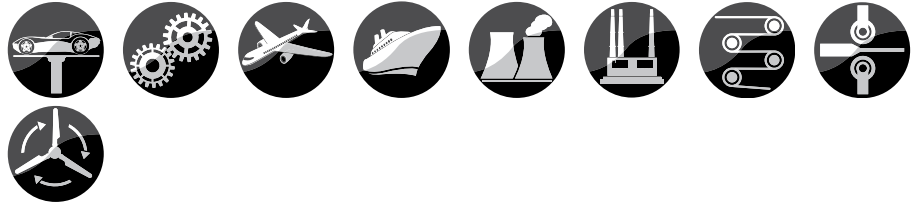


## ENS 3000 Series Electronic Level Sensor



### Applications



### Description

The ENS 3000 is an electronic level switch with integral display. The unit has either 1, 2 or 4 switching outputs and 1 or 2 analog output signals are cavitation as an option.

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

The ENS 3000 can be used for oil as well as water. The fluid type can be selected via the menu for specific applications.

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

The ENS 3000 is available in standard probe lengths of 9.84", 16.2", 20.5" and 28.7".

The unit is also available with or without an integrated temperature sensor.

### Special Features

- 1, 2 or 4 independent PNP transistor switching outputs
- Selectable for use with oil or water
- User-selectable switch outputs based on the measured value
- Switching and switch-back points can be adjusted independently
- Selectable analog output (4 to 20 mA or 0 to 10 VDC)
- 4-digit digital display
- Simple to operate due to menu-based keypad operation

### Approvals



CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

### Technical Details

Sensor Specifications				
Sensor type	capacitive fluid level sensor			
Parts in contact with media	Ceramic			
Probe length	9.80"	16.20"	20.50"	28.70"
Active zone	6.70"	10.20"	14.20"	23.20"
Inactive zone	3.10"	5.95"	6.35"	5.50"
Max speed of change in fluid level	1.57"/s	2.36"/s	3.15"/s	3.94"/s
Weight	approx. 135 g			
Output signal with 1 or 2 switching outputs	4 to 20 mA ohmic resistance max. 400 Ω 0 to 10 VDC ohmic resistance min 2 kΩ			
Output signal with 4 switching outputs	0 to 10 VDC ohmic resistance min 2 kΩ			
Temperature Sensor Specifications				
Sensor type	semiconductor sensor			
Measuring range	-13° to 212°F			
Accuracy	± 3.0°F (1.5°C)			
Reaction time (t90)	180 s			
Switching Specifications				
Type	PNP transistor output Programmable as N/O or N/C			
Repeatability	≤ ±2% FS max.			
Switching current	1 Switch Point	1.2A		
	2 Switch Points	1.2A each		
	4 Switch Points	0.25A each		
Set point range	1.5 to 100% FS			
Reset point range	1 to 99% FS			
Switching cycles	≥ 100 million			
Environmental Condition				
Compensated temperature range	32° to 140°F (0° to 60°C)			
Operating temperature range	32° to 140°F (0° to 60°C)			
Storage temperature range	-40° to 176°F (-40° to 80°C)			
Media temperature range	32° to 140°F (0° to 60°C)			
CE mark	EN 61000-6-1 / 2 / 3 / 4			
UL mark (Environmental conditions to 1.4.2 UL 61010-1; C22.2 No. 61010-1)	Certificate no. E318391			
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 5g			
Environmental protection	IP 67			
Maximum tank pressure	7 psi (temporary 40 psi, t < 1 min)			
Electrical Specifications				
Supply voltage -limited energy- according to:	9 to 35 VDC without analog output 18 to 35 VDC with analog output 9.3 UL 61010; Class 2; UL 1310/1585; LPS UL 60950			
Residual ripple supply voltage	≤ 5%			
Current consumption	max. 2.455 A total max. 35 mA with inactive switching outputs max. 55 mA with analog output and inactive switching outputs			
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard			
Display	7 segment LED display, 4 digits			

## Model Code

ENS 3 X 1 X - X - XXXX - 400 K

### Temperature Sensor Type

- 1 = with integral temperature sensor
- 2 = without integral temperature sensor

### Mechanical Connection

- 1 = 22mm diameter collar to fit cutting ring coupling ZBE 19 or ZBE 20

### Electrical Connection

- 6 = M12x1 plug, 4 pole for output codes 2 & 3 (connector not included)
- 8 = M12x1 plug, 5 pole for output code 5 (connector not included)
- P = M12x1 plug, 8 pole for output code 8 (connector not included)

### Output

- 2 = 2 Switching Outputs (only with electrical connection 6)
- 3 = 1 Switching Output with 1 analog output (4-20mA or 0-10 V) (only with electrical connection 6)
- 5 = 2 Switching Outputs with 1 analog output (4-20mA or 0-10 V) (only with electrical connection 8)
- 8 = 4 Switching Outputs with 2 analog outputs (0-10 V only) (only with electrical connection P)

### Probe Length

- 0100 = 9.84" (250mm)
- 0162 = 16.2" (410mm)
- 0205 = 20.5" (520mm)
- 0287 = 28.7" (730mm)

### Modification Number

- 400 = USA Standard

### Probe Type

- K = Ceramic

## Pin Connections

### M12x1, 4 pole

Pin	3X16-2	3X16-3
1	+U <sub>B</sub>	+U <sub>B</sub>
2	SP 2	Analog
3	0 V	0 V
4	SP 1	SP 1

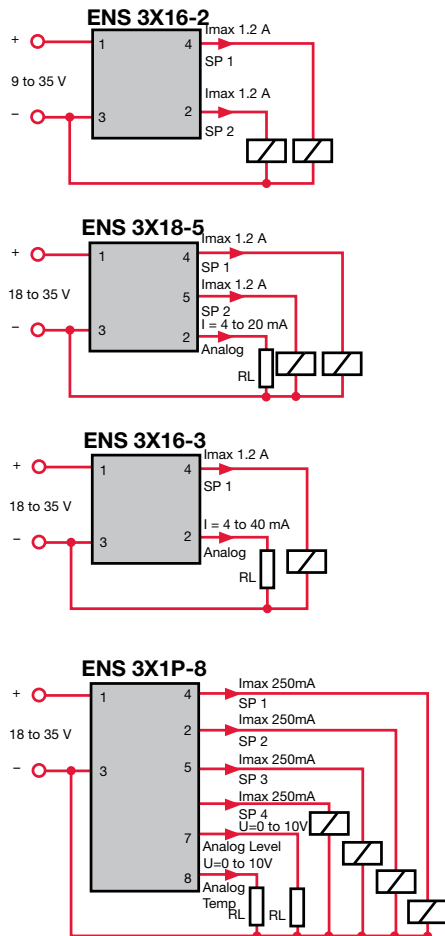
### M12x1, 5 pole

Pin	3X18-5
1	+U <sub>B</sub>
2	Analog
3	0 V
4	SP 1
5	SP 2

### M12x1, 8 pole

Pin	3X1P-8
1	+U <sub>B</sub>
2	SP 2
3	0 V
4	SP 1
5	SP 3
6	SP 4
7	Analog fluid level
8	Analog temperature

## Circuit Diagram

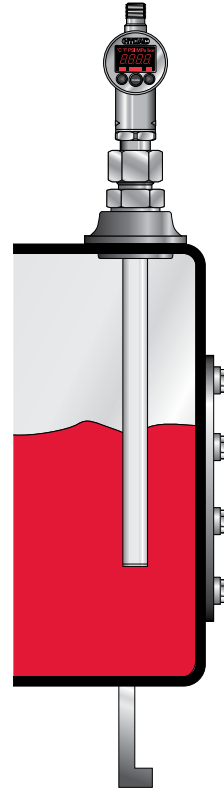


## Adapters

**ZBM 19**  
P/N 00908738  
Fits min. 1 1/8" tank hole  
(see page 141)



**ZBM 20**  
P/N 00908739  
G3/4 BSP  
(see page 141)



## Dimensions

