HYPONTECH
ENERGIZING FUTURE

Declaration of Conformity

Hereby manufacturer, Suzhou Hypontech Co.,Ltd, confirms that the inverter models listed below

HMS-600, HMS-600-C, HMS-800, HMS-800-C,
HPK-1000, HPK-1500, HPK-2000, HPK-2500, HPK-3000,
HPS-3000L, HPS-3680, HPS-4000, HPS-5000, HPS-3000DL, HPS-3680D, HPS-4000D, HPS-5000D,
HPT-3000, HPT-4000, HPT-5000, HPT-6000, HPT-8000, HPT-10000,
HPT-15K, HPT-17K, HPT-20K, HPT-25K,
HPT-30K, HPT-33K, HPT-36K, HPT-40K and HPT-50K.

Do fulfill the requirements defined for Type A or Type B power generating units, defined in:

- General application requirements resulting from *the Commission Regulation (EU) 2016/631 (NC RfG)*
- Standard *EN 50549-1:2019/AC:2019 (Type Approval)*

Relationship between EN50549-1 and the Commission Regulation (EU) 2016/631:
Generating plants compliant with the clauses of EN50549-1 are considered to be compliant with the relevant Article of Commission Regulation (EU) 2016/631. Please refer to the table of correspondence between EN50549-1 and the Commission Regulation (EU) 2016/631.

When set the safety type to *SL EN 50549-1 for Slovenia*, the default settings are preset as the following table of Interface protection system default settings and power controls in inverter. Adjustments and changes can be made using the Hiportal software. All changes must be coordinated with the responsible grid operator and need get the authorization from Hypontech.

Signed By Product Manager

Jack Tu

Date: 2022/6/20

Interface protection system default settings and power controls in inverter

Clause(s) / subclause(s) of EN50549-1	Ref	Parameter	Typical value range	Value default (EN 50549-1)		DSO requirement (SL EN 50549-1 default settings)	
4.3.2 Interface switch	n.a.	Single fault tolerance for interface switch required	yes | no	yes		yes	
4.4.2 Operating frequency range	A,B	47,0 – 47,5 Hz Duration	0 – 20 s	unlimited		unlimited	
	A,B	47,5 – 48,5 Hz Duration	30 – 90 min	unlimited		unlimited	
	A,B	48,5 – 49,0 Hz Duration	30 – 90 min	unlimited		unlimited	
	A,B	49,0 – 51,0 Hz Duration	not configurable	unlimited		unlimited	
	A,B	51,0 – 51,5 Hz Duration	30 – 90 min	unlimited		unlimited	
	A,B	51, 5 – 52 Hz Duration	0 – 15 min	unlimited		unlimited	
4.4.3 Minimal requirement for active power delivery at underfrequency	A,B	Reduction threshold	49 Hz – 49,5 Hz	N/A		Not defined	
	A,B	Maximum reduction rate	2 – 10 % PM/Hz	N/A		Not defined (No reduction for underfrequency)	
4.4.4 Continuous operating voltage range	n.a.	Upper limit	not configurable	110%Un		110%Un	
	n.a.	Lower limit	not configurable	85%Un		85%Un	
4.5.2 Rate of change of frequency (ROCOF) immunity	A,B	ROCOF withstand capability (defined with a sliding measurement window of 500 ms)	not defined	>2Hz/s		>2Hz/s	
		non-synchronous generating technology:		>2Hz/s		>2Hz/s	
4.5.3.2 Generating plant with non-synchronous generating technology	B	Maximum power resumption time	not defined	1s		1s	
	B	Voltage-Time-Diagram	see Figure 6	Time [s]	U [p.u.]	Time [s]	U [p.u.]
				0	0,05	0	0,05

				0,4	0,05	0,15	0,05
				3,0	0,85	2,5	0,85
4.5.4 Over-voltage ride through (OVRT)	n.a.	Voltage-Time-Diagram	not configurable	Time [s]	U [p.u.]	Not defined	
				0,1	1,25		
				5,0	1,20		
				60,0	1,15		
4.6.1 Power response to overfrequency	A,B	Enabling	Enable | disabled	enabled		enabled	
	A,B	Threshold frequency f1	50,2 Hz – 52 Hz	50,2Hz		50,2Hz	
	A,B	Droop	2 % – 12 %	5%		5%	
	A,B	Power reference	PM | Pmax	PM		Pmax	
	n.a.	Intentional delay	0 – 2 s	0s		0s	
	n.a.	Deactivation threshold fstop	50,0 Hz – f1	deactivated		deactivated	
	n.a.	Deactivation time tstop	0 – 600 s	deactivated		deactivated	
	A	Acceptance of staged disconnection	yes | no	yes		yes	
4.6.2 Power response to underfrequency	n.a.	Threshold frequency f1	49,8 Hz – 46 Hz	Not defined		Not defined	
	n.a.	Droop	2 – 12 %	Not defined		Not defined	
	n.a.	Power reference	PM | Pmax	Not defined		Not defined	
	n.a.	Intentional delay	0 – 2 s	Not defined		Not defined	
4.7.2.2 Capabilities	B	Active factor range overexcited	0,9 – 1	0,8		0,8	
	B	Active factor range underexcited	0,9 – 1	0,8		0,8	
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos φ setp. cos φ (P)	Q setpoint		Q setpoint	
4.7.2.3.2 Setpoint control modes	n.a.	Q setpoint and excitation	0 – 60 % Smax	0		0	
	n.a.	cos φ setpoint and excitation	1 – 0,9	1		1	
4.7.2.3.3 Voltage related control modes	n.a.	Characteristic curve	-	-		-	
	n.a.	Time constant	3 s – 60 s	3s		3s	
	n.a.	Min cos φ	0,0 – 1	0,8		0,8	

	n.a.	Lock in power	0 % – 20 %	20%	20%
	n.a.	Lock out power	0 % – 20 %	5%	5%
4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	-	-	-
4.7.4.2.2 Zero current mode for converter connected generating technology	n.a.	Enabling	enable | disable	Disabled	Disabled
	n.a	Static voltage range overvoltage	100 % Un – 120 % Un	120%Un	120%Un
	n.a	Static voltage range undervoltage	20 % Un – 100 % Un	80%Un	80%Un
4.9.2 Requirements on voltage and frequency protection	n.a	Threshold for protection as dedicated device [in A or kW, kVA]	16 A – 250 kVA	Interface protection integrated	Interface protection integrated
	B	Undervoltage threshold stage 1	0,2 Un – 1 Un	195,5V	195,5V (0,85Un)
	B	Undervoltage operate time stage 1	0,1 s – 100 s	100s	2,0s
	B	Undervoltage threshold stage 2	0,2 Un – 1 Un	115V	161,0V (0,7Un)
	B	Undervoltage operate time stage 2	0,1 s – 5 s	5s	0,2s
	B	Overvoltage threshold stage 1	1,0 Un – 1,2 Un	276V	255,3V (1,11Un)
	B	Overvoltage operate time stage 1	0,1 s – 100 s	100s	2,0s
	B	Overvoltage threshold stage 2	1,0 Un – 1,3 Un	299	264,5V (1,15Un)
	B	Overvoltage operate time stage 2	0,1 s – 5 s	5s	0,2s
	B	Overvoltage threshold 10 min mean protection	1,0 Un – 1,15 Un	253V	253V

	B	Underfrequency threshold stage 1	47,0 Hz– 50,0 Hz	47,5Hz	47,0Hz
	B	Underfrequency operate time stage 1	0,1 s – 100 s	100s	0,2s
	B	Underfrequency threshold stage 2	47,0 Hz – 50,0 Hz	47Hz	Not defined
	B	Underfrequency operate time stage 2	0,1 s – 5 s	5s	Not defined
	B	Overfrequency threshold stage 1	50,0 Hz – 52,0 Hz	51,5Hz	52,0Hz
	B	Overfrequency operate time stage 1	0,1 s – 100 s	100s	0,2s
	B	Overfrequency threshold stage 2	50,0 Hz – 52,0 Hz	52Hz	Not defined
	B	Overfrequency operate time stage 2	0,1 s – 5 s	5s	Not defined
4.10.2 Automatic reconnection after tripping	B	Lower frequency	47,0 Hz – 50,0 Hz	49,5Hz	49,9Hz
	B	Upper frequency	50,0 Hz – 52,0 Hz	50,2Hz	50,1Hz
	B	Lower voltage	50 % Un – 100 % Un	195,5V	195,5V (0,9Un)
	B	Upper voltage	100 % Un – 120 % Un	253V	253V (1,1Un)
	B	Observation time	10 s – 600 s	60	60
	B	Active power increase gradient	6 % – 3000 %/min	10%/min	10%/min
4.10.3 Starting to generate electrical power	A,B	Lower frequency	47,0 Hz – 50,0 Hz	49,5Hz	49,9Hz
	A,B	Upper frequency	50,0 Hz – 52,0 Hz	50,1Hz	50,1Hz
	A,B	Lower voltage	50 % – 100 % Un	195,5V	195,5V (0,9Un)
	A,B	Upper voltage	100 % – 120 % Un	253V	253V (1,1Un)
	A,B	Observation time	10 s – 600 s	60	60
	A,B	Active power increase gradient	6 % – 3000 %/min	600%/min	10%/min
4.11.1 Ceasing active power	A,B	Remote operation of	yes | no	yes	yes

		the logic interface			
4.11.2 Reduction of active power on set point	B	Remote operation NOTE: If yes further definition is provided by the DSO	yes | no	yes	yes
4.12 Remote information exchange	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes | no	no	yes

Correspondence between EN50549-1 and the COMMISSION Regulation (EU) 2016/631

Article	**Clause(s) / subclause(s) of EN50549-1**
13.1(a)	4.4.2 Operating frequency range
13.1(b)	4.5.2 Rate of change of frequency (ROCOF) immunity
13.2	4.6.1 Power response to overfrequency
13.3	4.4.3 Minimal requirement for active power delivery at underfrequency
13.4	4.4.3 Minimal requirement for active power delivery at underfrequency
13.5	4.4.3 Minimal requirement for active power delivery at underfrequency
13.6	4.11.1 Ceasing active power
13.7	4.10 Connection and starting to generate electrical power
14.1	4.4.2, 4.5.2, 4.6.1, 4.4.3, 4.11.1 and 4.10
14.2(a)	4.11.2 Reduction of active power on set point
14.2(b)	4.12 Remote information exchange
14.3	4.5.3 Under-voltage ride through (UVRT)
14.4	4.10 Connection and starting to generate electrical power
14.5(a)	4.6, 4.7, 4.9, 4.10, 4.11, 4.12
14.5(b)	4.9 Interface protection,
14.5(c)	4.1 General
14.5(d)	4.12 Remote information exchange
17.1	4. as applicable above
17.2	4.7.2 Voltage support by reactive power
17.3	4.5.3 Under-voltage ride through (UVRT)
20.1	4. as applicable above
20.2(a)	4.7.2 Voltage support by reactive power
20.2(b)(c)	4.7.4.2 Short circuit current requirements on generating plants
20.3	4.5.3 Under-voltage ride through (UVRT)