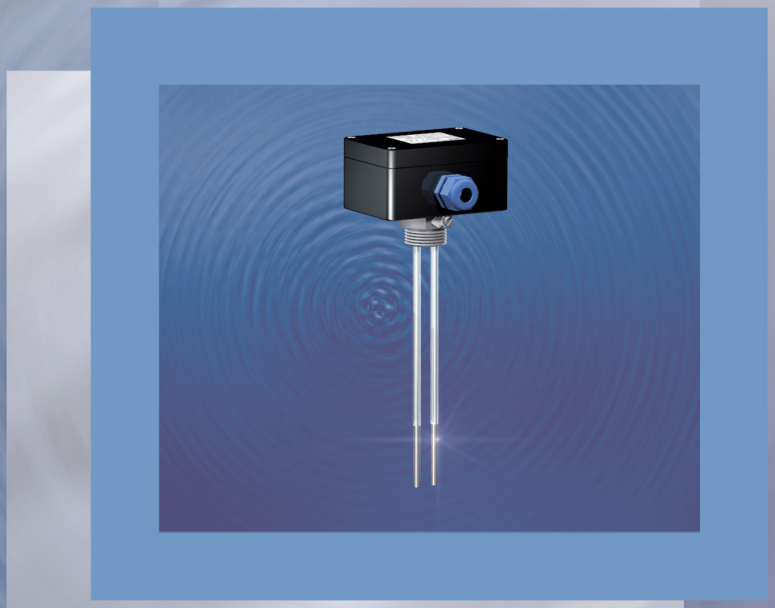
Ex
electrode controls

Conductive controlling devices for level signalling or regulation of electrically conductive liquids



Jola Spezialschalter GmbH & Co. KG
Klostergartenstr. 11 • 67466 Lambrecht (Germany)
Tel. +49 6325 188-01 • Fax +49 6325 6396
contact@jola-info.de • www.jola-info.de

Jola Spezialschalter GmbH & Co. KG sells only business-to-business (B2B).

The units described in this documentation may only be installed, connected, started up, serviced and replaced 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.

Ex electrode controls

Table of contents — Page

General information on electrode controls

for level signalling or regulation of electrically conductive liquids

1. Operating principle

Electrode controls are used for the automatic control of pumps or electromagnetic valves as well as overflow or run-dry protection in wells or tanks with electrically conductive liquids.

The liquid levels are monitored by electrodes which give switching commands to the electronic relay if they come into contact with the liquid.

For a two-point control system, you require two control electrodes and one ground electrode.

If you only wish to signal a liquid level, the control electrode E1 and the ground electrode will suffice.

You can also use a metallic, conductive tank wall as a ground connection in place of the ground electrode.

However, we recommend the use of a separate ground electrode in all cases.

2. Recommendations for the use of control electrodes

The conductive liquid to be controlled should have a specific conductivity of min. 50 µS/cm. The specific conductivity of tap water is usually set in a range from 100 µS/cm to 1,000 µS/cm.

3. Recommendations for the design of the electrodes

- **Highly conductive liquids:** if there is sufficient space, we advise you to use **several single electrodes** at a spacing of approx. 100 mm instead of a multiple electrode.
- **Poorly conductive liquids:** if electrodes are used in poorly conductive liquids, the electrode rods should be mounted as close as possible to one another. For these applications, we recommend the use of a **multiple electrode** in place of several single electrodes.

4. Electrode controls can or should not be used:

- in electrically non-conductive liquids (e.g. in mineral oils)
- in mushy or viscous liquids
- in liquids with a tendency to foam (e.g. possibly washing sodas etc.)
- in liquids with a high level of steam generation and condensate (e.g. at higher temperatures)
- in liquids with a tendency to form deposits (e.g. in limestone milk, oily waste water etc.)
- in liquids with solid particles (e.g. pieces of wood, remnant etc.)

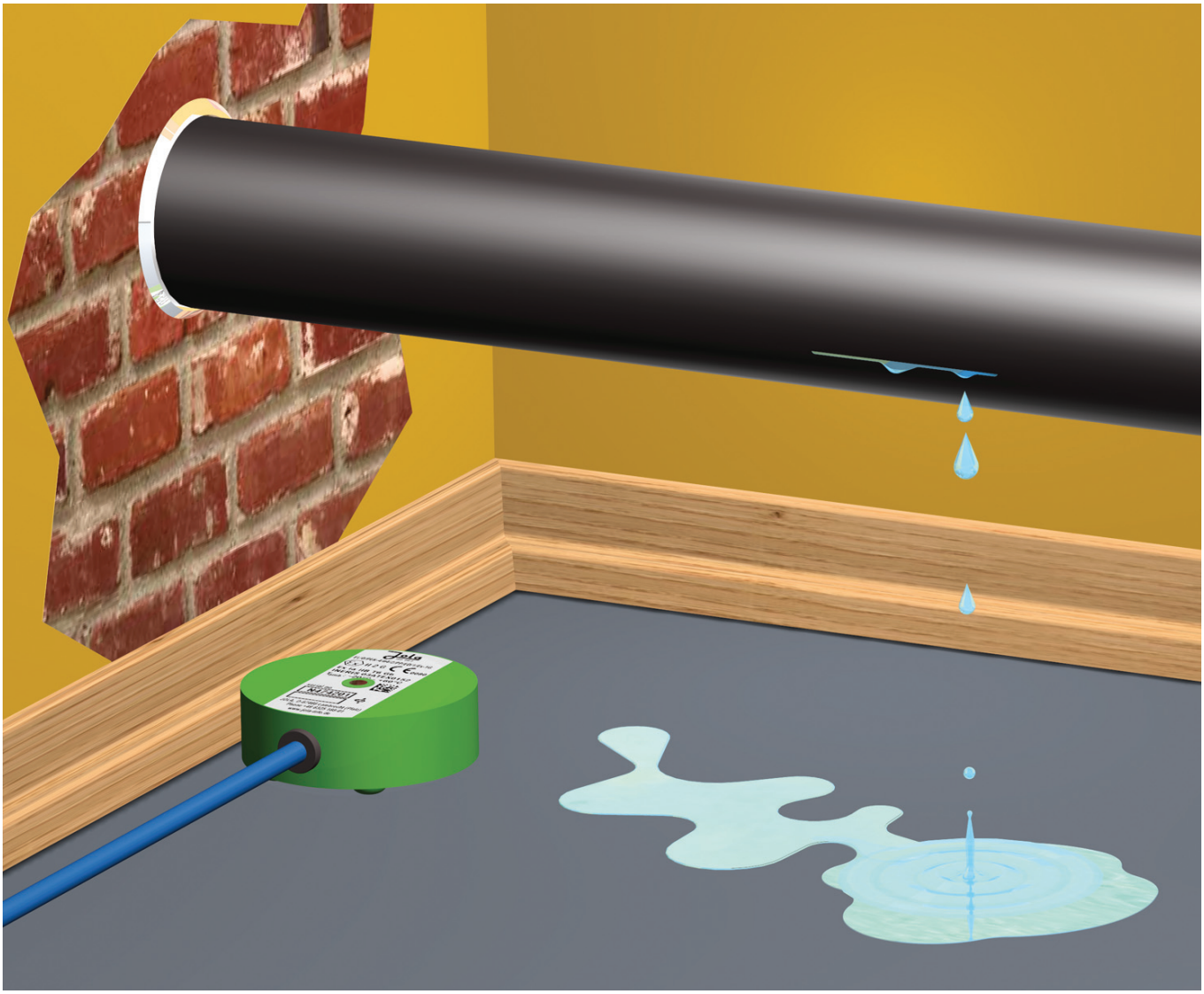
The conductive measuring principle

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 (e.g. oils, diesel, fuel oil, demineralised water ...).

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 Ex electrode controls consist 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 Ex 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 electrodes.



Examples of electrically 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)

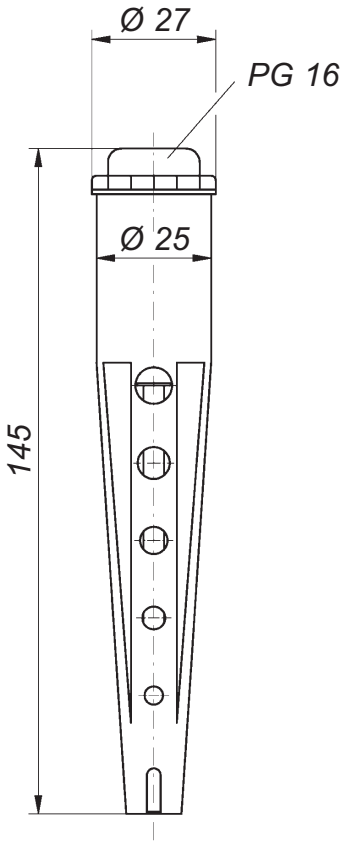
Zinc chloride *
Zinc nitrate *
Zinc sulphate *

* Saturated solution

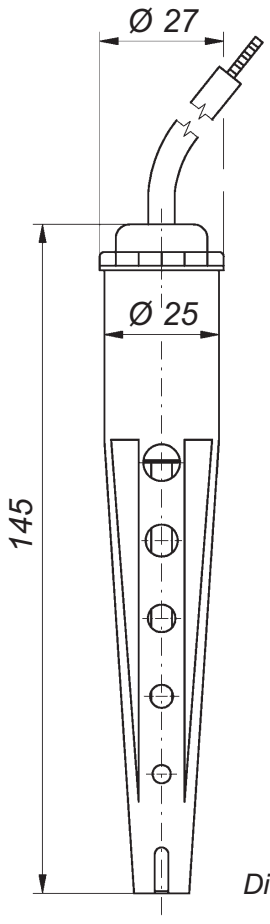
A reliable detection of electrically poor conductive liquids (compared to the above-mentioned liquids) can be achieved by adaption of the sensitivity of the conductive Ex electrode relay in our works (on request).

EL/0/EH./27/1/PP/ED/./Ex-1G
⟨Ex⟩ II 2 G Ex ia IIB T6 Gb
conductive Ex suspension electrodes

Technical data	EL/0/EH/ 27/1/PP/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb	EL/0/EHK/NL/ 27/1/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 or 2 EC type examination certificate INERIS 03ATEX0152**	
Design	1 control electrode or 1 ground electrode	
Sensitive element	1 electrode rod made of stainless steel 316 Ti, with 4 mm dia.	
Housing	PP, 27 mm Ø x approx. 145 mm	PP, 27 mm Ø x approx. 145 mm
Electrical connection	connection terminal	cable 1 x 1.5, length 1 m, longer on request
Mounting orientation	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/0/EH/27/1/PP/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb



Dimensions in mm

EL/0/EHK/NL/27/1/PP/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIB T6 Gb

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

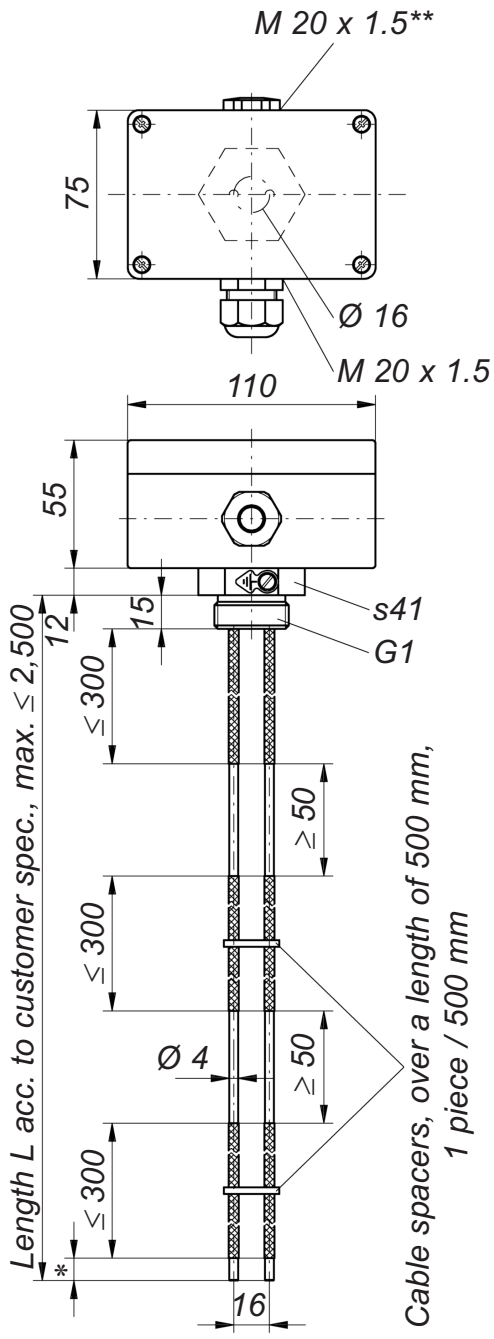
Technical data	EL/0/SB-1/G1/1/ ED/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb	EL/0/SB-1/G1/2/ ED/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb	EL/0/SB-1/G1/3/ ED/ED/0/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 or 2** **EC type examination certificate INERIS 03ATEX0152**		
Design	1 control electrode or 1 ground electrode	1 control electrode and 1 ground electrode	2 control electrodes and 1 ground electrode
Sensitive element(s)	1 electrode rod	2 electrode rods	3 electrode rods
	made of stainless steel 316 Ti, each with 4 mm dia., covered with PVDF shrinkdown tubing of **max. 300 mm** in length, standard length of each rod: 300 mm, on request: • other materials (e.g. hastelloy) • other lengths		
Max. rod length(s)	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 orientation	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/0/SB-1/G1/1/...
Ⓔx II 2 G Ex ia IIC T6 Gb

EL/0/SB-1/G1/2/...
Ⓔx II 2 G Ex ia IIC T6 Gb

EL/0/SB-1/G1/3/...
Ⓔx II 2 G Ex ia IIC T6 Gb

EL/0/SB-1/G1/2/ED/ED/0/Ex-1G
Ⓔx II 2 G Ex ia IIC T6 Gb



Dimensions in mm

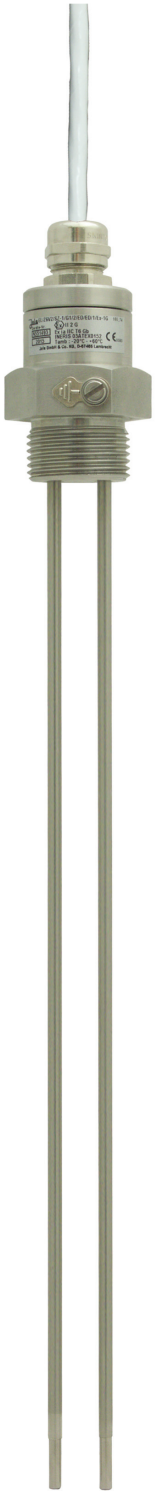
** 8 % of the electrode rod length, however min. 10 mm*

***** only for***
EL/0/SB-1/G1/2/...
Ⓔx II 2 G Ex ia IIC T6 Gb

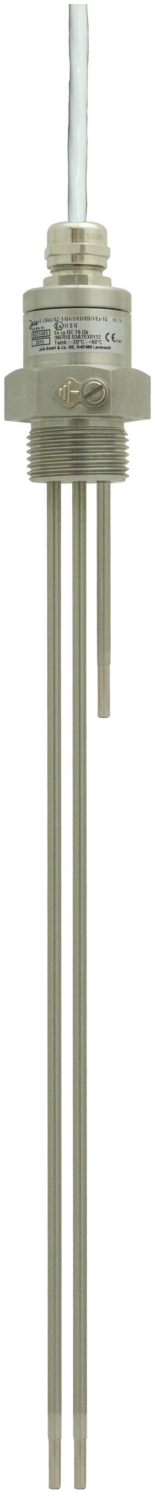
EL/0/SZ-1/G1/./ED/ED/1/Ex-1G
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
conductive Ex rod electrodes

Technical data	EL/0/SZ-1/G1/1/ ED/ED/1/Ex-1G ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb	EL/0/SZ-1/G1/2/	EL/0/SZ-1/G1/3/
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 1 or 2** **EC type examination certificate INERIS 03ATEX0152**		
Design	1 control electrode or 1 ground electrode	1 control electrode and 1 ground electrode	2 control electrodes and 1 ground electrode
Sensitive element(s)	1 electrode rod	2 electrode rods	3 electrode rods
	made of stainless steel 316 Ti, each with 4 mm dia., covered with PVDF shrinkdown tubing of **max. 300 mm** in length, standard length of each rod: 300 mm, on request: • other materials (e.g. hastelloy) • other lengths		
Max. rod length(s)	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 made of PTFE, length 2 m, longer on request		
Mounting orientation	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/0/SZ-1/G1/1/...
Ⓔx II 2 G
Ex ia IIC T6 Gb

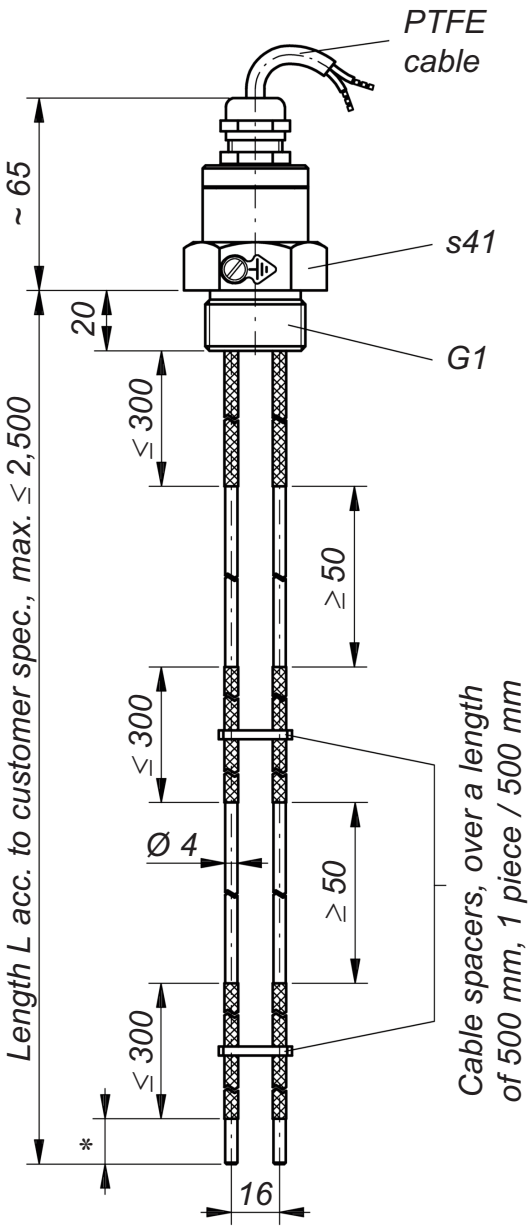


EL/0/SZ-1/G1/2/...
Ⓔx II 2 G
Ex ia IIC T6 Gb



EL/0/SZ-1/G1/3/...
Ⓔx II 2 G
Ex ia IIC T6 Gb

EL/0/SZ-1/G1/2/ED/ED/1/Ex-1G
Ⓔx II 2 G Ex ia IIC T6 Gb

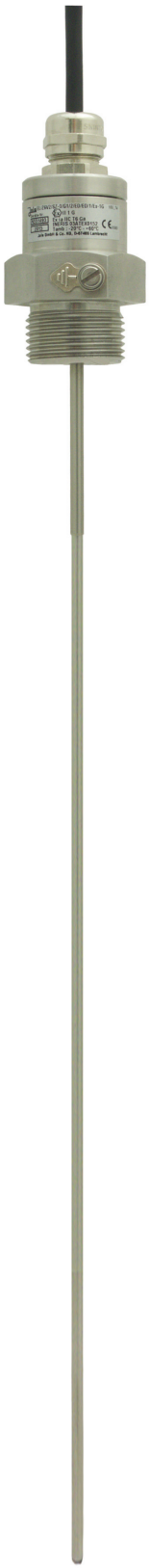


Dimensions in mm

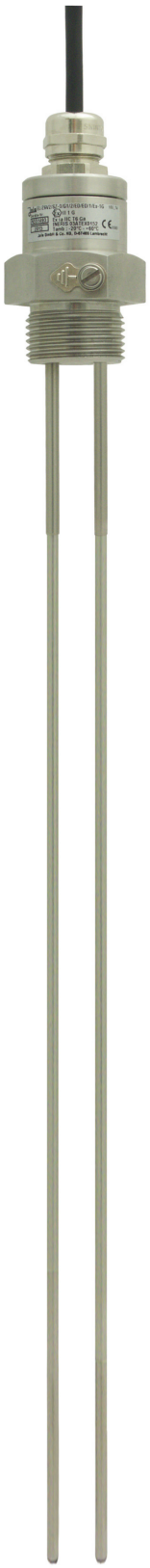
** 8 % of the electrode rod length, however min. 10 mm*

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

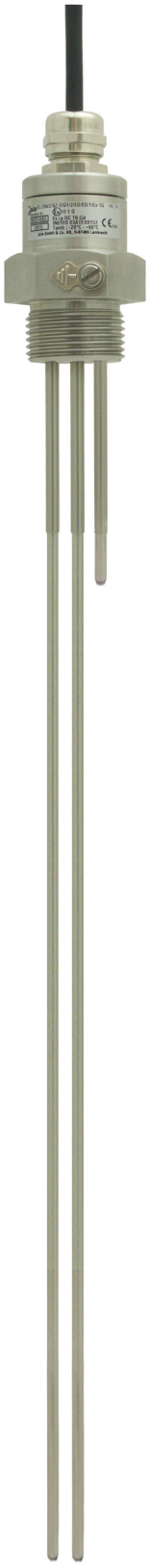
Technical data	EL/0/SZ-0/G1/1/ ED/ED/1/Ex-0G ⟨Ex⟩ II 1 G Ex ia IIC T6 Ga	EL/0/SZ-0/G1/2/ ED/ED/1/Ex-0G ⟨Ex⟩ II 1 G Ex ia IIC T6 Ga	EL/0/SZ-0/G1/3/ ED/ED/1/Ex-0G ⟨Ex⟩ II 1 G Ex ia IIC T6 Ga
Application	**for use in intrinsically safe circuits in potentially explosive atmospheres zone 0, 1 or 2** **EC type examination certificate INERIS 03ATEX0152**		
Design	1 control electrode or 1 ground electrode	1 control electrode and 1 ground electrode	2 control electrodes and 1 ground electrode
Sensitive element(s)	1 electrode rod	2 electrode rods	3 electrode rods
	made of stainless steel 316 Ti, each with 4 mm dia., covered with PVDF shrinkdown tubing of **max. 60 mm** in length, standard length of each rod: 300 mm, on request: • other materials (e.g. hastelloy) • other lengths		
Max. rod length(s)	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 made of antistatic PURLF (with external conductive PUR sheath), length 2 m, longer on request		
Mounting orientation	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/0/SZ-0/G1/1/...
Ⓔx II 1 G
Ex ia IIC T6 Ga

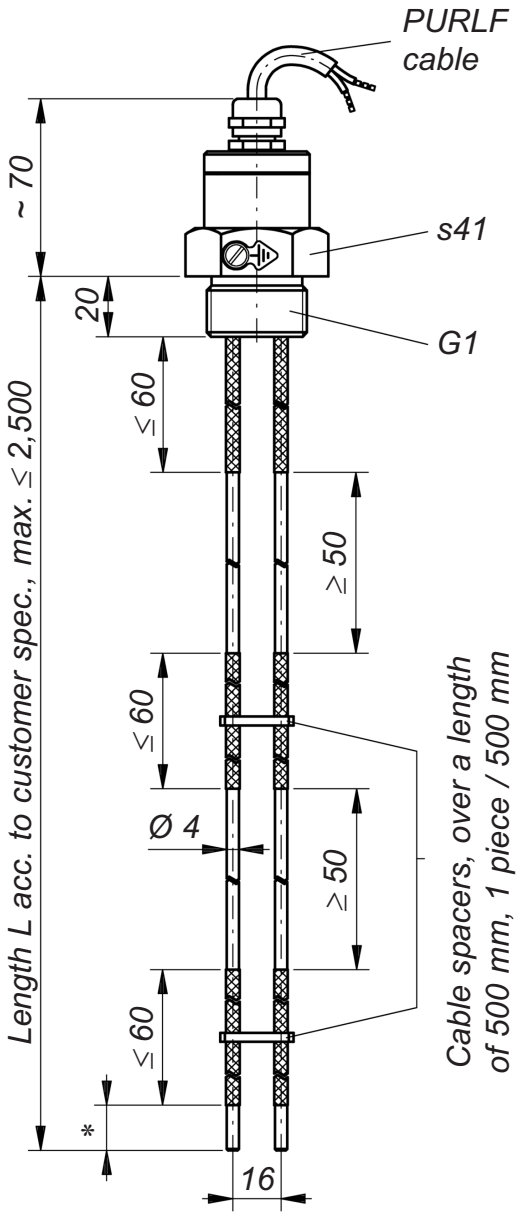


EL/0/SZ-0/G1/2/...
Ⓔx II 1 G
Ex ia IIC T6 Ga



EL/0/SZ-0/G1/3/...
Ⓔx II 1 G
Ex ia IIC T6 Ga

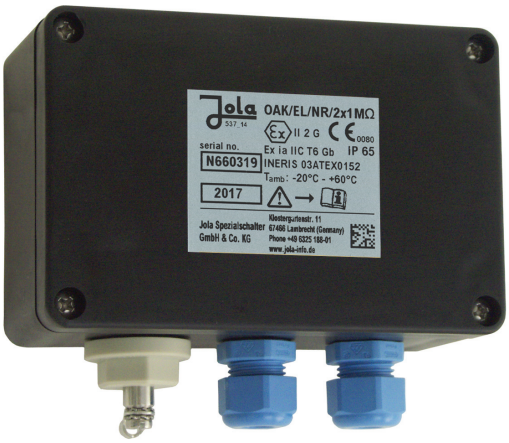
EL/0/SZ-0/G1/2/ED/ED/1/Ex-0G
Ⓔx II 1 G Ex ia IIC T6 Ga



Dimensions in mm

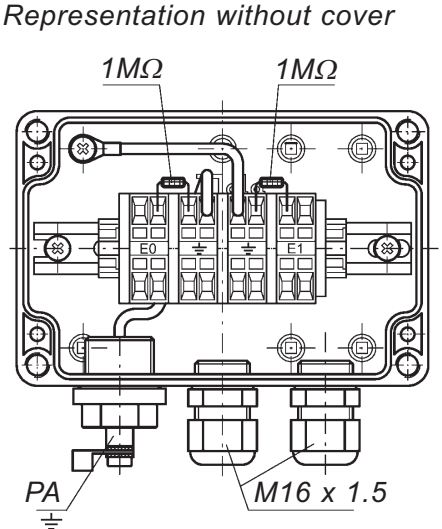
** 8 % of the electrode rod length, however min. 10 mm*

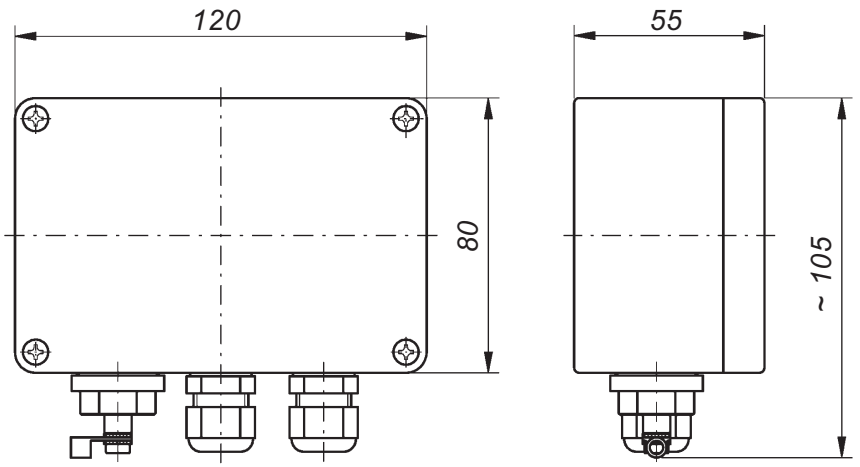
OAK/EL/NR/2x1MΩ
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
obligatory Ex connection box



Technical data	OAK/EL/NR/2x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
Application	• for integration of max. 2 electrode rods 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	antistatic (conductive) PP
Dimensions	120 x 80 x 55 mm
Cable entries	2 pieces made of plastic
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

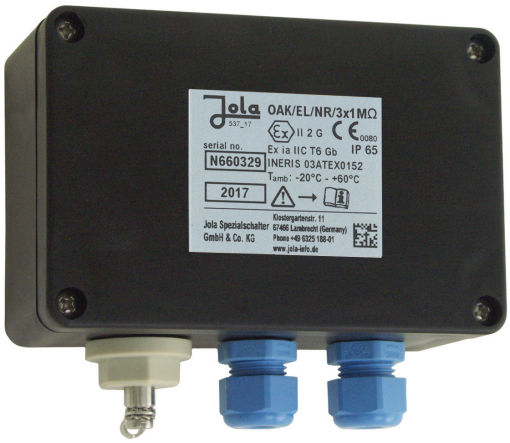
Representation without cover





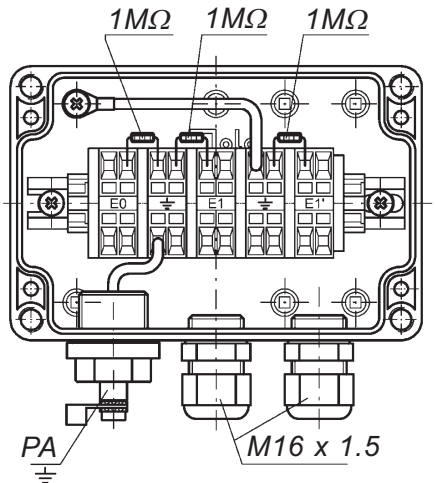
Dimensions in mm

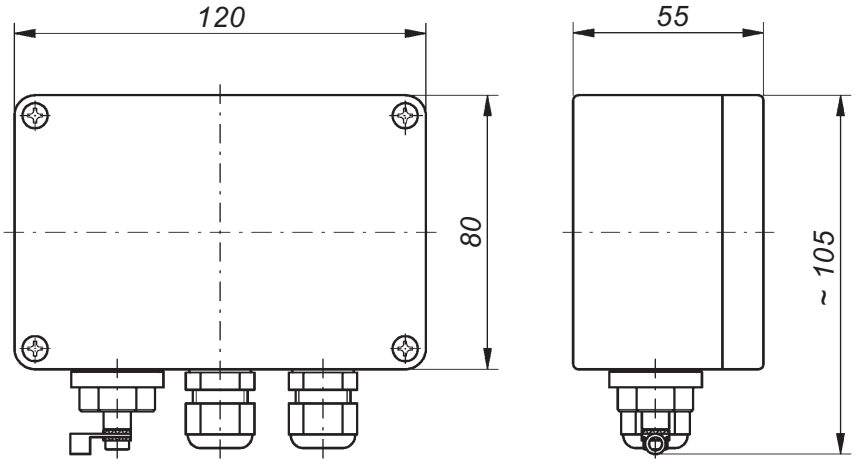
OAK/EL/NR/3x1MΩ
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
obligatory Ex connection box



Technical data	OAK/EL/NR/3x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
Application	• for integration of max. 3 electrode rods 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	antistatic (conductive) PP
Dimensions	120 x 80 x 55 mm
Cable entries	2 pieces made of plastic
Terminals	5 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

NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC electrode relay

for signalling a limit level or for level controlling

Ex electrode relay for DIN rail mounting or fastening via 2 boreholes, with connection terminals on top of the housing and with 2 built-in LEDs for signalling the respective alarm status.

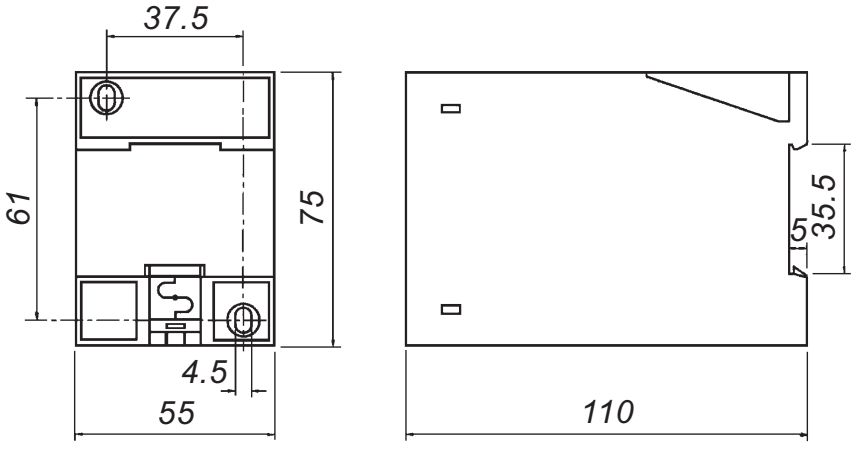
The unit is designed for switch cabinet mounting or installation in a suitable protective housing outside potentially explosive atmospheres and may therefore only be mounted / installed in these locations. It is suitable for use in clean environments only.

The **NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC** 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 ia II. T6 G. approved conductive electrodes, such as our types EL/./.../../../../../Ex ⟨Ex⟩ II 2 G or II 1 G Ex ia II. T6 G., may be used 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).**

The Ex electrode relay
NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC is based on the **quiescent current principle**: in OK status, the output relay is energised.

The Ex electrode relay
NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC, Version A is based on the **working current principle:** in OK status, the output relay is not energised.



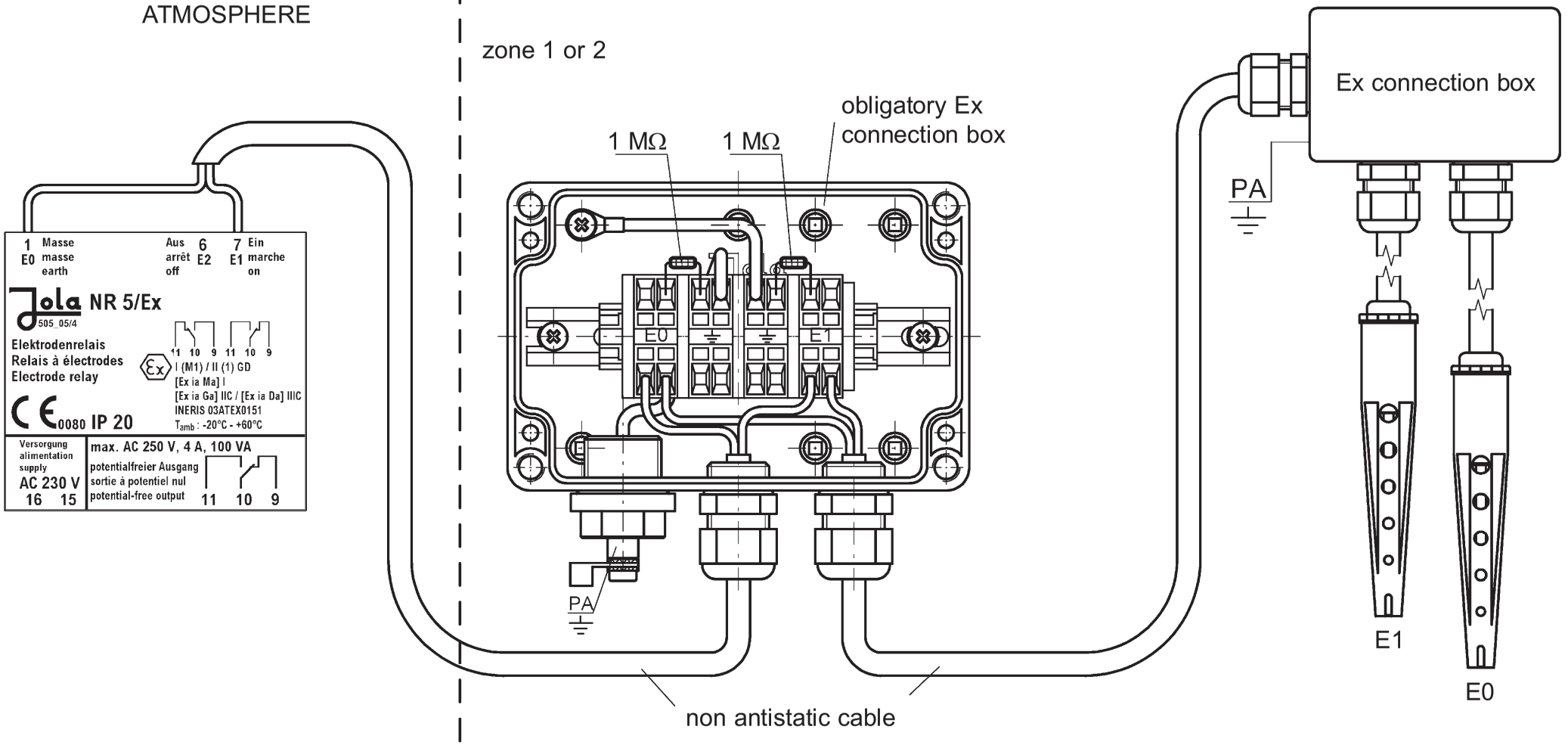
Dimensions in mm

Technical data	NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD | NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [Ex ia Ma] I / [Ex ia Ga] IIC / [Ex ia Da] IIIC Version A
Supply voltage (terminals 15 and 16)	AC 230 V, on request: AC 240 V, AC 115 V, AC 110 V or AC 24 V
Power input	approx. 3 VA
Electrode circuit (terminals 1, 6, 7)	3 terminals (under safety extra low voltage SELV), acting on 1 output relay
No-load voltage	3 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 (conductance)
Controlled circuit (terminals 9, 10, 11)	1 single-pole potential-free changeover contact with self-hold
Functioning	**quiescent current principle | working current principle**
Switching status indicators	1 green LED lights when output relay is energised 1 red LED lights when output relay is not energised
Switching voltage	max. AC 250 V
Switching current	max. AC 4 A
Switching capacity	max. 100 VA
Housing	insulating material, 75 x 55 x 110 mm (dimensions see page 7-2-17)
Connection	terminals on top of housing
Protection class	IP20
Mounting	on 35 mm DIN rail or fastening via 2 boreholes
Mounting orientation	any
Temperature range	– 20°C to + 60°C
Max. cable length between Ex electrode relay and Ex electrode	see Installation, Operating and Maintenance Instructions (sent on request)
EC type examination certificate	INERIS 03ATEX0151
CEM	• for interference emission in accordance with the appliance-specific requirements for households, business and commerce as well as small companies • for interference immunity in accordance with the appliance-specific requirements for industrial companies

NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2

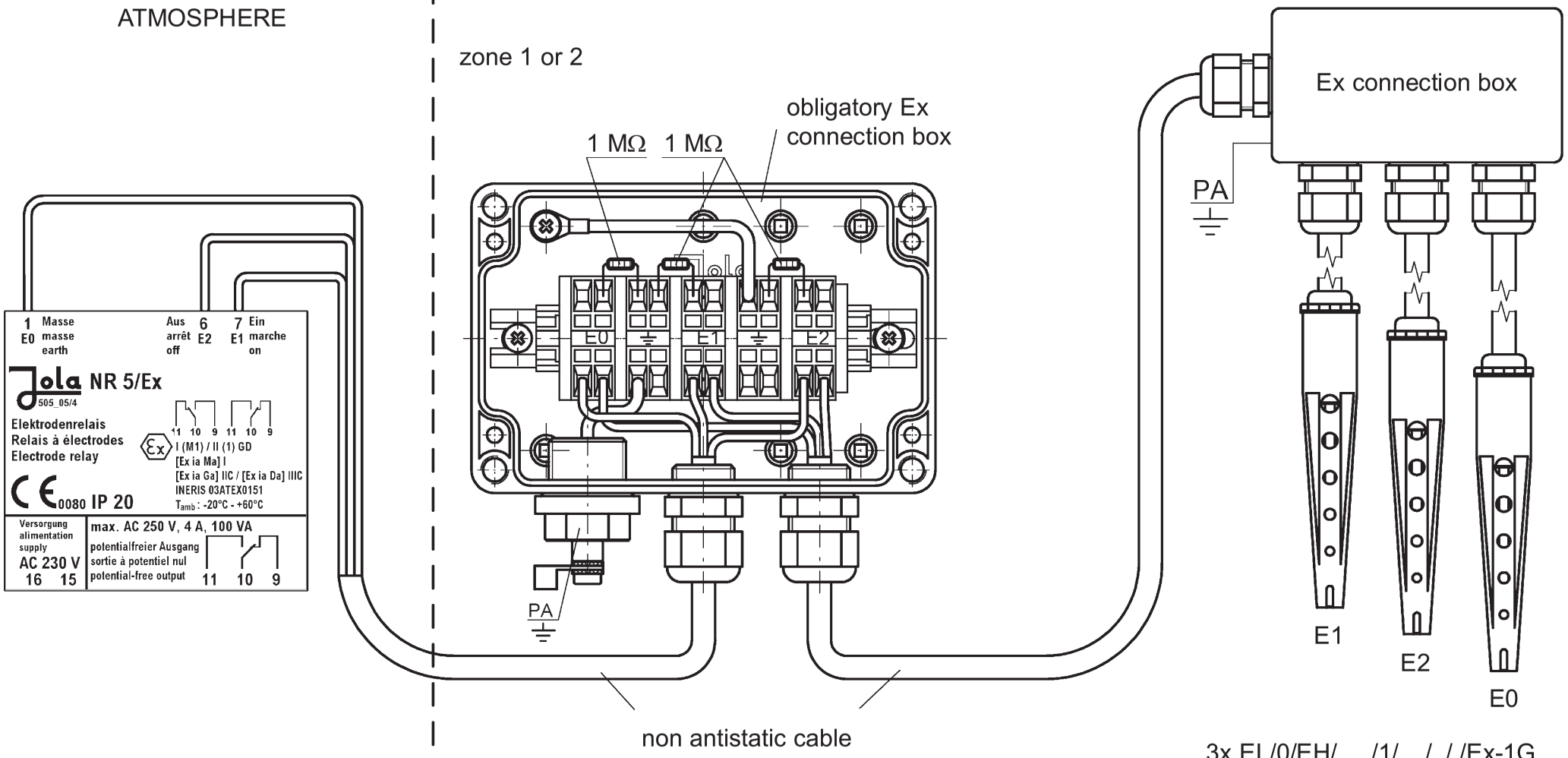


2x EL/0/EH/...../1/..../../Ex-1G
2x EL/0/EHK/NL/...../1/..../../Ex-1G

NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2



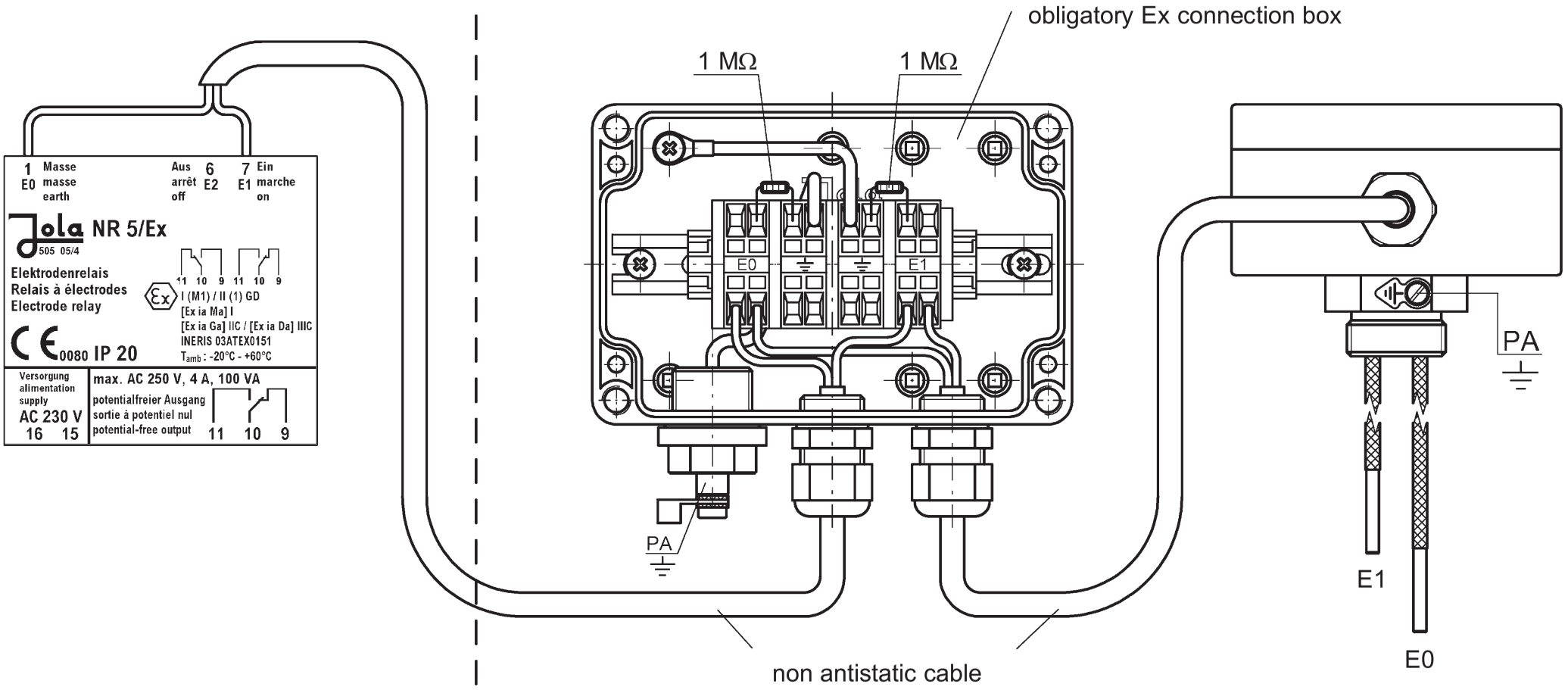
3x EL/0/EH/...../1..../../Ex-1G
3x EL/0/EHK/NL/...../1..../../Ex-1G

7-2-20

NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2

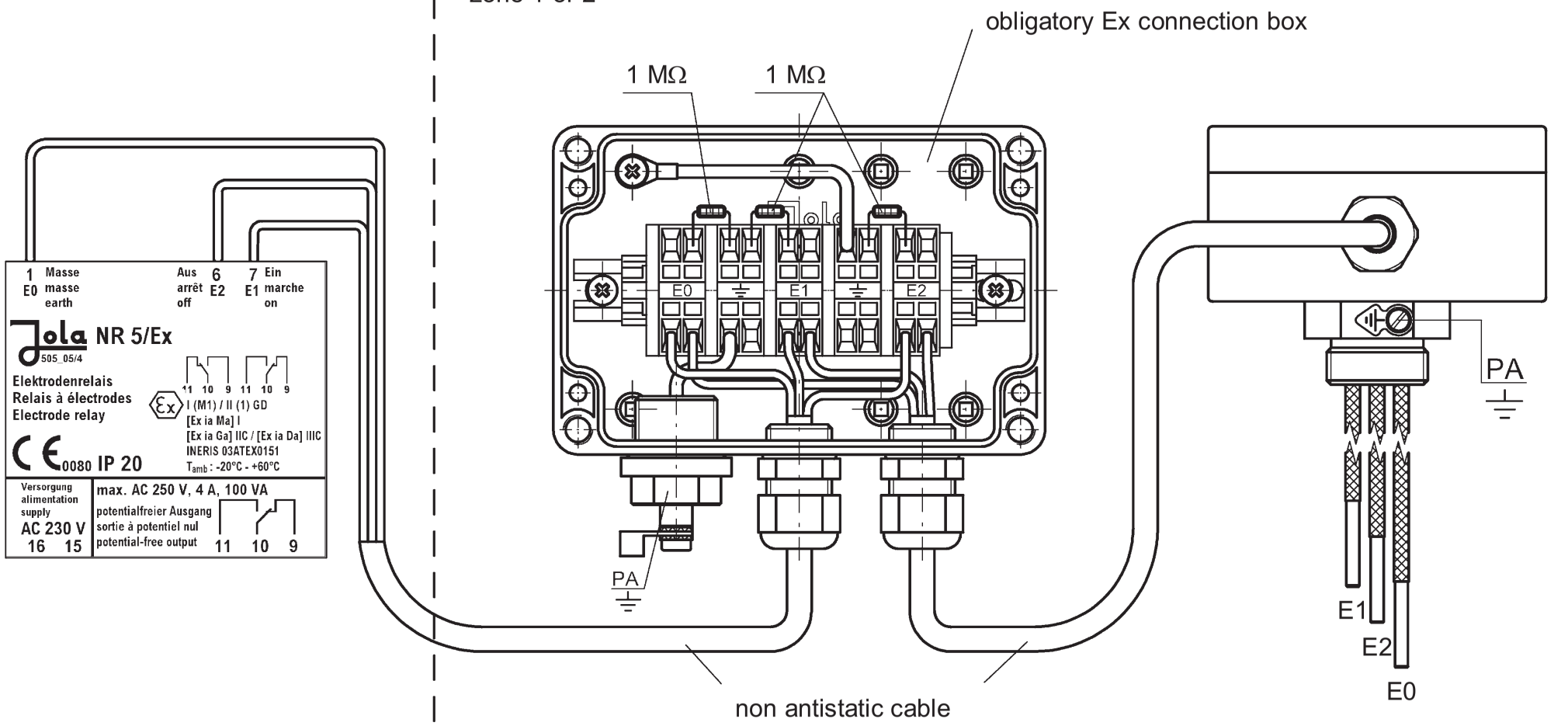


EL/0/SB-1/...../2/..../.././Ex-1G

NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2



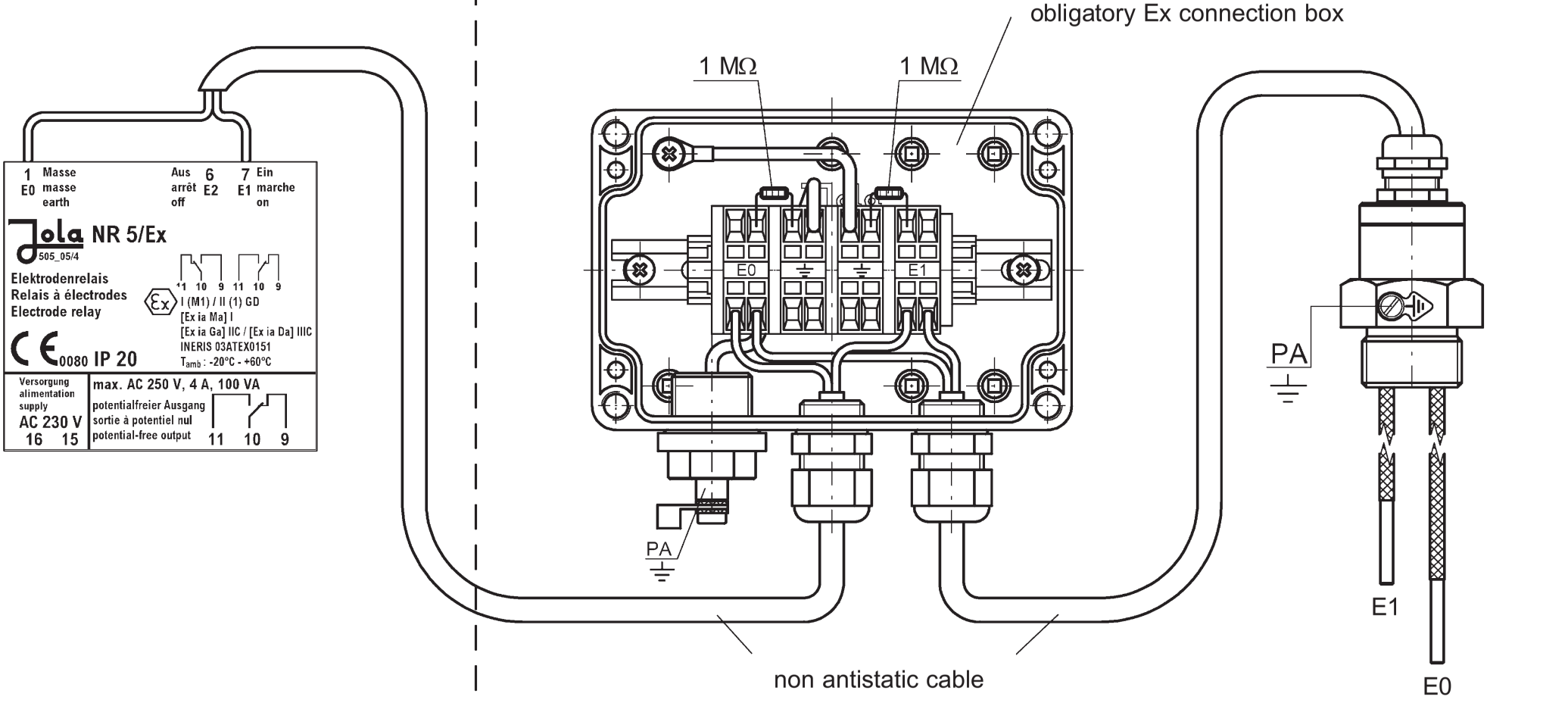
EL/0/SB-1/...../3/..../../Ex-1G

7-2-22

NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2

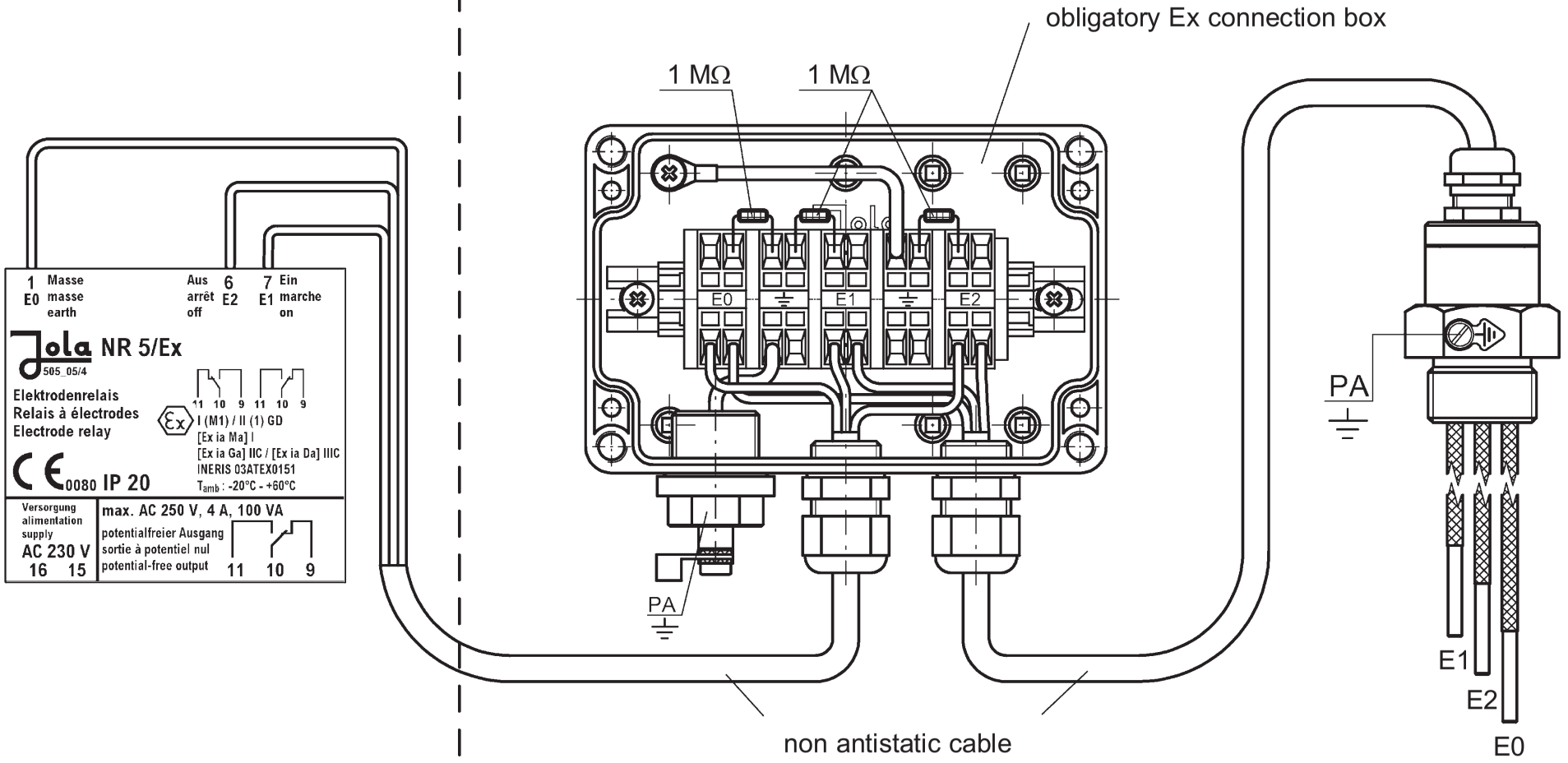


EL/0/SZ-1/...../2/..../../../Ex-1G

NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2



EL/0/SZ-1/...../3/..../../Ex-1G

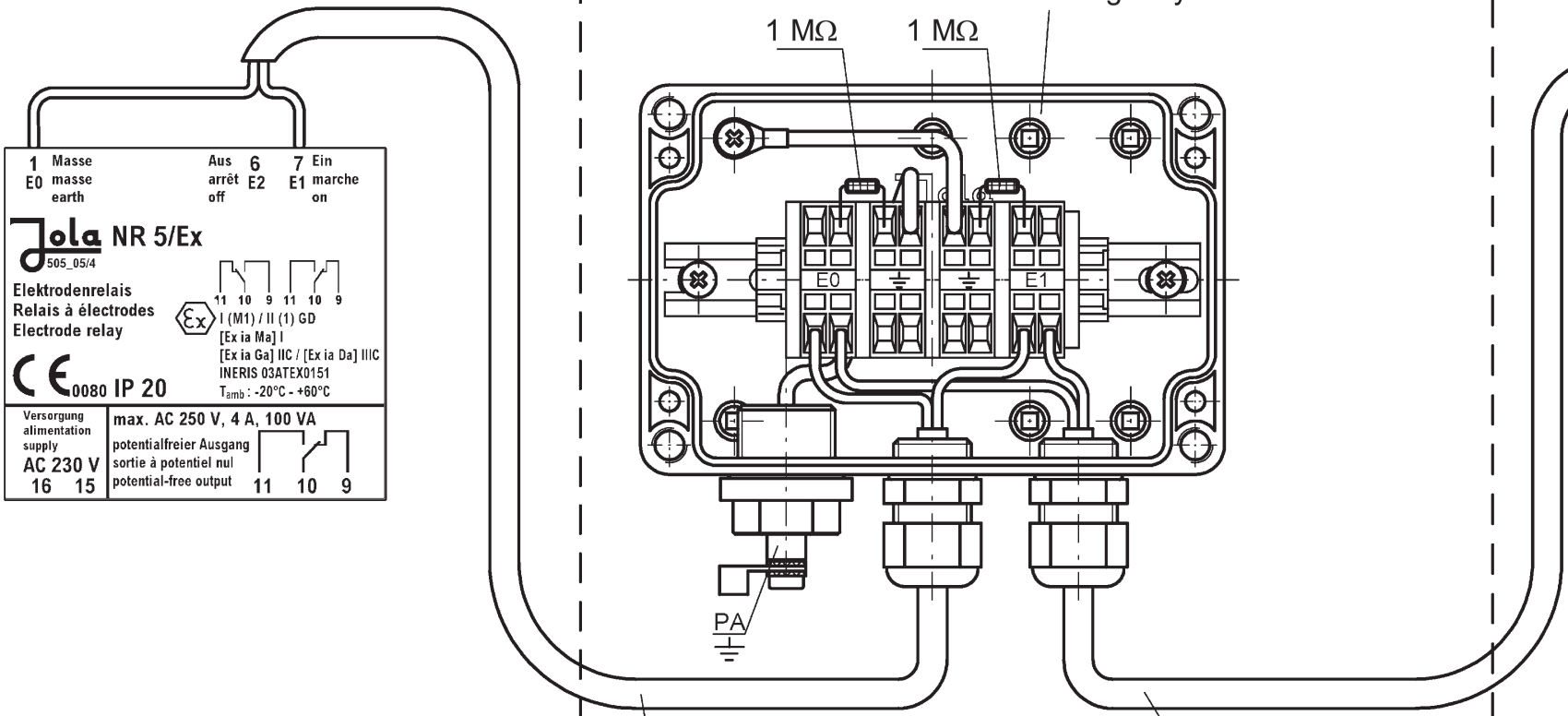
NON POTENTIALLY EXPLOSIVE ATMOSPHERE

POTENTIALLY EXPLOSIVE ATMOSPHERE

zone 1 or 2

zone 0, 1 or 2

obligatory Ex connection box



EL/0/SZ-0/...../2/..../../Ex-0G

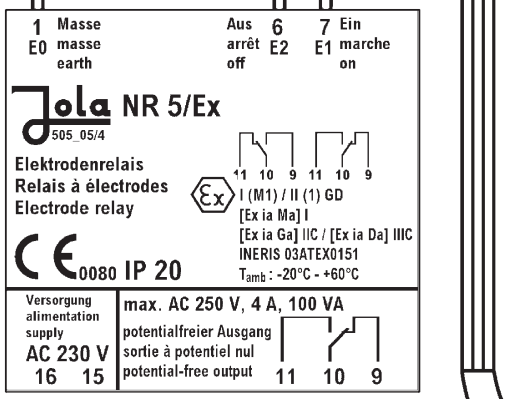
NON POTENTIALLY EXPLOSIVE ATMOSPHERE

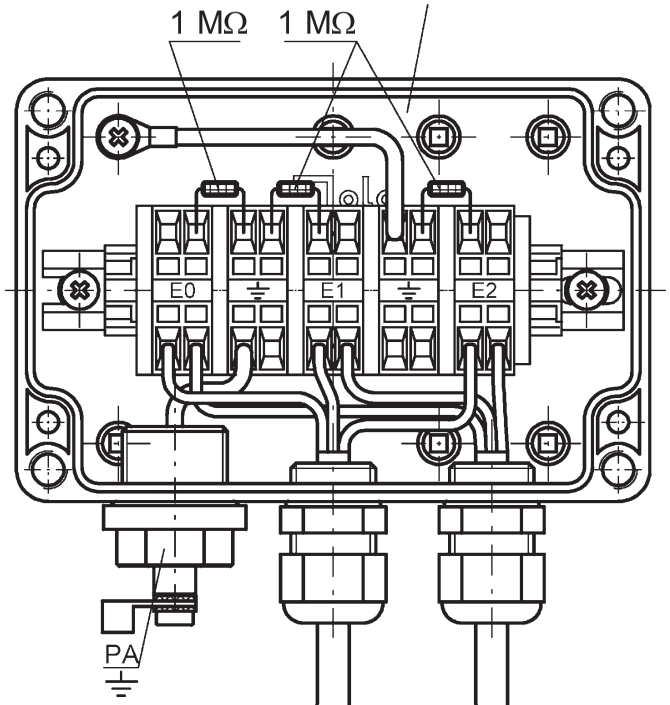
POTENTIALLY EXPLOSIVE ATMOSPHERE

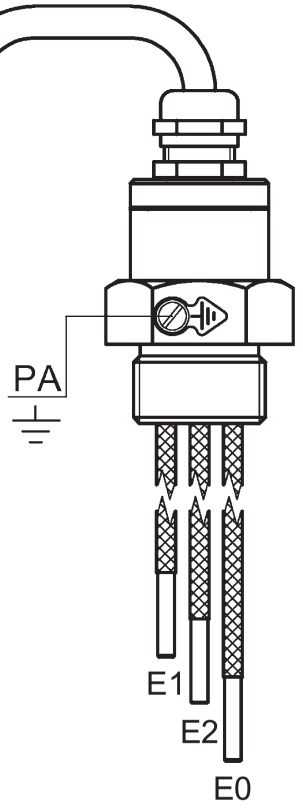
zone 1 or 2

zone 0, 1 or 2

obligatory Ex connection box







non antistatic cable

antistatic cable

EL/0/SZ-0/...../3/..../../Ex-0G

7-2-26