

LS-10,
LH-10

Level probe



LS-10



LH-10

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WIKA

Part of your business

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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.wika.de / www.wika.com
- The product data sheet is designated as PE 81.09
- Contact WIKA for additional technical support (+49) 9372 / 132-295

With special model number, e.g. LS-10000 or LH-10000, 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.

WIKA 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 LS-10, LH-10:

Use the pressure transmitter to transform the 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



Potential danger of life or of severe injuries.



Notice, important information, malfunction.



The product complies with the applicable European directives.



CSA
Canadian Standard Association
The product was tested and certified by CSA International. It complies with the applicable Canadian standards on safety.
Certificate-No.: 1360840.

- 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

- LS-10: Submersible pressure transmitter for level measurement, standard version.
LH-11: Submersible pressure transmitter for level measurement, High Performance.

Function: 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



- 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 removed pressure transmitter. Remaining media in the pressure port may be hazardous or toxic!**
- Have repairs performed by the manufacturer only.
- Open circuit before removing connector / cover.

Information about material consistency against corrosion and diffusion can be found in our WIKA-Handbook, 'Pressure and Temperature Measurement'.

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 WIKA 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 test the diaphragm, as this is a **safety-relevant component**.



Warning

- 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.

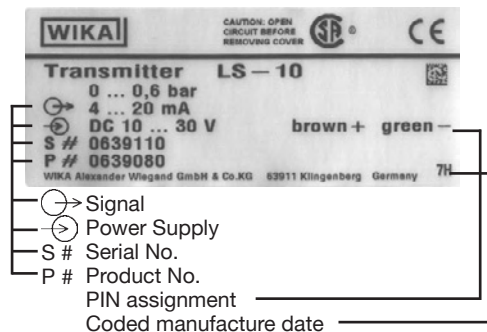
Mechanical connection



- The protection cap (A) protects the secluded diaphragm (B) from damaging the level probe during transport and immersion. Remove the protection cap if used with 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).

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Product label (example)



Generally the serial number on the product label applies. If there is no serial number on the product label, the number on the hexagon will apply.

Electrical connection



- Operate the pressure transmitter with a shielded cable and earth 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 with flying leads do not allow any ingress of moisture.

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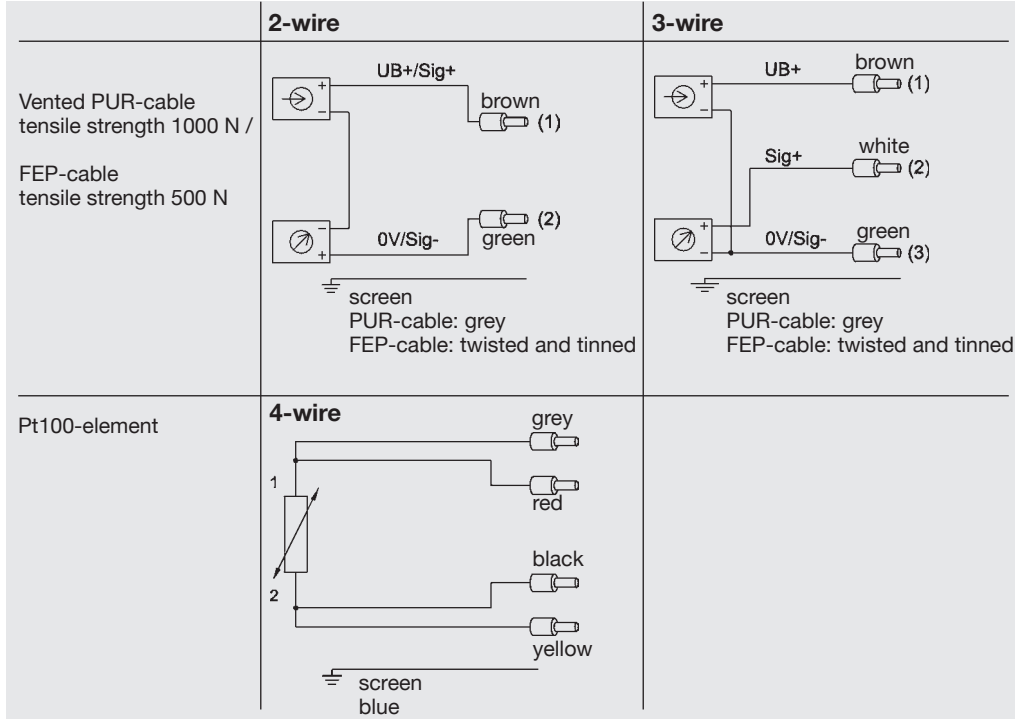
Power supply



Load (e.g. display)

UB+/Sig+ Positive supply / measurement connection

OV/Sig- Negative supply / measurement connection



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Specifications

Model LS-10 / LH-10

Pressure ranges														
» LS-10 / {LH-10 with FEP cable}	bar ¹⁾	0.25	0.4	0.6	1	1.6	2.5	4	6	10				
Over pressure safety	bar ¹⁾	2	2	4	5	10	10	10	10	10				
Burst pressure	bar ¹⁾	2.4	2.4	4.8	6	12	12	12	12	12				
Pressure ranges														
» LH-10 with PUR cable	bar ¹⁾	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25
Over pressure safety	bar ¹⁾	1	1.5	2	2	4	5	10	10	17	35	35	35	35
Burst pressure	bar ¹⁾	2	2	2.4	2.4	4.8	6	12	12	20.5	42	42	42	42

¹⁾ 1 bar = 10.2 mH₂O

		Model LS-10	Model LH-10
Materials			
■ Wetted parts		Stainless steel	Stainless steel {Hastelloy}
■ Pressureconnection/diaphragm		Stainless steel	Stainless steel {Hastelloy}
■ Protection cap		PA	PA {stainless steel} {Hastelloy}
■ Cable		PUR	PUR {FEP}
Power supply UB	UB in VDC	10 < UB ≤ 30	10 < UB ≤ 30 (14 ... 30 with signal output 0 ... 10 V) (5 ... 30 with battery operation, signal output 0.5 ... 4.5 V)
Signal output		4 ... 20 mA, 2-wire	4 ... 20 mA, 2-wire 0 ... 20 mA, 3-wire {0 ... 5 V, 3-wire} {0 ... 10 V, 3-wire} {0.5 ... 4.5 V, 3-wire, with battery operation} ²⁾
			{Pt100, 4-wire; IEC 60751}

²⁾ For pressure ranges ≥ 0 ... 0.25 bar.

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Specifications Model LS-10 / LH-10

Pt100 → only model LH-10				
■ I max	mA	-		3
■ I meas	mA	-		1
Max. load RA	RA in Ohm			
Current signal output	UB in VDC	RA ≤ (UB - 10 V) / 0.02 A - (0.14 Ohm x cable length in m)		
Voltage signal output		-		RA > 100 kOhm
Insulation voltage	VDC	500 ³⁾		500 ³⁾
		³⁾ Use NEC Class 02 power supply (low voltage and low current max. 100 VA even under fault conditions)		
Accuracy	% of span	≤ 0.5 ⁴⁾	≤ 0.25 ⁴⁾ (≤ 0.5 with pressure ranges < 0,25 bar)	
		⁴⁾ Including non-linearity, hysteresis, zero point and full scale error (corresponds to error of measurement per IEC 61298-2). Adjusted in vertical mounting position with lower pressure connection.		
Non-linearity	% of span	≤ 0.2 (BFSL) according to IEC 61298-2		
Non-repeatability	% of span	≤ 0.1		
1-year stability	% of span	≤ 0.2 (at reference conditions)		
Permissible temperature of Medium ⁵⁾		-10 ... +50 °C	+14 ... +122 °F	-10 ... +50 °C +14 ... +122 °F {-10 ... +85 °C option FEP-cable} {+14 ... +185 °F option FEP-cable}
Storage ⁵⁾		-30 ... +80 °C	-22 ... +176 °F	-30 ... +80 °C -22 ... +176 °F
		⁵⁾ Also complies with EN 50178, Tab. 7, Operation (C) 4K4H, Storage (D) 1K4, Transport (E) 2K3		
Compensated temp range		0 ... +50 °C	+32 ... +122 °F	0 ... +50 °C +32 ... +122 °F
Temperature coefficients within compensated temp range				
■ Mean TC of zero	% of span	≤ 0.2 / 10 K (< 0.4 for pressure range ≤ 250 mbar)		
■ Mean TC of range	% of span	≤ 0.2 / 10 K ≤ 0.2 / 10 K		

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Specifications Model LS-10 / LH-10

CE- conformity			
■ EMC directive		2004/108/EEC, EN 61 326 Emission (Group 1, Class B) and Immunity (Industrial locations)	
Wiring protection			
■ Short-circuit proofness		Sig+ towards UB-	
■ Reverse polarity protection		UB+ towards UB-	
			{Lightning protection EN 61000-4-5; 1,5J}
Weight	kg		
■ Level probe		Approx. 0.18	Approx. 0.20
■ Cable		Approx. 0.08	Approx. 0.08
■ Additional weight		Approx. 0.50	Approx. 0.50

{ } Items in curved brackets are optional extras for additional price.

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“.



- 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!

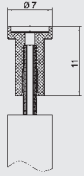
8. Maintenance, accessories



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

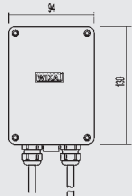
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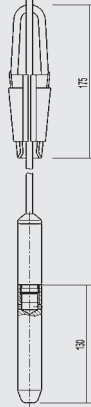
71 93 131

The optional filter element for self-mounting avoids the ingress of pollution and water into the venting tube for the pressure compensation to the atmosphere.



24 59 686

The optional cable box with weather protection IP 67 with venting element (NEMA 4) is suitable for mounting outside of the shafts and tanks or directly in dry control boxes.



20 74 257

For mechanical assembly of the level probe a cable straining clamp is optionally available.

15 24 399

In order to increase the mass of the level probe an additional mass (approx. 500 g = 1.1 lb.) can be screwed on.

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9. Trouble shooting



Warning

- Take precautions with regard to remaining media in removed pressure transmitters. Remaining media in the pressure port 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

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Failure	Possible cause	Procedure
Hot instrument case surface	Permissible ambient or medium temperature exceeded	Ensure permissible ambient/medium temperature limits are observed (see Operating Instructions)

In case of unjustified reclamation we charge the reclamation handling expenses.

*) Make sure that after the assembly the unit is working properly. In case the error continues to exist send in the instrument for reparation (or replace the unit).

If the problem persists, contact our sales department.

USA, Canada: If the problem continues, contact WIKA or an authorized agent for assistance. If the pressure transmitter must be returned obtain an RMA (return material authorization) number and shipping instructions from the place of purchase. Be sure to include detailed information about the problem. Pressure transmitters received by WIKA without a valid RMA number will not be accepted.

Process material certificate (Contamination 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 safely when a Product Return Form 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 Product Return Form on our internet site (www.wika.de / www.wika.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 in the pressure port 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.

WIKA reserves the right to alter these technical specifications.

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