

Netz- und Anlagenschutzrelais

RE - NA003-M64

Art. Nr.: 270010xE



BENUTZER HANDBUCH

für SW: 01.11.01e

Änderungen und Irrtümer vorbehalten

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1 Sicherheit und Symbole



**Vorsicht! Niemals bei angelegter Spannung arbeiten.
Es besteht Lebensgefahr! Das Gerät bei erkennbarer Beschädigung auf keinen Fall verwenden! Verwendung nur durch geschultes Fachpersonal!**



**Fachprodukt!
Dieses Produkt setzt besondere Fachkenntnisse bei der Installation voraus!**



**Dieses Gerät unterliegt der Elektro- und Elektronik-Altgeräteverordnung (WEEE) und darf nicht im normalen Hausmüll entsorgt werden.
Das Gerät besteht aus Werkstoffen, die von darauf spezialisierten Recycling-Betrieben wiederverwertet werden können. Entsorgen Sie es entsprechend den nationalen gesetzlichen Bestimmungen.**

1.1 Bestimmungsgemäße Verwendung

Der TELE NA003 dient dem Netz- und Anlagenschutz (NA-Schutz) bei einspeisenden Blockheizkraftwerken, Windkraft-, Wasserkraft- und Photovoltaikanlagen.

Im Falle eines Stromausfalls oder einer Störung im Netz des Energieversorgungsunternehmens müssen private Kleinkraftwerke sofort vom öffentlichen Netz getrennt werden, um die ungewollte Einspeisung zu verhindern. Ohne sofortige Netztrennung würde einerseits das Wartungspersonal gefährdet, andererseits könnten Verbraucher unzulässigen Spannungen und Frequenzen ausgesetzt werden.

Für den Fall, dass Netzbetreiber von den Standards abweichende Grenzwerte fordern, ist es teilweise möglich Grenzwerte außerhalb des normativ definierten Bereiches einzustellen.

Außerhalb dieses Bereiches ist das Gerät nicht mehr normkonform und die entsprechenden Zertifikate verlieren ihre Gültigkeit. Dieser Status wird am Display durch die Kennung „ncnf“ dargestellt. Einstellungen außerhalb dieses Bereiches liegen somit in der Verantwortung des Betreibers und/oder der Abnahmestelle der Anlage.

1.2 Sicherheitshinweise

Dieses Gerät wurde nach anerkannten sicherheitstechnischen Regeln gebaut und geprüft. Dennoch kann bei unsachgemäßer Verwendung Gefahr für Mensch und Gerät entstehen.

Benutzen Sie dieses Gerät nur für die bestimmungsgemäße Verwendung, im sicherheitstechnisch einwandfreien Zustand und unter Beachtung der für den Einsatzort geltenden Regeln und Vorschriften zur Unfallverhütung.

- Beseitigen Sie sofort alle Störungen, die die Sicherheit beeinträchtigen können.
- Nehmen Sie keine unzulässigen Änderungen vor und verwenden Sie ausschließlich Ersatzteile und Zusatzeinrichtungen, welche vom Hersteller des Gerätes verkauft oder ausdrücklich empfohlen werden.
- Bei offensichtlicher Beschädigung darf das Gerät nicht mehr verwendet werden.
- Die länderspezifischen Normen und Richtlinien sind zu beachten.
- Der NA003 kann nach der Inbetriebnahme mittels Passwortschutz oder Plombierung gegen unbefugte Änderungen geschützt werden. Sollte dies in der jeweils länderspezifischen Norm bzw. Richtlinie gefordert sein, muss einer der obengenannten Schutzmechanismen angewandt werden.

1.3 Elektrofachkraft

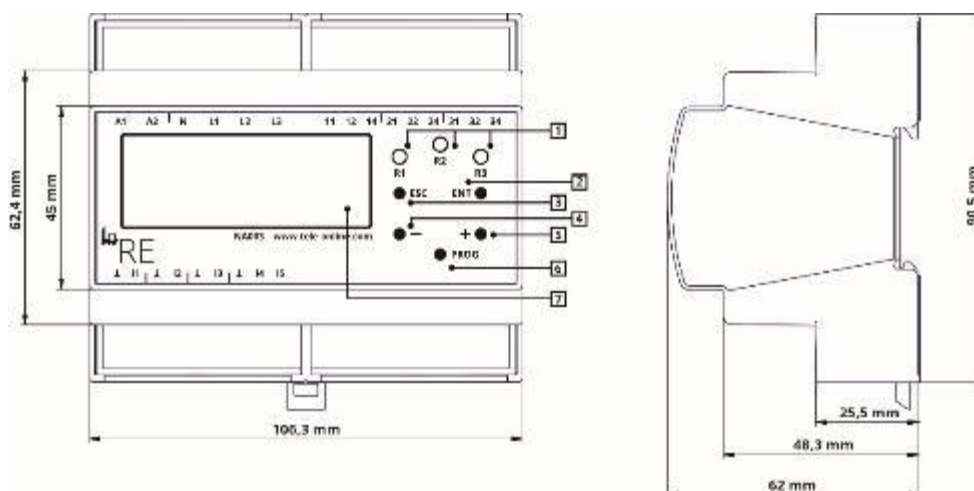
Eine Elektrofachkraft kann Gefahren durch die Elektrizität selbstständig erkennen und vermeiden. Voraussetzungen dafür sind:

- Kenntnisse der Elektrotechnik
- Erfahrungen mit elektrotechnischer Arbeit
- Kenntnisse und Arbeitserfahrung an der jeweiligen Anlage oder ähnlichen Anlagen (Anlagenart)
- Kenntnisse der Gefährdungen und Gegenmaßnahmen
- Die Fähigkeit zu erkennen, ob die Sicherheit bei der Arbeitsdurchführung gegeben ist

Die Elektrofachkraft ist speziell für das Arbeitsumfeld, in dem sie tätig ist, ausgebildet und kennt relevante Normen und Bestimmungen. Es gelten die Vorschriften des jeweiligen Landes.

2 Montage und Anschluss

2.1 Abmessungen und Bedienelemente



| Legende | Beschriftung | Typ | Funktion |
|---------|--------------|----------------------------|--|
| 1 | R1, R2, R3 | LED (gelb) | Statusanzeige Ausgangsrelais |
| 2 | ENT | Taster | ENTER, Eingabe, nächste Ebene |
| 3 | ESC | Taster | ESCAPE, Retour, Ebene zurück, Test/Reset |
| 4 | - | Taster | Parametereinstellung, Anzeigenwechsel |
| 5 | + | Taster | Parametereinstellung, Anzeigenwechsel |
| 6 | PROG | Taster (plombierbar) | PROGRAMM, Programmieren |
| 7 | | LCD-Display 4x20 Character | Anzeige |

2.2 Vorsicherung der Versorgungsspannung

Die Versorgungs- und Messspannungen aller Systemkomponenten sind mit Vorsicherungen abzusichern. Die Vorsicherungen sind gemäß dem verwendeten Leiterquerschnitt zu dimensionieren. Wir empfehlen die Ausgangsrelais bei Gefahr von Kurzschluss mit einer Sicherung 5A flink abzusichern!

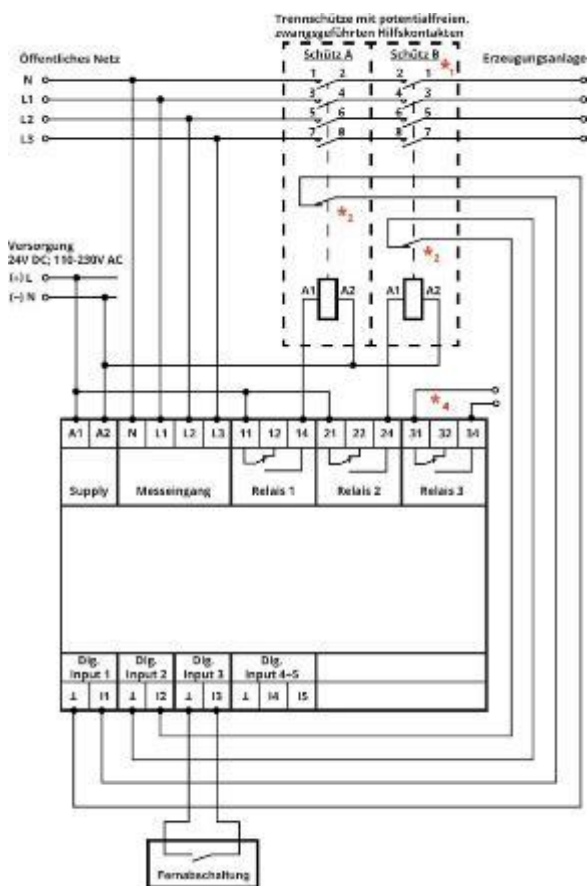
2.3 Klemmenbelegung

| | | |
|---------------|---|---|
| A1, A2 | Versorgungskreis | DC: 24V AC: 110 - 230V A1: L (+) A2: N (-) |
| L1, L2, L3, N | Messkreis | Un: 3x400V AC |
| 11, 12, 14 | Ausgangsrelais Kanal A (Wechsler) Statusanzeige durch gelbe LED R1 | Kontaktausgang (potentialfrei) 11: Wurzel 12: Öffner 14: Schließer |
| 21, 22, 24 | Ausgangsrelais Kanal B (Wechsler) Statusanzeige durch gelbe LED R2 | Kontaktausgang (potentialfrei) 21: Wurzel 22: Öffner 24: Schließer |
| 31, 32, 34 | Ausgangsrelais D (Wechsler) Statusanzeige durch gelbe LED R3 | Kontaktausgang (potentialfrei) 31: Wurzel 32: Öffner 34: Schließer |
| I1, ⊥ | Digitaler Eingang 1 (Rückmeldekontakt Schütz A) | Kontakteingang (24V/5mA) Eingang aktiv: I1 und ⊥ verbunden (konfigurierbar) |
| I2, ⊥ | Digitaler Eingang 2 (Rückmeldekontakt Schütz B) | Kontakteingang (24V/5mA) Eingang aktiv: I2 und ⊥ verbunden (konfigurierbar) Entfällt bei allen länderspezifischen Normen bei denen keine funktionale Sicherheit gefordert ist! |
| I3, ⊥ | Digitaler Eingang 3 (Fernabschaltung) | Kontakteingang (24V/5mA) Eingang aktiv: I3 und ⊥ verbunden (konfigurierbar) |
| I4, I5, ⊥ | Digitale Eingänge 4 und 5 (Parameterumschaltung) | Für CEI 0-21 Kontakteingang (24V/5mA) Eingang aktiv: I4 bzw. I5 und ⊥ verbunden |

2.4 Montage auf Hutschiene gemäß EN 60715

Rasten Sie den rückseitigen Montageclip des Geräts auf der Hutschiene so ein, dass ein sicherer und fester Sitz gewährleistet ist.

2.5 Anschlussbild 1 (allgemein, ohne FRT-Maßnahmen)



Anzuwenden für:

Aktuelle Standards

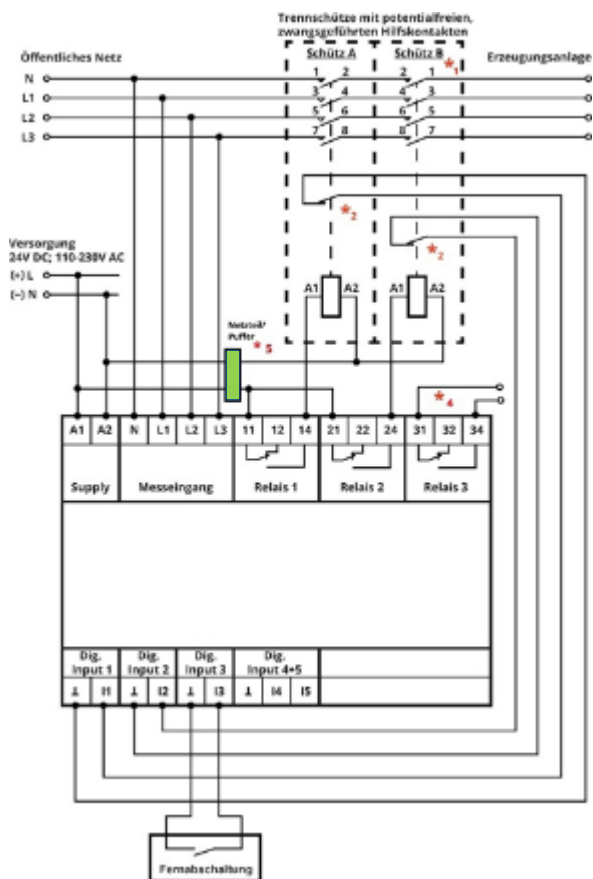
OVE TOR R25 NS SYNC, OOE TOR R25 NS SYNC
 OVE TOR R25 NS ASYNC, OOE TOR R25 NS ASYNC
 OVE TOR R25 MS SYNC, OOE TOR R25 MS SYNC
 OVE TOR R25 MS ASYNC, OOE TOR R25 MS ASYNC
 W TOR R25 NS SYNC
 W TOR R25 NS ASYNC
 W TOR R25 MS SYNC
 W TOR R25 MS ASYNC
 VDE-AR-N 4105:2018-11 (Pn ≤ 50 kW) *₁, *₄, *₅
 VDE-AR-N 4105:2018-11 (Pn > 50 kW) *₁, *₄, *₅
 VDE-AR-N 4105:2018-11 (Umrichter) *₄, *₅
 VDE-AR-N 4110:2018-11 *₁
 G99-1-3 LV:2018 *₁
 G99-1-3 HV:2018 *₁
 G98-1-2:2018 *₁
 C10-11:2019 LV-IP *₁, *₄
 C10-11:2019 LV-ASS *₁, *₄
 C10-11:2019 HV-IP *₁, *₄
 C10-11:2019 HV-ASS *₁, *₄
 EN50438:2013
 EN50438:2013 DK *₃
 VDE 0126-1-1:2013
 NRS 097-2-1:2017
 AS/NZS 4777.2:2015
 OPEN SETUP *₃

Rezertifizierte Standards

OVE E 8001-4-712 / E 8101-4-712
 VDE 0124-100:2013
 TR3 Rev23:2013 *₁
 G59/3/3:2015 LV *₁

- *₁ ... Schütz B entfällt bei allen länderspezifischen Normen bei denen keine funktionale Sicherheit gefordert ist!
- *₂ ... Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar.
- *₃ ... 1- oder 2-kanaliger Anschluss möglich und konfigurierbar.
- *₄ ... Auswertung, Kontaktfehler für Eigenerzeugungsanlagen nur für VDE-AR-N 4105:2018-11 und C10-11:2019
- *₅ ... VDE-AR-N 4105:2018-11 mit gepufferten Trennschützen für ein FRT (fault ride through) Verhalten

2.6 Anschlussbild 2 (allgemein, mit FRT-Maßnahmen)



Anzuwenden für:

Standards wie in 2.5 beschrieben

***₅ Verhalten von Trennschützen bei Unterspannung (FRT/fault ride through)**

Netzteil/Puffer. Trennschütze und wenn vorhanden Koppelrelais müssen bei Unterspannung für 3s / 0,3s gepuffert werden (FRT).

Auch in Niederspannungsnetze einspeisende Anlagen müssen das Netz unterstützen. Deshalb darf der Trennschütz bei einem Spannungseinbruch auf einen Wert knapp über $U_{<<}$ ($0,45 U_n$) bzw. 0,3s bei Spannungsunterbrechung wegen Unterspannung nicht abfallen, sondern erst wenn ihn der NA003 nach 3s ($U_{<}$) bzw. 0,3s ($U_{<<}$) abschaltet (Netzteil/Puffer nötig).

Bei Verwendung von 2 Trennschützen müssen beide für 3s versorgt werden. Der NA003 verfügt über ein internes Breitbandnetzgerät und braucht daher keine gepufferte Steuerspannung.

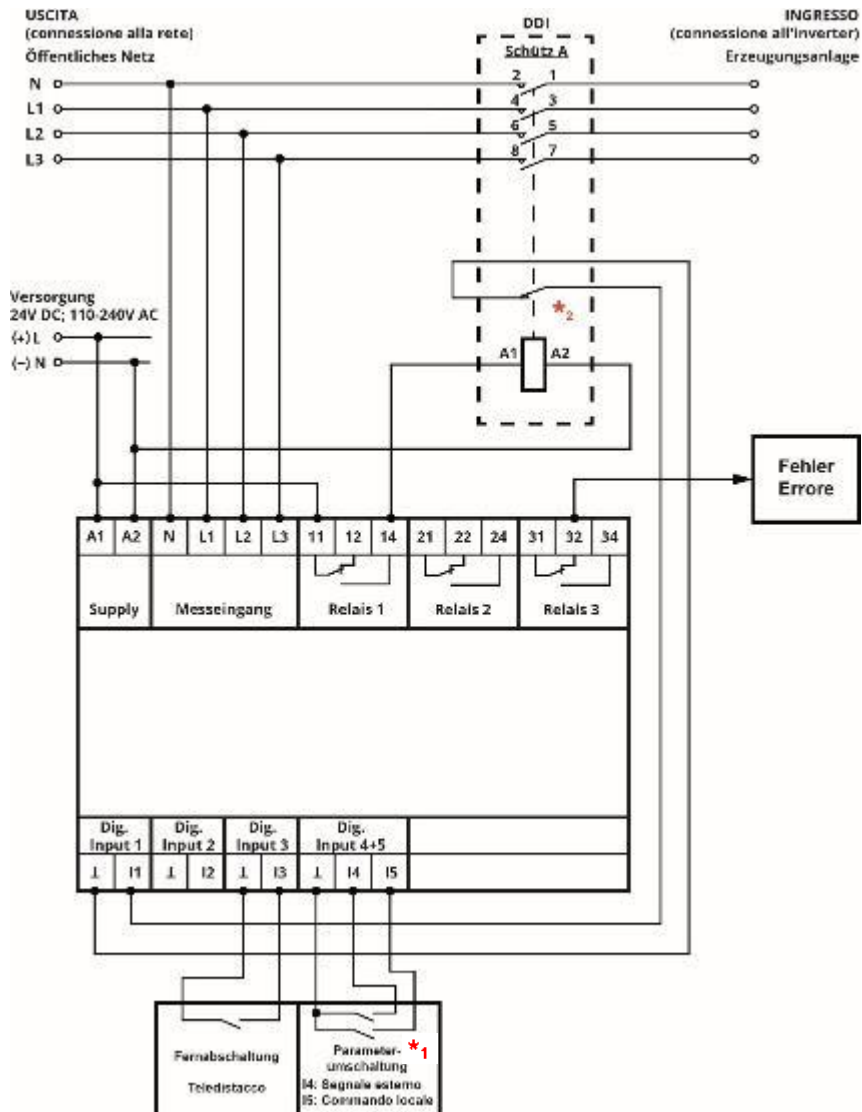
ACHTUNG bei Signalfolge:

- *₁ ... Schütz B entfällt bei allen länderspezifischen Normen bei denen keine funktionale Sicherheit gefordert ist!
- *₂ ... Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar.
- *₃ ... 1- oder 2-kanaliger Anschluss möglich und konfigurierbar.
- *₄ ... Auswertung, Kontaktfehler für Eigenerzeugungsanlagen nur für VDE-AR-N 4105:2018-11 und C10-11:2019
- *₅ ... Mit gepufferten Trennschützen, um ein FRT (fault ride through) Verhalten zu gewährleisten

2.7 Anschlussbild 3 (CEI 0-21)

Anzuwenden für:

CEI 0-21:2019



*₁ Parameterumschaltung:

definitive mode (Operational mode 0):

I4 inaktiv / Kontakt geöffnet:

Overfrequency 1, Underfrequency 1

I4 aktiv / Kontakt geschlossen:

Overfrequency 2, Underfrequency 2

transitory mode (Operational mode 1):

I5 aktiv / Kontakt geschlossen:

Overfrequency 2, Underfrequency 2

I5 inaktiv / Kontakt geöffnet:

Overfrequency 3, Underfrequency 3

*₂ Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar

3 Funktion

3.1 Features

- Einfache Inbetriebnahme durch vordefinierte Setups für länderspezifische Normen und Richtlinien mit in weiten Grenzen einstellbaren Parametern.
- Weiter Nennspannungs- und Nennfrequenzbereich, Einstellbare Nennspannung
- Zusätzliches „Open Setup“ für freie, praktisch unbeschränkte Parametrierbarkeit im Feld
- Einfehlersicherheit
- Zyklischer Selbsttest
- Überwachung der angeschlossenen Kuppelschalter
- Fernabschaltung
- Inselnetzerkennung (RoCoF, PShift, Außenleiterspannung)
- Testfunktion mit Ermittlung der Abschaltzeit
- Überwachung von 1- und 3-phasigen Netzen für Nieder- und Mittelspannungsnetze
- Fehlerspeicher mit Zeitstempel (50 Einträge)
- Passwortschutz und Plombierbarkeit
- Zufällige Abschaltsschwellen und Zuschaltzeiten für nichtregelbare Energieerzeuger (z.B. BHKW)

3.2 Funktionsbeschreibung

Je nach ausgewähltem Parametersatz führt das Gerät mehrere Überwachungsfunktionen gleichzeitig durch.

Beim Überschreiten eines Grenzwertes schaltet das Gerät nach einer für jeden Grenzwert eigens definierten Ansprechverzögerung ab. Beim Selbsttest und bei Aktivierung der Fernabschaltung schaltet das Gerät sofort ab. Erst wenn alle überwachten Größen innerhalb der zulässigen Grenzen liegen und die Fernabschaltung deaktiviert wurde, schaltet das Gerät nach einer definierten Einschaltzeit wieder zu.

Soweit nicht anders angegeben beträgt die Nennspannung 230V/400V und die Nennfrequenz 50Hz.

3.2.1 Neuheiten bezüglich VDE-AR-N 4105:2018

Bei den 3 Parametersätzen der VDE-AR-N 4105 (ID:311,312,313) gilt folgendes für die Inbetriebnahme:

Bei der Inbetriebnahme ist darauf zu achten, dass nur mehr ein Kuppelschalter (an R1) angewendet werden soll. VDE-AR-N 4105 für Umrichter bildet hier eine Ausnahme- hier müssen weiterhin 2 Kuppelschalter (an R1 und R2) zur Anwendung kommen.

Im Weiteren müssen die/der Rückmeldekontakt/e an den dafür vorgesehenen digitalen Eingängen I1(2) und \perp angeschlossen sein. Letztendlich wird unter Parameter 3.099 festgelegt, ob es sich bei den/m Rückmeldekontakt/en um normally closed (n.c.) oder normally open (n.o.) handelt.

Am Display erscheint ein Error C (Contact), insofern dies nicht berücksichtigt wurde. NA003 darf für die VDE-AR-N 4105 während Error C die Ausgangsrelais R1 und R2 nicht einschalten, solange die Rückmeldekontakte nicht korrekt angeschlossen und parametrier sind.

Contact Error-Reset:

Liegt U_N 3x400V AC ordnungsgemäß an, kann erst durch Drücken der Taste Esc (Ebene 1.010) oder Ent (Ebene 1.050) ein Reset durchgeführt werden. Der Contact Error wird dadurch gelöscht und die Ausgangsrelais R1 und R2 ziehen nach Ablauf der Einschaltzeit an.

Ein bestehender Contact Error kann zusätzlich über R3 an die Erzeugungsanlage gemeldet werden.

In diesem Zusammenhang möchten wir auf Kapitel 3.7 Testfunktion hinweisen (Ermittlung der Auslösezeit des Kuppelschalters).

Neuer Parameter T ConDelOn:

Durch Synchronisierereinrichtungen oder Leistungsschalter ist es erlaubt, dass nach der Freigabe durch das NA-Schutzrelais der/die Kuppelschütz/e erst verzögert eingeschaltet werden. Daher erfolgt auch die Rückmeldung vom Rückmeldekontakt verzögert. Die zulässige Ansprechverzögerung wird mit dem

Parameter .110

T ConDelOn definiert. In der Grundeinstellung ist diese Zeit mit **100ms** parametrier und kann bis auf maximal 300.000ms (5min) gestellt werden. Die Konformität ist bis 10.000ms gewährleistet.

Kriterien für den eingesetzten Kuppelschalter:

Bei den eingestellten 100ms Auslösezeit für die unterschiedlichen Schutzfunktionen ergibt sich bei den **deutschen Parametersätzen** eine maximale Auslösezeit des NA003-M64 von 119ms. Um die Gesamtauslösezeit von ≤ 200 ms (NA003-M64 + Kuppelschalter) zu gewährleisten, **muss der eingesetzte Kuppelschalter innerhalb von 81ms auslösen** können.

Passwortschutz:

Die Geräte sind bezüglich der VDE-AR-N 4105 bei Auslieferung mit einem fixen Passwortschutz versehen. Das Passwort lautet „4105“. Der Inbetriebnehmer ist aufgefordert, das Passwort aus Sicherheitsgründen unverzüglich zu ändern (siehe 5.2.5)

3.3 Übersicht der implementierten Parametersätze

3.3.1 OVE TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.2 OVE TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht synchr. Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.3 OVE TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.4 OVE TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.5 **OOE TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.6 **OOE TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.7 **OOE TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.8 **OOE TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.9 W TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.10 W TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht synchr. Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.11 W TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.12 W TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.13 VDE-AR-N 4105:2018-11 (Pn ≤ 50 kW)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes beim Zuschalten
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.14 VDE-AR-N 4105:2018-11 (Pn > 50 kW)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes beim Zuschalten
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.15 VDE-AR-N 4105:2018-11 (Umrichter)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes beim Zuschalten
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.16 VDE-AR-N 4110:2018-11 (geprüft nach TR3, Bewertungsbericht TR8)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen – Außenleiterspannung (autom. Auswahl abhängig von Connection Mode)
- 2 Unterspannungsschwellen – Außenleiterspannung (autom. Auswahl abhängig von Connection Mode)
- 2 Überspannungsschwelle - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Überfrequenzschwellen
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

3.3.17 CEI 0-21:2019

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Operational Mode (transitory mode / definitive mode)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung (autom. Auswahl abh. vom Connection Mode)
- 2 Unterspannungsschwellen - Außenleiterspannung (autom. Auswahl abh. vom Connection Mode)
- 1 Überspannungsschwelle - Sternspannung (autom. Auswahl abh. vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abh. vom Connection Mode)
- 10-Minuten Mittelwert Überspannungsschwelle
- 3 umschaltbare Überfrequenzschwellen (Umschaltung über Operational Mode und digitale Inputs)
- 3 umschaltbare Unterfrequenzschwellen (Umschaltung über Operational Mode und digitale Inputs)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar), RoCoF-Window verstellbar
- Auswählbare RoCoF window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.18 G99/1/3 LV:2018 (Niederspannung)

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.3.19 G99/1/3 HV:2018 (Mittel/Hochspannung)

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überfrequenzschwelle
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.3.20 G98/1/2:2018 (Niederspannung)

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.3.21 C10-11:2019 LV-IP (Interface Protection / Niederspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.22 C10-11:2019 LV-ASS (Automatic Separation System / Niederspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.23 C10-11:2019 HV-IP (Interface Protection / Hochspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.24 C10-11:2019 HV-ASS (Automatic Separation System / Hochspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontaktes
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwellen - Außenleiterspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.25 NA/EEA- CH 2014 Typ A <1MW (Niederspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.26 NA/EEA-NE7 - CH 2020 Typ A 800W bis 250kW (Niederspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.27 NA/EEA-NE7 - CH 2020 Typ B 250kW bis 36MW (Niederspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.28 EN 50438:2013

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

3.3.29 EN 50438:2013 (DK)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Safety Mode (1 Schütz oder 2 Schütze angesteuert und überwacht)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.3.30 VDE 0126-1-1:2013 (ERDF-NOI-RES_13E Frankreich)

- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)

3.3.31 NRS 097-2-1:2017

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwelle - Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Überspannungsschwelle - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.32 AS/NZS 4777.2:2015 (Niederspannung)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer/ kein)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

3.3.33 OPEN SETUP

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Safety Mode (1 Schütz oder 2 Schütze angesteuert und überwacht)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 2 Unterspannungsschwellen - Außenleiterspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 2 Überspannungsschwellen - Sternspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 2 Unterspannungsschwellen - Sternspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 10-Minuten Mittelwert Überspannungsschwelle (bei Bedarf manuell deaktivierbar)
- 2 Überfrequenzschwellen (bei Bedarf manuell deaktivierbar)
- 2 Unterfrequenzschwelle (bei Bedarf manuell deaktivierbar)
- Auswählbare Frequenz window length
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

3.3.34 E 8001/8101 (Vorgänger von OVE TOR R25)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

3.3.35 VDE 0124-100:2013 (Vorgänger von VDE-AR-N 4105:2018-11)

- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)

3.3.36 TR3 Rev23:2013 (Vorgänger von VDE-AR-N 4110:2018-11)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle – Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen – Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 1 Überspannungsschwelle - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

3.3.37 G59/3/3:2015 LV (Niederspannung – Vorgänger von G99/1/3 LV:2018)

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 2 Überfrequenzschwellen
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Einschaltverzögerung

3.3.38 G59/3/3:2015 MV (Mittelspannung Vorgänger von G99/1/3 HV:2018)

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überfrequenzschwellen
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Einschaltverzögerung

3.3.39 G83/2:2012 (Niederspannung Vorgänger von G98/1/2:2018)

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 2 Überfrequenzschwellen
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.3.40 C10-11:2012 LV (Niederspannung Vorgänger von C10-11:2019)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.3.41 C10-11:2012 MV (Mittelspannung Vorgänger von C10-11:2019)

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

3.4 Komparatoren

Je nach gewähltem Standard sind nicht alle Komparatoren bearbeitbar.

3.4.1 Spannungsüberwachung

| | | |
|-------------|------------------------------------|--|
| Außenleiter | Überspannung 1 Überspannung 2 | Alle 3 Außenleiterspannungen werden entsprechend den eingestellten Überspannungsschaltsschwellen überwacht! Bei Überschreiten der Schaltschwelle löst das Gerät nach der eingestellten Ansprechverzögerung t_{off} aus. Im 2-phasigen (L+N) sowie 4-phasigen (L1,L2,L3+N) Connection Mode deaktiviert! |
| Außenleiter | Unterspannung 1 Unterspannung 2 | Alle 3 Außenleiterspannungen werden entsprechend den eingestellten Unterspannungsschaltsschwellen überwacht! Bei Überschreiten der Schaltschwelle löst das Gerät nach der eingestellten Ansprechverzögerung t_{off} aus. Im 2-phasigen (L+N) sowie 4-phasigen (L1, L2, L3+N) Connection Mode deaktiviert! |
| Stern | Überspannung 1 Überspannung 2 | Alle 3 Sternspannungen werden entsprechend den eingestellten Überspannungsschaltsschwellen überwacht! Bei Überschreiten der Schaltschwelle löst das Gerät nach der eingestellten Ansprechverzögerung t_{off} aus. Ausnahme: Im 2-phasigen (L+N) Connection Mode erfolgt nur eine Überspannungsmessung zwischen L1 und N! Im 3-phasigen (L1, L2, L3) Connection Mode deaktiviert! |
| Stern | Unterspannung 1 Unterspannung 2 | Alle 3 Sternspannungen werden entsprechend den eingestellten Unterspannungsschaltsschwellen überwacht! Bei Überschreiten der Schaltschwelle löst das Gerät nach der eingestellten Ansprechverzögerung t_{off} aus. Ausnahme: Im 2-phasigen (L+N) Connection Mode erfolgt nur eine Überspannungsmessung zwischen L1 und N! Im 3-phasigen (L1, L2, L3) Connection Mode deaktiviert! |
| Mittelwert | Überspannung | Die gebildeten 10-Minuten Mittelwerte werden entsprechend den eingestellten Schaltschwellen für den langsamen Spannungssteigerungsschutz überwacht! Bei Überschreiten der Schaltschwelle löst das Gerät nach der eingestellten Ansprechverzögerung t_{off} aus. Im 2-phasigen Connection Mode: L-N Im 3-phasigen Connection Mode: L1-L2-L3 Im 4-phasigen Connection Mode: L1-N; L2-N; L3-N |

3.4.2 Frequenzüberwachung

| | |
|--|--|
| Überfrequenz 1 Überfrequenz 2 Überfrequenz 3 Überfrequenz 4 | Die Frequenz der 3 Sternspannungen werden entsprechend den eingestellten Überfrequenzschwellen überwacht. Ausnahme: im 2-wire mode nur U L1-N |
| Unterfrequenz 1 Unterfrequenz 2 Unterfrequenz 3 Unterfrequenz 4 | Die Frequenzen der 3 Sternspannungen werden entsprechend den eingestellten Unterfrequenzschwellen überwacht. Ausnahme: im 2-wire mode nur U L1-N |
| Überfrequenz Zufall | Die Frequenz der 3 Sternspannungen werden entsprechend den eingestellten Parametern (zufällige Max Frequenz) überwacht. Ausnahme: im 2-wire mode nur U L1-N |
| Frequenzüberwachung Unterspannung LL Frequenzüberwachung Unterspannung LN | Je nach Modus (2, 3, 4 wire) führt ein Unterschreiten der eingestellten Schwelle zur Deaktivierung der Frequenzkomparatoren. |
| RoCoF | Die Frequenzänderungsraten der 3 Sternspannungen werden entsprechend den eingestellten Parametern überwacht. Ausnahme: im 2-wire mode nur U L1-N |

3.4.3 Phasensprungüberwachung

| | |
|-------------|--|
| Phase Shift | Die Phasensprungverhalten der 3 Sternspannungen werden entsprechend den eingestellten Parametern überwacht. Ausnahme: im 2-wire mode nur U L1-N |
|-------------|--|

3.5 Inselnetzerkennung

3.5.1 Inselnetzerkennung mittels Spannungsmessung

Bei diesem Verfahren wird mit Hilfe der 3-phasigen Spannungsüberwachung ein Inselnetz erkannt.

3.5.2 Inselnetzerkennung mittels RoCoF

Bei diesem Verfahren wird ein Inselnetz mit Hilfe der Frequenzänderungsrate (Rate of change of frequency) festgestellt. Die Messung beruht auf Frequenzmessung und spricht bei einer über mehrere Perioden andauernden Frequenzänderung an. Der df/dt -Grenzwert wird in Hz/s angegeben und eingestellt.

3.5.3 Inselnetzerkennung mittels Vektorsprung

Bei diesem Verfahren wird durch Zeitmessung der Halbwellen und dem Vergleich mit vorhergehenden Messungen ein Phasen-/ bzw. Vektorsprung erkannt. Ein Vektorsprung kann durch einen plötzlichen Lastwechsel auftreten. Der Schwellwert wird in Grad angegeben und eingestellt.

3.6 Testfunktion

Die Testfunktion kann auf 2 Arten ausgelöst werden:

- Betätigen der ESC Taste in jedem beliebigen Fenster der Menüebene 1
- Betätigen der ENT Taste im Fenster 1.050

Die beiden Ausgangsrelais 1 und 2 werden bei Aktivierung der Testfunktion abgeschaltet und die Zuschaltzeit beginnt abzulaufen.

Wie bei jeder Abschaltung wird auch beim Test die Abschaltzeit der angeschlossenen Trennschütze/ Kuppelschalter gemessen: Die jeweils letzte Abschaltzeit kann im Fenster 1.040 abgelesen werden (Toff)

3.7 Digitale Eingänge

Die aktuellen Zustände der digitalen Eingänge können mit dem Menüpunkt 1.040 festgestellt werden.

Die digitalen Eingänge 1 und 2 (I1/2 und \perp) dienen als Rückmeldekontakte der beiden Trennschütze A und B. Sie werden über den Hilfskontakt des Trennschützes angesteuert. Hierbei kann der Hilfskontakt als Öffner oder Schließer angeschlossen und der digitale Eingang im Gerät entsprechend konfiguriert werden. Die unterschiedlichen \perp bei den digitalen Eingänge sind intern nicht miteinander verbunden, müssen bei Verwendung also einzeln angeschlossen werden.

Der digitale Eingang 3 (I3 und \perp) dient der Fernabschaltung. Bei Konfiguration .114 (I3 STOP) mit n.o. (normally open) werden R1 und R2 durch brücken von I3 mit \perp abgeschaltet.

Verwendet man n.c. (normally closed), muß für einen normalen Betrieb (R1 und R2 eingeschaltet) I3 mit \perp gebrückt sein. Durch ein Öffnen I3 von \perp werden R1 und R2 abgeschaltet und damit auch die angeschlossenen Trennschütze A und B. Wird für .114 dis. (disabled) gewählt, kann gar keine Fernabschaltung durchgeführt werden.

Die beiden digitalen Eingänge 4 und 5 dienen der Parameterumschaltung für die italienische Norm CEI 0-21.

3.8 Ausgangskontakte

Die beiden Ausgangsrelais R1 und R2 steuern die Trennschütze/Kuppelschalter an. Das Ausgangsrelais R3 schaltet im Fehlerfall ein (wenn entsprechend konfiguriert).

3.9 Fehler (Error)

Die Anzeige aktueller Fehler befindet sich in Ebene „1.060 Error“, die Anzeige des Fehlerspeichers befindet sich in Ebene 2. Es wird zwischen den 2 untenstehenden Fehlerarten unterschieden.

3.9.1 Messwertfehler

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

Hier wird nur der aktuell anliegende Fehler angezeigt!

Fehlerarten:

- UΔ Fehler Außenleiterspannung (Unter- oder Überspannung)
- UY Fehler Sternspannung (Unter- oder Überspannung)
- Ū Fehler 10 Minuten Spannungsmittelwert
- f Fehler Frequenz (Unter- oder Überfrequenz)
- Δf Fehler Frequenzrampe (RoCoF)
- ΔΦ Fehler Phasensprung (PShift)
- C Fehler Rückmeldekontakt – Schütz fälschlich geschlossen
- c Fehler Rückmeldekontakt – Schütz fälschlich offen

3.9.2 Systemfehler

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

Fehlerarten:

- T Fernabschaltung aktiv
- 0-9, A-F Tritt einer dieser Fehler permanent auf, kontaktieren Sie bitte unseren technischen Support.

Im Auslieferungszustand befinden sich im Fehlerspeicher Systemfehlereinträge. Diese entstehen bei der Endprüfung des Gerätes bei der diese Fehler bewusst herbeigeführt wurden. Da der Fehlerspeicher nicht löscht sein darf, stellen diese Einträge keinen Gerätefehler dar und können ignoriert werden.

3.9.3 Fehlerspeicher (LOG)

Die Anzeige des Fehlerspeichers für max. 50 LOGs befindet sich in Ebene 2.

Im Fehlerspeicher wird sowohl das Auftreten als auch das Wegfallen jedes Fehlers mit einem Zeitstempel gespeichert. Ein Eintrag ohne Fehlercodes ist daher kein Fehlverhalten.

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

nn ... Nummer des Eintrages im Fehlerspeicher

t ... Zeitstempel: Zeitdauer seit Auftritt des Fehlers in Tagen/Stunden/Minuten/Sekunden

4 Bedienung und Inbetriebnahme

4.1 Erste Inbetriebnahme

Das Gerät wird ohne eingestellten Parametersatz ausgeliefert. Bei der Erstinbetriebnahme geht das Gerät in die Parametersatzauswahl (Ebene 5 - Menüpunkt 5.001). Hier muss mittels +/- der entsprechende Parametersatz/Norm ausgewählt und mit ENTER bestätigt werden.

Weitere Informationen finden sie in der Menüstruktur.

4.2 Menüführung

Die Anzeigeeinheit besteht aus einem 4 zeiligen Text - Display mit je 20 Zeichen pro Zeile. Die Anzeige hat 5 Ebenen. Mittels + und - kann durch die verschiedenen Anzeigen der Ebenen navigiert werden.

4.2.1 Ebene 0

Startschirm (Anzeige für 5 Sekunden beim Power Up)

Hier werden Basisinformationen angezeigt. Dieser Schirm erscheint nach dem Einschalten, bleibt dann für 5s sichtbar. Danach springt die Anzeige auf das erste Fenster in Ebene 1.

4.2.2 Ebene 1

Messwerte (Schirm 1.010-1.032)

Anzeige der aktuellen Messwerte.

Außerdem wird hier angezeigt, ob das Parameterset der Default Konfiguration entspricht (dflt - default = Grund- oder Werkseinstellung), innerhalb der normativ zulässigen Grenzwerte editiert wurde (edit - edited = bearbeitet) oder außerhalb der normativ zulässigen Grenzwerte eingestellt ist (ncnf - non conform = nicht mit der ausgewählten Norm bzw. dem ausgewählten Standard konform).

Gegebenenfalls Anzeige Zeitablauf „reconnection timer“ (Zuschaltzeit) in Sekunden.

Navigation +/- . Von diesen Schirmen gelangt man mittels ENT in Ebene 3

Digitale Inputs und Abschaltzeit (Schirm 1.040)

Anzeige der aktuellen Zustände der digitalen Eingänge, sowie der letzten Abschaltzeit (Toff) der angeschlossenen Schütze (für zweikanalige Systeme der jeweils größere Wert).

Außerdem wird hier angezeigt, ob das Parameterset der Default Konfiguration entspricht (dflt - default = Grund- oder Werkseinstellung), innerhalb der normativ zulässigen Grenzwerte editiert wurde (edit - edited = bearbeitet) oder außerhalb der normativ zulässigen Grenzwerte eingestellt ist (ncnf - non conform = nicht mit der ausgewählten Norm bzw. dem ausgewählten Standard konform).

Gegebenenfalls Anzeige Zeitablauf „reconnection timer“ (Zuschaltzeit) in Sekunden. Statusanzeige der 5 digitalen Eingänge.

Navigation +/- . Von diesem Schirm gelangt man mittels ENT in Ebene 3.

Test/Reset (1.050)

Durch Betätigen der ENT-Taste wird ein Relaisreset ausgelöst. Dabei schalten die Relais A und B ab und der „reconnection-timer“ (Zuschaltzeit) beginnt abzulaufen.

Im Weiteren kann mit der Test/Reset-Funktion ein Reset-Ereignis durchgeführt werden, dass die Relais 1/2 nach einem Contact-Error (C) wieder zuschalten lässt (Notwendig für die drei Parametersätze der VDE-AR-N 4105). Das Test/Reset-Ereignis lässt sich auch durch Drücken der Taste ESC in Ebene 1 durchführen.

Error (1.060)

Anzeige aktueller Fehler:

| | |
|---|----------------|
| M | Messwertfehler |
| S | Systemfehler |

Navigation +/- . Durch Betätigen der ENT-Taste gelangt man in Ebene 2.

4.2.3 Ebene 2

Fehlerspeicher

Hier werden die letzten Fehler mit Zeitstempel (Zeit seit dem Auftreten) angezeigt. Die Zeit wird nur gezählt, wenn das Gerät versorgt ist. Es werden sowohl positive als auch negative Fehlerflanken gespeichert und angezeigt.

Navigation +/- . Von diesem Schirm gelangt man mittels ESC in Ebene 1.

4.2.4 Ebene 3

Parameteranzeige

Hier werden für den jeweiligen Parametersatz die sichtbar geschalteten Parameter angezeigt.

Navigation +/- . Von diesem Schirm gelangt man mittels ESC in Ebene 1.

Mittels PROG (plombierbar) gelangt man in den Editiermodus des gewählten Parameters.

Ist das Passwort „0000“ wird die Passwortabfrage übersprungen und man gelangt direkt in den Editiermodus in Ebene 5.

Wurde innerhalb der letzten 60 Sekunden ein gültiges Passwort eingegeben, so wird die Passwortabfrage übersprungen und man gelangt direkt in Ebene 5.

Wurde ein Passwort ungleich „0000“ festgelegt, so gelangt man zur Passwordeingabe in Ebene 4.

4.2.5 Ebene 4

Passwordeingabe

Mit +/- kann die jeweils aktive Stelle des Passwortes inkrementiert / dekrementiert (0..9) werden.

Mit ENT wird auf die jeweils nächste Stelle der Passwordeingabe gesprungen.

Nach Drücken von ENT bei der 4. Stelle wird das eingegebene Passwort überprüft.

Mit ESC wird auf die jeweils vorhergehende Stelle der Passwordeingabe gesprungen.

Nach Drücken von ESC bei der 1. Stelle des Passwortes wird in Ebene 3 zurückgesprungen.

Sollten Sie das eingestellte Passwort vergessen haben kontaktieren Sie bitte unter Bekanntgabe der Geräte-ID unseren technischen Support. Sie erhalten ein nur für Ihr Gerät gültiges Masterpasswort.

4.2.6 Ebene 5

Parametereditierung

In dieser Ebene kann der zuvor in Ebene 3 ausgewählte Parameter mit +/- geändert werden. Bestätigt wird mit ENT - Mit ESC wird die Änderung verworfen. In beiden Fällen springt die Anzeige auf den entsprechenden Parameter in Ebene 3.

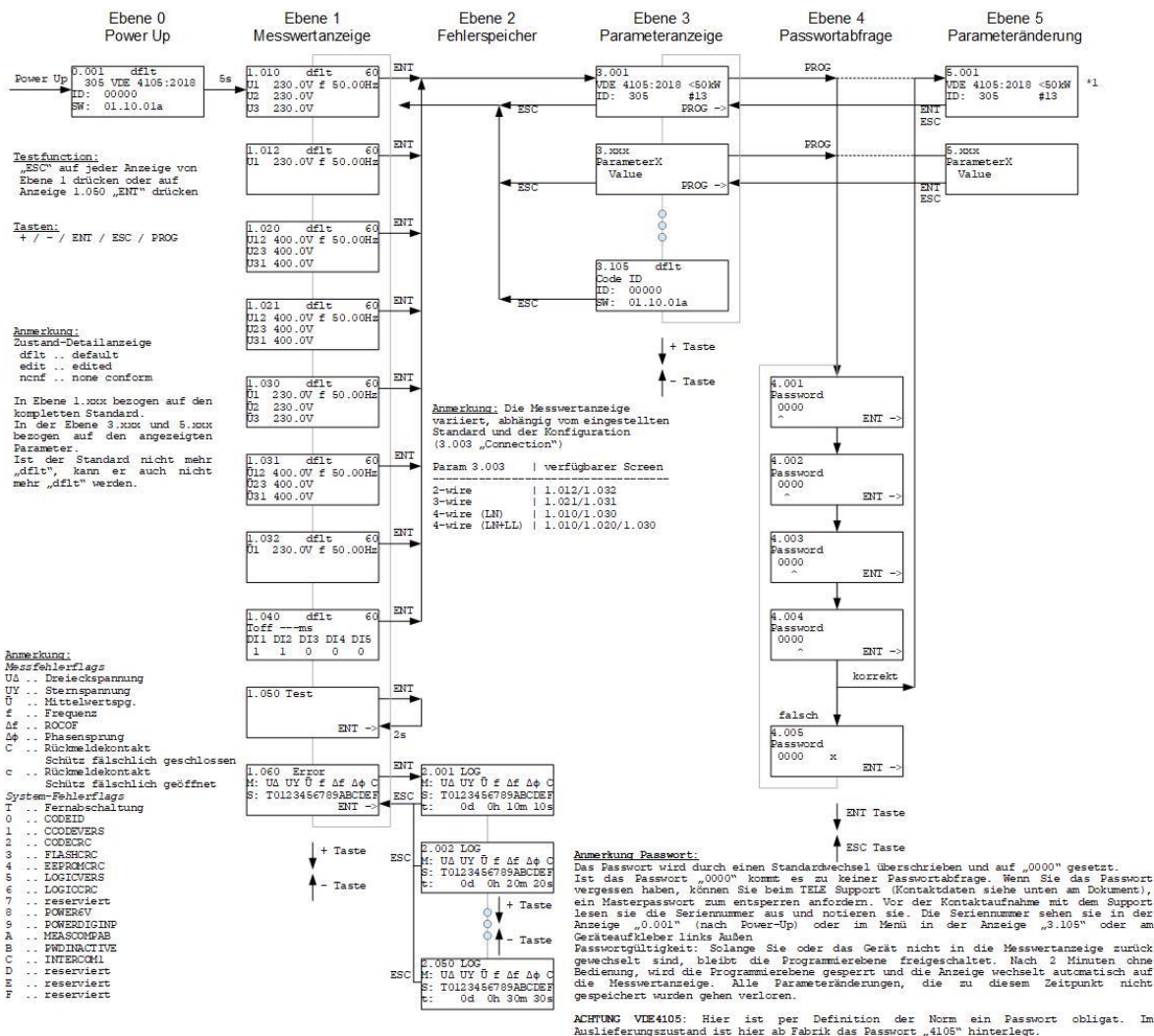
Außerdem wird hier angezeigt, ob der Wert des gerade bearbeiteten Parameters der Defaultkonfiguration entspricht (dflt - default = Grund- oder Werkseinstellung), innerhalb der normativ zulässigen Grenzwerte editiert wurde (edit - edited = bearbeitet) oder außerhalb der normativ zulässigen Grenzwerte eingestellt ist (ncnf - non conform = nicht mit der ausgewählten Norm bzw. dem ausgewählten Standard konform).

Neben Schwellen, Zeiten und Modi sind auch die 4 Stellen des Passwortes je 1 Parameter.

Auch der aktuelle Standard ist ein Parameter. D.h. durch Ändern dieses Parameters wird der neue ausgewählte Standard aktiviert. Sämtliche bisherigen Änderungen werden dabei verworfen.

Wird der bereits eingestellte Standard ausgewählt, wird der Standard auf Werkseinstellungen (default) zurückgesetzt.

4.3 Menüstruktur



4.4 Verfügbare Normen und Standards

| Slot | ID | Norm/Standard | Regions | Number of channels | | |
|------|-----|-------------------------------------|---|--------------------|-----------------------|--------------------------|
| | | | | 1 | 2 Funct. safety | 1 or 2 select able |
| #00 | 802 | OVE TOR R25 NS SYNC | Austria (low voltage) | | X | |
| #01 | 803 | OVE TOR R25 NS ASYNC | Austria (low voltage) | | X | |
| #02 | 852 | OVE TOR R25 MS SYNC | Austria (medium voltage) | | X | |
| #03 | 853 | OVE TOR R25 MS ASYNC | Austria (medium voltage) | | X | |
| #04 | 822 | OOE TOR R25 NS SYNC | Upper Austria Oberösterreich (low voltage) | | X | |
| #05 | 823 | OOE TOR R25 NS ASYNC | Upper Austria Oberösterreich (low voltage) | | X | |
| #06 | 872 | OOE TOR R25 MS SYNC | Upper Austria Oberösterreich (medium voltage) | | X | |
| #07 | 873 | OOE TOR R25 MS ASYNC | Upper Austria Oberösterreich (medium voltage) | | X | |
| #08 | 832 | W TOR R25 NS SYNC | Vienna (low voltage) | | X | |
| #09 | 833 | W TOR R25 NS ASYNC | Vienna (low voltage) | | X | |
| #10 | 882 | W TOR R25 MS SYNC | Vienna (medium voltage) | | X | |
| #11 | 883 | W TOR R25 MS ASYNC | Vienna (medium voltage) | | X | |
| #13 | 311 | VDE-AR-N 4105: 2018 (Pn ≤ 50kW) | Germany (low voltage) | X | | |
| #14 | 312 | VDE-AR-N 4105: 2018 (Pn > 50kW) | Germany (low voltage) | X | | |
| #15 | 313 | VDE-AR-N 4105: 2018 (converter) | Germany (low voltage) | | X | |
| #17 | 706 | VDE-AR-N 4110: 2018 (Pn > 135kW) | Germany (medium voltage) | X | | |
| #21 | 102 | CEI 0-21: 2019 | Italy | X | | |

| | | | | | | |
|------------------------------|------|---|---|---|---|---|
| #25 | 410 | G99/1/3: 2018 LV | Great Britain (low voltage) | X | | |
| #26 | 460 | G99/1/3: 2018 HV | Great Britain (medium/high voltage) | X | | |
| #28 | 510 | G98/1/2: 2018 | Great Britain (low voltage) | X | | |
| #32 | 601 | C10-11: 2019 LV-IP | Belgium (low voltage) interface protection | X | | |
| #33 | 602 | C10-11: 2019 LV-ASS | Belgium (low voltage) automatic separation system | X | | |
| #35 | 651 | C10-11: 2019 HV-IP | Belgium (medium/high voltage) interface protection | X | | |
| #36 | 652 | C10-11: 2019 HV-ASS | Belgium (medium/high voltage) automatic separation system | X | | |
| #37 | 1200 | NA/EEA- CH 2014 (Type A) | Switzerland 2014 (low voltage) | | X | |
| #38 | 1220 | NA/EEA-NE7 - CH 2020 (Type A) | Switzerland 2020 (low voltage) | | X | |
| #39 | 1221 | NA/EEA-NE7 - CH 2020 (Type B) | Switzerland 2020 (low voltage) | | X | |
| #40 | 900 | EN 50438:2013 | Europe | | X | |
| #41 | 950 | EN 50438: 2013 DK | Denmark | | | X |
| #44 | 200 | VDE V 0126-1-1:2013 | France, Turkey, Belgium, Greece, ... | | X | |
| #48 | 1000 | NRS 097-2-1: 2017 | South Africa | | X | |
| #50 | 1102 | AS/NZS 4777.2:2015 | Australia / Victoria (New Zealand) | | X | |
| #51 | 9004 | OPEN SETUP | Freely configurable setup | | | X |
| Recertified Standards | | | | | | |
| #53 | 801 | OVE E 8001/8101:2014 | Austria | | X | |
| #54 | 300 | VDE-AR-N 4105 tested according to VDE 0124-100:2013 | Germany (low voltage) | | X | |

| | | | | | | |
|-----|-----|---|------------------------------|---|--|--|
| #55 | 700 | TR3 Rev23:2013 certified according to BDEW 2008 | Germany (medium voltage) | X | | |
| #57 | 405 | G59/3/3: 2015 LV | Great Britain (low voltage) | X | | |
| #58 | 455 | G59/3/3: 2015 MV | Great Britain (high voltage) | X | | |
| #59 | 500 | G83/2: 2012 | Great Britain (low voltage) | X | | |
| #60 | 600 | C10-11: 2012 LV | Belgium (low voltage) | X | | |
| #61 | 650 | C10-11: 2012 MV | Belgium medium voltage | X | | |

4.5 Plombierung

Das Gerät ist nach der Inbetriebnahme mittels einstellbaren Passworts gegen unbefugte Änderungen der schutzrelevanten Einstellparameter zu sichern! Wird der Passwortschutz nicht genutzt oder fordert es die länderspezifische Norm oder der Standard, so ist das Gerät zu plombieren!

4.6 Fallbeispiele

4.6.1 Einsatz von Spannungswandlern in Mittelspannungsnetzen (ÖVE TOR R25, OOE TOR R25)

Am Beispiel Österreich wird bei Mittelspng. zwischen zwei grundlegenden Spngs.niveaus unterschieden: 21kV und [31,7kV für Sonderfälle Z.B. Windparks]. Außenleiter (Phase-Phase-Spannung).

Zum Einsatz kommt ein 200:1 Spannungswandler bei $U_c=21kV$:

1. Wahl des Parametersatzes **852** (OVE/OOE TOR R25 MS SYNC) für synchrone bzw. **853** (OVE/OOE TOR R25 NS ASYNC) für nicht synchrone Erzeugungsanlagen (Umrichter).
2. Parameter .005 (Einstellung der Nominalspannung ULN/LL nom) auf **60.4/105.0V**.
Rechnerisch ergibt sich der Wert aus $21kV / 200 = 105V$ (die 60.4V stehen für die Sternspannungen, die bei Mittelspannungsanwendungen nicht relevant sind). Die Einstellmöglichkeiten sind wie mit **60.4/105.0V** beschrieben möglich.

Zum Einsatz kommt ein 200:1 Spannungswandler bei $U_c=31,7kV$ (z.B. Windpark):

1. Wahl des Parametersatzes **852** (OVE/OOE TOR R25 MS SYNC) für synchrone bzw. **853** (OVE/OOE TOR R25 NS ASYNC) für nicht synchrone Erzeugungsanlagen (Umrichter).
2. Parameter .005 (Einstellung der Nominalspannung ULN/LL nom) auf **91.0/158.1V**.
Rechnerisch ergibt sich der Wert aus $31,7kV / 200 = 158,5V$ (die 91.0V stehen für die Sternspannungen, die bei Mittelspannungsanwendungen nicht relevant sind). Die Einstellmöglichkeiten sind wie mit **91/158,1V** beschrieben möglich.

Zum Einsatz kommt ein 300:1 Spannungswandler bei $U_c=31,7kV$ (z.B. Windpark):

1. Wahl des Parametersatzes **852** (OVE/OOE TOR R25 MS SYNC) für synchrone bzw. **853** (OVE/OOE TOR R25 NS ASYNC) für nicht synchrone Erzeugungsanlagen (Umrichter).
2. Parameter .005 (Einstellung der Nominalspannung ULN/LL nom) auf **60.4/105.0V**.
Rechnerisch ergibt sich der Wert aus $31,7kV / 300 = 105,6V$ (die 60,4V stehen für die Sternspannungen, die bei Mittelspannungsanwendungen nicht relevant sind). Die Einstellmöglichkeiten sind wie mit **60.4/105.0V** beschrieben möglich.

In jedem Fall gilt: Alle Schutzfunktionen $U_{>>}$, $U_{>}$, $U_{<<}$, $U_{<}$ stellen sich automatisch auf die neu eingestellten Spannungsniveaus ein, d.h. hier brauchen nur Änderungen durchgeführt zu werden, wenn diese den Vorgaben des Netzbetreibers nicht entsprechen.

Änderung der Schutzfunktion $U_{>}$ und $U_{>>}$ nach Vorgaben des Netzbetreibers:

Im Auslieferungszustand (default) betragen diese Schwellen für $U_{>off}$ $1,06 \times U_c$ (106%) und für $U_{>>off}$ $1,1 \times U_c$ (110%). Sollte der Netzbetreiber hier Einstellungen für $U_{>off}$ von beispielsweise $1,04 \times U_c$ (104%) und $U_{>>off}$ von $1,15 \times U_c$ (115%) verlangen, müssen sowohl Parameter .011 als auch .027 dementsprechend verstellt werden. Gibt es auch abweichende Vorgaben für die Unterspannungsschwellen, so müssen zusätzlich Parameter .015 ($U_{<off}$) und .031 ($U_{<<off}$) angepasst werden.

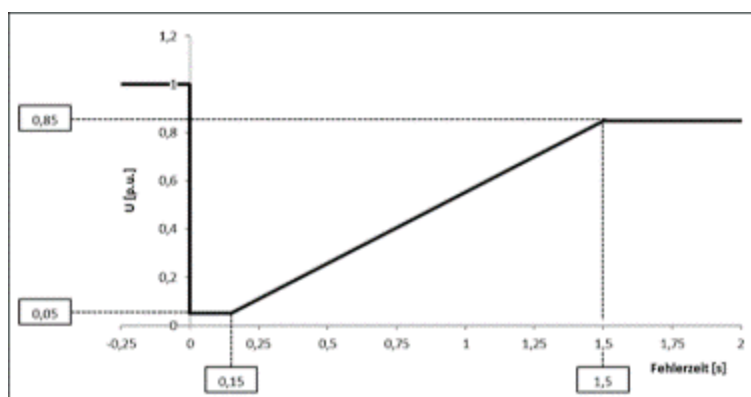
Hinweis: In Niederspngs.netzen wird die Nennspng. U_n bezeichnet und in Mittelspngs.netzen U_c .

4.6.2 FRT (Fault Ride Through) Fähigkeit von Stromerzeugungsanlagen:

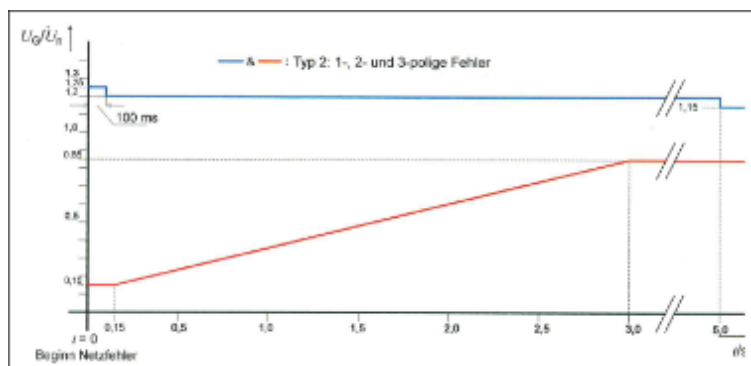
Die FRT-Fähigkeit muss für die unterschiedlichen Komponenten einer Stromerzeugungsanlage getrennt voneinander betrachtet werden. Die FRT-Fähigkeit von Trennschützen wird in Kapitel 2.6 dargestellt, dabei muss der Errichter der Stromerzeugungsanlage dafür sorgen, dass für die Trennschütze ausreichend Pufferung zur Verfügung steht.

Der Errichter der Stromerzeugungsanlage muss zusätzlich darauf achten, dass sich die Anforderungen aus der FRT (Unterschiedliche Anforderungen zwischen den Ländern) und den Schutzeinstellungen für Unterspannung (Höhe $U</U\ll$ und Time OFF) nicht gegenseitig beeinflussen.

Sollte der NA003 Versorgungsseitig (A1/A2) mit dem Hauptnetz verbunden sein (nicht getrennt vom Messkreis versorgt) kann gewährleistet werden, dass folgende FRT-Anforderungen aus der TOR 1.1 und VDE-AR-N 4105:2018 problemlos (auch öfters hintereinander) durchlaufen werden können, ohne dass die Ausgangsrelais R1/R2 fälschlicherweise bedingt durch das interne Netzteil abfallen.



(FRT-Profil nichtsynchrone Stromerzeugungsanlagen nach TOR 1.1 2019; ausgewählt, weil schwierigstes Verhalten für das interne Netzteil des NA-Schutzes)



(FRT-Profil nach VDE-AR-N 4105:2018 Typ2- keine Synchrongeneratoren; ausgewählt, weil schwieriger für das interne Netzteil des NA-Schutzes als Typ1)

Dieses FRT-Verhalten gilt für den gesamten AC-Versorgungsbereich 110-230VAC, für eine Versorgung mit 24VDC ist das FRT-Verhalten (kein Abfallen der Ausgangsrelais R1/R2) nicht gewährleistet. In diesem Fall muss der Errichter der Stromerzeugungsanlage für eine ausreichende Pufferung der 24VDC Sorge tragen (Geräteverbrauch 1,25W/4VA).

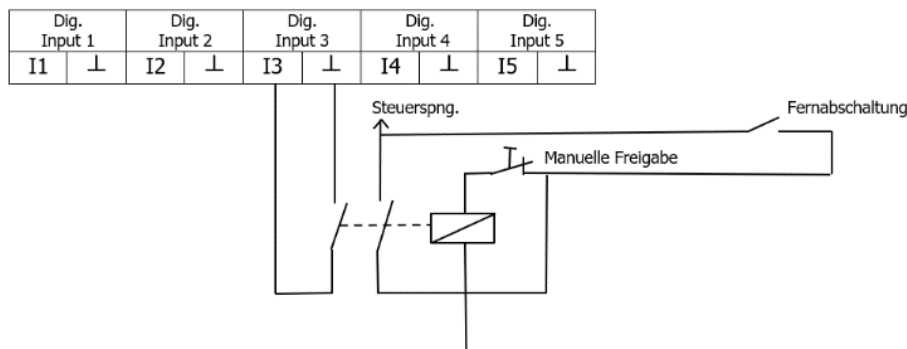
Sollte es zu einem komplett-Ausfall z.B. von L1 kommen, während A1 und A2 des NA-Schutzes mit L1 und N verbunden sind, kann das interne Netzteil des NA-Schutzes bei

- 230VAC <580ms
- 110VAC <200ms
- 24VDC < 70ms (NA-Schutz getrennt vom Messkreis versorgt)

überbrücken, sprich es kommt weder zu einem Reset des NA-Schutzes noch fallen die Relais R1/2 ab.

4.6.3 Selbsthalteschaltung für Fernabschaltung mit manueller Freigabe

Für spezielle Anwendungen kann vom Netzbetreiber gefordert werden, dass nach einer Fernabschaltung erst wieder manuell freigegeben (zugeschaltet) werden darf. Das ist momentan durch die Verwirklichung einer Selbsthalteschaltung möglich:



5 Technische Daten

5.1 Versorgungskreis

| | |
|----------------------------------|--|
| Klemmen | A1 (L bzw. +); A2 (N bzw. -) |
| Versorgungsspannung | DC: 24V AC: 110 - 230V |
| Toleranz der Versorgungsspannung | DC: $\pm 10\%$ AC: $\pm 30\%$ |
| Nennverbrauch | max. 1,25W / 4VA @ 230V AC |
| Nennfrequenz | 50 / 60Hz |
| Toleranz der Nennfrequenz | 48 - 63Hz |
| Einschaltdauer | 100% |
| Wiederbereitschaftszeit | 6 Sekunden + eingestellte Einschaltverzögerung |
| Abfallspannung | 7V |
| Überspannungskategorie | III |
| Bemessungsstoßspannung | 6 kV |
| Interne Absicherung | 250V / 500mA träge (eingelötet) |

Um die Gerätefunktion während eines Netzausfall zu gewährleisten, ist das Gerät über eine externe USV-Anlage zu versorgen!

5.2 Messkreis

| | |
|--------------------|--|
| Klemmen | L1-L2-L3-N |
| Messeingang | 3x 400V AC |
| Eingangswiderstand | 1M Ω |
| Messgrößen | Außenleiterspannung, Sternspannung, 10 Minuten Spannungsmittelwert, Frequenz, Frequenzänderung (RoCoF), Phasensprung (PShift) |

5.3 Messbereiche

| | |
|------------------------|---|
| Außenleiterspannung | 0 - 560VAC |
| Sternspannung | 0 - 325VAC |
| Frequenz | 40 - 65Hz (gemessen zw. L1/N) |
| RoCoF | 100mHz/s - 2.000mHz/s |
| Pshift | 1 - 15° |
| Überlastbarkeit | Dauerhaft $1,4 \times U_{Nom}$ Impuls $1,6 \times U_{Nom}$ (1 Sekunde) |
| Überspannungskategorie | III |
| Bemessungsstoßspannung | 4 kV |

5.4 Digitale Eingänge

| | |
|----------------|--|
| Klemmen | I1 und \perp ; I2 und \perp ; I3 und \perp ; I4 bzw. I5 und \perp I1, I2, I3 können als n.c., n.o. und dis. konfiguriert werden |
| Kontaktart | Potentialfrei (max. Leitungslänge 30m, Verlegung als Steuerleitung, getrennt von Energiekabeln) |
| Schaltleistung | 24V DC / 5mA |

5.5 Ausgangskreis

| | |
|--------------------------------------|---|
| Klemmen | 11-12-14; 21-22-24; 31-32-34 |
| Anzahl und Art der Kontakte | 3 Wechsler |
| Kontaktmaterial | AgNi |
| Schaltleistung | 5A / 250V AC |
| Schalzhäufigkeit elektrisch (AC-1) | 100×10^3 Schaltspiele |
| Schalzhäufigkeit mechanisch | 15×10^6 Schaltspiele |
| Dauerlast | 5A |
| Impulslast (1s) | 5A |
| Spannungsfestigkeit offener Kontakte | Relaiskontakte: $1000V_{rms}$ Klemmen: $450V_{rms}$ |
| Überspannungskategorie | III |
| Bemessungsstoßspannung | 4 kV |
| Absicherung | 5A flink |

5.6 Genauigkeit

| | |
|---|--|
| Spannungsmessung: | |
| Grundgenauigkeit | $< 0,5\% @ +25^{\circ}C$ |
| Temperatureinfluss | $< 0,01\%/^{\circ}C$ |
| Auflösung | 10mV |
| Frequenzmessung: | |
| Grundgenauigkeit | $< 0,01Hz @ +25^{\circ}C$ |
| Temperatureinfluss | $< 0,0002Hz/^{\circ}C$ |
| Auflösung | 1mHz |
| Anlaufverzögerung Ton delay | $0...600s \pm 0,6\%$ |
| Ansprechverzögerung (TIME OFF) tUTHR OFF | $0...300s \pm 0,6\%$ |
| Rückfallverzögerung tUTHR ON_total | $130ms \pm 45\%$ |
| Ansprechverz. bei Überspng. tover | $95ms \pm 50\%$ |
| Ansprechverz. bei Unterspng. tunder | $95ms \pm 40\%$ |
| Ansprechzeit, toff_total_over/under | toff_total_over = tover + tUTHR OFF toff_total_under = tunder + tUTHR OFF |
| Überschwingzeit | 40ms |

5.7 Isolationsdaten

| | |
|--------------------------------------|------------------|
| Bemessungsisolationsspannung | 400V |
| Isolierung | |
| Versorgungskreis / Messkreis | Sichere Trennung |
| Versorgungskreis / Ausgangskreis | Sichere Trennung |
| Versorgungskreis / Digitale Eingänge | Sichere Trennung |
| Ausgangskreis / Messkreis | Basisisolierung |
| Ausgangskreis / Digitale Eingänge | Basisisolierung |

5.8 Umgebungsbedingungen

| | |
|------------------------------|---|
| Umgebungstemperatur Betrieb | -25 bis +65°C |
| Umgebungstemperatur Lagerung | -40 bis +70°C |
| Anzeigefähigkeit Display | -15 bis +65°C |
| Relative Luftfeuchtigkeit | 5 bis 95% |
| Verschmutzungsgrad | 2 |
| Gewicht | 300g |
| MTTF | 93.000h (für Displaytemperatur 25°C +/-5°C) |

5.9 Elektrischer Anschluss

| | |
|--|---|
| Anschlussquerschnitt | max. 2,5mm ² |
| Abisolierlänge | max. 8mm |
| Elektrische Belastbarkeit der Klemmen: Relaisausgänge / Digitale Eingänge Messeingänge | max. 450V/16A max. 750V/16A |
| Anzugsdrehmoment | max. 0,5Nm |
| Schraube | M3, Längsschlitz für Schraubendreher 0,6 x 3,5mm |
| Digitale Eingänge und Ausgangsrelais | Keine Beschränkung für gleichzeitigen Betrieb von Ein- und Ausgängen. |

5.10 Plombier Draht

| | |
|------------------|---------------|
| Drahtdurchmesser | Ø max. 1,32mm |
|------------------|---------------|

5.11 Schutzart

| | |
|---------|-------|
| Klemmen | IP 20 |
| Gehäuse | IP 20 |

6 Settings der implementierten Parametersätze

Definition zu den folgenden Tabellen:

Grau hinterlegte Zeilen bedeuten, dass die zugehörigen Parameter editierbar sind. Alle anderen Parameter sind nicht verstellbar.

6.1.1 Connection Modes

| | |
|----------------|--|
| 2-wire | Es wird nur die Spannung zwischen L1 und N ausgewertet |
| 3-wire | Es werden nur die Außenleiterspannungen U_{L1-L2} , U_{L2-L3} und U_{L3-L1} |
| 4-wire (LN) | Es werden nur die Sternleiterspannungen U_{L1-N} , U_{L2-N} und U_{L3-N} ausgewertet |
| 4-wire (LN+LL) | Es werden sowohl die Sternspannungen U_{L1-N} , U_{L2-N} und U_{L3-N} als auch die Außenleiterspannungen U_{L1-L2} , U_{L2-L3} und U_{L3-L1} ausgewertet |

6.1.2 Einheiten

| | |
|-------|--|
| %Unom | Prozent der Nennspannung (Nennspannungsfaktor) |
|-------|--|

6.1.3 Funktionale Sicherheit

| | |
|------------|---|
| Errtol 2ch | es werden 2 getrennte Schütze mit 2 getrennten Hilfskontakten angeschlossen |
| Errtol 1ch | es wird 1 externer Schütz mit 1 Hilfskontakt angeschlossen |

6.1.4 Operational Mode

Hier kann zwischen 2 verschiedenen Betriebsmodi umgeschaltet werden

Wird momentan nur für die CEI-021 verwendet

| | |
|---------|-----------------|
| Mode 0: | transitory mode |
| Mode 1: | definitive mode |

6.1.5 Schwellen

| | |
|--------------------|---|
| $U_{THR OFF}$ | Spannungsschwelle für Abschaltung |
| $U_{THR ON}$ | Spannungsschwelle für Zuschaltung |
| $f_{THR OFF}$ | Frequenzschwelle für Abschaltung |
| $f_{THR ON}$ | Frequenzschwelle für Zuschaltung |
| $RoCoF_{THR OFF}$ | Frequenzänderungsschwelle für Abschaltung |
| $RoCoF_{THR ON}$ | Frequenzänderungsschwelle für Zuschaltung |
| $PShift_{THR OFF}$ | Phasensprungschwelle für Abschaltung |
| $PShift_{THR ON}$ | Phasensprungschwelle für Zuschaltung |

6.1.6 Zeiten

| | |
|----------------------------------|---|
| Time OFF | Abschaltverzögerung |
| T on delay | Einschaltverzögerung |
| F wnd Ermittlung vom | window length frequency measuring (beobachtetes Zeitfenster, das für die der Frequenzgröße f / Hz herangezogen wird, einstellbar von 0,1s bis 1s abhängig vom verwendeten Parametersatz) |
| RoCoF wnd | window length RoCoF (Rate of Change of Frequency) measuring (beobachtetes Zeitfenster, das für die Ermittlung des RoCoF Hz/s herangezogen wird, einstellbar von 0,1s bis 1s abhängig vom verwendeten Parametersatz) |
| PShift wnd | window length PShift (Phase Shift) measuring (beobachtetes Zeitfenster, das für die Ermittlung des PShift / ° herangezogen wird, einstellbar von 0,1s bis 1s abhängig vom verwendeten Parametersatz, wobei nur eine Einstellung von 0,1 bis 0,6s Sinn ergibt. Ein Pshift wnd von 0,6s bis 1s wirkt sich nicht auf die Gesamtabschaltverzögerung aus) |
| Gesamtabschaltverz. zusammen: | Diese setzt sich bei der Messung von Frequenz, RoCoF oder Pshift wie folgt zusammen: Frequenz Messung: $\text{TIME OFF}_{\text{gesamt}f} = \text{Time OFF}_f + F \text{ wnd}$ RoCoF-Messung: $\text{TIME OFF}_{\text{gesamtRoCoF}} = \text{Time OFF}_{\text{RoCoF}} + \text{RoCoF wnd}$ Phase Shift Messung: $\text{TIME OFF}_{\text{gesamtPShift}} = \text{Time OFF}_{\text{PShift}} + \text{PShift wnd}$ |

6.1.7 Hilfskontakt

Bei geforderter funktionaler Sicherheit ist das Rücklesen der Stellung der angesteuerten Schütze (über zwangsgeführte Hilfskontakte) notwendig. Für diese Hilfskontakte kann folgendes ausgewählt werden:

| | |
|--------------------------------|---|
| Contact n.c. (normally closed) | Hilfskontakt ist ein Öffner (empfohlene Ausführung) |
| Contact n.o. (normally opened) | Hilfskontakt ist ein Schließer |
| Contact dis. (disabled) | Hilfskontakt wird ignoriert (unzulässig für Standards die funktionale Sicherheit fordern) |
| Contact t | Einstellung der Zeit beim Abschalten, die vergehen darf, bis der Hilfskontakt an I1/2 zurückmelden muss, ansonsten anzeigen eines contact errors |
| T ConDelOn | Einstellung der Zeit beim Zuschalten die vergehen darf, bis der Hilfskontakt des Kuppelschalters an den Klemmen I1/2 zurückmelden muss. Andernfalls wird R1/2 abgeschaltet und ein contact error angezeigt. Zusätzlich wird R3 aktiviert. |

6.1.8 Ranges

| | |
|------------------|--|
| Conformity Range | Innerhalb dieser Grenzen, ist das Gerät normkonform konfiguriert. Außerhalb dieser Grenzen ist das Gerät nicht mehr normkonform und die entsprechenden Zertifikate verlieren ihre Gültigkeit. Dieser Status wird am Display durch die Kennung „ncnf“ dargestellt. Einstellungen außerhalb dieses Bereiches liegen somit in der Verantwortung des Betreibers und/oder der Abnahmestelle der Anlage. |
| Possible Range | Technisch möglicher Einstellbereich |

7 ANHANG (Parameter der implementierten Standards im Detail)

7.1 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 100.0 | 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 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 | 108 | 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 | 108 | 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) | | | | | | |

| 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 | 50.05 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.2 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 | 50.0 |

| 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 / off | | on / off | |
| .019 | Ueff > off | U _{THR} OFF | %Unom | 111 | 100 | 130 | 100 |
| .020 | Ueff > on | U _{THR} ON | %Unom | 108 | 100 | 108 | 100 |
| .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 | 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 / off | |
| .035 | Ueff>> off | U _{THR} OFF | %Unom | 115 | 100 | 130 | 100 |
| .036 | Ueff>> on | U _{THR} ON | %Unom | 108 | 100 | 108 | 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 / 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) | | | | | |

| 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 | 50.05 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.3 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) | | | | | | |

| 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 | 50.05 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.4 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) | | | | | | |

| 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 | 50.05 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.5 Oberösterreich OOE TOR R25 NS SYNC [ID 822] Typ A/B low voltage synchron. 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 100.0 | 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 | | |

| 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 | 85 | 85 | 100 | 10 | 100 |
| .025 | 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) | | | | | | |

| 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 | 30 | 10 | 100 | 10 | 100 |
| .040 | Ueff<< on | U _{THR} ON | %Unom | 85 | 85 | 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) | | | | | | |

| 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 | 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 | 50.1 | 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 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 | 600 |

| 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 | | | | |

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

7.6 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 100.0 | 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 | | |

| 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 | 85 | 85 | 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 | 85 | 85 | 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) | | | | | | |

| 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 | 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 | 50.1 | 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 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 | 600 |

| 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 | | | | |

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

7.7 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) | | | | | | |

| 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 | 50.1 | 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 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 | 47.5 | 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 | 600 |

| 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 | | | | |

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

7.8 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 | 50.1 | 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 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 | 47.5 | 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 | 600 |

| 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 | | | | |

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

7.9 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 | 50.0 |

| 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 / off | | on / off | |
| .019 | Ueff > off | U _{THR} OFF | %Unom | 108 | 100 | 130 | 100 |
| .020 | Ueff > on | U _{THR} ON | %Unom | 107 | 100 | 108 | 100 |
| .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 / off | |
| .035 | Ueff>> off | U _{THR} OFF | %Unom | 115 | 100 | 130 | 100 |
| .036 | Ueff>> on | U _{THR} ON | %Unom | 107 | 100 | 108 | 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 / 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) | | | | | |

| 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 | 51.00 | 50.00 | 55.00 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.10 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 | 50.0 |

| 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 / off | | on / off | |
| .019 | Ueff > off | U _{THR} OFF | %Unom | 108 | 130 | 100 | 135 |
| .020 | Ueff > on | U _{THR} ON | %Unom | 107 | 108 | 100 | 135 |
| .021 | T Ueff > | Time OFF | ms | 60000 | 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 | 100 | 10 | 100 |
| .024 | Ueff < on | U _{THR} ON | %Unom | 90 | 100 | 10 | 100 |
| .025 | T Ueff < | Time OFF | ms | 1000 | 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 / off | |
| .035 | Ueff>> off | U _{THR} OFF | %Unom | 115 | 130 | 100 | 135 |
| .036 | Ueff>> on | U _{THR} ON | %Unom | 107 | 108 | 100 | 135 |
| .037 | T Ueff>> | Time OFF | ms | 100 | 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 / off | |
| .039 | Ueff<< off | U _{THR} OFF | %Unom | 30 | 100 | 10 | 100 |
| .040 | Ueff<< on | U _{THR} ON | %Unom | 90 | 100 | 0 | 100 |
| .041 | T Ueff<< | Time OFF | ms | 200 | 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) | | | | | |

| 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 | 51.00 | 50.00 | 55.00 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.11 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 |
| | | Unom Δ | V | 102.0 | 100.0 | 400.0 | 50.0 |
| 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 |
| .012 | U > on | U _{THR} ON | %Unom | 107 | 100 | 108 | 100 |
| .013 | T U > | Time OFF | ms | 60000 | 50 | 180000 | 50 |
| 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 |
| .016 | U < on | U _{THR} ON | %Unom | 90 | 86 | 100 | 10 |
| .017 | T U < | Time OFF | ms | 1000 | 50 | 180000 | 50 |
| 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 /off | |
| .027 | U >> off | U _{THR} OFF | %Unom | 115 | 100 | 130 | 100 |
| .028 | U >> on | U _{THR} ON | %Unom | 107 | 100 | 108 | 100 |
| .029 | T U >> | Time OFF | ms | 100 | 50 | 180000 | 50 |
| 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 /off | |
| .031 | U << off | U _{THR} OFF | %Unom | 30 | 10 | 100 | 10 |
| .032 | U << on | U _{THR} ON | %Unom | 90 | 86 | 100 | 0 |
| .033 | T U << | Time OFF | ms | 200 | 50 | 180000 | 50 |
| 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) | | | | | |

| Overfrequency1 | | | | Conformity Range | | Possible Range | | |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID | | | | Default | Min | Max | Min | Max |
| .055 | f > off | f _{THR} OFF | Hz | 51.00 | 50.00 | 55.00 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.12 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) | | | | | | |

| Overfrequency1 | | | | Conformity Range | | Possible Range | | |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID | | | | Default | Min | Max | Min | Max |
| .055 | f > off | f _{THR} OFF | Hz | 51.00 | 50.00 | 55.00 | 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 | | | | | | |
| 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 | 49.50 | 47.55 | 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 | 600 |

| 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 | | | | |

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

7.13 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 | 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 | 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 | 85 | 80 | 85 |
| .016 | ULL < on | U _{THR} ON | %Unom | 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 | 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 | 85 | 80 | 85 |
| .024 | ULN < on | U _{THR} ON | %Unom | 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 | Min | Max |
| .043 | U > off | U _{THR} OFF | %Unom | 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 | 600 |

| 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 | | | | | |

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

7.14 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 |
| | | 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 | 100 |
| .017 | T ULL < | Time OFF | ms | 1000 | 50 | 1000 | 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 |
| | | 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 | 100 |
| .025 | T ULN < | Time OFF | ms | 1000 | 50 | 1000 | 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 | 100 |
| .033 | T ULL << | Time OFF | ms | 300 | 50 | 300 | 10000 |
| Comment: | | ULL << on has a fixed offset of 0.5% U _{NOM} added to the displayed value | | | | | |

| 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 |
| .041 | T ULN << | Time OFF | ms | 200 | 50 | 300000 | 50 | 300000 |
| 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 | 600 |

| 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 | | | | |

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

7.15 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 | | | | | | |

| 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 | 600 |

| 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 | | | | |

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

7.16 VDE-AR-N 4110:2018 TR3-25 [ID 706]

| 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 |

| 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 | 110 | 100 | 130 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (1% U _{NOM}) | | | |
| .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 |
| .019 | ULN > off | U _{THR} OFF | %Unom | 110 | 100 | 130 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (1% U _{NOM}) | | | |
| .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 |
| .027 | ULL >> off | U _{THR} OFF | %Unom | 125 | 100 | 130 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (1% U _{NOM}) | | | |
| .029 | T ULL >> | Time OFF | ms | 100 | 100 | 100 | 10000 |
| 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 | 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 |
| .035 | ULN >> off | U _{THR} OFF | %Unom | 125 | 100 | 130 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (1% U _{NOM}) | | | | |
| .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 | | | | | | |

| Overfrequency2 | | | | 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 | | | | |

| Auxiliary Contact type | | | | Conformity Range | | Possible Range | | |
|------------------------|-----------|----------|------------------------|------------------|------------------------|----------------|------------------------|-----|
| ID | | | Default | | Min | Max | Min | Max |
| .099 | Contact | Type | dis. (disabled) | | n.o. (normally opened) | | n.o. (normally opened) | |
| | | | | | n.c. (normally closed) | | n.c. (normally closed) | |
| | | | | | dis. (disabled) | | 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) | | n.c. (normally closed) | |
| | | | | | dis. (disabled) | | 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 | 600 |

| Password | | | | | Min | Max |
|----------|-----|---|--|---------|-----|-----|
| ID | | | | Default | | |
| .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: xxxxxx | xxxxx = 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 |

7.17 CEI 0-21:2019 [ID 102]

| 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) | | | | | | |

| 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} | | | | | | |

| 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.18 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 | 240.0 | 100.0 | 240.0 |
| | | Unom Δ | V | 400.0 | 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 | 114 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .021 | T O/V st 1 | Time OFF | ms | 1000 | 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 | 119 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .037 | T O/V st 2 | Time OFF | ms | 500 | 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 | 80 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .041 | T U/V | Time OFF | ms | 2500 | 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 | 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 | 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 | 52.00 | 50.00 | 55.00 |
| | | f _{THR} ON | Hz | Fixed Hysteresis (0.05 Hz) | | | | |
| .065 | T O/F | 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 | 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.19 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 100.0 | 400 | 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 | 110 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .013 | T O/V st 1 | Time OFF | ms | 1000 | 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 | 113 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .029 | T O/V st 2 | Time OFF | ms | 500 | 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 | 80 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .033 | T U/V | Time OFF | ms | 2500 | 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 | 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 | 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 | 52.00 | 50.00 | 55.00 |
| | | f _{THR} ON | Hz | Fixed Hysteresis (0.05 Hz) | | | | |
| .065 | T O/F | 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 | 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.20 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 | 240.0 | 100.0 | 240.0 |
| | | Unom Δ | V | 400.0 | 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 | 114 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .021 | T O/V st 1 | Time OFF | ms | 1000 | 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 | 119 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .037 | T O/V st 2 | Time OFF | ms | 500 | 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 | 80 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .041 | T U/V | Time OFF | ms | 2500 | 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 | 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 | 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 | 52.00 | 50.00 | 55.00 |
| | | f _{THR} ON | Hz | Fixed Hysteresis (0.05 Hz) | | | | |
| .065 | T O/F | 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 | | 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.21 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 | 110 | 100 | 100 | 135 |
| .020 | U LN > on | U _{THR} ON | %Unom | 109 | 100 | 100 | 135 |
| .021 | T U LN > | Time OFF | ms | 1000 | 0 | 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 | 70 | 50 | 0 | 100 |
| .024 | U LN < on | U _{THR} ON | %Unom | 85 | 50 | 0 | 100 |
| .025 | T U LN < | Time OFF | ms | 1500 | 0 | 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 | 100 | 135 |
| .036 | U LN>> on | U _{THR} ON | %Unom | 114 | 100 | 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 | 0 | 100 |
| .040 | U LN<< on | U _{THR} ON | %Unom | 85 | 50 | 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) | | | | | |

| Overfrequency1 | | | | Conformity Range | | Possible Range | |
|------------------|---------|---|----|---|-------|----------------|-------|
| ID | | Default | | Min | Max | Min | Max |
| .055 | f > off | f _{THR} OFF | Hz | 51.50 | 51.50 | 50.00 | 55.00 |
| .056 | f > on | f _{THR} ON | Hz | 50.10 | 50.00 | 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 | 600 |

| 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 | | | | |

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

7.22 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 | 120 | 100 | 135 |
| .020 | U LN > on | U _{THR} ON | %Unom | 109 | 100 | 120 | 100 | 135 |
| .021 | T U LN > | Time OFF | ms | 100 | 100 | 100000 | 100 | 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 | 100 | 0 | 100 |
| .024 | U LN < on | U _{THR} ON | %Unom | 85 | 50 | 100 | 0 | 100 |
| .025 | T U LN < | Time OFF | ms | 100 | 100 | 100000 | 100 | 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 /off | | |
| .043 | Uavg off | U _{THR} OFF | %Unom | 110 | 100 | 115 | 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} | | | | | | |

| 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 | 600 |

| 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: xxxxxx | xxxxx = 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 |

7.23 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 |

| 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 | 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 | 100 | 130 | 135 |
| .028 | U LL>> on | U _{THR} ON | %Unom | 114 | 100 | 120 | 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 | 100 |
| .032 | U LL<< on | U _{THR} ON | %Unom | 90 | 50 | 100 | 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) | | | | | |

| Overfrequency1 | | | | Conformity Range | | Possible Range | |
|------------------|---------|---|----|---|-------|----------------|-------|
| ID | | Default | | Min | Max | Min | Max |
| .055 | f > off | f _{THR} OFF | Hz | 51.50 | 51.50 | 50.00 | 55.00 |
| .056 | f > on | f _{THR} ON | Hz | 50.10 | 50.00 | 52.00 | 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 | 600 |

| 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 | | | | |

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

7.24 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 100.0 | 400.0 | 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 | U LL > off | U _{THR} OFF | %Unom | 115 | 100 | 120 | 100 | 135 |
| .012 | U LL > on | U _{THR} ON | %Unom | 109 | 100 | 120 | 100 | 135 |
| .013 | T U LL > | Time OFF | ms | 100 | 100 | 100000 | 100 | 100000 |
| 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 | 100 |
| .016 | U LL < on | U _{THR} ON | %Unom | 90 | 50 | 100 | 0 | 100 |
| .017 | T U LL < | Time OFF | ms | 100 | 100 | 100000 | 100 | 100000 |
| 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 | 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 |
| .057 | T f > | Time OFF | ms | 100 | 100 | 100000 | 100 | 100000 |
| 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 |
| .061 | T f < | Time OFF | ms | 100 | 100 | 100000 | 100 | 100000 |
| 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 | 600 |

| 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: xxxxxx | xxxxx = 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 |

7.25 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 | |
| .011 | ULL > off | U _{THR} OFF | %Unom | 110 | 115 | 100 | 135 |
| .012 | ULL > on | U _{THR} ON | %Unom | 110 | 110 | 100 | 135 |
| .013 | T ULL > | Time OFF | ms | 60000 | 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 | 100 | 10 | 100 |
| .016 | ULL < on | U _{THR} ON | %Unom | 90 | 100 | 10 | 100 |
| .017 | T ULL < | Time OFF | ms | 100 | 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 | |
| .019 | ULN > off | U _{THR} OFF | %Unom | 110 | 115 | 100 | 135 |
| .020 | ULN > on | U _{THR} ON | %Unom | 110 | 110 | 100 | 135 |
| .021 | T ULN > | Time OFF | ms | 60000 | 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 | 100 | 10 | 100 |
| .024 | ULN < on | U _{THR} ON | %Unom | 90 | 100 | 10 | 100 |
| .025 | T ULN < | Time OFF | ms | 100 | 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 | | | | | |

| 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 |
| .102 | Ton delay | Turn on time | s | 120 | 0 | 1800 | 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 | | | |

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

7.26 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 | 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 | |
| .011 | ULL > off | U _{THR} OFF | %Unom | 110 | 115 | 100 | 135 |
| .012 | ULL > on | U _{THR} ON | %Unom | 110 | 110 | 100 | 135 |
| .013 | T ULL > | Time OFF | ms | 60000 | 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 | 100 | 10 | 100 |
| .016 | ULL < on | U _{THR} ON | %Unom | 85 | 100 | 10 | 100 |
| .017 | T ULL < | Time OFF | ms | 1500 | 10000 | 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 | |
| .019 | ULN > off | U _{THR} OFF | %Unom | 110 | 115 | 100 | 135 |
| .020 | ULN > on | U _{THR} ON | %Unom | 110 | 110 | 100 | 135 |
| .021 | T ULN > | Time OFF | ms | 60000 | 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 | 100 | 10 | 100 |
| .024 | ULN < on | U _{THR} ON | %Unom | 85 | 100 | 10 | 100 |
| .025 | T ULN < | Time OFF | ms | 1500 | 10000 | 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 | | | | | |

| 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 | | | | | | |

| 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 | | | | | |

| Device Information | | |
|--------------------|---------------|---|
| ID | | |
| .105 | ID: xxxxxx | xxxxx = 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 |

7.27 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 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 | | |

| Overvoltage ¹ 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 | | | | | | |

| Undervoltage ¹ 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 | 85 | 85 | 100 | 10 | 100 |
| .017 | T ULL < | Time OFF | ms | 1000 | 50 | 10000 | 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 | | | | | | |

| Overvoltage ¹ 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 | | | | | | |

| Undervoltage ¹ 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 | 85 | 85 | 100 | 10 | 100 |
| .025 | T ULN < | Time OFF | ms | 1000 | 50 | 10000 | 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 | | | | | | |

| 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 | | | | | | |

| 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 | | | | | Min | Max | |
|----------|-----|---|--|---------|-----|-----|---|
| 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: xxxxxx | xxxxx = 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 |

7.28 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 | 100 | 135 |
| .020 | U > on | U _{THR ON} | %Unom | 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 | | | |

| 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.29 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 | 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) | | | | | |

| 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.30 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 | V | Fixed to 230.0 / 400.0 | | | |
| | | Unom Δ | V | | | | |

| 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 | 100 | 135 |
| .012 | ULLmax on | U _{THR} ON | %Unom | 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 | 10 | 100 |
| .016 | ULLmin on | U _{THR} ON | %Unom | 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 | 100 | 135 |
| .020 | U >> on | U _{THR} ON | %Unom | 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 | 10 | 100 |
| .024 | U < on | U _{THR} ON | %Unom | 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 | 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 | 50.00 | 55.00 |
| .056 | F > on | f _{THR} ON | Hz | 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 |
| | | 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 | 600 |

| 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 | | | | | |

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

7.31 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) | | | | | |

| Undervoltage2 Line to Line | | | | Conformity Range | | Possible Range | | |
|----------------------------|-----------|--|-------|------------------|-----|----------------|-----|-------|
| ID | | | | Default | Min | Max | Min | Max |
| .031 | ULL<2 OFF | U _{THR} OFF | %Unom | 49 | 49 | 49 | 10 | 100 |
| .032 | ULL<2 ON | U _{THR} ON | %Unom | 51 | 51 | 100 | 10 | 100 |
| .033 | ULL<2 T | Time OFF | ms | 200 | 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 | 121 | 100 | 135 |
| .036 | ULN>2 ON | U _{THR} ON | %Unom | 119 | 100 | 119 | 100 | 135 |
| .037 | ULN>2 T | Time OFF | ms | 160 | 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 | 49 | 10 | 100 |
| .040 | ULN<2 ON | U _{THR} ON | %Unom | 51 | 51 | 100 | 10 | 100 |
| .041 | ULN<2 T | Time OFF | ms | 200 | 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 | 52.00 | 50.00 | 60.00 |
| .056 | f>1 ON | f _{THR} ON | Hz | 50.50 | 50.00 | 50.50 | 50.00 | 60.00 |
| .057 | f>1 T | Time OFF | ms | 4000 | 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 | 47.00 | 40.00 | 50.00 |
| .060 | f<1 ON | f _{THR} ON | Hz | 47.10 | 47.10 | 50.00 | 40.00 | 50.00 |
| .061 | f<1 T | Time OFF | ms | 200 | 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 | 50.00 | 50.49 | 50.00 | 50.49 |
| .089 | f>RND T | Time OFF | ms | 4000 | 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 | 10 | 9990 | 10 | 9990 |
| .092 | RoCoF ON | RoCoF _{THR} ON | mHz/s | 950 | 10 | 9990 | 100 | 9990 |
| .093 | RoCoFDelay | Time OFF | ms | 500 | 50 | 60000 | 50 | 60000 |
| .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 | ° | 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 | 600 |

| 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 | | | | |

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

7.32 AS/NZS 4777.2:2015 [ID 1102]

| 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 |

| Underfrequency1 | | | | Conformity Range | | Possible Range | |
|-----------------|--------|----------------------|----|------------------|-------|----------------|--------|
| ID | | Default | | Min | Max | Min | Max |
| .059 | F< off | f _{THR} OFF | Hz | 47.00 | 47.00 | 40.00 | 50.00 |
| .060 | F< on | f _{THR} ON | Hz | 47.50 | 50.00 | 40.00 | 50.00 |
| .061 | T F< | Time OFF | ms | 2000 | 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 | 600 |

| 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 | | | | |

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

7.33 OPEN SETUP [ID 9005]

| 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 | 250.0 |
| | | Unom Δ | V | 400.0 | 50.0 | 434.8 | 50.0 | 434.8 |

| 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 | | | | |

| Overvoltage ¹ Line to Line | | | | Conformity Range | | Possible Range | | |
|---------------------------------------|-----------|--|-------|------------------|-----|----------------|-----|--------|
| ID | | Default | | Min | Max | Min | Max | |
| .010 | ULL>1 | Enable function | | on | | on / off | | |
| .011 | ULL>1 OFF | U _{THR} OFF | %Unom | 110 | 0 | 180 | 0 | 180 |
| .012 | ULL>1 ON | U _{THR} ON | %Unom | 109 | 0 | 180 | 0 | 180 |
| .013 | ULL>1 T | Time OFF | ms | 200 | 50 | 300000 | 50 | 300000 |
| Only active for: | | Connection Modes: 3-wire, 4-wire (LN+LL) | | | | | | |

| Undervoltage ¹ Line to Line | | | | Conformity Range | | Possible Range | | |
|--|-----------|--|-------|------------------|-----|----------------|-----|--------|
| ID | | Default | | Min | Max | Min | Max | |
| .014 | ULL<1 | Enable function | | on | | on / off | | |
| .015 | ULL<1 OFF | U _{THR} OFF | %Unom | 90 | 0 | 180 | 0 | 180 |
| .016 | ULL<1 ON | U _{THR} ON | %Unom | 91 | 0 | 180 | 0 | 180 |
| .017 | ULL<1 T | Time OFF | ms | 200 | 50 | 300000 | 50 | 300000 |
| Only active for: | | Connection Modes: 3-wire, 4-wire (LN+LL) | | | | | | |

| Overvoltage ¹ Line to Neutral | | | | Conformity Range | | Possible Range | | |
|--|-----------|---|-------|------------------|-----|----------------|-----|--------|
| ID | | Default | | Min | Max | Min | Max | |
| .018 | ULN>1 | Enable function | | on | | on / off | | |
| .019 | ULN>1 OFF | U _{THR} OFF | %Unom | 110 | 0 | 180 | 0 | 180 |
| .020 | ULN>1 ON | U _{THR} ON | %Unom | 109 | 0 | 180 | 0 | 180 |
| .021 | ULN>1 T | Time OFF | ms | 200 | 50 | 300000 | 50 | 300000 |
| Only active for: | | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) | | | | | | |

| Undervoltage ¹ Line to Neutral | | | | Conformity Range | | Possible Range | | |
|---|-----------|---|-------|------------------|-----|----------------|-----|--------|
| ID | | Default | | Min | Max | Min | Max | |
| .022 | ULN<1 | Enable function | | on | | on / off | | |
| .023 | ULN<1 OFF | U _{THR} OFF | %Unom | 90 | 0 | 180 | 0 | 180 |
| .024 | ULN<1 ON | U _{THR} ON | %Unom | 91 | 0 | 180 | 0 | 180 |
| .025 | ULN<1 T | Time OFF | ms | 200 | 50 | 300000 | 50 | 300000 |
| 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>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 |

| 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 |

| 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 | 600 |

| 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 | | | | |

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

7.34 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) | | | | | |

| 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 | | | | | | |

| 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.35 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 | 100 | 135 |
| .012 | ULLmax on | U _{THR} ON | %Unom | 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 | 10 | 100 |
| .016 | ULLmin on | U _{THR} ON | %Unom | 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 | 100 | 135 |
| .020 | U >> on | U _{THR} ON | %Unom | 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 | 10 | 100 |
| .024 | U < on | U _{THR} ON | %Unom | 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 | 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 | 50.00 | 55.00 |
| .056 | f > on | f _{THR} ON | Hz | 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 | 600 |

| 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 | | | | | |

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

7.36 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 | 50.0 |

| 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 | 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) | | | | | |

| 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 |
| .032 | ULL<< On | U _{THR} ON | %Unom | 95 | 95 | 95 | 10 |
| .033 | T ULL<< | Time OFF | ms | 300 | 300 | 300 | 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) | | | | | |

| 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 | 600 |

| 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 | | | | |

| Device Information | | |
|--------------------|---------------------------------|--|
| ID | | |
| .105 | ID: xxxxxx SW: aa.dd.ccb | xxxxx = 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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| 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 | 240.0 | 100.0 | 240.0 |
| | | Unom Δ | V | 400.0 | 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 | 114 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .021 | T O/V st 1 | Time OFF | ms | 1000 | 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 | 87 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .025 | T U/V st 1 | Time OFF | ms | 2500 | 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 | 119 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .037 | T O/V st 2 | Time OFF | ms | 500 | 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 | 80 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .041 | T U/V st 2 | Time OFF | ms | 500 | 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 | 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 | 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 | 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 | 20000 | 1000 | 300000 |

| 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = 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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| 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 | 241.4 |
| | | Unom Δ | V | 400.0 | 100.0 | 400.0 | 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 | 110 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .013 | T O/V st 1 | Time OFF | ms | 1000 | 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 | 87 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .017 | T U/V st 1 | Time OFF | ms | 2500 | 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 | 113 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .029 | T O/V st 2 | Time OFF | ms | 500 | 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 | 80 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .033 | T U/V st 2 | Time OFF | ms | 500 | 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 | 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 | 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 | 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 | 20000 | 1000 | 300000 |

| 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 | 600 |

| 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 | | | | |

| Device Information | | |
|--------------------|---------------------------------|--|
| ID | | |
| .105 | ID: xxxxxx SW: aa.dd.ccb | xxxxx = 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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| 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 | 240.0 | 100.0 | 240.0 |
| | | Unom Δ | V | 400.0 | 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 | 114 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .021 | T O/V st 1 | Time OFF | ms | 1000 | 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 | 87 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .025 | T U/V st 1 | Time OFF | ms | 2500 | 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 | 119 | 100 | 135 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .037 | T O/V st 2 | Time OFF | ms | 500 | 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 | 80 | 0 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.75% U _{NOM}) | | | | |
| .041 | T U/V st 2 | Time OFF | ms | 500 | 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 | 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 | 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 | 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 | 20000 | 1000 | 120000 |

| 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = 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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| 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 | 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 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.5% U _{NOM}) | | | |
| | | Time OFF | ms | 1500 | 100 | 1500 | 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 | 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 | 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 | | | | | |

| Underfrequency1 | | | | Conformity Range | | Possible Range | |
|-----------------|---------|---|----|---|-------|----------------|-------|
| ID | | Default | | Min | Max | Min | Max |
| .059 | f < off | f _{THR} OFF | Hz | 47.50 | 47.50 | 40.00 | 50.00 |
| .060 | f < on | f _{THR} ON | Hz | 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 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 | 600 |

| 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: xxxxxx SW: aa.dd.ccb | xxxxx = Device ID dd: Software version of Display Software aa: Software version of Measuring Software cc: Index of Configuration set b: Version of Configuration set |

7.41 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 | 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 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 | 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 | 100 |
| | | U _{THR} ON | %Unom | Fixed Hysteresis (0.5% U _{NOM}) | | | |
| | | Time OFF | ms | Fixed to fastest possible disconnection | | | |
| .017 | T ULL < | Time OFF | ms | 1500 | 100 | 1500 | 10000 |
| 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 | 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 | 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 | | | | | |

| Underfrequency1 | | | | Conformity Range | | Possible Range | |
|-----------------|---------|---|----|---|-------|----------------|-------|
| ID | | Default | | Min | Max | Min | Max |
| .059 | f < off | f _{THR} OFF | Hz | 47.50 | 47.50 | 40.00 | 50.00 |
| .060 | f < on | f _{THR} ON | Hz | 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 | 600 |

| 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: xxxxxx | xxxxx = 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 |

Für weitere Informationen kontaktieren Sie bitte:

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