



Protection relays and electrode alarm relays



Jola Speziialschalter 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.**



Protection relays and electrode alarm relays

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KR 3 and KR 3 A protection relays

for signalling a limit level (1 sensor) or
for two-point control (2 sensors)

Protection relays for DIN rail mounting, with connection terminals on top of housing and with 2 built-in LEDs for signalling the respective switching status.

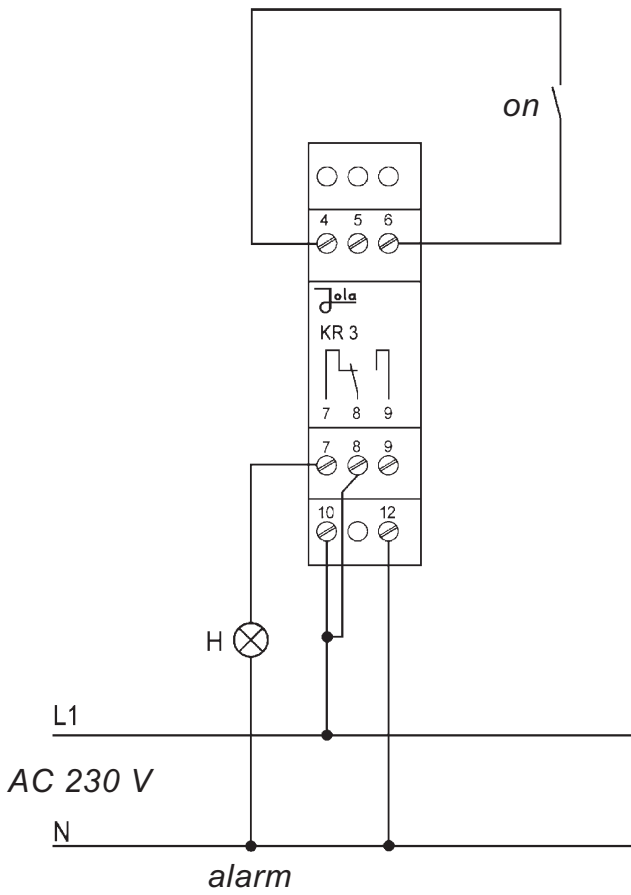
These units are designed for switch cabinet mounting or installation in a suitable protective housing and may therefore only be mounted / installed in these locations. They are suitable for use in clean environments only.



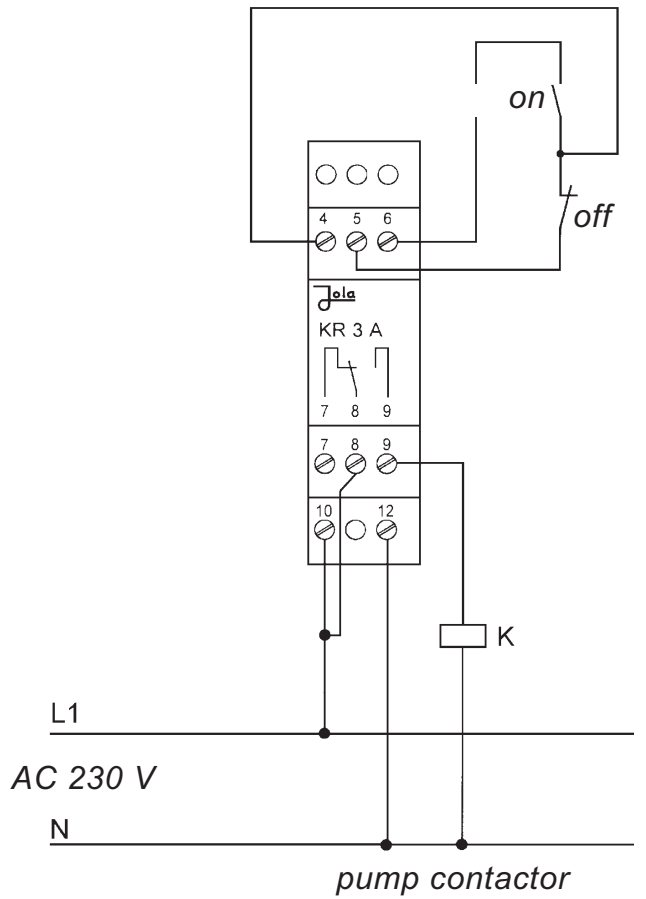
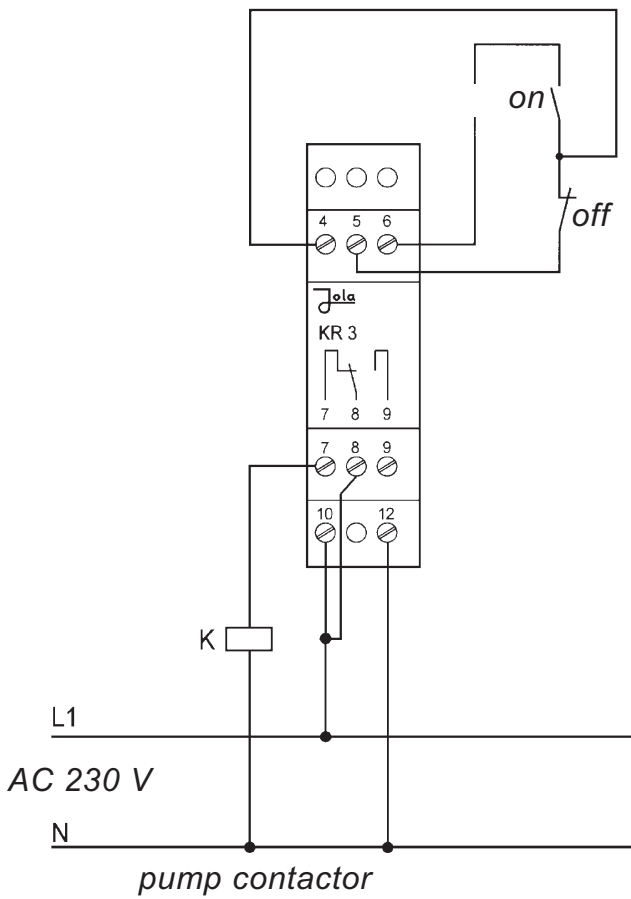
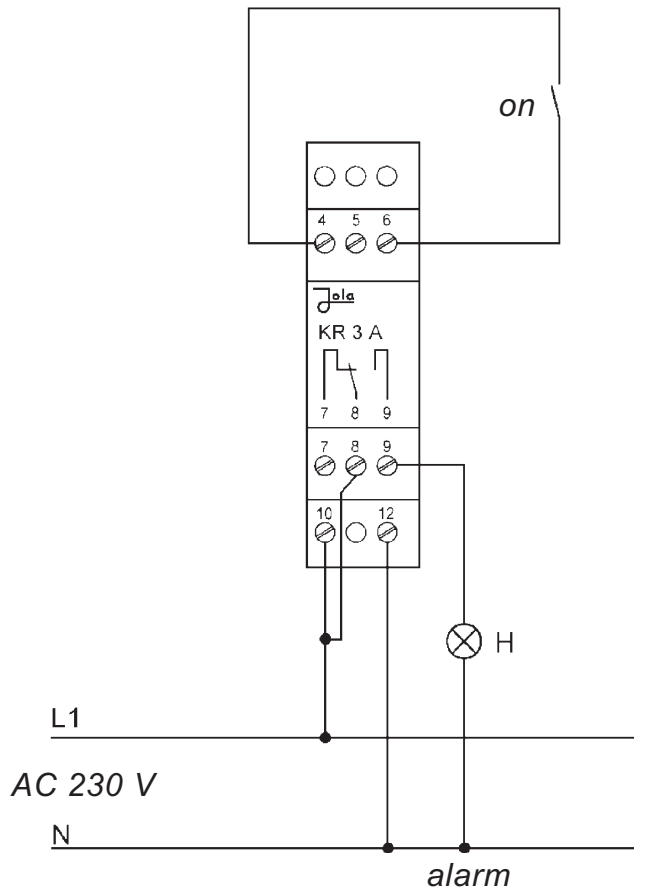
Technical data	KR 3	KR 3 A
Supply voltage (AC versions: terminals 10 and 12; DC versions: • terminal 10: – • terminal 12: +)	AC 230 V, on request: AC 240 V, AC 115 V, AC 24 V, DC 24 V, } only for connection to a low safety voltage DC 12 V } according to the safety regulations relating to the application or further supply voltages	
Power input	approx. 3 VA	
Control circuit (terminals 4, 5, 6)	3 terminals (under safety extra low voltage SELV), acting on 1 output relay with self-hold	
No-load voltage	DC 8.4 V (safety extra low voltage SELV)	
Short-circuit current	< 10 mA	
Response hysteresis	1.5 mA \square 1.8 mA	
Controlled circuit (terminals 7, 8, 9)	1 single-pole potential-free changeover contact with self-hold	
Principle	quiescent current principle working current principle	
Switching status indication	1 green LED lights when the output relay is energized 1 red LED lights when the output relay is not energized	
Switching voltage	max. AC 250 V	
Switching current	max. AC 4 A	
Switching capacity	max. 500 VA	
Housing	insulating material, 75 x 22.5 x 100 mm (dimensions see page 12-1-14)	
Connection	terminals on top of housing	
Protection class	IP20	
Mounting	on 35 mm DIN rail	
Mounting orientation	any	
Temperature range	– 20°C to + 60°C	
Max. length of connecting cable	1,000 m between protection relay and sensor(s)	
EMC	<ul style="list-style-type: none"> • for interferences 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 	

Connection diagrams

KR 3



KR 3 A



Position of output contact when KR 3 / KR 3 A without supply voltage



KR 5 and KR 5 A protection relays

for signalling a limit level (1 sensor)
or
for two-point control (2 sensors)

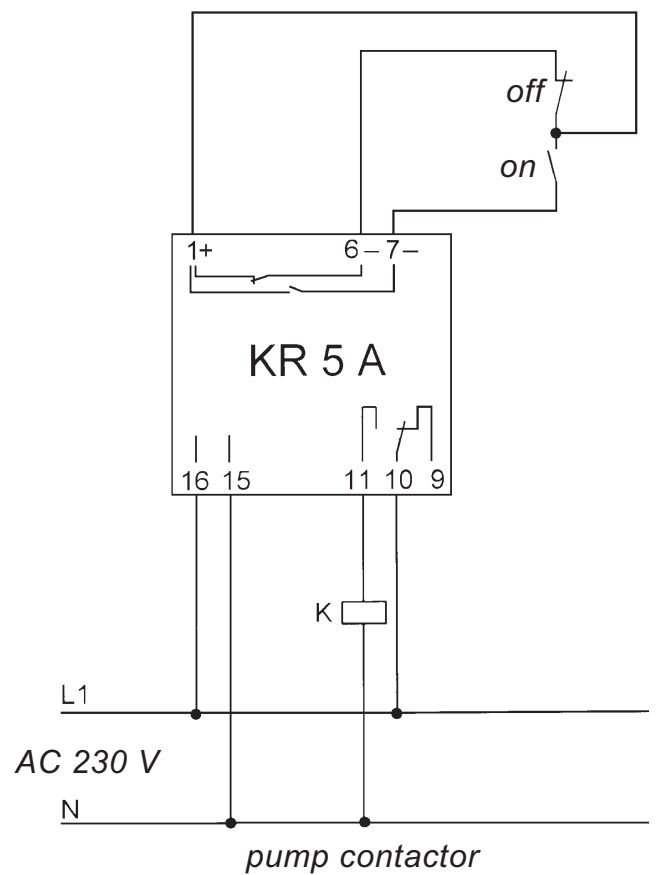
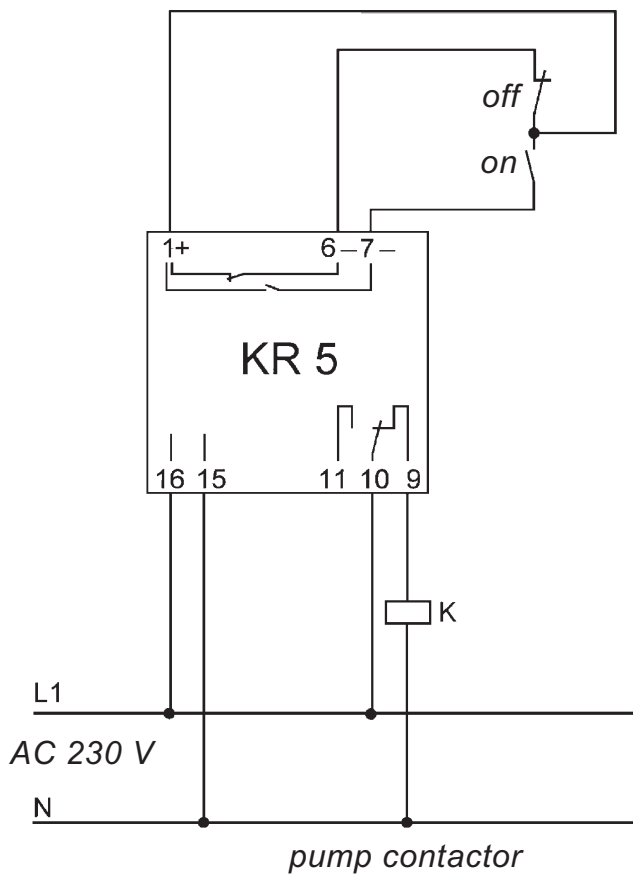
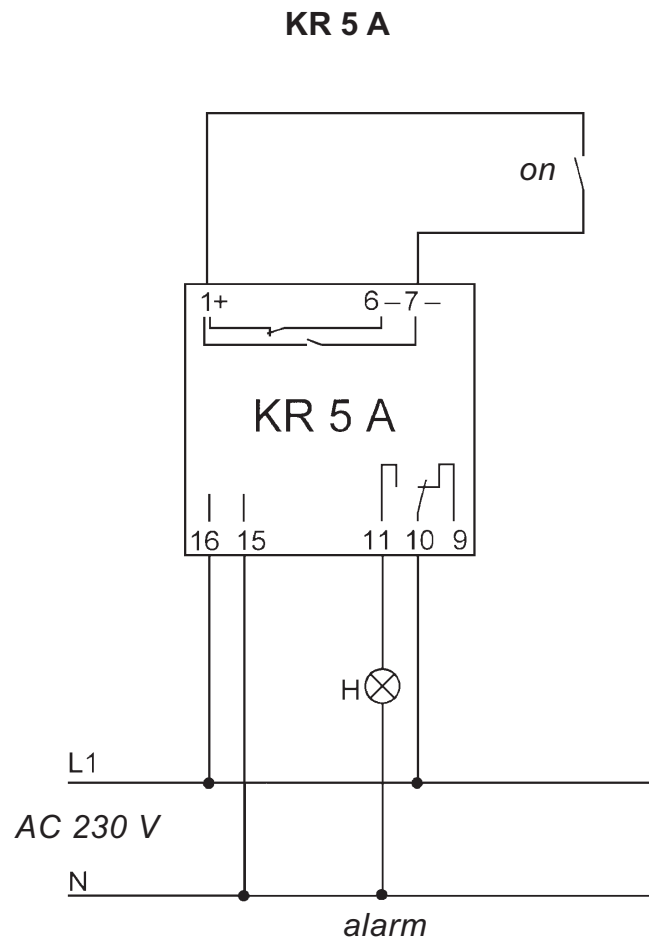
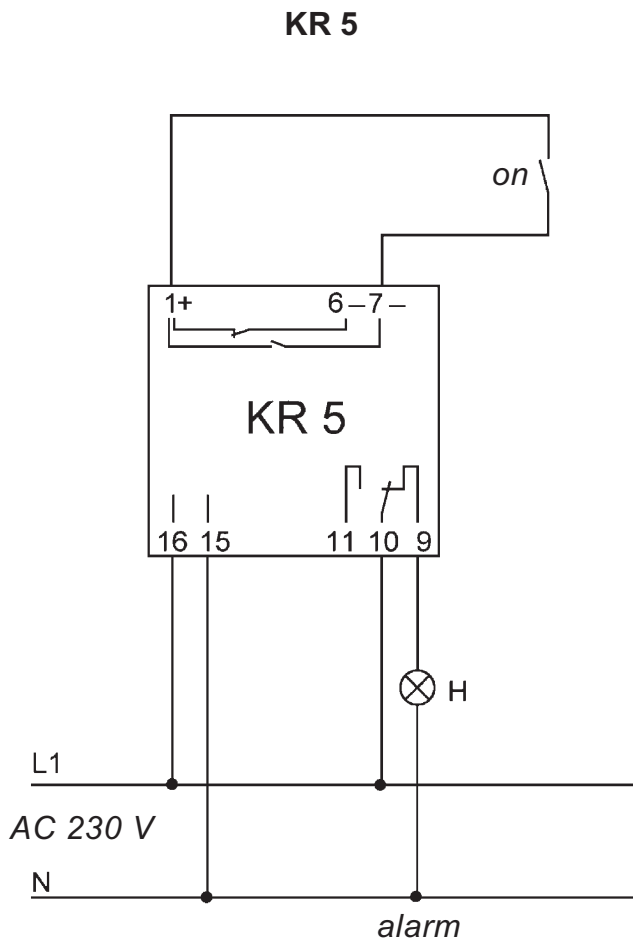
Protection relays for DIN rail mounting or fastening via 2 boreholes, with connection terminals on top of housing and with 2 built-in LEDs for signalling the respective switching status.

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.



Technical data	KR 5	KR 5 A
Supply voltage (AC versions: terminals 15 and 16; DC versions: • terminal 15: – • terminal 16: +)	AC 230 V, on request: AC 240 V, AC 115 V, AC 24 V, DC 24 V, } only for connection to a low safety voltage DC 12 V } according to the safety regulations relating to the application or further supply voltages	
Power input	approx. 3 VA	
Control circuit (terminals 1, 6, 7)	3 terminals (under safety extra low voltage SELV), acting on 1 output relay with self-hold	
No-load voltage	DC 8.4 V (safety extra low voltage SELV)	
Short-circuit current	< 10 mA	
Response hysteresis	1.5 mA \square 1.8 mA	
Controlled circuit (terminals 9, 10, 11) Principle Switching status indication	1 single-pole potential-free changeover contact with self-hold quiescent current principle working current principle 1 green LED lights when the output relay is energised 1 red LED lights when the output relay is not energised	
Switching voltage	max. AC 250 V	
Switching current	max. AC 4 A	
Switching capacity	max. 500 VA	
Housing	insulating material, 75 x 55 x 110 mm (dimensions see page 12-1-14)	
Connection	terminals on top of housing	
Protection class	IP20	
Mounting	on 35 mm DIN rail or fastening via two boreholes	
Mounting orientation	any	
Temperature range	– 20°C to + 60°C	
Max. length of connecting cable	1,000 m between protection relay and sensor(s)	
EMC	<ul style="list-style-type: none"> • for interferences 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 	

Connection diagrams



Position of output contact when KR 5 / KR 5 A without supply voltage



KR 5/G protection relay

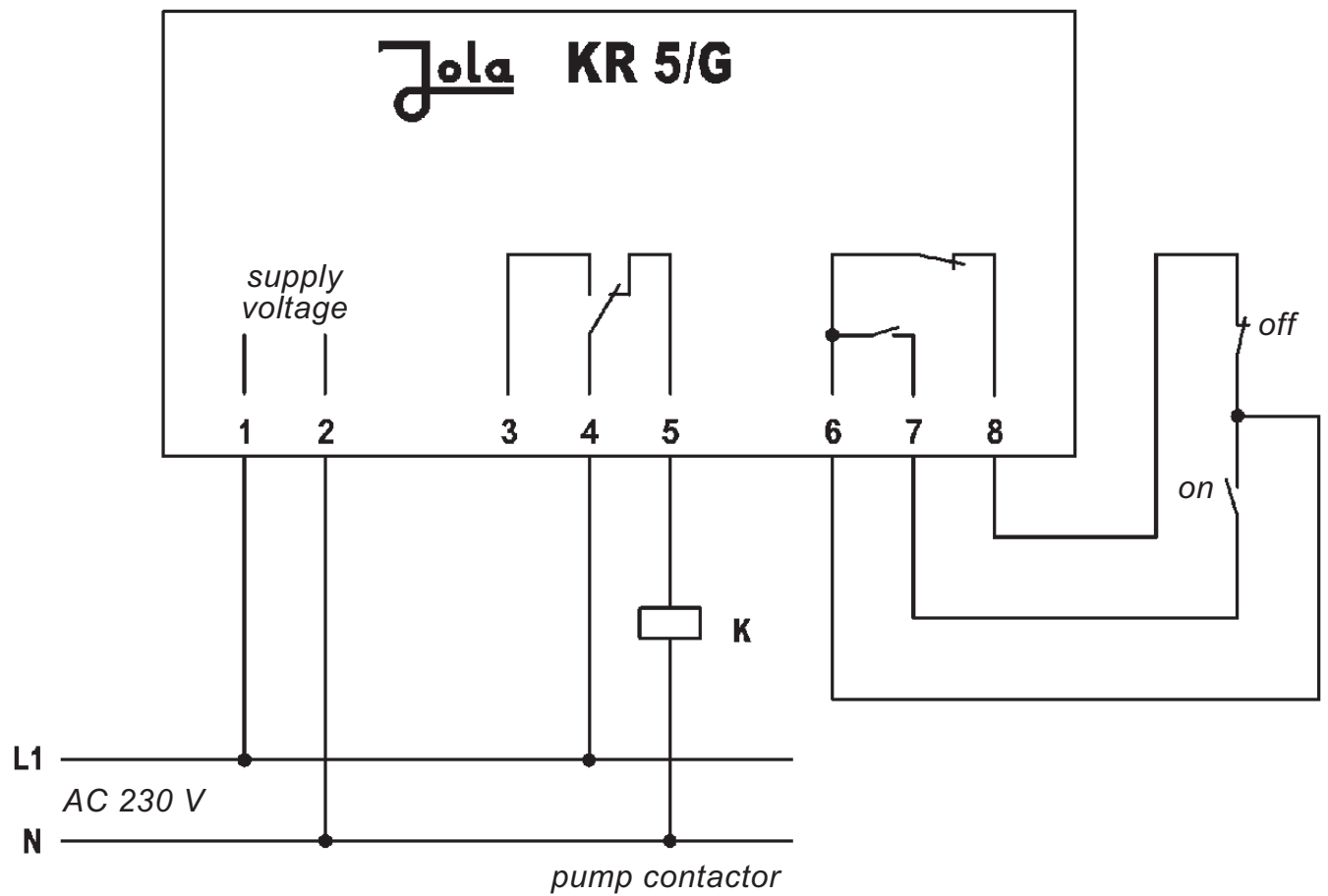
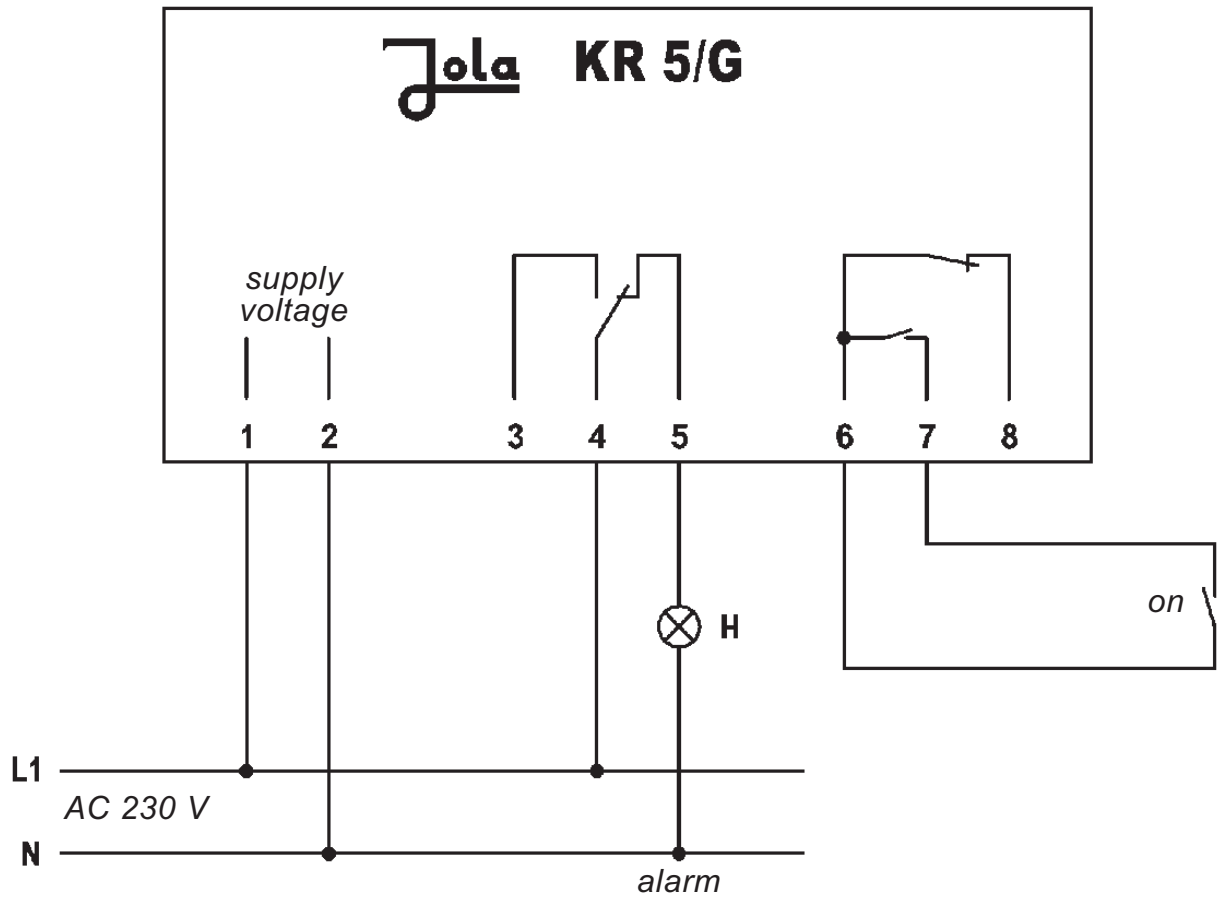
for signalling a limit level
(1 sensor)
or
for two-point control
(2 sensors)

Protection relay in surface-mount housing
with transparent cover and
with 2 LEDs for signalling the respective switching
status, inside the housing



Technical data	KR 5/G
Supply voltage (AC versions: terminals 1 and 2; DC versions: • terminal 1: – • terminal 2: +)	AC 230 V, on request: AC 240 V, AC 115 V, AC 24 V, DC 24 V, } only for connection to a low safety voltage DC 12 V } according to the safety regulations relating to the application or further supply voltages
Power input	approx. 3 VA
Control circuit (terminals 6, 7, 8)	3 terminals (under safety extra low voltage SELV), acting on 1 output relay with self-hold
No-load voltage	DC 8.4 V (safety extra low voltage SELV)
Short-circuit current	< 10 mA
Response hysteresis	1.5 mA \square 1.8 mA
Controlled circuit (terminals 3, 4, 5)	1 single-pole potential-free changeover contact with self-hold quiescent current principle
Principle	
Switching status indication	1 green LED lights when the output relay is energized 1 red LED lights when the output relay is not energized
Switching voltage	max. AC 250 V
Switching current	max. AC 4 A
Switching capacity	max. 500 VA
Housing	insulating material, with 3 cable entries (dimensions see page 12-1-14)
Connection	internal terminals
Protection class	IP54
Mounting	surface mounting using 4 screws
Mounting orientation	any
Temperature range	– 20°C to + 60°C
Max. length of connecting cable	1,000 m between protection relay and sensor(s)
EMC	<ul style="list-style-type: none"> • for interferences 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

Connection diagrams



Position of output contact when KR 5/G without supply voltage



ESA 2 electrode alarm relay

Electrode alarm relay for DIN rail mounting or fastening via 2 boreholes, with connection terminals on top of housing and with 1 built-in two-colour LED for signalling the respective switching status.

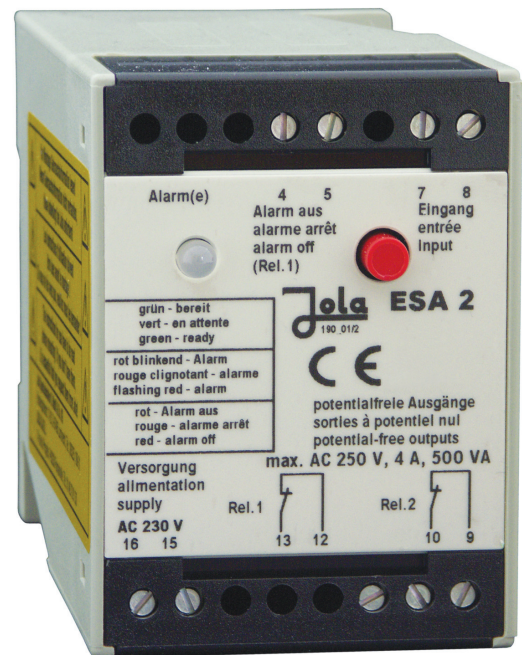
This unit is designed for switch cabinet mounting or installation in a suitable protective housing and may therefore only be mounted / installed in these locations. It is suitable for use in clean environments only.

The design of the electrode alarm relay is based on the **quiescent current principle**, in other words, an alarm signal is given if there is no connection between terminals 7 and 8; the 2 potential-free NC output contacts of the unit also revert to alarm status if there is a supply voltage failure.

In standby status (unit is supplied with voltage and connection between terminals 7 and 8), the two potential-free NC output contacts are in activated condition (= open) and the two-colour LED lights green.

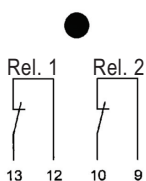
In the event of an alarm (unit supplied with voltage and no connection between terminals 7 and 8), the two potential-free NC output contacts are in non activated condition (= closed) and the two-colour LED flashes red.

The output relay 1 can be reset using the built-in acknowledgement button or a connected external acknowledgement button (connection option at terminals 4 and 5) in order to cancel the alarm given via this output. The LED then stops flashing and reverts to permanent red.



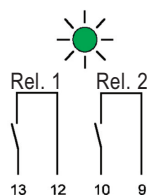
Position of output contacts of the ESA 2 electrode alarm relay

ESA 2 without voltage



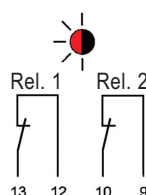
LED dark:
both output relays not energized, output contacts closed

standby



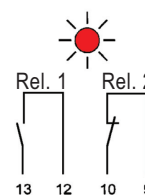
LED lights green:
both output relays energized, output contacts open

ESA 2 under voltage alarm



LED flashes red:
both output relays not energized, output contacts closed

alarm acknowledged



LED lights red:
output relay 1 energized, contact 12, 13 open, output rel. 2 not energized, contact 9, 10 closed

Technical data	ESA 2
Supply voltage (AC versions: terminals 15 and 16; DC versions: • terminal 15: – • terminal 16: +)	AC 230 V, on request: AC 240 V, AC 115 V, AC 24 V, DC 24 V, } only for connection to a low safety voltage DC 12 V } according to the safety regulations relating to the applications or further supply voltages
Power input	approx. 3 VA
Control circuit (terminals 7 and 8)	2 terminals (under safety extra low voltage SELV), acting on 2 output relays without self-hold (1 output relay can be reset if an alarm is activated)
No-load voltage	9 V _{eff} \square 10 Hz (safety extra low voltage SELV)
Short-circuit current	max. 0.5 mA _{eff}
Response sensitivity	approx. 30 k Ω or approx. 33 μ S (electrical conductance)
Controlled circuits (terminals 12, 13 – Rel. 1, terminals 9, 10 – Rel. 2)	2 potential-free normally closed contacts based on the quiescent current principle, both activated in standby status. One of the two normally closed contacts (terminals 12, 13 – rel. 1) can be reset in the event of alarm. The other normally closed contact (terminals 9, 10 – rel. 2) retains its switching status as long as the alarm is given.
Acknowledgement	output relay 1 (terminals 12, 13) can be reset via the built-in or via an external acknowledgement button (connection option at terminals 4 and 5)
Switching status indication	via a two-colour LED: green = standby, both output relays energized flashing red = alarm, both output relays not energized lights red = alarm acknowledged, output relay 1 reset
Switching voltage	max. AC 250 V
Switching current	max. AC 4 A
Switching capacity	max. 500 VA
Housing	insulating material, 75 x 55 x 110 mm (dimensions see page 12-1-14)
Connection	terminals on top of housing
Protection class	IP20
Mounting	on 35 mm DIN rail or fastening via two boreholes
Mounting orientation	any
Temperature range	– 20°C to + 60°C
Max. length of connecting cable	1,000 m between electrode alarm relay and sensor(s)
EMC	<ul style="list-style-type: none"> • for interferences 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

Connection diagram: see page 12-1-13



ESA 2/G electrode alarm relay

Electrode alarm relay in surface-mount housing, with transparent cover and with 2 LEDs for signalling the respective switching status, inside the housing

The design of the electrode alarm relay is based on the **quiescent current principle**, in other words, an alarm signal is given if there is no connection between terminals 11 and 12; the two potential-free output contacts of the unit also revert to alarm status if there is a supply voltage failure.

In standby status (unit supplied with voltage and connection between terminals 11 and 12), the two potential-free changeover output contacts are in activated condition and the two-colour LED lights green.

In the event of an alarm (unit supplied with voltage and no connection between terminals 11 and 12), the two potential-free changeover output contacts are in non activated condition (contacts in quiescent state), and the two-colour LED flashes red. An additional red flashing LED also flashes as a switching status indicator for the output relay which can be acknowledged.

The output relay 1 (terminals 3, 4, 5) can be reset using a connected external acknowledgement button (connection option at terminals 9 and 10) in order to cancel the alarm given via this output. The red flashing LED then stops flashing and the two-colour LED reverts to permanent red.



Position of output contacts of the ESA 2/G electrode alarm relay

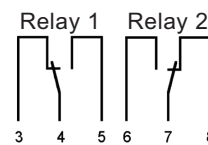
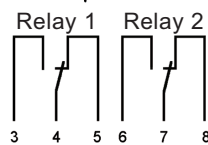
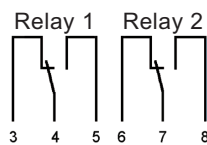
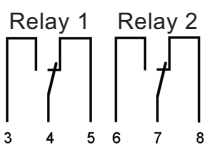
ESA 2/G without voltage

standby

ESA 2/G under voltage alarm

alarm acknowledged

Two colour LED ●
● Red flashing LED



LEDs dark:

Two-colour LED lights green, red flashing LED dark:
both output relays energized

Two-colour LED flashes red, red flashing LED flashes:
both output relays not energized

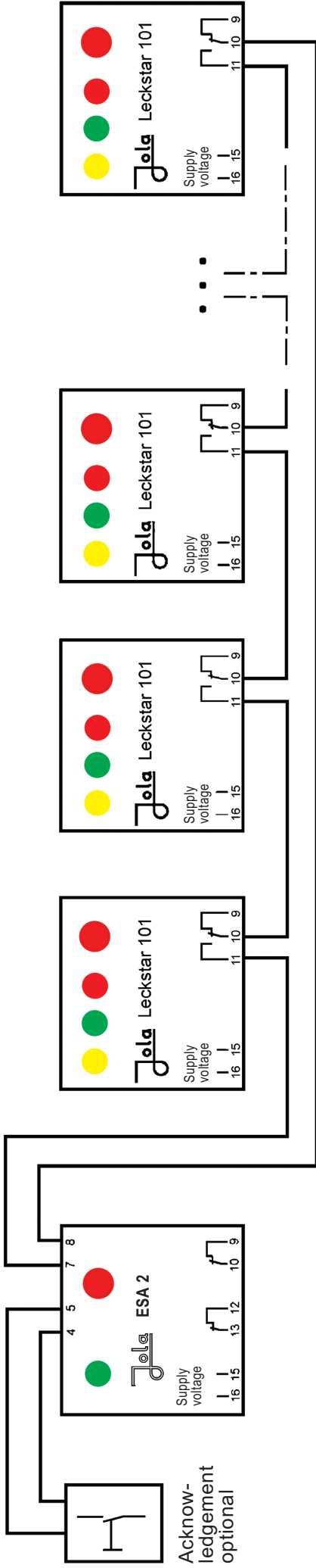
Two-colour LED lights red, red flashing LED dark:
output relay 1 energized, output rel. 2 not energized

both output relays not energized

Technical data	ESA 2/G
Supply voltage (AC versions: terminals 1 and 2; DC versions: • terminal 1: – • terminal 2: +)	AC 230 V, on request: AC 240 V, AC 115 V, AC 24 V, DC 24 V, } only for connection to a low safety voltage DC 12 V } according to the safety regulations relating to the applications or further supply voltages
Power input	approx. 3 VA
Control circuit (terminals 11 and 12)	2 terminals (under safety extra low voltage SELV), acting on 2 output relays without self-hold (1 output relay can be reset if an alarm is activated)
No-load voltage	9 V _{eff} \square 10 Hz (safety extra low voltage SELV)
Short-circuit current	max. 0.5 mA _{eff}
Response sensitivity	approx. 30 k Ω or approx. 33 μ S (electrical conductance)
Controlled circuits (terminals 3 to 8)	2 potential-free changeover contacts based on the quiescent current principle, both activated in standby status. One of the two changeover contacts (terminals 3, 4, 5 – rel. 1) can be reset in the event of alarm. The other changeover contact (terminals 6, 7, 8 – rel. 2) retains its switching status as long as the alarm is given.
Acknowledgement	output relay 1 (terminals 3, 4, 5) can be reset via an external acknowledgement button (connection option at terminals 9 and 10)
Switching status indication	• via a two-colour LED: green = standby, both output relays energized flashing red = alarm, both output relays not energized lights red = alarm acknowledged, output relay 1 reset • and a red flashing LED: flashes red = output relay 1 in alarm status
Switching voltage	max. AC 250 V
Switching current	max. AC 4 A
Switching capacity	max. 500 VA
Housing	insulating material, with 3 cable entries (dimensions see page 12-1-14)
Connection	internal terminals
Protection class	IP54
Mounting	surface mounting using 4 screws
Mounting orientation	any
Temperature range	– 20°C to + 60°C
Max. length of connecting cable	1,000 m between electrode alarm relay and sensor(s)
EMC	• for interferences 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

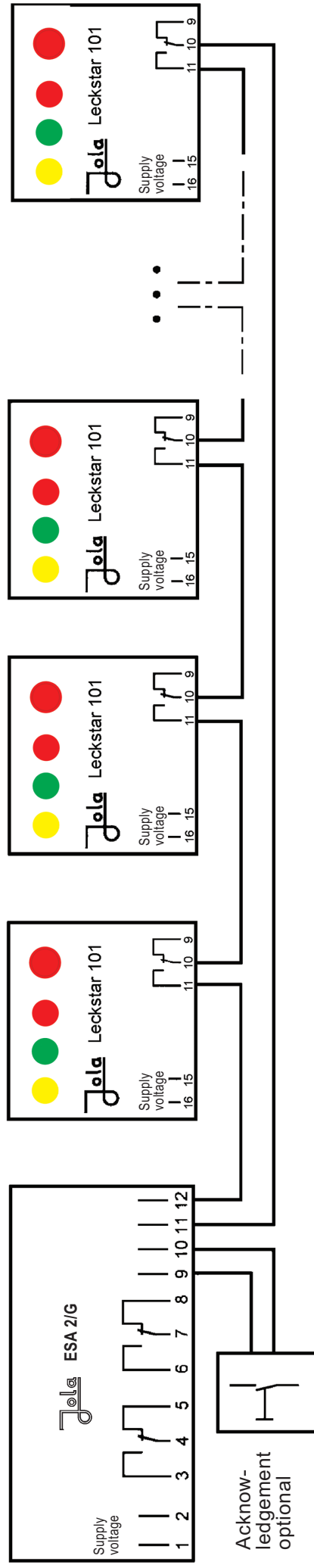
Connection diagram: see page 12-1-13

Circuit diagram for connection of several Leckstar 101 electrode relays connected to each other to an electrode alarm relay ESA 2 (example)



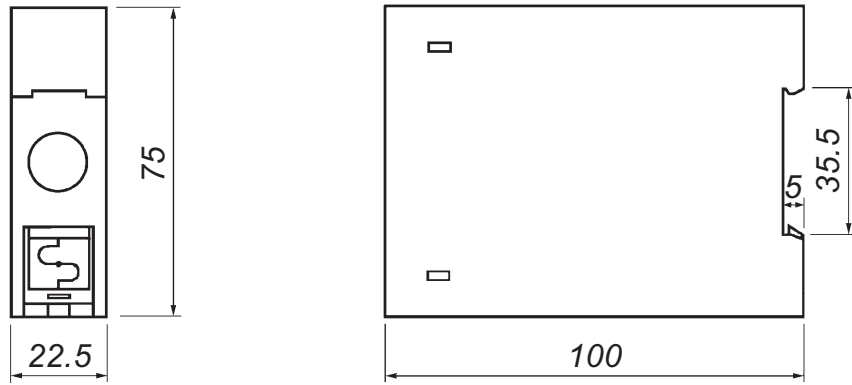
Position of output contacts when relays without supply voltage

Circuit diagram for connection of several Leckstar 101 electrode relays connected to each other to an electrode alarm relay ESA 2/G (example)

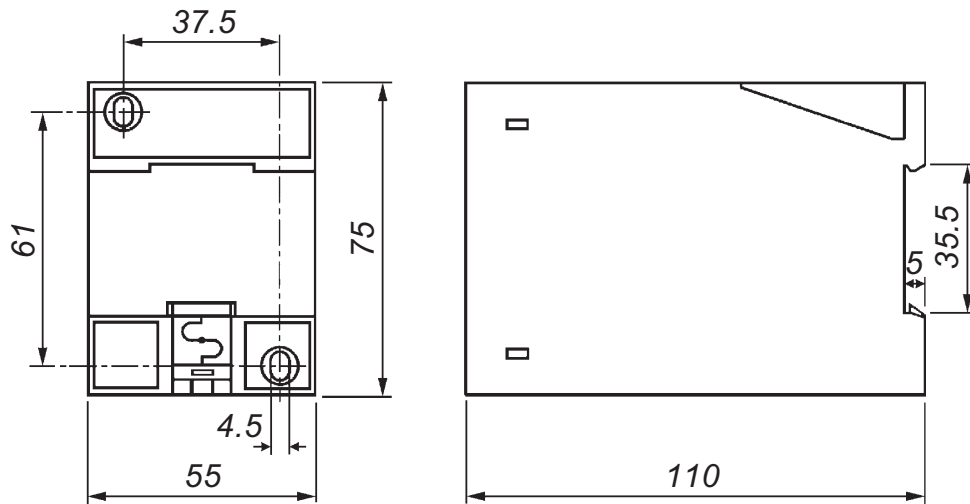


Position of output contacts when relays without supply voltage

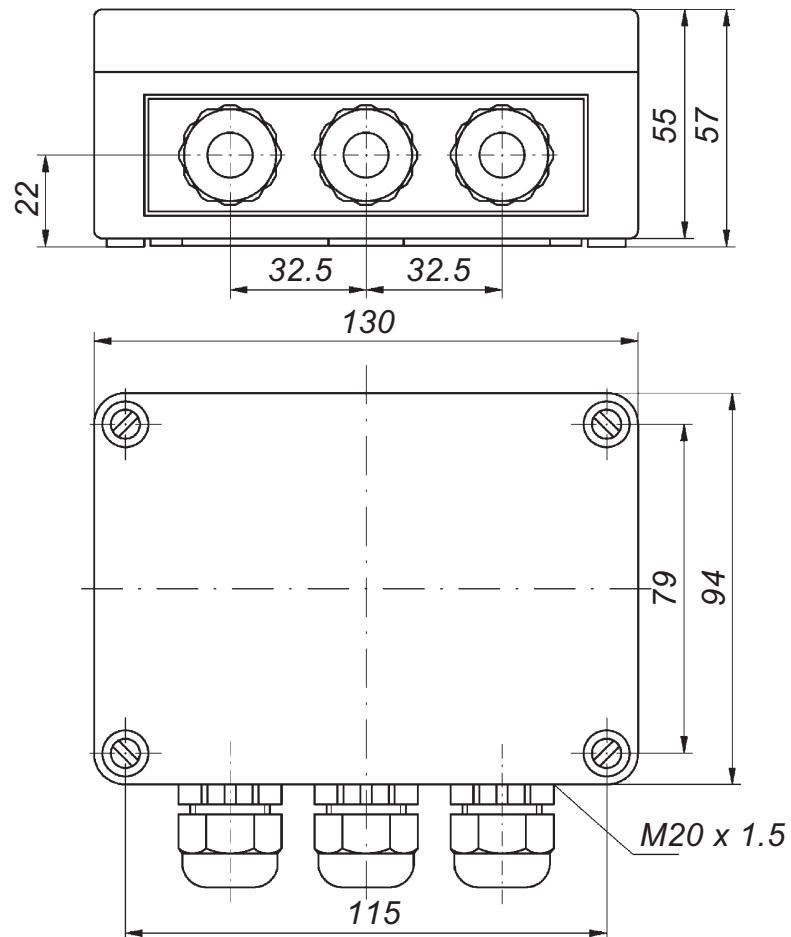
Dimensional drawings
KR 3 or KR 3 A



KR 5, KR 5 A or ESA 2



KR 5/G or ESA 2/G





Signallers

for connection to an ESA 2 or ESA 2/G relay

Technical data	HU 2 acoustic signaller	HU 14 optical and acoustic signaller
Application	dry rooms	damped rooms or outer mounting
Supply voltage	AC 230 V	AC 230 V
Power consumption	10 mA	optical: 25 mA acoustic: 25 mA
Sound level at a distance of 1 m	approx. 88 dB	approx. 92 dB
Dimensions	approx. 80 Ø x 152 mm	approx. 91 Ø x 121 mm
Protection class	IP43	IP65



HU 2



HU 14