# Electronic Temperature Switch
## ETS 1700

## Description:

The electronic temperature switch ETS 1700 is used mainly together with the temperature probe TFP 100, which was specially developed for tank mounting.

The 4-digit display can indicate the actual temperature, one of the switching points or the maximum temperature.

The maximum temperature indicates the highest temperature which has occurred since the unit was switched on or was last reset.

The 4 switching outputs can be used to control heating and cooling processes in hydraulic systems, for example. 4 switching and switch-back points which are independent of each other can be adjusted very simply via the keypad.

For incorporation into monitoring systems (e.g. with PLC) an analogue output (4 .. 20 mA or 0 .. 10 V) is also available.

## Special features:

- 4-digit display
- Easy operation due to key programming
- 4 limit relays, switching points and switch back points can be adjusted independently
- Analogue output signal selectable (4 .. 20 mA or 0 .. 10 V)
- Many useful additional functions
- Optional mounting position (pressure connection on the top/ bottom, keypad and display can be turned through 180°)

## Technical specifications:

| Input data | |
|---|---|
| Measuring range | 0 .. +100°C (+32 ... 212 °F)* |

| Output data | |
|---|---|
| Accuracy (display, analogue output) | $\leq \pm 1.0$ °C ($\leq \pm 2.0$°F) |
| Repeatability | $\leq \pm 0.25$ % FS |
| Temperature drift (environment) | $\leq \pm 0.03$ % FS / °C max. zero point |
| | $\leq \pm 0.03$ % FS / °C max. range |

| Analogue output (optional) | |
|---|---|
| Signal | selectable: |
| | 4 .. 20 mA     ohmic resist. max. 400 $\Omega$ |
| | 0 .. 10 V     ohmic resistance min. 2 k$\Omega$ |
| | corresponds in each case to 0 .. +100 °C |

| Switching outputs | |
|---|---|
| Type | 4 relays with change-over contacts in 2 groups (common supply of each group conn.) |
| Switching voltage | 0.1 .. 250 V AC / DC |
| Switching current | 0.009 .. 2 A per output |
| Switching capacity | 400 VA, 50 W (for inductive load, use varistors) |
| Switching cycles | > 20 million at minimum load |
| | > 1 million at maximum load |

| Environmental conditions | |
|---|---|
| Ambient temperature range | -25 .. +60 °C |
| Storage temperature range | -40 .. +80 °C |
| CE mark | EN 61000-6-1 / 2 / 3 / 4 |
| Vibration resistance to DIN EN 60068-2-6 (0 .. 500 Hz) | $\leq 5$ g |
| Shock resistance to DIN EN 60068-2-29 (1 ms) | $\leq 10$ g |
| Protection class to DIN 40050 | IP 65 |

| Other data | |
|---|---|
| Supply voltage | 22 .. 32 V DC |
| Current consumption | approx. 200 mA |
| Residual ripple of supply voltage | $\leq 10$ % |
| Display | 4-digit, LED, 7 segment, red, height of digits 13 mm |
| Weight | approx. 800 g |

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.
*Depending on the temperature range of the connected temperature sensor, the indication range of the ETS 1700 may be reduced.
**FS** (**F**ull **S**cale) = relative to complete measuring range

## Setting options:
The microprocessor integrated into the ETS 1700 enables many useful extra functions in addition to the switching functions, as compared with a normal mechanical temperature switch.
It is possible, for example, to activate switching delay times or to change the relay switching direction.
All settings are made via the keypad.

## Setting ranges of the switching points and switch-back hystereses:
- Switching point relays 1 to 4:
  1.5 .. 100 % of the measuring range
- Switching point relays 1 to 4:
  1 .. 99 % of the measuring range
  or alternatively
- Switch-back hystereses 1 to 4:
  1.. 99 % of the measuring range

## Additional functions:
- Switching direction of the relays 1 to 4 (N/C or N/O function)
- Switch-on delay relays 1 to 4 in the range from 0.0 .. 900.0 seconds
- Switch-back delay relays 1 to 4 in the range from 0.0 .. 900.0 seconds
- Switch-back mode (alternatively switch-back point or switch-back hysteresis)
- Display of the actual temperature, a switching point or of the peak value
- Display range individually selectable in °C or °F
- Measurement unit (°C, °F) is displayed
- Analogue output (4 .. 20 mA or 0 .. 10 V)
- Programming disable

## Terminal assignment:
Device connection

| Pin | |
|---|---|
| 1 | +$U_B$ |
| 2 | 0 V |
| 3 | Analogue output Signal + |
| 4 | Analogue output Signal - (0 V) |
| 5 | Relay 1 N/C |
| 6 | Relay 1 N/O |
| 7 | Centre relay 1 and 2 |
| 8 | Relay 2 N/C |
| 9 | Relay 2 N/O |
| 10 | Relay 3 N/C |
| 11 | Relay 3 N/O |
| 12 | Centre relay 3 and 4 |
| 13 | Relay 4 N/C |
| 14 | Relay 4 N/O |

Probe connection

| Pin | |
|---|---|
| 1 | +$U_B$ |
| 2 | Signal + |
| 3 | n.c. |
| 4 | Signal - |
| 5 | 0 V |

## Model code:

$$ETS\ 1\ 7\ 0\ X - 100 - 000$$

**Type of sensor**
0 = For PT 100 sensors

**Display**
1 = 4-digit display °C
2 = 4-digit display °F

**Measuring range**
0 .. 100 °C (+32 .. 212 °F)

**Modification number**
000 = standard

### Note:
On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

### Accessories:
PG cable glands, mounting screws, a 5 pole female connector (Binder series 681) for connecting the separate temperature probe and a 3 m sensor cable (LIYCY 4 x 0.25 mm²) are supplied with the unit.
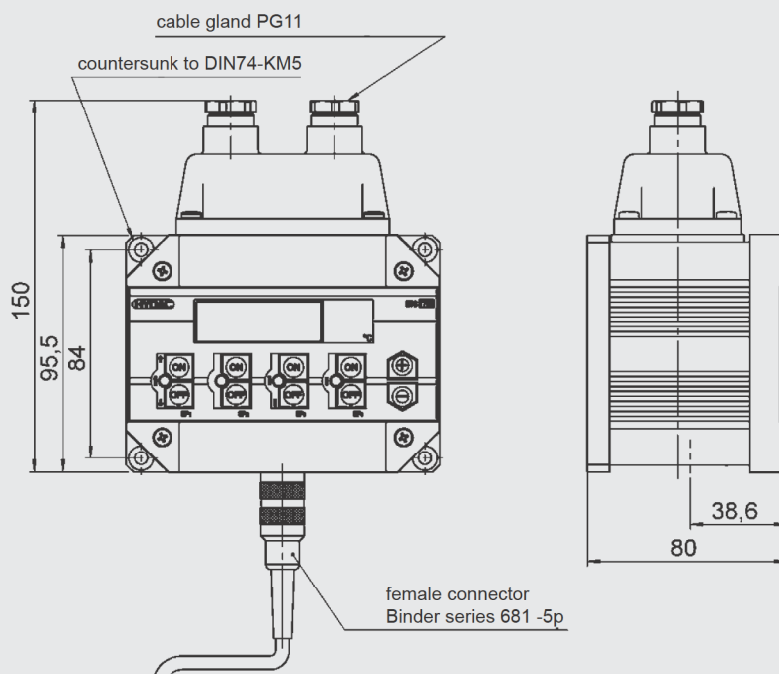Other accessories, such as vibration mounts etc can be found in the Accessories section.

## Separate temperature probe:
(Not supplied with unit)
- TFP 104 - 000    with electr. conn. 4 pole Binder series 714 M18    Part No.: 904696
  (female connector supplied)
- TFP 106 - 000    with electr. conn. 4 pole M12x1    Part No.: 921330
  (female connector not supplied)
- Tank-mounting sleeve for TFP 100    Part No.: 906170

## Dimensions:



cable gland PG11
countersunk to DIN74-KM5
female connector Binder series 681 -5p

## Note:
The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

**HYDAC**