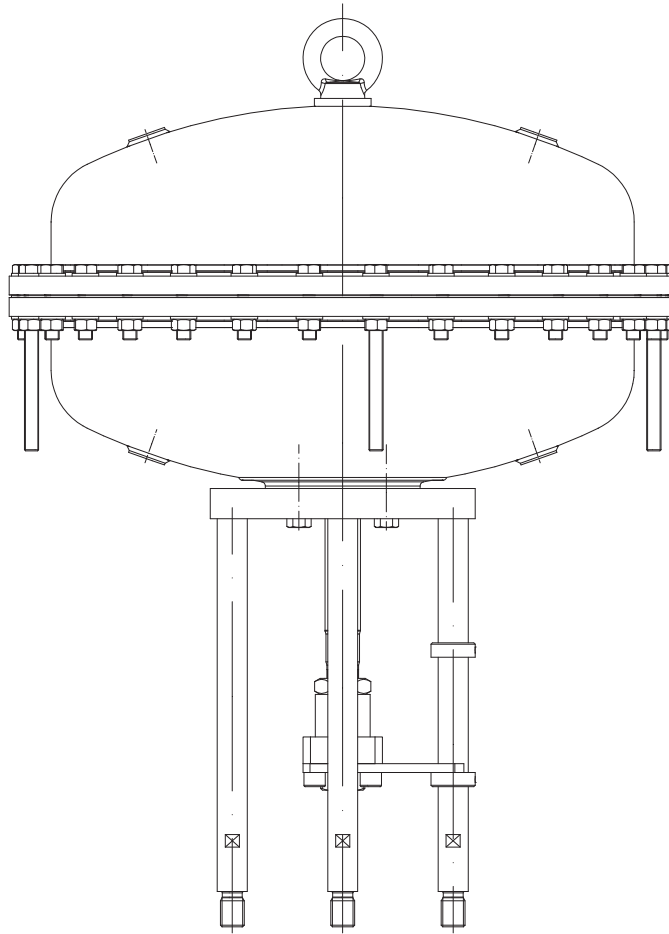


Operating and installation instructions

Pneumatic actuators - DP35



DP35

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1.0 General information on operating instructions

These operating instructions provide information on mounting and maintaining the actuators. Please contact the supplier or the manufacturer in case of problems which cannot be solved by reference to the operating instructions.

They are binding on the transport, storage, installation, start-up, operation, maintenance and repair.

The notes and warnings must be observed and adhered to.

- Handling and all work must be carried out by expert personnel or all activities must be supervised and checked.

It is the owner's responsibility to define areas of responsibility and competence and to monitor the personnel.

- In addition, current regional safety requirements must be applied and observed when taking the fittings out of service as well as when maintaining and repairing them.

The manufacturer reserves the right to introduce technical modifications at any time.

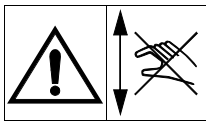
These Operating Instructions comply with the requirements of EU Directives.

2.0 Notes on possible dangers

2.1 Significance of symbols



Warning of general danger.



Exposed to injury!
Don't put your hand into the up or downwards moving appliance.


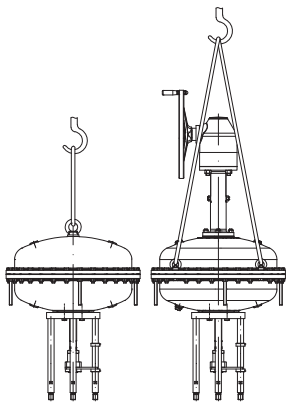
2.2 Explanatory notes on safety information

In these Operating and Installation Instructions dangers, risks and items of safety information are highlighted to attract special attention.

Information marked with the above symbol and "**ATTENTION!**" describe practices, a failure to comply with which can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasised such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.

3.0 Storage and transport


	<p>ATTENTION !</p> <ul style="list-style-type: none"> - Protect against external force (like impact, vibration, etc.). - Valve mountings such as actuators, handwheels, hoods must not be used to take external forces, e.g. they are not designed for use as climbing aids, or as connecting points for lifting gear. - Suitable materials handling and lifting equipment should be used. <p>Observe max. load-carrying capacity of the eye nuts: DP35 = 1800kg (Refer to catalog sheet for weights)</p>	
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- At -20°C to +65°C.
- Do not damage paint protection. (The actuators should rest in the packing till installation.)

4.0 Description

4.1 Scope of applications

The pneumatic actuators are to be mounted on the top of valves and are necessary to operate the valves (stem movement) under service conditions. The units are suitable for being employed in control systems used in the chemical industry.

	<p>ATTENTION !</p> <ul style="list-style-type: none"> - Refer to the data sheet for applications, limits on use and possibilities.
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Please contact the supplier or the manufacturer if you have any questions.

4.2 Operating principles

By means of the pneumatic actuator units, pneumatic control signals are converted into a translatory motion. The necessary restoring force is generated by means of the compression springs on the bulk of the diaphragm plate.

In case of air fall-off, the actuator will be restored by means of the spring force in the starting position.

By using a rolling diaphragm, linear rod forces during long lifts can be obtained.


The operating mode of the actuator is the following:

- „actuator stem extends by spring force“ (on air failure) or
- „actuator stem retracts by spring force“ (on air failure)

This operation is obtained and dependent on the assembly of the springs.

In open / close operation, the operating pressure should be restricted depending on the actuator's operating range. The permitted operating range with which the actuator's lift range can be travelled through is indicated on the name plate. The idea behind this is to extend the service life of the actuators, and it can also mean that a filter or pressure regulator must be used.

The pneumatic actuators with manual emergency adjustment can be operated without operating pressure by turning the handwheel.

	<p>ATTENTION !</p> <ul style="list-style-type: none"> - After engaging, the manual emergency adjustment has to be set in starting position to avoid the deadlock with usual operating.
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4.3 Diagram

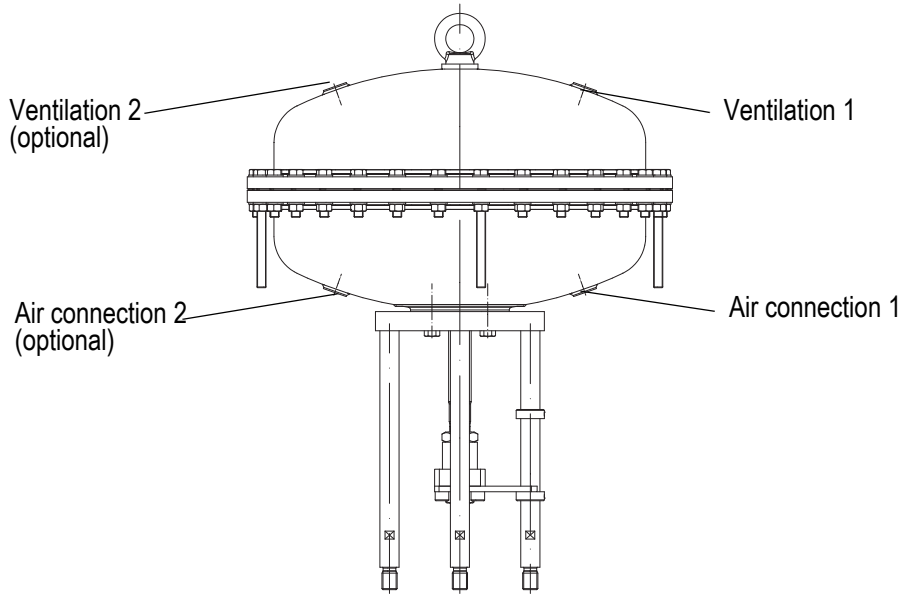


Fig. 1: DP35 „actuator stem extends by spring force“

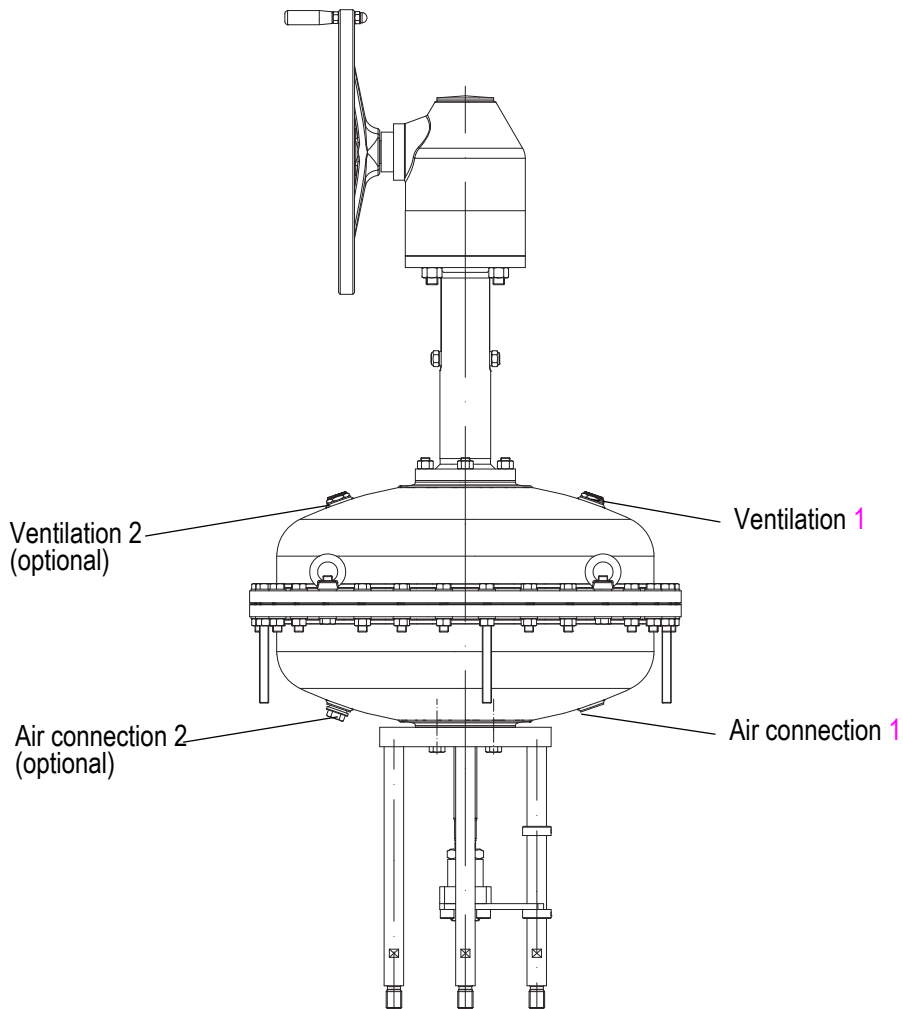


Fig. 2: DP35 with manual emergency adjustment „actuator stem extends by spring force“

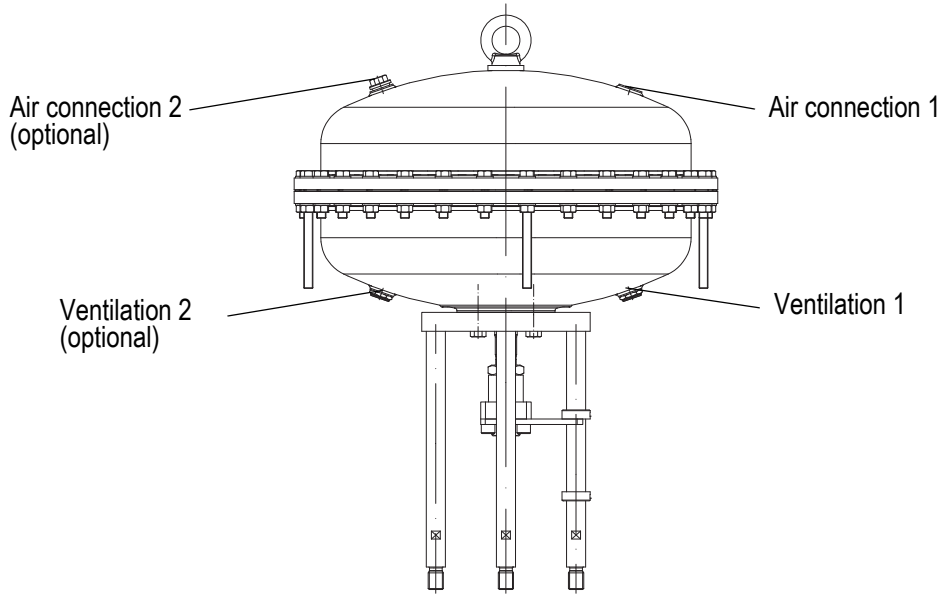


Fig. 3: DP35 „actuator stem retracts by spring force“

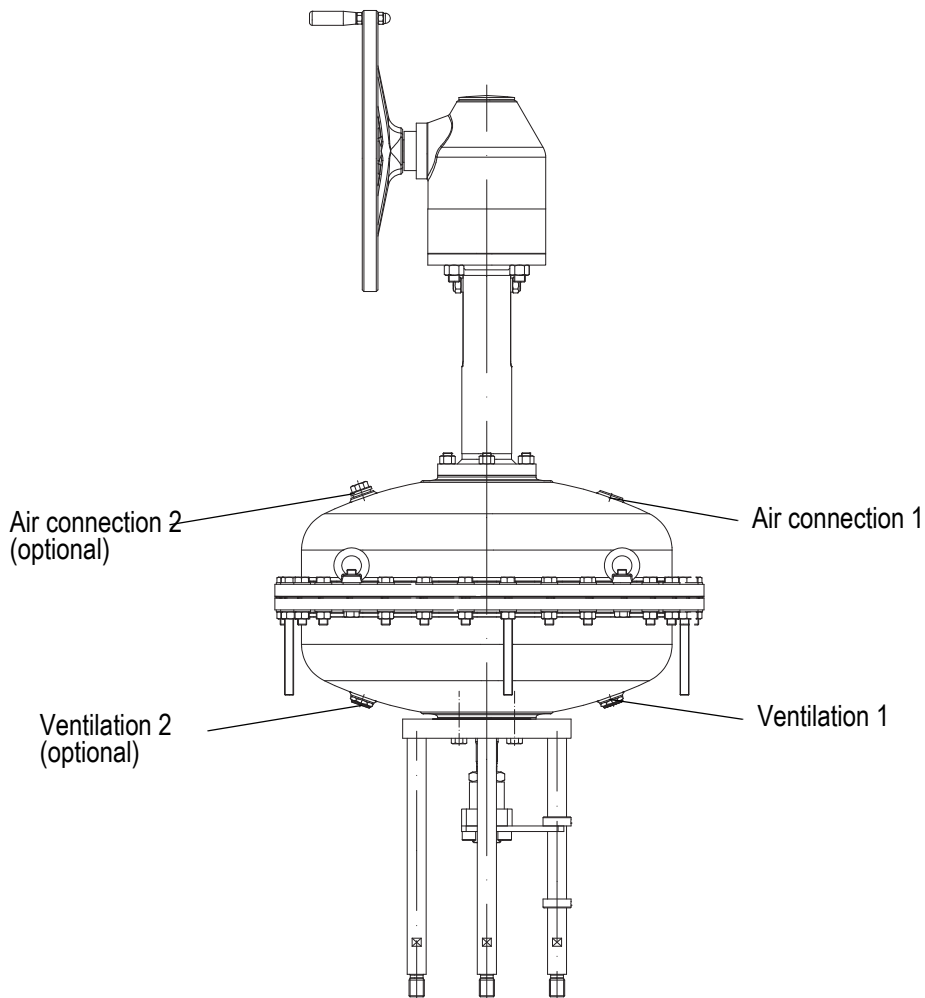


Fig. 4: DP35 with manual emergency adjustment „actuator stem retracts by spring force“

4.4 Technical data

Actuator type	Diaphragm area	Teile-Nr.00001		Spring range	Nominal lift	Number of springs	Filling-volume
	(cm ²)	Standard	with manual emergency adjustment	(bar)	(mm)	(Stück)	(Liter)
DP35	2800	9224000001	9244000001	2,97 - 3,80	50	12	33,7
				2,72 - 3,80	65	12	29,4
				2,30 - 3,80	90	12	22,3
				1,80 - 3,80	120	12	13,8
	2800	9224200002	9244200002	0,60 - 0,88	50	3	13,8
				0,60 - 0,96	65	3	13,8
				0,60 - 1,10	90	3	13,8
				0,60 - 1,27	120	3	13,8

max. operating pressure 6 bar

4.5 Marking

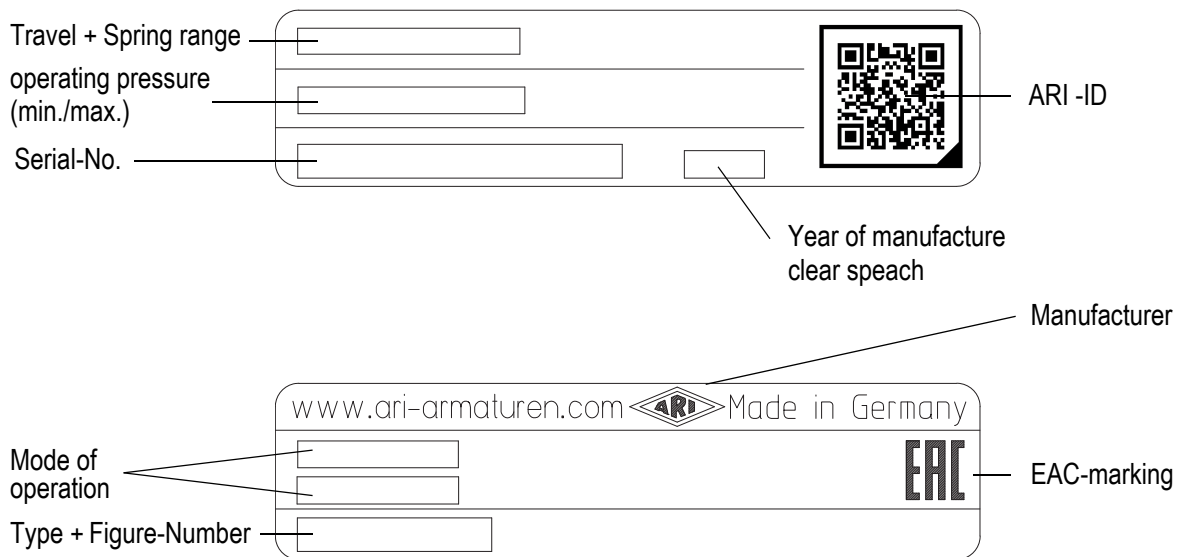


Fig. 5

- Address of manufacturer: refer to item 11.0 Warranty / Guarantee

5.0 Installation

5.1 General notes on installation

The following points should be taken into account besides the general principles governing installation work:



ATTENTION !

- *Observe the information provided in the operating manual of the applicable valve.*
- *Observe the information provided in the operating manuals of all components (for ex. position adjuster, filter reduction station, interlocking relay ...).*
- *Valve (all included) with traverse.*
- *Observe the applicable current driving power and the provided line length of the chosen line cross section.*
- *The actuator unit's technical data must be in agreement with the requirements for operation.*
- *The control air must be in accordance with the instructions given on the nameplates of the actuator unit.*
- *The air quality should be in accordance with DIN IEC 60654-2.*
- *The actuator unit must be provided in full, with distance columns and coupling parts, for the extension on the applicable valve.*
- *Personnel with knowledge of the rules and regulations is required for the construction of the compressed air system.*
- *Actuators have no internal stops. The stops must be ensured by means of the valve, for instance.*

5.2 Requirements at the place of installation

The place of installation should be easily accessible and provide ample space for maintenance and removing the actuator. The valve should preferably installed vertically with the actuator at the top. Inclined or horizontal installation without supports is permissible only with supporting of the actuator.



ATTENTION !

- *The permissible actuator weight may not be exceeded. For that, the corresponding operating instructions of the valve have to be observed.*

- The actuator can be employed within a temperature range with the max. of -10 °C up to 80 °C (optional: - 40 °C up to + 80 °C). By minus temperatures, attention must be given that the control air is dry, and by high temperatures, if possible, that insulation against heat is provided for.

5.3 Diagram for valve with actuator

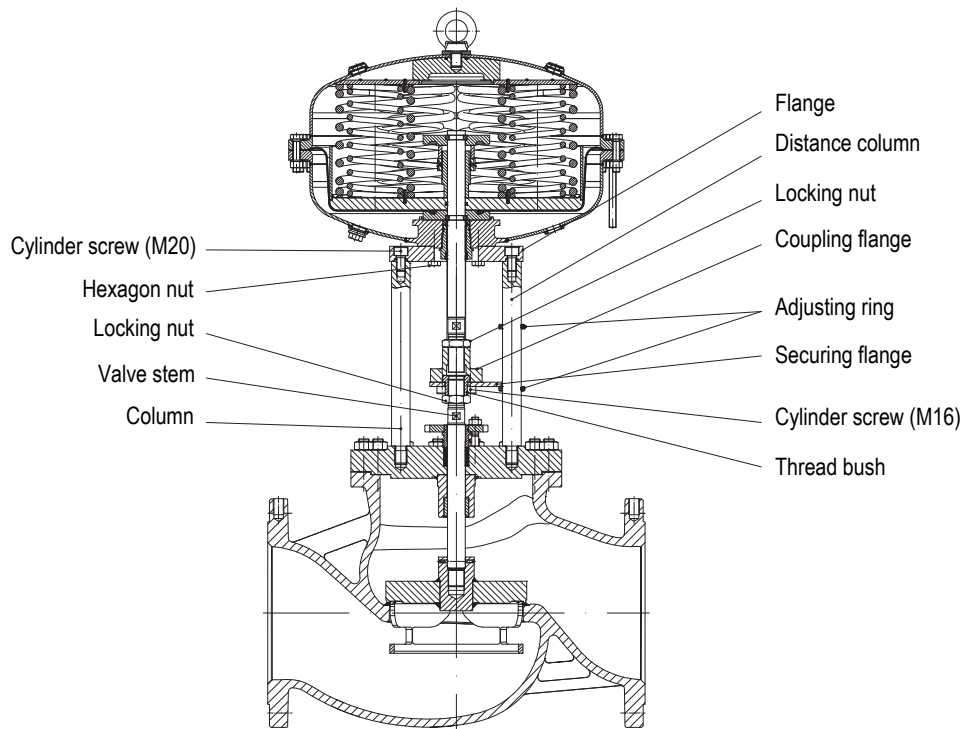


Fig. 6: Pneumatic straight through control valve
Operating mode of the actuator: „actuator stem extends by spring force“
Spring closes on air failure.

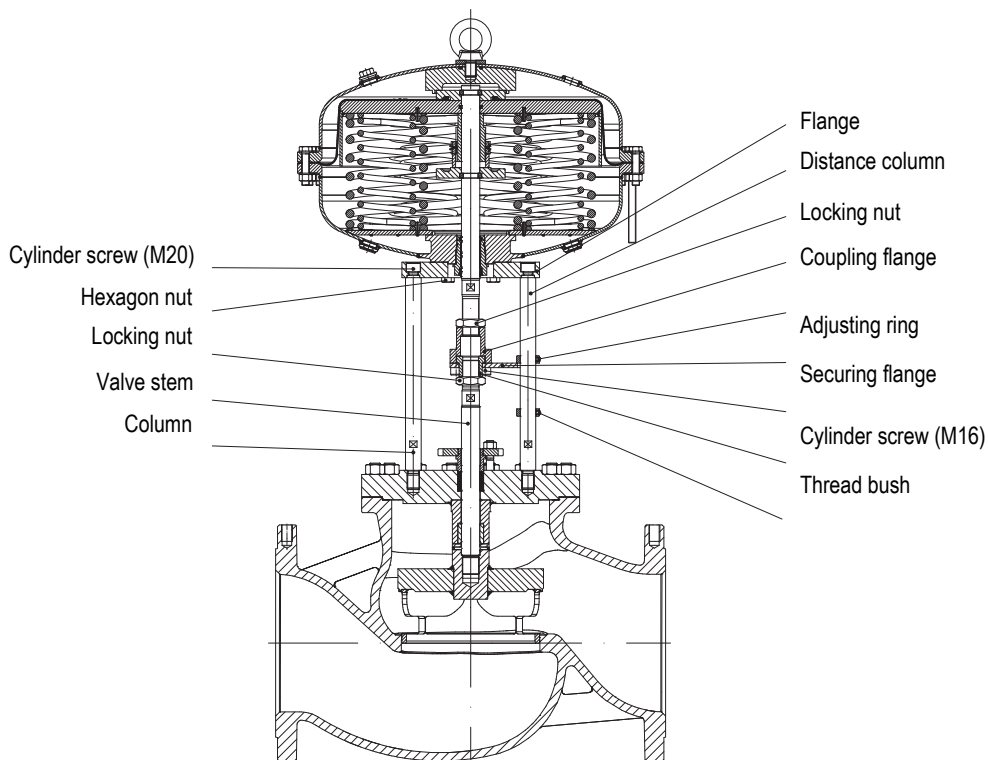


Fig. 7: Pneumatic straight through control valve
Operating mode of the actuator : „actuator stem retracts by spring force“
Spring opens on air failure.

5.4 Control pressure connection

Die Stelldruck-Anschlussleitung ist bei Wirkungsweise "Antriebsspindel durch Federkraft ausfahrend" am Membranboden (an Luftanschluss 1, siehe Fig. 1), bei Wirkungsweise „Antriebsspindel durch Federkraft einfahrend" an der Membranhaube (an Luftanschluss 1, siehe Fig. 2) anzuschließen.

The threaded joint connection is DP35: G1“



ATTENTION !

- *The actuator diaphragm is only allowed to be admitted control air on the opposite side of the springs (pressure chamber).
The component hole on the spring side must always be open.*
- *By very rapid bleeding, a very high sound level can be caused at the connection hole (ventilation), which can be reduced by using a suitable silencer.*

5.5 Assembling the valve, operating mode „actuator stem extends by spring force“

Straightway valves will be closed by spring force on air failure (Fig. 6).

- In the case that the valve and actuator have been delivered separately, the plug with stem are to be set into the terminal position by means of pressing „CLOSE.“



ATTENTION !

- *During assembly jobs, the plug is not allowed to be turned on the valve seat while under contact pressure*

- Loosen cylinder-screws (M16).
Remove securing flange and threaded sleeve from the coupling flange.
- Screw the locknut onto the valve stem.
- Place the securing flange over the valve stem and screw the threaded sleeve onto the valve stem.
- Screw columns into the bonnet.
- Put the flange onto the columns.
- Fix flange with cylinder screws (M20).
- Check that the actuator has been set into the correct operating mode.
- **Actuators with manual emergency adjustment:**
Check the position of the manual emergency adjustment, please refer to Fig. 2.
- Connect the control pressure line to the air connection 1 of the diaphragm base (Fig. 1) and pressure measuring equipment.
- Drive the actuator with control pressure in midtravel (in the middle of the spring range).
- Place the actuator onto the column construction and fasten by means of hexagon-nuts.

5.6 Setting the starting point, operating mode „actuator stem extends by spring force“

- Set the actuator unit to the desired starting point of the spring range.
- Screw back the threaded bushing on the valve stem, until the top corner of the coupling flange appears in the groove and fits tightly.
Simultaneously, the plug on the valve seat must be tight fitting.
- Attention must be paid, that the valve stem is in deep enough into the threadbush.
If need be, screw back the coupling flange.
- Fasten the safety flange with cylinder-screws onto the coupling flange.
- Check to see if at the starting point of the spring range, the plug lifts from the seat.
- After a test run adjust the position indicator (adjusting ring with set screw) to the terminal positions and screw both locking nuts tightly (at ca. 50% lifting positioning).
(Do not turn the plug on the valve seat while under contact pressure).

5.7 Assembling the valve, operating mode „actuator stem retracts by spring force“

Straightway valves will be opened by spring force on air failure (Fig. 10).

- In case the valve and actuator have been delivered separately, the plug with stem are to be set into the terminal position by means of pressing „OPEN.“
- In the case of the three-way mixing valves, the terminal position is the horizontal throughway A-AB.



ATTENTION !

- During assembly jobs, the plug on the valve seat is not allowed to be turned while under contact pressure.

- Loosen the cylinder-screws (M16) .
- Remove the safety flange and threaded bushing from the actuator coupling.
- Screw the locknut onto the valve stem.
- Place the safety flange over the valve stem and screw the threaded bushing onto the valve stem.
- Screw columns into the bonnet.
- Put the flange onto the columns.
- Fix flange with cylinder screws (M20).
- Check that the actuator has been set into the correct operating mode.
- **Actuators with manual emergency adjustment:**
Check the position of the manual emergency adjustment, please refer to Fig. 4.
- Connect the control pressure line to the air connection 1 of the diaphragm base (Fig. 3) and pressure measuring equipment.
- Drive the actuator with control pressure in midtravel (in the middle of the spring range).
- Place the actuator onto the column construction and fasten by means of hexagon-nuts.

5.8 Setting the starting point, operating mode „actuator stem retracts by spring force“

- Set the actuator unit to the desired end point of the spring range.
- Screw back the threaded bushing on the valve stem until the top corner of the coupling flange appears in the groove and fits tightly.
Simultaneously, the plug must be set on the valve seat.
- Hereby, attention must be given, that the valve stem is in deep enough into the threadbush.
If need be, screw back the coupling flange.
- Fasten the safety flange by means of cylinder-screws onto the coupling flange.
- Check to see that the end point of the spring range, the plug is resting on the valve seat.
- After a test run, adjust the position indicator (adjusting ring with set screw) to the terminal positions and screw both locking nuts tightly. (at a ca. 50% lifting positioning)
(Do not turn the plug on the valve seat while under contact pressure.)

6.0 Putting the valve into operation



ATTENTION !

Before putting a new plant into operation or restarting a plant after repairs or modification, always make sure that:

- *All works has been completed!*
- *The valve is in the correct position for its function.*
- *Safety devices have been attached.*

Before putting a new plant into operation make sure that:

- Attention paid that the control pressure connection has been properly installed (please see point 5.4).
- Check to make sure that all mobile, exterior parts can move freely.
- All applicable, current information given in the operating manuals for additional parts (for ex. positioner, filter reduction station, interlocking relay, ...) have been observed.
- In case of improper functioning, all assembly and setting jobs must be checked over and corrected, is necessary.

7.0 Disassembly of the actuator unit from the valve



ATTENTION !

- *Due to safety reasons, the system must be driven down prior to disassembly of the actuator unit (in a pressureless state!).*

To proceed with the disassembly of the actuator unit from the valve, the following must be observed:

- Drive the actuator with control pressure into the middle position.
- Loosen cylinder screws (Fig. 6).
Remove the securing flange and thread bush from the actuator coupling.
- Remove hexagon nuts (Fig. 6) and take of the actuator from the valve.

7.1 Disassembly of the actuator unit



ATTENTION !

- *Maintenance, repairs or alterations can only be carried out in the factory or by authorized workshops having special tools and devices!*

8.0 Care and maintenance

Maintenance and maintenance intervals have to be defined by the operator according to the service conditions.

- For each operating mode, the actuator unit, if need be, should be freed from exterior dirt.
- The actuator unit may not be cleaned with high-pressure equipment or with aggressive cleaning products, that are a health hazard, or with flammable cleaning products or solvents.
- After cleaning, for example, an inspection should be carried out checking the sealings of the actuator unit.
- In order to ensure smooth running, the operation device for the control air should be furnished with a maintenance unit (see point 6.1).
- The rolling diaphragm (pos. 10) and the stem guiding with O-ring-sealing are wearing parts and must be replaced when necessary (refer also to item 8.1).

8.1 Replacement of the stem guiding



ATTENTION !

- To replace the stem guiding, it is not necessary to open the actuator!

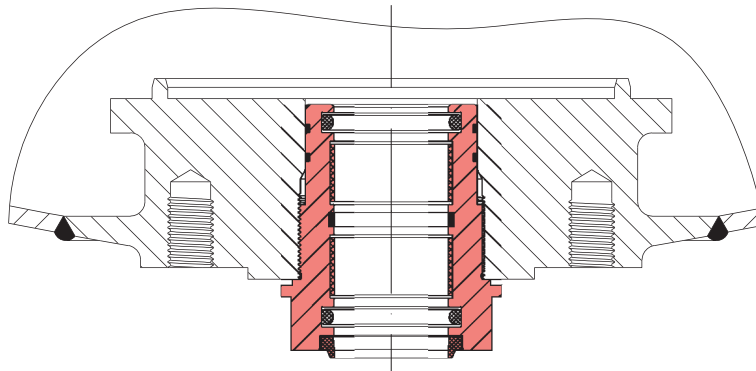


Fig. 8

- Remove the actuator from the valve, as described in item 7.0.
- Unscrew the stem guiding from the diaphragm base.
- Pay attention to clean, undamaged stem surface.
- Grease new stem guiding (replacement part-no. 0460000060) and actuator stem.
- Screw new stem guiding into diaphragm base.
- Reassemble actuator onto the valve and adjust (acc. to items 5.5 and 5.6 resp. 5.7 and 5.8)

8.2 Replacement the operation mode / Replacing the rolling diaphragm / Replacing the spring set



ATTENTION !

- Maintenance, repairs or alterations can only be carried out in the factory or by authorized workshops having special tools and devices!

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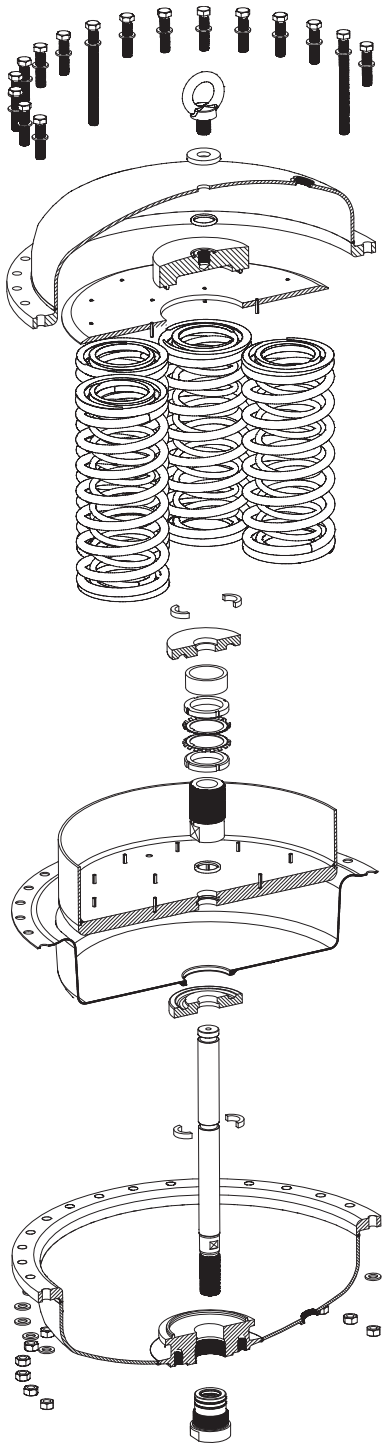


Fig. 9: DP 35 „actuator stem extends by spring force“

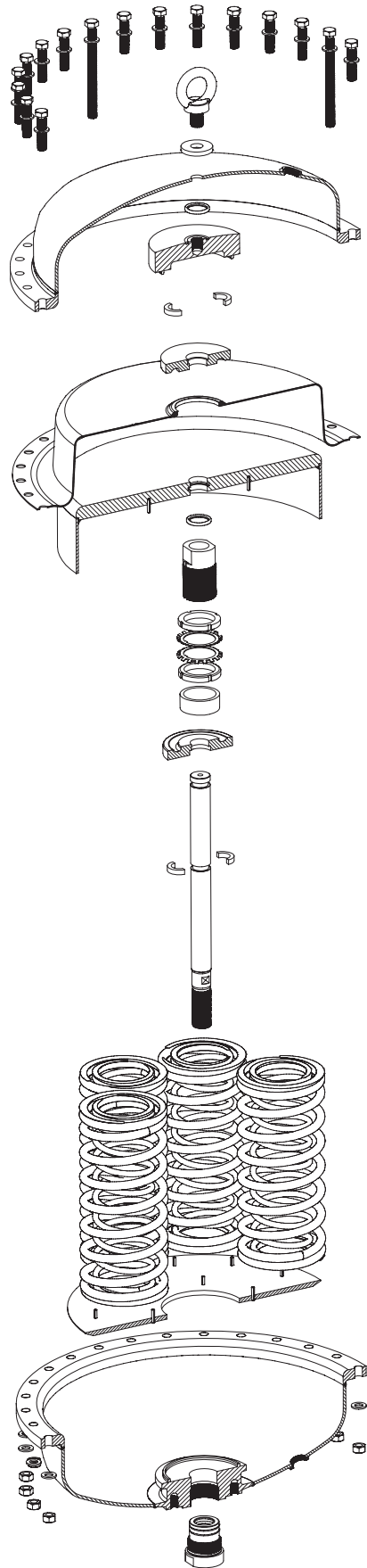


Fig. 10: DP 35 „actuator stem retracts by spring force“

9.0 Troubleshooting

In the event of malfunction or faulty operating performance check that the installation and adjustment work has been carried out and completed in accordance with these Operating Instructions.



ATTENTION !

It is essential that the safety regulations are observed when identifying faults.

If malfunctions cannot be eliminated with the help of the following table „**10.0 Troubleshooting table**“, the supplier or manufacturer should be consulted.

10.0 Troubleshooting table



ATTENTION !

- read point 7.0 and 8.0 prior to dismantling and repair work !
- read point 6.0 before restarting the plant !

Fault	Possible causes	Corrective measures
Stellantrieb bewegt sich nicht	No compressed air on the control pressure line	Discern the causes and remedy
	Actuator unit has been improperly installed	Check the actuator's operating mode and connect to the control pressure line in accordance to this operating mode.
	The rolling diaphragm is defect	Let replace the rolling diaphragm and springs
	Manual emergency adjustment is blocked	Set the manual emergency adjustment into the correct position (both position indicators must be at the starting point and be in the same position).
There is not enough positioning force available	Wrong spring pieces (the spring range of the actuator is wrong)	Let replace springs (actuator unit)
	Stem sealing has a leak	Let renew the stem sealing (refer to item 8.1)
	The ventilation is plugged and the air cannot escape from the actuator unit	Screw cap must be disengaged
	The actuator unit does not ventilate sufficiently	Check the control adjustment

11.0 Warranty / Guarantee

The extent and period of warranty cover are specified in the "Standard Terms and Conditions of Albert Richter GmbH & Co. KG" valid at the time of delivery or, by way of departure, in the contract of sale itself.

We guarantee freedom of faults in compliance with state-of-the-art technology and the confirmed application.

No warranty claims can be made for any damage caused as the result of incorrect handling or disregard of operating and installation instructions, technical data sheets and relevant regulations.

This warranty also does not cover any damage which occurs during operation under conditions deviating from those laid down by specifications or other agreements.

Justified complaints will be eliminated by repair carried out by us or by a specialist appointed by us.

No claims will be accepted beyond the scope of this warranty. The right to replacement delivery is excluded.

The warranty shall not cover maintenance work, installation of external parts, design modifications or natural wear.

Any damage incurred during transport should not be reported to us but *rather* to the competent cargo-handling depot, the railway company or carrier company immediately or else claims for replacements from these companies will be invalidated.



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