



FUNCTIONAL SAFETY CERTIFICATE

This is to certify that the

***Maxseal ranges of solenoid valves:
ICO3S, ICO4S, ICO4D, ICO4N and SOV 1 to 6***

manufactured by

Thompson Valves Ltd

*17 Balena Close
Creekmoor
Poole, Dorset, BH17 7EF
UK*

have been assessed by Sira Certification Service and found to meet the requirements of

IEC 61508-1:1998 & IEC 61508-2:2000

as being suitable for use in safety-related applications up to and including the following Safety Integrity Levels:

- **SIL 3** in a redundant or non-redundant configuration
- **SIL 4** in a redundant configuration

where the safety operation of the valve is by de-energisation of the solenoid. Certification is awarded in respect of the scope and conditions stated on pages 2 to 4 of this certificate.

Certification Manager:

A handwritten signature in black ink, appearing to read "P. Rene".

Initial Certification: 26 July 2004
This certificate issued: 14 August 2009
Renewal date: 25 July 2014

This certificate may only be reproduced in its entirety, without any change.



Sira Certification Service

Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

Product description and scope of certification

Not all valves or configurations are covered by the certification. Certified models and configurations of the Maxseal solenoid valves are identified in Table 1 below. The Thompson Valves code sheets referred to in Table 1 are contained in Sira Certification Report FSCR 675-0049 and R56A13869.

Table 1: Certified valves and configurations

Valve description	Model	CERTIFIED VARIANTS	
		Code sheet	Iss
Maxseal Instrument Changeover and Process Control Valve for Hazardous Areas	ICO3S	ER0533 App 1A	7
	ICO4D ¼"	ER0533 App 1B	7
	ICO4D ½"		
	ICO4S ¼"		
	ICO4S ½"		
	ICO4N ¼"		
Maxseal Direct Solenoid-Operated Control Valve for Hazardous Areas	SOV sizes 1&2 (½" to ¾")	ER0533 App 1C	7
	SOV sizes 3-6 (1" to 3")		
	SOV sizes 1-6 (1" to 4")		

Use in safety function(s)

The valves may be used in low or high demand mode safety functions where the safety operation of the valve is de-energisation of the solenoid.

User instructions

Information regarding the safe installation, operation and maintenance of the certified equipment is provided in the manufacturer's documentation listed below:

ICO3S	MI0294
ICO4D, ICOS	MI0202
ICO4N	MI0241
SOV1-6	MI0238

Certified data in support of use in safety functions

The assessment has verified, through 'Proven in Use' data:

- a probability of failure to release on demand of $5 \cdot 10^{-4}$
- a failure rate of 0.14 per million hours
- a safe failure fraction (SFF) >90%

Note: The above figures for probability of failure to release on demand, failure rate and safe failure fraction apply **solely** to the requirement for the valve to respond correctly to the **de-energisation** of its solenoid.

Management of functional safety

The assessment has demonstrated that the certified products are supported by an appropriate functional safety management system that meets the relevant requirements of IEC 61508-1:1998 clause 6.

Table 2: Conditions for maintaining safety integrity capability

Parameter	Limits/requirements
Temperature range	- 40 deg C to + 90 deg C
Ingress protection	Stated on specification sheets
Pressure limits	Stated on valve plates
Lifetime usage limit	25 years
Proof test interval	12 months
Maintenance interval	6 years or 10 ⁴ operations
Process media:	Instrument air; nitrogen; benign gases; water; hydraulic fluids.
NB: other media can be used, but may invalidate certification. Consult Thompson Valves first.	

Failure to observe the above conditions will invalidate the certified data and may compromise the integrity of the safety function performed by the valves

Conditions of Certification

The validity of the certified failure data is conditional on the manufacturer complying with the following conditions:

1. The manufacturer shall analyse failure data from returned products on an on-going basis. Sira Certification Service shall be informed in the event of any indication that the actual failure rates are worse than the certified failure rates. (A process to rate the validity of field data should be used. To this end, the manufacturer should co-operate with users to operate a formal field-experience feedback programme).
2. Sira shall be notified in advance (with an impact analysis report) before any modifications to the certified equipment or the functional safety information in the user documentation is carried out. Sira may need to perform a re-assessment if modifications are judged to affect the product's certified functional safety.
3. On-going lifecycle activities associated with this product (e.g., modifications, corrective actions, field failure analysis) shall be subject to surveillance by Sira in accordance with 'Regulations Applicable to the Holders of Sira Certificates'.



Sira Certification Service

Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

Conditions of Safe Use

The validity of the certified failure data in any specific user application is conditional on the user complying with the following conditions:

1. The user shall comply with the conditions given in Table 2 above and the requirements given in the manufacturer's user instructions in regard to all relevant functional safety aspects such as application of use, installation, operation, maintenance, proof tests, maximum ratings, environmental conditions, repair, etc.
2. Selection of this equipment for use in safety functions and the installation, configuration, overall validation, maintenance and repair shall only be carried out by competent personnel, observing all the manufacturer's conditions and recommendations in the user documentation.
3. All information associated with any field failures of this product should be collected under a dependability management process (e.g., IEC 60300-3-2) and reported to the manufacturer.

General Conditions and Notes

1. This certificate is based upon a functional safety assessment of the product described in Sira Test & Certification Assessment Reports FSCR 675-0049, R56A13869 and R56A20423A.
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The use of this Certificate and the Sira Certification Mark that can be applied to the product or used in publicity material are subject to the 'Regulations Applicable to the Holders of Sira Certificates' and 'Supplementary Regulations Specific to Functional Safety Certification'.
4. This document remains the property of Sira and shall be returned when requested by the issuer.



Sira Certification Service

Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com