Short Operating Manual UFR1001E

from Firmware:0-01
updated:120522WL/Fz

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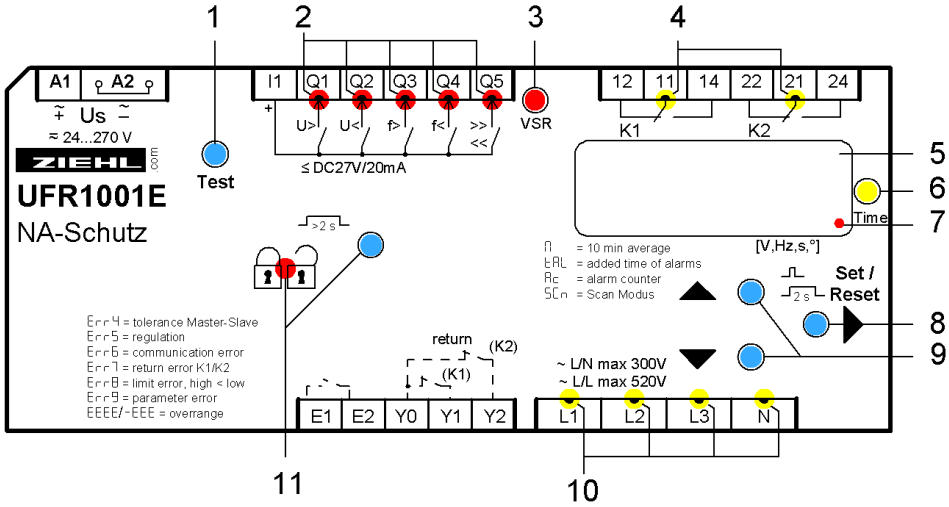
Temperature-Relays, Grid-Relays, Digital Panelmeters MINIPAN, Switching Relays and Controls, Transducers

- NA-protection according to VDE-AR-N 4105, power generators at the low voltage grid
- for use in power generators at the medium voltage grid according to BDEW
- with selectable vector shift detection

Operating controls



1 Test button

Press shortly	Output relays de-energize immediately. If Y1+Y2 are connected and the feedback signal is activated, the tripping time is displayed as long as no button is actuated

2 LEDs Frequency / voltage, above / below threshold (red)

ON, AL or AL 1	Above / below threshold
Flashing, AL or AL 1	OFF-delay doF active

3 LED Vektor shift (VSR, red)

ON, AL	Threshold value for vector shift exceeded
Flashing, AL	OFF-delay doF active

4 LEDs Relay status (yellow)

OFF	Relays de-energized
ON	Relays energized

5 Digital display 4-digit (red)

Depending on program, display of current voltage, frequency, vector shift, average value
Display of alarm message AL , AL 1
Display of error with error code e.g. Err9

6 LED Time (yellow)

ON	A time is displayed

7 Backmost decimal point (red)

OFF	Display mode
Lightning	Menu mode
Flashing	Configuration mode

8 Set / Reset button ▶ (in display mode, normal state)

Press shortly	Display of next measured value / alarm counter
Press for > 2 s	Reset, quit error messages
Press for > 4 s	Display of program, e.g. Pr 1
Press for > 10 s	Display of firmware version, e.g. 0-01

9 **Up / Down button** ▲▼ (in display mode, normal state)

Press shortly	Change to the menu mode, display of alarm memory (Down) / cumulative time of alarms (Up), additional pushing of Set button for ≥ 2 s makes a reset of the stored values
Press for > 2 s	Display of MAX (Up) / MIN (Down) measured values, additional pushing of Set button for ≥ 2 s deletes the stored values

10 **LEDs Allocation of the measured value** (yellow)

LEDs	Measured value
Lx and N ON	Voltage (L1 against N, L2 against N, L3 against N)
Lx and Ly ON	Voltage (L1 against L2, L2 against L3, L1 against L3)
Lx flashing quickly	Vector shift (L1, L2, L3)
L1 flashing	Frequency

11 **Sealable button + LED**

Press for > 2 s	Lock / Unlock
LED red	Settings and simulation mode are locked, in case of setting attempts `Loc` is displayed for 3 s
LED green	Setting and simulation enabled

Description of the connections

A1 and A2	Rated control supply voltage U_s, see Technical Data (any polarity)
11, 12, 14; 21, 22, 24	Relay K1 and K2
E1 – E2 Enable-input, needed only for vector shift detection	Volt-free n/c contact
	Contact closed, no evaluation of vector shift (suppression)
	Contact open, evaluation of vector shift
Y0, Y1, Y2 Inputs, feedback contacts	Volt-free n/o or n/c contact, self-learning when switching on
	Adjust the turn-on time of the section switch under `trEL.` / switch-off if not used
I1	Supply voltage for digital outputs, max. 27 V DC
Q1…Q4	Digital output over-/undervoltage/-frequency
Q5	Digital output Error, in Pr 3 + 4 additionally the 2nd threshold value
L1, L2, L3, N	Phase L1, L2, L3 and neutral conductor

Important notice

In the supply line in the vicinity of the device (easily accessible), a switch marked as disconnecting device as well as an overcurrent protection element (rated current ≤ 6 A) have to be provided.

Attention!
For the rated control supply voltage, see label at the side of the unit!

WARNING

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

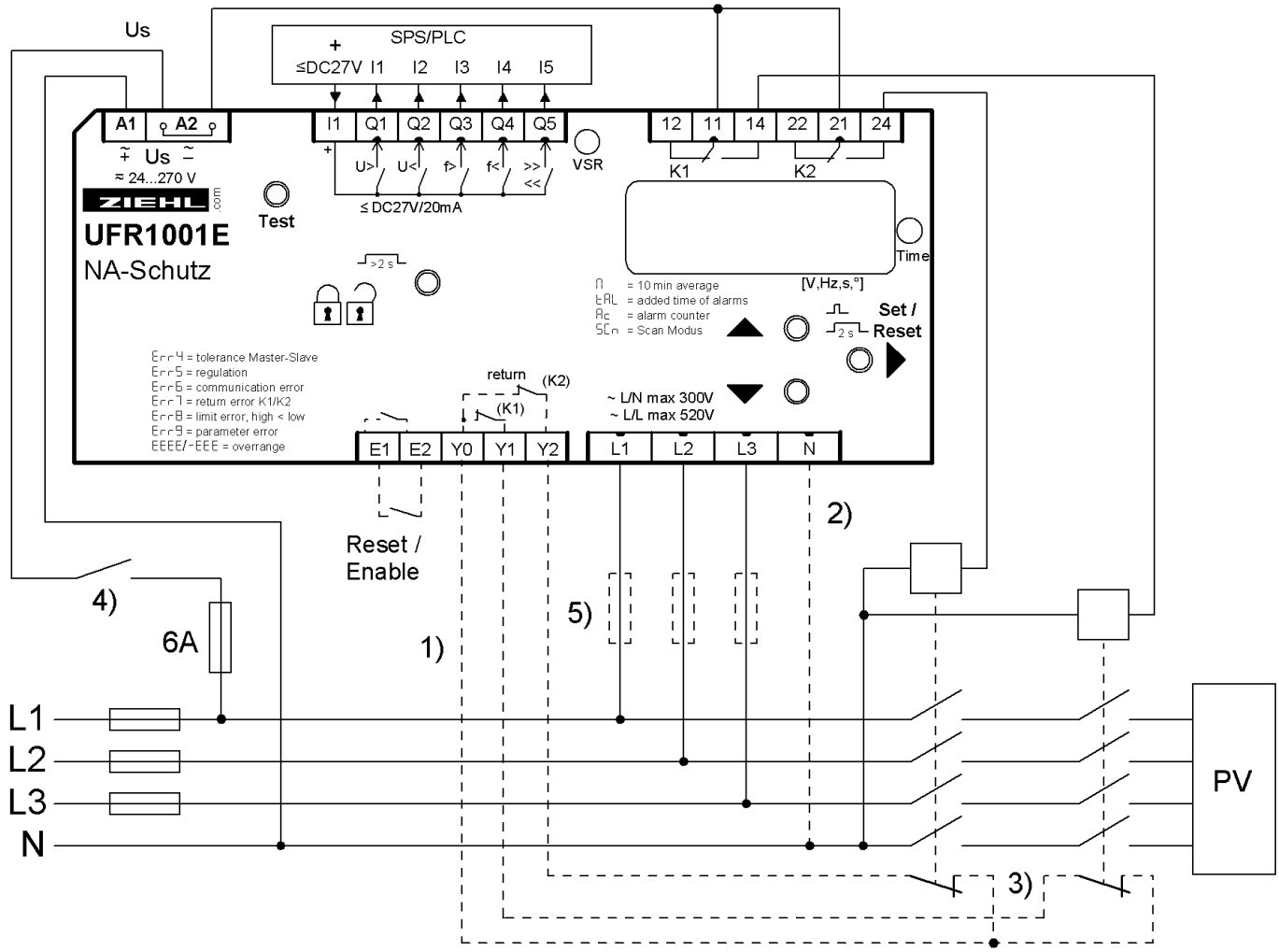
Mounting

The device can be mounted:

- Distribution panel or control panel on 35 mm rail according to EN 60715

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.

Connection diagram



1) Feedback contacts not connected: set rEL. → trEL. → oFF.
2) N connected: select Pr 1 , Pr 3 or Pr 5
3) Nc- or no-contacts can be connected, self-learning when switching on
4) Switch off of plant without recording an alarm, e.g. with contact of a ripple control receiver
5) Fuses only when line protection necessary, e.g. 3x16A

Program setup

The suitable program must be set on the CM-UFD.M21 in accordance with the application. If the CM-UFD.M21 is sealed/locked (red LED lightning), sealing has to be deactivated first.

Pr	Connection	Threshold values	Voltage
*1	3 AC with N	Low voltage 1x overvoltage, 1x undervoltage 1x overfrequency, 1x underfrequency 10 min average value, 1x vector shift	230 V
2	3 AC w/o N		400 V
3	3 AC with N	Medium voltage 2x overvoltage, 2x undervoltage 2x overfrequency, 2x underfrequency 10 min average value, 1x vector shift	57.7 V
4	3 AC w/o N		100 V
5	3 AC with N		230V
6	3 AC w/o N		400V

* default setting

Adjustment process:

- If present, remove seal (only authorised person)
- Apply control supply voltage at A1-A2
- Slightly lift the button cover and turn 180°
- Actuate the small blue button by strong pressing on the button cover (LED starts flashing) until the green LED is lightning.
- Press button ▲ 1x → Display InFo.
- Press button ▶ 5x → Display Pr 1.
- 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.

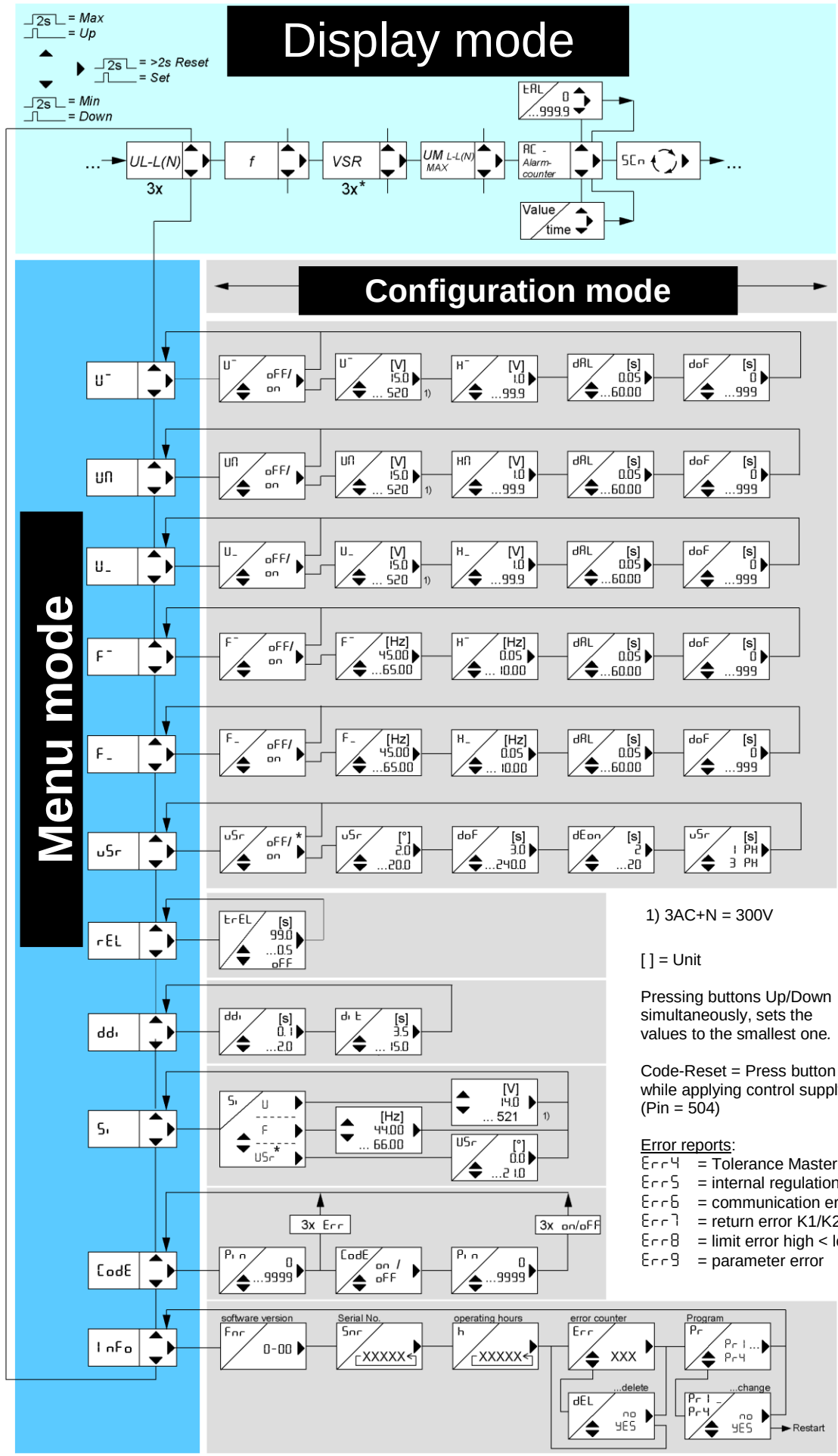
Technical data

Rated control supply voltage U_S:	24-240 V AC/DC, DC / 40-70 Hz, <5 VA
Tolerance	-15…+10 %
Output relays:	2 c/o contacts
Max. switching voltage	400 V AC
Conventional thermal current I_{th}	6 A
Inrush current (at 10 % ED)	25 A max. 4 s / 50 A max. 1 s
Rated operational current I_e (AC15)	230 V AC / 1.5 A
Fuse rating to achieve short-ciruit protection	max. gG/gL 6 A
Mechanical lifetime	30 x 10^6 switching cycles
Electrical lifetime	1 x 10^6 switching cycles at AC12, 230 V, 6 A
Output voltage - transistor outputs	Q1-Q5
Operational voltage V_Q	4.5-27 V DC
Max. current consumption Q1…Q5	20 mA / output
Input circuit - feedback contacts	Y0 – Y1/2
No-load voltage at the control inputs	15-35 V DC
	Feedback time section switch 0.5-99.0 s selectable

Subject to change without prior notice

Control chart

Pr 1 **3AC with N, acc. to VDE-AR-N 4105** **Pr 2** **3AC w/o N, acc. to VDE-AR-N 4105**



1) 3AC+N = 300V

[ ] = Unit

Pressing buttons Up/Down simultaneously, sets the values to the smallest one.

Code-Reset = Press button Set *2 s* while applying control supply voltage. (Pin = 504)

Error reports:

Err4 = Tolerance Master Slave
Err5 = internal regulation
Err6 = communication error
Err7 = return error K1/K2
Err8 = limit error high < low
Err9 = parameter error

Default settings and firmware version

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

Menu point	Parameter / Unit		Default settings						Users data
			Low voltage		Medium voltage				
			3AC+N 230V	3AC 400V	3AC+N 57,7V	3AC 100V	3AC+N 230V	3AC 400V	
			Pr 1 *	Pr2	Pr3	Pr4	Pr5	Pr6	
U--	U-- Alarm on/off		-	-	on	on	on	on	
	U-- Overvoltage	V	-	-	66.4	115	264	458	
	H-- Hysteresis	V	-	-	1.0	1.0	3.0	3.0	
	dAL ON-delay	s	-	-	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	-	-	60	60	60	60	
U-	U- Alarm on/off		on	on	on	on	on	on	
	U- Overvoltage	V	264	458	62.3	108	249	430	
	H- Hysteresis	V	5.0	5.0	1.0	1.0	3.0	3.0	
	dAL ON-delay	s	0.10	0.10	60.00	60.00	60.00	60.00	
	doF OFF-delay	s	60	60	60	60	60	60	
UN	UN Alarm on/off		on	on	oFF	oFF	oFF	oFF	
	UN Overvoltage	V	253	438	253	438	253	438	
	HN Hysteresis	V	3.0	3.0	3.0	3.0	3.0	3.0	
	dAL ON-delay	s	0.10	0.10	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	60	60	60	60	60	60	
U_	U_ Alarm on/off		on	on	on	on	on	on	
	U_ Undervoltage	V	184	318	46.2	80.0	184	318	
	H_ Hysteresis	V	5.0	5.0	1.0	1.0	3.0	3.0	
	dAL ON-delay	s	0.10	0.10	2.70	2.70	2.70	2.70	
	doF OFF-delay	s	60	60	60	60	60	60	
U__	U__ Alarm on/off		-	-	oFF	oFF	oFF	oFF	
	U__ Undervoltage	V	-	-	26.0	45.0	104	180	
	H__ Hysteresis	V	-	-	1.0	1.0	2.0	2.0	
	dAL ON-delay	s	-	-	0.30	0.30	0.30	0.30	
	doF OFF-delay	s	-	-	60	60	60	60	
F--	F-- Alarm on/off		-	-	oFF	oFF	oFF	oFF	
	F-- Overfrequency	Hz	-	-	51.50	51.50	51.50	51.50	
	H-- Hysteresis	Hz	-	-	1.45	1.45	1.45	1.45	
	dAL ON-delay	s	-	-	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	-	-	60	60	60	60	
F-	F- Alarm on/off		on	on	on	on	on	on	
	F- Overfrequency	Hz	51.50	51.50	51.50	51.50	51.50	51.50	
	H- Hysteresis	Hz	1.45	1.45	1.45	1.45	1.45	1.45	
	dAL ON-delay	s	0.10	0.10	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	60	60	60	60	60	60	

Menu point	Parameter / Unit			Default settings						Users data
				Low voltage		Medium voltage				
				3AC+N 230V	3AC 400V	3AC+N 57,7V	3AC 100V	3AC+N 230V	3AC 400V	
				Pr 1 *	Pr2	Pr3	Pr4	Pr5	Pr6	
F_	F_	Alarm on/off		on	on	on	on	on	on	
	F_	Underfrequency	Hz	47.50	47.50	47.50	47.50	47.50	47.50	
	H_	Hysteresis	Hz	1.00	1.00	1.00	1.00	1.00	1.00	
	dAL	ON-delay	s	0.10	0.10	0.10	0.10	0.10	0.10	
	doF	OFF-delay	s	60	60	60	60	60	60	
F__	F__	Alarm on/off		-	-	oFF	oFF	oFF	oFF	
	F__	Underfrequency	Hz	-	-	47.50	47.50	47.50	47.50	
	H__	Hysteresis	Hz	-	-	1.00	1.00	1.00	1.00	
	dAL	ON-delay	s	-	-	0.10	0.10	0.10	0.10	
	doF	OFF-delay	s	-	-	60	60	60	60	
uSr	uSr	Alarm on/off		oFF	oFF	oFF	oFF	oFF	oFF	
	uSr	Vector shift	°	10.0	10.0	10.0	10.0	10.0	10.0	
	doF	OFF-delay	s	3	3	3	3	3	3	
	dEon	Suppression time	s	2	2	3	3	3	3	
	uSr	Number of phases		3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	
rEL	trEL	Switching time	s	5.0	5.0	oFF	oFF	oFF	oFF	
ddi	ddi	Display delay	s	0.5	0.5	0.5	0.5	0.5	0.5	
	di t	Display duration	s	3.5	3.5	3.5	3.5	3.5	3.5	
Si	U	Voltage	V	230	400	57.7	100	230	400	
	F	Frequency	Hz	50.00	50.00	50.00	50.00	50.00	50.00	
	uSr	Vector shift	°	0.0	0.0	0.0	0.0	0.0	0.0	
CodE	Pin	Pin code		504	504	504	504	504	504	
InFo	Fnr	Firmware version		0-00	0-00	0-00	0-00	0-00	0-00	
	Snr	Serial number		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	
	h	Operating hours	h	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	
	Err	Error counter		xxx	xxx	xxx	xxx	xxx	xxx	
	Pr	Program		1	2	3	4	5	6	

* factory preset

Display of the program: InFo → Pr or when switching on
Display of the firmware version: InFo → Fnr

Protective functions, default settings according to VDE-AR-N 4105 section 6.5.2

Voltage increase protection	U>>	U>	1.15 Un	100 ms
Voltage increase protection	U>	U>	1.1 Un	100 ms
Voltage decrease protection	U<	U<	0.8 Un	100 ms
Frequency increase protection	*f*>	F>	51.5 Hz	100 ms
Frequency decrease protection	*f*<	F<	47.5 Hz	100 ms

Troubleshooting

Error	Cause	Remedy
EEEE or -EEE appears in the display	Measured voltage, frequency or the vector shift is too large or too small	Consider the measuring range
Err4 appears in the display	Too high internal measurement deviation of the two measuring channels	Perform a reset → interrupt the control supply voltage for >5 s
Err5 appears in the display	Error internal regulation	
Err6 appears in the display	Communication error internal interface	
Err7 appears in the display + LED d of the faulty output circuit is lightning	Error feedback contacts	Feedback contacts not connected - set trEL. → oFF Feedback contacts connected - check the correct connection - Adjust the turn-on time of the section switch under trEL. - Perform a reset → interrupt the control supply voltage for >5 s
Err8 appears in the display	Hysteresis error: overlapping of the release points	Upper threshold value must be higher than the lower threshold value, check the threshold values
Err9 appears in the display	Configuration error	Reset to factory settings, see “Program setup”
A time expires in the display	If a OFF-delay doF is active, the time runs down in the display (the shortest one first)	Wait until the time is complete (depending on the setting, several times may elapse one after the other)
Device cannot be configured / only the threshold values can be configured	Code lock / Sealing activated	When having problems with the code lock (Pin forgotten), the lock can be deactivated and the pin can be reset to 504 , by pressing the button ▶ until CodE / oFF is shown in the display, while switching on the control supply voltage
Implausible voltage values	Pr selected with N, but N not connected	Select Pr without N or connect N
Loc appears in the display	Sealing is active	See „Program setup“
CodE appears in the display	Code lock is active	See „Code lock“