

INSPECTION CERTIFICATE

Registration No.: 5119154-2E5/19

Manufacturer: **ABO valve, s.r.o.
Dalimilova 285/54
CZ-783 35 Olomouc**

ID No.: **49609050**

Product: **double eccentricity shut-off (or regulating) flap**

Type designation: **2E5**

Product line: **DN 50-100, PN 6-50;
DN 125-200, PN 6-40
DN 250-800, PN 6-25 for use in the temperature
range from -60°C to +500°C depending on the
material variant intended for gases and liquids**

Technical standard and regulations: **Functional safety acc. to ČSN EN 61508-1, ed. 2,
ČSN EN 61508-2, ed. 2
ČSN EN 61511, ed. 2**

Inspection report No.: **5119154/01/01**

TÜV NORD Czech, s.r.o. as an independent organization (third party) according to ČSN EN 61508-4, article 3.8.13 confirms that the 2E5 valves with actuator modification of the mentioned series together with flanged (or threaded) connection meet the requirements in systems with functional safety **SIL2** (for a separate device without actuator) according to ČSN EN 61508, **type A**.

The product can be used in:

- a) configuration of one channel 1oo1 to SIL2
- b) to SIL 2 without external diagnostic tests, or in configuration of two 1oo2 channels, or in one channel with series products up to SIL 3

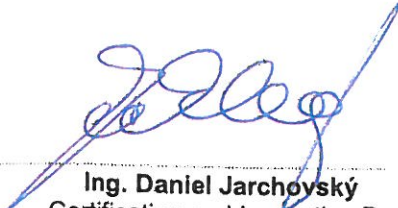
This certificate is issued on the request of the manufacturer as voluntary certification; does not include the production supervision.

The certificate is valid until 17.12.2022

Prague, 17.12.2019

Place and date




Ing. Daniel Jarchovský
Certification and Inspection Body
TÜV NORD Czech, s.r.o.

Attachment of the inspection certificate no. 5119154-2E5/19

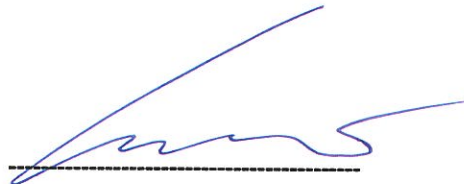
Member of functional reliability report	Butterfly valve 2E5 with double eccentricity, without limit switch	
Type of subsystem	ČSN EN 61508-2, Article 7.4.3.1.3, type A	
Hardware failure tolerance	HFT	0
Diagnostic coverage	DC	35%
Safety functions	Delivery of regulation and shut-off flap without actuator	
Mode of operation	Low Demand Mode	

Systematic Capability	SC3				
1 year	8760 hours				
Architectural constraints	Route 1 _H :	SFF	Route 2 _H :	Use (reclamations)	Route 2 _s acc to NE 130
	SIL2 can be reached in a 1oo1 architecture and SIL3 in a 1oo2 architecture				
Random failure rates					
Configuration 1oo1	Safety function	λ_{DU} [1/a]	λ_{DD} [1/a]	λ_{SD} [1/a]	λ_D [1/a]
	Flats 2E5	1,2E-05	1,06E-05	2,19E-05	2,26E-05
Safe failure fraction	SFF			%	73,0
				PFD _{AVG(1oo1)}	1,13E-05
Average probability of failure to perform its safety function on demand at partial stroke test every 3 months			PFD _{AVG(1oo1,PST)}	3,1E-06	
Remark:			Partial stroke test (PST) every 2 to 3 months		

Remarks:

For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, make reference to in the Safety Instructions for Installation, Operation and Maintenance of ABO Butterfly Valves Series 2E5. Certification of flats 2E5 does not include fire resistance and dissipation of static electricity.

END OF THE CERTIFICATE



Elaborated by the inspector: Ing. Oldrich Schieferstein

