

Current recognition Relays for alternating current

General

ZIEHL current monitors for current recognition are electronic measuring relays for current monitoring in up to 8 measuring circuits. The current is captured by STWA1 type current transducers. Current monitors in OR-evaluation (STW1K, STW6S and STW12), in AND-circuits (STW20K, STW20V), in NAND-circuits (STWL3S) or for individual monitoring (STW12 and

STW2SK) are available for different monitoring tasks. OR-circuit current monitors signal if at least one of several monitored lines is connected.

AND-circuit current monitors signal if not all lines are connected.

The 2-channel STW2SK device can be cascaded via its voltage output, and thus has a wide variety of applications.

The STWL3S NAND-circuit current-/voltage monitor compares whether current flows after the sink has been switched on.

2

Summary

| Type | STW2V | STW1K | STW12V | STW12 | STW20K | STW20V |
|--|-------------------|-------------------|-------------------|-------------------------|---------------------|---------------------|
| Number of circuits | 1 | 8 | 12 | 12 | 3 | 3 |
| Connection via change-over STWA 1 or Current-Sensor S1 | only S1 | X | X +contact | X | X | X |
| Response value | 5 / 5-30 A | 1 A | 0,5 - 5 A | 10 x 1 A 2 x 1 - 5 A | 1 A | 1A |
| Relay output | 1 U | 1 U | 1 U | 1 U | 2 U | 2 U |
| Transistor outoput | - | - | - | 12 | - | - |
| Operating mode | operating-current | operating-current | operating-current | operating-current | cl.-circuit current | cl.-circuit current |
| Evaluation principle | single | OR | OR | single/ OR | AND | AND |
| Current/voltage comparison | - | - | - | - | - | - |

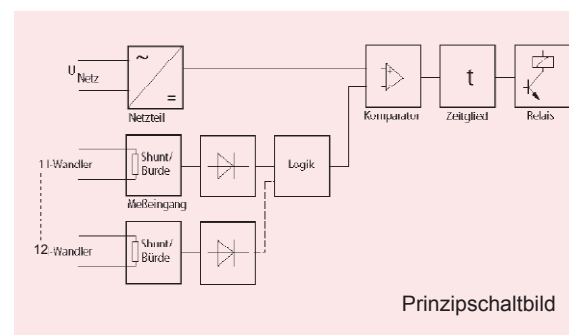
Function and Features

In case of current flow through a connected STWA1 type transformer, a voltage is induced at the current monitor input. This voltage is captured, evaluated, and releases corresponding switching functions.

Due to the simple yes/no evaluation of current recognition and the permission of relatively high tolerances ($\pm 20\%$) in the transformer and evaluation device, a wide variety of functions can be created with a good performance at moderate prices. The operating state of consumers outside the switch cabinet can be captured without a direct feedback of the consumer (costly and work-intensive wiring being unnecessary).

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.

Current relays of type STW conform to VDE 0435 part 303, 4.8.2



Current-Relay STW2V

Current-Detection AC/DC with Current-Sensor S1

STW2V



The current relay STW2V in combination with a current-sensor S 1 monitors AC- and DC-current-flow yes/no. It supplies the power for the current-sensor. The STW 2 V can also be used as a switching-amplifier for potential-free contacts.

Application:

- Monitoring of current-flow yes/no for AC- and DC-currents
- Detecting state (on/off or defective) of a load by measuring the current in the feed line
- Monitoring of fuses
- Control of dedusting fans at welding work-stations with automatic run-after for the motor of the fan

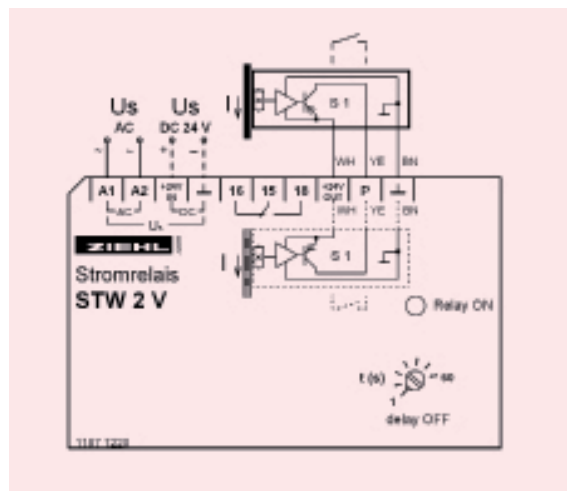
Features

- Input for current-sensor S 1
- Detection of AC- and DC- currents
- Switching-point see current-sensor S 1
- Switch-off delay adjustable 1-60 s
- Relay-output 1 change-over contact
- Housing for mounting in switchgear-cabinets

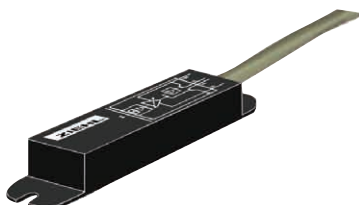
Order-number

AC 220 - 240 V

S225541



Current-Sensor S1 for AC- und DC-currents



The current-sensor S 1 records the current in a cable with a hall-sensor. At currents of app. 5 A (adjustable version 5-30 A) the transistor-outputs report a current in the monitored cable. The current-sensor can be easily fixed to the cable without disconnecting it. This allows a simple change of cables. For mounting at welding devices a version for mounting in a tong is available.

Features:

- switching point app. 5 A (option: adjustable 5-30 A)
- mounting without disconnection of cable possible
- LED for current-flow
- robust, sealed execution
- overload capacity unlimited

Order-numbers::

Current-sensor S 1, 5 A fixed

S225693

Current-sensor S 1, 5-30 A adjustable

S225694

Technical Data

Supply voltage U_s

AC 220 - 240 V, +10...-15%, < 3 VA, 50/ 60 Hz
DC 24 V, $\pm 20\%$

Relay output

Type of contact

Test conditions

Rated ambient temp. range

1 change-over contact (co)

type 2 see "general technical informations"

see "general technical informations"

-20°C...+55°C

Inputs

Switching point

1 current-sensor S 1 or potential-free contact
see current-sensor S 1

Switch-off delay

Switch-on delay

Overload capacity

adjustable 1...60 s

app. 0,5 s

with current-sensor S 1 unlimited

Dimensions (H x W x D)

Attachment

Protection housing/terminals

Weight

Design V4: 90x70x58 [mm], mounting height 55 mm
on 25 mm DIN-rail or with screws M4

IP 30 / IP 20

app. 190 g

Current-Relay STW1K

AC-Detection, OR-Evaluation of 1-8 Transformers

STW1K



Current relay in OR evaluation with 8 inputs, designed e.g. for controlling of suction plants in the timber and plastics processing industry.

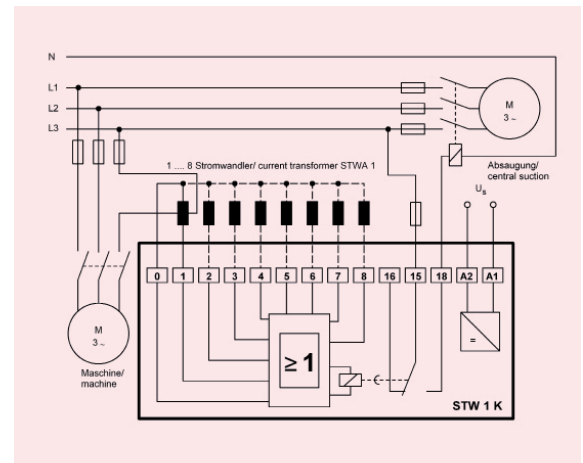
When there is an AC-current >1 A through one of up to 8 connected transformers STWA 1, the integrated relay (1co) picks up. When all currents are 0, the relay releases with a delay of approx. 10s. This enables a run-after of the central suction.

- 8 inputs
- OR-evaluation
- relay picks up if at least 1 input is activated
- operating value approx. 1 A
- turn-off delay approx. 10 s
- not necessary inputs remain open
- options:
 - switch-on delay 3 s
 - without switch-off delay

Order-number:

AC 220 - 240 V

S225636



Technical Data

Rated supply voltage U_s AC 220 - 240 V $+10-15\%$, < 3 VA, 50/ 60 Hz

Transformer input
 Overload cap.continuous/max 10s
 Function
 Switching point on
 Switching point off
 Switch-off delay
 Switch-on delay

1...8, type STWA , order-number S 225201
 100 A / 300 A
 OR-evaluation
 \leq AC 1 A
 $>$ AC 0,3 A
 approx. 10 sec.
 approx. 0,5 sec.

Output relay
 Type of contact
 Test conditions
 Rated ambient temperature range

1 change-over contact (co)
type 2, see "general technical informations"
 see "general technical informations"
 $-20^{\circ}\text{C} \dots +55^{\circ}\text{C}$

Dimensions (h x w x d)
 Attachment

Design K: 75 x 22.5 x 115 [mm]
 on 35 mm DIN rail according to DIN EN 60715
 or with screws M4 (option)

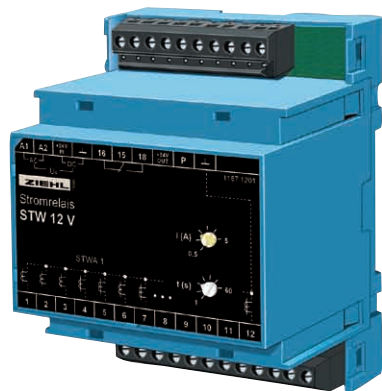
Protection housing / terminals
 Weight

IP 30 / IP 20
 approx. 140 g

Current-Relay STW12V

Current-Detection, OR-Evaluation, 1-12 Inputs, adjustable

STW12V



Current relays in OR evaluation with 12 inputs, designed e.g. for controlling of suction plants in the timber and plastics processing industry.

Recording of current is made with current transformers type STWA 1, current-sensors S 1 (DC also) or potential-free contacts.

When there is an AC-current higher than the set response value (setting range 0.5 - 5A) through at least one of the connected transformers, the integrated relay (1 NO) picks up. If all monitored circuits are switched off or the current falls below the set response value by approx. 0.3A, the output relay releases after the set time delay (1 - 60).

Due to the adjustable response value, the user can permit lower currents without releasing switchings. Thus, for example, a machine can be switched on in order to adjust its electronic settings (low current via transformers). The STW will only switch on when the main motor has been put into operation (high current). Due to the adjustable switch off delay an easy adjustment of the follow-on is possible.

- Current monitoring of up to 12 currents
- Inputs for current transformers STWA 1, current-sensors S 1 or potential-free contacts
- Adjustable switching point 0.5 - 5 A

- Adjustable switch off delay (1 - 60 s)
- Plug-in terminals
- Supply-voltage AC 220-240 V and DC 24 V
- Housing for mounting in switchgear cabinets or fuse-boxes, 70 mm wide, mounting height 55 mm

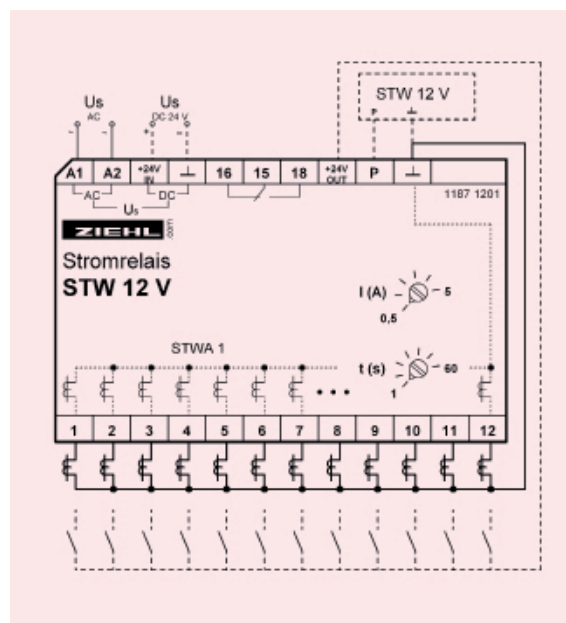
Application:

ZIEHL current monitors in OR-circuits can be used particularly where dust, fumes and gases are generated by various electrical devices, and where these must be extracted by a central suction system. Due to the integrated delaytime the follow-on of the suction is controlled.

Order-number

AC 220 - 240 V / DC 24 V

S225509



Technical Data

Supply voltage U_s

AC 220 - 240 V, +10...-15%, < 3 VA, 50/ 60 Hz
DC 24 V, $\pm 20\%$

Relay output

1 change-over contact (co)

Type of contact

type 2 see "general technical informations"

Test conditions

siehe "general technical informations"

Rated amb. temperature range

-20°C...+55°C

Function

OR-evaluation

Measuring inputs

12 x for current transmitters STWA 1, current-sensors S 1 or potential-free contacts

Overload cap./continuous max 10s

100 A / 300 A

Switching point

with STWA 1 adjustable, AC 0,5 - 5 A

Tolerance

$\pm 20\%$

Switch-off delay

adjustable 1- 60 s

Switch-on delay

app. 0,5 s

Dimensions (H x W x D)

design V4: 90x70x58 [mm], mounting height 55 mm

Attachment

on 35 mm DIN-rail according to EN 60 715 or with screws M4

Protection housing/terminals

IP 30 / IP 20

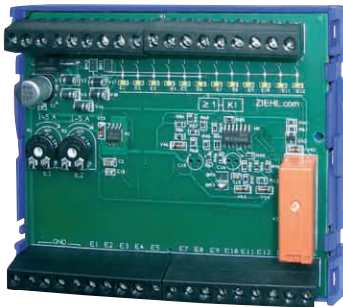
Weight

app. 200 g

Current-Relay STW12

AC-Detection, 12-channel, Single evaluation, OR-Circuit

STW12



The current relay STW12 monitors the current flow yes/no of up to 12 alternating-current circuits. If there is an AC-current of ≥ 1 A through a connected transformer STWA 1, the according output transistor switches and the yellow LED lights up.

All the OR inputs are linked at the same time. If a current is identified in at least one of the monitored current circuits, a relay (1 change-over contact) picks up.

The STW12 is installed at an open printed circuit board. The lower part can be used for snap-fastening on a 35 mm DIN-rail or for screw fastening (option). The supply voltage is DC 24.

This voltage can be used at the same time for inquiry of the output transistors. When requesting the outputs in 2 groups in multiplex operation, only 8 I/Os of the PLC are needed

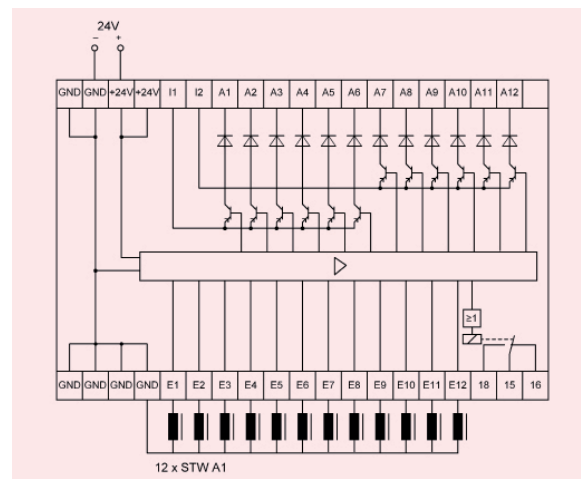
- 12 inputs (for transformer STWA1)
- 2 of these inputs with adjustable switching threshold AC 0,5...5 AA
- 12 outputs (Open Collector) max. DC 40 V/40 mA
- relay OR-linked (of all 12 inputs)
- LED displays (1/channel)
- Multiplex operation possible

Applications:

The current relay STW12 is used where AC-current yes/no has to be evaluated, however, the exact value of the current is not relevant. Examples are the control of machines in suction plants or monitoring of the mode of operation of loads (on, off or damaged). The STW12 is suitable in particular for being used in connection with a PLC.

Order-number
DC 20 - 30 V

S225127



Technical Data

Power supply U_s

DC 20 - 30 V, < 2 VA

Function
Transformer input
Overload cap.continuous/max 10s
Switching points E1, E2
Tolerance
Switching points E3...E12

12-channel single/OR
1...12, type STWA 1
100 A / 300 A
adjustable, AC 0,5...5 A
 $\pm 20\%$
on \leq AC 1 A
off \geq AC 0,3 A
10 s.
approx. 0,5 s.

Switch-off delay
Switch-on delay

Output relay
Type of contact
Open Collector
Testing conditions
rated ambient temperature range

1 CO, 12 x Open-Collector
type 2 see "general technical informations"
max. DC 40 V/40 mA
see "general technical informations"
-20°C...+55°C

Dimensions H x B x T
Attachment

design V 6: 90 x 105 x 32 [mm], 37-pole
on 35 mm DIN rail according to DIN EN 50 022 or
with screws M4 (option)

Protection housing / terminals
Weight

P 30 / IP 20
approx. 135 g

Current-Relay STW20K

AC-Detection, AND-Evaluation, 3 Transformers

STW20K



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.

Applications:

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.

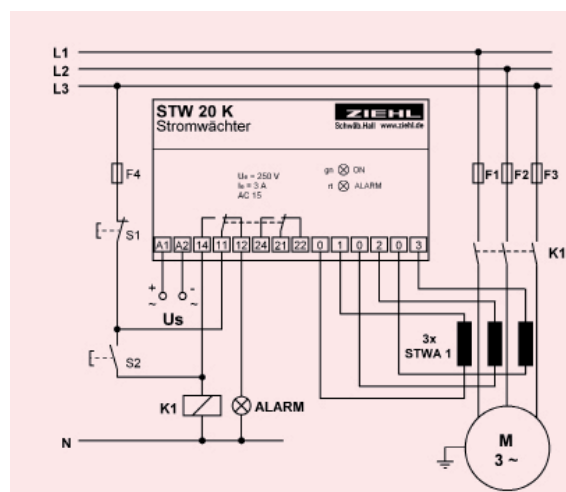
If the switching threshold is not reached due to low currents of less than 1 A, the monitored wire should be led multiple times through the transformer. Not required inputs have to be connected to a occupied input.

Features

- 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

Order-number
AC 220 - 240 V

S225112



Technical Data

Power supply U_s

AC 220 - 240 V, +10...-15%, < 2 VA, 50/ 60 Hz

Function

Transformer input
Overload cap.continuous/max 10s
Switching point on
Switching point off
Tolerance
Switch-off delay
Switch-on delay

3 channel/AND

1 to 3, type STWA 1
100 A / 300 A
 \leq AC 1 A
 \geq AC 0,3 A
 \pm 20%
approx. 0,3 s
approx. 0,3 ms

Output relay

Type of contact
Testing conditions
rated ambient temperature range

2 CO

type 2 see "general technical informations"
see "general technical informations"
-20°C...+55°C

Dimensions H x B x T

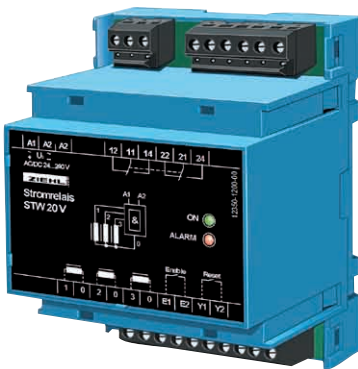
Protection housing / terminals
Weight

design K: 75 x 22,5 x 110 [mm], 12-pol
IP 30 / IP 20
approx. 150 g

Current-Relay STW20V

AC-Detection, AND-Evaluation, 3 Transformers

STW20V



The current relay STW20V monitors the current in up to 3 lines with current transformers STWA 1 (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. This can be avoided if the device is constantly alive and monitoring is started by closing a contact at the Enable input. With a bridge at the Enable input, monitoring is automatically started when voltage is applied.

- 3 inputs (transformer STWA1)
- 3 x current-sensor S1 (power-supply required)
- AND-evaluation
- output relay 2 CO
- switching point app. AC 1 A Enable-input
- storage of alarms or Auto-Reset
- LEDs power on and alarm
- housing V4 for mounting on DIN-rail or wall-mount

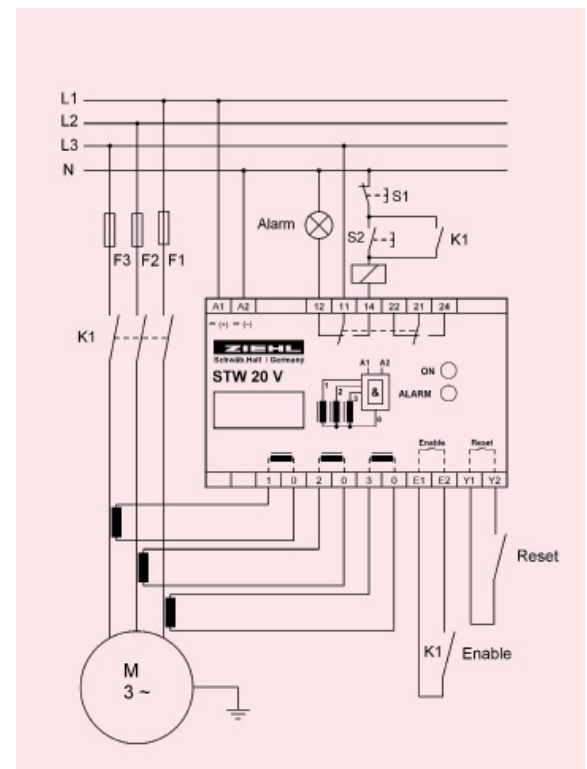
Applications:

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.

Order-number
AC/DC 24 - 240 V

S225124



Technical Data

Power supply Us

Function
Transformer input
Overload cap. continuous/
max.10s
Switching point on
Switching point off
Switch-off delay
Switch-on delay
Overload capacity

Output relay
Type of contact
Testing conditions
rated ambient temperature
range

Dimensions H x B x T
Protection housing / terminals
Weight

AC/DC 24 - 240 V, < 3 W, < 5 VA,
(AC 20 - 264 V, DC 20,4 - 297 V) AND-evaluation
AND-evaluation
1 or 3, type STWA 1
100A / 300 A

≤ AC 1 A
≥ AC 0,3 A
approx. 0,3 s.
approx. 0,3 s.
with STWA 1 unlimited

2 CO
type 2 see "general technical informations"
see "general technical informations"

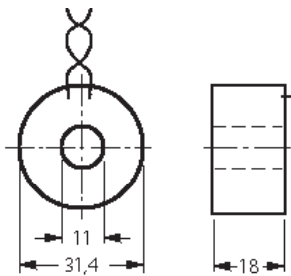
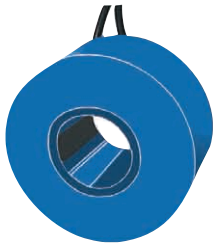
-20°C...+55°C

design V 4: 90 x 70 x 58 [mm]
IP 30 / IP 20
approx. 240 g

Current Transformer STWA1

for recognition of AC-currents

Current Transformer
STWA1
for monitoring current
yes/no

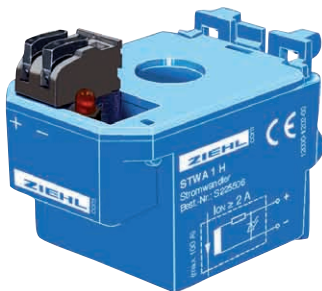


The STWA1 current transformer is made to match the STW current monitor. One current transformer is required for each line being monitored. The STWA1 consists of a climate-proven sealed-in coil with toroidal tape core. The connection cables are permanently fixed to the transformer and are 1 m in length. The level of the current to be monitored is limited to 100 A continuously, 300 A for max. 10s.

In case of current of more than approx. 5 A, an LED can be triggered directly via the STWA 1 current transformer. Thus it's easy for users to visually monitor the current conduction in a line. The LED is protected by an anti-parallel diode or by its connection in series. A protective resistor is necessary depending on the LED used or the level of current being monitored.

Order-number **S225201**

Current Transformer
STWA1H
for DIN-rail-mount or
screw-mount



Current-transformers STWA1H can be fixed on a 35 mm DIN-rail or with 2 screws.

The electrical connection is made via pluggable terminals.

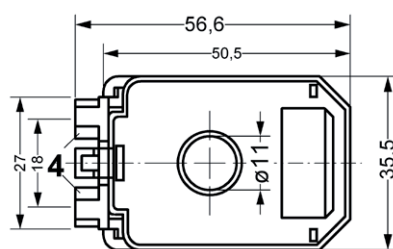
The cables are led vertical through the transformer (right angle to 35 mm-rail). The available diameter is 11 mm.

A built-in LED lights up at currents > app. 2 A. Even short current pulses are visible.

ZIEHL current monitor type STW or an external LED can be connected to the terminals. The built-in resistor protects the LED from overload.

The STWA 1 H can also be used to visualize current-flow in stand-alone mode, without connecting it to a current monitor.

Order-number **S225506**



- 1 Housing
- 2 Clip for DIN-rail (removeable)
- 3 Terminal (pluggable)
- 4 Wall-mounting (M4)

