



SA11 Ramp Rates			
		CAL-Setup	HI-Setup
Output current Rating [A]	I _{rated}	according rating plate	according rating plate
Minimum normal ramp up rate [%I _{rated} /sec]	RR _{norm_up_min}	0,1	0,1
Maximum normal ramp up rate [%I _{rated} /sec]	RR _{norm_up_max}	100	100
Minimum output current [A]	I _{low}	10% I _{rated}	10% I _{rated}
Ramp Rate Accuracy MSARR [%I _{rated} /sec]		≤ 1%	≤ 1%
Minimum soft start ramp up rate [%I _{rated} /sec]	RR _{SS_min}	0,1	0,1
Maximum soft start ramp up rate [%I _{rated} /sec]	RR _{SS_max}	100	100

SA12 SPF - Specified Power Factor			
		CAL-Setup	HI-Setup
Apparent Power Rating [VA]	S _{rated}	according rating plate	according rating plate
Output Power Rating [W]	P _{rated}	according rating plate	according rating plate
DC input voltage range with function enabled [V]		according rating plate	according rating plate
Nominal AC voltage [V]	V _{nom}	according rating plate	according rating plate
AC voltage range with function enabled [V _{min} , V _{max}]		according rating plate	according rating plate
AC voltage measurement accuracy [V]	MSA _{Vac}	≤ 1% V _n	≤ 1% V _n
DC voltage measurement accuracy [V]	MSA _{Vdc}	≤ 2% V _n	≤ 2% V _n
Active power range of function [W]	P _{low} , P _{rated}	20% - 100%	20% - 100%
Power Factor Accuracy	MSA _{PF}	0,01	0,01
Power Factor settling time [sec]		1	2
Minimum Inductive (Underexcited) Power Factor	PF _{min,ind}	0,85	0,85
Minimum Capacitive (Overexcited) Power Factor	PF _{min,cap}	0,85	0,85
Power factor default	PF	1	-0.95
PF _{mid,cap}		0,925	0,925
PF _{mid, ind}		0,925	0,925

SA13 Volt-Var Mode			
		CAL-Setup	HI-Setup
Apparent Power Rating [VA]	S _{rated}	according rating plate	according rating plate
Output Power Rating [W]	P _{rated}	according rating plate	according rating plate
EUT Input voltage range with function enabled [V]		according rating plate	according rating plate
Nominal AC EPS voltage [V]	V _{nom}	according rating plate	according rating plate
AC EPS voltage range with function enabled [V]	V _{min} - V _{max}	according rating plate	according rating plate
Reactive Power Accuracy [% or Var]		±2,5% S _n	±2,5% S _n
Maximum Ramp Rate[Var/s]		100%Q _{max} / 0,02V _n	100%Q _{max} / 0,02V _n
Maximum Rated Reactive Power Production (Capacitive,Overexcited) [Var]	Q _{max,over cap}	53% of S _n	53% von S _n
Maximum Rated Reactive Power Production (Inductive,Underexcited) [Var]	Q _{max,under ind}	53% of S _n	53% von S _n
Maximum Slope [Var/V]	K _{VARmax}	48,08%Q _{max} / V	48,08%Q _{max} / V
Deadband Range [V]	Deadband _{min} Deadband _{max}	0%V _{nom} 20%V _{nom}	0%V _{nom} 20%V _{nom}
Settling Time [s]		10	10
V1=the voltage at Q1		0,88 V _n	0,92 V _n
Q1=the maximum reactive power production setting		53% or 100% of nameplate apparent power	53% or 100% of nameplate apparent power

V2=the voltage at Q2		0,99 Vn	0,98 Vn
Q2=the reactive power setting at the lower voltage deadband limit		0	0
V3=the voltage at Q3		1,01 Vn	1,02 Vn
Q3=the reactive power setting at the upper voltage deadband limit		0	0
V4=the voltage at Q4		1,1 Vn	1,06 Vn
Q4=the maximum reactive power absorption setting		53% or 100% of nameplate apparent power	53% of nameplate apparent power

SA14 Frequency Watt

		CAL-Setup	HI-Setup
Output Power Rating [W]	P _{rated}	according rating plate	according rating plate
AC frequency range with function enabled [Hz]	f _{min} , f _{max}	according rating plate	according rating plate
Manufacturer's stated AC frequency measurement accuracy [Hz or %Hz]	MSA _{Hz}	0,05Hz	0,05
Manufacturer's stated P(f) accuracy [W or %W]	MSA _{P(f)}	±2,5% Prated	±2,5% Prated
Settling time [sec]	t _s	1	1
Adjustment range of the start of frequency droop [Hz]	f _{start_min} , f _{start_max}	60,017 Hz - 66 Hz	60,017 Hz - 66 Hz
Maximum slope of frequency droop [%Prated/Hz]	K _{Power-Frequ_Max}	100 %/Hz	100 %/Hz
Minimum slope of frequency droop [%Prated/Hz]	K _{Power-Frequ_Min}	10 %/Hz	10 %/Hz
Slope of active power response to changes in frequency	K _{Power_Frequ}	33%/Hz	33%/Hz

SA15 Voltage Watt

		CAL-Setup	HI-Setup
Output Power Rating [W]	P _{rated}	according rating plate	according rating plate
AC voltage range with function enabled [V]	V _{min} - V _{max}	according rating plate	according rating plate
Nominal AC voltage [V]	V _{nom}	according rating plate	according rating plate
AC voltage accuracy [V or %V]	MSA _{Vac}	≤ 1% Vn	≤ 1% Vn
Output Power accuracy [W or %W]	MSA _{Watts}	≤2,5%Prated	≤2,5%Prated
Accuracy of time	MSA _t	1cyc +1,5cyc (detection time)	1cyc +1,5cyc (detection time)
Settling time [sec]	t _s	10 sec	10 sec
Adjustment range of the start of active power reduction [V]	V _{start_min} , V _{start_max}	103%Vnom - 113%Vnom	103%Vnom - 113%Vnom
Adjustment range of the stop of the curtailment function [V]	V _{stop_min} , V _{stop_max}	no hysteresis	no hysteresis
Maximum Slope of active power reduction @208V [%Prated/V]	K _{power-Volt_Max}	48.1 %Pmom/V	48.1 %Pmom/V
Maximum Slope of active power reduction @240V [%Prated/V]	K _{power-Volt_Max}	41,7%Pmom/V	41,7%Pmom/V
Maximum Slope of active power reduction @480V [%Prated/V]	K _{power-Volt_Max}	36,1%Pnom/V	36,1%Pnom/V
Minimum Slope of active power reduction @208V [%Prated/V]	K _{power-Volt_Min}	6,8 %Pmom/V	6,8 %Pmom/V
Minimum Slope of active power reduction @240V [%Prated/V]	K _{power-Volt_Min}	5,9%Pmom/V	5,9%Pmom/V
Minimum Slope of active power reduction @480V [%Prated/V]	K _{power-Volt_Min}	5,16%Pnom/V	5,16%Pnom/V
Range of adjustment of a delay before return to normal operation [sec]	t _{return_min} , t _{return_max}	no hysteresis	no hysteresis
Adjustment range of the rate of return to normal operation [%Prated/sec]	K _{Power_Rate_Min} , K _{Power_Rate_Max}	no hysteresis	no hysteresis
Use of hysteresis in the Volt-Watt function		no hysteresis	no hysteresis
Slope of the active power response to changes in voltage	K _{Power_Volt_default}	12.02 %Pmom/V	12.02 %Pmom/V
Slope of the active power response to changes in voltage	K _{Power_Volt_default}	10,4 %Pmom/V	10,4 %Pmom/V
Slope of the active power response to changes in voltage	K _{Power_Volt_default}	9,03%Pnom/V	9,03%Pnom/V
Active power rate of return to normal operation	K _{Power_Rate}	no hysteresis	no hysteresis

Voltage Line - Line

calculated Line - Neutral Voltage

Line - Neutral Voltage Monitoring

Frequency

values are used for the following trip limits:
- U Inner Limit Max / - U IL Max TripTime
- U Inner Limit min / - U IL Min TripTime
- U Outer Limit Max / - U OL Max TripTime
- U Outer Limit Min / - U OL Min TripTime
- U reconnection max / - U reconnection min
- Initial Start Time / - Reconnect Time

values are used for the following trip limits:
- NL U Inner Limit Max / - NL U IL Max TripTime
- NL U Inner Limit min / - NL U IL Min TripTime
- NL U Outer Limit Max / - NL U OL Max TripTime
- NL U Outer Limit Min / - NL U OL Min TripTime

values are used for the following trip limits:
- Freq Inner Limit Max / - Freq IL Max TripTime
- Freq Inner Limit min / - Freq IL Min TripTime
- Freq Outer Limit Max / - Freq OL Max TripTime
- Freq Outer Limit Min / - Freq OL Min TripTime
- Freq reconnection max / - Freq reconnection min

Table for Trip Limit 208V (Setup Cal2, Cal4, Rule 21, 3P). Columns: UAC [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 120V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit NL-Mon 120V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 60Hz. Columns: F [Hz], Clearing Time [sec], Clearing Time [Cycles]. Rows include LF2, LF1, HF1, HF2, and adjustable limits.

Table for Trip Limit 208V (Setup H12, H14, Rule 14H, 3P). Columns: UAC [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 120V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit NL-Mon 120V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 60Hz. Columns: F [Hz], Clearing Time [sec], Clearing Time [Cycles]. Rows include LF2, LF1, HF1, HF2, and adjustable limits.

Table for Trip Limit 240V (Setup Cal1, Cal5, Rule 21, 3P). Columns: UAC [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 138V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit NL-Mon 120V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 60Hz. Columns: F [Hz], Clearing Time [sec], Clearing Time [Cycles]. Rows include LF2, LF1, HF1, HF2, and adjustable limits.

Table for Trip Limit 240V (Setup H11, H15, Rule 14H, 3P). Columns: UAC [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 138V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit NL-Mon 120V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 60Hz. Columns: F [Hz], Clearing Time [sec], Clearing Time [Cycles]. Rows include LF2, LF1, HF1, HF2, and adjustable limits.

Table for Trip Limit 480V (Setup Cal3, Rule 21, 3P). Columns: UAC [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 277V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit NL-Mon 277V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 60Hz. Columns: F [Hz], Clearing Time [sec], Clearing Time [Cycles]. Rows include LF2, LF1, HF1, HF2, and adjustable limits.

Table for Trip Limit 480V (Setup H13, Rule 14H, 3P). Columns: UAC [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 277V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit NL-Mon 277V. Columns: Uac [V], Clearing Time [sec], Clearing Time [Cycles]. Rows include LV3, LV2, LV1, HV1, HV2, and adjustable limits.

Table for Trip Limit 60Hz. Columns: F [Hz], Clearing Time [sec], Clearing Time [Cycles]. Rows include LF2, LF1, HF1, HF2, and adjustable limits.

Table with 2 columns: Accuracy, +/- 1.0% of Vnom. Rows include Voltage trip limit accuracy, Frequency trip limit accuracy, Trip time accuracy, and Detection time.

Setup 208 V				Setup 240 V			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V < 50%	104	0.16	9	V < 50%	120	0.16	9
50 ≤ V < 88 %	183	2	118	50 ≤ V < 88 %	211	2	118
110 < V < 120 %	229	1	58	110 < V < 120 %	264	1	58
V ≥ 120 %	249	0.16	9	V ≥ 120 %	288	0.16	9
V _{min inner} adjustable	104 - 198	0.016 - 21.0	1 - 1260	V _{min inner} adjustable	104 - 228	0.016 - 21.0	1 - 1260
V _{max inner} adjustable	218 - 288	0.016 - 21.0	1 - 1260	V _{max inner} adjustable	252 - 288	0.016 - 21.0	1 - 1260
V _{max outer} adjustable	218 - 288	0.016 - 4.25	1 - 255	V _{max outer} adjustable	252 - 288	0.016 - 4.25	1 - 255
V _{min outer} adjustable	104 - 198	0.016 - 4.25	1 - 255	V _{min outer} adjustable	104 - 228	0.016 - 4.25	1 - 255
	F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]		F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]
F + 0.5 (max inner)	> 60.5	0.16	9	F + 0.5 (max inner)	> 60.5	0.16	9
F + 2.0 (max outer)	> 62.0	0.16	9	F + 2.0 (max outer)	> 62.0	0.16	9
F - 0.7 (min inner)	< 59.3	0.16	9	F - 0.7 (min inner)	< 59.3	0.16	9
F - 3.0 (min outer)	< 57.0	0.16	9	F - 3.0 (min outer)	< 57.0	0.16	9
F _{min inner} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min inner} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000
F _{max inner} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max inner} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000
F _{min outer} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min outer} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000
F _{max outer} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max outer} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000
Setup 220 V				Setup 50 Hz			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V < 50%	110	0.16	9	V < 50%	110	0.16	8
50 ≤ V < 88 %	194	2	118	50 ≤ V < 88 %	194	2	100
110 < V < 120 %	242	1	58	110 < V < 120 %	242	1	50
V ≥ 120 %	264	0.16	9	V ≥ 120 %	264	0.16	8
V _{min inner} adjustable	104 - 209	0.016 - 21.0	1 - 1260	V _{min inner} adjustable	104 - 209	0.016 - 21.0	1 - 1050
V _{max inner} adjustable	231 - 288	0.016 - 21.0	1 - 1260	V _{max inner} adjustable	231 - 288	0.016 - 21.0	1 - 1050
V _{max outer} adjustable	231 - 288	0.016 - 4.25	1 - 255	V _{max outer} adjustable	231 - 288	0.016 - 4.25	1 - 212
V _{min outer} adjustable	104 - 209	0.016 - 4.25	1 - 255	V _{min outer} adjustable	104 - 209	0.016 - 4.25	1 - 212
	F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]		F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]
F + 0.5 (max inner)	> 60.5	0.16	9	F + 0.5 (max inner)	> 50.5	0.16	8
F + 2.0 (max outer)	> 62.0	0.16	9	F + 5.0 (max outer)	> 55.0	0.16	8
F - 0.7 (min inner)	< 59.3	0.16	9	F - 2.0 (min inner)	< 48.0	0.16	8
F - 3.0 (min outer)	< 57.0	0.16	9	F - 5.0 (min outer)	< 45.0	0.16	8
F _{min inner} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min inner} adjustable	45.0 - 55.0	0.020 - 600	1 - 30000
F _{max inner} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max inner} adjustable	45.0 - 55.0	0.020 - 600	1 - 30000
F _{min outer} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min outer} adjustable	45.0 - 55.0	0.020 - 600	1 - 30000
F _{max outer} adjustable	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max outer} adjustable	45.0 - 55.0	0.020 - 600	1 - 30000
Trip Limits NL-Mon (120 V)				Trip Limits NL-Mon (127 V)			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V < 50%	60	0.16	9	V < 50%	64	0.16	9 (60Hz) / 8 (50Hz)
50 ≤ V < 88 %	106	2	118	50 ≤ V < 88 %	112	2	118 (60Hz) / 100 (50Hz)
110 < V < 120 %	132	1	58	110 < V < 120 %	139	1	58 (60Hz) / 50 (50Hz)
V ≥ 120 %	144	0.16	9	V ≥ 120 %	152	0.16	9 (60Hz) / 8 (50Hz)
V _{min inner} adjustable	60 - 114	0.016 - 21.0	1 - 1260	V _{min inner} adjustable	60 - 121	0.016 - 21.0	1 - 1260 / 1050 (50Hz)
V _{max inner} adjustable	126 - 152	0.016 - 21.0	1 - 1260	V _{max inner} adjustable	133 - 152	0.016 - 21.0	1 - 1260 / 1050 (50Hz)
V _{max outer} adjustable	126 - 152	0.016 - 4.25	1 - 255	V _{max outer} adjustable	133 - 152	0.016 - 4.25	1 - 255 / 212 (50Hz)
V _{min outer} adjustable	60 - 114	0.016 - 4.25	1 - 255	V _{min outer} adjustable	60 - 121	0.016 - 4.25	1 - 255 / 212 (50Hz)
Accuracy							
Voltage trip limit accuracy	+/- 1.0% of V _{nom}						
Frequency trip limit accuracy	+/- 0.05 Hz						
Trip time accuracy	+/- 16.7 ms (60Hz) / +/- 20.0 ms (50Hz) (1 cycle)						
Detection time	25 ms (60Hz) / 30 ms (50Hz) (1.5 cycles)						
Reconnection 60 Hz Setups				Reconnection 50 Hz Setups			
Reconnection Time	300 s			Reconnection Time	300 s		
Reconnection Time adjustable	5 - 900 s			Reconnection Time adjustable	5 - 900 s		
F _{max} reconnect value	< 60.5Hz			F _{max} reconnect value	< 50.5Hz		
F _{min} reconnect value	> 59.3Hz			F _{min} reconnect value	> 48.0Hz		
V _{min} reconnect value	V > 88%			V _{min} reconnect value	V > 88%		
V _{max} reconnect value	V < 106%			V _{max} reconnect value	V < 106%		
F _{min} reconnect value adjustable	50.0 - 66.0			F _{min} reconnect value adjustable	45.0 - 55.0		
F _{max} reconnect value adjustable	50.0 - 66.0			F _{max} reconnect value adjustable	45.0 - 55.0		
V _{min} reconnect value adjustable	V > 50% - V > 95%			V _{min} reconnect value adjustable	V > 50% - V > 95%		
V _{max} reconnect value adjustable	V < 101% - V < 120%			V _{max} reconnect value adjustable	V < 101% - V < 120%		
F _{max} reconnect value (only für H11 setup)	< 60.1Hz						
F _{min} reconnect value (only für H11 setup)	> 59.9Hz						
V _{max} reconnect value (only für H11 setup)	V < 110%						

Setup 240 V (CAL1; CAL5; Rule21 240V 1P)				Setup 208 V (CAL2; CAL4; Rule 21 208V 1P)			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V < 50% (LV3)	120	1 - 1,5	88 (1.46s)	V < 50% (LV3)	104	1 - 1,5	88 (1.46s)
50 ≤ V < 70 % (LV2)	168	10 - 11	658 (10.96s)	50 ≤ V < 70 % (LV2)	146	10 - 11	658 (10.96s)
70 ≤ V < 88 % (LV1)	211	20 - 21	1258 (20.96s)	70 ≤ V < 88 % (LV1)	183	20 - 21	1258 (20.96s)
110 < V < 120 % (HV1)	264	12 - 13	778 (12.96s)	110 < V < 120 % (HV1)	229	12 - 13	778 (12.96s)
V ≥ 120 % (HV2)	288	0.16	9 (0.149s)	V ≥ 120 % (HV2)	249	0.16	9 (0.149s)
V _{min inner} adjustable (LV1)	104 - 228	0.016 - 21.0	1 - 1260	V _{min inner} adjustable (LV1)	104 - 198	0.016 - 21.0	1 - 1260
V _{max inner} adjustable (HV1)	252 - 288	0.016 - 21.0	1 - 1260	V _{max inner} adjustable (HV1)	218 - 288	0.016 - 21.0	1 - 1260
V _{min middle} adjustable (LV2)	104 - 228	0.016 - 21.0	1 - 1260	V _{min middle} adjustable (LV2)	104 - 198	0.016 - 21.0	1 - 1260
V _{max outer} adjustable (HV2)	252 - 288	0.016 - 4.25	1 - 255	V _{max outer} adjustable (HV2)	218 - 288	0.016 - 4.25	1 - 255
V _{min outer} adjustable (LV3)	104 - 228	0.016 - 4.25	1 - 255	V _{min outer} adjustable (LV3)	104 - 198	0.016 - 4.25	1 - 255
	F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]		F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]
60.5<f<=62.0 (max inner) (HF1)	60.5	299 - 300	17998 (299.96s)	60.5<f<=62.0 (max inner) (HF1)	60.5	299 - 300	17998 (299.96s)
f >62.0 (max outer) (HF2)	62.0	0.16	9 (0.149s)	f >62.0 (max outer) (HF2)	62.0	0.16	9 (0.149s)
57.0<f<=58.5 (min inner) (LF1)	58.5	299 - 300	17998 (299.96s)	57.0<f<=58.5 (min inner) (LF1)	58.5	299 - 300	17998 (299.96s)
f<=57.0 (min outer) (LF2)	57.0	0.16	9 (0.149s)	f<=57.0 (min outer) (LF2)	57.0	0.16	9 (0.149s)
F _{min inner} adjustable (LF1)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min inner} adjustable (LF1)	50.0 - 66.0	0.016 - 600	1 - 36000
F _{max inner} adjustable (HF1)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max inner} adjustable (HF1)	50.0 - 66.0	0.016 - 600	1 - 36000
F _{min outer} adjustable (LF2)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min outer} adjustable (LF2)	50.0 - 66.0	0.016 - 600	1 - 36000
F _{max outer} adjustable (HF2)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max outer} adjustable (HF2)	50.0 - 66.0	0.016 - 600	1 - 36000

Setup 240 V (HI1; HI5; Rule14H 240V 1P)				Setup 208 V (HI2; HI4; Rule 14H 1P)			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V < 50% (UVR3)	120	2.0	118 (1.96s)	V < 50% (UVR3)	104	2.0	118 (1.96s)
50 ≤ V < 70 % (UVR2)	168	10 - 21	1258 (20.96s)	50 ≤ V < 70 % (UVR2)	146	10 - 21	1258 (20.96s)
70 ≤ V < 88 % (UVR1)	211	20 - 21	1258 (20.96s)	70 ≤ V < 88 % (UVR1)	183	20 - 21	1258 (20.96s)
110 < V < 120 % (OVR1)	264	0.92 - 1	58 (0.96s)	110 < V < 120 % (OVR1)	229	0.92 - 1	58 (0.96s)
V ≥ 120 % (OVR2)	288	0.16	9 (0.149s)	V ≥ 120 % (OVR2)	249	0.16	9 (0.149s)
V _{min inner} adjustable (UVR1)	104 - 228	0.016 - 21.0	1 - 1260	V _{min inner} adjustable (UVR1)	104 - 198	0.016 - 21.0	1 - 1260
V _{max inner} adjustable (OVR1)	252 - 288	0.016 - 21.0	1 - 1260	V _{max inner} adjustable (OVR1)	218 - 288	0.016 - 21.0	1 - 1260
V _{min middle} adjustable (UVR2)	104 - 228	0.016 - 21.0	1 - 1260	V _{min middle} adjustable (UVR2)	104 - 198	0.016 - 21.0	1 - 1260
V _{max outer} adjustable (OVR2)	252 - 288	0.016 - 4.25	1 - 255	V _{max outer} adjustable (OVR2)	218 - 288	0.016 - 4.25	1 - 255
V _{min outer} adjustable (UVR3)	104 - 228	0.016 - 4.25	1 - 255	V _{min outer} adjustable (UVR3)	104 - 198	0.016 - 4.25	1 - 255
	F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]		F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]
63.0<f<=64.0 (max inner) (OFR1)	63.0	20 - 21	1258 (20.96s)	63.0<f<=64.0 (max inner) (OFR1)	63.0	20 - 21	1258 (20.96s)
f >64.0 (max outer) (OFR2)	64.0	0.16	9 (0.149s)	f >64.0 (max outer) (OFR2)	64.0	0.16	9 (0.149s)
56.0<f<=57.0 (min inner) (UFR1)	57.0	20 - 21	1258 (20.96s)	56.0<f<=57.0 (min inner) (UFR1)	57.0	20 - 21	1258 (20.96s)
f<=56.0 (min outer) (UFR2)	56.0	0.16	9 (0.149s)	f<=56.0 (min outer) (UFR2)	56.0	0.16	9 (0.149s)
F _{min inner} adjustable (UFR1)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min inner} adjustable (UFR1)	50.0 - 66.0	0.016 - 600	1 - 36000
F _{max inner} adjustable (OFR1)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max inner} adjustable (OFR1)	50.0 - 66.0	0.016 - 600	1 - 36000
F _{min outer} adjustable (UFR2)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{min outer} adjustable (UFR2)	50.0 - 66.0	0.016 - 600	1 - 36000
F _{max outer} adjustable (OFR2)	50.0 - 66.0	0.016 - 600	1 - 36000	F _{max outer} adjustable (OFR2)	50.0 - 66.0	0.016 - 600	1 - 36000

Trip Limits NL-Mon (120 V) (Setup CAL1; CAL2)				Trip Limits NL-Mon (120 V) (Setup HI1; HI2)			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V < 50% (LV3)	60	1 - 1,5	88 (1.46s)	V < 50% (UVR3)	60	2.0	118 (1.96s)
50 ≤ V < 70 % (LV2)	84	10 - 11	658 (10.96s)	50 ≤ V < 70 % (UVR2)	84	10 - 21	1258 (20.96s)
70 ≤ V < 88 % (LV1)	106	20 - 21	1258 (20.96s)	70 ≤ V < 88 % (UVR1)	106	20 - 21	1258 (20.96s)
110 < V < 120 % (HV1)	132	12 - 13	778 (12.96s)	110 < V < 120 % (OVR1)	132	0.92 - 1	58 (0.96s)
V ≥ 120 % (HV2)	144	0.16	9 (0.149s)	V ≥ 120 % (OVR2)	144	0.16	9 (0.149s)
V _{min inner} adjustable (LV1)	60 - 114	0.016 - 21.0	1 - 1260	V _{min inner} adjustable (UVR1)	60 - 114	0.016 - 21.0	1 - 1260
V _{max inner} adjustable (HV1)	126 - 152	0.016 - 21.0	1 - 1260	V _{max inner} adjustable (OVR1)	126 - 152	0.016 - 21.0	1 - 1260
V _{min middle} adjustable (LV2)	60 - 114	0.016 - 21.0	1 - 1260	V _{min middle} adjustable (UVR2)	60 - 114	0.016 - 21.0	1 - 1260
V _{max outer} adjustable (HV2)	126 - 152	0.016 - 4.25	1 - 255	V _{max outer} adjustable (OVR2)	126 - 152	0.016 - 4.25	1 - 255
V _{min outer} adjustable (LV3)	60 - 114	0.016 - 4.25	1 - 255	V _{min outer} adjustable (UVR3)	60 - 114	0.016 - 4.25	1 - 255

Accuracy	
Voltage trip limit accuracy	+/- 1.0% of V _{nom}
Frequency trip limit accuracy	+/- 0.05 Hz
Trip time accuracy	+/- 16.7 ms (60Hz) (1 cycle)
Detection time	25 ms (60Hz) (1.5 cycles)

Reconnection Setups (Setup CAL1; CAL2; CAL4; CAL5)		Reconnection Setups (Setup HI1; HI2; HI4; HI5)	
Reconnection Time	300 s	Reconnection Time	300 s
Reconnection Time adjustable	5 - 900 s	Reconnection Time adjustable	5 - 900 s
F _{max} reconnect value	< 60.5Hz	F _{max} reconnect value	< 60.1Hz
F _{min} reconnect value	> 58.5Hz	F _{min} reconnect value	> 59.9Hz
V _{min} reconnect value	V > 88%	V _{min} reconnect value	V > 88%
V _{max} reconnect value	V < 106%	V _{max} reconnect value	V < 110%
F _{min} reconnect value adjustable	50.0 - 66.0	F _{min} reconnect value adjustable	50.0 - 65.0
F _{max} reconnect value adjustable	50.0 - 66.0	F _{max} reconnect value adjustable	50.0 - 65.0
V _{min} reconnect value adjustable	V > 50% - V > 95%	V _{min} reconnect value adjustable	V > 50% - V > 95%
V _{max} reconnect value adjustable	V < 101% - V < 120%	V _{max} reconnect value adjustable	V < 101% - V < 120%

Special Purpose Utility-Interactive

This unit has been evaluated according to IEEE 1547 and IEEE 1574.1 utility interconnection protective functions. When "Special Purpose Utility-Interactive" (SPUI) setup will be activated, the inverter does not comply to these standards anymore because islanding function will be disabled, frequency and voltage depending power reduction will be activated and the frequency and voltage limits will be changed.

Frequency Dependent Power Reduction (FDPR): When the specified grid frequency limit value is exceeded, the effective power is reduced according to a defined gradient.

Voltage Dependent Power Reduction (VDPR): When the specified grid voltage limit value is exceeded, the maximum effective power is reduced. The power is reduced by a specified gradient according to the phase with the highest voltage.

The field adjustable trip points can be set at the PROFi Service Menu. The access code will be provided by Fronius upon request.

For detailed information ask your national Technical Support team (TSN).

Setup MG 240 V 60Hz (MG6P; MG6N; Microgrid 240V 60Hz 1P)				Setup MG 240 V 50Hz (MG5P; MG5N; Microgrid 240V 50Hz 1P)			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V _{min} outer	115	0,5	28 (0.46s)	V _{min} outer	115	0,5	28 (0.46s)
V _{min} inner	184	0,5	28 (0.46s)	V _{min} inner	184	0,5	28 (0.46s)
V _{max} inner	276	0,5	28 (0.46s)	V _{max} inner	276	0,5	28 (0.46s)
V _{max} outer	276	0,5	28 (0.46s)	V _{max} outer	276	0,5	28 (0.46s)
V _{min} inner adjustable	104 - 228	0.016 - 21.0	1 - 1260	V _{min} inner adjustable	104 - 209	0.016 - 21.0	1 - 1050
V _{max} inner adjustable	252 - 288	0.016 - 21.0	1 - 1260	V _{max} inner adjustable	231 - 288	0.016 - 21.0	1 - 1050
V _{max} outer adjustable	252 - 288	0.016 - 4.25	1 - 255	V _{max} outer adjustable	231 - 288	0.016 - 4.25	1 - 212
V _{min} outer adjustable	104 - 228	0.016 - 4.25	1 - 255	V _{min} outer adjustable	104 - 209	0.016 - 4.25	1 - 212
	F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]		F [Hz]	Clearing Time [sec]	Clearing Time [Cycles]
F _{min} outer	56,0	0,5	28 (0.46s)	F _{min} outer	46,0	0,5	28 (0.46s)
F _{min} inner	56,0	0,5	28 (0.46s)	F _{min} inner	46,0	0,5	28 (0.46s)
F _{max} inner	62,8	0,5	28 (0.46s)	F _{max} inner	52,8	0,5	28 (0.46s)
F _{max} outer	62,8	0,5	28 (0.46s)	F _{max} outer	52,8	0,5	28 (0.46s)
F _{min} inner adjustable	45.0 - 66.0	0.016 - 600	1 - 36000	F _{min} inner adjustable	45.0 - 55.0	0.020 - 600	1 - 36000 / 30000 (50Hz)
F _{max} inner adjustable	45.0 - 66.0	0.016 - 600	1 - 36000	F _{max} inner adjustable	45.0 - 55.0	0.020 - 600	1 - 36000 / 30000 (50Hz)
F _{min} outer adjustable	45.0 - 66.0	0.016 - 600	1 - 36000	F _{min} outer adjustable	45.0 - 55.0	0.020 - 600	1 - 36000 / 30000 (50Hz)
F _{max} outer adjustable	45.0 - 66.0	0.016 - 600	1 - 36000	F _{max} outer adjustable	45.0 - 55.0	0.020 - 600	1 - 36000 / 30000 (50Hz)
Trip Limits NL-Mon (120 V) (MG6P; MG6N; Microgrid 240V 60Hz 1P)				Trip Limits NL-Mon (120 V) (MG5P; MG5N; Microgrid 240V 50Hz 1P)			
	U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]		U _{AC} [V]	Clearing Time [sec]	Clearing Time [Cycles]
V _{min} outer	96	0,4	24	V _{min} outer	96	0,4	24
V _{min} inner	96	0,4	24	V _{min} inner	96	0,4	24
V _{max} inner	144	0,4	24	V _{max} inner	144	0,4	24
V _{max} outer	144	0,4	24	V _{max} outer	144	0,4	24
V _{min} inner adjustable	60 - 114	0.016 - 21.0	1 - 1260	V _{min} inner adjustable	60 - 121	0.016 - 21.0	1 - 1260 / 1050 (50Hz)
V _{max} inner adjustable	126 - 152	0.016 - 21.0	1 - 1260	V _{max} inner adjustable	133 - 152	0.016 - 21.0	1 - 1260 / 1050 (50Hz)
V _{max} outer adjustable	126 - 152	0.016 - 4.25	1 - 255	V _{max} outer adjustable	133 - 152	0.016 - 4.25	1 - 255 / 212 (50Hz)
V _{min} outer adjustable	60 - 114	0.016 - 4.25	1 - 255	V _{min} outer adjustable	60 - 121	0.016 - 4.25	1 - 255 / 212 (50Hz)
Accuracy							
Voltage trip limit accuracy	+/- 1.0% of Vnom						
Frequency trip limit accuracy	+/- 0.05 Hz						
Trip time accuracy	+/- 16.7 ms (60Hz) / +/- 20.0 ms (50Hz) (1 cycle)						
Detection time	25 ms (60Hz) / 30 ms (50Hz) (1.5 cycles)						
Reconnection 60 Hz Setups				Reconnection 50 Hz Setups			
Reconnection Time	20 s			Reconnection Time	20 s		
Reconnection Time adjustable	5 - 900 s			Reconnection Time adjustable	5 - 900 s		
F _{max} reconnect value	< 64.5Hz			F _{max} reconnect value	< 54.5Hz		
F _{min} reconnect value	> 56.0Hz			F _{min} reconnect value	> 46.0Hz		
V _{min} reconnect value	V > 184.0V			V _{min} reconnect value	V > 184.0V		
V _{max} reconnect value	V < 275.0V			V _{max} reconnect value	V < 275.0V		
F _{min} reconnect value adjustable	45.0 - 66.0			F _{min} reconnect value adjustable	45.0 - 66.0		
F _{max} reconnect value adjustable	45.0 - 66.0			F _{max} reconnect value adjustable	45.0 - 66.0		
V _{min} reconnect value adjustable	V > 50% - V > 95%			V _{min} reconnect value adjustable	V > 50% - V > 95%		
V _{max} reconnect value adjustable	V < 101% - V < 120%			V _{max} reconnect value adjustable	V < 101% - V < 120%		