

BUREAU VERITAS
Certification



Type certificate by assessment of the product design

Issued to

JFlow Controls.
4665, Interstate Drive
Cincinnati, Ohio. 45246

Bureau Veritas Certification certifies that the design of the following product
by the company mentioned above:

**JFC032D-JFC400D Rack & Pinion Double Acting Actuator
(Version A)**

has been assessed and fulfils the relevant requirements of the following
standard:

IEC 61508 (edition 2) – Parts 1, 2, 4

in accordance with SIL 2 in HFT=0 configuration
in accordance with SIL 3 in HFT=1 configuration

as a type A element
and following the description, configuration and limitation defined in the annex
of the present certificate

This certificate only applies to the design of the product (as referred above) and to the
corresponding technical file.

The annex is an integral part of this certificate.

This certificate is based on the following assessment report:

- Assessment report reference:
INS-JZ-15-0142(C150004)_1 Assessment Report Rev.1

Certificate N°: C150004-1
Emission date: 11/12/2018
End of validity: 10/12/2023

Jacques MATILLON
General Manager
p/p Eric Rouaix
Functional Safety Certification Manager



**Annex to the certificate n° C150004-1 issued by Bureau Veritas Certification
to JFlow Controls.**

Product description

The product versions used for the assessment are the following:

Product	Model	Catalog reference	Version number
Rack & Pinion Double Acting Actuator	Series: JFC032D-JFC400D	JFCActuator Catalogs 170208	A

The product Safety Function found compliant to SIL 2 is the following:

- SF1: to actuate the valves to open or close on demand.

Hypothesis and calculation results

Hypothesis taken into account are the following:

- the mode of operation is "Low demand", which means less than 1 trip demand each year;
- the proof test interval is 1 year;
- the MTTR (Mean Time To Repair) used for each component is 24 hours;
- failure rates are considered constant and do not take into account early life and end-of-life failures;
- the HFT (Hardware Fault Tolerance) configuration – specific to the redundancy level required to reach the certified SIL – is indicated in the table below

Type	HFT	Safety function	Intermediate results			Final results	
			Undetected dangerous failure rate (λdu)	SFF (%)	DC (%)	SIL	Probability of Failure on Demand (PFD)
Series	0	SF1	1.09 E-07	0	0	SIL 2	4.75 E-04
JFC032D~ JFC400D	1	SF1	N/A	N/A	N/A	SIL 3	4.81 E-05

Conditions and limits

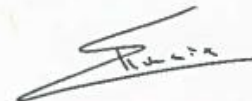
Use of the product must comply with the terms of use in order to preserve SIL2 properties. These rules are reminded in the section 6 of the evaluation report (ref: INS-JZ-15-0142(C150004)_1 Assessment Report Rev.1).

Acceptable environmental constraints and design lifetime for the product are stated in the following document:

- Safety Manual (Ref.: VT QP ME010 safety manual Rev.A0)

These elements must be checked for each integration of the product, as well as during the operation and maintenance phases.

This certificate does not imply compliance with European Directive and does not allow for provision of a CE marking.



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the assessment report are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS CERTIFICATION. This certificate is issued within the scope of the General conditions of Service of BUREAU VERITAS CERTIFICATION available. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS CERTIFICATION for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the BUREAU VERITAS CERTIFICATION or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.