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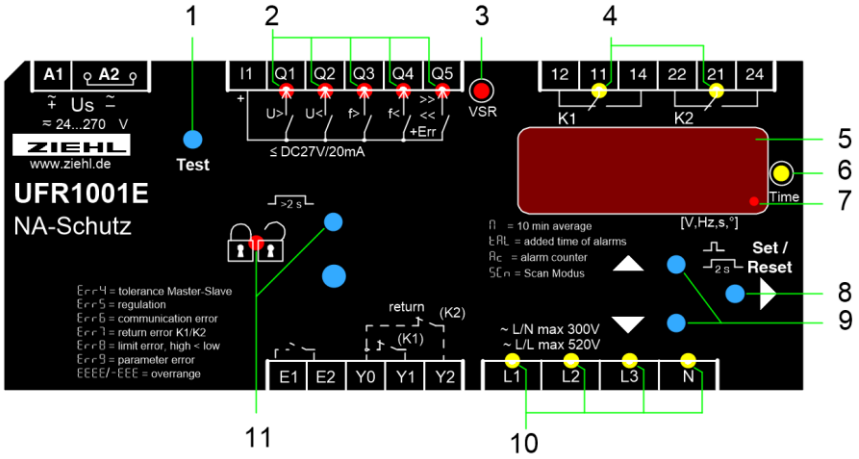
Quick Guide UFR1001E

updated: 2017-11-14/Ba
from Firmware: 0-08

- 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 and Rate of Change of Frequency (ROCOF,df/dt)

Detailed operating manual see: http://www.ziehl.com/en/AllProducts/detail/UFR1001E-54
New, Firmware 0-06: new program 15 with default settings for Switzerland
to VSE/EEA-CH 2014, Pr 20-23 (GB) vector shift (uSr) up to 65°
display of the firmware function InFo → Fnr or press “Set” for >10 s

1 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 / max 60s

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. 0-05

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, standby counter, standby time (Up), 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

2 Default settings and firmware version

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

Menu	Parameter / Unit		Default settings							Users Data
			Low voltage VDE-AR-N 4105			Medium voltage BDEW				
			3 AC+N 230V	3 AC 400V	2/1 AC+N 230V	3 AC+N 57,7V	3 AC 100V	3/2/1AC +N 230V	3 AC 400V	
			Pr 1 *	Pr2	Pr7	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 Response time	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	on	
	U- **Overvoltage**	V	264	458	264	62.3	108	249	430	
	H- Hysteresis	V	5.0	5.0	5.0	1.0	1.0	3.0	3.0	
	dAL Response time	s	0. 10	0. 10	0. 10	60.00	60.00	60.00	60.00	
	doF OFF-delay	s	60	60	60	60	60	60	60	
UN	UN Alarm on/off		on	on	on	oFF	oFF	oFF	oFF	
	UN **Overvoltage**	V	253	438	253	63.5	110	253	438	
	HN Hysteresis	V	3.0	3.0	3.0	1.0	1.0	3.0	3.0	
	dAL Response time	s	0. 10	0. 10	0. 10	0. 10	0. 10	0. 10	0. 10	
	doF OFF-delay	s	60	60	60	60	60	60	60	
U_	U_ Alarm on/off		on	on	on	on	on	on	on	
	U_ **Undervoltage**	V	184	318	184	46.2	80.0	184	318	
	H_ Hysteresis	V	5.0	5.0	5.0	1.0	1.0	3.0	3.0	
	dAL Response time	s	0. 10	0. 10	0. 10	2.70	2.70	2.70	2.70	
	doF OFF-delay	s	60	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 Response time	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 Response time	s	-	-	-	0. 10	0. 10	0. 10	0. 10	
	doF OFF-delay	s	-	-	-	60	60	60	60	

* factory preset **Display of the program**: `InFo` → `Pr` or when switching on

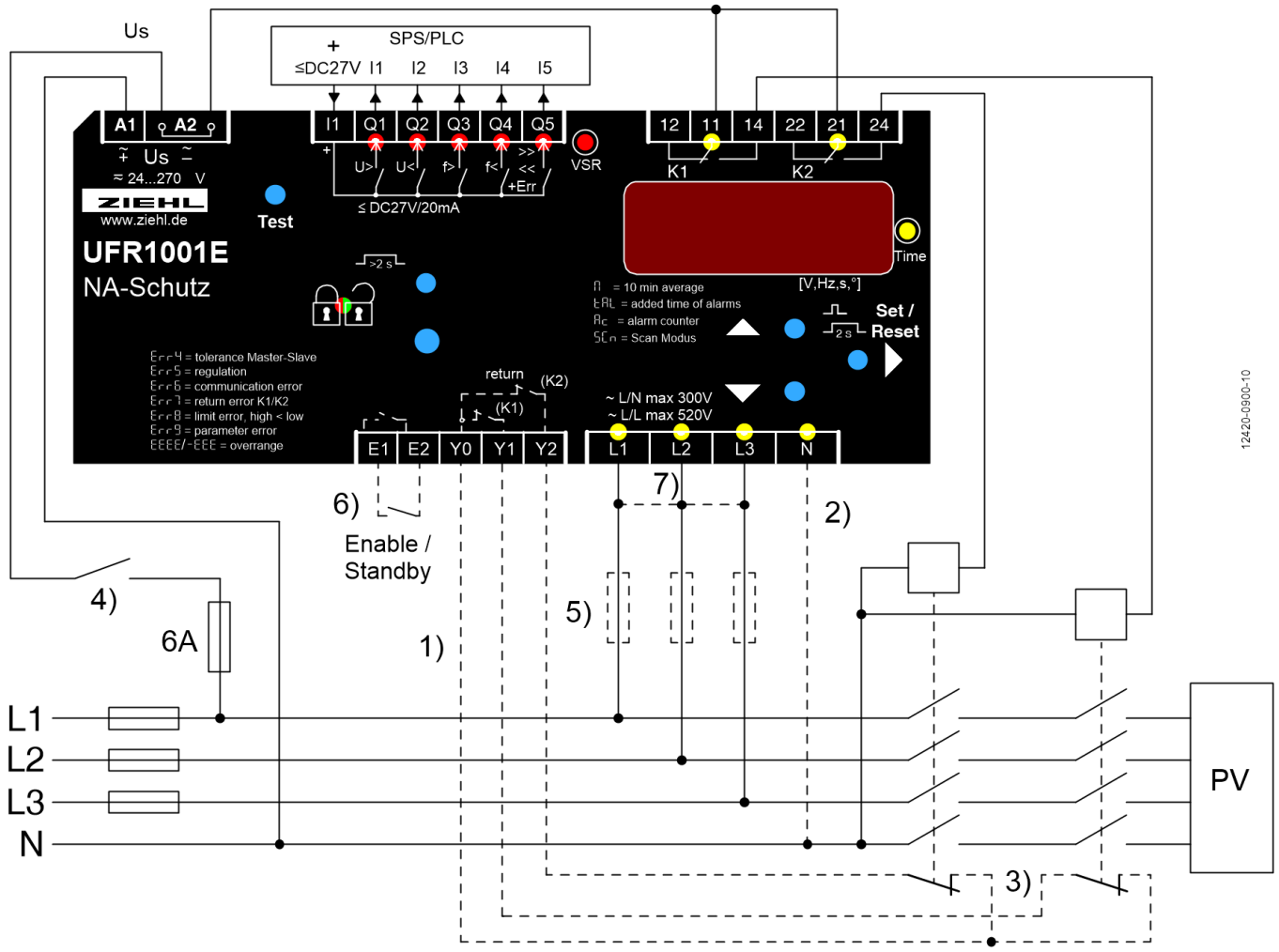
Menu	Parameter / Unit		Default settings							Users Data
			Low voltage VDE-AR-N 4105			Medium voltage BDEW				
			3 AC+N 230V	3 AC 400V	2/1AC+N 230V	3AC+N 57,7V	3 AC 100V	3/2/1AC+ N 230V	3 AC 400V	
			Pr 1 *	Pr2	Pr7	Pr3	Pr4	Pr5	Pr6	
F⁻	F⁻ Alarm on/off		on	on	on	on	on	on	on	
	F⁻ **Overfrequency**	Hz	51.50	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	1.45	
	dAL Response time	s	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	60	60	60	60	60	60	60	
F_	F_ Alarm on/off		on	on	on	on	on	on	on	
	F_ **Underfrequency**	Hz	47.50	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	1.00	
	dAL Response time	s	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	60	60	60	60	60	60	60	
F__	F__ Alarm on/off		-	c	-	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 Response time	s	-	-	-	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	-	-	-	60	60	60	60	
UonF	UonF on/off		oFF	oFF	oFF	oFF	oFF	oFF	oFF	
	UonF voltage	V	46.0	46.0	46.0	20.0	20.0	46.0	46.0	
uSr	uSr Alarm on/off		StbY	StbY	StbY	StbY	StbY	StbY	StbY	
	uSr **Vector shift**	°	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
	doF OFF-delay	s	3	3	3	3	3	3	3	
	dEon Suppression time	s	2	2	2	3	3	3	3	
	uSr Number of phases		3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	
rocF	rocF Alarm on/off		oFF	oFF	oFF	oFF	oFF	oFF	oFF	
	dFdt **delta f / delta t**	Hz /s	0.800	0.800	0.800	0.800	0.800	0.800	0.80	
	PEr periods		20	20	20	20	20	20	20	
	dAL Response time	s	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	60	60	60	60	60	60	60	
rEL	trEL Response time Yx	s	5.0	5.0	5.0	oFF	oFF	oFF	oFF	
	doFA Mode		ind	ind	ind	ind	ind	ind	ind	
	doFA Off-delay all	s	0	0	0	0	0	0	0	
ddi	ddi Display delay	s	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	di t Display duration SCn	s	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Si	U Voltage	V	230	400	230	57.7	100	230	400	
	F Frequency	Hz	50.00	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	0.0	
CodE	Pin Pincode		504	504	504	504	504	504	504	
InFo	Fnr Firmware version		0-06	0-06	0-06	0-06	0-06	0-06	0-06	
	Snr Serial number		xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
	h Operating hours	h	xxxx	xxxx	xxxx	xxxx	Xxxx	xxxx	xxxx	
	Err Error counter		xxx	xxx	xxx	xxx	xxx	xxx	xxx	
	Pr Program		1	2	7	3	4	5	6	

* factory preset **Display of the program**: InFo → Pr or when switching on

Default settings VDE-AR-N 4105:

Frequency increase protection f> F⁻ 51,5 Hz
Frequency decrease protection f< F_ 47,5 Hz
Voltage decrease protection U< U_ 0,8 Un 184 V
Voltage increase protection U> UN 1,1 Un 253 V
Voltage increase protection U>> U⁻ 1,15 Un 264 V
For all Limits: ON-delay dAL = 100 ms, OFF-delay doF = 60 s

3 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
6) Contact closed suppresses evaluation of feedback contacts and vector shift (`uSr .` → `on.`), suppresses evaluation of feedback contacts (`uSr .` → `y 142.`) or switches to standby (`uSr .` → `Stby.` = default) e.g. by ripple control receiver or clock
7) 1 phase Application connect L1-L2-L3, 2 phase Application L1 / L2+L3 (only Pr 5, 7, 10, 20)

4 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	Volt-free contact
	uSr . → oFF. , no function
	uSr . → on. , E1-E2 closed: vector shift active but not evaluated, monitoring of feedback contacts Y1/Y2 off for use with generator
	uSr . → StbY. , E1-E2 closed: K1 and K2 off (standby), vector shift off
	uSr . → Y1Y2. , E1-E2 closed: monitoring of feedback contacts Y1/Y2 off, vector shift off
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 rEL. → trEL. , switch-off (oFF .) if not connected or if switches are controlled from other device
I1	Supply voltage for digital outputs, max. 27 V DC
Q1…Q4	Digital output over-/undervoltage/-frequency, Q3 + Q4 = ROCOF
Q5	Digital output Error, in Program 3-6 additionally the 2nd threshold value
L1, L2, L3, N	Phase L1, L2, L3 and neutral conductor

5 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.

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.

6 Mounting

The device can be mounted:

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

7 Program setup

The suitable program must be set on the UFR1001E in accordance with the application. If the UFR1001E is sealed/locked (red LED lightning), sealing has to be deactivated first.

Pr	Connection	Treshold Values	Voltage	Country / Standard
*1	3 AC with N	Low voltage 1x over voltage, 1x under voltage 1x over frequency, 1x under frequency 10 min average value, 1x vector shift 1x ROCOF	230V	VDE-AR-N 4105
2	3 AC without N		400V	
7	2/1 AC with N		230V	
3	3 AC with N	Medium voltage 2x over voltage, 2x under voltage 2x over frequency, 2x under frequency 10min mean value, 1x vector shift 1x ROCOF	57,7V	BDEW Juni 2008 nach 3.2.3.3-1
4	3 AC without N		100V	
5	3/2/1 AC with N		230V	
6	3 AC without N		400V	
10	3/2/1 AC with N	1x overvoltage, 1x under voltage 1x over frequency, 1x under frequency 10 min average value, 1x vector shift 1x ROCOF	230V	ÖVE/ÖNORM E 8001-4-712
15	3 AC with N		230V	VSE/EEA-CH 2014
20	3/2/1 AC with N	2x over voltage, 2x under voltage 2x over frequency, 2x under frequency 10min mean value, 1x vector shift 1x ROCOF	230V	G83/2 + G59/3
21	3 AC without N		400V	
22	3 AC with N		57,7V	
23	3 AC without N		100V	

* 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 ▶

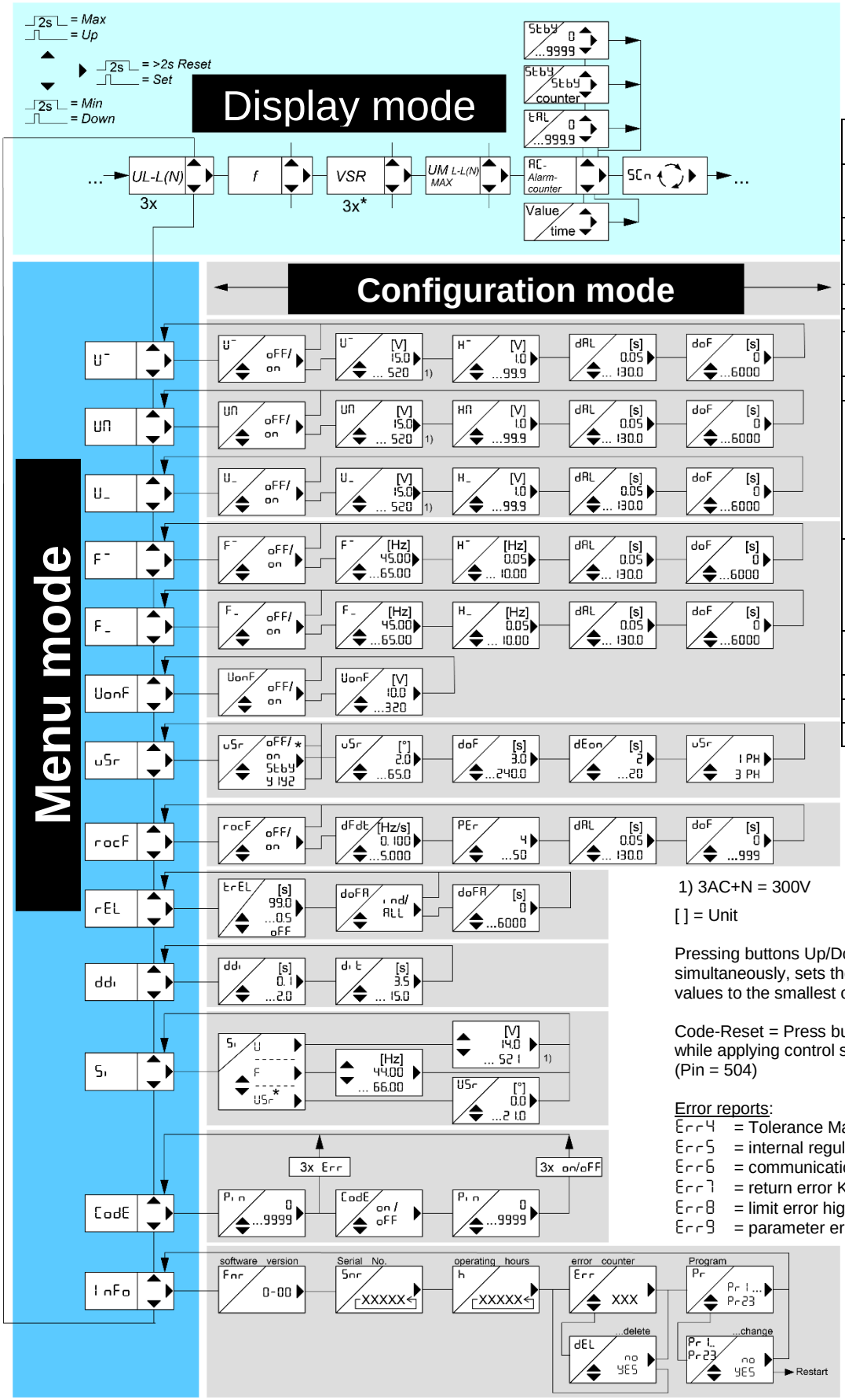
⇒ Device resets and starts with the newly selected program

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.

8 Technical data

Rated control supply voltage U_s:	24-270V AC/DC -15…+10 %, DC / 40-70 Hz, <5 VA
Output relays:	2 c/o contacts
Max. switching voltage	400 V AC
Inrush current (at 10 % ED)	25 A max. 4 s / 50 A max. 1 s
Rated operational current I_e (AC15)	230 V AC / 6 A
Fuse rating to achieve short-ciruit protection	max. gG/gL/B 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

9 Control chart, Pr1, 2, 7, 10 (3-6, 20-23 Detailed operating manual see http://www.ziehl.com/en/AllProducts/detail/UFR1001E-54)



Pr	Connection	Country / Standard
*1	3 AC + N	VDE-AR-N 4105
2	3 AC	
7	2 / 1 AC + N	
3	3 AC + N	BDEW Juni 2008 nach 3.2.3.3-1
4	3 AC	
5	3 / 2 / 1 AC + N	
6	3 AC	
10	3 / 2 / 1 AC + N	ÖVE/ ÖNORM E 8001-4-712
15	3 AC + N	VSE/EEA-CH 2014
20	3 / 2 / 1 AC + N	G83/2 + G59/3
21	3 AC	
22	3 AC + N	
23	3 AC	

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

10 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	Tolerance error, internal measurement value deviation of both 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 even after 2 automatic repeated trials of switching on + LED K1 and/or K2 is lightning	Error feedback contacts, switches not connected correctly or broken or switches are controlled from other device	Feedback contacts not connected - set rEL . → trEL. → oFF Feedback contacts connected - check the correct connection - Adjust the turn-on time of the section switch under rEL . → 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“
StbY appears in the display	Standbymode, E1-E2 closed	check parameter uSr.
AL and LED Q3 (f>) is on, reading in good range	hysteresis for F- incorrectly	Ceck hysteresis for reset point 50,05 Hz

***** If the error cannot be patched by a reset, send back to factory for repair.