

Certificate of Conformity No.: 28714133

Manufacturer: Z.A.VE.RO. S.r.l.
 Via dei Martiri, 121/B
 I-28078 Romagnano Sesia (NO)

Specifications: IEC 61508-1+7:2010

Product: Floating Ball Valves

Type: Series 60-62-90-75-20-22-78-92-175-120-122

RESULT:

As per the TÜV Rheinland Italia Report No. FS 28714133 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-07	1,16E-07	3
Close with Tight Shut Off	3,38E-07	2,36E-07	3

The above values are compatible with SIL 2, and with SIL 3 with specific values of Partial Stroke and Full Stroke Test Intervals (see Attachments).

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 table 6 of IEC 61511-1 have to be observed.

Expiry date: 2017-04-30

Location: **Milan**

Date: **2014-04-16**

TÜV Rheinland Italia S.r.l.
 Via Enrico Mattei, 3
 I - 20010 Pogliano Milanese

Giovanni De Felippi
 Operational Manager




**Attachment 1 to
Certificate of Conformity No.: 28714133**



Manufacturer: ZA.VE.RO. S.r.l.
Via dei Martiri, 121/B
I-28078 Romagnano Sesia (NO)

Specifications: IEC 61508-1+7:2010

Product: Floating Ball Valves

Type: Series 60-62-90-75-20-22-78-92-175-120-122

		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	1,55E-04	2,64E-04	4,81E-04	6,99E-04	9,16E-04
	2	1,97E-04	3,06E-04	5,24E-04	7,41E-04	9,59E-04
	3	2,40E-04	3,48E-04	5,66E-04	7,83E-04	1,00E-03
	6		4,75E-04	6,93E-04	9,10E-04	1,13E-03
	9				1,04E-03	
	12			9,46E-04	1,16E-03	1,38E-03

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
3,66E-04	7,29E-04	1,45E-03	2,18E-03	2,90E-03

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

Location: Milan

Date: 2014-04-16

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**Attachment 2 to
Certificate of Conformity No.: 28714133**



Manufacturer: ZA.VE.RO. S.r.l.
Via dei Martiri, 121/B
I-28078 Romagnano Sesia (NO)

Specifications: IEC 61508-1+7:2010

Product: Floating Ball Valves

Type: Series 60-62-90-75-20-22-78-92-175-120-122

		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	3,16E-04	5,38E-04	9,81E-04	1,42E-03	1,87E-03
	2	4,02E-04	6,24E-04	1,07E-03	1,51E-03	1,95E-03
	3	4,89E-04	7,10E-04	1,15E-03	1,60E-03	2,04E-03
	6		9,69E-04	1,41E-03	1,86E-03	2,30E-03
	9				2,11E-03	
	12			1,93E-03	2,37E-03	2,82E-03

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
7,47E-04	1,49E-03	2,96E-03	4,44E-03	5,92E-03

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

Location: Milan

Date: 2014-04-16

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