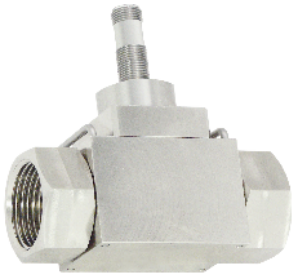
CF, LABO-CF-S, I, U, F, C, FLEX-CF, OMNI-CF

Вихревые измерители потока жидкости

GHM MESSTECHNIK

Технические характеристики

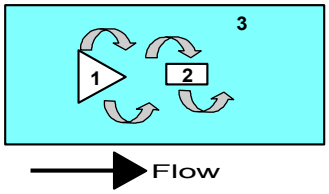
Flow Transmitter CF



- **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.

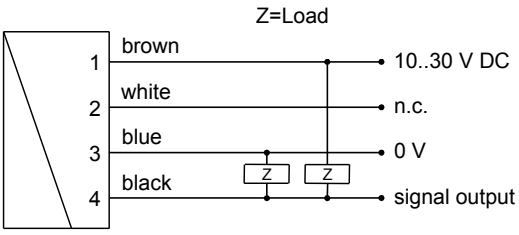
Technical data

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	

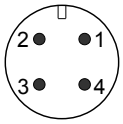
Ranges

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

Wiring

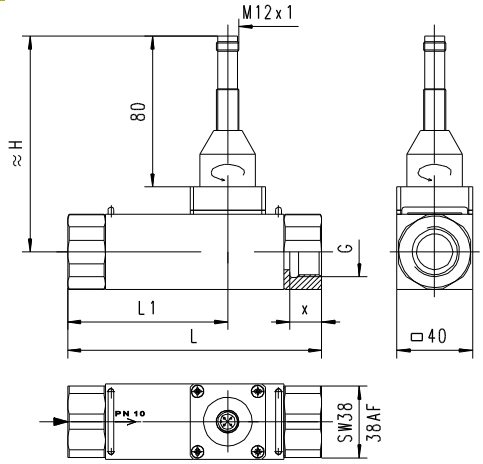


Connection example: PNP NPN



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

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

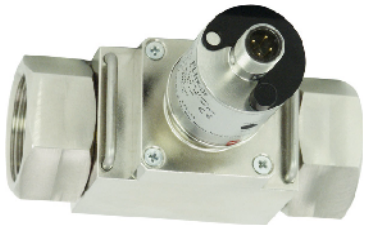
❍ = Option

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

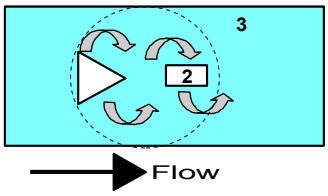
Flow Transmitter / Switch FLEX-CF



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

The sensor is configured in the factory, or alternatively this can be done with the aid of the optionally available ECI-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 Connection Detector Seal	CW614N plated, 1.4571 or POM GF CW614N plated, 1.4571 or POM ETFE PA6T6I 40 % GF 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	
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	

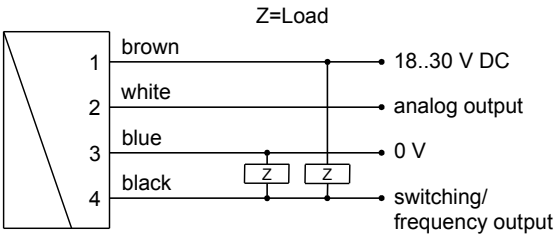
Ranges

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

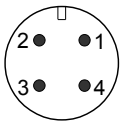
Product Information

FLEX-CF

Wiring

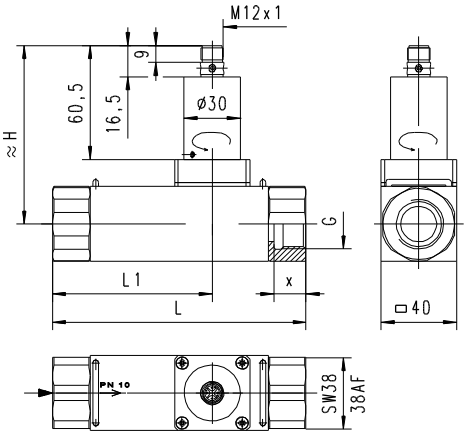


Connection example: PNP NPN



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).

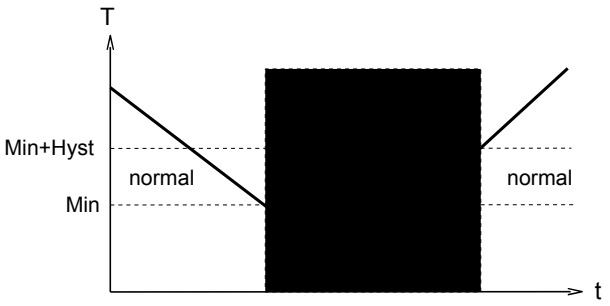
After the programming ("teaching"), the clip can either be left on the device, or removed to protect data.
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.
In order to avoid the need to transit to an 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".

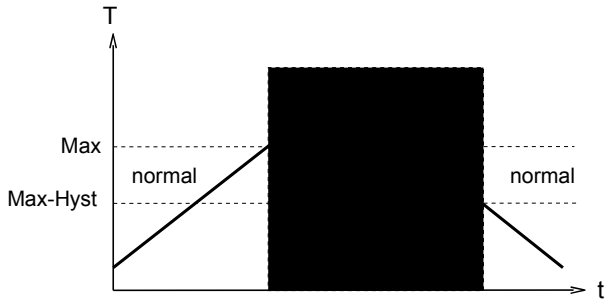
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minima or maxima.

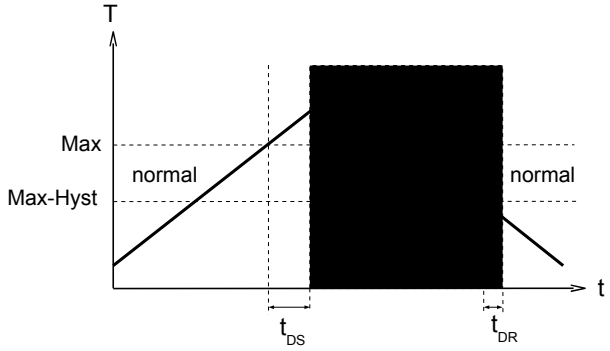
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



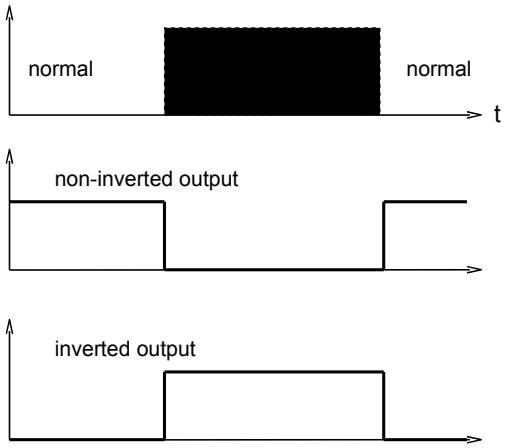
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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.

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						
11.	**Switching signal**							
	O	standard output						
	I	inverted output						

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)

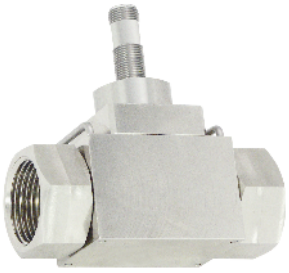
Switching output fixed ☐☐☐ l/min

Special hysteresis (standard = 2 % EW) ☐☐ %

Accessories

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

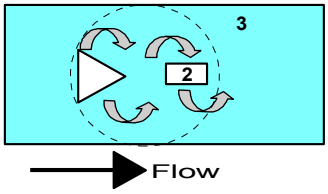
Flow Transmitter LABO-CF-I / U / F / C



- **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	
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	

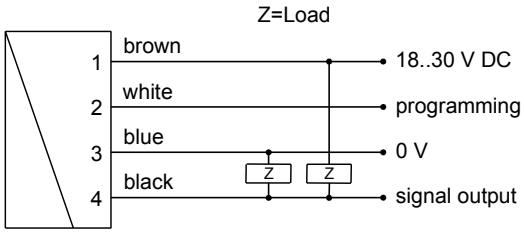
Ranges

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

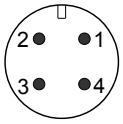
Product Information

LABO-CF-I/U/F/C

Wiring

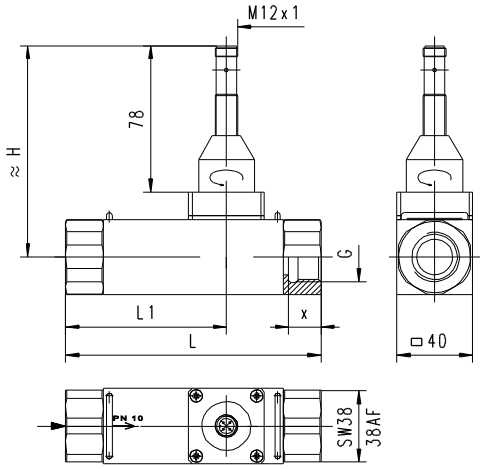


Connection example: PNP NPN



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.

HONSBERG INSTRUMENTS

Product Information

LABO-CF-I/U/F/C

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

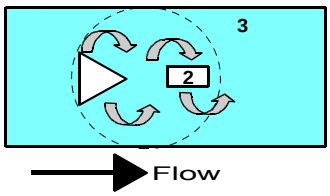
- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Converter / counter OMNI-TA
- Device configurator ECI-1

Flow 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

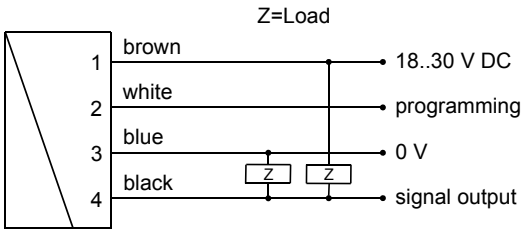
Sensor	vortex principle
Nominal width	DN 8..25
Process connection	female thread G $^1/_4$..G 1 (others available on request)
Switching ranges	0.9..150 l/min for details, see table "Ranges"
Measurement accuracy	up to 50 % of full scale value: ±1 % of measured value from 50 % of full scale value: ±2 %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

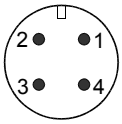
Ranges

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

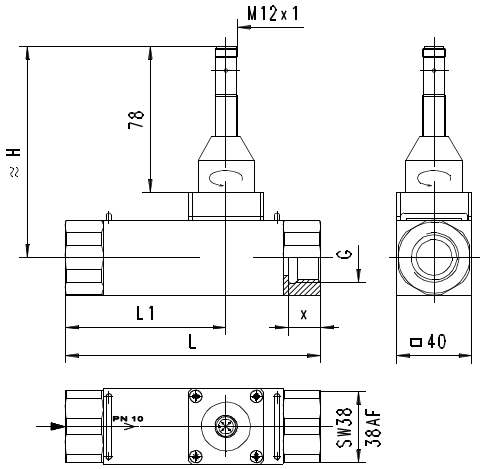


Connection example: PNP NPN



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.

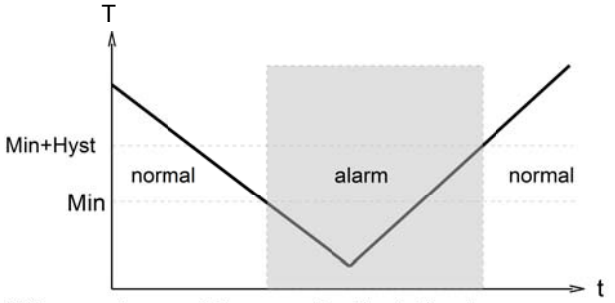
Example: The switching value should be set to 80 l/min. However, it is possible only to reach 60 l/min without problems. In this case, the device would be ordered with a teach-offset of +20 l/min. At a flow rate of 60 l/min in the process, teaching would then store a value of 80 l/min.

Note

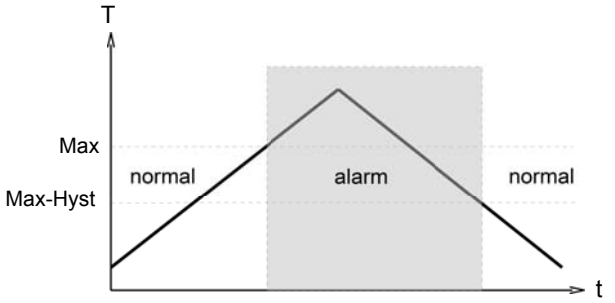
The switching value can be programmed by the user via "teaching". If desired, programmability can be blocked by the manufacturer.
The ECI-1 device configurator with associated software is available as a convenient option for programming all parameters by PC, and for adjustment.

The limit switch can be used to monitor minima or maxima.

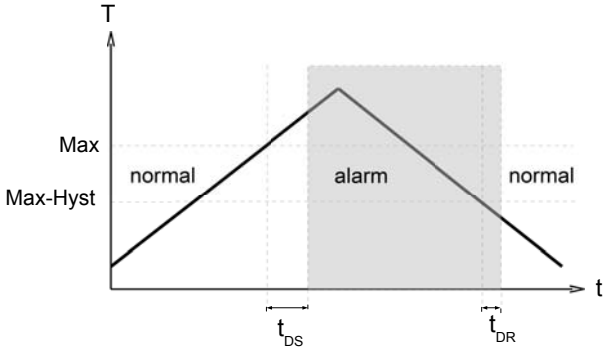
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



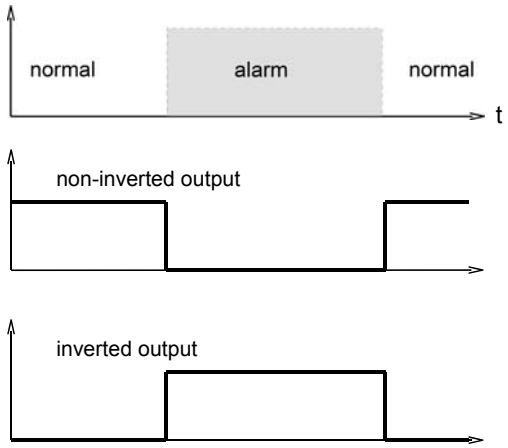
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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.

Product Information

LABO-CF-S

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

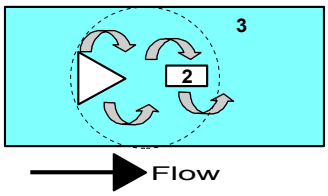
- Cable/round plug connector (KB...)
  see additional information “Accessories”
- Device configurator ECI-1

Flow Transmitter / 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 minima or maxima, 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	

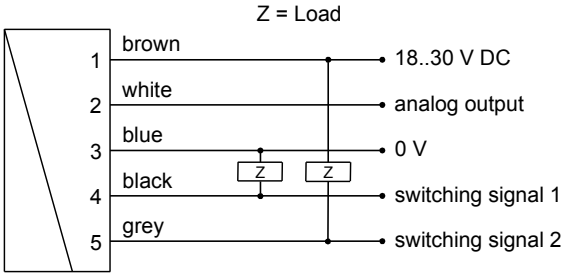
Product Information

OMNI-CF

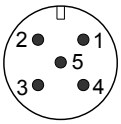
Ranges

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

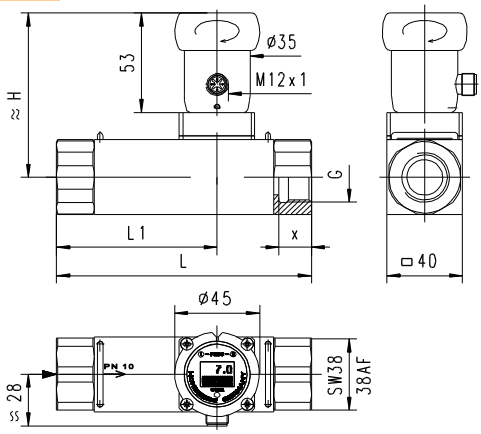


Connection example: PNP NPN



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

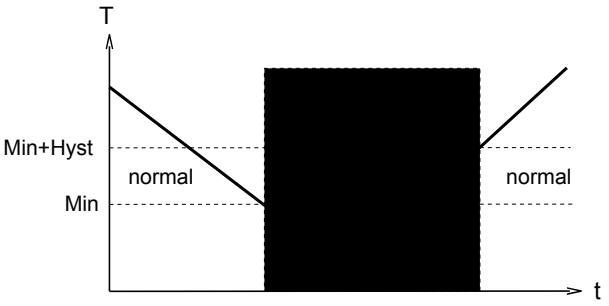
To simplify commissioning, the sensor provides a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26.0 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested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

Factory settings

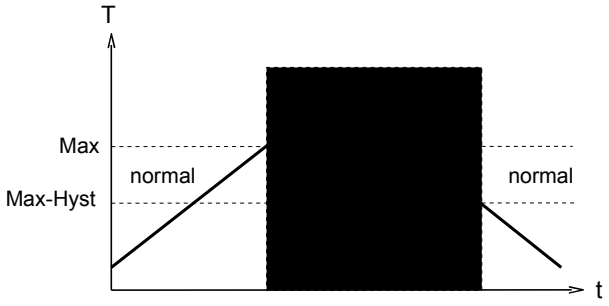
After modifying the configuration parameters, it is possible to reset them to the factory settings at any time using **Code 989**.

The limit switches S1 and S2 can be used to monitor minima or maxima.

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

			015	032	050	085	150	008	010	015	020	025
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**											
	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