Level Switch
HNS 3000

Magnetostrictive | **Display**

IO-Link
Optional temperature measurement

IO-Link

Description:

The HNS 3000 with IO-Link communication interface is an electronic level switch with integrated display. The instrument has a switching output and an additional output that can be configured as switching or analogue output (4 .. 20 mA or 0 .. 10 V) The HNS 3000 can be used not only for oil but also for water, and is available with or without temperature probe.

IO-Link is the communication between the sensor/actuator (IO-Link device) and an IO-Link master based on a point-to-point interface.

The advantages:
Process data, parameters and diagnostic information of the level switch can be transmitted via a standard cable (SDCI mode). The integrated LED display provides information on the operating mode and the switching statuses.

Simple exchange: the IO-Link master saves the parameters of the connected level switch and transmits them to the newly connected level switch when replaced. Thus, time-consuming new parameterisations will no longer be required.

If IO-Link is not used, the sensor still functions as a level switch with two switching outputs (SIO mode).

To create customer-specific small series or to duplicate sensor settings across the system, the sensor can also be easily adjusted outside the system to suit the particular application, with the HYDAC Programming Device HPG P1-000, the HYDAC Programming Adapter ZBE P1-000 or by means of the Portable Data Recorder HMG 4000.

Typical fields of application for HNS 3000 IO-Link are machine tools, handling and assembly automation, intralogistics or the packaging industry.

Technical data:

Input data							
Measuring ranges	mm	178	208	298	338	448	658
Rod length [1]	mm	250	280	370	410	520	730
Max. speed of change in the fluid level		No restrictions					
Mechanical connection		G ¾" ISO 1179-2					
Tightening torque, recommended		30 Nm					
Parts in contact with fluid		Rod: Stainless steel 1.4571 Float: PP (Polypropylene); 0.6 kg/dm³ Seal: Seal ring DIN 3869-27-FKM					
Fluids [2]		Hydraulic oils (mineral based), synth. oils, fluids containing water					
Temperature							
Measuring range [3]		-25 .. +100 °C					
Output data							
Switching outputs		PNP transistor outputs Switching current: max. 250 mA per switching output					
Analogue output, permitted load resistance		Selectable: 4 .. 20 mA load resist. max. 500 Ω 0 .. 10 V load resist. min. 1 kΩ					
Accuracy		Level: ≤ ± 1.0 % FS Temperature: ± 1.5 °C					
Temperature drift (environment)		≤ 0.04 % FS / °C					
Repeatability [4]		Level: ≤ ± 1.0 % FS Temperature: ≤ ± 0.5 °C					
Response time acc. to DIN EN 60751 (temperature probe)		t_{90} ~100 s					
Environmental conditions							
Ambient temperature range		-25 .. +80 °C					
Storage temperature range		-40 .. +80 °C					
Fluid temperature range [5]		-40 .. +120 °C / -25 .. +120 °C					
Max. tank pressure		3 bar (short-term 10 bar, t < 1 min)					
CE mark		EN 61000-6-1 / 2 / 3 / 4					
Vibration resistance acc. to DIN EN 60068-2-6 (0 .. 500 Hz)		≤ 2 g					
Shock resistance acc. to DIN EN 60068-2-27 (11 ms)		≤ 20 g					
Protection class acc. to DIN EN 60529 [6]		IP 67					
IO-Link specific data							
IO-Link revision		V1.1 / support V1.0					
Transmission rate, baud rate [7]		38.4 kBaud (COM2)					
Minimum cycle time		20 ms					
Process data width		Version without temperature sensor: 16 Bit Version with temperature sensor: 32 Bit					
SIO mode supported		Yes					
M-sequence capability		PREOPERATE: TYPE_0 OPERATE: TYPE_2_2 (level) TYPE_2_V (level / temperature) ISDU: Supported					
IO Device Description (IODD) download at: https://ioddfinder.io-link.com/#/							
Other data							
Supply voltage		9 .. 35 V DC if PIN 2 = SP2 18 .. 35 V DC if PIN 2 = analogue output					
Residual ripple of supply voltage		≤ 5 %					
Current consumption		≤ 0.535 A with active switching outputs ≤ 35 mA with inactive switching outputs ≤ 55 mA with inactive switching output and analogue output					
Display		4-digit, LED, 7 segment, red, height of digits 7 mm					
Weight		500 .. 1000 g (depending on length)					

Note: Reverse polarity protection of the supply voltage, overvoltage, override and short circuit protection are provided.
FS (**F**ull **S**cale) = relative to complete measuring range

[1] Other rod lengths on request
[2] Other fluids on request
[3] Observe ambient temperature range
[4] Specified at calm, non-turbulent fluid
[5] -25 °C with FKM seal, -40 °C on request
[6] With mounted mating connector in corresponding protection class
[7] Connection with unshielded standard sensor line possible up to a maximum line length of 20 m.

Setting options:

All terms and symbols used for setting the HNS 3000 as well as the menu structure comply with the specifications in the VDMA Standard for level switches.

Setting ranges for the switching outputs:

Measuring range/ rod length in cm	Lower limit of RP (FL) in cm	Upper limit of SP (FH) in cm
17.8 / 25.0	0.3	17.8
20.8 / 28.0	0.4	20.8
29.8 / 37.0	0.5	29.8
33.8 / 41.0	0.6	33.8
44.8 / 52.0	0.7	44.8
65.8 / 73.0	1.0	65.8

Measuring range/ rod length in cm	Min. difference betw. RP & SP and FL & FH in cm	Increment* in cm
17.8 / 25.0	0.1	0.1
20.8 / 28.0	0.2	0.1
29.8 / 37.0	0.2	0.1
33.8 / 41.0	0.2	0.1
44.8 / 52.0	0.3	0.1
65.8 / 73.0	0.4	0.1

Measuring range Temperature	Lower limit of RP (FL)	Upper limit of SP (FH)
-25 .. +100 °C	-23.5 °C	100.0 °C

Measuring range Temperature	Min. difference betw. RP and SP & FL and FH	Increment*
-25 .. +100 °C	1.5 °C	0.5 °C

* All ranges given in the table can be adjusted by the increments shown.

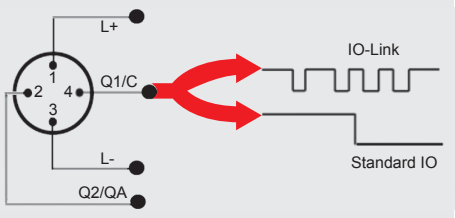
SP = switch point
RP = switch-back point
FL = level/temperature window lower value
FH = level/temperature window upper value

Additional functions:

- Switching mode of the swiching outputs adjustable (switch point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O function)
- Switching outputs can be assigned to the fluid level or to the temperature
- Switch-on and switch-off delay adjustable from 0.00 .. 99.99 seconds
- Analogue output signal selectable 4 .. 20 mA or 0 .. 10 V
- Analogue output can be assigned to fluid level or temperature as required (depending on model)

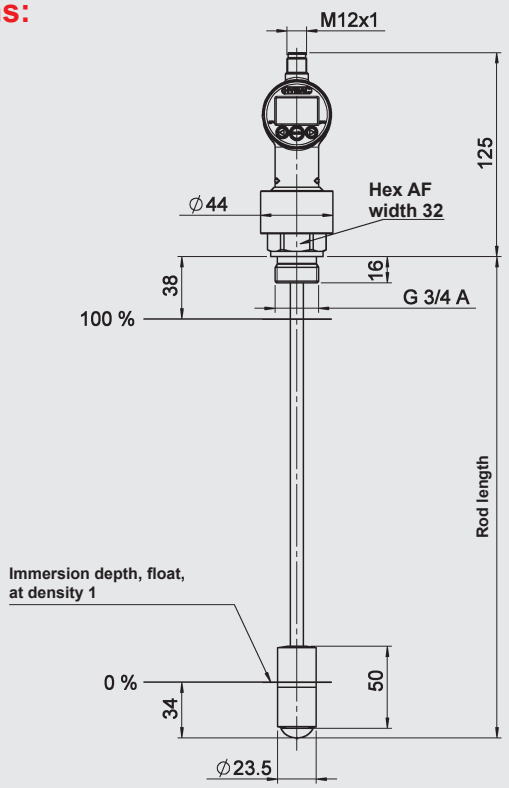
Pin connections:

M12x1, 4 pole



Pin	Signal	Description
1	L+	$+U_B$
2	Q2/QA	Switching output (SP2) / analogue output
3	L-	0 V
4	Q1/C	IO-Link communication / switching output (SP1)

Dimensions:



Model code:

HNS 3 X 2 6 – F31 – XXXX – 000

Temperature probe
1 = with temperature probe
2 = without temperature probe

Mechanical connection
2 = G 3/4 A ISO 1179-2

Electrical connection
6 = male M12x1, 4 pole
(mating connector not supplied)

Output
F31 = IO-Link interface

Rod length, physical
0250; 0280; 0370; 0410; 0520; 0730 mm

Modification number
000 = standard

Accessories:
Appropriate accessories, such as mating connectors, mechanical adapters, splash guards and programming units, can be found in the Accessories brochure.

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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