

Certificate



SIL/PL
Capability

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Nr./No.: 968/V 1097.01/23

**Prüfgegenstand
Product tested**

Pneumatische Schwenkantriebe
Pneumatic Actuators

**Zertifikats-
inhaber
Certificate
holder**

AMG - Pesch GmbH
Adam-Riese-Str. 1
50996 Köln
Germany

**Typbezeichnung
Type designation**

SAF, PGF, SADP (einfachwirkend / single acting)
SAD, PGD, SADT (doppeltwirkend / double acting)
see Revision List

**Prüfgrundlagen
Codes and standards**

IEC 61508 Parts 1-2 and 4-7:2010

**Bestimmungsgemäße
Verwendung
Intended application**

Sicherheitsfunktion: Einnehmen der Ruhestellung
Die Antriebe sind zur Verwendung in einem sicherheitsgerichteten System bis SIL 2 (Low Demand Mode) nach IEC 61508 geeignet. Unter Berücksichtigung der mindestens erforderlichen Hardware-Fehlertoleranz von HFT = 1 für das gesamte finale Element können die Antriebe auch bis SIL 3 nach IEC 61508 und IEC 61511 eingesetzt werden.
Safety Function: Going into the resting position
The actuators are suitable for use in a safety instrumented system up to SIL 2 (low demand mode) acc. IEC 61508. Under consideration of the minimum required hardware fault tolerance HFT = 1 for the complete final element the valves may be used up to SIL 3 acc. IEC 61508 and IEC 61511.

**Besondere Bedingungen
Specific requirements**

Die Hinweise in der zugehörigen Installations- und Betriebsanleitung sowie des Sicherheitshandbuchs sind zu beachten.
The instructions of the associated Installation, Operating and Safety Manual shall be considered.

Zusammenfassung der Testergebnisse siehe Rückseite des Zertifikates.
Summary of test results see back side of this certificate.

Der Ausstellung dieses Zertifikates liegt eine Evaluierung entsprechend dem Zertifizierungsprogramm CERT FSP1 V1.0:2017 in der aktuellen Version zugrunde, deren Ergebnisse im Bericht Nr. 968/V 1097.01/23 vom 17.01.2023 dokumentiert sind. Dieses Zertifikat ist nur gültig für Erzeugnisse, die mit dem Prüfgegenstand übereinstimmen. Ausgestellt von der durch die DAkkS nach DIN EN ISO/IEC 17065 akkreditierte Zertifizierungsstelle. Die Akkreditierung gilt nur für den in der Urkundenanlage D-ZE-11052-02-01 aufgeführten Akkreditierungsumfang.
The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT FSP1 V1.0:2017 in its actual version, whose results are documented in Report No. 968/V 1097.01/23 dated 2023-01-17. This certificate is valid only for products, which are identical with the product tested. Issued by the certification body accredited by DAkkS according to DIN EN ISO/IEC 17065. The accreditation is only valid for the scope listed in the annex to the accreditation certificate D-ZE-11052-02-01.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit

Köln, 2023-03-06

Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. (FH) Wolf Rückwart

Holder: AMG Pesch GmbH
Adam-Riese-Straße 1
50996 Köln

Product tested: Pneumatische Schwenkantriebe
Pneumatic Actuator
SAF, PGF, SADF (einfachwirkend / single acting)
SAD, PGD, SADT (doppeltwirkend / double acting)

Results of Assessment

Route of Assessment		2 _H / 1 _S
Type of Sub-system		Type A
Mode of Operation		Low Demand Mode
Hardware Fault Tolerance	HFT	0
Systematic Capability		SC 3

SAD, PGD (doppeltwirkend / double acting)

Dangerous Failure Rate	λ_D	2.74 E-07 / h	274 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.20 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.22 E-04	

SAF, PGF (einfachwirkend / single acting)

Dangerous Failure Rate	λ_D	1.85 E-07 / h	185 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.10 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.18 E-05	

SADT (doppeltwirkend / double acting)

Dangerous Failure Rate	λ_D	3.90 E-07 / h	390 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.71 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.74 E-04	

SADF (einfachwirkend / single acting)

Dangerous Failure Rate	λ_D	2.91 E-07 / h	291 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.27 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.29 E-04	

Assumptions for the calculations above: DC = 0 %, $T_1 = 1$ year, $\beta_{1oo2} = 10$ %

Origin of values

The stated values are the results of extensive qualification tests and FMEDA analysis on the reliability of the safety function under critical conditions. In addition, the failure rate was verified by the analysis of field feedback of the last five years. Random and systematic failures which are the responsibility of the manufacturer were examined.

Systematic Capability

The development and manufacturing process and the functional safety management applied by the manufacturer in the relevant lifecycle phases of the product have been audited and assessed as suitable for the manufacturing of products for use in applications with a maximum Safety Integrity Level of 3 (SC 3).

Periodic Tests and Maintenance

The given values require periodic tests and maintenance as described in the Safety Manual. The operator is responsible for the consideration of specific external conditions (e.g. ensuring of required quality of media, max. temperature, time of impact), and adequate test cycles.