Installation, Operating and Maintenance Instructions for

Jola Electrodes
EL/.../...../...../../..../.././Ex-...
⟨Ex⟩ II 1 G Ex ia IIC T6 Ga or
⟨Ex⟩ II 1 G Ex ia IIB T6 Ga or
⟨Ex⟩ II 2 G Ex ia IIC T6 Gb or
⟨Ex⟩ II 2 G Ex ia IIB T6 Gb or
⟨Ex⟩ I M2 Ex ia I Mb
and the system with
the obligatory connection box
OAK/EL/NR/.x1MΩ ⟨Ex⟩ II 2 G Ex ia IIC T6 Gb
⟨Ex⟩ I M2 Ex ia I Mb
and the Jola Electrode Relay
NR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD
[Ex ia Ma] I [Ex ia Ga] IIC [Ex ia Da] IIIC

These Installation, Operating and Maintenance Instructions must always be handed over to the fitter/operator/service personnel of our products together with all other user documentation and information! They should be stored in a safe place together with all other user documentation and information so they can be consulted again when necessary at any time!

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1. Area of application

The combination of conductive electrodes EL/.../...../...../../..../../../Ex-...

JOLA
D-67466 Lambrecht

CE 0080

EL/.../...../...../../..../../../Ex-...
Ex II 1 G Ex ia IIC T6 Ga or
Ex II 1 G Ex ia IIB T6 Ga or
Ex II 2 G Ex ia IIC T6 Gb or
Ex II 2 G Ex ia IIB T6 Gb or
Ex I M2 Ex ia I Mb

(serial number)
(production year)

T_{amb}: - 20°C to + 60°C

INERIS 03ATEX0152

the obligatory connection box OAK/EL/NR/.x1MΩ and one electrode relay NR 5/Ex is designed to transmit electrical switching signals coming **from conductive electrodes EL/.../...../...../../..../../../Ex-... installed in a potentially explosive atmosphere,** to non-hazardous areas via one **electrode relay NR 5/Ex**.

The components of the system have to be installed:

<table>
<tr><th colspan="2">in above-ground areas which could be at risk due to a potentially explosive atmosphere</th><th rowspan="2">in underground areas in mines as well as in above-ground areas of mines which could be at risk due to firedamp and/or flammable dusts</th><th rowspan="2">only outside potentially explosive atmospheres</th></tr>
<tr><th>zone 0, 1 or 2</th><th>zone 1 or 2</th></tr>
<tr><td rowspan="2">EL/…/Ex…-0G
Ex II 1 G
or
EL/…/Ex…-0BG
Ex II 1 G</td><td>EL/…/Ex…-1G
Ex II 2 G</td><td>EL/…/Ex…-M
Ex I M2</td><td rowspan="2">NR 5/Ex,
Ex I (M1) /
II (1) GD
[Ex ia Ma] I
[Ex ia Ga] IIC
[Ex ia Da] IIIC</td></tr>
<tr><td>OAK/EL/NR/.x1MΩ
Ex II 2 G</td><td>OAK/EL/NR/.x1MΩ
Ex I M2</td></tr>
</table>

As mentioned before, the above mentioned electrodes are devices for use:

- **in underground areas in mines as well as in above-ground areas of mines which could be at risk due to firedamp and/or flammable dusts:**
  EL/.../...../...../../..../.././Ex-M Ⓔx I M2;

- **in above-ground areas which could be at risk due to a potentially explosive atmosphere:**
  EL/.../...../...../../..../.././Ex-0G Ⓔx II 1 G: in zone 0, 1 or 2,
  EL/.../...../...../../..../.././Ex-0BG Ⓔx II 1 G: in zone 0, 1 or 2,
  EL/.../...../...../../..../.././Ex-1G Ⓔx II 2 G: in zone 1 or 2.

°°°°°°°°°°°°°°°°°°°

The combination of conductive electrodes and electrode relay is designed to **detect leakage of electrically conductive liquids in normally dry rooms or for level control (for the automatic control of pumps or solenoid valves or for overflow or run-dry protection in wells or tanks) of electrically conductive liquids**.

Leakage detection:
For the purpose of leakage detection, a conductive electrode in which one control and one earth electrode are integrated is connected to an electrode relay NR 5/Ex. Alternatively, several electrodes of this type can be parallel-connected to one electrode relay NR 5/Ex.

Level control:
The liquid levels are monitored by electrodes which transmit switching commands to the connected electrode relay NR 5/Ex if they come into contact with the liquid.
Two-point control requires two control electrodes and one earth electrode.
Signalling of a liquid level requires only the control electrode E1 and one earth electrode.
A conductive tank wall made of metal may serve for earthing purposes in place of the earth electrode.
However, we always advise you to use a separate earth electrode.

A combination of conductive electrodes and electrode relay may or must not be used:

- in electrically non-conductive liquids (e.g. in mineral oils).
- in pasty or highly viscous liquids.
- in liquids which have a tendency to foam (under certain circumstances in beer or washing lyes, for example).
- in liquids with high steam generation and condensation (at high temperatures, for example).
- in liquids which have a tendency to form residues (for example in milk of lime, waste water containing fats, certain paints etc.).
- in liquids that contain coarse solid particles (wood chips, material residues, for example).

All **the technical parameters of the conductive electrodes and/or the electrode relay** are listed in this brochure and/or the accompanying product descriptions. These documents also contain the corresponding **installation recommendations**.
You must always observe and follow all the instructions relating to these parameters and installation recommendations. The units may not be used for applications outside the specified parameter range.

If the product descriptions are not supplied with the products or are lost, **you must always request a copy of the descriptions prior to installation, connection or start-up and ensure that they are read and observed by the suitably qualified specialist personnel. Otherwise the conductive electrode and/or electrode relay may not be installed, connected and started up.**

2. Preconditions for safe use

- **Maximum parameters of the conductive electrodes EL/.../...../...../../..../.././Ex-... fitted with a connecting cable**

Electrode type	Type designation	Li	Ci
Rod electrodes	EL/.../SB-1/...../../..../.././Ex-...	0 + 1µH per metre connecting cable	0 + 200 pF per metre connecting cable
Rod electrodes	EL/.../SZ-./...../../..../.././Ex-...		
Rod electrodes	EL/.../SZ/PPLF-./...../../..../.././Ex-...		
Rod electrodes	EL/.../SE-./...../../..../.././Ex-...		
Rod electrodes	EL/.../SE/NL/...../../..../.././Ex-...		
Rod electrodes	EL/.../SE/LF-./...../../..../.././Ex-...		
Plate electrodes	EL/.../PE/...../../..../.././Ex-...		
Plate electrodes	EL/.../PEK..../...../../..../.././Ex-...		
Plate electrodes	EL/.../WDX/NL/...../../..../.././Ex-...		
Plate electrodes	EL/.../WDX/LF-./...../../..../.././Ex-...		
Suspension electrodes	EL/.../EH/...../../..../.././Ex-...		
Suspension electrodes	EL/.../EHK/NL/...../../..../.././Ex-...		
Suspension electrodes	EL/.../EHK/LF/...../../..../.././Ex-...		
Suspension electrodes	EL/.../EHW/NL ./...../../..../.././Ex-...		
Suspension electrodes	EL/.../EHW/LF ./...../../..../.././Ex-...		
Cable electrodes	EL/.../KE/...../../..../.././Ex-...	1.7 µH per metre detection cable + 1 µH per metre connecting cable	25 pF per metre detection cable + 200 pF per metre connecting cable

- **Special requirements/conditions for the safe use of the conductive electrodes EL/.../...../...../../..../../../Ex-...**

  To ensure safe operation, power supply to the conductive electrode EL/.../...../...../../..../../../Ex-... must be via an Ex ia voltage source with output circuits which are approved as Ex ia intrinsically safe for use in the potentially explosive atmosphere which corresponds to the gas explosion group in which the device is installed: IIC, IIB, IIA respectively I.

  Always observe all the restrictions specified with regard to the voltage source.

  The maximum output parameters of this voltage source must not exceed the following values:
  U = 20 V; I = 0.1 A and P = 0.5 W.

- **Maximum parameters of the electrode relay NR 5/Ex**

  Rated supply voltages (terminals J15, J16):
  U = AC 24 V; AC 110 V, AC 115 V, AC 230 V or AC 240 V

  Maximum electrical parameters of the electrical circuit connected to terminals J9, J10 and J11:
  U_{max} = 250 V; I_{max} = 4 A, **but max. P = 100 VA**

  Maximum electrical parameters at output terminals J6 and J7:
  U_o = 22 V; I_o = 6 mA, but max. P_o = 31.8 mW

  Maximum electrical parameters at output terminals (J1, J6) or (J1, J7):
  U_o = 11.5 V; I_o = 11.6 mA, but max. P_o = 64 mW

- **Special requirements/conditions for the safe use of the electrode relay NR 5/Ex**

  The maximum parameters of the external circuits that may be connected to terminals J6 and J7 are as follows:

For explosion group IIC	For explosion group IIB	For explosion group IIA / I
Co(L=0) = 165 nF Lo(C=0) = 672 mH or Lo/Ro = 350 µH/Ohm	Co(L=0) = 1.14 µF Lo(C=0) = 972 mH or Lo/Ro = 510 µH/Ohm	Co(L=0) = 4.2 µF Lo(C=0) = 972 mH or Lo/Ro = 510 µH/Ohm

The maximum parameters of the external circuits that may be connected to terminals J6, J1 or J7, J1 are as follows:

For explosion group IIC	For explosion group IIB	For explosion group IIA / I
Co(L=0) = 1.62 µF Lo(C=0) = 172 mH or Lo/Ro = 156 µH/Ohm	Co(L=0) = 11.1 µF Lo(C=0) = 672 mH or Lo/Ro = 707 µH/Ohm	Co(L=0) = 45 µF Lo(C=0) = 972 mH or Lo/Ro = 1.05 mH/Ohm

3. Additional conditions for safe operation

The admissible temperature range for use of the conductive electrode EL/.../...../...../../..../../../Ex-... is between - 20°C and + 60°C, and the temperature may not be above or below this range.

The ambient temperature at the terminal box or at the body of the conductive electrode EL/.../...../...../../..../../../Ex-... must be between - 20°C and + 60°C.

Before using the conductive electrodes EL/.../...../...../../..../../../Ex-..., you must ensure that the materials used in the respective electrode are sufficiently chemically and mechanically resistant to the liquids to be monitored and all other external influences.

In case of doubt, consult a suitably trained expert prior to use. Do not use the product before these questions have been fully clarified.

4. Installation, connection, start-up and maintenance, general regulations

Installation, connection, start-up and maintenance of the conductive electrode(s) and the electrode relay may only be performed by suitably qualified specialist personnel in line with all the information material and documentation supplied with the units and following all instructions contained therein.

The qualified specialist personnel must ensure that they are familiar with all valid standards, regulations, local requirements and specific conditions, in particular the standards, regulations, local requirements and specific conditions relating to explosion protection – and must proceed accordingly.
In potentially explosive atmospheres with gas hazards, the entire installation set-up of the electrodes EL/.../...../...../../..../../../Ex-... the obligatory connection box OAK/EL/NR/.x1MΩ and the electrode relay NR 5/Ex must always comply with the standard EN 60 079-14 resp. the replacing standard.

You must always read – and adhere to the instructions outlined in - the yellow DIN A 5 leaflet "User information/Instructions for use with mounting, operating and maintenance instructions for the product...". If the leaflet is not supplied with the product or is lost, you must always request a replacement leaflet from Jola.

5. Installation of the conductive electrodes EL/.../...../...../../..../.././Ex-...

The conductive electrodes must be installed **by qualified specialist personnel**.

Follow the instructions supplied with the electrodes when installing the conductive electrodes EL/.../...../...../../..../.././Ex-.... If no specific documents concerning installation are enclosed with the delivery, the electrodes must be installed in accordance with the relevant accepted practices.

6. Mounting of the electrode relay NR 5/Ex

The electrode relays NR 5/Ex must be mounted **by qualified specialist personnel** following the Installation, Operating and Maintenance Instructions for the Jola electrode relay NR 5/Ex.

7. Connection in the form of an intrinsically safe system

The intrinsically safe system composed of the conductive electrode
EL/.../...../...../../..../.././Ex-... with 2 electrode rods,
the obligatory connection box OAK/EL/NR/2x1MΩ and one electrode relay NR 5/Ex must be installed and connected according to the connection diagrams
90P-7577-1 dated 26.07.2013,
90P-8528 dated 14.10.2017,
90P-7573-2 dated 14.10.2017 or
90P-7575-2 dated 14.10.2017
to be found in the annex.

The installation personnel has to control that the 2 resistors of 1 MOhm each are present in the obligatory connection box OAK/EL/NR/2x1MΩ and correctly connected as shown on the above mentioned connection diagrams.

The intrinsically safe system composed of the
floating electrode EL/.../...../...../../..../.././Ex-... with 3 electrode rods,
the obligatory connection box OAK/SCHE/NR/3x1MΩ and the two electrode relays NR 5/Ex, Version A must be installed and connected according to the connection diagrams
90P-8347 dated 19.12.2016,
90P-7578-1 dated 26.07.2013,
90P-8529 dated 14.10.2017,
90P-7572-2 dated 14.10.2017 or
90P-7576-2 dated 14.10.2017
to be found in the annex.

The installation personnel has to control that the 3 resistors of 1 MOhm each are present in the obligatory connection box OAK/EL/NR/3x1MΩ and correctly connected as shown on the above mentioned connection diagrams.

Always observe the following when connecting the unit:

- **Potential equalisation**

  To avoid the danger coming from the static electricity, potential equalisation is necessary for the conductive electrodes EL/.../...../...../../..../../../Ex-... with body and/or screw-in nipple made of metal or of antistatic (conductive) PPLF:

  Connect the external earth connection terminals on the screw-in nipple and, if present, on the optional flange of the conductive electrode to the potential equalisation system.

  Connection to the potential equalisation system is essential for safe operation and must never be neglected.

  In potentially explosive atmospheres with gas hazards, the entire installation set-up must always comply with the standard EN 60 079-14 resp. the replacing standard.

♦ **Use of several electrodes and electrode relays for control operations in the same tank**

A **particular connection mode** as represented in the connection diagrams 58P-7622 dated 03.07.2013, 58P-7613 dated 03.07.2013, 58P-7616 dated 03.07.2013, 58P-7619 dated 03.07.2013 and 58P-7625 dated 03.07.2013 may **only** be used "**x" times in the same tank,** taking into account the **maximum overall length of all connecting cables taken together of "y" metres** (see attached connection diagrams and the table below).

« x » times per mode / max. overall length of all connecting cables taken together	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Mode A (*)	1000 m	1000 m	350 m	250 m	150 m	125 m	100 m	75 m
Mode A (**)	1000 m	1000 m	313 m	200 m	88 m	50 m	13 m	-----
Mode B	1000 m	1000 m	350 m	250 m	150 m	125 m	100 m	75 m
Mode C	1000 m	250 m	125 m	100 m	75 m	50 m	-----	-----
Mode D	1000 m	250 m	125 m	100 m	75 m	50 m	-----	-----
Mode E	1000 m	250 m	125 m	100 m	75 m	50 m	-----	-----

(*) = all mode A electrodes **except** electrodes EL/./KE/...../2/..../../../Ex-...
(**) = mode A electrodes EL/./KE/...../2/..../../../Ex-...

- **Connecting cables**

  All cables that are used to connect the electrodes to the obligatory Ex connection box OAK/EL/NR/.x1MΩ and possibly to optional Ex connection boxes and to the electrode relay NR 5/Ex are considered as connecting cables.

  Each connecting cable must possess a dielectric strength of at least AC 500 V test voltage.
  Each conductor must have a cross section greater than or equal to 0.017 mm².

  See the above table for the maximum admissible total length of all connecting cables taken together.

  In all cases, the parameters of these cables must be below or equal to the following values:
  C = 200 pF/m and L = 1 µH/m.

- **Supplementary terminal boxes (optional extras)**

  The protection class of each terminal box must be at least IP 20.
  The terminal box(es) must be **approved** for use in the corresponding potentially explosive atmosphere.

  If the **terminal box is made of metal or of conductive plastic**, the **dielectric strength** between the intrinsically safe circuit and the conductive body of the terminal box must be **greater than or equal to AC 500 V**.

- **Dielectric strength between the intrinsically safe circuit and an adjacent non-intrinsically safe circuit**

  The **dielectric strength** between the intrinsically safe circuit and an adjacent non-intrinsically safe circuit **must be greater than or equal to AC 1500 V.**

8. Start-up

Prior to start-up, you must re-check the mounting position, the mechanical fastening and the electrical connection of the units.
In particular, you must check once again that the conductive electrode(s) is (are) also connected to the corresponding, admissible intrinsically safe circuit(s).

In addition, you must also check and verify that there is no possibility whatsoever of hazardous conditions occurring due to non-adherence to any of the relevant instructions, standards or official regulations.

Only then may the unit in question be started up electrically.

9. Maintenance

The electrodes EL/.../...../...../../..../../../Ex-... are maintenance-free when used in low-viscosity, non-adhesive liquids that are free of solids and do not attack the component materials and/or in clean environments.

To rule out any risks, the electrode(s) and the relay must be serviced by qualified specialist personnel at least once a year.
Where risks cannot be ruled out, you should adhere to an inspection frequency suited to the application in question and laid down in consultation with the relevant supervisory authorities.

If electrode(s) and electrode relay are installed as safety elements within a system, they must always be inspected and checked at intervals to be agreed with the local supervisory authorities.

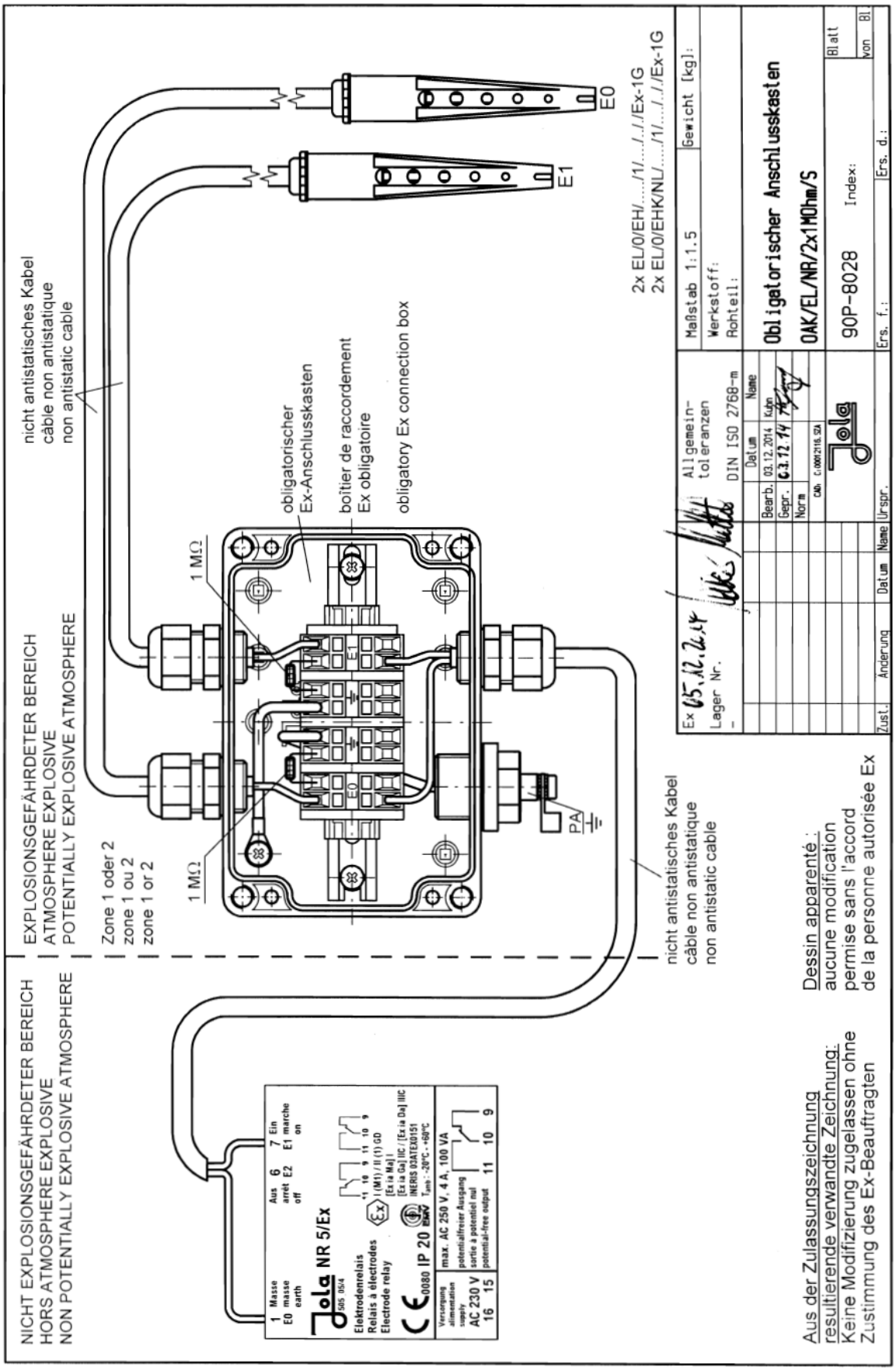
Prior to all maintenance work, the qualified specialist personnel must inform themselves of all valid standards, regulations, local guidelines and special conditions, in particular standards, regulations, local guidelines and special conditions concerning explosion protection and proceed accordingly.

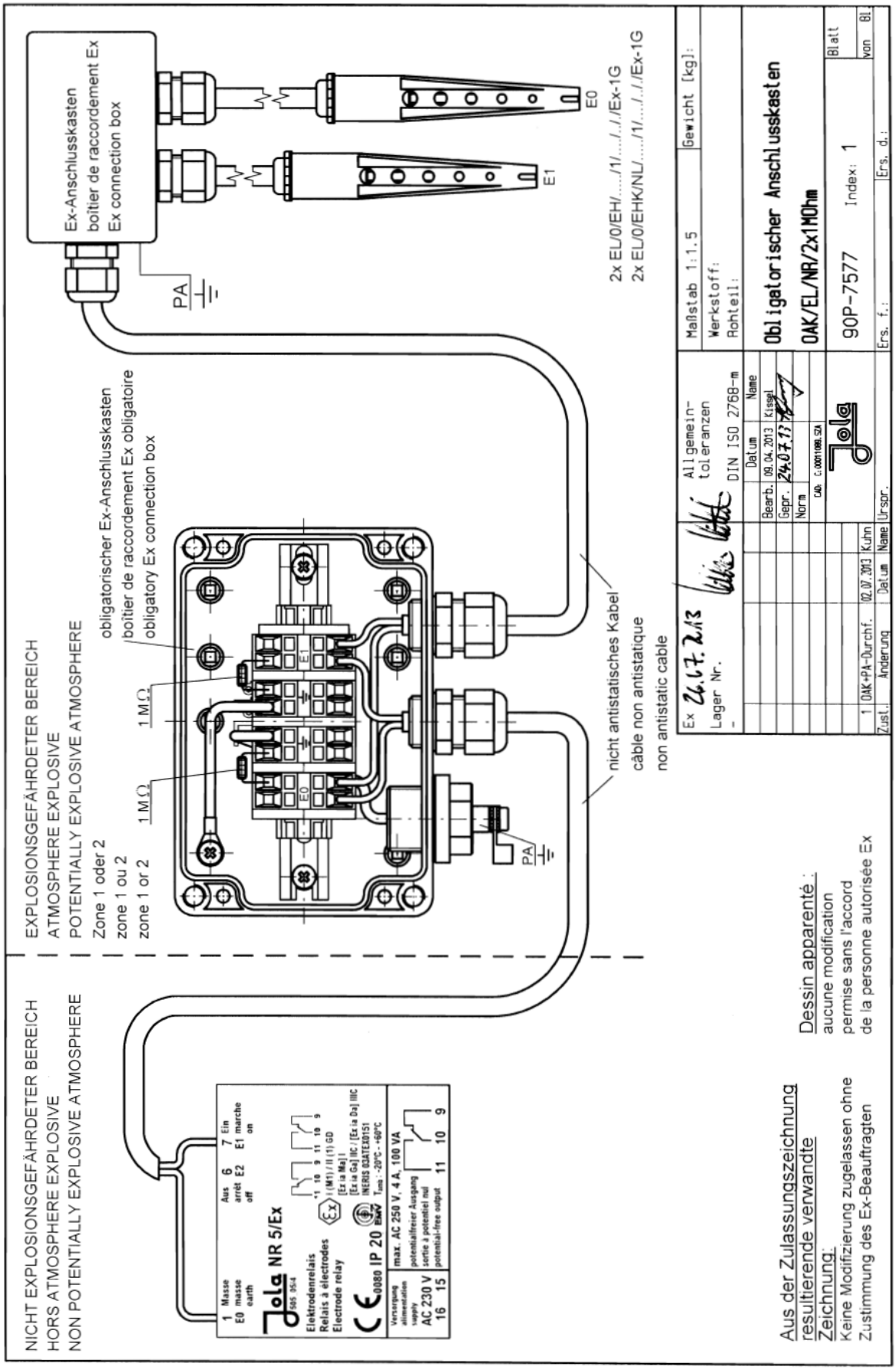
10. Repair

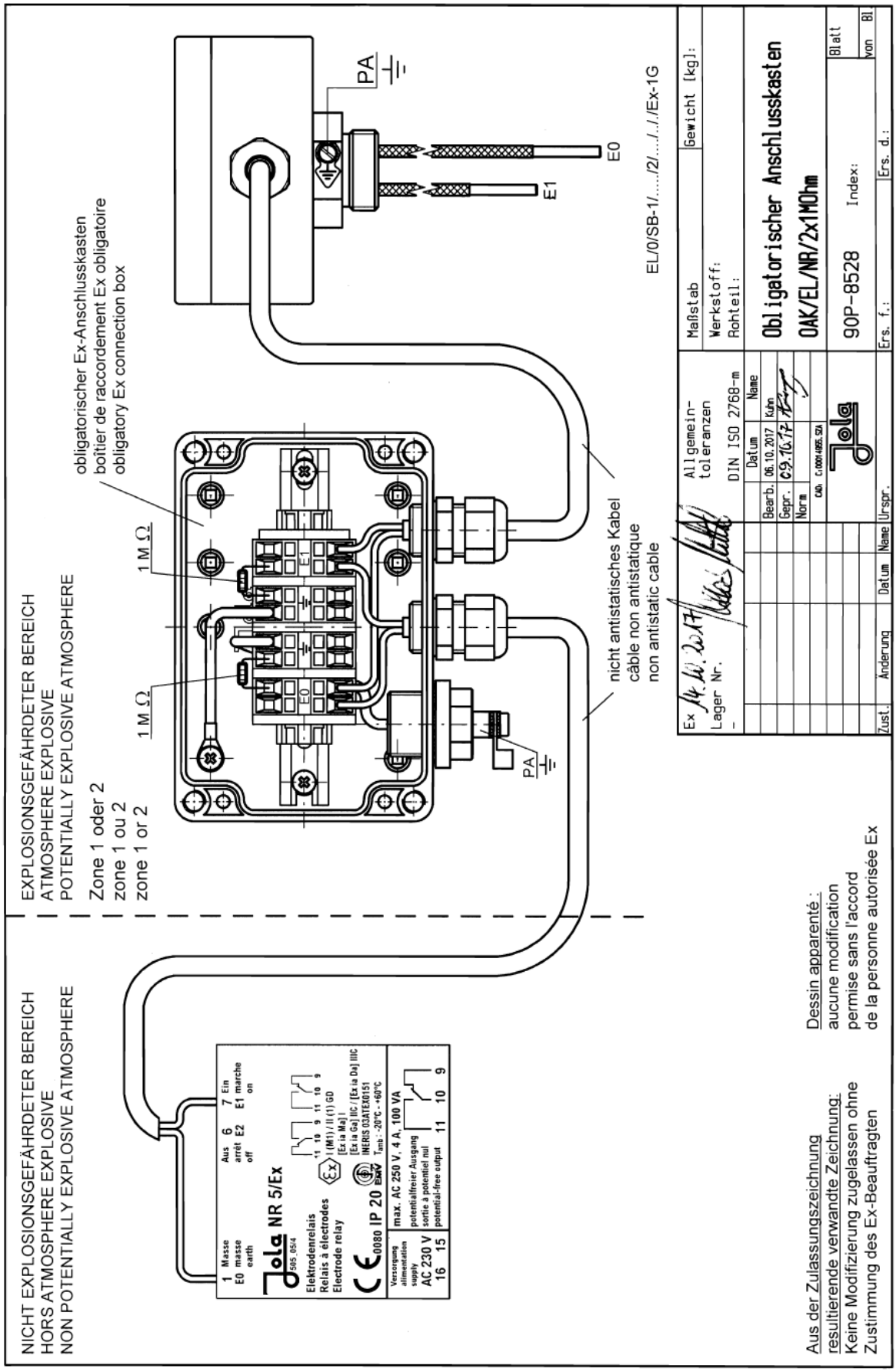
All alterations and repairs to the electrode EL/.../...../...../../..../../../Ex-... and/or the electrode relay NR 5/Ex must be performed in the manufacturer's facility. Under no circumstances may other individuals or companies perform unauthorised alterations or repairs.

11. Disposal

The units must be disposed of by depositing them in conformity with the law at an appropriate collection point for electrical and electronic devices.


NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
E0
E1
PA
2x EL/0/EH/...../1...../../Ex-1G
2x EL/0/EHK/NL/...../1...../../Ex-1G
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
1 Masse E0 masse earth
Aus 6 arrêt E2 off
7 Ein E1 marche on
Jola NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
max. AC 250 V, 4 A, 100 VA
potentialfreier Ausgang
sortie à potentiel nul
potential-free output
Versorgung alimentation supply
AC 230 V
16 15
11 10 9
IP 20
Maßstab 1:1.5
Gewicht [kg]:
Werkstoff:
Rohteil:
Allgemeintoleranzen
DIN ISO 2768-m
Obligatorischer Anschlusskasten
OAK/EL/NR/2x1MOhm/S
90P-8028
Index:
Blatt
Ers. f.:
Ers. d.:
von
Bl
Ex 05.12.2014
Lager Nr.
Bearb. 03.12.2014 Kuhn
Gepr. 6.3.12.14
Norm
Zust. Änderung Datum Name Urspr.
Dessin apparenté : aucune modification permise sans l'accord de la personne autorisée Ex
Aus der Zulassungszeichnung resultierende verwandte Zeichnung: Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten


EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
Ex-Anschlusskasten
boîtier de raccordement Ex
Ex connection box
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
PA
E0
E1
2x EL/0/EH/...../1/...../../Ex-1G
2x EL/0/EHK/NL/...../1/...../../Ex-1G
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
Jola NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
Aus 6
arrêt E2
off
Ein 7
E1 marche
on
Masse
E0 masse
earth
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
Ex 24.07.2013
Lager Nr.
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab 1:1.5
Gewicht [kg]:
Werkstoff:
Rohteil:
Datum
Name
Bearb. 09.04.2013 Kissel
Gepr. 24.07.13
Norm
CAD-Nr. 0001088.SDA
Obligatorischer Anschlusskasten
OAK/EL/NR/2x1MOhm
90P-7577
Index: 1
Blatt
von Bl
Ers. f.:
Ers. d.:
1 OAK+PA-Durchf. 02.07.2013 Kuhn
Zust. Änderung Datum Name Urspr.
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
aucune modification permise sans l'accord de la personne autorisée Ex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Zone 1 oder 2
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obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
PA
PA
E0
E1
E0
E1
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
EL/0/SB-1/...../2/...../../../Ex-1G
1 Masse E0 masse earth
Aus 6 arrêt E2 off
7 Ein E1 marche on
Jola NR 5/Ex
595 054
Elektrodenrelais
Relais à électrodes
Electrode relay
11 10 9 11 10 9
I (M1) / II (1) GD
[Ex ia Ma] I
[Ex ia Ga] IIC / [Ex ia Da] IIIC
INERIS 03ATEX0151
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
Ex 14.11.2017
Lager Nr.
-
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab
Gewicht [kg]:
Werkstoff:
Rohteil:
Datum
Name
Bearb. 06.10.2017 Kuhn
Gepr. 09.10.17
Norm
Obligatorischer Anschlusskasten
OAK/EL/NR/2x1MOhm
90P-8528
Index:
Blatt
Ers. f.:
Ers. d.:
von Bl
Zust. Änderung Datum Name Urspr.
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
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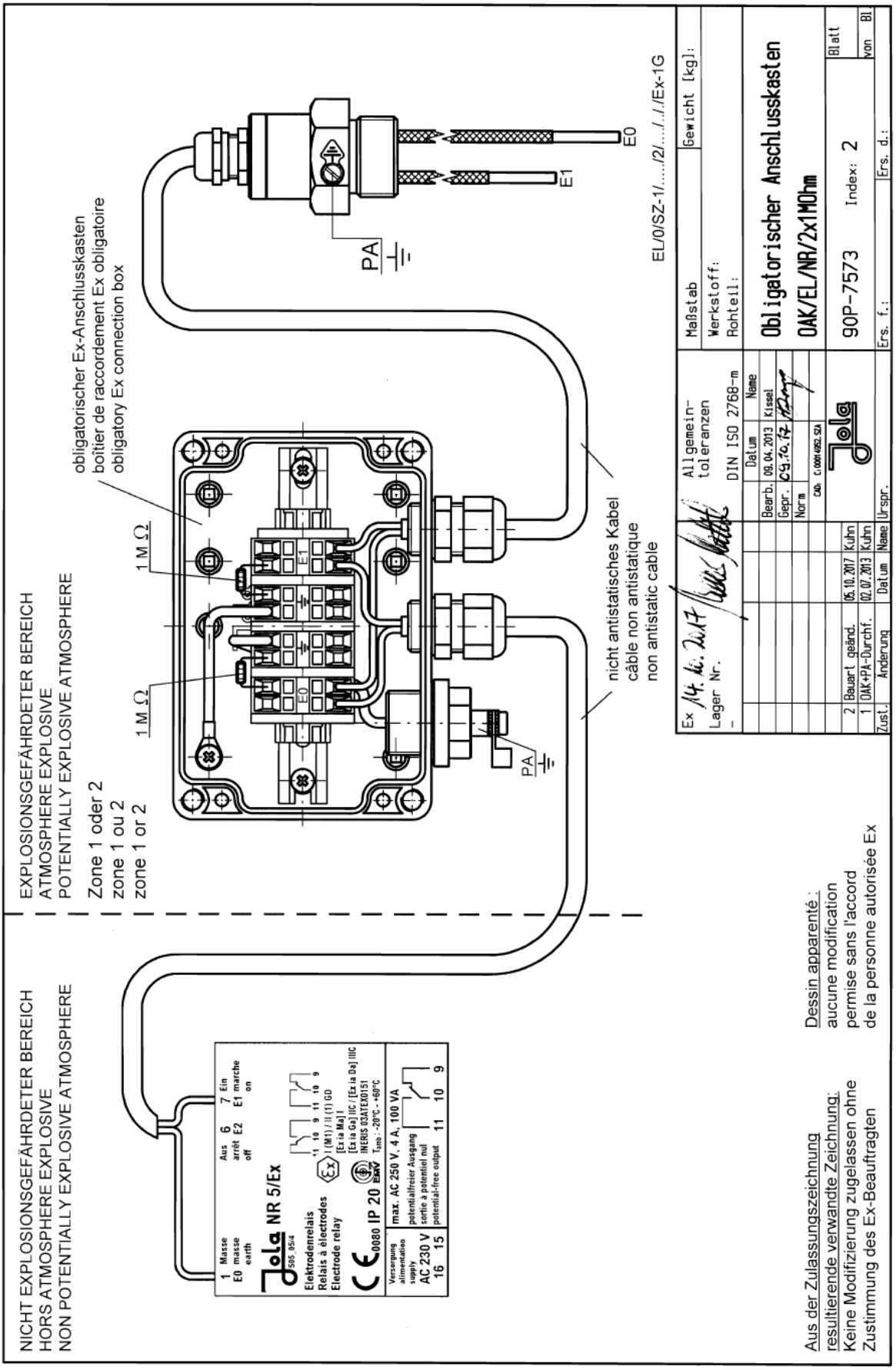
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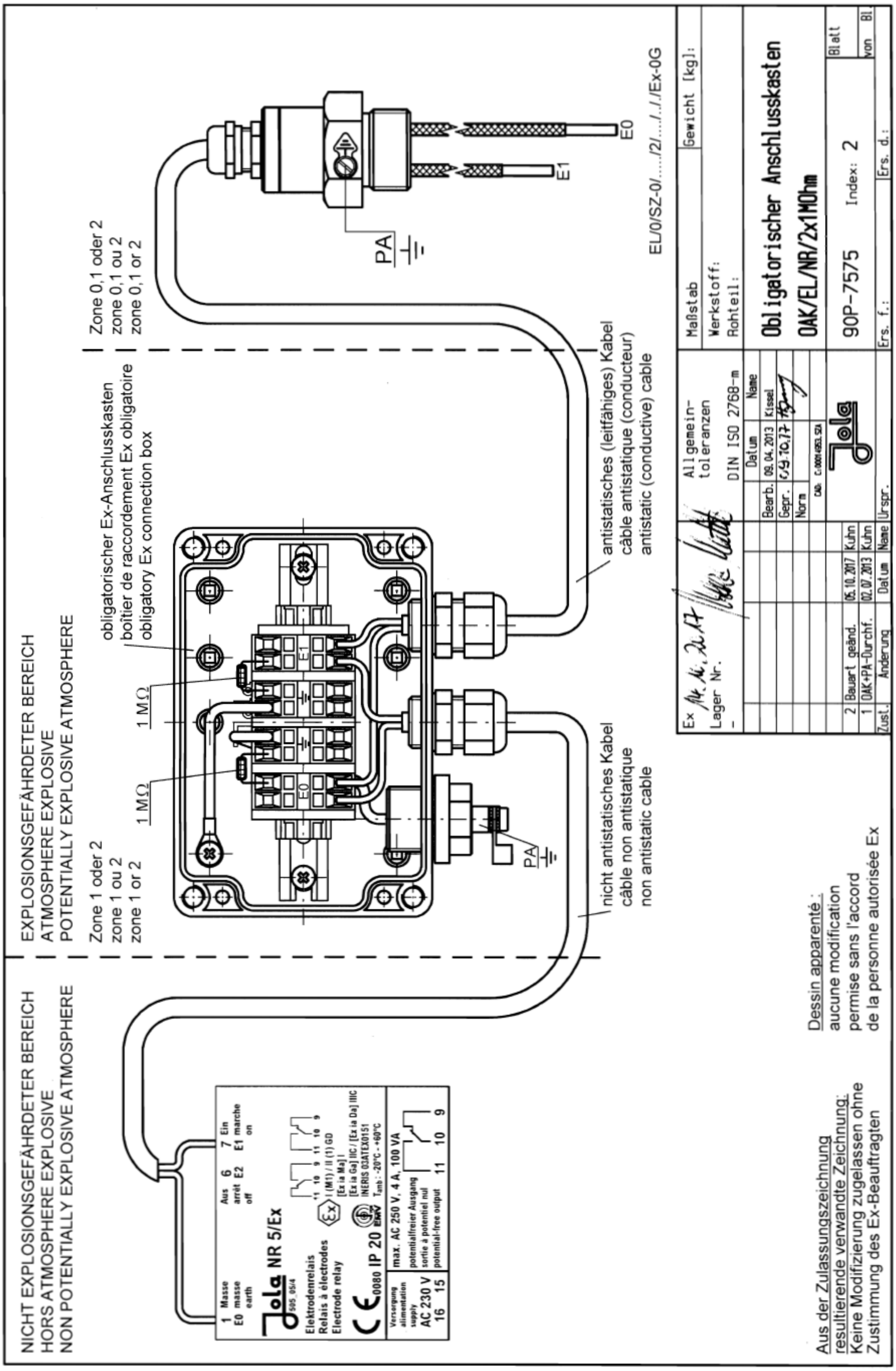
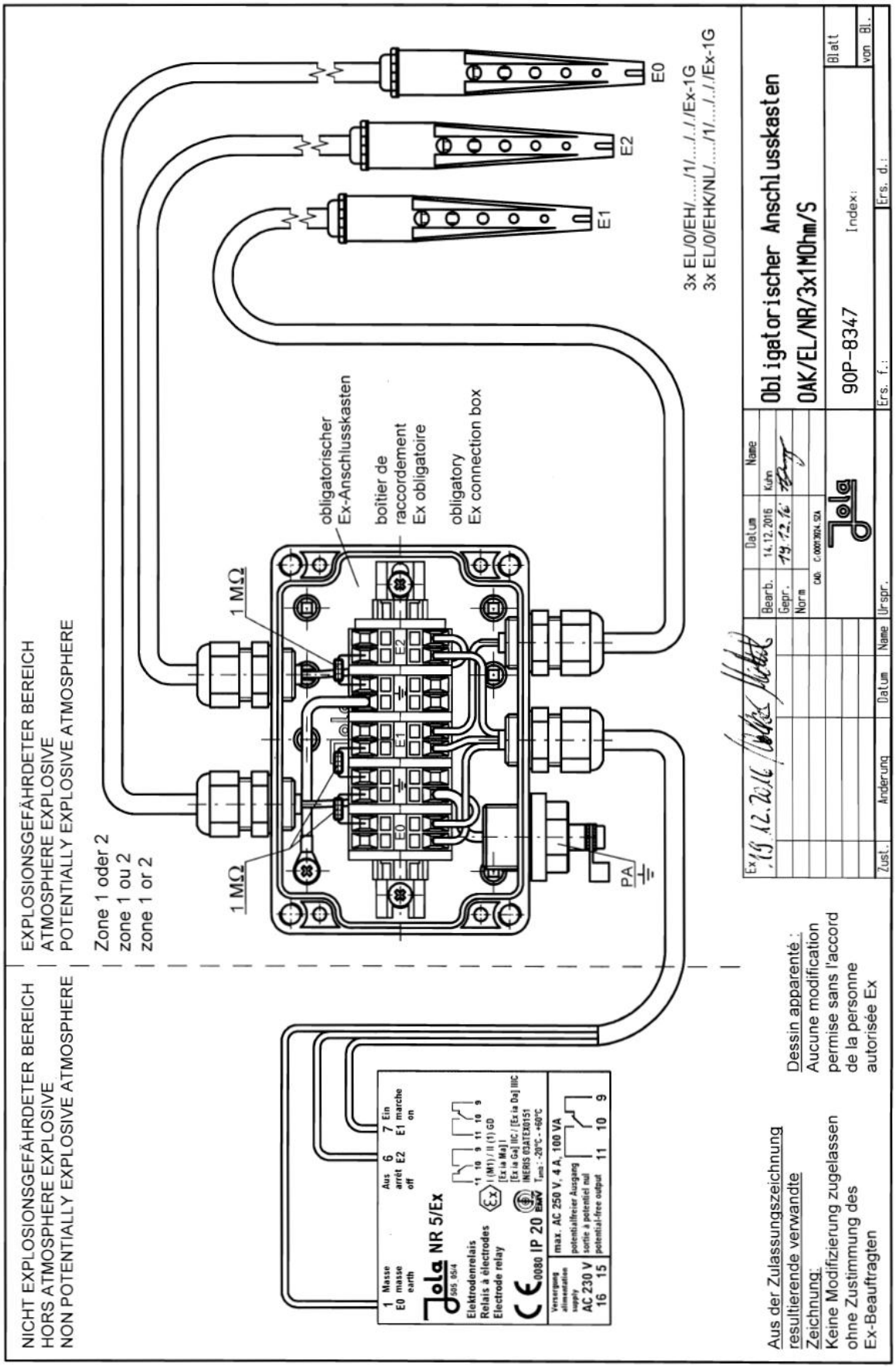
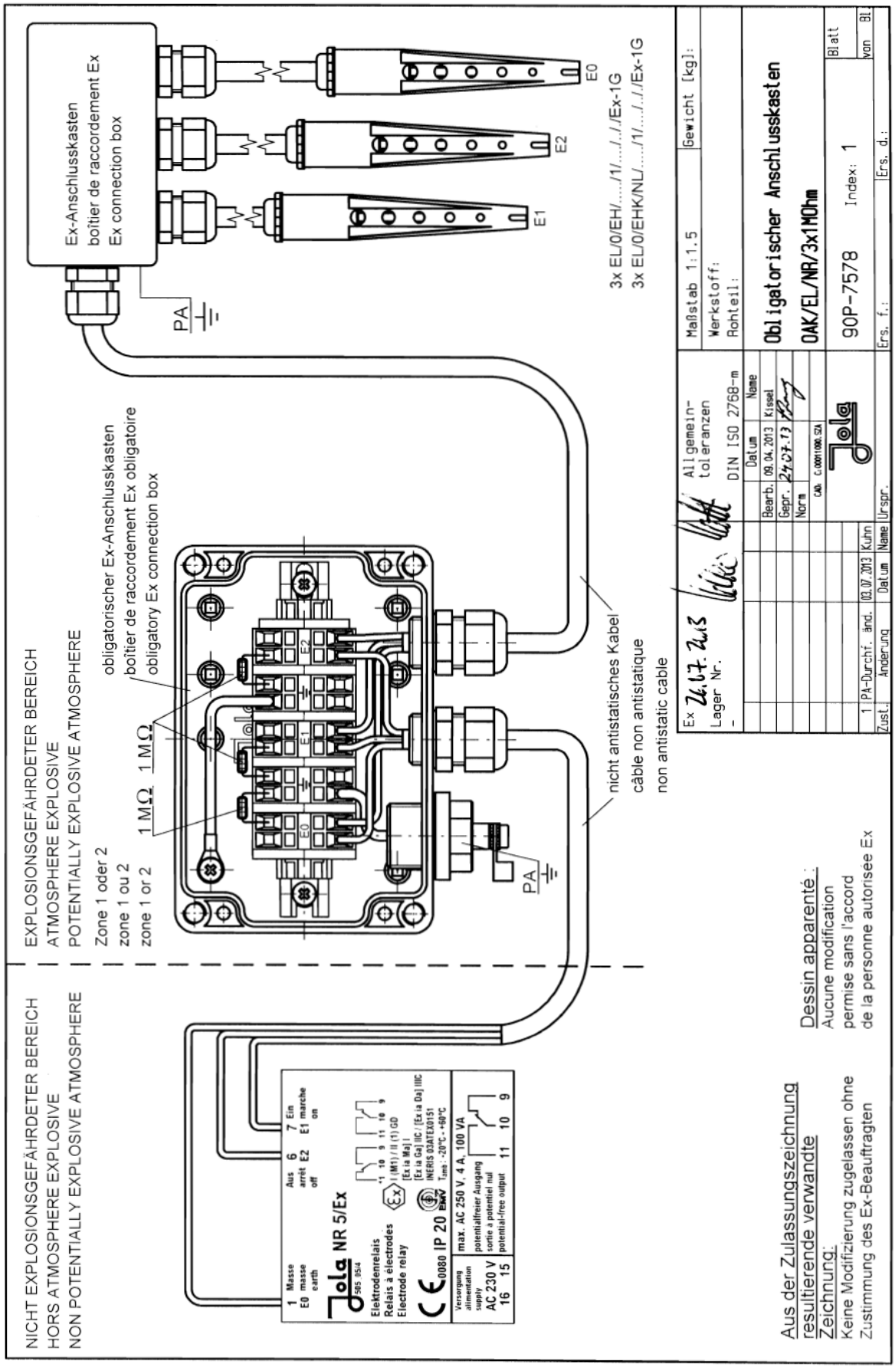
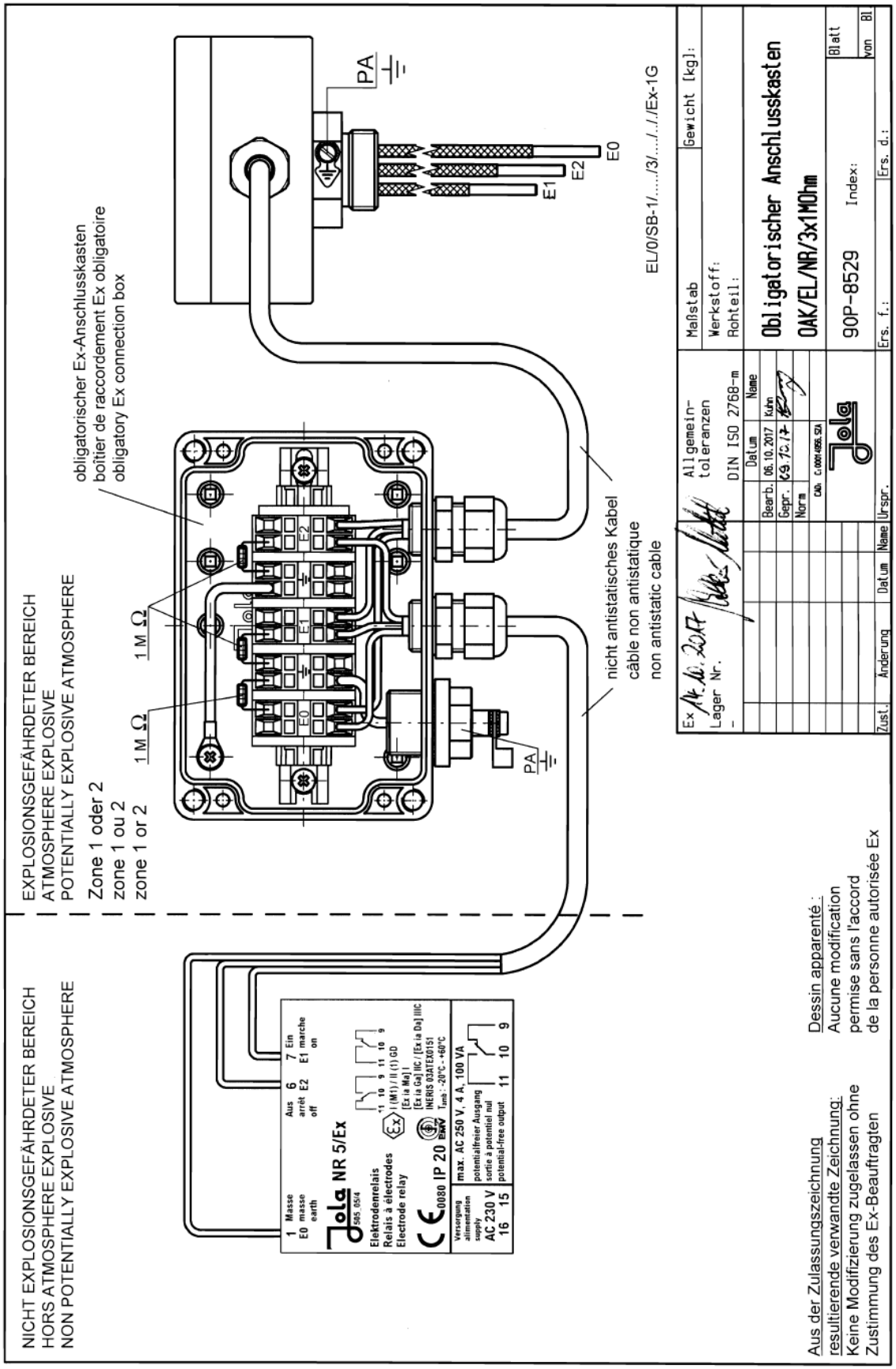
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
1 M Ω
1 M Ω
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
PA
E0
E1
EL/0/SZ-1/...../2/...../../../Ex-1G
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
PA
1 Masse
E0 masse
earth
Aus 6
arrêt E2
off
7 Ein
E1 marche
on
Jola NR 5/Ex
505 954
Elektrodenrelais
Relais à électrodes
Electrode relay
II (M1) / II (1) GD
[Ex ia Ma]
[Ex ia Ga] IIC / [Ex ia Da] IIIC
INERIS 03ATEX0151
Tamb. -20°C...+60°C
0080 IP 20
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
Ex 14. Mi. 2017
Lager Nr.
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab
Gewicht [kg]:
Werkstoff:
Rohteil:
Datum
Name
Bearb. 09.04.2013 Kissel
Gepr. 09.10.17
Norm
CAD: C:\0001\052.SLA
Obligatorischer Anschlusskasten
OAK/EL/NR/2x1MOhm
90P-7573
Index: 2
Blatt
Ers. f.:
Ers. d.:
von Bl
2 Bauart geänd. 05.10.2017 Kuhn
1 OAK+PA-Durchf. 02.07.2013 Kuhn
Zust. Änderung Datum Name Urspr.
Aus der Zulassungszeichnung
resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne
Zustimmung des Ex-Beauftragten
Dessin apparenté :
aucune modification
permise sans l'accord
de la personne autorisée Ex

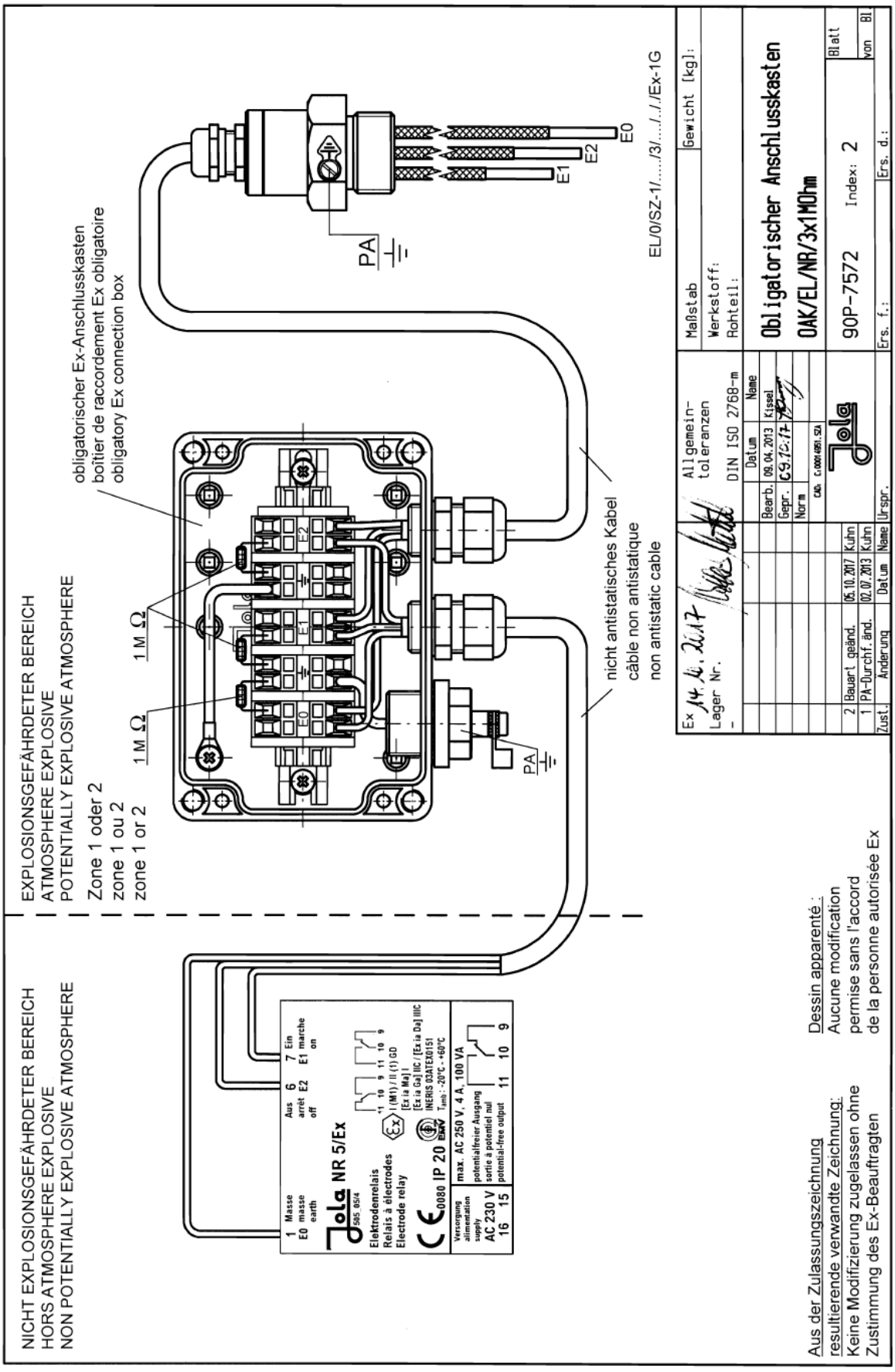


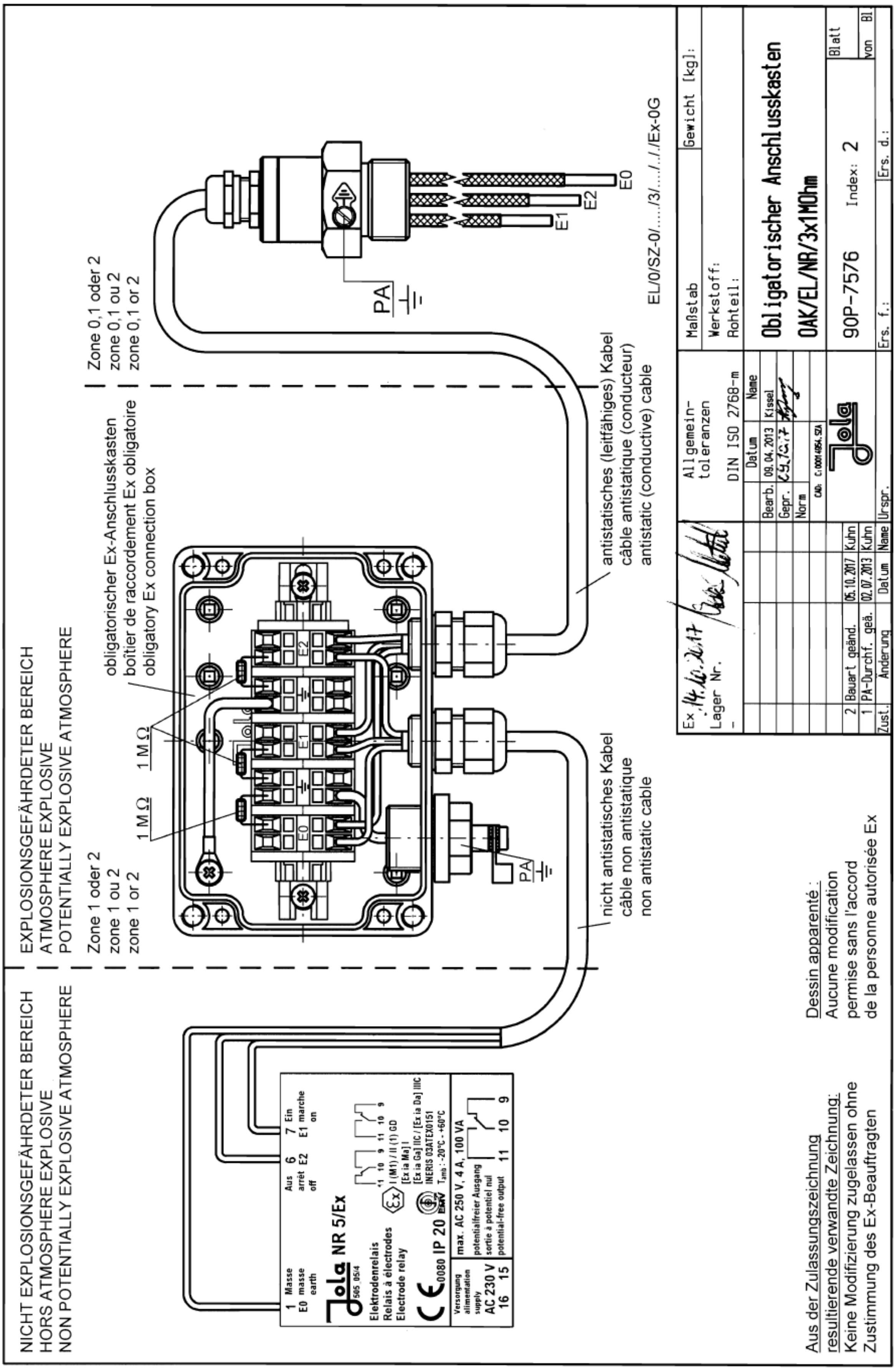
NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
Zone 0,1 oder 2
zone 0,1 ou 2
zone 0,1 or 2
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
PA
PA
E1
E0
EL/0/SZ-0/...../2/..../../Ex-0G
antistatisches (leitfähiges) Kabel
câble antistatique (conducteur)
antistatic (conductive) cable
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
IP 20
1 Masse masse earth E0
6 Aus arrêt off E2
7 Ein marche on E1
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
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
aucune modification permise sans l'accord de la personne autorisée Ex
Maßstab
Gewicht [kg]:
Werkstoff:
Rohteil:
Allgemeintoleranzen
DIN ISO 2768-m
Datum
Name
Bearb. 09.04.2013 Kissel
Gepr.
Norm
Obligatorischer Anschlusskasten
OAK/EL/NR/2x1MOhm
90P-7575
Index: 2
Blatt
von Bl
Ers. f.:
Ers. d.:
Urspr.
2 Bauart geänd. 05.10.2017 Kuhn
1 OAK+PA-Durchf. 02.07.2013 Kuhn
Zust. Änderung Datum Name
Ex
Lager Nr.

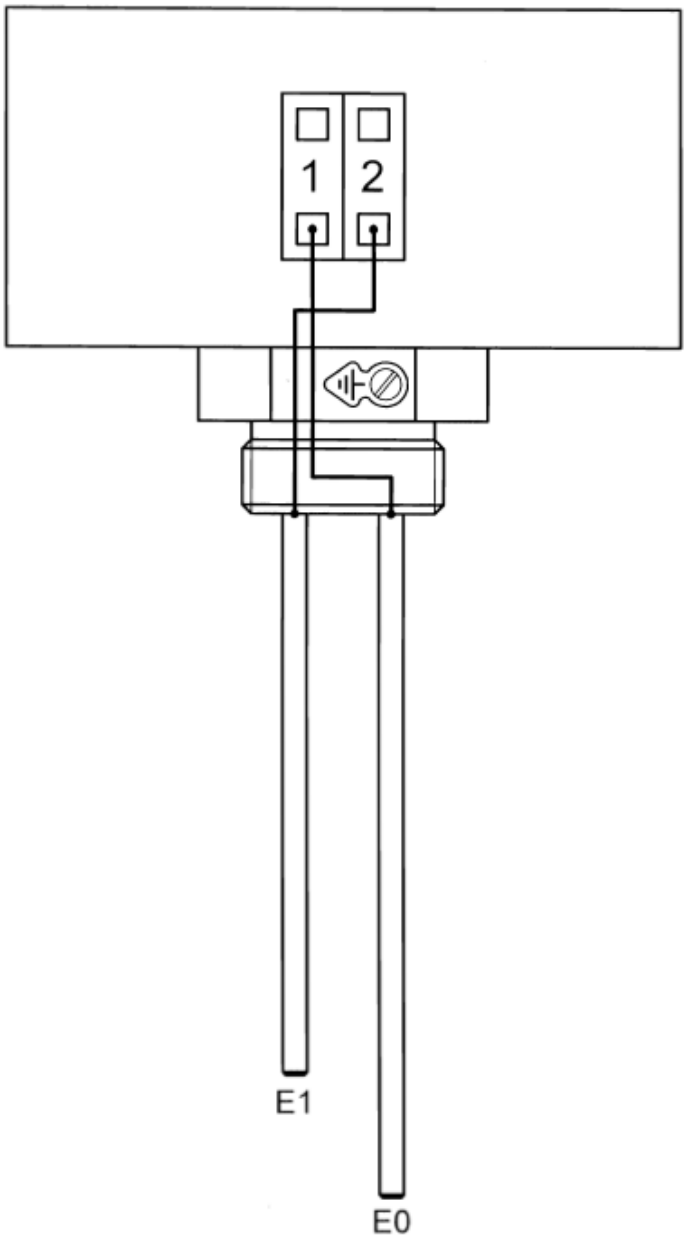

NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
3x EL/0/EH/...../1/...../.../Ex-1G
3x EL/0/EHK/NL/...../1/...../.../Ex-1G
E0
E2
E1
obligatorischer Ex-Anschlusskasten
boitier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
PA
Jola NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
max. AC 250 V, 4 A, 100 VA
AC 230 V
Obligatorischer Anschlusskasten
OAK/EL/NR/3x1MOhm/S
90P-8347
Index:
Blatt
Ers. f.:
Ers. d.:
von Bl.
Bearb.
Gepr.
Norm
Datum
14.12.2016
Name
Kuhn
Zust.
Änderung
Datum
Name
Ursprung
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex


EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
Ex-Anschlusskasten
boîtier de raccordement Ex
Ex connection box
PA
E0
E1
E2
3x EL/0/EH/...../1/...../../../Ex-1G
3x EL/0/EHK/NL/...../1/...../../../Ex-1G
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
Jola NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
max. AC 250 V, 4 A, 100 VA
AC 230 V
potentialfreier Ausgang
sortie à potentiel nul
potential-free output
Maßstab 1:1.5
Gewicht [kg]:
Werkstoff:
Rohteil:
Allgemeintoleranzen
DIN ISO 2768-m
Obligatorischer Anschlusskasten
OAK/EL/NR/3x1MOhm
90P-7578
Index: 1
Blatt
von Bl
Ex 24.07.2013
Lager Nr.
Bearb. 09.04.2013 Kissel
Gepr. 24.07.13
Norm
Datum
Name
1 PA-Durchf. änd. 03.07.2013 Kuhn
Zust. Änderung Datum Name Urspr.
Ers. f.:
Ers. d.:
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisee Ex


NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
1 M Ω
1 M Ω
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
PA
E0
E1
E2
PA
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
EL/0/SB-1/...../3/...../../Ex-1G
Jola NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
max. AC 250 V, 4 A, 100 VA
AC 230 V
Maßstab
Gewicht [kg]:
Werkstoff:
Rohteil:
Allgemeintoleranzen
DIN ISO 2768-m
Obligatorischer Anschlusskasten
OAK/EL/NR/3x1MOhm
90P-8529
Index:
Blatt
Bearb. 06.10.2017 Kuhn
Gepr.
Norm
Ers. f.:
Ers. d.:
Zust. Änderung Datum Name Ursprung
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex


EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
1 M Ω
1 M Ω
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
PA
E0
E1
E2
EL/0/SZ-1/...../3/...../../../Ex-1G
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
PA
NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
1 Masse E0 masse earth
Aus 6 E2 arrêt off
7 Ein E1 marche on
Jola NR 5/Ex
095 05/4
Elektrodenrelais
Relais à électrodes
Electrode relay
IP 20
max. AC 250 V, 4 A, 100 VA
potentialfreier Ausgang
sortie à potentiel nul
potential-free output
11 10 9
Versorgung alimentation supply
AC 230 V
16 15
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab
Gewicht [kg]:
Werkstoff:
Rohteil:
Obligatorischer Anschlusskasten
OAK/EL/NR/3x1MOhm
90P-7572
Index: 2
Blatt
Bearb. 09.04.2013 Kissel
Gepr. 09.10.17
Norm
Datum Name
2 Bauart geänd. 05.10.2017 Kuhn
1 PA-Durchf. änd. 02.07.2013 Kuhn
Zust. Änderung Datum Name Urspr.
Ers. f.: Ers. d.:
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex

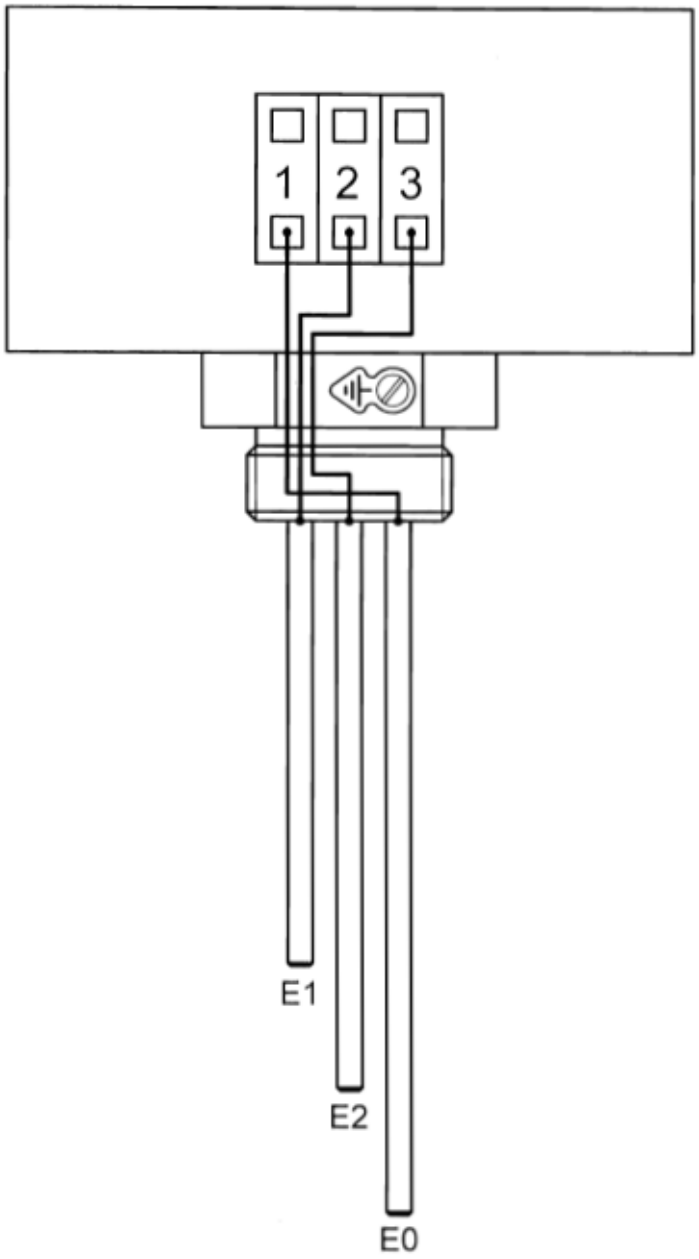

NICHT EXPLOSIONSGEFÄHRDETER BEREICH
HORS ATMOSPHERE EXPLOSIVE
NON POTENTIALLY EXPLOSIVE ATMOSPHERE
EXPLOSIONSGEFÄHRDETER BEREICH
ATMOSPHERE EXPLOSIVE
POTENTIALLY EXPLOSIVE ATMOSPHERE
Zone 1 oder 2
zone 1 ou 2
zone 1 or 2
Zone 0,1 oder 2
zone 0,1 ou 2
zone 0,1 or 2
obligatorischer Ex-Anschlusskasten
boîtier de raccordement Ex obligatoire
obligatory Ex connection box
1 MΩ
1 MΩ
antistatisches (leitfähiges) Kabel
câble antistatique (conducteur)
antistatic (conductive) cable
nicht antistatisches Kabel
câble non antistatique
non antistatic cable
PA
PA
E0
E1
E2
E0
E1
E2
EL/0/SZ-0/…../3/…/../Ex-0G
NR 5/Ex
Elektrodenrelais
Relais à électrodes
Electrode relay
1 Masse E0 masse earth
Aus 6 arrêt E2 off
7 Ein E1 marche on
IP 20
I (M1) / II (1) GD
[Ex ia Ma] I
[Ex ia Ga] IIC / [Ex ia Da] IIIC
INERIS 03ATEX0151
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
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex
Lager Nr.
Allgemeintoleranzen
DIN ISO 2768-m
Bearb. 09.04.2013 Kissel
Gepr.
Norm
2 Bauart geänd. 05.10.2017 Kuhn
1 PA-Durchf. geä. 02.07.2013 Kuhn
Zust. Änderung Datum Name Urspr.
Maßstab
Werkstoff:
Rohteil:
Gewicht [kg]:
Obligatorischer Anschlusskasten
OAK/EL/NR/3x1MOhm
90P-7576
Index: 2
Blatt
von Bl
Ers. f.:
Ers. d.:



Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten

Dessin apparenté :
aucune modification permise sans l'accord de la personne autorisée Ex

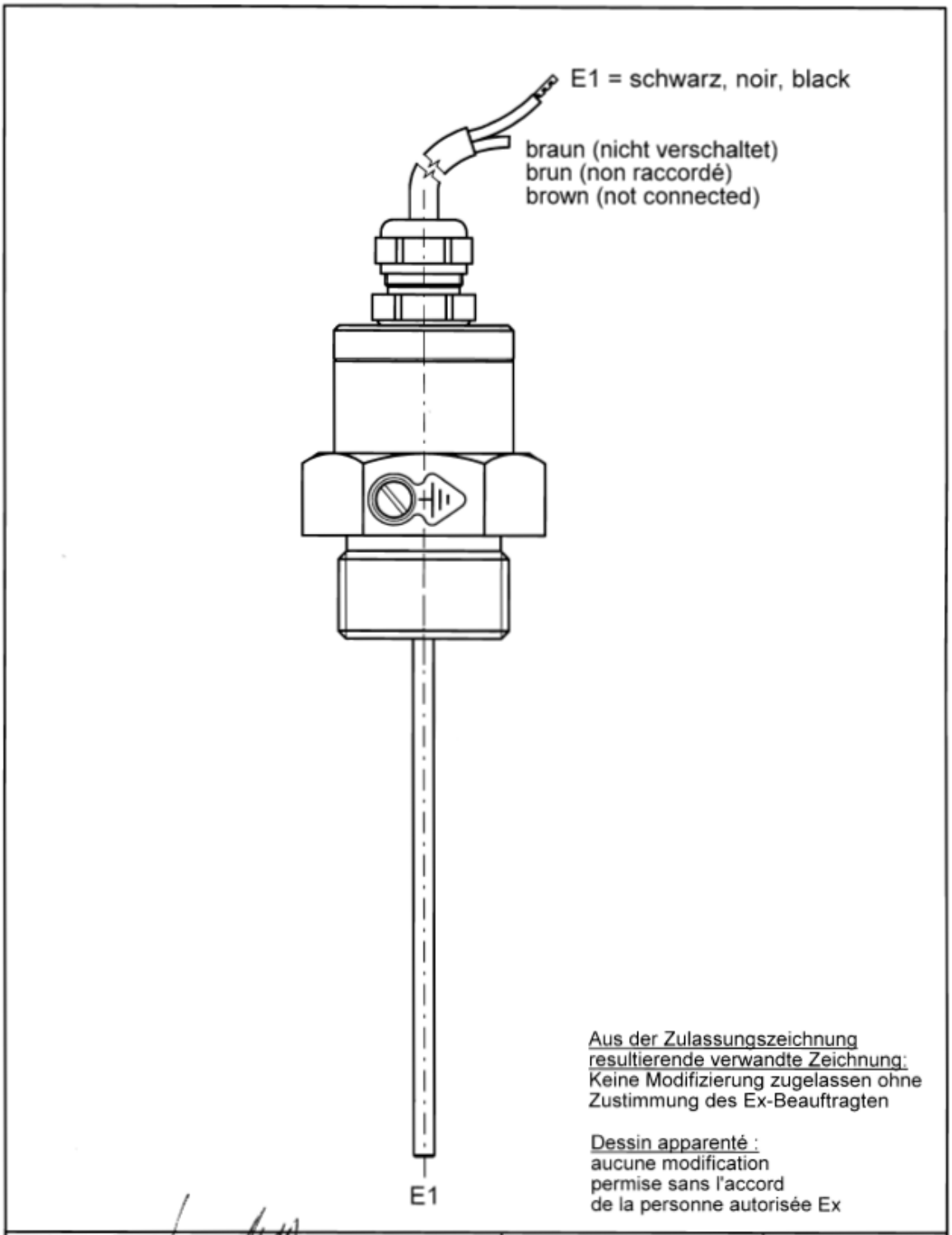
Ex 25.05.2015 Lager Nr. -				Allgemeintoleranzen DIN ISO 2768-m		Maßstab 1:1	Gewicht
						Werkstoff: Rohteil:	
				Bearb.	12.05.2014 Kuhn	Prinzipanschlussbild für EL/./SB-./G1/2/ED/ED/0/Ex-1G	
				Gepr.	9.14		
				Norm			
1	Stabbez. berichtigt	12.05.2014	Kuhn			51P-6013 Index: 1	Blatt Bl.
Zust.	Änderung	Datum	Name	Urspr.		Ers. f.:	Ers. d.:

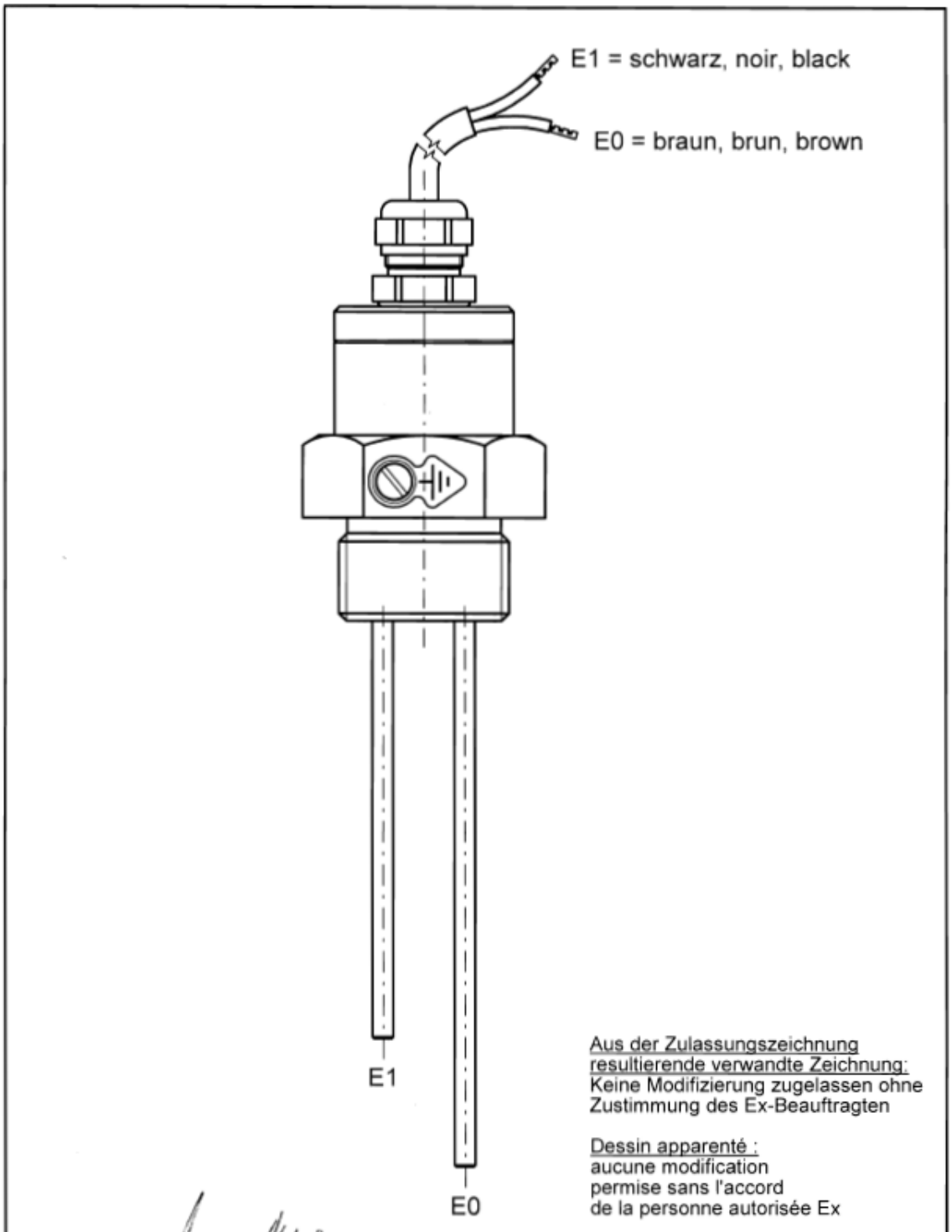


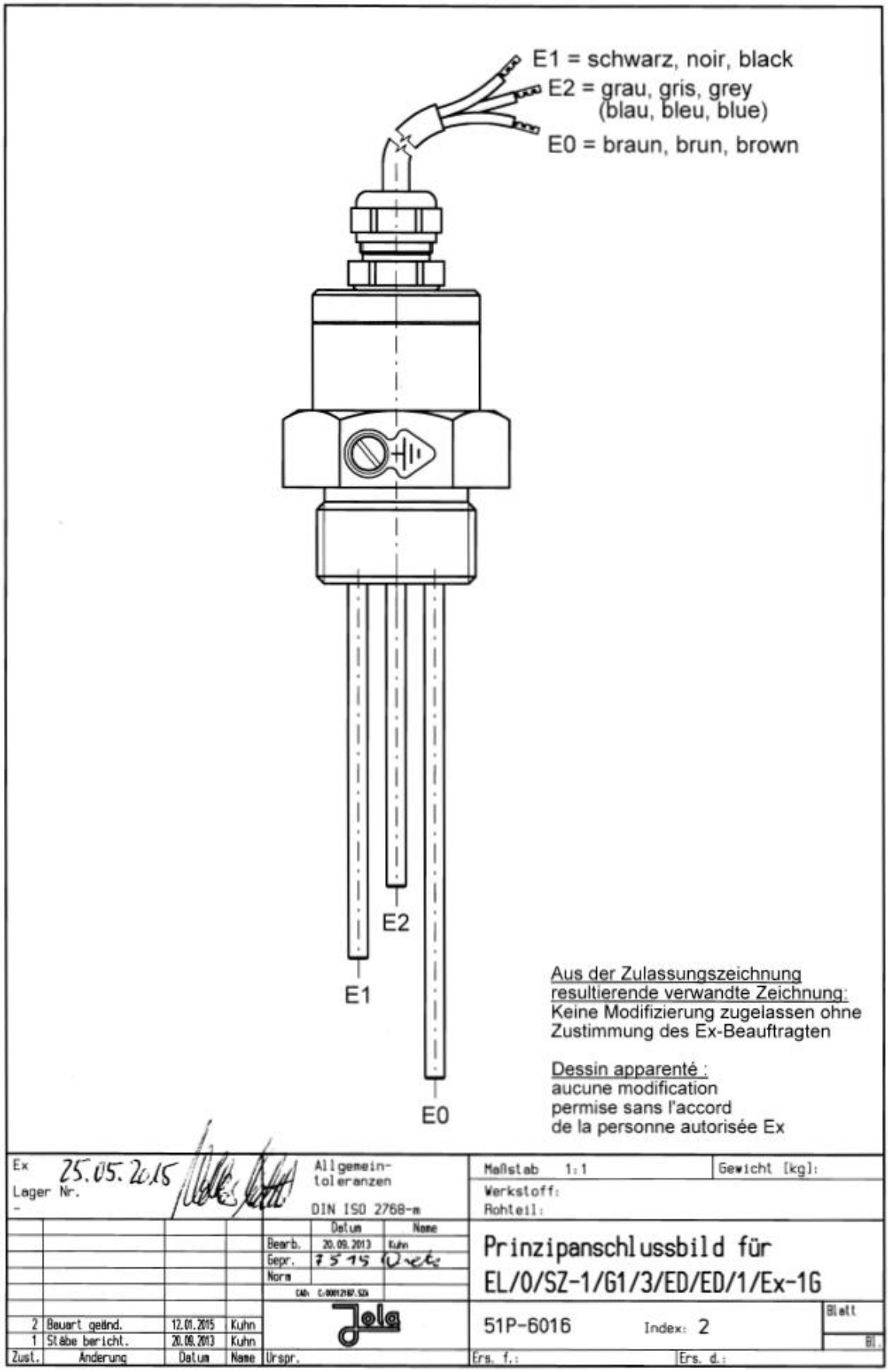
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten

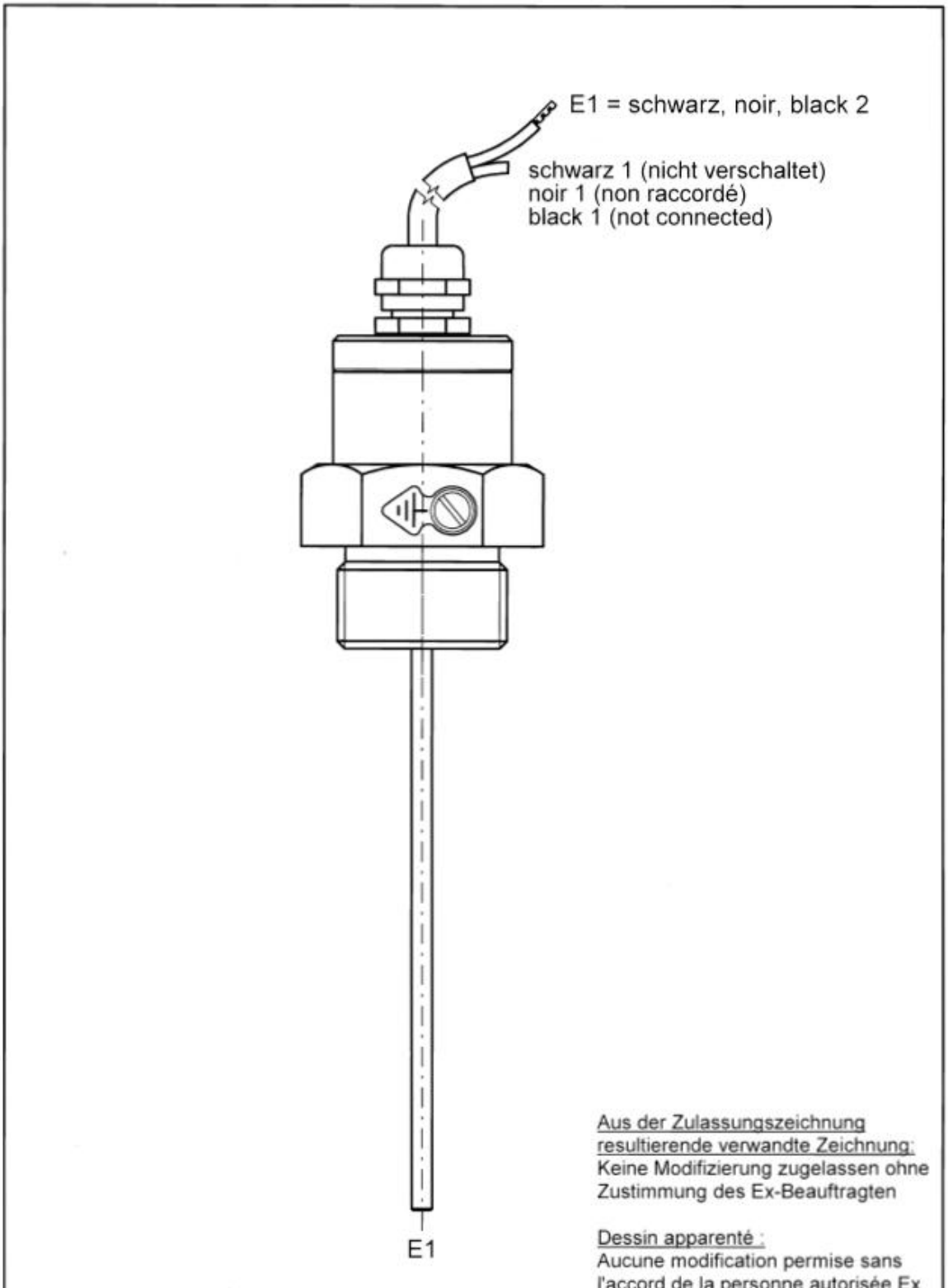
Dessin apparenté :
aucune modification permise sans l'accord de la personne autorisée Ex

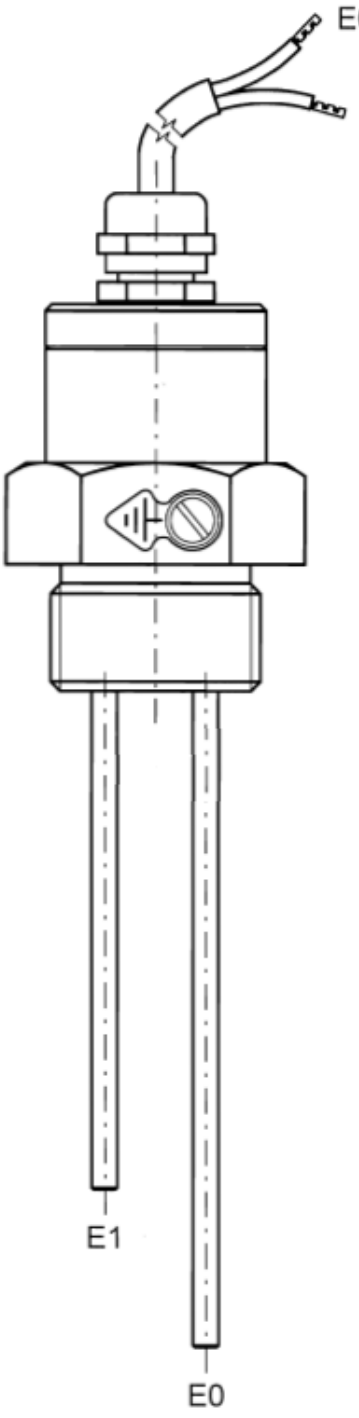
Ex 25.05.2015 Lager Nr. -			Allgemeintoleranzen DIN ISO 2768-m	Maßstab 1:1	Gewicht
				Werkstoff: Rohteil:	
			Datum / Name	Prinzipanschlussbild für EL/./SB-./G1/3/ED/ED/0/Ex-1G	
			Bearb. 12.05.2014 Kuhn		
			Gepr. 11.5.15 Quetz		
			Norm		
			CAD: C:\0001625.SDA		
1	Stabbez. berichtigt	12.05.2014	Kuhn	51P-6014 Index: 1	Blatt Bl.
Zust.	Änderung	Datum	Name	Urspr.	Ers. f.: Ers. d.:


E1 = schwarz, noir, black
braun (nicht verschaltet)
brun (non raccordé)
brown (not connected)
E1
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
aucune modification permise sans l'accord de la personne autorisée Ex
Ex 25.05.2015
Lager Nr.
-
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab 1:1
Gewicht [kg]:
Werkstoff:
Rohteil:
Datum
Name
Bearb. 20.09.2013 Kuhn
Gepr. 25.5.15
Norm
Prinzipanschlussbild für
EL/0/SZ-1/G1/1/ED/ED/1/Ex-1G
2 Bauart geänd. 12.06.2015 Kuhn
1 Benennung geä. 20.06.2013 Kuhn
Zust. Änderung Datum Name
Ursprung
51P-6253
Index: 2
Blatt
Bl.
Ers. f.:
Ers. d.:


E1 = schwarz, noir, black
E0 = braun, brun, brown
E1
E0
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
aucune modification permise sans l'accord de la personne autorisée Ex
Ex 25.05.2015
Lager Nr. -
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab 1:1
Gewicht [kg]:
Werkstoff:
Rohteil:
Bearb. 20.09.2013 Kuhn
Gepr. 25.05.2015
Norm
Prinzipanschlussbild für EL/0/SZ-1/G1/2/ED/ED/1/Ex-1G
2 Bauart geänd. 12.01.2015 Kuhn
1 Stäbe berichtigt 20.09.2013 Kuhn
Zust. Änderung Datum Name Ursprung
51P-6015 Index: 2
Blatt Bl.
Ers. f.: Ers. d.:


E1 = schwarz, noir, black
E2 = grau, gris, grey
(blau, bleu, blue)
E0 = braun, brun, brown
E2
E1
E0
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
aucune modification
permise sans l'accord
de la personne autorisée Ex
Ex
Lager Nr.
25.05.2015
Allgemeintoleranzen
DIN ISO 2768-m
Maßstab 1:1
Gewicht [kg]:
Werkstoff:
Rohteil:
Datum
Name
Bearb. 20.09.2013 Kuhn
Gepr. 7.5.15
Norm
Prinzipanschlussbild für
EL/0/SZ-1/G1/3/ED/ED/1/Ex-1G
51P-6016
Index: 2
Blatt
Bl.
2 Bauart geänd. 12.01.2015 Kuhn
1 Stäbe berichtigt 20.09.2013 Kuhn
Zust. Änderung Datum Name
Ursprung
Ers. f.:
Ers. d.:


E1 = schwarz, noir, black 2
schwarz 1 (nicht verschaltet)
noir 1 (non raccordé)
black 1 (not connected)
E1
Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten
Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex
Ex 15.03.24.17
Datum
Name
Bearb. 20.09.2013 Kuhn
Gepr. 2.3.17
Norm
1 Bauart geänd. 13.01.2015 Kuhn
Zust. Änderung Datum Name
Ursprung
Prinzipanschlussbild für
EL/0/SZ-0/G1/1/ED/ED/1/Ex-06
51P-7728 Index: 1
Blatt
von Bl.
Ers. f.:
Ers. d.:



Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten

Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex

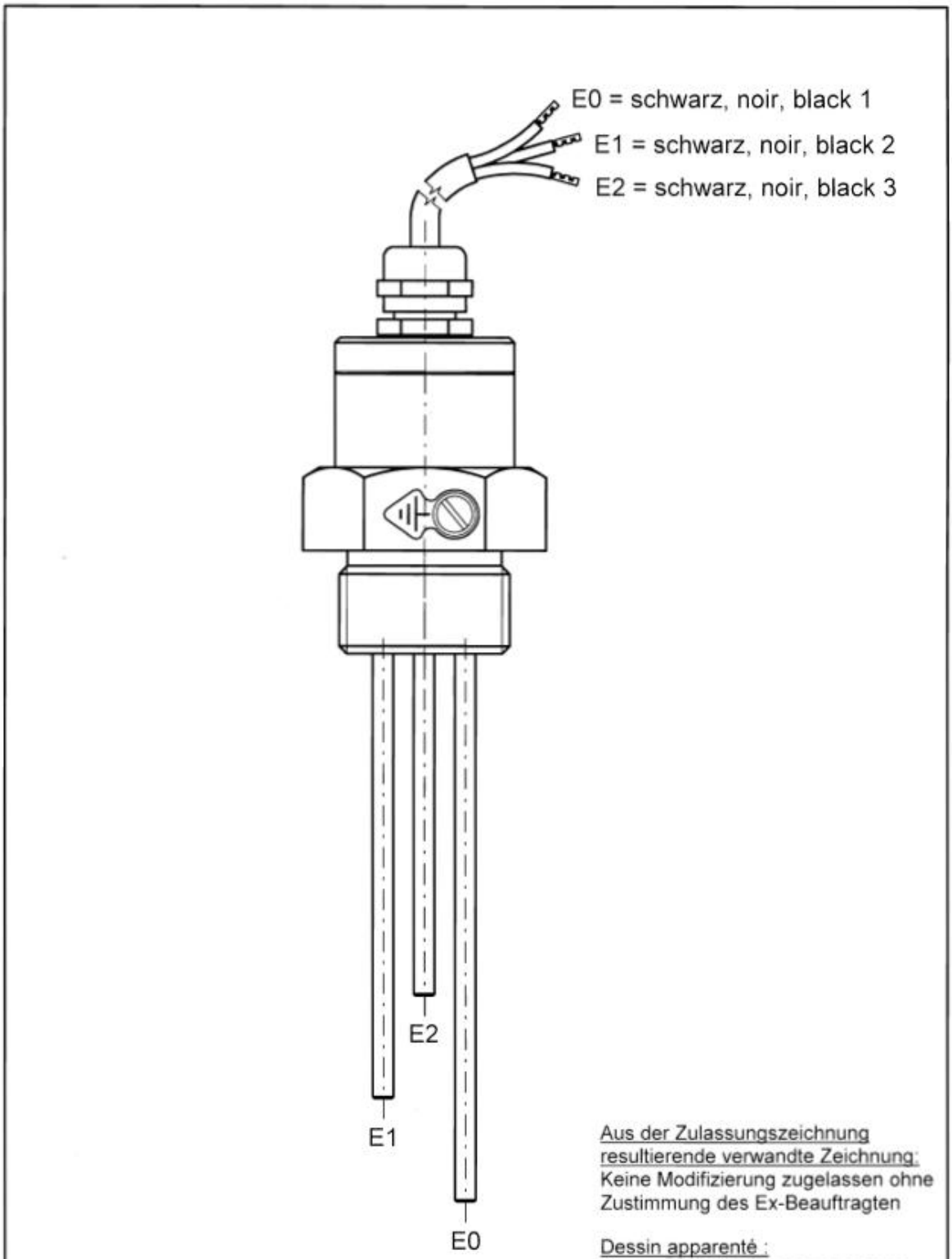
Ex 05.03.2017				Datum	Name
			Bearb.	20.09.2013	Kuhn
			Gepr.	23.17	Dietz
			Norm		
			CAD: C:\00012185.SZA		
1	Bauart geänd.	13.01.2015	Kuhn		
Zust.	Änderung	Datum	Name	Urspr.	

Prinzipanschlussbild für
EL/0/SZ-0/G1/2/ED/ED/1/Ex-06

51P-7729 Index: 1

Blatt
von Bl.

Ers. f.: Ers. d.:



Aus der Zulassungszeichnung resultierende verwandte Zeichnung:
Keine Modifizierung zugelassen ohne Zustimmung des Ex-Beauftragten

Dessin apparenté :
Aucune modification permise sans l'accord de la personne autorisée Ex

Ex	15.12.17			Datum	Name
			Bearb.	20.09.2013	Kuhn
			Gepr.	2.3.17	
			Norm		
			CAD: C:\00012196.52A		
1	Bauart geänd.	13.01.2015	Kuhn		
Zust.	Änderung	Datum	Name	Urspr.	

Prinzipanschlussbild für
EL/0/SZ-0/G1/3/ED/ED/1/Ex-0G

51P-7730 Index: 1

Blatt
von Bl.

Ers. f.: Ers. d.:

Installation, Operating and Maintenance Instructions for

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

These Installation, Operating and Maintenance Instructions must always be handed over to the fitter/operator/service personnel of our products together with all other user documentation and information!
They should be stored in a safe place together with all other user documentation and information so they can be consulted again when necessary at any time!

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1. Area of application

The electrode relay NR 5/Ex

JOLA
D-67466 Lambrecht

CE 0080
NR 5/Ex Ex I (M1) / II (1) GD

(serial number)
(production year)

[Ex ia Ma] I
[Ex ia Ga] IIC
[Ex ia Da] IIIC

Tamb : - 20°C to + 60°C
INERIS 03ATEX0151

is designed to transmit electrical signals coming **from one or more conductive electrodes installed in a potentially explosive atmosphere** to non-hazardous areas. **The electrode relay NR 5/Ex must be installed outside potentially explosive atmospheres or be protected by a suitable standardised ignition protection class.**

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The conductive electrodes are, **for example, used for leakage detection or for the automatic control of pumps or solenoid valves or for the purpose of overflow or run-dry protection in tanks.**

All the **technical parameters of the conductive electrodes and/or the electrode relay** are listed in this brochure and/or the accompanying product descriptions. These documents also contain the corresponding **installation recommendations**.
You must always observe and follow all the instructions relating to these parameters and installation recommendations. The relay may not be used for applications outside the specified parameter range.

If the product descriptions are not supplied with the products or are lost, **you must always request a copy of the descriptions prior to installation, connection or start-up and ensure that they are read and observed by the suitably qualified specialist personnel. Otherwise the conductive electrodes and/or the electrode relay may not be installed, connected and started up.**

2. Preconditions for safe use

- **Maximum parameters of the conductive electrodes**
  The maximum parameters of the conductive electrodes are listed in the corresponding product documentation.

- **Special requirements/conditions for the safe use of the conductive electrodes**
  The special requirements/conditions for the safe use of the conductive electrodes are listed in the corresponding product documentation.

- **Maximum parameters of the electrode relay NR 5/Ex**
  Rated supply voltages (terminals J15, J16):
  U = AC 24 V, AC 110 V, AC 115 V, AC 230 V or AC 240 V

  Maximum electrical parameters of the electrical circuit connected to terminals J9, J10 and J11:
  Umax. = 250 V; Imax. = 4A, **but max. P = 100 VA**

  Maximum electrical parameters at output terminals J6 and J7:
  Uo = 22 V; Io = 6 mA, but max. Po = 31.8 mW

  Maximum electrical parameters at output terminals (J1, J6) or (J1, J7):
  Uo = 11.5 V; Io = 11.6 mA, but max. Po = 64 mW

- **Special requirements/conditions for the safe use of the electrode relay NR 5/Ex**

  The electrode relay NR 5/Ex must be **installed outside potentially explosive atmospheres** or be protected by a suitable standardised ignition protection class.

  The electrical circuits connected to terminals J6 and J7
  must be approved for use
  - in above-ground areas which could be at risk due to a potentially explosive atmosphere caused by gases (groups IIC, IIB or IIA) or
  - in underground areas in mines as well as in above-ground areas of mines which could be at risk due to firedamp and/or flammable dusts (group I) or
  - in above-ground areas which could be at risk due to a potentially explosive atmosphere caused by dusts

  and their suitability in terms of intrinsic safety must be ensured.

The maximum parameters of the external circuits that may be connected are as follows:

For explosion group IIC	For explosion group IIB and for dust	For explosion groups IIA and I
Co(L=0) = 165 nF Lo(C=0) = 672 mH or Lo/Ro = 350 µH/Ohm	Co(L=0) = 1.14 µF Lo(C=0) = 972 mH or Lo/Ro = 510 µH/Ohm	Co(L=0) = 4.2 µF Lo(C=0) = 972 mH or Lo/Ro = 510 µH/Ohm

The electrical circuits connected to terminals J6, J1 or J7, J1
must be approved for use
- in above-ground areas which could be at risk due to a potentially explosive atmosphere caused by gases (groups IIC, IIB or IIA) or
- in underground areas in mines as well as in above-ground areas of mines which could be at risk due to firedamp and/or flammable dusts (group I) or
- in above-ground areas which could be at risk due to a potentially explosive atmosphere caused by dusts

and their suitability in terms of intrinsic safety must be ensured.

The maximum parameters of the external circuits that may be connected are as follows:

For explosion group IIC	For explosion group IIB and for dust	For explosion groups IIA and I
Co(L=0) = 1.62 µF Lo(C=0) = 172 mH or Lo/Ro = 156 µH/Ohm	Co(L=0) = 11.1 µF Lo(C=0) = 672 mH or Lo/Ro = 707 µH/Ohm	Co(L=0) = 45 µF Lo(C=0) = 972 mH or Lo/Ro = 1.05 mH/Ohm

3. Additional conditions for safe operation

Before using the conductive electrodes, you must ensure that the materials used in the respective conductive electrode are sufficiently chemically and mechanically resistant to the liquid to be monitored and all other external influences.
In case of doubt, consult a suitably trained expert prior to use. Do not use the product before these questions have been fully clarified.

4. Installation, connection, start-up and maintenance, general regulations

Installation, connection, start-up and maintenance of the conductive electrodes and the electrode relay may only be performed by suitably qualified specialist

personnel in line with all the information material and documentation supplied with the units and following all instructions contained therein.

The qualified specialist personnel must ensure that they are familiar with all valid standards, regulations, local requirements and specific conditions, in particular the standards, regulations, local requirements and specific conditions relating to explosion protection – and must proceed accordingly.

You must always read – and adhere to the instructions outlined in - the yellow DIN A 5 leaflet "User information/Instructions for use with mounting, operating and maintenance instructions for the product...". If the leaflet is not supplied with the product or is lost, you must always request a replacement leaflet from Jola.

5. Installation and connection of the electrode relay NR 5/Ex

The electrode relay NR 5/Ex must be installed outside potentially explosive atmospheres or be protected by a suitable standardized ignition protection class.
The entire installation set-up must always comply with the standard EN 60 079-14 resp. the replacing standard.

The unit is designed exclusively for installation in a switch cabinet or in a suitable protective housing and may therefore only be installed in these locations. It is only suitable for use in clean environments.

6. Start-up

Prior to start-up, you must re-check the mounting position of all the units, the mechanical fastening and the electrical connection.
In particular, you must check once again that the electrodes are connected to the corresponding, admissible intrinsically safe circuit(s).
In addition, you must also check and verify that there is no possibility whatsoever of hazardous conditions occurring due to non-adherence to any of the relevant instructions, standards or official regulations.
Only then may the unit in question be started up electrically.

7. Maintenance

The maintenance intervals are listed in the product documentation for the conductive electrodes.
To rule out any risks, however, the conductive electrodes and electrode relay must be sight-checked and function-tested by qualified specialist personnel at least once a year.

Where risks cannot be ruled out, you should adhere to an inspection frequency suited to the application in question and laid down in consultation with the relevant supervisory authorities.

If the conductive electrode(s) and electrode relay are installed as safety elements within a system, they must always be inspected and checked at intervals to be agreed with the local supervisory authorities.

Prior to all maintenance work, the qualified specialist personnel must inform themselves of all valid standards, regulations, local guidelines and special conditions, in particular standards, regulations, local guidelines and special conditions concerning explosion protection and proceed accordingly.

8. Repair

All alterations and repairs to the conductive electrode(s) and/or the electrode relay NR 5/Ex must be performed in the manufacturer's facility. Under no circumstances may other individuals or companies perform unauthorised alterations or repairs.