

Certificate

No. V 56 2009 C3

Manufacturer: Flowserve (Austria) GmbH
Control Valves – Villach Operation
Kasernengasse 6, A 9500 Villach

Product: **pneumatic safety shut off valves with controll function**

Type: **FlowTop, V 726, D 726, V 738, D738, V 740, D 740**
FlowPro, V724, V760

Test results: **The above mentioned appliances are suitable for use in safety related systems up to and including SIL 4 according to IEC 61508**

For detailed results see test report Nr. V 56 2009 E2 vom 29.01.2009


A short summary of test results is filed up on the backside of this certificate.

The suitability for certain fields of application can only be assessed by additional evaluation of the actuator and further components of the subsystem.

This certificate remains valid until 02/2014

Cologne 2009-01-29

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



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to report No. V 56 2009 E2

company **Flowserve (Austria) GmbH**
Control Valves – Villach Operation

Type: FlowTop, V 726, D726, V 738, D738, V 740, D740

appliance: FlowPro, V724, V760
 pneumatic safety shut off valves with controll function

Appliance-specific values determined:

Ermittelte gerätespezifische Werte:

Probability of Failure on Demand	PFD	Failure/demand	3,84E-07	
Confidence level	1- α		0,99	
Safe failure fraction	SFF	%	99	
Hardware fault tolerance	HFT		0	
Diagnostic coverage	DC		0	
Type of sub system	IEC 61508-2, 7.4.3.1.2		Typ A	

abgeleitete Werte:

Assumed demands per year			10	
Demand/hour	F_{np}	demand/h	1,14E-03	
Dangerous failure rate	λ_D	1/h	4,38E-10	0,44 FIT
Safe failure rate	λ_S		4,34E-08	43,8 FIT
Total failure rate	$\lambda_S + \lambda_D$		4,38E-08	43,8 FIT
MTBF		h	22812500	
MTBF		y	2604	

influence of test interval

Testintervall	T_i	y	1	5
	T_i	h	8760	43800
Probability of Failure on Demand	PFD avg		1,92E-06	9,60E-06

In the opinion of the Test Centre the valves are suitable for installation in safety related systems as a single safety related subsystem up to and including SIL 3. With a structure establishing a HFT of 1 the valves are usable in SIL 4.

Only the valves stated above are deemed to be the subject of this investigation. As a rule in safety related systems (E/E/PE safety related systems in accordance with IEC 61508) these represent an actuator.

The statement is valid for new or serviced valves valves for a period of operation of 7 years for use under all safety relevant operation conditions defined by the manufacturer.

The statement is bound to application of a safety relevant quality management system by the manufacturer.