40 to 392°F)
m	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 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

8138





Type 8793 Process controller

Type 2103 Diaphragm valve

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

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



Electrical data	
Operating voltage	14 - 36 V DC or 14 - 30 V DC (Ex ia instrument)
Permissible residual ripple	< 100 Hz: Uss < 1 V 100 Hz 10 kHz: Uss < 10 mV
Output signal	4 20 mA/HART
Resolution	1.6 μΑ
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 Security NAMUR Approvals	EN61326 EN61010-1 NE 21; NE 43 ATEX <sup>1)</sup> : EN60079-0; EN60079-11; EN60079-26 FDA
Specifications Ex	
Protection	Categories 1/2G or 2G
🐵 - Certification	Ex ia IIC T6
Conformity specifications <sup>1)</sup> Operating voltage Ui Short circuit rating li Power limitation Pi Ambient temperature Internal capacity Ci	30 V 131 mA 983 mW -40 to +55°C (-40 to 131°F) (dependent on categories) negligible
Internal inductivity Li	negligible





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## **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 cleanability 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





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

Necessary components:

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





# Dimensions [mm]



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# Dimensions [mm]



burkert

## Dimensions [mm]



# burkert

#### 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	Clamp 2"	Cable gland M20 x 1.5	560 169
		(2 wires)	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 -	14 - 30 V DC	4 20 mA/HART	Clamp 2"	Cable gland M20 x 1.5	560 170
ATEX approval		(2 wires)	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



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	ltem 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 Ty	pe 813	8 - requ	est for quo	tation			lote
Please fill in and send to your lo	cal Bürkert S	ales Centr	e* with you	ur inquiry or or	der.			You can fill out the fields directly
Company:			Со	ntact person:				in the PDF file
Customer No.:				partment:				before printing
Address:				Tel. / Fax.:				Odet
Postcode / Town:			E-r	nail:				
Radar level measuring device 8	138							
Qua	antity:			De	esired deliver	y date:		]
Antenna		🗌 Encap	sulated hori	n (-40 200°C)	🗌 Hygieni	c encapsulate	ed horn (-40 130	J°C)
Process connection:								
Clamp	2"		21/2"		3"		4"	
Bolting DIN 11851	🗌 DN50 PI	N16,	DN6	5 PN16	🗌 DN80 F	PN16	🗌 DN100 F	°N16
Hygienic fitting	with tensi	on flange DN	N32 PN16		with cor	with compression nut F40 PN16		
Aseptic Bolting DIN 11864-2-	A 🗌 DN50 (0-	ring at vessel)	DN60	) (O-ring at vessel)	DN80 (	O-ring at vessel)		
SMS 1145		DN51				DN76	6	
Neuno Biocontrol		Size 5	0 PN16					
Flange		DN50	PN40, Forr	n C, DIN2501		2" 15	0 lb RF, ANSI B16	.5
			PN40, Forr	n C, DIN2501		3" 15	0 lb RF, ANSI B16	.5
		DN10	0 PN40, Fo	rm C, DIN2501		4" 15	0 lb RF, ANSI B16	.5
		DN15	0 PN40, Fo	rm C, DIN2501		6" 15	0 lb RF, ANSI B16	i.5
		DN20	0 PN40, Fo	rm C, DIN2501		8" 150	0 lb RF, ANSI B16	i.5
DN25 connection adapted for GEA Tuchenhagen VARINLINE pr	rocess connections	DN25	PN10					
Display/configuration module		Yes	🗌 No					
ATEX approval		Yes	🗌 No	FDA ap	proval	Yes	No No	

## Interconnection possibilities with other Bürkert devices

Type 8802-GD- Element Control valve system Type 8138 - Radar level measuring device Type 8110 - Level switch
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\*To find your nearest Bürkert office, click on the orange box ightarrow

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

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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  $\langle E_x \rangle$



Type 8619 multiCELL Transmitter/Controller

Type 2035 Diaphragm valve

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.



Type 8802-GD Continuous TopControl system





FLUID CONTROL SYSTEMS

Valve islands

PLC

General data	
Materials	
Housing / Cover	PBT, Stainless steel 316L (1.4404) / PC
Seal ring / Ground terminal	NBR / Stainless steel 316L
Wetted parts	
Process fitting	
Rod and cable	Stainless steel 316L* and PPS for version up to 6 bar
	Stainless steel 316L* and PEEK for version up to 40 bar
Coaxø 21.3 mm -	Stainless steel 316L* and PEEK
Process seal	FKM
Inner conductor	
(up to the separation cable/rod)	Stainless steel 316L*
Spacers	PFA (only for coax. probe version)
Rod-ø 8 mm	Stainless steel 316L*
Cable-ø 4 mm with gravity weight	Stainless steel 316L*
Coaxø 21.3 mm (tube)	Stainless steel 316L*
Display	LCD in full dot matrix
Weight	
Housing	890 g
Rod-ø 8 mm	approx. 400 g/m
Cable-ø 4 mm	approx. 60 g/m
Coaxø 21.3 mm	approx. 1110 g/m
Gravity weight (only with cable version)	approx. 200 g
Process fitting	Thread G or NPT - 3/4", 1"
Length	
Rod-ø 8 mm	0.3 6 m - Lateral load: 10 Nm
Cable-ø 4 mm	0.5 75 m - Max. tensile load: 2.5 KN
Coaxø 21.3 mm	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	εr > 1.6
Coaxø 21.3 mm	εr > 1.4

\* (1.4404 or 1.4435)

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General data (continued)	
Dead band	
in water	
III water Dod a 9 mm	From top of probal 90 mm, from bottom of such - 0
Cable-a 1 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
$C_{able} = 0.4 \text{ mm}$	From top of probe: 30 mm - from bottom of probe: 0 mm
in oil	Trom top of probe. So min - nom bottom of probe: 0 mm
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
Coaxø 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	For process fitting in:
(depends on the process fitting)	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 PS) (-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 (Un)	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 μΑ
Fault signal (adjustable)	Last valid measured value or $\ge$ 21 mA; $\le$ 3.6 mA
Current limitation	21.5 mA (max. output current)
Load	(Un - Umin.)/0.0215 A
Integration time (63% of the input variable)	0 999 s, adjustable
Environment	
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 <sup>1)</sup>	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 specifications <sup>1)</sup>	
Operating voltage Ui	30 V
Short circuit rating li	131 mA
Power limitation Pi	983 mW
Ambient temperature	-50 to +46°C (-40 to 105.8°F) (depend on categories)
Internal capacity Ci	negligible
Internal inductivity Li	≤5 μH

Measurement range diagram Þ ÌD I -•1 -•1 4 4 ŝ 3 2 2 3 5 • 5 \_1 \_ Cable version Rod version Þ -. • 1 0 4 2 ٩ 3 . 5 Coax. version 1 Reference plane

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

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













#### Load diagram Ω HART load Voltage limit Ex ia instrument Voltage limit non-Ex instrument З Supply voltage ⓓ V



#### Application examples with Type 8188





#### 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<sup>™</sup> 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



#### 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<sup>™</sup> and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms

Power supply unit



burkert

## Dimensions [mm]



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# 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,	9.6 - 35 V DC	4 - 20 mA/HART	Rod	1 m	Cable gland M20 x 1.5	565 800
temp. max. 80°C		(2 wires)		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,	9.6 - 35 V DC	4 - 20 mA/HART	Rod	1 m	Cable gland M20 x 1.5	565 802
temp. max. 150°C		(2 wires)		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, 9.6 - 35 V	9.6 - 35 V DC	4 - 20 mA/HART	Rod	1 m	Cable gland M20 x 1.5	565 801
PN6, temp. max. 80°C		(2 wires)		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,	9.6 - 35 V DC	4 - 20 mA/HART	Rod	1 m	Cable gland M20 x 1.5	865 803
PN40, temp. max. 150°C		(2 wires)		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	ltem no. with display/ configuration module
Ex version - ATEX approval -	9.6 - 30 V DC	4 - 20 mA/HART	Rod	1 m	Cable gland M20 x 1.5	565 808
G 3/4" mounting thread, PN6, temp max 80°C		(2 wires)		2 m	Cable gland M20 x 1.5	565 810
			Cable	5 m	Cable gland M20 x 1.5	565 820
			Coax.	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
			Coax.	1 m	Cable gland M20 x 1.5	565 833
				2 m	Cable gland M20 x 1.5	565 834
Ex version - IECEx approval	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 839
- NPT 3/4" mounting thread,				2 m	Cable gland M20 x 1.5	565 840
			Cable	5 m	Cable gland M20 x 1.5	565 841
			Coax.	1 m	Cable gland M20 x 1.5	565 835
				2 m	Cable gland M20 x 1.5	565 836
Ex version - IECEx approval	9.6 - 30 V DC	4 - 20 mA/HART	Rod Cable Coax.	1 m	Cable gland M20 x 1.5	565 842
- NPT 1" mounting thread,		(2 wires)		2 m	Cable gland M20 x 1.5	565 843
1 14+0, temp. max. 100 C				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 microw	ave level measure	ment devic	e Type 8188 - reques	t for quotation	ote
Please fill in and sen	d to your local Bürkert Sa	ales Centre* wit	h your inquiry or order.	Yc th in	u can fill ou e fields dire the PDF fil
Company:			Contact person:	b	efore prinui ut the form
Customer No.:			Department:	0	
Address:			Tel. / Fax.:		
Postcode / Town:			E-mail:		
Guided microwave le	evel measuring device 81	88			
	Quantity:		Desired deli	ivery date:	
Process connection	n:				
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 multiple of	<sup>1</sup> 100 mm between 300 and 6000 mm for 100 mm between 500 and 75000 mm fo	Rod version or coax version - r cable version)	
Display/configuration	ion module	Yes	No		
ATEX approval		Yes	No		
IECEx approval		Yes	No		

## Interconnection possibilities with other Bürkert devices









# 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  $\langle E_x \rangle$



multiCELL Transmitter/Controller

Diaphragm valve

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 Ra < 0.76  $\mu$ 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.



Type 8802-GD Continuous TopControl system





Valve islands

PLC

General data	
Materials Housing / Cover Seal ring / Ground terminal Wetted parts	PBT, Stainless steel 316L (1.4404) / PC NBR / Stainless steel 316L
Process fitting / process seal Rod-ø 8 mm - polished	Stainless steel 316L (1.4404 or 1.4435) and PEEK / EPDM Stainless steel 316L (1.4435)
Rod surface finish	Ra < 0.76 μm (BN2)
Display	LCD in full dot matrix
Weight Housing Rod-ø 8 mm	890 g 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	εr > 1.6
<b>Dead band</b> in water in oil	From top of probe: 80 mm - from bottom of probe: 0 mm 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	< ±1 mm
Deviation	$\pm 2$ mm (see deviation diagram, on next page)

Electrical data	
Operating voltage (Un)	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 μΑ
Fault signal (adjustable)	Last valid measured value or $\ge$ 21 mA or $\le$ 3.6 mA
Current limitation	21.5 mA (max. output current)
Load	(Un - Umin.)/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	
Protection class	III (IEC 61010-1)
Standard	
EMC / Safety	EN61326 / EN61010-1
ATEX <sup>1)</sup>	EN60079-0; EN60079-11; EN60079-26
NAMUR	NE 21; NE 43
Approvals	FDA
Specifications Ex	
- Protection	Categories 1 G, 1/2 G or 2 G
- Certification	Ex ia IIC T6
Conformity specifications <sup>1)</sup>	
Operating voltage Ui	30 V
Short circuit rating li	131 mA
Power limitation Pi	983 mW
Ambient temperature	-50 to +46°C (-40 to 105.8°F) (depend on categories)
Internal capacity Ci	negligible
Internal inductivity Li	≤5 μH
1) homologation certificate IECEx TUR 14	.0014 X / TUV 14 ATEX 7490 X



#### **Deviation diagram**





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## Target applications with Type 8189

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, overpressure, foam dielectric value and the shape of the material cone.



p. 3/7





#### 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 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 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<sup>™</sup> 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<sup>™</sup> and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms

Power supply unit





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## Dimensions [mm]



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## 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	Rod	1 m	Cable gland M20 x 1.5	565 850
		(2 wires)		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 - 9.6 - 30 V DC	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 854
Clamp 2"				2 m	Cable gland M20 x 1.5	565 856
Ex version - ATEX approval -	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 855
DIN11851 DN50				2 m	Cable gland M20 x 1.5	565 857
Ex version - IECEx approval -	9.6 - 30 V DC	4 - 20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 x 1.5	565 858
Clamp 2"				2 m	Cable gland M20 x 1.5	565 860
Ex version - IECEx approval - 9.6 - 30 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



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)

Specifica- tions	ltem 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



Note

#### 8189

## 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.

		in the printing
Company:	Contact person:	out the form.
Customer No.:	Department:	
Address:	Tel. / Fax.:	
Postcode / Town:	E-mail:	

Guided microwave level measurement device 8189							
	Quantity:		Desired delivery date:				
Process connec	tion:						
Clamp	1"1/2	2"	2"1/2	3"			
DIN 11851	DIN 11851		DN50	DN65			
Sensor version:							
Length	☐ 1 m ☐ Spec. length ☐	2 m mm (multiple of 10	00 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				

## Interconnection possibilities with other Bürkert devices



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

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

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## TCL001/8181





# 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° ±3° (8.5 mm ±3 mm)			
Switching function	normally closed/open or alternating			
Normally closed/open Switching voltage Switching current Contact rating	max. 250 V max. 1 A max. 50 W / VA			
Alternating Switching voltage Switching current Contact rating	max. 150 V max. 0.25 A 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"			

#### TCL001/8181

# Technical data - 8181

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General data	Type 8181 standard	Type 8181 with relay module				
Switching point	at tilt of <b>7° ±3°</b> (8.5 mm ±3 mm)	at tilt of <b>7° ±3°</b> (8.5 mm ±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 <sup>1)</sup>	approx. 0.7 <sup>1)</sup>				
Acceptable pressure PP version Stainless steel version	<ol> <li>bar (vertical or horizontal mounting position)</li> <li>bar (vertical mounting position)</li> <li>bar (horizontal mounting position)</li> </ol>	<ol> <li>bar (vertical or horizontal mounting position)</li> <li>bar (vertical mounting position)</li> <li>bar (horizontal mounting position)</li> </ol>				
<b>Medium temperature</b> 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 <sup>2</sup> min. cross section leads or PVC covering cable, 0.25 mm <sup>2</sup> min. cross section, 2 wires + shielding	-				
Electrical data	Type 8181 standard	Type 8181 with relay module				
Electrical data Output type	Type 8181 standard Reed contact	Type 8181 with relay module           1 single change-over contact				
Electrical data Output type Switching function	Type 8181 standard Reed contact Normally closed/open	Type 8181 with relay module           1 single change-over contact           Normally closed/open				
Electrical data Output type Switching function Voltage	Type 8181 standard Reed contact Normally closed/open Switching: max. 48 V AC/DC	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC				
Electrical data Output type Switching function Voltage Current	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A				
Electrical data Output type Switching function Voltage Current Breaking power	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for PP-vertical version)         600 V DC	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for PP-vertical version)         600 V DC         Min. 10 MΩ	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         -         -         -         -         -         -         -         -				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for PP-vertical version)         600 V DC         Min. 10 MΩ	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         100 000 acc. to standard VDE 0435				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)         600 V DC         Min. 10 MΩ         -	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)         600 V DC         Min. 10 MΩ         -         -         Type 8181 standard	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA         Type 8181 with relay module				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment Ambient temperature	Type 8181 standard         Reed contact         Normally closed/open         Switching: max. 48 V AC/DC         Switching: max. 0.25 A         66 VA AC/DC (only for PP-vertical version)         50 VA AC/DC         Max. 150 mΩ         Max. 200 mΩ (only for stainless steel horizontal version)         600 V DC         Min. 10 MΩ         -         -         Type 8181 standard         - 10 to +80°C (operation and storage)	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment Ambient temperature Standards, directives and approvals	Type 8181 standardReed contactNormally closed/openSwitching: max. 48 V AC/DCSwitching: max. 0.25 A66 VA AC/DC (only for PP-vertical version)50 VA AC/DCMax. 150 m $\Omega$ Max. 200 m $\Omega$ (only for stainless steel horizontal version)60 V DCMin. 10 M $\Omega$ Type 8181 standard- 10 to +80°C (operation and storage)Type 8181 standard	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         100 000 acc. to standard VDE 0435         < 3 mA         Type 8181 with relay module         - 10 to +80°C (operation and storage)         Type 8181 with relay module				
Electrical data Output type Switching function Voltage Current Breaking power Contact resistance Breakdown voltage Insulating resistance Number of cycles Current consumption Environment Ambient temperature Standards, directives and approvals Protection class	Type 8181 standardReed contactNormally closed/openSwitching: max. 48 V AC/DCSwitching: max. 0.25 A $66$ VA AC/DC (only for PP-vertical version) $50$ VA AC/DCMax. 150 mΩMax. 200 mΩ (only for stainless steel horizontal version) $600$ V DCMin. 10 MΩType 8181 standard- 10 to +80°C (operation and storage)Type 8181 standardIP 65	Type 8181 with relay module         1 single change-over contact         Normally closed/open         Max. 250 V AC / 30 V DC         Max. 3 A         -         -         -         100 000 acc. to standard VDE 0435         < 3 mA         Type 8181 with relay module         - 10 to +80°C (operation and storage)         Type 8181 with relay module         IP 65				



# Dimensions [mm] Type TCL001



Ø 23

25.

Ø 18

G 3/4

85 ,32 hex-nut

34

128



148

Ø 23

27

Ø 28

hex-nut IG 3/4"

85 32

35

128

## Dimensions [mm] Type 8181





# Dimensions [mm] Type 8181

#### Switch with relay module



Horizontal, stainless steel version



Vertical, PP version



Vertical, stainless steel version



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#### Ordering chart

Type	Connection	Material	Version	Switching current	Switching voltage	Switching function	Electrical connection	Item no.
TCL001	R1/2	PP	Horizontal	al max 1 A	Max 250V	Normally closed/open*	3 m cable	783 793
					Max 150V	Alternating	3 m cable	783 794
8181 G1/4	G1/4	PP	Horizontal	0.5 A	Max 48 V AC/DC	Normally closed/open*	300 mm leads	438 141
	G1/8	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 St. St.	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
			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

#### По вопросам продаж и поддержки обращайтесь:

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

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

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