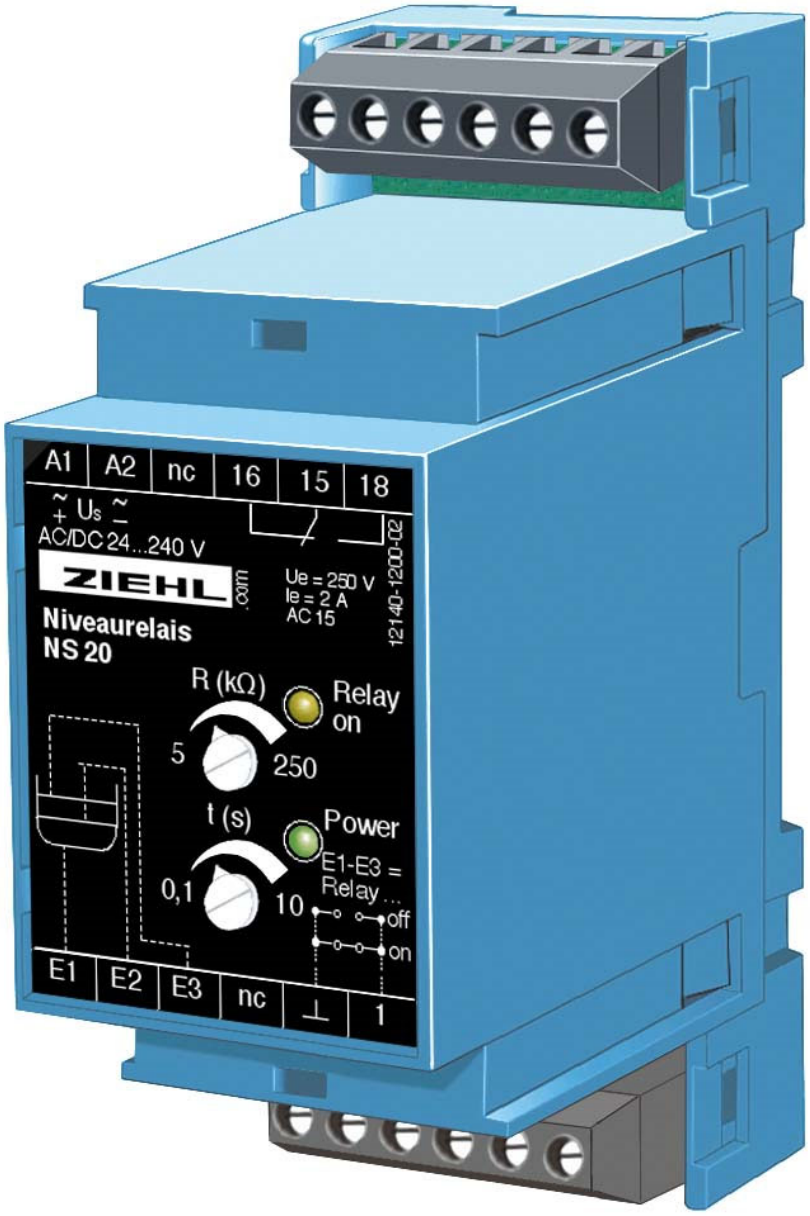
Operating Manual

Niveaurelais NS 20

for conductive liquids
adjustable sensitivity



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Description

Level-Relays NS 20 for conductive liquids can be used as monitors for 1 Level and for controlling a level between 2 electrodes.

- 3 elektrodes for MIN/MAXcontrol
- 2 elektrodes (E2 open) as level monitor
- Sensitivity adjustable 5 kΩ…250 kΩ
- LED for state of relay
- Function of relay reversible (picks up or releases at top electrode)
- Switching-delay adjustable 0,1…10 s
- Housing 35 mm wide, mounting height 55 mm
- Universal supply-voltage AC/DC 24-240 V

Application level monitor:
Protection from running dry or overflow, monitoring of pumps for leaks, detection of leaks.

Application Min/Max:
Controlling a level between minimum (elektrode E2) and maximum (E3). As long as E3 is dry, a magnetic valve is opened (or a pump is running) and liquid is influenting. As soon as maximum (E3) is reached, the NS 20 closes the valve. When the level falls below E2, the cycle starts new.
In reverse also discharging of a container can be controlled.

Overview of functions **example filling with 2 electrodes**

The detection of the level is made with a ***DC-free*** measuring of resistance between all electrodes The common electrode in E 1. A magnetic valve that is switched with relay-contacts 15-18 opens and lets liquid in until the upper electrode E3 is in contact with the liquid. Then the relay releases (15-18 open) and the valve closes. The relay remains released as long as electrode E 2 is in contact with the liquid. When the level falls below E2, the relay picks up (LED Relay on, 15-18 close) and the procedure starts new with opening the valve. Thus the level of the liquid is kept between E 1 and E 2.

For monitoring one level only or in applications to protect from running dry or overflow or leak detection, only electrodes E1 and E3 are connected.

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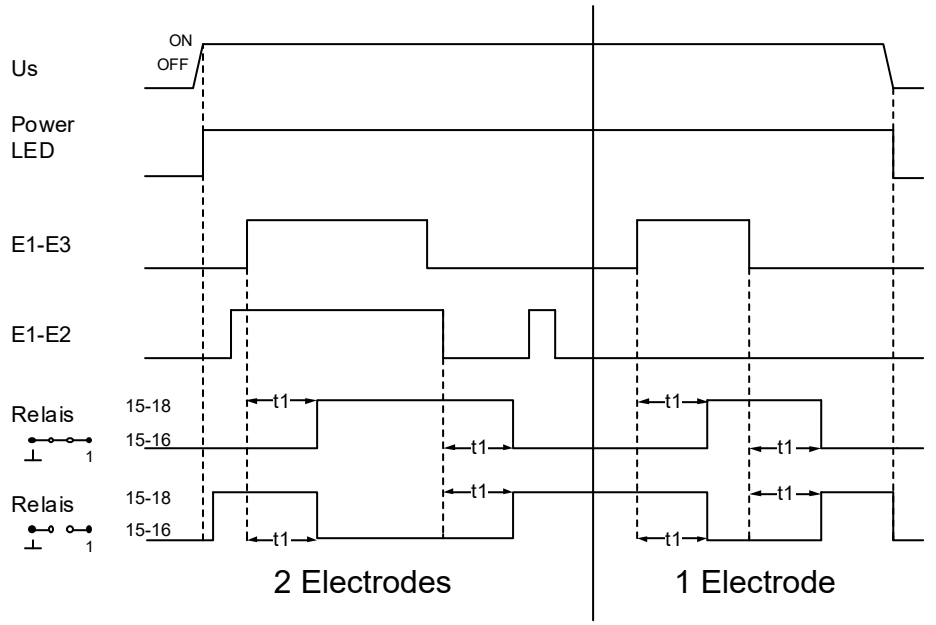
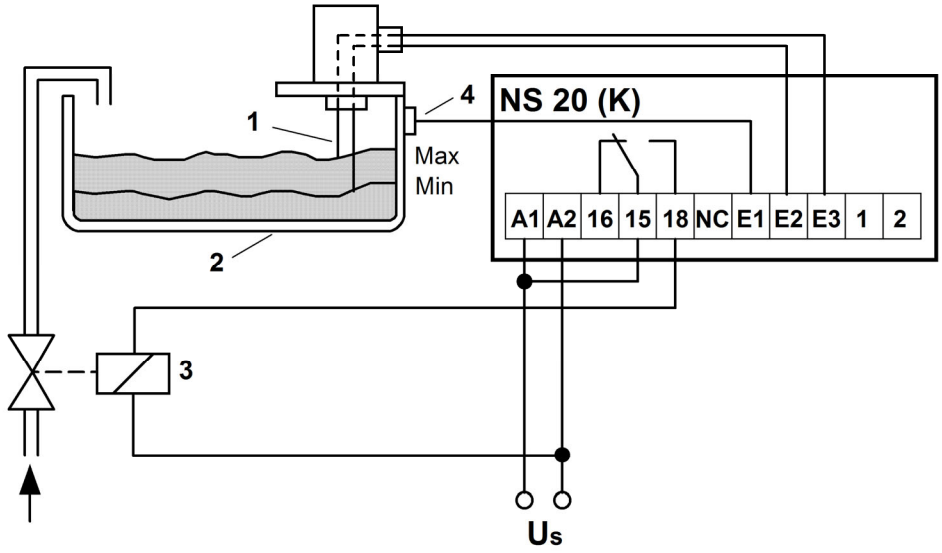
Action Chart



t1 = adjusted switching-delay
LED Relay on = relay

Connection Plan

filling tank with 2 electrodes (E3 dipped, relay off 15 – 16 closed)



1	electrodes	3	magnetic valve
2	tank	4	basicelectrode

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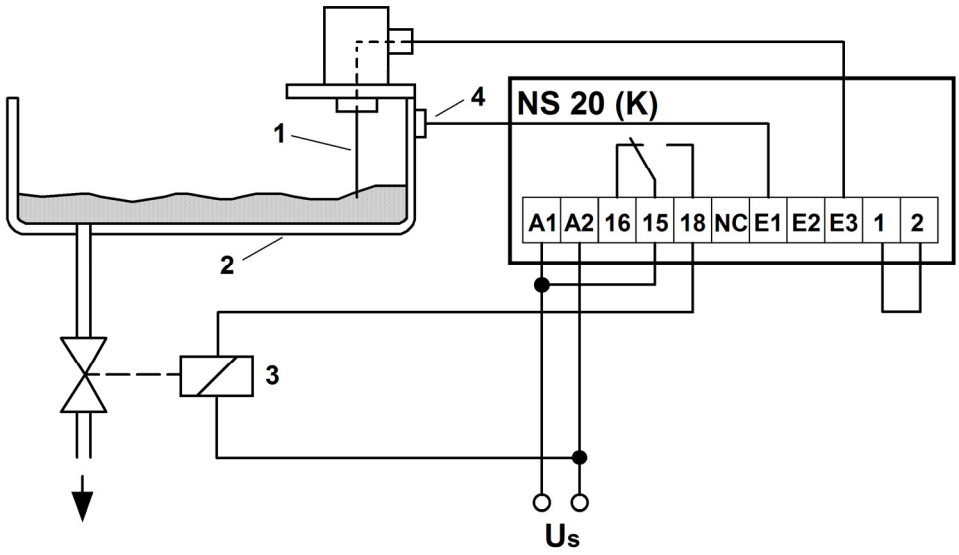
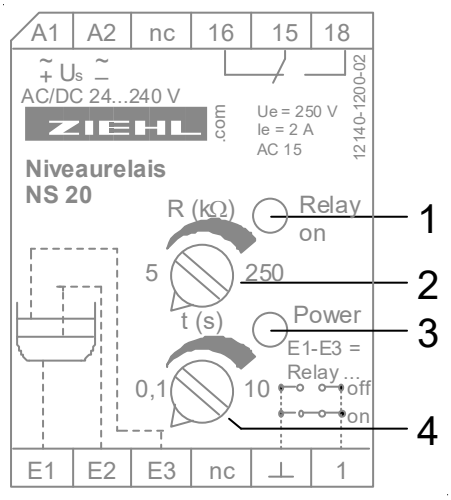
monitoring of liquid with 1 electrode (E3 dipped, relay on 15 – 18 closed)



1	electrodes	3	magnetic valve
2	tank	4	basicelectrode

Display and Operating Elements

1. LED Relay on
2. Potentiometer for Sensitivity
3. LED Power
4. Potentiometer Switching-delay



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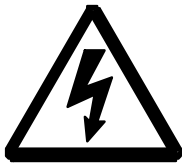
Installation

- Installation in switchgear cabinet on 35 mm mounting rail or wall-mount with screws M4
- Connection according to connection plan or type plate

ATTENTION!
Before switching on the unit make sure that the connected voltage corresponds with the voltage on the lateral type-plate!

Observe the maximum temperature permissible when installing in switching cabinet. Make sure sufficient space to other equipment or heat sources. If the cooling becomes more difficult e.g. through close proximity of apparatus with elevated surface temperature or hindrance of the cooling air, the tolerable environmental temperature is diminishing.



ATTENTION
Dangerous electrical voltage!
May lead to electrical shock and burn.
Before beginning of work switch unit and equipment free of voltage.

Putting into Operation

LED Power on = ready
LED Relay On on = relay picked up (15-16 open, 15-18 closed)

Adjusting the sensitivity:
- Start with potentiometer set for highest sensitivity/resistance (250 kΩ)
- At malfunction because of too long cables (capacity of cable) or when conductive foam covers the electrodes reduce sensitivity (turn left).
- At liquids with a high conductivity (e.g. dirty water) a low sensitivity can be set from the beginning

Error Search

- Relay doesn't switch
  - Check whether LED Power is on and if supply-voltage is connected properly to A1, A2 and i fit corresponds with the voltage on the lateral type-plate.
  - Check whether the electrodes are connected properly.

- Relay switches though the electrodes are not in cintact with the liquid:
  - Check whether the electrodes ar bridged by a liquid film or by
  - Capacity of cable too high
    Normally both errors can be solved by setting the sensitivity to a lower resistance (turn potentiometer left)

In case of any other malfunctions send it in for repair together with a description of the occurred malfunction.

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Technical Data

Supply voltage Us:	AC/DC 24 – 240 V, 0 / 50 / 60 Hz < 3 W < 5 VA
Tolerance	DC 20,4 - 297 V, AC 20 - 264 V
Level-electrodes (E1 , E2 , E3)	
max. voltage:	< 6 Veff
max. current:	<250 µA
Switching point:	adjustable app. 5 kΩ ... 250 kΩ
Switching point	max. cable-length max. capacity of cable.
5 kΩ	2500 m 500 nF
250 kΩ	50 m 10 nF
Switch on-/off-delay	0,1...10sec adjustable
Tolerance	25%
Data of relay	EN 60947-5
Type of contact	1 change-over-contact (CO)
Switching voltage	max. AC 415 V
Switching current	max. 6 A
Switching power	max. 2000 VA (ohmic load)
	max. 120 W bei DC 24 V
Rated nominal current Ie for co	3 A AC15 250 V;2 A DC13 24 V
Recommended fuse	3,15 A slow (gL)
Contact life mechanical	3 x 10^7 operations
Contact life electrical	1 x 10^5 operations at 240 V / 6 A
	1 x 10^6 operations at 240 V / 2 A
Reduction factor at cosφ = 0,3	0,5
UL electrical ratings	250 V ac, 3 A, general use
	240 V ac, 1/4 hp, 2.9 FLA
	120 V ac, 1/10 hp, 3.0 FLA
	C 300
Test conditions:	EN 50178 / EN 60 947 safe insulation
Rated impulse withstand voltage	4000 V
Contamination level	3
Rated insulation voltage Ui	250 V
On-period	100 %
Rated ambient temperature range	-20 °C ... +60 °C
	EN 60068-2-1 dry heat
Interference resistance	EN 61000-6-2
Interference transmission	EN 61000-6-3
Vibration resistance EN 60068-2-6	2…25 Hz ±1,6 mm
	25 ... 150 Hz 5 g

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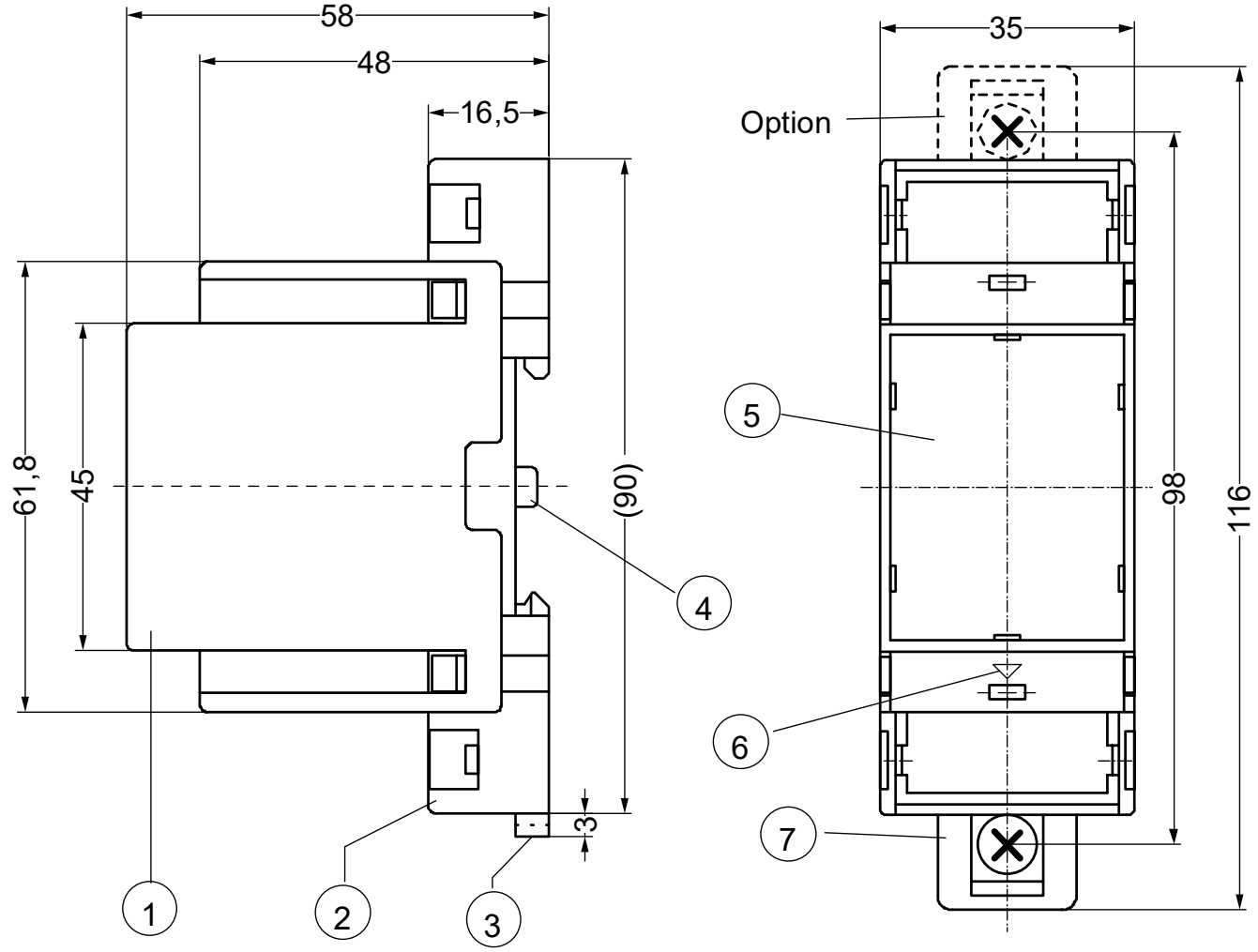
Housing	design V2
Mounting height	55 mm
Dimensions (B x H x T)	35 x 90 x 58 mm
Line connection 1 wire	each 1 x 4 mm^2
Stranded wire with wire-end sleeves	each 1 x 2,5 mm^2
Protection housing	IP 30
Protection terminals	IP 20
Attachment	Snap-mount on DIN-rail 35 mm according to EN 60 715 or screws M4
Weight	app. 130 g

Sunject to technical changes

Housing V2 Dimensions in mm



1 Oberteil / cover
2 Unterteil / base
3 Riegel / bar for snap mounting
4 Plombenlasche / latch for sealing
5 Frontplatteneinsatz / front panel
6 Kennzeichen für unten / position downward
7 Riegel bei Wandbefestigung mit Schrauben. Riegelbohrung Ø 4,2 mm / for fixing to wall with screws, Ø 4,2 mm

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