STÜBBE

MOT
MAGNETOSTRICTIVE
LEVEL SENSOR
DATASHEET

PE

Level measuring range in cm 10..200

Characteristics

- Magnetostrictive measuring principle
- Continuous measurement of the filling level in liquids
- Absolute and accurate method of measurement
- Stable and reliable measurements even in difficult environments
- Installation opening for ¾ inch and 2 inch
- Available in small sensor length increments
- Tank screw connection infinitely adjustable in height
- alternative signal output interfaces (current loop/relay/Modbus RTU)

Note

- The display and control unit (Uni display) is required for setting the sensor in the current (-C4), relay (-R) and Modbus (-MD) version!

MOT-10..200
C2 / R / C4 / MD

Magnetostrictive

MOT

Signal - output

- C2 — Current: 2 wires, 1 x 4...20mA
- C4 — Current: 4 wires, 1 x 0/4...20mA
- R — Relay: 4 relays, 2 inputs NC/NO switching function
- MD — Modbus – RTU, 2 Relais 2 Inputs, Change-over contact switching function

C4, R, MD → * UNI-Display

Housing / Sensor — PE — 1 — O

Measuring range	Measuring range	Measuring range
	0,05 ...0,10 m	0,05 ...1,10 m
	0,05 ...0,20 m	0,05 ...1,20 m
	0,05 ...0,30 m	0,05 ...1,30 m
	0,05 ...0,40 m	0,05 ...1,40 m
	0,05 ...0,50 m	0,05 ...1,50 m
	0,05 ...0,60 m	0,05 ...1,60 m
	0,05 ...0,70 m	0,05 ...1,70 m
	0,05 ...0,80 m	0,05 ...1,80 m
	0,05 ...0,90 m	0,05 ...1,90 m
	0,05 ...1,00 m	0,05 ...2,00 m

1 Materials PP and PTFE for sealing

* Not included in delivery

● Available
○ not available

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Function

- The MOT uses the magnetostrictive effect to measure the filling level in containers. A pulse is generated at the position of the magnetic float in the sensor wire. The time this pulse takes to reach the receiver is a direct measurement of the float position, i.e. the filling level.
- The output values can be indicated by the UNI display and/or transmitted via the respective outputs.
- C4: The current module transmits pressure and temperature via normalised 0/4–20 mA signals.
- 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 or independent filling level regulation in containers.
- 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.
- C2: Low-cost version without display, with a standardized 2-conductor 4-20mA output.

Application

- Filling level measurement of liquids in tight head drums, IBC containers, collection containers, dosing containers and similar containers or tanks with a 3/4" or 2" IG fitting.
- Precision measurement of filling levels in flat containers
- Measurements in containers with overpressure or underpressure
- Measurements in liquids with a foaming tendency
- Measurements in gas-emitting liquids
- Measurements in liquids with moving surfaces
- Measurements independent of liquid properties such as conductivity, dielectricity, density
- Measurements in containers with additional installed components
- Based on DIN EN 61326-1, the resistance to interference for use in industrial electromagnetic environments was tested according to table 2

Application limits

- Sticky or highly viscous liquids that prevent the float from positioning
- Check resistance according to resistance list
- Environment with strong magnetic fields

Accessories

- Display and control unit (Uni-Display) Art.Nr. 144153
- Sealing ring Tank leadthrough EPDM ¾“ Art. NR: 539281010
- Sealing ring Tank leadthrough EPDM 2" Art. NR: 539321010
- Sealing ring Tank leadthrough FPM ¾“ Art. NR: 539371010
- Sealing ring Tank leadthrough FPM 2" Art. NR: 539411010

STÜBBE resistance guide

- www.stuebbe.com/pdf_resistance/300051.pdf

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Technical Data

Measuring		MOT-10..MOT-200
Measuring range filling level	cm	5..200
Measuring resolution filling level	mm	1
Step response (10–90 %)	ms	800
Measuring deviation		±(1.6mm)
Power up	s	2
Voltage supply	V DC	18 - 30

Signal output		
Current loop C2	mA	4 – 20
Current loop C4	mA	0/4 – 20
Relais -R		4 Relais 5A/230VAC, 2 inputs
Modbus RTU -MD		2 relais 1A/30VDC 2 inputs, RS485
Cable outside diameter	mm	5 – 11
Nominal cross-section (max.)	mm2	0.3
Connection		pluggable screw connectors

Material coming into contact0 with the media	
Sensor	LDPE
float	PE
Sensor seal	PP und PTFE

Material not coming into contact with the media	
Housing	PP - GF
Housing cover	PP - GF / PA transsparent
Cover seal	NBR

Process conditions		
Ambient temperature	°C	-15–40
Atmospheric ambient pressure	bar	0,8–1
Relative humidity	%	20–85
Process temperature	°C	0–70

Mechanical data	
Mounting position	vertical
Type of protection	IP67
Accessories	Uni-Display (-C4, -R, -MD) Sealing ring for the tank screw connection PSU-Power Supply

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UNI display

- Can be used for all measuring instruments of the UNI display platform (PTM, HFT, HFB 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!

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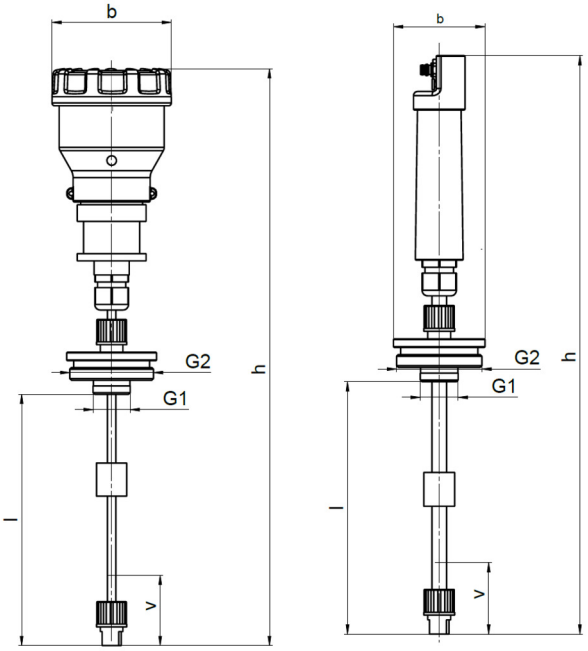
MOT Magnetostrictive level sensor

Dimensioned drawing



	l [mm]	v [mm]	h [mm]	h2 [mm]	b [mm]	b2 [mm]	G1	G2	[g]
MOT-10	100	50	340	330	90	64	3/4"	2"	360
MOT-20	200	50	440	430	90	64	3/4"	2"	370
MOT-30	300	50	540	530	90	64	3/4"	2"	380
MOT-40	400	50	640	630	90	64	3/4"	2"	390
MOT-50	500	50	740	730	90	64	3/4"	2"	400
MOT-60	600	50	840	830	90	64	3/4"	2"	410
MOT-70	700	50	940	930	90	64	3/4"	2"	420
MOT-80	800	50	1040	1030	90	64	3/4"	2"	430
MOT-90	900	50	1140	1130	90	64	3/4"	2"	440
MOT-100	1000	50	1240	1230	90	64	3/4"	2"	450
MOT-110	1100	50	1340	1330	90	64	3/4"	2"	460
MOT-120	1200	50	1440	1430	90	64	3/4"	2"	470
MOT-130	1300	50	1540	1530	90	64	3/4"	2"	480
MOT-140	1400	50	1640	1630	90	64	3/4"	2"	490
MOT-150	1500	50	1740	1730	90	64	3/4"	2"	500
MOT-160	1600	50	1840	1830	90	64	3/4"	2"	510
MOT-170	1700	50	1940	1930	90	64	3/4"	2"	520
MOT-180	1800	50	2040	2030	90	64	3/4"	2"	530
MOT-190	1900	50	2140	2130	90	64	3/4"	2"	540
MOT-200	2000	50	2240	2230	90	64	3/4"	2"	550

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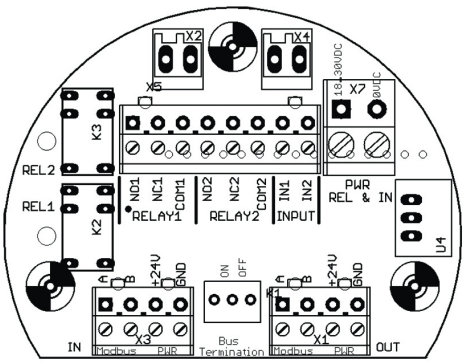
Connection plan, modbus-RTU version, Process connection



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

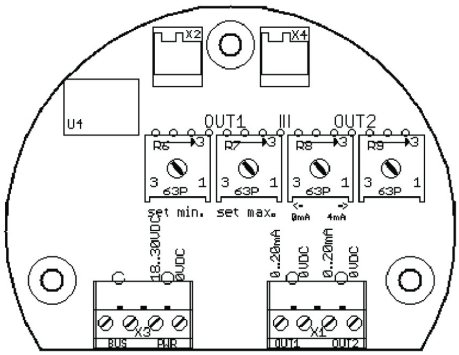
Connector X7

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 plan, 4-wire current version, Process connection



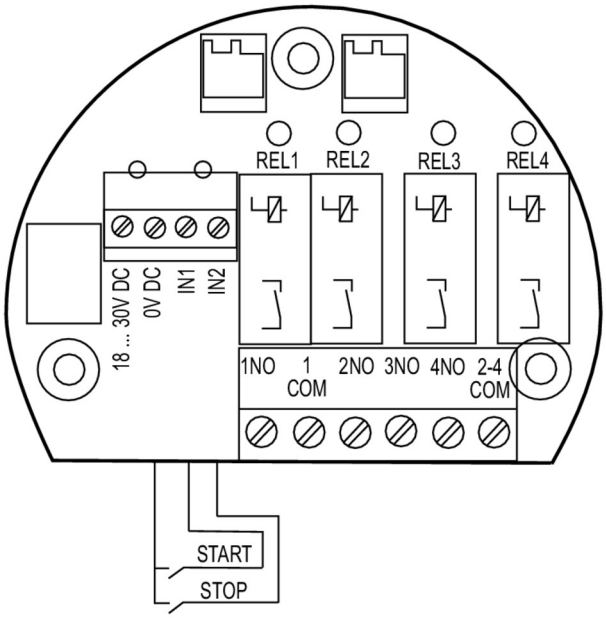
Connector X3

PWR: 18–30 V DC	Voltage supply (18–30 V DC)
PWR: 0 V DC	Voltage supply (–)

Connector X1

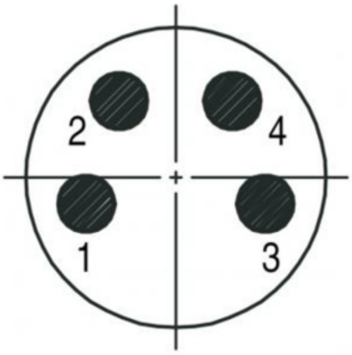
OUT1: 0–20 mA	0/4–20 mA signal
OUT1: 0 V DC	Earth, signal
OUT2: 0–20 mA	0/4–20 mA temperature
OUT2: 0 V DC	Earth, temperature

Connection plan USF, 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

MOT Magnetostrictive level sensor



M8 Stecker (Steckseite)	Connection / function
1	4–20 mA signal
2	-
3	-
4	4–20 mA signal