

FUNCTIONAL SAFETY CERTIFICATE

Registration No.: 5125068/01/02

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

ID No.: **49609050**

Product: **Butterfly valves**

Type designation: **Series 2E**

Product line: **Pw = 6 – 51 bar
for use in the temperature range from -196°C to
+500°C depending on the material variant
intended for gases and liquids**

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

Inspection report No.: **5125068/01/04**

TÜV NORD Czech, s.r.o., as an independent organization (third party) according to EN 61508-4, article 3.8.13 confirms that the 2E 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 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 company is certified by Quality Austria with an ISO 9001 certificate, no. 05209/0.

The certificate is valid until 05.June 2028

Prague, 05.June 2025

Place and date

Libor Laňka

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

TÜV NORD Czech, s.r.o.
Českomoravská 2420/15
CZ-190 00 Praha 9
tuev-nord.cz

Attachment of the inspection certificate no. 5125068/01/02

Member of functional reliability report	Butterfly valve series 2E , without actuator and limit switch	
Type of subsystem	EN 61508-2, Article 7.4.4.2.2, type A	
Hardware failure tolerance	HFT	0
Diagnostic coverage	DC	0
Safety functions	Delivery of regulation and shut-off valve without actuator and limit switch	
Mode of operation	Low Demand Mode	
Systematic Capability	SC3	
1 year	8760 hours	
Architectural constraints	Route 2H/1s	SIL2 can be reached in a 1oo1 architecture and SIL3 in a 1oo2 architecture

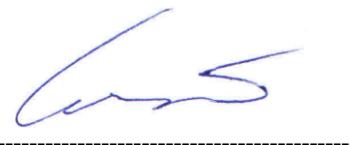
Random failure rates (1FIT=10E-09/hour)					
Configuration 1oo1	Safety function	λ_{DU} [FIT]	λ_{DD} [FIT]	λ_S [FIT]	λ_D [FIT]
Database from 2014 to 2024, n=78 053		6,6	4,4	--	11,0
Remark: in summary from 2014 to 2024; with λ_D ($\lambda_{DD} + \lambda_{DU}$) on new installation					
				PFD _{avg}	PFD _{avg}
PFD _{avg} (TI=1 year, PTC=100%); with $\lambda_{DD} + \lambda_{DU}$			1oo1	--	2,89 E-05
			--	only with λ_{DU}	$\lambda_{DD} + \lambda_{DU}$
PFD _{avg} (TI=1 year, PTC=70%, LT=5 years) Visual test only			1oo1	6,36E-05	1,06E-04
PFD _{avg} (TI=1 year, PTC=95%, LT=5 years) Visual test and torque, seal tightness and closing time control			1oo1	3,47 E-05	5,78E-05
PFD _{avg} (TI=1 year, PTC=70%, LT=5 years); $\beta_{1oo2}=10\%$ Visual test only			1oo2	6,37 E-06	1,06E-05
PFD _{avg} (TI=1 year, PTC=95%, LT=5 years); $\beta_{1oo2}=10\%$ Visual test and torque, seal tightness and closing time control			1oo2	3,47 E-06	5,79E-06
PFD _{avg} (PVST= 6 months; FVST=1 year)			1oo1	1,87 E-05	3,12 E-05
PFD _{avg} (PVST= 3 months; FVST=1 year)			1oo1	1,37 E-05	2,29 E-05
1oo1=SIL 2; HFT=0 , SC3 @ 1oo2=SIL 3; HFT 1; Route 2H/1s					

Remarks: LT- live time, PTC - proof test coverage; PVST partial valve stroke test; FVST full valve stroke test

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 valves series 2E does not include fire resistance and dissipation of static electricity.

END OF THE CERTIFICATE



Elaborated by the inspector:

Ing. Oldřich Schieferstein

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