

HYDAC INTERNATIONAL

Electronic Temperature Sensor ETS 3000

Description:

The ETS 3000 is a compact electronic temperature sensor with digital display. For optimum adaptation to the particular application there are three different models available. The model with an 18mm integral sensor probe is pressure resistant to 600 bar and can be screwed directly inline or into a hydraulic block. For tank mounting, there are two models available. The ETS 3000 with integral sensor probe in various lengths for direct mounting onto the tank and the model with a separate sensor input for external temperature sensors. This is used mainly together with the temperature sensor TFP 100 which was specially developed for tank mounting.

Different output models offer a variety of application possibilities.

The switching points and the associated hystereses can be adjusted very quickly and easily via the membrane keypad.

Special features:

- 2 switching outputs, output capacity 1.2 A each
- Analogue output 4 .. 20 mA or 0 .. 10 V can be selected
- 4-digit digital display
- Optimum alignment - display can be rotated in two axes
- Switching points and switch-back points and many other useful functions can be set via the membrane keypad
- Display of temperature and unit of measurement in °C or °F.



E 18.319.0/02.07

Setting options:

All the settings available on the ETS 3000 are combined in two easy-to-follow menus. To prevent unauthorised adjustment of the unit, a program disable can be activated.

Setting ranges of the switching points and/or switch-back hystereses:

	Switching point or upper switching value in °C (°F)	Hysteresis or lower switching value in °C (°F)
Integral sensor	-23.0 .. 100.0 (-10 .. 212)	1.0 .. 123.5 (2 .. 222)
Separate sensor	-27.0 .. 150.0 (-17 .. 302)	1.0 .. 178.0 (2 .. 320)

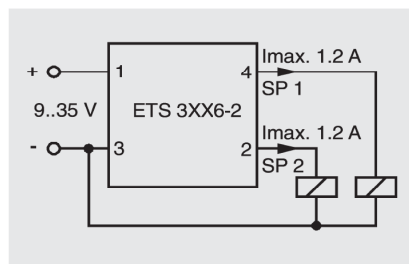
Additional functions:

- Switching mode of the switching outputs adjustable (switching point function or window function)
- Switching direction of the outputs adjustable (N/O or N/C function)
- Switch and switch-back delay adjustable between 0.00 .. 99.99 seconds
- Choice of display (actual temperature, peak temperature, switching point 1, switching point 2, display off)

Circuit diagram:

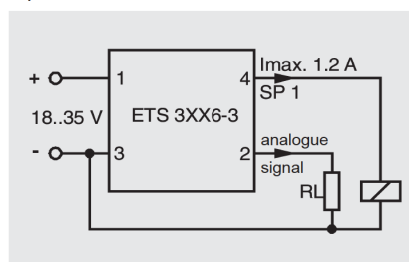
Model with 2 switching outputs:

4 pole connection M12x1



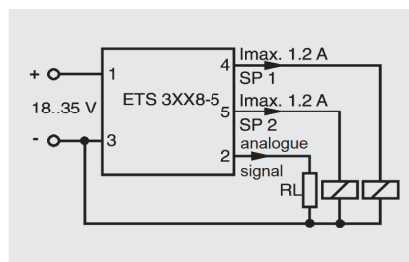
Model with 1 switching output and 1 analogue output:

4 pole connection M12x1



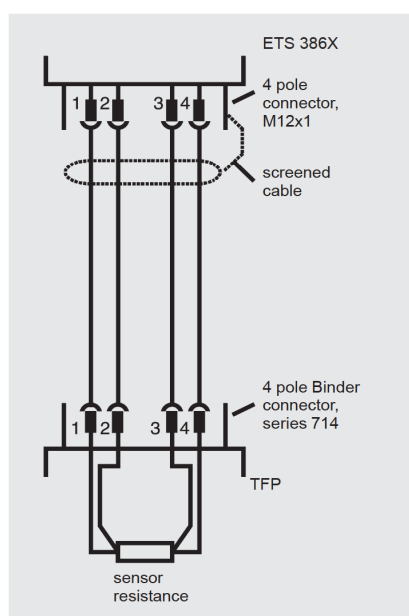
Model with 2 switching outputs and 1 analogue output:

5 pole connection M12x1



Sensor connection:

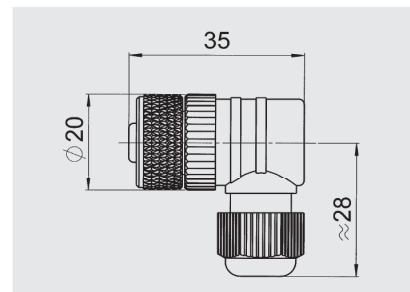
Separate sensor (e.g. TFP 100):



Electrical accessories:

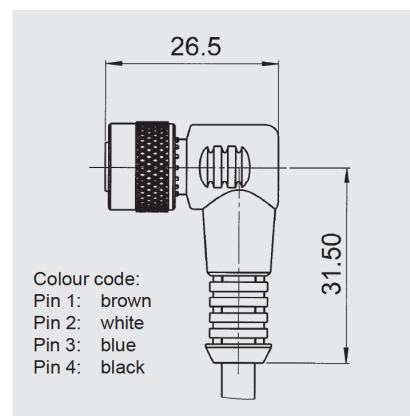
For the output models with 2 switching points and the model with 1 switching output plus analogue output

ZBE 06 (4 pole)
 Right-angled connector, M12x1
 Order no.: 6006788



ZBE 06-02 (4 pole)
 Right-angled connector, M12x1, with 2 m cable
 Order no.: 6006790

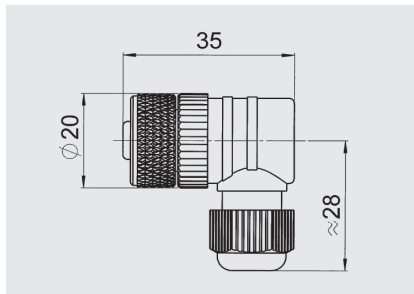
ZBE 06-05 (4 pole)
 Right-angled connector, M12x1, with 5 m cable
 Order no.: 6006789



Electrical accessories:

For all output models

ZBE 08 (5 pole)
Right-angled connector, M12x1
Order no.: 6006786



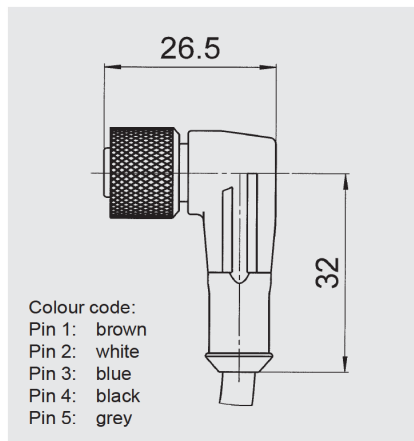
ZBE 08-02 (5 pole)
Right-angled connector,
M12x1, with 2 m cable
Order no.: 6006792

ZBE 08-05 (5 pole)
Right-angled connector,
M12x1, with 5 m cable
Order no.: 6006791

ZBE 08S-02 (5 pole)
Right-angled connector,
M12x1, with 2 m screened cable
Order no.: 6019455

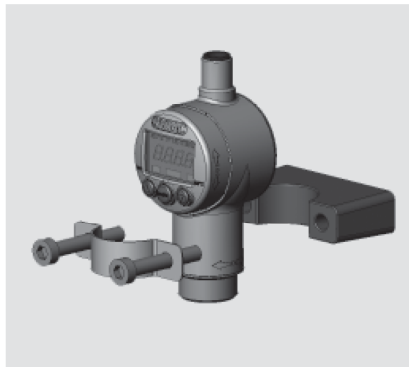
ZBE 08S-05 (5 pole)
Right-angled connector,
M12x1, with 5 m screened cable
Order no.: 6019456

ZBE 08S-10 (5 pole)
Right-angled connector,
M12x1, with 10 m screened cable
Order no.: 6023102

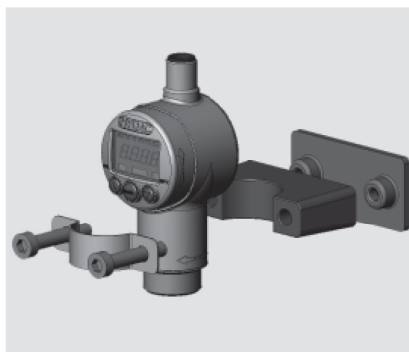


Mechanical accessories:

ZBM 3000
(ETS 3000 for separate sensor only)
Clamp for wall-mounting,
screw-mounted
Order no.: 3184630



ZBM 3100
(ETS 3000 for separate sensor only)
Clamp for wall-mounting,
weld-type
Order no.: 3184632

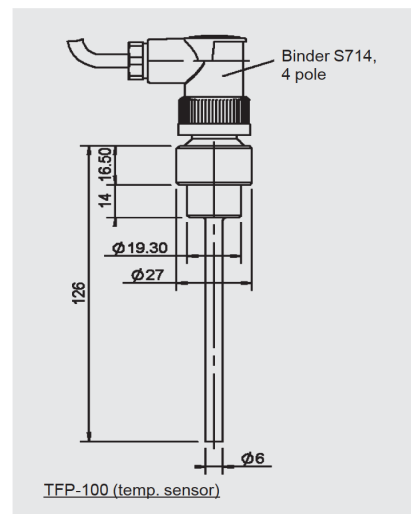


ZBM 3200
Splash protection
Order no.: 3201919

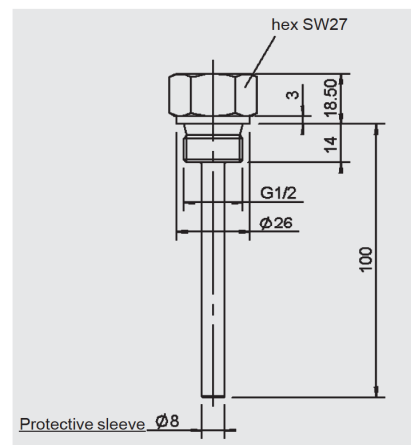


Separate PT100 sensor: TFP 100

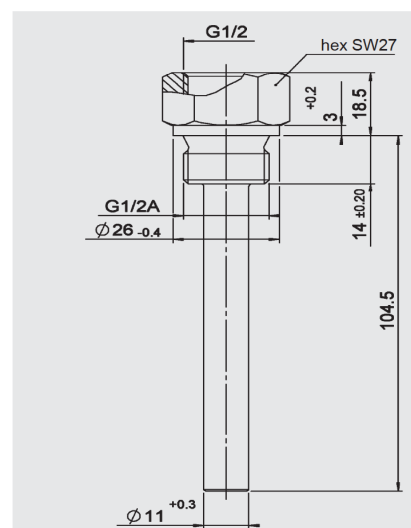
Order no.: 904696



Tank mounting sleeve for
separate sensor probe TFP 100
Order no.: 906170



Tank mounting sleeve for ETS 3000 with
integral sensor probe, probe length 100 mm
Order no. 909640



Technical specifications:

Input parameters:	ETS 3000 with integral sensor probe	ETS 3000 for use with separate sensor
Measurement range:	-25 .. 100 °C (-13 .. 212 °F)	-30 .. 150 °C (-22 .. 302 °F)*
Sensor connection:	–	Cable connection M12x1, 4-pole
Pressure resistance:	probe length 18 mm: 600 bar probe length 100 mm: 50 bar probe length 250 mm: 50 bar probe length 350 mm: 50 bar	–
Hydraulic connection:	G1/2 A DIN 3852	–
Tightening torque:	45 Nm	–
Components in contact with fluid:	Stainless steel, seal: FPM	–
Output parameters:		
Accuracy (display, analogue output):	≤ ± 1.0 °C (≤ ± 2.0 °F)	± 1.0 % FS (+ PT100 error)
Temperature drift (ambient):	≤ ± 0.15 % /10 K (zero point and range)	≤ ± 0.15 % /10 K (zero point and range)
Reaction time (t ₉₀)	approx. 20 s	–
Analogue output:	0 .. 10 V; ohmic resistance: min. 1 kΩ 4 .. 20 mA; ohmic resistance: ≤ 500 Ω	0 .. 10 V; ohmic resistance: min. 1 kΩ 4 .. 20 mA; ohmic resistance: ≤ 500 Ω
Switching outputs:		
Type:	PNP transistor output	PNP transistor output
Switching current:	max. 1.2 A	max. 1.2 A
Switching cycles:	> 100 million	> 100 million
Ambient conditions:		
Temperature range of fluid (for probe):	- 40 .. + 100 °C	–
Ambient temperature range:	- 25 .. + 85 °C	- 25 .. + 80 °C
Storage temperature range:	- 40 .. + 85 °C	- 40 .. + 80 °C
Rated temperature range:	- 10 .. + 70 °C	- 10 .. + 70 °C
CE mark:	EN 61000 - 6 - 1, EN 61000 - 6 - 2, EN 61000 - 6 - 3, EN 61000 - 6 - 4	EN 61000 - 6 - 1, EN 61000 - 6 - 2, EN 61000 - 6 - 3, EN 61000 - 6 - 4
Vibration resistance:	approx. 10 g / 0 .. 500 Hz (IEC 60068 - 2 - 6)	approx. 10 g / 0 .. 500 Hz (IEC 60068 - 2 - 6)
Shock resistance:	approx. 50 g / 11 ms (IEC 60068-2-29)	approx. 50 g / 11 ms (IEC 60068 - 2 - 29)
Other specifications:		
Supply voltage:	18 .. 35 V _{DC} (version with analogue output) 9 .. 35 V _{DC} (version without analogue output)	18 .. 35 V _{DC} (version with analogue output) 9 .. 35 V _{DC} (version without analogue output)
Current consumption:	max. 35 mA (inactive switching output)	max. 35 mA (inactive switching output)
Protection type:	IP 67	IP 67
Components in contact with fluid:	stainless steel	–
Display:	4-digit, LED, 7-segment, red Digit height: 7 mm	4-digit, LED, 7-segment, red Digit height: 7 mm
Weight (complete unit including sensor probe):	approx. 135 g (probe length 18 mm) approx. 150 g (probe length 100 mm) approx. 185 g (probe length 250 mm) approx. 210 g (probe length 350 mm)	approx. 87 g (excluding connector and without probe)

Technical specifications - Accessories:

Temperature sensor TFP 100:	
Temperature range of medium (for TFP 100):	-40 .. +125 °C / -40 .. +257 °F
Electrical connection:	4-pole Binder connector, series 714 M18 (ZBE 03 connector included)
Tank-mounting sleeve for ETS 3000	
Pressure resistance	10 bar
Parts in contact with medium:	CuZn39Pb3 (brass), nickel-plated

FS (Full Scale) = relative to the full measuring range

* Depending on the temperature range of the temperature sensor fitted, this can reduce the display range of the ETS 3000 with separate sensor input.

ETS 322x - x - 018

probe length



Ordering Details: ETS 3000 with integral sensor

ETS 3 2 2 X - X - XXX - XXX

Model _____
2 = with integral temperature sensor

Connection type, mechanical _____
2 = G1/2 A male thread

Connection type, electrical _____
6 = 4 pole M12x1 inlet plug
Possible only on output models 2 and 3
(connector not included)
8 = 5 pole M12x1 inlet plug
Possible only on output model 5
(connector not included)

Output _____
2 = 2 switching outputs
(available only in conjunction with electrical connection type 6)
3 = 1 switching output and 1 analogue output
(available only in conjunction with electrical connection type 6)
5 = 2 switching outputs and 1 analogue output
(available only in conjunction with electrical connection type 8)

Sensor probe length _____
018 = probe length: 18 mm
100 = probe length: 100 mm
250 = probe length: 250 mm
350 = probe length: 350 mm

Modification number _____
000 = standard (set by manufacturer)
400 = sensor probe length in inches

Items supplied:
1x ETS 322X-X-XXX-000
1x manual

ETS 3000 for use with separate sensor

ETS 3 8 6 X - X - 000 - XXX

Model _____
8 = external temperature sensor

Connection type, external temperature sensor _____
6 = Cable connection (female) M12x1, 4 pole

Connection type, electrical _____
6 = 4 pole M12x1
Possible only on output models 2 and 3
(connector not included)
8 = 5 pole M12x1
Possible only on output model 5
(connector not included)

Output _____
2 = 2 switching outputs
(available only in conjunction with electrical connection type 6)
3 = 1 switching output and 1 analogue output
(available only in conjunction with electrical connection type 6)
5 = 2 switching outputs and 1 analogue output
(available only in conjunction with electrical connection type 8)

Sensor probe length _____
000 = external temperature sensor

Modification number _____
000 = standard (set by manufacturer)

Items supplied:
1x ETS 386X-X-000-000
1x manual
1x cable plug connector M12x1, 4 pole, for connecting the external sensor probe
1x sensor connector cable 3 m, LIYCY 4 x 0.25 mm² - screened

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.