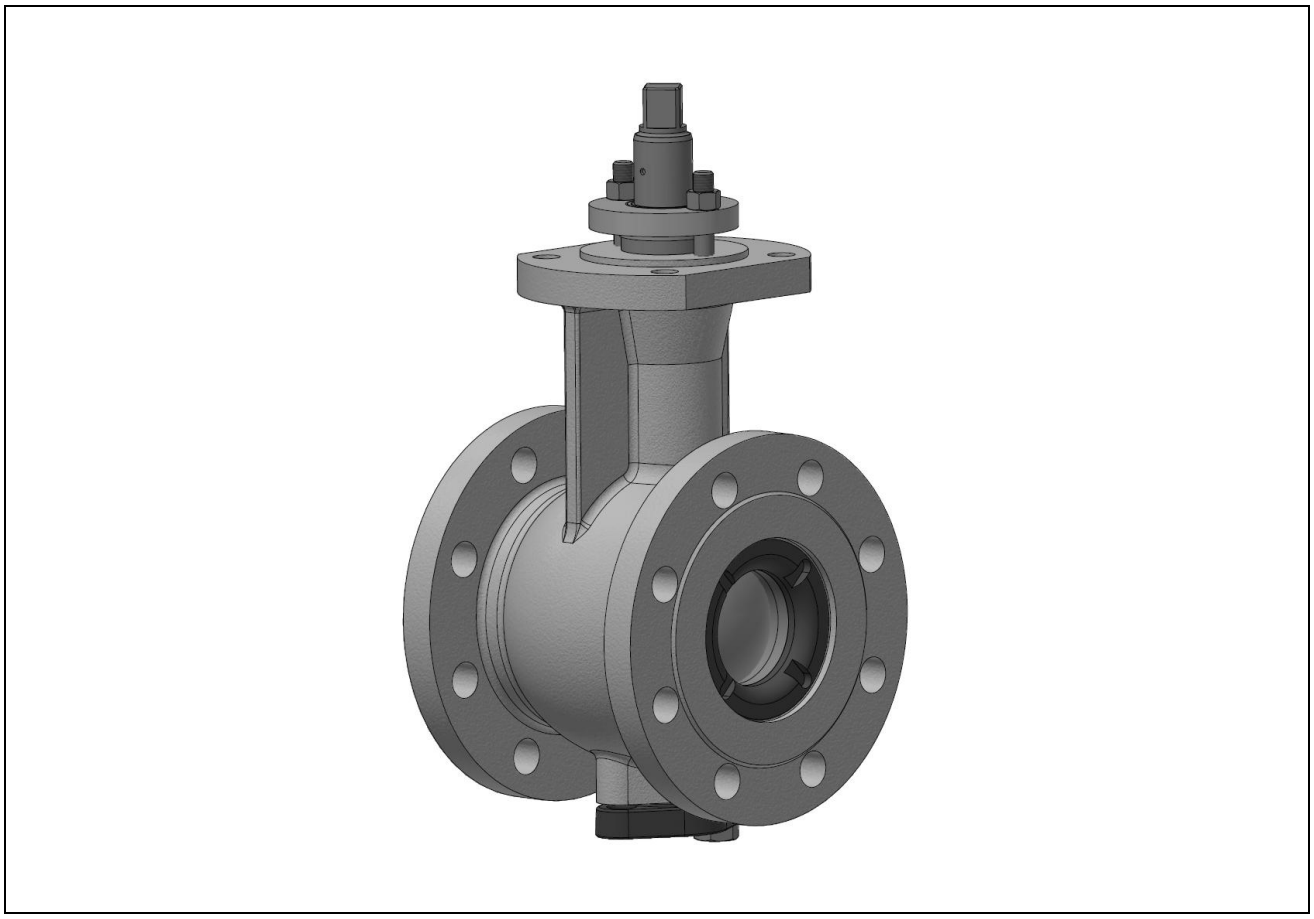
SAFETY MANUAL

SH005.001 EN

Translation of original instructions



Rotary Plug Valves · Series 82

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VETEC Ventiltechnik GmbH · Subsidiary of SAMSON AG

Purpose of this manual

The Safety Manual SH005.001 contains information relevant for the use of the Series 82 Rotary Plug Valve in safety-instrumented systems according to IEC 61508 and IEC 61511. The safety manual is intended for planners, constructors, and operators of safety-instrumented systems.

The images shown in these instructions are for illustration purposes only.

→ For the safe and proper use of these instructions, read them carefully and keep them for later reference.

NOTICE

Risk of malfunction due to incorrect installation or start-up of the device!

➔ *Refer to the mounting and operating instructions on how to install and start-up the device!*

➔ *Observe the warnings and safety instructions written in the mounting and operating instructions!*

Definition of signal words

DANGER

Hazardous situations which, if not avoided, will result in death or serious injury

WARNING

Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE

Property damage message or malfunction

Note

Additional information

Tip

Recommended action

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Further documentation:

Detailed descriptions of the commissioning, function and operation of the valve can be found in the documents listed below. The device-related documents are available on the Internet at vetec.samsongroup.com > Service & Support > Downloads > Documentation or can be requested via sales-vetec-de@samsongroup.com:

Type 82.7 Rotary Plug Valve

► TY005.005	Data sheet (DIN/ANSI)
► TY005.064/065	Data sheet for type-tested valves acc. to DVGW/GAR/EN161
► TY005.069	Max. permissible differential pressures
► EB005.022	Mounting and operating instructions rotary plug valve in combination with a pneumatic rotary diaphragm actuator e.g., Type R, MD, MN, MZ
► EB005.035	Mounting and operating instructions rotary plug valve in combination with a pneumatic rotary piston actuator e.g., Type AT (SC/SO) und BR31a
► EB005.069	Markings on the device
► EB005.045	Storage of VETEC products
► EB005.057, 036	Transporting the valve (depending on the valve configuration)
► EB005.031, 032	Support or suspension of the valve in the pipeline (depending on the valve configuration)
► WA 236	SAMSON brochure "Functional Safety for Control Valves, Rotary Plug Valves, Ball Valves and Butterfly Valves " (www.samsongroup.com)

Note

In addition to the valve documentation, observe the technical documentation for the actuator and valve accessories.

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1. Field of application

1.1. General

The rotary plug valve type 82.7 in combination with an actuator, e.g., the pneumatic rotary actuator type MD, MN, MZ, R or Type AT (SC/SO) and BR31a is designed to regulate the flow rate of liquid, gaseous, solid-containing, or vaporous media.
The valve and its actuators are designed for precisely defined conditions (such as operating pressure, medium used, temperature, etc.). Therefore, the operator must ensure that the control valve is only used where the operating conditions meet the design criteria.

The control valve is not suitable for the following applications:

→ Use outside the limits defined during sizing and by the technical data.
→ Use outside the limits defined by the valve accessories connected to the valve

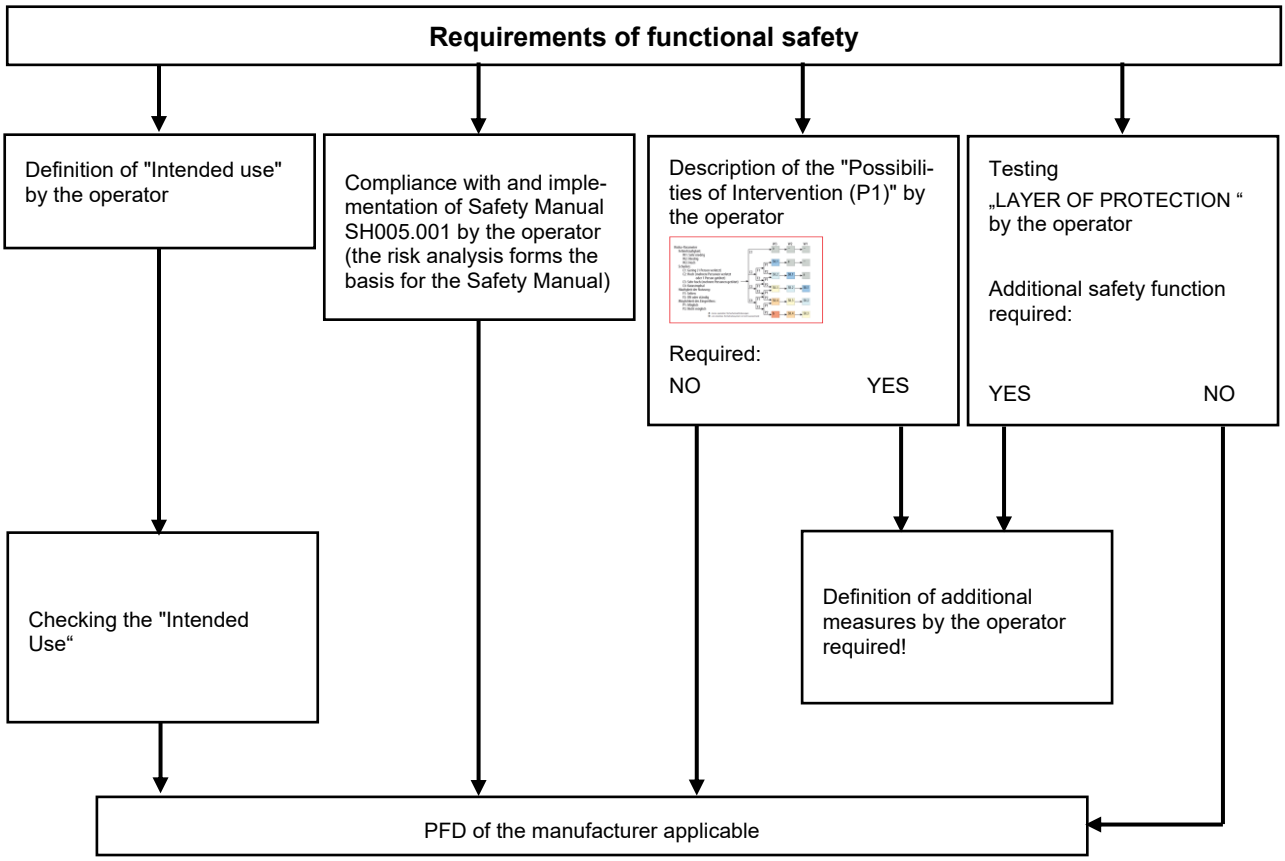
The following activities do not comply with the intended use:

→ Use of non-original spare parts
→ Performing service and repair work not described

1.2. Use in safety-instrumented systems

The valve can be used in safety-instrumented systems according to IEC 61508 and IEC 61511. The valve can be used in safety-instrumented systems up to SIL 2 (single device) and SIL 3 (redundant configuration) on observing the requirements of IEC 61508.

The safety-instrumented function of the valve is to be regarded as a Type A element in accordance with IEC 61508-2.



Note

The architecture and the interval between proof tests must be considered in order to achieve the safety integrity level.

Tip

The diagnostic coverage can be increased and, as a result, the probability of failure on demand reduced by mounting a positioner with diagnostic capabilities on the control valve.

1.3. Versions

The control valve (valve, actuator, peripheral devices, etc.) is selected and designed according to the intended use and the technical specification. Applicable regulations and standards are part of the technical specification. The constructive design of the valves is based on technical, chemical, physical and mechanical properties of the application.
The choice of materials and peripheral equipment depends on the intended use and the design specification of the control valve.

Changes, conversions and other modifications to the product are not authorised by SAMSON VETEC. They are carried out exclusively at the user's own risk and may, among other things, lead to safety risks and to the product no longer meeting the requirements necessary for its use.

Valves combined with actuators with **travel stop and/or handwheel are not suitable** for use in safety-instrumented systems.

1.4. Mounting

➔ The valve and actuator are normally delivered already assembled by SAMSON VETEC.
➔ If the actuator is not mounted, it must be mounted in the specified position on the valve. In case of deviation from this mounting method, consult SAMSON VETEC.

2. Technical Data

Standard designs

Fig. 2.1: *Valve Type 82.7*

Series 82 valves close counterclockwise and have an opening angle of 75°.

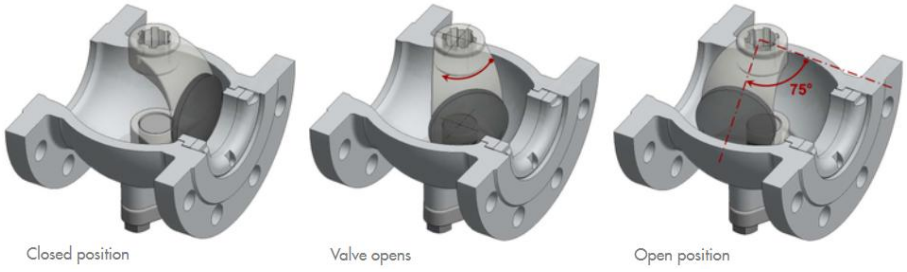


Fig. 2.2: *Swivel direction (rotation) of the plug*

Design changes (new generation)

Standard design 82.7

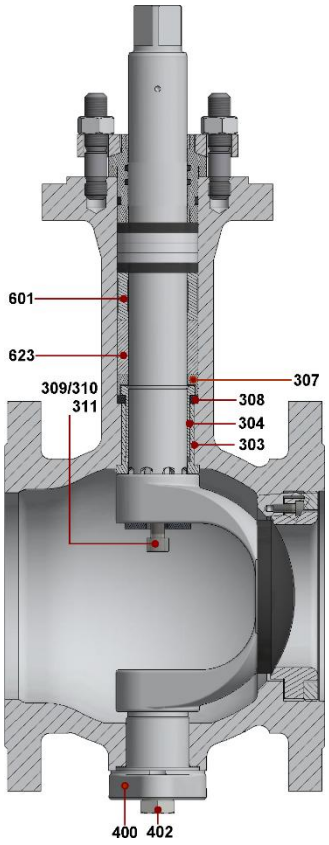


Fig. 3: *82.7, DN 150*

- → Blow-out protection of the shaft by **screw** (309, 310, 311)
- → Internal parts (303, 304, 307, 308, 601, 623)
- → Trunnion bearing with 2 screws (400, 402)

Extended construction 82.7-02

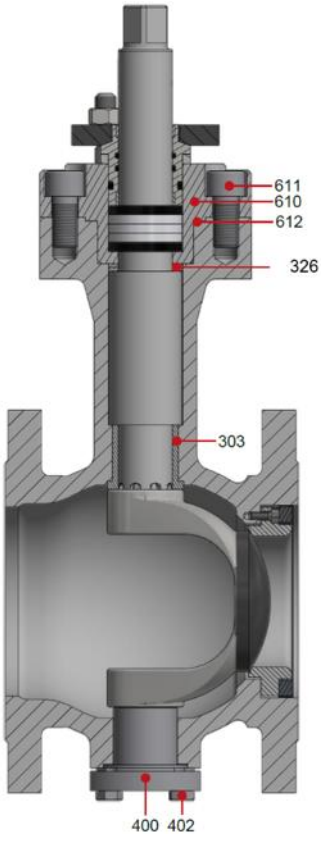


Fig. 5: *82.7-02, DN 150*

- → Blow-out protection of the shaft using a **packing bush** (610)
- → Internal parts (303, 326)
- → Trunnion bearing with 4 screws (400, 402)

Further designs

Valve with insulating section

Fig. 2.6: *Insulating section Type **IT1***

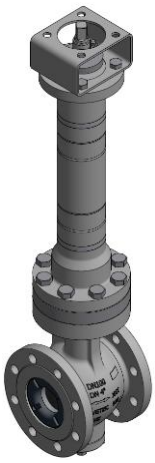


Fig. 2.7: *Insulating section Type **IT2***

Valve with double stuffing box

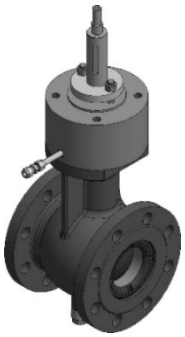


Fig. 2.8: D*ouble stuffing box **DSB***

Valve with heating jacket

Fig. 2.9: H*eating jacket **HM***

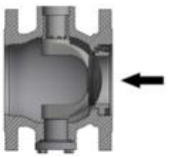
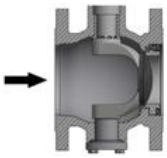
Valve with protective sleeve

Fig. 2.10: P*rotective sleeve **PB***

Info

The images shown in these instructions are for illustration purposes only.

Table 1.1: Technical data for Type 82.7-xx · DIN version

Design parameters			
Size		DN 25 · 40 · 50 · 80 · 100 · 150 · 200 · 250 · 300 · 350 (Type 82.7-02)	
Pressure rating		PN 10 · 16 · 25 · 40	
Max. operating pressure		acc. to pressure-temperature diagram	
Max. permissible differential pressures		acc. to TY005.069	
Face-to-face dimensions		DIN EN 558, R 36	
Type of end connection	Flange	acc. to DIN EN 1092-1	
Seat/plug seal		metal seal · soft seal	
Seat factors		F1 (100%) · F0,6 (60%) · F0,4 (40%) · F0,25 (25%)	
Characteristic		natural (inherent) · equal percentage · linear · ON/OFF	
Rangeability		up to 200:1	
Opening (rotation) angle		75°	
Plug movement (direction of rotation)		closes counterclockwise	
Conformity		CE · EAC	
Flow direction		 Flow to open (FTO)	 Flow to close (FTC)
Temperature range in °C [1]			
Body	without insulating section	-40… +350	
	with insulating section (IT1)	-100…-40 / 350… 500	
	with insulating section (IT2)	-196… -100	
Leakage rate according to DIN EN 60534-4			
Seat	Metal seal	IV	
	Soft seal	VI	

[1] The valve design may vary depending on the sealing elements installed (e.g., packing, O-rings) and operating parameters. The specified temperature values are only to be understood as guide values. The design of the valve is checked in each individual case.

Table 1.2: DIN · Standard materials

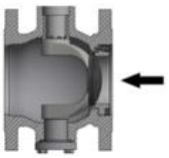
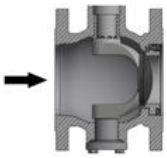
Item	**Materials and temperature ranges**		
Body	Cast steel 1.0619 -10… +400 °C	Stainless cast steel 1.4408 -196… +500 °C	
Plug	R30006 (Stellite® 6) -10… +400 °C	1.4408 (stellited) -196… +500 °C	
Shaft	1.4542 (17-4PH®) -29… +315 °C	1.4404 -196… +400 °C	1.4980 -196… +500 °C
Trunnion bearing	1.4404 (stellited/ hardened)	1.4408 (stellited) (stellited/ hardened)	
Seat	1.4404 (stellited/ hardened)	1.4408 (stellited/ hardened)	
Retaining ring	1.4404	1.4408	
Packing bushing (Version 82.7-01/02)	1.4404		
Packing	PTFE/Graphite -29… +280 °C	Graphite -196… +500 °C	
Gasket	VA/Graphite		
O-ring	FPM 80		

Other materials on request

Note

Technical data for further versions (e.g., DVGW, GAR, EN 161) can be found in the corresponding data sheets, see section "Further documentation".

Table 2.1: Technical data for Type 82.7-xx · ANSI version

Design parameters			
Size		NPS 1 · 1½ · 2 · 3 · 4 · 6 · 8 · 10 · 12 · 14 (Type 82.7-02)	
Pressure rating		CL 150 · 300	
Max. operating pressure		acc. to pressure-temperature diagram	
Max. permissible differential pressures		acc. to TY005.069	
Face-to-face dimensions		ISA 75.08.02	
Type of end connection	Flange	acc. to ANSI/ASME B16.5	
Seat/plug seal		metal seal · Soft seal	
Seat factors		F1 (100%) · F0,6 (60%) · F0,4 (40%) · F0,25 (25%)	
Characteristic		Natural (inherent) · equal percentage · linear · ON/OFF	
Rangeability		Up to 200:1	
Opening (rotation) angle		75°	
Plug movement (direction of rotation)		closes counterclockwise	
Conformity		CE · EAC	
Flow direction		 Flow to open (FTO)	 Flow to close (FTC)
T Temperature range in °C [2]			
Body	without insulating section	-40… +350 (-40… +662 °F)	
	with insulating section (IT1)	-100…-40 / 350… 500 (-148…-40 / 662… 932 °F)	
	with insulating section (IT2)	-196… -100 (-321… -148 °F)	
Leakage rate according to ANSI/FCI 70-2 (DIN EN 60354-4)			
Seat	Metal seal	IV	
	Soft seal	VI	

[2] The valve design may vary depending on the sealing elements installed (e.g., packing, O-rings) and operating parameters. The specified temperature values are only to be understood as guide values. The design of the valve is checked in each individual case.

Table 2.2: ANSI · Standard materials

Teil	Materials and temperature ranges		
Body	Cast steel A216 WCC -10… +400 °C	Stainless cast steel A351 CF8M -196… +500 °C	
Plug	R30006 (Stellite® 6) -10… +400 °C	A351 CF8M (stellited) -196… +500 °C	
Shaft	AISI 630 -29… +315 °C	316L -196… +400 °C	A638 (660) -196… +500 °C
Trunnion bearing	316L (stellited/hardened)	A351 CF8M (stellited/hardened)	
Seat	316L (stellited/hardened)	A351 CF8M (stellited/hardened)	
Retaining ring	316L	A351 CF8M	
Packing bushing (Version 82.7-01/02)	1.4404		
Packing	PTFE/Graphite -29… +280 °C	Graphite -196… +500 °C	
Gasket	VA/Graphite		
O-ring	FPM 80		

Other materials on request

Note

Technical data for further versions (e.g., DVGW, GAR, EN 161) can be found in the corresponding data sheets, see section "Further documentation".

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3. Safety-related functions

3.1. Safety-related fail-safe action

The valve, in combination with a pneumatic actuator, controls the process medium flowing through it. When the signal pressure acting on the actuator is changed, the springs in the actuator move the actuator stem to close or open the valve. The fail-safe action is triggered when no signal pressure is applied to the actuator.

3.2. Fail-safe action

The signal pressure is normally applied to the actuator. The actuator is vented upon demand as part of the safety-instrumented function. As soon as the actuator is vented (signal pressure = atmospheric pressure), the spring forces cause the actuator stem to move to the failsafe position. The valve is completely open or completely closed.
Depending on the actuator's direction of action (see the associated actuator documentation), the valve has one of the following fail-safe positions:

- Fail-safe action „**Spring force closes FC**“: In the event of emergency, the springs move the actuator stem and close the valve. The valve opens when the signal pressure increases against the force of the springs.
- Fail-safe action „**Spring force opens FO**“: In the event of emergency, the springs move the actuator stem and open the valve. The valve closes when the signal pressure increases against the force of the springs.

Example: Fail-safe positions illustrated with a control valve with pneumatic actuator Type R *

Monting position of the actuator**: A**

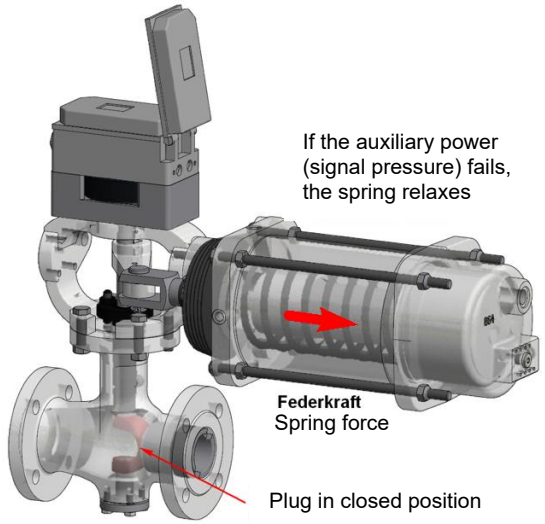


Fig. 3.1: *Mounting position A · Spring force closes*

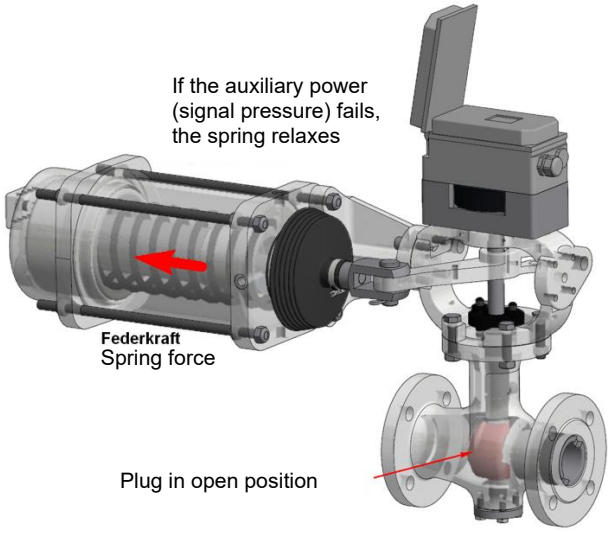


Fig. 3.2: *Mounting position A · Spring force opens*

** The images shown in these instructions are for illustration purposes only.*

3.3. Protection against unauthorized changes to the configuration

The valve's fail-safe position depends on the mounted actuator's direction of action. The actuator's direction of action can be reversed. However, this is not possible while the process is running.

4. Installation and start-up

The valve is delivered ready to install and can be installed into the pipeline without the need for any additional installation work. Refer to the valve documentation on how to install and start-up the valve.

SAMSON VETEC recommends:

➔ To install the valve in a horizontal pipeline with the actuator facing upwards: e.g. Type R-actuator with horizontal piston rod (parallel to the pipeline), see fig.4.1; Type M-actuators with vertical piston rod (perpendicular to the pipeline), see fig. 4.2 and 4.3. If another mounting position is used that is less favourable, the plant operator must ensure that the functional safety is not impaired as a result. See data sheet ►TY005.071.

➔ Install the control valve in accordance with the specification. If the installation position differs from that specified, consult SAMSON VETEC. Tilting or tipping over of the valve must be prevented.

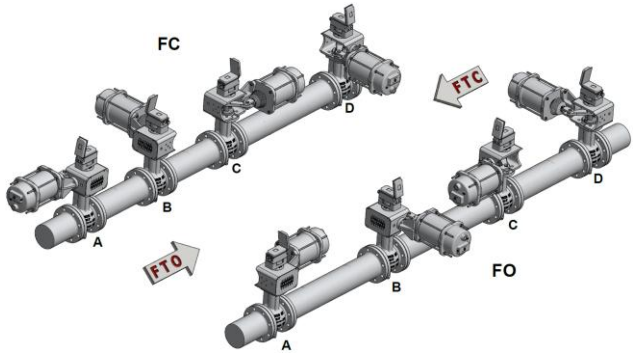


Fig. 4.1: *Installation positions in horizontal pipeline / Valve with Type R Actuator*

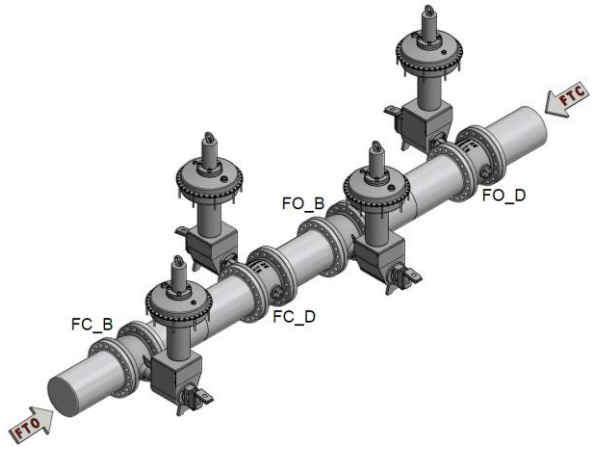


Fig. 4.2: *Installation positions in horizontal pipeline / Valve with Type MD, MZ Actuator*

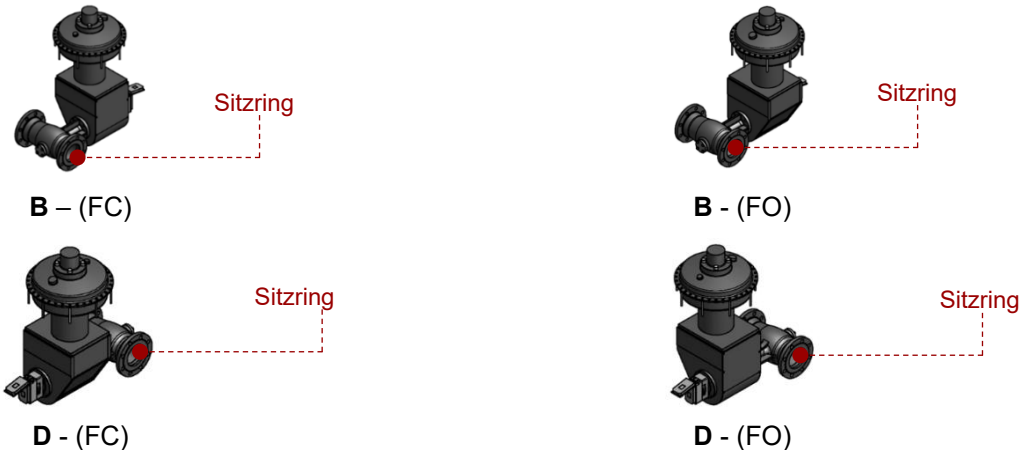


Fig. 4.3: *Permissible installation positions in horizontal pipeline / Valve with Type MN Actuator, attachment types (B and D)*

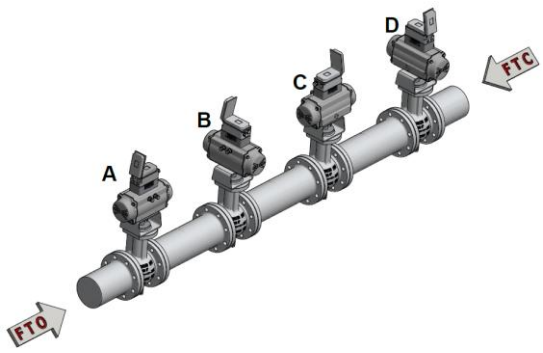
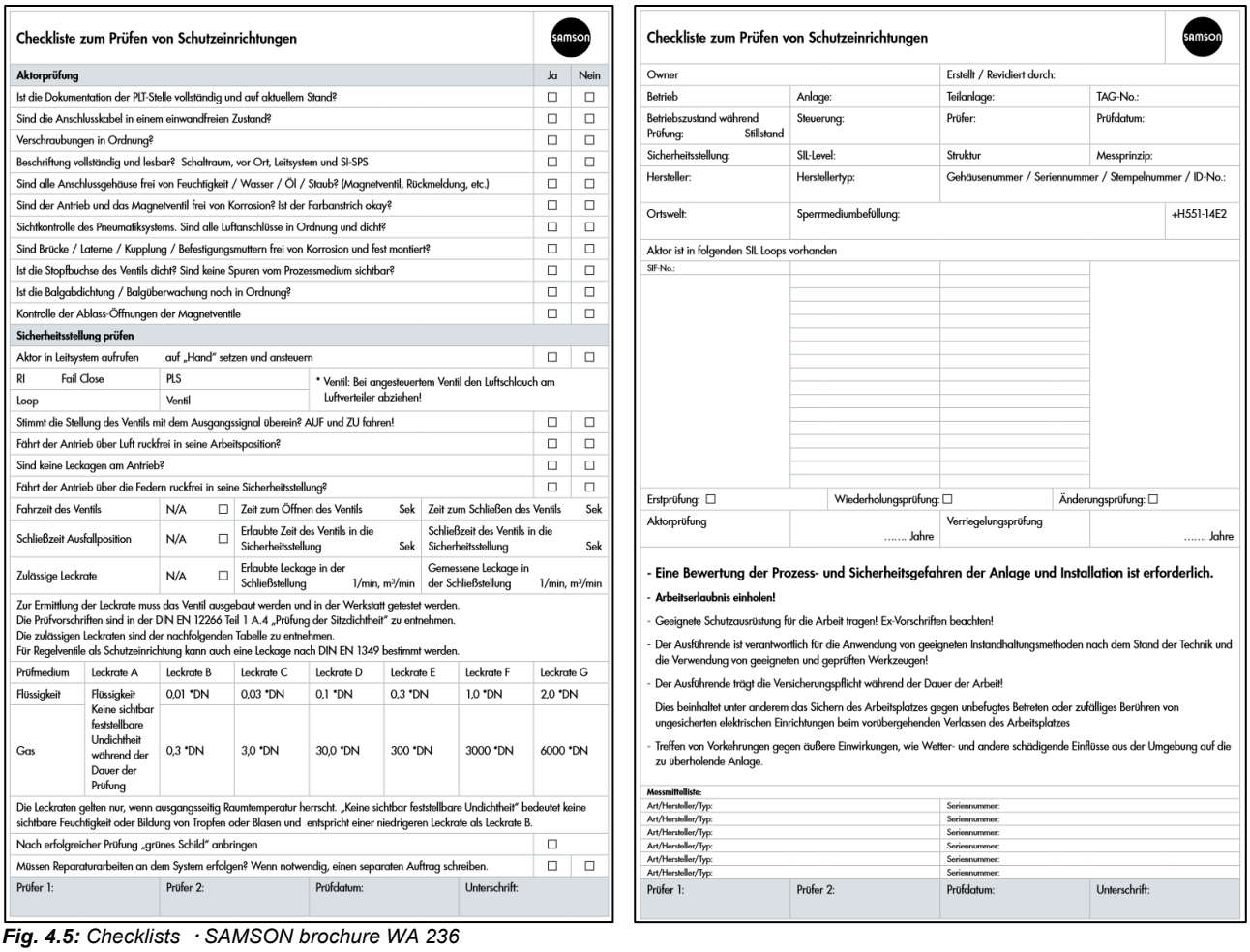


Fig. 4.4: *Installation positions in horizontal pipeline / Valve with Type AT (SC/SO) and BR31a Actuator*

Tip

VETEC recommend checking the installation and start-up using a checklist. Examples of such checklists are included in VDI 2180-5 and the SAMSON brochure WA 236 (Functional safety of globe valves, rotary plug valves, ball valves and butterfly valves).

Examples of checklists · SAMSON brochure WA 236



Checkliste zum Prüfen von Schutzeinrichtungen

Aktorprüfung	Ja	Nein
Ist die Dokumentation der PLT-Stelle vollständig und auf aktuellem Stand?	☐	☐
Sind die Anschlusskabel in einem einwandfreien Zustand?	☐	☐
Verschraubungen in Ordnung?	☐	☐
Beschriftung vollständig und lesbar? Schaltraum, vor Ort, Leitsystem und SI-SPS	☐	☐
Sind alle Anschlussgehäuse frei von Feuchtigkeit / Wasser / Öl / Staub? (Magnetventil, Rückmeldung, etc.)	☐	☐
Sind der Antrieb und das Magnetventil frei von Korrosion? Ist der Farbanstrich okay?	☐	☐
Sichtkontrolle des Pneumatiksystems. Sind alle Luftanschlüsse in Ordnung und dicht?	☐	☐
Sind Brücke / Laterne / Kupplung / Befestigungsmuttern frei von Korrosion und fest montiert?	☐	☐
Ist die Stopfbuchse des Ventils dicht? Sind keine Spuren vom Prozessmedium sichtbar?	☐	☐
Ist die Balgabdichtung / Balgüberwachung noch in Ordnung?	☐	☐
Kontrolle der Ablass-Öffnungen der Magnetventile	☐	☐
Sicherheitsstellung prüfen		
Aktor in Leitsystem aufrufen — auf „Hand" setzen und ansteuern	☐	☐
RI Fail Close / Loop — PLS / Ventil — * Ventil: Bei angesteuertem Ventil den Luftschlauch am Luftverteiler abziehen!		
Stimmt die Stellung des Ventils mit dem Ausgangssignal überein? AUF und ZU fahren!	☐	☐
Fährt der Antrieb über Luft ruckfrei in seine Arbeitsposition?	☐	☐
Sind keine Leckagen am Antrieb?	☐	☐
Fahrt der Antrieb über die Federn ruckfrei in seine Sicherheitsstellung?	☐	☐

Fahrzeit des Ventils	N/A ☐	Zeit zum Öffnen des Ventils Sek	Zeit zum Schließen des Ventils Sek
Schließzeit Ausfallposition	N/A ☐	Erlaubte Zeit des Ventils in die Sicherheitsstellung Sek	Schließzeit des Ventils in die Sicherheitsstellung Sek
Zulässige Leckrate	N/A ☐	Erlaubte Leckage in der Schließstellung 1/min, m³/min	Gemessene Leckage in der Schließstellung 1/min, m³/min

Zur Ermittlung der Leckrate muss das Ventil ausgebaut werden und in der Werkstatt getestet werden.
Die Prüfvorschriften sind in der DIN EN 12266 Teil 1 A.4 „Prüfung der Sitzdichtheit" zu entnehmen.
Die zulässigen Leckraten sind der nachfolgenden Tabelle zu entnehmen.
Für Regelventile als Schutzeinrichtung kann auch eine Leckage nach DIN EN 1349 bestimmt werden.

Prüfmedium	Leckrate A	Leckrate B	Leckrate C	Leckrate D	Leckrate E	Leckrate F	Leckrate G
Flüssigkeit	Flüssigkeit	0,01 *DN	0,03 *DN	0,1 *DN	0,3 *DN	1,0 *DN	2,0 *DN
Gas	Keine sichtbar feststellbare Undichtheit während der Dauer der Prüfung	0,3 *DN	3,0 *DN	30,0 *DN	300 *DN	3000 *DN	6000 *DN

Die Leckraten gelten nur, wenn ausgangsseitig Raumtemperatur herrscht. „Keine sichtbar feststellbare Undichtheit" bedeutet keine sichtbare Feuchtigkeit oder Bildung von Tropfen oder Blasen und entspricht einer niedrigeren Leckrate als Leckrate B.

Nach erfolgreicher Prüfung „grünes Schild" anbringen			☐
Müssen Reparaturarbeiten an dem System erfolgen? Wenn notwendig, einen separaten Auftrag schreiben.			☐ ☐
Prüfer 1:	Prüfer 2:	Prüfdatum:	Unterschrift:

Checkliste zum Prüfen von Schutzeinrichtungen

Owner		Erstellt / Revidiert durch:	
Betrieb	Anlage:	Teilanlage:	TAG-No.:
Betriebszustand während Prüfung: Stillstand	Steuerung:	Prüfer:	Prüfdatum:
Sicherheitsstellung:	SIL-Level:	Struktur	Messprinzip:
Hersteller:	Herstellertyp:	Gehäusenummer / Seriennummer / Stempelnummer / ID-No.:	
Ortswelt:	Sperrmediumbefüllung:		+H551-14E2

Aktor ist in folgenden SIL Loops vorhanden

SIF-No.:			

Erstprüfung: ☐	Wiederholungsprüfung: ☐		Änderungsprüfung: ☐
Aktorprüfung	..... Jahre	Verriegelungsprüfung	..... Jahre

- Eine Bewertung der Prozess- und Sicherheitsgefahren der Anlage und Installation ist erforderlich.

- **Arbeitserlaubnis einholen!**
- Geeignete Schutzausrüstung für die Arbeit tragen! Ex-Vorschriften beachten!
- Der Ausführende ist verantwortlich für die Anwendung von geeigneten Instandhaltungsmethoden nach dem Stand der Technik und die Verwendung von geeigneten und geprüften Werkzeugen!
- Der Ausführende trägt die Versicherungspflicht während der Dauer der Arbeit!

  Dies beinhaltet unter anderem das Sichern des Arbeitsplatzes gegen unbefugtes Betreten oder zufälliges Berühren von ungesicherten elektrischen Einrichtungen beim vorübergehenden Verlassen des Arbeitsplatzes
- Treffen von Vorkehrungen gegen äußere Einwirkungen, wie Wetter- und andere schädigende Einflüsse aus der Umgebung auf die zu überholende Anlage.

Messmittelliste:	
Art/Hersteller/Typ:	Seriennummer:
Art/Hersteller/Typ:	Seriennummer:
Art/Hersteller/Typ:	Seriennummer:
Art/Hersteller/Typ:	Seriennummer:
Art/Hersteller/Typ:	Seriennummer:
Art/Hersteller/Typ:	Seriennummer:

Prüfer 1:	Prüfer 2:	Prüfdatum:	Unterschrift:

Fig. 4.5: *Checklists · SAMSON brochure WA 236*

5. Required conditions

⚠ WARNING

Risk of malfunction due to incorrect selection or wrong installation and operating conditions!
➔ *Only use valves in safety-instrumented systems if the necessary conditions in the plant are fulfilled.*

Tip

VETEC recommend checking the installation and start-up using a checklist. Examples of such checklists are included in VDI 2180-5 and the SAMSON brochure WA 236 (Functional safety of globe valves, rotary plug valves, ball valves and butterfly valves).

5.1. Selection

➔ The suitability of the entire control valve assembly (valve, actuator, valve accessories) for the intended use (pressure, temperature) has been checked.
➔ The valve materials are suitable for the process medium.
➔ The actuator is correctly sized based on the required transit time and thrust.

5.2. Mechanical and pneumatic installation

➔ The valve is installed properly into the pipeline as described in the mounting and operating instructions and the actuator is mounted on it. Valve accessories are mounted correctly.
➔ The prescribed direction of flow is observed. The arrow on the valve indicates the direction of flow.
➔ The control valve is configured with the correct fail-safe position (FC or FO).
➔ Specified inlet and outlet lengths are complied with (see installation and operating instructions of the control valve).
➔ Tightening torques (e.g., for flange connections) are observed.
➔ If necessary, install supports (valve/actuator) free of vibration and stress. Observe specified support points.
➔ A strainer must be installed when the process medium contains solids, which could block the valve.
➔ Auxiliary power and signals are as specified.

5.3. Operation

➔ The valve is only used in operating conditions that meet the specifications used for sizing at the ordering stage.
➔ The plug/shaft is not blocked
➔ The medium flow through the valve is not blocked.

5.4. Maintenance

➔ Maintenance is only performed by fully trained, qualified operating personnel.
➔ Only original VETEC parts are used as spare parts.
➔ Service work is performed as described in the ‘Servicing’ section of the associated valve documentation.

Tip

Contact SAMSON VETEC After-sales Service concerning any work not described in the 'Servicing' section in the associated valve documentation: sales-vetec-de@samsongroup.com, Tel. +49 6232 6412 0

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6. Proof testing (periodic testing)

Regular proof testing to verify functional safety is necessary.
The proof test interval and the extent of testing lie within the operator's responsibility. The operator must draw up a test plan, in which the proof tests and the interval between them are specified. We recommend summarizing the requirements of the proof test in a checklist.

⚠ DANGER

Risk of dangerous failure due to malfunction in the event of emergency (valve does not move to the fail-safe position)!
➔ *Only use devices in safety-instrumented systems that have passed the proof test according to the test plan drawn up by the operator!*

⚠ DANGER

Risk of dangerous failure due to malfunction of the control valve in the event of prolonged non-operation!
➔ *Check the function and fail-safe action of the valve at regular intervals.*

To test the safety-instrumented function properly, the following requirements must be met:
− Valve and actuator are assembled properly.
− The control valve is installed properly into the plant.

Regularly check the safety-instrumented function of the entire SIS loop. The test interval determines the probability of failure (PFD) and the suitability for a specific safety-related application.

Tip

SAMSON VETEC recommend checking the installation and start-up using a checklist. Examples of such checklists are included in VDI 2180-5 and the SAMSON brochure WA 236 (Functional safety of globe valves, rotary plug valves, ball valves and butterfly valves).

6.1. Visual inspection to avoid systematic failure

To avoid systematic failure, inspect the valve regularly. The frequency and the scope of the inspection lie within the operator's responsibility. Take application-specific influences into account, such as:

− Blockage of plug/shaft
− Corrosion (destruction primarily of metals due to chemical and physical processes)
− Material fatigue
− Wear induced by the process medium
− Abrasion (material removed by solids contained in the process medium)
− Medium deposits
− Aging (damage caused to organic materials, e.g., plastics or elastomers, by exposure to light and heat)
− Chemical attack (organic materials, e.g., plastics or elastomer, which swell, leach out or decompose due to exposure to chemicals)

NOTICE

Risk of malfunction due to the use of unauthorized parts!
➔ *Only use SAMSON VETEC original parts to replace worn parts.*

6.2. Function testing

Regularly check the safety-instrumented function according to the test plan drawn up by the operator.

DANGER

Risk of dangerous failure due to malfunction of the control valve in the event of prolonged non-operation!

➔ *Check the function and fail-safe action of the valve at regular intervals.*

Tip

We recommend the use of SAMSON positioner with integrated diagnostic firmware for valves used for on/off ser-vice. The partial stroke test included in this software helps prevent a shut-off valve normally in its end position from seizing up or getting jammed.

Safety-related fail-safe action

1. Supply the actuator with the signal pressure to allow the valve to move to the end position (completely open or closed).
2. Disconnect the signal pressure. This must cause the valve to move to its fail-safe position.
3. Check whether the valve reaches the end position within the required time.
4. Check whether the maximum permissible leakage is observed.

Safety-instrumented function of valve accessories

Check the safety-instrumented function of valve accessories. Refer to the associated safety manuals.

7. Repairs

Only perform the work on the valve described in the valve documentation.

NOTICE

Safety-instrumented function will be impaired if repair work is performed incorrectly!

➔ *Only allow qualified personnel trained by VETEC to perform service and repair work.*

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8. Safety-related data and certificates

Useful lifetime

A useful lifetime of approximately fifteen years can be assumed. Other values can be used based on the user's previous experience (proven in use).

Intended use

– See the mounting and operating instructions for the valve.

– Requirements regarding instrument air quality, see the installation and operating instructions or user manual for fitted accessories (e.g. positioner, solenoid valve).

Safety-related assumptions

In the event of failure, the actuator is vented, causing the valve to move to its fail-safe position.

Note

Partial function testing, especially partial stroke testing, can help reduce the dangerous undetected failure rate. On request, SAMSON provides details on proof test coverage (PTC) or revised safety-related data based on a partial stroke test. Such partial stroke testing can be performed by using a positioner. Smart positioners can perform extensive diagnostics while the process is running. Depending on the application, a diagnostic coverage factor for dangerous failures of ≥70 % can be achieved.

Requirements

– Short mean time to repair compared to the average rate of demand.
– Normal exposure to industrial environment and fluids.
– The user is responsible for ensuring that the device is used as intended.

Safety-related data

The safety-related data are listed in the following declaration of the manufacturer.

HERSTELLERERKLÄRUNG
MANUFACTURER DECLARATION

FB002.012

Herstellererklärung zur Betriebsbewährung nach IEC 61508/61511

Der Hersteller
VETEC Ventiltechnik GmbH
Siemensstraße 12
67346 Speyer

bestätigt, dass folgende Produkte:

Stellventile Typ 62, 72, 73, 82

und die dazugehörigen pneumatischen Antriebe von VETEC oder AIR TORQUE, dass die Geräte der o.g. Baureihen für die Verwendung in sicherheitsgerichteten Systemen nach IEC 61508 und IEC 61511 einsetzbar sind. Die Geräte sind geeignet für den Einsatz in sicherheitsgerichteten Anwendungen bis SIL 2 (einzelnes Gerät) und SIL 3 (redundante Verschaltung) gemäß IEC 61508.
Der Nachweis erfolgte auf Basis der Betriebsbewährtheit (proven in use).

Sicherheitstechnische Kenndaten

$\lambda_{safe\ undetected}$	$6{,}7 * 10^{-7}$ 1/hr
$\lambda_{safe\ detected}$	0
$\lambda_{dangerous\ undetected}$	$1{,}7 * 10^{-7}$ 1/hr
$\lambda_{dangerous\ detected}$	0
PFD_{avg} bei jährlicher Prüfung	$7{,}4 * 10^{-4}$
HFT (Hardware Fault Tolerance)	0
Gerätetyp	A

Nutzbare Lebensdauer
Nach IEC 61508-2 Abschnitt 7.4.9.5 können acht bis zwölf Jahre angenommen werden oder ein Wert benutzt werden, der sich durch Betriebsbewährung des Anwenders ergibt.

Daraus ergeben sich:

SFF (Safe Failure Fraction)	80 %
$MTBF_{gesamt}$	136 Jahre
$MTBF_{dangerous}$	671 Jahre
DC (Diagnostic coverage)	0

Bestimmungsgemäße Verwendung ist zu beachten
- Bedienungsanleitung
- Anforderung an Instrumentenluftqualität (Sicherheitshandbuch, soweit vorhanden)

Sicherheitstechnische Annahme
Im Störfall wird der Antrieb entlüftet, dadurch fährt das Ventil in die Sicherheitslage.

Hinweis
Durch den Einsatz eines Stellungsreglers kann eine umfangreiche Diagnose auch im laufenden Betrieb durchgeführt werden. Damit kann sich je nach Einsatzfall ein Diagnosegrad (diagnostic coverage factor) für gefährliche Fehler von größer 70 % ergeben.

Voraussetzungen
Die Reparaturzeit ist klein gegenüber der mittleren Anforderungsrate . Durchschnittliche Beanspruchung in industrielle Umgebung durch Medien und Umgebungsbedingungen. Der Anwender ist für bestimmungsgemäßen Gebrauch verantwortlich.

Manufacturer's Declaration for proven-in-use according to IEC 61508/61511

The Manufacturer
VETEC Ventiltechnik GmbH
Siemensstrasse 12
67346 Speyer · Germany

confirmed that the following products:

Control valves Type 62, 72, 73, 82

with the corresponding pneumatic actuators, made from VETEC or AIR TORQUE, are suitable for use in safety instrument systems according to IEC 61508 and IEC 61511. The devices are suitable for use in safety-related applications up to SIL 2 (single device) and SIL 3 (redundant configuration) according to IEC 61508.

The evidence is based on proven in use.

Safety related characteristics

$\lambda_{safe\ undetected}$	$6{,}7 * 10^{-7}$ 1/hr
$\lambda_{safe\ detected}$	0
$\lambda_{dangerous\ undetected}$	$1{,}7 * 10^{-7}$ 1/hr
$\lambda_{dangerous\ detected}$	0
PFD_{avg} with annual tests	$7{,}4 * 10^{-4}$
HFT (Hardware Fault Tolerance)	0
Device type	A

Usable lifetime
According to IEC 61508-2 section 7.4.9.5 a useable lifetime of eight to twelve years can be assumed. Other values can be used based on the user's experience.

This results in:

SFF (Safe Failure Fraction)	80 %
$MTBF_{total}$	136 Jahre
$MTBF_{dangerous}$	671 Jahre
DC (Diagnostic coverage)	0

Intended use must be observed
- Operating instructions
- Requirements for instrument air quality (see safety manual, if available)

Safety related assumption
In case of failure, the pneumatic actuator is vented, causing the valve to move to its fail-safe position.

Note
By using digital valve positioners, the user has access to extensive diagnostic functions also while the process is running. As a result, the diagnostic coverage factor for dangerous failures can exceed 70 % depending on the application.

Preconditions
The mean time to repair is short to the average rate of demand. Normal exposure to industrial environment and fluids.
The user is responsible for ensuring that the device is used as intended.

Speyer, 20.05.2025

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