

COMPACT LEVEL SENSOR AND SWITCH



Type: **MKLS**

- RANGE 100 ... 2000 mm
- CONTACTS OR 4 ... 20 mA HART
- STAINLESS STEEL BODY
- OPTION Pt100, 2-WIRE



IP65



IP68



Stainless
Steel



M12

ORDER CODE

Code	Field	Meaning
MN	series	Compact Level Sensor and Switch
1 · 2 · 3	float	plastic Ø 24 (density at least 1) · plastic Ø 29 (standard) · stainless steel Ø 29
100 ... A00	fitting length	100 · 200 · 300 · 400 · 600 mm · A00 for 1000 mm
0 ... 3	output	0 contacts min/max · 1 contacts min/max/min1 · 2 contacts min/max/max1 · 3 4 ... 20 mA current loop, HART
3 · 4 · 5 · 9	process connection	3/4" · 1" · 1.5" · 1" NPT; A flange DIN, B other, both on request
0	resolution	in steps of 4.5 mm, only with output 4 ... 20 mA
0 ... F	electrical connection	0 ... 4 with metal insert: gland with 2 m cable, MIL D38999, valve plug EN 175301-803, M12 6- and 4-pole · 5 ... F with plastic insert: M12 4-, 5-, 6-, 8-pole, Deutsch DT04, Super Seal, bayonet, valve plug, cable, AMP MIL
0 · 1	Pt100	without · with, 2-wire
0	other	special model

Further fitting lengths from 150 to 2000 mm are listed in the manufacturer document. The resolution of 4.5 mm applies to the current output; as a switch the device carries fixed switching points.



OVERVIEW

A float carrying a magnet rides on the surface and travels along a stainless steel protecting tube of Ø 10 mm. The device is ordered either as a limit switch with two or three contacts, or as a transmitter with 4 ... 20 mA and a superimposed HART signal — the output is fixed when ordering, not switched on the device. The range covers 100 to 2000 mm in steps of 4.5 mm. Unlike the MELS series the body is stainless steel 1.4571; only the insert carrying the electrical connection is plastic, and stainless steel is available against a surcharge. A Pt100 in two-wire technique can be fitted as an option, so one tube delivers level and temperature. Set over HART with a DEV-HM interface.

MEASUREMENT	DEVICE AND MOUNTING
• Float with magnet, read out inside the protecting tube • Range 100 ... 2000 mm, step 4.5 mm, hysteresis about 3 mm • Either 2 or 3 contacts: minimum, maximum, minimum1 or maximum1 • Or 4 ... 20 mA with superimposed HART signal • Contacts 5 W/VA, 60 V AC/DC, 0.3 A at least 10 mA • Measuring amplifier 16 bit, 10 measurements per second • Signal on error 21 mA, current range 3.6 ... 21 mA • Operating range 0 ... +80 °C, medium 0 ... +100 °C	• Process connection 3/4", with adaptor 1", 1.5" or 1" NPT • Protecting tube stainless steel 1.4571, Ø 10 mm • Body stainless steel 1.4571, insert PBT GF30 or stainless steel • Float of PE Ø 24 or Ø 29, or stainless steel Ø 29 • System pressure 25 bar maximum, vertical fitting position • Option Pt100 in two-wire technique, class A • Fourteen connector forms, and a 2 m cable tail • Set over HART with a DEV-HM interface



TECHNICAL DATA

MEASUREMENT

Principle	float with magnet, read out in the protecting tube
Level	100 ... 2000 mm
Resolution, sensor	step 4.5 mm
Hysteresis	approx. 3 mm
Medium	liquids, non-aggressive
Fitting position	vertical
Turn-on delay time	< 5 s
Option	resistance thermometer Pt100, 2-wire, class A

PROCESS AND MATERIALS

Process connection	3/4"; with adaptor 1" · 1.5" · 1" NPT
System pressure	25 bar maximum
Protecting tube	stainless steel 1.4571, Ø 10 mm
Float	PE Ø 24 (medium density 1 or more) · PE Ø 29 · stainless steel Ø 29 (1.4571)
Adaptor, process connection	stainless steel 1.4571
Body	stainless steel 1.4571; insert for the electrical connection PBT GF30, option stainless steel 1.4571
Weight	approx. 220 g (1/2", 100 mm, M12)
Protection class	IP65 electronics at least · IP68 sensor · PCB potted

OUTPUT AND SUPPLY

Current signal	4 ... 20 mA with superimposed HART signal
Current range	3.6 ... 21 mA
Signal on error	21 mA sensor break, open circuit, short circuit, underflow
Contacts	2 or 3 normally open: minimum / maximum / minimum1 or maximum1
Contact rating	5 W/VA max. · 60 V AC/DC max. · 0.3 A max. · at least 10 mA
Supply voltage	from the HART loop 12 ... 40 V DC
Burden	$R = (U_B - 12 \text{ V}) / 22 \text{ mA}$ · reverse voltage protection available

ACCURACY

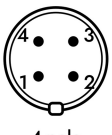
Resolution, measuring amplifier	16 bit
Filter setting	0 ... 99 s
Transfer behaviour	linear with level
Measuring rate	10 measurements per second

CONFIGURATION AND ENVIRONMENT

Configuration	over HART with a DEV-HM interface (USB) or a HART communicator: range start and end, filter, output current trim and simulation, two-point and ten-point calibration, HART address; a communication resistance of at least 250 Ω is required
Environment	operating range 0 ... +80 °C · storing -20 ... +85 °C · medium 0 ... +100 °C · condensation uncritical



ELECTRICAL CONNECTION

View onto the connector pins at the device	Current loop 4 ... 20 mA HART			Contacts				
	Connector form	U+	U-	Pt100	COM	min	max	min1/max1 Pt100
 4-pole	M12 x 1, 4-pole	1	3	2-4	1	2	3	4
 5-pole	M12 x 1, 5-pole	1	3	2-4	1	2	3	4
 8-pole	M12 x 1, 5-pole				1	2	3	4-5
	M12 x 1, 6-pole	1	3	2-4	1	2	3	4 5-6
	M12 x 1, 8-pole	1	3	2-4	1	2	3	4 5-6

The five M12 forms; the manufacturer document lists nine further ones, among them Deutsch DT04, Super Seal, bayonet, valve plug, MIL and two cable tails. The second 5-pole row is the contact version: it carries no current loop, and the Pt100 sits on 4-5. The view onto the connector pins is taken from the operating instructions of the MELS series of the same manufacturer; none is in house for the MKLS.

ACCESSORIES

DEV-HM interface	HART over USB with software, order no. 01310-00220; needed for setting range, filter and calibration
Connecting cable	to suit the connector form ordered, with the matching protection class
Adaptor	stainless steel 1.4571, for 1", 1.5" and 1" NPT

A HART modem needs a communication resistance of at least 250 Ω . The HART tool runs on Windows and is used for commissioning, configuration, signal analysis and documentation.

COMPLIANCE

 IP65	Protection class, electronics	IP65 at least
 IP68	Protection class, sensor	IP68, PCB potted
 Stainless Steel	Wetted material	stainless steel 1.4571, body and protecting tube
 M12	Electrical connection	M12 x 1 in four pin counts, and ten further connector forms

No approval beyond these is documented for this device in the manufacturer document.



DIMENSIONS (mm)

