HYDAC INTERNATIONAL

Temperature Switches
ETS 3800

Separate temperature probe	Display

IO-Link

4

Description:

The ETS 3800 with IO-Link communication interface is a compact, electronic temperature switch with an integrated 4-digit display. The version for a separate temperature probe has a measuring range of -30 .. +150 °C and is used primarily with the TFP 100 temperature probe which was specially developed for tank installation.

It is also possible, however, to evaluate commonly available PT 100 temperature probes.

The instrument has a switching output and additional output that can be configured as switching or analogue output (4 .. 20 mA or 0 .. 10 V).

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 temperature 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 temperature switch and transmits them to the newly connected temperature 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 temperature 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 ETS 3800 IO-Link are machine tools, handling and assembly automation, intralogistics or the packaging industry.

Technical data:

Input data	
Measuring element	PT 100 (TFP 100)
Connection, separate temperature probe	Female cable connector M12x1, 4 pole
Measuring range [1]	-30 .. +150 °C (-22 .. +302 °F)
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 corresp. in each case to -30 .. +150 °C
Accuracy (at room temperature)	≤ ± 1.0 °C (≤ ± 2.0 °F) (+error separate temperature probe)
Temperature drift (environment)	≤ ± 0.015 % FS / °C
Repeatability	≤ ± 0.25 % FS max.
Environmental conditions	
Operating temperature range	-25 .. +80 °C (-13 .. +176 °F) (-25 .. +60 °C [-13 .. +140 °F] for UL-Spec.)
Storage temperature range	-40 .. +80 °C (-40 .. +176 °F)
CE mark	EN 61000-6-1 / -2 / -3 / -4
cULus mark [2]	Certificate-No.: E318391
Vibration resistance acc. to DIN EN 60068-2-6 at 0 .. 500 Hz	≤ 10 g
Shock resistance acc. to DIN EN 60068-2-27 (11 ms)	≤ 50 g
Protection class acc. to DIN EN 60529 [3]	IP 67
IO-Link specific data	
IO-Link revision	V1.1 / support V1.0
Transmission rate, baud rate [4]	38.4 kBaud (COM2)
Minimum cycle time	2.5 ms
Process data width	16 bit
SIO mode supported	Yes
M-sequence capability	PREOPERATE: TYPE_0 OPERATE: TYPE_2_2 ISDU: Supported
IO Device Description (IODD) download at: https://ioddfinder.io-link.com/#/	
Other data	
Supply voltage when applied acc. to UL specifications	9 .. 35 V DC, if PIN 2 = SP2 18 .. 35 V DC, if PIN 2 = analogue output - limited energy – acc. to 9.3 UL 61010; Class 2; UL 1310 / 1585; LPS UL 60950
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	~ 87 g (excluding cable connector and probe)

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] Depending on the fluid temperature range of the connected temperature sensor, the measurement range of the ETS 3000 may be reduced.
[2] Environmental conditions acc. to 1.4.2 UL 61010-1; C22.2 No. 61010-1
[3] With mounted mating connector in corresponding protection class
[4] 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 ETS 3800 as well as the menu structure comply with the specifications in the VDMA Standard for temperature switches.

Setting ranges for the switching outputs:

Measuring range	Lower limit of RP / FL	Upper limit of SP / FH
-30 .. +150 °C	-28.0 °C	150.0 °C
-22 .. +302 °F	-19 °F	302 °F

Measuring range	Min. difference betw. RP and SP & FL and FH	Increment*
-30 .. +150 °C	2.0 °C	0.5 °C
-22 .. +302 °F	3 °F	1 °F

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

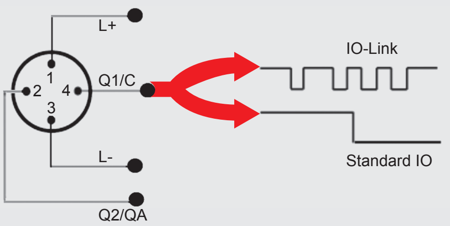
SP = switch point
RP = switch-back point
FL = temperature window lower value
FH = temperature window upper value

Additional functions:

- Switching mode of the switching outputs adjustable (switch point function or window function)
- Switching direction or switching outputs adjustable (N/C or N/O function)
- Switch-on or switch-off delay adjustable from 0.00 .. 99.99 seconds
- Analogue output signal selectable 4 .. 20 mA or 0 .. 10 V
- Choice of display (actual temperature, peak temperature, switch point 1, switch point 2, display off)

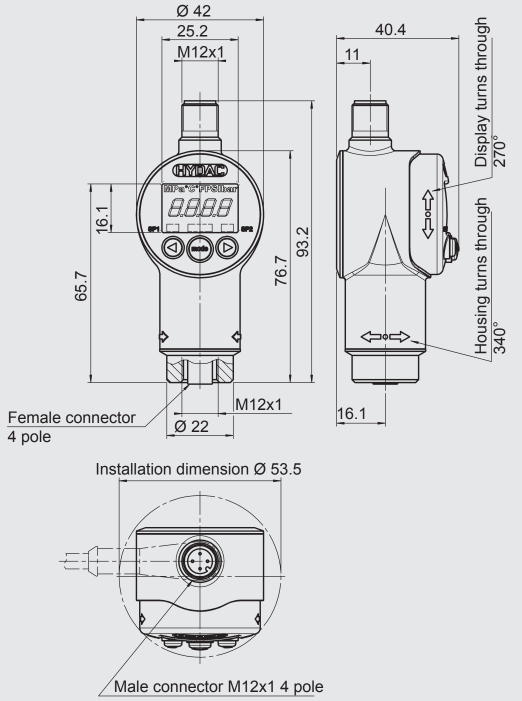
Pin connections:

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:

ETS 3 8 6 6 – F31 – 000 – 000

Type
8 = for separate temperature probes

Mechanical connection
6 = female cable connector M12x1, 4 pole

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

Output
F31 = IO-Link interface

Probe length in mm
000 = separate temperature probe

Modification number
000 = standard

Accessories (supplied with instrument**):**
A male cable connector M12x1, 4 pole, to connect the separate temperature probe and a 3 m sensor cable, LIYCY 4 x 0.25 mm².

Accessories available (not supplied with instrument):
Separate temperature probe:

- TFP 106 - 000 with male 4 pole M12x1 (mating connector not included) — Part no.: 921330
- Tank installation sleeve for TFP 100 — Part no.: 906170

Further information on accessories as well as further accessories, such as mating connectors, splash guards, clamps for wall-mounting 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.

HYDAC ELECTRONIC GMBH
Hauptstraße 27, 66128 Saarbrücken
Germany
Telephone +49 (0)6897 509-01
Fax +49 (0)6897 509-1726
E-mail: electronic@hydac.com
Internet: www.hydac.com