

Inspection Certificate



Certificate No **968/INS 554.00/22**

Client / Certificate Owner
Ace Valve CO., LTD.
1-12, Somang-gil
Juchon-myeon, Gimhae-si
Gyeongsangnam-do
Republic of Korea

Product
Check Valves

Type designation
AV-KD Dual Plate Check Valves
AV-K Swing Check Valves

Standards applied for inspection
IEC 61508 Parts 1-2 and 4-7:2010

Inspection Results
The function of the check valves is to shut-off the valve and block the reverse flow of the fluid. Neither an external force nor an actuator is required to perform this function.
The check valves are suitable for use in Safety Instrumented Systems (SIS) as an additional part of the final element / actuator assembly and designed to be used in SIS of any SIL rating for use in low demand applications with no negative impact on the safety function performed by the SIS itself.
The check valves are independent, do not adversely affect the execution of the safety function and do not contribute to the average PFD of the SIS.

The instructions of the associated Installation, Operating and Safety Manual shall be considered.

Summary of test results see back side of this certificate.

Inspection Period
2022-02-22 - 2022-06-30

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Bereich Automation
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Cologne, 2022-06-30

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Inspection Body of TÜV Rheinland Industrie Service GmbH

Automation - Functional Safety, www.tuvasi.com

Holder: ACE VALVE CO., LTD.
 1-12, Somang-gil, Juchon-myeon, Gimhae-si,
 Gyeongsangnam-do
 Republic of Korea

Product tested: Check Valves
 AV-KD (Dual Plate Check Valve)
 AV-K (Swing Check Valve)

Results of Assessment

Route of Assessment		2 _H / 1 _S
Type of Sub-system		Type A
Mode of Operation		Low Demand Mode
Hardware Fault Tolerance	HFT	0
Systematic Capability		SC 3

Shut off the valve and block the reverse flow of the fluid

		AV-KD		AV-K	
Dangerous Failure Rate	λ_D	1.31 E-07 / h	131 FIT	1.02 E-07 / h	102 FIT

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process. Furthermore the results have been verified by field-feedback data. Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing. The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

Time of Usage

A time of usage of more than 5 years (+ 1.5 years of storage) can only be favoured 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. Please consider the references in the Safety Manual according to test intervals and procedures as well as maintenance in respect with the useful lifetime, including the possibility of longer periods of use.