

Quick Guide UFR1001E

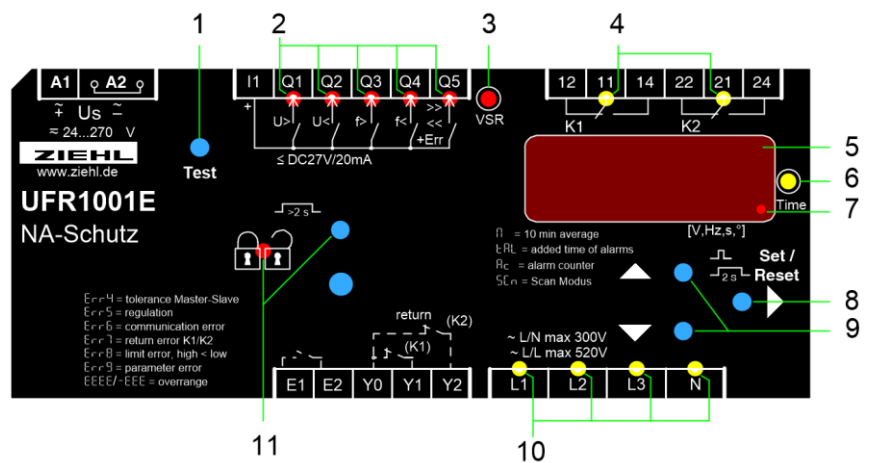
updated: 2019-02-13/Fu
from Firmware: 0-10

- NA-protection according to VDE-AR-N 4105:2011+2018-11, power generators at the low voltage grid, TAR medium voltage VDE-AR-N 4110:2018-11
- 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: <https://www.ziehl.com/en/products/?view=detail&detail=54>
New, Firmware 0-10: default setting program 2 for low voltage VDE-AR-N 4105:2018-11
4 new programs (11-14) for medium voltage according to 4110:2018-11, new test mode
(display of the firmware function $I_n f_0 \rightarrow F_{nr}$ or press "Set" for >10 s)

1 Operating controls



1 Test button

Press	Display <u>test-menu</u> : Relay K1 ($E5E1$) or K2 ($E5E2$) can be tested independently. (3min shortly without a button is pressed = go back to the normal mode)
-------	--

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

ON, RL or $RL \Omega$	Above / below threshold
Flashing, RL or $RL \Omega$	OFF-delay d_{oF} active

3 LED Vektor shift (VSR, red)

ON, RL	Threshold value for vector shift exceeded
Flashing, RL	OFF-delay d_{oF} 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 RL , $RL \Omega$
Display of error with error code e.g. E_{rr9}

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. $P_r 1$
Press for > 10 s	Display of firmware version, e.g. $0-10$



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 volt. VDE-AR-N 4105:			Medium voltage VDE-AR-N 4110:2018-11					
		2011	2018	2011						
		3 AC+N 230V Pr 1	3 AC +N 230V Pr 2 *	2/1 AC+N 230V Pr 1	3 AC+N 57,7V Pr 11	3 AC 100V Pr 12	3/2/1AC+N 230V Pr 13	3 AC 400V Pr 14		
U ⁻⁻ 59.S2 59>S2	U ⁻⁻ Alarm on/off		-	on	-	Pr 11	Pr 12	Pr 13	Pr 14	
	U ⁻⁻ Overvoltage	V	-	287	-	on	on	on	on	
	H ⁻⁻ Hysteresis	V	-	350	-	69.2	120	287	498	
	dRL Response time	s	-	0.10	-	1.0	1.0	3.0	3.0	
doF OFF-delay	s	-	60	-	0.30	0.30	0.10	0.10		
U ⁻ 59.S1 59>S1	U ⁻ Alarm on/off		on	oFF	on	60	60	60	60	
	U ⁻ Overvoltage	V	264	264	264	on	on	oFF	oFF	
	H ⁻ Hysteresis	V	5.0	12.0	5.0	63.5	110	249	430	
	dRL Response time	s	0.10	0.10	0.10	1.0	1.0	3.0	3.0	
doF OFF-delay	s	60	60	60	180.0	180.0	60.0	60.0		
UN ⁻ 59-Av	UN ⁻ Alarm on/off		on	on	on	60	60	60	60	
	UN ⁻ Overvoltage	V	253	253 ³	253	oFF	oFF	oFF	oFF	
	HN ⁻ Hysteresis	V	3.0	5.0	3.0	63.5	110	253	438	
	dRL Response time	s	0.10	0.10	0.10	1.0	1.0	3.0	3.0	
doF OFF-delay	s	60	60	60	0.10	0.10	0.10	0.10		
U ₋ 27.S1 27<S1	U ₋ Alarm on/off		on	on	on	60	60	60	60	
	U ₋ Undervoltage	V	184	184	184	on	on	on	on	
	H ₋ Hysteresis	V	5.0	12.0	5.0	46.2	80.0	184	318	
	dRL Response time	s	0.10	3.00 ³	0.10	1.0	1.0	35.0	35.0	
doF OFF-delay	s	60	60	60	2.70	2.70	1.00	1.00		
U ₋₋ 27.S2 27<S2	U ₋₋ Alarm on/off		-	on	-	60	60	60	60	
	U ₋₋ Undervoltage	V	-	103	-	oFF	oFF	oFF	oFF	
	H ₋₋ Hysteresis	V	-	93.0	-	26.0	45.0	111	180	
	dRL Response time	s	-	0.30 ³	-	1.0	1.0	108	108	
doF OFF-delay	s	-	60	-	0.30	0.30	0.30	0.30		
F ⁻⁻ 81.S2 81>S2	F ⁻⁻ Alarm on/off		-	oFF	-	60	60	60	60	
	F ⁻⁻ Overfrequency	Hz	-	52.50	-	oFF	oFF	on	on	
	H ⁻⁻ Hysteresis	Hz	-	2.40 ²	-	51.50	51.50	52.50	52.50	
	dRL Response time	s	-	0.10	-	1.40 ²	1.40 ²	2.40 ²	2.40 ²	
doF OFF-delay	s	-	60	-	0.10	0.10	0.10	0.10		

* factory preset

Menu	Parameter / Unit		Default settings 							Users Data
			Low volt. VDE-AR-N 4105:			Medium voltage VDE-AR-N 4110:2018-11				
			2011	2018	2011	3 AC+N	3 AC	3/2/1AC+N	3 AC	
			3 AC+N 230V	3 AC+N 230V	2/1 AC+N 230V	3 AC+N 57,7V	3 AC 100V	3/2/1AC+N 230V	3 AC 400V	
			Pr 1	Pr 2 *	Pr 1	Pr 11	Pr 12	Pr 13	Pr 14	
F ⁻ 81.S1 81>S1	F ⁻ Alarm on/off		on	on	on	oFF	oFF	on	on	
	F ⁻ Overfrequency	Hz	5 150	5 150	5 150	5 150	5 150	5 150	5 150	
	H ⁻ Hysteresis	Hz	1,45 ¹	1,40 ²	1,45 ¹	1,40 ²	1,40 ²	1,40 ²	1,40 ²	
	dRL Response time	s	0.10	0.10	0.10	5.40	5.40	5.00	5.00	
	doF OFF-delay	s	60	60	60	60	60	60	60	
F ₋ 81.S1 81<S1	F ₋ Alarm on/off		on	on	on	oFF	oFF	on	on	
	F ₋ Underfrequency	Hz	47.50	47.50	47.50	47.50	47.50	47.50	47.50	
	H ₋ Hysteresis	Hz	1.00	0.10	1.00	2.40 ⁴	2.40 ⁴	2.40 ⁴	2.40 ⁴	
	dRL Response time	s	0.10	0.10	0.10	0.40	0.40	0.10	0.10	
	doF OFF-delay	s	60	60	60	60	60	60	60	
F ₋₋ 81.S2 81<S2	F ₋₋ Alarm on/off		-	oFF	-	oFF	oFF	oFF	oFF	
	F ₋₋ Underfrequency	Hz	-	47.00	-	47.50	47.50	47.50	47.50	
	H ₋₋ Hysteresis	Hz	-	0.60	-	2.40 ⁴	2.40 ⁴	2.40 ⁴	2.40 ⁴	
	dRL Response time	s	-	0.10	-	0.10	0.10	0.10	0.10	
	doF OFF-delay	s	-	60	-	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	
u5r 78	u5r Alarm on/off		5t6y	5t6y	5t6y	5t6y	5t6y	5t6y	5t6y	
	u5r 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	
	u5r Number of phases		3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	
rocF 81r	rocF Alarm on/off		oFF	oFF	oFF	oFF	oFF	oFF	oFF	
	dFdt delta f / delta t	Hz /s	0.800	2.000	0.800	2.000	2.000	2.000	2.000	
	PEr periods		20	20	20	20	20	20	20	
	dRL 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	ErEL Response time Yx	s	5.0	5.0	5.0	oFF	oFF	oFF	oFF	
	doFR Mode		ind	ind	ind	ind	ind	ind	ind	
	doFR 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	230	230	57.7	100	230	400	
	F Frequency	Hz	50.00	50.00	50.00	50.00	50.00	50.00	50.00	
	u5r 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- 10	0- 10	0- 10	0- 10	0- 10	0- 10	0- 10	
	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	1	11	12	13	14	

* factory preset

¹ = Autohysteresis 50,05 Hz

² = Autohysteresis 50,10 Hz

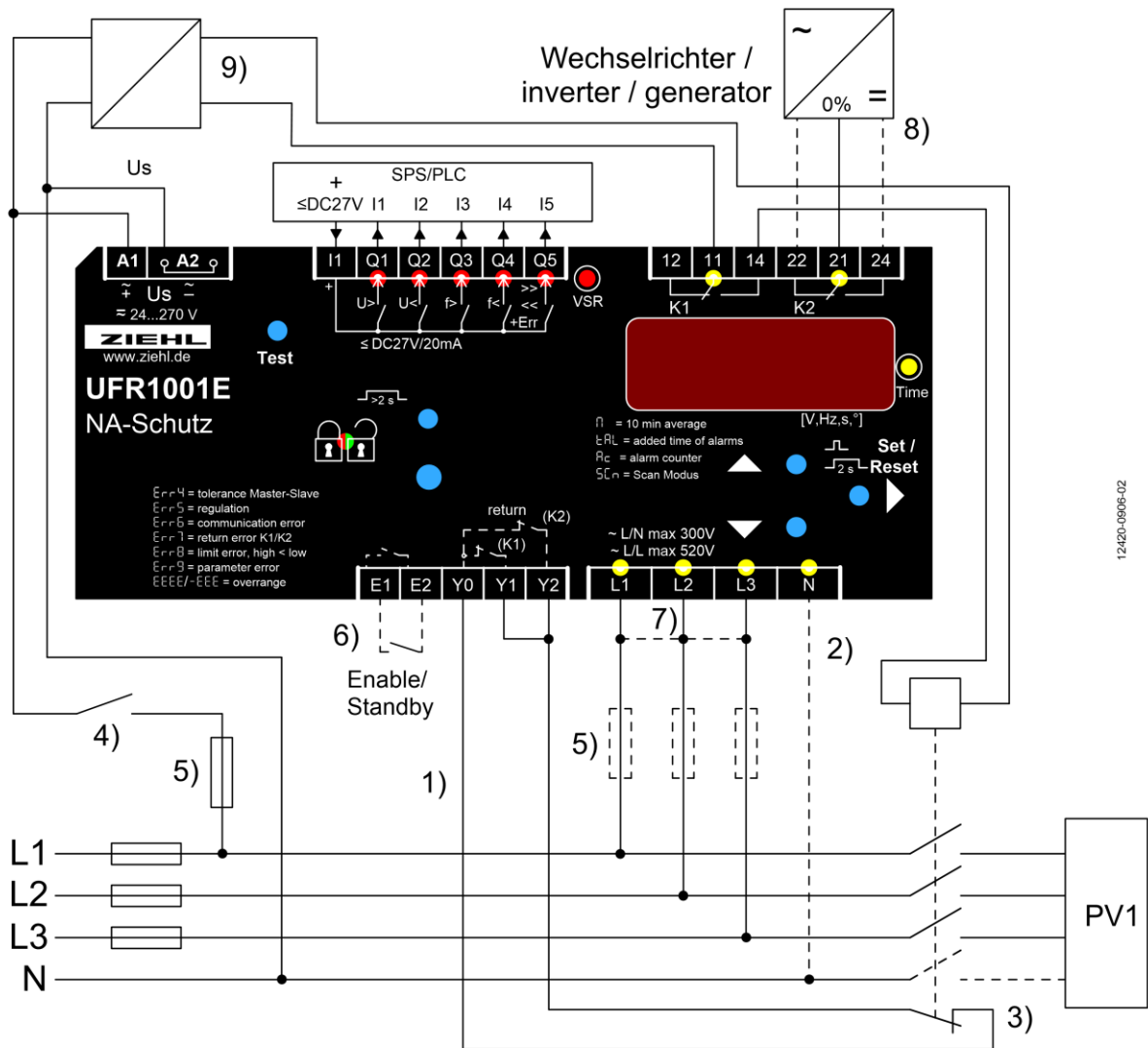
³ = Parameter can changed independently of the code lock (only in Pr2)

⁴ = Autohysteresis 49,90 Hz

Display of the program: Info → Pr or when switching on

Display of the firmware version: Info → Fnr

3 Connection diagram, 1x section switch (VDE-AR-N 4105:2018-11)



- 1) Feedback contacts Y1/Y2 not connected set rEL → t_rEL → **OFF**.
- 2) N connected set $Pr 1$, $Pr 3$ or $Pr 5$
- 3) Nc- or no-contacts can be connected, automatic detection when switching on
- 4) Switch off the plant without recording an alarm, e.g. with output contact of a ripple control receiver
- 5) Fuses only when line protection necessary, e.g. 16 A
- 6) Contact closed suppresses evaluation of feedback contacts and vector shift (u_{sr} → **on**) suppresses feedback contacts (u_{sr} → y_{Y2}) or switches device into standby (u_{sr} → t_{sbY} = default setting) e.g. through ripple control receiver or timer
- 7) 1 phase Application connect L1-L2-L3, 2 phase Application L1 / L2+L3 (only Pr 5, 7, 10, 13, 20)
- 8) Additional switch-off of self generating plant.
Single-fault safety: shutdown of the self generation plant e.g. by ripple control input 0% with K2. Use coupling relays for contact multiplication of if safe isolation is required.
This second shutdown path must be tested separately during commissioning. (t_{st2})
- 9) UPS/buffer. Switches have to withstand undervoltage for 3 s (FRT)

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
	$u5r . \rightarrow oFF .$, no function
	$u5r . \rightarrow on .$, E1-E2 closed: vector shift active but not evaluated, monitoring of feedback contacts Y1/Y2 off for use with generator
	$u5r . \rightarrow StBY .$, E1-E2 closed: K1 and K2 off (standby), 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 $rEL . \rightarrow ErEL .$, 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 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	Limit	Voltage	Country / Standard
* 2	3 AC with N	<u>Niederspannung</u> 2x over voltage, 2x under voltage 2x over frequency, 2x under frequency 10min average value, 1x vector shift 1x ROCOF	230V	 VDE-AR-N 4105:2018
1	3 AC with N	<u>Niederspannung</u> 1x over voltage, 1x under voltage 1x over frequency, 1x under frequency 10min average value, 1x vector shift 1x ROCOF	230V	 VDE-AR-N 4105:2011
7	2/1 AC with N			
11(3)	3 AC with N	<u>Mittelspannung</u>	63,5V	 VDE-AR-N 4110:2018 (BDEW Juni 2008 by 3.2.3.3-1)
12(4)	3 AC without N	2x over voltage, 2x under voltage	100V	
13(5)	3/2/1 AC with N	2x over frequency, 2x under frequency	230V	
14(6)	3 AC without N	10min average value, 1x vector shift 1x ROCOF	400V	
10	3/2/1 AC with N	1x over voltage, 1x under voltage 1x over frequency, 1x under frequency 10min 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	230V	 G98(G83/2) + G99(G59/3)
21	3 AC without N	2x over frequency, 2x under frequency	400V	
22	3 AC with N	10min average value, 1x vector shift	63,5V	
23	3 AC without N	1x ROCOF	110V	

* default setting, default settings **Pr 3 ... Pr 6**, **Pr 10**, **Pr 15**, **Pr 20 ... Pr 23** see <https://www.ziehl.com/en/products/?view=detail&detail=54>

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 I nFa.
• Press button  5x → Display Pr l.
• 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

<u>Rated control supply voltage U_s:</u>	24-270V AC/DC -15...+10 %, DC / 40-70 Hz, <5 VA
<u>Output relays:</u>	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-circuit protection	max. gG/gL/B 6 A

Output voltage - transistor outputs

Operational voltage V_Q

Max. current consumption Q1...Q5

Input circuit - feedback contacts

No-load voltage at the control inputs

Subject to change without prior notice

Q1-Q5

4.5-27 V DC

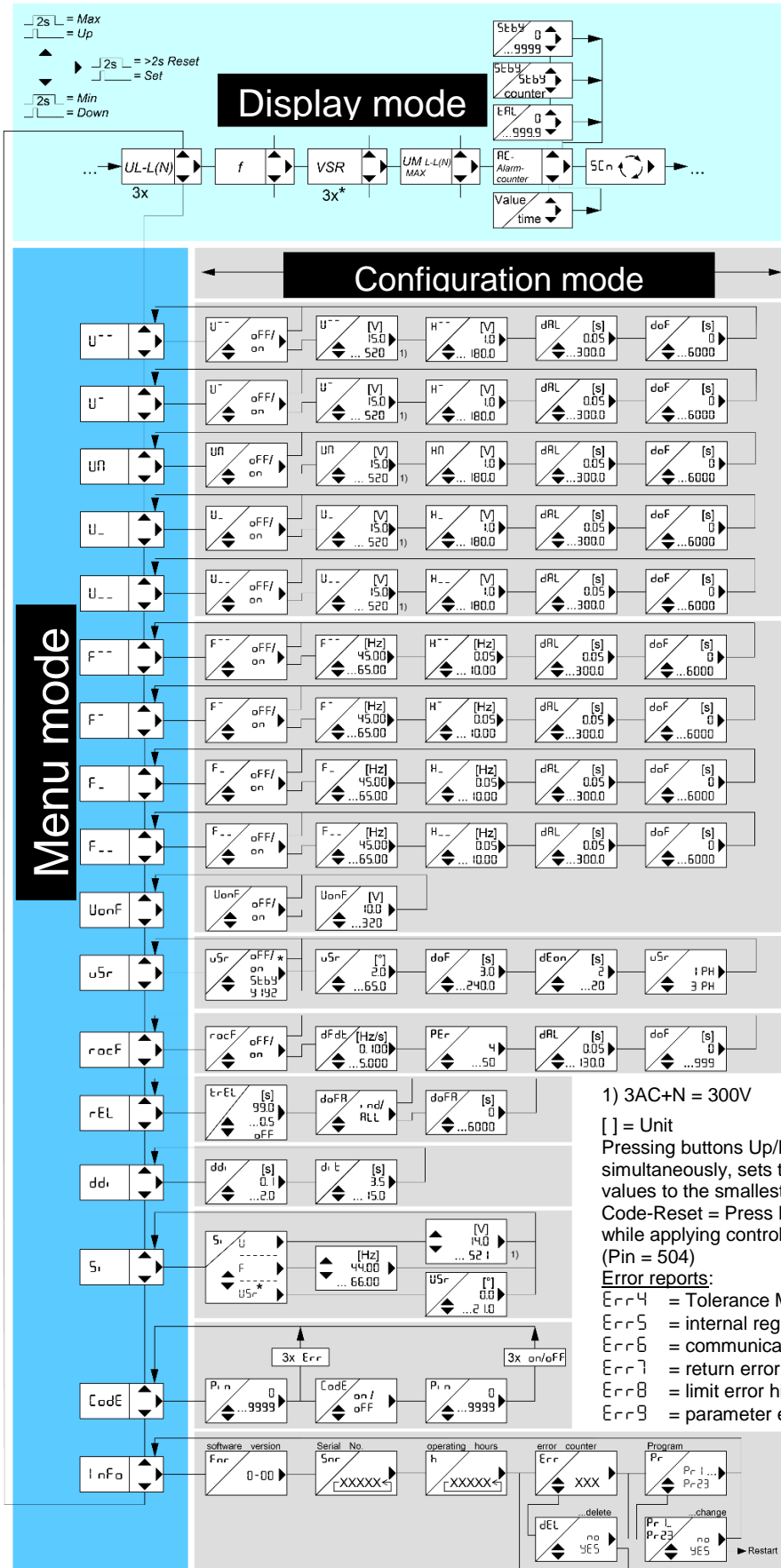
20 mA / output

Y0 – Y1/2

15-35 V DC

9 Control chart (Pr 1, 7, 10, 15 see Detailed operating manual

<https://www.ziehl.com/en/products/?view=detail&detail=54>



Pr	Connection	Country / Standard
2	3 AC + N	VDE-AR-N 4105:2018
11	3 AC + N	VDE-AR-N 4110:2018
12	3 AC	
13	3/2/1 AC + N	
14	3 AC	BDEW Juni 2008 nach 3.2.3.3-1
3	3 AC + N	
4	3 AC	
5	3/2/1 AC + N	G98(G83/2) + G99(G59/3)
6	3 AC	
20	3/2/1 AC + N	
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	<u>Feedback contacts not connected</u> - set rEL . → tREL . → OFF <u>Feedback contacts connected</u> - check the correct connection - Adjust the turn-on time under rEL . → tREL . greater then the switch-on time of the switcher - Perform a reset → press Set/Reset for >2 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 u5r.
RL and LED Q3 (f>) is on, reading value in good range	hysteresis for F~ incorrectly	Check hysteresis for reset point 50,05 Hz
noY1 or noY2 appears in the display	Feedback contact not connected or switch does not switch	Check the connection and function of the switch. Its normal in Pr2 at Test 2 noY2 .

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