

# HYDROSTATIC FILLING LEVEL SENSOR HFB C4 / R / MD

Pressure measuring range 0-0.5 bar

Voltage supply 18–30 V DC

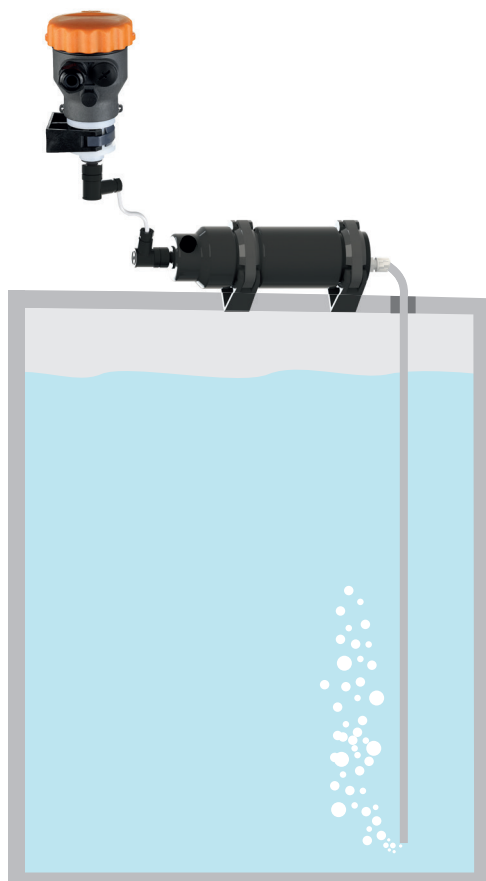
## Features

- Filling level detection through measuring the hydrostatic medium pressure by means of blowing out a measuring hose or pipe (air bubbling technique)
- suitable for foaming medium types
- for filling level measurement up to a 5 m water column in pressure-free containers
- Alternative signal output interfaces (current loop / relay / Modbus RTU)
- Sensor without medium contact

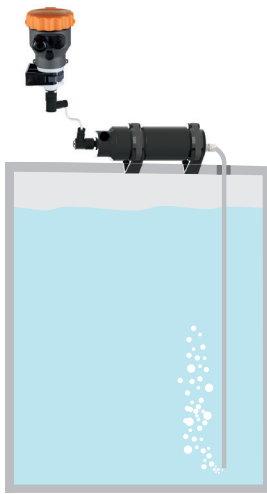
## Note

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

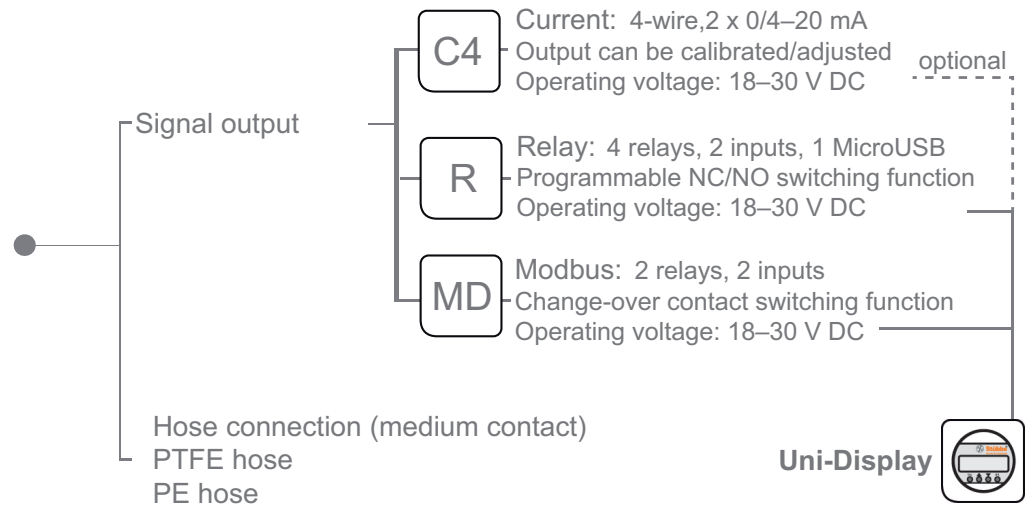
[www.asv-stuebbe.com/products/instrumentation](http://www.asv-stuebbe.com/products/instrumentation)



## Hydrostatic filling level sensor HFB C<sub>4</sub> / R / MD



**HFB Flex**



Sensor AL<sub>2</sub>O<sub>3</sub> 96 % (no medium contact)

## Hydrostatic filling level sensor HFB C<sub>4</sub> / R / MD

### Application

The filling level sensor (type HFB) is a pressure transducer for filling level measurement according to the air bubbling technique. It measures the air pressure in a hose or pipe ending at the bottom of the tank, which matches the hydrostatic pressure at the bottom of the tank.

An integrated, electronically controlled air compressor maintains the hydrostatic pressure in the measuring pipe or hose.

### Use

- Pressure transducer for filling level measurement for installation outside of the medium.
- Designed for measurements in fountains, basins and open or closed pressure-free containers.
- Comprehensive operating and display possibilities with relay, 0/4–20 mA signal output or Modbus RTU connection

### Function

- The hydrostatic pressure or process pressure in the blown-out measuring pipe is registered by a ceramic transducer made of AL<sub>2</sub>O<sub>3</sub>.  
The values are converted in the connection housing.
- The output values can be indicated by the UNI display and/or transmitted via the respective outputs.

#### • Versions

##### C<sub>4</sub>:

The current module transmits the pressure level via standard 0/4–20 mA signals.

##### 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.

##### 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.

### Type

- HFB Flex with the connection housing separate from the sensor housing, connected by a 5 m long sensor cable and a compressor integrated in the sensor housing.

### Interfaces

- Signal output, current loop (C<sub>4</sub>):  
0/4–20 mA  
Output can be calibrated/adjusted
- Signal output, Modbus RTU (MD):  
RS485  
2 relays, 1 A / 30 V AC/DC  
2 DC isolated inputs
- Signal output, relay (R):  
4 relays, 5 A / 230 V AC  
Programmable NC/NO switching function  
2 inputs

### Operation

- 4-wire current version (C<sub>4</sub>):  
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 RTU

### Measured variables

- Pressure (filling level)

### Device connection

- 6x4 mm hose connection

### Voltage supply

- U = 18–30 V DC

### Cable connections

- Cable outside diameter: 5–11 mm
- Nominal cross-section, voltage supply: 0.25 mm<sup>2</sup>
- Nominal cross-section, relay outputs: 0.5 mm<sup>2</sup>
- Nominal cross-section, gate inputs: 0.25 mm<sup>2</sup>
- Nominal cross-section, Modbus: 0.35 mm<sup>2</sup>

### Materials, wetted parts

- Hose, see accessories
- Hose weight: PVDF

### Materials, not wetted parts

- Sensor: AL<sub>2</sub>O<sub>3</sub> 96 %
- Sensor housing: PE
- Sensor seal: FPM
- Connection cable, sensor / display: TPE-V, UV-resistant
- Housing: PP-GF
- Housing cover: PP-GF / PA transparent
- Cover seal: NBR
- Housing fastening elements: PE

### Weights

- Basic weight: 0.8 kg
- Additional weight: 1.2 kg

### Type of protection

- IP 67

### Output behaviour

- Power up: < 120 s
- Step response (10-90%) < 300 ms
- Integration time: 0-60 s, adjustable

### Sensor data (pressure)

- Measuring range: 0-0.5 bar
- Precision at 0-85°C: ±0.2 % (after calibration basic correction, from maximum value)
- Resolution: 0.1 mbar

### Ambient conditions

- Ambient temperature: -15-70 °C
- Atmospheric ambient pressure: 0.8-1.1 bar
- Relative humidity: 20-85 %

### Process temperature

- according to the hose material used

### Process pressure

- Atmospheric: 0.8-1.1 bar

### Mounting position

- As required

### Accessories

- PTFE hose 6x4 mm
- PE natural hose 6x4 mm
- Hose weight HFB
- Tank leadthrough 2"
- Display and control unit (UNI display)
- Additional weight

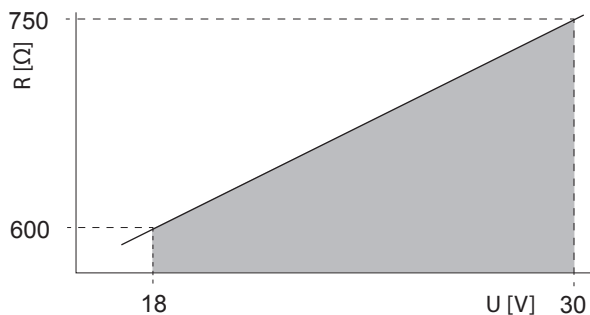
### Display and control unit (UNI display)

- 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 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.



# Hydrostatic filling level sensor HFB C<sub>4</sub> / R / MD

## Ohmic resistance



No.	Description
R	Max. ohmic resistance
U	Voltage supply

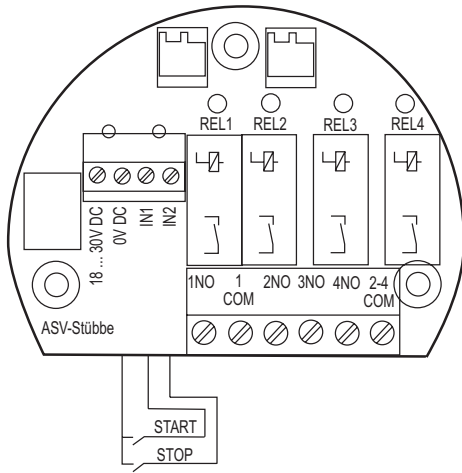
## HFB Flex



No.	Description
1	Housing cover
2	Connection housing
3	Sensor housing with compressor
4	Mounting clip
5	Sensor cable
6	Mounting clip
7	6x4 mm hose connection
8	Air filter

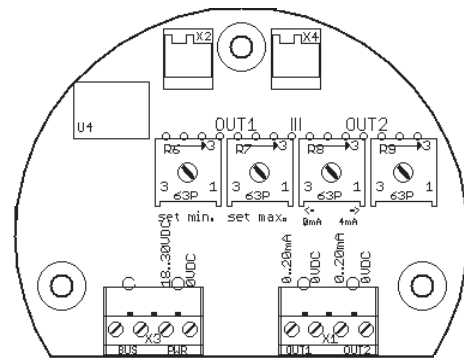
# Hydrostatic filling level sensor HFB C<sub>4</sub> / R / MD

**Terminal connection plan, relay version**



Terminal	Connection
18–30 V DC	Voltage supply (18–30 V DC)
0 V DC	Voltage supply (-)
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

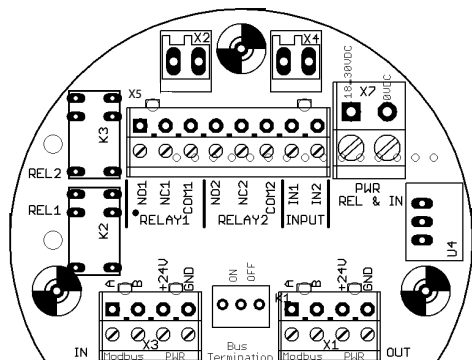
**Terminal connection plan, 4-wire current version**



Terminal	Connection
<b>Connector X<sub>3</sub></b>	
PWR: 18–30 V DC	Voltage supply (18–30 V DC)
PWR: 0 V DC	Voltage supply (-)
<b>Connector X<sub>1</sub></b>	
OUT1: 0–20 V DC	0/4–20 mA pressure
OUT1: 0 V DC	Earth, pressure

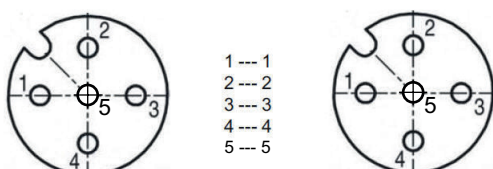
# Hydrostatic filling level sensor HFB C<sub>4</sub> / R / MD

## Connection plan Modbus RTU Version



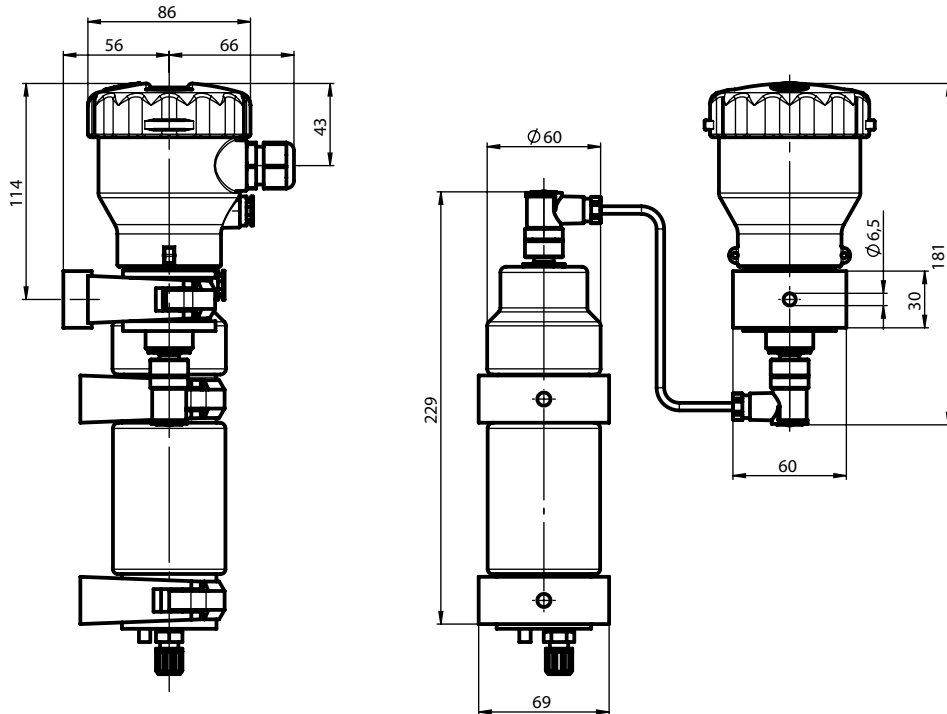
Terminal	Connection
<b>Connector X2 / X4</b>	
Plug-type connection	UNI display
<b>Connector X5</b>	
NO1	Relay 1 normally open contact
NC1	Relay 1 normally closed contact
COM1	Relay 1 COM
NO2	Relay 2 normally open contact
NC2	Relay 2 normally closed contact
COM2	Relay 2 COM
<b>Connector X7</b>	
PWR: 18–30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

## Pin assignment, 5 pole

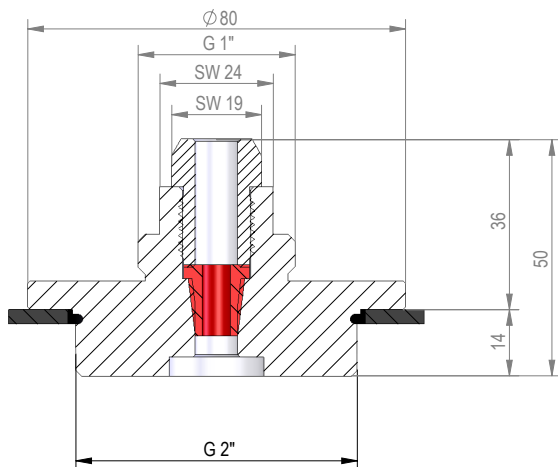


# Hydrostatic filling level sensor HFB C<sub>4</sub> / R / MD

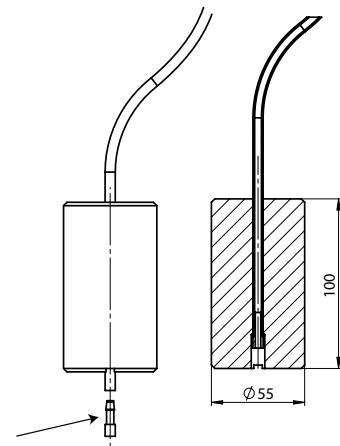
## HFB Flex



## Tank leadthrough



## Additional weight



Installation of the additional weight:

- 1) Guide the hose through the hole in the additional weight.
- 2) Push the nipple into the hose.
- 3) Retract the hose.