GHM GROUP - Honsberg | GHM Messtechnik GmbH
Tenter Weg 2-8 | 42897 Remscheid | GERMANY
Phone +49 2191 9672-0 | Fax +49 2191 9672-40
www.ghm-group.de | info@ghm-group.de

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Produktinformation   **HFK35**

Flow Transmitter / Switch HFK35

- **Flow indicator for foodstuffs use, without moving parts**
- **Short response times for a calorimetric sensor**
- **Medium comes into contact with only one material**
- **Analog output 0/4..20 mA or 0/2..10 V**
- **Two programmable switches (push-pull)**
- **Graphical LCD display, backlit (transreflective), can be read in sunlight and in the dark**
- **Programmable parameters via rotatable, removable ring (programming protection)**
- **Full metal housing with non-scratch, chemically resistant glass**
- **Rotatable electronic head for best reading position**
- **Small, compact construction**
- **Simple installation**

Characteristics

The calorimetric sensor measures the flow speed in aqueous fluids. The integrated transducer has a backlit graphics LCD display which is very easy to read both in the dark and in bright sunlight. The graphics display allows the presentation of measured values and parameters in a clearly understandable form. The measured values are displayed to 4 places, together with their physical unit, which may also be modified by the user. The electronics have an analog output (4..20 mA or 0..10 V) and two switching outputs, which can be used as limit switches for monitoring minimal or maximal, or as two-point controllers.

The switching outputs are designed as push-pull drivers, and can therefore be used both as PNP and NPN outputs. Exceeding limit values is signalled by a red LED which is visible over a long distance, and by a cleartext in the display. The stainless steel case has a hardened non-scratch mineral glass pane. It is operated by a programming ring fitted with a magnet, so there is no need to open the operating controls housing, and its leakproofness is permanently ensured.

By turning the ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180 ° and replaced, or completely removed, thus acting as a key.
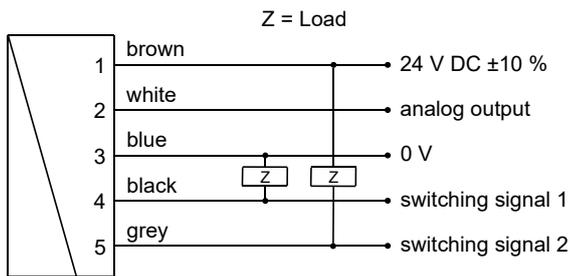
It is recommended also to order a T-piece, as the later installation position corresponds to the factory calibration situation.
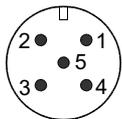
Technical data

Sensor	calorimetric measurement principle
Process connection	GHM*adapt* G $^1/_2$
Metering range	water 2..150 cm/s range, 2..300 cm/s available on request oil (available on request)
Measurement accuracy	±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
Media temperature	0..+100 °C
Ambient temperature	-20..+70 °C
Storage temperature	-20..+80 °C
CIP- / SIP temperature	140 °C, < 30 min
Materials medium-contact	stainless steel 1.4435, FDA-compliant
Materials, non-medium-contact	Housing: stainless steel 1.4305 Glass: mineral glass, hardened Magnet: samarium-Cobalt Ring: POM
Supply voltage	24 V DC ±10 %
Analog output	0/4..20 mA or 0/2..10 V
Power consumption	max. 2.5 W
Switching outputs S1 and S2	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max. per output
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum switching value
Display	backlit graphical LCD-Display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display.
Electrical connection	for round plug connector M12x1, 5-pole
Ingress protection	IP 67
Weight	approx. 0.25 kg
Conformity	CE FDA

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Wiring

Z = Load

1 brown — 24 V DC ±10 %
2 white — analog output
3 blue — 0 V
4 black — switching signal 1
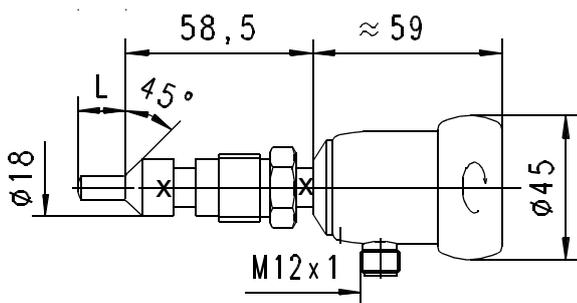5 grey — switching signal 2

Connection example: PNP   NPN

The switching outputs are self-configuring, depending on whether they are connected as PNP or NPN switches (push-pull).
It is recommended to use shielded wiring.

Dimensions

58,5   ≈ 59
L   45°
Ø18   Ø45
M12 x 1

For compatible adapters in the GHM*adapt* series, see attachment.

Handling and operation

Installation

● In order to ensure the sensor's maximum insensitivity to interference, the flow should run from bottom to top (best degassing even at the slowest flow speed).
● Installation in the pipework is achieved by means of GHM*adapt* T-pieces, or welded-on nozzles.
● The reduction of the sensor tip must lie completely in the open flow cross-section.
● Run-in and run-out sections of 10 x D should be ensured.

Programming

The annular gap of the programming ring can be turned to positions 1 and 2. The following actions are possible:

Set to 1 = continue (STEP)
Set to 2 = modify (PROG)

Neutral position between 1 and 2

The ring can be removed to act as a key, or turned through 180 ° and replaced to create a programming protector.
Operation is by dialog with the display messages, which makes its use very simple.
Starting from the normal display (present value and unit), if 1 (STEP) is repeatedly selected, then the display shows the following information in this order:

Display of the parameters, using position 1

● Switching value S1 (switching point 1 in the selected unit)
● Switching characteristic of S1
  MIN = Monitoring of minimum value
  MAX = Monitoring of maximum value
● Hysteresis 1 (hysteresis value of S1 in the set unit)
● Switching value S2
● Switching characteristic of S2
● Hysteresis 2
● Code
  After entering the **code 111**, further parameters can be defined:
● Filter (settling time of the display and output)
● Physical unit (Units)
● Output: 0..20 mA or 4..20 mA
● 0/4 mA (measured value corresponding to 0/4 mA)
● 20 mA (measured value corresponding to 20 mA)

For models with a voltage output, replace 20 mA accordingly with 10 V.

Edit, using position 2

If the currently visible parameter is to be modified:
● Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
● By repeatedly turning to position 2, values are increased; by turning to position 1, the cursor moves to the next digit.
● Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
● If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

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The limit switches S1 and S2 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.
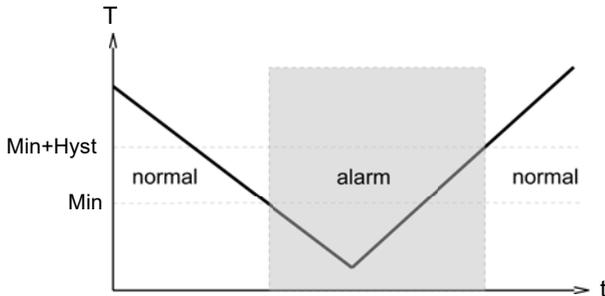
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.
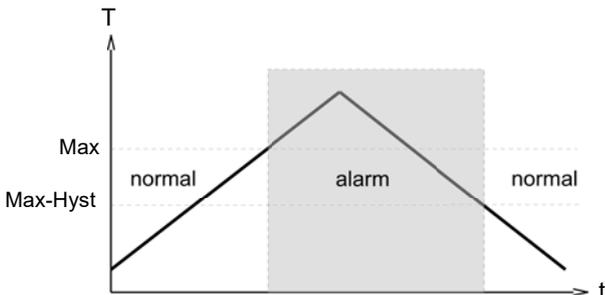
The change to the alarm state is indicated by the integrated red LED and a cleartext in the display.
While in the normal state the switching outputs are at the level of the supply voltage; in the alarm state they are at 0 V, so that a wire break would also display as an alarm state at the signal receiver.

Overload display
Overload of a switching output is detected and indicated on the display ("Check S1 / S2"), and the switching output is switched off.

Simulation mode
To simplify commissioning, the sensor provides a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26.0 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested during commissioning. This mode is accessed by means of code **311**.

Factory settings
After modifying the configuration parameters, it is possible to reset them to the factory settings at any time using **code 989**.

Ordering code

	1.	2.	3.	4.	5.	6.
HFK35 -	015	K1		S		

○=Option

1.	**Sensor tip length**	
	015	L = 15 mm
2.	**Sensor material**	
	K1	stainless steel 1.4435
3.	**Analog output**	
	I	current output 0/4..20 mA
	U ○	voltage output 0/2..10 V
4.	**Electrical connection**	
	S	for round plug connector M12x1, 5-pole
5.	**Options**	
	00	without option
6.	**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

Accessories

- ECI-3 device configurator (USB programming adapter)
- Process adapter
- Cable/round plug connector (KH...)
  see additional information "Accessories"