



SOR Inc
14685 W 105th St.
Lenexa, KS 66215



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Certificate of Compliance to IEC 61508

FM Approvals
Certifies herewith that the

Mechanical Level Switch Products
(Safety Manual [Form 1538 (3.12) © 2012 SOR Inc.]

Complies with the relevant requirements of standards listed below:

Standards	Description	Compliance
IEC 61508-1 1997	Functional Safety of Electronic/Electrical/Programmable Electronic Safety-Related Systems- General Requirements	Part 1
IEC 61508-2 2000	Functional Safety of Electronic/Electrical/Programmable Electronic Safety-Related Systems	Part 2

And therefore

**IS DECLARED "FIT FOR USE" IN A
Low Demand SAFETY APPLICATION**

(Type A Component with HFT 0)

*This certificate is subject to conditions of use presented in FM Approval Report
Project ID # 0003044628*

A handwritten signature in black ink, appearing to read 'J.E. Marquedant'.

James E. Marquedant
Group Manager, Electrical
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062

April 18, 2012
Approval Granted

0003044628 Mechanical Level Switch Products



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Displacer Operated Top-Insertion Tank Mounted

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
701, 702, 703, 704, 705, 706, 707, 708	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm	DPDT	2	0.66	1.10E-04	25
				SPDT	2	0.68	8.78E-05	20
			Low Alarm	DPDT	2	0.70	9.88E-05	22.5
				SPDT	2	0.72	7.68E-05	17.5
	Hermetically Sealed		High Alarm	DPDT	2	0.67	9.66E-05	22
				SPDT	2	0.69	7.46E-05	17
			Low Alarm	DPDT	2	0.70	8.56E-05	19.5
				SPDT	2	0.73	6.37E-05	14.5
	Anti-Vibration & Extra-High Temperature	High Alarm	DPDT	2	0.67	1.10E-04	25	
			SPDT	2	0.69	8.78E-05	20	
		Low Alarm	DPDT	2	0.70	9.88E-05	22.5	
			SPDT	2	0.73	7.68E-05	17.5	



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Displacer Operated Top Insertion Tank Mounted

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)	
730, 731, 732, 733, 734, 735, 736, 737	Dry-Contact & Mini-Hermetically Sealed	Dual	High Alarm	DPDT	2	0.68	1.76E-04	40	
				SPDT	2	0.71	1.32E-04	30	
		Hermetically Sealed	Dual	Low Alarm	DPDT	2	0.70	1.65E-04	37.5
					SPDT	2	0.73	1.21E-04	27.5
	Hermetically Sealed	Dual	High Alarm	DPDT	2	0.71	1.49E-04	34	
				SPDT	2	0.74	1.05E-04	24	
		Dual	Low Alarm	DPDT	2	0.73	1.38E-04	31.5	
				SPDT	2	0.77	9.44E-05	21.5	



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Displacer Operated Sealed Tamperproof & Flanged Serviceable Chamber

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
740, 741, 742, 743, 801, 802, 803, 804	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm	DPDT	2	0.75	1.10E-04	25
				SPDT	2	0.77	8.78E-05	20
			Low Alarm	DPDT	2	0.78	9.88E-05	22.5
				SPDT	2	0.80	7.68E-05	17.5
		Dual	High Alarm	DPDT	2	0.74	1.76E-04	40
				SPDT	2	0.77	1.32E-04	30
			Low Alarm	DPDT	2	0.75	1.65E-04	37.5
				SPDT	2	0.79	1.21E-04	27.5
	Hermetically Sealed	Single	High Alarm	DPDT	2	0.76	9.66E-05	22
				SPDT	2	0.79	7.46E-05	17
			Low Alarm	DPDT	2	0.79	8.56E-05	19.5
				SPDT	2	0.82	6.37E-05	14.5
		Dual	High Alarm	DPDT	2	0.76	1.49E-04	34
				SPDT	2	0.80	1.05E-04	24
			Low Alarm	DPDT	2	0.78	1.38E-04	31.5
				SPDT	2	0.82	9.44E-05	21.5
Anti-Vibration & Extra-High Temperature	Single	High Alarm	DPDT	2	0.75	1.10E-04	25	
			SPDT	2	0.78	8.78E-05	20	
		Low Alarm	DPDT	2	0.78	9.88E-05	22.5	
			SPDT	2	0.81	7.68E-05	17.5	



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Displacer Operated Top Insertion Tank Mounted

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
750, 751, 752, 753, 754, 755, 756, 757	Dry-Contact & Mini-Hermetically Sealed	Triple	High Alarm	DPDT	2	0.69	2.41E-04	55
				SPDT	2	0.72	1.76E-04	40
			Low Alarm	DPDT	2	0.71	2.30E-04	52.5
				SPDT	2	0.74	1.65E-04	37.5
	Hermetically Sealed		High Alarm	DPDT	2	0.72	2.02E-04	46
				SPDT	2	0.76	1.36E-04	31
			Low Alarm	DPDT	2	0.74	1.91E-04	43.5
				SPDT	2	0.78	1.25E-04	28.5



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Float Operated Flanged Serviceable & Sealed Tamperproof Chamber

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
101, 102, 103, 104, 109, 121, 122, 123, 124, 201, 202, 203, 204, 205, 206, 207, 209, 221	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm	DPDT	2	0.72	1.23E-04	28
				SPDT	2	0.74	1.01E-04	23
			Low Alarm	DPDT	2	0.78	9.88E-05	22.5
				SPDT	2	0.80	7.68E-05	17.5
		Dual	High Alarm	DPDT	2	0.72	1.89E-04	43
				SPDT	2	0.74	1.45E-04	33
			Low Alarm	DPDT	2	0.75	1.65E-04	37.5
				SPDT	2	0.79	1.21E-04	27.5
	Hermetically Sealed	Single	High Alarm	DPDT	2	0.73	1.10E-04	25
				SPDT	2	0.75	8.78E-05	20
			Low Alarm	DPDT	2	0.79	8.56E-05	19.5
				SPDT	2	0.82	6.37E-05	14.5
		Dual	High Alarm	DPDT	2	0.74	1.62E-04	37
				SPDT	2	0.77	1.19E-04	27
			Low Alarm	DPDT	2	0.78	1.38E-04	31.5
				SPDT	2	0.82	9.44E-05	21.5
Anti-Vibration & Extra-High Temperature	Single	High Alarm	DPDT	2	0.73	1.23E-04	28	
			SPDT	2	0.74	1.01E-04	23	
		Low Alarm	DPDT	2	0.78	9.88E-05	22.5	
			SPDT	2	0.81	7.68E-05	17.5	



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Float Operated Top Insertion Tank Mounted

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
301, 303, 304	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm	DPDT	2	0.62	1.23E-04	28
				SPDT	2	0.63	1.01E-04	23
			Low Alarm	DPDT	2	0.70	9.88E-05	22.5
				SPDT	2	0.72	7.68E-05	17.5
		Dual	High Alarm	DPDT	2	0.66	1.89E-04	43
				SPDT	2	0.68	1.45E-04	33
			Low Alarm	DPDT	2	0.70	1.65E-04	37.5
				SPDT	2	0.73	1.21E-04	27.5
	Hermetically Sealed	Single	High Alarm	DPDT	2	0.62	1.10E-04	25
				SPDT	2	0.63	8.78E-05	20
			Low Alarm	DPDT	2	0.70	8.56E-05	19.5
				SPDT	2	0.73	6.37E-05	14.5
		Dual	High Alarm	DPDT	2	0.68	1.62E-04	37
				SPDT	2	0.71	1.19E-04	27
			Low Alarm	DPDT	2	0.73	1.38E-04	31.5
				SPDT	2	0.77	9.44E-05	21.5
Anti-Vibration & Extra-High Temperature	Single	High Alarm	DPDT	2	0.63	1.23E-04	28	
			SPDT	2	0.64	1.01E-04	23	
		Low Alarm	DPDT	2	0.70	9.88E-05	22.5	
			SPDT	2	0.73	7.68E-05	17.5	



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Float Operated Horizontal Insertion Tank Mounted

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
401, 402, 403, 404, 405, 406	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm	DPDT	2	0.61	1.32E-04	30
				SPDT	2	0.61	1.10E-04	25
			Low Alarm	DPDT	2	0.68	1.08E-04	24.5
				SPDT	2	0.70	8.56E-05	19.5
	Hermetically Sealed		High Alarm	DPDT	2	0.60	1.19E-04	27
				SPDT	2	0.61	9.66E-05	22
			Low Alarm	DPDT	2	0.68	9.44E-05	21.5
				SPDT	2	0.71	7.24E-05	16.5
	Anti-Vibration & Extra-High Temperature	High Alarm	DPDT	2	0.62	1.32E-04	30	
			SPDT	2	0.62	1.10E-04	25	
		Low Alarm	DPDT	2	0.69	1.08E-04	24.5	
			SPDT	2	0.70	8.56E-05	19.5	



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Float Operated Sealed Tamperproof & Flanged Serviceable Horizontal Chamber

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
108, 208	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm	DPDT	2	0.71	1.32E-04	30
				SPDT	2	0.72	1.10E-04	25
			Low Alarm	DPDT	2	0.76	1.08E-04	24.5
				SPDT	2	0.78	8.56E-05	19.5
	Hermetically Sealed	Single	High Alarm	DPDT	2	0.71	1.19E-04	27
				SPDT	2	0.73	9.66E-05	22
			Low Alarm	DPDT	2	0.77	9.44E-05	21.5
				SPDT	2	0.80	7.24E-05	16.5
	Anti-Vibration & Extra-High Temperature	Single	High Alarm	DPDT	2	0.71	1.32E-04	30
				SPDT	2	0.73	1.10E-04	25
			Low Alarm	DPDT	2	0.76	1.08E-04	24.5
				SPDT	2	0.79	8.56E-05	19.5



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Vane Operated Vertically Mounted

Series	Switch Type	Switch Stage	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
901, 902, 903, 904	Dry-Contact & Mini-Hermetically Sealed	Single	High Alarm/ Low Alarm	DPDT	2	0.72	7.46E-05	17
				SPDT	2	0.75	5.27E-05	12
	Hermetically Sealed		High Alarm/ Low Alarm	DPDT	2	0.76	6.15E-05	14
			SPDT	2	0.80	3.96E-05	9	
	Anti-Vibration & Extra-High Temperature		High Alarm/ Low Alarm	DPDT	2	0.73	7.46E-05	17
			SPDT	2	0.76	5.27E-05	12	



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1510 Electric Horizontal Level

Series	Switch Type	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
1510	Reed Sw	High Alarm	SPST	1	0.34	9.21E-06	2.1
			SPDT	1	0.36	1.00E-05	2.287
	Low Alarm	SPST	2	0.66	4.83E-06	1.1	
		SPDT	2	0.64	5.65E-06	1.287	

1550 Electric Vertical Level

Series	Switch Type	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
1550	Reed Sw	High Alarm	SPST	1	0.34	9.21E-06	2.1
			SPDT	1	0.36	1.00E-05	2.287
	Low Alarm	SPST	2	0.66	4.83E-06	1.1	
		SPDT	2	0.64	5.65E-06	1.287	



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1710 Electric Horizontal Explosionproof Level

Series	Switch Type	Chamber/ Non- Chamber	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
1710	Std. Dry Contact	No Chamber	High & Low Alarm	DPDT	2	0.66	7.90E-05	18
		Chamber		SPDT	2	0.64	5.71E-05	13
				DPDT	2	0.77	7.90E-05	18
		Hermetically Sealed		No Chamber	SPDT	2	0.79	5.71E-05
	DPDT				2	0.63	7.90E-05	18
	Chamber			SPDT	2	0.65	5.70E-05	13
				DPDT	2	0.76	7.90E-05	18
	SPDT	2		0.79	5.70E-05	13		

2210 Electric Horizontal Level

Series	Switch Type	Chamber/ Non- Chamber	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
2210	Std. Dry Contact	No Chamber	High & Low Alarm	DPDT	2	0.63	7.90E-05	18
				SPDT	2	0.65	5.71E-05	13
		Chamber		DPDT	2	0.76	7.90E-05	18
				SPDT	2	0.79	5.71E-05	13



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1520 Electric Flow

Series	Switch Type	Process Measurement	Switch Contact Type	SIL Level	SFF	PFD	Dangerous Undetected Failures (FIT)
1520	Reed Sw	High Alarm	SPST	1	0.5	4.83E-06	1.1
			SPDT	1	0.5	5.65E-06	1.287
		Low Alarm	SPST	1	0.5	4.83E-06	1.1
			SPDT	1	0.5	5.65E-06	1.287



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