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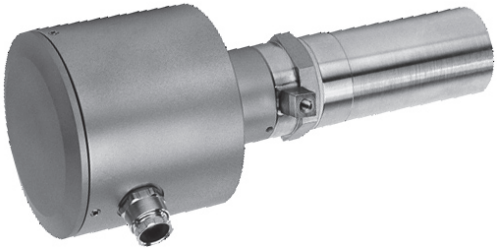
Flow - magnetic inductive - probe form



Characteristics

System	Magnetic inductive metering system for all conductive fluids.
Evaluation	Display, switching Metering, counting
Nominal widths	DN 50..300
Range	117.. 34000 l/min
Media	Non-aggressive conductive fluids
Pressure resistance	Max. 25 bar
Medium temperature	-25..+150 °C

Applications

- **Metering of present value**
- **Filling applications**
- **Consumption metering**
- **Dry-run protection**

Function and benefits

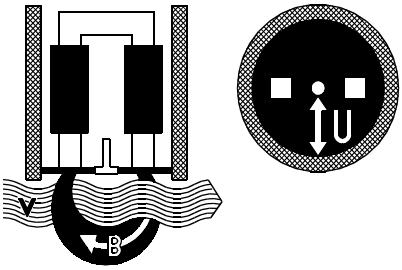
- **No moving parts**
- **Lowest pressure lost and influence on the tube cross-section**
- **Conveniently monitor large tubes**
- **A measuring probe for a wide range of tubing diameter**
- **High-quality materials (stainless steel and ceramic)**
- **Measurement insert can be replaced without opening the tube**

If an electrical lead moves perpendicularly to a magnetic field, the movement in this wire induces a voltage (Faraday's law of induction). With this measurement principle, the conductive liquid of the "lead". The magnetic field is perpendicular to the flow direction. The induced voltage *U* is directly proportional to the flow speed *v*.

$$U = k \cdot B \cdot D \cdot v$$

k = device constant
B = strength of the magnetic field
D = electrode spacing
v = local speed

The voltage *U* is extracted at the electrodes, centre point and earth electrode (sleeve) and converted to a speed-proportional 4 - 20 mA signal.



Installation note

The supplied welding sleeve or the plastic clamp enable the use of a device various nominal tubing widths. Markings on the welding sleeve indicate how wide the sensor should be immersed into the tube diameter.

Local programmability of parameters

The FIS sensors can be combined with the OMNI intelligent sensor family . This combination enables a multitude of local parameter changes.

OMNI-FIS..

Programming with magnet ring:
With the aid of the display and of the movable ring, numerous parameters can be conveniently set on the spot.

Universal switching outputs

The push-pull transistor outputs of the OMNI electronics enable the simplest installation. The outputs can be connected like a PNP or an NPN switch and behave accordingly, without programming or wire breaks.

You are assured of resistance to short circuits and pole reversal. Overloads or short circuits are shown in the display.

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Device overview

Device		Housing material	Range	Nominal width	Pressure resistance in bar	Medium temperature	Supply voltage	Displays	Output signal		Page
									Switching	Measuring	
FIS		stainless steel, ceramic	1..8 m/s	DN 50..300	PN 10..25	-25..+150 °C	24 V DC	-	-	4.. 20 mA	**4**
OMNI-FIS		stainless steel, ceramic	1..8 m/s	DN 50..300	PN 10..25	-25..+150 °C	18..30 V DC	Graphics LCD illuminated transflective and signal LED	2 x Push-Pull	0/4..20 mA or 0..10 V	**6**

OMNI-Zähleroption-C		Preset Counter with external reset facility, anti-complementary switching outputs and actual value display.	**10**
OMNI-Zähleroption-C1		Instantaneous value display with analog output, pulse output and volume totalizer.	**13**
ECI-1		All LABO, FLEX, and OMNI parameters can be set or modified using the ECI-1 configurator.	**16**
Options		● OMNI – Tropical model	**17**
Accessories		● Type ZV / ZE (Filter) ● KB.... (Round plug connector 4/5-pin) ● OMNI-TA (Panel meter) ● OMNI-remote	**17**

Errors and technical modifications reserved.

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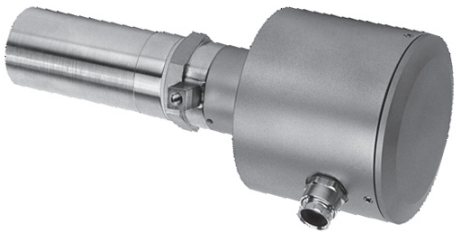
Magnetic-Inductive Flow Probe FIS



- **Measurement of flow 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**

Characteristics

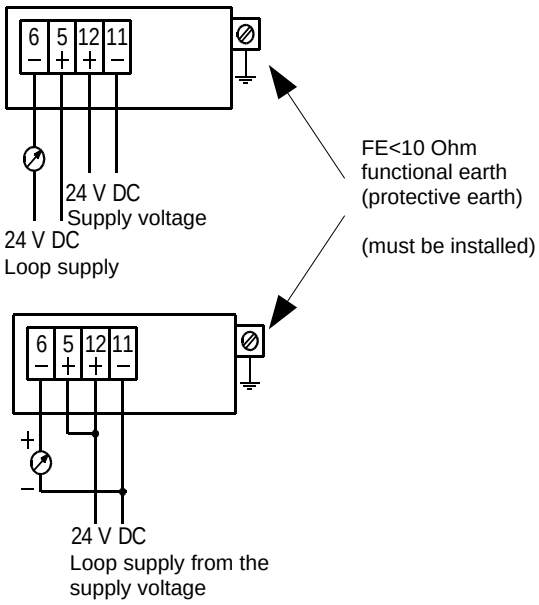
The FIS magnetic-inductive flow probes are built into the piping by means of the supplied welded-on sleeves (DN 50..DN 400) or by means of the plastic fixing clip (DN 50..DN 150) .
The complete measurement probe is removable without creating an opening to the medium, and so if a fault occurs, only the 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.

Technical data

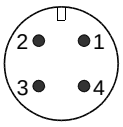
Sensor	magnetic-inductive
Nominal width	DN 50..300 welded-on nozzle DN 50..150 tapping sleeve
Process connection	welded-on nozzle, tapping sleeve
Metering ranges	full scales 1..8 m/s in steps of 1 m/s
Measurement accuracy	±5 % of the measured value, (when calibrated on the spot ±2 % of the measured value), from 3 cm/s
Repeatability	±2 % of the measured 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
Operating pressure	max. 25 bar for welded-on nozzle max. 10 bar for tapping sleeve

Materials	Probe	stainless steel 1.4435
	Insulation	ceramic (zirconium oxide)
	Tapping sleeve	PP, 1.4305
	Electronics housing	stainless steel 1.4305 FKM and Klingerit
Supply voltage	24 V DC ±10 %	
Current consumption	50 mA (at 24 V DC and 20 °C)	
Output	4..20 mA (passive current output) load resistance max. 500 Ohm	
Ingress protection	IP 65 cable screw gland IP 67 round plug connector	
Weight	2,4 kg excluding tapping sleeve	
Conformity	CE	

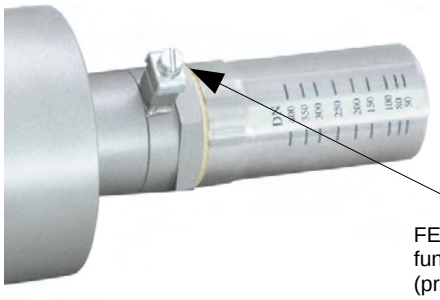
Wiring



For model with round plug connector:



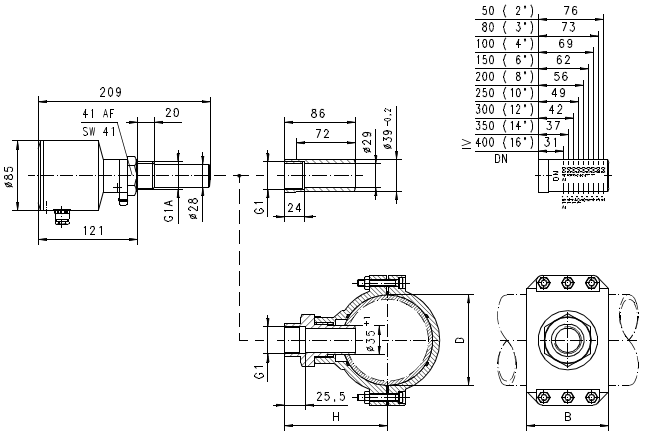
1 = supply voltage 24 V
2 = current loop +
3 = GND (0 V)
4 = current loop -



FE<10 Ohm
functional earth
(protective earth)

(must be installed!)

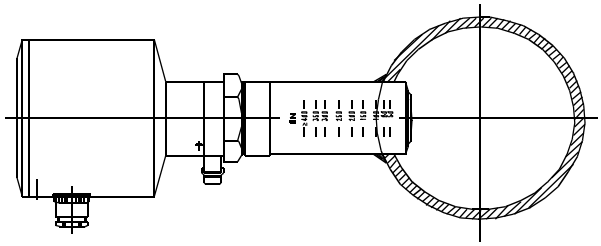
Dimensions



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 (≥ DN 50 / ≥ G 2). See diagrams for installation position and depth.

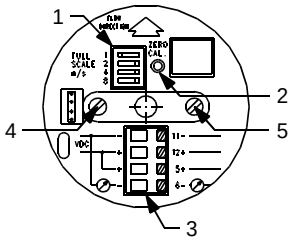


Weld on the nozzle at the marking
according to its nominal width, free of distortion.

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.

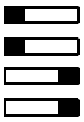
The complete measurement probe is removable without creating an opening to the medium, and so if a fault occurs, only the electronic part is replaced.
The electrical connection is made after opening the cover (unlosable because of its earthing cable). For this, completely remove the three internal hex bolts from the lid. (Take care not to lose them)

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 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



= 3 m/s

Zero point setting:

- 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

During commissioning, an automatic self-test is carried out. The device status is signalled at the current output:

3 mA	The device is still conducting the self-test or has detected an error
4..20 mA	Device is in measurement mode and is displaying the speed measured currently

Ordering code

FIS [1.] [2.] [3.] [4.] [5.]

❍=Option

1.	**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)		
2.	**Process connection**			
	V	welded-on nozzle		●
	B	tapping sleeve	●	
3.	**Material for mechanical connection**			
	K	stainless steel (welded-on nozzle)		●
	B	PP (tapping sleeve)	●	
4.	**Full scale 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		
	008	8 m/s		
5.	**Electrical connection**			
	G	cable screw gland Pg 9 excluding cable		
	S ❍	for round plug connector M12x1, 4-pole		

Accessories

- Cable/round plug connector (KB...)
  see additional information “Accessories”

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 ° and replaced, or completely removed, thus acting as a key.

Technical data

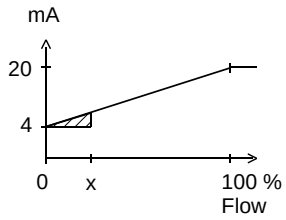
Sensor	magnetic-inductive	
Nominal width	DN 50..300 welded-on nozzle DN 50..150 tapping sleeve	
Process connection	welded-on nozzle, tapping sleeve	
Metering ranges	full scales 1..8 m/s in steps of 1 m/s	
Measurement accuracy	±5 % of the measured value, (when calibrated on the spot ±2 % of the measured value), from 3 cm/s	
Repeatability	±2 % of the measured 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	stainless steel 1.4435
	Insulation	ceramic (zirconium oxide)
	Tapping sleeve	PP, 1.4305
	Electronics housing	stainless steel 1.4305 FKM and Klingerit
Materials non-medium-contact	Electronics housing	stainless steel 1.4305
	Glass	mineral glass hardened
	Magnet	samarium-Cobalt
	Ring	POM
Supply voltage	18..30 V DC	
Power consumption	< 2 W	
Analog output	4..20 mA / max. load 500 Ω or 0..10 V / min. load 1 kΩ	
Switching outputs	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 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

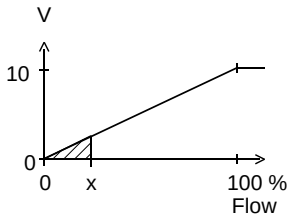
Signal output curves

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

Current output

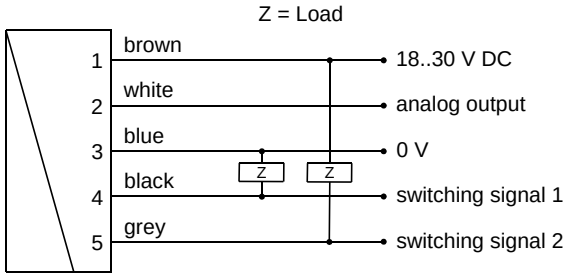


Voltage output

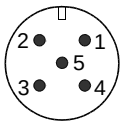


Other characters on request.

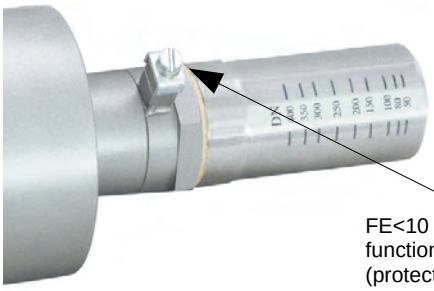
Wiring



Connection example: PNP NPN



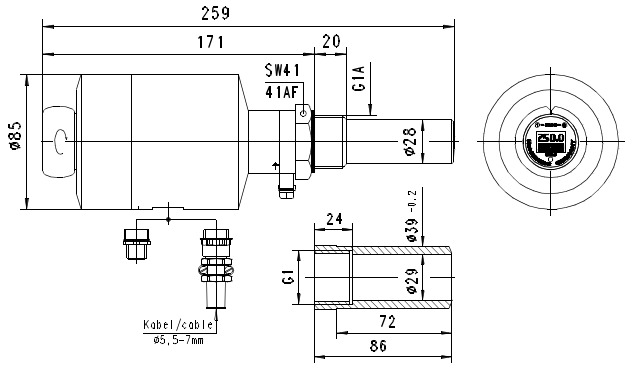
connector M12x1

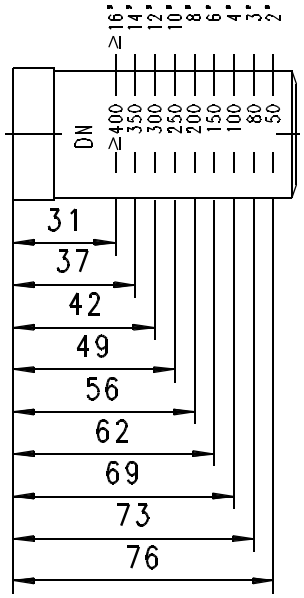


FE<10 Ohm
functional earth
(protective earth)

(must be installed)

Dimensions

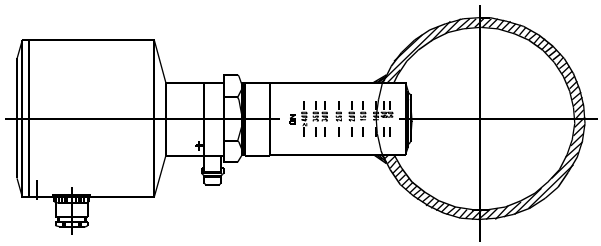




Handling and operation

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 (≥ DN 50 / ≥ G 2). See diagrams for installation position and depth.



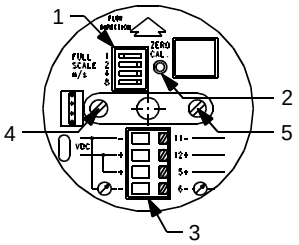
Weld on the nozzle at the marking
according to its nominal width, free of distortion.

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.

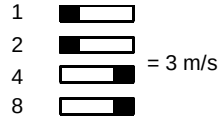
The electrical connection is made after opening the cover (unlosable because of its earthing cable). For this, completely remove the three internal hex bolts from the lid.

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 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:



Zero point setting:
- 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

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)

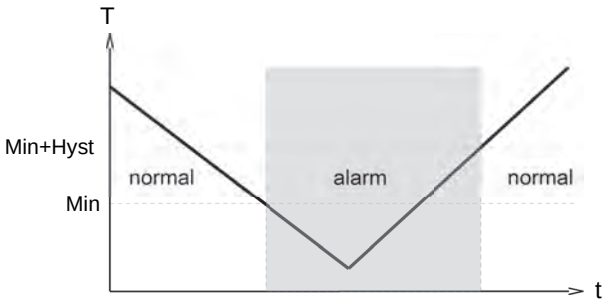
For models with a voltage output, replace 20 mA accordingly with 10 V.
Edit, using position 2

If the currently visible parameter is to be modified:

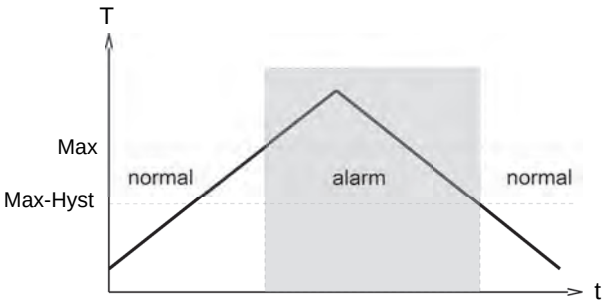
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the cursor moves to the next digit
- Leave the parameter by turning to position 1 (until the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

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-			

❍=Option

1.	**Nominal width**								
	025	DN 25 (welded-on nozzle) for installation from DN50							●
	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.	**Mechanical connection**								
	V	welded-on nozzle							●
	B	tapping sleeve	●	●	●	●	●	●	
3.	**Material for mechanical connection**								
	K	stainless steel (welded-on nozzle)							●
	B	PP (tapping sleeve)	●	●	●	●	●	●	
4.	**Full scale 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							
	008	8 m/s							
5.	**Connection for**								
	E	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 output**								
	I	current output 0/4..20 mA							
	U ❍	voltage output 0/2..10 V							
8.	**Electrical connection**								
	G	cable screw gland Pg 9 excluding cable							
	S ❍	for round plug connector M12x1, 5-pole							

Accessories

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

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OMNI-C Counter

Counter for flow transmitters:

- Dynamic diaphragm
- Rotor
- Turbine
- Gear
- Screw
- Calorimetry
- MID
- Vortex

- **Simple totalisation**
- **Simple filling counter with programmable end signal**
- **Control switchover at present value**
- **Automatic, dynamic change of display unit and decimal places in the graphics display**
- **Antivalent outputs**
- **Simple guided menu via graphics display**

Characteristics

The totaliser of the OMNI flow rate system enables a totalisation or measurement of consumption for all HONSBERG device families (for fluids and gases) with which the OMNI system is compatible; this is independent of the input signal, pulse or analogue input, and of the measurement process.

Simple filling control is also possible. Here, the counter can be set to count upwards or downwards.
When the preset point is reached, a switching signal is emitted which is available in antivalent form to two outputs.
Resetting can be carried out by means of a signal input or also by a programming ring.

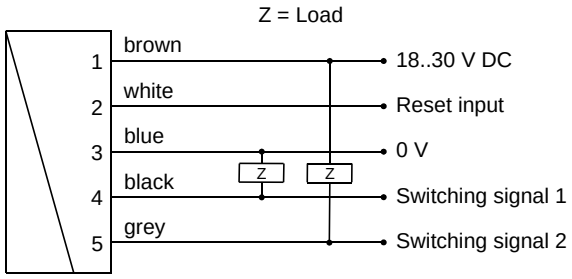
The state of the counter is indicated in an LCD display with only four digits. Here, the number of decimal places and the unit displayed is continuously matched to the current state of the counter. In this case, the smallest value which can be displayed is 0.001 ml (= 1 µl), and the largest is 9999 m³. The counter therefore has 13 places, of which the four most significant are displayed at any one time. The display resolution at all times is therefore at least 1 per thousand of the displayed value, or better, and this generally exceeds the accuracy of the connected flow transmitter. The non-displayed digits of the counter are in that case irrelevant to the accuracy of the measurement.
The automatic dynamic changeover of units in the display in relation to the state of the counter makes the value easy to read in spite of a display with only four digits. In addition, user configuration of the counter is unnecessary.

In addition to the totalised value, the present flow rate can be displayed.

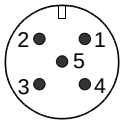
Technical data

Counter range	0.000 ml to 9999 m³ with automatic setting of the decimal places and of the applicable unit.
Switching signal outputs (Pin 4 + 5)	2 x pushpull output, max. 100 mA, resistant to short circuits and polarity reversal, antivalent states, configurable on the device as a wipe or edge signal
Counter reset signal (Pin 2)	Input 18..30 V resistant to short circuits and reversed polarity PIN 2, wiper signal, positive or negative edge can be selected locally

Wiring



Connection example: PNP NPN



Before the connecting the supply voltage, it must be ensured that this corresponds with the data sheet! The use of shielded cabling is recommended

Sensor connection to OMNI-C-TA, see dimensions.

Handling and operation

Installation

For assembly, please observe the handling instructions for the different device versions.

After assembly, it is possible to move the sensor head to the most optimal reading position opposite the sensor part using its rotating function.

Programming

On the display, the counter indicates the state of the totaliser as a value and unit. The units ml, L, m³ are set automatically.

For operation as a totaliser, no configuration by the user is necessary.

To use the other functions, configuration may be required. This is carried out using the programming ring located on the device.

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 dialogue with the display messages, which makes its use very simple.

The control display of the present flow rate depends on the metering range of the selected flow transmitter, and has already been set appropriately in the factory (ml/min, l/min, l/h, m³/h).
It is activated by turning the ring to position 1
After 10 seconds, the display automatically returns to the totaliser mode.

For operation as a preset counter, the following must be set:

1. The preset point
2. The type of output signal ("Preset has been reached"):
   Signal edge / wiper pulse
   width of the wiper pulse, if required
3. The unit of the preset point:
   (ml, litre, m³).

Starting from the normal display (total and unit), if 1 (Step) is selected repeatedly, then the counter shows the following information:

- Normal display is total and unit (e.g. litre)
- Display of present value (e.g. l/min)
- Preset point incl. type of switching output.
- Code

The code gives access to various input levels into which parameters can be entered (so that this does not occur inadvertently, the code must be entered!).

Code 111:

- Gate time (available only for sensors which transmit frequency)
- Filter time
- Direction of count (pos / neg)
- Unit for switching value reset point
- Decimal place for switching value / reset point
- Switching type for switching value (edge / wiper signal)
- Pulse duration (for wiper signal)
- Reset method (manual / via signal)

Code 100:

- Manual reset for totaliser

The detailed flow chart for operation is available in the "Operating instructions for OMNI-C".

Combination examples

Vortex CF..	
Calorimetric F.. (separate data sheet)	
Calorimetric FG.. (separate data sheet)	
Calorimetric FIN..	
Magnetic inductive FIS.. (separate data sheet)	
Piston HD.. HR.. MR..	
Magnetic inductive MID1..	
Panel mounting **OMNI-TA** (separate data sheet)	
Rotor RR..	
Turbine RT..	
Screw VHS..	

Gear VHZ..	
Dynamic diaphragm XF..	

Momentary value indicator, transmitter and meter OMNI-C1 electronics

Counter for flow transmitters:

- Dynamic diaphragm
- Rotor
- Turbine
- Gear
- Screw
- MID
- Vortex

- **Momentary value indicator and totalisation**
- **Pulse output with adjustable pulse per volume**
- **Antivalent outputs**
- **Analogue output of the momentary value**
- **Simple guided menu via graphics display**

Characteristics

The local OMNI-C1 electronics offers a momentary value indicator and a totalisation of the flow rate quantity.

The momentary value is output at the analogue output as a 4..20 mA signal (or optionally as a 0..10 V signal).
In addition, the electronics has a pulse output, which outputs a pulse after a preset quantity with a duration of 36 ms. The pulse is available at two switching outputs in anitvalent form.

The primary displayed value is the flow rate. Using the programming ring, you can temporarily switch to the totalisation.

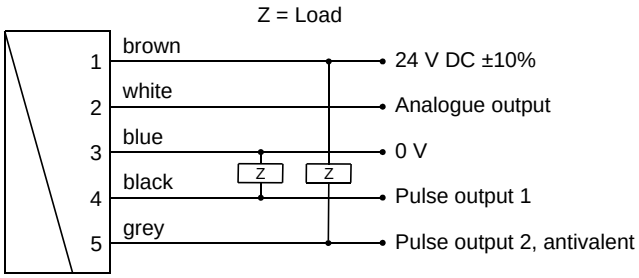
The state of the totalisation is indicated in an LCD display with only four digits. Here, the number of decimal places and the unit displayed is continuously matched to the current state of the counter. In this case, the smallest value which can be displayed is 0.001 ml (= 1 µl), and the largest is 9999 m³. The counter therefore has 13 places, of which the four most significant are displayed at any one time. The display resolution at all times is therefore at least 1 per thousand of the displayed value, or better, and this generally exceeds the accuracy of the connected flow transmitter. The non-displayed digits of the counter are in that case irrelevant to the accuracy of the measurement.
The automatic dynamic changeover of units in the display in relation to the state of the counter makes the value easy to read in spite of a display with only four digits. In addition, user configuration of the counter is unnecessary.

Counter C:
Instead of the counter option C1 the counter option C is available (see corresponding datasheet). It offers a totalizer with adjustable preset value and external reset. This allows to realize a filling control application for example. Additionally the actual flow rate value can be displayed, however without an analog output.

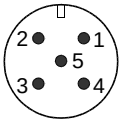
Technical data

Counter range	0.000 ml to 9999 m³ with automatic setting of the decimal places and of the applicable unit
Pulse outputs (Pin 4 + 5)	2 x pushpull output, max. 100 mA, resistant to short circuits and polarity reversal, antivalent statuses, pulse width 36 ms

Wiring



Connection example: PNP NPN



Plug connector M12x1

Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.
The use of shielded cabling is recommended.

Handling and operation

Installation

For assembly, please observe the handling instructions for the different device versions.

After assembly, it is possible to move the sensor head to the most optimal reading position opposite the sensor part using its rotating function.

Programming

The resetting of the meter to zero takes place through the programming.

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.

On the display, the meter indicates the current flow rate as a value and unit. For this purpose, no adjustments by the user are necessary.

To use the other functions, configuration may be required. This is carried out using the programming ring located on the device.

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 dialogue with the display messages, which makes its use very simple.

Rotating the ring once to Pos. 1 displays the totaliser status. In the process, the unit is automatically set to the quantity already counted.
After 10 seconds, the display automatically returns to the momentary value mode.
If the ring is turned to position 1 again while the totaliser status is shown, the code input is reached.
The code gives access to various input levels into which parameters can be changed (so that this does not occur inadvertently, the code must be entered!).

Code 100:

Reset for totaliser

Code 111:

Filter	Enables the input of a filter time in multiple levels The filter time describes the time after which a volatile change in flow occurs until the display value has adopted the new value
PlsUnit	Enables the input of the unit of the pulse volume (pulse per volume), e.g. cm³, Litre, m³
PlsVal	Enables the input of the meter value of the pulse flow (0..9999)
Output	Enables switching of the analogue output between 0..20 mA and 4..20 mA (optionally (0..10 V and 2..10 V)
4 mA	Defines the momentary value at which 4 mA should be output
20 mA	Defines the momentary value at which 20 mA should be output

Combination examples

Vortex CF..	
Calorimetric F.. (separate data sheet)	
Calorimetric FG.. (separate data sheet)	
Calorimetric FIN..	
Magnetic inductive FIS.. (separate data sheet)	
Piston HD.. HR.. MR..	
Magnetic inductive MID1..	
Panel mounting **OMNI-TA** (separate data sheet)	
Rotor RR..	
Turbine RT..	
Screw VHS..	

Gear VHZ..	
Dynamic diaphragm XF..	

Device Configurator ECI-1

- **Can be used on site for:**
  - **parameter modification**
  - **firmware update**
  - **adjustment of inputs and outputs**
- **Can be connected via USB**

Characteristics

The device configurator ECI-1 is an interface which allows the connection of microcontroller-managed HONSBERG sensors to the USB port of a computer.
Together with the Windows software "HONSBERG Device Configurator" it enables

- the modification of all the sensor's configuration settings
- the reading of measured values
- the adjustment of inputs and outputs
- firmware updates

Technical data

Supply voltage	12..30 V DC (depending on the connected sensor) and via USB
Power consumption	< 1 W
Connection	
Sensor	cable bushing M12x1, 5-pole, straight length approx. 50 cm
Lead	device connector M12x1, 5-pole
USB	USB bushing type B
Operating temperature	0..50 °C
Storage temperature	-20..+80 °C
Dimensions of housing	98 mm (L) x 64 mm (W) x 38 mm (H)
Housing material	ABS
Ingress protection	IP 40

Handling and operation

Connection

The device configurator is intended for temporary connection to the application. It is connected between the the existing sensor lead and the sensor. Power supply is via the supply to the sensor and the computer's USB port. When inactive (no communication), the configurator behaves completely neutrally; all signals from the sensor remain available to the application. During communication between computer and sensor, the signal wirings are separated in the configurator, so that in this state the sensor's output signals are not available.

To connect 4-pole leads without a middle hole to the installed 5-pole device connector, adapter K04-05 is included. 4-pole leads with a middle hole can be used without an adapter.

Ordering code

Device configurator (for scope of delivery, see the diagram below)	**ECI-1**

Scope of delivery

1. Device configurator ECI-1
2. USB cable
3. Adapter K04-05
4. Plug KB05G
5. Cable K05PU-02SG
6. Carrying case

Incl. software

Accessories:

Mains connector 24 V DC (with fitted round plug connector, 5-pole, incl. international plug set)		**EPWR24-1**

Replacement parts:

M12x1 adapter 4- / 5-pole	**K04-05**
PUR cable, 5-pole, shielded with round plug connector M12x1	**K05PU-02SG**
Round plug connector M12x1, 5-pole (without cable)	**KB05G**

Options

OMNI - Tropical model

This OMNI electronic option should be used where temperatures change quickly, or for external installations (the device is filled with oil, and thus prevents condensate formation in the electronics housing, even under adverse circumstances)

Accessories

Filter

Type ZV

Type ZE

The HONSBERG filters are offered for the protection of the devices from dirt or as independent components for coarse and fine filtration of liquids.

For more information, see additional product information.

Round plug connector 4 / 5-pin

1	brown
2	white
3	blue
4	black

1	brown
2	white
3	blue
4	black
5	grey

Ordering code

Self-assembly

	1.	2.
KB		

1.	**Number of pins**	
	04	4-pin
	05	5-pin
2.	**Connector output**	
	G	straight
	W	elbow 90 °

Packaged

1.	2.		3.	4.	5.	6.
	PU	-				

1.	**Number of pins**	
	K	4-pin
	K05	5-pin
2.	**Cable material**	
	PU	PUR
3.	**Cable length**	
	02	2 m
	05	5 m
	10	10 m
4.	**Shielding**	
	N	shielding not applied to coupling
	S	shielding applied to coupling
5.	**Connector output**	
	G	straight
	W	elbow 90 °
6.	**Shielding**	
	A	shielded

Panel meter OMNI-TA

Primary Sensors
0..10 V
4..20 mA
Frequency

Converter with the same data as the OMNI in situ electronics; but as an external panel-mounting variant with IP 67 housing.

OMNI - Remote

Primary Sensors
0/2..10 V
4/0..20 mA
Frequency

Function is identical to OMNI-in situ. Connection to the sensor is, however, made by wire, and so the measurement point and display location can be apart

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Product Overview

„Industrial Sensors and Instrumentation“

Temperature
Flow
Level / Filling Height
Analysis
Humidity
Pressure
Weighing Instruments

„Process Instrumentation “Hygienic Design“

GHM*adapt*
Temperature
Flow
Level / Filling Height
Analysis

“Laboratory Instrumentation“

„Industrial Electronics“

Displays / Controller
Transmitter / Signal conditioning
Isolating converters
Safety and Monitoring Devices
Power Electronics
Calibration and Testing

“Measuring Data Acquisition“

Data Logging and Monitoring
Test Bench Measurement Technology
Renewable Energies