



Installation, Operating and Maintenance Instructions for

Jola Floating Electrodes SCHE ... and the system with an Jola Electrode Relay ESA 2, ESA 2/G or NR 3 A

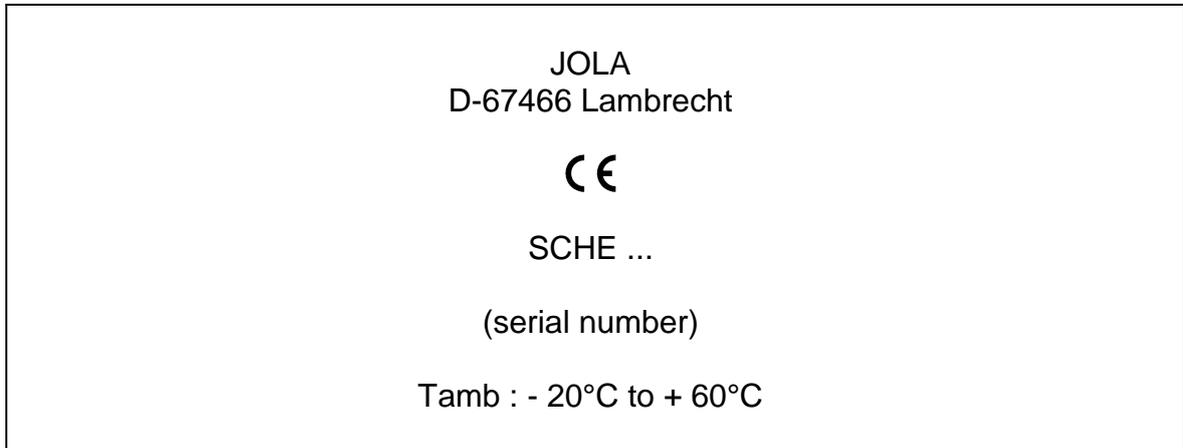
**These Installation, Operating and Maintenance
Instructions must always be handed over to the
fitter/operator/service personnel
of our products together with all other user
documentation and information!**

**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 a conductive floating electrode SCHE ...



and one or two electrode relays ESA 2, ESA 2/G or NR 3 A is designed to transmit electrical switching signals coming from a conductive floating electrode SCHE ... via one or two electrode relays ESA 2, ESA 2/G or NR 3 A.

Floating electrodes are designed **for use in pits, collection reservoirs, pump shafts, separating systems for liquids that are lighter than water ("light liquids") or similar areas.**

Please note that floating electrodes can **only be used for the detection of a layer of an electrically non-conductive "light liquid" that is not soluble in water on the surface of water or another electrically conductive liquid that has a higher specific gravity than the respective "light liquid" and that is sufficiently tranquil to allow phase formation (layer formation).**

The precondition for the proper functioning of the floating electrodes is the possibility of **clear separation between the heavier, electrically conductive liquid and the lighter, electrically non-conductive liquid to be detected** in the application locations such as pits, collection reservoirs, pump shafts, separating systems or similar locations.

In analogy with DIN 1999-100, DIN EN 858-1 and DIN EN 858-2 (separators for "light liquids"), separation is proven in the case of "light liquids" that are not soluble in water and are insaponifiable, such as benzines, diesel and fuel oils, and other oils of mineral origin with specific gravities up to max. 0.95. The functionality of the floating electrodes is therefore assured **when used in self-contained monitoring areas without drainage (pits, collection reservoirs, pump shafts) and in separating systems in accordance with DIN 1999-100, DIN EN 858-1 and DIN EN 858-2** for the specified media.

Application tests have shown that an alarm is emitted when non-conductive liquids have formed in a layer of between approx. 3 mm and 10 mm on the conductive heavy liquid to be monitored (e.g. water).



Before using the floating electrodes in any other area of application, it must first be proven that the prevailing operating conditions (such as flow ratios, potential dwell time of the "light liquid" to be detected at the application location etc.) allow the phase formation with the corresponding minimum layer height of the non-conductive "light liquid" required for accurate functioning.

In case of doubt, you should consult a specialist from Jola or from a monitoring organisation (e.g. the TÜV in Germany) to ascertain the suitability of the installation environment for the use of the floating electrodes.

It is also important to note that, although the floating electrodes may in principle be used in the respective temperature ranges specified in the product brochure, **it is essential that both media are present in low-viscosity form to ensure proper functioning of the electrodes**. This means, for example, that proper functioning is only assured with water above temperatures of 0°C.

Proper functioning of the floating electrodes also requires a **minimum liquid level above the floor** (see the technical data of the respective floating electrodes). If this minimum liquid level is not present, the tips of the electrode rods are not in the liquid – in other words, they are not electrically bridged by the electrically conductive liquid. The result is normally undesired activation of the alarm via the connected electrode relay. The SCHE 2/E (Variant ILS) is the only type equipped with an alarm bridging contact for this eventuality.

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All the technical parameters of the conductive floating 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 floating electrode and/or the electrode relay(s) may not be installed, connected and started up.**

2. Preconditions for safe use

**Maximum parameters of the electrode relays
ESA 2, ESA 2/G and NR 3 A:**

Rated supply voltages:

U = DC 12 V, DC 24 V, AC 24 V, AC 115 V, AC 230 V or AC 240 V

Maximum electrical parameters of the electrical circuit connected to the output terminals:

$U_{\max.} = 250 \text{ V}$; $I_{\max.} = 4 \text{ A}$, but max. $P = 500 \text{ VA}$

3. Additional conditions for safe operation

Before using the conductive floating electrodes SCHE ..., you must ensure that the materials used in the respective floating 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 floating electrode and the electrode relay(s) 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.

The entire installation set-up of the the floating electrode SCHE ... and the electrode relay(s) must always comply with the standard VDE 0100 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 floating electrodes SCHE ...

Orientation of the floating electrode:

The floating electrode is placed on the surface of the liquid to be monitored in such a way that the electrode rod tips point downwards and the cable points upwards.

Length of the cable:

The **cable of the floating electrode** must be sufficiently long and flexible to ensure that the floating electrode can follow the expected upward and downward movement of the liquid.

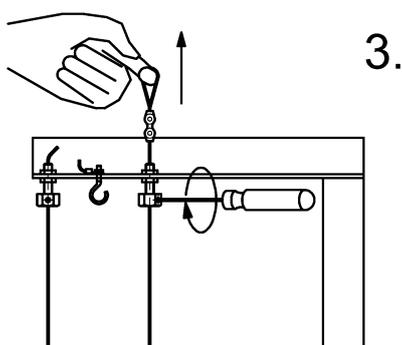
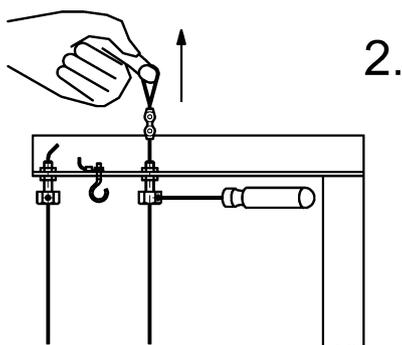
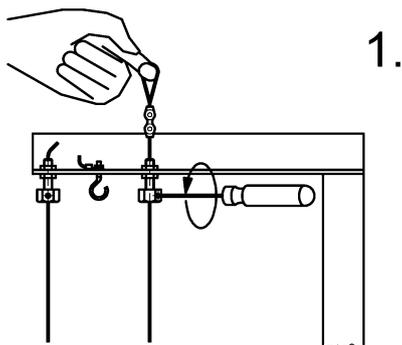
Mounting frame:

In order to prevent uncontrolled movement of the floating electrode on the liquid surface and to ensure that the proper functioning of the floating electrode is not impaired we highly recommend the use of a **mounting frame with two guide ropes**. A suitable mounting frame can be purchased from Jola.

In order to ensure a good functioning of the floating electrode the guiding ropes of the mounting frame have always to be stretched correctly. Stretching of the guiding ropes has to be done prior to start-up, at the event of all maintenance interventions and eventually as well more often.

First, the Allen screw of the guiding ropes fixing device must be loosened with a 2 mm Allen key in order to stretch the guiding ropes manually using the loop as shown above. When the guiding ropes are correctly stretched, the Allen screw must be retightened.

Stretching of the guiding ropes has to be effected by a competent and suitably qualified personnel.





Auxiliary float:

We recommend that a **float** be attached to the connecting cable of the floating electrode to ensure the signalling accuracy of the floating electrode **when used in deep shafts with high liquid movement** requiring a long floating electrode connecting cable that needs to follow the movement of the liquid. When the liquid level is high, this float bears the weight of the connecting cable and prevents the floating electrode from tilting or falling over due to a one-sided load.

This auxiliary float must be supplied by Jola.

6. Adjustment of the floating electrode

The floating electrode SCHE... floats normally on an electrically conductive liquid – on water, for example. The height of the rod electrode integrated in the floating electrode is set to ensure that the two electrode rod tips (model SCHE 3/E, the electrode rod tip of the upper electrode rod and the electrode rod of the earth electrode E0) are permanently under water if the surface of the water is tranquil. Depending on the degree of movement of the surface of the liquid, the position of the rod electrode must be set lower to a greater or lesser degree.

SCHE 2/E, SCHE 3/E and SCHE 2/E (Variant ILS):

The position of the rod electrode is adjusted by loosening the fastening screw(s) and pushing the rod electrode shaft up or down in the corresponding guide.

SCHE 2/T/...:

The position of the rod electrode is adjusted by using the threaded shaft of the rod electrode and the 2 counter nuts situated above and below the stabilisation plate

When adjusting the rod electrode, its position should be optimised in such a way that the two electrode rod tips (model SCHE 3/E: the electrode rod tip of the top electrode rod) is permanently but only just under water – so that if an electrically non-conductive liquid (e.g. fuel oil) forms on top of the electrically conductive liquid (e.g. water), a thin layer of the electrically non-conductive liquid suffices to lift the electrode rod tips out of the electrically conductive water phase up into the electrically non-conductive fuel oil phase, thereby interrupting the control current from the electrode relay at the rod electrode and activating the alarm.

7. Installation of the electrode relays

ESA 2 and NR 3 A:

These units are designed for switch cabinet mounting or installation in a suitable protective housing and may therefore only be mounted/installed in these locations. They are suitable for use in clean environments only.

The ESA 2 electrode relay is designed for clip attachment on 35 mm DIN rail or fastening via 2 boreholes.

The NR 3 A electrode relay is designed for clip attachment on 35 mm DIN rail only.



The electrode relay(s) must be installed and connected by qualified specialist personnel.

ESA 2/G:

The ESA 2/G electrode relay is fitted with a surface-mount housing with protection class IP54.

The ESA 2/G electrode relay has to be fitted vertically. The cable entries must point downwards.

The following actions have to be performed when installing the ESA 2/G electrode relay:

- Unscrew the 4 screws of the cover of the electrode relay and remove the cover.
- Drill 4 holes for dowel 6 mm Ø into the wall following the drilling template on the rear of the housing of the electrode relay.
- Place the 4 dowels.
- Position the open housing of the electrode relay in the way that the 4 holes in the housing are exactly above the 4 dowels.
- Fix the housing by screwing the 4 screws into the 4 dowels.
- Check the position and the perfect fixing of the electrode relay.

The electrode relay(s) must be installed and connected by qualified specialist personnel.

**8. Connection of the floating electrodes to the electrode relays
ESA 2, ESA 2/G and NR 3 A:**

The attached connection diagrams show how to connect a conductive floating electrode SCHE ... to one or two electrode relays:

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51P-7959, dated 26/08/2014.



Always observe the following when connecting the unit:

Maximum cable length between floating electrode and electrode relay(s):

Electrode type	Connection to "x" electrode relay(s)	Maximum length of cable between floating electrode and electrode relay(s) with a cable where $C \leq 200 \text{ pF/m}$ and $L \leq 1 \text{ }\mu\text{H/m}$	Maximum length of cable between floating electrode and electrode relay(s) with a cable where $C \leq 100 \text{ pF/m}$ and $L \leq 1 \text{ }\mu\text{H/m}$
SCHE ...	1	1000 m	1000 m
SCHE 3/E	2	350 m	700 m

9. Start-up

Prior to start-up, you must re-check the mounting position, the mechanical fastening and the electrical connection of the units.

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.

You must then perform the first maintenance routine.

10. Response in the event of an alarm

After every alarm, the floating electrode in question, the connecting cable and the operating area must be cleaned thoroughly.

If the floating electrode or its cable show signs of mechanical or chemical aggression, the floating electrode must be replaced.

11. Maintenance

The floating electrodes and the electrode relays must be serviced at regular intervals by **qualified specialist personnel**. The intervals depend on the risk of soiling to the respective floating electrode and its environment.



The unit must, however, be serviced directly after start-up.

To rule out any risks, however, the floating electrode 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 floating electrode and electrode relay(s) 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 and proceed accordingly.

Maintenance work should include the following:

- Cleaning of the electrode and the surrounding area.
- Sight check of the electrode to ensure clean, flawless condition.
- Function check of the electrode as follows:

All types with the exception of type SCHE 2/E (Variant ILS)..:

Lift the floating electrode by the electrode body or, if present, by the special handle-shaped holder, **but not by its cable!** Then lift the electrode rod tips of the rod electrode mounted on the floating electrode out of the water phase. An alarm must then be emitted.

Type SCHE 2/E (Variant ILS)..:

Lift the floating electrode by the electrode body or, if present, by the special handle-shaped holder, **but not by its cable!** Then lift the electrode rod tips of the rod electrode mounted on the floating electrode out of the water phase without activating the alarm bridging contact via the activation arm (the activation arm must be freely suspended!). An alarm must then be emitted.

Then test the alarm bridging contact by lifting and lowering the activation arm. During the test, the electrode rod tips may not be electrically bridged by the water.

No alarm should be given when the activation arm is raised.

An alarm must be emitted when the activation arm is lowered.

- Testing the cable break monitoring feature:
Ensure that the electrode rod tips of the rod electrode are bridged by the water. Then disconnect an electrode cable (two cables with model SCHE 3/E) in the junction box nearest the floating electrode – or, where the electrode cable is not routed through a junction box, on the respective electrode relay. Proper functioning of the cable break monitoring feature is signalled by the fact that the



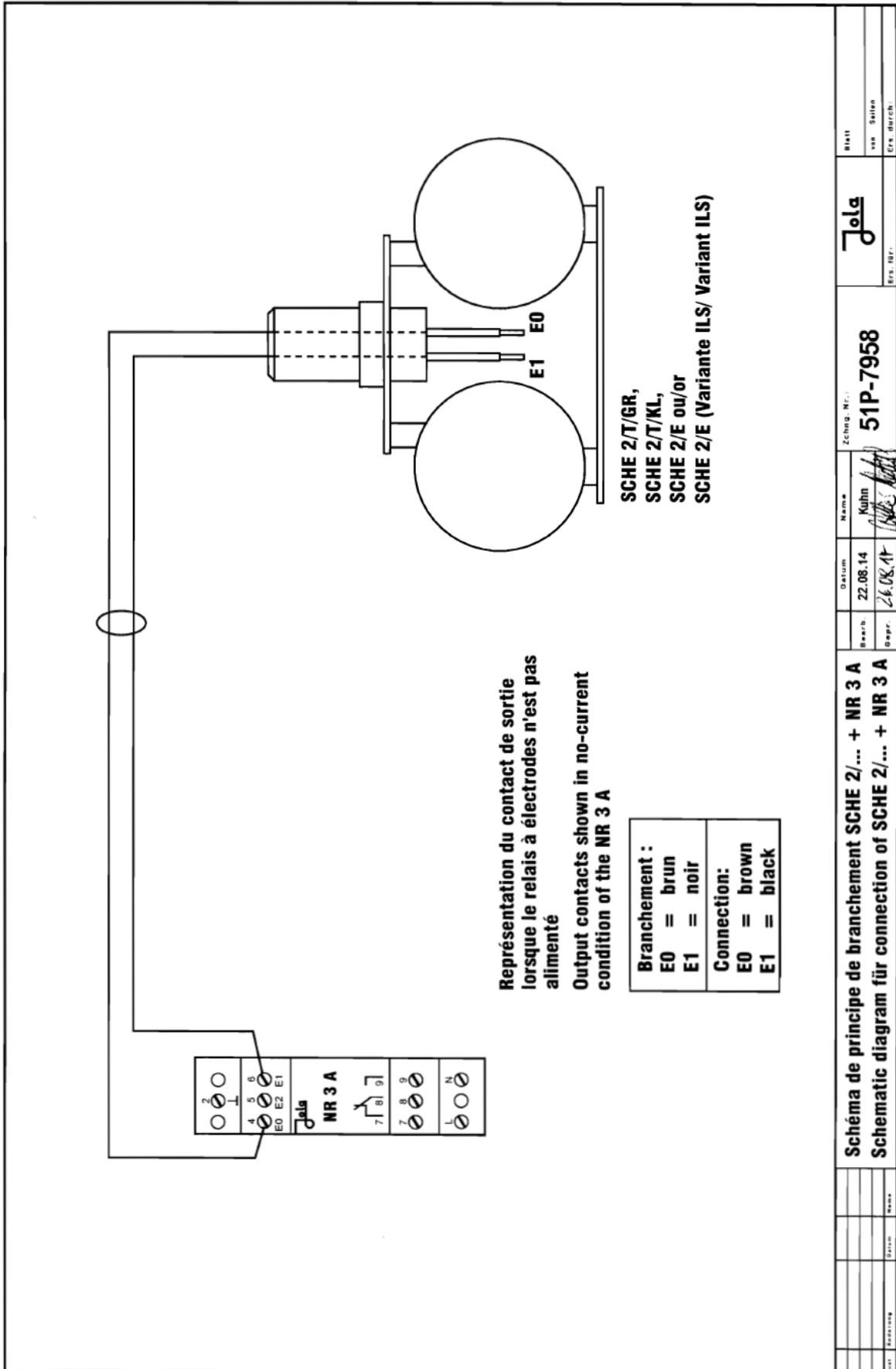
assigned electrode relay reverts to alarm status. The switching status caused by the cable break corresponds to the status causing an alarm due to an electrically non-conductive liquid.

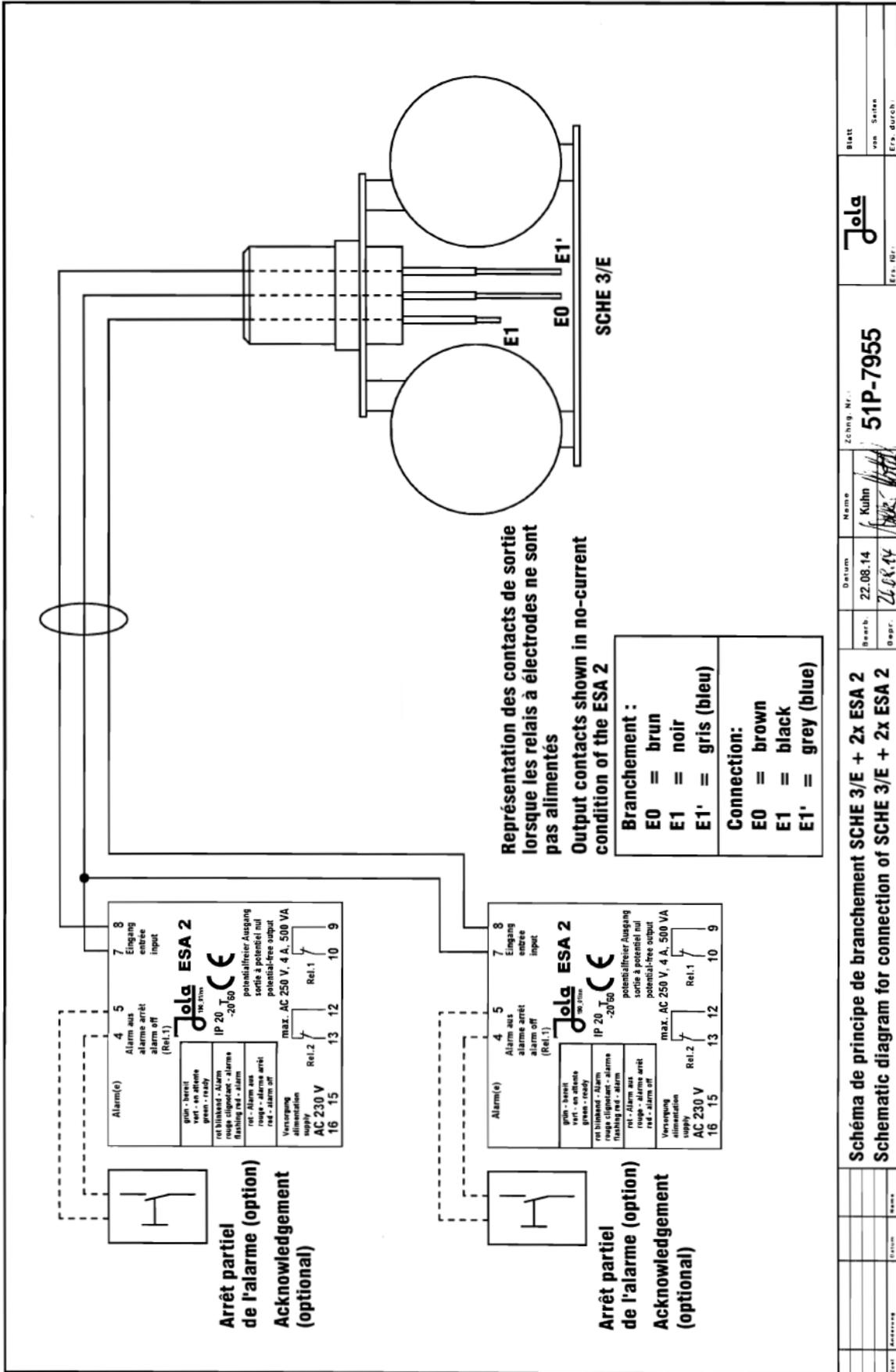
12. Repair

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

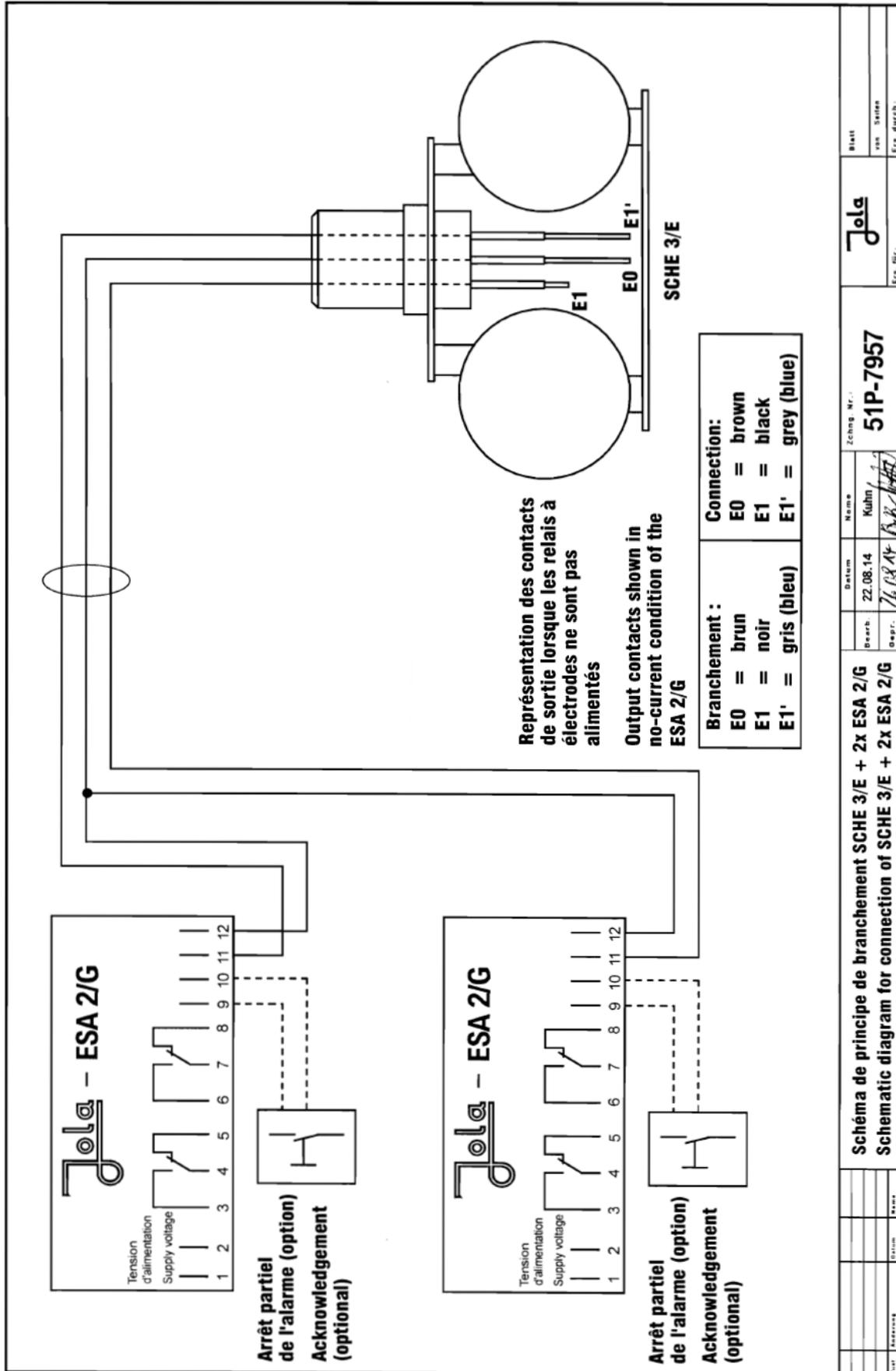
13. Disposal

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





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Schéma de principe de branchement SCHE 3/E + 2x ESA 2			
Schematic diagram for connection of SCHE 3/E + 2x ESA 2			



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