

# INSPECTION CERTIFICATE

Registration No.: 5122113/01/04

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

ID No.: **49609050**

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

Type designation: **3E**

Product line: **DN 80-125, PN 6-50;**  
**DN 150-200, 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.: **5122113/01/05**

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 3E 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 at the request of the manufacturer as voluntary certification; does not include the production supervision.

The certificate is valid until 17.11.2025

Prague, 17.11.2022

Place and date



**Libor Laňka**

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

**Attachment of the inspection certificate no. 5122113/01/04**


Member of functional reliability report	Butterfly valve <b>3E</b> series with triple eccentricity, without limit switch	
Type of subsystem	ČSN EN 61508-2, para. 7.4.3.1.3, type A	
Hardware failure tolerance	HFT	0
Diagnostic coverage	DC	39,2%
Safety functions	Delivery of regulation and shut-off flap without actuator	
Mode of operation	Low Demand Mode	

Systematic Capability	SC 3					
1 year	8760 hours					
Architectural constraints	Route 1 <sub>H</sub> :	--	Route 2 <sub>H</sub> :	Use (reclamations)	Route 2 <sub>S</sub> :	acc.to NE 130
	SIL2 can be reached in a 1oo1 architecture and SIL3 in a 1oo2 architecture					
Random failure rates (1FIT=10E-09/hour)						
Configuration 1oo1	Safety function	$\lambda_{DU}$ [FIT]	$\lambda_{DD}$ [FIT]	$\lambda_{SD}$ [FIT]	$\lambda_D$ [FIT]	
	Flats <b>3E</b>	<b>390</b>	<b>606</b>	--	<b>996</b>	
average probability of failure to perform its safety function on demand, $C_{PT}=100\%$			$PFD_{AVG(1oo1)}$	<b>4,86E-03/year</b>		
Series ČSN EN 61511						
$PFD_{AVG}(PVST=2190 \text{ hours; FVST}=1 \text{ year})$			<b>1oo1</b>	<b>2,22E-03/year</b>	For a small number of flaps	
				$\lambda_{DU}$	$\lambda_{DD} + \lambda_{DU}$	
$PFD_{avg}(TI=1 \text{ year, } C_{PT}=70\%, MT=5 \text{ years})$ Visual test only			<b>1oo1</b>	<b>3,83E-03</b>	<b>9,6E-03</b>	
$PFD_{avg}(TI=1 \text{ year, } C_{PT}=95\%, MT=5 \text{ years})$ Visual test and torque, seal tightness and closing time control			<b>1oo1</b>	<b>2,0E-03</b>	<b>5,23E-03</b>	
$PFD_{avg}(TI=1 \text{ year, } C_{PT}=70\%, MT=5 \text{ years}; \beta_{1oo2}=10\%)$ Visual test only			<b>1oo2</b>	<b>3,98E-04</b>	<b>1,06E-03</b>	
$PFD_{avg}(TI=1 \text{ year, } C_{PT}=95\%, MT=5 \text{ years}; \beta_{1oo2}=10\%)$ Visual test and torque, seal tightness and closing time control			<b>1oo2</b>	<b>2,13E-04</b>	<b>5,33E-04</b>	
<b>1oo1=SIL 2; HFT=0, SC3 @ 1oo2=SIL 3; HFT 1; Route 2<sub>H</sub>/2<sub>S</sub></b>						

Remarks: LT- live time,  $C_{PT}$  - proof test coverage

For further details, including environmental conditions, limitations of use, lifetime, failure rates traceability, make reference to in the SIL manual (manual for the maintenance of the SIS system) IMS 716 of 4.11.2022.  
Certification of flats 3E does not include fire resistance and dissipation of static electricity.

**END OF THE CERTIFICATE**




**Elaborated by the inspector: Ing. Oldřich Schieferstein**