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TEST REPORT
IEC 60730-1
Automatic electrical controls for household and similar use (Controls using software)

Report Number. ..... :	260513099GZU-001
Date of issue ..... :	2026.07.09
Total number of pages ..... :	35
Name of Testing Laboratory preparing the Report ..... :	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Room101/301/401/102/202/302/402/502/602/702/802, No. 7-2, Caipin Road, Huangpu District, Guangzhou, Guangdong, China
Applicant's name ..... :	Huizhou Epever Technology Co., Ltd.
Address ..... :	No. 6 Laowu Road, Start-up Area of China-Korea (Huizhou) Industrial Park, Zhongkai District, Huizhou City, Guangdong, China
Test specification:	
Standard ..... :	IEC 60730-1:2013, AMD1:2015, AMD2:2020
Test procedure ..... :	--
Non-standard test method ..... :	N/A
TRF template used.....:	IECEE OD-2020-F1:2020, Ed.1.3
Test Report Form No. ..... :	IEC60730_1KSOF
Test Report Form(s) Originator .... :	UL(US)
Master TRF ..... :	2020-08-14

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Test Item description ..... :	The Software is embedded in On-Grid Hybrid Inverter.
Trade Mark(s) ..... :	Refer to end-used product safety report.
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	EHT30KTL-CTL-V1.00
Ratings ..... :	Nominal AC voltage, Frequency: 3L/PE/N 380/400/415a.c. V, 50/60Hz
Software module(s) and associated version(s) ..... :	The Controller Model EHT30KTL-CTL-V1.00 use microcontroller chip TMS320F28075 as master control core, use microcontroller chip TMS320F280039 as slave control core. And the embedded software information, refer to section Model Differences.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**Testing Laboratory:**	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch	
Testing location/ address.....:		Room101/301/401/102/202/302/402/502/602/702/802, No. 7-2, Caipin Road, Huangpu District, Guangzhou, Guangdong, China	
Tested by (name, function, signature).....:		Jimmy Lin / Project Engineer	Jimmy Lin
Approved by (name, function, signature)...:		Runze Hu / Asst. Manager	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:		N/A	
Tested by (name, function, signature).....:		N/A	
Approved by (name, function, signature)...:		N/A	
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:		N/A	
Tested by (name + signature).....:		N/A	
Witnessed by (name, function, signature) .:		N/A	
Approved by (name, function, signature)...:		N/A	
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:		N/A	
Tested by (name, function, signature).....:		N/A	
Witnessed by (name, function, signature) .:		N/A	
Approved by (name, function, signature)...:		N/A	
Supervised by (name, function, signature) :		N/A	

List of Attachments (including a total number of pages in each attachment):

N/A

Summary of testing/evaluation:

Tests performed (name of test and test clause):	**Testing location:**
All clauses concerned with software evaluation for electronic controls for: IEC 60730-1 Ed. 5.2 :2020, Annex H.11.12 EN 60730-1 :2016+A1;A2, Annex H.11.12	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Room101/301/401/102/202/302/402/502/602/702/802 , No. 7-2, Caipin Road, Huangpu District, Guangzhou, Guangdong, China

Summary of compliance with National Differences (List of countries addressed):

List of countries addressed

N/A

Copy of marking plate:

Please refer to end-used product safety report 250425016GZU-001 and 250425016GZU-002 issued by INTERTEK.

Test Item Particulars ..... :	Manufacturer's specified operating ambient temperature range: -25℃ to +60℃ (> 45℃ derating)
Classification of installation and use ..... :	N/A
Supply Connection ..... :	N/A
Possible test case verdicts	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)
Testing..... :	
Date of receipt of test item ..... :	2026.05.14
Date (s) of performance of tests ..... :	2026.05.14 to 2026.07.01

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

This Test Report is only applicable to controls using software. This TRF is to be used in conjunction with the IEC 60730-1, Edition 5.2 Test Report.

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Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	Huizhou Epever Technology Co., Ltd. No. 6 Laowu Road, Start-up Area of China-Korea (Huizhou) Industrial Park, Zhongkai District, Huizhou City, Guangdong, China

General product information and other remarks:

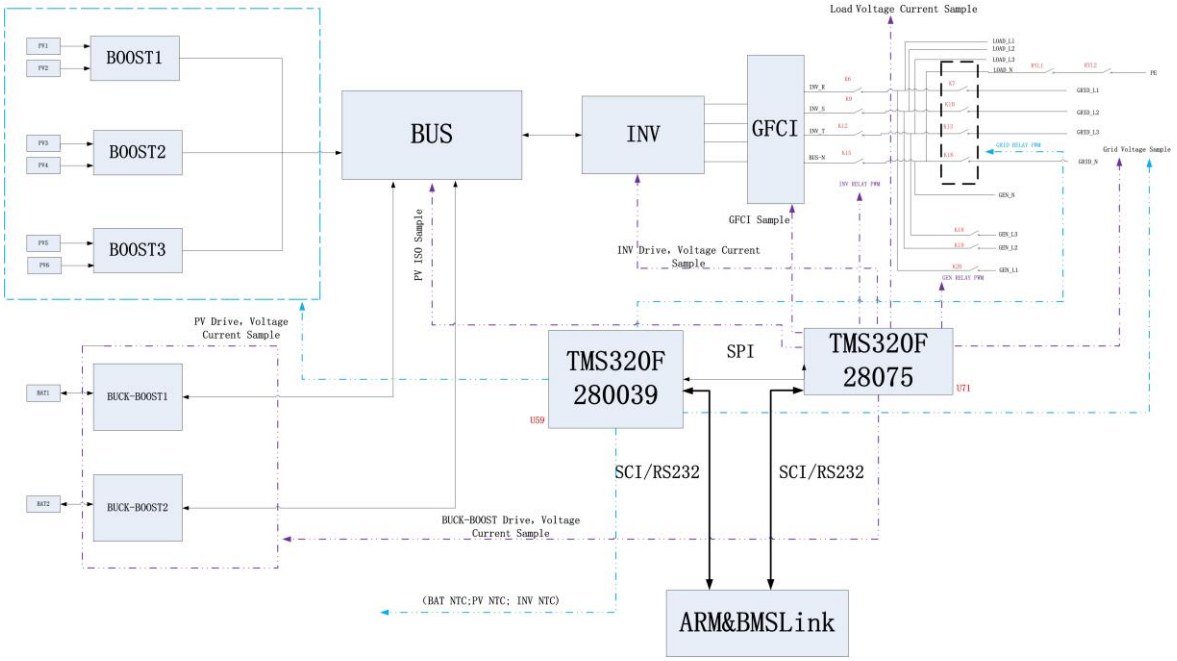
The Software is embeddedd in On-Grid Hybrid Inverterr which include the following safety function:

1. Over temperature protect function
2. Leakage current detects protection function (GFCI)
3. Inverter peak overcurrent protection function
4. Inverter effective value overcurrent protection function
5. Bus peak overvoltage protection function
6. Power grid relay adhesion fault protection function
7. Battery Over voltage protect function
8. Power grid voltage/under voltage protection function
9. Anti islands protection function
10. Insulation resistance detects protection function (ISO)
11. Power grid Over/Under frequency protection function
12. PV reverse connection protection function
13. PV overvoltage protection function
14. MCU self-check function

The architecture of controller model refers to below:

1) The controller model EHT30KTL-CTL-V1.00 use microcontroller chip TMS320F28075 as the master control unit to sample the voltage, frequency and current of PV or inverter or gird or battery pack which used for executing safety function logical and power control, and the master control unit will drive INV side relay, GEN(Oil engine) relay to disconnect or close.
2) The controller model EHT30KTL-CTL-V1.00 use microcontroller chip TMS320F280039 as the slave control unit to sample the voltage, current of inverter or gird and temperature and send to main control chip by SPI communication, and the slave control unit drive the grid relay to disconnect or close.
3) The controller will detect the voltage difference between the two terminals of the grid relay before grid connection to determine whether the relay has become stuck. If a connection failure occurs, the controller will control the inverter side relay to disconnect the connection, and stop the PWM control of all power transistors, thus putting the product in a safe state.
4) The controller also uses an ARM chip as the control board for the main control unit. This control board is mainly used for external communication and display and other non-safety-related functions. This time, the control board will not be evaluated.

Refer to illustration:



Model Differences –

The detail information of model and controller following below:

End-used Product Model	Controller Model	Software name and checksum and version and release date	Hardware name and version	End-used product safety report No.:
EHT15K EHT20K EHT25K EHT30K	EHT30KTL-CTL-V1.00	CPU: TMS320F28075 (U71) Software name: EHT15_30K_DSPM_APP_BOOT.hex Version: V1.000 Checksum: 0x561f7622 Released date: 2026-4-30 MCU: TMS320F280039 (U59) Software name: EHT15_30K_DSPS_APP_BOOT.hex Version: V1.000 Checksum: 0xFE067648 Released date: 2026-4-30	Hardware Name: EHT30KTL-CTL-V1.00 Version: V1.00	250425016GZU-001 and 250425016GZU-002

Remark:

1. The end-used product model EHT15K, EHT20K, EHT25K and EHT30K uses the same controller model, except for the power derated by software.
2. The detail description of end-used product model, please refer to end-used product safety report.

Critical Component List			
Microcontroller Type	**Features**	**Manufacturer**	**Remark**
TMS320F28075 (U71)	• Core: TMS320C280x 32-bit CPU • RAM: 100KB • Flash: 512KB • Package: HLQFP176 • Operation temperature range: -40°C to + 105°C	TEXAS INSTRUMENT	Test with compliance
TMS320F280039 (U59)	• Core: TMS320C280x 32-bit DSP • RAM: 69KB • Flash: 384KB (192KW) • Package: LQFP100 • Operation temperature range: -40°C to + 150°C	TEXAS INSTRUMENT	Test with compliance

Additional application considerations – (Considerations used to test a component) –

Please refer to end-used product safety report 250425016GZU-001 and 250425016GZU-002 issued by INTERTEK.

DESCRIPTION OF SAFETY FUNCTION(S)
(Similar to Protective Electronic Circuit, per IEC 60335-1)

The Software is embedded in on Hybrid Inverter which includes the following safety function:

1. Over temperature protection function
2. Leakage current detects protection function (GFCI)
3. Inverter peak overcurrent protection function
4. Inverter effective value overcurrent protection function
5. Bus peak overvoltage protection function
6. Power grid relay adhesion fault protection function
7. Battery Over voltage protect function
8. Power grid voltage/under voltage protection function
9. Anti islands protection function
10. Insulation resistance detects protection function (ISO)
11. Power grid Over/Under frequency protection function
12. PV reverse connection protection function
13. PV overvoltage protection function
14. MCU self-check function

All of the above are Class B control functions.

The Controller Model EHT30KTL-CTL-V1.00 use microcontroller chip TMS320F28075 as master control core, and the embedded software release on 2026-4-30, checksum 0x561f7622, use microcontroller chip TMS320F280039 as slave control core, and the embedded software release on 2026-4-30, checksum 0xFE067648.

The interactions between the hardware circuitry and the software, and interfaces between safety and non-safety related software functions can be found in the below files:

1. Software design documentations
2. software test record

Additional information

The following is typical of the information to be summarized on this page:

1. A description of each safety function of the software; including any declared response times, parameters, Class.

Safety function	The description of safety function	Action state	Parameters	The response time	Safety level
Over temperature protection function	When the machine is operating normally, it is necessary to prevent the temperature from getting too high, as this could cause damage to the machine components or lead to overheating.	The chip detects the inverter temperature, PV temperature, ambient temperature and battery temperature. Once the temperature limit values are reached, the inverter PWM output is shut off, and the PWM outputs for the battery, inverter and PV are also turned off.	1. Inverter side NTC temperature > 98℃; 2. PV side NTC temperature > 92℃; 3. Battery side NTC temperature > 90℃; 4. Ambient temperature > 86℃	Temperature delay time: 500ms	Class B
Leakage current detects protection function (GFCI)	Detect and protect the leakage current at the grid-connected output terminal to prevent it from exceeding the safety standard limit.	It was detected that the machine's leakage current has reached the limit value. The machine then shuts off the battery, inverter, and PWM on the PV side, and disengages the inverter relay and grid relay.	1wGFCIAvgDelta > 150mA 3wGFCIAvgDelta > 60mA wGFCIAvgDelta > 30mA	One power cycle: wGFCIAvgDelta > 150mA; Three power cycles: wGFCIAvgDelta > 60mA; Five power cycles: wGFCIAvgDelta > 30mA	Class B
Inverter peak overcurrent protection function	During machine operation, avoid inverter peak overcurrent occurring under both off-grid and grid-connected conditions, which may cause damage to the machine.	When the chip detects that the peak value of the inverter current has reached the limit, the machine shuts off the inverter PWM and disconnects the inverter side relay.	The peak current of the inverter output for L1/L2/L3 > 136A	150us	Class B
Inverter effective value overcurrent protection function	During machine operation, the effective value of the inverter output exceeds the range.	When the chip detects that the effective value of the inverter current has reached the limit, the machine shuts off the inverter PWM and disconnects the inverter-side relay.	The inverter output inductor current > the rated output current+5A.	200ms	Class B

Safety function	The description of safety function	Action state	Parameters	The response time	Safety level
Bus peak overvoltage protection function	During machine operation, the bus voltage exceeds the range.	When the chip detects that the effective value of the inverter current has reached the limit value, the machine will turn off the PWM on the inverter side / PV side / battery side and disconnect the relay on the inverter side.	Bus peak voltage > 990V or positive and negative half-bus voltages > 500V	150us	Class B
Power grid relay adhesion fault protection function	Before the machine starts running, check whether the grid connection relay is stuck.	When the chip detects that the voltage at both ends of the grid connection relay is lower than the limit value, the machine will turn off the PWM on the inverter side / PV side / battery side and disconnect the relay on the inverter side.	Before the grid connection relay is closed, the difference between the inverter voltage and the grid voltage is less than 20V.	1s	Class B
Battery Over voltage protect function	The voltage at the battery terminal exceeds the maximum value to prevent damage to the components on the battery side.	The chip detected that the battery voltage exceeded the battery voltage range. The machine shut off the battery-side PWM and disconnected the battery-side relay.	Battery voltage > Battery overvoltage protection value 850V	200us	Class B
Power grid voltage/under voltage protection function	If the grid voltage exceeds the limit value of the grid, the machine cannot be connected to the grid.	The chip detected that the mains voltage exceeded the range and disconnected the relay on the power grid side.	1. Voltage > 287V 2. Voltage > 253V 3. Voltage < 184V 4. Voltage < 101.5V	1. Time: 60ms 2. Time: 60ms 3. Time: 3000ms 4. Time: 600ms	Class B

Safety function	The description of safety function	Action state	Parameters	The response time	Safety level
Anti islands protection function	To prevent the disconnection of the power grid, at this point the load consumes the energy from the PV and can generate the same frequency as the mains power. At this time, the machine considers that the mains power is always available, causing the machine to remain connected to the grid and unable to stop generating electricity. This leads to the risk of electric shock for the maintenance personnel.	By periodically injecting a small perturbation into the output frequency, the system detects when the grid frequency exceeds the frequency protection range. Then, the mains power side relay is disconnected and the system switches to off-grid operation.	The change in the mains frequency before and after the injection of the disturbance is greater than 0.2 Hz.	Island protection: 1.28 seconds	Class B
Insulation resistance detects protection function (ISO)	Prevent insufficient PV insulation, which could lead to machine damage and the risk of personnel electric shock	When the machine detects that the PV insulation resistance is less than 33KΩ or greater than 5M, it will shut off the PWM of the inverter, battery and PV, and disconnect the grid-side and inverter-side relays.	The resistance between the PV side and the ground < 33KΩ or >5M.	6s	Class B
Power grid Over/Under frequency protection function	Prevent the grid frequency from exceeding the regulatory range, which could affect the grid frequency and cause damage to the machine or the load during operation beyond the frequency range	The chip detects that the mains power frequency is out of range. It disconnects the AC-side relay and switches to off-grid operation.	1. Frequency > 52Hz, 2. Frequency > 51.5Hz, 3. Frequency < 47.5Hz 4. Frequency < 45Hz	1. Time: 60ms 2. Time: 60ms 3. Time: 60ms 4. Time: 60ms	Class B
PV reverse connection protection function	Prevent damage to the machine after the PV connection is reversed	The chip detects that the PV current is less than -2A. The machine shuts off the PWM on the PV side.	PV current < -2A	10s	Class B

Safety function	The description of safety function	Action state	Parameters	The response time	Safety level
PV overvoltage protection function	Prevent damage to the machine due to excessive voltage input of the PV	The chip detects that the PV voltage exceeds the maximum voltage. It shuts off the inverter, battery, and PV's PWM, and disconnects the relay on the inverter side.	PV voltage > 945V	200ms	Class B
MCU self-check function	The CPU and MCU chips of the product implement program self-test to prevent the failure of internal components of the chip, resulting in the failure of the product to perform the safety protection function, resulting in the danger of the product.	Program self-test found fault, into the endless loop, the watchdog reset.	The program performs CPU special register, PC program count, clock, interrupt, RAM, Flash, communication, ADC converter power-on initialization and cycle self-test.	DSP 280039 chip self-test total time < 5s DSP 28075 chip self-test total time < 5s	Class B

2. Summary of interactions between the hardware circuitry and the software.

For chip: TMS320F28075

Pin number	Input/ output	Details	Type	Amo unt	Physica l range	Software identifier
162	Output	R phase horizontal pipe is driven close to BUSN	High and low levels	1	0/3V	R.PWM3
163	Output	R phase lower pipe is driven	High and low levels	1	0/3V	R.PWM2
164	Output	R phase horizontal pipe is in the middle of driving	High and low levels	1	0/3V	R.PWM4
165	Output	R phase upper pipe is driven	High and low levels	1	0/3V	R.PWM1
166	Output	S phase horizontal pipe is driven close to BUSN	High and low levels	1	0/3V	S.PWM3
167	Output	S phase lower pipe is driven	High and low levels	1	0/3V	S.PWM2
18	Output	S phase horizontal pipe is in the middle of driving	High and low levels	1	0/3V	S.PWM4
19	Output	S phase upper pipe is driven	High and low levels	1	0/3V	S.PWM1
1	Output	T phase horizontal pipe is driven close to BUSN	High and low levels	1	0/3V	T.PWM3
2	Output	T phase lower pipe is driven	High and low levels	1	0/3V	T.PWM2
4	Output	T phase horizontal pipe is in the middle of driving	High and low levels	1	0/3V	T.PWM4
5	Output	T phase upper pipe is driven	High and low levels	1	0/3V	T.PWM1
6	Output	Balance bridge upper pipe is driven	High and low levels	1	0/3V	BL.PWM+
7	Output	Balance bridge lower pipe is driven	High and low levels	1	0/3V	BL.PWM-

Pin number	Input/ output	Details	Type	Amount	Physical range	Software identifier
13	Output	buck-boost boost2 is driving	High and low levels	1	0/3V	BST2.PWM+
12	Output	buck-boost buck1 is driving	High and low levels	1	0/3V	BUK1.PWM+
38	Input	BUCK-BOOST1 current	High and low levels	1	0/3V	BKI1.V
39	Input	R phase inverter current	High and low levels	1	0/3V	R_INVLI
40	Input	BUCK-BOOST2 current	High and low levels	1	0/3V	BKI2.V
41	Input	S phase inverter current	High and low levels	1	0/3V	S_INVLI
42	Input	M_LOAD.I_R # M_LOAD.I_S # M_LOAD.I_T # EX_CT_R.I # R_INVDC.V # R_DCI. # BKI2.VL # BKI1.VL (R phase load current # S phase load current # T phase load current # R phase external CT current # R phase inverter voltage DC component # R phase inverter current DC component # BUCK-BOOST1 current # BUCK-BOOST2 current (with large filtering, for display and power limiting)	analogy quantity	1	0~3V	Main DSP_IN1
43	Input	R_GEN.I#S_GEN.I#T_GEN.I#EX_CT_T.I#T_INVDC.V#T_DCI#GFCI.V#V_N-PE (R phase oil electric current# RS phase oil electric current# T phase oil electric current# T phase external CT current# T phase inverter voltage DC component# T phase inverter current DC component## leakage current# N-PE voltage)	analogy quantity	1	0~3V	Main DSP_IN2
44	Input	T-phase inverter current	analogy quantity	1	0~3V	T_INVLI
45	Input	Battery 1 voltage # Battery 2 voltage	analogy quantity	1	0~3V	BAT1.V#BAT2.V
46	Input	T-phase grid voltage # T-phase inverter voltage	analogy quantity	1	0~3V	T_GRID.V-B#T_INV.V
47	Input	S-phase grid voltage # S-phase inverter voltage	analogy quantity	1	0~3V	S_GRID.V-B#S_INV.V
48	Input	Full bus # Positive bus	analogy quantity	1	0~3V	BUS.V1/B#+BUS.V1/B
49	Input	R-phase grid voltage # R-phase inverter voltage	analogy quantity	1	0~3V	R_GRID.V-B#R_INV.V
56	Input	R-phase oil-immersed transformer voltage # R_S grid line voltage	analogy quantity	1	0~3V	R_GEN.V#R_S_GRID.V-A
57	Input	S-phase oil-immersed transformer voltage # R_T grid line voltage	analogy quantity	1	0~3V	S_GEN.V#R_T_GRID.V-A
58	Input	T-phase oil-immersed transformer voltage # Balance bridge current	analogy quantity	1	0~3V	T_GEN.V#BLI_BUS

Pin number	Input/ output	Details	Type	Amo unt	Physica l range	Software identifier
59	Input	M_LOAD.RV # M_LOAD.SV # M_LOAD.TV# EX_CT_S.I# S_INVDC.V# S_DCI# BUS-_ISO.V (R phase load voltage # S phase load voltage # T phase load voltage # S phase external CT current # S phase inverter voltage DC component # S phase inverter current DC component # Insulation impedance)	analogy quantity	1	0~3V	Main DSP_IN3
41	Input	S-phase inverter current compared with input	High and low levels	1	0/3V	S_INVLI
39	Input	R-phase inverter current compared with input	High and low levels	1	0/3V	R_INVLI
44	Input	T-phase inverter current compared with input	High and low levels	1	0/3V	T_INVLI
31	Input	BUCK-BOOST2 current compared with input	High and low levels	1	0/3V	BKI2.V
29	Input	BUCK-BOOST1 current compared with input	High and low levels	1	0/3V	BKI1.V
157	Input	Bus hardware overvoltage	High and low levels	1	0/3V	OVP_BUS
151	Output	N-phase inverter relay	High and low levels	1	0/3V	NGEN.RLY
113	Output	T-phase inverter relay	High and low levels	1	0/3V	TLOAD.RL Y
100	Output	S-phase inverter relay	High and low levels	1	0/3V	SLOAD.RL Y
98	Output	R-phase inverter relay	High and low levels	1	0/3V	RLOAD.RL Y
87	Output	R-phase grid relay signal (measured by load)	High and low levels	1	0/3V	RGRID.RL Y
89	Output	S-phase grid relay signal (measured by load)	High and low levels	1	0/3V	SGRID.RL Y
90	Output	T-phase grid relay signal (measured by load)	High and low levels	1	0/3V	TGRID.RL Y
93	Output	N-line grid relay signal (measured by load)	High and low levels	1	0/3V	NGRID.RL Y
103	Input	Communication signal with 280039 SPISI	High and low levels	1	0/3V	Main_SPISI
104	Output	Communication signal with 280039 SPISO	High and low levels	1	0/3V	Main_SPIS O
105	Output	Communication signal with 280039 SPICLK	High and low levels	1	0/3V	Main_SPIC LK
107	Output	Communication signal with 280039 SPIEN	High and low levels	1	0/3V	Main_SPIE N

For chip: TMS320F280039

Pin number	Input/ output	Details	Type	Amo unt	Physica l range	Software identifier
77	Output	PV1 drive	High and low levels	1	0/3V	PV1_PWM
75	Output	PV2 drive	High and low levels	1	0/3V	PV2_PWM
97	Output	PV3 drive	High and low levels	1	0/3V	PV3_PWM
14	Input	Full BUS voltage sampling	analogy quantity	1	0~3V	BUS.V1/A

Pin number	Input/ output	Details	Type	Amount	Physical range	Software identifier
15	Input	Thermal detection of the radiator near INV	analogy quantity	1	0~3V	INV.THERM
16	Input	Current leakage detection	analogy quantity	1	0~3V	GFCI.V-A
17	Input	Phase voltage of R in the grid	analogy quantity	1	0~3V	R_GRID.V-A
18	Input	R_T grid line voltage	analogy quantity	1	0~3V	R_T_GRID.V-A
19	Input	Near BUCK-BOOST radiator temperature detection	analogy quantity	1	0~3V	BAT.THERM
20	Input	PV2 voltage sampling	analogy quantity	1	0~3V	PV2.V
22	Input	PV2 current sampling	analogy quantity	1	0~3V	PVI_2
23	Input	PV1 current sampling	analogy quantity	1	0~3V	PVI_1
28	Input	PV3 voltage sampling	analogy quantity	1	0~3V	PV3.V
29	Input	Phase voltage of S in the grid	analogy quantity	1	0~3V	S_GRID.V-A
31	Input	+BUS voltage sampling	analogy quantity	1	0~3V	+BUS.V1/A
35	Input	R-S grid line voltage	analogy quantity	1	0~3V	R_S_GRID.V-A
36	Input	Near BOOST radiator temperature detection	analogy quantity	1	0~3V	BOOST.THERM
37	Input	Internal environmental temperature	analogy quantity	1	0~3V	T.THERM
39	Input	PV1 voltage sampling	analogy quantity	1	0~3V	PV1.V
40	Input	Grid phase voltage of T	analogy quantity	1	0~3V	T_GRID.V-A
41	Input	PV3 current sampling	analogy quantity	1	0~3V	PVI_3
80	Input	BOOST overcurrent signal	High and low levels	1	0/3V	BOOST_OCP
43	Output	Communication signal with 28075 SPISO	High and low levels	1	0/3V	Main_SPISO
65	Input	Communication signal with 28075 SPICLK	High and low levels	1	0/3V	Main_SPICLK
66	Output	Communication signal with 28075 SPICEN	High and low levels	1	0/3V	Main_SPIEN
13	Input	Communication signal with 28075 SPISI	High and low levels	1	0/3V	Main_SPISI

3. A description of any interfaces between safety and non-safety related software functions.

Safety function	Interface between safety functions and non-safety functions	Interface description
Over temperature protection function	g_SysFaultMessage.bit.TempFault	Send the over-temperature protection status to M3 and display it on the LCD.
Leakage current detects protection function (GFCI)	g_SysFaultMessage.bit.GFCI g_SysFaultMessage.bit.GFCIDeviceFault	Send the leakage current protection status to M3 and display it on the LCD.
Inverter effective value overcurrent protection function	g_SysFaultMessage.bit.SwAcRmsOCP	Send the inverter effective value overcurrent protection status to M3 and display it on the LCD.

Safety function	Interface between safety functions and non-safety functions	Interface description
Bus peak overvoltage protection function	g_SysFaultMessage.bit.SwBusOVP g_SysFaultMessage.bit.SwBusInstantOVP g_SysFaultMessage.bit.HwBusOVP	Send the bus overvoltage protection status to M3 and display it on the LCD.
Power grid relay adhesion fault protection function	g_SysFaultMessage.bit.RelayFail	Send the grid relay protection status to M3 and display it on the LCD.
Battery Over voltage protect function	g_SysFaultMessage.bit.BatOVP	Send the battery overvoltage protection status to M3 and display it on the LCD.
Power grid over voltage protection function	g_SysFaultMessage.bit.GridOVP	Send the grid overvoltage protection status to M3 and display it on the LCD.
Power grid under voltage protection function	g_SysFaultMessage.bit.GridUVP	Send the grid undervoltage protection status to M3 and display it on the LCD.
Power grid Over frequency protection function	g_SysFaultMessage.bit.GridOFP	Send the grid overfrequency protection status to M3 and display it on the LCD.
Power grid Under frequency protection function	g_SysFaultMessage.bit.GridUFP	Send the grid undervoltage protection status to M3 and display it on the LCD.
Anti islands protection function	g_SysFaultMessage.bit.IslandFault	Send the islanding protection status to M3 and display it on the LCD.
Insulation resistance detects protection function (ISO)	g_SysFaultMessage.bit.IsoFault	Send the PV insulation impedance protection status to M3 and display it on the LCD.
PV reverse connection protection function	g_SysFaultMessage.bit.ReversalConnection	Send the PV reverse connection impedance protection status to M3 and display it on the LCD.
PV overvoltage protection function	g_SysFaultMessage.bit.PvOVP	Send the PV overvoltage protection status to M3 and display it on the LCD.

4. Software module(s) and associated version(s)

For chip: TMS320F28075

Code list	Name	Function description	Version	Release date	Remark
main.c	Main program Initialization	Main function and interrupt function related	V1.000	2026-4-30	Safety related
Initial.c	List of protection subroutines	MCU initialization function	V1.000	2026-4-30	Non-safety related
ProtectionLogic.c	Header file for protection values definition	System error information related	V1.000	2026-4-30	Safety related

Code list	Name	Function description	Version	Release date	Remark
ProtectionLogic.h	List of calculation for sampled AC effective value	System error information related	V1.000	2026-4-30	Safety related
AinAcMeasure.c	Header file for calculation of sampled AC effective value	Calculation of AC effective value of system sampling parameters	V1.000	2026-4-30	Safety related
AinAcMeasure.h	List of calculation for sampled DC effective value	Calculation of AC effective value of system sampling parameters	V1.000	2026-4-30	Safety related
AinDcMeasure.c	Header file for calculation of sampled DC effective value	Calculation of DC average value of system sampling parameters	V1.000	2026-4-30	Safety related
AinDcMeasure.h	Master chip IO configuration file	Calculation of DC average value of system sampling parameters	V1.000	2026-4-30	Safety related
IO.c	Master chip IO configuration header file	System IO output and input related	V1.000	2026-4-30	Safety related
IO.h	List of communication files for master-slave CPUs	Configuration related to system IO and functions	V1.000	2026-4-30	Safety related
CommMtoS.c	Header file for communication of master-slave CPUs	Related functions for master-slave CPU communication	V1.000	2026-4-30	Safety related
CommMtoS.h	List of state switching files	Related functions for master-slave CPU communication	V1.000	2026-4-30	Safety related
Task_Stateupdate.c	Header file for state switching and relay control	Related functions for system state switching, relay detection, closing, and opening	V1.000	2026-4-30	Safety related
Task_StateUpdate.h	Interrupt protection program file	Related functions for system state switching, relay detection, closing, and opening	V1.000	2026-4-30	Safety related
FaultCheckIsr.c	Header file for interrupt protection program	Related functions for interrupt rapid protection and hardware protection	V1.000	2026-4-30	Safety related
FaultCheckIsr.h	Main program Initialization	Main function and interrupt function related	V1.000	2026-4-30	Safety related

For chip: TMS320F280039

Code list	Name	Function description	Version	Release date	Remark
Main.c	main program	Main function and interrupt function related	V1.000	2026-4-30	Safety related
Initial.c	Initialization	MCU initialization function	V1.000	2026-4-30	Non-safety related
FaultManager.c	List of protection subroutines	PV error and temperature error information related	V1.000	2026-4-30	Safety related
FaultManager.h	Header file for protection values definition	PV error and temperature error information related	V1.000	2026-4-30	Safety related
AinAcMeasure.c	List of calculation for sampled AC effective value	Calculation of AC effective value of PV, temperature and other sampling parameters	V1.000	2026-4-30	Safety related
AinAcMeasure.h	Header file for calculation of sampled AC effective value	Calculation of AC average value of PV, temperature and other sampling parameters	V1.000	2026-4-30	Safety related
AinDcMeasure.c	List of calculation for sampled DC effective value	Calculation of DC average value of PV, temperature and other sampling parameters	V1.000	2026-4-30	Safety related
AinDcMeasure.h	Header file for calculation of sampled DC effective value	Calculation of DC average value of PV, temperature and other sampling parameters	V1.000	2026-4-30	Safety related
IO.c	From chip IO configuration file	System IO output and input related	V1.000	2026-4-30	Safety related
IO.h	From chip IO configuration header file	System error information related	V1.000	2026-4-30	Safety related
MDSPToSDSP.c	List of files for master-slave CPU communication	Functions related to master-slave CPU communication	V1.000	2026-4-30	Safety related
MDSPToSDSP.h	Header file for master-slave CPU communication	Functions related to master-slave CPU communication	V1.000	2026-4-30	Safety related
StateMachine.c	List of files for PV state switching	PV state switching, grid relay detection, closing, and opening related	V1.000	2026-4-30	Safety related
StateMachine.h	Header file for PV state switching and relay control	PV state switching, grid relay detection, closing, and opening related	V1.000	2026-4-30	Safety related
FaultCheckIsr.c	Interrupt protection program file	Interrupt rapid PV side protection, protection related to PV side hardware	V1.000	2026-4-30	Safety related
FaultCheckIsr.h	Header file for interrupt protection program	Main function and interrupt function related	V1.000	2026-4-30	Safety related

5. Method of identification of software module(s) and associated versions(s) at the production location

Through Programmed memory Checksum when using CCS 9.1.0 tool to burn software at the production location to identify the software module and version.

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict

H.6	Classification, additions		—
H.6.18	Class of control function (A, B, C).....:	Class B	—
H.7	Information in addition to Table 1 provided:		—
	66 - Software sequence documentation; clause: H.11.12.2.9; method: X..... :	Refer to “Software design documentations and software test record” file	P
	67 - Programme documentation; clause: H.11.12.2.9, H.11.12.2.12; method: X ..... :	Refer to “Software design documentations and software test record” file	P
	68 - Software fault analysis; clause: H.11.12, H.27.1.1.4; method: X ..... :	Refer to “Software design documentations and software test record” file	P
	69 - Software class(es) and structure; clause: H.11.12.2, H.11.12.3, H.27.1.2.2.1, H.27.1.2.3.1; method: D ..... :	Refer to “Software design documentations and software test record” file	P
	70 - Analytical measures and fault/error control techniques employed; clause: H.11.12.1.2, H.11.12.2.2, H.11.12.2.4; method: X ..... :	Refer to “Software design documentations and software test record” file	P
	71 - Software fault/error detection time(s) for controls with software Classes B or C; clause: H.2.17.10, H.11.12.2.6; method: X..... :	Refer to “Software design documentations and software test record” file	P
	72 - Control response(s) in case of detected fault/error; clause: H.11.12.2.7; method: X..... :	Refer to “Software design documentations and software test record” file	P
	93 – Maximum number of reset actions within a time period; clause H.11.12.4.3.6, H.11.12.4.3.4; method: D ..... :	This model is claimed hasn’t remote reset function	N/A
	94 – Number of remote reset actions; clause H.17.1.4.3; method: X ..... :	This model is claimed hasn’t remote reset function	N/A
	m – Controls with software classes B or C had information provided for safety-related segments of the software. Information on the non-safety related segments was sufficient to establish that they did not influence safety-related segments..... :	Class B	P
	n – Software sequence was documented and, together with the operating sequence, included a description of the control system philosophy, the control flow, data flow and the timings..... :	Refer to “Software design documentations and software test record” file	P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
	o - Safety-related data and safety-related segments of the software sequence, the malfunction of which could result in non-compliance with the requirements of Clauses 17, 25, 26 and 27, are identified ..... :	Refer to “Software design documentations and software test record” file	P
	– Included the operating sequence..... :	Refer to “Software design documentations and software test record” file	P
	– Software fault analysis was related to the hardware fault analysis in Clause H.27 ..... :	Refer to “Software design documentations and software test record” file	P
	q - Programming documentation was supplied in a programming design language declared by the manufacturer..... :	Refer to “Software design documentations and software test record” file	P
	r – Different software classes applied to different control functions ..... :	Software class B control function	N/A
	s - Measures declared are chosen by manufacturer from the requirements of Clauses H.11.12.1.2 to H.11.12.2.4 inclusive ..... :	Refer to “Software design documentations and software test record” file	P
H.11	Constructional requirements		—
H.11.12	Controls using software		—
	Controls using software were so constructed that the software did not impair control compliance with the requirements of this standard		P
H.11.12.1	Requirements for the architecture		—
H.11.12.1.1	Control functions with software class B or C use measures to control and avoid software-related faults/errors in safety-related data and safety-related segments of the software, as detailed in H.11.12.1.2 to H.11.12.3 inclusive		P
H.11.12.1.2	Control functions with software class C have one of the following structures:		—
	– single channel with periodic self-test and monitoring (H.2.16.7)		N/A
	– dual channel (homogenous) with comparison (H.2.16.3)		N/A
	– dual channel (diverse) with comparison (H.2.16.2)		N/A

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
	Control functions with software class B have one of the following structures:		—
	– single channel with functional test (H.2.16.5)		P
	– single channel with periodic self-test (H.2.16.6)		P
	– dual channel without comparison (H.2.16.1)		N/A
H.11.12.1.3	Other structure permitted with equivalent level of safety to those in H.11.12.1.2 .....:		N/A
H.11.12.2	Measures to control faults/errors		—
H.11.12.2.1	Redundant memory with comparison provided on two areas of the same component: data stored in different formats		N/A
H.11.12.2.2	Software class C using dual channel structures with comparison: additional fault/error detection means		N/A
H.11.12.2.3	Software class B or C: means for recognition and control of errors in transmission to external safety-related data paths: Means took into account errors of data, addressing, transmission timing and sequence of protocol		N/A
H.11.12.2.4	Software class B or C: within the control, measures are taken to address the fault/errors in safety-related segments and data indicated in Table H.1 and identified in Table 1 requirement 68.		P
H.11.12.2.5	Measures others than those specified in H.11.12.2.4 utilized to satisfy the requirements listed in Table H.1		N/A
H.11.12.2.6	Software fault/error detection:		—
	– occur not later than declared time(s), Table 1, requirement 71		P
	– acceptability of declared time(s): evaluated during fault analysis of the control		P
H.11.12.2.7	For controls with functions, classified as Class B or C, detection of fault/error:		—
	– results in the response declared in Table 1, requirement 72		P
	– for Class C: independent means capable of performing this response provided		N/A

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
H.11.12.2.8	Class C, dual channel structure, loss of dual channel capability: deemed to be an error		N/A
H.11.12.2.9	Software referenced:		—
	– to relevant parts of the operating sequence		P
	– to the associated hardware functions		P
H.11.12.2.10	Labels used for memory locations are unique		P
H.11.12.2.11	Software protected from user alteration of safety-related segments and data		P
H.11.12.2.12	Software and safety-related hardware under its control is initialized to and terminates at a declared state, Table 1, requirement 66 ..... :		P
H.11.12.3	Measures to avoid errors		—
H.11.12.3.1	For controls with software class B or C the measures shown in Figure H.1 to avoid systematic faults are applied	Class B	P
	Other methods utilized that incorporate disciplined and structured processes including design and test phases		N/A
H.11.12.3.2	Specification		—
H.11.12.3.2.1	Software safety requirements		—
H.11.12.3.2.1.1	The specification of the software safety requirements includes:		—
	• A description of each safety related function to be implemented, including its response time(s): - functions related to the application including their related software classes - functions related to the detection, annunciation and management of software or hardware faults		P
	• A description of interfaces between software and hardware		P
	• A description of interfaces between any safety and non-safety related functions		P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict

H.11.12.3.2 .2	Software architecture		—
H.11.12.3.2 .2.1	The description of software architecture include the following aspects:		P
	• Techniques and measures to control software faults/errors (refer to H.11.12.2)		P
	• Interactions between hardware and software		P
	• Partitioning into modules and their allocation to the specified safety functions		P
	• Hierarchy and call structure of the modules (control flow)		P
	• Interrupt handling		P
	• Data flow and restrictions on data access		P
	• Architecture and storage of data		P
	• Time based dependencies of sequences and data		P
H.11.12.3.2 .2.2	The architecture specification is verified against the specification of the software safety requirements by static analysis		P
H.11.12.3.2 .3	Module design and coding		—
H.11.12.3.2 .3.1	Software is suitably refined into modules. Software module design and coding are implemented in a way that is traceable to the software architecture and requirements. The module design specified:		P
	– function(s)		P
	– interfaces to other modules		P
	– data		P
H.11.12.3.2 .3.2	Software code is structured		P
H.11.12.3.2 .3.3	Coded software is verified against the module specification, and the module specification is verified against the architecture specification by static analysis		P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
H.11.12.3.2 .4	Design and coding standards		P
	Program design and coding standards is used during software design and maintenance		P
	Coding standards .....:		—
	– specified programming practice		P
	– proscribed unsafe language features		P
	– specify procedures for source code documentation		P
	– specify data naming conventions		P
H.11.12.3.3	Testing		—
H.11.12.3.3 .1	Module design (software system design, software module design and coding)		—
H.11.12.3.3 .1.1	A test concept with suitable test cases is defined based on the module design specification.		P
H.11.12.3.3 .1.2	Each software module is tested as specified within the test concept		P
H.11.12.3.3 .1.3	Test cases, test data and test results are documented		P
H.11.12.3.3 .1.4	Code verification of a software module by static means includes such techniques as software inspections, walk-throughs, static analysis and formal proof		P
	Code verification of a software module by dynamic means includes functional testing, white-box testing and statistical testing		P
H.11.12.3.3 .2	Software integration testing		—
H.11.12.3.3 .2.1	A test concept with suitable test cases is defined based on the architecture design specification		P
H.11.12.3.3 .2.2	The software is tested as specified within the test concept		P
H.11.12.3.3 .2.3	Test cases, test data and test results are documented		P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
H.11.12.3.3 .3	Software validation		—
H.11.12.3.3 .3.1	A validation concept with suitable test cases is defined based on the software safety requirements specification		P
H.11.12.3.3 .3.2	The software is validated with reference to the requirements of the software safety requirements specification as specified within the validation concept		P
	The software is exercised by simulation or stimulation of:		—
	• input signals present during normal operation		P
	• anticipated occurrences		P
	• undesired conditions requiring system action		P
H.11.12.3.3 .3.3	Test cases, test data and test results are documented		P
H.11.12.3.4	Other Items		—
H.11.12.3.4 .1	Equipment used for software design, verification and maintenance was qualified appropriately and demonstrated to be suitable for purpose in manifold applications		P
H.11.12.3.4 .2	Management of software versions: All versions are uniquely identified for traceability		P
H.11.12.3.4 .3	Software modification		—
H.11.12.3.4 .3.1	Software modifications are based on a modification request which details the following:		P
	• the hazards which may be affected		P
	• the proposed change		P
	• the reasons for change		P
H.11.12.3.4 .3.2	An analysis is carried out to determine the impact of the proposed modification on functional safety.		P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
H.11.12.3.4.3.3	A detailed specification for the modification is generated including the necessary activities for verification and validation, such as a definition of suitable test cases		P
H.11.12.3.4.3.4	The modification is carried out as planned		P
H.11.12.3.4.3.5	The assessment of the modification is carried out based on the specified verification and validation activities.		P
H.11.12.3.4.3.6	All details of modification activities are documented		P
H.11.12.3.5	For class C control functions: One of the combinations (a–p) of analytical measures given in the columns of table H.9 is used during hardware development ..... :		N/A
H.11.12.4	Remotely actuated control functions		—
H.11.12.4.1.1	Data Exchange – General – Remotely actuated control functions are connected to separate, independent devices, which may themselves contain control functions or provide other information and any data exchange between these devices does not compromise the integrity of class B control function or class C control function.	According to Annex B of the end-use product standard IEC/EN 62109:2010, it is confirmed that the remote drive control function is not related to the safety function based on the RA (risk analysis) results provided by the customer. So, the whole clause H.11.12.4 don't need to be considered.	N/A
H.11.12.4.1.2	Type of data - Message types for data exchange in a control function or functions are allocated to class A control function, class B control function or class C control function. The safety or protective relevance or influence, message types or data exchange are allocated only to class B control function or class C control functions, see Table H.10.		N/A
H.11.12.4.1.3.1	Communication of Safety Related Data – Transmission – Safety relevant data is transmitted authentically concerning:		N/A
	– data corruption		N/A
	– address corruption		N/A
	– wrong timing or sequence		N/A

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
	Data variation or corrupted data did not lead to an unsafe state		N/A
	Before transmitted data was used it was ensured that data corruption, address corruption and wrong timing or sequence are addressed using the measures as given in Annex H.		N/A
	The following failure modes are addressed..... :		—
	– permanent “auto-sending” or repetition,		N/A
	– interruption of data transfer		N/A
H.11.12.4.1 .3.2	Access to data exchange -		N/A
	Adequate hardware/software measures are taken to prevent unauthorized access to the control functions (class B and C; operating data, configuration parameters and/or software modules)		N/A
	Access to data exchange of class B control function or class C control function related operating data through public networks, has appropriate cryptographical techniques implemented.		N/A
H.11.12.4.1 .3.3	For class B and class C software revisions the requirements of H.11.12.3 and hardware configuration management are applied and the control maintains its protective functions		N/A
H.11.12.4.1 .4	Remotely actuated control function operation have the duration or limits set before switching on except when automatic switching off is realized at the end of a cycle or the system is designed for permanent operation.		N/A
H.11.12.4.2	Priority of remotely actuated control functions over control functions does not lead to a hazardous condition.		N/A
H.11.12.4.3 .1	Remote reset action is manually initiated.	No remote function	N/A
	Reset functionality initiated by a hand-held device required at least two manual actions to activate		N/A
H.11.12.4.3 .2	Reset functions are capable of resetting the system as intended		N/A

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
H.11.12.4.3.3	Unintended resets from safe state do not occur.		N/A
H.11.12.4.3.4	Any fault of the reset function does not cause the control or controlled function to result in a hazardous condition, and was evaluated for its Class B classification		N/A
H.11.12.4.3.5	For reset functions initiated by manual action not in visible sight of the appliance, the following additional requirements apply:	No remote function	N/A
	– the actual status and relevant information of the process under control is visible to the user before, during and after the reset action;		N/A
	– the maximum number of reset actions within a time period is declared. Following this, any further reset is denied unless the appliance is physically checked..... :		N/A
H.11.12.4.3.6	The reset function is evaluated on the final application.		N/A
	Manual switching of a thermostat or device with similar function that activates a reset is declared by the manufacturer and is suitable in the final application..... :		N/A
H.11.12.4.4	Software Download and Installation		—
H.11.12.4.4.1	Software updates for Class B and Class C software provided by the manufacturer and transmitted to the control via remote communication were checked prior to its use:		N/A
	– against corruption through communication ensuring Hamming distance 3 for software class B, or Hamming distance 4 for software class C;		N/A
	– that the software version is compatible with the hardware version of the control according to the version management documentation.		N/A
	The software which performs the above mentioned checks had measures to control the fault/error conditions specified in H.11.12.2.		N/A

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
H.11.12.4.4.2	In case of software download via remote communication, the cryptographic techniques in H.11.12.4.5 were provided. In addition to the requirements in H.11.12.4.5, identification procedures were provided for the software packages.		N/A
	The cryptographic techniques employed were part of the control, did not rely upon part of the router or similar data transmission device itself, and were performed prior to transmission.		N/A
H.11.12.4.4.3	Each update of software had provisions for authorization by the user and a version ID number which were accessible.		N/A
H.11.12.4.4.4	The installation of class B software or class C software was permitted during and after which the software installation process the control remained in compliance with the requirements of this standard.		N/A
H.11.12.4.5	Cryptographical techniques		—
	In cases where class B control function or class C control function related operating data, configuration parameters and/or software modules were transmitted over a public network, and/or where software updates were provided by the manufacturer via remote communication, cryptographic techniques were employed.		N/A
H.27.1.2	Protection against internal faults to ensure functional safety		—
H.27.1.2.1	Design and construction requirements		—
H.27.1.2.1.1	Fault avoidance and fault tolerance		—
	Controls incorporating control functions of class B or C are designed according to H.27.1.2 taking into account the failure modes of Cl. H.11.12 for software	Class B	P
	Systematic errors are avoided		P
	Random faults are dealt with by a proper system configuration		P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
	Functional analysis of the application resulted in a structured design with:		P
	– Control flow		P
	– Data flow		P
	– Time related functions required by the application		P
	For custom-chips special attention was made to minimize systematic errors		N/A
	System configuration was failsafe or:		P
	Incorporated components with direct safety-critical functions guarded by safeguards that cause a completely independent safety shut-down in accordance to H.11.12 software class B or C		P
	- safeguards are built into hardware and,		P
	- safeguards are supplemented by software		P
	Time slot monitoring is sensitive to both an upper and a lower limit of the time interval.		P
	Faults resulting in a shift of the upper and/or lower limit are taken into account.		P
	In a class C control function when a single fault in a primary safeguard can render the safeguard inoperative, a secondary safeguard is provided		N/A
	The reaction time of the secondary safeguard is in accordance with Clause H.27.1.2.3.		N/A
H.27.1.2.1.2	Documentation		—
	The documentation was based on H.11.12.3.2		P
	The functional analysis of the control and the safety related programs under its control are documented in a clear hierarchical way in accordance with the safety philosophy and the program requirements.		P
	Documentation provided for assessment included:		—
	• A description of the system philosophy, the control flow, data flow and timings.		P

IEC 60730-1 (Software)			
Clause	Requirement + Test	Result - Remark	Verdict
	• A clear description of the safety philosophy of the system with all safeguards and safety functions clearly indicated. Sufficient design information is provided to enable the safety functions or safeguards to be assessed		P
	• Documentation for any software within the system		P
	Programming documentation is supplied in a programming design language declared by the manufacturer..... :		P
	Safety related data and safety related segments of the operating sequence are identified and classified according to H.11.12.3		P
	There is a clear relationship between the various parts of the documentation		P
H.27.1.2.2	Class B control function		—
H.27.1.2.2.1	Design and construction requirements		—
	Software complies with software class B		P
H.27.1.2.3	Class C control function		—
H.27.1.2.3.1	Design and construction requirements		—
	Software complies with software class C		N/A
H.27.1.2.5	Circuit and construction evaluation		—
H.27.1.2.5.3	Assessment		P
	Only the safety related software (software class B and C) as identified according to H.27.1.2.1.2 were subjected to further assessment	Class B	P

TABLE H.1 – MEASURES TO ADDRESS FAULT/ERRORS (Software Class B)			
Component	Fault/error	Declared measures	Verdict
1. CPU	-	-	-
1.1 Registers	Stuck at	Refer to “Software design documentations” and “software test record” file	P
1.3 Program counter	Stuck at	Refer to “Software design documentations” and “software test record” file	P
2. Interrupt handling and execution	No interrupt	Refer to “Software design documentations” and “software test record” file	P
	Too frequent interrupt	Refer to “Software design documentations” and “software test record” file	P
3. Clock	Wrong frequency (for quartz synchronized clock: harmonics/ sub-harmonics only)	Refer to “Software design documentations” and “software test record” file	P
4. Memory	-	-	-
4.1 Invariable memory	All single bit faults	Refer to “Software design documentations” and “software test record” file	P
4.2 Variable memory	DC fault	Refer to “Software design documentations” and “software test record” file	P
4.3. Addressing (relevant to variable and invariable memory)	Stuck at	Cover by 4.1 and 4.2	P
5. Internal data path	-	-	-
5.1 Data	Stuck at		N/A
5.2 Addressing	Wrong address		N/A
6. External communication	-	-	-
6.1 Data	Hamming distance 3	Refer to “Software design documentations” and “software test record” file	P

6.2 Addressing	Wrong address	Refer to “Software design documentations” and “software test record” file	P
6.3 Timing	Wrong point in time	Refer to “Software design documentations” and “software test record” file	P
	Wrong sequence	Refer to “Software design documentations” and “software test record” file	P
7. Input/output periphery	-	-	-
7.1 Digital I/O	Fault conditions specified in Cl.H.27	Cover by FMEA	P
7.2 Analog I/O	-	-	-
7.2.1 A/D and D/A-convertor	Fault conditions specified in Cl. H.27	Refer to “Software design documentations” and “software test record” file	P
7.2.2 Analog multiplexer	Wrong addressing	Refer to “Software design documentations” and “software test record” file	P
9. Custom chips e.g. ASIC, GAL, gate array	Any output outside the static and dynamic functional specification		N/A

TABLE H.1 – MEASURES TO ADDRESS FAULT/ERRORS (Software Class C)			
Component	Fault/error	Declared measures	Verdict
1. CPU	-	-	-
1.1 Registers	DC fault		N/A
1.2 Instruction decoding and execution	Wrong decoding and execution		N/A
1.3 Program counter	DC fault		N/A
1.4 Addressing	DC fault		N/A
1.5 Data paths instruction decoding	DC fault		N/A
	execution		N/A
2. Interrupt handling and execution	No interrupt		N/A
	Too frequent interrupt related to different sources		N/A
3. Clock	Wrong frequency (for quartz synchronized clock: harmonics/ sub-harmonics only)		N/A
4. Memory	-	-	-
4.1 Invariable memory	99,6 % coverage of all information errors		N/A
4.2 Variable memory	DC fault		N/A
	Dynamic cross links		N/A
4.3 Addressing (relevant to variable and invariable memory)	DC fault		N/A
5. Internal data path	-	-	-
5.1 Data	DC fault		N/A
5.2 Addressing	Wrong address		N/A
	Multiple addressing		N/A
6 External communication	-	-	-
6.1 Data	Hamming distance 4		N/A
6.2 Addressing	Wrong address		N/A
	Multiple addressing		N/A
6.3 Timing	Wrong point in time		N/A
	Wrong sequence		N/A
7. Input/output periphery	-	-	-

7.1 Digital I/O	Fault conditions specified in Cl.H.27		N/A
7.2 Analog I/O	-	-	-
7.2.1 A/D and D/A-convertor	Fault conditions specified in Cl. H.27		N/A
7.2.2 Analog multiplexer	Wrong addressing		N/A
8. Monitoring devices and comparators	Any output outside the static and dynamic functional specification		N/A
9 Custom chips e.g. ASIC, GAL, gate array	Any output outside the static and dynamic functional specification		N/A

Table: Manufacturer's Documentation Referenced in this TRF (informative)		
Title	Revision (#/Letter)	Date
Software design documentations	--	2026.07.01
software test record	--	2026.07.01

Remark: The list of critical components and the photos are referred to end used product safety report.

__End__