

Operating Manual STW20K

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- Current Relay for AC-Detection, AND-Evaluation, 3 Transformers



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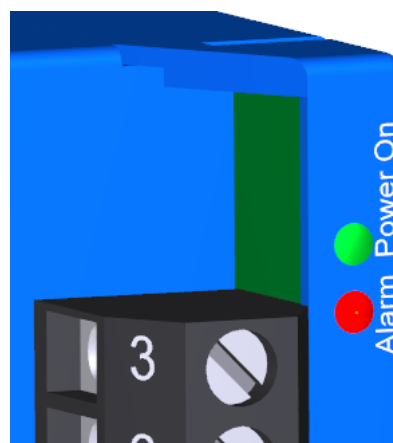
1 General Notes

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, commissioning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.

Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

2 Display and controls

1. LED green Power On
2. LED red Alarm



3 Application and short description

The current relay STW20K monitors the current in up to 3 lines with current transformers STWA1 (AND circuit). If there is a current in all 3 monitored lines, the relay (2 change-over contacts) picks up. If there is no current in at least one of the lines, the relay releases. The relay works in closed circuit current. When voltage is applied to the STW, the relay signals an alarm until the it has picked up.

Identifies power failure with 1- or 3-phase electrical consumers, e.g. with monitoring of heating elements or heating installations where a constant heating has to be guaranteed.

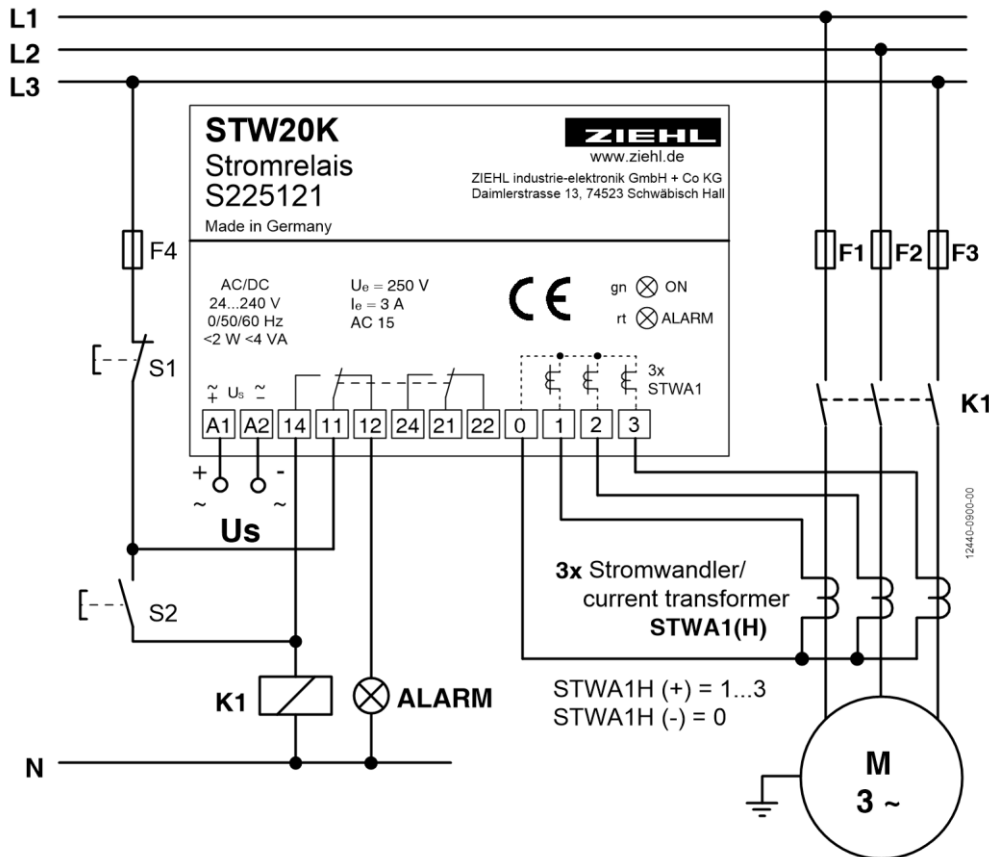
A further application is the identification of phase failure, monitoring of fuses, or triggering of operating hours counters.

If the switching threshold is not reached due to low currents of less than 1 A, the monitored wire should be led multiple times through the transformer STWA1, STWA1H. Not required inputs have to be connected to a occupied input.

4 Overview of functions

- 3 current transformers STWA1
- AND-evaluation
- relay output 2 CO
- Switching point approx. AC 1 A
- LED-display for power on and alarm
- housing design K

5 Connecting diagram



6 Important Information



DANGER!

Hazardous voltage!

Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.

To use the equipment flawless and safe, transport and store properly, install and start professionally and operate as directed.

Only let persons work with the equipment who are familiar with installation, start and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instructions manual, the information which are written on the equipment and the relevant security instructions for the setting up and the use of electrical units.

The equipment is built according to EN and checked and leave the plant according to security in perfect condition. If, in any case the information in the instructions manual is not sufficient, please contact our company or the responsible representative.

To maintain this condition, you must observe the safety instructions in this instruction manual titled "Important Information". Failure to follow the safety instructions may result in death, personal injury, or property damage to the equipment itself and other equipment and facilities.

Instead of the industrial norms and regulations written in this instruction manual valid for Europe, you must observe out of their geographical scope the valid and relevant regulations of the corresponding country.



DANGER!

In a non-loaded (open) secondary circuit of the current transformer STWA1 high voltages are induced at the secondary terminals.
For primary currents > 16 A, this voltage can be dangerous for human beings.
An "open mode", i.e. operation of the current transformer without secondary wiring, should be avoided.



Attention!

There may only one conductor be lead through the transformer!



Attention!

The connecting cable can be extended up to 50 m. When laying parallel to power cables use twisted or shielded cables.



Attention!

The polarity of the current transformer output (white marking on the cable) must be observed only if several current transformers are connected in series to increase the sensitivity.

7 Installation

- mount on 35 mm mounting rail according to EN 60715
- wall-mount with 3 x screws M4
- connecting wires refer to the connection plan to prevent miss-operation and malfunction.

8 Commissioning

- Connect the device according to the connection diagram
- Use relay outputs as required
- Connect current transformer STWA1, STWA1H
- Switch on supply voltage
- Relay switches on when current > 1 A flows in all circuits
- Relay turns off when a circuit is disconnected, not connected, or a current < 0.4 A flows.

9 Detailed description

The current monitor STW20K detects whether one of max. three circuits is interrupted or no current flows. The device works exclusively with current detection transformers type STWA1, STWA1H. This transformer supplies a voltage signal of approx. 1.5 V at 1 A. This voltage is fed to a comparator in AND circuit. If voltage is applied to all inputs, the built-in relay is switched on and the contacts 11, 14 and 21, 24 are closed. If an input is without voltage, the relay switches off and the contacts 11, 12 and 21, 22 are closed, the led alarm lights up red.

If the switching threshold is not reached at low currents below 1 A, the monitored conductor must be routed through the transformer several times.

9.1 Tips:

Limit too high (current in wire too low):

- Loop through wire several times

Limit too low (small loads shall not be recognized)

- Connect a resistor (0,25 W / 200 V) in parallel to the current transformer STWA1(H)
 - - - resistor 750 Ohm = enhancement by factor 2x
 - - - resistor 330 Ohm = enhancement by factor 4x
 - - - resistor 150 Ohm = enhancement by factor 10x

Because of high tolerances we recommend to determine the best value by try out.

10 Disposal

Disposal should be carried out properly and in an environmentally friendly manner in accordance with legal provisions.

11 Error search

- LED Power On is off
Make sure that supply voltage is connected correctly (+/-) to terminals A1/A2 and correspond with the voltage on type plate.
- Check that the current transformers are correctly connected and the terminal voltage is > AC 1.5V.
The load must be switched on.
- Check that only 1 live conductor has passed through the converter. Only 1 conductor per converter can be monitored.

See also „[Tips](#):“ under item Detailed description

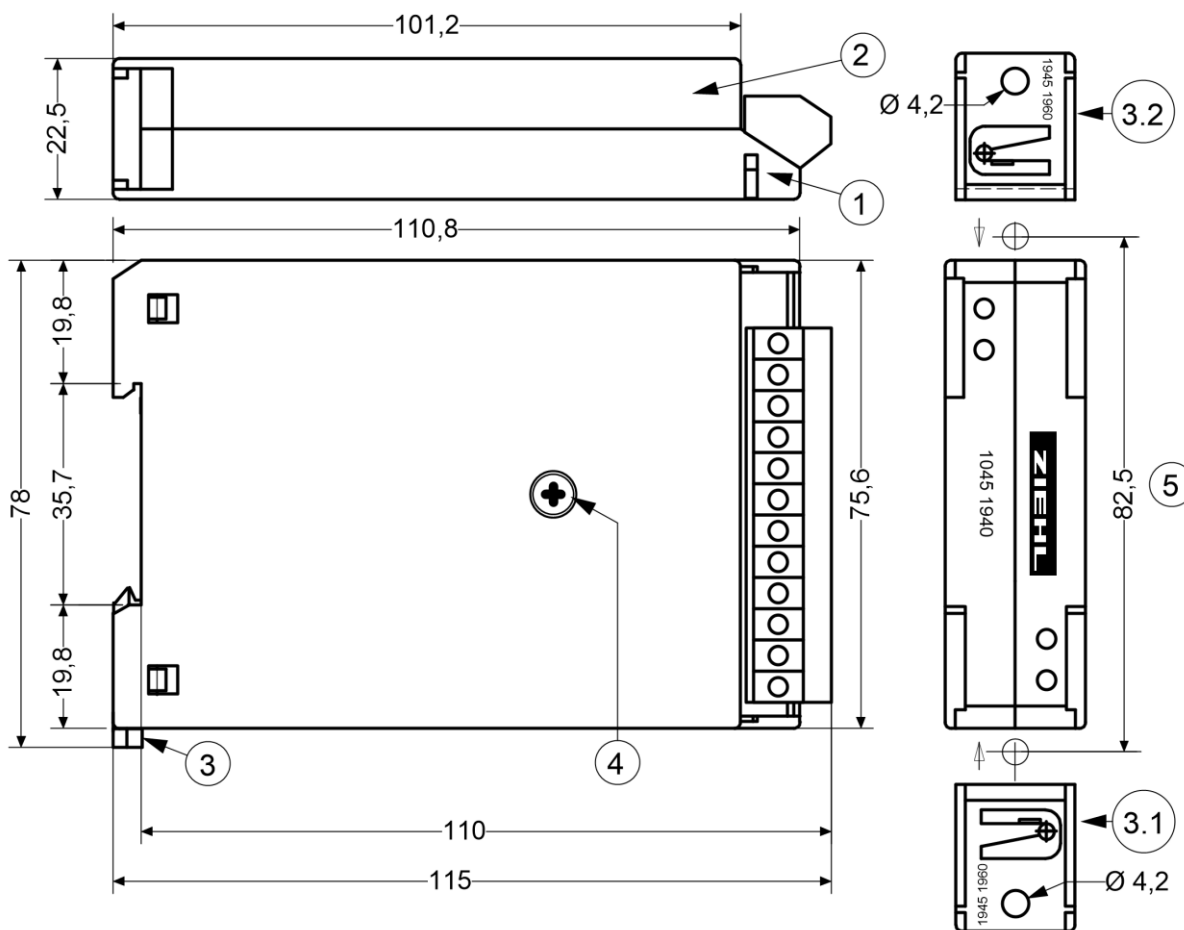
12 Technical data

Rated supply voltage U_s	DC/AC 24 – 240 V 0/50/60 Hz
Tolerance	DC 20.4 - 297 V AC 20 - 264 V 45 -62 Hz
Power consumption	< 1 W < 4 VA
Input	
Transformer	1-3 STWA1 or STWA1H
Rated thermal continuous current I_{cth}	AC 100 A
Thermal rated short-time current I_{th}	AC 300 A for 10 s
Limits	
operating mode	On, Off
Switching threshold on	$I_{on} \geq AC 1 A$
Switching threshold Off	$I_{on} \leq AC 0.4 A$
tolerance	$\pm 20 \%$
delay	< 300 ms
Off delay	< 300 ms
Output relay K1, K2 (Alarm 1, 2)	
Switching voltage	max. AC 300 V; DC 300 V
min. voltage / current	12 V 10 mA
conventional thermal current I_{th}	max. 5 A
Switching power max. AC $\cos \varphi = 1$	1250 VA 250 V * 5 A
Utilization category	AC-15 $I_e = 3 A U_e = 250 V$
Rated operational current	DC-13 $I_e = 2 A U_e = 24 V$
Rated operational voltage	DC-13 $I_e = 0.4 A U_e = 120 V$; $I_e = 0.2 A U_e = 240 V$
Recommended fuse NO	4 A time-lag or miniature circuit-breaker MCB B4
Recommended fuse NC	3,15 A time-lag
Test conditions	
Rated impulse voltage	4000 V
Overvoltage category	III
Pollution degree	2
Rated insulation voltage U_i	300 V
On-period	100 %
EMC-tests	
Emission	EN 61326-1; CISPR 11 Class B
Immunity	EN 61326-1
Electrical fast transient/burst	EN 61000-4-4 $\pm 4.5 kV$ Pulse 5/50 ns, $f = 5 kHz$, $t = 15 ms$, $T = 300 ms$
Surge immunity	IEC 61000-4-5 $\pm 1 kV$
Installation conditions	
Permissible ambient temperature	-20 °C ... +65 °C
Permissible storage temperature	-20 °C ... +70 °C
Installation height	< 2000 m over N.N.
Climatic conditions	5-85% rel. F., no condensation
Permissible wiring temperature	-5 °C ... +70 °C
Vibration resistance EN 60068-2-6	2 ... 13.2 Hz $\pm 1 mm$ 13.2 ... 100 Hz 1 g 2...25 Hz $\pm 1.6 mm$ 25 ... 150 Hz 5 g

Housing	Type K
Dimension (H x W x D)	75 x 22.5 x 115 mm
Width	1 TE
Connection type	Screw terminals/spring terminals
Connection properties solid-/stranded wire	1 x 0.5 mm ² – 2.5 mm ² / AWG 22 - 14
Stranded wire with ferrules (insulated ferrules)	1 x 0.14 mm ² – 1.5 mm ² / AWG 28 - 16
Stripping length / Tightening Torque	8 mm / 0,5 Nm
Protection class housing / terminals	IP40 / IP 20
Mounting	Snap mounting on 35 mm standard rail EN60715 or M4 screws (additional bar not included)
Mounting position	any
Weight	app. 120 g

Subject to technical changes

13 Housing Type K



- 1 Bottom
- 2 Top
- 3 Bolt
- 4 Screw
- 5 Holes for screw mounting