Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Features

- Measuring range UFM 600 up to 6 metres
- Measuring range UFM 200 up to 2 metres
- for distance, volume and filling level measurement
- for containers, open basins or channels
- simple installation via connection threads
- alternative signal output interfaces (current loop / relay / Modbus RTU)
- contact-free measuring principle

Attention

The display and control unit (UNI display) is required for setting the sensor in the relay and Modbus version.

www.asv-stuebbe.com/produkte/mess-und-regeltechnik

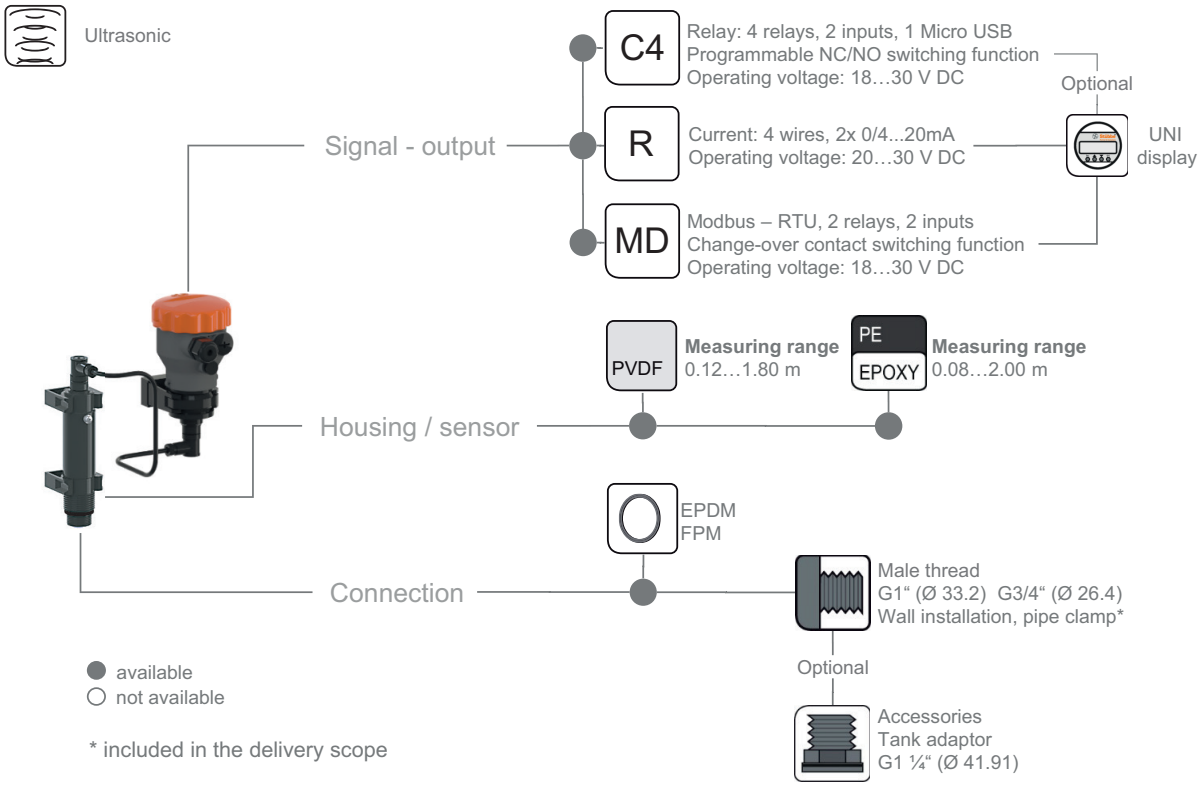
PVDF

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Pictogram Ultrasonic filling level sensor UFM 200 C4 / R / MD

UFM 200 Flex
R / C4 / MD

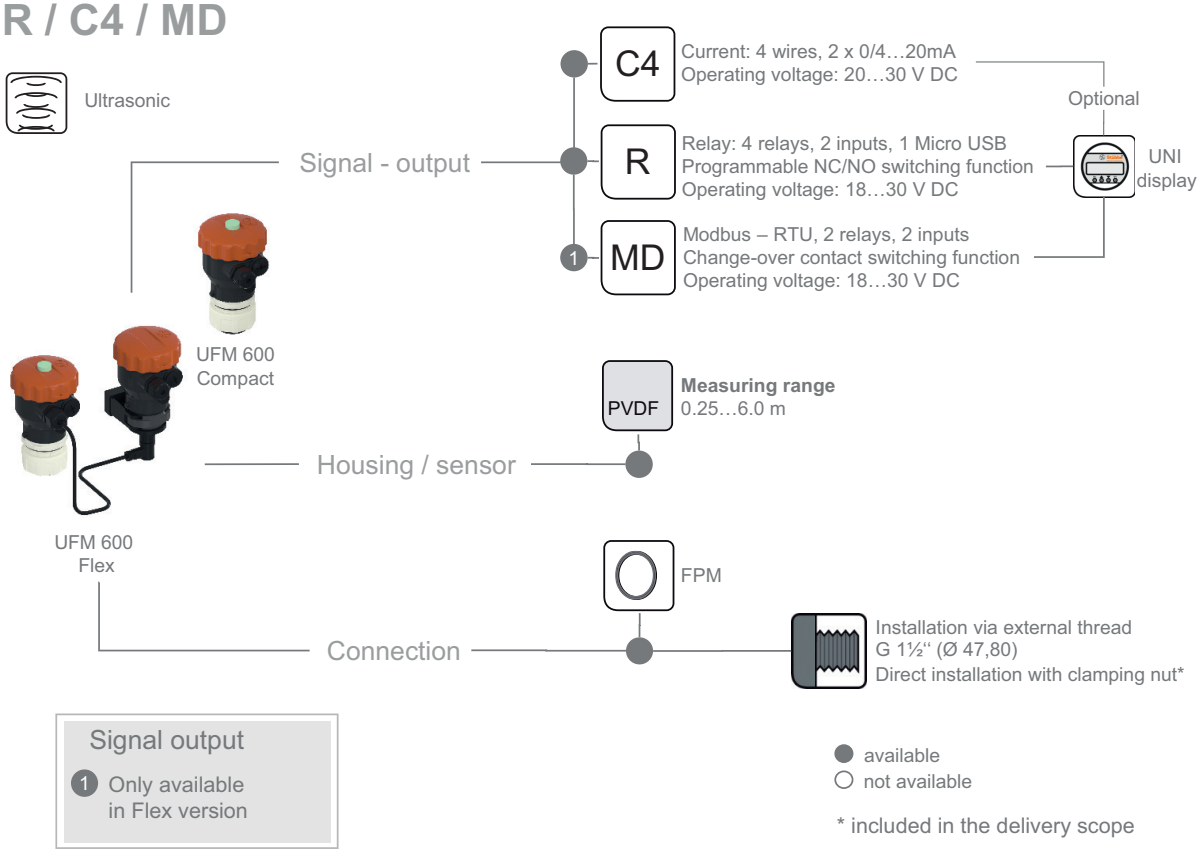


ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Pictogram Ultrasonic filling level sensor UFM 600 C4 / R / MD

UFM 600 Compact
UFM 600 Flex
R / C4 / MD



ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Application

- The UFM is an ultrasonic sensor for continuous contact-free filling level measurement of liquid medium types.

Use

- In containers or tanks in almost all industrial sectors
- Suitable for neutral and aggressive fluids in atmospheric air, provided the sensor components in contact with the medium are resistant to the medium (medium vapours) according to the ASV resistance guide

The following factors limit accuracy:

- foaming medium types
- heavily turbulent surfaces
- strong deposit build-up or condensate on the sensor
- interfering reflections
- quick temperature changes

Application limits

- heavy foam generation
- gas emitting medium types (steam pressure ›50 mbar)
- gaseous atmospheres (e.g. carbon dioxide)

ASV resistance guide

www.asv-stuebbe.de/pdf_resistance/300051.pdf

Version

- UFM Compact as compact one-piece variant for installation on the tank
- UFM Flex with the connection housing separate from the sensor housing, connected by a 10 m long sensor cable

Operation

- 4-wire current version (C4):
  using the integrated potentiometer,
  optionally using the display and control unit (Uni display)
- Relay version (R):
  using the display and control unit (Uni display)
- Modbus RTU version (MD):
  using the display and control unit (Uni display),
  relay / inputs via Modbus

Function

- The sensor consists of an ultrasonic transducer which continuously transmits short ultrasonic pulses to the surface of the medium to be measured. The pulses are received by the sensor as echoes.
- The time between the transmission and receipt of the pulses is measured. This time is proportional to the distance and therefore to the filling height of the medium. The values such as distance, filling height and volume are converted in the connection housing.
- The output values can be indicated by the UNI display and/or transmitted via the respective outputs.
- Versions

  C4:
  The current module transmits the filling level, distance or volume via a standard 0/4–20 mA signal.
  R:
  The relay module is equipped with four programmable relay outputs. It is particularly suitable for the direct control of sensitive plant components, e.g. for dry run protection of pumps.
  MD:
  The Modbus module enables data bus communication. It contains two additional freely programmable relay outputs which can be used for directly intervening in the process if necessary.

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Measuring value
- Filling level

Device connection
- see Pictogram „Ultrasonic filling level sensor UFM 200“
- see Pictogram „Ultrasonic filling level sensor UFM 600“

Weight UFM 200
- Basic weight: 0.6 kg
- Sensor cable: 0.1 kg/m

Weight UFM 600
- Basic weight: 0.9 kg
- Sensor cable: 0.1 kg/m

Accessories
- Display and control unit (UNI display)

Display and control unit (UNI display)
- Can be used for all measuring instruments of the UNI display platform (PTM, HFT or UFM).
- Housing: ABS
- Cover: PA, transparent
- Display: illuminated LCD
- Operation: 4-key function
- Front film: polyester
- Data logger function with date stamp
- Firmware update is possible
- Parameter settings can be saved and transmitted to other sensors.
- Storage function on a microSD card
- Battery: CR1220, 3 V
- The display unit can be removed from the sensor housing after the settings have been made.
- The display unit is required for setting the relay and Modbus version.

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Technical data

			Value		
			UFM 600 PVDF	UFM 200 PVDF	UFM 200 PE/Epoxy
Measuring					
Measuring range		cm	25–600	12–180	8–200
Dead zone 0–0.25 m		cm	0–25	0–12	0–8
Measuring resolution		mm		≤ 1	
Ultrasonic frequency		kHz	75	200	200
Angle of reflected beam (–3 dB)		°	14	10	14
Measuring interval		s	0.8–1.5	0.4–0.6	0.4–0.6
Accuracy: of the maximum value		%	0,2%	0,4%	0,4%
Power up	C4, R, MD (Flex)	s		5	
Step response (10–90%)		s		‹ 1.5 Integration time 0–60 s, adjustable	
Temperature compensation				Automatic	
Voltage supply					
Voltage supply		V DC	20–30	18–30	18–30
Power consumption	C4, R, MD (Flex)	W		3	
Signal output					
C4		mA		0/4–20	
R				4 relays, 5 A / 230 V AC	
MD				Modbus RTU 2 relays, 1 A / 30 V/DC 2 inputs, electrically isolated.	
Connection cable					
Cable outside diameter		mm		5–11	
Nominal cross-section	Voltage supply	mm²		0.25	
	Relay outputs	mm²		0.5	
	Gate inputs	mm²		0.25	
	Modbus	mm²		0.35	
material coming into contact with the media					
Sensor			PVDF	PVDF	PE, Epoxy
Sensor housing			PVDF	PVDF	PE
Sensor seal			FPM	FPM, EPDM	FPM, EPDM
Union nut			PVDF	–	–
Process sealing			FPM	FPM, EPDM	FPM, EPDM
material not coming into contact with the media					
Housing				PP-GF	
Housing cover				PP-GF / PA transparent	
Cover seal				NBR	
Connection cable, UV-resistant (Flex)				TPE-V	

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

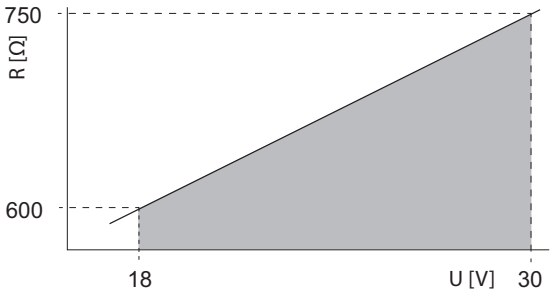
			Value		
			UFM 600 PVDF	UFM 200 PVDF	UFM 200 PE/Epoxy
Process conditions					
Ambient temperature		°C		–20–70	
Atmospheric ambient pressure		bar		0.8–1.1	
Relative humidity		%		20–85	
Process temperature		°C		–20–70	
Process pressure		bar		1	
Mechanical data					
Weight of Compact		kg	0.4	–	–
Weight of Flex		kg	0.9	0.6	0.6
Mounting position				vertical	
Mounting the threaded neck			1 1/2“	1“, 3/4“	1“, 3/4“
Type of protection				IP 67	

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Ohmic resistance



	Description
R	Max. ohmic resistance
U	Voltage supply

Components of UFM 600 Compact

No.	Description
1	Housing cover
2	Connection and sensor housing
3	Device connection
4	Sensor
5	Cable lead throughs

Components UFM 200 Flex

No.	Description
1	Connection cable connector
2	Fastening clamp
3	Sensor housing
4	Fastening clamp
5	Spacer
6	Connection housing
7	Pipe clamp
8	Sensor cable
9	Protective earth connection

Components UFM 600 Flex

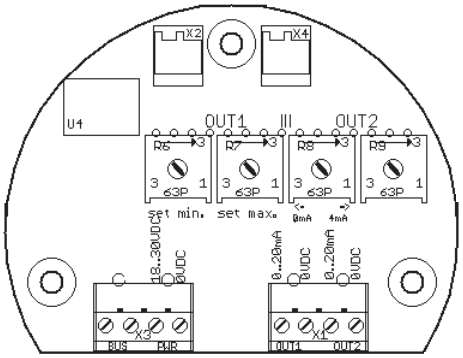
No.	Description
1	Housing cover
2	Sensor housing
3	Device connection
4	Sensor
5	Connection housing
6	Spacer
7	Pipe clamp
8	Sensor cable

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Revo03

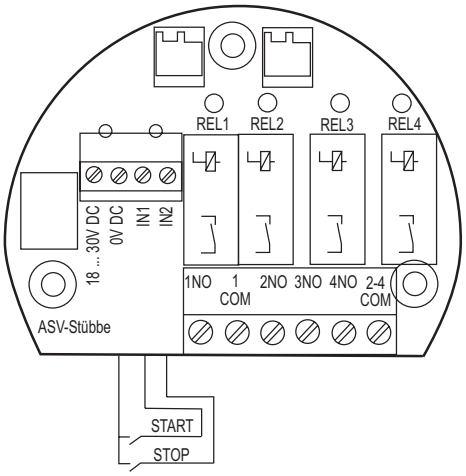
Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Connection plan UFM 200 / UFM 600, 4-wire current version, Process connection



Terminal	Connection
Connector X3	
PWR: 18–30 V DC	Voltage supply (18–30 V DC)
PWR: 0 V DC	Voltage supply (–)
Connector X1	
OUT1:	0/4–20 mA signal (filling level, distance, volume)
OUT1:	mass signal
OUT2:	–
OUT2:	–

Connection plan UFM 200 / UFM 600, relay version, Process connection



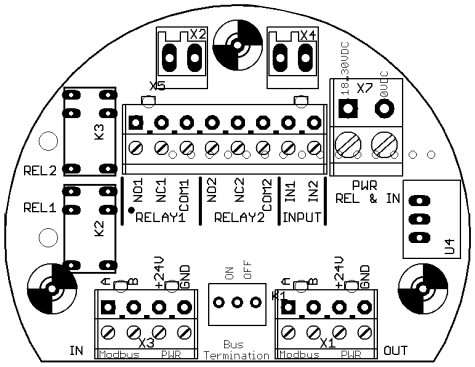
Terminal	Connection
18–30 V DC	Voltage supply (18–30 V DC)
0 V DC	Voltage supply (–)
IN1	Start button
IN2	Stop button
1NO	Relay 1 normally open contact
1COM	Relay 1 COM
2NO	Relay 2 normally open contact
3NO	Relay 3 normally open contact
4NO	Relay 4 normally open contact
2–4 COM	Relay 2–4 COM

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Rev003

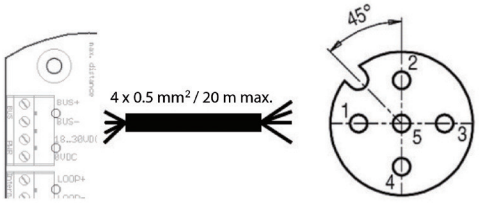
Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

Connection plan UFM 200 /UFM 600, modbus-RTU version, Process connection



Terminal	Connection
Connector X2 / X4	
Plug-type connection	UNI display
Connector X5	
IN1	Start button
IN2	Stop button
NO1	Relay 1 normally open contact
NC1	Relay 1 normally closed contact
COM1	Relay 1 COM
NO2	Relay 2 normally open contact
NC2	Relay 2 normally closed contact
COM2	Relay 2 COM
Connector X7	
PWR: 18–30 V DC	External voltage supply (inputs / relays)
PWR: 0 V DC	External earth
Connector X3 / X1	
A	RS485 A
B	RS485 B
PWR: +24 V	Operating voltage supply, sensor
PWR: GND	Operating voltage supply, sensor (earth)

Connection diagram UFM 600 Flex, sensor connection

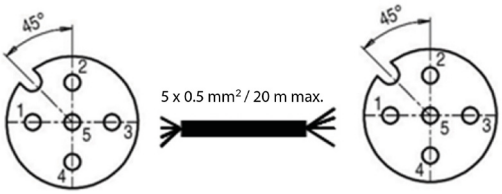


Sensor

Connection head, angular socket

No.	Terminal	No.	Terminal
1	BUS(+)	1	BUS(+)
2	BUS(-)	2	BUS(-)
		3	+5 V DC
3	+18–30 V DC	5	+18–30 V DC
4	0 V DC	4	0 V DC

Connection diagram UFM 200 Flex, sensor connection

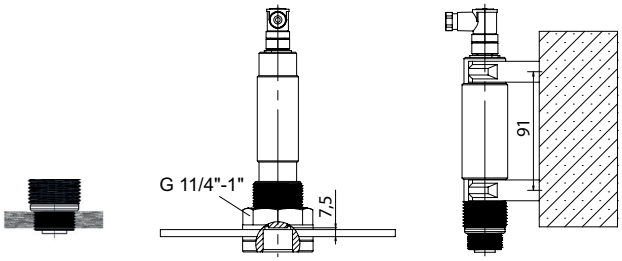


Sensor angular socket

Connection head, angular socket

No.	Terminal	No.	Terminal
1	BUS(+)	1	BUS(+)
2	BUS(-)	2	BUS(-)
3	+5 V DC	3	+5 V DC
4	0 V DC	4	0 V DC
5	+18–30 V DC	5	+18–30 V DC

Assembly example

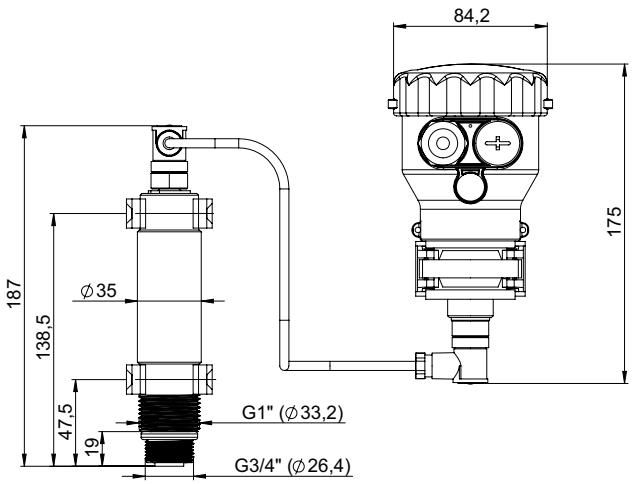


ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

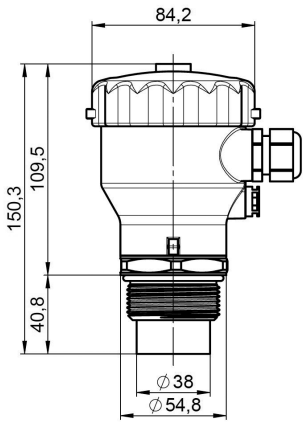
We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Revo03

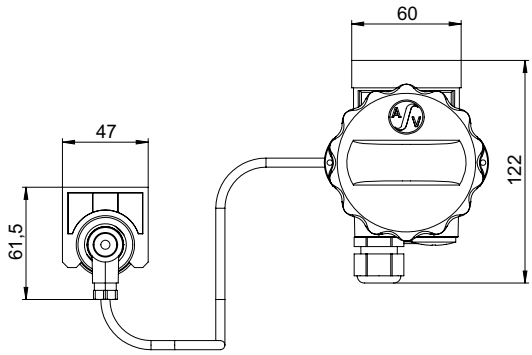
Ultrasonic filling level sensor UFM 200 / 600 C4 / R / MD

UFM 200 Flex

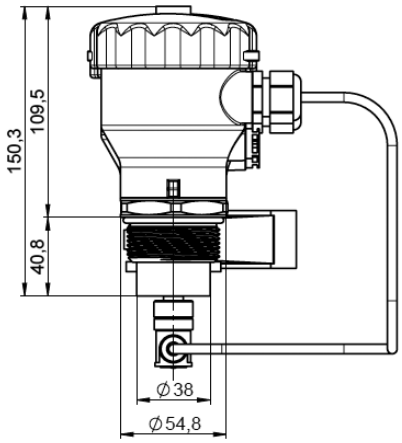


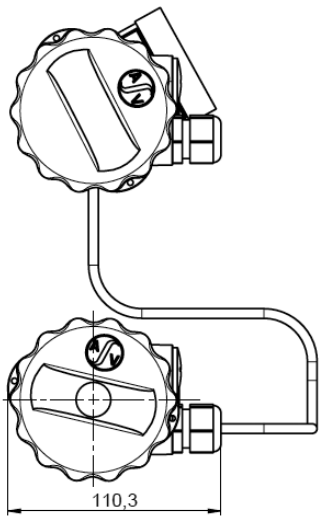
UFM 600 Compact





UFM 600 Flex





ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5 · 32602 Vlotho, Germany
Phone: +49 (0) 5733-799-0 · Fax: +49 (0) 5733-799-5000
Email: contact@asv-stuebbe.de · Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.
Issue 2017.07.03-en
Print No. 300184
TR MA DE Revo03