

Flow Transmitter / Switch OMNI-FIS



- Flow measurement in conductive fluids
- A measurement probe for a wide range of piping diameters
- High quality materials
- No moving parts
- Change the sensor without loss of media
- Analog output 4..20 mA or 0..10 V
- Two programmable switches
- Graphical LCD display, backlit, can be read in sunlight and in the dark
- Selectable units in the display
- Programmable parameters via rotatable, removable ring (programming protection)
- Electronics housing with non-scratch, chemically resistant glass
- Rotatable electronic housing for best reading position
- Designed for industrial use
- Small, compact construction
- Simple installation

Characteristics

The FIS magnetic-inductive flow probes are built into the piping by means of the supplied welded-on sleeves (DN 50..DN 400) or by means of the plastic fixing clip (DN 50..DN 150).

The complete measurement probe is removable without creating an opening to the medium, and so if a fault occurs, only the electronic part is replaced.

When an electric conductor moves at right angles to the magnetic field, the movement induces a voltage U in the conductor. With this measurement principle, the electrically conductive medium is the conductor. The magnetic field B is transverse to the direction of flow. The induced voltage U is directly proportional to the local flow speed v.

The OMNI transducer located on the sensor 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 $^\circ$ and replaced, or completely removed, thus acting as a key.



Technical data			
Sensor	magnetic-inductive		
Nominal width	DN 50300 welded-on nozzle DN 50150 tapping sleeve		
Process connection	welded-on nozzle, tapping sleeve		
Metering ranges	full scales 1 8 m/s in	stens of 1 m/s	
Measurement accuracy	full scales 18 m/s in steps of 1 m/s ±5 % of the measured value, (when calibrated on the spot ±2 % of the measured value), from 3 cm/s		
Repeatability	±2 % of the measure	d value	
Time constant	5 seconds fixed		
Media	conductive, largely homogeneous fluids, pastes, and slurries, also having solids components		
Electrical conductivity	min. 20 mS/cm		
Medium temperature	-25+150 °C		
Ambient temperature	-25+60 °C		
Pressure resistance	max. 25 bar, welded-on nozzle max. 10 bar, tapping sleeve		
Materials	Probe Insulation Tapping sleeve Electronics housing	stainless steel 1.4435 ceramic (zirconium oxide) PP, 1.4305 stainless steel 1.4305 FKM and Klingerit	
Materials non-medium- contact	Electronics housing Glass Magnet Ring	stainless steel 1.4305 mineral glass hardened samarium-Cobalt POM	
Supply voltage	1830 V DC		
Power consumption	< 2 W		
Analog output	420 mA / max. load 500 Ω or 010 V / min. load 1 k Ω		
Switching outputs	transistor output "push-pull" (resistant to short circuits and polarity reversal) Iout = 100 mA max.		
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum		
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		



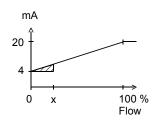
	simultaneous message on the display.	
Electrical connection	for round plug connector M12x1, 5-pole	
Ingress protection	IP 67	
Weight	see table "Dimensions"	
Conformity	CE	

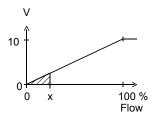
Signal output curves

Value x = Begin of the specified range = not specified range

Current output

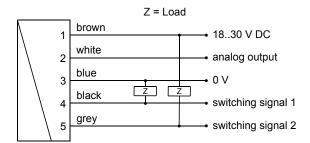
Voltage output





Other characters on request.

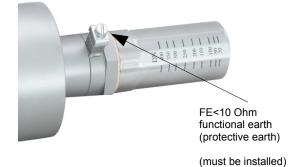
Wiring



Connection example: PNP NPN

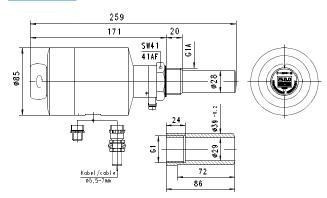


connector M12x1





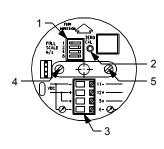
Dimensions





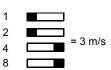
do with the alignment of the housing. This is possible at any time, without affecting the alignment of the internal component. The metering range full scale value has already been set in the

factory to the desired metering range, by means of the DIP switches (1, 2, 3, 4, 5, 6, 7, 8 m/s, see drawing). The figures next to the DIP switches are valid.



- 1 DIP switches
- 2 Button for zero point calibration
- 3 Connection clip

Example of the DIP switches:



- Fill the piping completely with medium
- Flow speed in the piping must be "zero"
- Press the "ZERO CAL" button
- After one minute, the device has automatically self-calibrated

Programming

Zero point setting:

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

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

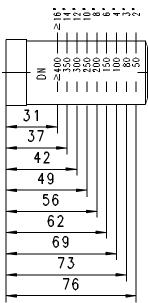
- Switching value S1 (switching point 1 in the selected unit)
- Switching characteristic of S1
 - MIN = Monitoring of minimum value MAX = Monitoring of maximum value
- Hysteresis 1 (hysteresis value of S1 in the set unit)
- Switching value S2
- Switching characteristic of S2
- Hysteresis 2
- Code

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

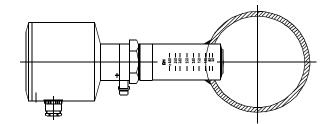
Edit, using position 2



Handling and operation

Installation

The FIS magnetic-inductive probes are installed in the pipework by means of the supplied welded-on sleeves or by means of the plastic fixing clip (\geq DN 50 / \geq G 2). See diagrams for installation position and depth.



Weld on the nozzle at the marking according to its nominal width, free of distortion.

Run-in and run-out sections must be greater than or equal to 10 x pipework diameter. Weld on the connection sleeve at right angles to pipework mid-line (see marking = external pipework diameter, for >DN 400 also at 400). Avoid distortions. The probe must screw in easily. After screwing in, the probe can be adjusted by rotating it.

The complete measurement probe is removable without creating an opening to the medium, and so if a fault occurs, only the electronic part is replaced.

The electrical connection is made after opening the cover (unlosable because of its earthing cable). For this, completely remove the three internal hex bolts from the lid.

The arrow on the electronics insert must be in the direction of flow (loosen bolts 4 and 5 by approx. 2 or 3 turns. Do not remove completely) Turn the electronic component appropriately, and then tighten the bolts again. The alignment of the arrow has nothing to

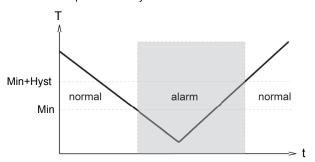


If the currently visible parameter is to be modified:

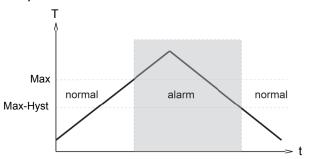
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the cursor moves to the next digit
- Leave the parameter by turning to position 1 (until the 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.

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

The basic device is ordered e.g. FIS xxx with electronics e.g. OMNI-FIS xxxx

	1.	2.	3.	4.	5.
FIS					E

		6.	7.	8.
OMNI-	FIS-			

O=Option

1.	Nominal v	width	
	025	DN 25 (welded-on nozzle) for installation from DN	
	050	DN 50 (tapping sleeve)	
	065	DN 65 (tapping sleeve)	
	080	DN 80 (tapping sleeve)	
	100	DN 100 (tapping sleeve)	
	125	DN 125 (tapping sleeve)	
	150	DN 150 (tapping sleeve)	
2.	Mechanic	al connection	
	V	welded-on nozzle	
	В	tapping sleeve	
3.	Material f	or mechanical connection	
	K	stainless steel	
		(welded-on nozzle)	
	В	PP (tapping sleeve)	
4.		value of range	
	001	1 m/s	
	002	2 m/s	
	003	3 m/s	
	004	4 m/s	
	005	5 m/s	
	006	6 m/s	
	007	7 m/s	
	800	8 m/s	
5.	Connection	on for	
	Е	electronics	
6.	For nominal width		
	025	DN 25 (welded-on nozzle)	
	050	DN 50 (tapping sleeve)	
	065	DN 65 (tapping sleeve)	
	080	DN 80 (tapping sleeve)	
	100	DN 100 (tapping sleeve)	
	125	DN 125 (tapping sleeve)	
	150	DN 150 (tapping sleeve)	
7.	Analog o	utput	
	I	current output 0/420 mA	
	U O	voltage output 0/210 V	
8.	Electrical	connection	
	G	cable screw gland Pg 9 excluding cable	
	s o	for round plug connector M12x1, 5-pole	

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1