

# Compliance Document

No. D 091849 0026 Rev. 00

**Holder of Certificate:** **CSI Solar Co., Ltd.**  
199 Lushan Road, SND  
215129 Suzhou, Jiangsu  
PEOPLE'S REPUBLIC OF CHINA

**Product:** **PV inverter**  
**GRID-CONNECTED PV INVERTER**

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. For details see: [www.tuvsud.com/ps-cert](http://www.tuvsud.com/ps-cert)

**Test report no.:** 704092320205-00

**Date,** 2023-03-09



( Zhengdong Ma )



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**Model(s):** CSI-100K-T4001A-E, CSI-100K-T4001B-E,  
CSI-110K-T4001A-E, CSI-110K-T4001B-E,  
CSI-120K-T4001A-E, CSI-120K-T4001B-E.

**Parameters:**  
Please see pages 3 to 6.

**Tested according to:** EN 50549-1:2019/AC:2019

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Model	CSI-100K-T4001A-E	CSI-110K-T4001A-E	CSI-120K-T4001A-E
PV input parameters:			
Vmax PV(absolute max.)	1100 Vd.c.		
MPPT voltage range	200-1000 Vd.c.		
Max. input current	6*40 Ad.c.		
Isc PV (absolute max.)	6*50 Ad.c.		
AC output parameters:			
Rated output power	100 kW	110 kW	120 kW
Max. output apparent power	100 kVA	110 kVA	120 kVA
AC nominal voltage	3/N/PE~ 230/400 Va.c.		
AC nominal frequency	50 Hz		
Max. output current	152 Aa.c.	167.1 Aa.c.	182.3 Aa.c.
Power factor	0.8 leading...0.8 lagging		

Model	CSI-100K-T4001B-E	CSI-110K-T4001B-E	CSI-120K-T4001B-E
PV input parameters:			
Vmax PV(absolute max.)	1100 Vd.c.		
MPPT voltage range	200-1000 Vd.c.		
Max. input current	9*30 Ad.c.		
Isc PV (absolute max.)	9*40 Ad.c.		
AC output parameters:			
Rated output power	100 kW	110 kW	120 kW
Max. output apparent power	100 kVA	110 kVA	120 kVA
AC nominal voltage	3/N/PE~ 230/400 Va.c.		
AC nominal frequency	50 Hz		
Max. output current	152 Aa.c.	167.1 Aa.c.	182.3 Aa.c.
Power factor	0.8 leading...0.8 lagging		

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Clause(s) /subclause(s) of this EN	Ref	Parameter	Typical value range	Value default	
4.3.2 Interface switch	n.a.	Single fault tolerance for interface switch required	yes   no	yes	
4.4.2 Operating frequency range	A,B	47.0 – 47.5 Hz Duration	0 – 20 s	20 s	
	A,B	47.5 – 48.5 Hz Duration	30 – 90 min	90 min	
	A,B	48.5 – 49.0 Hz Duration	30 – 90 min	90 min	
	A,B	49.0 – 51.0 Hz Duration	not configurable	-	
	A,B	51.0 – 51.5 Hz Duration	30 – 90 min	90 min	
	A,B	51.5 – 52 Hz Duration	0 – 15 min	15 min	
4.4.3 Minimal requirement for active power delivery at underfrequency	A,B	Reduction threshold	49 Hz – 49.5 Hz	No reduction	
	A,B	Maximum reduction rate	2 – 10 % P <sub>M</sub> /Hz	-	
4.4.4 Continuous operating voltage range	n.a.	Upper limit	not configurable	115%Un	
	n.a.	Lower limit	not configurable	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	
		non-synchronous generating technology:		2Hz/s	
		synchronous generating technology:		N/A	
4.5.3.2 Generating plant with non-synchronous generating technology	B	Maximum power resumption time	not defined	1 s	
		Voltage-Time-Diagram	see Figure 6	Time [s]	U [p.u.]
				0.0	0.2
				0.15	0.2
1.5	0.85				
4.5.3.3 Generating plant with synchronous generating technology	B	Maximum power resumption time	not defined	N/A	
		Voltage-Time-Diagram	see Figure 7 (N/A)	Time [s]	U [p.u.]
				-	-
				-	-
-	-				
4.5.4 Over-voltage ride through (OVRT)	n.a.	Voltage-Time-Diagram	not configurable	Time [s]	U [p.u.]
				0.0	1.25
				0.1	1.25
				0.1	1.20
				5.0	1.20
				5.0	1.15
				60	1.15
				60	1.10
4.6.1 Power response to overfrequency	A,B	Threshold frequency f <sub>1</sub>	50.2 Hz – 52 Hz	50.2 Hz	
	A,B	Droop	2 % – 12 %	5 %	
	A,B	Power reference	P <sub>M</sub>   P <sub>max</sub>	P <sub>M</sub>	
	n.a.	Intentional delay	0 – 2 s	0s	
	n.a.	Deactivation threshold f <sub>stop</sub>	50,0 Hz – f <sub>1</sub>	deactivated	
	n.a.	Deactivation time t <sub>stop</sub>	0 – 600 s	-	

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	A	Acceptance of staged disconnection	yes   no	yes
4.6.2 Power response to underfrequency	n.a.	Threshold frequency $f_1$	49.8 Hz – 46 Hz	49.8 Hz
	n.a.	Droop	2 – 12 %	5 %
	n.a.	Power reference	$P_M$   $P_{max}$	$P_{max}$
	n.a.	Intentional delay	0 – 2 s	0 s
4.7.2.2 Capabilities	B	Active factor range overexcited	0.9 – 1	0.8
	B	Active factor range underexcited	0.9 – 1	0.8
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos $\varphi$ setp. cos $\varphi$ (P)	Q setpoint
4.7.2.3.2 Setpoint control modes	n.a.	Q setpoint and excitation	0 – 60 % $S_{max}$	0
	n.a.	cos $\varphi$ setpoint and excitation	1 – 0.9	1
4.7.2.3.3 Voltage related control modes	n.a.	Characteristic curve	-	-
	n.a.	Time constant	3 s – 60 s	10 s
	n.a.	Min cos $\varphi$	0.0 – 1	0.8
	n.a.	Lock in power	0 % – 20 %	deactivated
	n.a.	Lock out power	0 % – 20 %	deactivated
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
	n.a.	Static voltage range overvoltage	100 % $U_n$ – 120 % $U_n$	115% $U_n$
	n.a.	Static voltage range undervoltage	20 % $U_n$ – 100 % $U_n$	85% $U_n$
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
	B	Undervoltage threshold stage 1	0.2 $U_n$ – 1 $U_n$	195.5 V
	B	Undervoltage operate time stage 1	0.1 s – 100 s	1.40 s
	B	Undervoltage threshold stage 2	0.2 $U_n$ – 1 $U_n$	115 V
	B	Undervoltage operate time stage 2	0.1 s – 5 s	0.30 s
	B	Overvoltage threshold stage 1	1.0 $U_n$ – 1.2 $U_n$	264.5 V
	B	Overvoltage operate time stage 1	0.1 s – 100 s	0.30 s
	B	Overvoltage threshold stage 2	1.0 $U_n$ – 1.3 $U_n$	287.5 V
	B	Overvoltage operate time stage 2	0.1 s – 5 s	0.10s
	B	Overvoltage threshold 10 min mean protection	1.0 $U_n$ – 1.15 $U_n$	253 V
	B	Underfrequency threshold stage 1	47.0 Hz – 50.0 Hz	47.5 Hz
	B	Underfrequency operate time stage 1	0.1 s – 100 s	0.40 s

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	B	Underfrequency threshold stage 2	47.0 Hz – 50.0 Hz	47.00 Hz	
	B	Underfrequency operate time stage 2	0.1 s – 5 s	0.20 s	
	B	Overfrequency threshold stage 1	50.0 Hz – 52.0 Hz	51.50 Hz	
	B	Overfrequency operate time stage 1	0.1 s – 100 s	0.40 s	
	B	Overfrequency threshold stage 2	50.0 Hz – 52.0 Hz	52.00 Hz	
	B	Overfrequency operate time stage 2	0.1 s – 5 s	0.20 s	
4.10.2 Automatic reconnection after tripping	B	Lower frequency	47.0 Hz – 50.0 Hz	49.5Hz	
	B	Upper frequency	50.0 Hz – 52.0 Hz	50.2Hz	
	B	Lower voltage	50 % $U_n$ – 100 % $U_n$	85% $U_n$	
	B	Upper voltage	100 % $U_n$ – 120 % $U_n$	110% $U_n$	
	B	Observation time	10 s – 600 s	60s	
4.10.3 Starting to generate electrical power	B	Active power increase gradient	6 % – 3000 %/min	10% $P_n$ /min	
	A,B	Lower frequency	47.0 Hz – 50.0 Hz	49.5Hz	
	A,B	Upper frequency	50.0 Hz – 52.0 Hz	50.1Hz	
	A,B	Lower voltage	50 % – 100 % $U_n$	85% $U_n$	
	A,B	Upper voltage	100 % – 120 % $U_n$	110% $U_n$	
4.11.1 Ceasing active power	A,B	Observation time	10 s – 600 s	60s	
	A,B	Active power increase gradient	6 % – 3000 %/min	abled	
	A,B	Remote operation of the logic interface	yes   no	Can be achieved by PGU. (Logic interface shall be specified by DNO)	
	4.11.2 Reduction of active power on set point	B	Remote operation	yes   no	Can be achieved by PGU. (Definition shall be specified by DNO)
			NOTE: If yes further definition is provided by the DSO		
4.12 Remote information exchange	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes   no	No	
The Column Ref specifies if a parameter is relevant for COMMISSION REGULATION 2016/631 and for what type of generating module the parameter is relevant. If n.a. is set, this parameter is: not applicable for 2016/631, but is introduced into EN50549-1 for local DSO network management reasons and is not considered as cross border issues.					