

# ERIKS

Actionneur pneumatique à pignon et crémaillère  
AMG types SAD et SAF  
Certificat SIL

## Certificate

No. V 113 2011 C3

Manufacturer: **AMG - Pesch GmbH**  
**Otto-Hahn-Straße 23**  
**50997 Köln**  
**Germany**

Product /  
Test item: **Pneumatic quarter turn actuator**

Type Series: **SAD, SAF, PGD, PGF**

Application /  
Safety Function: **Safety related actuator to control  
suitable valves**

Test Results: **The devices of the type series stated above are  
suitable for use in safety-related systems in  
accordance with DIN EN 61508 up to and including  
SIL 3.**

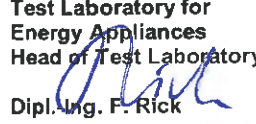
Detailed results can be found in the report  
No. V113 2011 V2 dated 2011-02-28.  
A summary of the test values is given on the  
reverse side of this certificate.

Suitability for certain applications can only be  
evaluated through examination of each safety-related  
overall system with regard to the requirements of  
EN 61508.

**This certificate is valid until March 2016**

Dated in Cologne, 2011-02-28

Inspector  
  
Dipl.-Ing. Th. Küppers

Test Laboratory for  
Energy Appliances  
Head of Test Laboratory  
  
Dipl.-Ing. F. Rick

TÜV Rheinland Energie und Umwelt GmbH, Am Grauen Stein, D-51105 Köln, Germany

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Precisely Right.



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Probability of failure on demand	PFD <sub>spec</sub>	Failure/demand	6,19E-06
Confidence niveau	1- $\alpha$		0,95
Safe failure fraction	SFF	%	90
Hardware failure tolerance		HFT	0
Diagnostic coverage		DC	0
Type of subsystem	Acc. IEC 61508-2, 7.4.4.1.2		Type A
Values calculated:			
Assumed demands per year			10
Demand/hour	F <sub>np</sub>	demand/h	1,14E-03
Dangerous failure rate	$\lambda_D$	1/h	7,07E-09
		FIT	7,07
MTBF of dangerous failures	MTBF D	h	1,42E+08
		y	16155
Safe failure rate	$\lambda_S$	FIT	6,36E-08
			63,60
Total failure rate	$\lambda_S + \lambda_D$	FIT	7,07E-08
			70,66
MTBF total		h	14151858
MTBF total		y	1616
Dangerous detected		$\lambda_{DD}$	0
Dangerous undetected		$\lambda_{DU}$	7,07E-09
safe detected		$\lambda_{SD}$	0
safe undetected		$\lambda_{SU}$	6,36E-08
<b>Impact of test interval (full functional test)</b>			
Test interval	Ti	y	1
	Ti	h	5
			8760
Probability of failure on demand	PFD avg		3,10E-05
			1,55E-04

### Test Results

It is the opinion of the Test Laboratory that the devices of the type series examined are suitable for use in safety-related systems in an operating mode with low demand rate (Low Demand Mode) according to DIN EN 61508 up to and including SIL 3.

The device-specific values determined refer only to the test object.

### Validity of Test Statement

Based on the experience up to now with these devices and regarding the corrosion protection and aging behaviour of the materials used in the FMEA, a maximum operation time of 5 years is assumed.

In the opinion of the test laboratory storage under the conditions given by manufacturer of 1.5 years after production and before taking into operation will not have a negative influence.

The operation time can only be extended under the responsibility of the plant operator regarding the special operation conditions and regarding special test intervals and maintenance procedures.

### Quality Management

The test statement is bound to the implementation of a suitable and verified safety-related quality management by the manufacturer.

TÜV Rheinland Energie und Umwelt GmbH, Am Grauen Stein, D-51105 Köln, Germany