



Level Switch HNS 3000

Magnetostrictive

Display

Up to 4 switching outputs
Up to 2 analogue outputs
Optional temperature measurement

Description:

The HNS 3000 is an electronic level switch with integrated display.

The float-based sensor for high-precision analogue monitoring of the fluid level has 1, 2 or 4 switching outputs and an analogue output signal is available as an option.

In addition to the standard minimum and maximum switching signals, with the 4 switching output version it is possible to set additional warning signals to prevent problems such as tank overflow or aeration of the pump.

Using the device is easy, thanks to the menu-guided key operation, so adjusting the user-specific parameters takes little time.

The main applications of the HNS 3000 are primarily in hydraulics, e.g. for fluid level monitoring of a tank.

The sensor is available in rod lengths of 250 .. 730 mm as standard. Rod lengths of up to 2500 mm are possible. The instrument is also available with or without temperature probe.

Depending on the application, several different floats are available, e.g. stainless steel for aggressive media or plastic.

When the device is used with temperature probe, the switching outputs can be individually assigned to the level or temperature variables.

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 fluid level	No restrictions						
Mechanical connection	G 3/4" ISO 1179-2						
Tightening torque, recommended	30 Nm						
Parts in contact with fluid	Rod: Stainless steel 1.4571 Float: PP (polypropylene); 0.6 kg/dm ³ Seal: Seal ring DIN3869-27-FKM						
Fluids ²⁾	Hydraulic oils (mineral based), synth. oils, fluids containing water						
Temperature							
Measuring range ³⁾	-25 .. +100 °C						
Output data							
Switching outputs	1; 2; 4 PNP transistor outputs Switching current: 1; 2 SP: max. 1.2 A per output 4 SP: max. 0.25 A per output Switching cycles: > 100 million						
Analogue output, permitted load resistance	1; 2 SP: 4 .. 20 mA load resist. max. 500 Ω 0 .. 10 V load resist. min. 1 kΩ 4 SP: 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⁾	IP67						
Other data							
Supply voltage	9 .. 35 V DC without analogue output 18 .. 35 V DC with analogue output						
Residual ripple of supply voltage	≤ 5 %						
Current consumption	≤ 2.470 A total ≤ 150 mA with inactive switching outputs and analogue outputs						
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 (Full Scale) = 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

Setting options:

All settings available on the HNS 3000 are combined in two easy-to-navigate menus.

In order to prevent unauthorised adjustment of the device, a programming lock can be set.

Setting ranges of the switch points and switch-back hystereses:

Fluid level switch point function

Rod length in cm	Meas. range in cm	Switch point in cm *	Switch hysteresis in cm *
25.0	17.8	0.3 .. 17.8	0.1 .. 17.6
28.0	20.8	0.4 .. 20.8	0.2 .. 20.5
37.0	29.8	0.5 .. 29.8	0.2 .. 29.5
41.0	33.8	0.6 .. 33.8	0.2 .. 33.4
52.0	44.8	0.7 .. 44.8	0.3 .. 44.3
73.0	65.8	1.0 .. 65.8	0.4 .. 65.1

The increment for all units is 0.1 cm.

Fluid level window function

Rod length in cm	Lower switch value in cm *	Upper switch value in cm *
25.0	0.3 .. 17.4	0.4 .. 17.6
28.0	0.4 .. 20.4	0.5 .. 20.5
37.0	0.5 .. 29.2	0.7 .. 29.5
41.0	0.6 .. 33.2	0.8 .. 33.4
52.0	0.7 .. 44.0	1.0 .. 44.3
73.0	1.0 .. 64.6	1.5 .. 65.1

The increment for all units is 0.1 cm.

Fluid level offset function

Rod length in cm	Measuring range in cm	Offset in cm *
25.0	17.8	0.0 .. 71.2
28.0	20.8	0.0 .. 83.2
37.0	29.8	0.0 .. 119.2
41.0	33.8	0.0 .. 135.2
52.0	44.8	0.0 .. 179.2
73.0	65.8	0.0 .. 263.2

The increment for all units is 0.1 cm.

Temperature switch point function

Unit	Measuring range	Switch point	Hysteresis
°C	-25 .. +100	-23.0 .. +100.0	0.8 .. 123.6

The increment for all units is 0.2 °C.

Temperature window function

Unit	Lower switch value	Upper switch value
°C	-23.0 .. +97.8	-22.2 .. +98.6

The increment for all units is 0.2 °C.

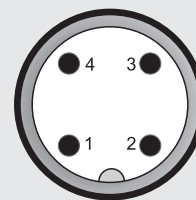
* All ranges given in the table can be adjusted by the increments shown.

Additional functions:

- Switching mode of the switching 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
- Choice of display (current level, current temperature, peak values, switch point 1, 2, 3, 4 or display off)
- Analogue output can be assigned to fluid level or temperature as required (depending on model)

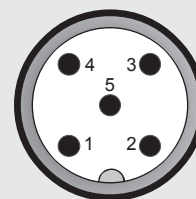
Pin connections:

M12x1, 4 pole



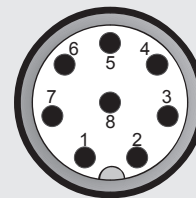
Pin	HNS 3X26-2	HNS 3X26-3
1	+U _B	+U _B
2	SP2	Analogue
3	0 V	0 V
4	SP1	SP1

M12x1, 5 pole



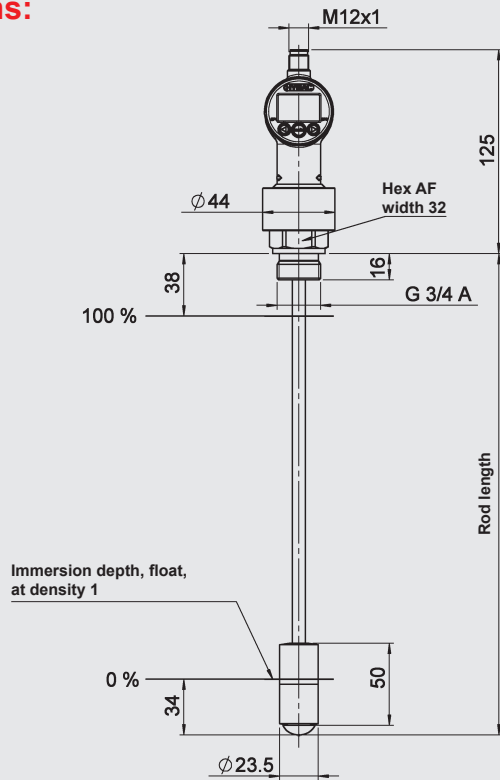
Pin	HNS 3X28-5
1	+U _B
2	Analogue
3	0 V
4	SP1
5	SP2

M12x1, 8 pole



Pin	HNS 3X2P-8
1	+U _B
2	SP2
3	0 V
4	SP1
5	SP3
6	SP4
7	Analogue fluid level
8	Analogue temperature

Dimensions:



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.

Model code:

HNS 3 X 2 X - X - XXXX - 000

Temperature probe

- 1 = with temperature probe
- 2 = without temperature probe

Mechanical connection

- 2 = G3/4 A ISO 1179-2

Electrical connection

- 6 = male M12x1, 4 pole
only possible on output models "2" and "3"
- 8 = male M12x1, 5 pole
only possible on output model "5"
- P = male M12x1, 8 pole
only possible on output model "8"

Output

- 2 = 2 switching outputs
only in conjunction with electrical connection type "6"
- 3 = 1 switching output and 1 analogue output
only in conjunction with electrical connection type "6"
- 5 = 2 switching outputs and 1 analogue output
only in conjunction with electrical connection type "8"
- 8 = 4 switching outputs and 2 analogue outputs
only in conjunction with electrical connection type "P"
and temperature probe "1"

Rod length (physical) in mm

0250; 0280; 0370; 0410; 0520; 0730

Modification number

000 = standard

Accessories:

Appropriate accessories, such as mating connectors, splash guards, etc. can be found in the Accessories brochure.

