

# Conductive leakage detectors of the Leckstar range

- for installation in normally dry environments



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# Model overview

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- for conductive liquids
- for installation in normally dry environments

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## **Leakage detectors w i t h o u t cable break monitoring**

- for conductive liquids
- for installation in normally dry environments

## **Leakage detection with “Leckstar” point sensors**

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**The units described in this documentation may only be installed, connected and started up by suitably qualified personnel!**

**Subject to deviations from the diagrams and technical data.**

**The details in this brochure are product specification descriptions and do not constitute assured properties in the legal sense.**



# Leakage detection with "Leckstar" point sensors

Application examples with plate electrodes

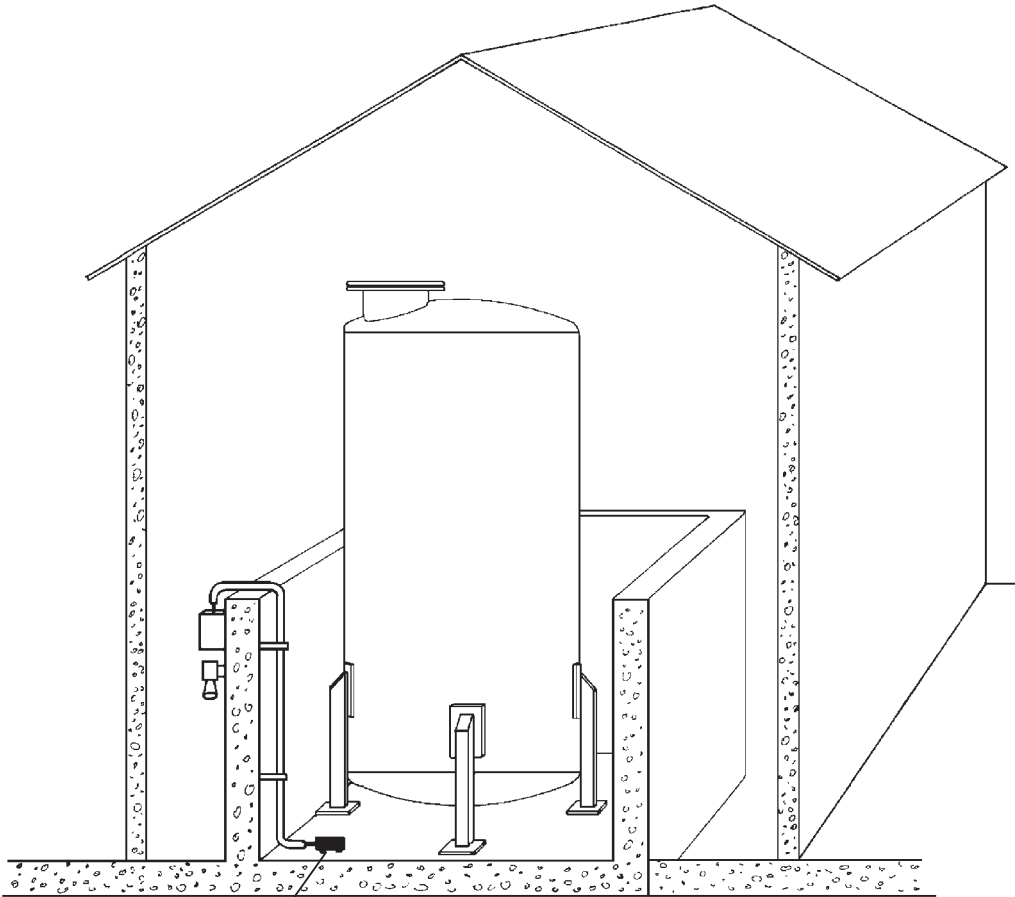


Plate electrode

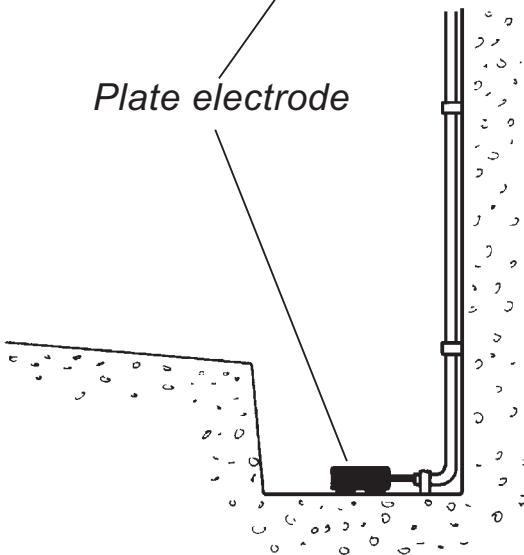
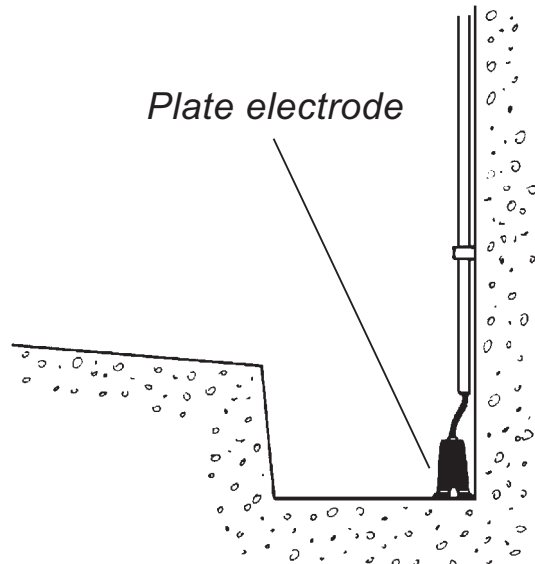
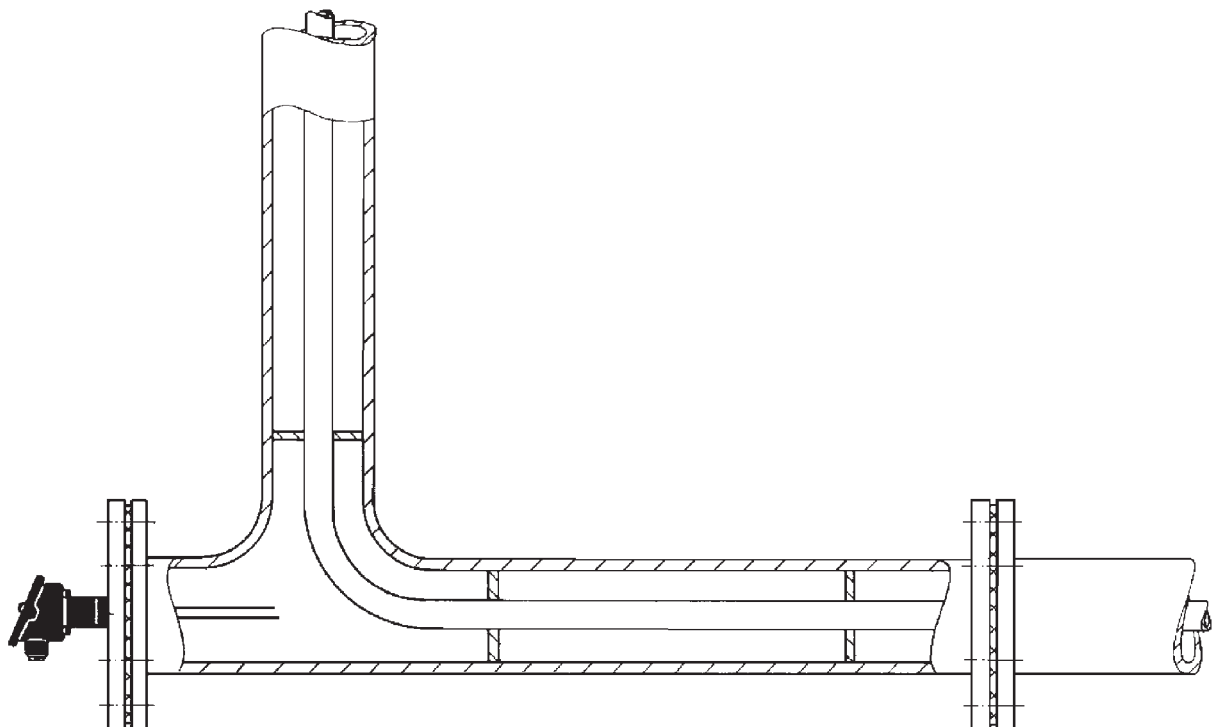
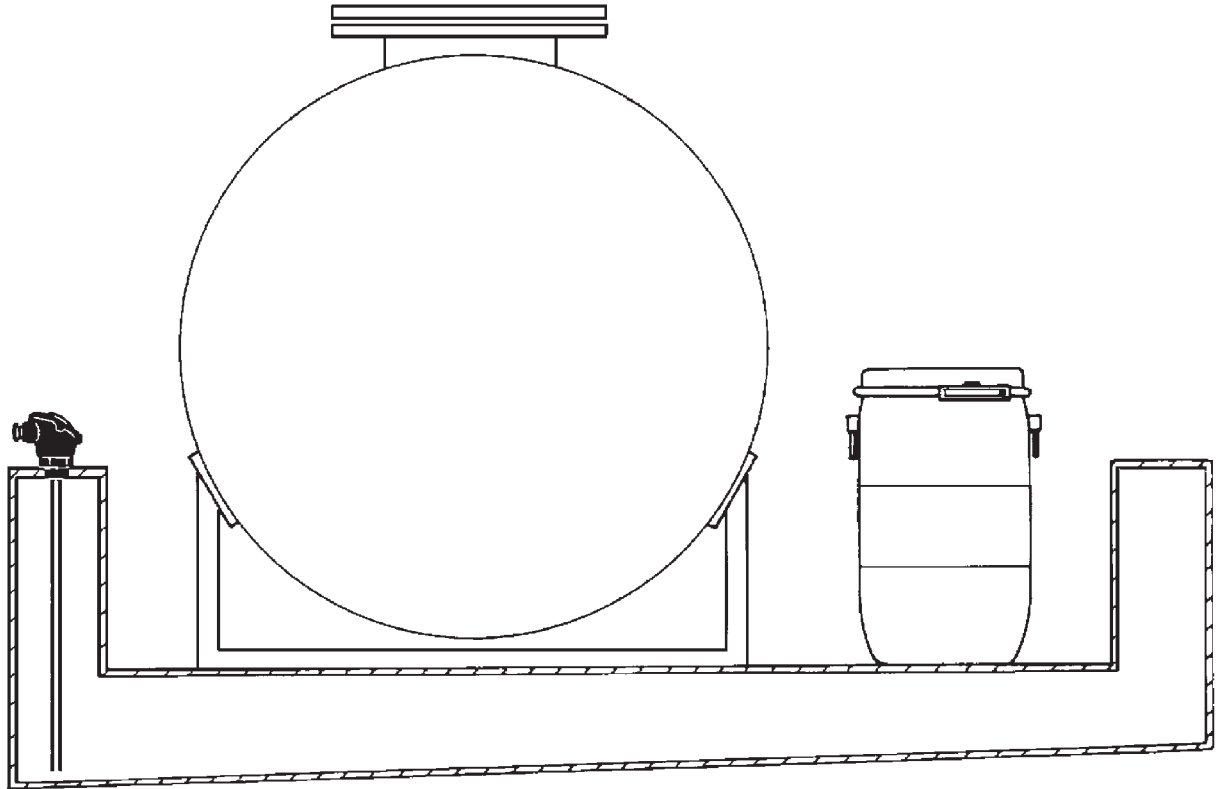


Plate electrode



# Leakage detection with “Leckstar” point sensors

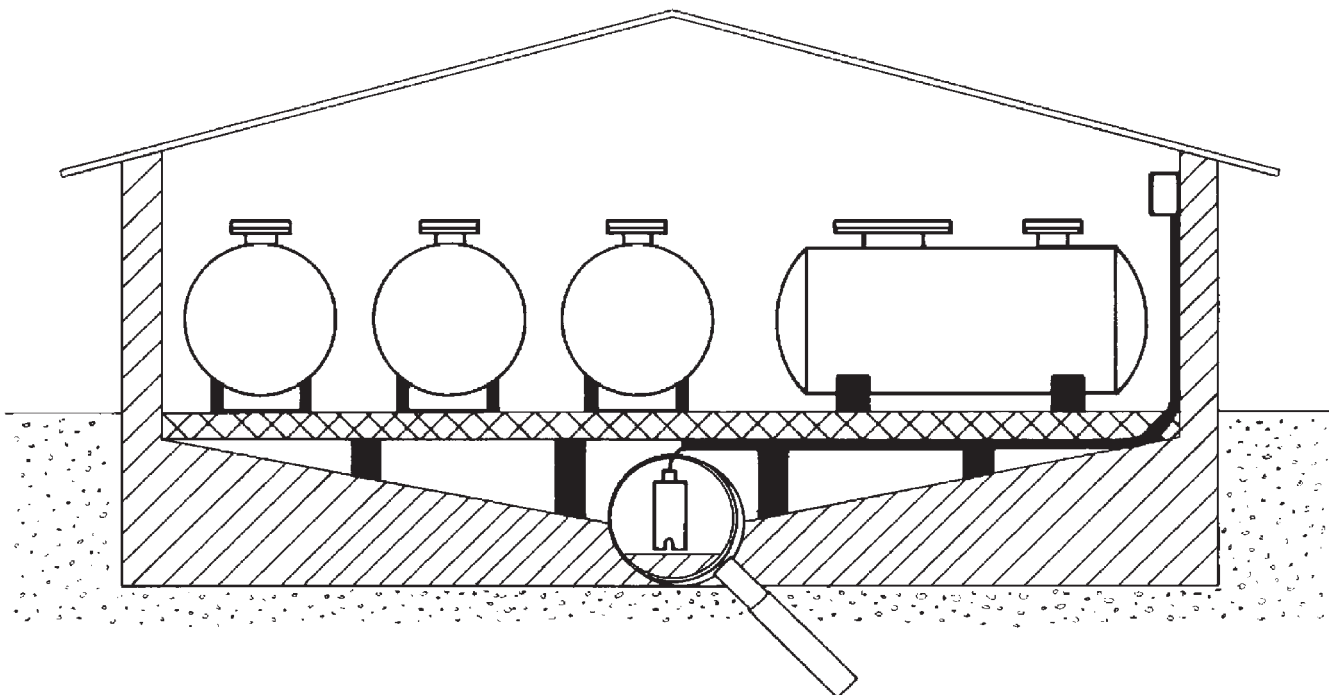
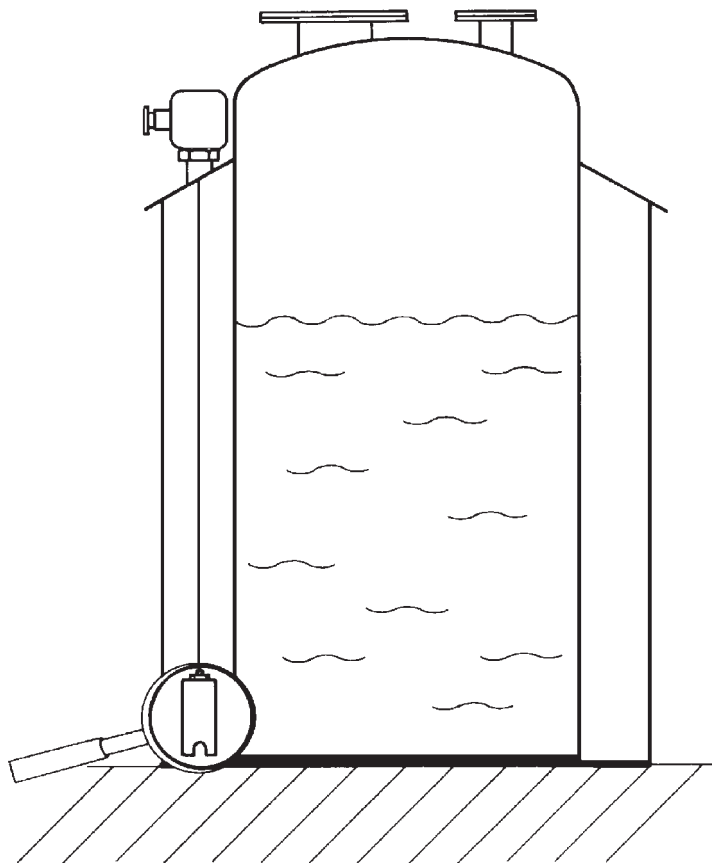
Application examples with rod electrodes





# Leakage detection with “Leckstar” point sensors

Application examples with suspension electrodes





# Plate electrodes for leakage detection

Plate electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Plate electrodes should only be used in normally dry environments. The electrode plates must point downwards. They can be used on floors or false ceilings.

If the two electrode plates of a plate electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.



**PE-Z10**  
plate electrode,  
connection side



**PEK-Z10**  
plate electrode,  
connection side



**PE or PE-Z10**  
plate electrode,  
sensor side



**WDX-Z10**  
plate electrode

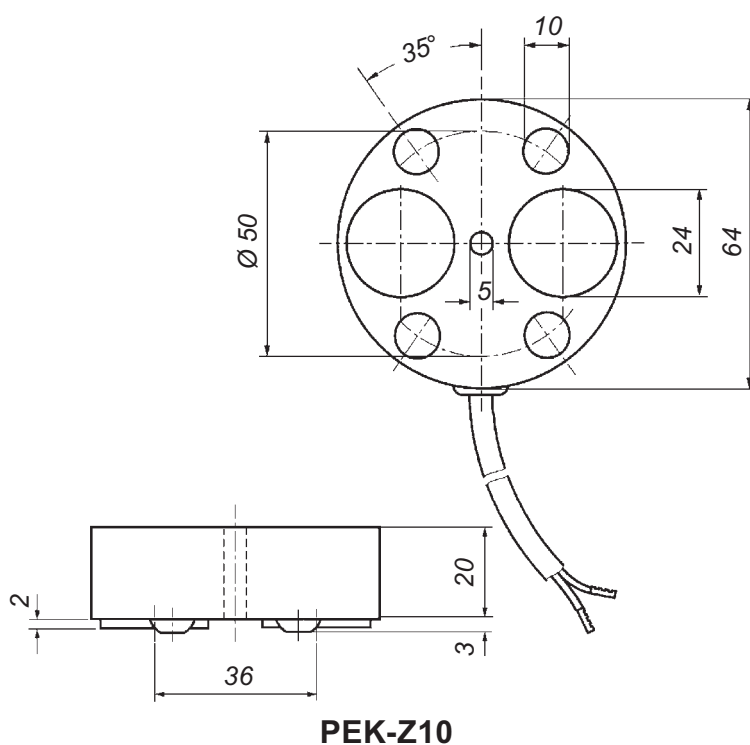
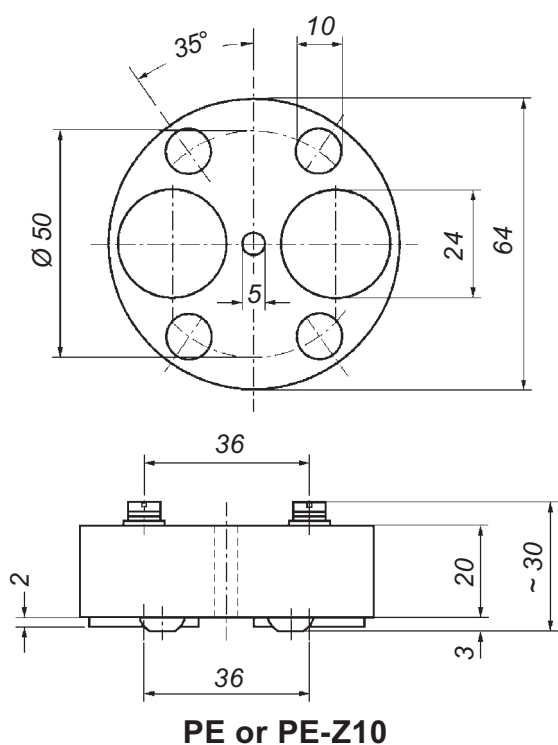


# PE, PE-Z10 and PEK-Z10 plate electrodes

The PE, PE-Z10 and PEK-Z10 plate electrodes are each fitted with two separate electrodes in the form of two electrode plates: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode plates, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

The PE-Z10 or PEK-Z10 plate electrode or the plate electrodes combination PE + PE-Z10 or PE + PEK-Z10 may only be connected to either the Leckstar 101 or Leckstar 101/S electrode relay. The connection must be made in line with the circuit diagrams on page 20 or 22.

Technical data	PE	PE-Z10	PEK-Z10
Design	1 control electrode and 1 earth electrode		
Electrode plates	stainless steel 316 Ti		
Housing	PP and cast resin		
Electrical connection	screw-type/crimp connection		connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	- 20°C to + 60°C		
Cable break monitoring	without	with	with
	integrated Z10 cable break monitoring unit		
Max. length of connecting cable between electrode relay and PE-Z10 or PEK-Z10	1,000 metres		



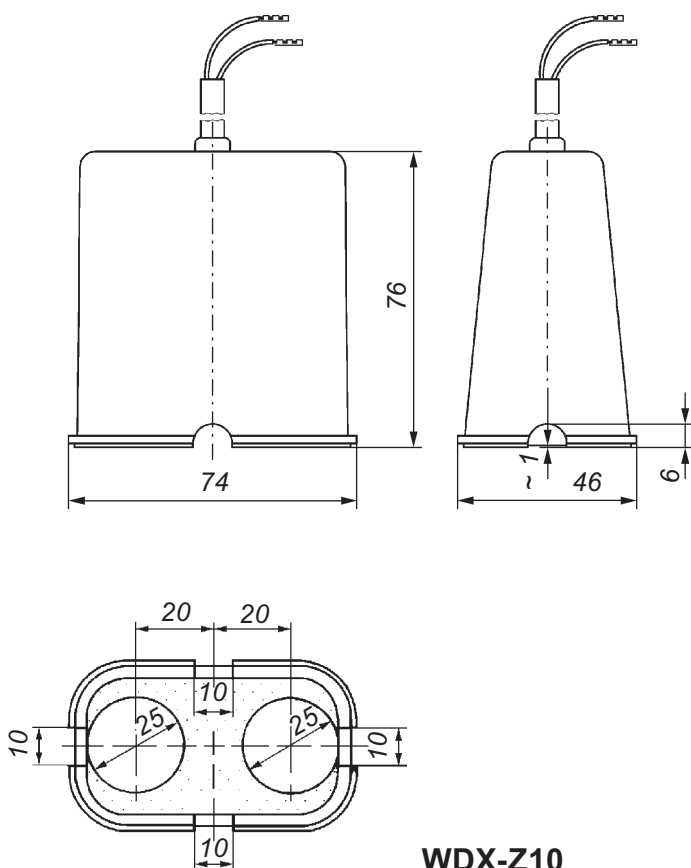


# Jola WDX-Z10 plate electrode

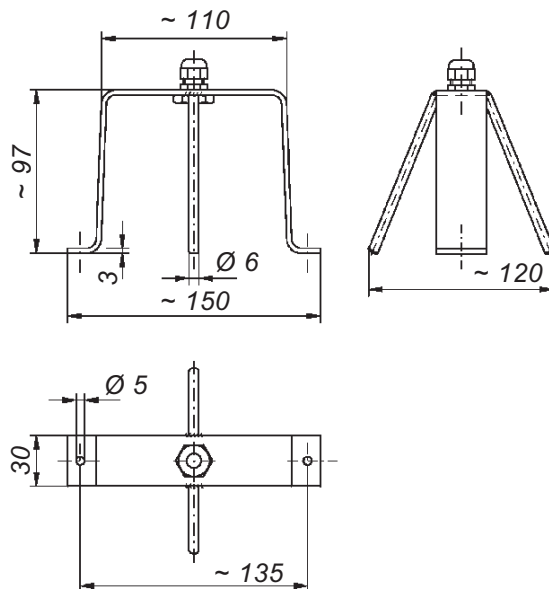
The WDX-Z10 plate electrode is fitted with two separate electrodes in the form of two electrode plates: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode plates, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

**The WDX-Z10 plate electrode may only be connected to either the Leckstar 101 or Leckstar 101/S electrode relay.**

Technical data	WDX-Z10
Design	1 control electrode and 1 earth electrode
Electrode plates	stainless steel 316 Ti
Housing	PP and cast resin
Weight of electrode	approx. 630 g
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	- 20°C to + 60°C
<b>Cable break monitoring</b>	<b>with integrated Z10 cable break monitoring unit</b>
Mounting accessory	stand (optional)
<b>Max. length of connecting cable between electrode relay and WDX-Z10</b>	<b>1,000 metres</b>



**Optional: mounting stand**  
(diagrams with smaller scale compared to adjacent drawings)





# Rod electrodes for leakage detection

Rod electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Rod electrodes should only be used in normally dry environments. They can be installed from the top or from the side. In both cases, it must be ensured that the rod tips are just above the floor to be monitored.

If the two non-insulated electrode rod sensor surfaces of a rod electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.

SE 2 3/4" /M-Z10



SE 2 M-Z10



S 2 M/PP-Z10



S 2 M/PVDF-Z10



S 2 AM-Z10



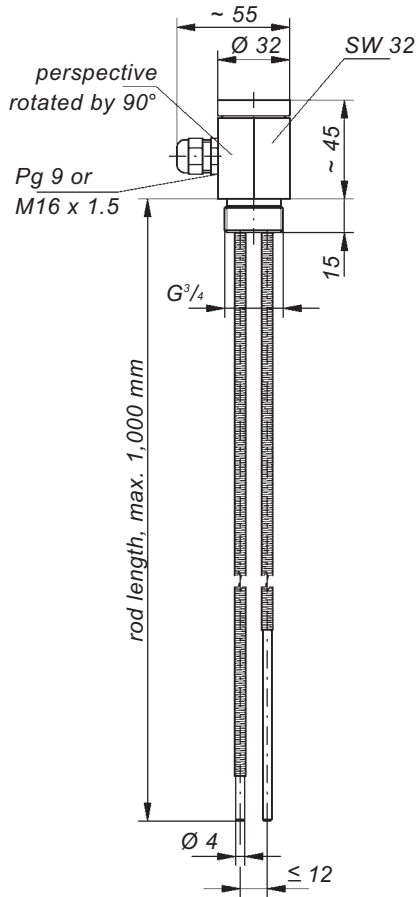
## SE 2<sup>3/4</sup>"/M-Z10, SE 2 M-Z10, S 2 M/PP-Z10, S 2 M/PVDF-Z10 and S 2 AM-Z10 rod electrodes

The SE 2<sup>3/4</sup>"/M-Z10, SE 2 M-Z10, S 2 M/PP-Z10, S 2 M/PVDF-Z10 and S 2 AM-Z10 rod electrodes are each fitted with two separate electrodes in the form of two electrode rods: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode rods, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

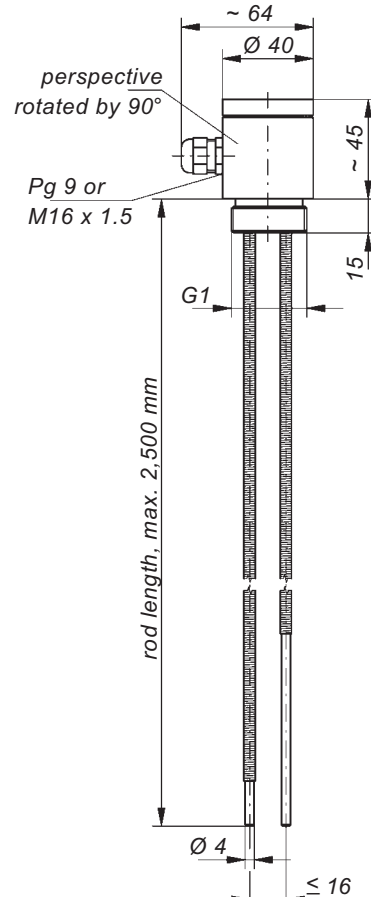
**The SE 2<sup>3/4</sup>"/M-Z10, SE 2 M-Z10, S 2 M/PP-Z10, S 2 M/PVDF-Z10 or S 2 AM-Z10 rod electrode may only be connected to either the Leckstar 101 or Leckstar 101/S electrode relay.**

Technical data	SE 2 <sup>3/4</sup> "/M-Z10	SE 2 M-Z10	S 2 M/PP-Z10	S 2 M/PVDF-Z10	S 2 AM-Z10
Design	1 control electrode and 1 earth electrode				
Electrode rods	2 rods made of stainless steel 316 Ti; other materials (e.g. titanium, Hastelloy, Monel or tantalum) on request; each 4 mm in dia., covered with polyolefin shrinkdown tubing (shrinkdown tubing made of PVDF or PTFE on request)				
Lengths	on request (measured from nipple sealing surface)				
Max. lengths	approx. 1,000 mm		approx. 2,500 mm		
Screw-in nipple	PP, other materials (e.g. PVC, PVDF or PTFE) on request		PP	PVDF	stainless steel 316 Ti, other materials (e.g. titanium, Hastelloy, Monel or tantalum) on request
	G <sup>3/4</sup>	G1, on request: G1 <sup>1/4</sup> , G1 <sup>1/2</sup> or G2	G1	G1	G1, on request: G1 <sup>1/4</sup> , G1 <sup>1/2</sup> or G2
Electrical connection	connection head made of the material of the screw-in nipple, protection class IP 55		connection head made of PP, protection class IP 54; on request: connection head made of cast aluminium, protection class IP 54		
Temperature application range	- 20°C to + 60°C				
Cable break monitoring	with integrated Z10 cable break monitoring unit				
Max. length of connecting cable between electrode relay and rod electrode	1,000 metres				

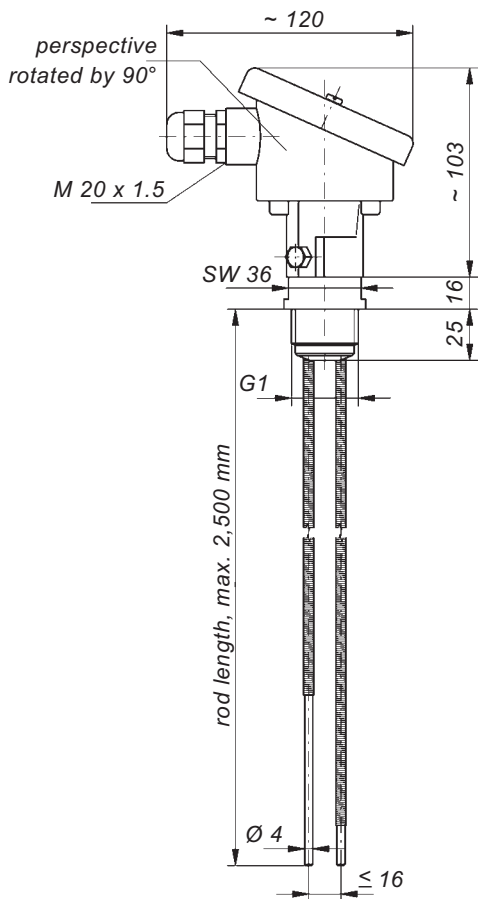
# WITH cable break monitoring



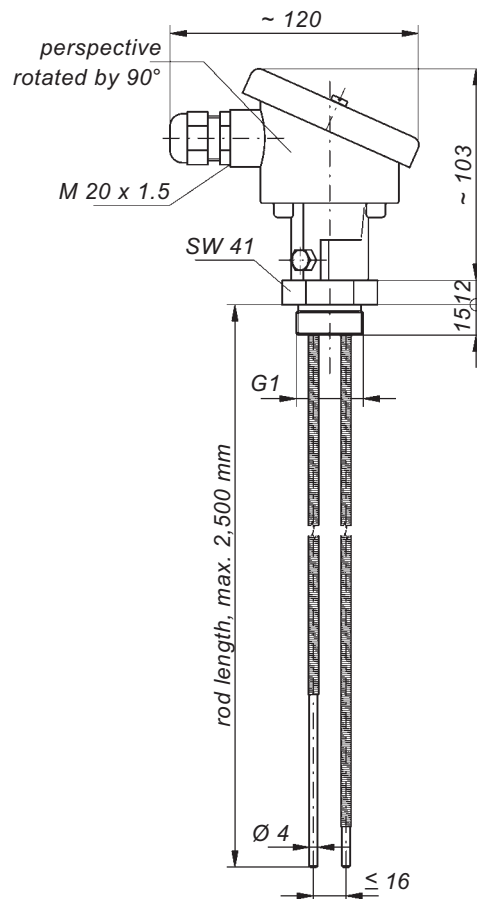
**SE 2 3/4''/M-Z10**



**SE 2 M-Z10**



**S 2 M/PP-Z10 or S 2 M/PVDF-Z10**



**S 2 AM-Z10**



# Suspension electrodes for leakage detection

Suspension electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Suspension electrodes should only be used in normally dry environments. The electrode rods must point downwards.

If the two electrode rods of a suspension electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.



EHW 1-Z10



EHW 2-Z10



EHW 3-Z10

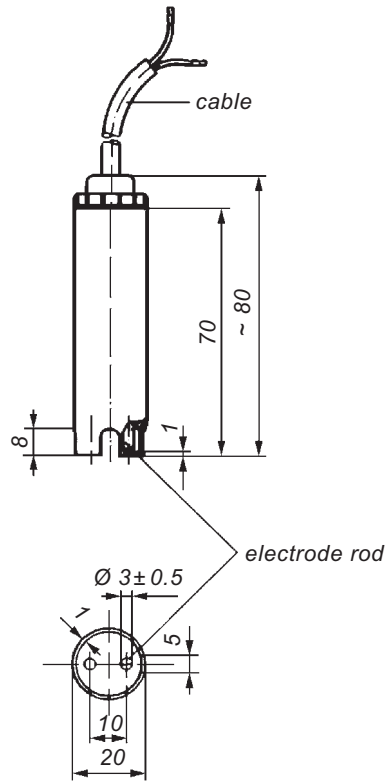


# EHW 1-Z10, EHW 2-Z10 and EHW 3-Z10 suspension electrodes

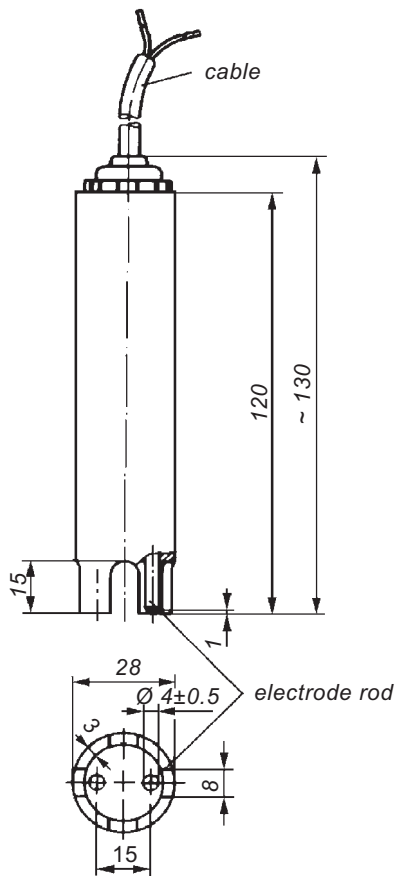
The EHW 1-Z10, EHW 2-Z10 and EHW 3-Z10 suspension electrodes are each fitted with two separate electrodes in the form of two electrode rods: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode rods, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

The EHW 1-Z10, EHW 2-Z10 or EHW 3-Z10 suspension electrode may only be connected to either the Leckstar 101 or Leckstar 101/S electrode relay.

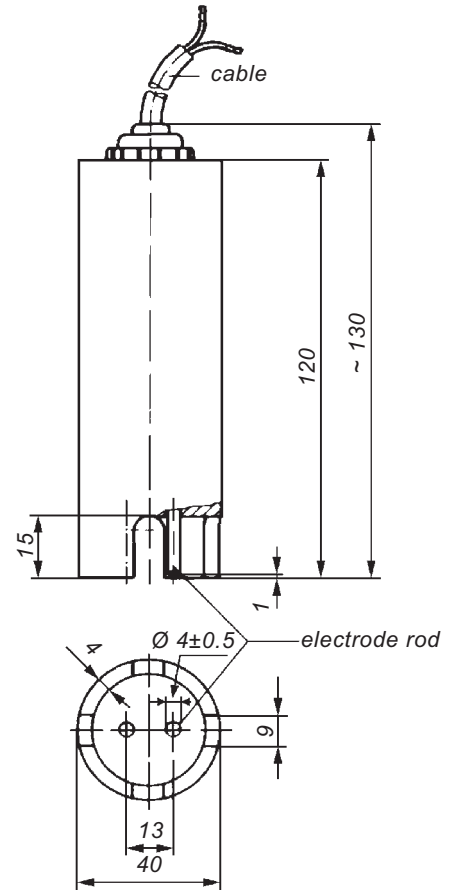
Technical data	EHW 1-Z10	EHW 2-Z10	EHW 3-Z10
Design	1 control electrode and 1 earth electrode		
Electrode rods	2 rods made of stainless steel 316 Ti; other materials (e.g. titanium, Hastelloy, Monel or tantalum) on request		
Housing	PP; other materials (e.g. PVC, PVDF or PTFE) on request, 20 mm Ø x approx. 80 mm high	28 mm Ø x approx. 130 mm high	40 mm Ø x approx. 130 mm high
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; connecting cable made of CM or PTFE on request		
Temperature application range	– 20°C to + 60°C		
Cable break monitoring	with integrated Z10 cable break monitoring unit		
Max. length of connecting cable between electrode relay and suspension electrode	1,000 metres		
Mounting accessories	stuffing glands, housings with integrated stuffing gland or flanges with stuffing gland on request		



**EHW 1-Z10**



**EHW 2-Z10**

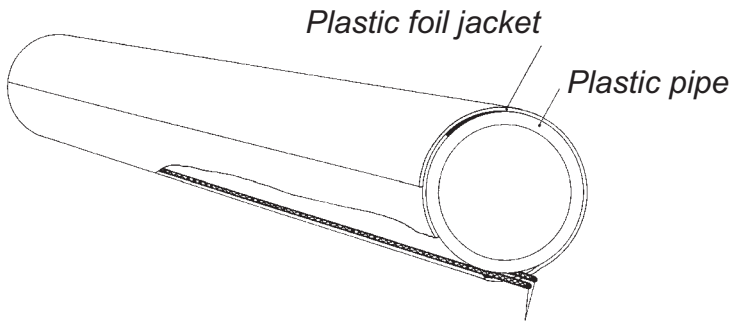


**EHW 3-Z10**

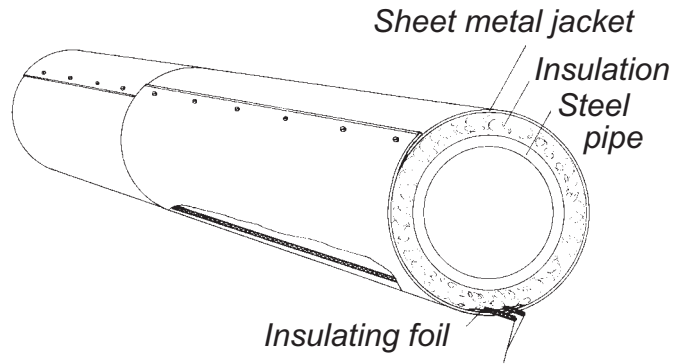


# Leakage detection with "Leckstar" line sensors

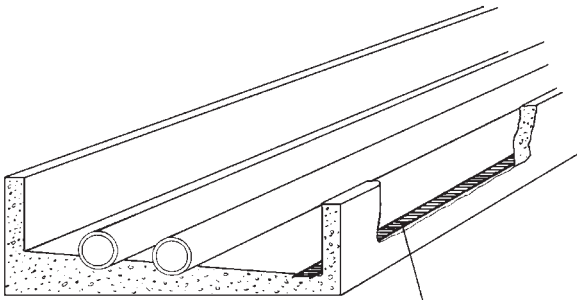
## Application examples with cable electrodes and tape electrodes



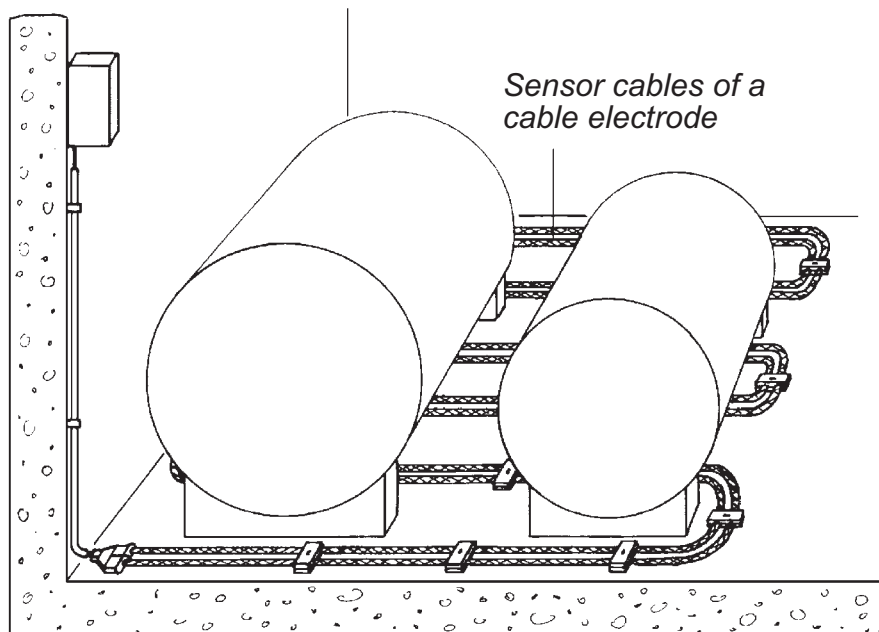
Sensor cables of a cable electrode



Sensor cables of a cable electrode



Sensor tape of a tape electrode, laid in a pipe duct







# Cable and tape electrodes for leakage detection

Cable and tape electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Cable and tape electrodes should only be used in normally dry environments. They can be used on floors, false ceilings, alongside pipes or in double-pipe systems. They should be installed at the lowest point of the potential hazard area which they are intended to monitor.

If the two stainless steel ropes of a cable or tape electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.



KE-Z10  
cable  
electrode

BAE-Z10  
tape  
electrode



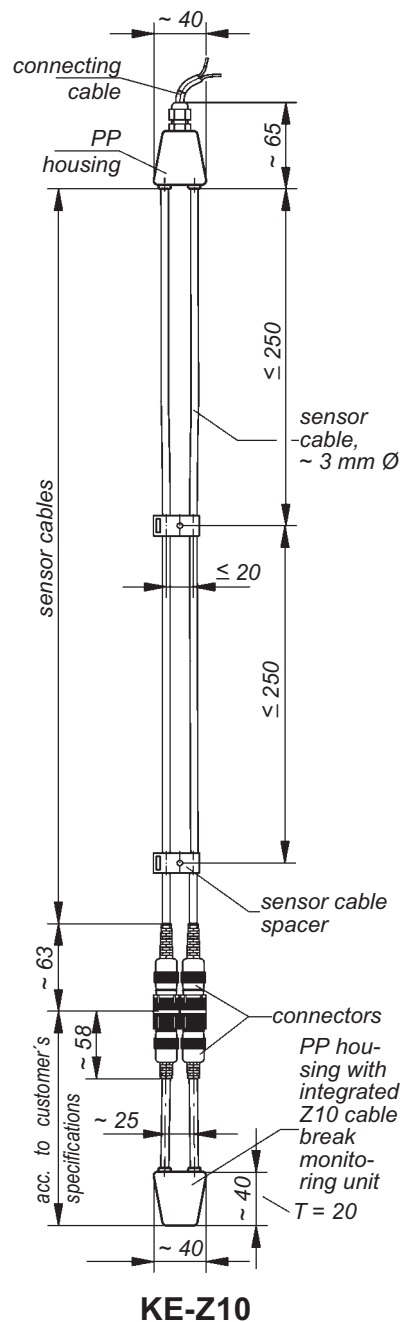
# KE-Z10 cable electrode

The KE-Z10 cable electrode is fitted with two separate electrodes in the form of two sensor cables: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two sensor cables, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

Each of the two sensor cables consists of a stainless steel rope core and a protective sheath made of polyester. This protective sheath is designed to prevent contact of the stainless steel ropes with one another or with an electrically conductive surface (e.g. steel tub, steel pipe etc.) and thus to avoid false alarms, whilst allowing leakage liquid to penetrate through to the stainless steel ropes.

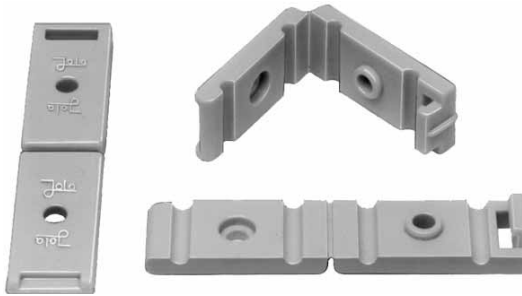
**The KE-Z10 cable electrode may only be connected to either the Leckstar 101 or Leckstar 101/S electrode relay.**

Technical data	KE-Z10
Design	1 control electrode and 1 earth electrode
Sensor cables	2 ropes made of stainless steel 316 or 316 Ti, each 3 mm in dia., each covered by a halogen-free protective polyester sheath; length 2 metres each, longer on request
Max. length of sensor cables when laid in a relatively straight line	<b>100 metres;</b> if the sensor cables are wound round a pipe or tank, the possible lengths may be considerably shorter depending on the type and method of laying.
Supplied mounting accessories	4 sensor cable spacers made of PP per metre of sensor cable
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	- 20°C to + 60°C
Cable break monitoring	<b>with integrated Z10 cable break monitoring unit to monitor the connecting cable and the sensor cables</b>
Max. length of connecting cable between electrode relay and KE-Z10	<b>1,000 metres minus the length of the sensor cable pair</b>

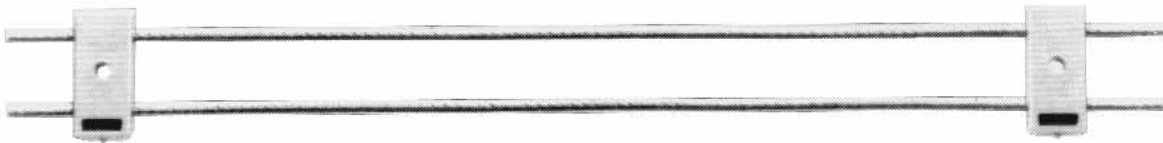


## WITH cable break monitoring

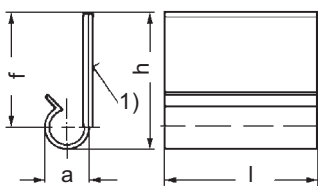
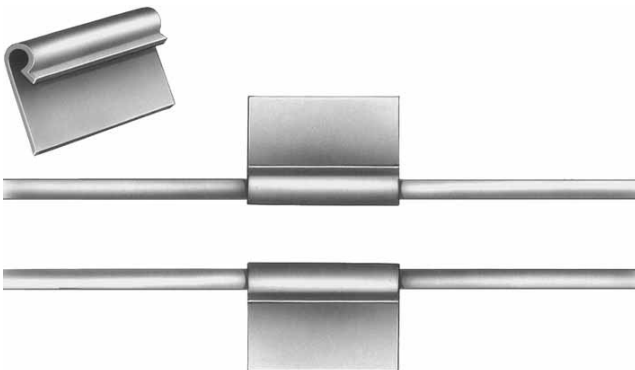
**Supplied mounting accessories:**  
sensor cable spacers



Sensor cables with sensor cable spacers



**Optional mounting accessories:**  
self-adhesive sensor cable fastening clips



1) Self-adhesive foil

$a = 7.6 \text{ mm}$   
 $f = 19.6 \text{ mm}$   
 $h = 22.6 \text{ mm}$   
 $l = 31.8 \text{ mm}$

### Mode of installation of the KE-Z10 cable electrode

The two sensor cables of the cable electrode must be mounted parallel to one another at a distance of approx. 2 cm using the sensor cable spacers, as a greater or lesser spacing affects the response level of the system in the event of leakage.

Only non-conductive materials (e.g. cable ties, insulated cable clips etc.) must be used for installation of the sensor cables.



KE-Z10



## BAE-Z10 tape electrode

The BAE-Z10 tape electrode is fitted with two separate electrodes in the form of two stainless steel ropes: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two stainless steel ropes, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

In contrast to the cable electrode on the previous page, the tape electrode is not fitted with two separate sensor cables. The two stainless steel ropes are integrated in a halogen-free polyester fabric tape which ensures that the spacing between them remains constant. This plastic fabric tape is designed to prevent contact of the stainless steel ropes with one another or with an electrically conductive surface (e.g. steel tub, steel pipe etc.) and thus to avoid false alarms, whilst allowing leakage liquid to penetrate through to the stainless steel ropes.

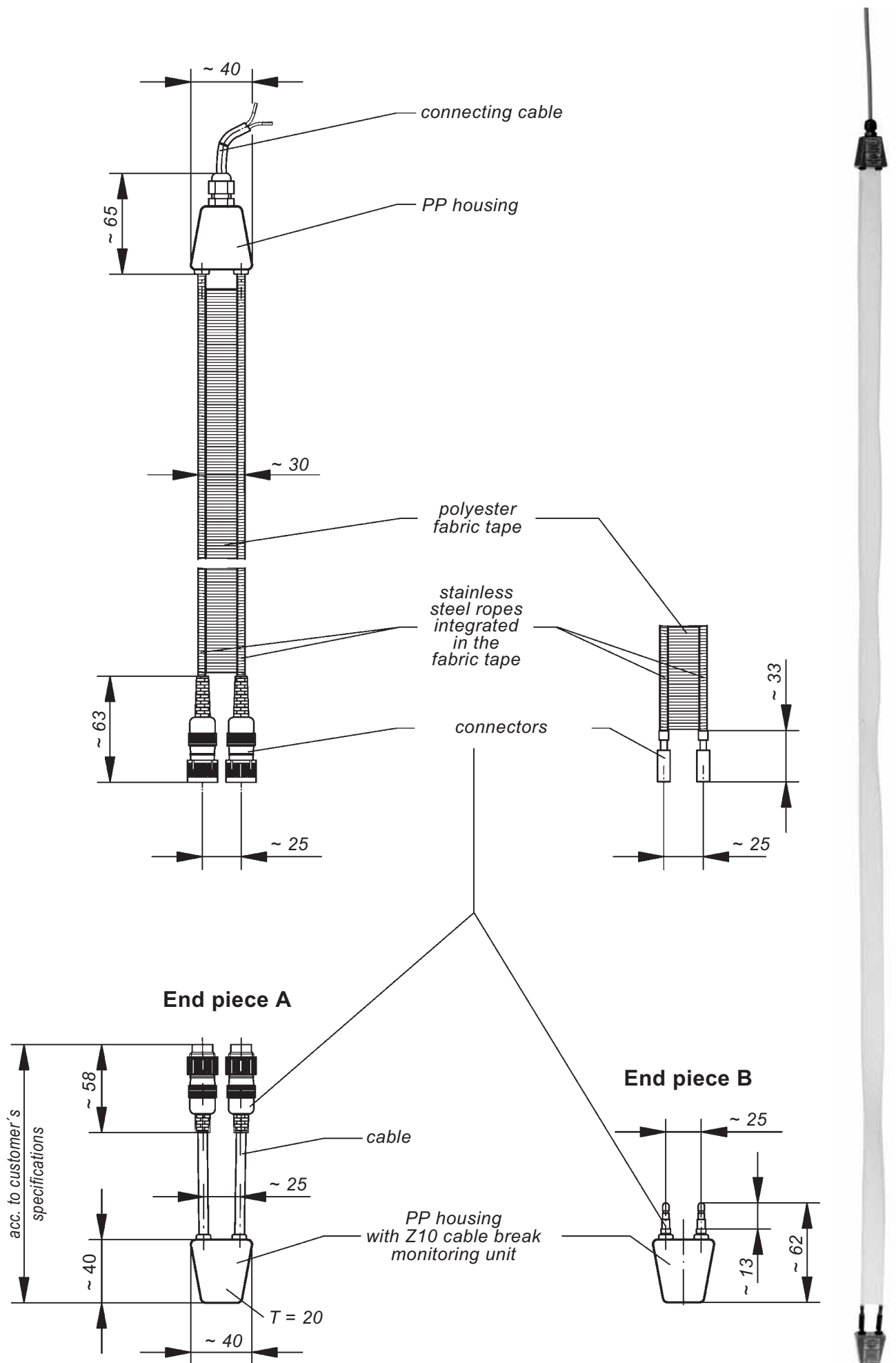
**To avoid false alarms, it is essential that the surroundings of the tape electrodes are absolutely dry under normal circumstances, as the tape electrodes have the ability to bind moisture (including high levels of air humidity).**

**The BAE-Z10 tape electrode may only be connected to either the Leckstar 101 or Leckstar 101/S electrode relay.**

Technical data	BAE-Z10
Design	1 control electrode and 1 earth electrode
Sensor band	2 ropes made of stainless steel 316 or 316 Ti, each 1.5 mm in dia., woven into a halogen-free approx. 30 mm-wide polyester fabric tape at a spacing of approx. 25 mm, length 2 metres, longer on request
Max. length of the sensor tape laid in a relatively straight line	<b>30 metres;</b> if the sensor tape is wound around a pipe or a tank, the possible length may be considerably shorter depending on the type and method of laying.
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	– 20°C to + 60°C
Cable break monitoring	<b>with</b> <b>integrated Z10 cable break monitoring unit to monitor the connecting cable and the sensor tape</b>
Max. length of connecting cable between electrode relay and BAE-Z10	<b>1,000 metres minus the length of the sensor tape</b>

# WITH cable break monitoring

BAE-Z10



# Jola Leckstar 101 electrode relay

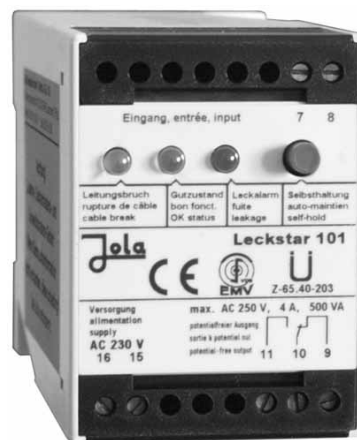
With cable break monitoring feature and switchable self-hold, for the connection of all conductive electrodes with Z10 cable break monitoring unit.

Electrode relay for U-bar mounting or surface mounting, with connection terminals on top, and with 3 built-in LEDs for signalling the operating statuses.

The appliance is designed for switch cabinet installation or mounting in an appropriate protective housing and may therefore not be installed in other locations. It is only suitable for use in clean environments.

### Self-hold:

- If the switch for self-hold is switched on, an alarm is stored. The relay continues to signal the alarm even if the cause of the alarm (e.g. the presence of water or a cable break) is no longer present – in other words, if the sensor is dry again or if the line has contact. The alarm is acknowledged by switching off the switch for self-hold.
- If the switch for self-hold is not switched on, the alarm is not maintained when the cause of the alarm has been remedied but is terminated.



### Technical data

### Leckstar 101

#### Alternative supply voltages

- (AC versions:  
terminals 15 and 16;  
DC versions:  
- terminal 15: –  
- terminal 16: +)

- AC 230 V (delivered if no other supply voltage is specified in the order) or
  - AC 240 V or
  - AC 115 V or
  - AC 24 V or
  - DC 24 V or
  - DC 12 V or
- } in these two cases, the unit must only be connected to a low safety voltage which corresponds to the safety regulations relating to the application
- further supply voltages on request  
approx. 3 VA

#### Power input

#### Electrode connection (terminals 7 and 8)

- no-load voltage
- short-circuit current
- response sensitivity

#### Cable break monitoring Controlled circuit (terminals 9, 10, 11)

- 2 terminals (under safety extra low voltage SELV) acting on 1 output relay with switchable self-hold  
18 V<sub>eff</sub>  $\sqrt{10}$  Hz (safety extra low voltage SELV)  
max. 0.5 mA<sub>eff</sub>  
approx. 30 kohm or approx. 33  $\mu$ S (electric conductance) via Zener diode (Z10) circuit at the end of the sensor line

#### 1 single-pole potential-free changeover contact based on the quiescent current principle

#### Switching status indicators

- Switching voltage
- Switching current
- Switching capacity

- 3 LEDs (see next page)
- max. AC 250 V
- max. AC 4 A
- max. 500 VA

#### Housing

#### Connection

#### Protection class

#### Mounting

- insulating material, 75 x 55 x 110 mm (dimensions s. p. 39)
- terminals on top of housing
- IP 20

#### Mounting orientation

#### Temperature application range

#### Max. length of connecting cable between electrode relay and Z10 cable break monitoring unit

#### EMC

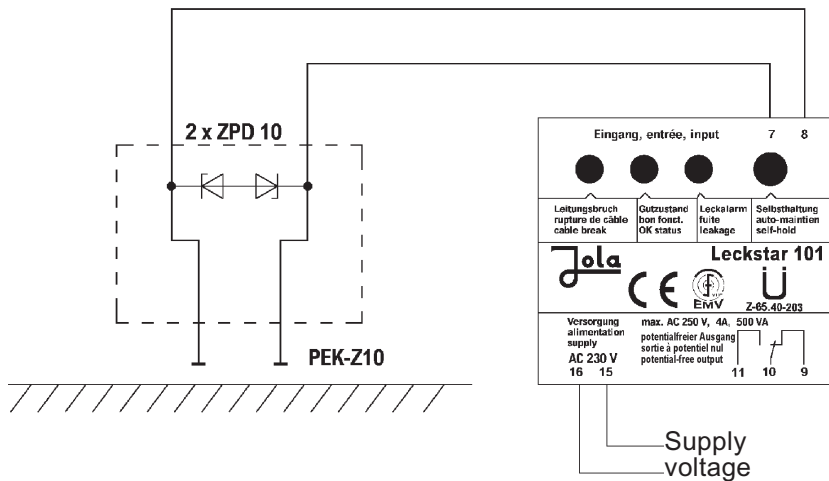
- clip attachment for U-bar to DIN 46 277 and EN 50 022 or fastening via two boreholes
- any
- 15°C to + 60°C

#### 1,000 metres

for interference emission in accordance with the appliance-specific requirements for households, business and commerce as well as small companies, and for interference immunity in accordance with the appliance-specific requirements for industrial companies.

# WITH cable break monitoring

## Connection diagram - Leckstar 101 electrode relay

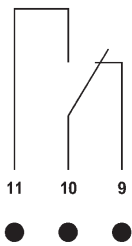


Due to the design of the unit, only one electrode cable can be monitored for cable break. If several plate electrodes of the type PE... are to be connected to a common Leckstar 101 electrode relay, only one plate electrode (the last one) may be fitted with the Z10 cable break monitoring unit. All other plate electrodes are to be used without integrated Z10 cable break monitoring unit (see right-hand circuit diagram).

Position of contact when Leckstar 101 without voltage

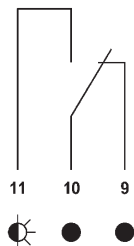
## Position of output contact of the Leckstar 101 electrode relay

Relay Leckstar 101 without voltage



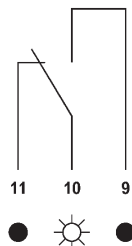
**LEDs dark:**  
Leckstar 101 without voltage, output relay not energized

Cable break



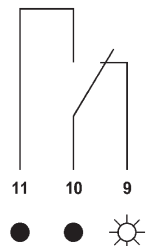
**yellow LED flashes:**  
Leckstar 101 under voltage, electrode cable break, output relay not energized

OK status



**green LED lights:**  
Leckstar 101 under voltage, electrode not energized, output relay energized

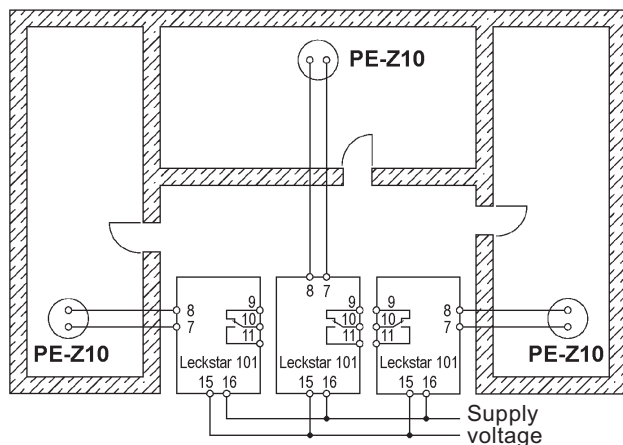
Alarm status



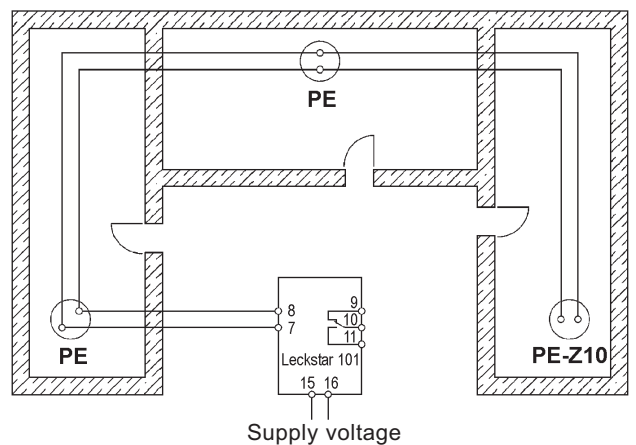
**red LED lights:**  
Leckstar 101 under voltage, electrode energized, output relay not energized

## Circuit diagrams

(position of contacts when Leckstar 101 without voltage)



Connection of several plate electrodes to several Leckstar 101 electrode relays – separate alarms.



Connection of several plate electrodes to one Leckstar 101 electrode relay – group alarm



# Jola Leckstar 101/S electrode relay

With separately routed cable break monitoring output and switchable self-hold, for the connection of all conductive electrodes with Z10 cable break monitoring unit

Electrode relay for U-bar mounting or surface mounting, with connection terminals on top, and with 3 built-in LEDs for signalling the operating statuses.

The appliance is designed for switch cabinet installation or mounting in an appropriate protective housing and may therefore not be installed in other locations. It is only suitable for use in clean environments.



One output relay (potential-free break contact) is designed to activate an alarm in the event of a leakage or cable break. A further relay (potential-free break contact) is designed to activate a separate alarm in the event of a cable break.

**Self-hold: see Leckstar 101**

## Technical data

## Leckstar 101/S

### Alternative supply voltages

(AC versions:  
terminals 15 and 16;  
DC versions:  
- terminal 15: -  
- terminal 16: +)

- AC 230 V (delivered if no other supply voltage is specified in the order) or  
- AC 240 V or  
- AC 115 V or  
- AC 24 V or  
- DC 24 V or } in these two cases, the unit must only be  
- DC 12 V or } connected to a low safety voltage which  
corresponds to the safety regulations  
relating to the application

### Power input

Electrode connection (term. 7 a. 8)

- no-load voltage  
- short-circuit current  
- response sensitivity  
Cable break monitoring  
**1st controlled circuit**  
(terminals 9, 10)

- further supply voltages on request  
approx. 3 VA  
2 terminals (under safety extra low voltage SELV) acting  
on 2 output relays with switchable self-hold  
18 V<sub>eff</sub>  $\square$  10 Hz (safety extra low voltage SELV)  
max. 0.5 mA<sub>eff</sub>  
approx. 30 kohm or approx. 33  $\mu$ S (electric conductance)  
via Zener diode (Z10) circuit at the end of the sensor line

**1 single-pole potential-free break contact based on the quiescent current principle for alarm activation in the event of a leakage or cable break**

**2nd controlled circuit**  
(terminals 12, 13)

**1 single-pole potential-free break contact based on the quiescent current principle for additional alarm activation in the event of a cable break**

Switching status indicators  
Switching voltage  
Switching current  
Switching capacity  
Housing  
Connection  
Protection class  
Mounting

3 LEDs (see next page)  
max. AC 250 V  
max. AC 4 A  
max. 500 VA  
insulating material, 75 x 55 x 110 mm (dimensions s. p. 39)  
terminals on top of housing  
IP 20  
clip attachment for U-bar to DIN 46 277 and EN 50 022 or  
fastening via two boreholes  
any  
- 15°C to + 60°C

### Mounting orientation

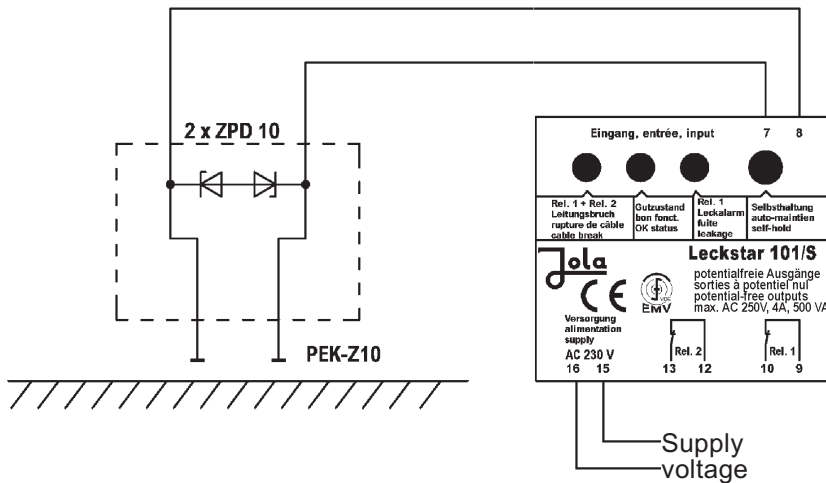
Temperature application range  
**Max. length of connecting cable**  
**between electrode relay and**  
**Z10 cable break monitoring unit**  
EMC

**1,000 metres**  
for interference emission in accordance with the appliance-specific requirements for households, business and commerce as well as small companies, and for interference immunity in accordance with the appliance-specific requirements for industrial companies.



# WITH cable break monitoring

## Connection diagram - Leckstar 101/S electrode relay

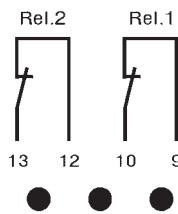


Due to the design of the unit, only one electrode cable can be monitored for cable break. If several plate electrodes of the type PE... are to be connected to a common Leckstar 101/S electrode relay, only one plate electrode (the last one) may be fitted with the Z10 cable break monitoring unit. All other plate electrodes are to be used without integrated Z10 cable break monitoring unit (see right-hand circuit diagram).

Position of contact when Leckstar 101/S without voltage diagram).

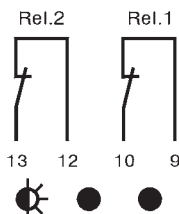
## Position of output contacts of the Leckstar 101/S electrode relay

Relay Leckstar 101/S without voltage



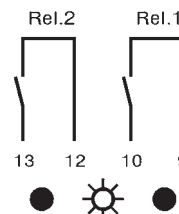
**LEDs dark:**  
Leckstar 101/S without voltage, both output relays not energized, output contacts closed

Cable break



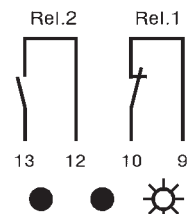
**yellow LED flashes:**  
Leckstar 101/S under voltage, electrode cable break, both output relays not energized, output contacts closed

OK status



**green LED lights:**  
Leckstar 101/S under voltage, electrode not energized, both output relays energized, output contacts open

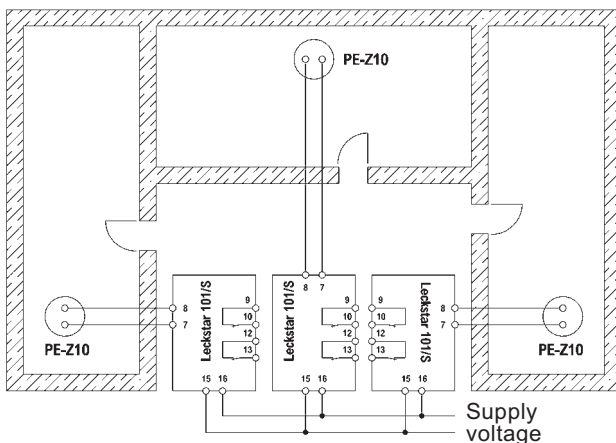
Alarm status



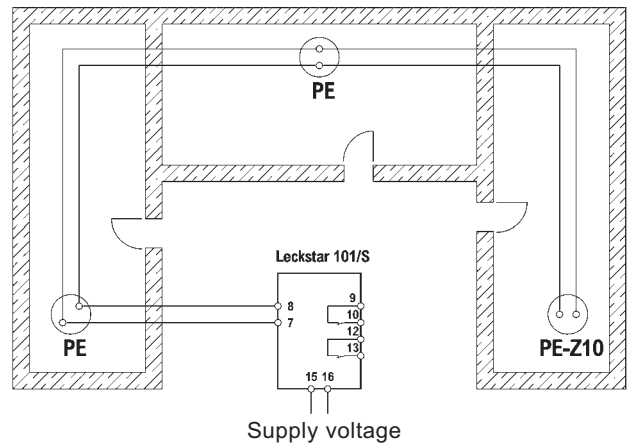
**red LED lights:**  
Leckstar 101/S under voltage, electrode energized, output relay 1 not energized, output contact closed, output relay 2 energized, output contact open

## Circuit diagrams

(position of contacts when Leckstar 101/S without voltage)



**Connection of several plate electrodes to several Leckstar 101/S electrode relays – separate alarms.**



**Connection of several plate electrodes to one Leckstar 101/S electrode relay – group alarm**



# Leakage detection with “Leckstar” point sensors

Application examples with plate electrodes: see page 1

Application examples with rod electrodes: see page 2

Application examples with suspension electrodes: see page 3



## Plate electrodes for leakage detection

Plate electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Plate electrodes should only be used in normally dry environments. The electrode plates must point downwards. They can be used on floors or false ceilings.

If the two electrode plates of a plate electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.



**PE**  
plate electrode,  
connection side



**PEK**  
plate electrode,  
connection side



**PE**  
plate electrode,  
sensor side



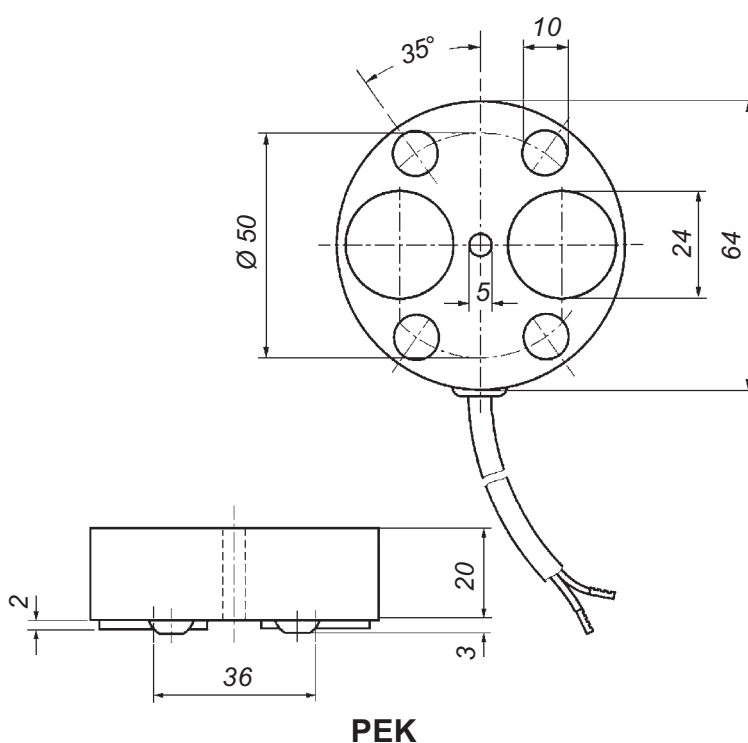
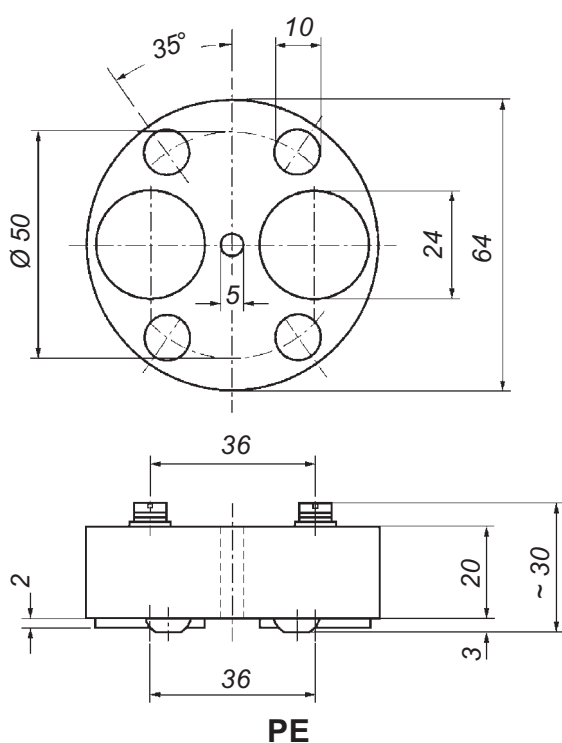
**WDX**  
plate electrode

# Jola PE and PEK plate electrodes

The PE and PEK plate electrodes are each fitted with two separate electrodes in the form of two electrode plates: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode plates, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

The PE and PEK plate electrodes may only be connected to either the Leckstar 5 or Leckstar 5/G electrode relay.

Technical data	PE	PEK
Design	1 control electrode and 1 earth electrode	
Electrode plates	stainless steel 316 Ti	
Housing	PP and cast resin	
Electrical connection	screw-type/crimp connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	- 20°C to + 60°C, higher temperatures on request	
Cable break monitoring	<b>without</b>	
Max. length of connecting cable between electrode relay and PE or PEK	<b>1,000 metres</b>	

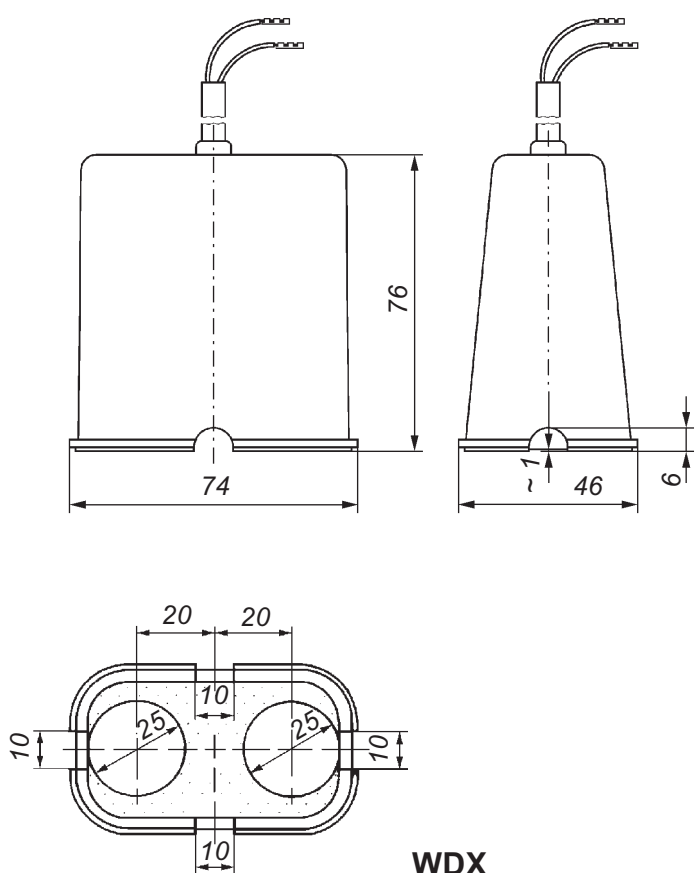


# Jola WDX plate electrode

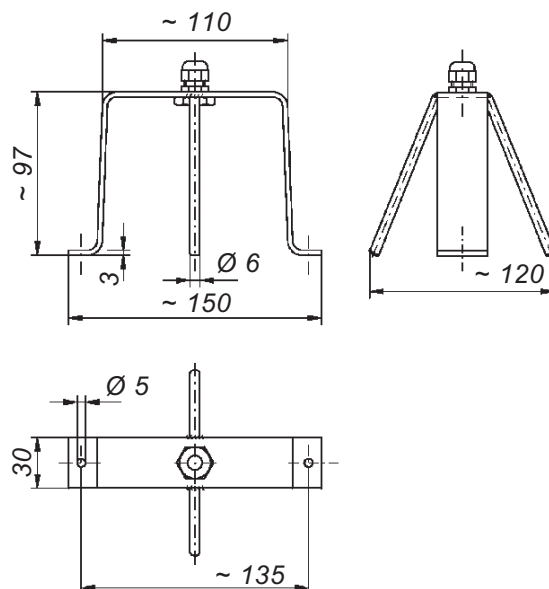
The WDX plate electrode is fitted with two separate electrodes in the form of two electrode plates: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode plates, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

**The WDX plate electrode may only be connected to either the Leckstar 5 or Leckstar 5/G electrode relay.**

Technical data	WDX
Design	1 control electrode and 1 earth electrode
Electrode plates	stainless steel 316 Ti
Housing	PP and cast resin
Weight of electrode	approx. 630 g
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	- 20°C to + 60°C, higher temperatures on request
<b>Cable break monitoring</b>	<b>without</b>
Mounting accessory	stand (optional)
<b>Max. length of connecting cable between electrode relay and WDX</b>	<b>1,000 metres</b>



**Optional: mounting stand**  
(diagrams with smaller scale compared to adjacent drawings)





# Rod electrodes for leakage detection

Rod electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Rod electrodes should only be used in normally dry environments. They can be installed from the top or from the side. In both cases, it must be ensured that the rod tips are just above the floor to be monitored.

If the two non-insulated electrode rod sensor surfaces of a rod electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.

SE 2 3/4" / M



SE 2 M



S 2 M/PP



S 2 M/PVDF



S 2 AM



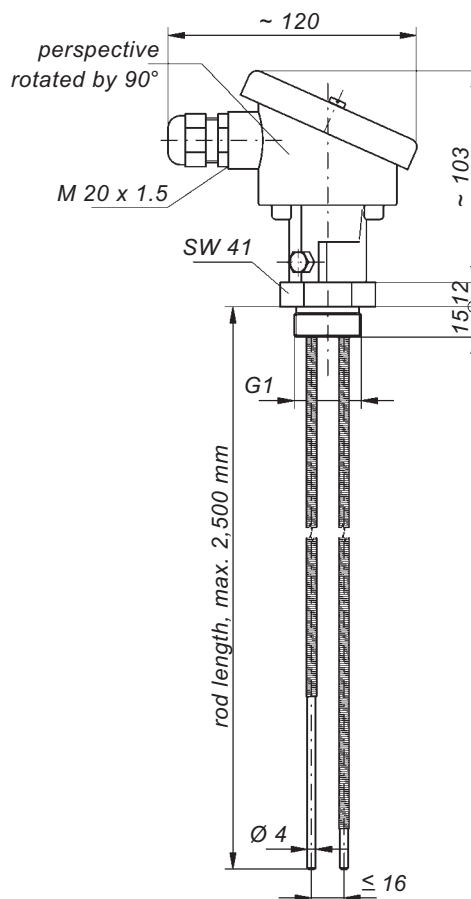
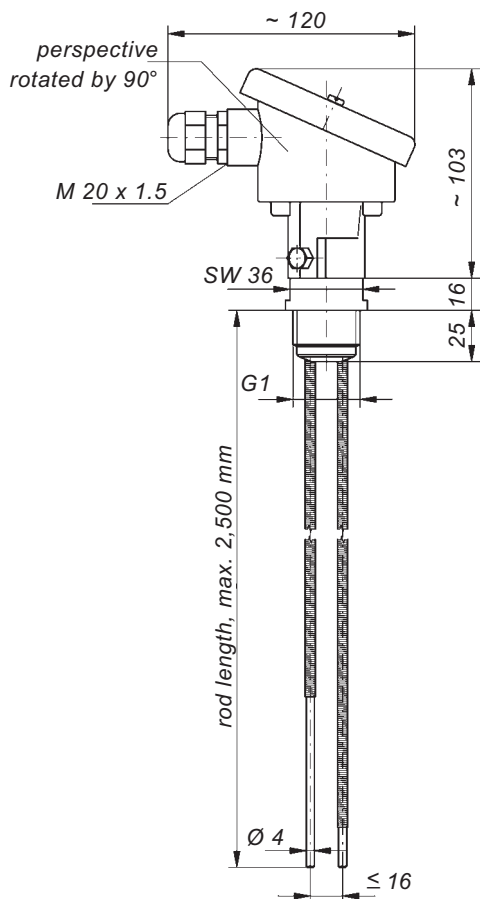
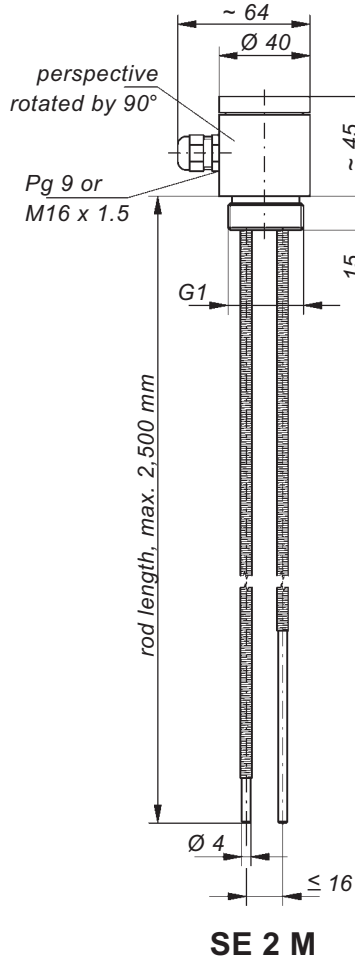
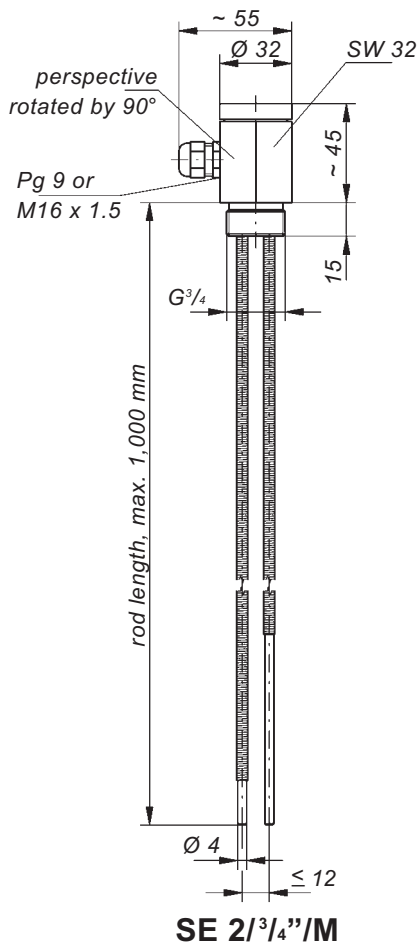
# SE 2<sup>3/4</sup>"/M, SE 2 M, S 2 M/PP, S 2 M/PVDF and S 2 AM rod electrodes

The SE 2<sup>3/4</sup>"/M, SE 2 M, S 2 M/PP, S 2 M/PVDF and S 2 AM rod electrodes are each fitted with two separate electrodes in the form of two electrode rods: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode rods, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

The SE 2<sup>3/4</sup>"/M, SE 2 M, S 2 M/PP, S 2 M/PVDF and S 2 AM rod electrodes may only be connected to either the Leckstar 5 or Leckstar 5/G electrode relay.

Technical data	SE 2 <sup>3/4</sup> "/M	SE 2 M	S 2 M/PP	S 2 M/PVDF	S 2 AM
Design	1 control electrode and 1 earth electrode				
Electrode rods	2 rods made of stainless steel 316 Ti; other materials (e.g. titanium, Hastelloy, Monel or tantalum) on request; each 4 mm in dia., covered with polyolefin shrinkdown tubing (shrinkdown tubing made of PVDF or PTFE on request)				
Lengths	on request (measured from nipple sealing surface)				
Max. lengths	approx. 1,000 mm		approx. 2,500 mm		
Screw-in nipple	PP, other materials (e.g. PVC, PVDF or PTFE) on request		PP	PVDF	stainless steel 316 Ti, other materials (e.g. titanium, Hastelloy, Monel or tantalum) on request
	G <sup>3/4</sup>	G1, on request: G1 <sup>1/4</sup> , G1 <sup>1/2</sup> or G2	G1	G1	G1, on request: G1 <sup>1/4</sup> , G1 <sup>1/2</sup> or G2
Electrical connection	connection head made of the material of the screw-in nipple, protection class IP 55		connection head made of PP, protection class IP 54; on request: connection head made of cast aluminium, protection class IP 54		
Temperature application range	– 20°C to + 60°C, higher temperatures on request				
Cable break monitoring	without				
Max. length of connecting cable between electrode relay and rod electrode	1,000 metres				

# WITHOUT cable break monitoring





# Suspension electrodes for leakage detection

Suspension electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Suspension electrodes should only be used in normally dry environments. The electrode rods must point downwards.

If the two electrode rods of a suspension electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.



LWZ



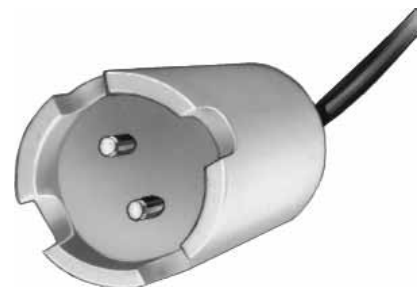
EHW 1



EHW 2



EHW 3







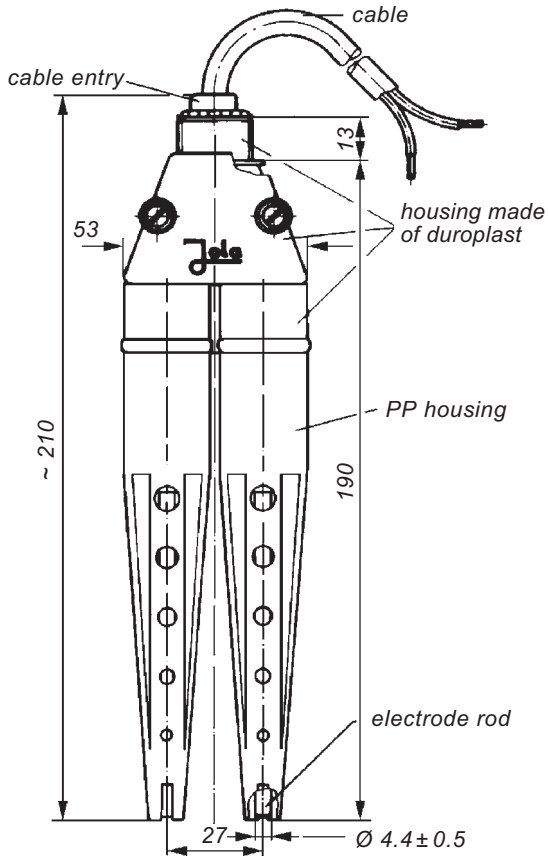
# LWZ, EHW 1, EHW 2 and EHW 3 suspension electrodes

The EHW 1, EHW 2 and EHW 3 suspension electrodes are each fitted with two separate electrodes in the form of two electrode rods: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two electrode rods, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

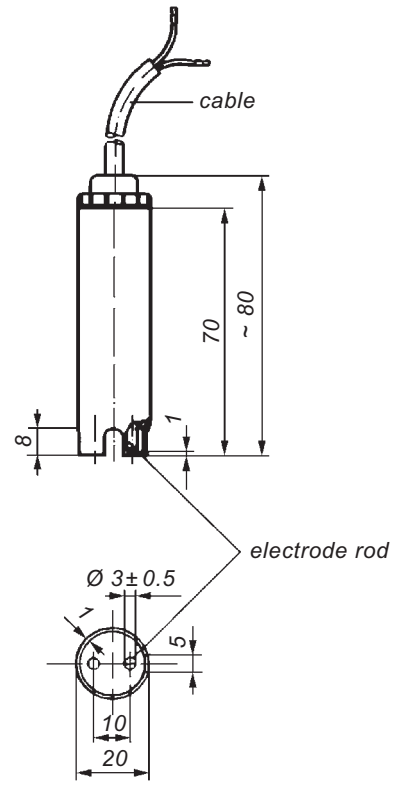
**The LWZ, EHW 1, EHW 2 and EHW 3 suspension electrodes may only be connected to either the Leckstar 5 or Leckstar 5/G electrode relay.**

Technical data	LWZ	EHW 1	EHW 2	EHW 3
Design	1 control electrode et 1 earth electrode			
Electrode rods	2 rods made of stainless steel 316 Ti; other materials (e.g. titanium, Hastelloy, Monel or tantalum) on request			
Housing	PP and duroplast, 2 x 27 mm Ø x approx. 210 mm high	PP; other materials (e.g. PVC, PVDF or PTFE) on request 20 mm Ø x approx. 80 mm high	PP; other materials (e.g. PVC, PVDF or PTFE) on request 28 mm Ø x approx. 130 mm high	40 mm Ø x approx. 130 mm high
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; connecting cable made of CM or PTFE on request			
Temperature application range	– 20°C to + 60°C, higher temperatures on request			
Cable break monitoring	<b>without</b>			
Max. length of connecting cable between electrode relay and suspension electrode	<b>1,000 metres</b>			
Mounting accessories	<b>stuffing glands, housings with integrated stuffing gland or flanges with stuffing gland on request</b>			

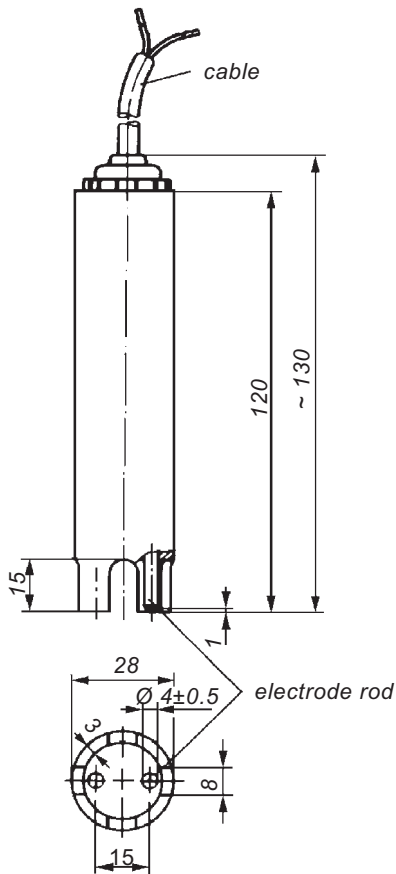
**WITHOUT cable break monitoring**



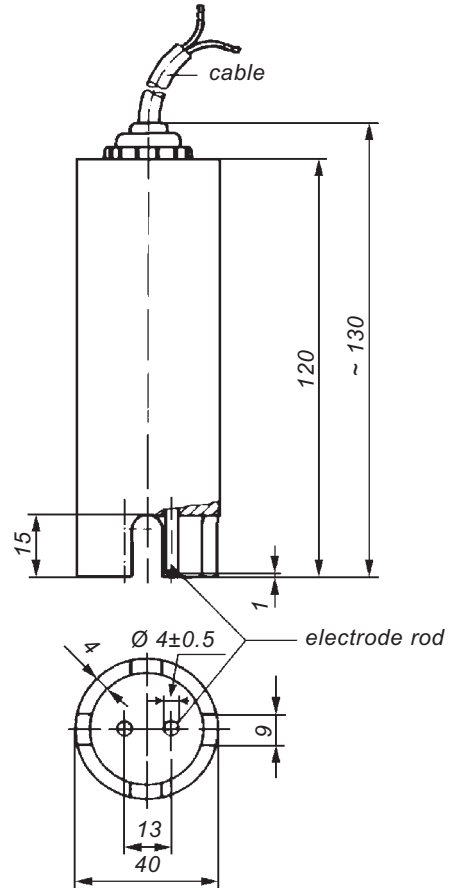
**LWZ**



**EHW 1**



**EHW 2**



**EHW 3**



# Leakage detection with “Leckstar” line sensors

Application examples with cable electrodes and tape electrodes: see page 13



# Cable and tape electrodes for leakage detection

Cable and tape electrodes are designed to signal the presence of a conductive liquid caused, for example by burst pipes.

Cable and tape electrodes should only be used in normally dry environments. They can be used on floors, false ceilings, alongside pipes or in double-pipe systems. They should be installed at the lowest point of the potential hazard area which they are intended to monitor.

If the two stainless steel ropes of a cable or tape electrode come into contact with a conductive liquid (e.g. water, acid etc), an electrical contact is made and an alarm signal given.



KE  
cable  
electrode

BAE  
cable  
electrode

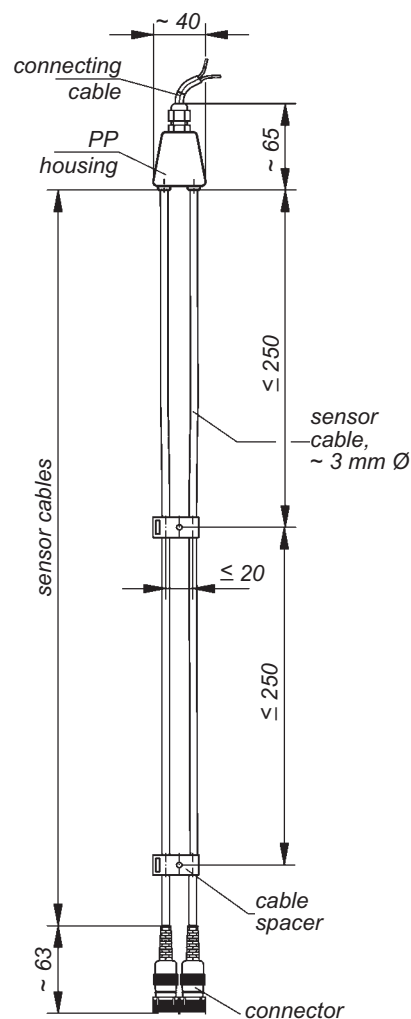
# Jola KE cable electrode

The KE cable electrode is fitted with two separate electrodes in the form of two sensor cables: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two sensor cables, a control current flows from the corresponding electrode relay. The latter is then energized and a contact made.

Each of the two sensor cables consists of a stainless steel rope core and a protective sheath made of polyester. This protective sheath is designed to prevent contact of the stainless steel ropes with one another or with an electrically conductive surface (e.g. steel tub, steel pipe etc.) and thus to avoid false alarms, whilst allowing leakage liquid to penetrate through to the stainless steel ropes.

**The KE cable electrode may only be connected to either the Leckstar 5 or Leckstar 5/G electrode relay.**

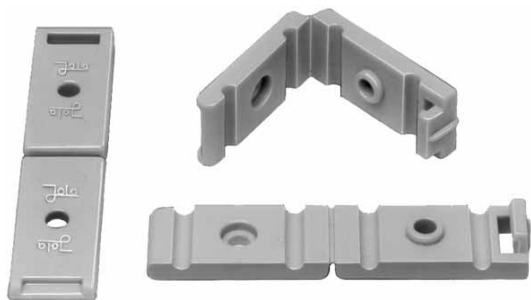
Technical data	KE
Design	1 control electrode and 1 earth electrode
Sensor cables	2 ropes made of stainless steel 316 or 316 Ti, each 3 mm in dia., each covered by a halogen-free protective polyester sheath; length 2 metres each, longer on request
Max. length of sensor cables when laid in a relatively straight line	<b>100 metres;</b> <b>if the sensor cables are wound round a pipe or tank, the possible lengths may be considerably shorter depending on the type and method of laying.</b>
Supplied mounting accessories	4 sensor cable spacers made of PP per metre of sensor cable
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	- 20°C to + 60°C, higher temperatures on request
Cable break monitoring	<b>without</b>
Max. length of connecting cable between electrode relay and KE	<b>1,000 metres minus the length of the sensor cable pair</b>



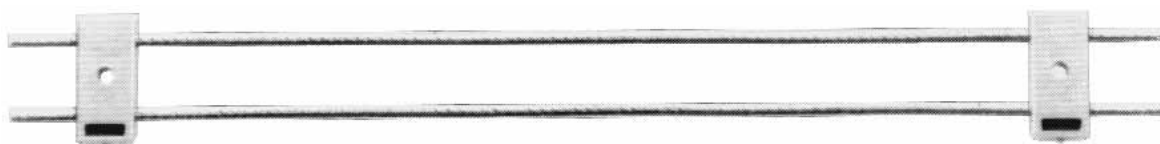
KE

## WITHOUT cable break monitoring

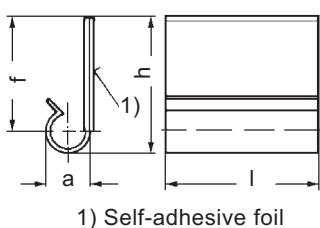
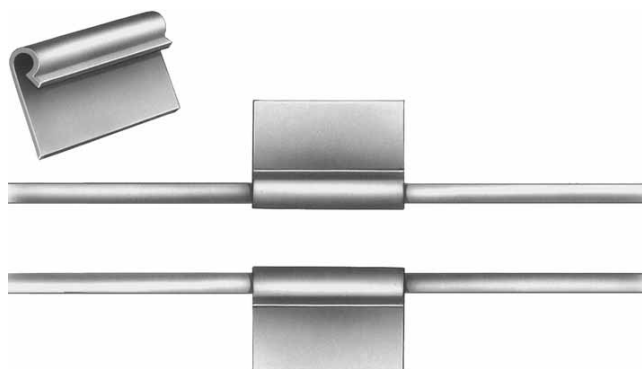
**Supplied mounting accessories:**  
sensor cable spacers



Sensor cables with sensor cable spacers



**Optional mounting accessories:**  
self-adhesive sensor cable fastening clips



a = 7.6 mm  
f = 19.6 mm  
h = 22.6 mm  
l = 31.8 mm

1) Self-adhesive foil

### Mode of installation of the KE cable electrode

The two sensor cables of the cable electrode must be mounted parallel to one another at a distance of approx. 2 cm using the sensor cable spacers, as a greater or lesser spacing affects the response level of the system in the event of leakage.

Only non-conductive materials (e.g. cable ties, insulated cable clips etc.) must be used for installation of the sensor cables.



KE

# Jola BAE tape electrode

The BAE tape electrode is fitted with two separate electrodes in the form of two stainless steel ropes: 1 control electrode and 1 earth electrode. As soon as a trace of a conductive liquid creates a conductive path between the two stainless steel ropes, a control current flows from the corresponding electrode relay. The latter is then energised and a contact made.

In contrast to the cable electrode on the previous page, the tape electrode is not fitted with two separate sensor cables. The two stainless steel ropes are integrated in a halogen-free polyester fabric tape which ensures that the spacing between them remains constant. This plastic fabric tape is designed to prevent contact of the stainless steel ropes with one another or with an electrically conductive surface (e.g. steel tub, steel pipe etc.) and thus to avoid false alarms, whilst allowing leakage liquid to penetrate through to the stainless steel ropes.

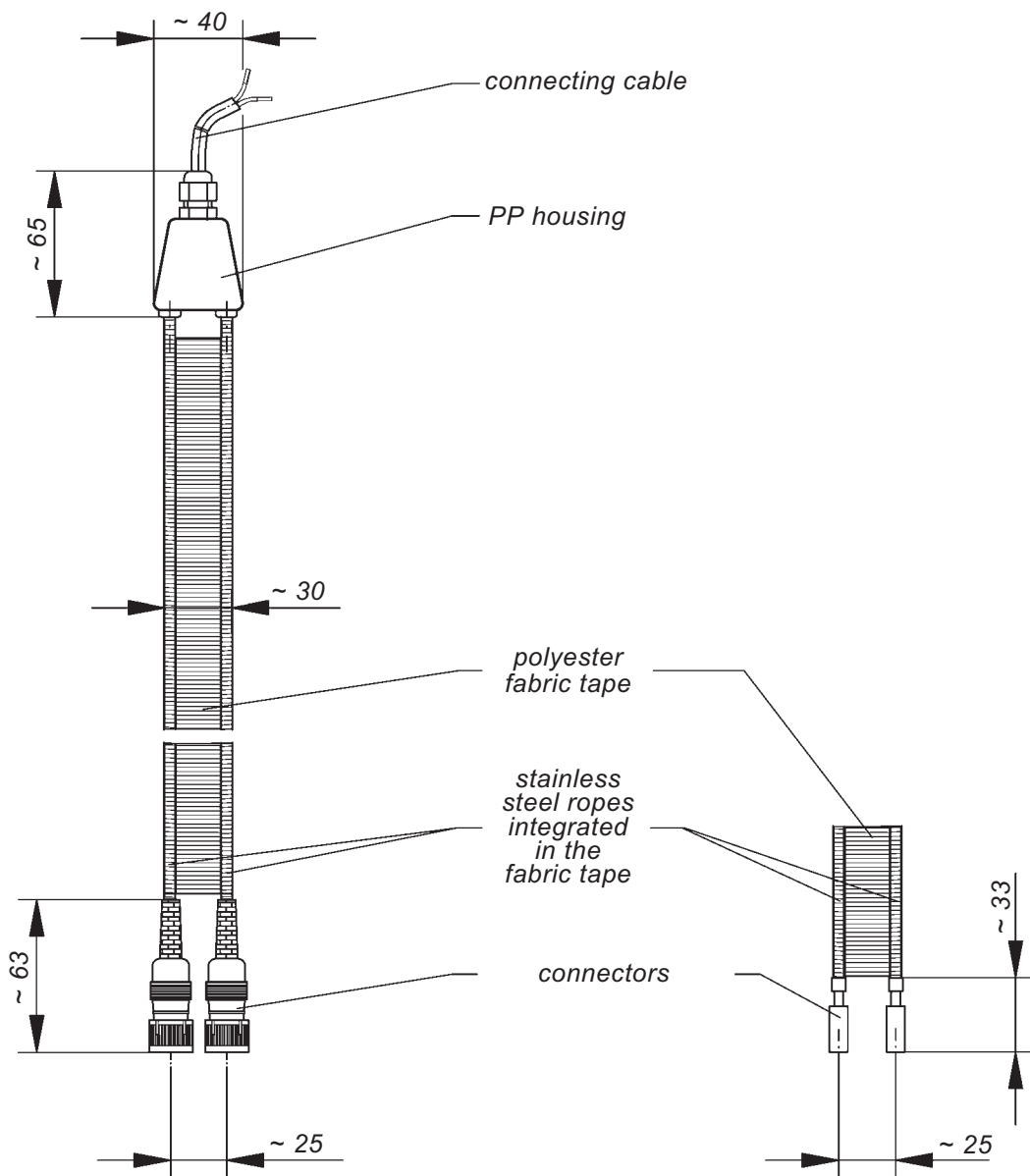
**To avoid false alarms, it is essential that the surroundings of the tape electrodes are absolutely dry under normal circumstances, as the tape electrodes have the ability to bind moisture (including high levels of air humidity).**

**The BAE tape electrode may only be connected to either the Leckstar 5 or Leckstar 5/G electrode relay.**

Technical data	BAE
Design	1 control electrode and 1 earth electrode
Sensor band	2 ropes made of stainless steel 316 or 316 Ti, each 1.5 mm in dia., woven into a halogen-free approx. 30 mm-wide polyester fabric tape at a spacing of approx. 25 mm, length 2 metres, longer on request
Max. length of the sensor tape laid in a relatively straight line	<b>30 metres;</b> if the sensor tape is wound around a pipe or a tank, the possible length may be considerably shorter depending on the type and method of laying.
Electrical connection	connecting cable 2 x 0.75, length 2 metres, longer cable on request; halogen-free connecting cable on request
Temperature application range	– 20°C to + 60°C, higher temperatures on request
Cable break monitoring	<b>without</b>
Max. length of connecting cable between electrode relay and BAE	<b>1,000 metres, minus the length of the sensor tape</b>

# WITHOUT cable break monitoring

BAE





# Leckstar 5 electrode relay

with switchable self-hold,  
for the connection of all conductive electrodes without cable break monitoring unit

Electrode relay for U-bar mounting or surface mounting, with connection terminals on top, and with built-in LED for signalling the alarm status.

The appliance is designed for switch cabinet installation or mounting in an appropriate protective housing and may therefore not be installed in other locations. It is only suitable for use in clean environments.

### Self-hold:

- If the switch for self-hold is switched on, an alarm is stored. The relay continues to signal the alarm even if the cause of the alarm (e.g. the presence of water or a cable break) is no longer present – in other words, if the sensor is dry again or if the line has contact. The alarm is acknowledged by switching off the switch for self-hold.

- If the switch for self-hold is not switched on, the alarm is not maintained when the cause of the alarm has been remedied but is terminated.



### Technical data

### Leckstar 5

Alternative supply voltages  
(AC versions:  
terminals 15 and 16;  
DC versions:  
- terminal 15: –  
- terminal 16: +)

– AC 230 V (delivered if no other supply voltage is specified in the order) or  
– AC 240 V or  
– AC 115 V or  
– AC 24 V or  
– DC 24 V or } in these two cases, the unit must only be  
– DC 12 V or } connected to a low safety voltage which  
corresponds to the safety regulations  
relating to the application  
– further supply voltages on request  
approx. 3 VA

Power input  
Electrode connection  
(terminals 7 and 8)

– no-load voltage  
– short-circuit current  
– response sensitivity

**Controlled circuit  
(terminals 9, 10, 11)**

2 terminals (under safety extra low voltage SELV) acting on 1 output relay with switchable self-hold  
18 V<sub>eff</sub>  $\sqrt{10}$  Hz (safety extra low voltage SELV)  
max. 0.5 mA<sub>eff</sub>  
approx. 30 kohm or approx. 33  $\mu$ S (electric conductance)

**1 single-pole potential-free changeover contact based on the quiescent current principle**

Switching status indicator

1 red LED lights when the sensor is wet / output relay is not energized

Switching voltage  
Switching current  
Switching capacity

max. AC 250 V  
max. AC 4 A  
max. 500 VA

Housing  
Connection  
Protection class  
Mounting

insulating material, 75 x 55 x 110 mm (dimensions s. p. 39)  
terminals on top of housing  
IP 20  
clip attachment for U-bar to DIN 46 277 and EN 50 022 or fastening via two boreholes

Mounting orientation  
Temperature application range

any  
– 15°C to + 60°C

**Max. length of connecting cable between electrode relay and electrode(s)**  
EMC

**1,000 metres**

for interference emission in accordance with the appliance-specific requirements for households, business and commerce as well as small companies, and for interference immunity in accordance with the appliance-specific requirements for industrial companies.





# Leckstar 5/G electrode relay

for the connection of all conductive electrodes without cable break monitoring unit

Electrode relay in surface-mount housing with transparent cover, with mains monitoring indicator and switching status indicator inside the housing



## Technical data

## Leckstar 5/G

Alternative supply voltages (AC versions: terminals 1 and 2; DC versions: - terminal 1: - - terminal 2: +)

- AC 230 V (delivered if no other supply voltage is specified in the order) or  
 - AC 240 V or  
 - AC 115 V or  
 - AC 24 V or  
 - DC 24 V or } in these two cases, the unit must only be  
 - DC 12 V or } connected to a low safety voltage which  
 corresponds to the safety regulations relating to the application  
 - further supply voltages on request  
 approx. 3 VA

Power input  
 Electrode connection (terminals 6 and 7)

2 terminals (under safety extra low voltage SELV) acting on 1 output relay without self-hold  
 $18 V_{\text{eff}} \text{ } \square \text{ } 10 \text{ Hz}$  (safety extra low voltage SELV)  
 max.  $0.5 \text{ mA}_{\text{eff}}$   
 approx. 30 kohm or approx. 33  $\mu\text{S}$  (electric conductance)

- no-load voltage  
 - short-circuit current  
 - response sensitivity

### Controlled circuit (terminals 3, 4, 5)

### 1 single-pole potential-free changeover contact based on the quiescent current principle

Switching status indicator

1 red LED lights when the sensor is wet / output relay is not energized

Switching voltage

max. AC 250 V

Switching current

max. AC 4 A

Switching capacity

max. 500 VA

Housing

insulating material, with 3 screw connections (dimensions see page 39)

Connection

internal terminals

Protection class

IP 54

Mounting

surface mounting using 4 screws

Mounting orientation

any

Temperature application range

- 15°C to + 60°C

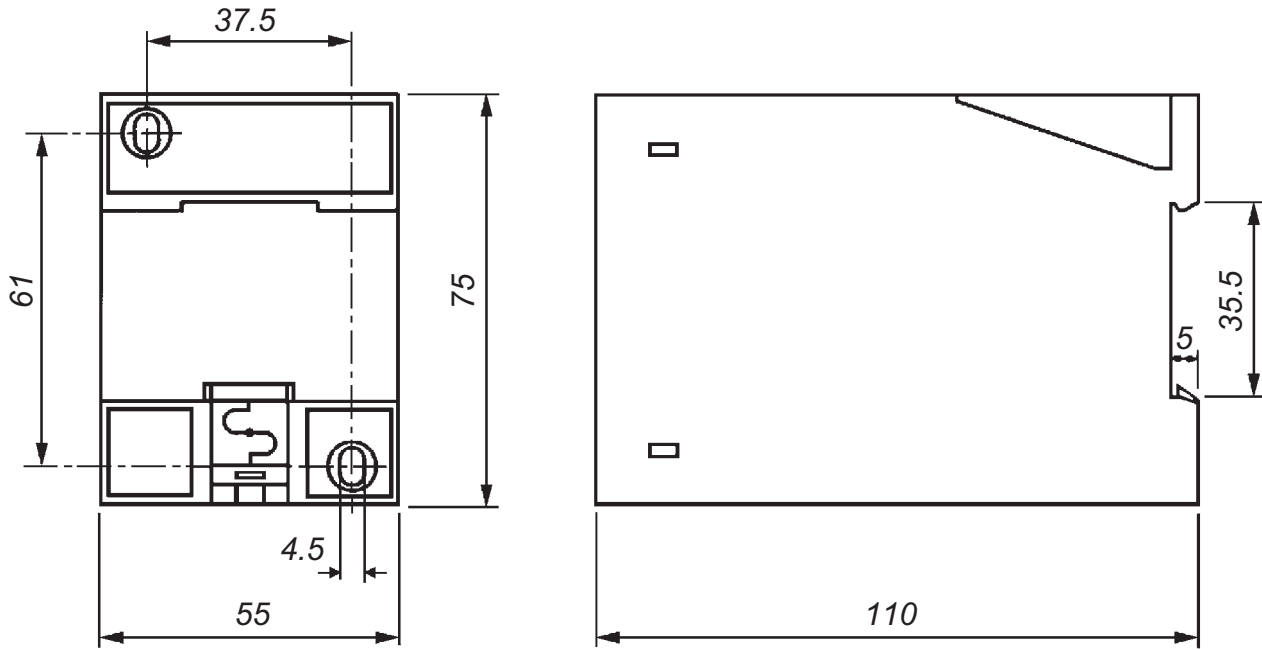
### Max. length of connecting cable between electrode relay and electrode(s)

**1,000 metres**

EMC

for interference emission in accordance with the appliance-specific requirements for households, business and commerce as well as small companies, and for interference immunity in accordance with the appliance-specific requirements for industrial companies.

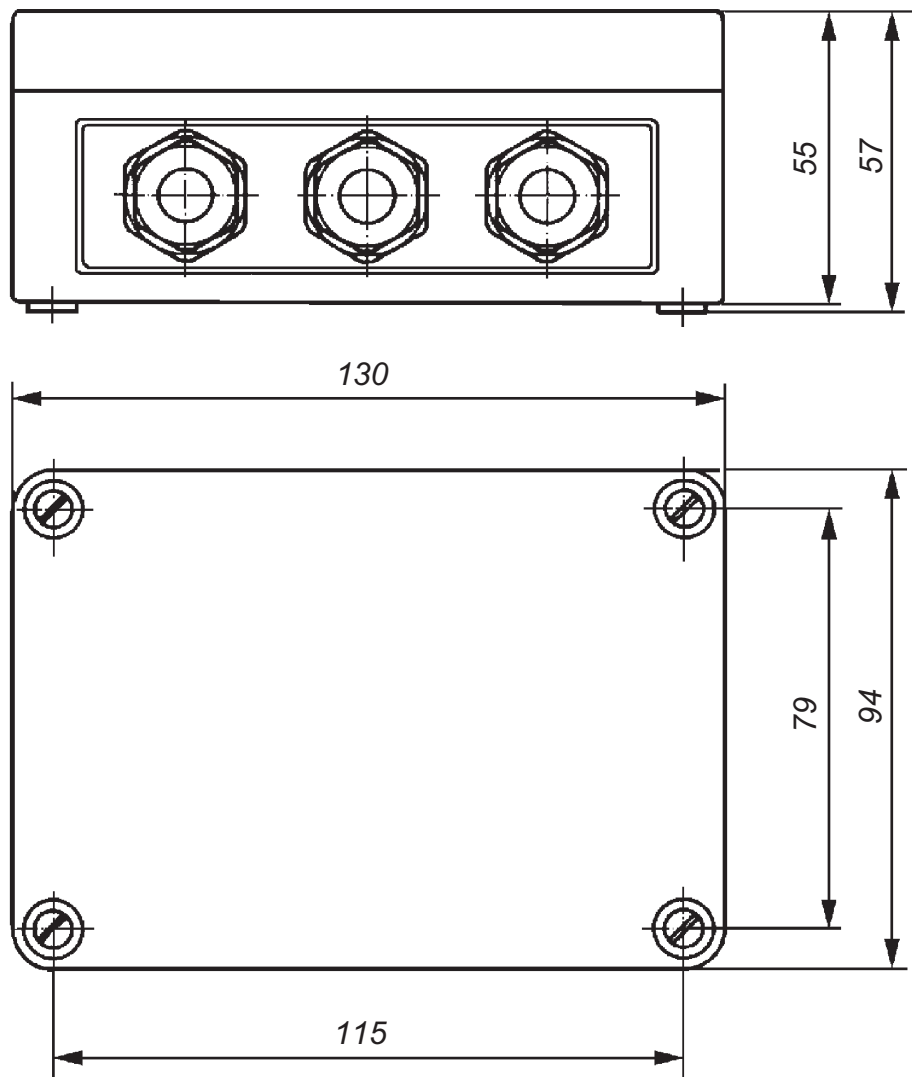
## Dimensional drawings



Leckstar 5

Leckstar 101

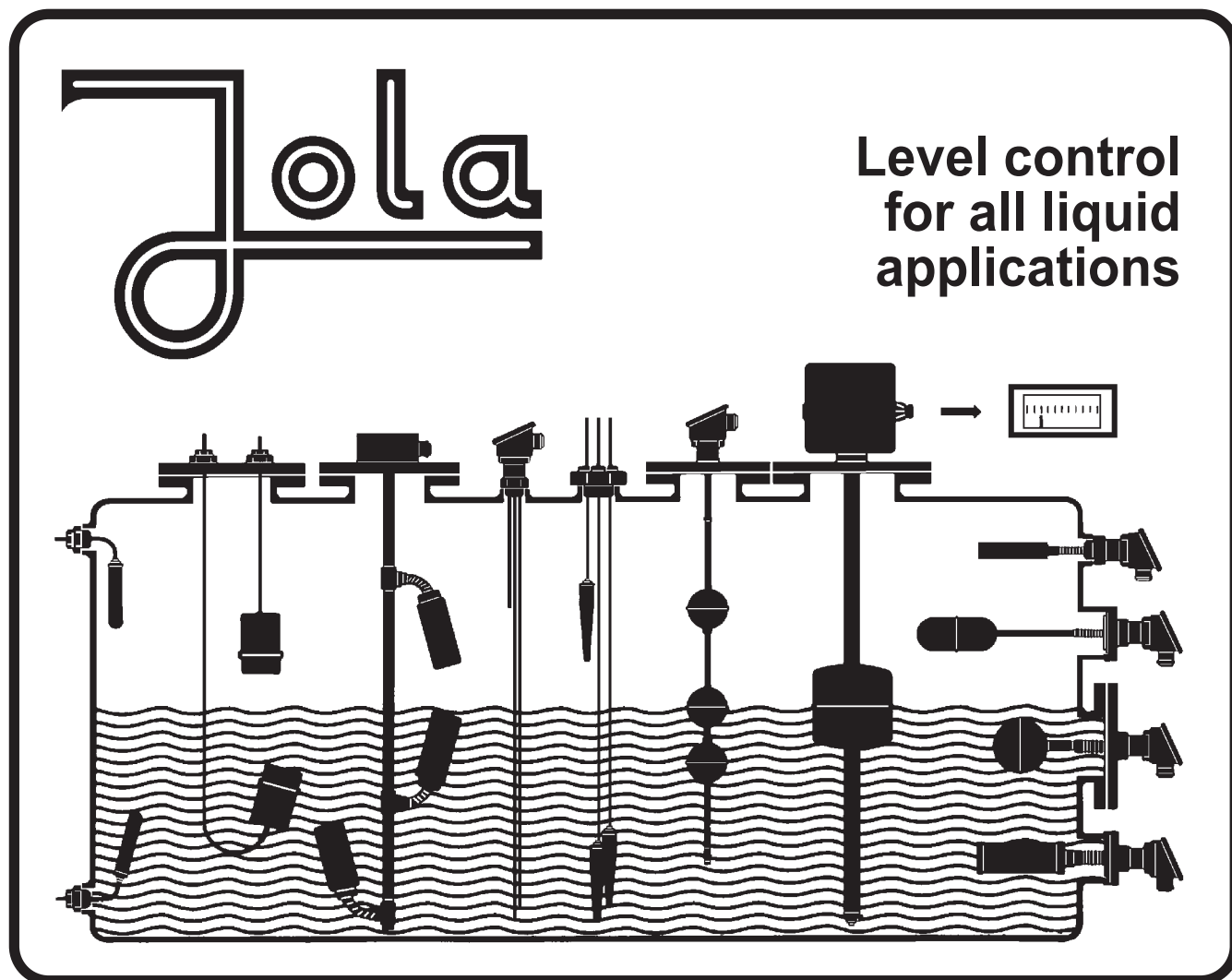
Leckstar 101/S



Leckstar 5/G



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