Rockwell Automation
Functional Safety Data Sheet

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Rockwell Automation

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Type	Family	Part Number	See Notes	SIL CL	PL	Category per EN ISO 13849-1	PFH_D Probability of dangerous failure per hour according to EN/IEC 61508 or EN/IEC 62061 (Continuous and High demand mode)	PFD Probability of dangerous failure on demand according to EN/IEC 61508 (Low demand mode)	B10d (Electro-Mechanical products)	MTTFd (years) for the product when used as a "block"	T1 Proof Test Interval – Mission Time – Lifetime Years
Interlock Switches	Elf	440K-E33	*1, *7, *8, *12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Cadet 3	440K-C21	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Trojan 5, 6 & T15	440K-T11	*1, *7, *8,*12, *16, *20,*31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	MT-GD2	440K-MT	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	SensaGuard: RFID coded	440N-Z21S* 440N-Z21U*		3	e	4	1.12E-9				20
	Magnetically coded: MC2	440N-Z21W*	*7, *14, *20, *23,*31			N/A (Must only be used with a designated monitoring unit - Up to Cat 4.)			2.00E+06		20
	Magnetically coded: MC1	440N-Z2NRS*	*7, *14, *20, *23,*31			N/A (Must only be used with a designated monitoring unit - Up to Cat 4.)			2.00E+06		20
	Ferrogard	440N-G	*1, *7, *8,*12, *20, *31			1 (Up to 4 with monitoring unit)			2.00E+06		20
	Sipha Sensors S1, S2 ,S3, S4	440N-S	*1, *7,*12,*14, *20, *31			N/A (Must only be used with a designated monitoring unit - Up to Cat 4.)			2.00E+06		20
Guard Locking Switches	440G-MT	440G-MT	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	TLS-GD2	440G-T	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	TLS-Z GD2	440G-TZ***	*37		e	4	1.70E-09				20 years or 1000000 cycles
	440G-LZ Guard Locking Switch	440G-LZ	*40	3	e	4	2.80E-09	4.90E-04			20
	Access Box	442G-MABR-* 442G-MABL-*	*11	3	e	4	2.47E-08				
	Access Box: CIP Safety Ethernet/IP	442G-MABRB-* 442G-MABLB-*		3	e	4	5.10E-09				
	Emergency stop device on Access Box: CIP Safety Ethernet/IP	442G-MABRB-* 442G-MABLB-*				1 (higher with monitoring unit)			1.00E+05		20
	Atlas 5	440G-L	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Spartan	440G-S	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20

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Hinge Interlocking Switches	Sprite	440H-S	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Ensign 3	440H-E	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Rotacam	440H-R	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Prosafe Trapped Key System	440-T	*56		d	3	1.00E-07				20
Presence Sensing	Safety Single Beam	440L-R/T	*5, *6, *32	3	e	Cat 4 Type 4 (IEC 61496)	1.43E-08				20
	GuardShield 440L Type 4	440L		3	e	CAT 4 Type 4 (IEC 61496)	3.17E-9 (IEC 61508, single) 9.51E-9 (IEC 61508, 3 cascaded)				20
	GuardShield 440L-P2 Type 2	440L-P2		1	c	Cat 2 Type 2 (IEC 61496)	6.91E-09				20
	GuardShield Safe 2	445L		1	c	Type 2 (IEC 61496)	7.93E-9 (worst case figure; 32 modules x 30mm, L=3840 mm)	6.95E-4 (worst case figure, 32 modules x 30 mm, L=3840 mm)			20
	GuardShield Safe 4	445L		3	e	Type 4 (IEC 61496)	7.93E-9 (worst case figure; 32 modules x 30mm, L=3840 mm)	2.58E-4 (worst case figure, 7 modules x mixed, L= 840mm)			20
	GuardShield Micro 400	445L		3	e	Type 4 (IEC 61496)	4E-9 (Micro 400 alone, 255 beams) 6E-9 (worst case: Micro 400, MSR42, & MSR45E with 255 beams, cascaded)	4E-4 (Micro 400 alone, 255 beams) 5E-4(worst case: Micro 400, MSR42 & MSR45E with 255 beams cascaded)			20
	SafeZone	442L-S		2	d	3	4.46E-07	3.91E-03			
	SafeZone Mini	442L-SFZNMN		2	d	3	9.80E-09	8.50E-04			20
	SC300 Hand Detection Safety Sensor	442L-SAFCAM1		2	d	3	3.20E-09				20
	MatGuard sensor used with controllers	440F-Mxxx	*46, *47. *48, *49, *50	2	d	"3 Must only be used with a designated control unit"	2.00E-09		2.00E+05		20
	Safedge System	440F-E/C	*5, *42 *43	2	d	3	1.07E-08				

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E-Stop and Operator Interface	800B E-Stop	800B-MT	*1, *7, *8,*12, *17,*20			1 (higher with monitoring unit)			1.50E+06		20
	800F E-Stop (twist to release)	800FD-MT44	*1, *7, *8,*12, *17, *19, *20, *29			1 (higher with monitoring unit)			1.38E+05		20
	800F E-Stop (pull to release)	800FD-MT44	*1, *7, *8,*12, *17, *19, *20, *29			1 (higher with monitoring unit)			1.11E+05		20
	800F E-Stop (twist to release)	800FP-MT44, 800FM-MT44	*1, *7, *8,*12, *17, *18, *20, *29			1 (higher with monitoring unit)			7.36E+05		20
	800F E-Stop (twist to release)	800FP-LMT44, 800FM-LMT44	*1, *7, *8,*12, *17, *19, *20, *29			1 (higher with monitoring unit)			2.06E+05		20
	800F E-Stop (twist to release)	800FP-MK44, 800FM-MK44	*1, *7, *8,*12, *17, *18, *20, *29			1 (higher with monitoring unit)			2.01E+06		20
	800F E-Stop (pull to release)	800FP-MP4#, 800FM-MP4#	*1, *7, *8,*12, *17, *19, *20, *29			1 (higher with monitoring unit)			2.43E+05		20
	800F E-Stop (pull to release)	800FP-LMP4#, 800FM-LMP4#	*1, *7, *8,*12, *17, *19, *20, *29			1 (higher with monitoring unit)			2.43E+05		20
	800H E-Stop (twist to release)	800H-FRX_, 800HC-FRX_	*1, *7, *8,*12, *17, *18, *20, *29			1 (higher with monitoring unit)			1.82E+06		20
	800H E-Stop (pull to release)	800H-FRX_, 800HC-FRX_	*1, *7, *8,*12, *17, *18, *20, *29			1 (higher with monitoring unit)			1.91E+06		20
	800T E-Stop (twist to release)	800T-FX_, 800TC-FX_	*1, *7, *8,*12, *17, *20, *29			1 (higher with monitoring unit)			2.50E+06		20
	800T E-Stop (pull to release)	800T-FX_, 800TC-FX_	*1, *7, *8,*12, *17, *20, *29			1 (higher with monitoring unit)			1.95E+06		20
	LifeLine 3, 4	440E-L/D	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Zero-Force Touch Buttons	800Z	*12, *30							76	
	3 Position Enabling Switch	440J	*1, *7, *8,*12 *20,			1 (Up to 3 with monitoring unit)			1.00E+05		20
Limit Switches	802T	802T	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	440P-A*	440P	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
	Imp 1, 2	440P-M1	*1, *7, *8,*12, *16, *20, *31			1 (Up to 3 with monitoring unit)			2.00E+06		20
Safety Encoders	Servo Motor Encoder: VPx motors	VPL-xxxxxx-Wx1xAx, Frames 63-75	*59	2	d	3	4.0 E-08				20
	Servo Motor Encoder: VPx motors	VPL-xxxxxx-Qx1xAx, Frame 100- 165	*59	2	d	3	3.8 E-08				20
	Servo Motor Encoder: VPx motors	VPF-xxxxxx-Wx1xAx. Food Grade Frames 63-75	*59	2	d	3	4.0 E-08				20
	Servo Motor Encoder: VPx motors	VPF-xxxxxx-Qx1xAx, Food Grade Frames 100-165	*59	2	d	3	3.8 E-08				20

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Safety Logic	GSR-DI	440R-D22R2	*5, *33	3	e	4	4.35E-09				20
	GSR-DIS	440R-D22S2		3	e	4	4.39E-09				20
	GSR-SI	440R-S12R2	*5 *33	3	e	4	3.98E-09	5.68E-04			20
	GSR-CI	440R-SI3R2	*5 *33	3	e	4	4.26E-09	5.90E-04			20
	GSR-EM	440R-EM4R2	*5, *33	3	e	4	1.81E-09				20
	GSR-EMD (delayed)	440R-EM4R2D	*5, *33	3	e	4	4.40E-09	3.84E-04			20
	GSR-GLP	440R-GL2S2P	*36	2	d	3	7.18E-09				20
	GSR-GLT	440R-GL2S2T		3	e	4	8.10E-09				20
	MSR117	440R	*5, *33	3	e	4	2.31E-10	4.05E-05			20
	MSR5	440R	*5, *33	3	e	4	2.31E-10	4.05E-05			20
	MSR121	440R	*5, *33	3	e	4	9.26E-10	1.62E-04			20
	MSR122	440R	*5, *33	3	e	4	2.82E-10	4.94E-05			20
	MSR124	440R	*5, *33	3	e	4	2.00E-09	3.51E-04			20
	MSR125	440R	*5, *33	3	e	4	2.45E-10	4.29E-05			20
	MSR126	440R	*5, *33	3	e	4	5.90E-09				20
	MSR127	440R	*5, *33	3	e	4	5.90E-09				20
	MSR131	440R	*5, *33	3	e	4	2.66E-09				20
	MSR132E	440R	*5, *33	3	e	4	2.34E-10	4.10E-05			20
	MSR132ED	440R	*5, *33	2	d	3	2.34E-10	4.10E-05			20
	MSR138 - Immediate acting outputs	440R	*5,*10, *33	3	e	4	1.40E-08				20
	MSR138 - Delayed acting outputs	440R	*5,*33	2	d	3	1.40E-08				20
	MSR142	440R	*5, *33	3	e	4	1.20E-08				20
	MSR144	440R	*5, *33	3	e	4	6.00E-09				20
	MSR178	440R	*5, *33	3	e	4	2.74E-09	4.80E-04			20
	MSR210	440R	*5, *33	3	e	4	4.30E-09	7.54E-04			20
	MSR211	440R	*5, *33	3	e	4	4.30E-09	7.54E-04			20
	MSR220	440R	*5	3	e	4	9.19E-11	1.61E-05			20
	MSR221	440R	*5	3	e	4	9.19E-11	1.61E-05			20
	MSR230	440R	*5, *33	3	e	4	2.40E-10	4.21E-05			20
	MSR238	440R	*5, *33	2	d	3	2.88E-09	5.05E-04			20
	MSR30	440R	*5	3	e	4	9.20E-10	1.61E-04			20
	MSR310	440R	*5	3	e	4	3.15E-09	5.52E-04			20
	MSR312	440R	*5	3	e	4	3.15E-09	5.52E-04			20
	MSR320	440R	*5	3	e	4	3.10E-10	5.43E-05			20
	MSR329	440R	*5	3	e	4	3.80E-10	6.66E-05			20

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Safety Logic	MSR33	440R	*5	3	e	4	9.20E-10	1.61E-04			20
	MSR330	440R	*5, *33	3	e	4	2.30E-10	4.03E-05			20
	MSR338	440R	*5, *33	2	d	3	7.70E-10	1.35E-04			20
	MSR35	440R	*5	3	e	4	9.20E-10	1.61E-04			20
	MSR38	440R	*5	3	e	4	9.20E-10	1.61E-04			20
	MSR41	440R-P		3	e	4	9.00E-10	8.00E-05			20
	MSR42	440R-P		3	e	4	9.00E-10	8.00E-05			20
	Muting Controller Box 445L-AMUTBOX1	445L-AMUTBOX1		3	e	4	9.00E-10	8.00E-05			20
	MSR45E	440R-P		3	e	4	3.00E-10	2.00E-05			20
	MSR57 Safe Speed Monitor - single encoder mode - Pulse test OFF	440R-S	*5, *24, *26	3	e	3	1.48E-08	2.59E-03			20
	MSR57 Safe Speed Monitor - single encoder mode - Pulse test ON	440R-S	*5, *24	3	e	4	7.04E-09	1.23E-04			20
	MSR57 Safe Speed Monitor - Dual encoder mode - Pulse test OFF	440R-S	*5, *25, *26	3	e	3	1.11E-08	1.95E-03			20
	MSR57 Safe Speed Monitor- Dual encoder mode - Pulse test ON	440R-S	*5, *25	3	e	4	3.38E-09	5.93E-04			20
	CU2	440R	*5, *33	1	b	1	1.58E-07	2.80E-02			20
	CU3	440R	*33	2	c	1	8.19E-08	1.43E-02			20
	CU4	440R	*5, *33	2	d	3	2.31E-10	4.05E-05			20
	MatManager	440F-C	*5, *33	2	d	3	2.59E-09	4.54E-04			20
	MatGuard controller	440F-C	*5, *33	2	d	3	2.90E-08	5.08E-03			20
	Sipha 2 Controller	440N	*5, *33	2	d	3	7.27E-09	1.27E-03			20
	Software Configurable Safety Relay CR30	440C-CR30	*44	3	e	4	1.00E-08	8.78E-04			20
	GuardPLC 1200	1754-L28		3	N/A	3/4	3.09E-09	1.45E-04			10
	GuardPLC 1600	1753-L28		3	N/A	3/4	3.93E-09	4.16E-05			10
	GuardPLC 1800	1753-L32		3	N/A	3/4	5.67E-09	5.46E-05			10
	GuardPLC 2000	1755-L1		3	N/A	3/4	4.37E-09	4.88E-05			10
	GuardPLC I/O	1753-IB16		3	e	4	2.77E-09	3.68E-05			10
	GuardPLC I/O	1753-OB16		3	e	4	3.90E-09	3.63E-05			10
	GuardPLC I/O	1753-IB20XOB8		3	e	4	4.25E-09	5.11E-05			10
	GuardPLC I/O	1753-IB8XOB8		3	e	4	6.58E-09	4.60E-05			10
	GuardPLC I/O	1753-IB16XOB8		3	e	4	6.19E-09	6.66E-05			10

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Safety Logic	GuardPLC I/O	1753-IF8XOF4		3	e	4	5.16E-09	8.58E-05			10
	GuardPLC I/O	1753-OW8		3	e	4	1.73E-09	2.24E-05			10
	DeviceNet Safety Scanner	1753-DNSI		3	N/A	4	5.61E-10	9.30E-06			10
	SmartGuard 600 DeviceNet	1752-L24BBB		3	e	4	3.89E-10	3.42E-05			20
	SmartGuard 600 EtherNet/IP	1752-L24BBBE		3	e	4	3.89E-10	3.42E-05			20
	GuardLogix: L6xS & LSP	1756-L6xS / LSP		3	e	4	2.00E-10	1.20E-05			20
	GuardLogix: L7xS & L7SP	1756-L7xS / L7SP		3	e	4	1.20E-09	8.90E-05			20
	Compact GuardLogix: L4xS	1768-L4xS		3	e	4	2.10E-10	1.20E-05			20
	Compact GuardLogix 5370 controller	1769-L30ERMS, 1769-L33ERMS, 1769-L36ERMS		3	e	4	1.50E-09	1.20E-04			20
	CompactBlock Guard I/O (DeviceNet Safety)	1791DS-IB12		3	e	4	6.84E-11	6.01E-06			20
	CompactBlock Guard I/O (DeviceNet Safety)	1791DS-IB8XOB8		3	e	4	6.84E-11	6.01E-06			20
	CompactBlock Guard I/O (DeviceNet Safety)	1791DS-IB4XOW4	*5	3	e	4	4.07E-09	7.68E-04			20
	CompactBlock Guard I/O (DeviceNet Safety)	1791DS-IB8XOBV4		3	e	4	2.00E-10	1.75E-05			20
	CompactBlock Guard I/O (DeviceNet Safety)	1791DS-IB16		3	e	4	1.94E-10	1.70E-05			20
	ArmorBlock Guard I/O (DeviceNet Safety)	1732DS-IB8		3	e	4	1.94E-10	1.70E-05			20
	ArmorBlock Guard I/O (DeviceNet Safety)	1732DS-IB8XOBV4		3	e	4	2.00E-10	1.75E-05			20
	CompactBlock Guard I/O (EtherNet/IP Safety)	1791ES-IB8XOBV4		3	e	4	2.00E-10	1.75E-05			20
	CompactBlock Guard I/O (EtherNet/IP Safety)	1791ES-IB16		3	e	4	1.89E-10	1.65E-05			20
	ArmorBlock Guard I/O EtherNet/IP Safety Modules	1732ES-IB12XOBV2	*58	3	e	4	1.31E-10	1.12E-05			20
	ArmorBlock Guard I/O EtherNet/IP Safety Modules	1732ES-IB12XOB4	*58	3	e	4	1.31E-10	1.12E-05			20
	POINT Guard I/O	1734-IB8S		3	e	4	5.10E-10	4.23E-05			20
	POINT Guard I/O Analog - Dual Mode Operation	1734-IE4S, series A		3	e	4	3.90E-11	3.3E-06			20
	POINT Guard I/O Analog - Single Mode Operation	1734-IE4S, series A		3	e	4	5.6 E-11	4.8 E-06			20
	POINT Guard I/O	1734-OB8S		3	e	4	5.14E-10	4.27E-05			20

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Relay with Positively Guided Contacts	700-HPS at AC1 – 4A, 250V	700-HPS*	*5, *14, *20, *23, *34			B			3.50E+05		20
	700-HPS at AC15 - 3A, 250V	700-HPS*	*5, *14, *20, *23, *34			B			8.50E+04		20
	700-HPS at DC1 – 0.1A, 24V	700-HPS*	*5, *14, *20, *23, *34			B			5.00E+06		20
	700-HPS at DC13 - 1A, 24V	700-HPS*	*5, *14, *20, *23, *34			B			2.10E+05		20
Output actuation	Contactors 100S-C09 to C97at AC3	1100S-C09, C12, C16, C23, C30, C37, C40, C43, C55, C60, C72, C85, C90, C97	*3, *13 *20,			1			1.33E+06		20
	Contactors 100S-C09 to C55 - Mechanical	100S-C09…55	*3, *13, *20, *23			1			2.00E+07		20
	Contactors 100S-C60 to C97 - Mechanical	100S-C60...97	*3, *13, *20, *23			1			1.20E+07		20
	Contactors 100S-D115 to D300 at AC3 - Without Electronic coil interface	100S-D115...300	*13, *20, *23, *41			1			1.07E+06		20
	Contactor 100S-D420 at AC3 - Without Electronic coil interface	100S-D420	*13, *20, *23, *41			1			8.00E+05		20
	Contactor Relays: 700S-CFB at AC15	700S-CFB	*3, *13, *20, *23			1			2.00E+06		20
	Contactor Relays: 700S-CFB - Mechanical	700S-CFB	*3, *4,*13, *20, *23			1			2.00E+07		20
	Control Relays	700S-CF	*3, *13, *20, *23			1			2.00E+06		20
	Reversing Contactor 104S-C	104S-C09 to C97	*3, *13, *20, *23			1			1.33E+06		20
	ArmorStart 280…….SM used with 1732DS-IB8XOBV4 safety I/O module	280…….SM	*52, *53	N/A	e	4	2.47E-08				20
	ArmorStart 281…….SM used with 1732DS-IB8XOBV4 safety I/O module	281…….SM	*52, *54	N/A	e	4	2.47E-08				20
	ArmorStart 284…….SM used with 1732DS-IB8XOBV4 safety I/O module	284…….SM	*52, *54	N/A	e	4	2.47E-08				20
	ArmorStart 1000…….SM used with 1732DS-IB8XOBV4 safety I/O module	1000…….SM	*52, *55	N/A	e	4	2.47E-08				20
	PowerFlex 40P with Safe Torque Off	22D	*21, *27	2	d	3	2.00E-10	1.74E-05	1.00E+07		20
	PowerFlex 40P with Safe Torque Off USED AS BLOCK - 0DC	22D	*21, *27, *39							570776	20
	PowerFlex 70 with Safe Torque Off	20A	*21, *27	2	d	3	3.90E-10	3.40E-05	1.00E+07		20
	PowerFlex 70 with Safe Torque Off USED AS BLOCK - 0DC	20A	*21, *27, *39							292705	20
	PowerFlex 525 with Safe Torque Off	25B	*5	2	d	3	8.13E-10	6.62E-05			20

Type	Family	Part Number	See Notes	SIL CL	PL	Category per EN ISO 13849-1	PFH_D Probability of dangerous failure per hour according to EN/IEC 61508 or EN/IEC 62061 (Continuous and High demand mode)	PFD Probability of dangerous failure on demand according to EN/IEC 61508 (Low demand mode)	B10d (Electro-Mechanical products)	MTTFd (years) for the product when used as a "block"	T1 Proof Test Interval – Mission Time – Lifetime Years
Output actuation	PowerFlex 525 with Safe Torque Off USED AS BLOCK - 0DC	25B	*5,*39							140412	20
	PowerFlex 527 with Safe Torque Off	25C	*57	3	e	3	1.70E-09				20
	PowerFlex 700S with Safe Torque Off	20D	*21, *27	2	d	3	6.00E-10	5.28E-05	1.00E+07		20
	PowerFlex 700S with Safe Torque Off USED AS BLOCK - 0DC	20D	*21, *27, *39							190258	20
	PowerFlex 700L with Safe Torque Off	20L	*21, *27	2	d	3	6.00E-10	5.28E-05	1.00E+07		20
	PowerFlex 700L with Safe Torque Off USED AS BLOCK - 0DC	20L	*21, *27, *39							190258	20
	PowerFlex 700H with Safe Torque Off	20C	*5	2	d	3	1.70E-08	1.52E-03			20
	PowerFlex 700H with Safe Torque Off USED AS BLOCK - 0DC	20C	*5, *39							6715	20
	PowerFlex 753 with Safe Torque Off Frames 2 to 7	20F	*5	3	e	3	1.36E-09	3.29E-05			20
	PowerFlex 753 with Safe Torque Off Option S - Frame 8	20F		3	e	3	4.46E-09	3.81E-04			20
	PF753 Safe Speed Monitor, Single Encoder, Pulse Test On	20F	*24	3	e	4	2.68E-09	4.74E-04			20
	PF753 Safe Speed Monitor, Single Encoder, Pulse Test Off	20F	*24, *26	3	e	4	3.13E-08	5.44E-03			20
	PF753 Safe Speed Monitor, Dual Encoder, Pulse Test On	20F	*25,	3	e	4	2.39E-09	4.19E-04			20
	PF753 Safe Speed Monitor, Dual Encoder, Pulse Test Off	20F	*25, *26	3	e	4	2.77E-08	4.85E-03			20
	PowerFlex 755 with Safe Torque Off - Frames 2 to 7	20G	*5,	3	e	4	1.36E-09	3.29E-05			20
	PowerFlex 755 with Safe Torque Off Option S - Frame 8	20F		3	e	4	4.46E-09	3.81E-04			20
	PF755 Safe Speed Monitor, Single Encoder, Pulse Test On	20G	*24,	3	e	4	2.68E-09	4.74E-04			20
	PF755 Safe Speed Monitor, Single Encoder, Pulse Test Off	20G	*24, *26	3	e	4	3.13E-08	5.44E-03			20
	PF755 Safe Speed Monitor, Dual Encoder, Pulse Test On	20G	*25,	3	e	4	2.39E-09	4.19E-04			20
	PF755 Safe Speed Monitor, Dual Encoder, Pulse Test Off	20G	*25, *26	3	e	4	2.77E-08	4.85E-03			20
	Kinetix 300 and 350 with Safe Torque Off	2097	*5, *21,	2	d	3	5.90E-09	1.00E-03			20

Type	Family	Part Number	See Notes	SIL CL	PL	Category per EN ISO 13849-1	PFH_D Probability of dangerous failure per hour according to EN/IEC 61508 or EN/IEC 62061 (Continuous and High demand mode)	PFD Probability of dangerous failure on demand according to EN/IEC 61508 (Low demand mode)	B10d (Electro-Mechanical products)	MTTFd (years) for the product when used as a "block"	T1 Proof Test Interval – Mission Time – Lifetime Years
Output actuation	Kinetix 300 and 350 with Safe Torque Off USED AS BLOCK - 0DC	2097	*5, *21, *39							19348	20
	Kinetix 5500 with Safe Torque Off "Hardwired Safety"	2198	*57	2	d	3	3.50E-10	6.10E-05			20
	Kinetix 5500 with Safe Torque Off "Integrated Safety"	2198	*57	3	e	3	1.54E-09	1.21E-04			20
	Kinetix 5500 with Safe Torque Off "Hardware Safety" - USED AS BLOCK -	2198	*39, *57							326157	20
	Kinetix 5700 Single Axis Inverter with Safe Torque Off	2198	*57	3	e	3	1.57E-09	1.24E-04			20
	Kinetix 5700 Dual Axis Inverter with Safe Torque Off	2198	*57	3	e	3	1.64E-09	1.30E-04			20
	Kinetix 6000 with Safe Torque Off	2094-S	*5, *21	3	e	3	4.31E-10	2.73E-05			20
	Kinetix 7000 with Safe Torque Off	2099	*5, *21	3	e	3	4.31E-10	2.73E-05			20
	Kinetix 6200 Safe Torque Off		*5	3	e	4	1.85E-09	1.62E-04			20
	Kinetix 6200 Safe Speed Monitor		*24, *26*28	3	e	4	5.90E-09	5.20E-04			20
	Kinetix 6500 Safe Torque Off		*5	3	e	4	1.85E-09	1.62E-04			20
	Kinetix 6500 Safe Speed Monitor		*24, *26*28	3	e	4	5.90E-09	5.20E-04			20

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Notes
*1 – Other data may apply when combined into subsystems with other products. The resultant SIL CL and PFHd and can be determined using the methodolgy of IEC 62061 and the PL can be determined using the methodolgy of EN ISO 13849-1.
*2 – The maximum rating shown here assumes the monitoring all dangerous single fault modes and a maximum diagnostic test interval of 6 months.
*3 – B10d value assuming a failure to open is considered a dangerous failure. If in the application a failure to close is considered a dangerous failure, in this case 100S-C: B10d=4.00E+06, 700S-CFB: B10d=8.6E+05
*4 – For low energy switching, the contact reliability is expressed as "Assessed constant failure rate". The assessment method is given in IEC60947-5-4.
*5 – Some aspects of the diagnostic testing of electromechanical inputs or outputs are initiated by usage. Therefore the Diagnostic Test Interval is equal to the time period between the operations of the device safety function. For devices with electromechanical inputs or outputs the Diagnostic Test Interval (operating interval) should not exceed 6 months . See IEC61508-4 3.8.7 Diagnostic Test interval and EN13849-1: 3.1.29 Test rate.
*6 – This device does not provide monitoring of cross faults at ouput wiring. If this is required, additional measures will be required e.g. connection to a suitable monitoring relay.
*7 – Where the product has two electrical safety switching function channels, the B10d data given is based on a failure of either channel. It can be used to determine the MTTFd of each single channel and will this produce conservative data.
*8 – The data given, including fault tolerance, is based on the use of fault exclusion at some single fault mechanical failure points, for example: actuator, cam, contact plunger, lock mechanism. Because of the inherent strength and simplicity of those parts they have an extremely low likelihood of failure and those faults are excluded in accordance with EN ISO 13849-2: 2008 Clause A.5.2 Table A4.
*9 – Vacant
*10 – The delayed acting contacts are CAT 3, SIL CL 2, PLd. The PFHd given can be applied for the the immediate acting and delayed acting contacts
*11 – The PFH given was calculated using the the MTTFd 100 year limitation given in ISO 13849-1: 2006 clause 4.5.2
*12 – The DC or SFF value given is for the device used on its own with no additional monitoring/diagnostic equipment. An increased value for DC and SFF can be achieved by connection to specified external monitoring equipment. The maximum achievable value is based on individual monitoring of the devices in redundant or dual channel configuration. In some cases this will require the use of two devices. It assumes a maximum diagnostic test interval of 6 months. It assumes the monitoring all dangerous single fault modes. The maximum value given will not be achievable if it can be foreseen that some single faults will not be detected in , for example, multiple normally closed switches are connected in a series arrangement to the monitoring equipment.
*13 – Category 1 applies where the combination of the usage rate and the B10d value results in an MTTFd equal to or greater than 30 years.
*14 – This product must not be used in a safety related system unless it is connected to a suitable monitoring device.
*15 – Sipha control units are applied for EN 60947-5-3 as control devices of a PDF system together with sensors and OSSDs. The safety classifications referred in EN 60947-5-3 take into account the general principles of ISO 13849-1, but they are not directly equivalent to the categories defined in clause 6 of that standard.
*16 – The data given is based on the use of fault exclusion at some single fault mechanical failure points. Therefore subsystems intended to achieve Category 4, PLe or SIL 3 require the use of two separate devices. This is in accordance with the latest ISO and IEC Joint Technical Reports ISO TR 23849 and IEC TR 62061-1.
*17 – B10d values using actual test results and calculations with a 90% confidence interval and at least 1 NC (normally closed) contact block.
*18 – Monitoring includes a Self-Monitoring contact block.

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Notes
*19 – Safe failure = actuating force less than 50% of original.
*20 – The Mission Time stated is based on possible time based degradation factors. For usage based degradation factors refer to the calculated T10d value. Always use the lowest value (Mission Time or T10d) for calculation of SIL or PL.
*21 – External monitoring equipment required – See product manual.
*22 – The data given based on a 20 year mission time (proof test interval) applies only to product with a manufacturing date code of 2009/01/01 (January 1, 2009) or later. See the product label for the date code.
*23 – The DC value given is for the device used on its own with no additional monitoring/diagnostic equipment. An increased value for DC and SFF can be achieved by direct monitoring i.e. connection of the mechanically linked auxiliary contacts to external monitoring equipment. In most cases redundant devices or a second switch-off path this will be required. It assumes a maximum diagnostic test interval of 6 months. It assumes the monitoring all dangerous single fault modes. The maximum value given will not be achievable if it can be foreseen that some single faults will not be detected, for example, multiple normally closed switches are connected in a series arrangement to the monitoring equipment.
*24 – The encoder input(s) must be added as a separate subsystem. Encoder Input 1 performs feedback signal monitoring to achieve a DC of 90% or 99% depending on encoder type (see product manual for details). Mechanical constraints can limit single encoder applications to PLd, SIL2 for the encoder input(s) subsystem. By using a certified SIL3 encoder under specific conditions to ensure no loss of the feedback and with justifiable fault exclusions for shaft slippage and shaft breakage a SIL3 rating is feasible.
*25 – The encoder input(s) must be added as a separate subsystem. Encoder Inputs perform feedback signal monitoring to achieve a DC of 90% or 99% depending on encoder type (see MSR57 product manual for details).
*26 – When pulse-testing of ALL used safety outputs is disabled, safety outputs and a power supply are only tested upon demand (at reset) or at a machine cycle (when motion starts). This has an effect on the PFHd. Enabled test pulses for at least one safety output can ensure main power supply testing. The diagnostic test interval is set to the demand rate of at least 0.5 years.
*27 – The data values given are based on a maximum usage rate of 500,000 switching operations per year of the Safe-Off board.
*28 – For the determination of the safety parameters a "worst case" configuration has been assumed (standalone, all inputs, all outputs, single encoder mode). Improved data can be achieved by use of dual encoders.
*29 – Load conditions - 20mA/24VDC, confidence factor 90%
*30 – 800Z is only suitable for safety use when combined into a subsystem with a relay (then the DC will be 99%) For the relay output versions we specify the maximum usage at 2 Million operations.
*31 – B10d data is based on test and aligned with EN ISO 13849-1 Table C1. (mechanical or minimal load e.g. safety monitoring relay unit)
*32 – The PFHd given is the sum of the PFHd of the electronic aspects and the PFHd resulting from the B10d values of the two output relays based on a maximum usage rate of 8790 operations per year. For different usage rates the electronic aspects and the electromechanical output relays can be entered as two separate two channel subsytem using the following data: PFHd of Electronic aspects 4.0E-9 B10d for each of the two electromechanical output relays: AC-15, 230V, 0.4A: 1.0E6 AC-15, 230V, 2.0A: 2.6E5 DC-13, 24V, 0.6A: 1.0E6 DC-13, 24V, 1.5A: 2.0E5 The electronic aspects provide 99% DC for the electromechanical output relays.

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Notes
*33 – The PFHd given is the sum of the PFHd of the electronic aspects and the PFHd resulting from the B10d values of the two output relays based on a maximum usage rate of 8760 operations per year at AC15 1A 230V AC or at DC13 1.5A 24VDC. For greater usage rates or loads please contact us for more information.
*34 – B10d value assumes a failure to open is considered a dangerous failure.
*35 – B10d data is based on test and aligned with EN ISO 13849-1 Table C1.
*36 – Some aspects of the diagnostic testing of the proximity sensor inputs are initiated by usage. Therefore the Diagnostic Test Interval is equal to the time period between demands of the safety function, i.e. exceeding the speed threshold. The Diagnostic Test Interval should not exceed 6 months. See IEC61508-4 3.8.7 Diagnostic Test interval and EN13849-1 3.1.29 Test rate.
*37 – The data is given for door monitoring and OSSD switching capability of the TLSZR/L-GD2 - Mechanical life = 1000000 cycles.
*38 – The B10d value has been determined with a confidence level of 70 %. During the B10d testing an electrical load of 100 mA provided by a 24 VDC power source was used.
*39 – When this Block is used as a channel of a dual channel subsystem the output should be monitored and DC should be evaluated according to the type of monitoring measure applied. For some devices it may be necessary to use an interposing relay to invert the signal when connecting to a monitoring safety relay. See product manual and Rockwell Automation Safety Accelerator Toolkit for more information.
*40 – The data is given for door monitoring and OSSD switching capability of the TLSZR/L-GD2. Mechanical life = 500,000 cycles
*41 – The MTTFd value for the electronic controlled coil must be added as a separate block or element when the interface function is used.
*42 – The Safedge system comprises the Safedge Sensor 440F-Exx and one of the Safedge Controllers 440F-C251P, 440F-C251D, or 440F-C252D.
*43 – The PFH given for the Safedge Systen includes the PHF for the Safedge Sensor (3E-09) and the Safedge Controller (7.7E-09). The PFH calculated for the Safedge Sensor is based on B10d 20000, DC 90% and a maximum actuation frequency of once per week. For greater actuation frequencies the PHF for the Safedge Sensor and System must be recalculated.
*44 – The PFH calculation is based on complete use of all inputs and outputs
*45 – Mechanical life = 200000 operations per code barrel
*46 – The MatGuard sensor mats must only be used with a suitable mat controller subsytem such as the 440F-C4000x or 440F-C280xx
*47 – The PFH for the Matguard sensors and the mat controller should be calculated as two separate subsystems
*48 – The PFH 2.0E-9 is based on the MatGuard sensor mats being connected to mat controllers that provide ≥90% DC (or SFF) such that faults like open and short circuits, permanent and no activation will be detected by the mat contrller. It is based a maximum usage rate of 1 operation per day. The PFH was calculated in accordance with IEC 62061. For higher usage rates the PFH must be recalculated based on a B10d of 200000 for each mat sensor channel. The resulting T10d should be used if it is less than the given mission time/proof test interval
*49 – A manual test of the safety function must be performed at least once per week
*50 – The data given, including fault tolerance, is based on the use of fault exclusion for the possibilty of insulation between internal mat sensor plates. The fault is excluded in accordance with and EN ISO 13849-2: 2012 Table D8 and ISO 13856-1:2013.
*51 – Vacant

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Notes
*52 – Suitable for use in PLe, Cat 4 (ISO13849-1) applications, provided that the conditions outlined below are met: a) Must be used used with 1732DS-IB8XOBV4 safety I/O module. b) The 1732DS-IB8XOBV4 safety I/O module must be entered as a separate subsystem c) The 1732DS-IB8XOBv4 shall be configured to perform the safety test pulses for the corresponding safety related inputs (normal closed switches shall be used) and safety related outputs (de-energized state shall be the safe state). d) The bipolar mode (output configuration of 1732DS-IB8XOBV4) shall be used for the safety related outputs P and M. The output configuration for the P and M shall be: - Point Operation Type = Dual (see 1791DS-UM001_-EN-P) - Point Mode = Safety Pulse Test (see 1791DS-UM001_-EN-P) e) SELV or PELV Power Supplies shall be used f) Signals SM1 and SM2 shall be monitored and the safe state shall be maintained if the SM feedback is open after a safety-related stop is executed.
*53 – The given 20 year mission time is dependant on a maximum operating rate of 100000 cycles per year. A 10 year mission time can be used for an operating rate of 200000 cycles per year. The PHF given is based on the use of EN ISO 13849-1 Annex K Table K1. The inputs are Category 4, DC= High, MTTFd = 2.4E4 yrs (clipped to 100 yrs). This results in PLe and 2.47E-8 PFH.
*54 – The given 20 year mission time is dependant on a maximum operating rate of 100000 cycles per year. A 10 year mission time can be used for an operating rate of 200000 cycles per year. The PHF given is based on the use of EN ISO 13849-1 Annex K Table K1. The inputs are Category 4, DC= High, MTTFd = 1.9E4 yrs (clipped to 100 yrs). This results in PLe and 2.47E-8 PFH.
*55 – The given 20 year mission time is dependant on a maximum operating rate of 100000 cycles per year. A 10 year mission time can be used for an operating rate of 200000 cycles per year. The PHF given is based on the use of EN ISO 13849-1 Annex K Table K1. The inputs are Category 4, DC= High, MTTFd = 2.1E4 yrs (clipped to 100 yrs). This results in PLe and 2.47E-8 PFH.
56 – For the rate of a dangerous failure per hour PFH a value of 1.0E-7/h can be used for the system (according to and tested to GS-ET-31). Exception: The data given does not apply to Timed Delay Units 440T-MSTUE, 440T-MDTUE*and and Stopped Motion units 440T-MSMSE*, 440T-MDMSE*
*57 – Determination of safety parameters is based on the assumption that the system operates in High-demand mode and that the safety function is requested at least once every three months
*58 - PFH and PFD Data is for both SIL3 dual-channel mode of operation and SIL2 single-channel Safety Inputs mode of operation.
*59 - W encoders have 9 bit safety resolution, Q encoders have 12 bit safety resolution

Type	Family	Part Number	See Notes	Relates to a failure that results in the ON state of the outputs unless otherwise indicated			Lifetime (years)
				MTTF (years)	MTTF (hours)	B10	
Optical Sensors	42EF RightSight	42EF-P2KBB-F4	*1,*2, *3	2.35E+02	2.06E+06		20
		42EF-P2JBB-F4	*1,*2, *3	2.35E+02	2.06E+06		20
		42EF-U2KBB-F4	*1,*2, *3	2.35E+02	2.06E+06		20
		42EF-U2JBB-F4	*1,*2, *3	2.35E+02	2.06E+06		20
		42EF-R9KBB-F4	*1,*2, *3	2.92E+02	2.56E+06		20
		42EF-R9JBB-F4	*1,*2, *3	2.92E+02	2.56E+06		20
		42EF-R9KBBT-F4	*1,*2, *3	2.92E+02	2.56E+006		20
		42EF-R9JBBT-F4	*1,*2, *3	2.92E+02	2.56E+06		20
		42EF-R9KBBV-F4	*1,*2, *3	2.92E+02	2.56E+06		20
		42EF-R9JBBV-F4	*1,*2, *3	2.92E+02	2.56E+06		20
		42EF-D1KBAK-F4	*1,*2, *3	2.25E+02	1.97E+06		20
		42EF-D1JBAK-F4	*1,*2, *3	2.25E+02	1.97E+06		20
		42EF-D1KBCK-F4	*1,*2, *3	6.72E+02	5.89E+06		20
		42EF-D1JBCK-F4	*1,*2, *3	6.72E+02	5.89E+06		20
		42EF-S1KBA-F4	*1,*2, *3	2.25E+02	1.97E+06		20
		42EF-S1JBA-F4	*1,*2, *3	2.25E+02	1.97E+06		20
		42EF-B1KBBC-F4	*1,*2, *3	4.91E+02	4.30E+06		20
		42EF-B1JBBC-F4	*1,*2, *3	4.92E+02	4.31E+06		20
		42EF-B1KBBE-F4	*1,*2, *3	4.91E+02	4.30E+06		20
		42EF-B1JBBE-F4	*1,*2, *3	4.92E+02	4.31E+06		20
		42EF-F2KBC-F4	*1,*2, *3	7.61E+02	6.67E+06		20
		42EF-F2JBC-F4	*1,*2, *3	7.61E+02	6.67E+06		20
	42CA	42CA-P2MNB-D4	*1,*2, *3	1126	9.87E+06		20
		42CA-P2MPB-D4	*1,*2, *3	1126	9.87E+06		20
		42CA-U2MNA-D4	*1,*2, *3	931	8162659		20
		42CA-U2MPA-D4	*1,*2, *3	931	8162659		20
		42CA-R1MNA1-D4	*1,*2, *3	1057	9.26E+06		20
		42CA-R1MPA1-D4	*1,*2, *3	1057	9.26E+06		20
		42CA-D1MNAL-D4	*1,*2, *3	931	8162659		20
		42CA-D1MPAL-D4	*1,*2, *3	931	8162659		20
	42JS Visisight	42JS-P2MNA2-F4	*1,*2, *3	1.28E+03	1.12E+07		20
		42JS-P2MPA2-F4	*1,*2, *3	1.28E+03	1.12E+07		20
		42JS-R9MNA2-F4	*1,*2, *3	1.28E+03	1.12E+07		20
		42JS-R9MPA2-F4	*1,*2, *3	1.26E+03	1.10E+07		20
		42JS-D2MNA1-F4	*1,*2, *3	1.28E+03	1.12E+07		20
		42JS-D2MPA1-F4	*1,*2, *3	1.28E+03	1.12E+07		20

Type	Family	Part Number	See Notes	Relates to a failure that results in the ON state of the outputs unless otherwise indicated			Lifetime (years)
				MTTF (years)	MTTF (hours)	B10	
Optical Sensors	Series 9000	42GRU-9200-QD	*1,*2, *3	1.28E+03	1.12E+07		20
		42GLP-9000-QD	*1,*2, *3	5.58E+02	4.89E+06		20
		42GRU-9000-QD	*1,*2, *3	1.28E+03	1.12E+07		20
Inductive proximity sensors	871TM	871TM-DH10NP30	*1,*2, *3	1.82E+03	1.60E+07		20
Proximity sensors	WPX2 (except long range sensing version)	872C WorldProx II 3-Wire DC (except long range sensing version)	*1,*2, *3	1.93E+03	1.69E+07		20
High Frequency 13.56 MHz ICOCE RFID	56RF - RFID ICODE Interface, EtherNet/IP, Dual Channel with I/O	56RF-IN-IPD22	*1,*2, *3	91	8.05E+05		9.6
	56RF - RFID ICODE Transceiver, Square 40 x 40 mm	56RF-TR-4040	*1,*2, *3	1.26E+02	1.10E+06		13
	56RF - RFID ICODE Transceiver, Rectangular 80 x 90 mm	56RF-TR-8090	*1,*2, *3	1.30E+02	1.15E+06		12
Output actuation	Contactors 100-C09 to C97at AC3	1100S-C09, C12, C16, C23, C30, C37, C40, C43, C55, C60, C72, C85, C90, C97	*1,*3, *4, *5			1.33E+06	20
	Contactors 100-C09 to C55 - Mechanical (current carrying not breaking)	100-C09, C12, C16, C23, C30, C37, C40, C43, C55	*1, *3, *4, *5			2.00E+07	20
	Contactors 100-C09 to C55 - Mechanical only (current carrying not breaking)	100-C60, C72, C85, C90, C97	*1, *3, *4, *5			1.20E+07	20
	Electronic coil interface option for Contactors 100/4/S D115 to D300EA		*1, *3, *6, *7, *9	7.04E+02			20
	Electronic coil interface option for Contactor 100/4/S D420E		*1, *3, *6, *8, *9	4.93E+02			20
	100-JE electronic interface for use with 100-C or 700-CF contactors	100-JE	*1, *3, *6, 10	7.46E+02			20
Encoders	Encoders 842HR	842HR	*2,*3, *11, *12	2.80E+02			20
	Encoders 842E-SIP and 842E-MIP	842E-SIP and 842E-MIP	*2,*3, *11, *12	8.00E+01			20
	Encoders 847A, 847B, 847H, 847HF and 847T	847A, 847B, 847H, 847HF and 847T	*2,*3, *11, *12	3.30E+02			20
	Servo Motor Encoder: MPx motors. MPx-xxxxx-VxxxAA	MPx-xxxxx-VxxxAA	*2, *3, *11, *13	1.94E+02			–
	Servo Motor Encoder: MPx motors. MPx-Axxxx-MxxxAA	MPx-Axxxx-MxxxAA	*2, *3, *11, *13, *14	2.29E+02			20
	Servo Motor Encoder: MPx motors. MPx-Bxxxx-MxxxAA	MPx-Bxxxx-MxxxAA	*2, *3, *11, *13, *14	2.48E+02			20

Type	Family	Part Number	See Notes	Relates to a failure that results in the ON state of the outputs unless otherwise indicated			Lifetime (years)
				MTTF (years)	MTTF (hours)	B10	
Encoders	Servo Motor Encoder: MPx motors. MPx-xxxxx-ExxxAA	MPx-xxxxx-ExxxAA	*2, *3, *11, *13	1.88E+02			–
	Servo Motor Encoder: MPx motors. MPx-Axxxx-SxxxAA	MPx-Axxxx-SxxxAA	*2, *3, *11, *13, *14	2.59E+02			20
	Servo Motor Encoder: MPx motors. MPx-Bxxxx-SxxxAA	MPx-Bxxxx-SxxxAA	*2, *3, *11, *13, *14	2.83E+02			20

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Notes
*1 – Products in this part of the library are not specifically intended as safety devices, and the associated data represents reliability data. For this product any use of the terms MTTFd, B10d, T10d or PFHd does not relate to a failure to danger. It relates only to a failure that results in the ON state of the outputs. The user assumes all costs and liability for any decision on whether a failure that results in the ON state of the outputs could be dangerous.
*2 – For this data, a conservative approach is taken by representing MTTFd by the total MTTF, and representing the B10d by the total B10 value.
*3 – The user assumes all costs and liability for any decision to use these products as part of a functional safety related system. Please review important Access Terms and Conditions at Information -LEGAL NOTICES with regard to the RA SISTEMA Library.
*4 – B10 value is for a failure to open. For failure to close B10=4.00E+06:
*5 – The Mission Time stated is based on possible time based degradation factors. For usage based degradation factors refer to the calculated T10 value. Always use the lowest value (Mission Time or T10) for calculation.
*6 – The MTTFd value for the electronic controlled coil must be added as a separate block or element when the interface function is used.
*7 – The data given applies to the following coil codes: J, ZJ, Y, ZY, D, ZD, A, ZA, N.
*8 – The data given applies to the following coil codes: D, ZD, A, ZA, N.
*9 – If the contactor is used with the electronic interface selected it must be used in a redundant and monitored configuration for safety related applications
*10 – If the 100-JE electronic interface is used with 100-C or 700-CF contactors they must be used in a redundant and monitored configuration for safety related applications
*11 – Products in this part of the library are not specifically intended as safety devices, and the associated data represents reliability data. For this product any use of the terms MTTFd, B10d, T10d or PFHd does not relate to a failure to danger. It relates only to a failure to provide correct data at the outputs. The user assumes all costs and liability for any decision on whether that could be dangerous.
*12 – Data given is based on nominal load of components, average ambient temperature 40°C, frequency of use 8760 h/a

IMPORTANT: The data given cannot be regarded as valid unless proper account is taken of the relevant * notes.

Notes
*13 - Rotor Connection Motor/Encoder Shaft. a long-term integrity of mechanical fixing is claimed, based on frictional connection with overstress factor of 20
*14 - When correctly connected and monitored by a MSR57P Safe Speed Monitoring Safety Relay according to instructions given in per manual 440r-um004_-en-p.pdf or Kinetix 6200 and Kinetix 6500 Safe Speed Monitoring Multi-axis Servo Drives according to instructions given in reference manual 2094-rm001-en-p.pdf and based on the structure and MTTFd the following information is available: Category 3. PFH = 1.2E-8. DC = 90%. SFF = 95%. It is the responsibility of the user to decide if this is can be suitable for achieving a required PL or SIL.

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