

Certificate

No. V 72 2010 C7

Manufacturer: **ASCO Joucomatic SA**
32 av. Albert 1er
92506 Rueil Malmaison
France

Product: **Solenoid control valve**
with safety function

Type: **Series 126 00 ... , 126 60 ...**

Test results: **The examined product is, with a hardware fault tolerance of 1 or 2, suitable for use in safety related systems up to and including SIL 4 according to IEC 61508.**

For detailed results see test report
No. V 72 2010 V6, dated 2010-01-11

A short summary of test results is filed up on the backside of this certificate.

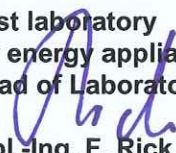
For the final assessment of the usability of the test item as part of a specific safety related system or a specific SIL, the final safety related system has to be assessed in accordance with IEC 61508.

This certificate remains valid until January 2015

Cologne 2010-01-11

Expert

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type series:	126 00 ... , 126 60 ...

Appliance-specific values determined:

			126 00 ... (standard design)	126 60 ... (very low demand design)
specific Probability of Failure on Demand	PFD_{spec}	Failure/demand	8,00E-07	8,00E-07
Usable life span	T_i	y	5	12
Confidence niveau	$1-\alpha$	%	70	70
Safe failure fraction	SFF	%	91,1	94,7
Hardware fault tolerance	HFT	[-]	0	0
Diagnostic coverage	DC	%	0	0
Type of sub system	IEC 61508-2, 7.4.3.1.2		Type A	Type A
Mode of Operation	IEC 61508-4, 3.5.12		Low Demand Mode	Low Demand Mode
assumed demands per year	f_{np}	demand/y	10	10
Interval for closing test		y	1	3
Derived Values				
Demand/hour	f_{np}	demand/h	1,14E-03	1,14E-03
Meantime between demands		h	8,76E+02	8,76E+02
average Probability of Failure on Demand	PFD_{avg}	Failure/demand	2,00E-05	2,40E-05
dangerous failure rate	λ_D	1/h	9,13E-10	9,13E-10
		FIT	0,91	0,91
MTBF dangerous failures	$MTBF_D$	h	1,10E+09	1,10E+09
		y	125000,00	125000,00
Safe failure rate	λ_S	1/h	9,35E-09	1,63E-08
		FIT	9,35	16,32
Total failure rate	$\lambda_S + \lambda_D$		1,03E-08	1,72E-08
		FIT	10,26	17,23
MTBF total		h	9,75E+07	5,80E+07
MTBF total		y	11125,00	6625,00
Dangerous detected	λ_{DD}	1/h	0,00E+00	0,00E+00
Dangerous undetected	λ_{DU}	1/h	9,13E-10	9,13E-10
Safe detected	λ_{SD}	1/h	0,00E+00	0,00E+00
Safe undetected	λ_{SU}	1/h	9,35E-09	1,63E-08

In the opinion of the test centre the test item is suitable for installation in safety related systems as a single safety related subsystem for up to and including SIL 3. With a structure establishing a HFT of 1 the test item is usable in SIL 4.

Remarks:

Derived values depend on the actual number of demands per year.

This statement applies to new appliances. This statement is only valid if the requirements of the manufacturer concerning operating conditions and maintenance, based on the accompanying report, are fulfilled. In the opinion of the test centre the storage over a period of no longer than 1.5 year does not affect the maximum life span of the valve types. This statement is bound to the proven and verified employment of a safety-related quality management by the manufacturer.