

MANUAL

Ex9JP-G - Grid Protection Relay



Noark

Index

Safety precautions.....	4
Safety advice.....	4
Intended use.....	4
Qualified personel.....	4
Installation and connection.....	5
Dimensions and operating elements.....	5
Back-up fuse of the supply voltage.....	5
Installation on top-hat rail according to EN 60715.....	5
Terminal allocation.....	6
Circuit diagram 1 (general, without activities for FRT).....	7
Circuit diagram 2 (general, with FRT behaviour).....	8
Circuit diagram 3 (CEI 0-21).....	9
Circuit diagram 4 (C010/11).....	10
Operation and commisioning.....	11
Menu navigation.....	11
Operating menu structure.....	13
Lead seal.....	14
Use cases.....	14
Supply circuit.....	15
Measuring circuit.....	15
Measuring ranges.....	16
Digital inputs.....	16
Output circuit.....	16
Accuracy.....	17
Insulation data.....	17
Environmental conditions.....	17
Electrical connection.....	18
Sealing wire.....	18
Protection class.....	18
Mechanical resilience.....	18
Safety concept.....	19
Setting of the implemented parameter sets.....	20
Connection modes.....	20
Units.....	20
Funtional safety.....	20
Operational mode.....	20
Thresholds.....	20
Times.....	21
Auxiliary contact.....	21
Ranges.....	21

Index

Function.....	22
Features.....	22
Commissioning.....	22
Functional description.....	22
Protection fuctions.....	24
Voltage monitoring.....	24
Frequency monitoring.....	25
Phase shift monitoring.....	25
Loss of Mains detection.....	26
Test fuction.....	26
Digital inputs.....	26
Output relays R1, R2, R3.....	27
Error.....	27
Novelties concerning country-specific parameter sets.....	29
VDE-AR-N 4105:2018.....	29
C10/11:2021.....	30
EN50549-1/2:2019 (default Netherlands).....	31
OPEN_SETUP.....	31
Parameters of implemented standards (Separate index).....	32

Safety precautions

Safety advice



Danger! Never carry out work on live parts! Danger of fatal injury!
The product must not be used in case of obvious damage! To be installed by qualified and authorized personnel only!



In General: Strictly and always follow safety advices and warnings!
Do not use this product in case of obvious damage!

This device was designed, manufactured, and tested to meet current industry standards. However, improper use or handling can pose risks to people and equipment. Failure to follow these instructions could lead to injury, property damage, or financial loss. Use the device only as directed in the installation and operation manual. Ensure it is securely installed and in good condition. Additionally, all relevant accident prevention regulations must be strictly observed at the place of use.

- Eliminate all faults immediately which may endanger safety!
- Do not make any unauthorised changes and only use replacement parts and optional accessories purchased from or recommended by NOARK.
- In case of obvious damage, the device must be checked and replaced if necessary!
- Country-specific regulations have to be considered in any case!
- If required by national standards, the Ex9JP-G has to be protected against unauthorized changes by password and/or sealing!

Intended use

The Ex9JP-G serves as grid and system protection for supplying cogeneration units, wind power stations, hydroelectric power plants, and photovoltaic systems. In the event of a power failure or a fault in the grid of the energy supply company, private small power plants must immediately be isolated from the public grid to prevent accidental infeed. For one, maintenance personnel could be endangered without immediate grid separation, and secondly, consumers could be exposed to impermissible voltages and frequencies.

In case the grid operator requires threshold values that deviate from the standards, it is possible in part to set some of the threshold values outside of the standard defined range. Outside of this range the device is no longer in compliance with standards and the corresponding certificates lose their validity. This status is shown on the display by the identifier „ncnf.“ Settings outside of this range are therefore within the operator's scope of responsibility and/or the acceptance authority of the system.

The Ex9JP-G can only be configured using a computer, as additional national standards mandated by local authorities are available exclusively online. The manual can be downloaded from the Noark Electric website.

Qualified personnel

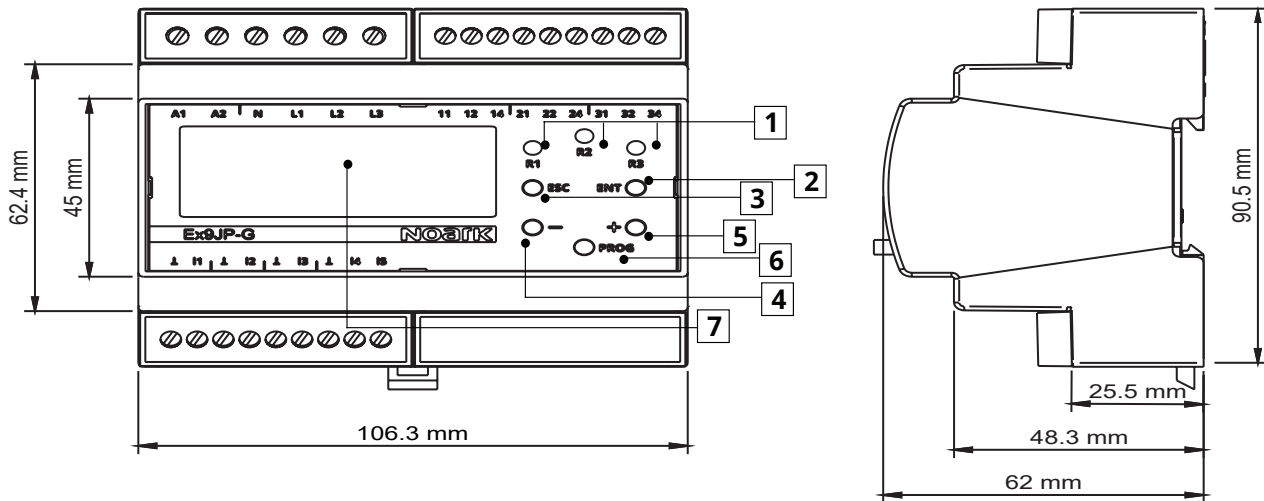
The personnel required to install this device are qualified electricians that can independently recognize and prevent dangers from electricity. Requirements for this are:

- Knowledge of electrical engineering
- Experience in electrical work
- Knowledge and work experience with the corresponding system or similar systems (system type)
- Knowledge of the hazards and countermeasures
- The ability to recognize whether safety is provided during the performance of work

Qualified electricians are specially trained and know the relevant standards and regulations for the work environment in which they are active. The regulations of the corresponding country apply.

Installation and connection

Dimensions and operating elements



Control elements

#	Marking	Type	Function
1	R1, R2, R3	LED (yellow)	Status indication output relays
2	ENT	Pushbutton	ENTER, input, menu level forward
3	ESC	Pushbutton	ESCAPE, input, menu level back, test/reset
4	-	Pushbutton	Change parameters, menu navigation
5	+	Pushbutton	Change parameters, menu navigation
6	PROG	Pushbutton (sealable)	PROGRAM, enter programming mode
7		LCD display	Display 4x20 characters

Back-up fuse of the supply voltage

The supply and measuring voltages of all system components are to be secured with back-up fuses. The back-up fuses are to be dimensioned according to the conductor cross-section used. We recommend securing the output relay against the danger of short-circuiting with a 5A fast-acting fuse!

Installation on top-hat rail according to EN 60715

Latch the mounting clip on the reverse of the device to the top-hat rail so that a safe and secure fit is ensured.

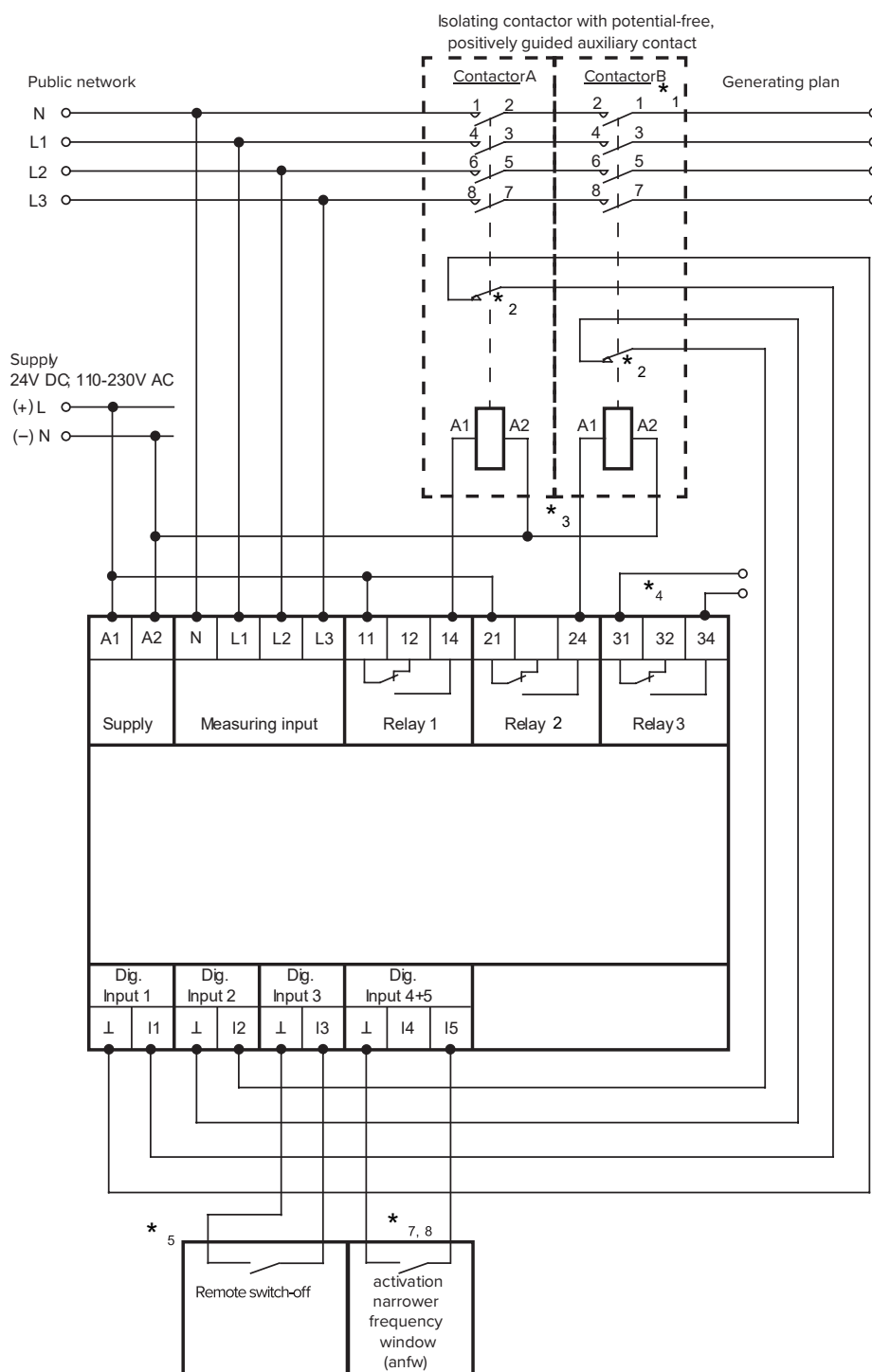
Installation and connection

Terminal allocation

Terminals		
A1, A2	Supply	DC: 24 V AC: 110-230 V @f: 48-63 Hz A1: L (+) A2: N (-)
L1, L2, L3, N	Measuring input	UN: 3x400 V AC
11, 12, 14	Output relay channel A (CO contact) Status indication via yellow LED R1	Isolated changeover contact 31: Common 32: Normally closed contact 34: Normally open contact
21, 22, 24	Output relay channel B (CO contact) Status indication via yellow LED R2	Isolated changeover contact 31: Common 32: Normally closed contact 34: Normally open contact
31, 32, 34	Output relay R3 (CO contact) Status indication via yellow LED R3	Isolated changeover contact 31: Common 32: Normally closed contact 34: Normally open contact
I1, ⊥	Digital input 1 (Feedback contact contactor A)	Contact input (24 V / 5 mA), configurable Input active: I1 connected to ⊥
I2, ⊥	Digital input 2 (Feedback contact contactor B)	Contact input (24 V / 5 mA), configurable Input active: I2 connected to ⊥. Does not apply to national standards without functional safety!
I3, ⊥	Digital input 3 (Remote disconnection)	Contact input (24 V / 5 mA), configurable Input active: NO->I3 to ⊥ (std); NC->I3 open
I4, I5, ⊥	Digital inputs 4 and 5 (Parameter switchover)	Applies to CEI 0-21, C10/11 LV/HV EN50549-1/2 LV/HV. Contact input (24 V / 5 mA). Input active: I4 or I5 connected to ⊥

Installation and connection

Circuit diagram 1 (general, without activities for FRT)



In general use for actual standards:

OVE TOR R25 NS/MS A/SYNC,
OOE TOR R25 NS/MS A/SYNC
WIEN TOR R25 NS/MS A/SYNC
TIROL TOR NS/MS A/SYNC
BURGENLAND TOR NS/MS A/SYNC
VDE-AR-N 4110:2018-11 *1
G99-1-3 LV:2018 *1
G99-1-3 HV:2018 *1
G98-1-2:2018 *1
EN50549-1:2019 LV *4, *8
EN50549-2:2019 HV *4, *8
EN50438:2013 DK *3
VDE 0126-1-1:2013
Romania ARNE 2021
Bulgaria 2024
AS/NZS 4777.2:2020
NRS 097-2-1:2017
OPEN SETUP *3, *4

Recertified standards:

EN50438:2013
OVE E 8001-4-712 / E 8101-4-712
VDE 0124-100:2013
TR3 Rev23:2013 *1
AS/NZS 4777.2:2015
G59/3/3:2015 LV *1
G59/3/3:2015 MV *1
G83/2:2012 *1

*1 ... Contactor B not applicable for all country specific standards in which no functional safety is required!

*2 ... Auxiliary contact configurable as "n/o", "n/c" or "disabled"

*3 ... 1- or 2-channel connection possible and can be configured.

*4 ... Evaluation, contact error for power generation plants mandatoried for VDE-AR-N 4105:2018-11 and C10-11:2019

*5 ... Digital contact as normally opened, normally closed, or „disabled“. Default is n.o.

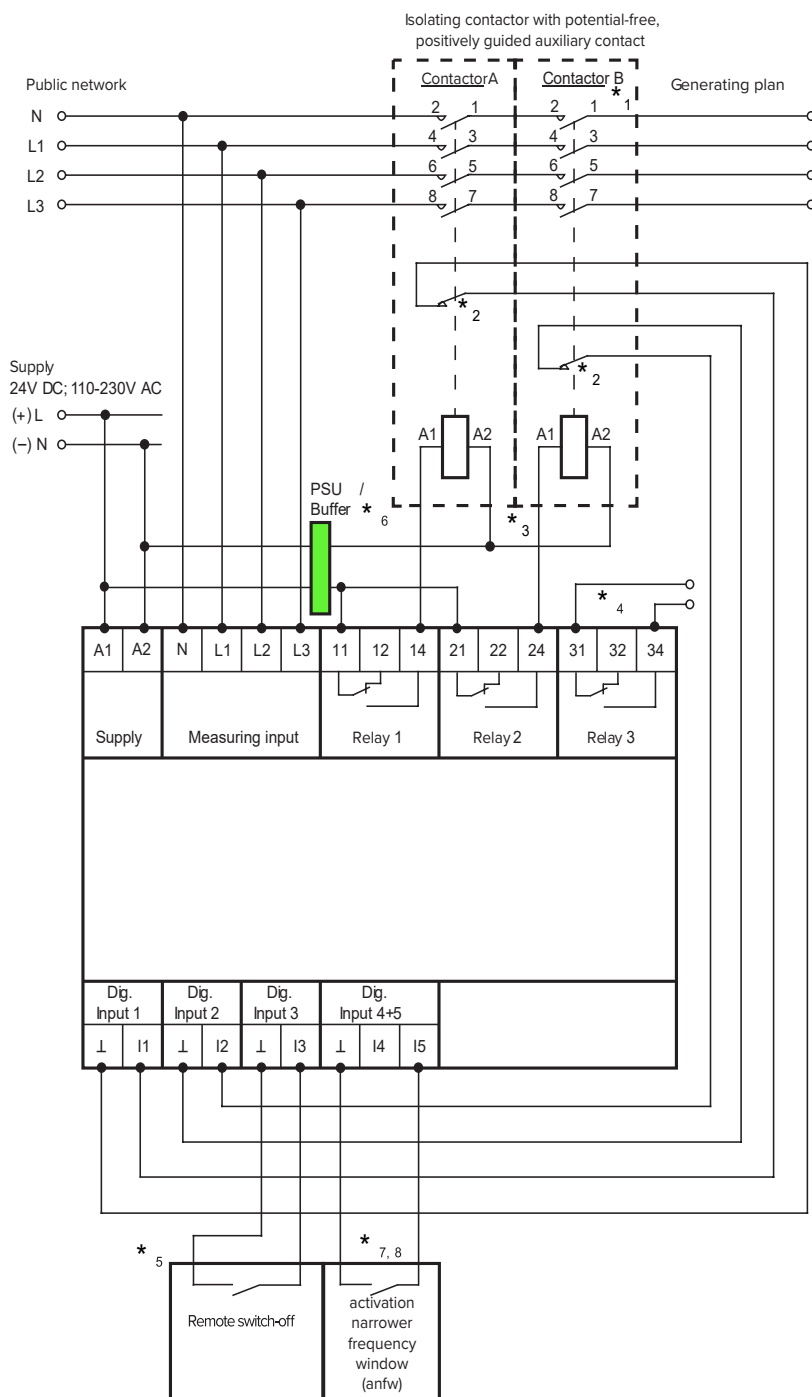
*6 ... VDE-AR-N 4105:2018-11 FRT (fault ride through) behaviour with buffered isolation contactors.

*7 ... Parameter switching, see connection diagram 3 - CEI 0-21

*8 ... Parameter switching, see connection diagram 4 - C10/11

Installation and connection

Circuit diagram 2 (general, with FRT behavior)



Applies in specific to:

VDE-AR-N 4105:2018-11 ($P_n \leq 50 \text{ kW}$) *1, *4, *6
 VDE-AR-N 4105:2018-11 ($P_n > 50 \text{ kW}$) *1, *4, *6
 VDE-AR-N 4105:2018-11 (Inverter) *4, *6

*6 FRT - fault ride through: behaviour with buffered isolation contactors, Power supply/buffer. Isolation contactors and coupling relays, if present, must be buffered for 3s/0.3s in the event of undervoltage (FRT).

Power generation devices into low-voltage networks must help to stabilize the network. Therefore, the isolating contactor must not drop out at a voltage just above $U < (0.45 U_n)$ or 0.3s in the event of a voltage interruption due to undervoltage. Only the Ex9JP-G switches the contactor off after 3s ($U <$) or 0.3s ($U <$). A power supply / buffer is required.

When using 2 isolating contactors, both must be supplied for 3s. The Ex9JP-G has an internal broadband power supply and therefore does not need a buffered control voltage at 230V a.c.

At 24V d.c. supply, there is the need for external buffering.

*1 ... Contactor B not applicable for all country specific standards in which no functional safety is required!

*2 ... Auxiliary contact configurable as "n/o", "n/c" or "disabled"

*3 ... 1- or 2-channel connection possible and can be configured.

*4 ... Evaluation, contact error for power generation plants mandated for VDE-AR-N 4105:2018-11 and C10-11:2019

*5 ... Digital contact as normally opened, normally closed, or „disabled“. Default is n.o.

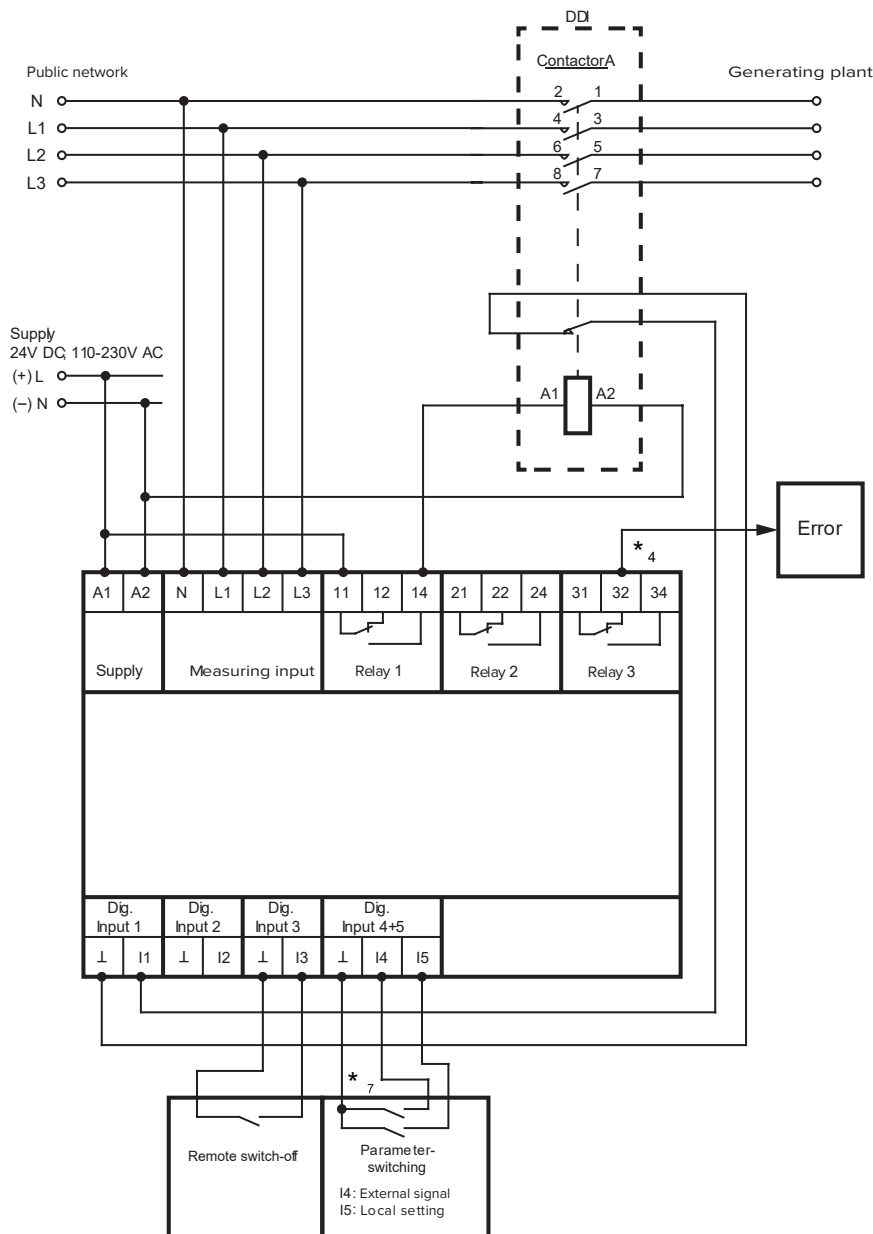
*6 ... VDE-AR-N 4105:2018-11 FRT (fault ride through) behaviour with buffered isolation contactors.

*7 ... Parameter switching, see connection diagram 3 - CEI 0-21

*8 ... Parameter switching, see connection diagram 4 - C10/11

Installation and connection

Circuit diagram 3 (CEI 0-21)



Applies in specific to:
CEI 0-21 *1, *4, *7

*7 ... Parameter switching (CEI):

definitive mode (Operational mode 0):

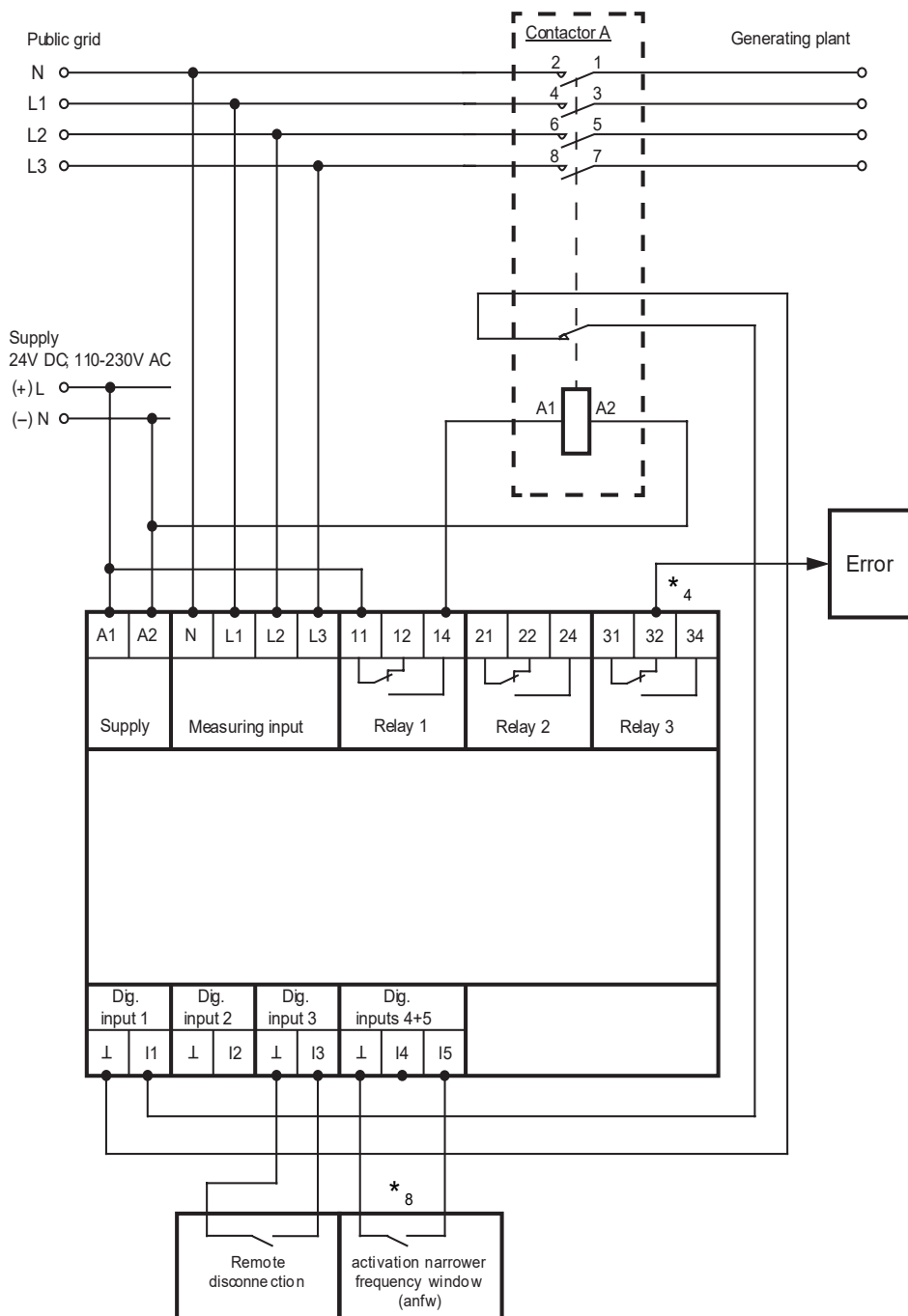
I4 inactive / contact open: overfrequency 1, underfrequency 1
I4 active / contact closed: overfrequency 2, underfrequency 2

transitory mode (Operational mode 1):

I5 active / contact closed: overfrequency 2, underfrequency 2
I5 inactive / contact open: overfrequency 3, underfrequency 3

Installation and connection

Circuit diagram 4 (C10/11)



Applies in specific to:

C10-11:2019 LV-ASS *1, *4, *8
 C10-11:2019 HV-ASS *1, *4, *8
 C10-11:2021 LV-IP *1, *4, *8
 C10-11:2021 HV-IP *1, *4, *8

Recertified standards:

C10-11:2012 LV *1, *4
 C10-11:2012 MV *1, *4
 C10-11:2019 LV *1, *4, *8
 C10-11:2019 HV *1, *4, *8

*8 ... Parameter switching (C10/11):

I5 inactive / contact opened: Overfrequency 1, Underfrequency 1

I5 active / contact closed: Overfrequency 2, Underfrequency 2 (narrower frequency window)
 (based on local voltage criteria / local setting)

Operation and commissioning

Menu navigation

The device is delivered without a pre-configured country specific parameter set. During initial commissioning, the device will prompt to select a parameter set (level 5 - menu item 5.001). Here, the corresponding configuration/standard must be selected via +/- and confirmed with ENTER. You can find more information in the menu structure.

The display unit consists of a 4-line text display with 20 characters per line. The display has 5 levels. The different displays of the levels can be navigated via + and -.

Level 0:

(for Start display (Display for 5 seconds during power up) Basic information is displayed here example SW-Version and serial number). This display appears after power-up and remains visible for 5 s. Then the display jumps to the first window in level 1.

Level 1:

Measurements (Display 1.010-1.032)

Display of the current measurements.

Additionally, it will also be displayed here if the parameter set corresponds to the default configuration (dfit - default = base or factory setting). If a parameter was edited within the normative permissible limit values (edit – edited), or if it was set outside the normative permissible limit values (ncnf – non conform = does not comply with the regulations or the selected standard).

The expiring timer of Ton delay can also be read out in menu item 1.010 (in seconds).

Navigation +/- . From these displays, pressing the ENT-key takes you to level 3.

Digital inputs and turn-off time (Display 1.040)

Displays the actual states of the digital inputs and the last turn-off time (Toff) of the connected contactors (the larger value for two-channel systems).

Test/Reset (Display 1.050)

A relay test is triggered by pressing the ENT key. In this test, relays A and B turn off and the „reconnection timer“ (turn-on time) begins to run.

Also, a reset event can be carried out with the test/reset function, which allows relay 1/2 to be switched on again after a contact error (C) (required for the three-parameter sets VDE-AR-N 4105). The test/reset event can also be performed by pressing the ESC key in level 1.

Error (Display 1.060)

Display of current error:
M Measurement error
S System error

Navigation +/- . Access level 2 by pressing the ENT key.

Level 2:

Error memory

This is where the latest errors are displayed with a timestamp (time since occurrence). The time is only counted when the device is powered. Both positive, as well as negative error flanks, are saved and displayed.

Navigation +/- . From this screen, you can access level 1 via ESC.

Operation and commissioning

Menu navigation

Level 3:

Parameter display

Here, the parameters that have been visibly switched for the corresponding configuration are displayed. Navigation +/- . From this screen, you can access level 1 via ESC.
You can access the editing mode of the selected parameter via PROG (can be lead-sealed).

The password query is skipped if the password is „0000“ and you will end up directly in editing mode in level 5.

If a valid password has been entered in the last 60 seconds, the password query is skipped and you will end up directly in level 5.

If a password other than „0000“ has been defined, you will be asked for the password in level 4.

Level 4:

Password input

The currently active digit of the password can be incremented/decremented (0...9) via +/- . ENT jumps to the next digit of the password entry.

The entered password is checked after pressing ENT in the 4th position.

ESC jumps back to the previous digit of the password entry.

The program goes back to Level 3 when you press ESC at the first digit of the password.

If you have forgotten the password, please contact our technical support and let them know the device ID. You will receive a master password only relevant to your device.

Level 5:

Parameter editing

In this level, the parameter previously selected in level 3 can be changed with +/- .

Confirm with ENT or use ESC to discard the change. In both cases, the display jumps to the corresponding parameter in level 3.

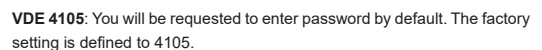
Additionally, it will also be displayed here whether the value that was just edited corresponds to the default configuration (dflt - default = base or factory setting) if it was edited within the normative permissible limit values (edit – edited) or is set outside the normative permissible limit values (ncnf – non conform = does not comply with the selected regulation or the selected standard).

Alongside thresholds, times, and modes, the 4 digits of the password also have 1 parameter each.

The current standard is a parameter too. This means that a newly selected standard will be activated by changing this parameter. Therefore, all previous changes will be discarded.

If the already set standard is selected, the standard will be reset to default.

Operating menu structure



Operation and commissioning

Lead seal

After commissioning, the device is to be secured against unauthorized changes of the protection-relevant setting parameters via a configurable password! If password protection is not used or if the country-specific regulations or standards demand it, the device is to be lead-sealed!

Use cases

Using Austria as an example, in medium voltage networks a distinction is made between two basic voltage levels:

21 kV and 31.7 kV for special cases e.g. wind farms phase to phase voltage.

Use of a 200:1 voltage converter at $U_c = 21$ kV:

1. Select the parameter set 852 (OVE/OOE TOR R25 MS SYNC) for synchronous or 853 (OVE/OOE TOR R25 NS ASYNC) for non-synchronous generating systems (converter).
2. Parameter .005 (setting the nominal voltage ULN/LL nom) to 60.4/105.0V. Mathematically, the value results from $21 \text{ kV} / 200 = 105 \text{ V}$ (the 60.4 V stand for the phase to neutral voltages, which are not relevant for medium-voltage applications). The setting options are possible as described with 60.4 / 105.0 V.

Use of a 200:1 voltage converter at $U_c = 31,7$ kV (e.g. wind farms):

1. Select the parameter set 852 (OVE/OOE TOR R25 MS SYNC) for synchronous or 853 (OVE/OOE TOR R25 NS ASYNC) for non-synchronous generating systems (converter).
2. Parameter .005 (setting the nominal voltage ULN/LL nom) to 91.0/158.1V. Mathematically, the value results from $31.7 \text{ kV} / 200 = 158.5 \text{ V}$ (the 91.0 V stand for the phase to neutral voltages, which are not relevant for medium-voltage applications). The setting options are possible as described with 91.0 / 158.1 V.

Use of a 300:1 voltage converter at $U_c = 31,7$ kV (e.g. wind farms):

1. Select the parameter set 852 (OVE/OOE TOR R25 MS SYNC) for synchronous or 853 (OVE/OOE TOR R25 NS ASYNC) for non-synchronous generating systems (converter).
2. Parameter .005 (setting the nominal voltage ULN/LL nom) to 60.4 / 105.0 V. Mathematically, the value results from $31.7 \text{ kV} / 300 = 105.6 \text{ V}$ (the 60.4 V stand for the phase to neutral voltages, which are not relevant for medium-voltage applications). The setting options are possible as described with 60.4 / 105.0 V.

In any case, the following applies: All protective functions $U_{>>}$, $U_{>}$, $U_{<<}$, $U_{<}$ automatically adjust to the newly set voltage levels, this means changes only need to be made if they do not meet the requirements of the network operator.

Changing the protective function $U_{>}$ and $U_{>>}$ according to the specifications of the network operator:

In the delivery state (default), these thresholds for $U_{>\text{off}}$ are $1.06 \times U_c$ (106%) and for $U_{>>\text{off}}$ $1.1 \times U_c$ (110%). If the network operator requests settings for $U_{>\text{off}}$ for example $1.04 \times U_c$ (104%) and $U_{>>\text{off}}$ for example $1.15 \times U_c$ (115%), both parameters .011 and .027 must be adjusted. If there are also different specifications for the undervoltage thresholds, parameters .015 ($U_{<\text{off}}$) and .031 ($U_{<<\text{off}}$) must also be adjusted.

Note: In low-voltage networks, the nominal voltage is designated U_n and in medium voltage networks U_c .

Operation and commissioning

Supply circuit

Terminals	A1 (L or +); A2 (N or -)
Supply voltage	DC: 24 V AC: 110-230 V
Tolerance of the supply voltage	DC: $\pm 10\%$ AC: $\pm 30\%$
Nominal consumption total Nominal consumption A1/A2	max. 1,35 W / 4VA @ 230 V AC max. 1,25 W / 4VA @ 230 V AC
Nominal frequency	50/60 Hz
Tolerance of the nominal frequency	48-63 Hz
Duration of operation	100%
Recovery time	6 seconds + set turn-on delay
Drop-out voltage	7V
Overvoltage category	III
Rated surge voltage	6 kV
Internal fusing	250 V / 500 mA slow blow (soldered)

To ensure the device's functionality during a power failure, the device is to be supplied via an external UPS system!

Measuring circuit

Terminals	L1-L2-L3-N
Measuring input	3x 400 V AC
Input impedance	1 M Ω
Input burden	<275 mW (at 3x230 V a.c. $\sim$)
Measure parameters	Phase to phase voltage, phase-to-neutral voltage, 10 minutes voltage average, frequency, frequency change (RoCoF), Phase shift (PShift), Zero Sequence

Operation and commissioning

Measuring ranges

Phase voltage	0 - 560 VAC
Phase to neutral voltage	0 - 325 VAC
Frequency	40 - 65 Hz (measured between L1/N)
RoCoF	100 mHz/s - 2.000 mHz/s
PShift	1 - 15°
Overload capacity	Permanent 1,4 x UNom Impulse 1,6 x UNom (1 second)
Overvoltage category	III
Rated surge voltage	4kV

Digital inputs

Terminals	I1 and $\perp$; I2 and $\perp$; I3 and $\perp$; I4 resp. I5 and $\perp$ I1, I2, I3 can be configured as n.c. (normally closed), n.o. (normally open) or dis.
Contact type	potential-free (max. cable length 30m, laying as a control line, separate from power cables)
Switching capacity	24V / 5mA d.c. 
Input burden	<120mW

Output circuit

Terminals	11-12-14; 21-22-24; 31-32-34
Number and type of contacts	3 changeover contacts
Contact material	AgNi
Switching capacity	5A / 250V a.c. ~
Output burden	1250VA
Electrical switching frequency (AC1-)	100 x 10 ³ switching cycles
Mechanical switching frequency	15 x 10 ⁶ switching cycles
Continuous current value	5A
Short time value (1s)	5A
Withstanding voltage across open contacts	Relay contacts: 1000Vrms Terminals: 450Vrms
Overvoltage category	III
Rated surge voltage	4kV
Fusing	5A/250V fast acting

Operation and commissioning

Accuracy

Voltage measurement:	
Base accuracy	< 0,5% @ +25°C
Temperature effect	< 0,01%/°C
Resolution	10 mV
Frequency measurement:	
Base accuracy	< 0,01 Hz @ +25°C
Temperature effect	< 0,0002 Hz/°C
Resolution	1 mHz
Start-up Ton delay	0...600 s ± 0,6%
Response-delay (TIME, OFF) t _{UTHR OFF}	0...300 s ± 0,6%
Reset (Release) delay, t _{UTHR ON_total}	130 ms ± 45%
Operating time at overvoltage t _{OVER}	95 ms ± 50%
Operating time at undervoltage t _{UNDER}	95 ms ± 40%
Response time, t _{off_total_over/under}	t _{off_total_over} = t _{over} + t _{UTHR OFF} t _{off_total_under} = t _{under} + t _{UTHR OFF}
Overshoot time	40 ms

Insulation data

Rated insulation voltage	400 V
Insulation	
Supply circuit/ measuring circuit	Safe isolation
Supply circuit/ output circuit	Safe isolation
Supply circuit/ digital inputs	Safe isolation
Output circuit/ measuring circuit	Base isolation
Output circuit/ digital inputs	Base isolation

Environmental conditions

Ambient temperature operation	-25 up to +65°C
Ambient temperature storage	-40 up to +70°C
Display capability	-15 up to +65°C
Relative air humidity	5 up to 95%
Pollution degree	2, pollution level can be increased by installation in suitable enclosures (according to IEC 60664-1)
Weight	300g
MTTF	93.000h (for display temperature 25°C +/-5°C)
Installation altitude:	Max. 2000 m above sea level (800mbar)
Installation:	An external circuit-breaker is required for mains installation to the unit. Installation class 1 must be available in the environment
Location:	For indoor use only
Ventilation:	No ventilation of surrounding air required
Cleaning:	If necessary, the surface of the housing may be cleaned with a dry cloth, only when all sources of power are switched off
Installation note:	Power contactors may cause significant disturbances. Therefore, the Ex9JP-G should be mounted with a minimum distance of 5 cm to neighbouring power contactors.

Operation and commissioning

Electrical connection

Connection cross-section	max. 2,5mm ²
Stripping length	max. 8mm
Electrical capacity of the clamps: Relay outputs / digital inputs Measuring inputs	max. 450 V/16 A max. 750 V/16 A
Tightening torque	max. 0,5Nm
Screw	M3, screwdriver for slotted screws 0,6 x 3,5mm
Digital input circuits and output relays	No limitation for simultaneous operation of inputs and/or outputs within the specified limits

Sealing wire

Wire diameter	Ø max. 1,32mm
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Protection class

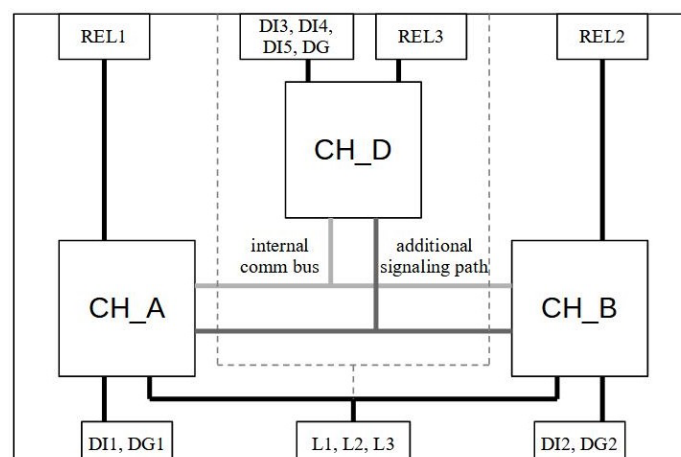
Terminals	IP2XB
Housing	IP2XB

Mechanical resilience

Vibration resilience according to IEC 60255-21-1	Class 2
Schock resilience according to IEC 60255-21-2	Class 2
Seismic resilience according to IEC 60255-21-3	Class 2

Safety concept

The system consists of three microcontrollers. CH_A and CH_B are the measuring channels. These channels record, calculate and monitor the measured values, read the inputs for the feedback contacts and switch the associated relay independently. Both measuring channels are structurally redundant (e.g., voltage reference, time base). The third controller CH_D observes both measuring channels for deviations, controls the user interface (LEDs, display, keys) and non-safety-relevant inputs and outputs.



Operation and commissioning

Safety concept

Troubleshooting

Errors are divided into three classes:

1. Exceeded limit

This is a normal operating condition. This includes for example the detection of overvoltage or underfrequency. These faults are handled according to the normative specification. Usually, the relays of CH_A and CH_B are switched off after a trigger delay. After the error is no longer detected and all other parameters are within the permissible limits, the relays are switched on again after a switch-on delay.

2. Non-critical system errors

These errors indicate a problem but are not safety critical. This includes a supply voltage that is too low or a feedback contact that is detected as open and should be closed or internal communication errors.

3. Critical system errors

These errors are safety-critical errors. This includes an extremely high measurement variance of the two measurement channels, thus the memory integrity is not given. If such a fault is detected, the system goes into the safety state (relay in idle state- OFF).

System error:

- T Remote shutdown activated
- 0 CH_A or CH_B contains invalid software (CODEID)
- 1 Software in CH_A and CH_B is different (CODEVERS)
- 2 Incorrect checksum of the code memory (CODECRC)
- 3 Incorrect checksum of the firmware (currently not used - FLASHCRC)
- 4 Incorrect checksum of the EEPROM (EEPROMCRC)
- 5 Configuration is inconsistent (LOGICVERS)
- 6 Incorrect checksum of the configuration (LOGICCRC)
- 7 Allocated
- 8 Error in the supply voltage for the outputs (POWER6V)
- 9 Error in the supply voltage for the inputs (POWERDIGINP)
- A Deviation of the measuring channels (MEASCOMPAB)
- B Password request deactivated (PWDINACTIVE)
- C Measuring channel does not communicate internally (INTERCOM1)
- D Allocated
- E Allocated
- F Allocated

Setting of the implemented parameter sets

Connection modes

2-wire	Only the voltage between L1 and N is evaluated
3-wire	Only the line to line voltages UL1-L2, UL2-L3 and UL3-L1 are evaluated
4-wire (LN)	Only the phase-to-neutral voltages UL1-N, UL2-N, and UL3-N are evaluated
4-wire (LN+LL)	Both the phase-to-neutral voltages UL1-N, UL2-N, and UL3-N as well as the phase to phase voltages UL1-L2, UL2-L3, and UL3-L1 are evaluated.

Units

%Unom	Percent of the nominal voltage (nominal voltage factor)
-------	---

Functional safety

Errtol 2ch	2 separated contactors with 2 separated auxiliary contacts are connected
Errtol 1ch	1 external contactor with 1 auxiliary contact is connected

Operational mode

It is possible to switch between 2 different operating modes
It is currently only used for the CEI-021

Mode 0:	transitory mode
Mode 1:	definitive mode

Thresholds

UTHR OFF	Voltage threshold for the turn-off
UTHR ON	Voltage threshold for turn-on
fTHR OFF	Frequency threshold for the turn-off
fTHR ON	Frequency threshold for turn-on
RoCoFTHR OFF	Frequency change threshold for the turn-off
RoCoFTHR ON	Frequency change threshold for turn-on
PShiftTHR OFF	Phase shift threshold for the turn-off
PShiftTHR ON	Phase shift threshold for turn-on

Setting of the implemented parameter sets

Times

Time OFF	response-delay
T on delay	Turn-on delay
F wnd	window length frequency measuring (observed time window used for determining frequency f / Hz, adjustable from 0.1s to 1s depending on the used parameter set).
RoCoF wnd	window length RoCoF (Rate of Change of Frequency) measuring (observed time window that is used to determine the RoCoF Hz / s, adjustable from 0.1s to 1s depending on the parameter set used)
PShift wnd	window length PShift (phase shift) measuring (observed time window that is used to determine the PShift / °, adjustable from 0.1s to 1s depending on the parameter set used, whereby only a setting of 0.1 to 0.6s makes sense. Pshift wnd from 0.6s to 1s does not affect the total tripping time.)

Total tripping time This is made up of the following when measuring frequency, RoCoF or Pshift:

Frequency measurement: $\text{TIME OFF total} = \text{Time OFF} + \text{F wnd}$

RoCoF measurement: $\text{TIME OFF totalRoCoF} = \text{Time OFFRoCoF} + \text{RoCoF wnd}$

Phase shift measurement: $\text{TIME OFF totalPShift} = \text{Time OFFPShift} + \text{PShift wnd}$

Auxiliary contact

Read back of the position of the actuated contactors (via positively driven auxiliary contacts) is required for the necessary functional safety. The following can be selected for these auxiliary contacts:

Contact n.c. (normally opened)	Auxiliary contact is normally opened (recommended implementation)
Contact n.o. (normally closed)	Auxiliary contact is normally closed
Contact dis. (disabled)	Auxiliary contact is ignored (impermissible for standards that require functional safety)
Contact t	Setting the time-delay (for switching off) that could elapse before the auxiliary contact of the coupling relay must feedback to I1/2, otherwise display a contact error.
T ConDelOn	Setting the time-delay (for switching on) that could elapse before the auxiliary contact of the coupling relay must feedback to I1/2, otherwise display a contact error and switch off R1/2. R3 is also activated.

Ranges

Conformity range	Within this range, the device is configured in compliance with the selected standards. Outside of these ranges, the device is no longer compliant with standards and the corresponding certificates lose their validity. This status is shown on the display by the identifier „ncnf.“ Settings outside of this range are therefore within the operator's scope of responsibility and/or the acceptance authority of the system.
Possible range	Technically possible setting range

Function

Features

- Simple implementation through pre-defined setups for country-specific standards and guidelines with parameters that can be set within a wide range.
- Wide nominal voltage and nominal frequency range, configurable nominal voltage
- Protection functions: $U_{<<}$, $U_{<}$, $U_{>}$, $U_{>>}$, U_{10min} , $f_{<}$, $f_{>}$, $f_{<<}$, $f_{>>}$
- Additional „Open setup“ for free, practically unlimited parametrization in the field
- Single-fault tolerance
- Cyclical self-test
- Monitoring of the connected section switch
- Remote shutdown
- Loss of mains detection (RoCoF, PShift, phase voltage)
- Test function with the determination of the turn-off time of the connected isolated contactors
- Monitoring of 1- and 3- phase grids for low and medium voltage grids
- Error memory with a timestamp (50 entries)
- Password protection and ability to seal
- Random turn-off thresholds and turn-on times for non-controllable energy producers (e.g. CHP)
- Detection of the symmetrical component “Zero Sequence” in the 3-phase network (U_{zero})
- Switching to different frequency bands (narrower frequency window)
- FRT (fault ride through) capability
- Configuration service and single test protocols

Commissioning

After applying the supply voltage to A1 and A2, the start display appears for 5 seconds. The device is delivered without a preselected parameter set. During initial commissioning, the device enters parameter set selection (level 5 - menu item 5.001). Here, the corresponding country-specific parameter set/standard must be selected using +/- and confirmed with ENTER. For more information, see Menu navigation.

Functional description

Depending on the country-specific configuration selected, the device can handle several monitoring functions (protection functions) at the same time.

Unless otherwise stated, the nominal voltage is 230V/400V and the nominal frequency is 50Hz (check menu item 1.010).

After exceeding or falling below a threshold value, R1 and R2 switch off after a response-delay that is defined especially for each threshold value. During the self-test or when the remote shutdown is activated, R1 and R2 switch off immediately. Only once all monitored parameters are within the permissible limits and the remote shutdown is deactivated, R1 and R2 switch on again after a defined turn-on time.

R1 and R2, together with the connected isolating contactors (A and B), ensure the required mains separation (generating system - public mains) when a protective function is triggered.

1.010	dflt	60
U1	230.0V	f 50.0 Hz
U2	230.0V	
U3	230.0V	

After exceeding or falling below a threshold value, R1 and R2 switch off after a response-delay that is defined especially for each threshold value. During the self-test or when the remote shutdown is activated, R1 and R2 switch off immediately. Only once all monitored parameters are within the permissible limits and the remote shutdown is deactivated, R1 and R2 switch on again after a defined turn-on time.

R1 and R2, together with the connected isolating contactors (A and B), ensure the required mains separation (generating system - public mains) when a protective function is triggered.

Function

Functional description

The switching actions of the isolating contactors are also monitored by the feedback contacts of the isolating contactors, which are connected to the digital inputs of the NA003-M64, which further increases plant safety.

Make sure that the feedback contacts of the isolating contactors A/B are correctly connected. Menu item 1.040 provides information about the status of contactors A and B (DI1 and DI2). The feedback contacts may have to be re-parameterised to menu item 3.099 (n.c. versus n.o.). Another source of error are the masses of the digital inputs I1 and I2, which are not connected internally and must therefore always be connected externally.

Both relays R1 and R2 LEDs dark means that R1 and R2 are OFF (inoperative):

1.040	dflt					60
Toff - - - ms						
DI1		DI2	DI3	DI4	DI5	
1		1	0	0	0	

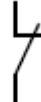
The digital inputs DI1(2) signal a closed feedback contact of the isolating contactors with „1“. If n.c. (normally closed) is selected for parameter 3.099, the wiring is correct.

However, if the digital inputs DI1(2) are monitoring „0“, an open feedback contact of the contactors as in the following display is recognized.

1.040	dflt					60
Toff - - - ms						
DI1		DI2	DI3	DI4	DI5	
0		0	0	0	0	

In this case parameter 3.099 must be changed to n.o. (normally open), or the wiring between the isolating contactors A/B and the digital inputs has not been carried out correctly.

Table of parameter 3.099:

Type of contactor of auxiliary contact			Parameter 3.099 (setting value)
Contact type	Contact designation	Symbol	
<i>Normally open contact (n.o.)</i>	13/14, 23/24, 33/34, ...		n.o.
<i>Normally closed contact (n.c.)</i>	11/12, 21/22, 31/32, ...		n.c.

Function

Protection functions / comparators

Depending on the selected parameter set, certain protection functions / comparators are editable.

Voltage monitoring

Line to line	Overvoltage 1 Overvoltage 2	All 3 phase to phase voltages are monitored according to the set over-voltage thresholds. If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. Line to line monitoring is deactivated in 2-phase (L+N) and 4-phase (L1, L2, L3+N) connection mode!
Line to line	Undervoltage 1 Undervoltage 2	All 3 phase to phase voltages are monitored according to the undervoltage thresholds set. When falling below the threshold, R1 and R2 switch to OFF after the set response delay toff. Line to line monitoring is deactivated in 2-phase (L+N) and 4-phase (L1, L2, L3+N) connection mode!
Line to Neutral	Overvoltage 1 Overvoltage 2	All 3 phase-to-neutral voltages are monitored according to the overvoltage thresholds set! If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. Exception: In 2-phase (L+N) connection mode, overvoltage monitoring only takes place between L1 and N! Line to Neutral monitoring is deactivated in 3-phase (L1, L2, L3) connection mode!
Line to Neutral	Undervoltage 1 Undervoltage 2	All 3 phase-to-neutral voltages are monitored according to the undervoltage thresholds set! When falling below the threshold, R1 and R2 switch to OFF after the set response delay toff. Exception: In 2-phase (L+N) connection mode, overvoltage monitoring only takes place between L1 and N! Line to Neutral monitoring is deactivated in 3-phase (L1, L2, L3) connection mode!
Average	Overvoltage	The calculated 10-minutes average is monitored according to the thresholds set for the slow voltage increase protection. If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. In 2-phase coupling mode: L-N In 3-phase coupling mode: L1-L2-L3 In 4-phase coupling mode: L1-N; L2-N; L3-N
U (Zero Sequence) U _{zero} Line to Neutral Line to line	Overvoltage	All 3 line-to-neutral voltages are added with magnitude and phase position. This resulting voltage (zero sequence) is determined in terms of magnitude to the neutral conductor and subsequently divided by three. If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. The zero sequence is only activated in the 4-phase (LN +LL) connection mode!
U (resulting) U _{res} Line to Neutral Line to line	Overvoltage	Activation of the narrower frequency window when the threshold of 3 x Zero Sequence is exceeded after the set response delay toff. U _{res} is only activated in the 4-phase (LN +LL) connection mode!
U (activation narrower frequency window) U _{anfw} Line to Neutral	Undervoltage	All 3 line-to-neutral voltages are monitored according to the set undervoltage thresholds. If the value falls below the threshold, the narrower frequency window is activated after the set response delay toff.

Function

Frequency monitoring

Overfrequency 1 Overfrequency 2 Overfrequency 3 Overfrequency 4	The frequency of the 3 phase-to-neutral voltages is monitored according to the overvoltage thresholds set. If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. Exception: in 2-wire mode only U L1-N is monitored
Underfrequency 1 Underfrequency 2 Underfrequency 3 Underfrequency 4	The frequencies of the 3 phase-to-neutral voltages are monitored according to the under-frequency thresholds set. When falling below the threshold, R1 and R2 switch to OFF after the set response delay toff. Exception: in 2-wire mode only U L1-N is monitored
Random over frequency	The frequency of the 3 phase-to-neutral voltages is monitored according to the parameters set (random max. frequency). If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. Exception: in 2-wire mode only U L1-N is monitored
Frequency monitoring undervoltage LL Frequency monitoring undervoltage LN	Depending on the connection mode (2-, 3-, 4-wire) falling below the set threshold leads to the deactivation of the frequency monitoring.
RoCoF	The rate of change of frequency of the 3 phase-to-neutral voltages are monitored according to the parameters set. If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. Exception: in 2-wire mode only U L1-N is monitored

Phase shift monitoring

Phase shift	The phase shift behavior of the 3 phase-to-neutral voltages is monitored according to the parameters set. If the threshold is exceeded, R1 and R2 switch to OFF after the set response delay toff. Exception: in 2-wire mode only U L1-N is monitored
-------------	---

Function

Loss of mains: (Microgrid) detection

A Loss of Mains or Microgrid is a locally defined electricity main that consists of only one or a few electric generators, supplying only a small area and is no longer connected to other electric grids.

Loss of mains: (Microgrid) detection via voltage measurement

In this process, a microgrid is detected via 3-phase voltage monitoring (line-to-line).

Loss of mains: (Microgrid) detection via RoCoF

In this process, a microgrid is detected via rate of change of frequency. This measurement is based on frequency measurements and triggers in the event of lasting frequency changes over multiple periods. The df/dt limit is specified and set in mHz/s.

Loss of mains: (Microgrid) detection vector shift

In this procedure, a phase or vector shift is detected via time measurements of the half-waves and the comparison with previous measurements. A vector jump can occur due to a sudden load change or shortcuts in the superordinate mains. The limit is specified and set in degrees (0,1 etc.).

Test function

The test function can be activated in two different ways:

- Pressing the ESC key in any display of menu level 1
- Pressing the ENT key in menu item 1.050

Both output-relays R1 and R2 are switched off activating the test function and the turn-on time begins to run.

As with every turn-off, the turn-off time in the test function is determined. The last turn-off time can be read out in menu item 1.040 (Toff).

Digital inputs

The actual state of the digital inputs can be seen with menu item 1.040.

The different $\perp$ for the digital inputs are not connected to each other internally, so they all must be connected individually when used.

Digital inputs 1 and 2 (each with $\perp$) serve as feedback contacts of both isolating contactors A and B. They are driven via the auxiliary contact of the isolation contactors. Here, the auxiliary contact must be connected as normally opened or normally closed and the digital inputs must be configured accordingly in menu item 3.099 of the device. The different $\perp$ for the digital inputs are internally not connected to each other, so they must be connected individually when used.

The digital input 3 (I3 and $\perp$) serves for remote shutdown. Menu item .114 (I3 STOP) is by default n.o. (normally open). In this case R1 and R2 switch off by bridging I3 with $\perp$. Changing menu item .114 to n.c. (normally closed), I3 must be bridged with $\perp$ for normal operation (R1 and R2 switched on). By opening I3 from $\perp$, R1 and R2 are switched off and thus also the connected contactors A and B. Disabling .114 (dis.) no remote shutdown can be performed.

Both digital inputs 4 and 5 are used for parameter switching for Italian standard CEI 0-21. Digital input 5 is used to activate the narrower frequency window for the Belgian and European parameter sets C10/11:2021 and EN50549-1/2:2019.

Function

Output relays R1, R2 and R3

The two output relays R1 and R2 trigger the isolating contactors/coupling switches. If the public mains is measured and found to be OK by the Ex9JP-G, the generating unit may supply in. Therefore R1 and R2 switch state to ON (LED R1 and LED R2 light up). The connected isolating contactors at 11-14 (21-24) are actuated and connect the generating unit to the power grid.

If measured line-to-neutral/line-to-line voltages, mains frequency (or RoCoF, Pshift, Uzero) move outside their defined thresholds, a protection function is activated. In this case R1 and R2 switch to OFF, which opens the isolating contactors 11-14 (21-24), thus disconnecting the generating unit from the public mains.

The output relay R3 is handled country-specific. This allows error states (violations of the protective function, incorrectly configured/wired feedback contacts) to be evaluated. Depending on the error case for which R3 is configured, it switches state to ON in the event of an error (LED R3 lights up). An error occurs if, for example there is an overvoltage error or the feedback contacts are not connected correctly.

Error

Latest errors are displayed in level „1.060 Error,“ the display of the error memory is located in level 2. There is a difference between Measurement errors and system errors as follows:

If you are in the error window and no letter and/or number code is visible, the device has no error!

Error: Measurement error

```
1.060 Error
M: UΔ UY Ū f Δf ΔΦ C
S:T0123456789ABCDEF
ENT - >
```

Only the current present error is shown here!

Error types:

UΔ	Phase to phase voltage error (under or overvoltage)
UY	Phase-to-neutral voltage error (under or overvoltage, Zero Sequence)
Ū	10-minute average voltage error
f	Frequency error (under or over frequency)
Δf	Frequency ramp error (RoCoF)
ΔΦ	Phase shift error (PShift)
C	Feedback contact error – Contactor falsely closed
c	Feedback contact error – Contactor falsely opened
	No error visible? The device is working properly

Error: System error

```
1.060 Error
M: UΔ UY Ū f Δf ΔΦ C
S:T0123456789ABCDEF
ENT - >
```

Error types:

T	Remote shutdown active
0-9, A-F	If this error appears permanently, please contact our technical support.

System error entries are found in the error memory when the unit is delivered. These are caused by the factory due to final tests of the device, in which these errors are induced on purpose. As the error memory cannot be deleted, these entries do not represent a device error and can simply be ignored.

Function

Error: System error

Further information for system errors

T .. remote disconnection

0 .. CODEID

1 .. CCODEVERS

2 .. CODECRC

3 .. FLASHCRC

4 .. EEPROMCRC

5 .. LOGICVERS

6 .. LOGICCRC

7 .. reserved

8 .. POWER6V

9 .. POWERDIGINP

A .. MEASCOMPAB

B .. PWDINACTIVE

C .. INTERCOM1

D .. reserved

E .. reserved

F .. reserved

Error: Error memory (LOG)

The error memory (for max. 50 LOGs) is displayed in level 2.

In the error memory, both the occurrence and the disappearance of each error are stored with a time stamp. Entries without an error code is therefore not a malfunction.

2.0nn	Error
M:	UΔ UY Ū f Δf ΔΦ C
S:	T0123456789ABCDEF
t:	9999d 15h 03m 01s

nn ... The number of the entry in the error memory

t ... Timestamp: duration since occurrence in days/hours/minutes/seconds

VDE-AR-N 4105:2018

For the 3 parameter sets of VDE-AR-N 4105 (ID:311,312,313), the following applies for commissioning:

When commissioning, make sure that only one coupling switch (at R1) is to be used. VDE-AR-N 4105 for inverters is an exception - here, 2 coupling switches (at R1 and R2) must still be used.

Furthermore, the feedback contact(s) must be connected to the digital inputs I1(2) and $\perp$ provided for this purpose. Finally, parameter 3.099 determines whether the feedback contact(s) are normally closed (n.c.) or normally open (n.o.).

An Error C (Contact) appears on the display if this has not been taken into account. The Ex9JP-G must not switch on the output relays R1 and R2 for VDE-AR-N 4105 during Error C as long as the feedback contacts are not correctly connected and parameterised.

Contact Error-Reset:

If UN 3x400V AC is properly applied, a reset can only be performed by pressing Esc (level 1.010) or Ent (level 1.050). The contact error is thereby deleted and the output relays R1 and R2) pick up after the switch-on time has elapsed.

An existing contact error can also be reported to the generating unit via R3.

In this context, we would like to refer to chapter 3.7 Test function (determining the tripping time of the coupling switch).

New parameter T ConDelOn:

By means of synchronising devices or circuit breakers, it is permitted that after the release by the Ex9JP-G protective relay, the coupling contactor(s) are only switched on with a delay. Therefore, the feedback from the feedback contact is also delayed. The permissible response delay is defined with the parameter 3.110.

T ConDelOn. In the default setting, this time is parameterised with 100ms and can be set up to a maximum of 300,000ms (5min). Conformity is guaranteed up to 10.000ms.

Criteria for used coupling switch:

With the set 100ms trigger time for the different protective functions, the maximum trigger time of the Ex9JP-G is 119ms with the German parameter sets. To ensure the total tripping time of ≤ 200 ms (Ex9GP-G + coupling switch), the coupling switch used must be able to trip within 81ms.

Password protection:

With regard to VDE-AR-N 4105, the appliances are provided with fixed password protection upon delivery. The password is „4105“. The commissioning engineer is requested to change the password immediately for security reasons (see Operating menu structure)

Novelties concerning country-specific parameter sets

C10/11:2021

Zero Sequence protection function:

The detection of the zero sequence (U_{zero}) in the three-phase system forms a further supplement to the protection functions. Zero sequence can be used, for example, to detect short circuits in the superordinate medium power grid. For this purpose, the three line-to-neutral voltages L1, L2 and L3, which are normally shifted by 120° , both the magnitude and the phase position are added to each other. The magnitude of the voltage difference (without angle) to the neutral conductor is determined and divided by three.

If all line-to-neutral voltages have the same magnitude and are shifted exactly 120° to each other, the zero sequence is 0VAC.

In the currently valid version of the C10/11, the threshold value for zero sequence is defined with 20% U_n (46VAC). If this limit is exceeded for $>1.5\text{s}$, R1 and R2 switch off and do not switch on again after the T_{on} delay has elapsed until the zero sequence falls below 15% U_n (34.5VAC). The corresponding parameters can be found in parameter set ID:603 from 3.115 to 3.118 (see appendix).

Connection Mode 4-wire (LN+LL) is required to determine the zero sequence. This is activated by default in parameter set ID 603 for C10-11:2021 LV-IP and must not be changed by the local mains operator if the Zero Sequence protection function is mandatory. In parameter set ID 653 for C10-11:2021 HV-IP, the determination of the zero sequence must be individually discussed with the local mains operator and set accordingly.

For error-free detection of the zero sequence, none of the 3 angles (Φ_1 , Φ_2 or Φ_3) between L1, L2 and L3 must not exceed $>180^\circ$. Furthermore, the direction of rotation of the 3 phases L1→L2→L3 must be strictly ensured. For this purpose, L1, L2 and L3 of the power grid must be connect parallel to the phases L1, L2 and L3 of the Ex9JP-G in this order. To detect the zero sequence, the neutral conductor must be connected (also due to Connection Mode 4-wire (LN+LL)).

Activation of narrower frequency window:

This is based on 2 criteria of locally prevailing voltages in Microgrids. In the event of a response, a narrower frequency window $<49.7\text{Hz}$ and $>50.3\text{Hz}$ (500ms) is monitored in addition to the normal frequency monitoring $\leq 47.5\text{Hz}$ and $\geq 51.5\text{Hz}$ ($<100\text{ms}$), thus forming a further protection function for shut down R1 and R2 for mains disconnection.

- 1. Criterion:** Activation of the narrower frequency window on exceeding $U_{\text{res-anfw}} > 5\% U_n$ ($U_{\text{res-anfw}} = 3 * U_{\text{zero}}$). Related parameters for deactivation, for example, starting from 3.119 to 3.122.
With this criterion, it should be noted that even the smallest changes in one of the line-to-neutral voltages $<218.5\text{VAC}$ (for $U_n = 230\text{VAC}$) or an angular change in one of the line-to-neutral voltages of $>2.87^\circ$ result in the activation of the narrower frequency window.
- 2. Criterion:** Activation of the narrower frequency window when one of the line-to-neutral voltages is below 85%. This criterion replaces the measurement of the rotating and counterrotating symmetrical components of the 3-phase system.
Related parameters for deactivation, for example Starting with 3.123 to 3.126.

Another possibility to activate the narrower frequency window is to bridge the digital input I5 with $\perp$ in order to be able to connect further measurement options here, as recommended in EN50549-1:2019 + AC:2019 (see connection diagram 4).

Important!

The settings for activating the narrower frequency window (3.062 to 3.069 and 3.119 to 3.126) must be agreed and documented with the local network operator.

Novelties concerning country-specific parameter sets

EN50549-1/2:2019 (default Netherlands)

For the European EN50549-1/2 parameter set, the same requirements apply for the activation of the narrower frequency window as in chapter 3.10.2. However, the corresponding parameters (3.062 to 3.069 and 3.119 to 3.126) are deactivated and must be parameterized after consultation with the local network operator. Furthermore, the protection function Zero Sequence can also be activated in the parameter sets of EN50549-1/2 as mentioned in 3.10.2.

The default settings in the parameter set are designed for the standard protection functions of the Netherlands.

OPEN_SETUP

Within the parameter set OPEN_SETUP, voltage threshold values for the deactivation of all 3 possible frequency monitoring can now be activated. Activation/deactivation is done with parameter 3.046 for LL measurements and parameter 3.050 for LN measurements. With 3.047 (for LL) or with 3.051 (for LN), the voltage thresholds for deactivating the frequency monitors can be set. In most countries, these are around 20%Un. The hysteresis for the reactivation is automatically defined with 1%.

With OPEN_SETUP, the Zero Sequence can also be activated as the activation of narrower frequency band.

Index: Parameters of the implemented standards

00. ÖVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators.....	34
01. ÖVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators.....	37
02. ÖVE TOR R25 MS SYNC [ID 852] Typ A/B medium voltage synchr. generators.....	40
03. ÖVE TOR R25 MS ASYNC [ID 853] Typ A/B medium voltage asynchr. generators.....	43
04. Oberösterreich OOE TOR R25 NS SYNC [ID 822] Typ A/B low voltage synchr. generators.....	46
05. Oberösterreich OOE TOR R25 NS ASYNC [ID 823] Typ A/B low voltage asynchr. generators.....	49
06. Oberösterreich OOE TOR R25 MS SYNC [ID 872] Typ A/B medium voltage synchr. generators.....	52
07. Oberösterreich OOE TOR R25 MS ASYNC [ID 873] Typ A/B med. voltage asynchr. generators.....	55
08. Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators.....	58
09. Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators.....	61
10. Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators.....	64
11. Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators.....	67
12. TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators.....	70
13. TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators.....	73
14. TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators.....	76
15. TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators.....	79
16. BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators.....	82
17. BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators.....	85
18. BURGENLAND TOR R25 MS SYNC [ID 892] Typ A/B medium voltage synchr. generators.....	88
19. BURGENLAND TOR R25 MS ASYNC [ID 893] Typ A/B medium voltage asynchr. generators.....	91
20. VDE-AR-N4105:2018≤50kW[ID311].....	94
21. VDE-AR-N4105:2018>50kW[ID312].....	97
22. VDE-AR-N4105:2018Umr[ID313].....	100
23. VDE-AR-N4110:2018TR3-25[ID707].....	103
24. CEI 0-21:2022-03 [ID 103].....	106
25. G99/1/3:2018LV[ID410].....	110
26. G99/1/3:2018HV[ID460].....	113
27. G98/1/2:2018[ID510].....	116
28. C10-11:2021LV-IP[ID603]InterfaceProtectionlowvoltage.....	119
29. C10-11:2019LV-ASS[ID602]AutomaticSeparationSystem/LowVoltage.....	123
30. C10-11:2021HV-IP[ID653]InterfaceProtection/HighVoltage.....	126
31. C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage.....	129
32. NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW.....	132
33. NA/EEA-NE7- CH 2020 [ID 1220] Low Voltage Type A >800W to ≤250kW.....	135
34. NA/EEA-NE7- CH 2020 [ID 1221] Low Voltage Type B >250kW to ≤36MW.....	139
35. EN50549-1:2019 LV Netherlands [ID 901].....	143
36. EN50549-2:2019 HV Netherlands [ID 926].....	148
37. EN50549-1:2019 LV Ireland [ID 905].....	153
38. EN50438:2013 DK [ID 950].....	158
39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910].....	161

Index: Parameters of the implemented standards

40. VDE 0126-1-1:2013 [ID 200].....	166
41. Romania ANRE 2021 [ID 1300].....	169
42. AB AS 4777.2:2020 [ID 1110].....	171
43. C AS 4777.2:2020 [ID 1120].....	174
44. NZS 4777.2:2020 [ID 1130].....	177
45. NSW-Augrid 23 [ID 1135].....	180
46. NSW-Essential 23 [ID 1140].....	183
47. NSW-Endeavour 23 [ID 1145].....	186
48. VIC-United Energy 23 [ID 1150].....	190
49. VIC-Ausnet Energy 23 [ID 1155].....	194
50. VIC-Citipower 23 [ID 1160].....	197
51. VIC-Jemana 23 [ID 1165].....	200
52. VIC-Powercor 23 [ID 1170].....	203
53. VIC-Western Power 23 [ID 1175].....	206
54. ACT-Evoenergy 23 [ID 1180].....	210
55. QLD-Energex 23 [ID 1185].....	214
56. QLD-Ergon 23 [ID 1190].....	217
57. SA-Power networks23 [ID 1195].....	220
58. NRS 097-2-1:2017 [ID 1000].....	223
59. OPEN SETUP [ID 9006].....	227
60. CZ-2024 [ID: 930].....	231
61. EN50549-1: SI Uf A/B [ID: 940].....	237
62. EN50549-2: SI Uf C [ID: 945].....	243
63. Bulgaria LV 2024 [ID: 1400].....	248
64. Bulgaria MV 2024 [ID: 1450].....	251
65. EN50438:2013 [ID 900].....	254
66. OVE E8001/8101:2014 [ID 801] renewed standard.....	256
67. VDE 0124-100:2013 [ID 300] renewed standard.....	259
68. TR3 Rev23:2013 [ID 700] renewed standard.....	262
69. AS/NZS 4777.2:2015 [ID 1102] renewed standard.....	265
70. G59/3/3:2015 LV [ID 405] renewed standard.....	267
71. G59/3/3:2015 MV [ID 455] renewed standard.....	270
72. G83/2:2012 [ID 500] renewed standard.....	273
73. C10-11:2013 LV [ID 600] renewed standard.....	276
74. C10-11:2013 MV [ID 650] renewed standard.....	279
75. C10-11:2019 LV-IP [ID 601] Interface Protection low voltage.....	282
76. C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage.....	285

00. ÖVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators

00. ÖVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	241.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	Ueff >	Enable function	on	on / off		on /off	
.019	Ueff > off	U _{THR} OFF	%Unom	111	100	130	100
.020	Ueff > on	U _{THR} ON	%Unom	108	100	108	135
.021	T Ueff >	Time OFF	ms	60000	50	180000	50
Comment:		Ueff > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10
.024	Ueff < on	U _{THR} ON	%Unom	90	86	100	10
.025	T Ueff <	Time OFF	ms	1000	50	180000	50
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on /off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100
.036	Ueff>> on	U _{THR} ON	%Unom	108	100	108	135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on /off	
.039	Ueff<< off	U _{THR} OFF	%Unom	30	10	100	10
.040	Ueff<< on	U _{THR} ON	%Unom	90	86	100	0
.041	T Ueff<<	Time OFF	ms	200	50	180000	50
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

00. ÖVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	111	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900	

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

00. ÖVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R) (T)	on
Contact feedback contact reports closed, although it should be open (C) (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

01. ÖVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators

01. ÖVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	241.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	Ueff >	Enable function	on	on / off		on / off	
.019	Ueff > off	U _{THR} OFF	%Unom	111	100	130	100
.020	Ueff > on	U _{THR} ON	%Unom	108	100	108	135
.021	T Ueff >	Time OFF	ms	60000	50	180000	50
Comment:		Ueff > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10
.024	Ueff < on	U _{THR} ON	%Unom	90	86	100	100
.025	T Ueff <	Time OFF	ms	1500	50	180000	50
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100
.036	Ueff>> on	U _{THR} ON	%Unom	108	100	108	135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on / off	
.039	Ueff<< off	U _{THR} OFF	%Unom	25	10	100	10
.040	Ueff<< on	U _{THR} ON	%Unom	90	86	100	0
.041	T Ueff<<	Time OFF	ms	500	50	180000	50
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

01. ÖVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	111	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

01. ÖVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

02. ÖVE TOR R25 MS SYNC [ID 852] Typ A/B medium voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	60.4	57.5	230.0	28.8	241.4
		Unom Δ	V	105.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	106	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	104	100	108	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	70	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	90	86	100	10	100
.017	T U <	Time OFF	ms	1500	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	110	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	104	100	108	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	90	86	100	0	100
.033	T U <<	Time OFF	ms	700	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

02. ÖVE TOR R25 MS SYNC [ID 852] Typ A/B medium voltage synchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900

Password								
ID				Default	Min	Max	Min	Max
.106	PW1	1 st digit of Password			0		0	9
.107	PW2	2 nd digit of Password			0		0	9
.108	PW3	3 rd digit of Password			0		0	9
.109	PW4	4 th digit of Password			0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

02. ÖVE TOR R25 MS SYNC [ID 852] Typ A/B medium voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

03. ÖVE TOR R25 MS ASYNC [ID 853] Typ A/B medium voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	60.4	57.5	230.0	28.8	241.4
		Unom Δ	V	105.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31.7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	106	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	104	100	108	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	80	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	90	86	100	10	100
.017	T U <	Time OFF	ms	1500	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	110	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	104	100	108	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	90	86	100	0	100
.033	T U <<	Time OFF	ms	700	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

03. ÖVE TOR R25 MS ASYNC [ID 853] Typ A/B medium voltage asynchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

03. ÖVE TOR R25 MS ASYNC [ID 853] Typ A/B medium voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

04. Oberösterreich OOE TOR R25 NS SYNC [ID 822] Typ A/B low voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	50.0
							241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10
.024	Ueff < on	U _{THR} ON	%Unom	85	85	100	10
.025	T Ueff <	Time OFF	ms	200	50	180000	50
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
							100
							100
							180000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on /off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100
.036	Ueff>> on	U _{THR} ON	%Unom	109	100	109	135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
							135
							135
							180000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on /off	
.039	Ueff<< off	U _{THR} OFF	%Unom	30	10	100	10
.040	Ueff<< on	U _{THR} ON	%Unom	85	85	100	0
.041	T Ueff<<	Time OFF	ms	200	50	180000	50
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
							100
							100
							180000

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	U10min	Enable function	on	on / off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	111	100	130	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})			
		Time OFF	ms	Fixed to fastest possible disconnection			
							135

04. Oberösterreich OOE TOR R25 NS SYNC [ID 822] Typ A/B low voltage synchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900

Password								
ID				Default	Min	Max	Min	Max
.106	PW1	1 st digit of Password			0	0	0	9
.107	PW2	2 nd digit of Password			0	0	0	9
.108	PW3	3 rd digit of Password			0	0	0	9
.109	PW4	4 th digit of Password			0	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

05. Oberösterreich OOE TOR R25 NS ASYNC [ID 823] Typ A/B low voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10
.024	Ueff < on	U _{THR} ON	%Unom	85	85	100	10
.025	T Ueff <	Time OFF	ms	1500	50	180000	50
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100
.036	Ueff>> on	U _{THR} ON	%Unom	109	100	109	100
.037	T Ueff>>	Time OFF	ms	100	50	180000	50
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on / off	
.039	Ueff<< off	U _{THR} OFF	%Unom	25	10	100	10
.040	Ueff<< on	U _{THR} ON	%Unom	85	85	100	0
.041	T Ueff<<	Time OFF	ms	500	50	180000	50
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	U10min	Enable function	on	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom	111	100	130	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})			
		Time OFF	ms	Fixed to fastest possible disconnection			

05. Oberösterreich OOE TOR R25 NS ASYNC [ID 823] Typ A/B low voltage asynchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900

Password								
ID				Default	Min	Max		
.106	PW1	1 st digit of Password			0	0	9	
.107	PW2	2 nd digit of Password			0	0	9	
.108	PW3	3 rd digit of Password			0	0	9	
.109	PW4	4 th digit of Password			0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

06. Oberösterreich OOE TOR R25 MS SYNC [ID 872] Typ A/B medium voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	60.4	57.5	230.0	28.8	241.4
		Unom Δ	V	105.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31.7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	104.5	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	104.5	100	109	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	70	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	85	85	100	10	100
.017	T U <	Time OFF	ms	200	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	108	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	104.5	100	109	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	85	85	100	0	100
.033	T U <<	Time OFF	ms	200	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

06. Oberösterreich OOE TOR R25 MS SYNC [ID 872] Typ A/B medium voltage synchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom	104.5	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00	
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00	
.061	T f <	Time OFF	ms	50	50	50	50	180000	
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value							
Only active for:		Voltage > 60% U _{NOM}							

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.	
On = it is possible to detect this error	
Off = it is not possible to show this error on relay R3	
Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

07. Oberösterreich OOE TOR R25 MS ASYNC [ID 873] Typ A/B med. voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	60.4	57.5	230.0	28.8	241.4
		Unom Δ	V	105.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31.7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	104.5	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	104.5	100	109	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	80	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	85	85	100	10	100
.017	T U <	Time OFF	ms	1000	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	108	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	104.5	100	109	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	85	85	100	0	100
.033	T U <<	Time OFF	ms	500	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom	104.5	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00	
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00	
.061	T f <	Time OFF	ms	50	50	50	50	180000	
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value							
Only active for:		Voltage > 60% U _{NOM}							

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900	

Password							
ID				Default	Min	Max	
.106	PW1	1 st digit of Password		0	0	9	
.107	PW2	2 nd digit of Password		0	0	9	
.108	PW3	3 rd digit of Password		0	0	9	
.109	PW4	4 th digit of Password		0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

08. Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators

08. Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	Ueff >	Enable function	on	on / off		on / off	
.019	Ueff > off	U _{THR} OFF	%Unom	108	100	130	100 135
.020	Ueff > on	U _{THR} ON	%Unom	107	100	108	100 135
.021	T Ueff >	Time OFF	ms	60000	50	180000	50 180000
Comment:		Ueff > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10 100
.024	Ueff < on	U _{THR} ON	%Unom	90	86	100	10 100
.025	T Ueff <	Time OFF	ms	1000	50	180000	50 180000
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100 135
.036	Ueff>> on	U _{THR} ON	%Unom	107	100	108	100 135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50 180000
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on / off	
.039	Ueff<< off	U _{THR} OFF	%Unom	30	10	100	10 100
.040	Ueff<< on	U _{THR} ON	%Unom	90	86	100	0 100
.041	T Ueff<<	Time OFF	ms	200	50	180000	50 180000
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

08. Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom	108	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00	
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00	
.061	T f <	Time OFF	ms	50	50	50	50	180000	
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value							
Only active for:		Voltage > 60% U _{NOM}							

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

08. Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

09. Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators

09. Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	241.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	Ueff >	Enable function	on	on / off		on / off	
.019	Ueff > off	U _{THR} OFF	%Unom	108	100	130	100
.020	Ueff > on	U _{THR} ON	%Unom	107	100	108	135
.021	T Ueff >	Time OFF	ms	60000	50	180000	50
Comment:		Ueff > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10
.024	Ueff < on	U _{THR} ON	%Unom	90	86	100	100
.025	T Ueff <	Time OFF	ms	1000	50	180000	50
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100
.036	Ueff>> on	U _{THR} ON	%Unom	107	100	108	135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on / off	
.039	Ueff<< off	U _{THR} OFF	%Unom	30	10	100	10
.040	Ueff<< on	U _{THR} ON	%Unom	90	86	100	0
.041	T Ueff<<	Time OFF	ms	200	50	180000	50
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

09. Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	108	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

09. Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

10. Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators

10. Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	58.7	57.5	230.0	28.8	241.4
		Unom Δ	V	102.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	108	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	107	100	108	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	80	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	90	86	100	10	100
.017	T U <	Time OFF	ms	1000	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	115	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	107	100	108	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	90	86	100	0	100
.033	T U <<	Time OFF	ms	200	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

10. Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900

Password								
ID				Default	Min	Max	Min	Max
.106	PW1	1 st digit of Password			0		0	9
.107	PW2	2 nd digit of Password			0		0	9
.108	PW3	3 rd digit of Password			0		0	9
.109	PW4	4 th digit of Password			0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

10. Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

11. Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators

11. Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	58.7	57.5	230.0	28.8	241.4
		Unom Δ	V	102.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	108	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	107	100	108	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	80	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	90	86	100	10	100
.017	T U <	Time OFF	ms	1000	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	115	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	107	100	108	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	90	86	100	0	100
.033	T U <<	Time OFF	ms	200	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

11. Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	300	0	900

Password								
ID				Default	Min	Max	Min	Max
.106	PW1	1 st digit of Password			0	0	0	9
.107	PW2	2 nd digit of Password			0	0	0	9
.108	PW3	3 rd digit of Password			0	0	0	9
.109	PW4	4 th digit of Password			0	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

11. Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

12. TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators

12. TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	Ueff >	Enable function	on	on / off		on / off	
.019	Ueff > off	U _{THR} OFF	%Unom	111	100	130	100
.020	Ueff > on	U _{THR} ON	%Unom	109	100	109	135
.021	T Ueff >	Time OFF	ms	60000	50	180000	50
Comment:		Ueff > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10
.024	Ueff < on	U _{THR} ON	%Unom	86	86	100	10
.025	T Ueff <	Time OFF	ms	1000	50	180000	50
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100
.036	Ueff>> on	U _{THR} ON	%Unom	109	100	109	135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on / off	
.039	Ueff<< off	U _{THR} OFF	%Unom	30	10	100	10
.040	Ueff<< on	U _{THR} ON	%Unom	86	86	100	0
.041	T Ueff<<	Time OFF	ms	200	50	180000	50
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

12. TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom	111	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00	
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00	
.061	T f <	Time OFF	ms	50	50	50	50	180000	
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value							
Only active for:		Voltage > 60% U _{NOM}							

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	300	0	300	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

12. TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

13. TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators

13. TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	241.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	Ueff >	Enable function	on	on / off		on / off	
.019	Ueff > off	U _{THR} OFF	%Unom	111	100	130	100 135
.020	Ueff > on	U _{THR} ON	%Unom	109	100	109	100 135
.021	T Ueff >	Time OFF	ms	60000	50	180000	50 180000
Comment:		Ueff > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom	80	10	100	10 100
.024	Ueff < on	U _{THR} ON	%Unom	86	86	100	10 100
.025	T Ueff <	Time OFF	ms	1500	50	180000	50 180000
Comment:		Ueff < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	Ueff>>	Enable function	on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom	115	100	130	100 135
.036	Ueff>> on	U _{THR} ON	%Unom	109	100	109	100 135
.037	T Ueff>>	Time OFF	ms	100	50	180000	50 180000
Comment:		Ueff>> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.038	Ueff<<	Enable function	on	on		on / off	
.039	Ueff<< off	U _{THR} OFF	%Unom	25	10	100	10 100
.040	Ueff<< on	U _{THR} ON	%Unom	86	86	100	0 100
.041	T Ueff<<	Time OFF	ms	500	50	180000	50 180000
Comment:		Ueff<< on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

13. TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom	111	100	130	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00	
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00	
.061	T f <	Time OFF	ms	50	50	50	50	180000	
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value							
Only active for:		Voltage > 60% U _{NOM}							

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.c. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	300	0	300	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

13. TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

14. TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators

14. TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	57.5	57.5	28.8	241.4
		Unom Δ	V	100.0	100.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1					

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	100	108	100	135
.013	T U >	Time OFF	ms	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	86	100	10	100
.017	T U <	Time OFF	ms	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.026	U >>	Enable function	on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	100	108	100	135
.029	T U >>	Time OFF	ms	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.030	U <<	Enable function	on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	86	100	0	100
.033	T U <<	Time OFF	ms	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

14. TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.c. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	300	0	300	0	900

Password								
ID				Default	Min	Max		
.106	PW1	1 st digit of Password			0	0	9	
.107	PW2	2 nd digit of Password			0	0	9	
.108	PW3	3 rd digit of Password			0	0	9	
.109	PW4	4 th digit of Password			0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

14. TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

15. TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators

15. TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	57.5	57.5	230.0	28.8	241.4
		Unom Δ	V	100.0	100.0	400.0	50.0	420.0
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31.7kV and 300:1						

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom	105	100	130	100	135
.012	U > on	U _{THR} ON	%Unom	104	100	108	100	135
.013	T U >	Time OFF	ms	60000	50	180000	50	180000
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom	80	10	100	10	100
.016	U < on	U _{THR} ON	%Unom	86	86	100	10	100
.017	T U <	Time OFF	ms	1500	50	180000	50	180000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom	115	100	130	100	135
.028	U >> on	U _{THR} ON	%Unom	104	100	108	100	135
.029	T U >>	Time OFF	ms	100	50	180000	50	180000
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	U << on	U _{THR} ON	%Unom	86	86	100	0	100
.033	T U <<	Time OFF	ms	500	50	180000	50	180000
Comment:		U << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

15. TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	50.10	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 60% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.c. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	300	0	300	0	900

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

15. TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

16. BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators

16. BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LN	4-wire LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V /400,00V	57,50V /100,00V	230,00V /400,00V	28,75V /50,00V	241,50V /420,00V
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1					

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	Ueff >	Enable function		on	on / off		on /off	
.019	Ueff > off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	Ueff > on	U _{THR} ON	%Unom /VUnom	108,00% (248,40V)	100,00% (230,00V)	108,00% (248,40V)	100,00% (230,00V)	135,00% (310,50V)
.021	T Ueff >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom /VUnom	80,00% (184,00V)	10,00% (23,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)	
.024	Ueff < on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	86,00% (197,80V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)	
.025	T Ueff <	Time OFF		1000 ms	50 ms	180000 ms	50 ms	180000 ms	
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)							

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	Ueff>>	Enable function		on	on		on /off	
.035	Ueff>> off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	Ueff>> on	U _{THR} ON	%Unom /VUnom	108,00% (248,40V)	100,00% (230,00V)	108,00% (248,40V)	100,00% (230,00V)	135,00% (310,50V)
.037	T Ueff>>	Time OFF		100 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

16. BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	Ueff<<	Enable function		on	on		on /off	
.039	Ueff<< off	U _{THR} OFF	%Unom /VUnom	30,00% (69,00V)	10,00% (23,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	Ueff<< on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	86,00% (197,80V)	100,00% (230,00V)	0,00% (0,00V)	100,00% (230,00V)
.041	T Ueff<<	Time OFF		200 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V /444,00V)	100,00% (230,00V /400,00V)	130,00% (299,00V /520,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.054	f oA	Enable function	on					
.055	f > off	f _{THR} OFF	51,500 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz	
.056	f > on	f _{THR} ON	50,10 Hz	50,000 Hz	50,10 Hz	50,000 Hz	55,000 Hz	
.057	T f >	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms	

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f uA	Enable function	on				
.059	f < off	f _{THR} OFF	47,500 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,500 Hz	47,500 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.c. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	300 s	0 s	900 s

16. BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

17. BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators

17. BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LN	4-wire LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V /400,00V	57,50V /100,00V	230,00V /400,00V	28,75V /50,00V	241,50V /420,00V
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1					

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	Ueff >	Enable function		on	on / off		on /off	
.019	Ueff > off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	Ueff > on	U _{THR} ON	%Unom /VUnom	108,00% (248,40V)	100,00% (230,00V)	108,00% (248,40V)	100,00% (230,00V)	135,00% (310,50V)
.021	T Ueff >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	Ueff < off	U _{THR} OFF	%Unom /VUnom	80,00% (184,00V)	10,00% (23,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	Ueff < on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	86,00% (197,80V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T Ueff <	Time OFF		1500 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	Ueff>>	Enable function		on	on		on /off	
.035	Ueff>> off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	Ueff>> on	U _{THR} ON	%Unom /VUnom	108,00% (248,40V)	100,00% (230,00V)	108,00% (248,40V)	100,00% (230,00V)	135,00% (310,50V)
.037	T Ueff>>	Time OFF		100 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

17. BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	Ueff<<	Enable function		on	on		on /off	
.039	Ueff<< off	U _{THR} OFF	%Unom /VUnom	25,00% (57,50V)	10,00% (23,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	Ueff<< on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	86,00% (197,80V)	100,00% (230,00V)	0,00% (0,00V)	100,00% (230,00V)
.041	T Ueff<<	Time OFF		500 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		off	on / off		on / off	
.043	U10min off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V /444,00V)	100,00% (230,00V /400,00V)	130,00% (299,00V /520,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V /540,00V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.054	f oA	Enable function	on				
.055	f > off	f _{THR} OFF	51,500 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	50,10 Hz	50,000 Hz	50,10 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f uA	Enable function	on				
.059	f < off	f _{THR} OFF	47,500 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,500 Hz	47,500 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.c. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	300 s	0 s	900 s

17. BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

18. BURGENLAND TOR R25 MS SYNC [ID 892] Typ A/B medium voltage synchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire LL	3-wire LL	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	59,23V /103,00V	57,50V /100,00V	230,00V /400,00V	28,75V /50,00V	241,50V /420,00V
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1					

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom /VUnom	105,00% (108,15V)	100,00% (103,00V)	130,00% (133,90V)	100,00% (103,00V)	135,00% (139,05V)
.012	U > on	U _{THR} ON	%Unom /VUnom	103,00% (106,09V)	100,00% (103,00V)	108,00% (111,24V)	100,00% (103,00V)	135,00% (139,05V)
.013	T U >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom /VUnom	70,00% (72,10V)	10,00% (10,30V)	100,00% (103,00V)	10,00% (10,30V)	100,00% (103,00V)
.016	U < on	U _{THR} ON	%Unom /VUnom	90,00% (92,70V)	86,00% (88,58V)	100,00% (103,00V)	10,00% (10,30V)	100,00% (103,00V)
.017	T U <	Time OFF		1500 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom /VUnom	110,00% (113,30V)	100,00% (103,00V)	130,00% (133,90V)	100,00% (103,00V)	135,00% (139,05V)
.028	U >> on	U _{THR} ON	%Unom /VUnom	103,00% (106,09V)	100,00% (103,00V)	108,00% (111,24V)	100,00% (103,00V)	135,00% (139,05V)
.029	T U >>	Time OFF		100 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

18. BURGENLAND TOR R25 MS SYNC [ID 892] Typ A/B medium voltage synchr. generators

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom /VUnom	30,00% (30,90V)	10,00% (10,30V)	100,00% (103,00V)	10,00% (10,30V)	100,00% (103,00V)
.032	U << on	U _{THR} ON	%Unom /VUnom	90,00% (92,70V)	86,00% (88,58V)	100,00% (103,00V)	0,00% (0,00V)	100,00% (103,00V)
.033	T U <<	Time OFF		700 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	51,500 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	50,10 Hz	50,000 Hz	50,10 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f uA	Enable function	on				
.059	f < off	f _{THR} OFF	47,500 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,500 Hz	47,500 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Frequency measuring in general				Conformity Range			
ID			Default	Min	Max		
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.c. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	300 s	0 s	900 s

Password							
ID				Default	Min	Max	
.106	PW1	1 st digit of Password		0	0	9	
.107	PW2	2 nd digit of Password		0	0	9	
.108	PW3	3 rd digit of Password		0	0	9	
.109	PW4	4 th digit of Password		0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

18. BURGENLAND TOR R25 MS SYNC [ID 892] Typ A/B medium voltage synchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

19. BURGENLAND TOR R25 MS ASYNC [ID 893] Typ A/B medium voltage asynchr. generators

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire LL	3-wire LL	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	59,23V /103,00V	57,50V /100,00V	230,00V /400,00V	28,75V /50,00V	241,50V /420,00V
Comment:		Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1					

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U > off	U _{THR} OFF	%Unom /VUnom	105,00% (108,15V)	100,00% (103,00V)	130,00% (133,90V)	100,00% (103,00V)	135,00% (139,05V)
.012	U > on	U _{THR} ON	%Unom /VUnom	103,00% (106,09V)	100,00% (103,00V)	108,00% (111,24V)	100,00% (103,00V)	135,00% (139,05V)
.013	T U >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.015	U < off	U _{THR} OFF	%Unom /VUnom	80,00% (82,40V)	10,00% (10,30V)	100,00% (103,00V)	10,00% (10,30V)	100,00% (103,00V)	
.016	U < on	U _{THR} ON	%Unom /VUnom	90,00% (92,70V)	86,00% (88,58V)	100,00% (103,00V)	10,00% (10,30V)	100,00% (103,00V)	
.017	T U <	Time OFF		1500 ms	50 ms	180000 ms	50 ms	180000 ms	
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)							

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	U >>	Enable function		on	on		on /off	
.027	U >> off	U _{THR} OFF	%Unom /VUnom	110,00% (113,30V)	100,00% (103,00V)	130,00% (133,90V)	100,00% (103,00V)	135,00% (139,05V)
.028	U >> on	U _{THR} ON	%Unom /VUnom	103,00% (106,09V)	100,00% (103,00V)	108,00% (111,24V)	100,00% (103,00V)	135,00% (139,05V)
.029	T U >>	Time OFF		100 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

19. BURGENLAND TOR R25 MS ASYNC [ID 893] Typ A/B medium voltage asynchr. generators

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	U <<	Enable function		on	on		on /off	
.031	U << off	U _{THR} OFF	%Unom /VUnom	30,00% (30,90V)	10,00% (10,30V)	100,00% (103,00V)	10,00% (10,30V)	100,00% (103,00V)
.032	U << on	U _{THR} ON	%Unom /VUnom	90,00% (92,70V)	86,00% (88,58V)	100,00% (103,00V)	0,00% (0,00V)	100,00% (103,00V)
.033	T U <<	Time OFF		700 ms	50 ms	180000 ms	50 ms	180000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	51,500 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	50,10 Hz	50,000 Hz	50,10 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	47,500 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,500 Hz	47,500 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	50 ms	50 ms	50 ms	50 ms	180000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.c. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	300 s	0 s	900 s

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

19. BURGENLAND TOR R25 MS ASYNC [ID 893] Typ A/B medium voltage asynchr. generators

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	on
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

20. VDE-AR-N 4105:2018 ≤50kW [ID 311]

20. VDE-AR-N 4105:2018 ≤50kW [ID 311]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range	Possible Range
ID			Default	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	V V	Fixed to 230.0 / 400.0	

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	1ch	1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	ULL >> off	U _{THR} OFF	%Unom	Fixed to 115% U _{NOM}				
.012	ULL >> on	U _{THR} ON	%Unom	110	110	110	100	110
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	80	80	85	80	85
.016	ULL < on	U _{THR} ON	%Unom	85	85	85	85	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage1 Line to Neutral				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.019	ULN >> off	U _{THR} OFF	%Unom	Fixed to 115% U _{NOM}				
.020	ULN >> on	U _{THR} ON	%Unom	110	110	110	100	110
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULN >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	80	80	85	80	85
.024	ULN < on	U _{THR} ON	%Unom	85	85	85	85	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULN < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

10 minutes average overvoltage				Conformity Range	Possible Range
ID			Default	Min	Max
.043	U > off	U _{THR} OFF	%Unom	110	115
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})	
		Time OFF	ms	Fixed to fastest possible disconnection	

20. VDE-AR-N 4105:2018 ≤50kW [ID 311]

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	Fixed to 51.50Hz			
.056	f > on	f _{THR} ON	Hz	50.10	50.10	50.10	50.10
		Time OFF	ms	Fixed to fastest possible disconnection			

Underfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	Fixed to 47.50Hz				
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	47.50	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value						

Random overfrequency					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.086	f > random	Enable function		off	on / off		on /off	
.087	f > random	f _{THR} OFF	Hz		50.20	51.50	50.20	51.50
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.10Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited						

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 100ms				
.110	T ConDelOn	Time ON	ms	100	100	10000	100	300000
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	1	900

Random Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.103	Ton random	Enable function	off	on / off		on / off	
.104	Ton random	Turn on time	s	60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited					

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	4	0	9
.107	PW2	2 nd digit of Password	1	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	5	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

20. VDE-AR-N 4105:2018 ≤50kW [ID 311]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

21. VDE-AR-N 4105:2018 >50kW [ID 312]

21. VDE-AR-N 4105:2018 >50kW [ID 312]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	V V	Fixed to 230.0 / 400.0				

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	1ch	1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.011	ULL >> off	U _{THR} OFF	%Unom	Fixed to 125% U _{NOM}				
.012	ULL >> on	U _{THR} ON	%Unom	110	110	110	100	110
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	Fixed to 80% U _{NOM}				
.016	ULL < on	U _{THR} ON	%Unom	85	85	85	85	100
.017	T ULL <	Time OFF	ms	1000	50	1000	50	10000
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage1 Line to Neutral				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.019	ULN >> off	U _{THR} OFF	%Unom	Fixed to 125% U _{NOM}				
.020	ULN >> on	U _{THR} ON	%Unom	110	110	110	100	110
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULN >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	Fixed to 80% U _{NOM}				
.024	ULN < on	U _{THR} ON	%Unom	85	85	85	85	100
.025	T ULN <	Time OFF	ms	1000	50	1000	50	10000
Comment:		ULN < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	ULL << off	U _{THR} OFF	%Unom	Fixed to 45% U _{NOM}				
.032	ULL << on	U _{THR} ON	%Unom	85	85	85	85	100
.033	T ULL <<	Time OFF	ms	300	50	300	50	10000
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

21. VDE-AR-N 4105:2018 >50kW [ID 312]

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	ULN << off	U _{THR} OFF	%Unom	Fixed to 45% U _{NOM}			
.040	ULN << on	U _{THR} ON	%Unom	85	85	85	100
.041	T ULN <<	Time OFF	ms	200	50	300000	50
Comment:		ULN << on has a fixed offset of 0.5% U _{NOM} added to the displayed value					

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.043	U > off	U _{THR} OFF	%Unom	110	110	115	110
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})			
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	Fixed to 51.50Hz			
.056	f > on	f _{THR} ON	Hz	50.10	50.10	50.10	50.00
		Time OFF	ms	Fixed to fastest possible disconnection			

Underfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	Fixed to 47.50Hz				
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	47.50	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value						

Random overfrequency				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.086	f > random	Enable function		off	on / off		on /off	
.087	f > random	f _{THR} OFF	Hz		50.20	51.50	50.20	51.50
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.10Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited						

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 100ms				
.110	T ConDelOn	Time ON	ms	100	100	10000	100	300000
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	1	900

21. VDE-AR-N 4105:2018 >50kW [ID 312]

Random Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.103	Ton random	Enable function	off	on / off		on / off	
.104	Ton random	Turn on time	s	60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited					

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	4	0	9
.107	PW2	2 nd digit of Password	1	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	5	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ü)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

22. VDE-AR-N 4105:2018 Umr [ID 313]

22. VDE-AR-N 4105:2018 Umr [ID 313]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	V V	Fixed to 230.0 / 400.0				

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	ULL >> off	U _{THR} OFF	%Unom	Fixed to 125% U _{NOM}				
.012	ULL >> on	U _{THR} ON	%Unom	110	110	110	100	110
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	Fixed to 80% U _{NOM}				
.016	ULL < on	U _{THR} ON	%Unom	85	85	85	85	100
		Time OFF	ms	Fixed to 3000ms				
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.019	ULN >> off	U _{THR} OFF	%Unom	Fixed to 125% U _{NOM}				
.020	ULN >> on	U _{THR} ON	%Unom	110	110	110	100	110
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULN >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	Fixed to 80% U _{NOM}				
.024	ULN < on	U _{THR} ON	%Unom	85	85	85	85	100
		Time OFF	ms	Fixed to 3000ms				
Comment:		ULN < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Undervoltage2 Line to Line				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.031	ULL << off	U _{THR} OFF	%Unom	Fixed to 45% U _{NOM}				
.032	ULL << on	U _{THR} ON	%Unom	85	85	85	85	100
		Time OFF	ms	Fixed to 300ms				
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

22. VDE-AR-N 4105:2018 Umr [ID 313]

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.039	ULN << off	U _{THR} OFF	%Unom	Fixed to 45% U _{NOM}				
.040	ULN << on	U _{THR} ON	%Unom	85	85	85	85	100
		Time OFF	ms	Fixed to 300ms				
Comment:		ULN << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.043	U > off	U _{THR} OFF	%Unom	110	110	115	110	115
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	Fixed to 51.50Hz				
.056	f > on	f _{THR} ON	Hz	50.10	50.10	50.10	50.00	50.10
		Time OFF	ms	Fixed to fastest possible disconnection				

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	Fixed to 47.50Hz				
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	47.50	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value						

Random overfrequency					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.086	f > random	Enable function		off	on / off		on /off	
.087	f > random	f _{THR} OFF	Hz		50.20	51.50	50.20	51.50
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.10Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 100ms				
.110	T ConDelOn	Time ON	ms	100	100	10000	100	300000
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	1	900

22. VDE-AR-N 4105:2018 Umr [ID 313]

Random Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.103	Ton random	Enable function	off	on / off		on / off	
.104	Ton random	Turn on time	s	60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited					

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	4	0	9
.107	PW2	2 nd digit of Password	1	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	5	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ü)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

23. VDE-AR-N 4110:2018 TR3-25 [ID 707]

23. VDE-AR-N 4110:2018 TR3-25 [ID 707]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	3-wire, 4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	50.0
							241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL >	Enable function	on	on / off		on / off	
.011	ULL > off	U _{THR} OFF	%Unom	110	100	130	100
.012	ULL > on	U _{THR} ON	%Unom	109	103	109	135
.013	T ULL >	Time OFF	ms	180000	100	180000	100
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	80	10	100	10
.016	ULL < on	U _{THR} ON	%Unom	95	95	95	10
.017	T ULL <	Time OFF	ms	1500	1500	2400	50
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN >	Enable function	on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom	110	100	130	100
.020	ULN > on	U _{THR} ON	%Unom	109	103	109	135
.021	T ULN >	Time OFF	ms	180000	100	180000	100
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	80	10	100	10
.024	ULN < on	U _{THR} ON	%Unom	95	95	95	10
.025	T ULN <	Time OFF	ms	1500	1500	2400	50
Comment:		ULN < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))					

Overvoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.026	ULL >>	Enable function	on	on		on / off	
.027	ULL >> off	U _{THR} OFF	%Unom	125	100	130	100
.028	ULL >> on	U _{THR} ON	%Unom	124	103	124	135
.029	T ULL >>	Time OFF	ms	100	100	100	10000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

23. VDE-AR-N 4110:2018 TR3-25 [ID 707]

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	ULL << off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	ULL << on	U _{THR} ON	%Unom	95	95	95	10	100
.033	T ULL <<	Time OFF	ms	800	800	800	50	60000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN >>	Enable function		on	on		on / off	
.035	ULN >> off	U _{THR} OFF	%Unom	125	100	130	100	135
.036	ULN >> on	U _{THR} ON	%Unom	124	103	124	100	135
.037	T ULN >>	Time OFF	ms	100	100	100	100	10000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.039	ULN << off	U _{THR} OFF	%Unom	30	10	100	10	100
.040	ULN << on	U _{THR} ON	%Unom	95	95	95	10	100
.041	T ULN <<	Time OFF	ms	800	800	800	50	60000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						
Comment:		ULN << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	55.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.10	50.10	50.00	55.00
.057	T f >	Time OFF	ms	5000	150	5000	150	10000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	45.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	49.90	49.90	49.90	45.00	50.00
.061	T f <	Time OFF	ms	50	50	70	50	10000
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value f < on has a fixed offset of 0.01 Hz added to the displayed value						

Overfrequency 2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.063	f >> off	f _{THR} OFF	Hz	52.50	50.00	55.00	50.00	55.00
.064	f >> on	f _{THR} ON	Hz	50.10	50.10	50.10	50.00	55.00
.065	T f >>	Time OFF	ms	50	50	70	50	10000
Comment:		f >> off has a fixed offset of 0.01 Hz subtracted to the displayed value						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

23. VDE-AR-N 4110:2018 TR3-25 [ID 707]

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	60	0	1800

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	off
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	off

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

24. CEI 0-21:2022-03 [ID 103]

24. CEI 0-21:2022-03 [ID 103]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	2-wire, 3-wire, 4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	V V	Fixed to 230.0 / 400.0			

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Operational Mode			Conformity Range	Possible Range
ID		Default		
.009	Mode	1 (transitory)	0 (definitive), 1 (transitory)	0 (definitive), 1 (transitory)

Overvoltage1 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.011	V 59.S2 LL	U _{THR} OFF	%Unom	115	100	130	100	135	
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})					
.013	T 59.S2 LL	Time OFF	ms	200	50	1000	50	10000	
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)							

Undervoltage1 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.015	V 27.S1 LL	U _{THR} OFF	% Unom	85	20	100	0	100	
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})					
.017	T 27.S1 LL	Time OFF	ms	1500	50	5000	50	10000	
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)							

Overvoltage1 Line to Neutral					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.019	V 59.S2 LN	U _{THR} OFF	%Unom	115	100	130	100	135	
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})					
.021	T 59.S2 LN	Time OFF	ms	200	50	1000	50	10000	
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)							

Undervoltage1 Line to Neutral					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.023	V 27.S1 LN	U _{THR} OFF	%Unom	85	20	100	0	100	
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})					
.025	T 27.S1 LN	Time OFF	ms	1500	50	5000	50	10000	
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))							

Undervoltage2 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.031	V 27.S2 LL	U _{THR} OFF	%Unom	15	5	100	0	100	
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})					
.033	T 27.S2 LL	Time OFF	ms	200	50	5000	50	10000	
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)							

24. CEI 0-21:2022-03 [ID 103]

Undervoltage2 Line to Neutral					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.039	V 27.S2 LN	U _{THR} OFF	%Unom	15	5	100	0	100	
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})					
.041	T 27.S2 LN	Time OFF	ms	200	50	5000	50	10000	
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)							

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.043	V 59.S1	U _{THR} OFF	%Unom	110	100	120	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (4% U _{THR})				
.045	T 59.S1	Time OFF	ms	0	0	0	0	10000

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	F 81>S2 ws	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.2% f _{THR})				
.057	T 81>S2 ws	Time OFF	ms	1000	50	5000	50	10000
Only active for:		Operational Mode 0 (definitive mode) when DigIn4 is inactive (contact open) Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	F 81<S2 ws	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.2% f _{THR})				
.061	T 81<S2 ws	Time OFF	ms	4000	50	5000	50	10000
Only active for:		Operational Mode 0 (definitive mode) when DigIn4 is inactive (contact open) Voltage > 20% U _{NOM}						

Overfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.063	F 81>S1 nf	f _{THR} OFF	Hz	50.20	50.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.2% f _{THR})				
.065	T 81>S1 nf	Time OFF	ms	100	50	5000	50	10000
Only active for:		Operational Mode 0 (definitive mode) when DigIn4 is active (contact closed) Operational Mode 1 (transitory mode) when DigIn5 is active (contact closed) Voltage > 20% U _{NOM}						

Underfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.067	F 81<S1 nf	f _{THR} OFF	Hz	49.80	47.00	50.00	45.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.2% f _{THR})				
.069	T 81<S1 nf	Time OFF	ms	100	50	5000	50	10000
Only active for:		Operational Mode 0 (definitive mode) when DigIn4 is active (contact closed) Operational Mode 1 (transitory mode) when DigIn5 is active (contact closed) Voltage > 20% U _{NOM}						

Overfrequency3					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.071	F 81>S2 wf	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.2% f _{THR})				
.073	T 81>S2 wf	Time OFF	ms	100	50	5000	50	10000
Only active for:		Operational Mode 1 (transitory mode) when DigIn5 is inactive (contact open) Voltage > 20% U _{NOM}						

24. CEI 0-21:2022-03 [ID 103]

Underfrequency3					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.075	F 81<S2 wf	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.2% f _{THR})				
.077	T 81<S2 wf	Time OFF	ms	100	50	5000	50	10000
Only active for:		Operational Mode 1 (transitory mode) when DigIn5 is inactive (contact open) Voltage > 20% U _{NOM}						

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF OFF	RoCoF _{THR} OFF	mHz/s	2700	1000	4000	100	8000
.092	RoCoF ON	RoCoF _{THR} ON	mHz/s	2300	1000	4000	100	8000
.093	T RoCoF	Time OFF	ms	0	0	1000	0	10000
.111	RoCoF wnd	Window length	ms	100	100	1000	100	1000

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	5	0	300	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

24. CEI 0-21:2022-03 [ID 103]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ū)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	off

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

25. G99/1/3:2018 LV [ID 410]

25. G99/1/3:2018 LV [ID 410]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN)		

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	417.4	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	O/V st 1	U _{THR} OFF	%Unom	114	114	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.021	T O/V st 1	Time OFF	ms	1000	1000	50	300000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.035	O/V st 2	U _{THR} OFF	%Unom	119	119	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.037	T O/V st 2	Time OFF	ms	500	500	50	300000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	U/V	U _{THR} OFF	%Unom	80	80	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.041	T U/V	Time OFF	ms	2500	2500	50	300000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	U/F st 1	f _{THR} OFF	Hz	47.50	47.50	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.061	T U/F st 1	Time OFF	ms	20000	20000	1000	300000

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.063	O/F	f _{THR} OFF	Hz	52.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.065	T O/F	Time OFF	ms	500	500	50	300000

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.067	U/F st 2	f _{THR} OFF	Hz	47.00	47.00	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.069	T U/F st 2	Time OFF	ms	500	500	50	300000

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

25. G99/1/3:2018 LV [ID 410]

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	3000	10	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	3000	10	3000
.093	RoCoFDelay	Time OFF	ms	500	50	500	50	2000
.111	RoCoF wnd	Window length	ms	Fixed window length 225ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function			off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	12	--	--	3	15	
.096	PShift on	PShift _{THR} ON	°	9	--	--	3	15	
		Time OFF	ms	Fixed to fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 200ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	20	20	20	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.	
On = it is possible to detect this error	
Off = it is not possible to show this error on relay R3	
Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

25. G99/1/3:2018 LV [ID 410]

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

26. G99/1/3:2018 HV [ID 460]

26. G99/1/3:2018 HV [ID 460]

Connection Mode			Conformity Range		Possible Range	
ID		Default				
.003	Connection	Fixed to 3-wire				

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400	241.4
						50.0	420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	O/V st 1	U _{THR} OFF	%Unom	110	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.013	T O/V st 1	Time OFF	ms	1000	1000	50	300000

Overvoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.027	O/V st 2	U _{THR} OFF	%Unom	113	113	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.029	T O/V st 2	Time OFF	ms	500	500	50	300000

Undervoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.031	U/V	U _{THR} OFF	%Unom	80	80	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.033	T U/V	Time OFF	ms	2500	2500	50	300000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	U/F st 1	f _{THR} OFF	Hz	47.50	47.50	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.061	T U/F st 1	Time OFF	ms	20000	20000	1000	300000

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.063	O/F	f _{THR} OFF	Hz	52.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.065	T O/F	Time OFF	ms	500	500	50	300000

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.067	U/F st 2	f _{THR} OFF	Hz	47.00	47.00	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.069	T U/F st 2	Time OFF	ms	500	500	50	300000

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

26. G99/1/3:2018 HV [ID 460]

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	3000	10	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	3000	10	3000
.093	RoCoFDelay	Time OFF	ms	500	50	500	50	2000
.111	RoCoF wnd	Window length	ms	Fixed window length 225ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function			off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	12	--	--	3	15	
.096	PShift on	PShift _{THR} ON	°	9	--	--	3	15	
		Time OFF	ms	Fixed to fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 200ms					

Auxiliary Contact type					Conformity Range		Possible Range		
ID				Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		
.100	T Contact	Time OFF	ms	Fixed to 500ms					
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		
.100	T Contact	Time OFF	ms	Fixed to 500ms					

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	20	20	20	0	900

Password				Default	Min	Max
ID						
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.	
On = it is possible to detect this error	
Off = it is not possible to show this error on relay R3	
Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

26. G99/1/3:2018 HV [ID 460]

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

27. G98/1/2:2018 [ID 510]

27. G98/1/2:2018 [ID 510]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN)		

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	417.4	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	O/V st 1	U _{THR} OFF	%Unom	114	114	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.021	T O/V st 1	Time OFF	ms	1000	1000	50	10000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.035	O/V st 2	U _{THR} OFF	%Unom	119	119	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.037	T O/V st 2	Time OFF	ms	500	500	50	10000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	U/V	U _{THR} OFF	%Unom	80	80	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.041	T U/V	Time OFF	ms	2500	2500	50	10000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	U/F st 1	f _{THR} OFF	Hz	47.50	47.50	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.061	T U/F st 1	Time OFF	ms	20000	20000	1000	120000

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.063	O/F	f _{THR} OFF	Hz	52.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.065	T O/F	Time OFF	ms	500	500	50	10000

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.067	U/F st 2	f _{THR} OFF	Hz	47.00	47.00	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.069	T U/F st 2	Time OFF	ms	500	500	50	10000

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

27. G98/1/2:2018 [ID 510]

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	3000	10	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	3000	10	3000
		Time OFF	ms	Fixed to fastest possible disconnection				
.111	RoCoF wnd	Window length	ms	Fixed window length 535ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function			off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	12	--	--	3	15	
.096	PShift on	PShift _{THR} ON	°	9	--	--	3	15	
		Time OFF	ms	Fixed to the fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 200ms					

Auxiliary Contact type				Conformity Range		Possible Range		
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	20	20	20	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.	
On = it is possible to detect this error	
Off = it is not possible to show this error on relay R3	
Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ü)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	off
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	off

27. G98/1/2:2018 [ID 510]

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

28. C10-11:2021 LV-IP [ID 603] Interface Protection low voltage

28. C10-11:2021 LV-IP [ID 603] Interface Protection low voltage

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	U LN > off	U _{THR} OFF	%Unom	100	110	100	135
.020	U LN > on	U _{THR} ON	%Unom	100	120	100	135
.021	T U LN >	Time OFF	ms	0	3000	0	10000
Comment:		U LN > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	U LN < off	U _{THR} OFF	%Unom	50	85	0	100
.024	U LN < on	U _{THR} ON	%Unom	50	100	0	100
.025	T U LN <	Time OFF	ms	0	1500	0	10000
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.035	U LN>> off	U _{THR} OFF	%Unom	115	110	130	100	135
.036	U LN>> on	U _{THR} ON	%Unom	114	100	120	100	135
.037	T ULN>>	Time OFF	ms	0	0	0	0	10000
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LN > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	U LN<< off	U _{THR} OFF	%Unom	15	50	0	100
.040	U LN<< on	U _{THR} ON	%Unom	50	100	0	100
.041	T U LN<<	Time OFF	ms	0	5000	0	10000
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

28. C10-11:2021 LV-IP [ID 603] Interface Protection low voltage

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		on	on		on/off	
.116	Uzero> off	U _{THR} OFF	%Unom	20	20	20	5	100
.117	Uzero> on	U _{THR} ON	%Unom	15	1	19	1	100
.118	T Uzero >	Time OFF	ms	1500	0	1500	0	10000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		on	on		on/off	
.120	Ures > on	U _{THR} OFF	%Unom	5	5	5	2	100
.121	Ures > off	U _{THR} ON	%Unom	3	1	3	1	100
.122	T Ures >	Time OFF	ms	200	0	240000	0	240000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		on	on		on/off		
.124	Uanfw< on	U _{THR} OFF	%Unom	85	85	85	1	100	
.125	Uanfw< off	U _{THR} ON	%Unom	86	86	100	2	100	
.126	T Uanfw <	Time OFF	ms	0	0	240000	0	240000	
Only active for:		Connection Modes: 4-wire (LN+LL)							

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.057	T f >	Time OFF	ms	0	0	0	0	10000
Comment:		f > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	40.00	50.00	
.060	f < on	f _{THR} ON	Hz	49.90	47.00	50.00	40.00	50.00	
.061	T f <	Time OFF	ms	0	0	0	0	10000	
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value							
Only active for:		Voltage > 20% U _{NOM}							

Overfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.062	f nw >	Enable Function		on	on		on/off	
.063	f nw > off	f _{THR} OFF	Hz	50.30	50.30	50.30	50.00	55.00
.064	f nw > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.065	T f nw >	Time OFF	ms	500	500	500	0	10000
Comment:		f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)						

28. C10-11:2021 LV-IP [ID 603] Interface Protection low voltage

Underfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.066	f nw <	Enable Function		on	on		on/off	
.067	f nw < off	f _{THR} OFF	Hz	49.70	49.70	49.70	45.00	50.00
.068	f nw < on	f _{THR} ON	Hz	49.90	47.00	50.00	45.00	50.00
.069	T f nw <	Time OFF	ms	500	500	500	0	10000
Comment:		f nw < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	2000	100	5000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	2000	100	5000
.093	RoCoF t	Time OFF	ms	0	0	0	0	5000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	300	100	300	10	5000
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	T on delay	Turn on time	s	60	60	60	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

28. C10-11:2021 LV-IP [ID 603] Interface Protection low voltage

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ū)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxxxx	xxxxxxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

29. C10-11:2019 LV-ASS [ID 602] Automatic Separation System / Low Voltage

29. C10-11:2019 LV-ASS [ID 602] Automatic Separation System / Low Voltage

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	U LN > off	U _{THR} OFF	%Unom	115	100	100	135
.020	U LN > on	U _{THR} ON	%Unom	109	100	100	135
.021	T U LN >	Time OFF	ms	100	100	100000	100000
Comment:		U LN > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	U LN < off	U _{THR} OFF	%Unom	80	20	0	100
.024	U LN < on	U _{THR} ON	%Unom	85	50	0	100
.025	T U LN <	Time OFF	ms	100	100	100000	100000
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))					

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	Uavg	Enable function	on	on		on /off	
.043	Uavg off	U _{THR} OFF	%Unom	110	100	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	40.00	50.00
.060	f < on	f _{THR} ON	Hz	49.90	47.00	50.00	40.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

29. C10-11:2019 LV-ASS [ID 602] Automatic Separation System / Low Voltage

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	1000	100	2000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	1000	100	1000
.093	RoCoF t	Time OFF	ms	0	0	0	0	1000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function			on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15	
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15	
		Time OFF	ms	Fixed to the fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 100ms					
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value							

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	300	100	300	10	5000
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

29. C10-11:2019 LV-ASS [ID 602] Automatic Separation System / Low Voltage

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxxxx	xxxxxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

30. C10-11:2021 HV-IP [ID 653] Interface Protection / High Voltage

30. C10-11:2021 HV-IP [ID 653] Interface Protection / High Voltage

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	50.0
							241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	U LL > off	U _{THR} OFF	%Unom	110	100	110	135
.012	U LL > on	U _{THR} ON	%Unom	109	100	120	135
.013	T U LL >	Time OFF	ms	1000	0	3000	10000
Comment:		U LL > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	U LL < off	U _{THR} OFF	%Unom	70	50	85	100
.016	U LL < on	U _{THR} ON	%Unom	90	50	100	100
.017	T U LL <	Time OFF	ms	1500	0	1500	10000
Comment:		U LL < off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.027	U LL>> off	U _{THR} OFF	%Unom	115	110	130	135
.028	U LL>> on	U _{THR} ON	%Unom	114	100	120	135
.029	T U LL>>	Time OFF	ms	0	0	0	10000
Comment:		U LL>> off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.031	U LL<< off	U _{THR} OFF	%Unom	15	15	50	100
.032	U LL<< on	U _{THR} ON	%Unom	90	50	100	100
.033	T U LL<<	Time OFF	ms	250	0	5000	10000
Comment:		U LL<< off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

30. C10-11:2021 HV-IP [ID 653] Interface Protection / High Voltage

Undervoltage Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on/off		on/off	
.124	Uanfw< on	U _{THR} OFF	%Unom	85	85	85	1	100
.125	Uanfw< off	U _{THR} ON	%Unom	90	86	100	2	100
.126	T Uanfw <	Time OFF	ms	0	0	240000	0	240000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.057	T f >	Time OFF	ms	0	0	0	0	10000
Comment:		f > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	40.00	50.00
.060	f < on	f _{THR} ON	Hz	49.90	47.00	50.00	40.00	50.00
.061	T f <	Time OFF	ms	0	0	0	0	10000
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Overfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.062	f nw >	Enable Function		on	on		on/off	
.063	f nw > off	f _{THR} OFF	Hz	50.30	50.30	50.30	50.00	55.00
.064	f nw > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.065	T f nw >	Time OFF	ms	500	500	500	0	10000
Comment:		f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Dig Input5=HIGH (local setting)						

Underfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.066	f nw <	Enable Function		on	on		on/off	
.067	f nw < off	f _{THR} OFF	Hz	49.70	49.70	49.70	45.00	50.00
.068	f nw < on	f _{THR} ON	Hz	49.90	47.00	50.00	45.00	50.00
.069	T f nw <	Time OFF	ms	500	500	500	0	10000
Comment:		f nw < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Dig Input5=HIGH (local setting)						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	2000	100	5000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	2000	100	5000
.093	RoCoF t	Time OFF	ms	0	0	0	0	5000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

30. C10-11:2021 HV-IP [ID 653] Interface Protection / High Voltage

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	100	300	10	5000
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	T on delay	Turn on time	s	60	60	60	0	900

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ū)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

31. C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage

31. C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	50.0
							241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	U LL > off	U _{THR} OFF	%Unom	115	100	120	100
.012	U LL > on	U _{THR} ON	%Unom	109	100	120	100
.013	T U LL >	Time OFF	ms	100	100	100000	100
Comment:		U LL > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	U LL < off	U _{THR} OFF	%Unom	80	20	100	0
.016	U LL < on	U _{THR} ON	%Unom	90	50	100	0
.017	T U LL <	Time OFF	ms	100	100	100000	100
Comment:		U LL < off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	Uavg	Enable function	on	on		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	110	100	115	100
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00
.057	T f >	Time OFF	ms	100	100	100000	100
Comment:		f > off has a fixed offset of 0.01 Hz subtracted to the displayed value					
Only active for:		Voltage > 20% U _{NOM}					

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	40.00
.060	f < on	f _{THR} ON	Hz	49.90	47.00	50.00	40.00
.061	T f <	Time OFF	ms	100	100	100000	100
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value					
Only active for:		Voltage > 20% U _{NOM}					

31. C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	1000	100	2000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	1000	100	1000
.093	RoCoF t	Time OFF	ms	0	0	0	0	1000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	300	100	300	10	5000
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

31. C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

32. NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW

32. NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	28.8	241.4
		Unom Δ	V	400.0	400.0	50.0	420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.010	ULL >	Enable function		off	on / off		on /off	
.011	ULL > off	U _{THR} OFF	%Unom	110	100	115	100	135
.012	ULL > on	U _{THR} ON	%Unom	110	100	110	100	135
.013	T ULL >	Time OFF	ms	60000	50	180000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	80	10	100	10	100
.016	ULL < on	U _{THR} ON	%Unom	90	90	100	10	100
.017	T ULL <	Time OFF	ms	100	50	180000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		off	on / off		on /off	
.019	ULN > off	U _{THR} OFF	%Unom	110	100	115	100	135
.020	ULN > on	U _{THR} ON	%Unom	110	100	110	100	135
.021	T ULN >	Time OFF	ms	60000	50	180000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	80	10	100	10	100
.024	ULN < on	U _{THR} ON	%Unom	90	90	100	10	100
.025	T ULN <	Time OFF	ms	100	50	180000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))						
Comment:		ULN < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

32. NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.027	ULL >> off	U _{THR} OFF	%Unom	115	100	125	100	135
.028	ULL >> on	U _{THR} ON	%Unom	110	100	110	100	135
.029	T ULL >>	Time OFF	ms	100	50	180000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.035	ULN >> off	U _{THR} OFF	%Unom	115	100	125	100	135
.036	ULN >> on	U _{THR} ON	%Unom	110	100	110	100	135
.037	T ULN >>	Time OFF	ms	100	50	180000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))						
Comment:		ULN >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		on	on/off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	110	110	115	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	53.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.05	50.00	50.05	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max

32. NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

33. NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A > 800W to ≤ 250kW

33. NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A > 800W to ≤ 250kW

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	230.0	28.8
		Unom Δ	V	400.0	400.0	400.0	241.4
							50.0
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL >	Enable function	off	on / off		on /off	
.011	ULL > off	U _{THR} OFF	%Unom	110	100	115	100
.012	ULL > on	U _{THR} ON	%Unom	110	100	110	135
.013	T ULL >	Time OFF	ms	60000	50	180000	50
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	80	10	100	10
.016	ULL < on	U _{THR} ON	%Unom	85	85	100	100
.017	T ULL <	Time OFF	ms	1500	50	10000	50
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} added to the displayed value					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN >	Enable function	off	on / off		on /off	
.019	ULN > off	U _{THR} OFF	%Unom	110	100	115	100
.020	ULN > on	U _{THR} ON	%Unom	110	100	110	135
.021	T ULN >	Time OFF	ms	60000	50	180000	50
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	80	10	100	10
.024	ULN < on	U _{THR} ON	%Unom	85	85	100	100
.025	T ULN <	Time OFF	ms	1500	50	10000	50
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} added to the displayed value					

33. NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A > 800W to ≤ 250kW

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.027	ULL >> off	U _{THR} OFF	%Unom	120	100	125	100	135
.028	ULL >> on	U _{THR} ON	%Unom	110	100	110	100	135
.029	T ULL >>	Time OFF	ms	100	50	1000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	ULL << off	U _{THR} OFF	%Unom	45	10	100	10	100
.032	ULL << on	U _{THR} ON	%Unom	85	85	100	10	100
.033	T ULL <<	Time OFF	ms	300	50	1000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.035	ULN >> off	U _{THR} OFF	%Unom	120	100	125	100	135
.036	ULN >> on	U _{THR} ON	%Unom	110	100	110	100	135
.037	T ULN >>	Time OFF	ms	100	50	1000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						
Comment:		ULN >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.039	ULN << off	U _{THR} OFF	%Unom	45	10	100	10	100
.040	ULN << on	U _{THR} ON	%Unom	85	85	100	10	100
.041	T ULN <<	Time OFF	ms	300	50	1000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						
Comment:		ULN << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		On	on/off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	110	110	115	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	53.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.1	50.00	50.1	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						

33. NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A > 800W to ≤ 250kW

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	2000	2000	2000	100	5000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	1900	100	1900	100	5000
.093	RoCoF t	Time OFF	ms	0	0	500	0	10000
.111	RoCoF wnd	Window length	ms	Fixed window length 500ms				

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	1800	0	1800

Password					Default	Min	Max
ID							
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

33. NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A > 800W to ≤ 250kW

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

34. NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B > 250kW to ≤ 36MW

34. NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B > 250kW to ≤ 36MW

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	230.0	28.8
		Unom Δ	V	400.0	400.0	400.0	241.4
							50.0
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL >	Enable function	off	on / off		on /off	
.011	ULL > off	U _{THR} OFF	%Unom	110	100	115	100
.012	ULL > on	U _{THR} ON	%Unom	110	100	110	135
.013	T ULL >	Time OFF	ms	60000	50	180000	50
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom	80	10	100	10
.016	ULL < on	U _{THR} ON	%Unom	85	85	100	10
.017	T ULL <	Time OFF	ms	1000	50	10000	50
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} added to the displayed value					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN >	Enable function	off	on / off		on /off	
.019	ULN > off	U _{THR} OFF	%Unom	110	100	115	100
.020	ULN > on	U _{THR} ON	%Unom	110	100	110	135
.021	T ULN >	Time OFF	ms	60000	50	180000	50
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULN < off	U _{THR} OFF	%Unom	80	10	100	10
.024	ULN < on	U _{THR} ON	%Unom	85	85	100	10
.025	T ULN <	Time OFF	ms	1000	50	10000	50
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} added to the displayed value					

34. NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B > 250kW to ≤ 36MW

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.027	ULL >> off	U _{THR} OFF	%Unom	120	100	125	100	135
.028	ULL >> on	U _{THR} ON	%Unom	11010	100	110	100	135
.029	T ULL >>	Time OFF	ms	100	50	1000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	ULL << off	U _{THR} OFF	%Unom	45	10	100	10	100
.032	ULL << on	U _{THR} ON	%Unom	85	85	100	10	100
.033	T ULL <<	Time OFF	ms	300	50	1000	50	180000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.035	ULN >> off	U _{THR} OFF	%Unom	120	100	125	100	135
.036	ULN >> on	U _{THR} ON	%Unom	11010	100	110	100	135
.037	T ULN >>	Time OFF	ms	100	50	1000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						
Comment:		ULN >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.039	ULN << off	U _{THR} OFF	%Unom	45	10	100	10	100
.040	ULN << on	U _{THR} ON	%Unom	85	85	100	10	100
.041	T ULN <<	Time OFF	ms	300	50	1000	50	180000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						
Comment:		ULN << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		On	on/off		on /off	
.043	U10min off	U _{THR} OFF	%Unom	110	110	115	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	53.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.1	50.00	50.1	50.00	55.00
.057	T f >	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	50.00	45.00	50.00
.061	T f <	Time OFF	ms	50	50	50	50	180000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						

34. NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B > 250kW to ≤ 36MW

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	2000	2000	2000	100	5000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	1900	100	1900	100	5000
.093	RoCoF t	Time OFF	ms	0	0	500	0	10000
.111	RoCoF wnd	Window length	ms	Fixed window length 500ms				

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	600	60	1800	0	1800

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password			0	9
.107	PW2	2 nd digit of Password			0	9
.108	PW3	3 rd digit of Password			0	9
.109	PW4	4 th digit of Password			0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	on
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

34. NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B > 250kW to ≤ 36MW

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

35. EN50549-1:2019 LV Netherlands [ID 901]

35. EN50549-1:2019 LV Netherlands [ID 901]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	100.0
		Unom Δ	V	400.0	100.0	400.0	50.0
							230.0
							400.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL >	Enable Function	on	on/off		on/off	
.011	ULL > off	U _{THR} OFF	%Unom	110	100	120	100
.012	ULL > on	U _{THR} ON	%Unom	109	100	120	135
.013	T ULL >	Time OFF	ms	200	100	100000	300000
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	ULL <	Enable Function	on	on/off		on/off	
.015	ULL < off	U _{THR} OFF	%Unom	80	20	100	10
.016	ULL < on	U _{THR} ON	%Unom	85	50	100	100
.017	T ULL <	Time OFF	ms	3000	100	100000	3000000
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN >	Enable Function	on	on/off		on/off	
.019	ULN > off	U _{THR} OFF	%Unom	110	100	120	100
.020	ULN > on	U _{THR} ON	%Unom	109	100	120	135
.021	T ULN >	Time OFF	ms	200	100	100000	300000
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.022	ULN <	Enable Function	on	on/off		on/off	
.023	ULN < off	U _{THR} OFF	%Unom	80	20	100	10
.024	ULN < on	U _{THR} ON	%Unom	85	50	100	100
.025	T LN <	Time OFF	ms	3000	100	100000	0
Comment:		ULN < off has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

35. EN50549-1:2019 LV Netherlands [ID 901]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable Function		on	on/off		on/off	
.027	ULL >> off	U _{THR} OFF	%Unom	120	100	120	100	135
.028	ULL >> on	U _{THR} ON	%Unom	109	100	120	100	135
.029	T ULL >	Time OFF	ms	100	100	5000	100	300000
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable Function		on	on/off		on/off	
.031	ULL << off	U _{THR} OFF	%Unom	30	20	100	10	100
.032	ULL << on	U _{THR} ON	%Unom	85	50	100	10	100
.033	T ULL <<	Time OFF	ms	100	100	5000	100	3000000
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN>>	Enable Function		on	on/off		on/off	
.035	ULN>> off	U _{THR} OFF	%Unom	120	100	130	100	135
.036	ULN>> on	U _{THR} ON	%Unom	109	100	120	100	135
.037	T ULN>>	Time OFF	ms	100	100	5000	100	300000
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LN > off has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN<<	Enable Function		on	on/off		on/off	
.039	ULN<< off	U _{THR} OFF	%Unom	30	20	100	10	100
.040	ULN<< on	U _{THR} ON	%Unom	85	50	100	10	100
.041	T ULN<<	Time OFF	ms	100	100	5000	100	300000
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	110	100	115	100	135
.044	Uavg on	U _{THR} ON	%Unom	109	100	115	100	135
		Time OFF	ms	Fixed to fastest possible disconnection				

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on/off		on/off	
.116	Uzero> off	U _{THR} OFF	%Unom	20	1	100	1	100
.117	Uzero> on	U _{THR} ON	%Unom	15	1	100	1	100
.118	T Uzero >	Time OFF	ms	1500	200	100000	0	300000
Only active for:		Connection Modes: 4-wire (LN+LL)						

35. EN50549-1:2019 LV Netherlands [ID 901]

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on/off		on/off	
.120	U res > on	U _{THR} OFF	%Unom	5	2	20	2	200
.121	U res > off	U _{THR} ON	%Unom	3	1	20	1	100
.122	T Ures >	Time OFF	ms	200	0	240000	0	240000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on/off		on/off	
.124	Uanfw< on	U _{THR} OFF	%Unom	85	21	100	2	100
.125	Uanfw< off	U _{THR} ON	%Unom	86	21	100	2	100
.126	T Uanfw <	Time OFF	ms	0	0	240000	0	240000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.054	f >	Enable Function		on	on		on/off	
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.057	T f >	Time OFF	ms	100	100	100000	100	300000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.058	f <	Enable Function		on	on		on/off	
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	48.50	47.00	50.00	45.00	50.00
.061	T f <	Time OFF	ms	100	100	100000	100	300000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Overfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.062	f nw >	Enable Function		off	on/off		on/off	
.063	f nw > off	f _{THR} OFF	Hz	50.30	50.00	52.00	50.00	55.00
.064	f nw > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.065	T f nw >	Time OFF	ms	500	100	5000	100	300000
Comment:		f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)						

Underfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.066	f nw <	Enable Function		off	on/off		on/off	
.067	f nw < off	f _{THR} OFF	Hz	49.70	47.00	50.00	45.00	50.00
.068	f nw < on	f _{THR} ON	Hz	49.80	47.00	50.00	45.00	50.00
.069	T f nw <	Time OFF	ms	500	100	5000	100	300000
Comment:		f nw < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)						

35. EN50549-1:2019 LV Netherlands [ID 901]

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	ROCOF	Enable Function		off	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	mHz/s	1000	200	9990	100	9990
.092	ROCOF on	RoCoF _{THR} ON	mHz/s	800	100	9990	100	9990
.093	ROCOF t	Time OFF	ms	0	0	5000	0	5000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	2	15	2	15
.096	PShift on	PShift _{THR} ON	°	5	1	15	1	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	500				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	T on delay	Turn on time	s	60	10	600	10	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

35. EN50549-1:2019 LV Netherlands [ID 901]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

36. EN50549-2:2019 HV Netherlands [ID 926]

36. EN50549-2:2019 HV Netherlands [ID 926]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN+LL)	3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	100.0
		Unom Δ	V	400.0	100.0	400.0	240.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL >	Enable Function	on	on/off		on/off	
.011	ULL > off	U _{THR} OFF	%Unom	110	100	120	100
.012	ULL > on	U _{THR} ON	%Unom	109	100	120	135
.013	T ULL >	Time OFF	ms	200	100	100000	300000
Comment:		ULL > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	ULL <	Enable Function	on	on/off		on/off	
.015	ULL < off	U _{THR} OFF	%Unom	80	20	100	10
.016	ULL < on	U _{THR} ON	%Unom	90	50	100	100
.017	T ULL <	Time OFF	ms	3000	100	100000	3000000
Comment:		ULL < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN >	Enable Function	on	on/off		on/off	
.019	ULN > off	U _{THR} OFF	%Unom	110	100	120	100
.020	ULN > on	U _{THR} ON	%Unom	109	100	120	135
.021	T ULN >	Time OFF	ms	200	100	100000	300000
Comment:		ULN > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.022	ULN <	Enable Function	on	on/off		on/off	
.023	ULN < off	U _{THR} OFF	%Unom	80	20	100	10
.024	ULN < on	U _{THR} ON	%Unom	90	50	100	100
.025	T LN <	Time OFF	ms	3000	100	100000	0
Comment:		ULN < off has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

36. EN50549-2:2019 HV Netherlands [ID 926]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable Function		on	on/off		on/off	
.027	ULL >> off	U _{THR} OFF	%Unom	120	100	120	100	135
.028	ULL >> on	U _{THR} ON	%Unom	109	100	120	100	135
.029	T ULL >	Time OFF	ms	100	100	5000	100	300000
Comment:		ULL >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable Function		on	on/off		on/off	
.031	ULL << off	U _{THR} OFF	%Unom	30	20	100	10	100
.032	ULL << on	U _{THR} ON	%Unom	90	50	100	10	100
.033	T ULL <<	Time OFF	ms	100	100	5000	100	3000000
Comment:		ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN>>	Enable Function		on	on/off		on/off	
.035	ULN>> off	U _{THR} OFF	%Unom	120	100	130	100	135
.036	ULN>> on	U _{THR} ON	%Unom	109	100	120	100	135
.037	T ULN>>	Time OFF	ms	100	100	5000	100	300000
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LN > off has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN<<	Enable Function		on	on/off		on/off	
.039	ULN<< off	U _{THR} OFF	%Unom	30	20	100	10	100
.040	ULN<< on	U _{THR} ON	%Unom	90	50	100	10	100
.041	T ULN<<	Time OFF	ms	100	100	5000	100	300000
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	110	100	115	100	135
.044	Uavg on	U _{THR} ON	%Unom	109	100	115	100	135
		Time OFF	ms	Fixed to fastest possible disconnection				

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on/off		on/off	
.116	Uzero> off	U _{THR} OFF	%Unom	20	1	100	1	100
.117	Uzero> on	U _{THR} ON	%Unom	15	1	100	1	100
.118	T Uzero >	Time OFF	ms	1500	200	100000	0	300000
Only active for:		Connection Modes: 4-wire (LN+LL)						

36. EN50549-2:2019 HV Netherlands [ID 926]

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on/off		on/off	
.120	U res > on	U _{THR} OFF	%Unom	5	2	20	2	200
.121	U res > off	U _{THR} ON	%Unom	3	1	20	1	100
.122	T Ures >	Time OFF	ms	200	0	240000	0	240000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on/off		on/off	
.124	Uanfw< on	U _{THR} OFF	%Unom	85	21	100	2	100
.125	Uanfw< off	U _{THR} ON	%Unom	86	21	100	2	100
.126	T Uanfw <	Time OFF	ms	0	0	240000	0	240000
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.054	f >	Enable Function		on	on		on/off	
.055	f > off	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.057	T f >	Time OFF	ms	100	100	100000	100	300000
Comment:		f > on has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.058	f <	Enable Function		on	on		on/off	
.059	f < off	f _{THR} OFF	Hz	47.50	47.00	50.00	45.00	50.00
.060	f < on	f _{THR} ON	Hz	48.50	47.00	50.00	45.00	50.00
.061	T f <	Time OFF	ms	100	100	100000	100	300000
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Overfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.062	f nw >	Enable Function		off	on/off		on/off	
.063	f nw > off	f _{THR} OFF	Hz	50.30	50.00	52.00	50.00	55.00
.064	f nw > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
.065	T f nw >	Time OFF	ms	500	100	5000	100	300000
Comment:		f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)						

Underfrequency nw (narrower window)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.066	f nw <	Enable Function		off	on/off		on/off	
.067	f nw < off	f _{THR} OFF	Hz	49.70	47.00	50.00	45.00	50.00
.068	f nw < on	f _{THR} ON	Hz	49.80	47.00	50.00	45.00	50.00
.069	T f nw <	Time OFF	ms	500	100	5000	100	300000
Comment:		f nw < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)						

36. EN50549-2:2019 HV Netherlands [ID 926]

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	ROCOF	Enable Function		off	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	mHz/s	1000	200	9990	100	9990
.092	ROCOF on	RoCoF _{THR} ON	mHz/s	800	100	9990	100	9990
.093	ROCOF t	Time OFF	ms	0	0	5000	0	5000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	2	15	2	15
.096	PShift on	PShift _{THR} ON	°	5	1	15	1	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	500				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	T on delay	Turn on time	s	60	10	600	10	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

36. EN50549-2:2019 HV Netherlands [ID 926]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ū)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

37. EN50549-1:2019 LV Ireland [ID 905]

37. EN50549-1:2019 LV Ireland [ID 905]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	2-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	230,00V	57,50V	230,00V	28,75V	241,50V
		Unom Δ	/400,00V	/100,00V	/400,00V	/50,00V	/420,00V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.010	ULL >	Enable function		on	on / off		on /off	
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	117,00% (468,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	109,00% (436,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.013	T ULL >	Time OFF		70000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.014	ULL <	Enable function		on	on / off		on /off	
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	83,00% (332,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.017	T ULL <	Time OFF		700 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	117,00% (269,10V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T ULN >	Time OFF		70000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

37. EN50549-1:2019 LV Ireland [ID 905]

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	ULN <	Enable function		on	on / off		on /off	
.023	ULN < off	U _{THR} OFF	%Unom /VUnom	83,00% (190,90V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	ULN < on	U _{THR} ON	%Unom /VUnom	85,00% (195,50V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T ULN <	Time OFF		700 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable function		on	on / off		on /off	
.027	ULL >> off	U _{THR} OFF	%Unom /VUnom	122,00% (488,00V)	100,00% (400,00V)	130,00% (520,00V)	100,00% (400,00V)	135,00% (540,00V)
.028	ULL >> on	U _{THR} ON	%Unom /VUnom	109,00% (436,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.029	T ULL >>	Time OFF		700 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable function		off	on / off		on /off	
.031	ULL << off	U _{THR} OFF	%Unom /VUnom	30,00% (120,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.032	ULL << on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.033	T ULL <<	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN >>	Enable function		on	on / off		on / off	
.035	ULN >> off	U _{THR} OFF	%Unom /VUnom	122,00% (280,60V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	ULN >> on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.037	T ULN >>	Time OFF		700 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN <<	Enable function		off	on / off		on /off	
.039	ULN << off	U _{THR} OFF	%Unom /VUnom	30,00% (69,00V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	ULN << on	U _{THR} ON	%Unom /VUnom	85,00% (195,50V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.041	T ULN <<	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

37. EN50549-1:2019 LV Ireland [ID 905]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on/off		on/off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (34,50V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.118	T Uzero >	Time OFF		1500 ms	200 ms	100000 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on/off		on/off	
.120	U res > on	U _{THR} OFF	%Unom /VUnom	5,00% (11,50V)	2,00% (4,60V)	20,00% (46,00V)	2,00% (4,60V)	100,00% (230,00V)
.121	Ures > off	U _{THR} ON	%Unom /VUnom	3,00% (6,90V)	1,00% (2,30V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.122	T Ures >	Time OFF		200 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage LN (UY) Activation of a narrower frequency winw					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on/off		on/off	
.124	Uanfw< on	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.125	Uanfw< off	U _{THR} ON	%Unom /VUnom	86,00% (197,80V)	21,00% (48,30V)	100,00% (230,00V)	2,00% (4,60V)	100,00% (230,00V)
.126	T Uanfw <	Time OFF		0 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		off	on / off		on /off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	110,00% (253,00V /440,00V)	100,00% (230,00V /400,00V)	115,00% (264,50V /460,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V /436,00V)	100,00% (230,00V /400,00V)	115,00% (264,50V /460,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.054	f >	Enable function	on	on / off		on / off	
.055	f > off	f _{THR} OFF	52,000 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	500 ms	100 ms	100000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f <	Enable function	on	on / off		on / off	
.059	f < off	f _{THR} OFF	47,000 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	48,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	500 ms	100 ms	100000 ms	100 ms	300000 ms

37. EN50549-1:2019 LV Ireland [ID 905]

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.062	f nw >	Enable function	off	on / off		on / off	
.063	f nw > off	f _{THR} OFF	50,300 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.064	f nw > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.065	T f nw >	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.066	f nw <	Enable function	off	on / off		on / off	
.067	f nw < off	f _{THR} OFF	49,700 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.068	f nw < on	f _{THR} ON	49,800 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.069	T f nw <	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID			Default	Min	Max		
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	ROCOF	Enable Function	on	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	1000 mHz/s	200 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.092	ROCOF on	RoCoF _{THR} ON	800 mHz/s	100 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.093	T ROCOF	Time OFF	0 ms	0 ms	5000 ms	0 ms	5000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	Pshift	Enable Function	off	off		on / off	
.095	Pshift off	PShift _{THR} OFF	7,0 °	2,0 °	15,0 °	2,0 °	15,0 °
.096	Pshift on	PShift _{THR} ON	5,0 °	1,0 °	15,0 °	1,0 °	15,0 °

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	20 s	10 s	600 s	0 s	900 s

Password							
ID				Default		Min	Max
.106	PW1	1 st digit of Password		0		0	9
.107	PW2	2 nd digit of Password		0		0	9
.108	PW3	3 rd digit of Password		0		0	9
.109	PW4	4 th digit of Password		0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

37. EN50549-1:2019 LV Ireland [ID 905]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

38. EN50438:2013 DK [ID 950]

38. EN50438:2013 DK [ID 950]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	3-wire, 4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	ULL max 1	U _{THR} OFF	%Unom	110	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
.013	ULL max 1t	Time OFF	ms	39500	39500	50	60000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULL min	U _{THR} OFF	%Unom	90	90	10	100
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
.017	ULL min t	Time OFF	ms	9500	9500	50	60000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	ULN max 1	U _{THR} OFF	%Unom	110	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
.021	ULN max 1t	Time OFF	ms	39500	39500	50	60000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULN min	U _{THR} OFF	%Unom	90	90	10	100
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
.025	ULN min t	Time OFF	ms	9500	9500	50	60000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.027	ULL max 2	U _{THR} OFF	%Unom	113	113	113	100	135	
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})					
		Time OFF	ms	Fixed to 100ms					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)							

38. EN50438:2013 DK [ID 950]

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.035	ULN max 2	U _{THR} OFF	%Unom	113	113	113	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})				
		Time OFF	ms	Fixed to 100ms				
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	52.00	52.00	52.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.05	50.05	50.05	50.00	55.00
		Time OFF	ms	Fixed to 150ms				

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	45.00	50.00
		Time OFF	ms	Fixed to 150ms				
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	2500	2500	2500	100	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	2300	2300	2300	100	3000
		Time OFF	ms	Fixed to the fastest possible disconnection				
.111	RoCoF wnd	Window length	ms	Fixed window length 200ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900

Password								
ID				Default	Min	Max		
.106	PW1	1 st digit of Password			0	0	0	9
.107	PW2	2 nd digit of Password			0	0	0	9
.108	PW3	3 rd digit of Password			0	0	0	9
.109	PW4	4 th digit of Password			0	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

38. EN50438:2013 DK [ID 950]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage (Ū)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift (ΔΦ)	off
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	off
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	off

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910]

39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	2-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage			Conformity Range		Possible Range	
ID		Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V /400,00V	57,50V /100,00V	230,00V /400,00V	28,75V /50,00V 241,50V /420,00V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.010	ULL >	Enable function		on	on / off		on / off	
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	109,00% (436,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.013	T ULL >	Time OFF		200 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.014	ULL <	Enable function		on	on / off		on / off	
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	85,00% (340,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.017	T ULL <	Time OFF		3000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T ULN >	Time OFF		200 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910]

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	ULN <	Enable function		on	on / off		on / off	
.023	ULN < off	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	ULN < on	U _{THR} ON	%Unom /VUnom	85,00% (195,50V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T ULN <	Time OFF		3000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable function		off	on / off		on / off	
.027	ULL >> off	U _{THR} OFF	%Unom /VUnom	120,00% (480,00V)	100,00% (400,00V)	130,00% (520,00V)	100,00% (400,00V)	135,00% (540,00V)
.028	ULL >> on	U _{THR} ON	%Unom /VUnom	109,00% (436,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.029	T ULL >>	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable function		off	on / off		on / off	
.031	ULL << off	U _{THR} OFF	%Unom /VUnom	30,00% (120,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.032	ULL << on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.033	T ULL <<	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN >>	Enable function		off	on / off		on / off	
.035	ULN >> off	U _{THR} OFF	%Unom /VUnom	120,00% (276,00V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	ULN >> on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.037	T ULN >>	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN <<	Enable function		off	on / off		on / off	
.039	ULN << off	U _{THR} OFF	%Unom /VUnom	30,00% (69,00V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	ULN << on	U _{THR} ON	%Unom /VUnom	85,00% (195,50V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.041	T ULN <<	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (34,50V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.118	T Uzero >	Time OFF		1500 ms	200 ms	100000 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on / off		on / off	
.120	U res > on	U _{THR} OFF	%Unom /VUnom	5,00% (11,50V)	2,00% (4,60V)	20,00% (46,00V)	2,00% (4,60V)	100,00% (230,00V)
.121	Ures > off	U _{THR} ON	%Unom /VUnom	3,00% (6,90V)	1,00% (2,30V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.122	T Ures >	Time OFF		200 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage LN (UY) Activation of a narrower frequency winw					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on / off		on / off	
.124	Uanfw< on	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.125	Uanfw< off	U _{THR} ON	%Unom /VUnom	86,00% (197,80V)	21,00% (48,30V)	100,00% (230,00V)	2,00% (4,60V)	100,00% (230,00V)
.126	T Uanfw <	Time OFF		0 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		off	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	110,00% (253,00V /440,00V)	100,00% (230,00V /400,00V)	115,00% (264,50V /460,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V /436,00V)	100,00% (230,00V /400,00V)	115,00% (264,50V /460,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)
.045	Uavg o t	Time OFF		50 ms	200 ms	10000 ms	100 ms	10000 ms

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.054	f >	Enable function	on	on / off		on / off		
.055	f > off	f _{THR} OFF	50,200 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.056	f > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.057	T f >	Time OFF	100 ms	100 ms	100000 ms	100 ms	300000 ms	

Underfrequency ¹				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f <	Enable function	on	on / off		on / off	
.059	f < off	f _{THR} OFF	49,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	49,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	100 ms	100 ms	100000 ms	100 ms	300000 ms

39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910]

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.062	f nw >	Enable function	off	on / off		on / off	
.063	f nw > off	f _{THR} OFF	50,300 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.064	f nw > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.065	T f nw >	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.066	f nw <	Enable function	off	on / off		on / off	
.067	f nw < off	f _{THR} OFF	49,700 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.068	f nw < on	f _{THR} ON	49,800 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.069	T f nw <	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID			Default	Min	Max		
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	ROCOF	Enable Function	off	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	1000 mHz/s	200 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.092	ROCOF on	RoCoF _{THR} ON	800 mHz/s	100 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.093	T ROCOF	Time OFF	0 ms	0 ms	5000 ms	0 ms	5000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	Pshift	Enable Function	off	on / off		on / off	
.095	Pshift off	PShift _{THR} OFF	7,0 °	2,0 °	15,0 °	2,0 °	15,0 °
.096	Pshift on	PShift _{THR} ON	5,0 °	1,0 °	15,0 °	1,0 °	15,0 °

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	10 s	600 s	0 s	900 s

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

39. SRPS EN 50549-1:2020 LV (Serbia) [ID 910]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

40. VDE 0126-1-1:2013 [ID 200]

40. VDE 0126-1-1:2013 [ID 200]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN+LL)		

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	V V	Fixed to 230.0 / 400.0			

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.011	ULLmax off	U _{THR} OFF	%Unom	115	115	115	100	135	
.012	ULLmax on	U _{THR} ON	%Unom	110	110	110	100	135	
		Time OFF	ms	Fixed to fastest possible disconnection					
Comment:		ULLmax on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value							

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULLmin off	U _{THR} OFF	% Unom	80	80	80	10	100
.016	ULLmin on	U _{THR} ON	%Unom	85	85	85	10	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULLmin on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.019	U >> off	U _{THR} OFF	%Unom	115	115	115	100	135
.020	U >> on	U _{THR} ON	%Unom	110	110	110	100	135
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	U < off	U _{THR} OFF	%Unom	80	80	80	10	100
.024	U < on	U _{THR} ON	%Unom	85	85	85	10	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.043	U>	U _{THR} OFF	%Unom	110	110	115	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
.056	F > on	f _{THR} ON	Hz	50.05	50.05	50.05	50.00	55.00
		Time OFF	ms	Fixed to fastest possible disconnection				

40. VDE 0126-1-1:2013 [ID 200]

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	45.00	50.00
.060	f < on	f _{THR} ON	ms	47.50	47.50	47.50	45.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value						

Random overfrequency					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.086	f> random	Enable function		off	on / off		on /off	
.087	f> random	f _{THR} OFF	Hz		50.20	51.50	50.20	51.50
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.05Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900

Random Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.103	Ton random	Enable function		off	on / off		on / off	
.104	Ton random	Turn on time	s		60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited						

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

40. VDE 0126-1-1:2013 [ID 200]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	off
Undervoltage LL (UΔ)	off
Overvoltage LN (UY)	off
Undervoltage LN (UY)	off
10-min overvoltage ($\bar{U}$)	off
Overfrequency (f)	off
Underfrequency (f)	off
RoCoF (Rate of Change of Frequency) (Δf)	off
Phase shift ($\Delta\Phi$)	off
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	off
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	off

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

41. Romania ANRE 2021 [ID 1300]

41. Romania ANRE 2021 [ID 1300]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LN	4-wire LN	2-wire LN – 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	230,00V	57,50V	230,00V	28,75V	241,50V
		Unom Δ	/400,00V	/100,00V	/400,00V	/50,00V	/420,00V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.018	Ueff >	Enable function		on				
.019	Ueff > off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	Ueff > on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T Ueff >	Time OFF		500 ms	100 ms	5000 ms	100 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	0	Enable function		on				
.023	Ueff < off	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	Ueff < on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T Ueff <	Time OFF		3200 ms	100 ms	100000 ms	100 ms	180000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	U10min	Enable function		on	on / off		on /off	
.043	U10min off	U _{THR} OFF	%Unom /VUnom	110,00% (253,00V /440,00V)	100,00% (230,00V /400,00V)	115,00% (264,50V /460,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.054	f oA	Enable function	on				
.055	f > off	f _{THR} OFF	52,000 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	51,000 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	500 ms	100 ms	100000 ms	100 ms	180000 ms

41. Romania ANRE 2021 [ID 1300]

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f uA	Enable function	on				
.059	f < off	f _{THR} OFF	47,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	500 ms	100 ms	100000 ms	100 ms	180000 ms

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	100 ms				

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	(normally closed)	n.o. (normally opened) n.c. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	900 s	0 s	900 s	0 s	900 s

Password							
ID				Default		Min	Max
.106	PW1	1 st digit of Password		0		0	9
.107	PW2	2 nd digit of Password		0		0	9
.108	PW3	3 rd digit of Password		0		0	9
.109	PW4	4 th digit of Password		0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

ErrorLogic	
Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
underfrequency	on
RoCoF (Rate of Change of Frequency) (Δf)	on
phase shift	on
Remote shutdown / self-test (R)	on
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

42. AB AS 4777.2:2020 [ID 1110]

42. AB AS 4777.2:2020 [ID 1110]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	417.4	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom	115.2	115.2	100	135
.020	V> on	U _{THR} ON	%Unom	110	110	100	135
.021	T V>	Time OFF	ms	1000	1900	50	300000

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom	78.3	78.3	0	100
.024	V< on	U _{THR} ON	%Unom	89	100	0	100
.025	T V<	Time OFF	ms	10000	10900	50	300000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	V>>	Enable function	off	on / off		on / off	
.035	V>> off	U _{THR} OFF	%Unom	119.6	119.6	100	135
.036	V>> on	U _{THR} ON	%Unom	110	110	100	135
.037	T V>>	Time OFF	ms	100	200	100	300000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	V<< off	U _{THR} OFF	%Unom	30.4	30.4	0	100
.040	V<< on	U _{THR} ON	%Unom	89	100	0	100
.041	T V<<	Time OFF	ms	1000	1900	50	300000

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	Uavg	Enable function	on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	112.2	112.2	100	135
.044	Uavg on	U _{THR} ON	%Unom	110	110	100	135
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	Hz	52.00	52.00	50.00	55.00
.056	F> on	f _{THR} ON	Hz	50.15	50.15	50.00	55.00
.057	T F>	Time OFF	ms	100	200	100	300000

42. AB AS 4777.2:2020 [ID 1110]

Underfrequency ¹					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	Hz	47.00	47.00	47.00	40.00	50.00
.060	F< on	f _{THR} ON	Hz	47.50	47.50	50.00	40.00	50.00
.061	T F<	Time OFF	ms	1000	1000	1900	50	300000

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	9990	10	9990
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	9990	10	9990
.093	RoCoFDelay	Time OFF	ms	500	50	500	50	10000
.111	RoCoF wnd	Window length	ms	225	100	1000	100	1000

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	8	1	8	1	15
.096	PShift on	PShift _{THR} ON	°	6	1	7	1	15
.097	PShiftDel	Time OFF	ms	50	50	50	50	10000
.112	PShift wnd	Window length	ms	50	50	500	50	1000

Auxiliary Contact type		Conformity Range		Possible Range	
ID		Default		Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)
.100	T Contact	Time OFF	ms	Fixed to 500ms	
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	60	0	900

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password			0	9
.107	PW2	2 nd digit of Password			0	9
.108	PW3	3 rd digit of Password			0	9
.109	PW4	4 th digit of Password			0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

42. AB AS 4777.2:2020 [ID 1110]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

43. C AS 4777.2:2020 [ID 1120]

43. C AS 4777.2:2020 [ID 1120]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom	115.2	115.2	100	135
.020	V> on	U _{THR} ON	%Unom	110	110	100	135
.021	T V>	Time OFF	ms	1000	1900	50	300000

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom	78.3	78.3	0	100
.024	V< on	U _{THR} ON	%Unom	89	100	0	100
.025	T V<	Time OFF	ms	10000	10900	50	300000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	V>>	Enable function	off	on / off		on / off	
.035	V>> off	U _{THR} OFF	%Unom	119.6	119.6	100	135
.036	V>> on	U _{THR} ON	%Unom	110	110	100	135
.037	T V>>	Time OFF	ms	100	200	100	300000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	V<< off	U _{THR} OFF	%Unom	30.4	30.4	0	100
.040	V<< on	U _{THR} ON	%Unom	89	100	0	100
.041	T V<<	Time OFF	ms	1000	1900	50	300000

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	Uavg	Enable function	on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	112.2	112.2	100	135
.044	Uavg on	U _{THR} ON	%Unom	110	110	100	135
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	Hz	55.00	55.00	50.00	55.00
.056	F> on	f _{THR} ON	Hz	50.15	50.15	50.00	55.00
.057	T F>	Time OFF	ms	100	200	100	300000

43. C AS 4777.2:2020 [ID 1120]

Underfrequency ¹					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	Hz	45.00	45.00	45.00	40.00	50.00
.060	F< on	f _{THR} ON	Hz	47.50	47.50	50.00	40.00	50.00
.061	T F<	Time OFF	ms	5000	5000	5900	50	300000

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	9990	10	9990
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	9990	10	9990
.093	RoCoFDelay	Time OFF	ms	500	50	500	50	10000
.111	RoCoF wnd	Window length	ms	225	100	1000	100	1000

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	8	1	8	1	15
.096	PShift on	PShift _{THR} ON	°	6	1	7	1	15
.097	PShiftDel	Time OFF	ms	50	50	50	50	10000
.112	PShift wnd	Window length	ms	50	50	500	50	1000

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	60	0	900

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

43. C AS 4777.2:2020 [ID 1120]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

44. NZS 4777.2:2020 [ID 1130]

44. NZS 4777.2:2020 [ID 1130]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom	115.2	115.2	100	135
.020	V> on	U _{THR} ON	%Unom	110	110	100	135
.021	T V>	Time OFF	ms	1000	1900	50	300000

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom	78.3	78.3	0	100
.024	V< on	U _{THR} ON	%Unom	89	100	0	100
.025	T V<	Time OFF	ms	10000	10900	50	300000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	V>>	Enable function	off	on / off		on / off	
.035	V>> off	U _{THR} OFF	%Unom	119.6	119.6	100	135
.036	V>> on	U _{THR} ON	%Unom	110	110	100	135
.037	T V>>	Time OFF	ms	100	200	100	300000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	V<< off	U _{THR} OFF	%Unom	30.4	30.4	0	100
.040	V<< on	U _{THR} ON	%Unom	89	100	0	100
.041	T V<<	Time OFF	ms	1000	1900	50	300000

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	Uavg	Enable function	on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	108.3	112.2	100	135
.044	Uavg on	U _{THR} ON	%Unom	106.1	110	100	135
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	Hz	55.00	55.00	50.00	55.00
.056	F> on	f _{THR} ON	Hz	50.15	50.15	50.00	55.00
.057	T F>	Time OFF	ms	100	200	100	300000

44. NZS 4777.2:2020 [ID 1130]

Underfrequency ¹					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	Hz	45.00	45.00	45.00	40.00	50.00
.060	F< on	f _{THR} ON	Hz	47.50	47.50	50.00	40.00	50.00
.061	T F<	Time OFF	ms	1000	1000	1900	50	300000

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	9990	10	9990
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	9990	10	9990
.093	RoCoFDelay	Time OFF	ms	500	50	500	50	10000
.111	RoCoF wnd	Window length	ms	225	100	1000	100	1000

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	8	1	8	1	15
.096	PShift on	PShift _{THR} ON	°	6	1	7	1	15
.097	PShiftDel	Time OFF	ms	50	50	50	50	10000
.112	PShift wnd	Window length	ms	50	50	500	50	1000

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	60	0	900

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

44. NZS 4777.2:2020 [ID 1130]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	ID: xxxxxxxxxx	xxxxxxx = Device ID
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

45. NSW-Augrid 23 [ID 1135]

45. NSW-Augrid 23 [ID 1135]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	240,01V/	230,00V	240,01V	99,99V	240,01V
		Unom Δ	417,40V	/400,00V	/417,40V	/173,90V	/417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	105,00% (252,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

45. NSW-Augrid 23 [ID 1135]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on /off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	107,00% (256,81V /446,62V)	107,00% (256,81V /446,62V)	107,00% (256,81V /446,62V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V /438,27V)	105,00% (252,01V /438,27V)	105,00% (252,01V /438,27V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	4000 mHz/s	4000 mHz/s	4000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	3950 mHz/s	3950 mHz/s	3950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	100 ms	100 ms	100 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	20,0 °	20,0 °	20,0 °	1,0 °	25,0 °
.096	Pshift on	PShift _{THR} ON	18,0 °	17,0 °	17,0 °	1,0 °	24,0 °
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms

45. NSW-Augrid 23 [ID 1135]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password							
ID				Default	Min	Max	
.106	PW1	1 st digit of Password		0	0	9	
.107	PW2	2 nd digit of Password		0	0	9	
.108	PW3	3 rd digit of Password		0	0	9	
.109	PW4	4 th digit of Password		0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

46. NSW-Essential 23 [ID 1140]

46. NSW-Essential 23 [ID 1140]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	240,01V	230,00V	240,01V	99,99V	240,01V
		Unom Δ	/417,40V	/400,00V	/417,40V	/173,90V	/417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

46. NSW-Essential 23 [ID 1140]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length		100 ms	100 ms	100 ms	

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	1000 mHz/s	1000 mHz/s	1000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	950 mHz/s	950 mHz/s	950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	850 ms	850 ms	850 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	8,0 °	8,0 °	8,0 °	1,0 °	25,0 °
.096	Pshift on	PShift _{THR} ON	6,0 °	6,0 °	6,0 °	1,0 °	24,0 °
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms

46. NSW-Essential 23 [ID 1140]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password							
ID				Default	Min	Max	
.106	PW1	1 st digit of Password		0	0	9	
.107	PW2	2 nd digit of Password		0	0	9	
.108	PW3	3 rd digit of Password		0	0	9	
.109	PW4	4 th digit of Password		0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

47. NSW-Endeavour 23 [ID 1145]

47. NSW-Endeavour 23 [ID 1145]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	240,01V	230,00V	240,01V	99,99V	240,01V
		Unom Δ	/417,40V	/400,00V	/417,40V	/173,90V	/417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

47. NSW-Endeavour 23 [ID 1145]

47. NSW-Endeavour 23 [ID 1145]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	240,01V	230,00V	240,01V	99,99V	240,01V
		Unom Δ	/417,40V	/400,00V	/417,40V	/173,90V	/417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

47. NSW-Endeavour 23 [ID 1145]

Zero Voltage Line to Neutral				Conformity Range		Possible Range	
ID				Min	Max	Min	Max
.115	Uzero>	Enable Function	off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF	1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)					

Overfrequency1				Conformity Range		Possible Range	
ID				Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID				Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Min	Max		
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID				Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	1000 mHz/s	1000 mHz/s	1000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	950 mHz/s	950 mHz/s	950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	850 ms	850 ms	850 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID				Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	8,0 °	8,0 °	8,0 °	1,0 °	25,0 °
.096	Pshift on	PShift _{THR} ON	6,0 °	6,0 °	6,0 °	1,0 °	24,0 °
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID				Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

47. NSW-Endeavour 23 [ID 1145]

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

48. VIC-United Energy 23 [ID 1150]

48. VIC-United Energy 23 [ID 1150]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	110,00% (459,14V)	110,00% (459,14V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> off	U _{THR} ON	%Unom /VUnom	107,00% (446,62V)	107,00% (446,62V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on				
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	11000 ms	11000 ms	11000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	110,00% (264,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	107,00% (256,81V)	107,00% (256,81V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	11000 ms	11000 ms	11000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

48. VIC-United Energy 23 [ID 1150]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	VLL>>	Enable function		on				
.027	VLL>> off	U _{THR} OFF	%Unom /VUnom	114,00% (475,84V)	114,00% (475,84V)	114,00% (475,84V)	100,00% (417,40V)	135,00% (563,49V)
.028	VLL>> on	U _{THR} ON	%Unom /VUnom	107,00% (446,62V)	107,00% (446,62V)	107,00% (446,62V)	100,00% (417,40V)	135,00% (563,49V)
.029	T VLL>>	Time OFF		200 ms	200 ms	200 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	VLL<<	Enable function		on				
.031	VLL<< off	U _{THR} OFF	%Unom /VUnom	29,20% (121,88V)	29,20% (121,88V)	29,20% (121,88V)	0,00% (0,00V)	100,00% (417,40V)
.032	VLL<< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.033	T VLL<<	Time OFF		2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	V>>	Enable function		on	on / off		on / off	
.035	V>> off	U _{THR} OFF	%Unom /VUnom	114,00% (273,61V)	114,00% (273,61V)	114,00% (273,61V)	100,00% (240,01V)	135,00% (324,01V)
.036	V>> on	U _{THR} ON	%Unom /VUnom	107,00% (256,81V)	107,00% (256,81V)	107,00% (256,81V)	100,00% (240,01V)	135,00% (324,01V)
.037	T V>>	Time OFF		200 ms	200 ms	200 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	V<<	Enable function		on	on / off		on / off	
.039	V<< off	U _{THR} OFF	%Unom /VUnom	29,20% (70,08V)	29,20% (70,08V)	29,20% (70,08V)	0,00% (0,00V)	100,00% (240,01V)
.040	V<< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.041	T V<<	Time OFF		2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

48. VIC-United Energy 23 [ID 1150]

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off		
.091	RoCoF off	RoCoF _{THR} OFF	3000 mHz/s	3000 mHz/s	3000 mHz/s	10 mHz/s	5000 mHz/s	
.092	RoCoF on	RoCoF _{THR} ON	2950 mHz/s	2950 mHz/s	2950 mHz/s	10 mHz/s	4950 mHz/s	
.093	RoCoFDelay	Time OFF	850 ms	850 ms	850 ms	100 ms	10000 ms	
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms	

Phase Shift (PShift)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	21,0 °	21,0 °	21,0 °	1,0 °	25,0 °	
.096	Pshift on	PShift _{THR} ON	19,0 °	19,0 °	19,0 °	1,0 °	24,0 °	
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms	
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms	

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

48. VIC-United Energy 23 [ID 1150]

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

49. VIC-Ausnet Energy 23 [ID 1155]

49. VIC-Ausnet Energy 23 [ID 1155]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	105,00% (252,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

49. VIC-Ausnet Energy 23 [ID 1155]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	48,000 Hz	48,000 Hz	48,000 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off		
.091	RoCoF off	RoCoF _{THR} OFF	4000 mHz/s	4000 mHz/s	4000 mHz/s	10 mHz/s	5000 mHz/s	
.092	RoCoF on	RoCoF _{THR} ON	3950 mHz/s	3950 mHz/s	3950 mHz/s	10 mHz/s	4950 mHz/s	
.093	RoCoFDelay	Time OFF	850 ms	850 ms	850 ms	100 ms	10000 ms	
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms	

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	8,0 °	8,0 °	8,0 °	1,0 °	25,0 °
.096	Pshift on	PShift _{THR} ON	6,0 °	6,0 °	6,0 °	1,0 °	24,0 °
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

49. VIC-Ausnet Energy 23 [ID 1155]

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

50. VIC-Citipower 23 [ID 1160]

50. VIC-Citipower 23 [ID 1160]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage			Conformity Range		Possible Range	
ID		Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V 240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID		Default		Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID		Default		Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID		Default		Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID		Default		Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

50. VIC-Citipower 23 [ID 1160]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency ¹				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off		
.091	RoCoF off	RoCoF _{THR} OFF	1000 mHz/s	1000 mHz/s	1000 mHz/s	10 mHz/s	5000 mHz/s	
.092	RoCoF on	RoCoF _{THR} ON	950 mHz/s	950 mHz/s	950 mHz/s	10 mHz/s	4950 mHz/s	
.093	RoCoFDelay	Time OFF	850 ms	850 ms	850 ms	100 ms	10000 ms	
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms	

Phase Shift (PShift)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	8,0 °	8,0 °	8,0 °	1,0 °	25,0 °	
.096	Pshift on	PShift _{THR} ON	6,0 °	6,0 °	6,0 °	1,0 °	24,0 °	
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms	
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms	

50. VIC-Citipower 23 [ID 1160]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password							
ID				Default		Min	Max
.106	PW1	1 st digit of Password		0		0	9
.107	PW2	2 nd digit of Password		0		0	9
.108	PW3	3 rd digit of Password		0		0	9
.109	PW4	4 th digit of Password		0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

51. VIC-Jemana 23 [ID 1165]

51. VIC-Jemana 23 [ID 1165]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

51. VIC-Jemana 23 [ID 1165]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency ¹				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	1000 mHz/s	1000 mHz/s	1000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	950 mHz/s	950 mHz/s	950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	1850 ms	850 ms	850 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	8,0 °	8,0 °	8,0 °	1,0 °	25,0 °	
.096	Pshift on	PShift _{THR} ON	6,0 °	6,0 °	6,0 °	1,0 °	24,0 °	
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms	
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms	

51. VIC-Jemana 23 [ID 1165]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password							
ID				Default		Min	Max
.106	PW1	1 st digit of Password		0		0	9
.107	PW2	2 nd digit of Password		0		0	9
.108	PW3	3 rd digit of Password		0		0	9
.109	PW4	4 th digit of Password		0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

52. VIC-Powercor 23 [ID 1170]

52. VIC-Powercor 23 [ID 1170]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	108,00% (450,79V)	108,00% (450,79V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	105,00% (438,27V)	105,00% (438,27V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	108,00% (259,21V)	108,00% (259,21V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	105,00% (252,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

52. VIC-Powercor 23 [ID 1170]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	1000 mHz/s	1000 mHz/s	1000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	950 mHz/s	950 mHz/s	950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	850 ms	850 ms	850 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	8,0 °	8,0 °	8,0 °	1,0 °	25,0 °	
.096	Pshift on	PShift _{THR} ON	6,0 °	6,0 °	6,0 °	1,0 °	24,0 °	
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms	
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms	

52. VIC-Powercor 23 [ID 1170]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

53. VIC-Western Power 23 [ID 1175]

53. VIC-Western Power 23 [ID 1175]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	106,00% (442,44V)	106,00% (442,44V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> off	U _{THR} ON	%Unom /VUnom	103,00% (429,92V)	103,00% (429,92V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	10000 ms	10000 ms	10000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on				
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	80,00% (333,92V)	80,00% (333,92V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	83,00% (346,44V)	83,00% (346,44V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	10000 ms	10000 ms	10000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V)	106,00% (254,41V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	103,00% (247,21V)	103,00% (247,21V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	10000 ms	10000 ms	10000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	80,00% (192,00V)	80,00% (192,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	83,00% (199,20V)	83,00% (199,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	10000 ms	10000 ms	10000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

53. VIC-Western Power 23 [ID 1175]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	VLL>>	Enable function		on				
.027	VLL>> off	U _{THR} OFF	%Unom /VUnom	110,00% (459,14V)	110,00% (459,14V)	110,00% (459,14V)	100,00% (417,40V)	135,00% (563,49V)
.028	VLL>> on	U _{THR} ON	%Unom /VUnom	103,00% (429,92V)	103,00% (429,92V)	103,00% (429,92V)	100,00% (417,40V)	135,00% (563,49V)
.029	T VLL>>	Time OFF		500 ms	500 ms	500 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	VLL<<	Enable function		on				
.031	VLL<< off	U _{THR} OFF	%Unom /VUnom	50,00% (208,70V)	50,00% (208,70V)	50,00% (208,70V)	0,00% (0,00V)	100,00% (417,40V)
.032	VLL<< on	U _{THR} ON	%Unom /VUnom	83,00% (346,44V)	83,00% (346,44V)	83,00% (346,44V)	0,00% (0,00V)	100,00% (417,40V)
.033	T VLL<<	Time OFF		500 ms	500 ms	500 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	V>>	Enable function		on	on / off		on / off	
.035	V>> off	U _{THR} OFF	%Unom /VUnom	110,00% (264,01V)	110,00% (264,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.036	V>> on	U _{THR} ON	%Unom /VUnom	103,00% (247,21V)	103,00% (247,21V)	103,00% (247,21V)	100,00% (240,01V)	135,00% (324,01V)
.037	T V>>	Time OFF		500 ms	500 ms	500 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	V<<	Enable function		on	on / off		on / off	
.039	V<< off	U _{THR} OFF	%Unom /VUnom	50,00% (120,00V)	50,00% (120,00V)	50,00% (120,00V)	0,00% (0,00V)	100,00% (240,01V)
.040	V<< on	U _{THR} ON	%Unom /VUnom	83,00% (199,20V)	83,00% (199,20V)	83,00% (199,20V)	0,00% (0,00V)	100,00% (240,01V)
.041	T V<<	Time OFF		500 ms	500 ms	500 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	51,500 Hz	51,500 Hz	51,500 Hz	50,000 Hz	55,000 Hz	
.056	F> on	f _{THR} ON	51,400 Hz	51,400 Hz	51,400 Hz	50,000 Hz	55,000 Hz	
.057	T F>	Time OFF	2000 ms	0 ms	2000 ms	0 ms	300000 ms	

53. VIC-Western Power 23 [ID 1175]

Underfrequency ¹				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	10000 ms	10000 ms	10000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID			Default	Min	Max		
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	4000 mHz/s	4000 mHz/s	4000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	3950 mHz/s	3950 mHz/s	3950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	0 ms	0 ms	0 ms	0 ms	10000 ms
.111	RoCoF wnd	Window length	100 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	12,0 °	12,0 °	12,0 °	1,0 °	25,0 °
.096	Pshift on	PShift _{THR} ON	10,0 °	10,0 °	10,0 °	1,0 °	24,0 °
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password							
ID				Default		Min	Max
.106	PW1	1 st digit of Password		0		0	9
.107	PW2	2 nd digit of Password		0		0	9
.108	PW3	3 rd digit of Password		0		0	9
.109	PW4	4 th digit of Password		0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

53. VIC-Western Power 23 [ID 1175]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

54. ACT-Evoenergy 23 [ID 1180]

54. ACT-Evoenergy 23 [ID 1180]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	110,00% (459,14V)	110,00% (459,14V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> off	U _{THR} ON	%Unom /VUnom	107,00% (446,62V)	107,00% (446,62V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on				
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	11000 ms	11000 ms	11000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	110,00% (264,01V)	110,00% (264,01V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	107,00% (256,81V)	107,00% (256,81V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	11000 ms	11000 ms	11000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

54. ACT-Evoenergy 23 [ID 1180]

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	VLL<<	Enable function		on	on / off		on / off	
.031	VLL<< off	U _{THR} OFF	%Unom /VUnom	70,80% (295,52V)	70,80% (295,52V)	70,80% (295,52V)	0,00% (0,00V)	100,00% (417,40V)
.032	VLL<< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.033	T VLL<<	Time OFF		2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	V<<	Enable function		on	on / off		on / off	
.039	V<< off	U _{THR} OFF	%Unom /VUnom	70,80% (169,92V)	70,80% (169,92V)	70,80% (169,92V)	0,00% (0,00V)	100,00% (240,01V)
.040	V<< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.041	T V<<	Time OFF		2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	106,00% (254,41V /442,44V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	104,00% (249,61V /434,10V)	100,00% (240,01V /417,40V)	135,00% (324,01V /563,49V)

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz	
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms	

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

54. ACT-Evoenergy 23 [ID 1180]

Frequency measuring in general				Conformity Range			
ID			Default	Min	Max		
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	1000 mHz/s	1000 mHz/s	1000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	950 mHz/s	950 mHz/s	950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	1850 ms	1850 ms	1850 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	PShift	Enable Function	on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	10,0 °	10,0 °	10,0 °	1,0 °	25,0 °
.096	Pshift on	PShift _{THR} ON	8,0 °	8,0 °	8,0 °	1,0 °	24,0 °
.097	PshiftDel	Time OFF	50 ms	50 ms	50 ms	50 ms	10000 ms
.112	PShift wnd	Window length	50 ms	50 ms	500 ms	50 ms	1000 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

54. ACT-Evoenergy 23 [ID 1180]

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage ($\bar{U}$)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift ($\Delta\Phi$)	on
Remote shutdown / self-test (R)	off
Contactors feedback contact reports closed, although it should be open (C)	on
Contactors feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

55. QLD-Energex 23 [ID 1185]

55. QLD-Energex 23 [ID 1185]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	114,00% (475,84V)	114,00% (475,84V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> off	U _{THR} ON	%Unom /VUnom	111,00% (463,31V)	111,00% (463,31V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	200 ms	200 ms	200 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on				
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	114,00% (273,61V)	114,00% (273,61V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	111,00% (266,41V)	111,00% (266,41V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	200 ms	200 ms	200 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

55. QLD-Energex 23 [ID 1185]

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	VLL<<	Enable function		on	on / off		on / off	
.031	VLL<< off	U _{THR} OFF	%Unom /VUnom	29,20% (121,88V)	29,20% (121,88V)	29,20% (121,88V)	0,00% (0,00V)	100,00% (417,40V)
.032	VLL<< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.033	T VLL<<	Time OFF		3000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	V<<	Enable function		on	on / off		on / off	
.039	V<< off	U _{THR} OFF	%Unom /VUnom	29,20% (70,08V)	29,20% (70,08V)	29,20% (70,08V)	0,00% (0,00V)	100,00% (240,01V)
.040	V<< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.041	T V<<	Time OFF		3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	3000 ms	3000 ms	3000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length		100 ms	100 ms	100 ms	

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	4000 mHz/s	4000 mHz/s	4000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	3950 mHz/s	3950 mHz/s	3950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	350 ms	350 ms	350 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

55. QLD-Energex 23 [ID 1185]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contactor feedback contact reports closed, although it should be open (C)	on
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

56. QLD-Ergon 23 [ID 1190]

56. QLD-Ergon 23 [ID 1190]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	240,01V /417,40V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	114,00% (475,84V)	114,00% (475,84V)	100,00% (417,40V)	135,00% (563,49V)
.012	VLL> off	U _{THR} ON	%Unom /VUnom	111,00% (463,31V)	111,00% (463,31V)	100,00% (417,40V)	135,00% (563,49V)
.013	T VLL>	Time OFF	200 ms	200 ms	200 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on				
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	75,00% (313,05V)	75,00% (313,05V)	0,00% (0,00V)	100,00% (417,40V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.017	T VLL<	Time OFF	3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	114,00% (273,61V)	114,00% (273,61V)	100,00% (240,01V)	135,00% (324,01V)
.020	V> on	U _{THR} ON	%Unom /VUnom	111,00% (266,41V)	111,00% (266,41V)	100,00% (240,01V)	135,00% (324,01V)
.021	T V>	Time OFF	200 ms	200 ms	200 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	75,00% (180,00V)	75,00% (180,00V)	0,00% (0,00V)	100,00% (240,01V)
.024	V< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.025	T V<	Time OFF	3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

56. QLD-Ergon 23 [ID 1190]

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	VLL<<	Enable function		on	on / off		on / off	
.031	VLL<< off	U _{THR} OFF	%Unom /VUnom	29,20% (121,88V)	29,20% (121,88V)	29,20% (121,88V)	0,00% (0,00V)	100,00% (417,40V)
.032	VLL<< on	U _{THR} ON	%Unom /VUnom	78,00% (325,57V)	78,00% (325,57V)	78,00% (325,57V)	0,00% (0,00V)	100,00% (417,40V)
.033	T VLL<<	Time OFF		3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	V<<	Enable function		on	on / off		on / off	
.039	V<< off	U _{THR} OFF	%Unom /VUnom	29,20% (70,08V)	29,20% (70,08V)	29,20% (70,08V)	0,00% (0,00V)	100,00% (240,01V)
.040	V<< on	U _{THR} ON	%Unom /VUnom	78,00% (187,20V)	78,00% (187,20V)	78,00% (187,20V)	0,00% (0,00V)	100,00% (240,01V)
.041	T V<<	Time OFF		3000 ms	3000 ms	3000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (48,00V)	20,00% (48,00V)	20,00% (48,00V)	1,00% (2,40V)	100,00% (240,01V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (36,00V)	15,00% (36,00V)	15,00% (36,00V)	1,00% (2,40V)	100,00% (240,01V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	3000 ms	3000 ms	3000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length		100 ms	100 ms	100 ms	

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	4000 mHz/s	4000 mHz/s	4000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	3950 mHz/s	3950 mHz/s	3950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	350 ms	350 ms	350 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

56. QLD-Ergon 23 [ID 1190]

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ü)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

57. SA-Power networks23 [ID 1195]

57. SA-Power networks23 [ID 1195]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	4-wire LN - 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V /400,00V	230,00V /400,00V	240,01V /417,40V	99,99V /173,90V	240,01V /417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	VLL>	Enable function	on	on / off		on / off	
.011	VLL> off	U _{THR} OFF	%Unom /VUnom	113,00% (452,00V)	113,00% (452,00V)	100,00% (400,00V)	135,00% (540,00V)
.012	VLL> on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	110,00% (440,00V)	100,00% (400,00V)	135,00% (540,00V)
.013	T VLL>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	VLL<	Enable function	on	on / off		on / off	
.015	VLL< off	U _{THR} OFF	%Unom /VUnom	79,00% (316,00V)	79,00% (316,00V)	0,00% (0,00V)	100,00% (400,00V)
.016	VLL< on	U _{THR} ON	%Unom /VUnom	81,00% (324,00V)	81,00% (324,00V)	0,00% (0,00V)	100,00% (400,00V)
.017	T VLL<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom /VUnom	113,00% (259,90V)	113,00% (259,90V)	100,00% (230,00V)	135,00% (310,50V)
.020	V> on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	110,00% (253,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T V>	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom /VUnom	79,00% (181,70V)	79,00% (181,70V)	0,00% (0,00V)	100,00% (230,00V)
.024	V< on	U _{THR} ON	%Unom /VUnom	81,00% (186,30V)	81,00% (186,30V)	0,00% (0,00V)	100,00% (230,00V)
.025	T V<	Time OFF	2000 ms	2000 ms	2000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

57. SA-Power networks23 [ID 1195]

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero>	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (46,00V)	20,00% (46,00V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (34,50V)	15,00% (34,50V)	15,00% (34,50V)	1,00% (2,30V)	100,00% (230,00V)
.118	T Uzero>	Time OFF		1500 ms	1500 ms	1500 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on				
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	112,00% (257,60V /448,00V)	112,00% (257,60V /448,00V)	112,00% (257,60V /448,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V /440,00V)	110,00% (253,00V /440,00V)	110,00% (253,00V /440,00V)	100,00% (230,00V /400,00V)	135,00% (310,50V /540,00V)

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	52,000 Hz	52,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.056	F> on	f _{THR} ON	51,900 Hz	51,900 Hz	51,900 Hz	50,000 Hz	55,000 Hz
.057	T F>	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	47,000 Hz	47,000 Hz	47,000 Hz	40,000 Hz	50,000 Hz
.060	F< on	f _{THR} ON	47,500 Hz	47,500 Hz	47,500 Hz	40,000 Hz	50,000 Hz
.061	T F<	Time OFF	2000 ms	2000 ms	2000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range			
ID				Default	Min	Max	
.113	F wnd	Window length	100 ms	100 ms	100 ms		

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	En Function	on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	4000 mHz/s	4000 mHz/s	4000 mHz/s	10 mHz/s	5000 mHz/s
.092	RoCoF on	RoCoF _{THR} ON	3950 mHz/s	3950 mHz/s	3950 mHz/s	10 mHz/s	4950 mHz/s
.093	RoCoFDelay	Time OFF	100 ms	850 ms	850 ms	100 ms	10000 ms
.111	RoCoF wnd	Window length	225 ms	100 ms	1000 ms	100 ms	1000 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

57. SA-Power networks23 [ID 1195]

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	0 s	60 s	0 s	900 s

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

58. NRS 097-2-1:2017 [ID 1000]

58. NRS 097-2-1:2017 [ID 1000]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	28.8	250.0
		Unom Δ	V	400.0	400.0	50.0	434.8

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	ULL>1 OFF	U _{THR} OFF	%Unom	111	111	100	135
.012	ULL>1 ON	U _{THR} ON	%Unom	109	109	100	135
.013	ULL>1 T	Time OFF	ms	2000	200	200	60000
Comment:		ULL>1 OFF has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULL<1 OFF	U _{THR} OFF	%Unom	84	84	10	100
.016	ULL<1 ON	U _{THR} ON	%Unom	86	100	10	100
.017	ULL<1 T	Time OFF	ms	10000	600	200	60000
Comment:		ULL<1 OFF has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	ULN>1 OFF	U _{THR} OFF	%Unom	111	111	100	135
.020	ULN>1 ON	U _{THR} ON	%Unom	109	109	100	135
.021	ULN>1 T	Time OFF	ms	2000	200	200	60000
Comment:		ULN>1 OFF has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULN<1 OFF	U _{THR} OFF	%Unom	84	84	10	100
.024	ULN<1 ON	U _{THR} ON	%Unom	86	100	10	100
.025	ULN<1 T	Time OFF	ms	10000	600	200	60000
Comment:		ULN<1 OFF has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.027	ULL>2 OFF	U _{THR} OFF	%Unom	121	121	100	135
.028	ULL>2 ON	U _{THR} ON	%Unom	119	119	100	135
.029	ULL>2 T	Time OFF	ms	160	110	110	60000
Comment:		ULL>2 OFF has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

58. NRS 097-2-1:2017 [ID 1000]

Undervoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.031	ULL<2 OFF	U _{THR} OFF	%Unom	49	49	10	100
.032	ULL<2 ON	U _{THR} ON	%Unom	51	100	10	100
.033	ULL<2 T	Time OFF	ms	150	200	150	60000
Comment:		ULL<2 OFF has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.035	ULN>2 OFF	U _{THR} OFF	%Unom	121	121	100	135
.036	ULN>2 ON	U _{THR} ON	%Unom	119	119	100	135
.037	ULN>2 T	Time OFF	ms	110	160	110	60000
Comment:		ULN>2 OFF has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	ULN<2 OFF	U _{THR} OFF	%Unom	49	49	10	100
.040	ULN<2 ON	U _{THR} ON	%Unom	51	100	10	100
.041	ULN<2 T	Time OFF	ms	150	200	150	60000
Comment:		ULN<2 OFF has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f>1 OFF	f _{THR} OFF	Hz	52.00	52.00	50.00	60.00
.056	f>1 ON	f _{THR} ON	Hz	50.50	50.50	50.00	60.00
.057	f>1 T	Time OFF	ms	4000	4000	200	60000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	f<1 OFF	f _{THR} OFF	Hz	47.00	47.00	40.00	50.00
.060	f<1 ON	f _{THR} ON	Hz	47.10	50.00	40.00	50.00
.061	f<1 T	Time OFF	ms	200	200	200	60000

Random overfrequency				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.086	f>RND	Enable function	off	on / off		on / off	
.087	f>RND OFF	f _{THR} OFF	Hz	50.50	52.00	50.50	52.00
.088	f>RND ON	f _{THR} ON	Hz	50.10	50.49	50.00	50.49
.089	f>RND T	Time OFF	ms	4000	4000	50	60000
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited					

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	Enable Function	off	on / off		on / off	
.091	RoCoF OFF	RoCoF _{THR} OFF	mHz/s	1000	9990	10	9990
.092	RoCoF ON	RoCoF _{THR} ON	mHz/s	950	9990	100	9990
.093	RoCoFDelay	Time OFF	ms	500	60000	50	60000
.111	RoCoF wnd	Window length	ms	Fixed window length 225ms			

58. NRS 097-2-1:2017 [ID 1000]

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift OFF	PShift _{THR} OFF	°	7	2	20	2	20
.096	PShift ON	PShift _{THR} ON	°	5	2	20	2	20
.097	PShift T	Time OFF	ms	0	0	60000	0	60000
.112	PShift wnd	Window length	ms	Fixed window length 200ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	600	0	900

Random Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.103	Ton random	Enable function		off	on / off		on / off	
.104	Ton random	Turn on time	s		60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited						

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.	
On = it is possible to detect this error	
Off = it is not possible to show this error on relay R3	
Overvoltage LL (UΔ)	on
Undervoltage LL (UΔ)	on
Overvoltage LN (UY)	on
Undervoltage LN (UY)	on
10-min overvoltage (Ū)	on
Overfrequency (f)	on
Underfrequency (f)	on
RoCoF (Rate of Change of Frequency) (Δf)	on
Phase shift (ΔΦ)	on
Remote shutdown / self-test (R)	off
Contact feedback contact reports closed, although it should be open (C)	on
Contact feedback contact reports open, although it should be closed (no error, only info) (c)	on

58. NRS 097-2-1:2017 [ID 1000]

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

59. OPEN SETUP [ID 9006]

59. OPEN SETUP [ID 9006]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	28.8	250.0	28.8
		Unom Δ	V	400.0	50.0	434.8	50.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL>1	Enable function	on	on / off		on / off	
.011	ULL>1 OFF	U _{THR} OFF	%Unom	110	0	180	0
.012	ULL>1 ON	U _{THR} ON	%Unom	109	0	180	0
.013	ULL>1 T	Time OFF	ms	200	50	300000	50
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	ULL<1	Enable function	on	on / off		on / off	
.015	ULL<1 OFF	U _{THR} OFF	%Unom	90	0	180	0
.016	ULL<1 ON	U _{THR} ON	%Unom	91	0	180	0
.017	ULL<1 T	Time OFF	ms	200	50	300000	50
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN>1	Enable function	on	on / off		on / off	
.019	ULN>1 OFF	U _{THR} OFF	%Unom	110	0	180	0
.020	ULN>1 ON	U _{THR} ON	%Unom	109	0	180	0
.021	ULN>1 T	Time OFF	ms	200	50	300000	50
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.022	ULN<1	Enable function	on	on / off		on / off	
.023	ULN<1 OFF	U _{THR} OFF	%Unom	90	0	180	0
.024	ULN<1 ON	U _{THR} ON	%Unom	91	0	180	0
.025	ULN<1 T	Time OFF	ms	200	50	300000	50
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

59. OPEN SETUP [ID 9006]

Overvoltage2 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.026	ULL>2	Enable function		on	on / off		on / off		
.027	ULL>2 OFF	U _{THR} OFF	%Unom	120	0	180	0	180	
.028	ULL>2 ON	U _{THR} ON	%Unom	119	0	180	0	180	
.029	ULL>2 T	Time OFF	ms	100	50	300000	50	300000	
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)							

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL<2	Enable function		on	on / off		on / off	
.031	ULL<2 OFF	U _{THR} OFF	%Unom	80	0	180	0	180
.032	ULL<2 ON	U _{THR} ON	%Unom	81	0	180	0	180
.033	ULL<2 T	Time OFF	ms	100	50	300000	50	300000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN>2	Enable function		on	on / off		on / off	
.035	ULN>2 OFF	U _{THR} OFF	%Unom	120	0	180	0	180
.036	ULN>2 ON	U _{THR} ON	%Unom	119	0	180	0	180
.037	ULN>2 T	Time OFF	ms	100	50	300000	50	300000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN<2	Enable function		on	on / off		on / off	
.039	ULN<2 OFF	U _{THR} OFF	%Unom	80	0	180	0	180
.040	ULN<2 ON	U _{THR} ON	%Unom	81	0	180	0	180
.041	ULN<2 T	Time OFF	ms	100	50	300000	50	300000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	UAVG>	Enable function		on	on / off		on / off	
.043	UAVG> OFF	U _{THR} OFF	%Unom	110	0	180	0	180
.044	UAVG> ON	U _{THR} ON	%Unom	109	0	180	0	180
.045	UAVG> T	Time OFF	ms	0	0	300000	0	300000

Deactivation frequency monitoring LL					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.046	fdeac ULL<	Enable function		off	on / off		on / off	
.047	ULL< OFF	U _{THR} OFF	%Unom	9.5	9.5	60	2	100
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})				

Deactivation frequency monitoring LN					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.050	fdeac ULN<	Enable function		off	on / off		on / off	
.051	ULN< OFF	U _{THR} OFF	%Unom	9.5	9.5	60	2	100
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})				

59. OPEN SETUP [ID 9006]

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.054	f>1	Enable function		on	on / off		on / off	
.055	f>1 OFF	f _{THR} OFF	Hz	51.00	40.00	65.00	40.00	65.00
.056	f>1 ON	f _{THR} ON	Hz	50.90	40.00	65.00	40.00	65.00
.057	f>1 T	Time OFF	ms	200	75	300000	75	300000

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.058	f<1	Enable function		on	on / off		on / off	
.059	f<1 OFF	f _{THR} OFF	Hz	49.00	40.00	65.00	40.00	65.00
.060	f<1 ON	f _{THR} ON	Hz	49.10	40.00	65.00	40.00	65.00
.061	f<1 T	Time OFF	ms	200	75	300000	75	300000

Overfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.062	f>2	Enable function		on	on / off		on / off	
.063	f>2 OFF	f _{THR} OFF	Hz	52.00	40.00	65.00	40.00	65.00
.064	f>2 ON	f _{THR} ON	Hz	51.90	40.00	65.00	40.00	65.00
.065	f>1 T	Time OFF	ms	100	75	300000	75	300000

Underfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.066	f<2	Enable function		on	on / off		on / off	
.067	f<2 OFF	f _{THR} OFF	Hz	48.00	40.00	65.00	40.00	65.00
.068	f<2 ON	f _{THR} ON	Hz	48.10	40.00	65.00	40.00	65.00
.069	f<2 T	Time OFF	ms	100	75	300000	75	300000

Random overfrequency					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.086	f>RND	Enable function		off	on / off		on / off	
.087	f>RND OFF	f _{THR} OFF	Hz		50.20	51.50	50.20	51.50
.088	f>RND ON	f _{THR} ON	Hz	50.05	50.00	50.19	50.00	50.19
.089	f>RND T	Time OFF	ms	100	50	300000	50	300000
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	100	100	1000	100	1000	

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF OFF	RoCoF _{THR} OFF	mHz/s	1000	10	9990	10	9990
.092	RoCoF ON	RoCoF _{THR} ON	mHz/s	950	10	9990	10	9990
.093	RoCoFDelay	Time OFF	ms	500	50	300000	50	300000
.111	RoCoF wnd	Window length	ms	225	100	1000	100	1000

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift OFF	PShift _{THR} OFF	°	7	2	20	2	20
.096	PShift ON	PShift _{THR} ON	°	5	2	20	2	20
.097	PShift T	Time OFF	ms	0	0	300000	0	300000
.112	PShift wnd	Window length	ms	200	50	500	50	1000

59. OPEN SETUP [ID 9006]

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	600	0	900	

Random Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.103	Ton random	Enable function	off	on / off		on / off	
.104	Ton random	Turn on time	s	60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited					

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay R3.

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

Overvoltage LL (UA)	On/off
Undervoltage LL (UA)	On/off
Overvoltage LN (UY)	On/off
Undervoltage LN (UY)	On/off
10-min overvoltage (Ü)	On/off
Overfrequency (f)	On/off
Underfrequency (f)	On/off
RoCoF (Rate of Change of Frequency) (Δf)	On/off
Phase shift (ΔΦ)	On/off
Remote shutdown / self-test (R)	On/off
Contactor feedback contact reports closed, although it should be open (C)	On/off
Contactor feedback contact reports open, although it should be closed (no error, only info) (c)	On/off

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

60. CZ-2024 [ID: 930]

60. CZ-2024 [ID: 930]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN	2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V/ 400,00V	57,50V/ 100,00V	230,00V/ 400,00V	28,75V/ 50,00V	230,00V/ 400,00V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	1ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.010	ULL >	Enable function		off	on / off		on / off	
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	115,00% (460,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.013	T ULL >	Time OFF		5000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.014	ULL <	Enable function		off	on / off		on / off	
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	70,00% (280,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.017	T ULL <	Time OFF		2700 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T ULN >	Time OFF		5000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

60. CZ-2024 [ID: 930]

60. CZ-2024 [ID: 930]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN	2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V/ 400,00V	57,50V/ 100,00V	230,00V/ 400,00V	28,75V/ 50,00V	230,00V/ 400,00V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	1ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.010	ULL >	Enable function		off	on / off		on / off	
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	115,00% (460,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.013	T ULL >	Time OFF		5000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.014	ULL <	Enable function		off	on / off		on / off	
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	70,00% (280,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.017	T ULL <	Time OFF		2700 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T ULN >	Time OFF		5000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	ULN <	Enable function		on	on / off		on / off	
.023	ULN < off	U _{THR} OFF	%Unom /VUnom	70,00% (161,00V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	ULN < on	U _{THR} ON	%Unom /VUnom	85,00% (195,50V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T ULN <	Time OFF		2700 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable function		off	on / off		on / off	
.027	ULL >> off	U _{THR} OFF	%Unom /VUnom	120,00% (480,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.028	ULL >> on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.029	T ULL >>	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable function		off	on / off		on / off	
.031	ULL << off	U _{THR} OFF	%Unom /VUnom	45,00% (180,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.032	ULL << on	U _{THR} ON	%Unom /VUnom	85,00% (340,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.033	T ULL <<	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN >>	Enable function		on	on / off		on / off	
.035	ULN >> off	U _{THR} OFF	%Unom /VUnom	120,00% (276,00V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	ULN >> on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.037	T ULN >>	Time OFF		100 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN <<	Enable function		on	on / off		on / off	
.039	ULN << off	U _{THR} OFF	%Unom /VUnom	45,00% (103,50V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	ULN << on	U _{THR} ON	%Unom /VUnom	85,00% (195,50V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.041	T ULN <<	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (34,50V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.118	T Uzero >	Time OFF		1500 ms	200 ms	100000 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on / off		on / off	
.120	U res > on	U _{THR} OFF	%Unom /VUnom	5,00% (11,50V)	2,00% (4,60V)	20,00% (46,00V)	2,00% (4,60V)	100,00% (230,00V)
.121	Ures > off	U _{THR} ON	%Unom /VUnom	3,00% (6,90V)	1,00% (2,30V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.122	T Ures >	Time OFF		200 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage LN Activation of a narrower frequency winw					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on / off		on / off	
.124	Uanfw< on	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.125	Uanfw< off	U _{THR} ON	%Unom /VUnom	86,00% (197,80V)	21,00% (48,30V)	100,00% (230,00V)	2,00% (4,60V)	100,00% (230,00V)
.126	T Uanfw <	Time OFF		0 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V/ 444,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V/ 440,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)

Overfrequency ¹				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.054	f >	Enable function	on	on / off		on / off		
.055	f > off	f _{THR} OFF	51,500 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.056	f > on	f _{THR} ON	50,050 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.057	T f >	Time OFF	100 ms	100 ms	100000 ms	100 ms	300000 ms	

Underfrequency ¹				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.058	f <	Enable function	on	on / off		on / off		
.059	f < off	f _{THR} OFF	47,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz	
.060	f < on	f _{THR} ON	47,500 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz	
.061	T f <	Time OFF	100 ms	100 ms	100000 ms	100 ms	300000 ms	

60. CZ-2024 [ID: 930]

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.062	f nw >	Enable function	off	on / off		on / off	
.063	f nw > off	f _{THR} OFF	50,300 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.064	f nw > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.065	T f nw >	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.066	f nw <	Enable function	off	on / off		on / off	
.067	f nw < off	f _{THR} OFF	49,700 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.068	f nw < on	f _{THR} ON	49,800 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.069	T f nw <	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range	
ID			Default	Min	Max
.113	F wnd	Window length	100 ms	100 ms	100 ms

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	ROCOF	Enable Function	off	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	1000 mHz/s	200 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.092	ROCOF on	RoCoF _{THR} ON	800 mHz/s	100 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.093	T ROCOF	Time OFF	0 ms	0 ms	5000 ms	0 ms	5000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	Pshift	Enable Function	off	on / off		on / off	
.095	Pshift off	PShift _{THR} OFF	7,0 °	2,0 °	15,0 °	2,0 °	15,0 °
.096	Pshift on	PShift _{THR} ON	5,0 °	1,0 °	15,0 °	1,0 °	15,0 °

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	300 s	10 s	1200 s	0 s	1200 s

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.

On = it is possible to detect this error

Off = it is not possible to detect this error

Overvoltage LL	off
Undervoltage LL	off
Overvoltage LN	on
Undervoltage LN	on
10-min overvoltage	on
Overfrequency	on
Underfrequency	on
RoCoF (Rate of Change of Frequency)	off
Phase shift	off
Remote shutdown / self-test	on
Contactor feedback contact reports closed, although it should be open	on
Contactor feedback contact reports open, although it should be closed (no error, only info)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

61. EN50549-1: SI Uf A/B [ID: 940]

61. EN50549-1: SI Uf A/B [ID: 940]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN	2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN

Nominal Voltage			Conformity Range		Possible Range	
ID		Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V/ 400,00V	57,50V/ 100,00V	230,00V/ 400,00V	57,50V/ 100,00V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch	2ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.010	ULL >	Enable function	off	on / off		on / off	
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	111,00% (444,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)
.013	T ULL >	Time OFF	2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.014	ULL <	Enable function	off	on / off		on / off	
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	85,00% (340,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	90,00% (360,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)
.017	T ULL <	Time OFF	2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.018	ULN >	Enable function	on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	110,00% (253,00V)	100,00% (230,00V)
.021	T ULN >	Time OFF	2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.022	ULN <	Enable function	on	on / off		on / off	
.023	ULN < off	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)
.024	ULN < on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)
.025	T ULN <	Time OFF	2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

61. EN50549-1: SI Uf A/B [ID: 940]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable function		off	on / off		on / off	
.027	ULL >> off	U _{THR} OFF	%Unom /VUnom	115,00% (460,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.028	ULL >> on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	110,00% (440,00V)	100,00% (400,00V)	135,00% (540,00V)
.029	T ULL >>	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable function		off	on / off		on / off	
.031	ULL << off	U _{THR} OFF	%Unom /VUnom	70,00% (280,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.032	ULL << on	U _{THR} ON	%Unom /VUnom	90,00% (360,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.033	T ULL <<	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN >>	Enable function		on	on / off		on / off	
.035	ULN >> off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	ULN >> on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	110,00% (253,00V)	100,00% (230,00V)	135,00% (310,50V)
.037	T ULN >>	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN <<	Enable function		on	on / off		on / off	
.039	ULN << off	U _{THR} OFF	%Unom /VUnom	70,00% (161,00V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	ULN << on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.041	T ULN <<	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (34,50V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.118	T Uzero >	Time OFF		1500 ms	200 ms	100000 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

61. EN50549-1: SI Uf A/B [ID: 940]

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on / off		on / off	
.120	U res > on	U _{THR} OFF	%Unom /VUnom	5,00% (11,50V)	2,00% (4,60V)	20,00% (46,00V)	2,00% (4,60V)	100,00% (230,00V)
.121	Ures > off	U _{THR} ON	%Unom /VUnom	3,00% (6,90V)	1,00% (2,30V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.122	T Ures >	Time OFF		200 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage LN Activation of a narrower frequency winw					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on / off		on / off	
.124	Uanfw< on	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.125	Uanfw< off	U _{THR} ON	%Unom /VUnom	86,00% (197,80V)	21,00% (48,30V)	100,00% (230,00V)	2,00% (4,60V)	100,00% (230,00V)
.126	T Uanfw <	Time OFF		0 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		off	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	110,00% (253,00V/ 440,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V/ 436,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.054	f >	Enable function	on	on / off		on / off		
.055	f > off	f _{THR} OFF	52,000 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.056	f > on	f _{THR} ON	50,100 Hz	50,000 Hz	51,000 Hz	50,000 Hz	55,000 Hz	
.057	T f >	Time OFF	200 ms	100 ms	60000 ms	100 ms	300000 ms	

Underfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.058	f <	Enable function	on	on / off		on / off		
.059	f < off	f _{THR} OFF	47,000 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz	
.060	f < on	f _{THR} ON	49,900 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz	
.061	T f <	Time OFF	200 ms	100 ms	60000 ms	100 ms	300000 ms	

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.062	f nw >	Enable function	off	on / off		on / off	
.063	f nw > off	f _{THR} OFF	50,300 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.064	f nw > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.065	T f nw >	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

61. EN50549-1: SI Uf A/B [ID: 940]

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on / off		on / off	
.120	U res > on	U _{THR} OFF	%Unom /VUnom	5,00% (11,50V)	2,00% (4,60V)	20,00% (46,00V)	2,00% (4,60V)	100,00% (230,00V)
.121	Ures > off	U _{THR} ON	%Unom /VUnom	3,00% (6,90V)	1,00% (2,30V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.122	T Ures >	Time OFF		200 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage LN Activation of a narrower frequency winw					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on / off		on / off	
.124	Uanfw< on	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.125	Uanfw< off	U _{THR} ON	%Unom /VUnom	86,00% (197,80V)	21,00% (48,30V)	100,00% (230,00V)	2,00% (4,60V)	100,00% (230,00V)
.126	T Uanfw <	Time OFF		0 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		off	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	110,00% (253,00V/ 440,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	109,00% (250,70V/ 436,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.054	f >	Enable function	on	on / off		on / off		
.055	f > off	f _{THR} OFF	52,000 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.056	f > on	f _{THR} ON	50,100 Hz	50,000 Hz	51,000 Hz	50,000 Hz	55,000 Hz	
.057	T f >	Time OFF	200 ms	100 ms	60000 ms	100 ms	300000 ms	

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.058	f <	Enable function	on	on / off		on / off	
.059	f < off	f _{THR} OFF	47,000 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	49,900 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	200 ms	100 ms	60000 ms	100 ms	300000 ms

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.062	f nw >	Enable function	off	on / off		on / off	
.063	f nw > off	f _{THR} OFF	50,300 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.064	f nw > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz
.065	T f nw >	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

61. EN50549-1: SI Uf A/B [ID: 940]

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.066	f nw <	Enable function	off	on / off		on / off	
.067	f nw < off	f _{THR} OFF	49,700 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.068	f nw < on	f _{THR} ON	49,900 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.069	T f nw <	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range	
ID			Default	Min	Max
.113	F wnd	Window length	100 ms	100 ms	100 ms

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	ROCOF	Enable Function	off	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	5000 mHz/s	200 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.092	ROCOF on	RoCoF _{THR} ON	4900 mHz/s	100 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.093	T ROCOF	Time OFF	500 ms	0 ms	5000 ms	0 ms	5000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	Pshift	Enable Function	off	on / off		on / off	
.095	Pshift off	PShift _{THR} OFF	7,0 °	2,0 °	15,0 °	2,0 °	15,0 °
.096	Pshift on	PShift _{THR} ON	5,0 °	1,0 °	15,0 °	1,0 °	15,0 °

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	10 s	600 s	0 s	900 s

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

61. EN50549-1: SI Uf A/B [ID: 940]

Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.

On = it is possible to detect this error

Off = it is not possible to detect this error

Overvoltage LL	on
Undervoltage LL	on
Overvoltage LN	on
Undervoltage LN	on
10-min overvoltage	on
Overfrequency	on
Underfrequency	on
RoCoF (Rate of Change of Frequency)	on
Phase shift	on
Remote shutdown / self-test	on
Contactor feedback contact reports closed, although it should be open	on
Contactor feedback contact reports open, although it should be closed (no error, only info)	on

Device Information		
ID		
.105	SN: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

62. EN50549-2: SI Uf C [ID: 945]

62. EN50549-2: SI Uf C [ID: 945]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LL+LN	3-wire LL, 4-wire LN, 4-wire LL+LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V/ 400,00V	57,50V/ 100,00V	230,00V/ 400,00V	57,50V/ 100,00V	240,01V/ 417,40V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch	2ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.010	ULL >	Enable function		on	on / off		on / off	
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	111,00% (444,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	110,00% (440,00V)	100,00% (400,00V)	135,00% (540,00V)
.013	T ULL >	Time OFF		2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.014	ULL <	Enable function		on	on / off		on / off	
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	85,00% (340,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	90,00% (360,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.017	T ULL <	Time OFF		2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		on	on / off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V)	100,00% (230,00V)	120,00% (276,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	110,00% (253,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T ULN >	Time OFF		2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	ULN <	Enable function		on	on / off		on / off	
.023	ULN < off	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	ULN < on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T ULN <	Time OFF		2000 ms	100 ms	100000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

62. EN50549-2: SI Uf C [ID: 945]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL >>	Enable function		on	on / off		on / off	
.027	ULL >> off	U _{THR} OFF	%Unom /VUnom	115,00% (460,00V)	100,00% (400,00V)	120,00% (480,00V)	100,00% (400,00V)	135,00% (540,00V)
.028	ULL >> on	U _{THR} ON	%Unom /VUnom	110,00% (440,00V)	100,00% (400,00V)	110,00% (440,00V)	100,00% (400,00V)	135,00% (540,00V)
.029	T ULL >>	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL <<	Enable function		on	on / off		on / off	
.031	ULL << off	U _{THR} OFF	%Unom /VUnom	70,00% (280,00V)	20,00% (80,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.032	ULL << on	U _{THR} ON	%Unom /VUnom	90,00% (360,00V)	50,00% (200,00V)	100,00% (400,00V)	10,00% (40,00V)	100,00% (400,00V)
.033	T ULL <<	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN >>	Enable function		on	on / off		on / off	
.035	ULN >> off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	ULN >> on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	110,00% (253,00V)	100,00% (230,00V)	135,00% (310,50V)
.037	T ULN >>	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN <<	Enable function		on	on / off		on / off	
.039	ULN << off	U _{THR} OFF	%Unom /VUnom	70,00% (161,00V)	20,00% (46,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.040	ULN << on	U _{THR} ON	%Unom /VUnom	90,00% (207,00V)	50,00% (115,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.041	T ULN <<	Time OFF		200 ms	100 ms	5000 ms	100 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Zero Voltage Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.115	Uzero >	Enable Function		off	on / off		on / off	
.116	Uzero> off	U _{THR} OFF	%Unom /VUnom	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.117	Uzero> on	U _{THR} ON	%Unom /VUnom	15,00% (34,50V)	1,00% (2,30V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.118	T Uzero >	Time OFF		1500 ms	200 ms	100000 ms	0 ms	300000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

62. EN50549-2: SI Uf C [ID: 945]

Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.119	Ures-anfw>	Enable Function		off	on / off		on / off	
.120	U res > on	U _{THR} OFF	%Unom /VUnom	5,00% (11,50V)	2,00% (4,60V)	20,00% (46,00V)	2,00% (4,60V)	100,00% (230,00V)
.121	Ures > off	U _{THR} ON	%Unom /VUnom	3,00% (6,90V)	1,00% (2,30V)	20,00% (46,00V)	1,00% (2,30V)	100,00% (230,00V)
.122	T Ures >	Time OFF		200 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

Undervoltage LN Activation of a narrower frequency winw					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.123	Uanfw <	Enable Function		off	on / off		on / off	
.124	Uanfw< on	U _{THR} OFF	%Unom /VUnom	85,00% (195,50V)	20,00% (46,00V)	100,00% (230,00V)	1,00% (2,30V)	100,00% (230,00V)
.125	Uanfw< off	U _{THR} ON	%Unom /VUnom	86,00% (197,80V)	21,00% (48,30V)	100,00% (230,00V)	2,00% (4,60V)	100,00% (230,00V)
.126	T Uanfw <	Time OFF		0 ms	0 ms	240000 ms	0 ms	240000 ms
Only active for:		Connection Modes: 4-wire (LN+LL)						

10 minutes average overvoltage					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.042	Uavg	Enable function		off	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V/ 444,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)
.044	Uavg on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V/ 440,00V)	100,00% (230,00V/ 400,00V)	115,00% (264,50V/ 460,00V)	100,00% (230,00V/ 400,00V)	135,00% (310,50V/ 540,00V)

Overfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.054	f >	Enable function	on	on / off		on / off		
.055	f > off	f _{THR} OFF	55,000 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz	
.056	f > on	f _{THR} ON	50,100 Hz	50,000 Hz	51,000 Hz	50,000 Hz	55,000 Hz	
.057	T f >	Time OFF	5000 ms	100 ms	60000 ms	100 ms	300000 ms	

Underfrequency1				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.058	f <	Enable function	on	on / off		on / off		
.059	f < off	f _{THR} OFF	45,000 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz	
.060	f < on	f _{THR} ON	49,900 Hz	47,500 Hz	50,000 Hz	45,000 Hz	50,000 Hz	
.061	T f <	Time OFF	5000 ms	100 ms	60000 ms	100 ms	300000 ms	

Overfrequency2				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.062	f nw >	Enable function	off	on / off		on / off		
.063	f nw > off	f _{THR} OFF	50,300 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.064	f nw > on	f _{THR} ON	50,100 Hz	50,000 Hz	52,000 Hz	50,000 Hz	55,000 Hz	
.065	T f nw >	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms	

62. EN50549-2: SI Uf C [ID: 945]

Underfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.066	f nw <	Enable function	off	on / off		on / off	
.067	f nw < off	f _{THR} OFF	49,700 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.068	f nw < on	f _{THR} ON	49,900 Hz	47,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.069	T f nw <	Time OFF	500 ms	100 ms	5000 ms	100 ms	300000 ms

Overfrequency3				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.070	f >>	Enable function	on	on / off		on / off	
.071	f >> off	f _{THR} OFF	60,000 Hz	50,000 Hz	60,000 Hz	50,000 Hz	60,000 Hz
.072	f >> on	f _{THR} ON	50,100 Hz	50,000 Hz	51,000 Hz	50,000 Hz	55,000 Hz
.073	T f >>	Time OFF	200 ms	100 ms	100000 ms	100 ms	300000 ms

Underfrequency3				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.074	f <<	Enable function	on	on / off		on / off	
.075	f << off	f _{THR} OFF	40,000 Hz	40,000 Hz	50,000 Hz	40,000 Hz	50,000 Hz
.076	f << on	f _{THR} ON	49,900 Hz	47,500 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.077	T f <<	Time OFF	200 ms	100 ms	100000 ms	100 ms	300000 ms

Frequency measuring in general				Conformity Range	
.113	F wnd	Window length	100 ms	100 ms	100 ms

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	ROCOF	Enable Function	off	on / off		on / off	
.091	ROCOF off	RoCoF _{THR} OFF	5000 mHz/s	200 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.092	ROCOF on	RoCoF _{THR} ON	4900 mHz/s	100 mHz/s	9990 mHz/s	100 mHz/s	9990 mHz/s
.093	T ROCOF	Time OFF	500 ms	0 ms	5000 ms	0 ms	5000 ms

Phase Shift (PShift)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.094	Pshift	Enable Function	off	on / off		on / off	
.095	Pshift off	PShift _{THR} OFF	7,0 °	2,0 °	15,0 °	2,0 °	15,0 °
.096	Pshift on	PShift _{THR} ON	5,0 °	1,0 °	15,0 °	1,0 °	15,0 °

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	60 s	10 s	600 s	0 s	900 s

62. EN50549-2: SI Uf C [ID: 945]

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.

On = it is possible to detect this error

Off = it is not possible to detect this error

Overvoltage LL	on
Undervoltage LL	on
Overvoltage LN	on
Undervoltage LN	on
10-min overvoltage	on
Overfrequency	on
Underfrequency	on
RoCoF (Rate of Change of Frequency)	on
Phase shift	on
Remote shutdown / self-test	on
Contactors feedback contact reports closed, although it should be open	on
Contactors feedback contact reports open, although it should be closed (no error, only info)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

63. Bulgaria LV 2024 [ID: 1400]

63. Bulgaria LV 2024 [ID: 1400]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire LN	4-wire LN	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	230,00V/ 400,00V	57,50V/ 100,00V	230,00V/ 400,00V	28,75V/ 50,00V	250,01V/ 434,80V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	Ueff >	Enable function		on	on		on / off	
.019	Ueff > off	U _{THR} OFF	%Unom /VUnom	111,00% (255,30V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.020	Ueff > on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	110,00% (253,00V)	100,00% (230,00V)	135,00% (310,50V)
.021	T Ueff >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	Ueff <	Enable function		on	on		on / off	
.023	Ueff < off	U _{THR} OFF	%Unom /VUnom	80,00% (184,00V)	10,00% (23,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.024	Ueff < on	U _{THR} ON	%Unom /VUnom	84,00% (193,20V)	10,00% (23,00V)	100,00% (230,00V)	10,00% (23,00V)	100,00% (230,00V)
.025	T Ueff <	Time OFF		1500 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	Ueff>>	Enable function		on	on		on / off	
.035	Ueff>> off	U _{THR} OFF	%Unom /VUnom	115,00% (264,50V)	100,00% (230,00V)	130,00% (299,00V)	100,00% (230,00V)	135,00% (310,50V)
.036	Ueff>> on	U _{THR} ON	%Unom /VUnom	110,00% (253,00V)	100,00% (230,00V)	110,00% (253,00V)	100,00% (230,00V)	135,00% (310,50V)
.037	T Ueff>>	Time OFF		100 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

63. Bulgaria LV 2024 [ID: 1400]

Deactivation frequency monitoring LN					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.051	f deact U<	U _{THR} OFF	%Unom	60,00% (138,00V)	9,50% (21,85V)	60,00% (138,00V)	2,00% (4,60V)	100,00% (230,00V)
		U _{THR} ON	%Unom	Fixed Hysteresis (0,50% (1,150V) U _{NOM})				

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	50,300 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	50,200 Hz	50,000 Hz	50,200 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	2000 ms	50 ms	2000 ms	50 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	47,500 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,600 Hz	47,550 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	50 ms	50 ms	50 ms	50 ms	300000 ms

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.063	f >> off	f _{THR} OFF	51,500 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.064	f >> on	f _{THR} ON	51,400 Hz	50,000 Hz	51,400 Hz	50,000 Hz	55,000 Hz
.065	T f >>	Time OFF	50 ms	50 ms	50 ms	50 ms	300000 ms

Frequency measuring in general				Conformity Range	
ID			Default	Min	Max
.113	F wnd	Window length	100 ms	100 ms	100 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	600 s	0 s	600 s	0 s	900 s

Password							
ID				Default		Min	Max
.106	PW1	1 st digit of Password		0		0	9
.107	PW2	2 nd digit of Password		0		0	9
.108	PW3	3 rd digit of Password		0		0	9
.109	PW4	4 th digit of Password		0		0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

63. Bulgaria LV 2024 [ID: 1400]

Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.

On = it is possible to detect this error

Off = it is not possible to detect this error

Overvoltage LL	on
Undervoltage LL	on
Overvoltage LN	on
Undervoltage LN	on
10-min overvoltage	on
Overfrequency	on
Underfrequency	on
RoCoF (Rate of Change of Frequency)	on
Phase shift	on
Remote shutdown / self-test	on
Contactor feedback contact reports closed, although it should be open	on
Contactor feedback contact reports open, although it should be closed (no error, only info)	on

Device Information

ID		
.105	SN: xxxxxxxxxx	xxxxxxx = Device Serial Number
	SW: aa.dd.ccb	dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

64. Bulgaria MV 2024 [ID: 1450]

64. Bulgaria MV 2024 [ID: 1450]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire LL	3-wire LL	2-wire LN - 4-wire LL+LN

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	57,50V/ 100,00V	51,75V/ 90,00V	230,00V/ 400,00V	28,75V/ 50,00V	250,01V/ 434,80V

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	2ch	2ch, 1ch	2ch, 1ch
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	ULL > off	U _{THR} OFF	%Unom /VUnom	111,00% (111,00V)	100,00% (100,00V)	130,00% (130,00V)	100,00% (100,00V)	135,00% (135,00V)
.012	ULL > on	U _{THR} ON	%Unom /VUnom	110,00% (110,00V)	100,00% (100,00V)	110,00% (110,00V)	100,00% (100,00V)	135,00% (135,00V)
.013	T ULL >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULL < off	U _{THR} OFF	%Unom /VUnom	80,00% (80,00V)	10,00% (10,00V)	100,00% (100,00V)	10,00% (10,00V)	100,00% (100,00V)
.016	ULL < on	U _{THR} ON	%Unom /VUnom	84,00% (84,00V)	10,00% (10,00V)	100,00% (100,00V)	10,00% (10,00V)	100,00% (100,00V)
.017	T ULL <	Time OFF		1500 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.018	ULN >	Enable function		off	off		on / off	
.019	ULN > off	U _{THR} OFF	%Unom /VUnom	111,00% (63,83V)	100,00% (57,50V)	130,00% (74,75V)	100,00% (57,50V)	135,00% (77,63V)
.020	ULN > on	U _{THR} ON	%Unom /VUnom	110,00% (63,25V)	100,00% (57,50V)	110,00% (63,25V)	100,00% (57,50V)	135,00% (77,63V)
.021	T ULN >	Time OFF		60000 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.022	ULN <	Enable function		off	off		on / off	
.023	ULN < off	U _{THR} OFF	%Unom /VUnom	80,00% (46,00V)	10,00% (5,75V)	100,00% (57,50V)	10,00% (5,75V)	100,00% (57,50V)
.024	ULN < on	U _{THR} ON	%Unom /VUnom	84,00% (48,30V)	10,00% (5,75V)	100,00% (57,50V)	10,00% (5,75V)	100,00% (57,50V)
.025	T ULN <	Time OFF		60000 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

64. Bulgaria MV 2024 [ID: 1450]

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.027	ULL>> off	U _{THR} OFF	%Unom /VUnom	115,00% (115,00V)	100,00% (100,00V)	130,00% (130,00V)	100,00% (100,00V)	135,00% (135,00V)
.028	ULL>> on	U _{THR} ON	%Unom /VUnom	110,00% (110,00V)	100,00% (100,00V)	110,00% (110,00V)	100,00% (100,00V)	135,00% (135,00V)
.029	T ULL>>	Time OFF		100 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN>>	Enable function		off	off		on / off	
.035	ULN>> off	U _{THR} OFF	%Unom /VUnom	115,00% (66,13V)	100,00% (57,50V)	130,00% (74,75V)	100,00% (57,50V)	135,00% (77,63V)
.036	ULN>> on	U _{THR} ON	%Unom /VUnom	110,00% (63,25V)	100,00% (57,50V)	110,00% (63,25V)	100,00% (57,50V)	135,00% (77,63V)
.037	T ULN>>	Time OFF		100 ms	50 ms	180000 ms	50 ms	300000 ms
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Deactivation frequency monitoring LL					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.047	f deact U<	U _{THR} OFF	%Unom	60,00% (60,00V)	9,50% (9,50V)	60,00% (60,00V)	2,00% (2,00V)	100,00% (100,00V)
		U _{THR} ON	%Unom	Fixed Hysteresis (0,50% (0,500 V) U _{NOM})				

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	50,300 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.056	f > on	f _{THR} ON	50,200 Hz	50,000 Hz	50,200 Hz	50,000 Hz	55,000 Hz
.057	T f >	Time OFF	2000 ms	50 ms	2000 ms	50 ms	300000 ms

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	47,500 Hz	45,000 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.060	f < on	f _{THR} ON	47,600 Hz	47,550 Hz	50,000 Hz	45,000 Hz	50,000 Hz
.061	T f <	Time OFF	50 ms	50 ms	50 ms	50 ms	300000 ms

Overfrequency2				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.063	f >> off	f _{THR} OFF	51,500 Hz	50,000 Hz	55,000 Hz	50,000 Hz	55,000 Hz
.064	f >> on	f _{THR} ON	51,400 Hz	50,000 Hz	51,400 Hz	50,000 Hz	55,000 Hz
.065	T f >>	Time OFF	50 ms	50 ms	50 ms	50 ms	300000 ms

Frequency measuring in general				Conformity Range	
ID			Default	Min	Max
.113	F wnd	Window length	100 ms	100 ms	100 ms

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	Fixed to 500 ms				
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

64. Bulgaria MV 2024 [ID: 1450]

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	T on delay	Turn on time	600 s	0 s	600 s	0 s	900 s

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.

On = it is possible to detect this error

Off = it is not possible to detect this error

Overvoltage LL	on
Undervoltage LL	on
Overvoltage LN	on
Undervoltage LN	on
10-min overvoltage	on
Overfrequency	on
Underfrequency	on
RoCoF (Rate of Change of Frequency)	on
Phase shift	on
Remote shutdown / self-test	on
Contactorm feedback contact reports closed, although it should be open	on
Contactorm feedback contact reports open, although it should be closed (no error, only info)	on

Device Information		
ID		
.105	SN: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxx = Device Serial Number dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

65. EN50438:2013 [ID 900]

88. EN50438:2013 [ID 900]

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN)		

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.019	U > off	U _{THR} OFF	%Unom	115	115	115	100	135
.020	U > on	U _{THR} ON	%Unom	110	110	110	100	135
		Time OFF	ms	Fixed to 100ms				
Comment:		U > on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	U < off	U _{THR} OFF	%Unom	85	85	10	100
.024	U < on	U _{THR} ON	%Unom	85	85	10	100
.025	U < t	Time OFF	ms	1300	1300	50	10000
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value					

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.043	U avg off	U _{THR} OFF	%Unom	110	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})			
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	52.00	52.00	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.05	50.05	50.00	55.00
.057	f > t	Time OFF	ms	400	400	50	10000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	45.00	50.00
.061	f < t	Time OFF	ms	400	400	50	10000
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value					

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

65. EN50438:2013 [ID 900]

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

66. OVE E8001/8101:2014 [ID 801] renewed standard

89. OVE E8001/8101:2014 [ID 801] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	28.8	241.4
		Unom Δ	V	400.0	400.0	50.0	420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	ULLmax1off	U _{THR} OFF	%Unom	115	115	100	135
.012	ULLmax1on	U _{THR} ON	%Unom	110	110	100	135
.013	T ULL max1	Time OFF	ms	50	180000	50	180000
Comment:		ULLmax1on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULLmin1off	U _{THR} OFF	%Unom	80	80	10	100
.016	ULLmin1on	U _{THR} ON	%Unom	90	90	10	100
.017	T ULL min1	Time OFF	ms	50	180000	50	180000
Comment:		ULLmin1on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	ULNmax1off	U _{THR} OFF	%Unom	115	115	100	135
.020	ULNmax1on	U _{THR} ON	%Unom	110	110	100	135
.021	T ULN max1	Time OFF	ms	50	180000	50	180000
Comment:		ULNmax1on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULNmin1off	U _{THR} OFF	%Unom	80	80	10	100
.024	ULNmin1on	U _{THR} ON	%Unom	90	90	10	100
.025	T ULN min1	Time OFF	ms	50	180000	50	180000
Comment:		ULNmin1on has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

66. OVE E8001/8101:2014 [ID 801] renewed standard

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.026	ULL max 2	Enable function		off	on / off		on / off	
.027	ULLmax2off	U _{THR} OFF	%Unom	105	100	135	100	135
.028	ULLmax2on	U _{THR} ON	%Unom	110	110	110	100	135
.029	T ULL max2	Time OFF	ms	60000	50	180000	50	180000
Comment:		ULLmax2on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.030	ULL min 2	Enable function		off	on / off		on / off	
.031	ULLmin2off	U _{THR} OFF	%Unom	30	10	100	10	100
.032	ULLmin2on	U _{THR} ON	%Unom	90	90	90	0	100
.033	T ULL min2	Time OFF	ms	50	50	180000	50	180000
Comment:		ULLmin2on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.034	ULN max 2	Enable function		off	on / off		on / off	
.035	ULNmax2off	U _{THR} OFF	%Unom	105	100	135	100	135
.036	ULNmax2on	U _{THR} ON	%Unom	110	110	110	100	135
.037	T ULN max2	Time OFF	ms	60000	50	180000	50	180000
Comment:		ULNmax2on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.038	ULN min 2	Enable function		off	on / off		on / off	
.039	ULNmin2off	U _{THR} OFF	%Unom	30	10	100	10	100
.040	ULNmin2on	U _{THR} ON	%Unom	90	90	90	0	100
.041	T ULN min2	Time OFF	ms	50	50	180000	50	180000
Comment:		ULNmin2on has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes; 2-wire, 4-wire (LN), 4-wire (LN+LL)						

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.042	U avg	Enable function		on	on		on /off	
.043	U avg off	U _{THR} OFF	%Unom	112	110	115	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.05Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	45.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	45.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.01 Hz added to the displayed value						

66. OVE E8001/8101:2014 [ID 801] renewed standard

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)	n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms			
.114	I3 STOP	Type	n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	30	30	30	0	900	

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password		0	0	9
.107	PW2	2 nd digit of Password		0	0	9
.108	PW3	3 rd digit of Password		0	0	9
.109	PW4	4 th digit of Password		0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

67. VDE 0124-100:2013 [ID 300] renewed standard

90. VDE 0124-100:2013 [ID 300] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN+LL)		

Nominal Voltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y Unom Δ	V V	Fixed to 230.0 / 400.0				

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.011	ULLmax off	U _{THR} OFF	%Unom	115	115	115	100	135	
.012	ULLmax on	U _{THR} ON	%Unom	110	110	110	100	135	
		Time OFF	ms	Fixed to fastest possible disconnection					
Comment:		ULLmax on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value							

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	ULLmin off	U _{THR} OFF	%Unom	80	80	80	10	100
.016	ULLmin on	U _{THR} ON	%Unom	85	85	85	10	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		ULLmin on has a fixed offset of 0.5% U _{NOM} added to the displayed value						

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.019	U >> off	U _{THR} OFF	%Unom	115	115	115	100	135
.020	U >> on	U _{THR} ON	%Unom	110	110	110	100	135
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U >> on has a fixed offset of 0.5% U _{NOM} subtracted from the displayed value						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.023	U < off	U _{THR} OFF	%Unom	80	80	80	10	100	
.024	U < on	U _{THR} ON	%Unom	85	85	85	10	100	
		Time OFF	ms	Fixed to fastest possible disconnection					
Comment:		U < on has a fixed offset of 0.5% U _{NOM} added to the displayed value							

10 minutes average overvoltage				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.043	U>	U _{THR} OFF	%Unom	110	110	115	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.9% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				

67. VDE 0124-100:2013 [ID 300] renewed standard

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.05	50.05	50.05	50.00	55.00
		Time OFF	ms	Fixed to fastest possible disconnection				

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	45.00	50.00
.060	f < on	f _{THR} ON	ms	47.50	47.50	47.50	45.00	50.00
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.05Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.025 Hz added to the displayed value						

Random overfrequency				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.086	f> random	Enable function		off	on / off		on /off	
.087	f> random	f _{THR} OFF	Hz		50.20	51.50	50.20	51.50
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.05Hz				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		The random f _{THR} OFF threshold is shown in .087 and cannot be edited						

Frequency measuring in general					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms					

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900	

Random Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.103	Ton random	Enable function		off	on / off		on / off	
.104	Ton random	Turn on time	s		60	600	60	600
Comment:		The random time value is shown in .104 and cannot be edited						

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

67. VDE 0124-100:2013 [ID 300] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

68. TR3 Rev23:2013 [ID 700] renewed standard

91. TR3 Rev23:2013 [ID 700] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	3-wire, 4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	241.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	ULL>> Off	U _{THR} OFF	%Unom	120	100	130	100
		U _{THR} ON	%Unom	Fixed Hysteresis (1% U _{NOM})			
.013	T ULL>>	Time OFF	ms	50	50	50	10000
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	ULL< Off	U _{THR} OFF	%Unom	80	10	100	10
.016	ULL< On	U _{THR} ON	%Unom	95	95	95	10
.017	T ULL<	Time OFF	ms	1500	1500	2400	50
Comment:		ULL< On has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	ULN>> Off	U _{THR} OFF	%Unom	120	100	130	100
		U _{THR} ON		Fixed Hysteresis (1% U _{NOM})			
.021	T ULN>>	Time OFF	ms	50	50	50	10000
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	ULN< Off	U _{THR} OFF	%Unom	80	10	100	10
.024	ULN< On	U _{THR} ON	%Unom	95	95	95	10
.025	T ULN<	Time OFF	ms	1500	1500	2400	50
Comment:		ULN< On has a fixed offset of 0.5% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

68. TR3 Rev23:2013 [ID 700] renewed standard

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	ULL<< Off	U _{THR} OFF	%Unom	45	10	100	0	100
.032	ULL<< On	U _{THR} ON	%Unom	95	95	95	10	100
.033	T ULL<<	Time OFF	ms	300	300	300	50	10000
Comment:		ULL<< On has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.039	ULN<< Off	U _{THR} OFF	%Unom	45	10	100	0	100
.040	ULN<< On	U _{THR} ON	%Unom	95	95	95	10	100
.041	T ULN<<	Time OFF	ms	300	300	300	50	10000
Comment:		ULN<< On has a fixed offset of 0.5% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f> Off	f _{THR} OFF	Hz	51.50	50.00	52.00	50.00	55.00
.056	f> On	f _{THR} ON	Hz	50.05	50.05	50.05	50.00	55.00
.057	T f>	Time OFF	ms	50	50	50	50	10000

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f< Off	f _{THR} OFF	Hz	47.50	47.50	50.00	45.00	50.00
.060	f< On	f _{THR} ON	Hz	47.50	47.50	47.50	45.00	50.00
.061	T f<	Time OFF	ms	50	50	50	50	10000
Comment:		f< On has a fixed offset of 0.025 Hz added to the displayed value						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	60	0	900

Password								
ID				Default	Min	Max		
.106	PW1	1 st digit of Password			0	0	9	
.107	PW2	2 nd digit of Password			0	0	9	
.108	PW3	3 rd digit of Password			0	0	9	
.109	PW4	4 th digit of Password			0	0	9	
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

68. TR3 Rev23:2013 [ID 700] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

69. AS/NZS 4777.2:2015 [ID 1102] renewed standard

92. AS/NZS 4777.2:2015 [ID 1102] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 2ch		
Remark:		2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	V> off	U _{THR} OFF	%Unom	113	113	100	135
.020	V> on	U _{THR} ON	%Unom	111	112	100	135
.021	T V>	Time OFF	ms	2000	2000	100	300000

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	V< off	U _{THR} OFF	%Unom	78	78	0	100
.024	V< on	U _{THR} ON	%Unom	80	100	0	100
.025	T V<	Time OFF	ms	2000	2000	100	300000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.034	V>>	Enable function	off	on / off		on / off	
.035	V>> off	U _{THR} OFF	%Unom	115	115	100	135
.036	V>> on	U _{THR} ON	%Unom	111	112	100	135
.037	T V>>	Time OFF	ms	200	200	100	300000

10 minutes average overvoltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.042	Uavg	Enable function	on	on / off		on / off	
.043	Uavg off	U _{THR} OFF	%Unom	112	112	100	135
.044	Uavg on	U _{THR} ON	%Unom	111	111	100	135
		Time OFF	ms	Fixed to fastest possible disconnection			

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	F> off	f _{THR} OFF	Hz	52.00	52.00	50.00	55.00
.056	F> on	f _{THR} ON	Hz	51.90	51.90	50.00	55.00
.057	T F>	Time OFF	ms	2000	2000	100	300000

69. AS/NZS 4777.2:2015 [ID 1102] renewed standard

Underfrequency ¹					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	F< off	f _{THR} OFF	Hz	47.00	45.00	47.00	40.00	50.00
.060	F< on	f _{THR} ON	Hz	47.50	45.50	50.00	40.00	50.00
.061	T F<	Time OFF	ms	2000	1100	2000	1000	300000

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	3000	10	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	3000	10	3000
.093	RoCoFDelay	Time OFF	ms	500	50	500	50	10000
.111	RoCoF wnd	Window length	ms	225	100	1000	100	1000

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	8	1	8	1	15
.096	PShift on	PShift _{THR} ON	°	6	1	7	1	15
.097	PShiftDel	Time OFF	ms	50	50	50	50	10000
.112	PShift wnd	Window length	ms	50	50	500	50	1000

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	0	60	0	900

Password							
ID					Default	Min	Max
.106	PW1	1 st digit of Password			0	0	9
.107	PW2	2 nd digit of Password			0	0	9
.108	PW3	3 rd digit of Password			0	0	9
.109	PW4	4 th digit of Password			0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped					

Device Information		
ID		
.105	ID: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

69. G59/3/3:2015 LV [ID 405] renewed standard

93. G59/3/3:2015 LV [ID 405] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN)		

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	417.4	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	O/V st 1	U _{THR} OFF	%Unom	114	114	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.021	T O/V st 1	Time OFF	ms	1000	1000	50	300000

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	U/V st 1	U _{THR} OFF	%Unom	87	87	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.025	T U/V st 1	Time OFF	ms	2500	2500	50	300000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.035	O/V st 2	U _{THR} OFF	%Unom	119	119	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.037	T O/V st 2	Time OFF	ms	500	500	50	300000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	U/V st 2	U _{THR} OFF	%Unom	80	80	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.041	T U/V st 2	Time OFF	ms	500	500	50	300000

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	O/F st 1	f _{THR} OFF	Hz	51.50	51.50	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.057	T O/F st 1	Time OFF	ms	90000	90000	1000	300000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	U/F st 1	f _{THR} OFF	Hz	47.50	47.50	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.061	T U/F st 1	Time OFF	ms	20000	20000	1000	300000

69. G59/3/3:2015 LV [ID 405] renewed standard

Overfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.063	O/F st 2	f _{THR} OFF	Hz	52.00	52.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)				
.065	T O/F st 2	Time OFF	ms	500	500	500	50	300000

Underfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.067	U/F st 2	f _{THR} OFF	Hz	47.00	47.00	47.00	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)				
.069	T U/F st 2	Time OFF	ms	500	500	500	50	300000

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	3000	10	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	3000	10	3000
.093	RoCoFDelay	Time OFF	ms	500	50	2000	50	2000
.111	RoCoF wnd	Window length	ms	Fixed window length 225ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	12	6	12	3	15
.096	PShift on	PShift _{THR} ON	°	9	5	11	3	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 200ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	20	20	20	0	900

Password								
ID				Default	Min	Max		
.106	PW1	1 st digit of Password			0	0	0	9
.107	PW2	2 nd digit of Password			0	0	0	9
.108	PW3	3 rd digit of Password			0	0	0	9
.109	PW4	4 th digit of Password			0	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped						

69. G59/3/3:2015 LV [ID 405] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

70. G59/3/3:2015 MV [ID 455] renewed standard

94. G59/3/3:2015 MV [ID 455] renewed standard

Connection Mode			Conformity Range		Possible Range	
ID		Default				
.003	Connection	Fixed to 3-wire				

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	50.0
							241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.011	O/V st 1	U _{THR} OFF	%Unom	110	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.013	T O/V st 1	Time OFF	ms	1000	1000	50	300000

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	U/V st 1	U _{THR} OFF	%Unom	87	87	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.017	T U/V st 1	Time OFF	ms	2500	2500	50	300000

Overvoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.027	O/V st 2	U _{THR} OFF	%Unom	113	113	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.029	T O/V st 2	Time OFF	ms	500	500	50	300000

Undervoltage2 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.031	U/V st 2	U _{THR} OFF	%Unom	80	80	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.033	T U/V st 2	Time OFF	ms	500	500	50	300000

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	O/F st 1	f _{THR} OFF	Hz	51.50	51.50	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.057	T O/F st 1	Time OFF	ms	90000	90000	1000	300000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	U/F st 1	f _{THR} OFF	Hz	47.50	47.50	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.061	T U/F st 1	Time OFF	ms	20000	20000	1000	300000

70. G59/3/3:2015 MV [ID 455] renewed standard

Overfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.063	O/F st 2	f _{THR} OFF	Hz	52.00	52.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)				
.065	T O/F st 2	Time OFF	ms	500	500	500	50	300000

Underfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.067	U/F st 2	f _{THR} OFF	Hz	47.00	47.00	47.00	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)				
.069	T U/F st 2	Time OFF	ms	500	500	500	50	300000

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		on	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	10	3000	10	3000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	950	10	3000	10	3000
.093	RoCoFDelay	Time OFF	ms	500	50	2000	50	2000
.111	RoCoF wnd	Window length	ms	Fixed window length 225ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function		off	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	°	12	6	12	3	15	
.096	PShift on	PShift _{THR} ON	°	9	5	11	3	15	
		Time OFF	ms	Fixed to the fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 200ms					
Comment:		PShift off has a fixed offset of 0.2° subtracted from the displayed value							

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	20	20	20	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

70. G59/3/3:2015 MV [ID 455] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

71. G83/2:2012 [ID 500] renewed standard

95. G83/2:2012 [ID 500] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	Fixed to 4-wire (LN)		

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	417.4	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	O/V st 1	U _{THR} OFF	%Unom	114	114	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.021	T O/V st 1	Time OFF	ms	1000	1000	50	10000

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	U/V st 1	U _{THR} OFF	%Unom	87	87	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.025	T U/V st 1	Time OFF	ms	2500	2500	50	10000

Overvoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.035	O/V st 2	U _{THR} OFF	%Unom	119	119	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.037	T O/V st 2	Time OFF	ms	500	500	50	10000

Undervoltage2 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.039	U/V st 2	U _{THR} OFF	%Unom	80	80	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.75% U _{NOM})			
.041	T U/V st 2	Time OFF	ms	500	500	50	10000

Overfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.055	O/F st 1	f _{THR} OFF	Hz	51.50	51.50	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.057	T O/F st 1	Time OFF	ms	90000	90000	1000	120000

Underfrequency1				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.059	U/F st 1	f _{THR} OFF	Hz	47.50	47.50	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)			
.061	T U/F st 1	Time OFF	ms	20000	20000	1000	120000

71. G83/2:2012 [ID 500] renewed standard

Overfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.063	O/F st 2	f _{THR} OFF	Hz	52.00	52.00	52.00	50.00	55.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)				
.065	T O/F st 2	Time OFF	ms	500	500	500	50	10000

Underfrequency2					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.067	U/F st 2	f _{THR} OFF	Hz	47.00	47.00	47.00	40.00	50.00
		f _{THR} ON	Hz	Fixed Hysteresis (0.05 Hz)				
.069	T U/F st 2	Time OFF	ms	500	500	500	50	10000

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	200	190	210	100	1000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	190	180	210	100	1000
		Time OFF	ms	Fixed to the fastest possible disconnection				
.111	RoCoF wnd	Window length	ms	Fixed window length 535ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	12.0	11.0	13.0	3.0	15.0
.096	PShift on	PShift _{THR} ON	°	10.5	9.5	13.0	3.0	15.0
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 200ms				

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	20	20	20	0	900

Password						
ID				Default	Min	Max
.106	PW1	1 st digit of Password			0	9
.107	PW2	2 nd digit of Password			0	9
.108	PW3	3 rd digit of Password			0	9
.109	PW4	4 th digit of Password			0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped				

71. G83/2:2012 [ID 500] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

72. C10-11:2013 LV [ID 600] renewed standard

96. C10-11:2013 LV [ID 600] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.019	U LN >	U _{THR} OFF	%Unom	110	100	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.5% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LN > has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage1 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.023	U LN <	U _{THR} OFF	%Unom	85	50	85	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.5% U _{NOM})				
.025	T U LN <	Time OFF	ms	1500	100	1500	100	10000
Comment:		U LN < has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.039	U LN <<	U _{THR} OFF	%Unom	50	25	50	0	100	
		U _{THR} ON	%Unom	Fixed Hysteresis (0.5% U _{NOM})					
		Time OFF	ms	Fixed to fastest possible disconnection					
Comment:		U LN << has a fixed offset of 0.25% U _{NOM} added to the displayed value							
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)							

Overfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.055	f >	f _{THR} OFF	Hz	51.50	50.00	51.50	50.00	55.00	
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.05Hz					
		Time OFF	ms	Fixed to fastest possible disconnection					
Comment:		f > has a fixed offset of 0.01 Hz subtracted from the displayed value							

72. C10-11:2013 LV [ID 600] renewed standard

Underfrequency ¹				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	50.00	40.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	40.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.02 Hz added to the displayed value						

Frequency measuring in general				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms			

Rate of Change of Frequency (RoCoF)				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.090	RoCoF	Enable Function	off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	100	2000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	100	1000
.093	RoCoF T	Time OFF	ms	0	100	0	1000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms			

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 500ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	0	900

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

72. C10-11:2013 LV [ID 600] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

73. C10-11:2013 MV [ID 650] renewed standard

97. C10-11:2013 MV [ID 650] renewed standard

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	230.0	28.8
		Unom Δ	V	400.0	400.0	400.0	241.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U LL >	U _{THR} OFF	%Unom	110	100	110	100	135
		U _{THR} ON	%Unom	Fixed Hysteresis (0.5% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LL > has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.015	U LL <	U _{THR} OFF	%Unom	85	50	85	0
		U _{THR} ON	%Unom	Fixed Hysteresis (0.5% U _{NOM})			
.017	T ULL <	Time OFF	ms	1500	100	1500	100
Comment:		U LL < has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)					

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	U LL <<	U _{THR} OFF	%Unom	50	25	50	0	100
		U _{THR} ON	%Unom	Fixed Hysteresis (0.5% U _{NOM})				
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LL << has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overfrequency1					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.055	f >	f _{THR} OFF	Hz	51.50	50.00	51.50	50.00	55.00	
		f _{THR} ON	Hz	Fixed reconnection frequency of 50.05Hz					
		Time OFF	ms	Fixed to fastest possible disconnection					
Comment:		f > has a fixed offset of 0.01 Hz subtracted from the displayed value							

73. C10-11:2013 MV [ID 650] renewed standard

Underfrequency ¹					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	50.00	40.00	50.00
.060	f < on	f _{THR} ON	Hz	47.50	47.50	47.50	40.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < on has a fixed offset of 0.02 Hz added to the displayed value						

Frequency measuring in general				Conformity Range		Possible Range		
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	1000	100	2000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	1000	100	1000
.093	RoCoF T	Time OFF	ms	0	0	100	0	1000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15	
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15	
		Time OFF	ms	Fixed to the fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 100ms					
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value							

Auxiliary Contact type					Conformity Range		Possible Range	
ID			Default		Min	Max	Min	Max
.099	Contact	Type	dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	T Contact	Time OFF	ms	Fixed to 270ms				
.114	I3 STOP	Type	n.o. (normally opened)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900	

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

73. C10-11:2013 MV [ID 650] renewed standard

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

74. C10-11:2019 LV-IP [ID 601] Interface Protection low voltage

98. C10-11:2019 LV-IP [ID 601] Interface Protection low voltage

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	4-wire (LN)	4-wire (LN)	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	230.0	100.0	240.0
		Unom Δ	V	400.0	400.0	173.9	417.4

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.019	U LN > off	U _{THR} OFF	%Unom	100	110	100	135
.020	U LN > on	U _{THR} ON	%Unom	100	120	100	135
.021	T U LN >	Time OFF	ms	0	3000	0	10000
Comment:		U LN > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Undervoltage1 Line to Neutral				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.023	U LN < off	U _{THR} OFF	%Unom	50	85	0	100
.024	U LN < on	U _{THR} ON	%Unom	50	100	0	100
.025	T U LN <	Time OFF	ms	0	1500	0	10000
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value					
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)					

Overvoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.035	U LN>> off	U _{THR} OFF	%Unom	115	100	130	100	135
.036	U LN>> on	U _{THR} ON	%Unom	114	100	120	100	135
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LN > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

Undervoltage2 Line to Neutral					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.039	U LN<< off	U _{THR} OFF	%Unom	25	25	50	0	100
.040	U LN<< on	U _{THR} ON	%Unom	85	50	100	0	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LN < off has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)						

74. C10-11:2019 LV-IP [ID 601] Interface Protection low voltage

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	40.00	50.00
.060	f < on	f _{THR} ON	Hz	49.90	47.00	50.00	40.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	1000	100	2000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	1000	100	1000
.093	RoCoF t	Time OFF	ms	0	0	0	0	1000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off	
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15
		Time OFF	ms	Fixed to the fastest possible disconnection				
.112	PShift wnd	Window length	ms	Fixed window length 100ms				
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value						

Auxiliary Contact type					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.099	Contact	Type		dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	300	100	300	10	5000
.114	I3 STOP	Type		n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900

74. C10-11:2019 LV-IP [ID 601] Interface Protection low voltage

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Device Information		
ID		
.105	ID: xxxxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set

75. C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage

99. C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage

Connection Mode			Conformity Range	Possible Range
ID		Default		
.003	Connection	3-wire	3-wire	2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL)

Nominal Voltage				Conformity Range		Possible Range	
ID			Default	Min	Max	Min	Max
.005	ULN/LL nom	Unom Y	V	230.0	57.5	230.0	28.8
		Unom Δ	V	400.0	100.0	400.0	50.0
							241.4
							420.0

Functional Safety			Conformity Range	Possible Range
ID		Default		
.007	Errtol	Fixed to 1ch		
Remark:		1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary		

Overvoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.011	U LL > off	U _{THR} OFF	%Unom	110	100	110	100	135
.012	U LL > on	U _{THR} ON	%Unom	109	100	120	100	135
.013	T U LL >	Time OFF	ms	1000	0	3000	0	10000
Comment:		U LL > off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage1 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.015	U LL < off	U _{THR} OFF	%Unom	70	50	85	0	100
.016	U LL < on	U _{THR} ON	%Unom	90	50	100	0	100
.017	T U LL <	Time OFF	ms	1500	0	1500	0	10000
Comment:		U LL < off has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Overvoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.027	U LL>> off	U _{THR} OFF	%Unom	115	100	130	100	135
.028	U LL>> on	U _{THR} ON	%Unom	114	100	120	100	135
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LL>> off has a fixed offset of 0.25% U _{NOM} subtracted from the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

Undervoltage2 Line to Line					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.031	U LL<< off	U _{THR} OFF	%Unom	25	25	50	0	100
.032	U LL<< on	U _{THR} ON	%Unom	90	50	100	0	100
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		U LL<< off has a fixed offset of 0.25% U _{NOM} added to the displayed value						
Only active for:		Connection Modes: 3-wire, 4-wire (LN+LL)						

75. C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage

Overfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.055	f > off	f _{THR} OFF	Hz	51.50	51.50	51.50	50.00	55.00
.056	f > on	f _{THR} ON	Hz	50.10	50.00	52.00	50.00	55.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f > off has a fixed offset of 0.01 Hz subtracted to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Underfrequency1					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.059	f < off	f _{THR} OFF	Hz	47.50	47.50	47.50	40.00	50.00
.060	f < on	f _{THR} ON	Hz	49.90	47.00	50.00	40.00	50.00
		Time OFF	ms	Fixed to fastest possible disconnection				
Comment:		f < off has a fixed offset of 0.01 Hz added to the displayed value						
Only active for:		Voltage > 20% U _{NOM}						

Frequency measuring in general					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.113	F wnd	Window length	ms	Fixed window length 100ms				

Rate of Change of Frequency (RoCoF)					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.090	RoCoF	Enable Function		off	on / off		on / off	
.091	RoCoF off	RoCoF _{THR} OFF	mHz/s	1000	1000	1000	100	2000
.092	RoCoF on	RoCoF _{THR} ON	mHz/s	800	100	1000	100	1000
.093	RoCoF t	Time OFF	ms	0	0	0	0	1000
.111	RoCoF wnd	Window length	ms	Fixed window length 100ms				

Phase Shift (PShift)					Conformity Range		Possible Range		
ID					Default	Min	Max	Min	Max
.094	PShift	Enable Function		on	on / off		on / off		
.095	PShift off	PShift _{THR} OFF	°	7	7	7	3	15	
.096	PShift on	PShift _{THR} ON	°	5	3	7	3	15	
		Time OFF	ms	Fixed to the fastest possible disconnection					
.112	PShift wnd	Window length	ms	Fixed window length 100ms					
Comment:		PShift off has a fixed offset of 1° subtracted from the displayed value							

Auxiliary Contact type					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.099	Contact	Type		dis. (disabled)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	
.100	Contact t	Time OFF	ms	300	100	300	10	5000
.114	I3 STOP	Type		n.o. (normally opened)	n.o. (normally opened) n.c. (normally closed) dis. (disabled)		n.o. (normally opened) n.c. (normally closed) dis. (disabled)	

Turn-on delay					Conformity Range		Possible Range	
ID				Default	Min	Max	Min	Max
.102	Ton delay	Turn on time	s	60	60	60	0	900

75. C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage

Password					
ID			Default	Min	Max
.106	PW1	1 st digit of Password	0	0	9
.107	PW2	2 nd digit of Password	0	0	9
.108	PW3	3 rd digit of Password	0	0	9
.109	PW4	4 th digit of Password	0	0	9
Remark:		If all 4 digits of the Password are 0 (default setting) the Password request is skipped			

Device Information		
ID		
.105	ID: xxxxxxxxxx SW: aa.dd.ccb	xxxxxxxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set



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