

OPERATING INSTRUCTIONS

LFH

Pegelsonde
Level probe
Sonde de niveau
Sonda de nivel



D

GB

F

ES

Betriebsanleitung
Operating instructions
Mode d'emploi
Manual de instrucciones

SICK
Sensor Intelligence.

1. Important details for your information

Read these operating instructions before installing and starting the pressure transmitter. Keep the operating instructions in a place that is accessible to all users at any time.

The following installation and operating instructions have been compiled by us with great care but it is not feasible to take all possible applications into consideration. These installation and operation instructions should meet the needs of most pressure measurement applications. If questions remain regarding a specific application, you can obtain further information:

- Via our Internet address www.sick.com

With special model number, please note specifications in the delivery note.

If the serial number on the product label gets illegible (e.g. by mechanical damage or repainting), the retraceability of the instrument is not possible any more.

SICK pressure transmitters are carefully designed and manufactured using state-of-the-art technology. Every component undergoes strict quality and environmental inspection before assembly and each instrument is fully tested prior to shipment. Our environmental management system is certified to DIN EN ISO 14001.

Use of the product in accordance with the intended use LFH:

Use the pressure transmitter to transform hydrostatic pressure into an electrical signal.

Knowledge required:

Install and start the pressure transmitter only if you are familiar with the relevant regulations and directives of your country and if you have the qualification required. You have to be acquainted with the rules and regulations on measurement and control technology and electric circuits, since this pressure transmitter is "electrical equipment" as defined by EN 50178. Depending on the operating conditions of your application you have to have the corresponding knowledge, e.g. of aggressive media.

2. A quick overview for you

If you want to get a quick overview, read **Chapters 3, 5, 7 and 10**. There you will get some short safety instructions and important information on your product and its starting. **Read these chapters in any case.**

3. Signs, symbols and abbreviations



Warning

Potential danger of life or of severe injuries.



Notice, important information, malfunction.



The product complies with the applicable European directives.

- 2-wire Two connection lines are intended for the voltage supply.
The supply current is the measurement signal.
- 3-wire Two connection lines are intended for the voltage supply.
One connection line is intended for the measurement signal.
- 4-wire Two connection lines are intended for the voltage supply.
Two connection lines are intended for the measurement signal.

4. Function

LFH: Submersible pressure transmitter for level measurement

The hydrostatic pressure prevailing within the application is transformed into a standardised electrical signal through the deflection of the diaphragm, which acts on the sensor element with the power supply fed to the transmitter. This electric signal changes in proportion to the hydrostatic pressure and can be evaluated correspondingly.

5. For your safety



Warning

- Select the appropriate pressure transmitter with regard to scale range, performance and specific measurement conditions prior to installing and starting the instrument.
- Observe the relevant national regulations (e.g.: EN 50178) and observe the applicable standards and directives for special applications (e.g. with dangerous media such as acetylene, flammable gases or liquids and toxic gases or liquids and with refrigeration plants or compressors). If you do not observe the appropriate regulations, serious injuries and/or damage can occur!
- Open pressure connections only after the system is without pressure!
- Please make sure that the pressure transmitter is only used within the overload threshold limit all the time!
- Observe the ambient and working conditions outlined in section 7 "Technical data".
- Ensure that the pressure transmitter is only operated in accordance with the provisions i.e. as described in the following instructions.
- Do not interfere with or change the pressure transmitter in any other way than described in these operating instructions.
- Remove the pressure transmitter from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation
- Take precautions with regard to remaining media in and at removed pressure transmitter. Remaining media in and at the pressure transmitter may be hazardous or toxic!
- Have repairs performed by the manufacturer only.
- Open circuit before removing connector / cover.

6. Packaging

Has everything been supplied?



Check the scope of supply:

- Completely assembled level probe
- Inspect the pressure transmitter for possible damage during transportation. Should there be any obvious damage, inform the transport company and SICK without delay.
- Keep the packaging, as it offers optimal protection during transportation (e.g. changing installation location, shipment for repair).
- Ensure that the connection contacts will not be damaged.

7. Starting, operation

Diaphragm test for your safety

It is necessary that before starting the pressure transmitter you check the diaphragm, as this is a safety-relevant component.



- Pay attention to any liquid leaking out, for this points to a diaphragm damage.
- Use the pressure transmitter only if the diaphragm is undamaged.
- Use the pressure transmitter only if it is in a faultless condition as far as the safety-relevant features are concerned.



- The protection cap (A) protects the recessed diaphragm (B) from damage during transport and immersion. Remove the protection cap if used with highly viscous or contaminated media.
- An additional strain relief is not necessary because the cable has a max. tensile strength of 1000 N (500 N with FEP).
- Any ingress of liquids or moisture into the open end of the ventilation tube of the connection cable shall be avoided. Where necessary, a vent tube filter shall be attached.
- Specifically the connection cable is to be handled with great care. Any damage has to be avoided by all means.

Mechanical connection



Product label (example)



Generally the serial number on the product label applies.

Electrical connection



- Operate the pressure transmitter with a shielded cable and ground the shield at least on one side of the cable, if the cable is longer than 30m (2-wire) or 3m (3- or 4-wire), or if it is run outside of the building.
- Use power supplies which guarantee reliable electrical isolation of the operating voltage as per IEC/DIN EN 60204-1. Consider also the general requirements for PELV circuits in accordance with IEC/DIN EN 60204-1. Alternative for North America: The connection may also be made to "Class 2 Circuits" or "Class 2 Power Units" according to CEC (Canadian Electrical Code) or NEC (National Electrical Code).
- There must be no differences in potential between medium/tank and the grounding of the junction box and the control cabinet when the shield of the cable is applied.
- Ingress protection IP 68 per IEC 60529
- Please make sure that the ends of cables do not allow any ingress of moisture.



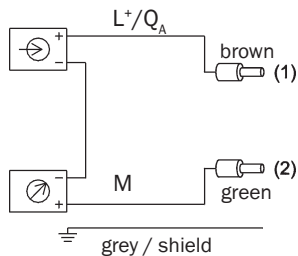
Power supply



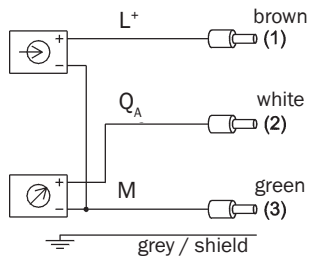
Load (e.g. display)

L^+/Q_A Positive supply / measurement connection
 M Negative supply / measurement connection

2-wire



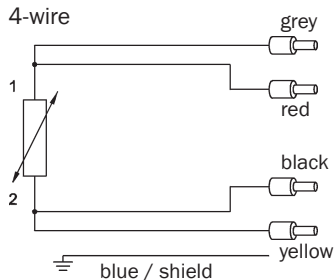
3-wire



Vented PUR-cable tensile strength 1000 N
 (500 N with FEP-cable)

Pt-100-element

4-wire



Pressure ranges	LFH												
Pressure ranges in bar ¹⁾	0.1 ²⁾	0.16 ²⁾	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16 ²⁾	25 ²⁾
Over pressure safety	1	1.5	2	2	4	5	10	10	10 ³⁾ /17	10 ³⁾ /35	10 ³⁾ /35	35	35
Burst pressure	2	2	2.4	2.4	4.8	6	12	12	12 ³⁾ /20.5	12 ³⁾ /42	12 ³⁾ /42	42	42

¹⁾ 1 bar = 10.2 mH₂O (meter water column)

²⁾ Only with enhanced version.

³⁾ With standard version and enhanced version with FEP cable.

Technical data	LFH	
Materials		
■ Wetted parts	Stainless steel	
■ Pressure connection/diaphragm	Stainless steel	
■ Protection cap	PA	
■ Cable	PUR (tensile strength 1000 N), FEP optional available (tensile strength 500 N) ⁴⁾	
Supply voltage	10 ... 30 V DC	
	14 ... 30 V DC with output signal 0 ... 10 V ⁴⁾	
Power supply	4 ... 20 mA, 2-wire	$R_A \leq (L+ - 10 \text{ V}) / 0.02 \text{ A} - (0.14 \times \text{cable length in m}) [\text{Ohm}]$
	0 ... 10 V, 3-wire optional ⁴⁾	$R_A > 100 \text{ kOhm}$
	0 ... 5 V, 3-wire optional ⁴⁾	$R_A > 100 \text{ kOhm}$
	Pt 100, 4-wire optional ⁴⁾	I max. = 3 mA, I meas. = 1 mA
Dielectric strength	500 V DC ⁵⁾	

⁴⁾ Only with enhanced version.

⁵⁾ Use NEC Class O2 power supply (low voltage and low current max. 100 VA even under fault conditions)

Functional test



The output signal must be proportional to the pressure. If not, this might point to a damage of the diaphragm. In that case refer to chapter 10 „Troubleshooting“.



Warning

- Observe the ambient and working conditions outlined in section 7 „Technical data“.
- Please make sure that the pressure transmitter is only used within the overload threshold limit at all times!

8. Maintenance



- SICK pressure transmitters require no maintenance.
- Have repairs performed by the manufacturer only.

9. Troubleshooting



Warning

- Take precautions with regard to remaining media in and at removed pressure transmitters. Remaining media may be hazardous or toxic!
- Remove the pressure transmitter from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation.
- Have repairs performed by the manufacturer only.



Do not insert any pointed or hard objects into the pressure port for cleaning to prevent damage to the diaphragm.

Please verify in advance if pressure is being applied (valves/ ball valve etc. open) and if the right voltage supply and the right type of wiring (2-wire/ 3-wire/4-wire) has been chosen.

Failure	Possible cause	Procedure
Signal span dropping off/too small	Diaphragm is damaged, e.g. through impact, abrasive/aggressive media; corrosion of diaphragm/pressure connector; transmission fluid missing.	Contact the manufacturer and replace the instrument
Signal span drops off	Moisture present (e.g. at the cable tail)	Install the cable correctly
Signal span erratic or incorrect	Working temperature too high/too low	Ensure permissible temperatures as per the Operating Instructions
Abnormal zero point signal	Medium or ambient temperature too high/too low	Control the internal temperature of the instrument within the permissible range; observe the allowable temperature error (see Operating Instructions)
	Diaphragm is damaged, e.g. through impact, abrasive/aggressive media; corrosion of diaphragm/pressure connector.	Replace instrument
	Working temperature too high/too low	Ensure permissible temperatures as per the Operating Instructions
Zero point signal unstable/ too low/high	Moisture present (e.g. at the cable tail)	Install the cable correctly, filter element insertion
Hot instrument case surface	Permissible ambient or medium temperature exceeded	Ensure permissible ambient/medium temperature limits are observed (see Operating Instructions)

*) Make sure that after the assembly the unit is working properly. In case the error continues to exist.

If the problem persists, contact our sales department.

Non-risk declaration (for returned goods)

Purge / clean dismantled instruments before returning them in order to protect our employees and the environment from any hazard caused by adherent remaining media.

Service of instruments can only take place when a non-risk declaration has been submitted and fully filled-in. This Return Form contains information on all materials with which the instrument has come into contact, either through installation, test purposes, or cleaning. You can find the non-risk declaration on our internet site www.sick.com).

10. Storage, disposal



When storing or disposing of the pressure transmitter, take precautions with regard to remaining media in removed pressure transmitters. We recommend cleaning the transmitter properly and carefully. Remaining media at the device may be hazardous or toxic!



Storage: Mount the protection cap when storing the pressure transmitter in order to prevent any damage to the diaphragm.



Disposal: Dispose of instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the instrument is supplied.

SICK reserves the right to alter the technical specifications.

Australia

Phone +61 3 9497 4100
1800 33 48 02 - tollfree
E-Mail sales@sick.com.au

Belgium

Phone +32 (0)2 466 55 66
E-Mail info@sick.be

Brasil

Phone +55 11 3215-4900
E-Mail sac@sick.com.br

Ceská Republika

Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

China

Phone +852-2763 6966
E-Mail ghk@sick.com.hk

Danmark

Phone +45 45 82 64 00
E-Mail sick@sick.dk

Deutschland

Phone +49 211 5301-301
E-Mail kundenservice@sick.de

España

Phone +34 93 480 31 00
E-Mail info@sick.es

France

Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Great Britain

Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

India

Phone +91-22-4033 8333
E-Mail info@sick-india.com

Israel

Phone +972-4-999-0590
E-Mail info@sick-sensors.com

Italia

Phone +39 02 27 43 41
E-Mail info@sick.it

Japan

Phone +81 (0)3 3358 1341
E-Mail support@sick.jp

Nederlands

Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

Norge

Phone +47 67 81 50 00
E-Mail austefjord@sick.no

Österreich

Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Polska

Phone +48 22 837 40 50
E-Mail info@sick.pl

Republic of Korea

Phone +82-2 786 6321/4
E-Mail kang@sickkorea.net

Republika Slovenija

Phone +386 (0)1-47 69 990
E-Mail office@sick.si

România

Phone +40 356 171 120
E-Mail office@sick.ro

Russia

Phone +7 495 775 05 34
E-Mail info@sick-automation.ru

Schweiz

Phone +41 41 619 29 39
E-Mail contact@sick.ch

Singapore

Phone +65 6744 3732
E-Mail admin@sicksgp.com.sg

Suomi

Phone +358-9-25 15 800
E-Mail sick@sick.fi

Sverige

Phone +46 10 110 10 00
E-Mail info@sick.se

Taiwan

Phone +886 2 2375-6288
E-Mail sales@sick.com.tw

Türkiye

Phone +90 216 587 74 00
E-Mail info@sick.com.tr

United Arab Emirates

Phone +971 4 8865 878
E-Mail info@sick.ae

USA/Canada/México

Phone +1(952) 941-6780
1 800-325-7425 - tollfree
E-Mail info@sickusa.com

More representatives and agencies
in all major industrial nations at
www.sick.com