

Operating Manual STW1K

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Operating manual, Quick guide, Datasheet, Connection diagram, CAD Data
Firmwareupdates, FAQ, Videos about installation and settings, Certificates

- AC Current Sensing Relay, OR circuit 1-8 of transducers



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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.

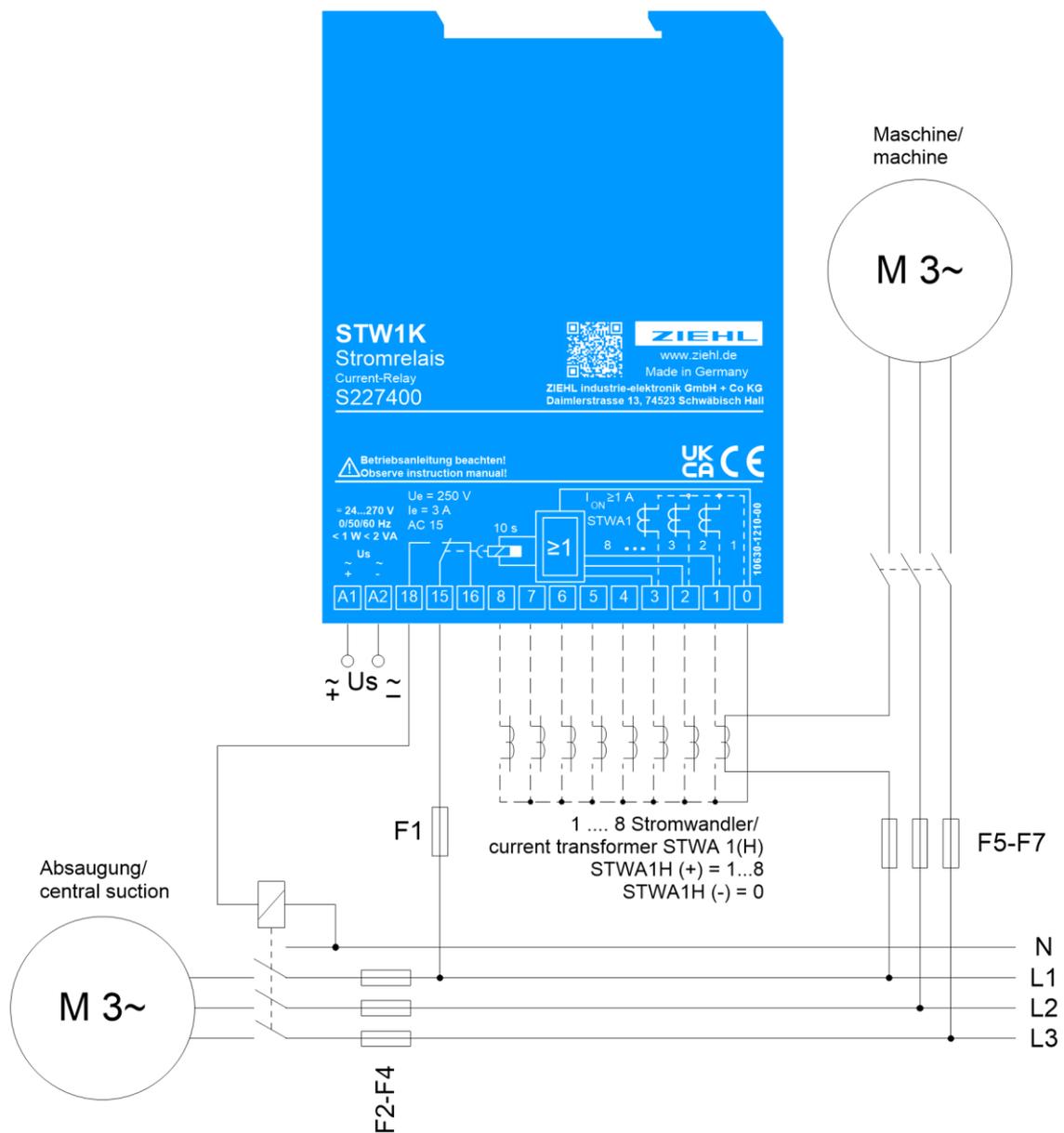
2 Application and short description

STW1K current relay is an automatic starting device in OR circuit with 8 inputs. If a current > 1 A flows through at least one connected transducer, the integrated relay (1co) is activated. If the currents through all transformers are 0, the relay switches off with a delay of about 10 s to allow for the necessary timeout, e.g. for a central extraction system in wood processing.

3 Overview of functions

- 8 inputs in OR circuit
- relay on when 1 input is activated
- response threshold approx. 1 A
- connection of current sensor S1 (power supply for S1 required)
- switch-off delay approx. 10 s
- Inputs that are not required remain open

4 Connecting diagram



5 Detailed description

The STW1K current relay operates in an OR circuit and detects whether or not current is flowing in one of up to 8 monitored wires. The relay is activated when the current flowing through the current transducer exceeds a value of approximately 1 A. The output is a potential-free switching contact. It can be used to turn on additional equipment such as extraction or blowing systems. If this value falls below approx. 0.5 A, the relay switches off the auxiliary equipment again (after the switch-off delay time has elapsed). The STWA1(H) current transformer can be loaded with a maximum current of 100 A.

Tips:

Response threshold is too high (current flow in the wire is too low):

- wires pass through the current transformer STWA1(H) several times.

Response threshold is too low (base load current must be extinguished):

- connect a resistor (0.25 W / 200 V) to the corresponding input of STW, in parallel to the current transformer STWA1(H).
 - 750 Ω resistor = increase by a factor 2
 - 330 Ω resistor = increase by a factor 4
 - 120 Ω resistor = increase by a factor 10

Due to large tolerances that must be considered, we recommend that the best values be determined by trial and error method.

Length of connecting cables STWA1(H):

Up to 50 m, also much longer are also possible.
Shielding may be required when laid parallel to power lines.

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.



Attention! Universal power supply

The device have a universal power supply, that is suitable for DC- and AC-voltages. Before connecting the device to supply-voltage make sure that the connected voltage corresponds with the voltage on the lateral type on the 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 DIN VDE/EN/IEC 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.

In order to maintain this status, you must observe the safety regulations entitled "caution" in this operating manual. Failures to follow the safety regulations can result in death, personal injury or property damage to the device itself and to other devices and facilities.

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(H) 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.

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.



A circuit-breaker or switch must be situated within easy reach of the unit and fused. Installation excess current protection should be ≤ 10 A.

**DANGER!**

The current transformer STWA1 is suitable for current detection in insulated cables. At applications with non-insulated conductors the operator must take care for touch safety. The insulation of the connection cables of the STWA1 must not be damaged. When laying the cable, make sure that there is sufficient distance to not isolated live parts (such as busbars). If necessary, use an additional electric insulation hose.

**Attention!**

The polarity of the STWA1 current transformer output (white marking on the cable) must be observed only if several current transformers are connected in series to increase the sensitivity.



When installing the device into the switchgear cabinet, please observe the max. admissible temperature. Care for both, sufficient clearance to other devices and sources of heat or enough forced draught. If cooling is made more difficult, e.g. close devices with increased surface temperature or by handicap of airflow cooling, the permissible ambient temperature has to be reduced.

8 Start-up

**Attention!**

Only 1 live conductor may be fed through the current transformer!

- switch on the mains voltage
- when the device is ready for operation, the relay must switch on when a current \geq approx. 1 A flows through the current transformer.

9 Trouble – shooting and remedies

Relay does not turn on:

- check that the control voltage at terminals A1, A2 is correctly applied and corresponds to the device voltage specified on the device's rating plate.
- check that the current transformer is properly connected. The consumer must be turned on. Verify that only one conductor is routed through the transmitter.

10 Technical data

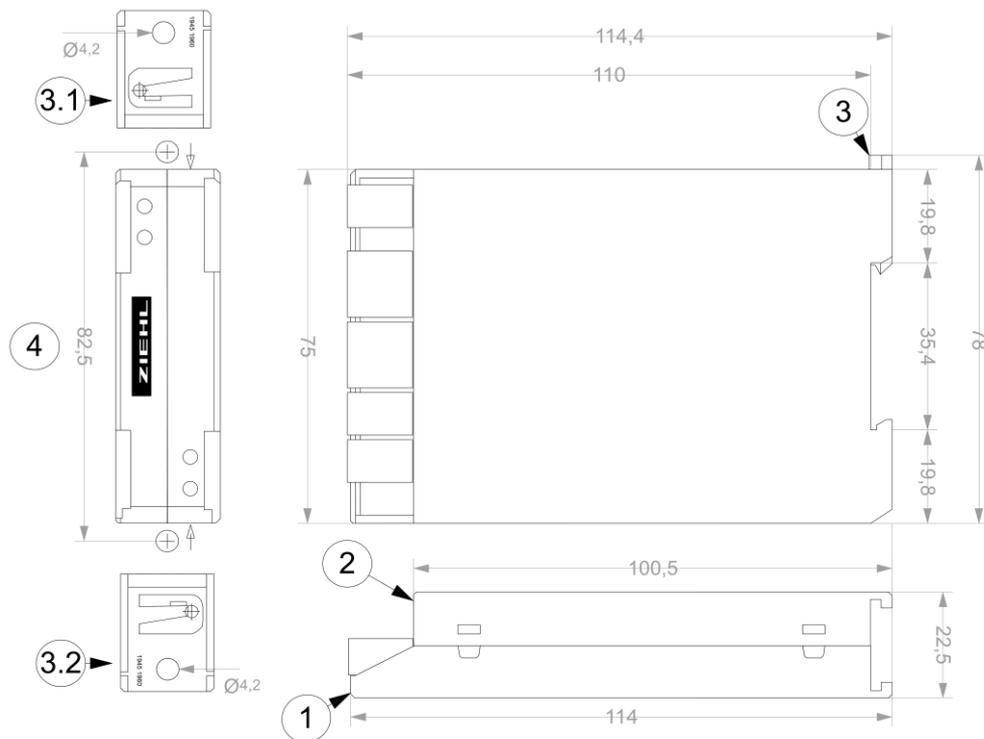
Rated supply voltage U_s	AC/DC 24 – 240 V 0/50/60 Hz		
Tolerance	AC 20 - 297 V / DC 20.4 - 297		
Power consumption	< 2 VA, < 1 W		
Output relay K1	1 change over contact		
Switching voltage	max AC 415 V		
conventional thermal current I_{th}	max 6A		
Switching capacity max AC $\cos \varphi = 1$	2000 VA (resistive load) 120W at 24 V DC		
electrical contact life $\cos \varphi = 1$	1 x 10 ⁵ switching cycles bei 240 V / 6 A		
Mechanical contact life	3 x 10 ⁷ switching cycles		
Short circuit resistance (NO)	4 A slow action or LS switch		
Short circuit resistance (NC)	B4 3.15 A slow action		
Shutdown capability 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			
Reduction factor for $\cos \varphi = 0.3$	0.5		
Transformer connection			
Connection transformers	1 ... 8 pcs Type STWA1 or STWA1H		
Alternating current - internal resistance	approx. 7k Ω		
Transformer overload capacity	max 100A continuous, max 300 A for 10 s		
Switching points			
Switching value	app. AC 1 A		
Activation delay	< 200 ms		
Switch-off delay	See nameplate (without < 200 ms)		
Test conditions	EN 61010-1		
Rated impulse voltage	4000 V		
Overtoltage category	III		
Pollution degree	2		
Rated insulation voltage U_i	250 V		
On-period	100 %		
EMC-tests	EN 61326-1 industrial environment		
Emission	EN 61326-1; CISPR 11 class B		
Immunity	EN 61326-1 industrial environment		
Electrical fast transient / Burst	EN 61000-4-4 ± 4 kV Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms		
SURGE immunity	IEC 61000-4-5 ± 4 kV (U_s), ± 2 kV (Inputs)		
Electrostatic discharge	IEC 61000-4-2 ± 8 kV contact discharge, ± 8 kV over air		
Reliability – failure rate	EN 61709/ SN29500		
Ambient conditions	Local operation in dry rooms		
Operation time 24/7/365	8760 h/y		
Failure rate (FIT)	$T_u = 40$ °C	$T_u = 60$ °C	$T_u = 80$ °C
$T_u = T_{ref}$ (component not in operation)	555 FIT	1147 FIT	2596 FIT
	100 (205) years	99 years	43 years

Installation conditions	
Permissible ambient temperature	-20 °C ... +55 °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 ±1 mm 13,2 ... 100 Hz 1 g 2...25 Hz ±1,6 mm 25 ... 150 Hz 5 g
Contact termination	
Protection class terminals	IP20
Actuation type	Push-Button
Number of levels	1
Solid conductor	1 x 0,14 mm ² ... 1,5 mm ² / AWG 28 ... 16
Fine-stranded conductor	1 x 0,14 mm ² ... 1,5 mm ² / AWG 26 ... 14
Fine-stranded with insulated ferrule	1 x 0,25 mm ² ... 0,75 mm ²
Fine-stranded with uninsulated ferrule	1 x 0,25 mm ² ... 1,5 mm ²
Strip length	8 ... 9 mm / 0.31 ... 0.35 inches
Housing	
Dimensions (W x H x D)	22,5 x 75 x 115 mm
Width	1 M
Protection class housing	IP40
IK-Code	IK06 (1 J impact energy)
Mounting	Snap mounting on 35 mm standard rail EN60715 or M4 screws (additional bar not included)
Mounting position	any
Weight	app. 95 g

Subject to technical changes

11 Housing Type K

Dimension in mm



- 1 Bottom part
- 2 cover
- 3 bar
- 4 Dimension for screw mounting

12 Disposal



Disposal should be carried out properly and in an environmentally friendly manner in accordance with legal provisions. ZIEHL is registered with the EAR Foundation under WEEE no. : DE 49 698 543.