

**Produktinformation**

**Sensors and Instrumentation**

**Temperature Transmitter / Switch FLEX-T**



- Analog 4..20 mA or 0..10 V output signal
- Programmable switching output (push-pull) or alternatively frequency output
- Switching point or full scale can be set via a magnet clip
- Programming protection by removal of the clip
- All metal housing
- Rotatable electronic head for alignment of the 90° cable outlet
- LED for switching status display
- Oil-filled tropical model
- High temperature model (200 °C) optionally available
- IP 67

**Characteristics**

The temperature sensor consists of a platinum resistance sensor and the downstream evaluation electronics.

The sensors work with a 16-bit processor, a 12-bit A/D and a 12-bit D/A converter. Linearisations and calibrations are carried out automatically. The flash memory guarantees the exchangeability of all programs.

An analog output (4..20 mA or 0..10 V) and a switching output (transistor output "push-pull") are available as output. The switching output can be configured either as a limit switch (minimum / maximum monitoring) or as a frequency output (max. 2 kHz).

Options allow:

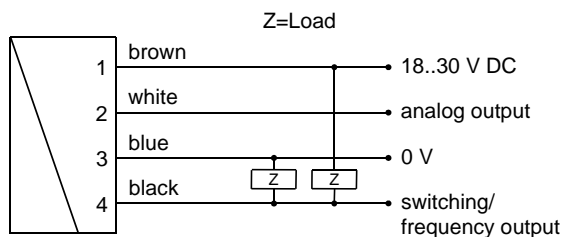
- Variable ranges for the analog outputs
- Variable hysteresis
- Minimum or maximum switches
- Inversion of the outputs
- Power-On delay
- Switching delays

**Technical data**

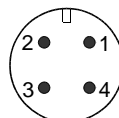
<b>Sensor</b>	platinum resistance sensor	
<b>Process connection</b>	male thread G 1/4 A.. G 1/2 A, union nut G 3/4 or Tri-clamp connection	
<b>Metering range</b>	0..100 °C	standard range
	0..200 °C	extended range for lance shape with gooseneck
	range -20..+200 °C or partial ranges available on request	
<b>Measurement accuracy</b>	±1 % FS	

<b>Reproducibility</b>	±0.1 % FS	
<b>Dynamic (τ)</b>	3 s	
<b>Pressure</b>	Lance shape	PN 25
	Compact construction	PN 100
<b>Medium temperature</b>	as metering range	
<b>Ambient temperature</b>	0..70 °C	
<b>Storage temperature</b>	-20..+80 °C	
<b>Materials medium-contact</b>	1.4571	
<b>Materials, non-medium-contact</b>	1.4305, PP	
<b>Supply voltage</b>	18..30 V DC	
<b>Analog output</b>	4..20 mA / max. load 500 Ω or 0..10 V / min. load 1 kΩ	
<b>Switching output</b>	Push-pull (can be connected as PNP or NPN), optionally NPN o.c., configurable as limit switch or frequency output (max. 2 kHz)	
<b>Output current</b>	max. 100 mA	
<b>Electrical connection</b>	for round plug connector M12x1, 4-pole	
<b>Ingress protection</b>	IP 67	
<b>Weight</b>	approx. 0.25 kg	
<b>Conformity</b>	CE	

**Wiring**



Connection example: PNP NPN

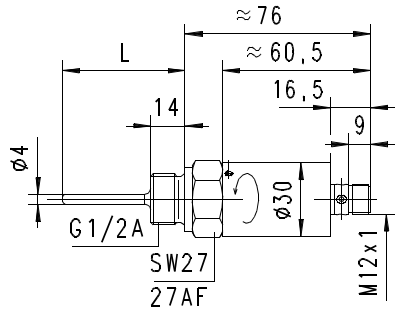


The use of shielded cabling is recommended.

**Produktinformation**

**Sensors and Instrumentation**

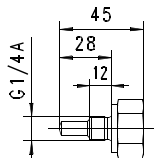
**Dimensions**



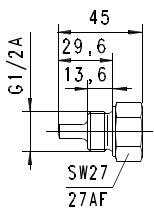
**Lance shape**

Lance type	Length X	Screw-in thread
..050..	50	G 1/2 A
..100..	100	G 1/2 A
..150..	150	G 1/2 A
..200..	200	G 1/2 A

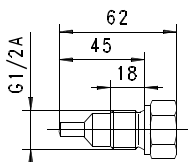
**Compact sensor**



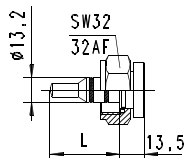
Screw-in sensor G 1/4 A  
Type ..028..



Screw-in sensor G 1/2 A  
Type ..029..

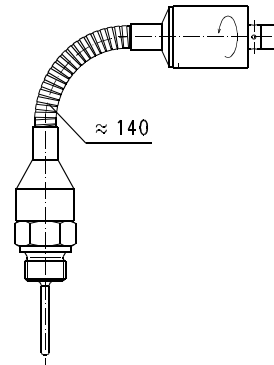


Screw-in sensor G 1/2 A  
Type ..045..



Sensor with union nut for  
T-piece G 3/8..G 1/2  
Type ..031.. (L = 31 mm)  
or  
T-piece G 3/4..G 2  
Type ..037.. (L = 37 mm)

"Gooseneck" option for higher temperatures  
(available for lance and compact shape)



**Handling and operation**

**Note**

The sensors are fully preconfigured at HONSBERG to customer wishes. However, as an option, the setting of one or more parameters using a magnetic clip through the enclosed housing (IP 67) is fully possible.

The parameters available are:

- Switching temperature of the limit switch
- Temperature at full scale analog output
- Temperature at full scale frequency output

The parameter to be programmed must be specified when ordering.

**Installation**

Sensors with screw-in threads are screwed into a T-piece or a nozzle in the pipework, using a suitable flat seal (e.g. Klingerit). Sensors with a union nut are mounted in a T-piece (see separate product information). Use only a hexagonal spanner to tighten. It should be ensured that the sensor tip is located fully in the medium, and does not push against the wall of the pipe. The upper part of the sensor with the connector outputs can be turned steplessly in order to align the cable outlet.

**Produktinformation**

**Sensors and Instrumentation**

**Operation and programming**

The electronics contain a magnetic contact, with the aid of which different parameters can be programmed. Programming takes place when a magnet clip is applied for a period between 0.5 and 2 seconds to the marking located on the label. If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields).



After the programming ("teaching"), the clip can either be left on the device, or removed to protect data.

The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.

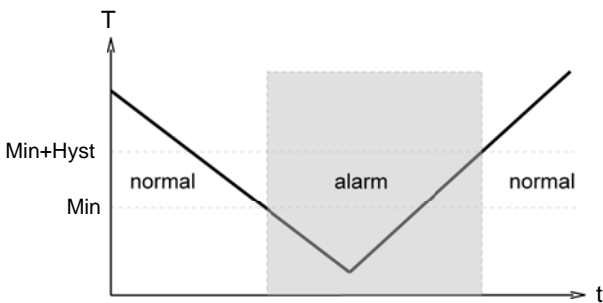
In order to avoid the need to transit to an undesired operating status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

*Example: The switching value is to be set to 70 % of the metering range, because at this flow rate a critical process status is to be notified. However, only 50% can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 %. At 50 % in the process, a switching value of 70 % would then be stored during "teaching".*

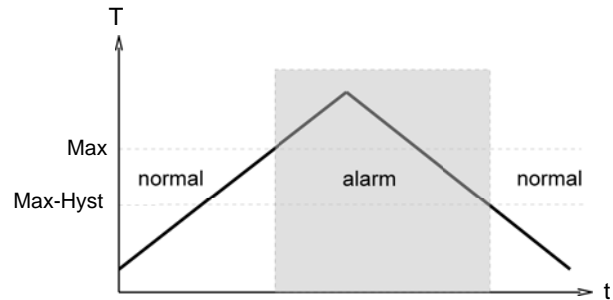
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minima or maxima.

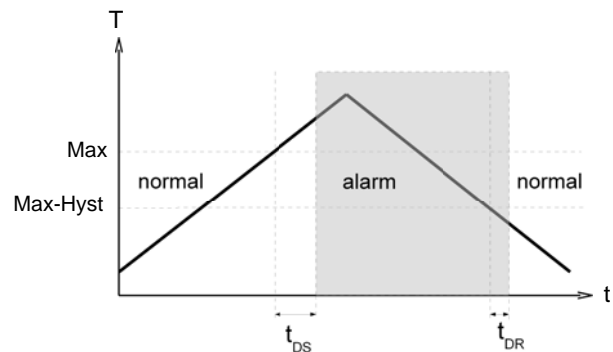
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.

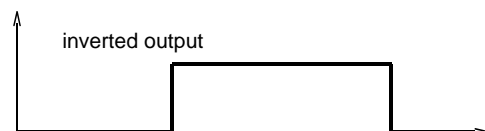
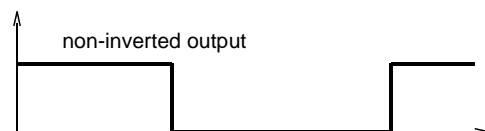


A switchover delay time ( $t_{DS}$ ) can be applied to the switchover to the alarm state. Equally, one switch-back delay time ( $t_{DR}$ ) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

**Produktinformation**

**Sensors and Instrumentation**

**Ordering code**

FLEX-T - 1.  2.  3.  4.  5.  6.  7.   
 K

Option = ○

<b>1. Connection material</b>		
K	stainless steel 1.4571	
<b>2. Connection size</b>		
008	○	connection G 1/4 A
013	connection for T-piece	
015	connection for G 1/2 A	
<b>3. Process connection</b>		
050	lance length	50 mm Ø 4 mm
100		100 mm Ø 4 mm
150		150 mm Ø 4 mm
200		200 mm Ø 4 mm
028	sensor length	28 mm (G 1/4 A)
029		29.6 mm (G 1/2 A)
045		45 mm (G 1/2 A)
031	sensor for	T-piece G 3/8..G 1/2
037		T-piece G 3/4..G 2
<b>4. Analog output</b>		
I	current output 4..20 mA	
U	voltage output 0..10 V	
K	no analog output	
<b>5. Switching output</b>		
T	switching output push-pull	
M	○	switching output NPN (open collector)
K	no switching output	
<b>6. Switching function</b>		
L	minimum-switch	
H	maximum-switch	
R	frequency output	
K	no switching output	
<b>7. Switching signal</b>		
O	standard output	
I	inverted output	

**Options**

For analog output:

**Special range for analog output:**

Start of metering range (4 mA or 0 V) at  °C  
 Standard = 0 °C

End of metering range (20 mA or 10 V) at  °C

For frequency output:

**End frequency** (max. 2000 Hz)  Hz  
 Standard = 2000 Hz

**Special range for frequency output:**

Start of metering range (0 Hz) at  °C  
 Standard = 0 °C

End of metering range (end frequency) at  °C  
 Standard = 100 °C

For switching output:

**Switching delay period** (0.0..99.9 s)  .  s  
 (from Normal to Alarm)

**Switch-back delay period** (0.0..99.9 s)  .  s  
 (from Alarm to Normal)

**Switching output fixed at**  °C  
**Switching hysteresis**  %

Standard = 2 % of the metering range

General:

**Power-On delay period** (0..99 s)  s  
**Teach-offset** (-20..+200 °C)  °C  
 Standard = 0 °C

**High temperature model**   
 (Gooseneck)

**Tropical model** (oil filled)

**Accessories**

- T-piece type TS-2... Thread G 3/8..G 2
- Cable/round plug connector (KB...)  
see additional information "Accessories"
- Evaluation electronics OMNI-TA
- Device configurator ECI-1