

## Sanitary and flange radar level transmitter



- Compact for level measurement up to 20 m
- 4 ... 20 mA/Hart - 2 wires
- Adjustable with PC
- ATEX approvals  $\text{Ex}$
- Clamp, Varivent® process connection

Type 8138 can be combined with...



**Type 8611**

Universal PI controller eControl



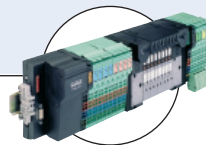
**Type 8635**

SideControl EEx



**Type 2712 (8630)**

Continuous TopControl system



**Type 8644**

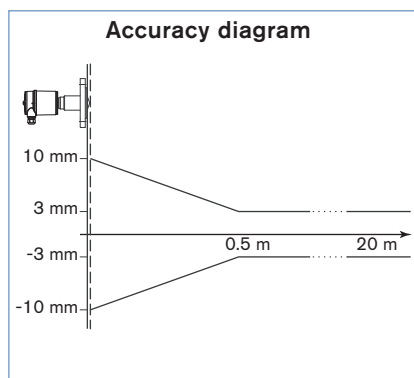
Valve islands



**PLC**

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

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



### General data

#### Materials

Housing / Cover	PBT, Stainless steel 316L / PC
Seal ring / Ground terminal	NBR / Stainless steel 316Ti/316L (1.4571/1.4435)
Wetted parts	
Process fitting	Stainless steel 316L
Antenna / Seal	TFM-PTFE / EPDM

#### Display \*

LCD in full dot matrix (in option)

#### Process fitting

Clamp 2", Varivent® DN25, Flange DN50, DN100 DIN2501

#### Torque of the flange screws

60 Nm

#### Electrical connection

Cable glands M20 x 1.5

#### Measuring type

Distance between process fitting and product surface

#### Min. dielectric figure

$\epsilon_r > 1.6$

#### Dead zone

50 mm (from flange)

#### Measuring range

0.05 up to 10 m (Clamp 2", flange DN50 or Varivent® version)  
0.05 up to 20 m (flange DN100)

#### Process temperature

with Clamp, flange connection  
with Varivent® connection

-40 up to +150°C  
-40 up to +130°C

#### Vessel pressure<sup>1)</sup>

-1 up to 16 bar (-100 up to 1600 kPa) (Clamp 2" version) OR  
-1 up to 10 bar (-100 up to 1000 kPa) (Varivent® DN25 version)  
or according 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 3dB

18° (Measuring range 0.05 up to 10m)  
10° (Measuring range 0.05 up to 20m)

#### Adjustment time

> 1 s (dependent on the parameter adjustment)

#### Accuracy

± 3 mm (see diagramm)

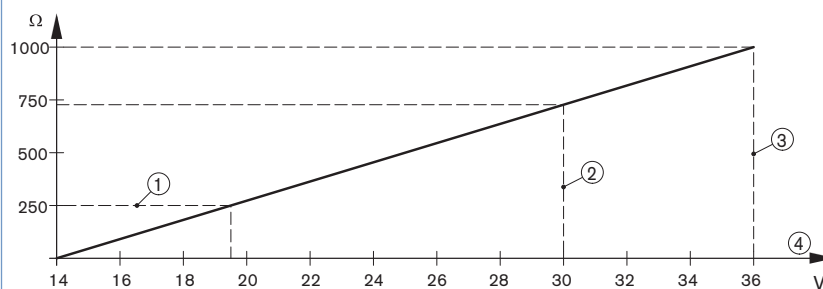
Clamp is a registered Trademark of Alfa Laval Inc.  
Varivent® is a registered Trademark of GEA Tuchenhagen.

\* to be ordered separately

Electrical data	
<b>Power supply</b>	14 to 36 V DC or 14 to 30 V DC (EEx ia instrument)
<b>Permissible residual ripple</b>	< 100 Hz: $U_{ss} < 1$ V 100 Hz...10 kHz: $U_{ss} < 10$ mV
<b>Output signal</b>	4...20 mA/HART
<b>Resolution</b>	1.6 mA
<b>Fault signal</b>	current output unchanged; 20.5 mA; 22 mA < 3.6 mA (adjustable)
<b>Current limitation</b>	22 mA
<b>Load</b>	see load diagram
<b>Damping</b> (63% of the input variable)	0...999 s, adjustable
<b>Fulfilled NAMUR recommendation</b>	NE 43
Environment	
<b>Ambient temperature</b>	-40 to +80°C (operation and storage)
<b>Relative humidity</b>	20-80 %; non condensated
Standards and approvals	
<b>Protection</b>	IP66/IP67 with M20 x 1.5 gland mounted and tightened
<b>Overvoltage category</b>	III
<b>Protection class</b>	II
<b>Standard</b>	
EMC	EN61326
Security	EN61010-1
NAMUR	NE 21; NE 43
<b>Approvals</b>	ATEX: EN50014; EN50020; EN50284 FDA WHG FM and 3A (in progress)
Specifications EEx	
<b>Ex - Protection</b>	Categories 1/2 G or 2G
<b>Ex - Certification</b>	EEx ia IIC T6
<b>Conformity specifications<sup>1)</sup></b>	
Power supply $U_i$	30 V
Short circuit rating $I_i$	131 mA
Power limitation $P_i$	983 mW
Ambient temperature	-40 up to +55°C (depend on categories)
Internal capacity $C_i$	negligible
Internal inductivity $L_i$	negligible

1) homologation certificate PTB 03 ATEX 2060 X

Load diagram



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

## Target applications

### In highly purified water

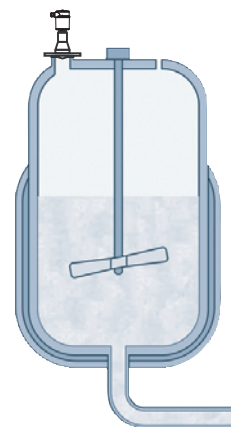
The manufacture of products, which are either injected directly into the bloodstream, or administered as nose or eye drops, requires high purity water (WFI). The transmitter 8138 is especially suitable for level measurement in the WFI storage tank. The contactless measurement is unaffected by pressure 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 produce take place in controlled, highly sterile surroundings. They therefore place heavy demands on the cleanliness of all parts that touch the medium. The cleaning processes themselves are correspondingly thorough. Contamination with foreign bacteria would lead to spoilage of the entire batch.

The radar transmitter 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 behavior.



## Principle of operation

The radar transmitter consists of an electronic housing, a process fitting element the antenna and a sensor. The antenna emits short radar pulses with a duration of approximate 1 ns to the measured product. These pulses are reflected by the product 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 an measured value.

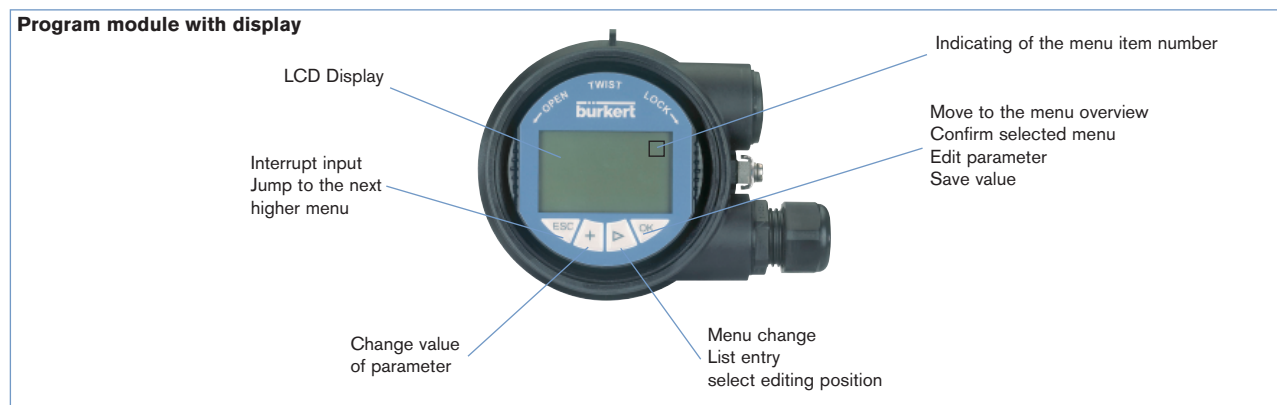
The transmitter can be adjusted with:

- the program module with display
- 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 transmitter Type 8138. Optionally, parameters may also be uploaded and downloaded with the program module with display or in PACTware™

▶ Set up with program module with display

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



▶ Set up with PACTware™ / DTM and HART communication

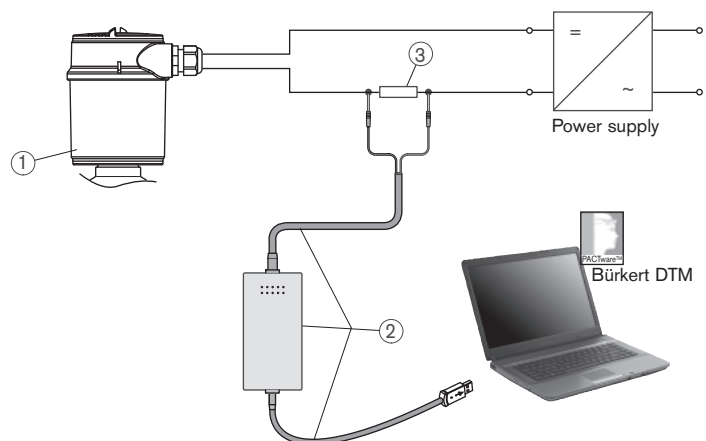
The transmitter can be operated directly on the instrument via PACTware™ or via the HART signal on the signal cable. An interface adapter is necessary for the adjustment with PACTware™. For the setup of the Type 8138, DTM-Collection in the actual version must be used. The basic version of this DTM Collection incl. PACTware™ is available as a free-of-charge download from the Internet at [www.burkert.com](http://www.burkert.com).

Connecting the PC via HART to the signal cable

1. Transmitter 8138
2. HART-USB Modem
3. Resistance 250 Ohm

Necessary components :

- Transmitter 8138
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem from the market
- Resistance approx. 250 Ohm
- Power supply unit

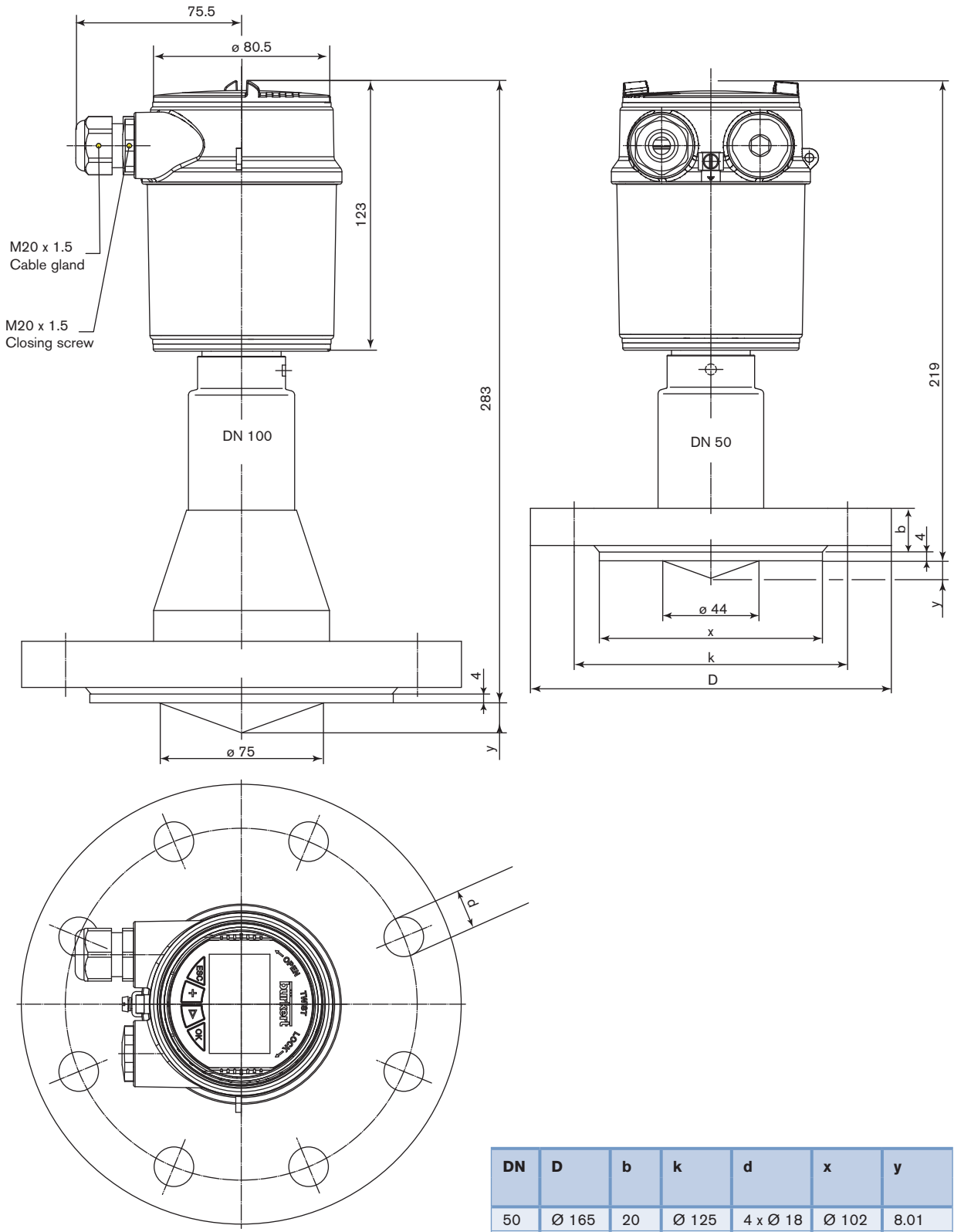






Dimensions [mm]

Flange connection



## Ordering chart for compact transmitter Type 8138

Specifications	Voltage supply	Output	Process connection	Electrical connection	without program module no display
Standard version	14-36 V DC	4-20 mA/HART (2 wires)	Clamp 2"	Cable gland M 20 x 1.5	560 169
			Varivent® DN25	Cable gland M 20 x 1.5	560 171
			Flange DN50 DIN 2501 /16 bar	Cable gland M 20 x 1.5	560 173
			Flange DN100 DIN 2501 /16 bar	Cable gland M 20 x 1.5	560 175
EEx version - ATEX approval	14-30 V DC	4-20 mA/HART (2 wires)	Clamp 2"	Cable gland M 20 x 1.5	560 170
			Varivent® DN25	Cable gland M 20 x 1.5	560 172
			Flange DN50 DIN 2501 /16 bar	Cable gland M 20 x 1.5	560 174
			Flange DN100 DIN 2501 /16 bar	Cable gland M 20 x 1.5	560 176

 **Further versions on request**

Please also use the "request for quotation" form on page 6 for ordering a customized transmitter. [go to page](#)

**Process connection**

Flange DN80PN40 Form C DIN2501  
DN150PN16 Form C DIN2501  
DN150PN40 Form C DIN2501  
2" 150 lb RF; ANSI B16.5  
3" 150 lb RF; ANSI B16.5  
4" 150 lb RF; ANSI B16.5  
6" 150 lb RF; ANSI B16.5

Clamp 3"; 4"

**Approvals**

FM, 3A agreements in progress

## Ordering chart - accessories for transmitter Type 8138 (has to be ordered separately)

Specifications	Item no.
Set with 2 reductions M 20 x 1.5 / NPT1/2" + 2 neoprene flat seals for cable gland + 2 screw-plugs M 20 x 1.5	551 782
Program module with display	559 279
Hart-USB Modem	560 177

**Customized transmitter Type 8138 - request for quotation**

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

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

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

**Radar level transmitter 8138**

Quantity:       Desired delivery date:

■ **Antenna**       Encapsulated horn (-40...150°C)       Hygienic encapsulated horn (-40...130°C)

■ **Process fitting connection:**

■ **Clamp**       2"       2" 1/2       3"       4"

■ **Bolting DIN 11851**       DN50 PN16,       DN65 PN16       DN80 PN16       DN100 PN16

■ **Hygienic fitting**       with tension flange DN32PN16       with compression nut F40 PN16

■ **Aseptic Bolting DIN 11864-2-A**       DN50 (O-ring at vessel)       DN60 (O-ring at vessel)       DN80 (O-ring at vessel)

■ **SMS 1145**       DN51       DN76

■ **Neuno Biocontrol**       Size 50 PN16

■ **Flange**

DN50 PN40, Form C, DIN2501       2" 150 lb RF, ANSI B16.5

DN80 PN40, Form C, DIN2501       3" 150 lb RF, ANSI B16.5

DN100 PN40, Form C, DIN2501       4" 150 lb RF, ANSI B16.5

DN150 PN40, Form C, DIN2501       6" 150 lb RF, ANSI B16.5

DN200 PN40, Form C, DIN2501       8" 150 lb RF, ANSI B16.5

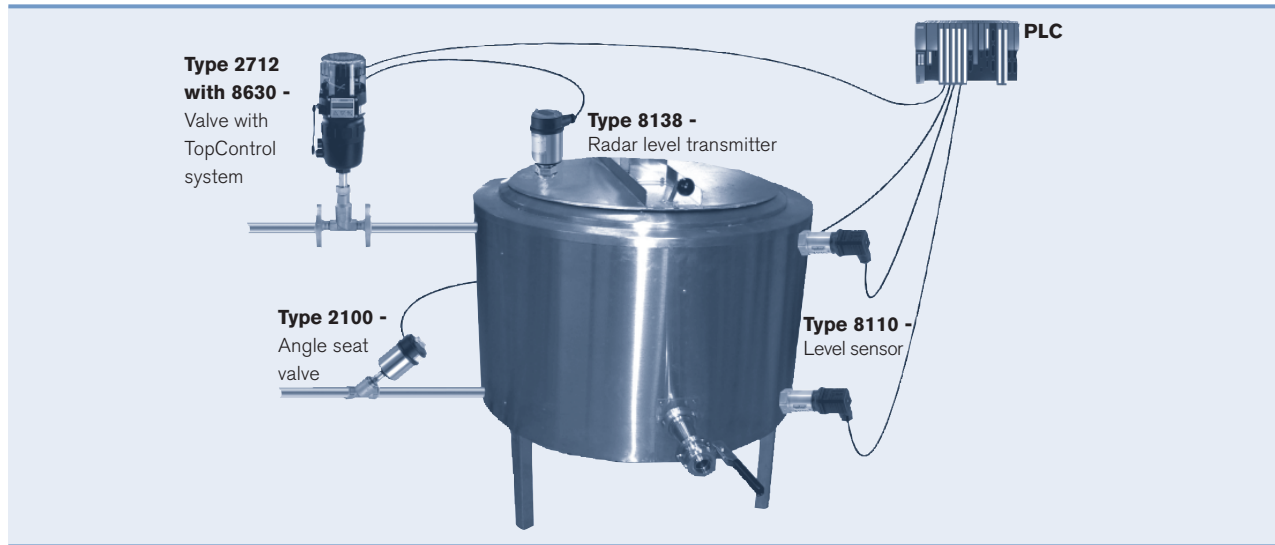
■ **Varivent®**       DN25... PN10

■ **Program module and display**       Yes       No

■ **ATEX approval**       Yes       No      ■ **FDA approval**       Yes       No

■ **WHG approval**       Yes       No

■ **FM approval**      *in progress*



\*To find your nearest Bürkert facility, click on the orange box → [www.burkert.com](http://www.burkert.com)

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