

Prüfstelle für energietechnische Einrichtungen

**Investigation of suitability
 of solenoid control valves with safety function
 for usage in defined safety integrity levels according to IEC 61508**

Manufacturer/Contractor Eugen Seitz AG
 Spitalstrasse 204
 8623 Wetzikon 3, Switzerland

Type designation CP 0632 ... oH, CP 0632 ... oHi
 see type list Annex 1 of report V11 2003 S2

Test item solenoid control valve with safety function

Maximum working pressure 8 bar

Possible temperature range ambient: -25 °C bis + 65°C

Work energy electric current, see typ sheets

Flow medium clean and dry compressed air (instrument air) in accordance to the mounting and operation instructions

Test results:

In the opinion of the Test Centre the valves are suitable for installation in safety related systems as a single safety related system according to IEC 61511 up to SIL 2 if used in a structure hardware fault tolerance HFT=0; if used in a structure hardware fault tolerance HFT=1 the valves are suitable up to SIL 3. They are suitable for a single safety related subsystem according to IEC 61508 up to and including SIL 4.

Probability of Failure on Demand	PFD	2,00E-07	
Confidence level	1-α	95	
Safe failure fraction	SFF	99	%
Hardware fault tolerance	HFT	0	
Diagnostic coverage	DC	0	%
Type of sub system acc. IEC 61508-2, 7.4.3.1.2		type B	
Derived values:			
Assumed demands per year		10	
Demand/hour	Fnp	1,14E-03	
Dangerous failure rate	λ _p	2,28E-10	1/h
MTBF dangerous failures	MTBF D	4,38E+09	h
Safe failure rate	λ _s	2,26E-08	22,60 FIT
Total failure rate	λ _s + λ _p	2,28E-08	22,83 FIT
MTBF total		43800000	h
Dangerous undetected	λ _{DU}	2,28E-10	
Safe undetected	λ _{SU}	2,26E-08	

Remarks:

These figures apply for such applications with a demand rate of an average of 1 to 10/year. The suitability for high demand mode applications can be calculated according to annex 2 based on the particular demand rate. The definitions low and/or high demand mode in IEC 61508 are deployed here accordingly, as the demand rate (frequency of operation) and the number of operating hours during the period of application have, as a result of the design, a negligible influence on the probability of failure within the normal field of application.

The statement is valid for a period of operation of 5 years plus a maximum of 1.5 years storage time before being used for the first time.

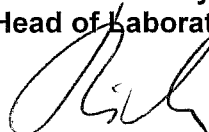
Only the valves stated above are deemed to be the subject of this investigation. As a rule in safety related systems (E/E/PE safety related systems in accordance with IEC 61508) these represent an actuator.

After expiry of the above mentioned periods of time the valves may not be used in safety related applications.

These statements are bound to the proven and verified deployment of a safety-related quality management of the manufacturer. The validity of the test report is limited to a period of 5 years until 09/2013.

Cologne, 2008-09-26

**Test Laboratory for Energy Appliances
 Head of Laboratory**



Dipl.-Ing. Rick

5.1 Anhang 1 Typenliste

Ventil Valve

Typ Type	DN	Funktion Function	Anschluss Connection
CP 0632 CGK oH	6	3/2 NC	G 1/4 G 1/4
CP 0632 CGK oH i			
CP 0632 CTK oH	6	3/2 NC	NPT 1/4 NPT 1/4
CP 0632 CTK oH i			
CP 0632 CNX oH	6	3/2 NC	NAMUR und G 1/4 NAMUR and G 1/4
CP 0632 CNX oH i			
CP 0632 CSX oH	6	3/2 NC	NAMUR und NPT 1/4 NAMUR and NPT 1/4
CP 0632 CSX oH i			
CP 0632 CPU oH	6	3/2 NC	NAMUR und G 1/4 mit Steuerluftversorgungsanschluss NAMUR and G 1/4 with control air supply connection
CP 0632 CPU oH i			
CP 0632 CRU oH	6	3/2 NC	NAMUR und NPT 1/4 mit Steuerluftversorgungsanschluss NAMUR and NPT 1/4 with control air supply connection
CP 0632 CRU oH i			
CP 0632 CFX oH	6	3/2 NC	Flansch Flange
CP 0632 CFX oH i			
CP 0632 CLX oH	6	3/2 NC	NAMUR - Laterne NAMUR - lantern
CP 0632 CLX oH i			

Magnetspule Solenoid

Typ Type	Zündschutzart Type of protection	Leistung Rated power	Spannung Rated Voltage
11 A 52	EEx em, IP 65	1,8 W	6 V DC ... 400 V DC
11 A 53	EEx em, IP 65	1,8 W	6 V DC ... 125 V DC
11 F 52	EEx em, IP 65	1,8 W / VA	6 V AC / DC ... 400 V AC / DC
11 F 53	EEx em, IP 65	1,8 W / VA	6 V AC / DC ... 125 V AC / DC
11 C 53	EEx em, IP 65	1,8 W / 3 VA	6 V AC ... 250 V AC
11 G 52	EEx ia, IP 65	0,15 W ... 1,2 W	14 V DC ... 32 V DC