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Product Information **HFK30**

Flow and Temperature Transmitter / Switch HFK30

- **Compact robust flow rate switch/transmitter for foodstuffs use**
- **Combination with temperature switch or transmitter possible**
- **Mo moving parts in the medium being monitored**
- **Only one medium-contact material**
- **Simple to use**
- **Very low pressure loss**
- **Rapid response times for a calorimetric Sensor**
- **Cable outlet infinitely rotatable**
- **Very small installation width, therefore very narrow pipework is possible**

Characteristics

The HFK30 flow sensor monitors fluid media. Its compact form combines the measurement tube and the converter / counter. The integrated transducer has an analog output (4..20 mA or 0..10 V) and one switching output, which can be configured as a limit switch for monitoring minimla or maximal, or as a frequency output.

The switching output is designed as a push-pull driver, and can therefore be used both as a PNP or an NPN output. The state of the switching output is signalled with a yellow LED in the switching outlet; the LED has all-round visibility.

The sensor is configured in the factory, or alternatively this can be done with the aid of the optionally available ECI-3 device configurator (USB interface for PC). A selectable parameter can be modified on the device, with the aid of the magnet clip provided. In this case, the current measured value is saved as the parameter value. Examples of these parameters are the switching value or the metering range end value. The stainless steel electronics housing is rotatable, so it is possible to orient the cable outlet after installation.

The converter / counter record two process parameters: the flow speed of the medium and its temperature. Both parameters can be assigned to the analog output or to the switching output. The following output combinations are available:

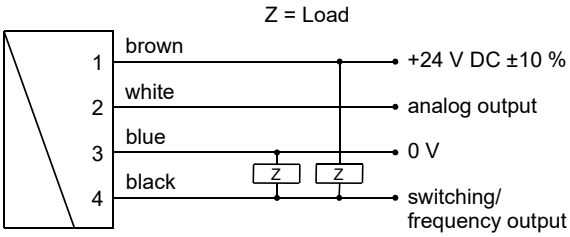
Flow		Temperature	
Analog output	Switching output	Analog output	Switching output
●			
	●		
●	●		
●			●
	●	●	

the switching output can be ordered as a minimum or a maximum switch. It is recommended also to order a T-piece, as the later installation position corresponds to the factory calibration situation.

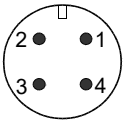
Technical data

Sensor	calorimetric measurement principle
Process connection	GHM*adapt* G $^1/_2$
Metering ranges Flow	water 2..150 cm/s range, 2..300 cm/s available on request oil (available on request)
Measurement accuracy Flow	±10 % end value, tested with 10 x D in inlet and output, with a rising pipe (medium: water)
Repeatability	±1 %
Temperature gradient	4 K/s
Start-up time	10 sec. after application of operating voltage
Response time	in water (25 °C) at an average flow speed of approx. 1-2 sec.
Process pressure	PN 50
Metering range Temperature	0..+100 °C (steam cannot be measured)
Measurement accuracy Temperature	±2 °C
Media temperature	0..+100 °C
Ambient temperature	-20..+70 °C
CIP- / SIP temperature	140 °C, < 30 min
Storage temperature	-20..+80 °C
Programming/ settings	by means of magnet
Materials medium-contact	sensor 1.4435, FDA-compliant
Materials, non-medium-contact	housing 1.4305, plug PA6.6, clip PA6.6
Supply voltage	24 V DC ±10 %
Current consumption	max. 100 mA
Switching output	transistor output "push-pull", compatible with PNP and NPN, (resistant to short circuits and polarity reversal) I_{out} = 100 mA max.
Switching hysteresis	flow 4 % of end value, temp.: approx. 2 °C
Display (only with switching output)	yellow LED (On = OK / Off = Alarm)
Analog output	4..20 mA / Load 500 Ohm max. or 0..10 V / Load min. 1 kOhm
Electrical connection	for round plug connector M12x1, 4-pole
Ingress protection	IP 67
Weight	approx. 0.2 kg (standard version)
Conformity	CE FDA

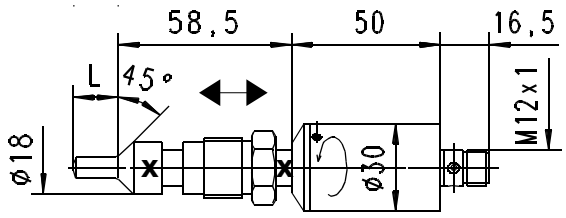
Wiring



Connection example: PNP NPN



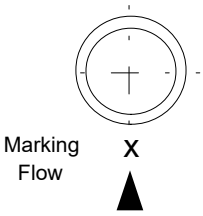
Dimensions



For compatible T-pieces and weld-on sockets in the GHM*adapt*series, see "Accessories".

Handling and operation

Installation



The sensor is inserted into the boring together with a sealing cone, oriented, and fastened in place with a pressure screw.
When a flow is present, this should impinge on the side of the sensor marked with an X, in order to achieve as small a response time as possible.
The torque on the pressure screw should be between 5..10 Nm.

Avoid bubbles or deposits on the sensor. It is therefore best to install at the side.
For T-pieces or welded-on nozzles, see Accessories.

Programming

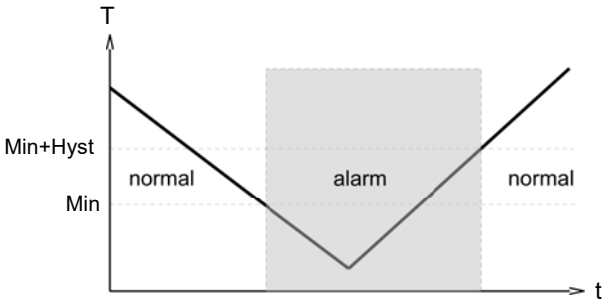
The electronics contain a magnetic contact, with the aid of which different parameters can be programmed. Programming takes place when a magnet clip is applied for a period between 0.5 and 2 seconds to the marking located on the label. If the contact time is longer or shorter than this, no programming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

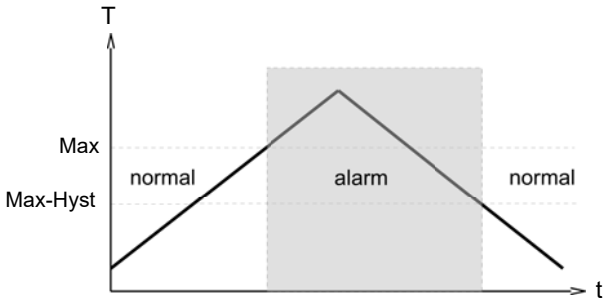
Example: The switching value is to be set to 70 % of the metering range, because at this flow rate a critical process status is to be notified. However, only 50% can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 %. At 50 % in the process, a switching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

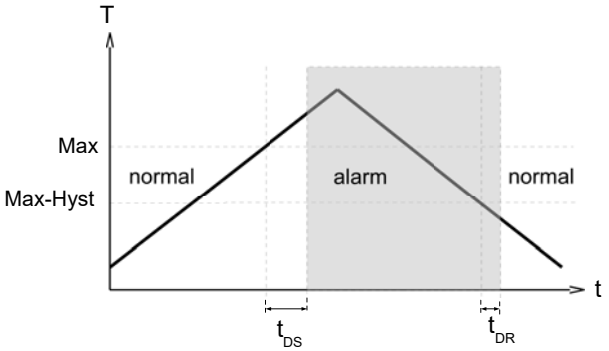
The limit switch can be used to monitor minimal or maximal. With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



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.

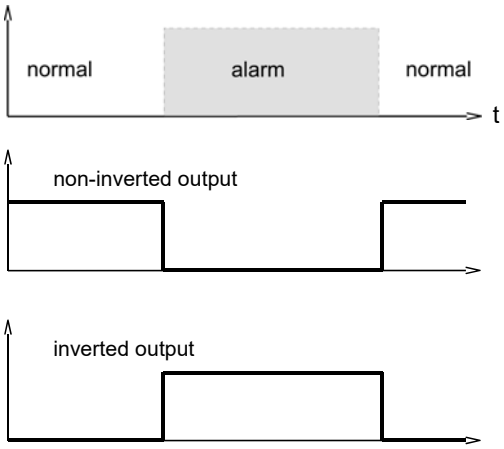


A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



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.

Ordering code

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
HFK30 -	**015**	**K1**								

❍=Option

1.	**Sensor tip length**	
	015	L = 15 mm
2.	**Sensor material**	
	K1	stainless steel 1.4435
3.	**Analog output**	
	I	current output 4..20 mA
	U	voltage output 0..10 V
4.	**Measurement parameter to analog output**	
	F	flow rate to analog output
	T	temperature to analog output
5.	**Switching output**	
	T	transistor output "push-pull"
	M ❍	NPN (open collector)
6.	**Measurement parameter to switching output**	
	F	flow to switching output
	T	temperature to switching output
7.	**Functioning of the switching output**	
	L	minimum-switch
	H	maximum-switch
	R	frequency output
8.	**Switching signal**	
	O	standard
	I	inverted
9.	**Options**	
	00	without option
10.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	WZ2.2	factory certification 2.2

Options

Special measuring range for flow: ___ cm/s
max. 300 cm/s (standard = 150 cm/s)

Special measuring range for temperature: ___ °C
Maximum 130 °C (standard = 100 °C)

Minimum -20 °C (standard = 0 °C) ___ °C

Special range for analog output: ___ cm/s °C
<= metering range (standard = metering range)

Special range for frequency output: ___ cm/s °C
<= metering range (standard = metering range)

End frequency (max. 2000 Hz) ____ Hz

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)

Power-On-Delay period (0..99 s) __ s
(time after applying power during which the outputs are not activated or set to defined values)

Switching output fixed ___ cm/s °C

Special hysteresis __ %/ °C

Teach-offset ____ %
(in percent of the metering range)
Standard = 0 %

If the field is not completed, the standard setting is selected automatically.

Accessories

- ECI-3 device configurator (USB programming adapter)
- Process adapter
- Cable/round plug connector (KH...)
  see additional information “Accessories”
- External display OMNI-TA or OMNI Remote