GHM Messtechnik GmbH – Sales Center International
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Flow - vortex

Characteristics

System	Flow - vortex
Evaluation	Display Switching Measuring Counting
Nominal widths	DN 8..25
Range	0.9..150 l/min
Media	Aqueous media (others available on request)
Pressure resistance	Max. 10 bar
Medium temperature	0..60 °C
Materials	PPS, stainless steel

Applications

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

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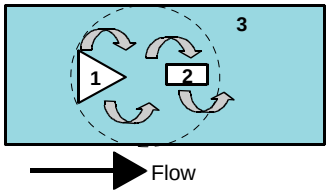
Function and benefits

- **High precision**
- **High overload protection**
- **No moving parts**
- **Fast installation and removal with clamping assembly**
- **Various connections in the modular system**

A narrow triangular body (1) which covers the entire cross-section of the measurement tube generates a vortex in the flow of the medium (Kármán vortex, vortex effect). The frequency of the vortex is proportional to the flow and is detected with a Piezo sensor (2), which is positioned after the triangular body. The entire unit, vortex body and detector are designed as an insert (3) and are inserted into the tube. As a result, the entire measuring unit can be quickly disconnected from the measuring tube.



A vortex flow meter has intrinsically safe behaviour. If the vortex is interrupted due to soiling, a defect is always detected.

Note:
Vibrations in the frequency range of the sensor should be avoided in order to prevent faults.

On the spot programming options

LABO-CF..-
I / U / F / C /S

Pulse programming on pin 2:
Apply the supply voltage level for 1 second and save the current value as the final value (for analog outputs) or as a switching value (for limit value switches).

OMNI-CF..

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

FLEX-CF..

Programming with magnet clip:
Hold the magnet to the marking for one second and save the present value as the final value (for analog outputs) or as a switching value (for limit value switches).

ECI-1

If required, all parameters can be set at any time on all intelligent sensors, using the ECI-1 device configurator.

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Device overview

Device		Range	Pressure resistance in bar	Medium temperature	Supply voltage	Display	Output signal		Page
							Switching	Measuring	
CF		0.9..150 l/min	PN 10	0..60 °C	10..30 V DC	Signal LED	-	Frequency (push-pull)	**4**
LABO-CF-S		0.9..150 l/min	PN 10	0..60 °C	10..30 V DC	Signal LED	1 x Push-Pull	-	**6**
LABO-CF-I		0.9..150 l/min	PN 10	0..60 °C	10..30 V DC	Signal LED	-	4..20 mA	**10**
LABO-CF-U		0.9..150 l/min	PN 10	0..60 °C	10..30 V DC	Signal LED	-	0..10 V	**10**
LABO-CF-F		0.9..150 l/min	PN 10	0..60 °C	10..30 V DC	Signal LED	-	Program-mable F / F Transducer 0..2 kHz Push-pull	**10**
LABO-CF-C		0.9..150 l/min	PN 10	0..60 °C	10..30 V DC	Signal LED	-	1 pulse per defined quan-tity Push-Pull	**10**
FLEX-CF		0.9..150 l/min	PN 10	0..60 °C	18..30 V DC	Signal LED	1 x Push-Pull	0/4..20 mA or 0..10 V or Frequency 0..2 kHz	**13**
OMNI-CF		0.9..150 l/min	PN 10	0..60 °C	18..30 V DC	Graphic LCD illuminated transflective and signal LED	2 x Push-Pull	0/4..20 mA or 0..10 V	**17**
Counter-OPTION-C		**Preset Counter with external reset facility, anti-complementary switching outputs and actual value display.**							**21**
Counter-OPTION-C1		**Instantaneous value display with analog output, pulse output and volume totalizer.**							**24**

ECI-1	All LABO, FLEX, and OMNI parameters can be set or modified using the ECI-1 configurator.	**27**
Options	● OMNI – Tropical model	**28**
Accessories	● Type ZV / ZE (Filter) ● KB.... (Round plug connector 4/5-pin) ● OMNI-TA (Panel meter) ● OMNI-remote	**28**

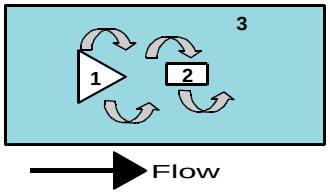
Errors and technical modifications reserved.

Flow Transmitter CF

- **Flow measurement device using the vortex measurement principle**
- **High precision**
- **High stability to excessive flow rates**
- **No moving parts**
- **Rapid installation and removal thanks to clamp fastening**
- **Various connections using building block system**

Characteristics

A narrow triangular body (1), which goes through the complete cross-section of the measurement pipe, creates vortices in the medium when there is a flow (Kármán vortex street, vortex effect). The frequency of the vortex is proportional to the flow, and is detected using a piezo-sensor (2), which lies behind the triangular body. The complete unit, vortex body, and detector are designed as a plug-in unit (3), and are inserted into the pipe. Here, a lightning fast separation between measurement pipe and the complete measurement unit is possible.



The frequency signal is made available to the output via a push-pull transistor stage, and is resistant to short circuits and reversed polarity protected. The push-pull output can as desired be connected as a PNP or an NPN output.

Technical data

Sensor	vortex principle	
Nominal width	DN 8..25	
Process connection	female thread G $^1/_4$..G 1 (others available on request)	
Metering ranges	0.9..150 l/min for details, see table "Ranges"	
Measurement accuracy	up to 50 % of full scale value: ±1 % of measured value from 50 % of full scale value: ±2 % of measured value	
Pressure resistance	PN 10 bar	
Media temperature	0..60 °C	
Ambient temperature	-20..+70 °C	
Materials medium-contact	Housing	CW614N plated, 1.4571 or POM GF
	Connection	CW614N plated, 1.4571 or POM
	Detector	ETFE PA6T6I 40 % GF
	Seal	EPDM
Supply voltage	10..30 V DC	
Current consumption at rest	approx. 20 mA (without load)	
Signal output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max. for output frequencies see table "Ranges"	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	see table "Dimensions"	
Conformity	CE	

Ranges

G	Types	Range l/min H_2O	Frequency Hz
G $^1/_4$	CF-008GM.	0.9.. 15 l/min	approx. 34..437
G $^3/_8$	CF-010GM.	1.8.. 32 l/min	approx. 24..382
G $^1/_2$	CF-015GM.	3.5.. 50 l/min	approx. 19..269
G $^3/_4$	CF-020GM.	5.0.. 85 l/min	approx. 14..229
G 1	CF-025GM.	9.0..150 l/min	approx. 12..202

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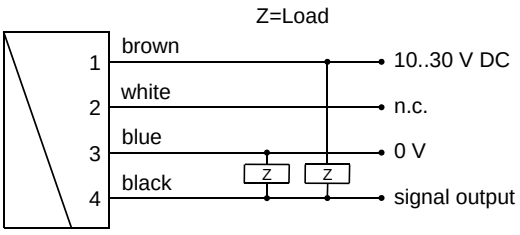
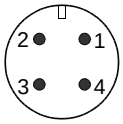
Wiring

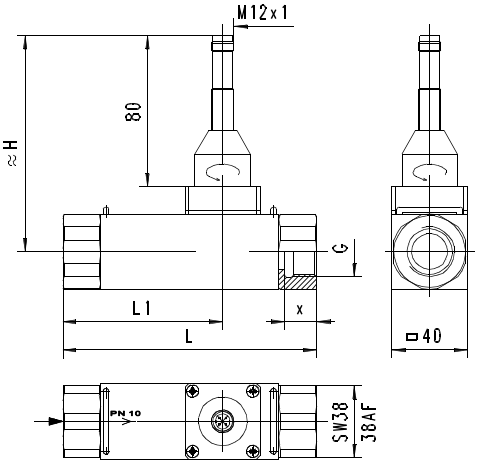


Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.
It is recommended to use shielded wiring.

Dimensions



G	DN	Types	H	L	L1	X	Weight* kg
G 1/4	DN 8	CF-008GM	113	125	69	12,5	1.45
G 3/8	DN 10	CF-010GM	111	100	50		1.10
G 1/2	DN 15	CF-015GM	113			14,5	1.10
G 3/4	DN 20	CF-020GM	115	135	85	16,5	1.50
G 1	DN 25	CF-025GM	117	155	95	18,5	1.30

*Weight details for metal model. Plastic models available on request

Handling and operation

Installation

The vortex flow meter requires a run-in length of 5..10 x D in order to achieve its specified accuracy. If deposits are to be expected, sensor and electronics should not be installed underneath. It should be ensured that the sensor is installed in the direction of the flow arrow. If the sensor is to be cleaned, the clamps should be released, and the device removed (the pipe should be pressure-free for this). It should be ensured during cleaning that the oscillating vortex body is not exposed to impact (in the moulded part there is a sensitive piezo-ceramic sensor, which can break).

Ordering code

	1.	2.	3.	4.	5.	6.	7.	8.
CF-						E	F	S

❍ = Option

1.	**Nominal width**		
	008	DN 8 - G 1/4	
	010	DN 10 - G 3/8	
	015	DN 15 - G 1/2	
	020	DN 20 - G 3/4	
	025	DN 25 - G 1	
2.	**Process connection**		
	G	female thread	
3.	**Connection material**		
	M	CW614N plated	
	K ❍	1.4571	
	P ❍	POM	
4.	**Body material**		
	M	CW614N plated	
	K	1.4571	
	P ❍	POM GF	
5.	**Metering range**		
	015	0.9.. 15 l/min	●
	032	1.8.. 32 l/min	●
	050	3.5.. 50 l/min	●
	085	5.0.. 85 l/min	●
	150	9.0..150 l/min	●
6.	**Sealing material**		
	E	EPDM	
7.	**Signal output**		
	F	frequency output (push-pull)	
8.	**Electrical connection**		
	S	for round plug connector M12x1, 4-pole	

Accessories

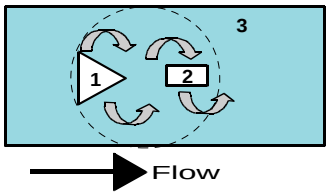
- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Counter EEZ-904
- Converter/counter OMNI-TA

Flow Switch LABO-CF-S

- **Flow measurement device using the vortex measurement principle**
- **High precision**
- **High overload protection**
- **No moving parts**
- **Rapid installation and removal thanks to clamp fastening**
- **Various connections using building block system**

Characteristics

A narrow triangular body (1), which goes through the complete cross-section of the measurement pipe, creates vortices in the medium when there is a flow (Kármán vortex street, vortex effect). The frequency of the vortex is proportional to the flow, and is detected using a piezo-sensor (2), which lies behind the triangular body. The complete unit, vortex body, and detector are designed as a plug-in unit (3), and are inserted into the pipe. Here, a lightning fast separation between measurement pipe and the complete measurement unit is possible.



The integrated converter / counter make available an electronic switching output (push-pull) with adjustable characteristics (minimum / maximum) and hysteresis, which responds when an adjustable limit is fallen short of or exceeded.
The switching value can be set to the currently existing flow using "teaching".
Models with analog or pulse output are also available.

Technical data

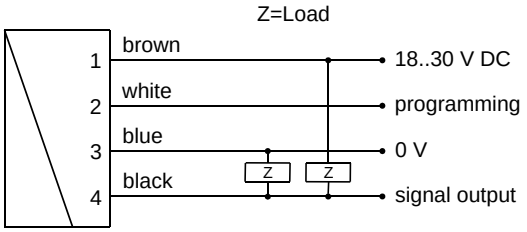
Sensor	vortex principle
Nominal width	DN 8..25
Process connection	female thread G $^1/_4$..G 1 (others available on request)
Switching ranges	0.9..150 l/min for details, see table "Ranges"
Measurement accuracy	up to 50 % of full scale value: ±1 % of measured value from 50 % of full scale value: ±2 % of measured value
Pressure resistance	PN 10 bar

Medium temperature	0..60 °C	
Ambient temperature	-20..+70 °C	
Materials medium-contact	Housing	CW614N plated, 1.4571 or POM GF
	Connection	CW614N plated, 1.4571 or POM
	Detector	ETFE PA6T6I 40 % GF
	Seal	EPDM
Supply voltage	10..30 V DC	
Power consumption	< 1 W (without load)	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max.	
Display	yellow LED (On = Normal / Off = Alarm / rapid flashing = Programming)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67 (IP 68 when oil-filled)	
Weight	see table "Dimensions"	
Conformity	CE	

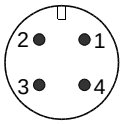
Ranges

G	Types	Range l/min H_2O
G $^1/_4$	LABO-CF-008	0.9.. 15 l/min
G $^3/_8$	LABO-CF-010	1.8.. 32 l/min
G $^1/_2$	LABO-CF-015	3.5.. 50 l/min
G $^3/_4$	LABO-CF-020	5.0.. 85 l/min
G 1	LABO-CF-025	9.0..150 l/min

Wiring

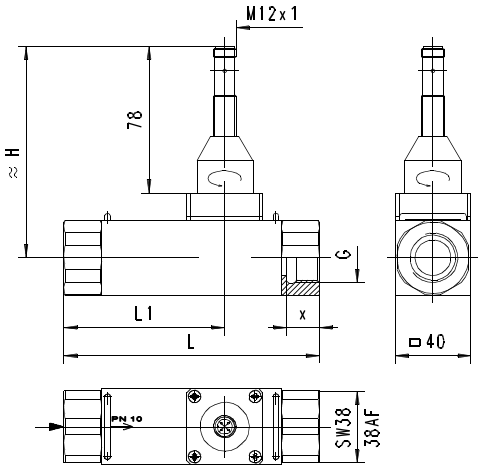


Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.
It is recommended to use shielded wiring.

Dimensions



G	DN	Types	H	L	L1	X	Weight* kg
G 1/4	DN 8	LABO-CF-008	111	125	69	12.5	1.62
G 3/8	DN 10	LABO-CF-010	109	100	50		1.27
G 1/2	DN 15	LABO-CF-015	111			14.5	1.27
G 3/4	DN 20	LABO-CF-020	113	135	85	16.5	1.67
G 1	DN 25	LABO-CF-025	115	155	95	18.5	1.47

*Weight details for metal model. Plastic models available on request

Handling and operation

Installation

The vortex flow meter requires a run-in length of 5..10 x D in order to achieve its specified accuracy. If deposits are to be expected, sensor and electronics should not be installed underneath. It should be ensured that the sensor is installed in the direction of the flow arrow. If the sensor is to be cleaned, the clamps should be released, and the device removed (the pipe should be pressure-free for this). It should be ensured during cleaning that the oscillating vortex body is not exposed to impact (in the moulded part there is a sensitive piezo-ceramic sensor, which can break).

Operation and programming

The switching value is set as follows:

- Apply the flow rate to be set to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

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.

To avoid the need to transit to an undesired operating status for the purpose of teaching, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving. The offset point can be positive or negative.

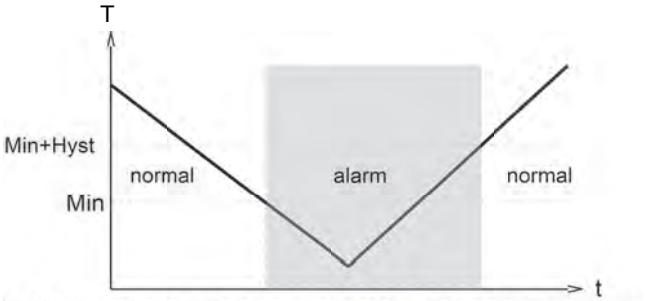
Example: The switching value should be set to 80 l/min. However, it is possible only to reach 60 l/min without problems. In this case, the device would be ordered with a teach-offset of +20 l/min. At a flow rate of 60 l/min in the process, teaching would then store a value of 80 l/min.

Note

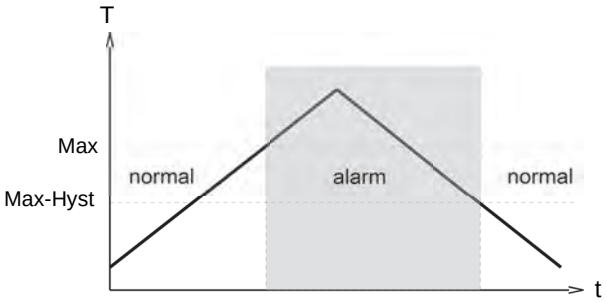
The switching value can be programmed by the user via "teaching". If desired, programmability can be blocked by the manufacturer.
The ECI-1 device configurator with associated software is available as a convenient option for programming all parameters by PC, and for adjustment.

The limit switch can be used to monitor minimal or maximal.

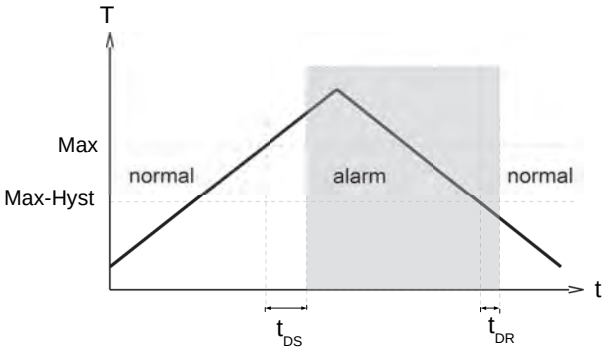
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



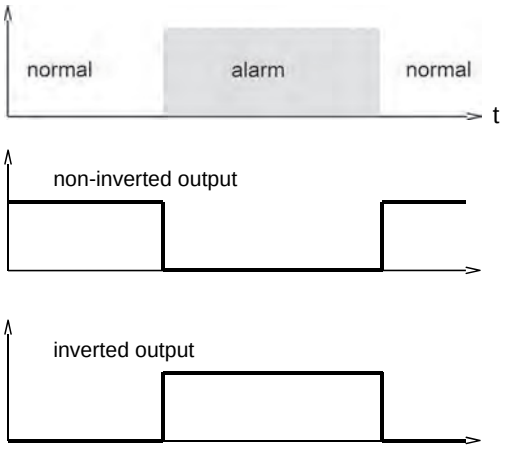
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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

The basic device is ordered e.g. CF-xxx
with electronics e.g. LABO-CF-xxx

	1.	2.	3.	4.	5.	6.	7.
CF-						**E**	**E**

	8.	9.	10.	11.	12.
LABO-CF-		**S**			

❍=Option

1.	**Nominal width**		
	008		DN 8 - G 1/4
	010		DN 10 - G 3/8
	015		DN 15 - G 1/2
	020		DN 20 - G 3/4
	025		DN 25 - G 1
2.	**Process connection**		
	G		female thread
3.	**Connection material**		
	M		CW614N plated
	K	❍	1.4571
	P	❍	POM
4.	**Body material**		
	M		CW614N plated
	K		1.4571
	P	❍	POM GF
5.	**Switching range**		
	015		0.9.. 15 l/min
	032		1.8.. 32 l/min
	050		3.5.. 50 l/min
	085		5.0.. 85 l/min
	150		9.0..150 l/min
6.	**Seal material**		
	E		EPDM
7.	**Connection for**		
	E		electronics
8.	**For nominal width**		
	008		DN 8 - G 1/4
	010		DN 10 - G 3/8
	015		DN 15 - G 1/2
	020		DN 20 - G 3/4
	025		DN 25 - G 1
9.	**Switching output (Limit switch)**		
	S		push-pull (compatible with PNP and NPN)
10.	**Programming**		
	P		full scale value can be programmed (teaching possible)
	N	❍	full scale value cannot be programmed (no teaching)
11.	**Switching function**		
	L		minimum switch
	H		maximum switch
12.	**Switching signal**		
	O		standard
	I		inverted
13.	**Electrical connection**		
	S		for round plug M12x1, 4-pole

Options

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
(after connecting the supply, time during which the switching output is not actuated)

Switching output fixed at l/min

Switching hysteresis %
Standard = 2 % of the metering range

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

Further options available on request.

Accessories

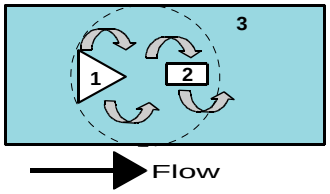
- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Device configurator ECI-1

Flow Transmitter LABO-CF-I / U / F / C

- **Flow measurement device using the vortex measurement principle**
- **High precision**
- **High overload protection**
- **No moving parts**
- **Rapid installation and removal thanks to clamp fastening**
- **Various connections using building block system**
- **0..10 V, 4..20 mA , frequency/pulse output, completely configurable**

Characteristics

A narrow triangular body (1), which goes through the complete cross-section of the measurement pipe, creates vortices in the medium when there is a flow (Kármán vortex street, vortex effect). The frequency of the vortex is proportional to the flow, and is detected using a piezo-sensor (2), which lies behind the triangular body. The complete unit, vortex body, and detector are designed as a plug-in unit (3), and are inserted into the pipe. Here, a lightning fast separation between measurement pipe and the complete measurement unit is possible.



The integrated converter / counter make available an electronic switching output (push-pull) with adjustable characteristics (minimum/maximum) and hysteresis, which responds when an adjustable limit is fallen short of or exceeded.
The switching value can be set to the currently existing flow using "teaching".
Models with analog or pulse output are also available.

Technical data

Sensor	vortex principle
Nominal width	DN 8..25
Process connection	female thread G $^1/_4$..G 1 (others available on request)
Metering ranges	0.9..150 l/min for details, see table "Ranges"
Measurement accuracy	up to 50 % of full scale value: ±1 % of measured value from 50 % of full scale value: ±2 % of measured value
Pressure resistance	PN 10 bar
Media temperature	0..60 °C
Ambient temperature	-20..+70 °C
Materials medium-contact	Housing: CW614N plated, 1.4571 or POM GF Connection: CW614N plated, 1.4571 or POM Detector: ETFE PA6T6I 40 % GF Seal: EPDM
Supply voltage	10..30 V DC voltage output 10 V: 15..30 V DC
Power consumption	< 1 W (without load)
Output data:	all outputs are resistant to short circuits and reversal polarity protected
Current output:	4..20 mA (0..20 mA available on request)
Voltage output:	0..10 V (2..10 V available on request) output current max. 20 mA
Frequency output:	transistor output "push-pull" I_{out} = 100 mA max.
Pulse output:	transistor output "push-pull" I_{out} = 100 mA max. pulse width 50 ms pulse per volume is to be stated
Display	yellow LCD shows operating voltage (LABO-CF-I / U) or output status (LABO-CF-F / C) or (rapid flashing = Programming)
Electrical connection	for round plug connector M12x1, 4-pole
Ingress protection	IP 67
Weight	see table "Dimensions"
Conformity	CE

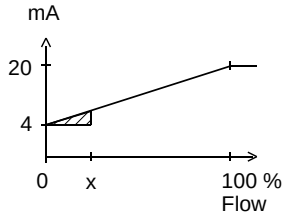
Ranges

G	Types	Range l/min H_2O
G $^1/_4$	LABO-CF-008	0.9.. 15 l/min
G $^3/_8$	LABO-CF-010	1.8.. 32 l/min
G $^1/_2$	LABO-CF-015	3.5.. 50 l/min
G $^3/_4$	LABO-CF-020	5.0.. 85 l/min
G 1	LABO-CF-025	9.0..150 l/min

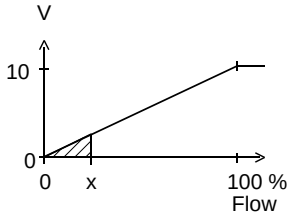
Signal output curves

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

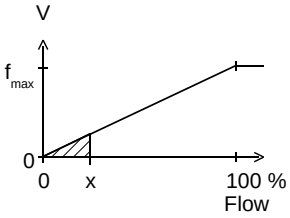
Current output



Voltage output



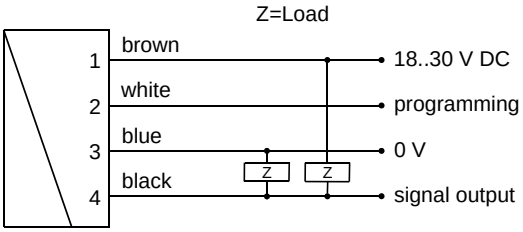
Frequency output



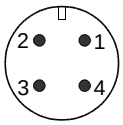
f_{max} selectable in the range of up to 2000 Hz

Other characters on request.

Wiring

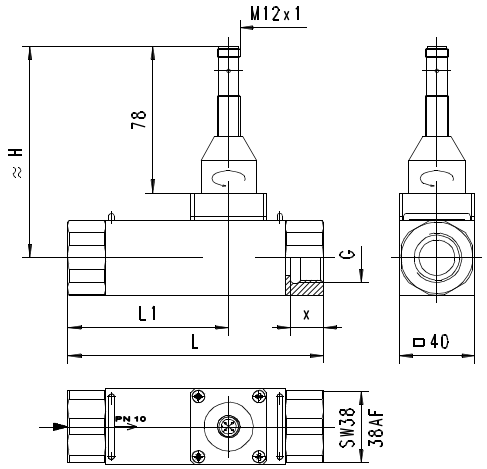


Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.
It is recommended to use shielded wiring

Dimensions



G	DN	Types	H	L	L1	X	Weight* kg
G 1/4	DN 8	LABO-CF-008	111	125	69	12.5	1.62
G 3/8	DN 10	LABO-CF-010	109	100	50		1.27
G 1/2	DN 15	LABO-CF-015	111			14.5	1.27
G 3/4	DN 20	LABO-CF-020	113	135	85	16.5	1.67
G 1	DN 25	LABO-CF-025	115	155	95	18.5	1.47

*Weight details for metal model. Plastic models available on request

Handling and operation

Installation

The vortex flow meter requires a run-in length of 5..10 x D in order to achieve its specified accuracy. If deposits are to be expected, sensor and electronics should not be installed underneath. It should be ensured that the sensor is installed in the direction of the flow arrow. If the sensor is to be cleaned, the clamps should be released, and the device removed (the pipe should be pressure-free for this). It should be ensured during cleaning that the oscillating vortex body is not exposed to impact (in the moulded part there is a sensitive piezo-ceramic sensor, which can break).

Note

The metering range end value can be programmed by the user via "teaching". Requirement for programmability must be stated when ordering, otherwise the device cannot be programmed.
The ECI-1 device configurator with associated software is available as a convenient option for programming all parameters by PC, and for adjustment.
The teaching option is not available for the pulse output version.

Operation and programming

The teaching process can be carried out by the user as follows:

- The flow rate to be set is applied to the device.
- Apply an impulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the supply voltage or a pulse from the PLC), in order to accept the measured value.
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

The devices have a yellow LED which flashes during the programming pulse. During operation, the LED serves as an indicator of operating voltage (for analog output) or of switching status (for frequency or pulse output).

To avoid the need to transit to an undesired operating status for the purpose of teaching, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving. The offset point can be positive or negative.

Example: The end of the metering range should be set to 80 l/min. However, it is possible only to reach 60 l/min without problems. In this case, the device would be ordered with a teach-offset of +20 l/min. At a flow rate of 60 l/min in the process, teaching would then store a value of 80 l/min.

Ordering code

The basic device is ordered e.g. CF-xxx
with electronics e.g. LABO-CF-xxx

	1.	2.	3.	4.	5.	6.	7.
CF-						**E**	**E**

	8.	9.	10.	11.
LABO-CF-				

❍=Option

1.	**Nominal width**							
	008		DN 8 - G 1/4					
	010		DN 10 - G 3/8					
	015		DN 15 - G 1/2					
	020		DN 20 - G 3/4					
	025		DN 25 - G 1					
2.	**Process connection**							
	G		female thread					
3.	**Connection material**							
	M		CW614N plated					
	K	❍	1.4571					
	P	❍	POM					
4.	**Body material**							
	M		CW614N plated					
	K		1.4571					
	P	❍	POM GF					
5.	**Metering range**							
	015		0.9.. 15 l/min					●
	032		1.8.. 32 l/min				●	
	050		3.5.. 50 l/min			●		
	085		5.0.. 85 l/min		●			
	150		9.0..150 l/min	●				
6.	**Seal material**							
	E		EPDM					
7.	**Connection for**							
	E		electronics					

8.	**For nominal width**							
	008		DN 8 - G 1/4					●
	010		DN 10 - G 3/8				●	
	015		DN 15 - G 1/2			●		
	020		DN 20 - G 3/4		●			
	025		DN 25 - G 1	●				
9.	**Signal output**							
	I		4..20 mA					
	U		0..10 V					
	F		frequency output (see "Ordering information")					
	C		pulse output (see "Ordering information")					

10.	**Programming**		
	N		full scale value cannot be programmed (no teaching)
	P	❍	full scale value can be programmed (teaching possible)
11.	**Electrical connection**		
	S		for round plug connector M12x1, 4-pole

Required ordering information

For LABO-CF-...F:
Output frequency at full scale ____ Hz
Maximum value: 2,000 Hz

For LABO-CF-...C:
For the pulse output version, the volume (with numerical value and unit) which will correspond to one pulse must be stated.

Volume per pulse (numerical value) ____

Volume per pulse (unit) ____

Options

Special range for analog output: ____ l/min
<= metering range (standard=metering range)

Special range for frequency output: ____ l/min
<= metering range (standard=metering range)

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

Further options available on request.

Accessories

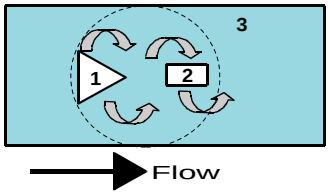
- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Converter / counter OMNI-TA
- Device configurator ECI-1

Flow Transmitter / Switch FLEX-CF

- **Universal flow sensor with vortex working principle**
- **Switching output and analog output (4..20 mA / 0..10 V)**
- **Ingress protection IP 67**
- **Cable outlet infinitely rotatable**
- **Robust stainless steel housing**

Characteristics

A narrow triangular body (1), which goes through the complete cross-section of the measurement pipe, creates vortices in the medium when there is a flow (Kármán vortex street, vortex effect). The frequency of the vortex is proportional to the flow, and is detected using a piezo-sensor (2), which lies behind the triangular body. The complete unit, vortex body, and detector are designed as a plug-in unit (3), and are inserted into the pipe. Here, a lightning fast separation between measurement pipe and the complete measurement unit is possible.



The FLEX transducer on the sensor 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 minimal or maximal, or as a frequency output or pulse 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-1 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 fullscale value.

The stainless steel electronics housing is rotatable, so it is possible to orient the cable outlet after installation.

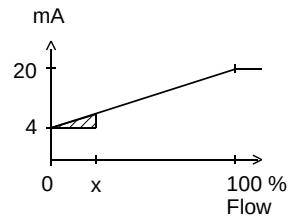
Technical data

Sensor	vortex principle	
Nominal width	DN 8..25	
Process connection	female thread G $^1/_4$..G 1 (others available on request)	
Metering ranges	0.9..150 l/min for details, see table "Ranges"	
Measurement accuracy	up to 50 % of full scale value: ±1 % of measured value from 50 % of full scale value: ±2 % of measured value	
Pressure resistance	PN 10 bar	
Media temperature	0..60 °C	
Ambient temperature	-20..+70 °C	
Materials medium-contact	Housing	CW614N plated, 1.4571 or POM GF
	Connection	CW614N plated, 1.4571 or POM
	Detector	ETFE PA6T6I 40 % GF
	Seal	EPDM
Supply voltage	18..30 V DC	
Power consumption	<1 W	
Analog output	4..20 mA / load 500 Ohm max. or 0..10 V / load min. 1 kOhm	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) I_{out} = 100 mA max.	
Switching hysteresis	adjustable (please state when ordering) Standard setting: 2 % F.S., for Min-switch, position of the hysteresis above the limit value, and for Max-switch, below the limit value	
Pulse output	pulse width 50 ms → max. output frequency < 20 Hz	
Display	yellow LED (On = Normal / Off = Alarm)	
Electrical connection	for round plug connector M12x1, 4-pole	
Ingress protection	IP 67	
Weight	see table "Dimensions"	
Conformity	CE	

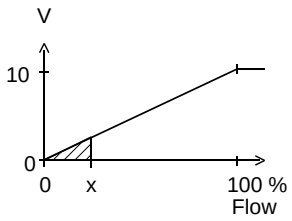
Signal output curves

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

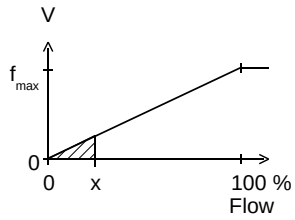
Current output



Voltage output



Frequency output



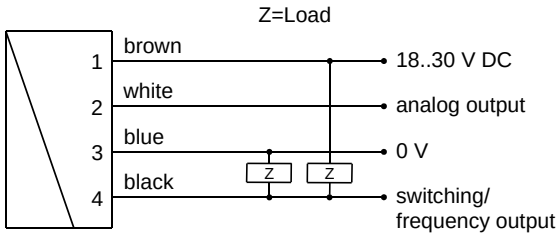
f_{max} selectable in the range of up to 2000 Hz

Other characters on request.

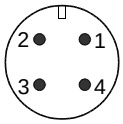
Ranges

G	Types	Range l/min H_2O
G 1/4	FLEX-CF-008	0.9.. 15 l/min
G 3/8	FLEX-CF-010	1.8.. 32 l/min
G 1/2	FLEX-CF-015	3.5.. 50 l/min
G 3/4	FLEX-CF-020	5.0.. 85 l/min
G 1	FLEX-CF-025	9.0..150 l/min

Wiring

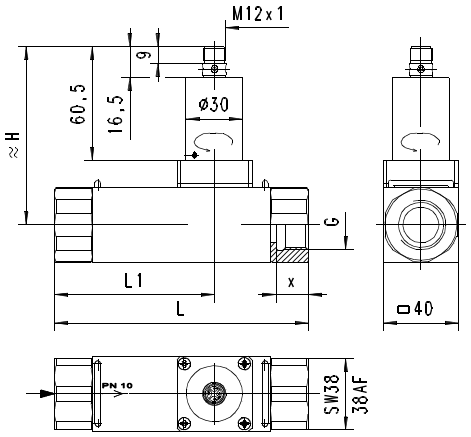


Connection example: PNP NPN



Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet.
It is recommended to use shielded wiring.

Dimensions



G	DN	Types	H	L	L1	X	Weight* kg
G 1/4	DN 8	FLEX-CF-008	93	125	69	12.5	2.23
G 3/8	DN 10	FLEX-CF-010	91	100	50		1.88
G 1/2	DN 15	FLEX-CF-015	93			14.5	1.88
G 3/4	DN 20	FLEX-CF-020	95	135	85	16.5	2.28
G 1	DN 25	FLEX-CF-025	97	155	95	18.5	2.08

*Weight details for metal model. Plastic models available on request

Handling and operation

Installation

The vortex flow meter requires a run-in length of 5..10 x D in order to achieve its specified accuracy. If deposits are to be expected, sensor and electronics should not be installed underneath. It should be ensured that the sensor is installed in the direction of the flow arrow. If the sensor is to be cleaned, the clamps should be released, and the device removed (the pipe should be pressure-free for this). It should be ensured during cleaning that the oscillating vortex body is not exposed to impact (in the moulded part there is a sensitive piezo-ceramic sensor, which can break).
The electronics housing is permanently connected to the sensor, and cannot be removed by the user. After installation, the electronic head can be turned to align the cable outlet.

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

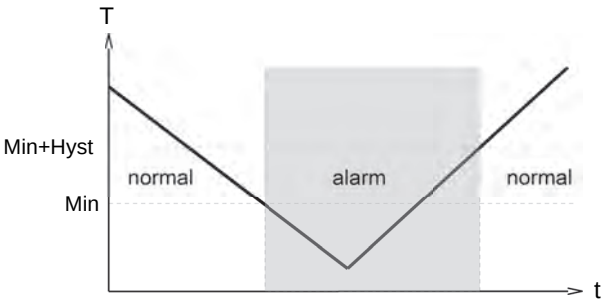
status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

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".

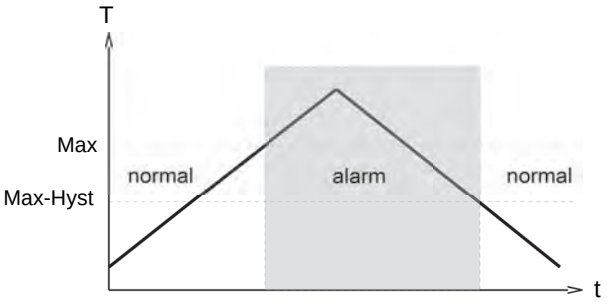
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minimal or maximal.

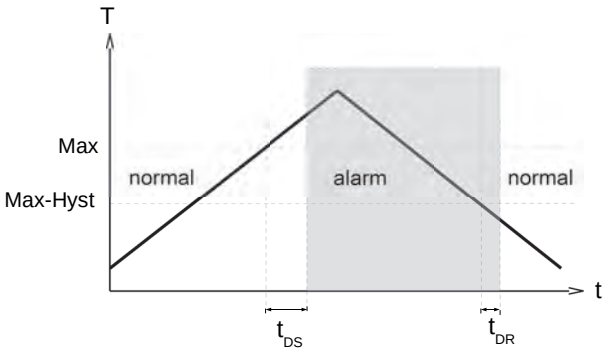
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



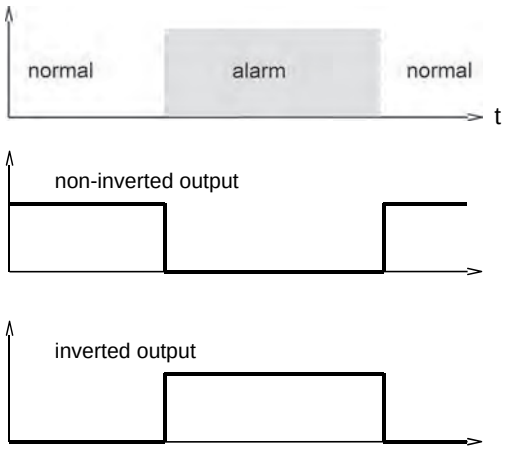
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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.

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www.ghm-messtechnik.de • info@honsberg.com

Ordering code

The basic device is ordered e.g. CF-xxx
with electronics e.g. FLEX-CF-xxx

	1.	2.	3.	4.	5.	6.	7.
CF-						**E**	**E**

	8.	9.	10.	11.
FLEX-CF-				

❍=Option

1.	**Nominal width**							
	008	DN 8 - G $^1/_4$						
	010	DN 10 - G $^3/_8$						
	015	DN 15 - G $^1/_2$						
	020	DN 20 - G $^3/_4$						
	025	DN 25 - G 1						
2.	**Process connection**							
	G	female thread						
3.	**Connection material**							
	M	CW614N plated						
	K ❍	1.4571						
	P ❍	POM						
4.	**Body material**							
	M	CW614N plated						
	K	1.4571						
	P ❍	POM GF						
5.	**Metering range**							
	015	0.9.. 15 l/min					●	
	032	1.8.. 32 l/min				●		
	050	3.5.. 50 l/min			●			
	085	5.0.. 85 l/min		●				
	150	9.0..150 l/min	●					
6.	**Sealing material**							
	E	EPDM						
7.	**Connection for**							
	E	electronics						
8.	**For nominal width**							
	008	DN 8 - G $^1/_4$					●	
	010	DN 10 - G $^3/_8$				●		
	015	DN 15 - G $^1/_2$			●			
	020	DN 20 - G $^3/_4$		●				
	025	DN 25 - G 1	●					
9.	**Analog output**							
	I	current output 4..20 mA						
	U	voltage output 0..10 V						
10.	**Functioning of the switching output**							
	L	minimum switch						
	H ❍	maximum switch						
	R	frequency output						
	C	Pulse output						
11.	**Switching signal**							
	O	standard output						
	I	inverted output						

Required ordering information

For FLEX-CF-C:
For the pulse output version, the volume (with numerical value and unit) which will correspond to one pulse must be stated.

Volume per pulse (numerical value) [ ]

Volume per pulse (unit) [ ]

Options

Special range for analog output: [ ] l/min
(not greater than the sensor's working range)

Special range for frequency output: [ ] l/min
(not greater than the sensor's working range)

End frequency (max. 2000 Hz) [ ] Hz

Switching delay [.] s
(from Normal to Alarm)

Switchback delay [.] s
(from Alarm to Normal)

Power-On delay (0..99 s) [ ] s
(time after power on, during which the outputs are not actuated)

Switching output fixed [ ] l/min

Special hysteresis (standard = 2 % EW) [ ] %

Accessories

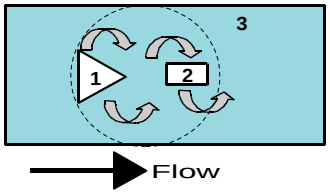
- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Device configurator ECI-1

Flow Transmitter / Switch OMNI-CF

- **Flow measurement device using the vortex measurement principle**
- **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

A narrow triangular body (1), which goes through the complete cross-section of the measurement pipe, creates vortices in the medium when there is a flow (Kármán vortex street, vortex effect). The frequency of the vortex is proportional to the flow, and is detected using a piezo-sensor (2), which lies behind the triangular body. The complete unit, vortex body, and detector are designed as a plug-in unit (3), and are inserted into the pipe. Here, a lightning fast separation between measurement pipe and the complete measurement unit is possible.



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.

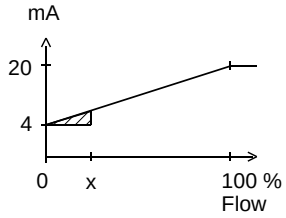
Technical data

Sensor	vortex principle	
Nominal width	DN 8..25	
Process connection	female thread G $^{1}/_{4}$..G 1 (others available on request)	
Metering range	0.9..150 l/min for details, see table "Ranges"	
Measurement accuracy	up to 50 % of full scale value: ±1 % of measured value from 50 % of full scale value: ±2 % of measured value	
Pressure resistance	PN 10 bar	
Medium temperature	0..+60 °C	
Ambient temperature	-20..+70 °C	
Materials medium-contact	Housing	CW614N plated, 1.4571 or POM GF
	Connection	CW614N plated, 1.4571 or POM
	Detector	ETFE PA6T6I 40 % GF
	Seal	EPDM
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	< 1 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 (IP 68 when oil-filled)	
Weight	see table "Dimensions"	
Conformity	CE	

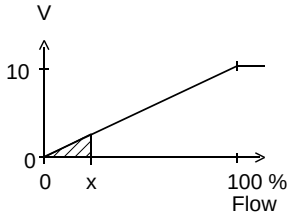
Signal output curves

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

Current output



Voltage output

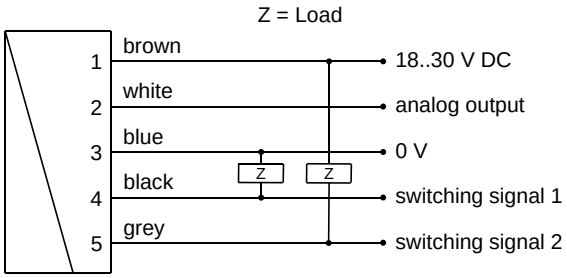


Other characters on request.

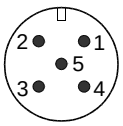
Ranges

G	Types	Range l/min H_2O
G $^1/_4$	OMNI-CF-008	0.9.. 15 l/min
G $^3/_8$	OMNI-CF-010	1.8.. 32 l/min
G $^1/_2$	OMNI-CF-015	3.5.. 50 l/min
G $^3/_4$	OMNI-CF-020	5.0.. 85 l/min
G 1	OMNI-CF-025	9.0..150 l/min

Wiring



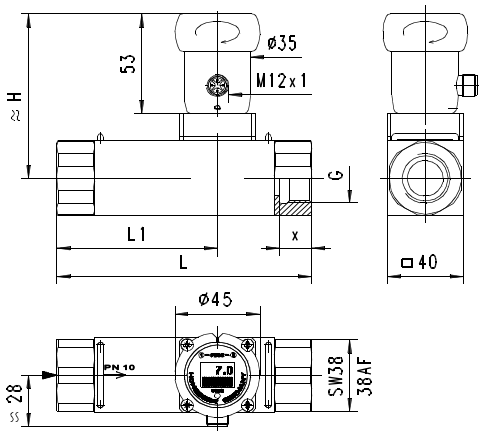
Connection example: PNP NPN



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.

Dimensions



G	DN	Types	H	L	L1	X	Weight* kg
G $^1/_4$	DN 8	OMNI-CF-008	86	125	69	12.5	2.8
G $^3/_8$	DN 10	OMNI-CF-010	84	100	50		2.45
G $^1/_2$	DN 15	OMNI-CF-015	86			14.5	2.45
G $^3/_4$	DN 20	OMNI-CF-020	88	135	85	16.5	2.85
G 1	DN 25	OMNI-CF-025	90	155	95	18.5	2.65

*Weight details for metal model. Plastic models available on request

Gooseneck option

A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation of the sensor. This option simultaneously provides thermal decoupling between the two units Length of the gooseneck is 140 mm.

Handling and operation

Installation

The vortex flow meter requires a run-in length of 5..10 x D in order to achieve its specified accuracy. If deposits are to be expected, sensor and electronics should not be installed underneath. It should be ensured that the sensor is installed in the direction of the flow arrow. If the sensor is to be cleaned, the clamps should be released, and the device removed (the pipe should be pressure-free for this). It should be ensured during cleaning that the oscillating vortex body is not exposed to impact (in the moulded part there is a sensitive piezo-ceramic sensor, which can break).

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.

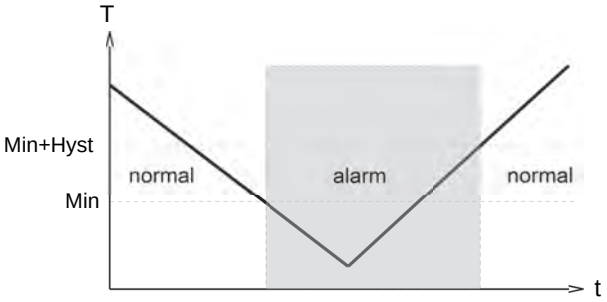
Overload display
Overload of a switching output is detected and indicated on the display ("Check S1 / S2"), and the switching output is switched off.

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**.

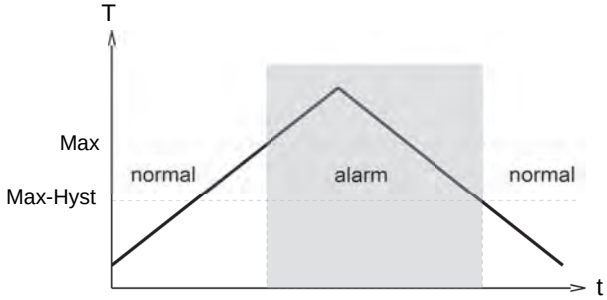
Factory settings
After modifying the configuration parameters, it is possible to reset them to the factory settings at any time using **Code 989**.

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.

Ordering code

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

	1.	2.	3.	4.	5.	6.	7.
CF-						**E**	**E**

	8.	9.	10.	11.
OMNI-CF-			**S**	

❍=Option

1.	**Nominal width**								
	008		DN 8 - G 1/4						●
	010		DN 10 - G 3/8					●	
	015		DN 15 - G 1/2				●		
	020		DN 20 - G 3/4			●			
	025		DN 25 - G 1		●				
2.	**Process connection**								
	G		female thread						
3.	**Connection material**								
	M		CW614N plated						
	K	❍	1.4571						
	P	❍	POM						
4.	**Body material**								
	M		CW614N plated						
	K		1.4571						
	P	❍	POM GF						
5.	**Metering range**								
	015		0.9.. 15 l/min						●
	032		1.8.. 32 l/min					●	
	050		3.5.. 50 l/min				●		
	085		5.0.. 85 l/min			●			
	150		9.0..150 l/min		●				
6.	**Sealing material**								
	E		EPDM						
7.	**Connection for**								
	E		electronics						
8.	**For nominal width**								
	008		DN 8 - G 1/4						●
	010		DN 10 - G 3/8					●	
	015		DN 15 - G 1/2				●		
	020		DN 20 - G 3/4			●			
	025		DN 25 - G 1		●				
9.	**Analog output**								
	I		current output 0/4..20 mA						
	U	❍	voltage output 0/2..10 V						
10.	**Electrical connection**								
	S		for round plug connector M12x1, 5-pole						
11.	**Option 1**								
	H	❍	gooseneck						
	O	❍	tropical model oil-filled version for heavy duty or external use						

Accessories

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

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.

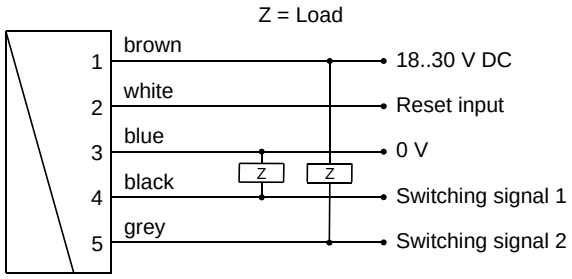
The state of the counter is indicated in an LCD display with only four digits. Here, the number of decimal places and the unit displayed is continuously matched to the current state of the counter. In this case, the smallest value which can be displayed is 0.001 ml (= 1 µl), and the largest is 9999 m³. 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.

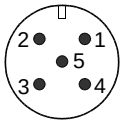
Technical data

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.

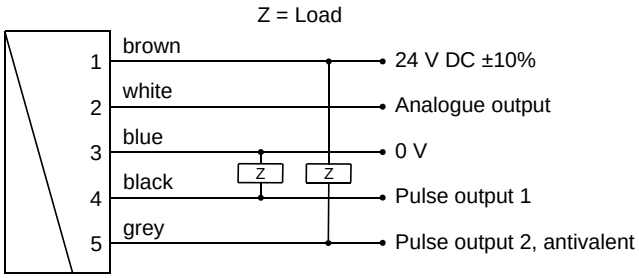
The state of the totalisation is indicated in an LCD display with only four digits. Here, the number of decimal places and the unit displayed is continuously matched to the current state of the counter. In this case, the smallest value which can be displayed is 0.001 ml (= 1 µl), and the largest is 9999 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.

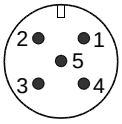
Technical data

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

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