

Certificate



SIL/PL
Capability

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ID 060000000

No.: V 492.01/15

Product tested Gate Valves for cryogenic and non-cryogenic use

Certificate holder AMPO S.COOP.
Division Valvulas Poyam
Katea Auzoa Z/G
20213 Idiazabal
(Guipuzcoa)
Spain

Type designation Gate Valve, Cryogenic Gate Valve, Pressure Seal, Cryogenic Pressure Seal, Parallel Slide, Parallel Slide Pressure Seal

Codes and standards IEC 61508 Parts 1-2 and 4-7:2010 IEC 61511 Parts 1-3:2004 (in extracts)

Intended application The valves are suitable for use in a safety instrumented system up to SIL 2. Under consideration of the minimum required hardware fault tolerance HFT=1 the valves may be used in a redundant structure up to SIL 3.

Specific requirements The instructions of the associated Installation and Operating Manual shall be considered.

Summary of test results see back side of this certificate.

Valid until 2020-08-03

The issue of this certificate is based upon an examination, whose results are documented in Report No. V 492.01/15 dated 2015-08-03.

This certificate is valid only for products which are identical with the product tested. It becomes invalid at any change of the codes and standards forming the basis of testing for the intended application.

TÜV Rheinland Industrie Service GmbH

Bereich Automation
Funktionale Sicherheit

Am Grauen Stein, 51105 Köln

Köln, 2015-08-03

Certification Body for FS-Products

Dr.-Ing. Thorsten Gantevoort

Manufacturer

AMPO S.COOP. Division Valvulas Poyam Katea
Auzoa Z/G
20213, Idiazabal-Guipuzcoa
SPAIN

tested

Product

Gate Valve, Cryogenic Gate Valve, Pressure Seal,
Cryogenic Pressure Seal, Parallel Slide,
Parallel Slide Pressure Seal

Device-Specific Values		Standard	Cryogenic	Parallel slide
Probability of Dangerous Failure on Demand	PFD _{spec}	6,80 E-04	2,26E-04	4,88E-03
Assumed Test Interval	Ti	1 a	1 a	1 a
Confidence Level	1- α	95 %	95 %	95 %
Safe Failure Fraction ^(see note)	SFF	67 %	67 %	67 %
Hardware Fault Tolerance	HFT	0	0	0
Diagnostic Coverage	DC	0 %	0 %	0 %
Type of Sub System		Type A	Type A	Type A
Mode of Operation		Low Demand	Low Demand	Low Demand
Proof Test Coverage	PTC	75 %	75 %	75 %
Partial Stroke Test Coverage	PSTC	not considered	not considered	not considered

Note

The Safe Failure Fraction (SFF) was estimated by an alternative method with a FMEA according to EN 161:2011/A3:2013.

Derived Values for 1oo1-Architecture		Standard		Cryogenic		Parallel slide	
Assumed Demands per Year	f _{np}	1 / a		1 / a		1 / a	
Total Failure Rate	$\lambda_S + \lambda_D$	2,35 E-07 / h	235 FIT	7,83 E-08 / h	78 FIT	1,69 E-06 / h	1.689 FIT
Lambda Dangerous Detected	λ_{DD}	0,00 E+00 / h	0 FIT	0,00 E+00 / h	0 FIT	0,00 E+00 / h	0 FIT
Lambda Dangerous Undetected	λ_{DU}	7,77 E-08 / h	78 FIT	2,59 E-08 / h	26 FIT	5,57 E-07 / h	557 FIT
Lambda Safe Detected	λ_{SD}	0,00 E+00 / h	0 FIT	0,00 E+00 / h	0 FIT	0,00 E+00 / h	0 FIT
Lambda Safe Undetected	λ_{SU}	1,58 E-07 / h	158 FIT	5,25 E-08 / h	52 FIT	1,13 E-06 / h	1.132 FIT
Mean Time To Failure	MTTF	4,25 E+06 h	485 a	1,28 E+07 h	1.457 a	5,92 E+05 h	68 a
Mean Time To Dangerous Failure	MTTF _D	1,29 E+07 h	1.470 a	3,87 E+07 h	4.416 a	1,79 E+06 h	205 a
Average Probability of Failure on Demand	PFD_{avg}	3,40 E-04		1,13 E-04		2,44 E-03	

Useful Lifetime

A time of usage of more than 5 years (+ 1.5 years of storage) can only be favored under responsibility of the operator, consideration of specific external conditions (securing of required quality of media, max. temperature, time of impact), and adequate test cycles.

Quality Management

These statements are bound to a proven and verified deployment of safety-related quality management of the manufacturer.