

HYDAC

INTERNATIONAL

Electronic Temperature Sensor ETS 1600

Application:

The temperature controller, type ETS 1600, is a combination of temperature display, 4 adjustable relay outputs and analogue output for remote display or programmable logic control (PLC) link.

It is therefore ideally suited to monitor and control the tank temperature of hydraulic or lubricating oil tanks.

It offers direct and precise temperature information via digital display on site and the temperature information can be passed via the PLC-compatible analogue signal to modern central monitoring systems.

Special features:

- temperature range 0 . . . 100 °C, display range 0 . . . 100 °C
- PT 100 temperature sensor separately connected via a cable in the tank mounted immersion tube (4-conductor technique)
- 3-digit temperature display in °C
- accuracy better than 1.0 °C
- 4 adjustable value contacts with relay output
- switching points and switch-back differential freely adjustable, without opening the unit
- switch-back differential 0.5 . . . 20 °C
- switching point display via key command at any time without affecting the performance
- analogue output optionally 4 . . . 20 mA or 0 . . . 10 V
- safety type IP 65
- can be combined with the pressure switch EDS 1600 of the same design



Construction:

The housing of the ETS 1600 consists of a special aluminium extrusion with plastic cover plates and a membrane keyboard front panel. For the temperature sensor, a PT 100 sensor is used, which is connected via a cable, for special tank mounting in the immersion tube. Any PT 100 sensor in 4-conductor technique can be connected via the standard plug connector to the sensor. Electrical connection is by means of a terminal strip with 14 connections inside the mounting plate.

Adjustments:

Display of switching and switch-back points.

On pressing the switching point keys 1 ... 4 on the front panel, the ETS 1600 always displays the temperature at which the change of the relay condition takes place. This means that if the critical value is not activated (the switching point LED is dark), the ETS 1600 displays the switch-on value. If the critical value is activated (the LED lights up), the switch-off value is displayed. This function also allows the switch-back value to be read accurately. If no key is pressed, the ETS 1600 always displays the current temperature (above 0 degrees).

Adjustment of switching points

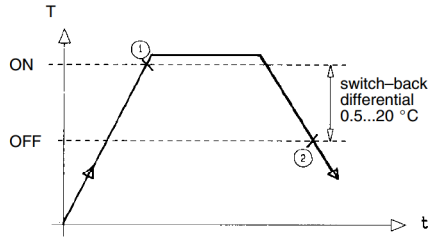
In order to adjust the switching points, the plastic slide on the left of the housing cover is pulled out. In the closed position the slide engages and with a little force can be pulled out against a stop. When the slide is pulled out, the arrangement of the potentiometers becomes visible and the openings for adjustment accessible. The switching points can be adjusted via a multi-turn potentiometer.

During adjustment the setting can be checked by pressing the appropriate switching point keys.

The temperature sensor can be adjusted during operation.

Switch-back differential

Irrespective of the switching point adjustment, a joint switch-back differential can be set for all 4 switching points. When the keys for switching point 1 and switching point 2 are pressed simultaneously the switch-back differential is displayed and can be adjusted via a potentiometer.



- ① With increasing temperature, the switching output is activated when the pre-set switching point is reached.
- ② With decreasing temperature, the switching output is switched to "inactive" when the pre-set switch-back differential is exceeded.

The setting range is approx. 0.5...20 °C.

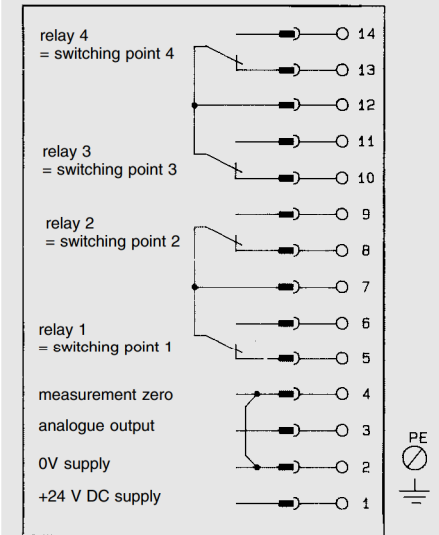
Anti-clockwise turning decreases the switch-back differential, clockwise turning increases it.

The unit is set by the manufacturer to an average value.

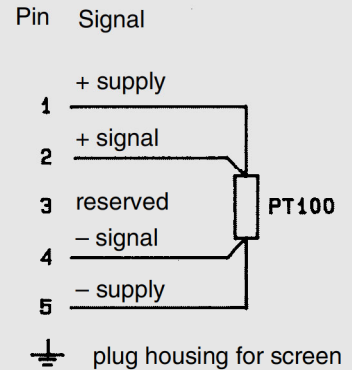
Contact connections:

Relay outputs

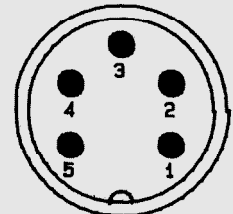
Terminal strip



Sensor connection



Plug connector appliance plug 5-pole Binder series 723



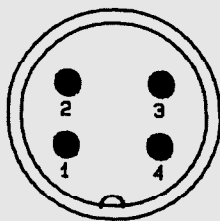
Mounting:

The temperature sensor ETS 1600 should always be mounted on rubber buffers (DIN vibration mounts).

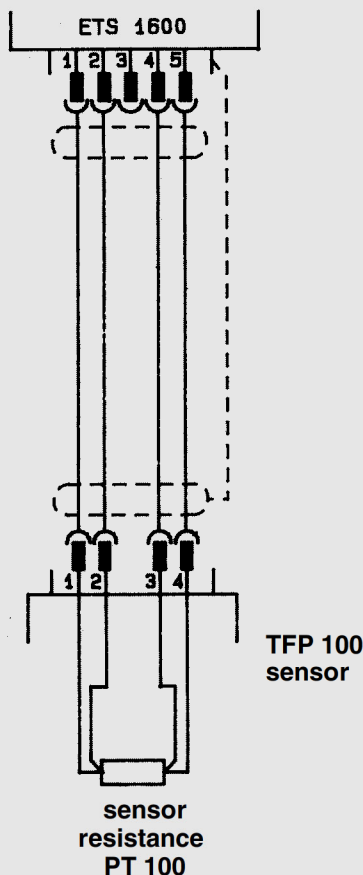
TFP Connection:

PIN	signal
1	+ supply
2	+ signal
3	- signal
4	- supply

Plug connector
appliance plug
4-pole
Binder series 714



Wiring example



Technical Details:

Supply voltage:	24 V $\pm$ 10% full bridge 3-phase bridge 24...32 V DC battery voltage 24...32 V
Fuse:	internal, 1 A delayed action base has to be opened
Current consumption:	approx. 200 mA starting current approx. 1.2 A/ 0.3 sec
Signal output:	0...100 °C = 4...20 mA ohmic resistance $\leq$ 400 Ohm, ohmic resistance effect < 0.025 mA/100 Ohm or 0...100 °C = 0...10 V ohmic resistance $\geq$ 2 kOhm
Class accuracy:	1.0 °C (linearity, hysteresis) at temperatures below 0 °C 00.0 is shown
CE mark	EN 50081-1, EN 50081-2 EN 50082-1, EN 50082-2
Temperature range of sensor:	-40...+125 °C
Display range:	0...+100 °C
Switching range:	0...+100 °C
Temperature range of electronics:	-25...+60 °C
Switch-back differential:	approx. 0.5...20 °C
Switching output:	0.1...250 V AC 0.025...2 A 400 VA, 50 W (for inductive load: use varistor)
Life expectancy of contacts:	20 million min. without load 1 million min. at nominal load
Switching delay:	approx. 25 ms bounce time approx. 2 ms
Connection:	14-pole, terminal strip, insulation stripping length 7 mm connection cross section 1.5 mm ² cable outlet 2 x PG 11
Safety type:	IP 65
Display:	3-digit, LED, 7-segment height of digits 13 mm, red
Weight:	approx. 800 grammes
Compatibility of safety sleeve with medium:	all materials compatible with nickel

Order Details:

ETS 1601 - X - XXX - 000	
Electronic temperature sensor	
Series no. (determined by manufacturer)	
Type of sensor 0 for PT 100 (sensor to be ordered separately, see below)	
Display 1 3-digit in °C	
Output signal B 0...10 V C 4...20 mA	
Measuring range 100 0...100 °C	
Modification number (determined by manufacturer) 000 standard	

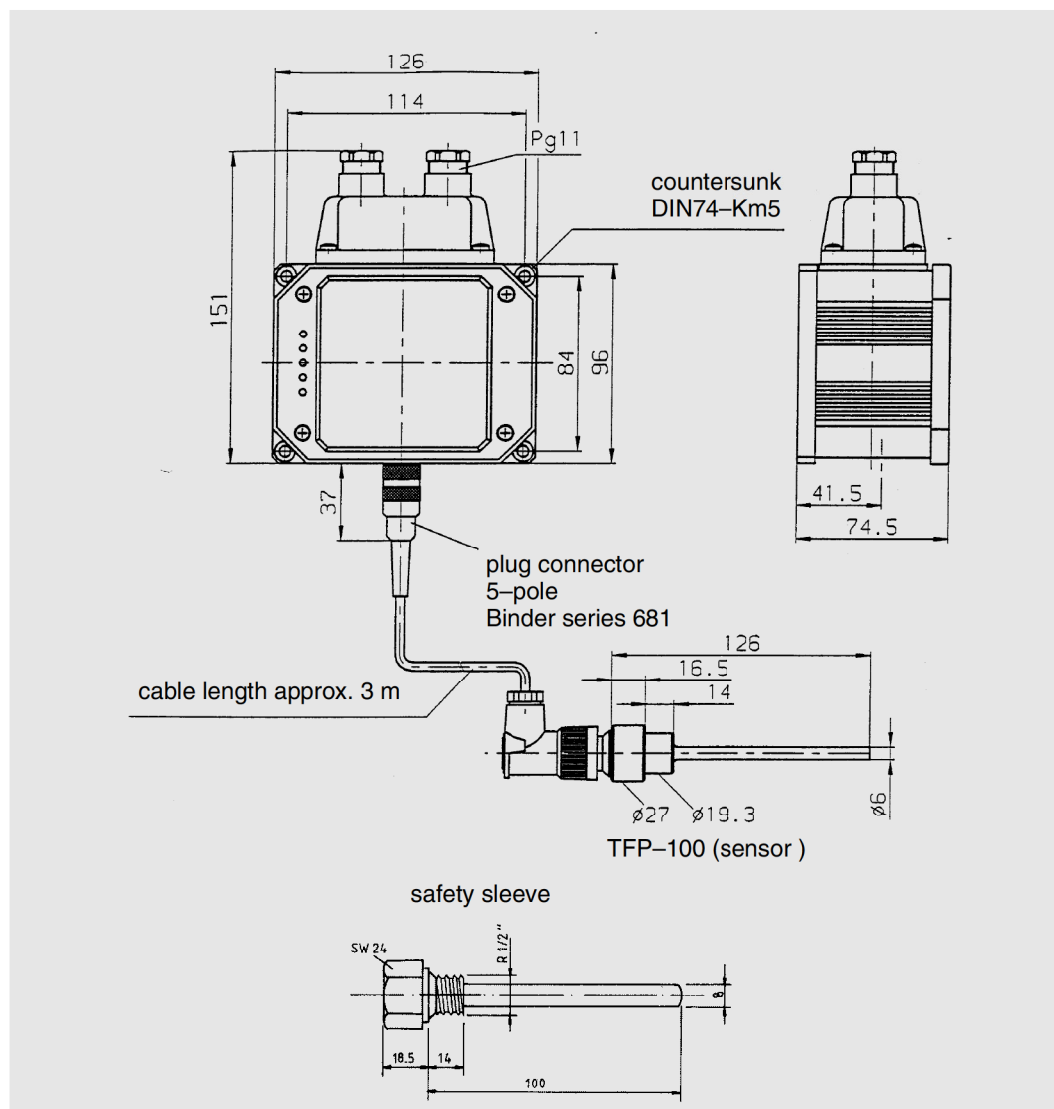
Accessories included:

PG 11 cable glands, 4 mounting screws M5 x 20 mm,
1 adjustment screwdriver, 5-pole plug connector, 3 m connection lead for sensor

Other accessories:

TFP 100 (PT 100 sensor), safety sleeve for tank mounting

Dimensions:



Please note:

All details in this brochure are subject to technical modifications.