Certificate

No.: V 359.11/16

Product tested	Air and gas pressure switch for application in thermoprocessing equipment	**Certificate holder**	Elster GmbH Strotheweg 1 49504 Lotte (Büren) Germany
Type designation	DG..U, B, H, N, I, T, HT, NT DG..C, VC, CT, VCT		
Codes and standards	EN ISO 13849-1:2008 + AC:2009 EN 13611:2015 (in extracts)	DIN EN 1854:2010-10	
Intended application	For use as pressure monitor of air, gas and exhaust gas in operation, e. g. in thermoprocessing equipment acc. EN 746-2. Safety function: Open/Close output contacts (COM-NO / COM-NC) when the pressure setpoint is exceeded/underrun. The pressure switches are suitable for safety-related application up to PL d acc. to EN 13611 in single-channel structure. If the pressure switches are used in redundant multi-channel structure, they can be used up to PL e. The pressure switches are suitable for safety-related application up to PL c acc. to EN ISO 13849-1 in single-channel structure. If the pressure switches are used in redundant multi-channel structure, they can be used up to PL e.		
Specific requirements	The instructions of the associated Installation, Operating and Safety Manual must be considered.		

Summary of test results see back side of this certificate.

Valid until 2021-11-09

The issue of this certificate is based upon an examination, whose results are documented in Report No. V 359.10/16 dated 2016-11-09.
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.

Köln, 2016-11-09

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln
Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. Stephan Häb

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TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, 51105 Köln / Germany
Tel.: +49 221 806-1790, Fax: +49 221 806-1539, E-Mail: industrie-service@de.tuv.com

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Manufacturer	Elster GmbH Strotheweg 1 49504 Lotte (Büren)
Type series	DG..U, B, H, N, I, T, HT, NT DG..C, VC, CT, VCT

Safety-specific values

Max. electric capacity			U=24VDC, I=10mA U=230VAC, I=4mA	U=24VDC, I=70mA U=230VAC, I=20mA	U=230V, I=2A
B_{10d} value	B_{10d}	[1]	6.689.500	4.414.000	974.800
Hardware fault tolerance	HFT_{int}	[-]	0		
Diagnostic coverage	DC	[-]	0		

Suitable for Perfomance Level(1)	PL	[-]	a, b, c, d, e
Suitable for Category(1)		[-]	B, 1, 2, 3, 4
Application of essential safety requirements			satisfied
Mean time to dangerous failure	$MTTF_d$	[h]	see below
Mean dangerous failure rate	λ_D	[1/h]	see below

(1): *HFT and DC of the safety-related overall system have to be considered for each application.*

Determination of PFH_D

The suitability for certain applications can only be realised through the evaluation of the respective safety-related overall system including all safety-related components and the calculation of the application oriented PFH_D, $MTTF_D$ and λ_D value. PFH_D, $MTTF_D$ and λ_D depend on frequency of demand nop of the safety-related overall systems and will be calculated according the following equation.

$$PFH_D = \lambda_D = \frac{1}{MTTF_d} = \frac{0{,}1}{B_{10d}} \cdot n_{op}$$

Useful lifetime under operating condition

A time of usage of more than 10 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. Further, the maximum cycle lifetime is limited to the B_{10d} value of the test item.