



Italia

COMPLIANCE

with IEC EN 61508:2010

Certificate No.: C-IS-236198-04 Rev.2

CERTIFICATE OWNER: G.M. International s.r.l.
Via G. Mameli, 53-55
I-20852 Villasanta (MB) – ITALY

WE HEREWITH CONFIRM THAT
THE MODULES IN THE TABLE ENCLOSED TO THE PRESENT DOCUMENT
MEET THE REQUIREMENTS OF IEC EN 61508:2010
(LOW DEMAND MODE OF OPERATION)

Examination result:

The above described Modules were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-236198-04) according to IEC EN 61508:2010, under fulfillment of the conditions listed in the related Reports, mentioned in the same table, in their currently valid version, on which this Certificate is based

Examination parameters:

Functional characteristics, reliability and availability parameters and functional safety management

Official Summary Table No.: T-IS-236198-04

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL SUMMARY TABLE IS AN INTEGRAL PART OF THIS DOCUMENT

Reference Standard

IEC EN 61508:2010 Part 1, 2, 4, 6, 7

Sesto San Giovanni, July, 24th 2020

TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Technical Manager


Paolo Marcone





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SUMMARY TABLE T-IS-236198-04

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
1.	D5090S_D5290S	R-IS-236198-01 Rev.1	Type A	9.81E-5	14 years	NE	SIL3*	SIL3
				1.40E-4	20 years		SIL3**	

Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
0.00 FIT	191.40 FIT	0.00 FIT	1.60 FIT	99.17 %	209.60 FIT	0.00 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
2.	D5091S_D5291S	R-IS-236198-02 Rev.1	Type A	9.57E-5	6 years	ND relays and NO contacts, for ND load	SIL3*	SIL3
				3.19E-4	20 years		SIL3**	
				9.81E-5	14 years	NE relays and NC contacts, for ND load	SIL3*	
				1.40E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
ND relays and NO contacts, for ND load	0.00 FIT	96.00 FIT	0.00 FIT	3.64 FIT	96.35 %	302.96 FIT	0.00 FIT
NE relays and NC contacts, for ND load	0.00 FIT	191.40 FIT	0.00 FIT	1.60 FIT	99.17 %	209.60 FIT	0.00 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
3.	D5014S_D5014D	R-IS-722159706 Rev.1	Type A	6.69E-5	1 year	Active Input	SIL3*	SIL3
				6.69E-4	10 years		SIL3**	
				9.37E-4	14 years		SIL2*	
				1.34E-3	20 years		SIL2**	
				6.36E-5	1 year	Passive Input	SIL3*	
				6.36E-4	10 years		SIL3**	
				9.54E-4	15 years		SIL2*	
				1.27E-3	20 years		SIL2**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Active Input	0.00 FIT	0.00 FIT	146.72 FIT	14.97 FIT	90.74 %	205.11 FIT	4.80 FIT
Passive Input	0.00 FIT	0.00 FIT	135.30 FIT	14.25 FIT	90.47 %	201.25 FIT	20.80 FIT

(*)Considering the products do not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products do contribute more than 10% of total SIF dangerous failure.

Please, for more Functional Safety information see Safety Manual ISM0382_r0.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
4.	D5014D	R-IS-722159706 Rev.1	Type A	6.69E-5	1 year	Duplicator with Input loop on two active inputs	SIL3*	SIL3
				6.69E-4	10 years		SIL3**	
				9.37E-4	14 years		SIL2*	
				1.34E-3	20 years		SIL2**	
				6.36E-5	1 year	Duplicator with Input loop on a passive input and an active input (Channel A with passive input)	SIL3*	
				6.36E-4	10 years		SIL3**	
				9.54E-4	15 years		SIL2*	
				1.27E-3	20 years		SIL2**	
				9.72E-5	1 year	Duplicator with Input loop on a passive input and an active input (Channel B with active input)	SIL3*	
				4.86E-4	5 years		SIL3**	
				9.72E-4	10 years		SIL2*	
				9.72E-3	20 years		SIL2**	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Duplicator with Input loop on two active inputs	0.00 FIT	0.00 FIT	146.96 FIT	14.97 FIT	90.76 %	205.11 FIT	376.16 FIT
Duplicator with Input loop on a passive input and an active input (Channel A with passive input)	0.00 FIT	0.00 FIT	135.54 FIT	14.25 FIT	90.49 %	201.25 FIT	392.16 FIT
Duplicator with Input loop on a passive input and an active input (Channel B with active input)	0.00 FIT	0.00 FIT	257.76 FIT	21.69 FIT	92.24 %	339.15 FIT	124.60 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.

Please, for more Functional Safety information see Safety Manual ISM0382_r0.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
5.	D5011S_D5011D	R-IS-722159706 Rev.1	Type A	6.01E-5	1 year	D5011S with Passive Input	SIL3*	SIL3
				6.01E-4	10 years		SIL3**	
				9.62E-4	16 years		SIL2*	
				1.20E-3	20 years		SIL2**	
				6.03E-5	1 year	D5011D with Passive Inputs	SIL3*	
				6.03E-4	10 years		SIL3**	
				9.65E-4	16 years		SIL2*	
				1.21E-3	20 years		SIL2**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
D5011S with Passive Input	0.00 FIT	0.00 FIT	131.47 FIT	13.46 FIT	90.71 %	194.87 FIT	4.20 FIT
D5011D with Passive Inputs	0.00 FIT	0.00 FIT	155.47 FIT	13.46 FIT	92.03 %	227.87 FIT	193.00 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.

Please, for more Functional Safety information see Safety Manual ISM0381_r0.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
6.	D5034S_D5034D	R-IS-236198-06 Rev.1	Type A	5.65E-5	1 year	NA	SIL3*	SIL3
				1.70E-4	3 years		SIL3**	
				2.82E-4	5 years		SIL3**	
				5.65E-4	10 years		SIL3**	
				9.61E-4	17 years		SIL2*	
				1.13E-3	20 years		SIL2**	

Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
0.00 FIT	0.00 FIT	125.63 FIT	12.64 FIT	90.86 %	182.53 FIT	4.80 FIT

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
7.	D5030S_D5030D	R-IS-236198-07 Rev.2	Type A	8.60E-4	5 years	Independent channel and maximum relay contact current is 4 A	SIL2*	SIL3
				3.44E-3	20 years		SIL2**	
				9.84E-5	2 years	Independent channel and maximum relay contact current is 100 mA	SIL3*	
				4.92E-4	10 years		SIL3**	
				9.84E-4	20 years		SIL2*	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Independent channel and maximum relay contact current is 4 A	0.00 FIT	143.62 FIT	0.00 FIT	39.22 FIT	78.55 %	202.96 FIT	6.20 FIT
Independent channel and maximum relay contact current is 100 mA	0.00 FIT	101.62 FIT	0.00 FIT	11.22 FIT	90.06 %	202.96 FIT	6.20 FIT

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Please, for more Functional Safety information see Safety Manual ISM0363_r0.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
8.	D5030D	R-IS-236198-07 Rev.2	Type A	8.62E-4	5 years	Used as Duplicator or as Fault indicator (only Out 1) and maximum relay contact current is 4 A	SIL2*	SIL3
				3.45E-3	20 years		SIL2**	
				9.92E-5	2 years	Used as Duplicator or as Fault indicator (only Out 1) and max. relay contact current is 100 mA	SIL3*	
				4.96E-4	10 years		SIL3**	
				9.92E-4	20 years		SIL2*	
				8.47E-4	5 years	Used as Fault indicator (only Out 2) and maximum relay contact current is 4 A	SIL2*	
				3.39E-3	20 years		SIL2**	
				9.32E-5	2 years	Used as Fault indicator (only Out 2) and max. relay contact current is 100 mA	SIL3*	
				4.66E-4	10 years		SIL3**	
				9.32E-4	20 years		SIL2*	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Used as Duplicator or as Fault indicator (only Out 1) and maximum relay contact current is 4 A	0.00 FIT	195.95 FIT	0.00 FIT	39.30 FIT	83.30 %	398.15 FIT	136.00 FIT
Used as Duplicator or as Fault indicator (only Out 1) and max. relay contact current is 100 mA	0.00 FIT	153.95 FIT	0.00 FIT	11.30 FIT	93.16 %	398.15 FIT	66.00 FIT
Used as Fault indicator (only Out 2) and maximum relay contact current is 4 A	0.00 FIT	195.41 FIT	0.00 FIT	38.62 FIT	83.50 %	399.38 FIT	136.00 FIT
Used as Fault indicator (only Out 2) and max. relay contact current is 100 mA	0.00 FIT	153.41 FIT	0.00 FIT	10.62 FIT	93.53 %	399.38 FIT	66.00 FIT

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Please, for more Functional Safety information see Safety Manual ISM0363_r0.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
9.	D5031S_D5031D	R-IS-236198-07 Rev.2	Type A	9.82E-5	2 years	Independent channel	SIL3*	SIL3
				4.91E-4	10 years		SIL3**	
				9.82E-4	20 years		SIL2*	
10.	D5031D			9.90E-5	2 years	Used as Duplicator or as Fault indicator (only Out 1)	SIL3*	
				4.95E-4	10 years		SIL3**	
				9.90E-4	20 years		SIL2*	
				9.09E-5	2 years	Used as Fault indicator (only Out 2)	SIL3*	
				4.55E-4	10 years		SIL3**	
				9.09E-4	20 years		SIL2*	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Independent channel	0.00 FIT	117.46 FIT	0.00 FIT	11.20 FIT	91.29 %	214.34 FIT	0.20 FIT
Used as Duplicator or as Fault indicator (only Out 1)	0.00 FIT	169.79 FIT	0.00 FIT	11.28 FIT	93.77 %	409.53 FIT	93.20 FIT
Used as Fault indicator (only Out 2)	0.00 FIT	169.25 FIT	0.00 FIT	10.36 FIT	94.23 %	410.99 FIT	93.20 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.

Please, for more Functional Safety information see Safety Manual ISM0364_r0.



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	ITEM NAME	REPORT CODE	FINAL RESULTS							
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL		
11.	D5032S_D5032D	R-IS-236198-07 Rev.2	Type A	9.84E-5	2 years	Independent channel and maximum relay contact current is 100 mA	SIL3*	SIL3		
				4.92E-4	10 years		SIL3**			
				9.84E-4	20 years		SIL2*			
12.	D5032D			Type A	9.92E-5	2 years	Used as Duplicator or as Fault indicator (only Out 1) and maximum relay contact current is 100 mA		SIL3*	SIL3
					4.96E-4	10 years			SIL3**	
					9.92E-4	20 years			SIL2*	
					9.32E-5	2 years	Used as Fault indicator (only Out 2) and maximum relay contact current is 100 mA		SIL3*	
					4.66E-4	10 years			SIL3**	
					9.32E-4	20 years			SIL2*	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Independent channel and max. relay contact current is 100 mA	0.00 FIT	101.62 FIT	0.00 FIT	11.22 FIT	90.06 %	202.96 FIT	6.20 FIT
Used as Duplicator or as Fault indicator (only Out 1) and max. relay contact current is 100 mA	0.00 FIT	153.95 FIT	0.00 FIT	11.30 FIT	93.16 %	398.15 FIT	66.00 FIT
Used as Fault indicator (only Out 2) and max. relay contact current is 100 mA	0.00 FIT	153.41 FIT	0.00 FIT	10.62 FIT	93.53 %	399.38 FIT	66.00 FIT

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Please, for more Functional Safety information see Safety Manual ISM0365_r0.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
13.	D5020S_D5020D	R-IS-236198-08 Rev.1	Type A	9.33E-4	10 years	NA	SIL2*	SIL3
				1.87E-3	20 years		SIL2**	

Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
0.00 FIT	0.00 FIT	136.38 FIT	21.00 FIT	86.65 %	255.92 FIT	65.70 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
14.	D5290S/SA	R-IS-236198-01 Rev.1	Type A	9.81E-5	14 years	NE	SIL3*	SIL3
				1.40E-4	20 years		SIL3**	
15.	D5290S-080			7.01E-5	10 years***		SIL3*	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
D5290S/SA NE configuration	0.00 FIT	97.20 FIT	0.00 FIT	1.60 FIT	98.38 %	88.40 FIT	0.00 FIT
D5290S-080 NE configuration	0.00 FIT	144.96 FIT	0.00 FIT	1.60 FIT	98.91 %	106.24 FIT	0.00 FIT

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(***)It is considered the product life time.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
16.	D5049S_D1049S	R-IS-236198-18 Rev.1	Type A	9.98E-5	12 years	Bus Powered / NE load	SIL3*	SIL3
				1.66E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
D5049S Bus Powered / NE load	0.00 FIT	171.63 FIT	0.00 FIT	1.90 FIT	98.91 %	274.47 FIT	31.60 FIT
D1049S Bus Powered / NE load	0.00 FIT	170.63 FIT	0.00 FIT	1.90 FIT	98.90 %	271.27 FIT	31.60 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
17.	D5048S_D1048S	R-IS-236198-18 Rev.1	Type A	0.00E+0	20 years***	Loop Powered / NE load	SIL3	SIL3

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
D5048S Loop Powered / NE load	0.00 FIT	142.45 FIT	0.00 FIT	0.00 FIT	100.00 %	219.65 FIT	34.70 FIT
D1048S Loop Powered / NE load	0.00 FIT	141.45 FIT	0.00 FIT	0.00 FIT	100.00 %	216.45 FIT	33.70 FIT

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
18.	D1044S	R-IS-236198-23 Rev.1	Type A	9.80E-4	6 years	Bus Powered	SIL2*	SIL3
				1.63E-3	10 years		SIL2**	
				9.83E-4	7 years	Loop Powered	SIL2*	
				1.40E-3	10 years		SIL2**	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Bus Powered	0.00 FIT	126.39 FIT	0.00 FIT	37.24 FIT	77.24 %	106.17 FIT	2.00 FIT
Loop Powered	0.00 FIT	131.72 FIT	0.00 FIT	32.00 FIT	80.45 %	106.08 FIT	2.00 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
19.	D1044D	R-IS-236198-23 Rev.1	Type A	9.80E-4	6 years	Bus Powered – Independent channels	SIL2*	SIL3
				1.63E-3	10 years		SIL2**	
				8.16E-5	10 years	Bus Powered – 1oo2 architecture	SIL3*	
				7.02E-5	10 years	Loop Powered – 1oo2 architecture	SIL3*	

Configuration	Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
Bus Powered – Independent channels	0.00 FIT	131.99 FIT	0.00 FIT	37.24 FIT	77.99 %	115.57 FIT	188.60 FIT
Bus Powered – 1oo2 arch.	0.00 FIT	218.80 FIT	0.00 FIT	1.86 FIT	99.16 %	248.74 FIT	4.00 FIT
Loop Powered – 1oo2 arch.	0.00 FIT	229.46 FIT	0.00 FIT	1.60 FIT	99.31 %	238.34 FIT	4.00 FIT

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			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
20.	D5040S_D5040D	R-IS-252327-01 Rev.1	Type A	0.00E+0	20 years***	NE load	SIL3	SIL3

Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
0.00 FIT	104.46 FIT	0.00 FIT	0.00 FIT	100.00 %	102.54 FIT	10.20 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
21.	PSD5201	R-IS-254276-01 Rev.1	Type A	8.65E-5	2 years	NE load	SIL3*	SIL3
				1.73E-4	4 years		SIL3**	
				4.33E-4	10 years		SIL3**	
				8.65E-4	20 years		SIL2*	

Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
0.00 FIT	101.50 FIT	0.00 FIT	9.86 FIT	91.15 %	133.64 FIT	9.60 FIT

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(***)It is considered the product life time.



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NOTE: The present table is integral part of the Document: C-IS-236198-04 Rev.2

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
22.	D5293S	R-IS-722188598-01 Rev.1	Type A	9.81E-5	13 years	NE loads	SIL3*	SIL3
				1.51E-4	20 years		SIL3**	

Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
0.00 FIT	130.74 FIT	0.00 FIT	1.72 FIT	98.70%	97.94 FIT	454.40 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
23.	D5294S	R-IS-722188598-01 Rev.1	Type A	9.81E-5	13 years	NE loads	SIL3*	SIL3
				1.51E-4	20 years		SIL3**	
				8.82E-5	6 years	F&G / ND loads	SIL3*	
				2.94E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
NE loads	0.00 FIT	244.29 FIT	0.00 FIT	1.72 FIT	99.30%	195.64 FIT	705.90 FIT
F&G / ND loads	0.00 FIT	133.80 FIT	0.00 FIT	3.35 FIT	97.56%	305.70 FIT	704.70 FIT

(*)Considering the products do not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.

Please, for more Functional Safety information see Safety Manual ISM0441_r0 (for D5293S) and ISM0442_r0 (for D5294S).



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
24.	D5295S	R-IS-722188598-01 Rev.1	Type A	9.74E-5	7 years	NE loads	SIL3*	SIL3
				2.78E-4	20 years		SIL3**	
				9.32E-5	11 years	F&G / ND loads	SIL3*	
				1.69E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
NE loads	0.00 FIT	141.78 FIT	0.00 FIT	3.17 FIT	97.81%	291.59 FIT	704.70 FIT
F&G / ND loads	0.00 FIT	239.60 FIT	0.00 FIT	1.93 FIT	99.20%	193.81 FIT	705.90 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.

Please, for more Functional Safety information see Safety Manual ISM0443_r0.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
25.	D5244S_D5244D	R-IS-260962-01 Rev.1	Type A	9.28E-4	6 years	Loop Powered with independent channels	SIL2*	SIL3
				1.86E-3	12 years		SIL2**	
				3.09E-3	20 years		SIL2**	
26.	D5244D		Type A	9.28E-5	12 years	Loop Powered with 1oo2 architecture	SIL3*	
				1.55E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
D5244S or D5244D Loop Powered with independent channels	0.00 FIT	109.72 FIT	0.00 FIT	35.23 FIT	75.70 %	92.45 FIT	2.00 FIT
D5244D Loop Powered with 1oo2 architecture	0.00 FIT	219.44 FIT	0.00 FIT	1.76 FIT	99.20 %	253.60 FIT	4.00 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	8.17E-5	1.5 years	Single PSM1250 into PSS1250 (with or without HS) or single PSW12xx , for NE load	SIL3*	SIL3
				1.63E-4	3 years		SIL3**	
				2.72E-4	5 years		SIL3**	
				5.45E-4	10 years		SIL3**	
				9.81E-4	18 years		SIL2*	
				1.09E-3	20 years		SIL2**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Single PSM1250 into PSS1250 (with HS) , for NE load	0.00 FIT	1890.87 FIT	42.76 FIT	12.34 FIT	99.37 %	1146.91 FIT	267.09 FIT
Single PSM1250 into PSS1250 (without HS) or single PSW12xx , for NE load	0.00 FIT	1635.27 FIT	42.51 FIT	12.34 FIT	99.27 %	938.09 FIT	169.89 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	9.97E-5	8 years	Two paralleled PSM1250 into PSS1250 (with or without HS) or two paralleled PSW12xx , for NE load	SIL3*	SIL3
				1.99E-4	16 years		SIL3**	
				2.49E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Two paralleled PSM1250 into PSS1250 (with HS) , for NE load	0.00 FIT	94.54 FIT	5.86 FIT	2.83 FIT	99.26 %	6082.53 FIT	534.18 FIT
Two paralleled PSM1250 into PSS1250 (without HS) or two paralleled PSW12xx , for NE load	0.00 FIT	81.76 FIT	5.85 FIT	2.83 FIT	96.88 %	5165.98 FIT	339.78 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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Italia

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	8.96E-5	4 years	Four paralleled PSM1250 into PSS1250 (with or without HS) or four paralleled PSW12xx , for NE load	SIL3*	SIL3
				1.79E-4	8 years		SIL3**	
				2.24E-4	10 years		SIL3**	
				3.36E-4	15 years		SIL3**	
				4.48E-4	20 years		SIL3**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Four paralleled PSM1250 into PSS1250 (with HS) , for NE load	0.00 FIT	94.54 FIT	9.68 FIT	5.09 FIT	95.34 %	12262.20 FIT	1068.36 FIT
Four paralleled PSM1250 into PSS1250 (without HS) or four paralleled PSW12xx , for NE load	0.00 FIT	81.76 FIT	9.67 FIT	5.09 FIT	94.72 %	10416.31 FIT	679.56 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

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Italia

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	9.72E-5	3 years	Six paralleled PSM1250 into PSS1250 (with or without HS) or six paralleled PSW12xx , for NE load	SIL3*	SIL3
				1.94E-4	6 years		SIL3**	
				3.24E-4	10 years		SIL3**	
				4.86E-4	15 years		SIL3**	
				6.48E-4	20 years		SIL2*	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Six paralleled PSM1250 into PSS1250 (with HS) , for NE load	0.00 FIT	94.54 FIT	13.50 FIT	7.36 FIT	93.62 %	18441.87 FIT	1602.54 FIT
Six paralleled PSM1250 into PSS1250 (without HS) or six paralleled PSW12xx , for NE load	0.00 FIT	81.76 FIT	13.49 FIT	7.36 FIT	92.83 %	15666.65 FIT	1019.34 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	8.54E-3	1 year	Single PSM1250 into PSS1250 (with HS), for ND load	SIL1*	SIL3
				1.71E-2	2 years		SIL1**	
				4.27E-2	5 years		SIL1**	
				7.42E-3	1 year	Single PSM1250 into PSS1250 (without HS) or single PSW12xx , for ND load	SIL1*	
				1.48E-2	2 years		SIL1**	
				3.71E-2	5 years		SIL1**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Single PSM1250 into PSS1250 (with HS) , for ND load	0.00 FIT	1146.91 FIT	0.00 FIT	1945.97 FIT	37.08 %	0.00 FIT	267.09 FIT
Single PSM1250 into PSS1250 (without HS) or single PSW12xx , for ND load	0.00 FIT	938.09 FIT	0.00 FIT	1690.12 FIT	35.69 %	0.00 FIT	169.89 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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Italia

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	8.72E-4	2 years	Two paralleled PSM1250 into PSS1250 (with HS), for ND load	SIL2*	SIL3
				1.74E-3	4 years		SIL2**	
				4.36E-3	10 years		SIL2**	
				8.72E-3	20 years		SIL1*	
				7.60E-4	2 years	Two paralleled PSM1250 into PSS1250 (without HS) or two paralleled PSW12xx , for ND load	SIL2*	
				1.90E-3	5 years		SIL2**	
				3.80E-3	10 years		SIL2**	
				7.60E-3	20 years		SIL1*	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Two paralleled PSM1250 into PSS1250 (with HS) , for ND load	0.00 FIT	6082.53 FIT	3.82 FIT	99.41 FIT	98.39 %	0.00 FIT	534.18 FIT
Two paralleled PSM1250 into PSS1250 (without HS) or two paralleled PSW12xx , for ND load	0.00 FIT	5165.98 FIT	3.82 FIT	86.62 FIT	98.35 %	0.00 FIT	339.78 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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Italia

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	8.92E-4	2 years	Four paralleled PSM1250 into PSS1250 (with HS), for ND load	SIL2*	SIL3
				1.78E-3	4 years		SIL2**	
				4.46E-3	10 years		SIL2**	
				8.92E-3	20 years		SIL1*	
				7.80E-4	2 years	Four paralleled PSM1250 into PSS1250 (without HS) or four paralleled PSW12xx , for ND load	SIL2*	
				1.95E-3	5 years		SIL2**	
				3.90E-3	10 years		SIL2**	
				7.80E-3	20 years		SIL1*	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Four paralleled PSM1250 into PSS1250 (with HS) , for ND load	0.00 FIT	12262.20 FIT	7.64 FIT	101.68 FIT	99.18 %	0.00 FIT	1068.36 FIT
Four paralleled PSM1250 into PSS1250 (without HS) or four paralleled PSW12xx , for ND load	0.00 FIT	10416.31 FIT	7.64 FIT	88.89 FIT	99.15 %	0.00 FIT	679.56 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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Italia

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
27.	PSS1250 power supply system and PSW12xx (PSW1250 or PSW1230) power supply module	R-IS-224248-06 Rev.2	Type A	9.12E-4	2 years	Six paralleled PSM1250 into PSS1250 (with HS), for ND load	SIL2*	SIL3
				1.82E-3	4 years		SIL2**	
				4.56E-3	10 years		SIL2**	
				9.12E-3	20 years		SIL1*	
				8.00E-4	2 years	Six paralleled PSM1250 into PSS1250 (without HS) or six paralleled PSW12xx , for ND load	SIL2*	
				2.00E-3	5 years		SIL2**	
				4.00E-3	10 years		SIL2**	
				8.00E-3	20 years		SIL1*	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
Six paralleled PSM1250 into PSS1250 (with HS) , for ND load	0.00 FIT	18441.87 FIT	11.46 FIT	103.95 FIT	99.44 %	0.00 FIT	1602.54 FIT
Six paralleled PSM1250 into PSS1250 (without HS) or six paralleled PSW12xx , for ND load	0.00 FIT	15666.65 FIT	11.46 FIT	91.15 FIT	99.42 %	0.00 FIT	1019.34 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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	ITEM NAME	REPORT CODE	FINAL RESULTS									
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL				
28.	D5036S	R-IS-265803-01 Rev.1	Type A	8.99E-4	4 years	NA	SIL2*	SIL3				
				1.80E-3	8 years		SIL2**					
				3.37E-3	15 years		SIL2**					
				4.50E-3	20 years		SIL2**					
29.	D5036D			R-IS-265803-01 Rev.1	Type A		8.99E-4		4 years	NA	SIL2*	SIL3
							1.80E-3		8 years		SIL2**	
							3.37E-3		15 years		SIL2**	
							4.50E-3		20 years		SIL2**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
D5036S	0.00 FIT	124.62 FIT	0.00 FIT	51.22 FIT	70.87 %	128.26 FIT	23.50 FIT
D5036D	0.00 FIT	130.16 FIT	0.00 FIT	51.22 FIT	71.76 %	138.62 FIT	200.20 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

(**)Considering the products contribute more than 10% of total SIF dangerous failure.



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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
30.	D5037S	R-IS-265803-01 Rev.1	Type A	9.65E-4	8 years	NA	SIL2*	SIL3
				1.93E-3	16 years		SIL2**	
				2.41E-3	20 years		SIL2**	
31.	D5037D			9.65E-4	8 years		SIL2*	
				1.93E-3	16 years		SIL2**	
				2.41E-3	20 years		SIL2**	

Configuration	Safe Detected Failure λ_{SD}	Safe Undetected Failure λ_{SU}	Dangerous Detected Failure λ_{DD}	Dangerous Undetected Failure λ_{DU}	Safe Failure Fraction SFF	No Effect Failure λ_{NE}	Not Part Failure λ_{NP}
D5037S	0.00 FIT	92.76 FIT	0.00 FIT	27.48 FIT	77.15 %	132.06 FIT	17.50 FIT
D5037D	0.00 FIT	98.30 FIT	0.00 FIT	27.48 FIT	78.15 %	142.42 FIT	148.40 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

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	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
32.	D5290S-091	R-IS-265803-02 Rev.1	Type A	9.83E-5	14 years	NE	SIL3*	SIL3
				1.40E-4	20 years		SIL3**	

Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
0.00 FIT	152.45 FIT	0.00 FIT	1.60 FIT	98.96 %	117.95 FIT	11.40 FIT

	ITEM NAME	REPORT CODE	FINAL RESULTS					
			System type	PFD _{avg}	T _{Proof}	Configuration	Allowed SIL	Allowed Systematic SIL
33.	D5090S-086	R-IS-260962-02 Rev.1	Type A	8.64E-5	6 years	ND relay, for NE load	SIL3*	SIL3
				1.87E-4	13 years		SIL3**	
				2.88E-4	20 years		SIL3**	

Safe Detected Failure λ _{SD}	Safe Undetected Failure λ _{SU}	Dangerous Detected Failure λ _{DD}	Dangerous Undetected Failure λ _{DU}	Safe Failure Fraction SFF	No Effect Failure λ _{NE}	Not Part Failure λ _{NP}
0.00 FIT	96.00 FIT	0.00 FIT	3.28 FIT	96.70 %	260.72 FIT	42.60 FIT

(*)Considering the products not contribute more than 10% of total SIF dangerous failure.

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FUNCTIONAL SAFETY ASSESSMENTS		
	REPORT CODE	FINAL RESULT
1	R-IS-722189296 Rev.2	Compliant to the standard for the following parts: <ul style="list-style-type: none">- Documentation (IEC EN 61508:2010 Part 1 Chapter 5)- Management of functional safety (IEC EN 61508:2010 Part 1 Chapter 6)- Functional safety assessment (IEC EN 61508:2010 Part 1 Chapter 8)- Realization: E/E/PES safety lifecycle from 10.1 to 10.6 (IEC EN 61508:2010 Part 2) for the all safety related modules object of this certificate.



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