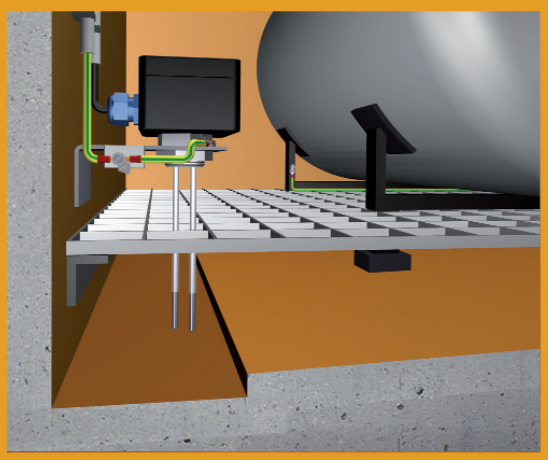
Conductive Ex leakage detectors of the Leckstar range

with electrode and relay



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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.

Conductive Ex leakage detectors

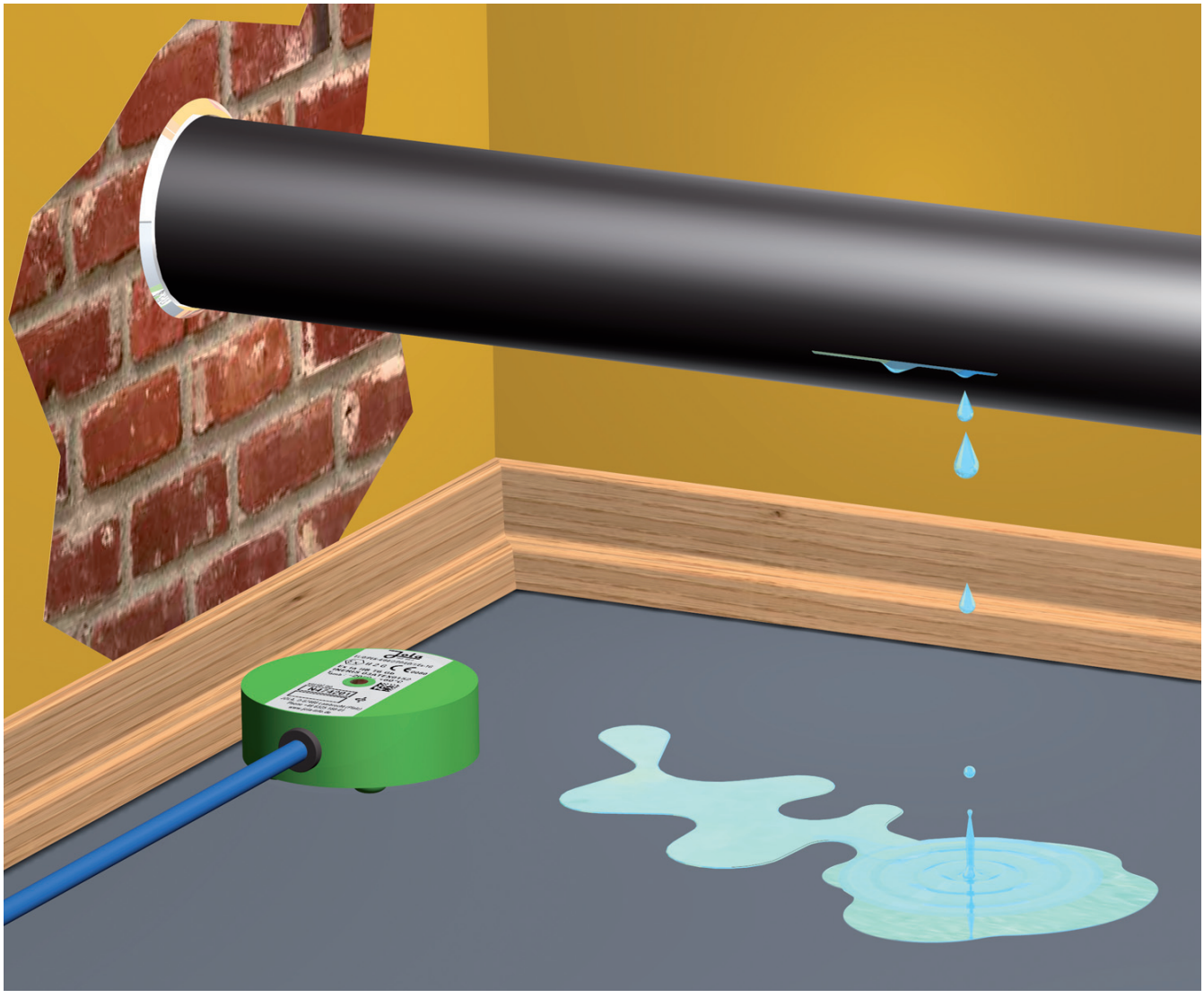
Contents **Pages**

The conductive measuring principle

The conductive measuring principle is used for the detection of **electrically conductive liquids**. It is not suitable for the detection of electrically non-conductive liquids.

Electrically conductive liquids are generally aqueous solutions of salts, acids or alkalis. The molecules of these substances dissociate in water into positive and negative ions which give the aqueous solution its electrical conductivity. The conductive Ex leakage detector of the Leckstar range consists of the combination of a conductive Ex electrode, an obligatory Ex connection box and a conductive Ex electrode relay. This combination detects the presence of an electrically conductive liquid at the electrodes, and an alarm signal is then emitted.

The measurement process uses alternating current to ensure exact response sensitivity and to prevent galvanic processes at the electrode.



Examples of conductive liquids

Accumulator acid, 32 %
Acetic acid, 70 %
Acrylic acid, 70 %
Adipic acid *
Aluminium chloride *
Aluminium potassium sulphate: see alums
Aluminium salts from mineral acids: see alums
Aluminium sulphate *
Alums (Me(I)-Me(III) sulphates) *
Ammonia water (ammonia solution), 25 %
Ammonium acetate *
Ammonium bromide *
Ammonium carbonate *
Ammonium chloride *
Ammonium fluoride *
Ammonium nitrate *
Ammonium phosphate *
Ammonium sulphate *
Ammonium sulphide, 40 %
Ammonium thiosulphate *
Anodic oxidation bath (HNO_3-30 %, H_2SO_4-10 %)
Anticalcium: see antiliming agent (sulfamic acid)
Antiliming agent (sulfamic acid), 50 g/l of H_20
Aqua regia, nitrohydrochloric acid, 1 : 1

Barium carbonate *
Barium chloride *
Barium hydroxide *
Barium nitrate *
Bicarbonate of ammonia *
Borax (sodium tetraborate) *
Borofluoric acid (tetra boro fluoric acid), 35 %
Bromine water *

Cadmium chloride *
Cadmium sulphate *
Calcium acetate *
Calcium bromide *
Calcium chloride *
Calcium fluoride *
Calcium hydroxide *
Calcium hypochlorite *
Calcium sulphate
Caustic potash solution (potassium hydroxide) *
Caustic soda, 32 %
Chlorine water *
Chloroacetic acid, saturated
Chlorsulfon acid, > 97 %
Chromic acid, 5 %
Chromic sulfuric / acid mixture
Citric acid *
Cupric chloride *
Cupric cyanide *
Cupric nitrate *
Cupric sulphate *

Electroplating bath, $AgNO_3$/KCN
Ethylen diamine tetra acetic acid (trilon B)

Ferric (III) chloride *
Ferrous (II) sulfate
Formaldehyde, 40 %
Formic acid, 80 %

Glycol acid, 50 %

Hydrazine hydrate, 80 %
Hydrobromic acid, aqueous solution *
Hydrochloric acid, 37 %
Hydrofluoric acid (fluohydric acid), 40 %
Hydrogen peroxide, 30 %

Javel water / bleaching lye: see sodium hypochloride

Liquid fertilizer application: see manuring salts

Magnesium chloride *
Magnesium hydroxide carbonate (magnesium carbonate) *
Magnesium sulphate *
Manuring salts / saline manure
Mercury nitrate *
Mercury sulphate *

Naphtalene sulphonic acid *
N-butyric acid, 70 %
Nickel chloride *
Nickel nitrate *
Nitrating acid mixture: see aqua regia, nitrohydrochloric acid
Nitric acid (fuming)
Nitric acid (not fuming), approx. 65 %
Nitrolotriacetic acid (Trilon A) *
Nitrosylsulphuric acid, 30 %

Oleum: see sulfuric acid, fuming

Phenidone (1-Phenyl-3-Pyra-zolidinone)
Phosporic acid, concentrated
Photographic developer, pure
Picric acid *
Potassium bicarbonate *
Potassium borate *
Potassium bromade
Potassium bromide *
Potassium carbonate (potash) *
Potassium chlorate *
Potassium chloride *
Potassium cyanide *
Potassium ferrocyanide and potassium ferricyanide *
Potassium iodide *
Potassium nitrate *
Potassium sulphate *
Propionic acid, 80 %

Salicylic acid *
Silver nitrate, 2 % solution
Sodium acetate *
Sodium aluminium sulphate: see alums
Sodium bisulphite *
Sodium bromide *
Sodium carbonate *
Sodium chlorate *
Sodium chloride *
Sodium cyanide *
Sodium dichromate *
Sodium dithionite *
Sodium hydrogen carbonate *
Sodium hydrogen sulphate *
Sodium hypochlorite (up to 30°C; 150 g/l of active chlor)
Sodium nitrate *
Sodium nitrite *
Sodium peroxide *
Sodium phosphate *
Sodium silicate *
Sodium sulfide *
Sodium sulphate *
Sodium sulphite *
Sodium tetraborate: see Borax
Sodium thiosulphate *
Sulfuric acid, 20 %
Sulfuric acid, 96 - 98 % **
Sulfuric acid, fuming (oleum), 65 % SO_3 **
Sulfurous acid, 5 - 6 % SO_2

Tartaric acid *
Tin(II) chloride *
Trichloracetic acid

Water (tap water)

Zinc chloride *
Zinc nitrate *
Zinc sulphate *

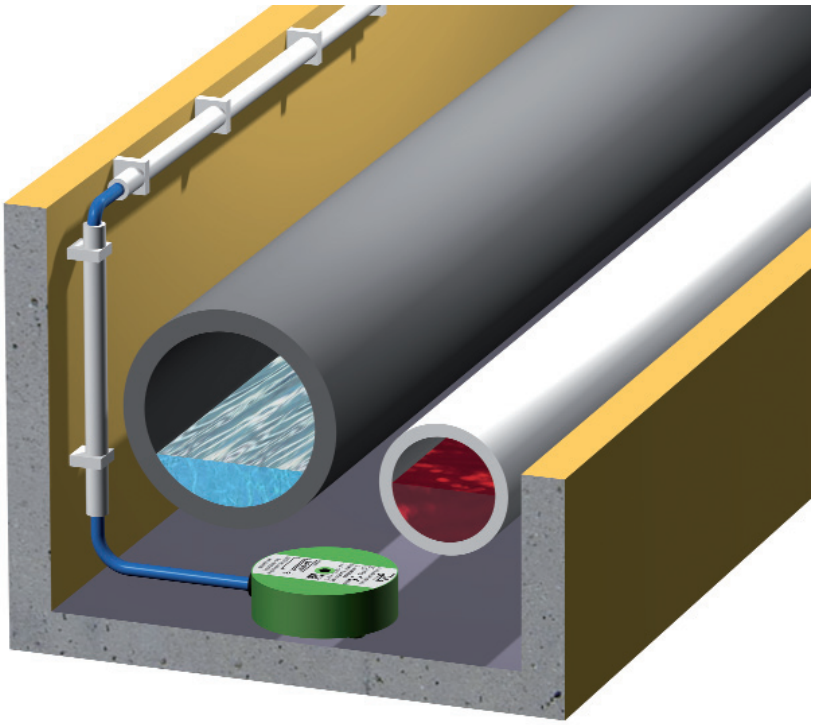
* Saturated solution

** Only suitable for point sensors, because the line sensor has a too long reaction period

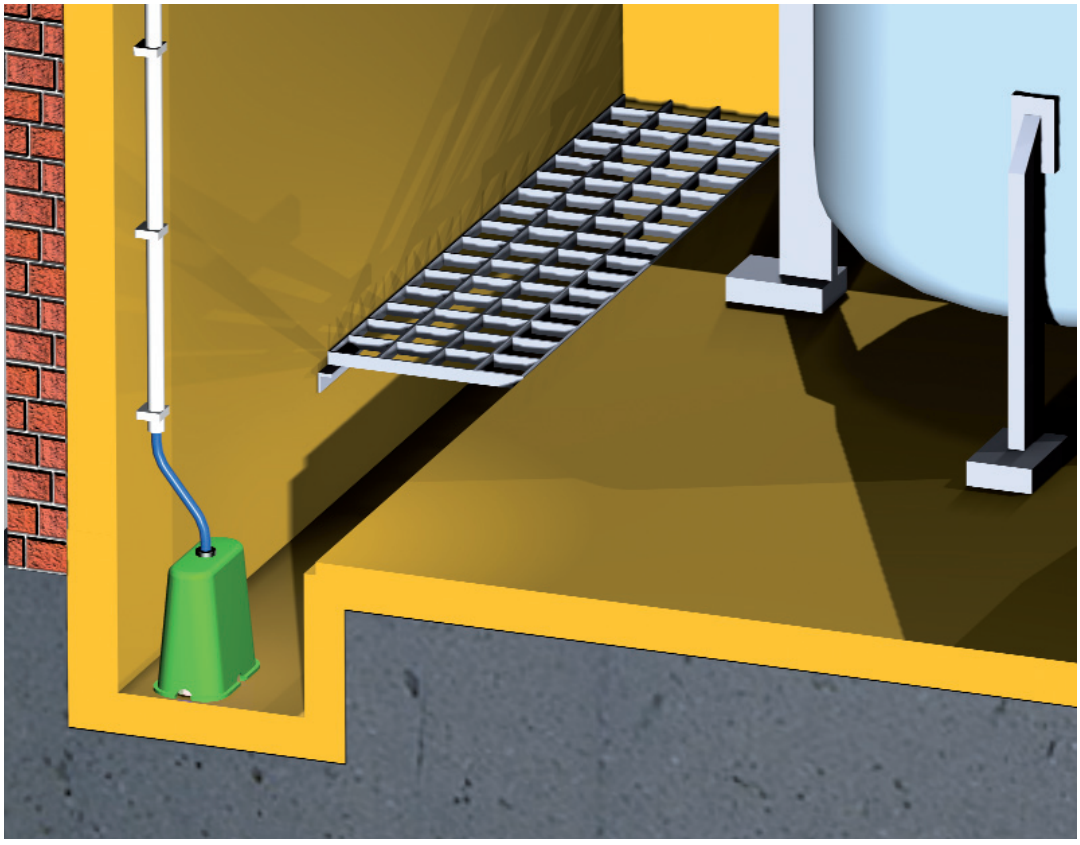
A reliable detection of electrically poor conductive liquids (compared to the above-mentioned liquids) can be achieved by adaption of the sensitivity of the Ex electrode relay in our works (on request).

Leakage detection with conductive “Leckstar” Ex point sensors

Application examples with conductive Ex plate electrodes



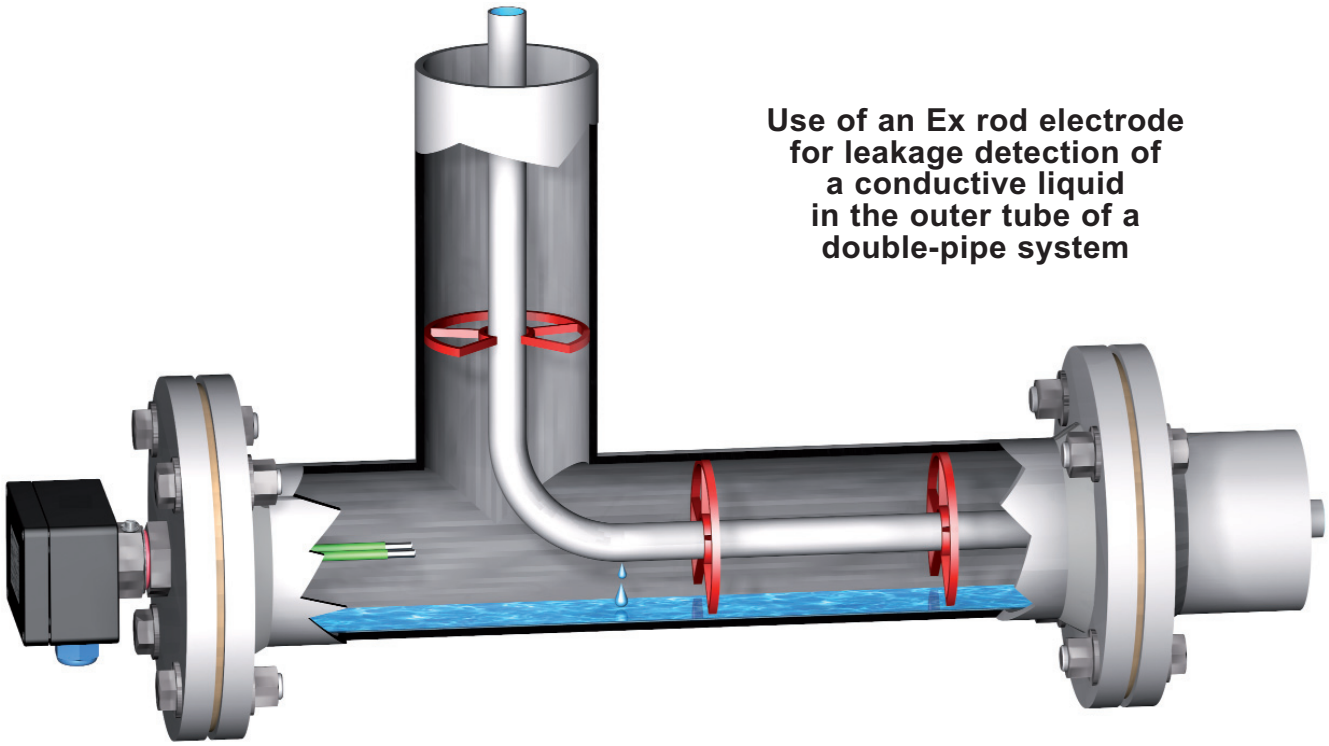
Use of an
Ex plate electrode
for leakage detection
of a conductive liquid
in a pipe duct



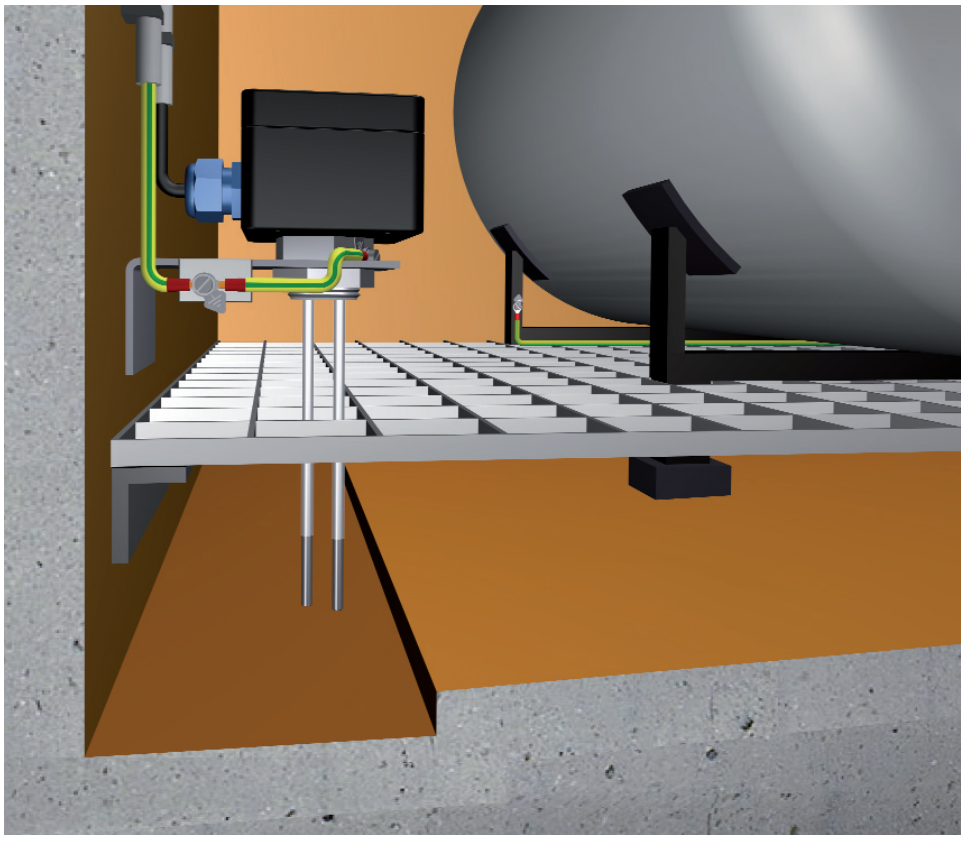
Use of an
Ex plate
electrode
for leakage
detection
of a conductive
liquid
at the lowest
point
(groove in the
picture) of a
collection room

Leakage detection with conductive “Leckstar” Ex point sensors

Application examples with conductive Ex rod electrodes



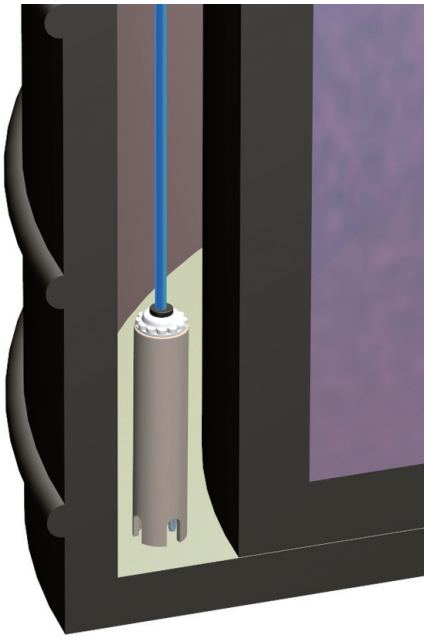
Use of an Ex rod electrode for leakage detection of a conductive liquid in the outer tube of a double-pipe system



Use of an Ex rod electrode for leakage detection of a conductive liquid at the lowest point (groove in the picture) of a collection room

Leakage detection with conductive “Leckstar” Ex point sensors

Application example with a conductive Ex suspension electrode



Use of an Ex suspension electrode for leakage detection of a conductive liquid in the collection tub of a storage tank for conductive water-polluting liquids

Conductive Ex plate electrodes

Conductive Ex plate electrodes are designed to signal via a connected conductive Ex electrode relay the presence of a conductive liquid caused, for example, by burst pipes.

Conductive Ex plate electrodes should only be used in normally dry environments. They must be installed on the floor in such a way that the sensor side faces downwards.

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

EL/0/PE/64/2/PP/ED/0/Ex-1G
II 2 G Ex ia IIB T6 Gb

EL/./PE/64/2/PP/ED/0/Ex-1G
II 2 G Ex ia IIB T6 Gb
sensor side

EL/0/PEK-2/2/64/2/PP/ED/1/Ex-1G
II 2 G Ex ia IIB T6 Gb

EL/0/PEK-4/64/2/PP/ED/1/Ex-1G
II 2 G Ex ia IIB T6 Gb

EL/Z6V2/WDX/74/2/PP/ED/1/Ex-1G
II 2 G Ex ia IIB T6 Gb

EL/Z6V2/PEK/64/2/PP/ED/1/Ex-1G
II 2 G Ex ia IIB T6 Gb

EL/./PE.../64/2/PP/ED/./Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb conductive Ex plate electrodes

The conductive Ex plate electrodes are fitted with two electrode plates as sensitive elements: 1 control electrode and 1 earth electrode.

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

Each conductive Ex plate electrode EL/Z6V2/PE/... or EL/Z6V2/PEK/... or an Ex plate electrode combination EL/0/PE/... or EL/0/PEK-2/2/... or EL/0/PEK-4/... + EL/Z6V2/PE/... or EL/Z6V2/PEK/... has to be connected via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb to a conductive Ex electrode relay Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC.

The connection must be made as shown in the circuit diagrams on pages 31-2-26 to 31-2-28.

Technical data	**EL/0/PE/ 64/2/PP/ED/0/**	**EL/Z6V2/PE/ 64/2/PP/ED/0/**	**EL/Z6V2/PEK/ 64/2/PP/ED/1/**	**EL/0/PEK-2/2/ 64/2/PP/ED/1/**	**EL/0/PEK-4/ 64/2/PP/ED/1/**
	Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb				
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 and 2; EC type examination certificate INERIS 03ATEX0152**				
Design	1 control electrode and 1 earth electrode				
Cable break monitoring	**without**	**with integrated Z6V2 cable break monitoring unit**			**without**
Sensitive elements	2 electrode plates made of stainless st. 316 Ti, each with 24 mm dia.				
Housing	PP and cast resin				
Electrical connection	screw-type/ crimp connection	connecting cable 2 x 0.75, | 2 x 2 x 0.75, | 4 x 0.75, length 2 m, longer cable on request; halogen-free connecting cable on request			
Mounting	vertical				
Temperature range	– 20°C to + 60°C				
Pressure resistance	for pressureless applications only, use only under atmospheric conditions				
Max. cable length between electrode relay and electrode(s)	see Installation, Operating and Maintenance Instructions (sent on request)				

EL/Z6V2/WDX/74/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb conductive Ex plate electrode

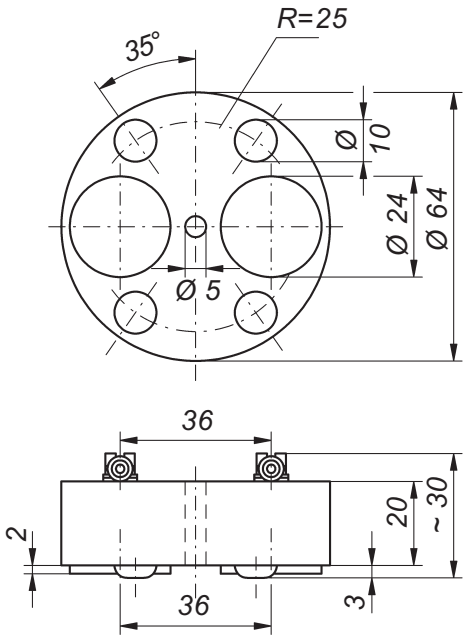
The conductive Ex plate electrode is fitted with two electrode plates as sensitive elements: 1 control electrode and 1 earth electrode.

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

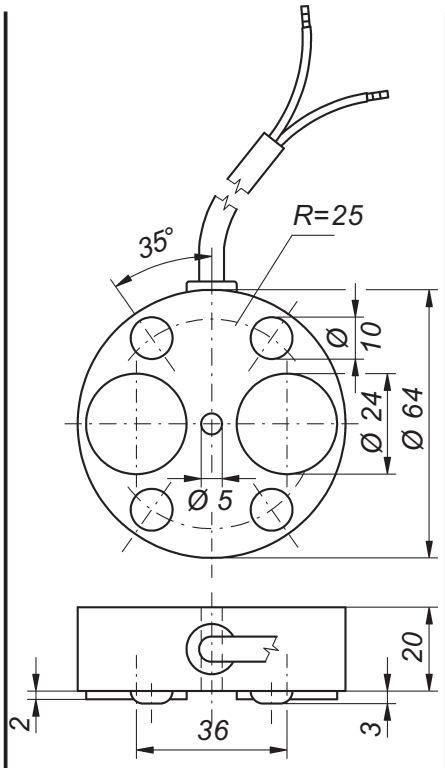
Each conductive Ex plate electrode EL/Z6V2/WDX/... has to be connected via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb to a conductive Ex electrode relay Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC.

The connection must be made as shown in the circuit diagrams on pages 31-2-26 to 31-2-28.

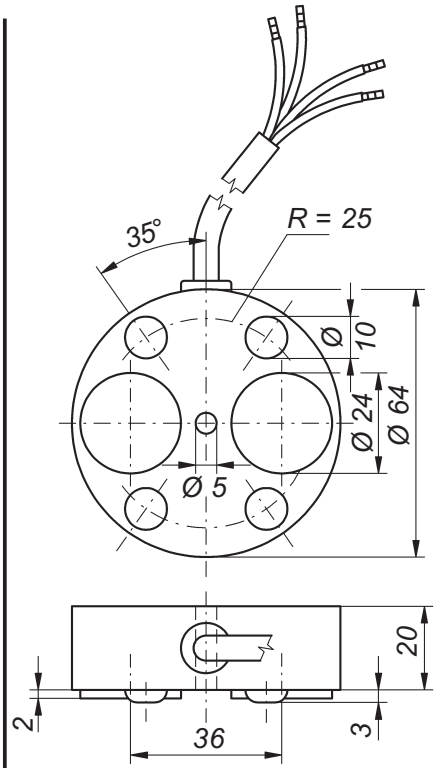
Technical data	**EL/Z6V2/WDX/74/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb**
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 and 2; EC type examination certificate INERIS 03ATEX0152**
Design	1 control electrode and 1 earth electrode
Cable break monitoring	**with integrated Z6V2 cable break monitoring unit**
Sensitive elements	2 electrode plates made of stainless steel 316 Ti, each with 25 mm dia.
Housing	PP and cast resin
Weight of the electrode	approx. 630 g
Electrical connection	connecting cable 2 x 0.75, length 2 m, longer cable on request; halogen-free connecting cable on request
Mounting	vertical
Temperature range	– 20°C to + 60°C
Pressure resistance	for pressureless applications only, use only under atmospheric conditions
Max. cable length between electrode relay and electrode	see Installation, Operating and Maintenance Instructions (sent on request)
Mounting accessory	stand made of stainless steel 316 Ti (option)



EL/./PE/... ⟨Ex⟩ II 2 G
Ex ia IIB T6 Gb

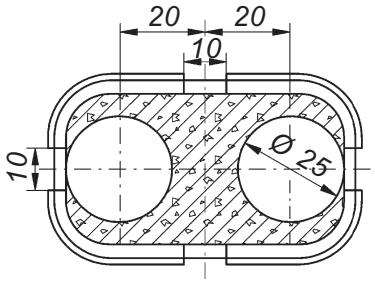


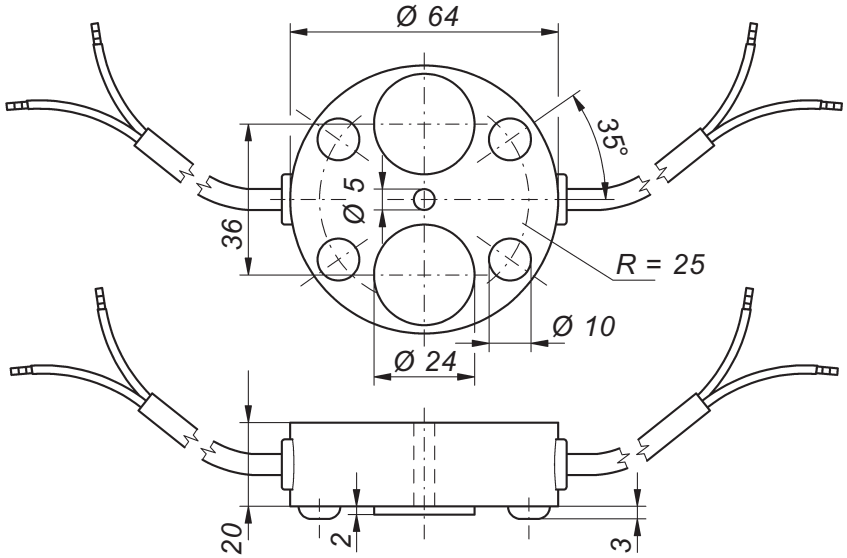
EL/Z6V2/PEK/... ⟨Ex⟩ II 2 G
Ex ia IIB T6 Gb



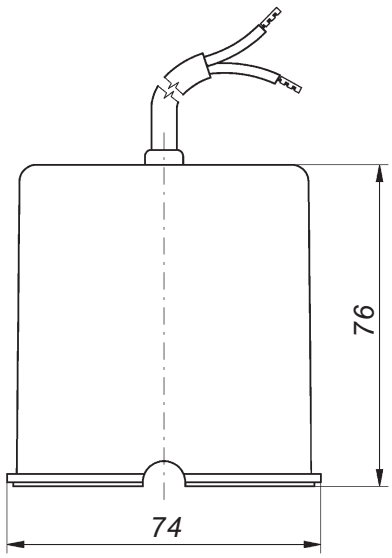
EL/0/PEK-4/... ⟨Ex⟩ II 2 G
Ex ia IIB T6 Gb

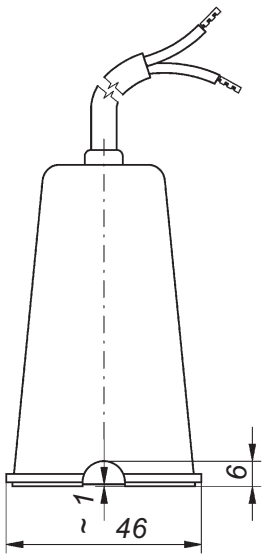
EL/Z6V2/WDX/... ⟨Ex⟩ II 2 G
Ex ia IIB T6 Gb

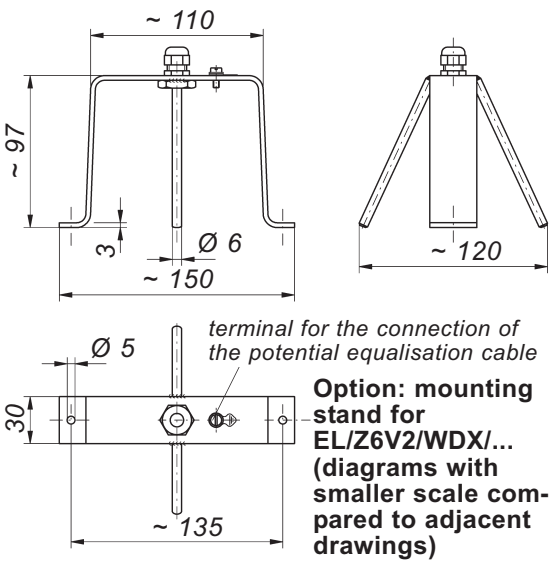




EL/0/PEK-2/2/... ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb







Option: mounting stand for EL/Z6V2/WDX/... (diagrams with smaller scale compared to adjacent drawings)

Conductive Ex rod electrode

Conductive Ex rod electrodes are designed to signal via a connected conductive Ex electrode relay the presence of a conductive liquid caused, for example, by burst pipes.

Conductive Ex 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 conductive Ex rod electrode come into contact with an electrically conductive liquid (e.g. water, acid etc.), an electrical contact is made and an alarm signal given via the connected conductive Ex electrode relay.

EL/./SB-1/G1/2/ED/ED/0/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb

EL/Z6V2/SZ-1/G1/2/ED/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb

EL/Z6V2/SZ-0/G1/2/ED/ED/1/Ex-0G
⟨Ex⟩ II 1 G Ex ia IIC T6 Ga

EL/./SB-1/G1/2/ED/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb conductive Ex rod electrodes

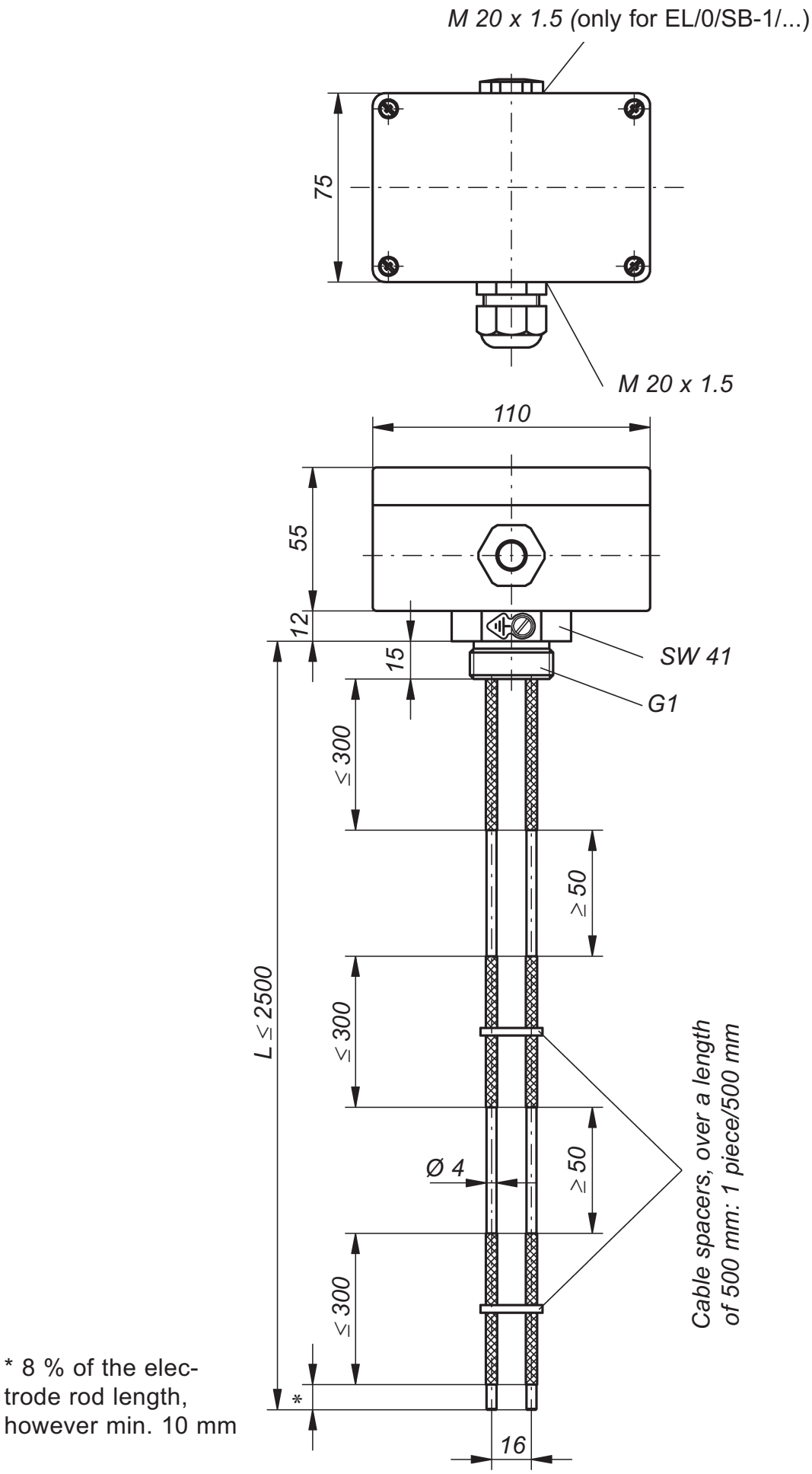
The conductive Ex rod electrodes are fitted with two electrode rods as sensitive elements: 1 control electrode and 1 earth electrode.

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

Each conductive Ex rod electrode EL/Z6V2/SB-1/... or the Ex rod electrode combination EL/0/SB-1/... + EL/Z6V2/SB-1/... has to be connected via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb to a conductive Ex electrode relay Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC.

The connection must be made as shown in the circuit diagrams on pages 31-2-26, 31-2-27 and 31-2-29.

Technical data	**EL/0/SB-1/ G1/2/ED/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb**	**EL/Z6V2/SB-1/ G1/2/ED/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb**
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 and 2; EC type examination certificate INERIS 03ATEX0152**	
Design	1 control electrode and 1 earth electrode	
Cable break monitoring	**without**	**with integrated Z6V2 cable break monitoring unit**
Sensitive elements	2 electrode rods made of stainless steel 316 Ti, each with 4 mm dia., covered with polyolefin shrinkdown tubing of **max. 300 mm** in length	
Lengths	as required (measured from the nipple sealing surface)	
Max. lengths	2,500 mm	
Screw-in nipple	stainless steel 316 Ti, G1	
Electrical connection	connection box made of glass fibre reinforced antistatic polyester, A 301, 110 x 75 x 55 mm, protection class IP65	
Mounting	vertical or horizontal	
Temperature range	– 20°C to + 60°C	
Pressure resistance	for pressureless applications only, use only under atmospheric conditions	
Max. cable length between electrode relay and electrode(s)	see Installation, Operating and Maintenance Instructions (sent on request)	



* 8 % of the electrode rod length, however min. 10 mm

EL/./SB-1/G1/2/ED/ED/0/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb

EL/Z6V2/SZ-1/G1/2/ED/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb and EL/Z6V2/SZ-0/G1/2/ED/ED/1/Ex-0G ⟨Ex⟩ II 1 G Ex ia IIC T6 Ga conductive Ex rod electrodes

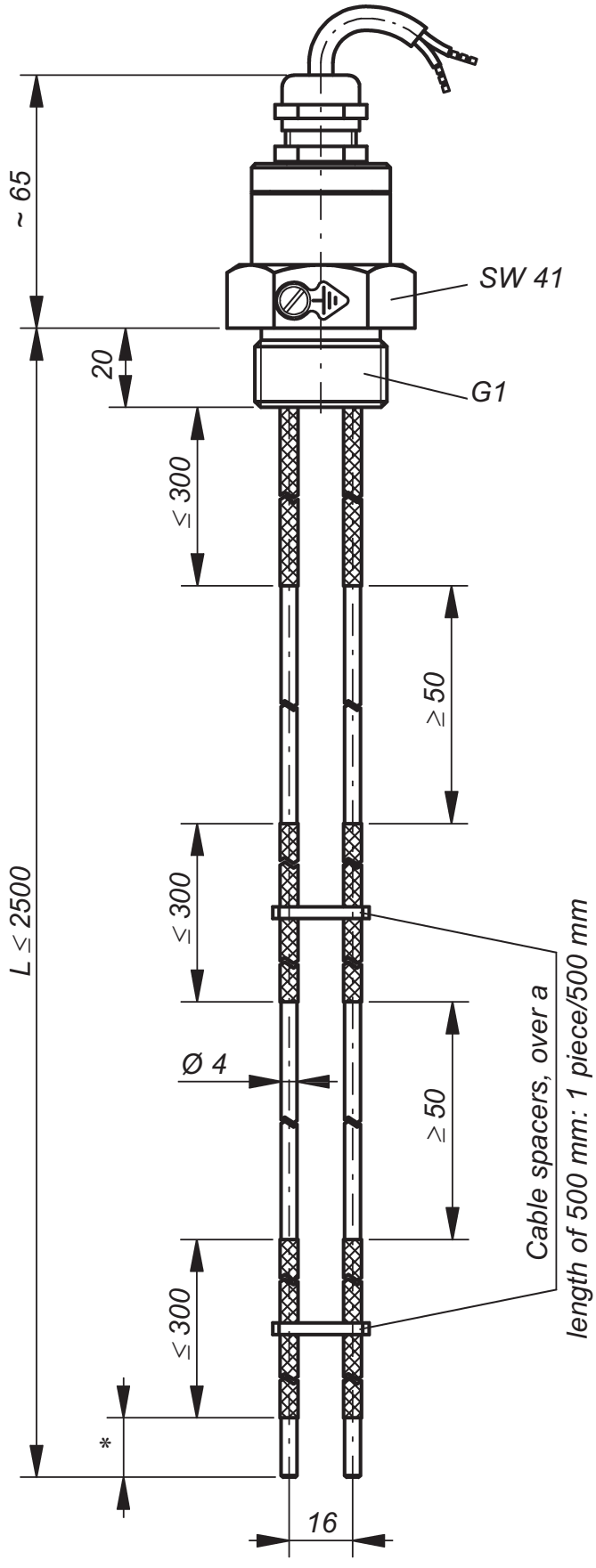
The conductive Ex rod electrodes are fitted with two electrode rods as sensitive elements: 1 control electrode and 1 earth electrode.

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

Each of the above mentioned conductive Ex rod electrodes has to be connected via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb to a conductive Ex electrode relay Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC.

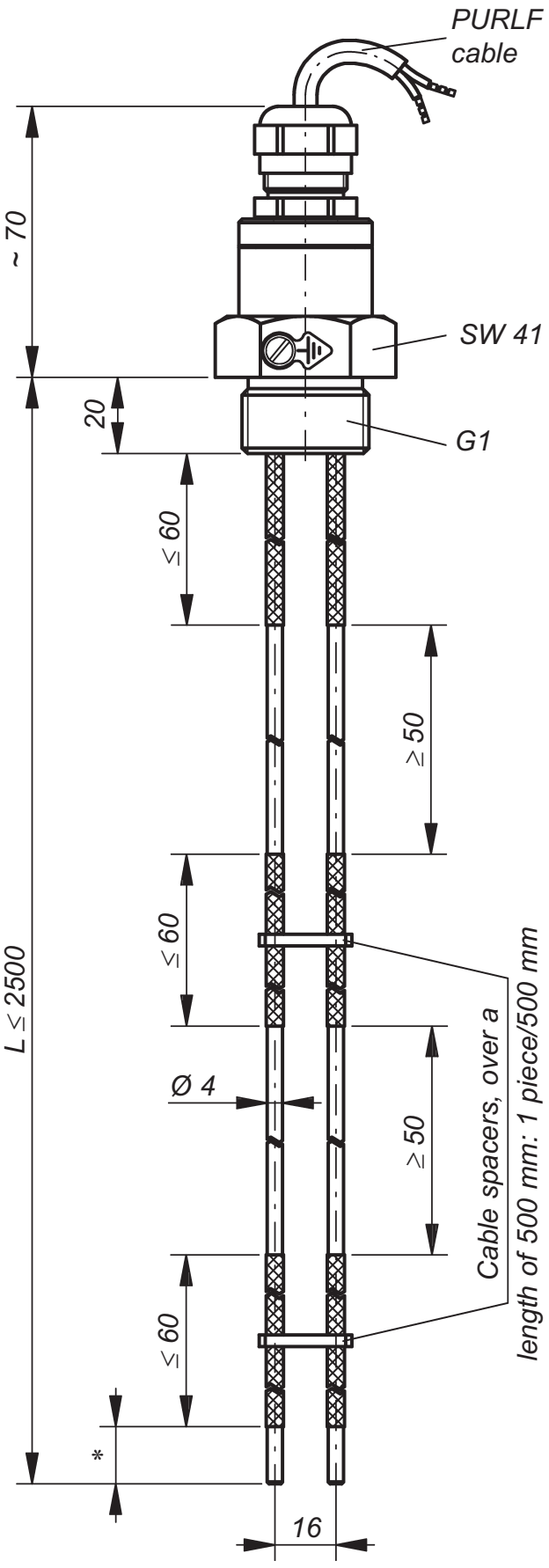
The connection must be made as shown in the circuit diagrams on pages 31-2-26, 31-2-27, 31-2-29 or 31-2-30.

Technical data	EL/Z6V2/SZ-1/ G1/2/ED/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb	EL/Z6V2/SZ-0/ G1/2/ED/ED/1/Ex-0G ⟨Ex⟩ II 1 G Ex ia IIC T6 Ga
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 or 2;**	**zone 0, 1 or 2; EC type examination certificate INERIS 03ATEX0152**
Design	1 control electrode and 1 earth electrode	
Cable break monitoring	**with integrated Z6V2 cable break monitoring unit**	
Sensitive elements	2 electrode rods made of stainless steel 316 Ti, each with 4 mm dia., covered with PVDF shrinkdown tubing of	
Length	**max. 300 mm** in length as required (measured from the nipple sealing surface)	**max. 60 mm** in length
Max. lengths	2,500 mm	
Screw-in nipple	stainless steel 316 Ti, G1	
Electrical connection	connection head made of stainless steel 316 Ti with cable entry made of brass, protection class IP68, with free connecting cable 2 x 0.75 made of PTFE, length 2 m, longer cable on request	antistatic PURLF (with external conductive PUR sheath), length 2 m, longer cable on request
Mounting	vertical or horizontal	
Temperature range	– 20°C to + 60°C	
Pressure resistance	for pressureless applications only, use only under atmospheric conditions	
Max. cable length between electrode relay and electrode	see Installation, Operating and Maintenance Instructions (sent on request)	



* 8 % of the electrode rod length, however min. 10 mm

EL/Z6V2/SZ-1/G1/2/ED/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb



* 8 % of the electrode rod length, however min. 10 mm

EL/Z6V2/SZ-0/G1/2/ED/ED/1/Ex-0G
⟨Ex⟩ II 1 G Ex ia IIC T6 Ga

Conductive Ex suspension electrodes

Conductive Ex suspension electrodes are designed to signal via a connected conductive Ex electrode relay the presence of a conductive liquid caused, for example, by burst pipes.

Conductive Ex suspension electrodes should only be used in normally dry environments. They must be mounted in suspended mode from above in such a way that the electrode rods are just slightly above the floor to be monitored.

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

EL/Z6V2/EHW/NL1/20/2/PP/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb

EL/Z6V2/EHW/NL2/28/2/PP/ED/1/Ex-1G
II 2 G Ex ia IIB T6 Gb

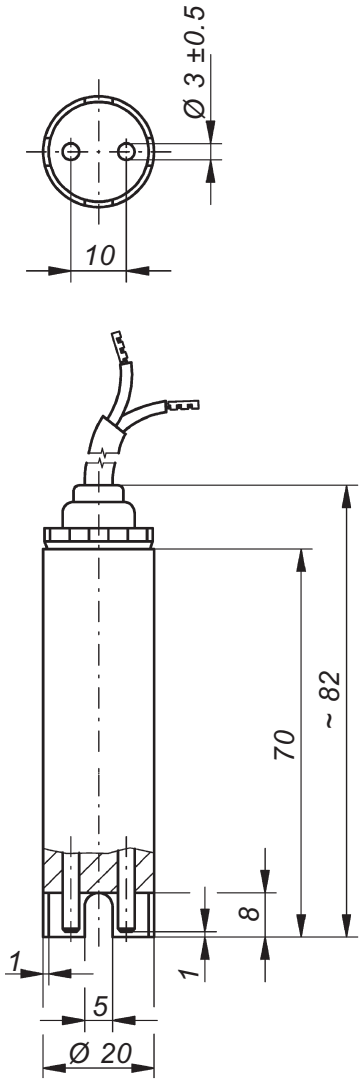
EL/Z6V2/EHW/NL1/20/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb and EL/Z6V2/EHW/NL2/28/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb conductive Ex suspension electrodes

The conductive Ex suspension electrodes are fitted with two electrode rods as sensitive elements: 1 control electrode and 1 earth electrode.

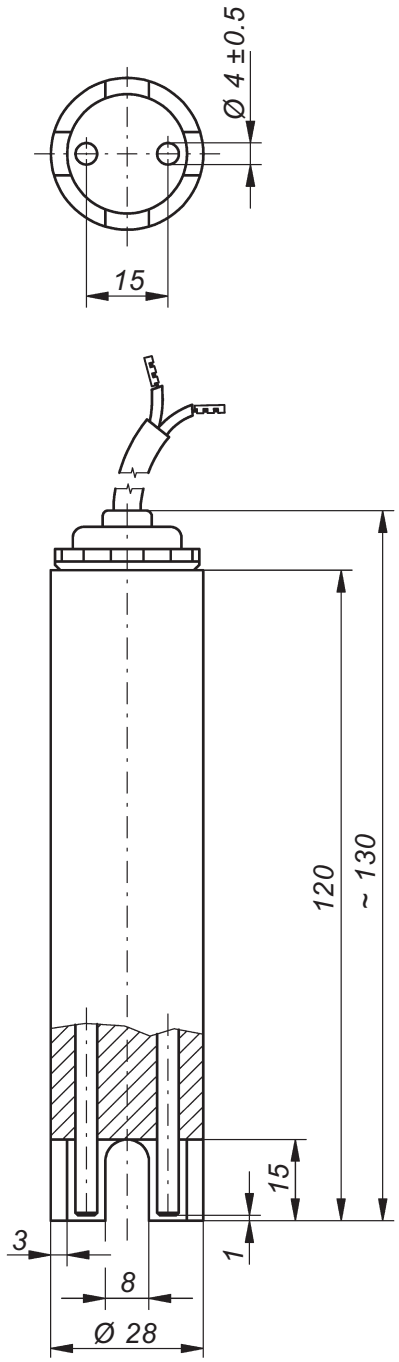
If the two electrode rods of an Ex suspension electrode come into contact with an electrically conductive liquid (e.g. water, acid etc.), an electrical contact is made and an alarm signal given via the connected conductive Ex electrode relay.

Each of the above mentioned conductive Ex suspension electrodes has to be connected via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb to a conductive Ex electrode relay Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC.
The connection must be made as shown in the circuit diagrams on pages 31-2-26 to 31-2-28.

Technical data	**EL/Z6V2/EHW/NL1/ 20/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb**	**EL/Z6V2/EHW/NL2/ 28/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb**
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 and 2; EC type examination certificate INERIS 03ATEX0152**	
Design	1 control electrode and 1 earth electrode	
Cable break monitoring	**with integrated Z6V2 cable break monitoring unit**	
Sensitive elements	2 electrode rods made of stainless steel 316 Ti, each with 3 mm dia.	each with 4 mm dia. other materials (e. g. Hastelloy) on request
Housing	PP; other materials (e. g. PVDF or PTFE) on request, 20 mm Ø x approx. 82 mm	28 mm Ø x approx. 130 mm
Electrical connection	connecting cable made of TPK 2 x 0.75, length 2 m, longer cable on request; connecting cable made of CM or PTFE on request	
Mounting	vertical	
Temperature range	– 20°C to + 60°C	
Pressure resistance	for pressureless applications only, use only under atmospheric conditions	
Max. cable length between electrode relay and electrode	see Installation, Operating and Maintenance Instructions (sent on request)	
Mounting accessories	**stuffing glands and flanges with stuffing glands on request**	



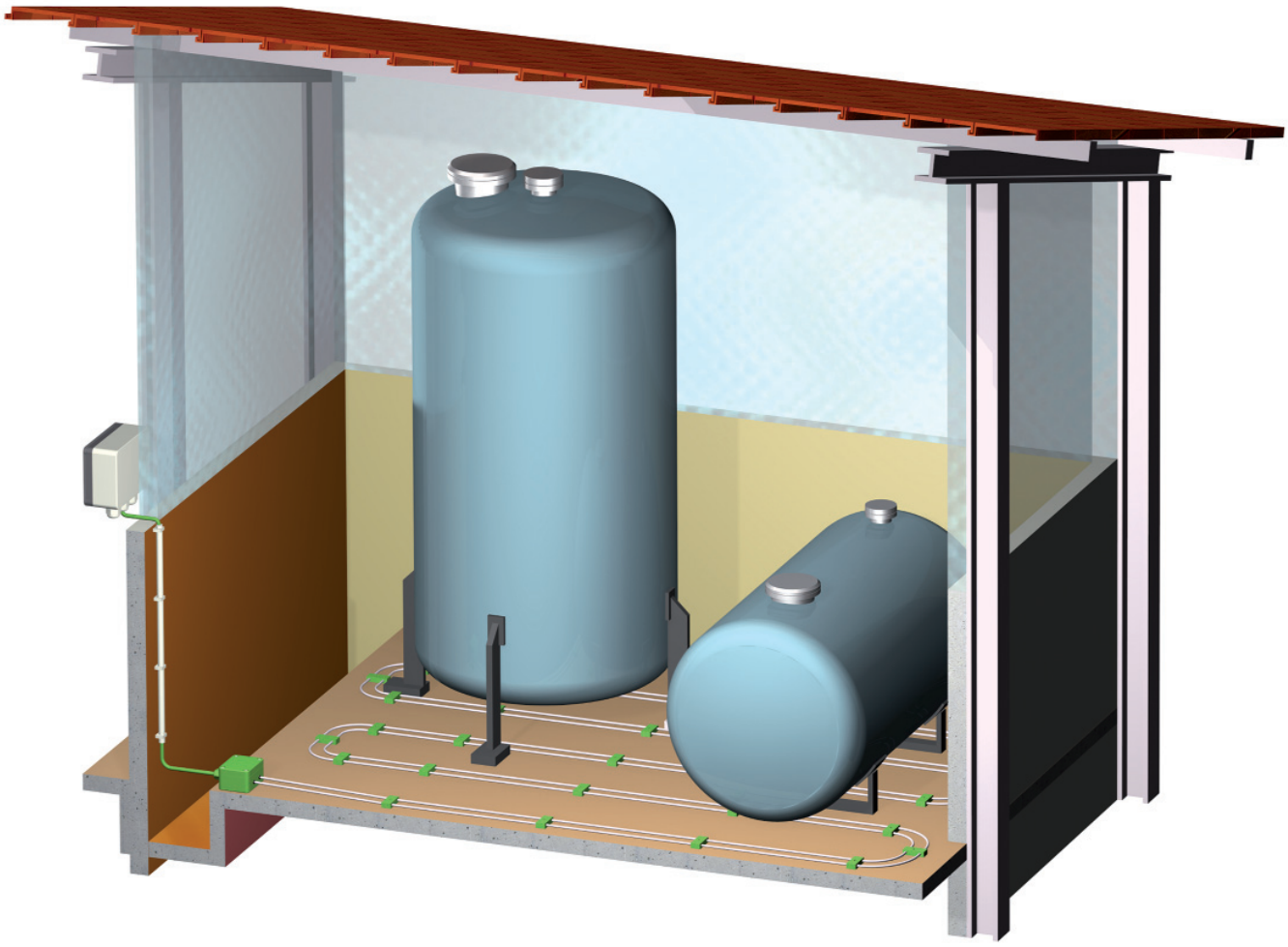
EL/Z6V2/EHW/NL1/20/2/PP/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb



EL/Z6V2/EHW/NL2/28/2/PP/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIB T6 Gb

Leakage detection with conductive “Leckstar” Ex line sensor

Application example with a conductive Ex cable electrode



Use of an Ex cable electrode for leakage detection of a conductive liquid in a storeroom

Conductive Ex cable electrode

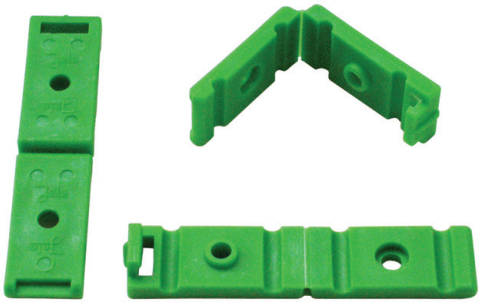
Conductive Ex cable electrodes are designed to signal via a connected conductive Ex electrode relay the presence of a conductive liquid caused, for example, by burst pipes.

Conductive Ex cable 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.

As soon as an electrically conductive liquid (e.g. water, acid etc.) creates a conductive path between the two sensor cables, an electrical contact is made and an alarm signal given via the connected conductive Ex electrode relay.

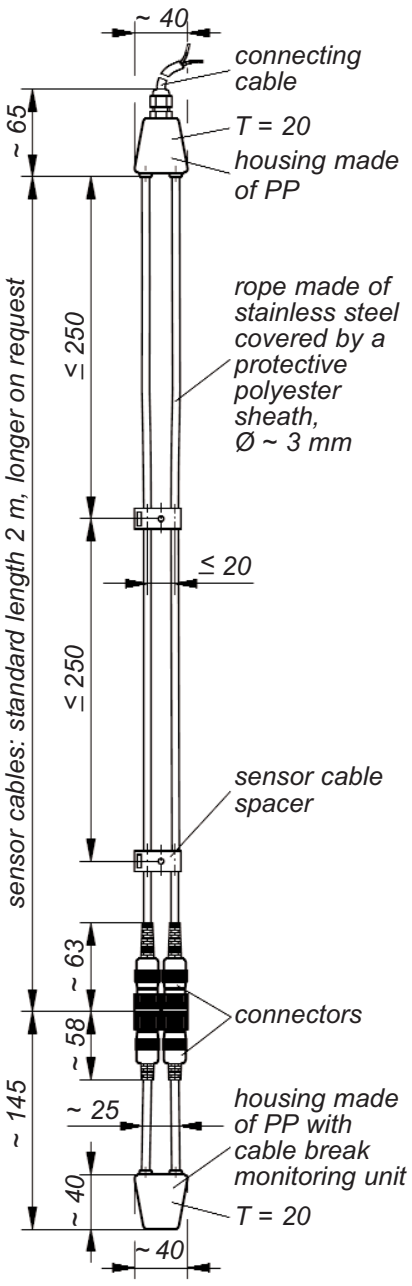
Supplied mounting accessories

Sensor cable spacers



Sensor cables with sensor cable spacers

Dimensions



EL/Z6V2/KE/40/2/PP/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIB T6 Gb

Mode of installation of the conductive Ex cable electrode

The two sensor cables of the conductive Ex 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.

EL/Z6V2/KE/40/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb conductive Ex cable electrode

The conductive Ex cable electrode is fitted with two sensor cables as sensitive elements: 1 control electrode and 1 earth electrode.

As soon as an electrically conductive liquid (e.g. water, acid etc.) creates a conductive path between the two sensor cables, an electrical contact is made and an alarm signal given via the connected conductive Ex electrode relay.

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 as far as possible false alarms, whilst allowing leakage liquid to penetrate throught to the stainless steel ropes.

Each conductive Ex cable electrode has to be connected via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb to a conductive Ex electrode relay Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC.

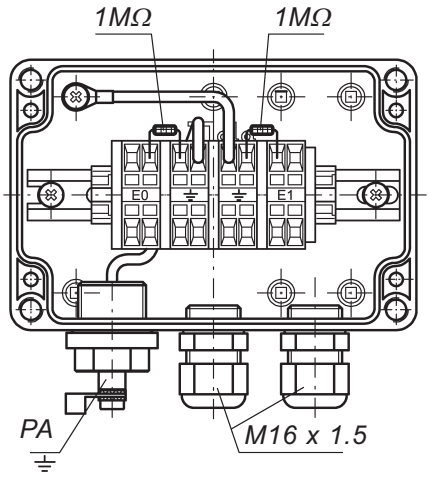
The connection must be made as shown in the circuit diagrams on pages 31-2-26 to 31-2-28.

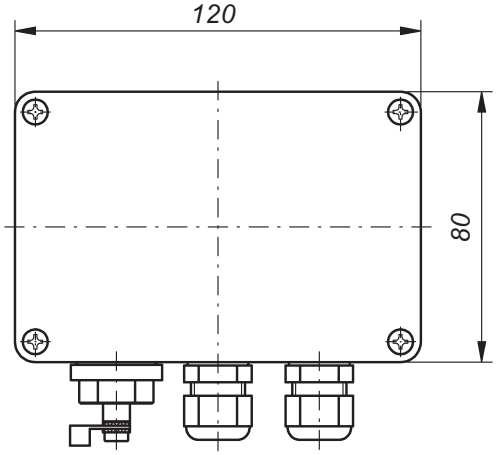
Technical data	**EL/Z6V2/KE/40/2/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb**
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 and 2; EC type examination certificate INERIS 03ATEX0152**
Design	1 control electrode and 1 earth electrode
Cable break monitoring	**with integrated Z6V2 cable break monitoring unit**
Sensitive elements	2 sensor cables in form of 2 ropes made of stainless steel 316, each with 3 mm dia., each covered by a halogen-free protective polyester sheath; length 2 m each, shorter or longer on request
Max. length of sensor cables	**100 m; if the sensor cables are wound round a pipe or tank, the possible length 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 cables
Electrical connection	connecting cable 2 x 0.75, length 2 m, longer cable on request; halogen-free connecting cable on request
Mounting	horizontal
Temperature range	– 20°C to + 60°C
Pressure resistance	for pressureless applications only, use only under atmospheric conditions
Max. cable length between electrode relay and electrode	see Installation, Operating and Maintenance Instructions (sent on request)

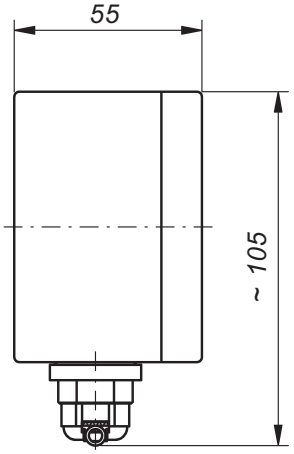
OAK/LST/2x1MΩ
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
obligatory Ex connection box

Technical data	OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
Application	• for integration of the plates or rods or sensor cables of the conductive Ex electrode(s) in question in the potential equalisation system of the installation, • for connection of the intrinsically safe control circuit of the conductive Ex electrode relay to the conductive Ex electrode(s) • for installation in potentially explosive atmospheres in zone 1 or 2. EC type examination certificate INERIS 03ATEX0152
Material	PPLF (condutive polypropylene)
Dimensions	120 x 80 x 55 mm
Cable entries	2 cable entries made of PA
Terminals	4 terminals for cable with a cross-section > 0.196 mm² and < 2.5 mm² and with a minimum diameter of 0.5 mm in case of multi-core conductors
Connection to the potential equalisation system	to outer potential equalisation terminal
Protection class	IP65
Mounting	via 4 boreholes Ø 4 mm
Mounting orientation	any
Temperature range	– 20°C to + 60°C

Representation without cover







Dimensions in mm

Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC conductive Ex electrode relay

- **with cable break monitoring feature and switchable self-hold**
- **for connection <u>of 1</u> conductive Ex electrode <u>with</u> Z6V2 cable break monitoring unit**
- **with 1 potential-free changeover contact at the output**

Conductive Ex 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 unit is designed for switch cabinet mounting or installation in a suitable protective housing <u>outside potentially explosive atmospheres</u> and may therefore only be mounted / installed in these locations. It is suitable for use in clean environments only.

The Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC conductive electrode relay is designed to transmit control commands from an intrinsically safe control current circuit to a non-intrinsically safe active current circuit. **It must be installed outside potentially explosive areas in compliance with the relevant standards and regulations.**

Ex approved conductive electrodes, such as our conductive Ex plate, rod, suspension or cable electrodes, may be used, via an obligatory Ex connection box OAK/LST/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb, in the intrinsically safe control current circuit. **The different application possibilities and the special conditions for safe use are described in the corresponding Installation, Operating and Maintenance Instructions (sent on request).**

Self-hold:

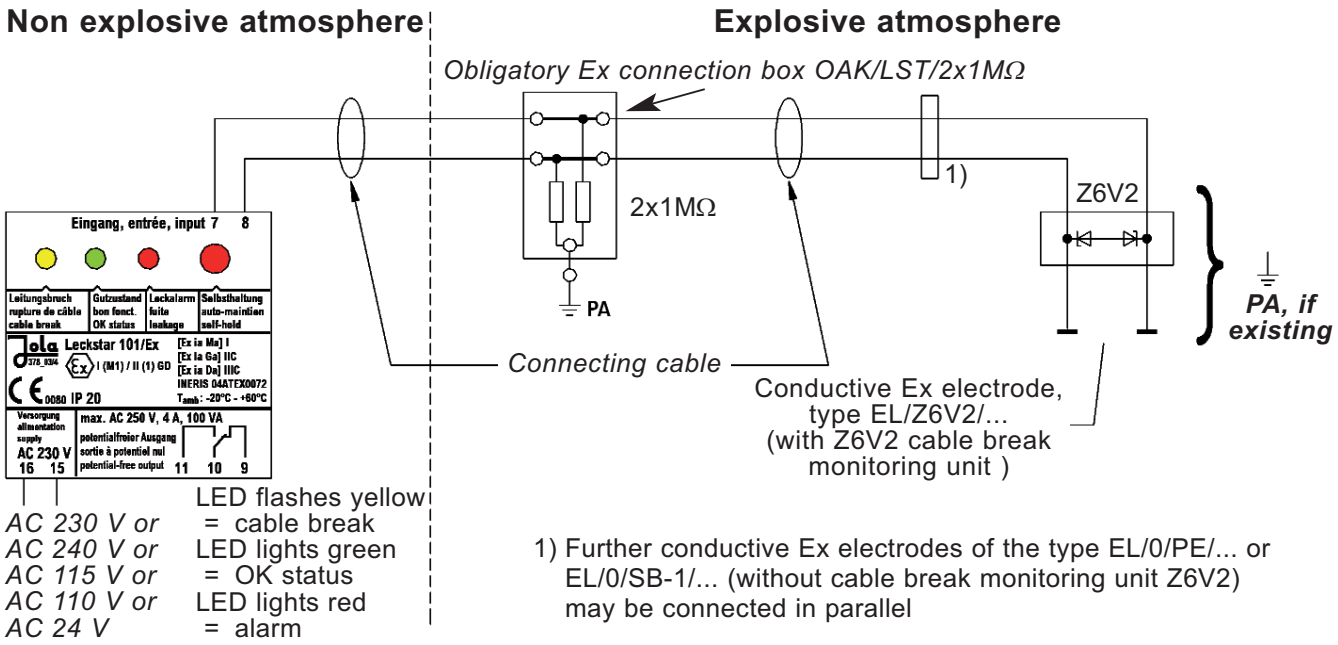
- If the switch **for self-hold is switched on**, **an alarm is stored**. The relay continues to signal the alarm even if the cause of the alarm (e.g. the presence of water or a cable break) is no longer present – in other words, if the sensor is dry again or if the line has contact. The alarm is acknowledged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

Connection diagrams
EL/./.../../../../../../Ex-.. ⟨Ex⟩ II 2 G or II 1 G Ex ia II. T6 G. conductive Ex electrodes to Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC conductive Ex electrode relay:
see pages 31-2-26 to 31-2-30 and Installation, Operating and Maintenance Instructions (sent on request).

Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC conductive Ex electrode relay

Technical data	Leckstar 101/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC
Alternative supply voltages (terminals 15 and 16)	AC 230 V (supplied if no other supply voltage is specified in the order) or AC 240 V or AC 115 V or AC 110 V or AC 24 V
Power consumption	approx. 3 VA
Electrode circuit (terminals 7 and 8)	2 terminals (under safety extra low voltage SELV), acting on 1 output relay with switchable self-hold
No-load voltage	8 V_{eff} ⊓⊔ 10 Hz (safety extra low voltage SELV)
Short-circuit current	max. 0.5 mA_{eff}
Response sensitivity	approx. 30 kΩ or approx. 33 µS (electric conductance)
Cable break monitoring	via Zener diode circuit (Z6V2) at the end of the electrode line
Power circuit (terminals 9, 10, 11)	1 single-pole potential-free changeover contact based on the quiescent current principle
Switching status indication	3 LEDs (see page 31-2-26)
Switching voltage	max. AC 250 V
Switching current	max. AC 4 A
Switching capacity	max. 500 VA
Housing	insulating material, 75 x 55 x 110 mm
Connection	terminals on top of housing
Protection class	IP20
Mounting	clip attachment for U-bar to DIN 46 277 and EN 50 022 or fastening via two boreholes
Mounting orientation	any
Temperature range	– 20°C to + 60°C
Max. length of connecting cable between Ex electrode relay and Z6V2 cable break monitoring unit	Installation, Operating and Maintenance Instructions (sent on request).
EC type examination certificate	INERIS 04ATEX0072
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

Connection diagram

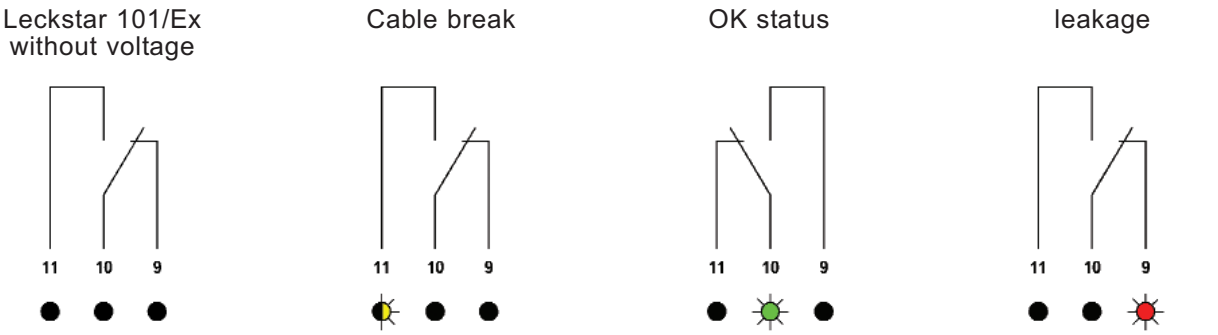


1) Further conductive Ex electrodes of the type EL/0/PE/... or EL/0/SB-1/... (without cable break monitoring unit Z6V2) may be connected in parallel

Position of contact when Leckstar 101/Ex without voltage

Due to the design of the unit, only one electrode cable can be monitored for cable break. If several Ex electrodes of the type EL/..../PE/... or EL/.../SB-1/... are to be connected to a common Leckstar 101/Ex electrode relay, only one electrode (the last one) may be fitted with the Z6V2 cable break monitoring unit. All other Ex electrodes are to be used without integrated Z6V2 cable break monitoring unit (see circuit diagrams on following pages).

Position of output contact of the Leckstar 101/Ex electrode relay



LEDs dark:
Ex electrode relay without voltage, output relay not energized

yellow LED flashes:
Ex electrode relay with voltage, electrode cable break, output relay not energized

green LED lights:
Ex electrode relay with voltage, Ex electrode dry, output relay energized

red LED lights:
Ex electrode relay with voltage, Ex electrode wet, output relay not energized

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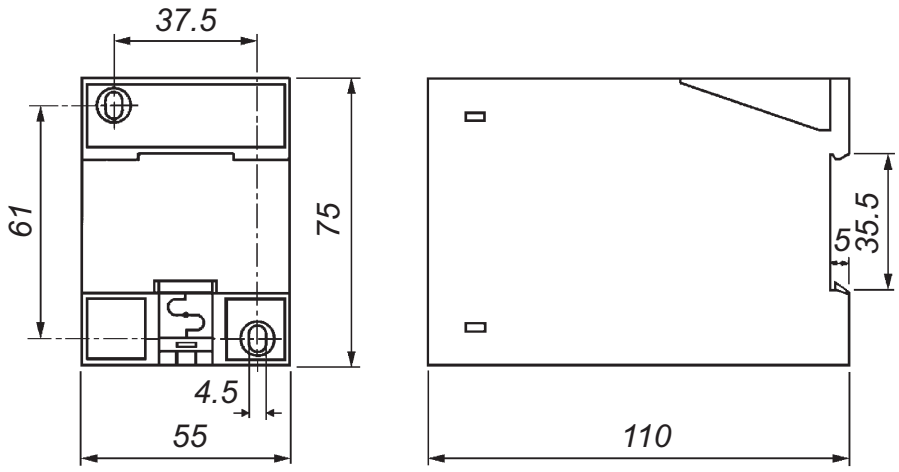
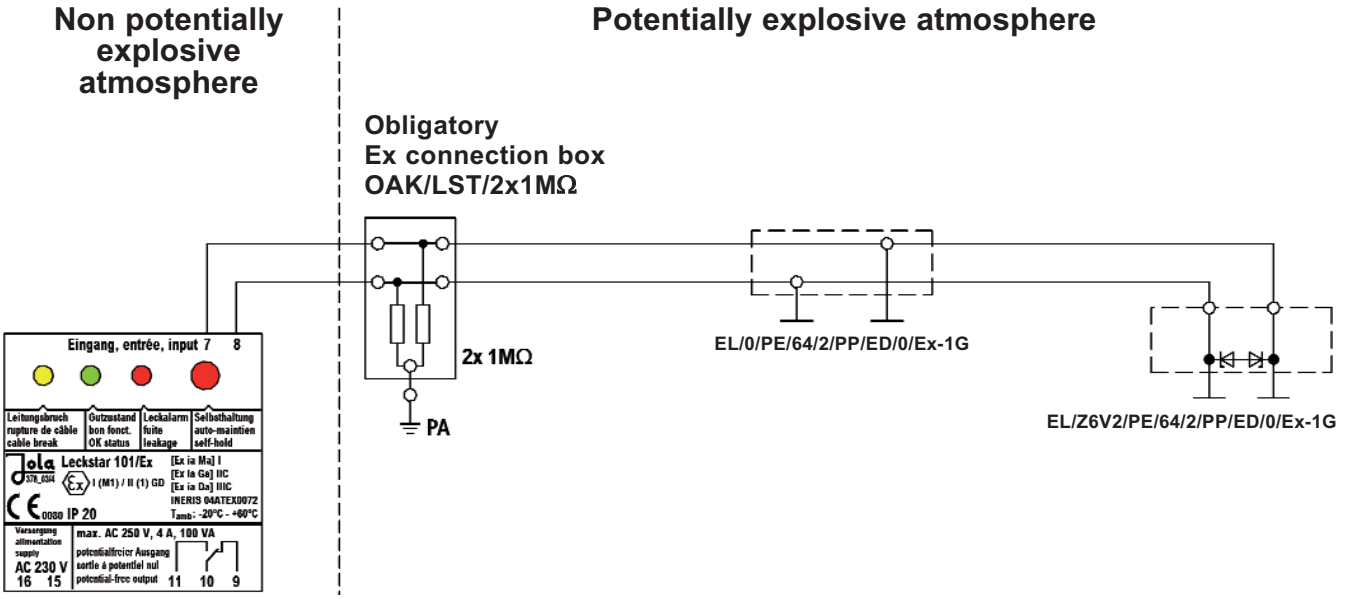
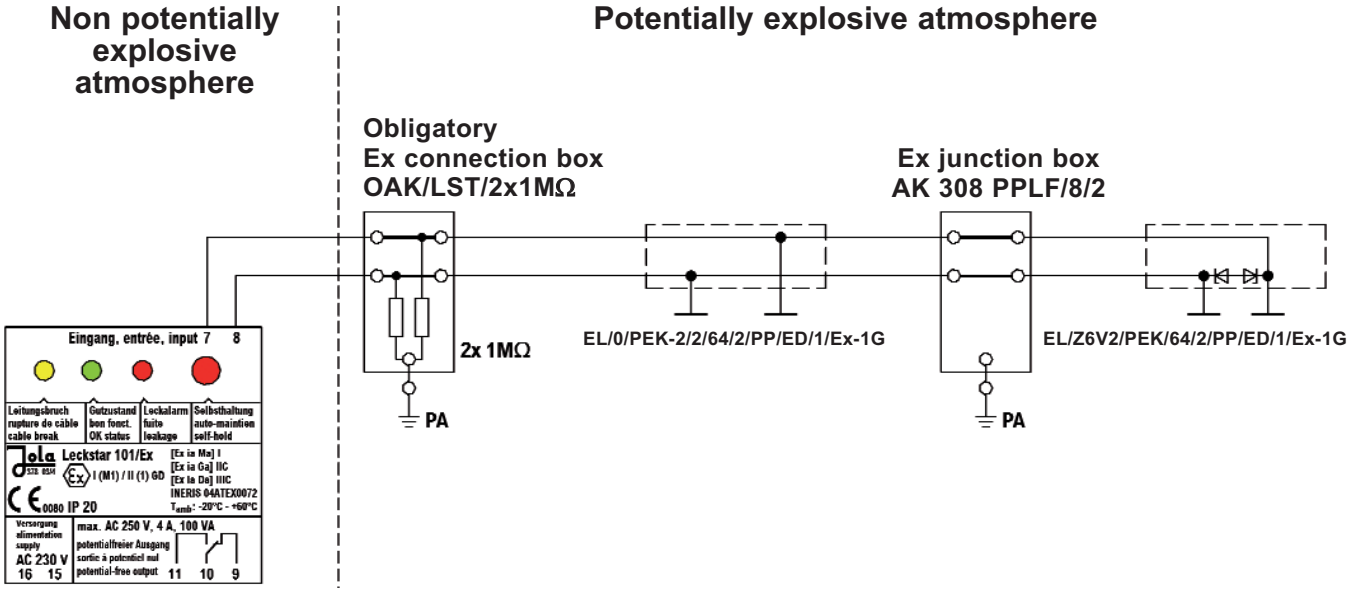
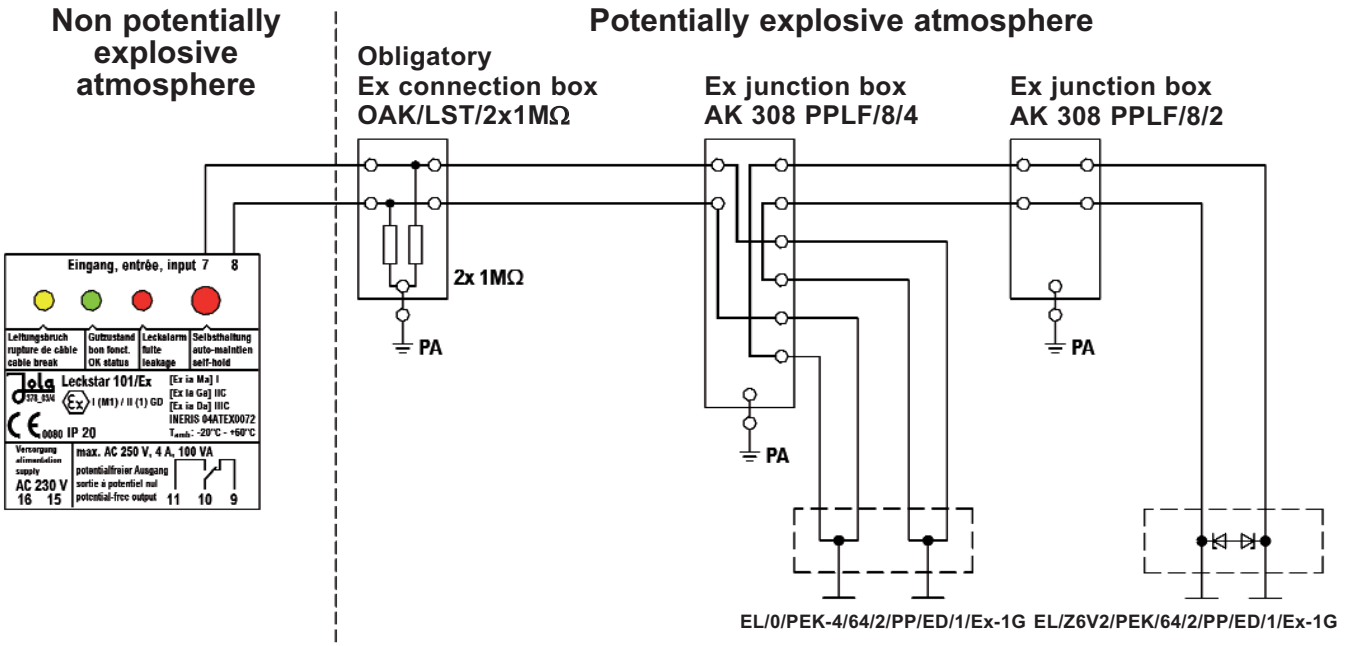
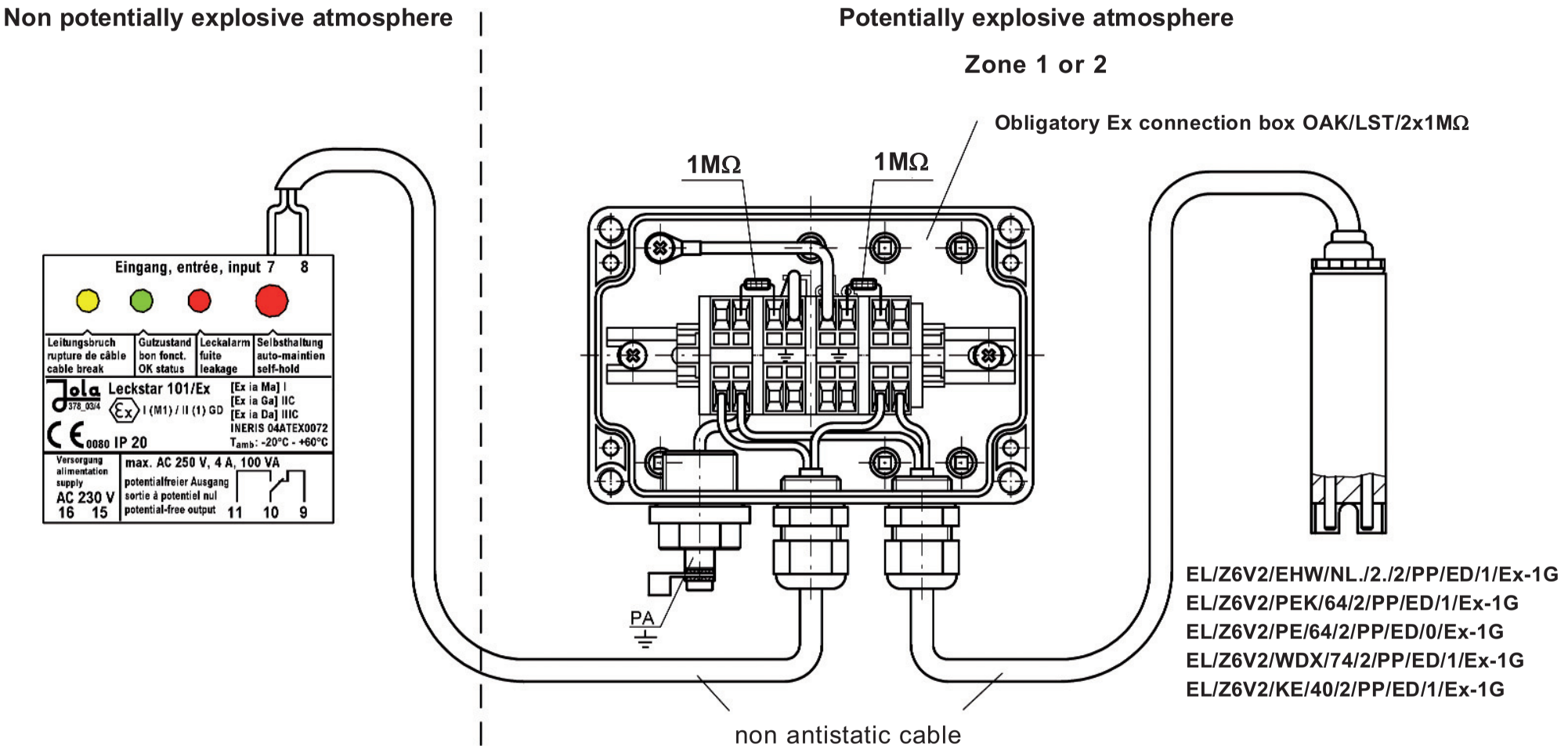


Connection diagrams:
Preservation of the cable break monitoring when connecting several electrodes, represented here with Ex electrode types EL/./PE... as an example





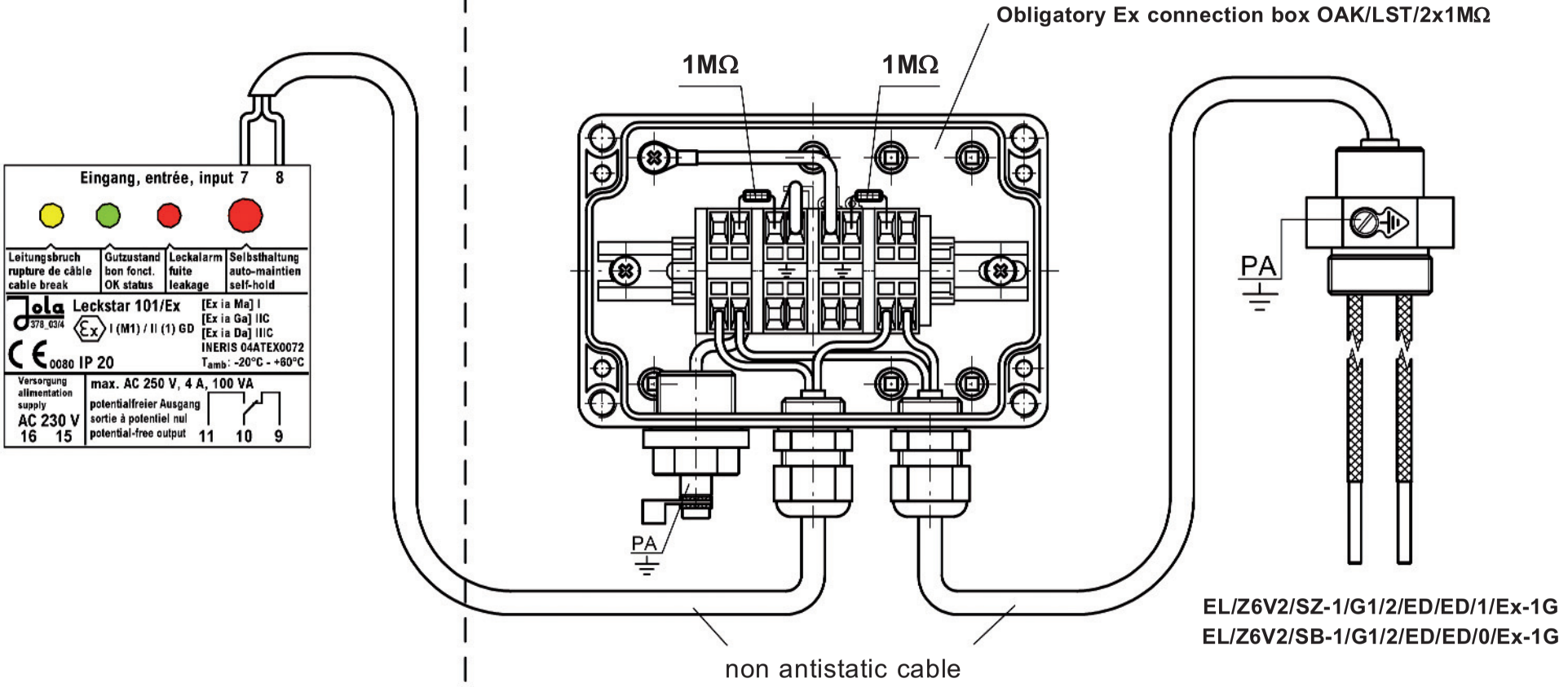


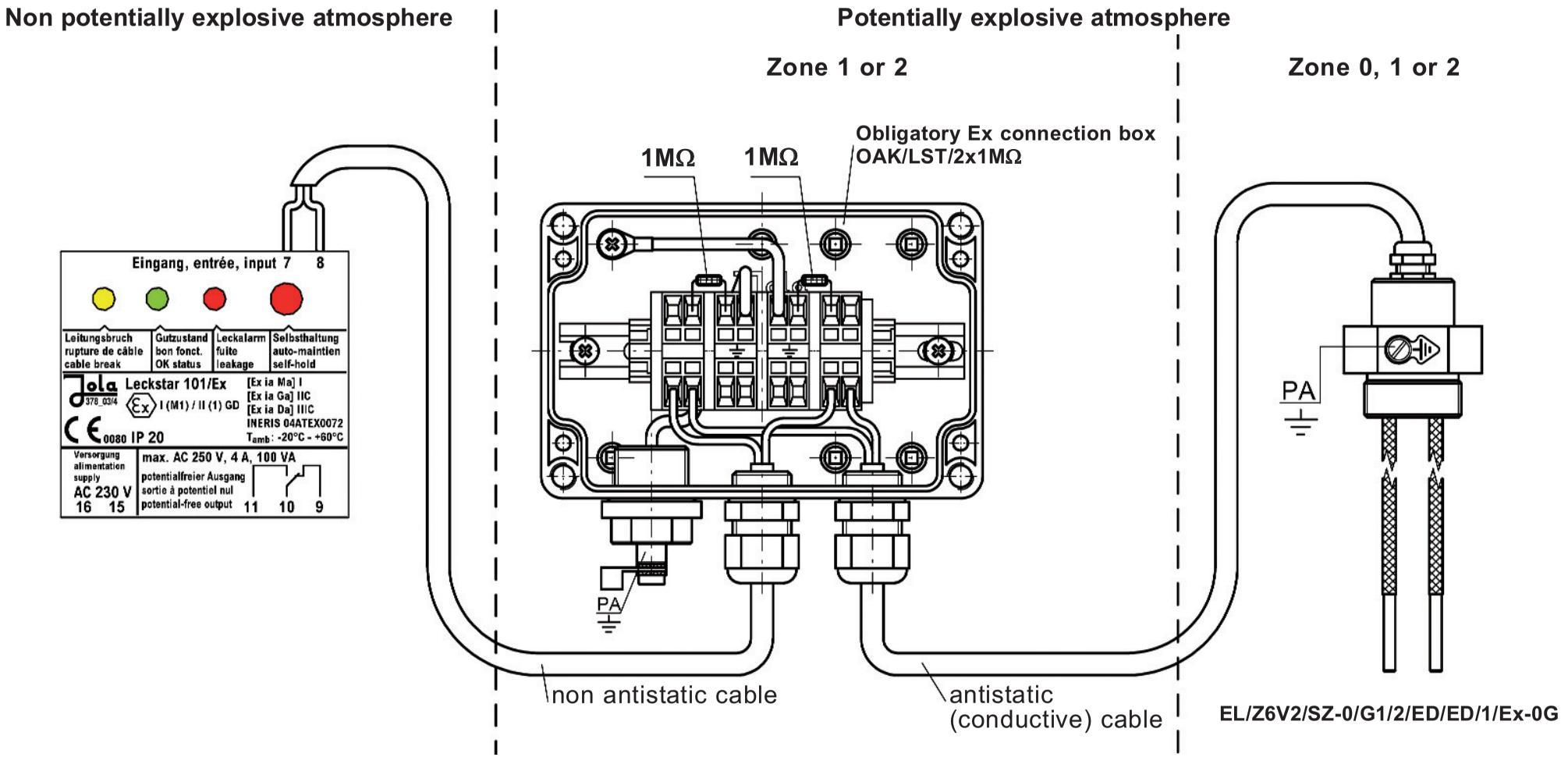

Non potentially explosive atmosphere
Potentially explosive atmosphere
Zone 1 or 2
Obligatory Ex connection box OAK/LST/2x1MΩ
1MΩ
1MΩ
Eingang, entrée, input 7 8
Leitungsbruch rupture de câble cable break
Gutzustand bon fonct. OK status
Leckalarm fuite leakage
Selbsthaltung auto-maintien self-hold
Jola 378_03/4
Leckstar 101/Ex
I (M1) / II (1) GD
[Ex ia Ma] I
[Ex ia Ga] IIC
[Ex ia Da] IIIC
INERIS 04ATEX0072
CE 0080 IP 20
Tamb: -20°C - +60°C
Versorgung alimentation supply
AC 230 V
16 15
max. AC 250 V, 4 A, 100 VA
potentialfreier Ausgang
sortie à potentiel nul
potential-free output
11 10 9
PA
non antistatic cable
EL/Z6V2/EHW/NL./2./2/PP/ED/1/Ex-1G
EL/Z6V2/PEK/64/2/PP/ED/1/Ex-1G
EL/Z6V2/PE/64/2/PP/ED/0/Ex-1G
EL/Z6V2/WDX/74/2/PP/ED/1/Ex-1G
EL/Z6V2/KE/40/2/PP/ED/1/Ex-1G

Non potentially explosive atmosphere

Potentially explosive atmosphere

Zone 1 or 2




Non potentially explosive atmosphere
Potentially explosive atmosphere
Zone 1 or 2
Zone 0, 1 or 2
Obligatory Ex connection box
OAK/LST/2x1MΩ
1MΩ
1MΩ
Eingang, entrée, input 7 8
Leitungsbruch
rupture de câble
cable break
Gutzustand
bon fonct.
OK status
Leckalarm
fuite
leakage
Selbsthaltung
auto-maintien
self-hold
Leckstar 101/Ex
I (M1) / II (1) GD
[Ex ia Ma] I
[Ex ia Ga] IIC
[Ex ia Da] IIIC
INERIS 04ATEX0072
0080 IP 20
Tamb: -20°C - +60°C
Versorgung
alimentation
supply
AC 230 V
16 15
max. AC 250 V, 4 A, 100 VA
potentialfreier Ausgang
sortie à potentiel nul
potential-free output
11 10 9
PA
PA
non antistatic cable
antistatic
(conductive) cable
EL/Z6V2/SZ-0/G1/2/ED/ED/1/Ex-0G