Temperature Relays and MINIKA®   Mains Monitoring   Digital Panelmeters MINIPAN®   Switching Relays and Controls   Measuring Transducers   Grid- and Plant Protection

Quick Guide SW32V

- voltage relay for monitoring direct, alternating and three-phase networks for overvoltage and/or undervoltage, Pr5+6 with default settings for grid and plant protection according to VDE-AR-N 4110:2018-11 directive (>135 kW)

Detailed operating manual see:
http://www.ziehl.com/en/AllProducts/detail/SW32V-52

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, start-up 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
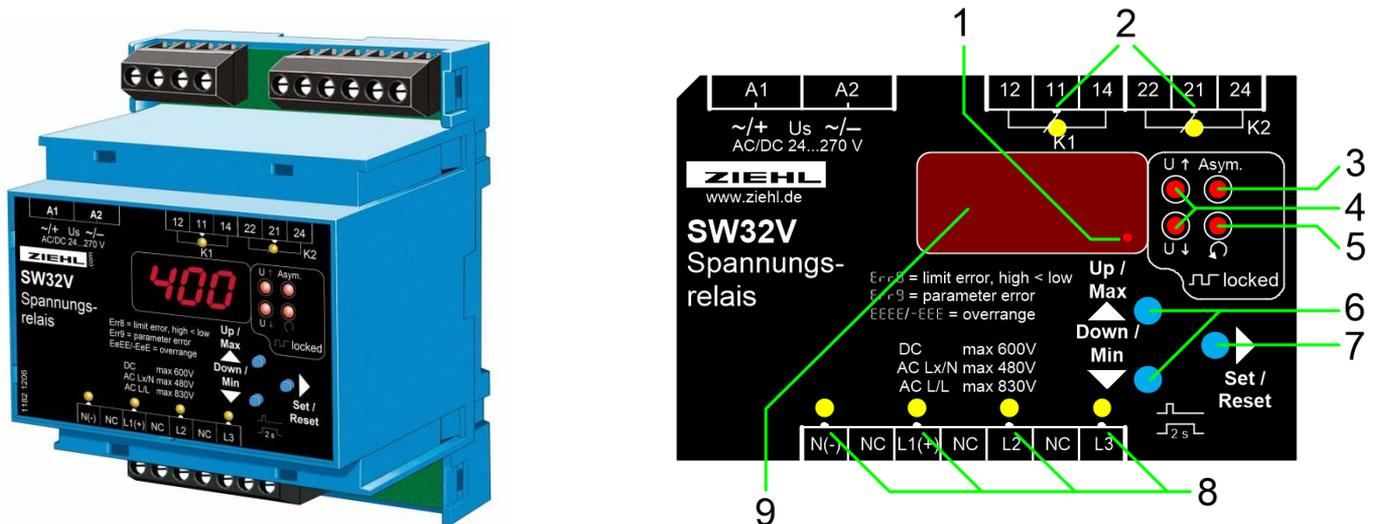
1   Last decimal point (red)

Off	Display mode
Illuminated	Menu mode
Flashes	Configuration mode

2   LEDs relay status (yellow)

OFF	Relay is released
ON	Relay operating

3   LED Asymmetry (red)

OFF	Asymmetry limit not exceeded
ON, A1 or A2	Asymmetry limit exceeded
FLASHES, A1L or A2L	Ready for reset after exceeding the limit
FLASHES, A1 or A2	Reset delay doF counting down

4 LEDs voltage limit undercut / exceeded (red)

ON, `A 1` or `A 2`	Limit undercut / exceeded
FLASHES, `A1L` or `A2L`	Ready for reset after undercutting / exceeding the limit value
FLASHES, `A 1` or `A 2`	Reset delay `doF` counting down
OFF	Limit value not undercut / exceeded

5 LED phase sequence (red)

OFF	Phase sequence correct (rotating clockwise) or `oFF`
ON, `A 1` or `A 2`	Phase sequence error (rotating counter-clockwise)
FLASHES, `A1L` or `A2L`	Ready for reset after phase sequence error

6 Up / Down key (in display mode, normal state)

Press briefly	Change into the menu mode (see Point 8.5)
Press for > 2 s	Displays the MAX (Up) and MIN (Down) measurement; additionally pressing the Set key for ≥ 2 s deletes the saved value

7 Set/Reset key (in display mode, normal state)

Press briefly	Displays the next measurement
Press for > 2 s	Reset after locked alarm (manual restart) (not possible if DoF Reset delay is counting down)
Press for > 4 s	Displays the program, e.g. `Pr1`
Press for > 10 s	Displays the software version e.g. `000`

8 LEDs measurement allocation (yellow)

LEDs	Measurement
Lx and N ON	Voltage value (L1 against N, L2 against N, L3 against N)
Lx and Ly ON	Voltage value (L1 against L2, L2 against L3, L1 against L3)

9 Digital display 3-digits (red)

Depending on the program display, actual voltage, frequency
Displays the alarm messages, e.g. `A 1` , `A2L` ,…
Displays the errors with error code e.g. `Er9`

3 Factory settings and software version

When changing programs, all parameters are reset to the factory settings.

Menu	Parameter / Unit		Default settings						Users Data
			3AC+N	3AC	1AC	DC	3AC+N	3AC	
			Pr1	Pr2	Pr3	Pr4	Pr5	Pr6	
A1¯ 59.S2 59>S2	A1¯ (Alarm)		on	on	on	on	on	on	
	U1¯ (upper limit)	V	253	440	253	242	287	120	
	H1¯ (Hysteresis)	V	5.0	5.0	5.0	5.0	3.0	1.0	
	dAL (Alarm delay)	s	0.10	0.10	0.10	0.10	0.10	0.3	
	doF (Reset delay)	s	0	0	0	0	60	60	
A1_ 27.S2 27<S2	A1_ (Alarm)		on	on	on	on	on	oFF	
	U1_ (lower limit)	V	196	340	196	198	104	45.0	
	H1_ (Hysteresis)	V	5.0	5.0	5.0	5.0	115	50.0	
	dAL (Alarm delay)	s	0.10	0.10	0.10	0.10	0.30	0.30	
	doF (Reset delay)	s	0	0	0	0	60	60	
A1	ASY (Asymmetry)	%	oFF	oFF			oFF	oFF	
	dAL (Alarm delay)	s	0.10	0.10			0.10	0.10	
	PhF (Phase sequence)		oFF	oFF			oFF	oFF	
	rEL (Relay function)		r	r	r	r	r	r	
A2¯ 59.S1 59>S1	A2¯ (Alarm)		on	on	on	on	oFF	on	
	U2¯ (upper limit)	V	253	440	253	242	249	110	
	H2¯ (Hysteresis)	V	5.0	5.0	5.0	5.0	3.0	1.0	
	dAL (Alarm delay)	s	0.10	0.10	0.10	0.10	60.0	180	
	doF (Reset delay)	s	0	0	0	0	60	60	
A2_ 27.S1 27<S1	A2_ (Alarm)		on	on	on	on	on	on	
	U2_ (lower limit)	V	196	340	196	198	184	80.0	
	H2_ (Hysteresis)	V	5.0	5.0	5.0	5.0	35.0	15.5	
	dAL (Alarm delay)	s	0.10	0.10	0.10	0.10	1.00	2.70	
	doF (Reset delay)	s	0	0	0	0	60	60	
A2	ASY (Asymmetry)	%	oFF	oFF			oFF	oFF	
	dAL (Alarm delay)	s	0.10	0.10			0.10	0.10	
	PhF (Phase sequence)		oFF	oFF			oFF	oFF	
	rEL (Relay function)		r	r	r	r	r	r	
ddi	ddi (Display delay)	s	0.5	0.5	0.5	0.5	0.5	0.5	
	dit (Display duration)	s	3.5	3.5			3.5	3.5	
Si	U (Voltage)	V	230	400	230	220	230	100	
Cod	on / oFF		oFF	oFF	oFF	oFF	oFF	oFF	
	Pin (Pin code)		504	504	504	504	504	504	
InF	Fnr Firmware version		_15	_15	_15	_15	_15	_15	
	Snr Serial number		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	
	Pr Program		1	2	3	4	5	6	

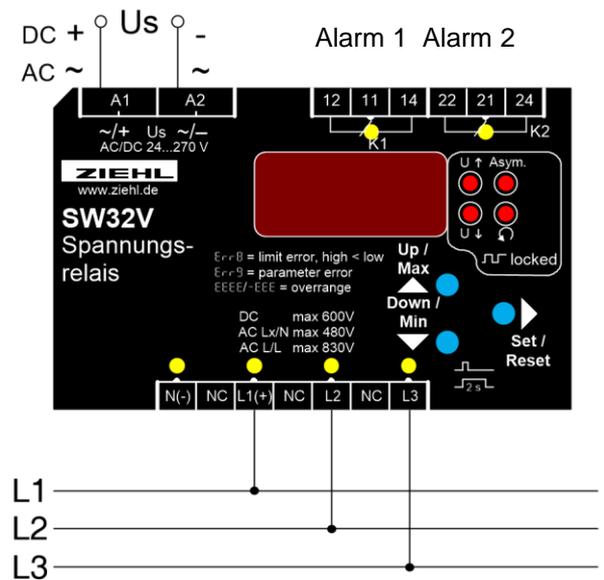**Display the program**: Press the "Set" key for 4 s in the display mode.
Display the software version: Press the "Set" key for 10 s in the display mode.

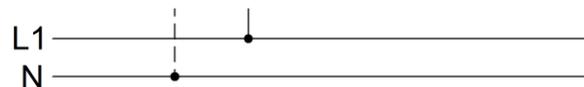# 4 Connection diagram and example grid- and plant protection

3 phase **with** N (Pr1)
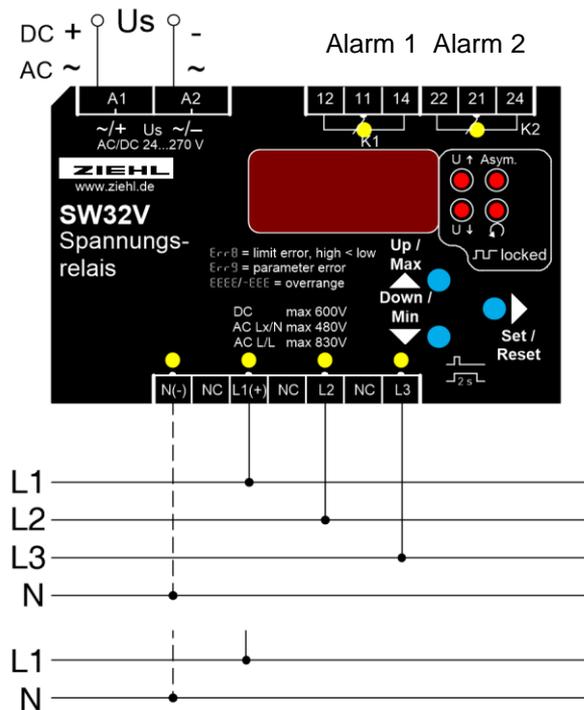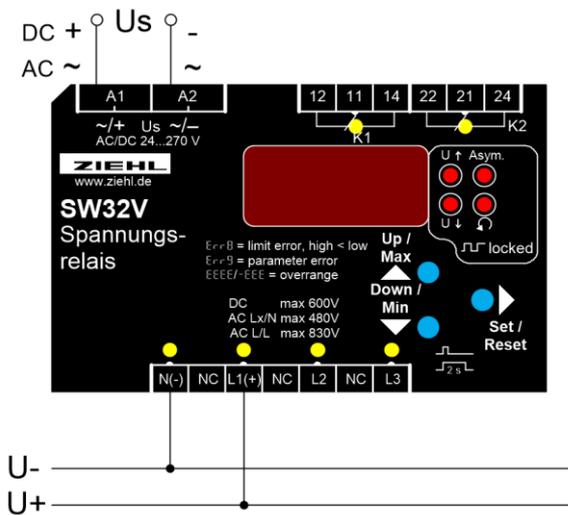

3 phase **without** N (Pr2)
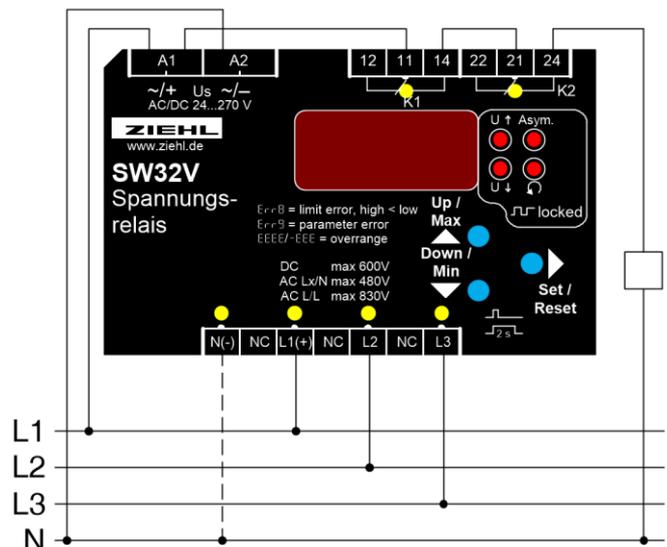

1 phase (Pr3)

DC (Pr4)

grid- and plant protection

5 Important Notice

WARNING

Hazardous electrical voltage!
Can lead to electric shock and burns.
Before starting work, switch plant and device voltage-free.

The flawless and safe operation of a device requires that it is shipped and stored appropriately, professionally installed and put into operation and operated according to its intended use.
Only people who are familiar with the installation, commissioning and operation and who have qualifications corresponding to their job are permitted to work on the device. They must comply with the contents of the operating instructions, the notices attached to the device and the relevant safety regulations for constructing and operating electrical plants.

Comply with the maximum permissible temperature when installing in a switch cabinet. Ensure sufficient clearance to other devices or heat sources. If cooling is inhibited, e.g., through close proximity to devices with increased surface temperature or interference with the cooling-air current, the permissible ambient temperature is decreased.

⚠ **Caution!**
Before you apply mains voltage to the device, make sure that the permissible control voltage U_S on the side rating plate matches the mains voltage connected to the device!

6 Mounting

The device can be mounted:
- Distribution board or switch cabinet on 35 mm rails according to EN 60715

6.1 Program setup

The suitable program must be set on the SW32V in accordance with the application (see table). That is taken care of during commissioning.
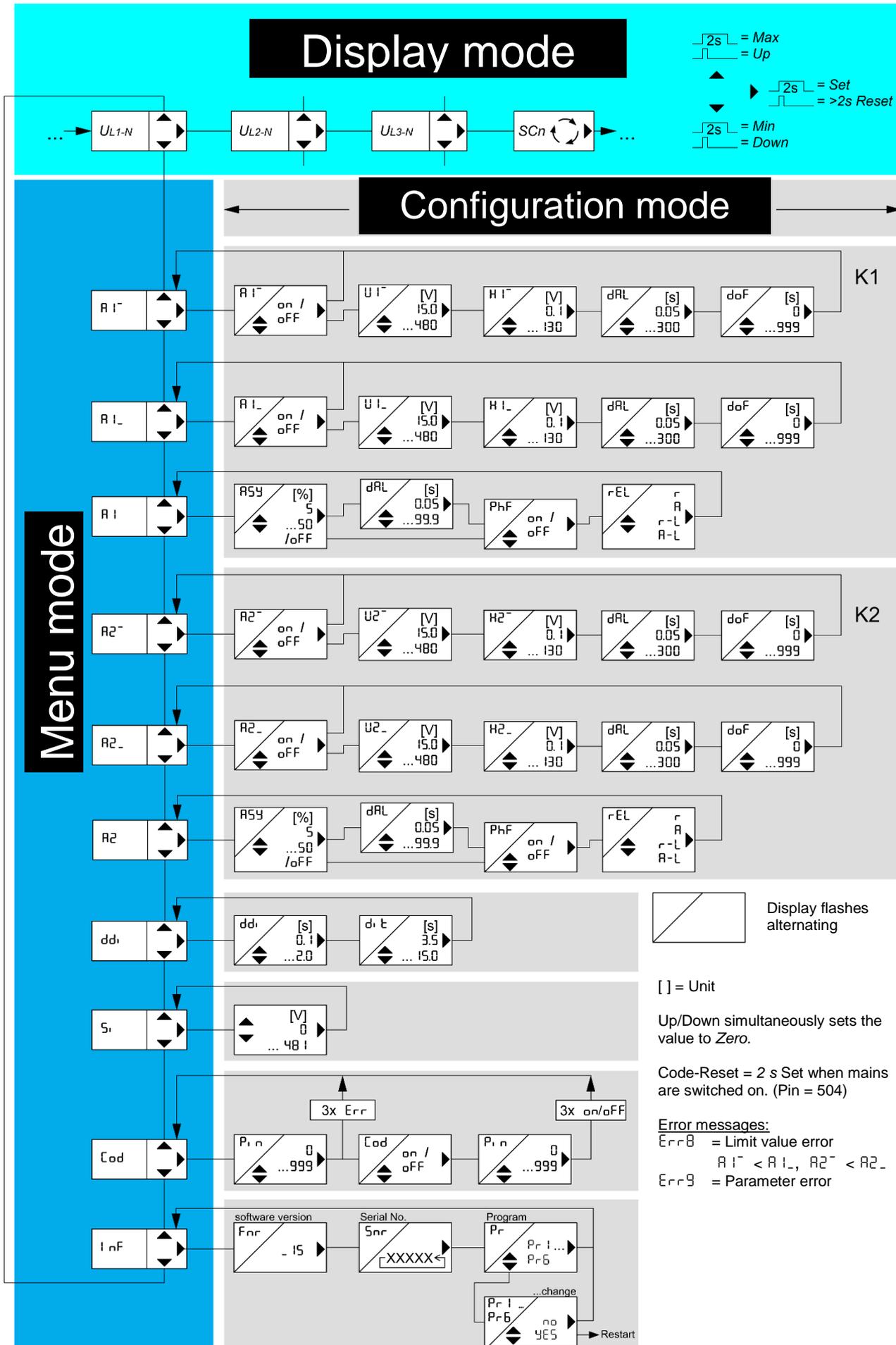
Pr	Connection	preset for rated voltage	Alarm1 (K1)	Alarm2 (K2)
*1	3 AC with N	230 V	Voltage + Asymmetry + Phase sequence	Voltage + Asymmetry + Phase sequence
2	3 AC without N	400 V	Voltage + Asymmetry + Phase sequence	Voltage + Asymmetry + Phase sequence
3	1 AC with N	230 V	Voltage	Voltage
4	DC	220 V	Voltage	Voltage
5	3 AC with N	230 V acc. to bdew	Voltage + Asymmetry + Phase sequence	Voltage + Asymmetry + Phase sequence
6	3 AC without N	100 V acc. to bdew	Voltage + Asymmetry + Phase sequence	Voltage + Asymmetry + Phase sequence

* factory set

Adjustment process:
- Press ▲ button 1x → display I nFo.
- Press ▶ button 3x → display Pr I.
- Set the program with the buttons ▲▼
- Press ▶ button 1x → display no.
- Press ▼ button 1x → display YES.
- Press ▶ button
  ⇒ Device resets and starts with the newly selected program

Hint: When changing programs, all parameters of the selected program are reset to "default settings" (see table „Default settings"). **Only change the parameters after having selected the correct program.**

Display mode

2s = Max
= Up
▲
▶ 2s = Set
▼ = >2s Reset
2s = Min
= Down

… | U_{L1-N} | U_{L2-N} | U_{L3-N} | SCn | …

Configuration mode

Menu mode

K1

A1⁻

| A1⁻ on / oFF | U1⁻ [V] 15.0 …480 | H1⁻ [V] 0.1 … 130 | dAL [s] 0.05 …300 | doF [s] 0 …999 |

A1_

| A1_ on / oFF | U1_ [V] 15.0 …480 | H1_ [V] 0.1 … 130 | dAL [s] 0.05 …300 | doF [s] 0 …999 |

A1

| ASY [%] 5 …50 /oFF | dAL [s] 0.05 …99.9 | PhF on / oFF | rEL r A r-L A-L |

K2

A2⁻

| A2⁻ on / oFF | U2⁻ [V] 15.0 …480 | H2⁻ [V] 0.1 … 130 | dAL [s] 0.05 …300 | doF [s] 0 …999 |

A2_

| A2_ on / oFF | U2_ [V] 15.0 …480 | H2_ [V] 0.1 … 130 | dAL [s] 0.05 …300 | doF [s] 0 …999 |

A2

| ASY [%] 5 …50 /oFF | dAL [s] 0.05 …99.9 | PhF on / oFF | rEL r A r-L A-L |

ddi

| ddi [s] 0.1 …2.0 | di t [s] 3.5 … 15.0 |

Si

| [V] 0 … 481 |

Cod

3x Err | 3x on/oFF

| Pin 0 …999 | Cod on / oFF | Pin 0 …999 |

InF

software version | Serial No. | Program
| Fnr - 15 | Snr XXXXX | Pr Pr 1… Pr6 |

…change
| Pr 1 … Pr6 no YES | → Restart

Display flashes alternating

[ ] = Unit

Up/Down simultaneously sets the value to *Zero.*

Code-Reset = 2 s Set when mains are switched on. (Pin = 504)

Error messages:
Err8 = Limit value error
A1⁻ < A1_, A2⁻ < A2_
Err9 = Parameter error

6.3 Description of the parameters

Parameter	Display	Explanation	Adjustment range
Alarms	A1¯ A2¯ A1_ A2_	Alarm 1, 2 Overvoltage (voltage increase) Alarm 1, 2 Undervoltage (voltage decrease)	on , oFF
Upper limit	U1¯ U2¯	Upper limit, U1¯ < U1_ → Er8 U2¯ < U2_ → Er8	15.0 … 480 26.0 … 830 10.0 … 600
Lower limit	U1_ U2_	Lower limit, U1_ > U1¯ → Er8 U2_ > U2¯ → Er8	15.0 … 480 26.0 … 830 10.0 … 600
Hysteresis upper limit	H1¯ H2¯	253 (Limit) - 5(Hysteresis) = 248 (Reset value)	0.1 … 130
Hysteresis lower limit	H1_ H2_	196 (Limit) + 5(Hysteresis) = 201 (Reset value)	0.1 … 130
Alarm delay (delay Alarm)	dAL	An alarm is suppressed for the set time (seconds).	0.05 … 300
Reset delay (delay Off)	doF	Reset is delayed for the set time. On voltage recovery the control voltage, first the reset delay time counts down. All alarms, excepting during false phase sequence, are suppressed during this time.	0 … 999
Asymmetry	ASY	Maximum phase asymmetry in %, e.g. 10% (Limit) – 1% (Fixed hysteresis) = 9% (Reset value) Measuring value: (Umin – Umax) / Uaverage L123	oFF , 5 … 50
Phase sequence	PhF	clockwise rotating field, alarm will not be delayed	on , oFF
Relay function	rEL	Idle current r : Relay is pulled up in good state (= no alarm) and releases on alarm and even when the control voltage is switched off. Locked r-L : Reset required Operating current A : Relay is released in good state and operates (attracts) on alarm or when the control voltage is switched off and during device faults. Locked A-L : Reset required	r A r-L A-L
Delay display	ddi	Interval during which the display is updated	0.1 … 2.0
Display time	di t	Display duration per measurement in Scn mode	3.5 … 15.0

6.4 Possible indications in display

Display mode

A1 , A2 , A1L , A2L , A1L , A2L	Alarm1, Alarm2, additional "L" locked, Reset required to reset
Er8 … Er9	Error messages (see 11. Error messages and measures)

Menu mode / Configuration mode

A1 … A2	Alarms
Si	Simulation
Fnr , Snr	Firmware version, serial number
Pr	Program

7 Troubleshooting

Fault	Cause	Remedy
`EEE` or `-EE` appears in the display	Measurement is above/below range	Measured voltage is too large or too small; comply with measurement range

`Er8` appears in the display	Limit error	`U1_` > `U1¯`
		 `U2_` > `U2¯`
		 Upper limit must be larger than lower limit

`Er9` appears in the display	Parameter error, internal error	Switch unit on and off, if necessary, rest to factory settings. If the error message continues, send the unit back to the factory for repair.
The device cannot be configured	Code lock	The code lock provides protection against unauthorised manipulations on the device. If the code lock is active, the parameters cannot be changed. The pin can be set by the user. <u>Pin code unknown? -> Perform a code reset:</u> ▪ While switching on the control voltage, keep the "Set" key pressed for **2 s** ⇒ The display alternates `888` – `Cod` – `oFF` – `888` ⇒ Release the Set key Code lock is switched off, Pin code = 504
Implausible voltage value	Pr selected with N, but N not connected	Select Pr without N or connect N

8 Technical Data

<u>Control voltage Us:</u>
    Rated connection   AC/DC 24-270 V, 0/45...65 Hz, < 5 VA
                                    DC: 20.4...297 V, AC: 20.4...297 V

<u>Housing:</u>
    Mounting type   V4
    Front-to-back size   55 mm
    Dimensions (W x H x D)   90 x 70 x 58 mm
    Wiring connection single strand   ea. 1 x 4 mm^2
    Finely stranded with wire end ferrule   ea. 1 x 2.5 mm^2
    Protection class, housing   IP 30
    Protection class, terminals   IP 20
    Mounting   Snap-on fastening on 35 mm mounting rail acc EN 60 715 or with M4 screwed attachment (additional bar not included in the scope of delivery)
    Weight: approx. 200 g

We reserve the right to make technical changes