

# LC, FLEX-LC, OMNI-LC Аналоговые измерители и сигнализатор уровня, класс защиты IP67 GHM MESSTECHNIK



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Сургут (3462)77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
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Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
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## Level transmitter LC-...HM / HK



- Mounted in the cover
- Materials combination may be selected

### Characteristics

A float fitted with a magnet affects a chain of reed contacts within the guide tube. The reed contacts are fitted with resistances in such a way that in the very simplest model, behaviour is similar to a potentiometer. The measured value can therefore be evaluated as a resistance value or as a radiometric signal (depending on the supply voltage). Alternatively, a sensor model with 4..20 mA analog output (2 wire or 3 wire) or 0..10 V may be selected. The arrangement of the reed contacts ensures the clarity of the switching state, and therefore a clean detection of the level. Resolution is 10 or 20 mm. The device has high reproducibility.

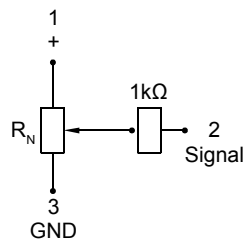
### Technical data

<b>Switch</b>	reed switch chain with float fitted with magnet	
<b>Mechanical Connection</b>	LC-S45	G 1 A
	LC-S44	G 1½ A
	LC-K52	G2A
<b>For metering ranges, lengths and divisions</b>	see "Ranges, dimensions and weights"	
<b>Length tolerance</b>	±5 mm	
<b>Pressure resistance</b>	LC-S45	PN 20 bar
	LC-S44	PN 20 bar
	LC-K52	PN 40 bar
<b>Medium temperature</b>	-20..+105 °C	
<b>Ambient temperature</b>	-20..+70 °C	
<b>Storage temperature</b>	-20..+80 °C	
<b>Density of medium</b>	LC-S45	<sup>3</sup> 0.34 g/cm <sup>3</sup>
	LC-S44	<sup>3</sup> 0.44 g/cm <sup>3</sup>
	LC-K52	<sup>3</sup> 0.66 g/cm <sup>3</sup>

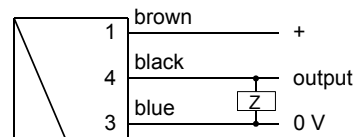
<b>Output</b>	resistor chain (radiometric), 4..20 mA or 0..10 V DC
<b>Electrical connection</b>	plug DIN 43650-A / ISO 4400 or for round plug connector M12x1, 4-pole (only for electronic output)
<b>Ingress protection</b>	IP 65 IP 67 for round plug connector
<b>Materials medium-contact</b>	LC-S45 CW614N and Spansil LC-S44 CW614N and Spansil LC-K52 Stainless steel 1.4404
<b>Materials Electronics housing</b>	stainless steel 1.4305
<b>Weights</b>	see table "Ranges, dimensions and weights"
<b>Conformity</b>	CE

### Wiring

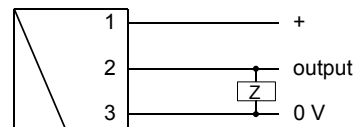
Reed switch chain Typ WB  
with plug DIN 43650-A / ISO 4400



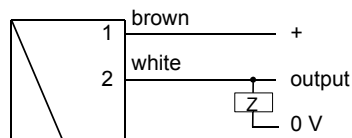
3 wire electronics Typ TS / VS  
for round plug connector M12x1, 4-pole



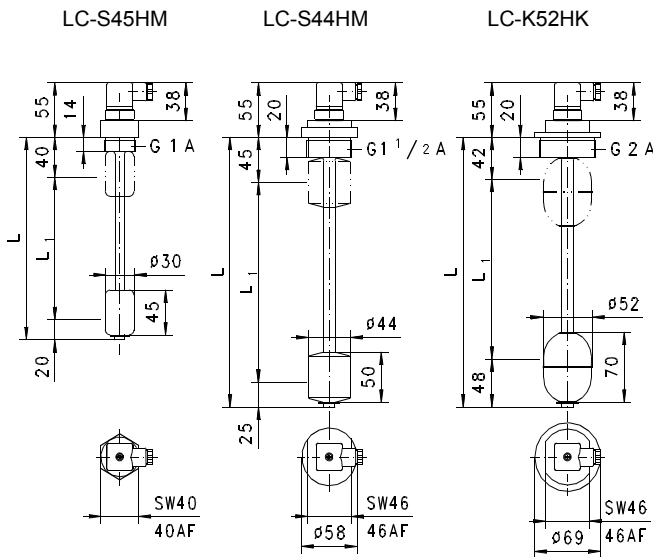
3 wire electronics Typ TB / VB  
with plug DIN 43650-A / ISO 4400



2 wire electronics Typ ZB / ZS



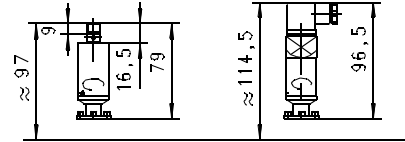
## Ranges, dimensions and weights



## Electronic attachments

Round plug connector

Plug  
DIN 43650-A / ISO 4400



Handling and operation

### Note:

Not suitable for use in media with ferritic particles.

### Installation

Installation is carried out by screwing the sensor into a suitable threaded drilling on the upper side of the container. A flat seal is included in the scope of the delivery.

## Ordering code

LC -  1.  2.  3.  4.

○=Option

Types LC-	L	L1	Division mm	Resistance * R <sub>N</sub> / Ohm	Tolerance Ohm	Weight kg
S45HM0250	250	190	10	1800	±136	0.5
S45HM0500	500	440		4300	±186	0.6
S45HM0750	750	690		1503	± 52	0.6
S45HM1000	1000	940		2055	± 64	0.7
S44HM1000	1000	930	20	2295	± 95	0.7
S44HM1500	1500	1430		3543	±121	0.8
S44HM2000	2000	1930		4790	±146	0.8
K52HK0250	250	160		10	1500	±130
K52HK0500	500	410	4000		±280	1.0
K52HK0750	750	660	20	1647	± 83	1.0
K52HK1000	1000	910		2246	± 94	1.1
K52HK1500	1500	1410		3493	±120	1.1
K52HK2000	2000	1910		4741	±144	1.1

\* + 1000 Ohm  
Pre-resistance

1. Version				
S45HM	screw-in fitting G 1 A brass - float Spansil			
S44HM	screw-in fitting G 1 1/2 A brass - float Spansil			
K52HK	screw-in fitting G 2 A stainless steel			
2. Tube length L				
0250	250 mm	●	●	●
0500	500 mm	●	●	●
0750	750 mm	●	●	●
1000	1000 mm	●	●	●
1500	1500 mm	●	●	
2000	2000 mm	●	●	
3. Output				
W	resistive sensors			
Z	○ 4..20 mA (2 wire)			
T	○ 4..20 mA (3 wire)			
V	○ 0..10 V			
4. Electrical connection				
B	plug DIN 43650-A / ISO 4400	●	●	●
S	○ round plug connector M12x1, 4-pole	●	●	●

### Options

- Special lengths
- Special divisions
- Temperature 120 °C

### Accessories

- Round plug connector/cable

## Level Transmitter / Switch FLEX-LC



- Level sensor with Reed chain
- Analog output and/or switching output
- Alternatively with temperature sensor
- Various materials available
- Designed for industrial use
- Small, compact construction
- Very simple installation

### Characteristics

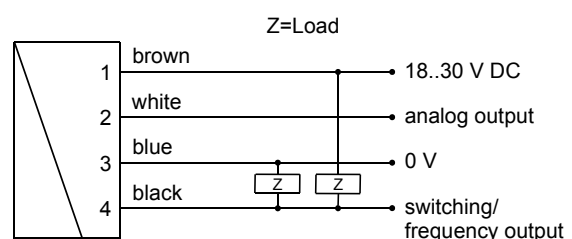
A float fitted with a magnet affects a Reed chain within the guide tube; the chain is connected as a potentiometer with resistances. The resolution is 10..20 mm and is highly reproducible. The FLEX sensor electronics use a microcontroller to convert the potentiometer values into standardised outputs, and offer both an analog and a switching output. A temperature sensor can optionally be integrated, and its measured value can be output either via the analog output or the switching output.

### Technical data

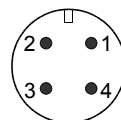
<b>Switch</b>	reed switch chain with float fitted with magnet
<b>Mechanical Connection</b>	FLEX-LC45M G 1 A FLEX-LC44M G 1½ A FLEX-LC52K G 2 A
<b>For metering ranges, lengths and divisions</b>	see "Ranges, dimensions and weights"

<b>Pressure resistance</b>	FLEX-LC45M PN 20 bar FLEX-LC44M PN 20 bar FLEX-LC52K PN 40 bar
<b>Medium temperature</b>	-20..+105 °C
<b>Ambient temperature</b>	-20..+70 °C
<b>Storage temperature</b>	-20..+80 °C
<b>Density of medium</b>	FLEX-LC45M <sup>3</sup> 0.34 g/cm <sup>3</sup> FLEX-LC44M <sup>3</sup> 0.44 g/cm <sup>3</sup> FLEX-LC52K <sup>3</sup> 0.66 g/cm <sup>3</sup>
<b>Supply voltage</b>	18..30 V DC
<b>Power consumption</b>	< 100 mA
<b>Analog output</b>	4..20 mA or 0..10 V DC
<b>Switching output</b>	transistor output "push-pull" (resistant to short circuits and polarity reversal) I <sub>out</sub> = 100 mA max.
<b>Switching hysteresis</b>	approx. 2 % or option, not smaller than division, position dependent on characteristics (minimum or maximum)
<b>Display</b>	yellow LED for switching output: On = Normal / Off = Alarm, otherwise displays operating voltage
<b>Electrical connection</b>	for round plug connector M12x1, 4-pole
<b>Materials medium-contact</b>	FLEX-LC45M CW614N and Spansil FLEX-LC44M CW614N and Spansil FLEX-LC52K Stainless steel 1.4404
<b>Materials, non-medium-contact</b>	stainless steel 1.4305, PA 6.6
<b>Ingress protection</b>	IP 67
<b>weights</b>	see "Ranges, dimensions and weights"
<b>Conformity</b>	CE

### Wiring

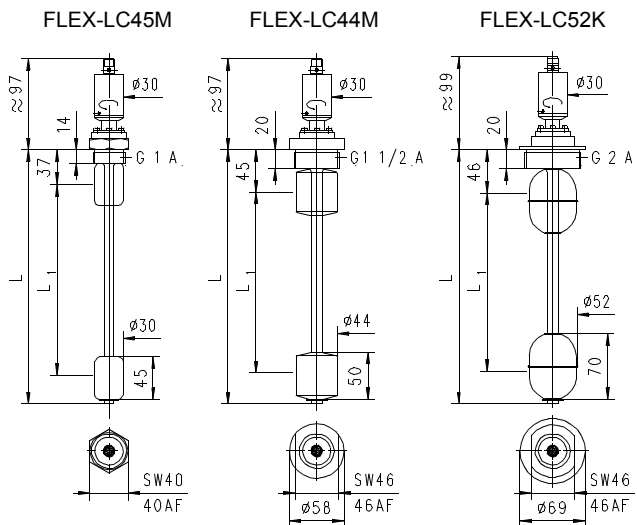


Connection example: PNP NPN



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

### Ranges, dimensions and weights



Types FLEX-	Division mm	L mm	L1 mm	Weight kg
LC45M0250	10	250	190	0.6
LC45M0500		500	440	0.7
LC45M0750		750	690	0.7
LC45M1000		1000	940	0.8
LC44M1000	20	1000	930	0.8
LC44M1500		1500	1430	0.9
LC44M2000		2000	1930	0.9
LC52K0250	10	250	160	1.1
LC52K0500		500	410	1.1
LC52K0750	20	750	660	1.1
LC52K1000		1000	910	1.2
LC52K1500		1500	1410	1.2
LC52K2000		2000	1910	1.2

### Handling and operation

#### Note:

Not suitable for use in media with ferritic particles.

#### Installation

Installation is carried out by screwing the sensor into a suitable threaded drilling on the upper side of the container. A flat seal is included in the scope of the delivery.

#### 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.

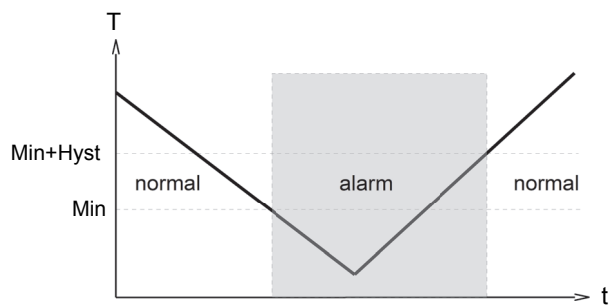
In order to avoid the need to transit to an undesired operating status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

*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".*

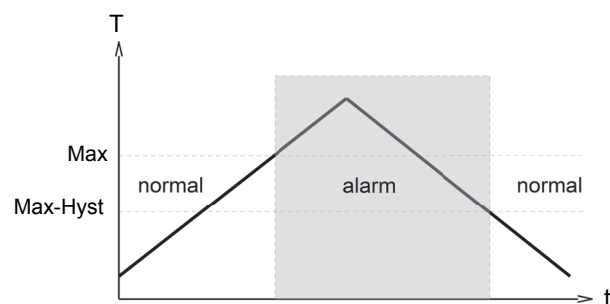
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

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.



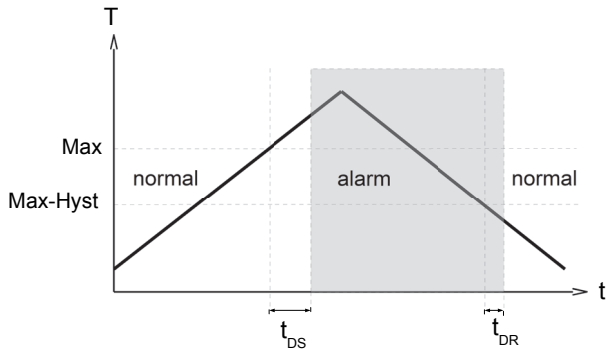
A switchover delay time ( $t_{DS}$ ) can be applied to the switchover to the alarm state. Equally, one switch-back delay time ( $t_{DR}$ ) of several can be applied to switching back to the normal state.

### Ordering code

FLEX-LC -  1.  2.  3.  4.  5.  6.

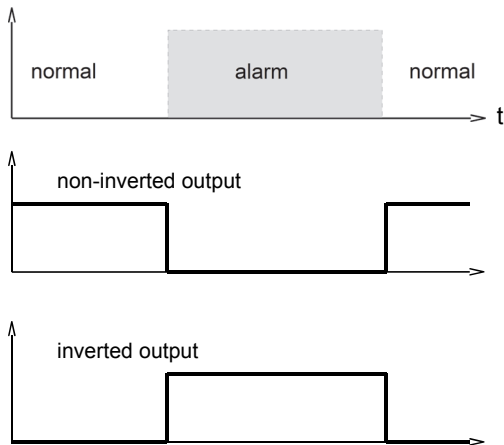
○=Option

<b>1. Version</b>			
45M	screw-in fitting G 1 A brass - float Spansil		
44M	screw-in fitting G 1 1/2 A brass - float spansil		
52K	screw-in fitting G 2 A stainless steel		
<b>2. Tube length L</b>			
0250	250 mm	●	●
0500	500 mm	●	●
0750	750 mm	●	●
1000	1000 mm	●	●
1500	1500 mm	●	●
2000	2000 mm	●	●
<b>3. Analog output for</b>			
I	4..20 mA		
U	0..10 V		
K	no analog output		
<b>4. Switching output</b>			
L	level		
T	temperature		
K	No analog output		
<b>5. Switching output</b>			
T	push-pull (PNP and NPN)		
K	no switching output		
<b>6. Switching output for</b>			
L	push-pull (PNP and NPN)		
T	temperature		
K	no switching output		
<b>7. Switching output function</b>			
L	minimum-switch		
H	maximum-switch		
R	frequency output		
K	no switching output		
<b>8. Switching output level</b>			
O	standard		
I	inverted		



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.

### Combinations with FLEX

FLEX-evaluation electronics can be combined with very different types of pickup systems for flow rate, level, temperature, and pressure. This has created a family of sensors with which different types of applications can be supported.



### Options

Special lengths and divisions available on request.

#### Special measuring range for temperature:

Maximum 120 °C (standard = 70 °C)  °C

Minimum -20 °C (standard = 0 °C)  °C

End frequency (max. 2000 Hz)  Hz

Switching delay (from Normal to Alarm)  .  s

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  °C/mm

Special hysteresis (standard = 2 % EW)  %

*If the field is not completed, the standard setting is selected automatically.*

### Accessories

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

## Level Transmitter / Switch OMNI-LC



- Level sensor with reed chain and integrated transmitter
- Analog output, two switching outputs
- Clear, easily legible, illuminated LCD display
- Modifiable units in the display
- Designed for industrial use
- Small, compact construction
- Very simple installation

### Characteristics

A float fitted with a magnet switches a reed chain within the guide tube; the chain is connected as a potentiometer with resistances. The resolution is 10 to 20 mm. The device has high reproducibility.

The integrated OMNI sensor electronics evaluate the potentiometer values using a microcontroller. The current level is shown in the display and output as an analog signal (0/4..20 mA or 0/2..10 V). In addition, if set limit values are fallen short of or exceeded, this can be signalled by means of two switching outputs and a red LED.

Because the complete upper part of the housing can be turned, it is possible to simply and infinitely adjust the display and the cable outlet.

By turning the programming 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.

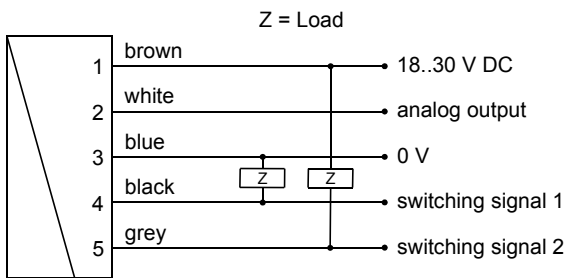


### Technical data

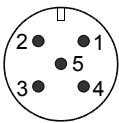
<b>Sensor</b>	reed switch chain with float fitted with magnet	
<b>Mechanical Connection</b>	OMNI-LC-S45HM	G 1 A
	OMNI-LC-S44HM	G 1½ A
	OMNI-LC-K52HK	G 2 A
<b>For metering ranges, lengths and divisions</b>	see "Ranges, dimensions and weights"	
<b>Pressure resistance</b>	OMNI-LC-S45HM	PN 20 bar
	OMNI-LC-S44HM	PN 20 bar
	OMNI-LC-K52HK	PN 40 bar
<b>Medium temperature</b>	-20..+70 °C (with gooseneck max. 105 °C)	
<b>Ambient temperature</b>	-20..+70 °C	
<b>Storage temperature</b>	-20..+80 °C	
<b>Density of medium</b>	OMNI-LC-S45HM	<sup>3</sup> 0.34 g/cm <sup>3</sup>
	OMNI-LC-S44HM	<sup>3</sup> 0.44 g/cm <sup>3</sup>
	OMNI-LC-K52HK	<sup>3</sup> 0.66 g/cm <sup>3</sup>
<b>Voltage supply</b>	18..30 V DC	
<b>Power consumption</b>	< 1 W	
<b>Analog output</b>	0/4..20 mA, max. load 500 Ohm or 0/2..10 V	
<b>Switching output</b>	transistor output "push-pull" (resistant to short circuits and polarity reversal) I <sub>out</sub> = 100 mA max.	
<b>Hysteresis</b>	adjustable, not smaller than division, position dependent on characteristics (minimum or maximum)	
<b>Display</b>	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.	
<b>Electrical connection</b>	for round plug connector M 12x1, 5-pole	
<b>Ingress protection</b>	IP 67	
<b>Materials medium-contact</b>	OMNI-LC-S45HM	CW614N and Spansil
	OMNI-LC-S44HM	CW614N and Spansil
	OMNI-LC-K52HK	stainless steel 1.4404
<b>Materials, non-medium-contact</b>	Housing	stainless steel 1.4305
	Glass	mineral glass, hardened
	Magnet	samarium-Cobalt
<b>Weights</b>	see "Ranges, dimensions and weights"	
<b>Conformity</b>	CE	



### Wiring

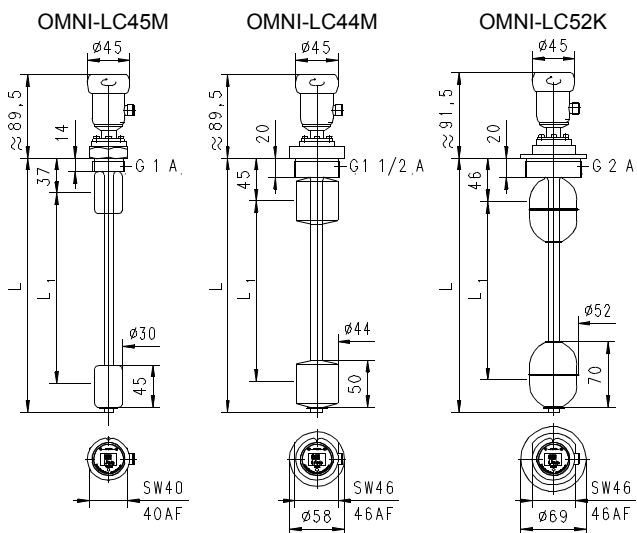


Connection example: PNP NPN



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

### Dimensions and weights



Types	Division	L	L1	Weight
OMNI-LC-	mm	mm	mm	kg
S45HM0250	10	250	190	0.6
S45HM0500		500	440	0.7
S45HM0750		750	690	0.7
S45HM1000		1000	940	0.8
S44HM1000	20	1000	930	0.8
S44HM1500		1500	1430	0.9
S44HM2000		2000	1930	0.9
K52HK0250	10	250	160	1.1
K52HK0500		500	410	1.1
K52HK0750	20	750	660	1.1
K52HK1000		1000	910	1.2
K52HK1500		1500	1410	1.2
K52HK2000		2000	1910	1.2

A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation and reading direction of the sensor. At the same time, this option ensures a thermal decoupling between the two units, so that media temperatures up to 105 °C become possible.

### Handling and operation

#### Note:

Not suitable for use in media with ferritic particles.

#### Installation

Installation is carried out by screwing the sensor into a suitable threaded drilling on the upper side of the container. A flat seal is included in the scope of the delivery.

After it has been screwed in, the OMNI head can be turned to the reading direction, thanks to its free rotatability.

### 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 (EDIT)

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 (currently measured value with 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, hysteresis greater than switching value,
- MAX = monitoring of maximum value, hysteresis less than switching 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)
- Units: e.g. l/min or m³/h
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (flow rate corresponding to 0/4 mA)
- 20 mA (flow rate corresponding to 20 mA)

#### Edit, using position 2

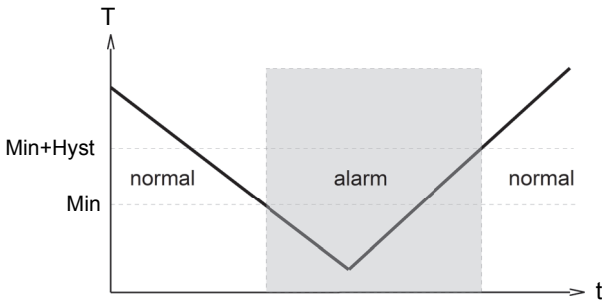
If the currently visible parameter is to be modified:

- 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 next digit is reached.
- Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
- If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

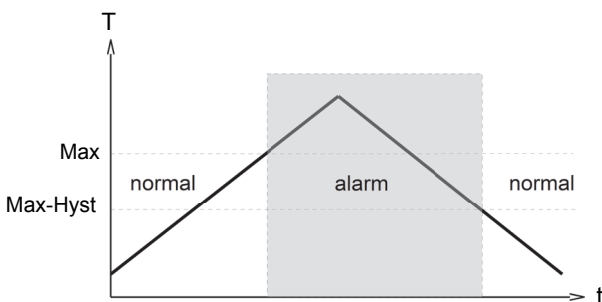
The S1 and S2 limit switches can be used to monitor minimal or

maximal.

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



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



The change to the alarm state is indicated by the integrated red LED and a cleartext in the display.

While in the normal state the switching outputs are at the level of the supply voltage; in the alarm state they are at 0 V, so that a wire break would also display as an alarm state at the signal receiver.

Overload of the switching output is detected, indicated on the display ("Check S 1 / S 2"), and the switching output is switched off.

### Simulation mode

To simplify commissioning, the sensor supports a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26 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.

### Overload display

Overload of the switching output is detected, indicated on the display, and the switching output is set to high impedance.

### Default setting

After setting the configuration parameters, they can be reset to factory values at any time, by means of code 989.

Starting from the normal display (currently measured value with unit), if 1 (STEP) is selected repeatedly, then the display shows the following information:

### Display of the parameters, using position 1

- Switching values S1 and S2: Switching values in the selected unit.
- Hysteresis direction of S1 and S2:  
Max = Hysteresis less than S1 or S2
- Max = Hysteresis greater than S1 or S2
- Hystereses Hyst1 and Hyst2:

- Hysteresis values of the switching values in the set unit
- After entering code 111, further parameters can be defined (this should take place only if necessary)
- Filter: Selectable filter constant in seconds (affects display and output)
- Unit: e.g. bar or psi ...
- Output: 0..20 mA or 4..20 mA
- 0/4 mA: Displayed value for 0/4 mA
- 20 mA: Displayed value for 20 mA

### Edit, using position 2

- If the **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 next digit is reached. In this way, every digit can be modified. If there is no action within 5 seconds, the device returns to the normal display range without accepting the modification.

### Saving the changes using position 1

- After leaving the last value, turn once to position 1; this accepts the modification.

### Ordering code

OMNI-LC -  1.  2.  3.

○=Option

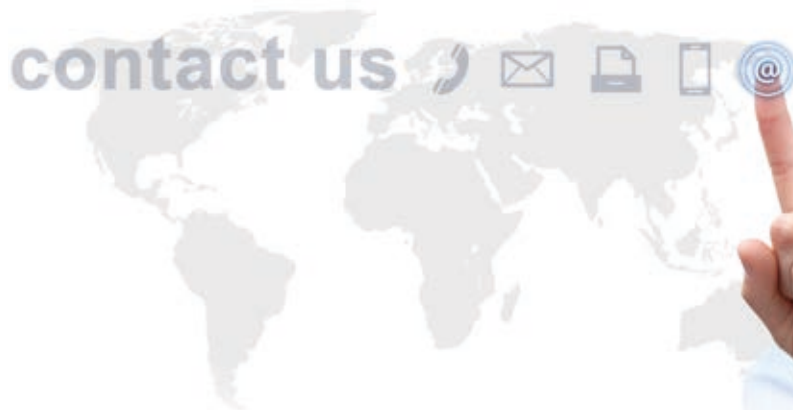
1. Version				
S45HM	screw-in fitting G 1 A brass - float spanil			
S44HM	screw-in fitting G 1 1/2 A brass - float spanil			
K52HK	screw-in fitting G 2 A stainless steel			
2. Tube length L				
0250	250 mm	●	●	●
0500	500 mm	●	●	●
0750	750 mm	●	●	●
1000	1000 mm	●	●	●
1500	1500 mm	●	●	●
2000	2000 mm	●	●	●
3. Optional				
H	○ model with gooseneck			

### Options

- Tropical model (completely oil-filled for severe external applications or for rapidly changing temperatures. Reliably prevents condensation).
- Special lengths

### Accessories

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



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<b>Астрахань</b> (8512)99-46-04	<b>Иркутск</b> (395)279-98-46	<b>Москва</b> (495)268-04-70	<b>Ростов-на-Дону</b> (863)308-18-15	<b>Тверь</b> (4822)63-31-35
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<b>Волгоград</b> (844)278-03-48	<b>Киров</b> (8332)68-02-04	<b>Новосибирск</b> (383)227-86-73	<b>Севастополь</b> (8692)22-31-93	<b>Уфа</b> (347)229-48-12
<b>Вологда</b> (8172)26-41-59	<b>Краснодар</b> (861)203-40-90	<b>Омск</b> (3812)21-46-40	<b>Симферополь</b> (3652)67-13-56	<b>Хабаровск</b> (4212)92-98-04
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