



CERTIFICATE

Applicant: **CE+T SA.**
Rue du charbonnage 12
4020 Wandre
Belgium

Product: **Hybrid System**

Model:

Stabiliti 30C3-CE	
Type a) 3x 400Vac Delta (Without Step-up Transformer)	Type b) 3x 480Vac Delta + Step-up Transformer
25,0kW	30,0kW

Rating:
(Nominal active power)

Firmware Version: DER 1.19

Intended use:

Hybrid inverter system according to EN 50549-1:2019 without integrated grid disconnection protection.

Applied standards and guidelines:

SOP-9-1_15 GCC Certification Program, 09/21

Based on:

EN 50549-1:2019

Requirements for generating plants to be connected in parallel with distribution networks Part 1: Connection to a LV distribution network - Generating plants up to and including Type B

Tested according to:

EN 50549-10:2022

Requirements for generating plants to be connected in parallel with distribution networks Part 10: Tests for conformity assessment of generating units

The safety concept of an aforementioned representative product corresponds at the time of issue of this certificate to the valid safety specifications for the specified use in accordance with regulations.

Limitation:

- The interface protection as well as the interface switch is not part of the unit.
- The ROCOF protective function has not been evaluated

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Parameter table acc. EN50549-10:2022 (Parameters as declared by the manufacturer and not according to a specific grid code. Additional testing for deviation to a specific grid code can be necessary)						
Parameter setting name in the generating unit:						
Clause(s) / subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value	Minimum step size	Considered value range
4.3.2 Interface switch	Single fault tolerance for interface switch required	NA	yes no	no	NA	NA
4.4.2 Operating frequency range	47,0 – 47,5 Hz Duration	Not Configurable (*)	0 – 20 s	0s		Infinite
	47,5 – 48,5 Hz Duration	Not Configurable (*)	30 – 90 min	30 min		Infinite
	48,5 – 49,0 Hz Duration	Not Configurable (*)	30 – 90 min	30 min		Infinite
	49,0 – 51,0 Hz Duration	Not Configurable (*)	not configurable	unlimited		Infinite
	51,0 – 51,5 Hz Duration	Not Configurable (*)	30 – 90 min	30 min		Infinite
	51,5 – 52 Hz Duration	Not Configurable (*)	0 – 15 min	0 s		Infinite
4.4.3 Minimal requirement for active power delivery at underfrequency	Reduction threshold	Not Configurable (**)	49 Hz – 49,5 Hz	49,5 Hz		
	Maximum reduction rate	Not Configurable (**)	2 – 10 % PM/Hz	10 % PM/Hz		
4.4.4 Continuous operating voltage range	Upper limit	Not Configurable	not configurable	110% Un		25kW @ 400VAC 30kW @ 480VAC
	Lower limit	Not Configurable (***)	not configurable	85% Un		21.2 kW @ 400VAC 25.5 kW @ 480VAC



Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value		Minimum step size	Considered value range
4.5.2 Rate of change of frequency (ROCOF) immunity	ROCOF withstand capability (defined with a sliding measurement window of 500 ms) non-synchronous generating technology: synchronous generating technology:	Not Configurable	not defined	2 Hz/s			[0, 4 Hz/s]
4.5.3.2 Generating plant with nonsynchronous generating technology	Maximum power resumption time	Not Configurable	not defined	1 s			1 s
	Voltage-Time-Diagram	uv1_disco_time [578] uv1_disco_level [576]	see Figure 6	Time [s]	U [p.u.]	10 ms 0.25 Vrms P-N	[0, 600 s] [0, 360 Vrms P-N]
		uv2_disco_time [585] uv2_disco_level [583]		3.0	0.85		

Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value		Minimum step size	Considered value range
4.5.3.3 Generating plant with synchronous generating technology	Maximum power resumption time		not defined	3 s		NA	NA
	Voltage-Time-Diagram		see Figure 7	Time [s]	U [p.u.]	NA	NA
				-	-	NA	NA
				-	-	NA	NA
				-	-	NA	NA
				-	-	NA	NA
				-	-	NA	NA



Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value		Minimum step size	Considered value range
				Time [s]	U [p.u.]		
4.5.4 Over- voltage ride through (OVRT)	Voltage-Time-Diagram		Not configurable				
		ov1_disco_time [610] ov1_disco_level [608]		0,1	1,25	10 ms 0.25 Vrms P-N	[0, 600 s] [0, 360 Vrms P- N]
		ov1_disco_time [615] ov1_disco_level [617]		5,0	1,20	10 ms 0.25 Vrms P-N	[0, 600 s] [0, 360 Vrms P- N]
		ov1_disco_time [622] ov1_disco_level [624]		60	1,15	10 ms 0.25 Vrms P-N	[0, 600 s] [0, 360 Vrms P- N]



Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value	Minimum step size	Considered value range
4.6.1 Power response to overfrequency	Threshold frequency f1	freq_threshold_overFreqParam [512]	50,2 Hz – 52 Hz	50,2 Hz	1 mHz	[50 Hz, 52 Hz]
	Droop	droop_overFreqParam [513]	2 % – 12 %	5 %	0.1 %	[2 %, 12 %]
	Power reference	pref_type_overFreqParam [518] 0 => Pref = PM 1 => Pref = Pmax	PM Pmax	Pmax, for synchronous Generating technology and EESS PM for other nonsynchronous Generating technology	1	[0, 1]
	Intentional delay	delay_overFreqParam [517]	0 – 2 s	0 s	10 ms	[0, 2 s]
	Deactivation threshold fstop	deactivation_freq_threshold_overFreqParam [516]	50,0 Hz – f1	deactivated	mHz	[50 Hz – 52 Hz]
	Deactivation time tstop	deactivation_time_stop_overFreqParam [515]	0 – 600 s	30 s	s	[0, 600 s]
	Acceptance of staged disconnection	-	yes no	yes	-	-
4.6.2 Power response to underfrequency	Threshold frequency f1	freq_threshold_underFreqParam [519]	46.0 Hz–49.8 Hz	49,8 Hz	1 mHz	[46 Hz, 50 Hz]
	Droop	droop_underFreqParam [520]	2 – 12 %	5 %	0.1 %	[2 %, 12 %]
	Power reference	Not Configurable	PM Pmax	Pmax		
	Intentional delay	delay_underFreqParam [522]	0 – 2 s	0 s	10 ms	[0, 2 s]



Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value	Minimum step size	Considered value range
4.7.2.2 Capabilities	Active factor range overexcited	Not Configurable (****)	No	No	N/A	[0.0 – 1.0]
	Active factor range underexcited	Not Configurable (****)	No	No	N/A	[0.0 – 1.0]
4.7.2.3 Control modes	Enabled control mode	Mode_voltage_response [524] Q(U): curve cf. param [531] to [541] cos φ (P) : curve cf. param [542] to [551]	Q setp. Q(U) cos φ setp. cos φ (P)	Q setpoint	3	[1 – 4]
4.7.2.3.2 Setpoint control modes	Q setpoint and excitation	q_setpoint_param[526]	0 – 48 % PD	0	10 Var	[-21.5 21.5] kVAr
	cos φ setpoint and excitation	Cosphi_setpoint_param [525]	[-1 – -0.75] [+0.75 – +1]	1.0	0.001 pu	[0.0 – 1.0] pu
4.7.2.3.3 Voltage related control modes	Characteristic curve		-	-		
	Time constant	filterTimeConst_voltageResponseParam [527]	3 s – 60 s	10 s	3 s	[0 60] s
	Min cos φ	minimalCosPhi_voltageResponseParam [528]	[-1 – -0.75] [+0.75 – +1]	0.4	0.001	[0.0 - 1.0] pu
	Lock in power	lockInActivePower_voltageResponseParam [529]	0 % – 20 %	deactivated	10 W	[0 – 30] kW
	Lock out power	lockOutActivePower_voltageResponseParam [530]	0 % – 20 %	deactivated	10 W	[0 – 30] kW
4.7.2.3.4 Power related control mode	Characteristic curve	Not Implemented	-	-		
4.7.4.2.2 Zero current mode for converter connected generating technology	Enabling	enable_UVTR_OVRT_Param [556]		1	-	[0, 1]
	Static voltage range overvoltage	overVoltage_UVTR_OVRT_Param [553]	100 % Un – 120 % Un	120 % Un	0.25 Vrms	[230 - 332] Vrms
	Static voltage range undervoltage	underVoltage_UVTR_OVRT_Param [552]	20 % Un – 100 % Un	50 % Un	0.25 Vrms	[46 - 277] Vrms



Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value	Minimum step size	Considered value range
4.9.2 Requirements on voltage and frequency protection	Threshold for protection as dedicated device [in A or kW, kVA]	NA	-			
	Undervoltage threshold stage 1	NA	-			
	Undervoltage operate time stage 1	NA	-			
	Undervoltage threshold stage 2	NA	-			
	Undervoltage operate time stage 2	NA	-			
	Overvoltage threshold stage 1	NA	-			
	Overvoltage operate time stage 1	NA	-			
	Overvoltage threshold stage 2	NA	-			
	Overvoltage operate time stage 2	NA	-			
	Overvoltage threshold 10 min mean protection	NA	-			
	Underfrequency threshold stage 1	NA	-			
	Underfrequency operate time stage 1	NA	-			
	Underfrequency threshold stage 2	NA	-			
	Underfrequency operate time stage 2	NA	-			
	Overfrequency threshold stage 1	NA	-			
	Overfrequency operate time stage 1	NA	-			
	Overfrequency threshold stage 2	NA	-			
	Overfrequency operate time stage 2	NA	-			



Clause(s) /subclause(s) of EN50549-1	Parameter	Parameter name in the generating unit	Configurable range	Default value	Minimum step size	Considered value range
4.10.2 Automatic reconnection after tripping	Lower frequency	uf_reconnect_level [669]	47,0 Hz – 50,0 Hz	49,5 Hz	1 mHz	[46 – 63] Hz
	Upper frequency	of_reconnect_level [701]	50,0 Hz – 52,0 Hz	50,2 Hz	1 mHz	[46 – 63] Hz
	Lower voltage	uv_reconnect_level [605]	50 % Un – 100 % Un	85 % Un	0.25 Vrms	[0 - 360] Vrms
	Upper voltage	ov_reconnect_level [637]	100 % Un – 120 % Un	110 % Un	0.25 Vrms	[0– 360] Vrms
	Observation time	reconnect_timer_set_0 [256]	10 s – 600 s	60 s	10ms	[0 – 1000] s
	Active power increase gradient	p1_reconnect_power_ramp_rate [70]	6 % – 3000 %/min	40 W/s	10 W/s	[0.01 - 60] kW/s
4.10.3 Starting to generate electrical power	Lower frequency	uf_connect_level [668]	47,0 Hz – 50,0 Hz	49,5 Hz	1 mHz	[46 – 63] Hz
	Upper frequency	of_connect_level [700]	50,0 Hz – 52,0 Hz	50,1 Hz	1 mHz	[46– 63] Hz
	Lower voltage	uv_connect_level [604]	50 % – 100 % Un	85 % Un	0.25 Vrms	
	Upper voltage	ov_connect_level [636]	100 % – 120 % Un	110 % Un	0.25 Vrms	[0– 360] Vrms
	Observation time	connect_timer_set [259]	10 s – 600 s	60 s	10ms	[0 – 1000] s
	Active power increase gradient	p1_startup_pwr_ramp_rate [66]	6 % – 3000 %/min	40 W/s	10 W/s	[0.01 - 60] kW/s
4.11.1 Ceasing active power	Remote operation of the logic interface	Grid_Connect_IO signal and/or p1_grid_access_control [95]	yes no	No		
4.11.2 Reduction of active power on set point	Remote operation	Not Configurable -> setpoint p1_real_pwr_setpt [68]	yes no	No	10 W	[0 – 25.5] kW
4.12 Remote information exchange	Remote information exchange required	Modbus TCP	-	Yes	NA	NA