

Certificate of Conformity No.: 28715066

Manufacturer: Dafram S.p.A.
Via Tito Vignoli, 9
I-20146 Milano (MI)

Specifications: IEC 61508-1÷7:2010

Product: Floating Ball Valves

Type: Series 16R, 16MC, 16ML, 40R, 40MC, 40ML, 16RE, 16RL, 40RE, 150MC, 300MC, 150RC, 300RC, 40ME, 16TE, 16TL, 40TE, 40TL, 16TM, 16TC, 40TM, 40TC, 150TM, 150TC, 300TM, 600R, 600T, 16VK, 16VL, 40VK, 40VL, 63TL, 100TL, 900T, 900R, 1500T, 1500R, 2500T, 2500R, 16ST.A, 150ST.A, 40ST.A, 300ST.A, 16WT, 150WT, 40WT, 300WT, D300F, D300R, D800F, D800R, D1500F, D1500R, D2500F, D2500R

RESULT:

As per the TÜV Rheinland Italia Report No. FS 28715066 Rev. 0, we declare that the product meets the below requirements:

IEC 61508: 2010, part 1 to 7

Functional Safety of electrical/electronic/programmable electronic safety related systems; Type A, Low Demand Mode, HFT=0

Safety Action	λ_D [1/h]	$\lambda_{DD(PS)}$ [1/h]	Systematic Capability
Close / Open	1,66E-08	1,16E-08	3
Close with Tight Shut Off	2,85E-08	2,00E-08	3

The above values are compatible with SIL 3.

For SFF values with external diagnostic tests, carried out according to definition 3.8.7 of IEC 61508-4, see what written in the Safety Manual.

The requirements of minimum hardware fault tolerance (HFT) according to table 6 of IEC 61511-1 have to be observed.

Expiry date: 2018-03-31

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Location **Milan**
Date **2015-03-20**



Carlo Filippi
Business Stream Manager
TÜVRheinland Italia
Industrial Services

Attachment 1 to

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		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	1,55E-05	2,64E-05	4,81E-05	6,99E-05	9,17E-05
	2	1,97E-05	3,06E-05	5,24E-05	7,41E-05	9,59E-05
	3	2,40E-05	3,48E-05	5,66E-05	7,84E-05	1,00E-04
	6		4,75E-05	6,93E-05	9,11E-05	1,13E-04
	9				1,04E-04	
	12			9,47E-05	1,16E-04	1,38E-04

PFD_{AVG} values according to IEC 61508 for different values of TI and TI_{PS}: Safety Action: Close / Open

Test Interval Frequency (months)				
6	12	24	36	48
3,67E-05	7,29E-05	1,45E-04	2,18E-04	2,90E-04

PFD_{AVG} values according to IEC 61508 for different values of TI (no Partial Stroke Test): Safety Action: Close / Open

NOTES:

- The above values of PFD_{AVG} are calculated for MRT=24 h and Proof Test Coverage=100%. For other values of MRT, TI, TI_{PS} and/or non-perfect Proof Test, the PFD_{AVG} values must be re-calculated.
- The PFD_{AVG} values including Partial Stroke Test are calculated considering the use of a commercial automatic Partial Stroking Test System: for further details, see the Safety Manual.

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Attachment 2 to
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		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	2,67E-05	4,55E-05	8,30E-05	1,21E-04	1,58E-04
	2	3,40E-05	5,28E-05	9,03E-05	1,28E-04	1,65E-04
	3	4,13E-05	6,01E-05	9,76E-05	1,35E-04	1,73E-04
	6		8,20E-05	1,19E-04	1,57E-04	1,94E-04
	9				1,79E-04	
	12			1,63E-04	2,01E-04	2,38E-04

PFD_{AVG} values according to IEC 61508 for different values of TI and TI_{PS}: Safety Action: Close with Tight Shut Off

Test Interval Frequency (months)				
6	12	24	36	48
6,32E-05	1,26E-04	2,51E-04	3,76E-04	5,01E-04

PFD_{AVG} values according to IEC 61508 for different values of TI (no Partial Stroke Test): Safety Action: Close with Tight Shut Off

NOTES:

- The above values of PFD_{AVG} are calculated for MRT=24 h and Proof Test Coverage=100%. For other values of MRT, TI, TI_{PS} and/or non-perfect Proof Test, the PFD_{AVG} values must be re-calculated.
- The PFD_{AVG} values including Partial Stroke Test are calculated considering the use of a commercial automatic Partial Stroking Test System: for further details, see the Safety Manual.

-----End report

