

Certificate



SIL/PL
Capability

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ID 060000000

No.: V 532.01/16

Product tested	Globe Valves	Certificate holder	AMPO S.COOP. Division Valvulas Poyam Katea Auzoa Z/G 20213 Idiazabal (Guipuzcoa) Spain
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Type designation	G.n.m" - Globe Valve G.n.m".C - Cryogenic Globe Valve G.n.m".PS - Pressure Seal Globe Valve G.n.m".SC - Stop Check Globe Valve G.n.m".PS.SC - Pressure Seal Stop Check Globe Valve G.Y.n.m" - Y Globe Valve G.Y.n.m".PS - Pressure Seal Y Globe Valve G.Y.n.m".SC - Y Body Stop Check Globe Valve G.Y.n.m".PS.SC - Pressure Seal Stop Check Y Type Globe Valve (n: Pressure rating; m": Size)
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Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010	IEC 61511-1:2016
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Intended application	Safety Function: - Move into safe position (open or close) upon demand - Keep up external tightness
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The valves are suitable for use in a safety instrumented system up to SIL 2 (low demand mode). Under consideration of the minimum required hardware fault tolerance HFT = 1 the valves may be used in a redundant architecture up to SIL 3.

Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.
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Summary of test results see back side of this certificate.

Valid until 2021-04-08

The issue of this certificate is based upon an examination, whose results are documented in Report No. V 532.01/16 dated 2016-04-08.

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, 2016-04-08

Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. Stephan Hüb

Manufacturer	AMPO S. COOP.
	Katea Auzoa Idiazabal-Guipuzcoa Spain
Products tested	Globe Valves
	G.n.m" - Globe Valve
	G.n.m".C - Cryogenic Globe Valve
	G.n.m".PS - Pressure Seal Globe Valve
	G.n.m"SC - Stop Check Globe Valve
	G.n.m"PS.SC - Pressure Seal Stop Check Globe Valve
	G.Y.n.m" - Y Globe Valve
	G.Y.n.m".PS - Pressure Seal Y Globe Valve
	G.Y.n.m".SC - Y Body Stop Check Globe Valve
	G.Y.n.m"PS.SC - Pressure Seal Stop Check Y Type Globe Valve (n: Pressure rating; m": Size)

Device-Specific Values

Probability of Dangerous Failure on Demand	p	2,21 E-03
Confidence Level	1- α	95 %
Safe Failure Fraction ^(see note)	SFF	67 %
Hardware Fault Tolerance	HFT	0
Diagnostic Coverage	DC	0 %
Type of Sub System		Type A
Mode of Operation		Low Demand
Proof Test Coverage	PTC	not considered
Partial Stroke Test Coverage	PSTC	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

Assumed Demands per Year	n_{op}	1 / a	1,14 E-04 / h
Assumed Test Interval	T_i	8760 h	1 a
Total Failure Rate	$\lambda_S + \lambda_D$	7,66 E-07 / h	766 FIT
Lambda Dangerous Detected	λ_{DD}	0,00 E+00 / h	0 FIT
Lambda Dangerous Undetected	λ_{DU}	2,53 E-07 / h	253 FIT
Lambda Safe	λ_S	5,13 E-07 / h	513 FIT
Mean Time To Failure	MTTF	1,31 E+06 h	149 a
Mean Time To Dangerous Failure	MTTF _D	3,96 E+06 h	452 a
Average Probability of Failure on Demand	PFD_{avg}	1,11 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.