

Certificate

No. V 24 2008 C5-2

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|---------------|--|--|
| Manufacturer: | ASCO Joucomatic Numatics 53, rue de Beauce 28110 Lucé France | Asco Controls BV NL 3925 ZG Scherpenzeel The Netherlands |
| | Asco Joucomatic Sp.ZO.O. Ul. Kurczaki 130 93-331 Lodz Poland | Asco India Limited 147, Karapakkam Village 600 096 Chennai India |

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

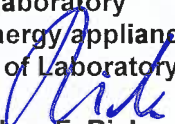
Type: **series ..551...**

Test results: **The valves of the above mentioned type series are
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 24 2008 V4-2 dated 2008- 09- 25
A short summary of test results is filed up on the backside of this
certificate.**

**The suitability for certain fields of application can only
be assessed by additional evaluation of further
components of the subsystem.**

This certificate remains valid until 06/2013

Cologne 2008-09-25

Test laboratory
for energy appliances
Head of Laboratory

Dipl.-Ing. F. Rick

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Am Grauen Stein, D-51105 Köln, Germany

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| | |
|-------------|-----------|
| type series | ...551... |
|-------------|-----------|

Appliance-specific values determined:

| | | | |
|----------------------------------|-------------------------|---------------|----------|
| Probability of Failure on Demand | PFD | 4,0 E-07 | |
| Confidence level | 1- α | 95 % | |
| Safe failure fraction | SFF | 98 % | |
| Hardware fault tolerance | HFT | 0 | |
| Diagnostic coverage | DC | 0 | |
| Type of sub system | IEC 61508-2, 7.4.3.1.2 | type A | |
| Derived values: | | | |
| Assumed demands per year | | 10 | |
| Demand/hour | Fnp | 1,14 E-03 | |
| Dangerous failure rate | λ_D | 4,57 E-10 1/h | 0,46 FIT |
| MTBF dangerous failures | MTBF D | 2,19 E+09 h | 250000 y |
| Safe failure rate | λ_S | 2,24 E-08 | 22,4 FIT |
| Total failure rate | $\lambda_S + \lambda_D$ | 2,28 E-08 | 22,8 FIT |
| MTBF total | | 43800000 h | 5000 y |
| Dangerous undetected | λ_{DU} | 4,57 E-10 | 0,46 FIT |
| Safe undetected | λ_{SU} | 2,24 E-08 | 22,4 FIT |

In the opinion of the Test Centre the valves are suitable for installation in safety related systems as a single safety related subsystem up to and including SIL 3. With a structure establishing a HFT of 1 the valves are usable in SIL 4.

Remarks:

This statement applies to new appliances and for deployment thereof for a period of time of maximum 5 years plus a maximum of 1,5 years storage time before being used for the first time and provided that all safety-relevant operating conditions as stated by the manufacturer are complied with. These statements are bound to the proven and verified deployment of safety-related quality management of the manufacturer.