

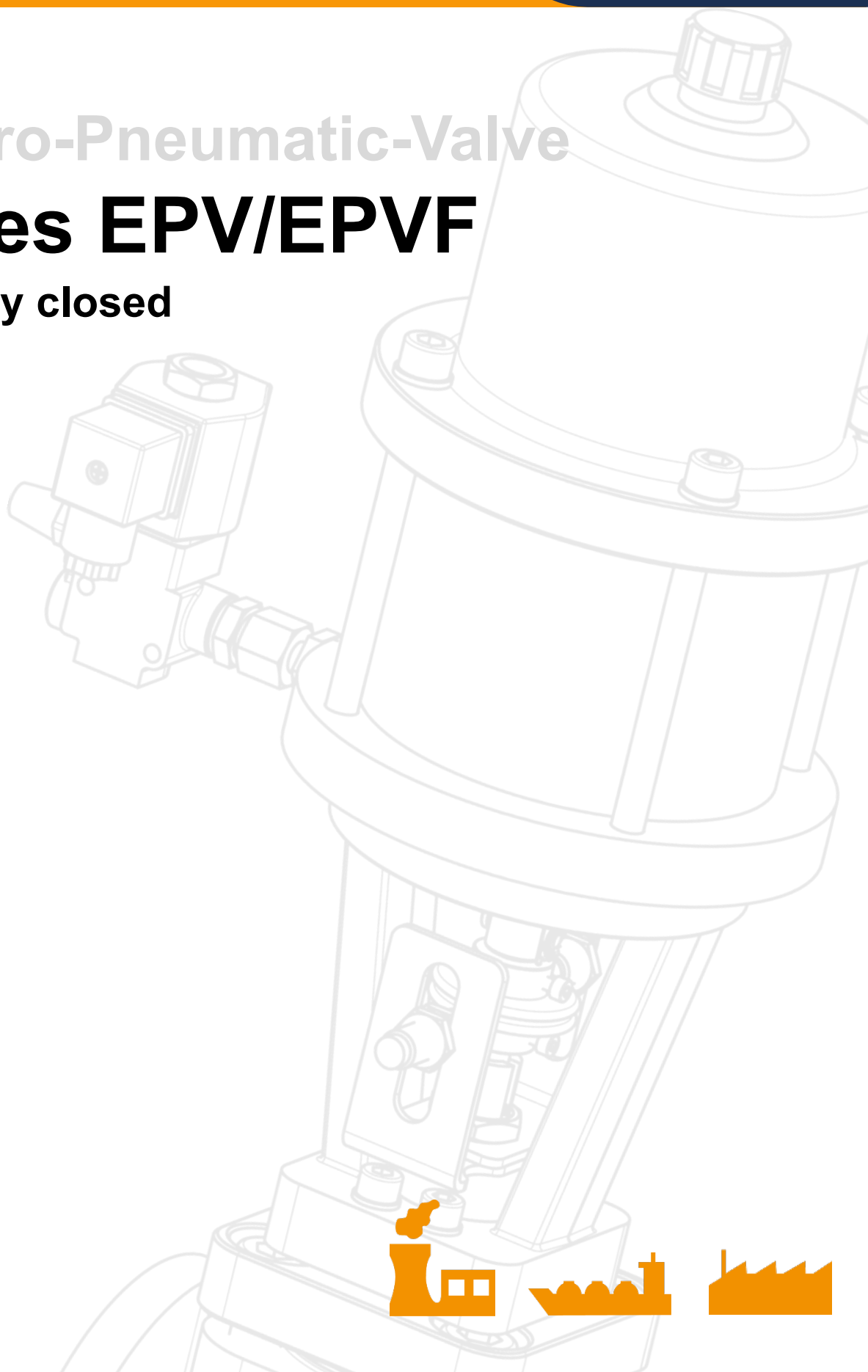


# Operating manual

Electro-Pneumatic-Valve

## Series EPV/EPVF

Normally closed



# EN





# Operating manual

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# Operating manual

## 1.0 General remarks

This operating manual includes instructions to assemble and operate the valve in the prescribed and safe way. **Additionally and accordance with the solenoid drive of the control valve (805), the relevant manufacturer's operating instructions must be taken into consideration.**

If any difficulties appear that can not be solved by means of the operating manual, further information may be demanded from the manufacturer.

This operating manual is in accordance with the relevant valid EN safety standards and the valid prescriptions and rules of the Federal Republic of Germany. If the solenoids are used abroad of the FRG, the operator and/or the person who is responsible for the plant concept must take care that the valid national rules are met. The manufacturer reserves the right of any technical change and improvement. The use of these operating instructions suppose the qualification of the user according to paragraph 2.3 "qualified staff".

The operating staff must be trained in accordance with the operating instructions. The operating manual must always be available at the location where used.

## 1.1 Valve data

### Manufacturer:

Uni-Geräte E. Mangelmann Elektrotechnische Fabrik GmbH  
Holtumsweg 13, 47652 Weeze, Germany

### Designation

Direct-acting, normally closed NC, spring-loaded automatic shut off valve with pneumatic actuator.

### Working pressure:

|               |                           |
|---------------|---------------------------|
| 6-4 - EPV(F)  | 0 - 6 bar (0 - 600 kPa)   |
| 8-4 - EPVF    | 0 - 8 bar (0 - 800 kPa)   |
| 9-4 - EPV(F)  | 0 - 9 bar (0 - 900 kPa)   |
| 15-4 - EPV(F) | 0 - 15 bar (0 - 1500 kPa) |
| 20-4 - EPV(F) | 0 - 20 bar (0 - 2000 kPa) |
| 30-4 - EPV(F) | 0 - 30 bar (0 - 3000 kPa) |
| 40-4 - EPV(F) | 0 - 40 bar (0 - 4000 kPa) |
| 45-4 - EPV    | 0 - 45 bar (0 - 4500 kPa) |

### Medium temperature:

|            |                                     |
|------------|-------------------------------------|
| 45-4 - EPV | -10 °C to + 60 °C (263 K to 333 K)  |
| EPV        | -10 °C to + 140 °C (263 K to 413 K) |
| EPVF       | -10 °C to + 200 °C (263 K to 473 K) |

### Ambient temperature:

-10 °C to + 60 °C (263 K to 333 K)

### Fitting position:

vertical or horizontal drive

### Switching cycles:

500 cycles/h





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## EPV with with flange connection measures acc. to DIN EN 1092-2 / ANSI

| Flange DN<br>Flange ANSI | PN | 15<br>1/2" | 20<br>3/4" | 25<br>1" | 32<br>1 1/4" | 40<br>1 1/2" | 50<br>2" | 65<br>2 1/2" | 80<br>3" | Test<br>pressure<br>(*) PT |
|--------------------------|----|------------|------------|----------|--------------|--------------|----------|--------------|----------|----------------------------|
| 40-4 - EPV               | 40 | O          | O          | O        | -            | -            | -        | -            | -        | PT 40                      |
| 45-4 - EPV               | 63 | -          | -          | -        | -            | O            | O        | -            | -        | PT 68                      |
| 30-4 - EPV*              | 40 | -          | -          | -        | O            | -            | -        | -            | -        | PT 40                      |
| 20-4 - EPV*              | 40 | -          | -          | -        | -            | O            | -        | -            | -        | PT 25                      |
| 15-4 - EPV*              | 40 | -          | -          | -        | -            | -            | O        | -            | -        | PT 25                      |
| 9-4 - EPV                | 40 | -          | -          | -        | -            | -            | -        | O            | -        | PT 16                      |
| 6-4 - EPV                | 40 | -          | -          | -        | -            | -            | -        | -            | O        | PT 16                      |

(\*) Test pressure to perform leakage test "No FUNCTION TEST"

O Acceptance test certificate 3.2 possible, - not available

\* For liquefied gas in its liquid form according to DIN 32725

## EPVF with with flange connection measures acc. to DIN EN 1092-2 / ANSI

| Flange DN<br>Flange ANSI | PN | 15<br>1/2" | 20<br>3/4" | 25<br>1" | 32<br>1 1/4" | 40<br>1 1/2" | 50<br>2" | 65<br>2 1/2" | 80<br>3" | Test<br>pressure<br>(*) PT |
|--------------------------|----|------------|------------|----------|--------------|--------------|----------|--------------|----------|----------------------------|
| 40-4 - EPVF              | 40 | O          | O          | O        | -            | -            | -        | -            | -        | PT 40                      |
| 30-4 - EPVF              | 63 | -          | -          | -        | O            | -            | -        | -            | -        | PT 40                      |
| 20-4 - EPVF              | 40 | -          | -          | -        | -            | O            | -        | -            | -        | PT 25                      |
| 15-4 - EPVF              | 40 | -          | -          | -        | -            | -            | O        | -            | -        | PT 25                      |
| 9-4 - EPVF               | 40 | -          | -          | -        | -            | -            | -        | O            | -        | PT 16                      |
| 6-4 - EPVF               | 40 | -          | -          | -        | -            | -            | -        | -            | O        | PT 16                      |
| 8-4 - EPVF               | 40 | -          | -          | -        | -            | -            | -        | -            | O        | PT 16                      |

(\*) Test pressure to perform leakage test "No FUNCTION TEST"

O Acceptance test certificate 3.2 possible, - not available

**Control medium:**

Air, nitrogen -20 °C up to + 60 °C

**Control pressure:**

Min. –control pressure, second number on the type plate

Max. –control pressure, e.g. 4 - 10 bar

**Electric connection control valve:**

Notice instructions on type plate of control valve.

## 1.2 Application

The electro-pneumatic-valves EPV and EPVF are used as automatic shut off valves to secure, to limit, shut-off and release in oil and liquid gas heating installations and in steam boiler plant.

Qualified for fuel oil EL, M (EPV) and fuel oil S (EPVF) as well as liquid gas in liquid state and other liquids having a viscosity rate up to 75mm<sup>2</sup>/s..

If used in other cases, the operator must carefully check if construction/design of valve, accessories and materials are suitable for the new application. The range of application is subject to the responsibility of the plant planner. The service life of the valve is 20 years.

## 2.0 Danger notices

### 2.1 Safety terms

The signal terms DANGER, CAUTION und NOTICE are used in this operating manual in case of notices concerning special dangers, or for unusual information, requiring a special marking.



#### **DANGER!**

means that in case of non-observance there is danger to life and/or considerable damage.





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## CAUTION!

means that in case of non-observance there is danger of injury and/or damage.



## NOTICE!

means that attention is drawn to technical correlations/connections.

Observance of other, not especially marked notices concerning transport, assembly, operation and maintenance and other data (in the operating manual, product documentation and at the unit itself) is also essential, in order to avoid disturbances that might affect direct or indirect damage to property or injury to persons.

## 2.2 Safety notice

Non observance of safety instructions can lead to loss of any claim for damages.

Non observance can lead to the following mentioned dangers:

- Failure of important functions of the valve/plant.
- Endangering of persons by electrical or mechanical influences.
- Protection against accidental contact for moving parts may not be removed as long as the valve is in operation.
- Leakage of dangerous media (e.g. explosive, toxic, hot) must be removed in the way that there is no danger for persons or environment. Laws and regulations must be observed.

## 2.3 Qualified staff

These are persons who are familiar with erection, assembly, starting, operation and maintenance of the product and who have special qualifications acc. to their activities and functions, e.g.:

- Instruction and obligation to carry out and meet all regional and in-house orders and requirements.
- Education or instruction according to the safety engineering standards in use and maintenance of adequate safety and working protection equipment.
- Training in first aid.

## 2.4 Unauthorized modification and spare part production

Modification or changes of the valve are only allowed after agreement of the manufacturer. Original drawings and accessories authorized by the manufacturer are for safety purposes. The use of other parts or unauthorized changes at the valve by third persons may cancel and abolish the manufacturer's liability for resulting consequences.

## 2.5 Unauthorized operation

Operational reliability of the delivered valve is only guaranteed in case of determined use in accordance to paragraph 1 of the operating manual. **The application limits mentioned on the type sign may on no account be exceeded.**





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## 2.6 Safety information for the use in explosion-prone areas guideline 2014/34/EU

- The temperature of the medium must not exceed the respective temperature class, and respectively, the respective maximum permitted medium temperature as per operation guideline.
- If the valve is heated (e.g. heating jacket), care must be taken, that the specified temperature class is kept in the time.
- The valve must be connected to the ground.  
In the case most simple this can be realized via pipe screws by means of tooth disc. Otherwise the connection to the ground must be implemented by other measures e.g. cable links.
- Control valves, electrical and electrical/mechanical drives as well as sensors must undergo a separate conformity check as per ATEX. In doing so the respective safety and explosion protection information in the operation instructions are to taken into special consideration.
- Any modifications whatsoever to the valve are not allowed. The ATEX approval is void with immediate effect if the valve is modified without prior authorization (even including painting).
- Uni-Geräte GmbH must be consulted before any modifications are made.

Furthermore we point out the guideline 1999/92/EG, which include the minimum regulations for the improvement of the health-related situation and the safety of the employees, who might be jeopardized by an explosive atmosphere.

## 2.7 Safety information regarding guideline 2014/68/EU attachment I



### **DANGER!**

Uni-valves are not an accessory with a safety function as defined in the PED 2014/68/EU Article 2 (4) and Article 4 (1) (d) by category IV Use or classify!

## 3.0 Handling

### 3.1 Transport

For any transport works, the generally recognised technical rules and standards as well as rules for prevention of accidents must be observed.

During transport, storage and decommissioning, protective caps must be attached to the sides of the valve.

The goods to be transported must be carefully treated. During transport, the valve must be protected against strokes, impacts or vibration. The coat of lacquer may not be damaged. Transport temperature is -20 °C up to +60 °C.

**Never transport the valve at pneumatic drive piping/ tubing or components.** Transport the valve at provided transport angles (256) from KA120 or ring nut (926) from KA160.

Transport the valve in a box or on a pallet with soft base and it smoothly on even floor. **Never put valve on the piping/ tubing or its components.**

The goods must be checked on completeness and transport damage. See also section 9.0





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## 3.2 Storage

If the valve is not installed immediately after delivery, it must be stored properly.

- Storage temperature -20 °C up to +60 °C, dry and clean.
- The lacquer protects against corrosion in neutral dry atmosphere. Do not damage colour.
- In humid rooms, a drying agent or a heating resp. is necessary because of condensation of water.

Requirements according to DIN 7716 (products made of caoutchouc and rubber) must be met.

## 3.3 Handling before mounting

- In case of valve with protection caps, they must be removed before being mounted!
- Protect against atmospheric influences such as humidity.
- Appropriate treatment protects against damage.

## 4.0 Product description

The electro-pneumatic-valves in the EPV and EPVF series are direct-acting, normally closed NC, spring-loaded automatic shut off valves with pneumatic actuator.

The drive is actuated by a 3/2 way control valve with solenoid drive, type 10-EVD 2 or 10-EVD 2/2401 resp.

The sectional drawing part 11.1 in Fig. 1 – Fig. 4 shows the valve construction.

## 4.1 Funktion

When opening the 3/2 way control valve (805) the control medium flows via the connection 3 □ 2 under the drive piston (217). The control medium pushes the drive piston (217) against the pressure spring (503) and opens- via the valve spindle (205)- the balance piston (220) or valve disk (200) that is pressure impinged. The valve is open.

The valve closes in case of shut-off, failure or interruption of power energy to control valve (805). The compressed control medium in the pneumatic drive is blown-off via the control valve (805).

## 4.2 Technical data

**Opening times:** 0,8 – 2s depends upon nominal width

**Closing times:** < 1s

**Drive types (KA) and air consumption in standard litre (NL) per connection at 4 bar control pressure**

| Flange DN<br>Flange ANSI | 15<br>1/2"      | 20<br>3/4"      | 25<br>1"        | 32<br>1 1/4"    | 40<br>1 1/2"    | 50<br>2"        | 65<br>2 1/2"    | 80<br>3"        |
|--------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 40-4 - EPV(F)            | KA 120<br>2,5NL | KA 120<br>2,5NL | KA 120<br>2,5NL | -               | -               | -               | -               | -               |
| 45-4 - EPV               | -               | -               | -               | -               | KA 120<br>2,5NL | KA 120<br>2,5NL | -               | -               |
| 30-4 - EPV(F)            | -               | -               | -               | KA 120<br>2,5NL | -               | -               | -               | -               |
| 20-4 - EPV(F)            | -               | -               | -               | -               | KA 120<br>2,5NL | -               | -               | -               |
| 15-4 - EPV(F)            | -               | -               | -               | -               | -               | KA 120<br>2,5NL | -               | -               |
| 9-4 - EPV(F)             | -               | -               | -               | -               | -               | -               | KA 120<br>2,5NL | -               |
| 6-4 - EPV(F)             | -               | -               | -               | -               | -               | -               | -               | KA 120<br>2,5NL |
| 8-4 - EPVF               | -               | -               | -               | -               | -               | -               | -               | KA 160<br>8NL   |

Air consumption for 10 bar, multiply control pressure table values by 2,2





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## Max. valve loading by pipe power

The indicated moments may not work longer than 10s.

| DN             |           | 8  | 10 | 15  | 20  | 25  | 32  | 40  | 50                | 65                | 80                | 100  | 125  | ≥150 |
|----------------|-----------|----|----|-----|-----|-----|-----|-----|-------------------|-------------------|-------------------|------|------|------|
| <b>Torsion</b> | <b>Nm</b> | 20 | 35 | 50  | 85  | 125 | 160 | 200 | 250 <sup>1)</sup> | 325 <sup>1)</sup> | 400 <sup>1)</sup> | -    | -    | -    |
| <b>Bending</b> | <b>Nm</b> | 35 | 70 | 105 | 225 | 340 | 475 | 610 | 1100              | 1600              | 2400              | 5000 | 6000 | 7600 |

<sup>1)</sup> Not valid in case of valves with flanges

## Starting torque, pipe screws greased

| DN            |           | 8  | 10 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | ≥150 |
|---------------|-----------|----|----|----|----|----|----|----|----|----|----|-----|-----|------|
| <b>Torque</b> | <b>Nm</b> | 20 | 30 | 30 | 30 | 30 | 50 | 50 | 50 | 50 | 50 | 80  | 160 | 160  |

## Starting torque, product screws and nuts greased

| Screw         |           | M6 | M8 | M10 | M12 | M16 | M20 | M24 |
|---------------|-----------|----|----|-----|-----|-----|-----|-----|
| <b>Torque</b> | <b>Nm</b> | 5  | 11 | 22  | 39  | 70  | 110 | 150 |

## 4.3 Marking

The type sign on the pneumatic drive has the following information:

- Fabricator
- Valve type, nominal width, pressure and temperature indication, fitting position
- Year of construction / production no.
- Valve class and valve group
- CE-Sign and no. of relevant location
- Fluid group and test pressure PT
- Pneumatic drive type
- Control medium,  $p_{min}$  and  $p_{max}$  for control medium

Refer also to section 10.0

## 5.0 Installation

### 5.1 Warning of dangers during installation, operation and maintenance



#### DANGER!

Safe operation of the valve can only be guaranteed if it is installed, commissioned and maintained by qualified personnel (see point 2.3 "Qualified staff") correctly and in observance of the warnings in this operating manual. Apart from that, the operation safety order and the qualified use of tools and protection equipment must be guaranteed. The operating instructions for the valve must be observed during all work on or with the valve. Failure to observe these instructions may result in injury or in damage to the valve or other installations.

When the valve is used as a final sealing element, a safety precaution e.g. blanking disc, blind flange, etc., in accordance with the code of practice of the German Technical and Scientific Association for Gas and Water (DVGW) is recommended during all repair work.

### 5.2 Installation

Apart from the general installation guidelines, the following points should be observed:



#### NOTICE!

- Remove protective caps.
- The inside of the valve and the pipeline must be free from foreign particles.
- Observe the installation position in relation to the flow direction, see markings on the valve.
- Centre gaskets between the flanges.
- The connecting flanges must be aligned.
- Ensure that none of the components is strained during installation.







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- The valve must not be used as a fixed point; it is supported by the pipework system.
- Protect valves from soiling, particularly during construction work.
- Thermal expansion of the pipework must be equalized using compensators.

According to DIN EN ISO 23553-1 a dirt catcher must be installed in front of every safety lock valve. The mesh diameter inside of the sieve must be 0.5 mm. In case of two safety lock valves combined it is sufficient to install one dirt catcher in front of the first valve. The dirt catcher must be installed in a not too far distance from the first valve. The Uni-Geräte dirt catchers of the SFR series are permitted for the use of flange valve.

The valve can be installed with vertical or horizontal pneumatic drive. The solenoid drive of the control valve should preferably be installed with vertical drive. The control air must be connected at connection 3. We recommend an air filter in front of the control valve. Mesh size 40 µm.



## NOTICE!

Please observe the control valve documentation.

## 6.0 Operation



### DANGER!

Before commissioning a new installation or before starting up an installation again after repairs or modifications, ensure:

- The proper completion of all installation and assembly work!
- Commissioning only by „qualified staff“ (see point 2.3).
- Installation or repair of existing guards and protection equipment.

### 6.1 Commissioning

- Before commissioning, check the data on material, pressure, temperature and flow direction with the layout plan of the pipework system.
- Depending on the field of application, the local regulations have to be observed, e.g. the operation safety order.
- Residues in the pipework and the valve (dirt, weld beads, etc.) will inevitably result in leaks.
- Leakage inspection of the installed valve.

### 6.2 Shutting down

- Depending on the field of application, the local regulations have to be observed, e.g. the operation safety order.

### 6.3 Maintenance

Electro-pneumatic-valves have to be checked at regular intervals for proper function and internal leak tightness. The intervals for regular inspections have to be defined by the operator according to the operating conditions. Uni-Geräte recommends an internal visual inspection once a year and an overhaul of the valve after 2 years or after the following number of switching cycles at the latest:

| Application temperature | ≤ DN 25 | ≤ DN 80 | ≤ DN 150 | > DN 150 |
|-------------------------|---------|---------|----------|----------|
| ≤ 25 °C                 | 150 000 | 75 000  | 25 000   | 20 000   |
| > 25 °C                 | 50 000  | 25 000  | 25 000   | 5 000    |

### Repair or maintenance works at the manufacturing company (UNI- Geräte)

- Valves and fittings must be delivered clean and free from substances which are harmful to health or to the environment.

### Uni-Geräte prescribes the following maintenance intervals for valves with SIL requirements:

The safety requirements with regard to the maintenance intervals to be adhered are described in the **SIL manual** of the type series and must be complied with.





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## 6.4 Putting back into operation

When putting a valve back into operation, ensure that all the necessary steps described in section 5.2 (Installation) and section 6.1 (Commissioning) are repeated.

## 7.0 Troubleshooting

### 7.1 Detection of defects



#### **DANGER!**

Be sure to observe the safety instructions during troubleshooting.

If the malfunctions cannot be remedied using the following **“Troubleshooting plan (7.2)”** please contact the manufacturer.

In the event of faults in the function or operating behaviour of the valve, check whether the installation work was carried out and completed as described in this operating manual. Depending on the field of application, the operation safety order must be observed.

Check the data on material, pressure, temperature, voltage and flow direction with the layout plan of the pipework system. In addition, check whether the operating conditions correspond to the technical data in the data sheet or on the rating plate.

### 7.2 Troubleshooting plan

| Malfunction                                  | Possible causes                                                           | Remedy                                                                                             |
|----------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| No flow                                      | Pneumatic drive does not open                                             | Switch on control valve (805)<br>Check control pressure<br>Clean filter control line, if necessary |
|                                              | Working pressure too high                                                 | Compare working pressure with the data on the rating plate                                         |
|                                              | Protective caps were not removed                                          | Remove protective caps                                                                             |
| Low flow rate                                | Clogging in the pipework system                                           | Check pipework system                                                                              |
| Valve leaking at seat, no internal tightness | Valve seat gasket (400) or valve seat (100) damaged by external particles | See section 8 or replace valve                                                                     |
| No external tightness                        | Gaskets damaged                                                           | See section 8 or replace valve                                                                     |
| Valve opens too slowly                       | Control pressure too low                                                  | Check control pressure                                                                             |
| Valve closes too slowly                      | Dirt in control line                                                      | Clean sound absorber (600)<br>Clean vent line                                                      |
|                                              | Reduced conductor cross sections                                          | Replace folded control lines                                                                       |
| Valve does not close                         | Control valve does not close                                              | Check, if residual voltage is aligned                                                              |
|                                              | Dirt in control line                                                      | Clean sound absorber (600)<br>Clean vent line                                                      |
|                                              | Reduced conductor cross sections                                          | Replace folded control lines                                                                       |
| Flange fracture (valve/pipework)             | Screws not tightened uniformly, mating flanges not aligned                | Align pipework.<br>Install new valve                                                               |



#### **NOTICE!**

Observe section 9.0 before all installation and repair work!

Observe section 6.4 when putting the valve back into operation!





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## 8.0 Dismantling of the valve

In addition to the general installation guidelines and the operation safety order, the following points must also be observed:



### **DANGER!**

- Depressurised pipework system
- Cooled medium
- Emptied installation
- Vent pipework systems containing corrosive, inflammable, aggressive or toxic media
- Have dismantling work carried out only by qualified staff (see point 2.3)
- For special application such as for oxygen use only the approved lubricants and appropriate sealing materials (BAM- approval)

## 8.2 Replacement of wear parts

Shut down the valve as described in section 6.2.



### **DANGER!**

Opening of pneumatic drive.

Spring cap is under spring tension. At least, two hex. head screw (900/2) resp. stud (236) with hex. nut (901/2) must be permanently screwed in the spring cap.

Remove two opposing studs (236), or respectively, hexagon head screws (900/2) and replace them by threaded rods with nuts.

| Drive size   | KA 70    | KA 120    | KA 160    | KA 200    | KA250     |
|--------------|----------|-----------|-----------|-----------|-----------|
| Threaded rod | M6 x 250 | M10 x 450 | M12 x 450 | M16 x 500 | M20 x 750 |

Before loosening of the final two hexagon head screws (900/2) resp.stud (236) with hex. nut (901/2) finger-tightly fasten the nuts at the threaded rod. Loosen and remove the hexagon head screws (900/2) resp. stud (236) with hex. nut (901/2); after that loosen and remove the nuts of the threaded rod.



### **NOTICE!**

To start with the spring cap (112) is pressed against the nuts of the threaded rod.

Unscrew the nuts on the threaded rod, so that the pressure spring (503/X) is unloaded.

Remove threaded rods and spring cap (112). De-install spring guide (204), pressure spring (503) and pneumatic cylinder (111). Loosen hex. nut (901/2) or connection piece limit switch mounting (246). Remove spring disk (216), drive piston (217) and sealing piece (226).

### **45-4 - EPV**

Loosen hex. nuts (901/1) with lock washer (905/1) and remove the spacer (110).

Remove spindle guide complete (212/1#) out of piston guide (221).

Take out the piston guide (221) with the balance piston (220+) of the valve housing (100).

Completely de-install the piston guide (221) from the balance piston (220+).



### **NOTICE!**

The spare parts kit contains a complete balance piston (220+), spindle guide (212/1#) and a complete spring seat (216\*\*). The item numbers marked with (+, #, \*\*) are delivered as a complete unit.

In case of damage to the valve seat, replace the whole valve.

If the sealing elements are damaged the spare parts kit must be used.





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## **-4 - EPV / -4 - EPVF**

Release safety bolt (902/2) with SL safety device. Pull valve spindle (205/2) out of spindle guide (212/2).

Loosen hexagon head cap screws (900/1) and remove them with lock washer (905/3). Remove housing flange (108) from spacer (110).

Loosen cylinder screw (910/2). Remove switch actuator (513) from valve spindle (205/1). Loosen and remove hex. nut (901/3). De-install limit switches (803) with limit switch console (512).

Loosen the cylinder screws (910/1) and remove them with lock washer (905/1). Then remove spacer (110).

## **..-4 EPV (lip ring sealing)**

Remove the complete interior part, valve disk (200/1\*), disk plate (201), valve disk sealing (400), ball (950), bolt (902/1), split-pin (912), valve spindle (205/1), sealing plate (115), spindle guide (212/1) and console support (249) from valve housing and put onto a clean surface.



### **NOTICE!**

The spare parts kit contains a complete valve disk (200/1\*) and a complete spring seat (216\*\*). The item numbers marked with (\*, \*\*) are delivered as a complete unit.

In case of damage to the valve seat, replace the whole valve.

If the sealing elements are damaged the spare parts kit must be used.

## **..-4 EPVF (Sealing of expansion bellows)**

Remove the complete interior part, valve disk (200/1\* respectively 200/2#), disk plate (201), valve disk sealing (400), ball (950), bolt (902/1), split-pin (912), valve spindle (205/1), expansion bellows (504) with expansion bellows piece (507), spring dowel sleeve (943) and torsion protection (227) from the valve housing (100) and put onto a clean surface.

Drive spring dowel sleeve (943) out of the torsion protection (227).



### **NOTICE!**

Spare part kit includes a complete valve disk (200/1\* resp. 200/2#) and spring disk (216\*\*). The position numbers marked with a (\*, \*\*, #) are supplied as complete unit.

In case of damage to the valve seat, replace the whole valve.

If the sealing elements and expansions bellow damaged the spare parts kit are must be used.

All parts marked as spare parts are to be replaced.

Install the valve in reverse order.



### **NOTICE!**

The O-rings (403/X), the flat seals (402/X), the lip rings (404/X) and in the case of a metal-to-metal seal the packing (406) must be replaced prior to installation.

Lubricate the pneumatic cylinder (111) within the of the drive piston (217) with lubricant Staburags NBU 30.



### **CAUTION!**

Install wear parts carefully and properly and do not damage them during assembly.

Examine the valve acc. to DIN EN 12266-1 for internal and external leaks and finally carry out a function test.





# Operating manual

## 9.0 Warranty

Scope and period of the warranty is specified in the edition of the “General Terms of Business of the Uni-Geräte E. Mangelmann Elektrotechnische Fabrik GmbH” valid at the time of delivery or else in the purchase agreement.

We warranty that the valve is free from faults in line with the state of the art and for the confirmed field of application.

No warranty claims will be accepted for damage resulting from improper use or failure to observe these operating and installation instructions, the statutory accident prevention regulations, the EN, DIN and VDE standards and other codes and regulations.

Warranty claims will also not be accepted for damage occurring during operation due to operating conditions deviating from those specified in the data sheet or in other agreements.

Justified complaints will be remedied by reworking by us or specialist companies authorized by us.

Claims going beyond the scope of the warranty will not be accepted. The customer shall have no right to the supply of a replacement valve.

Maintenance work, installation of parts from other manufacturers, any modifications to the design and natural wear are not covered by the warranty.

Transport damage must be reported not to us but **without delay** to your responsible goods handling company, the railway company or the shipping agent as otherwise all claims for damages against these companies will be voided.

## 10.0 Erklärungen zu Regelwerken

The Commission of the European Union has laid down common directives resp. regulations for the free trading of goods within the Union specifying minimum requirements for safety and health protection. The CE symbol confirms that products comply with the EU directives resp. regulations, i.e. in conformity with the relevant, in particular harmonised standards. Directive 2014/68/EU applies to the valve (mechanical part).

### Notes on Directive 2014/68/EU (Pressure Equipment Directive, DGRL):

It has been confirmed that the quality assurance in design control, manufacture and final acceptance of the manufacturer, Uni-Geräte E. Mangelmann Elektrotechnische Fabrik GmbH, satisfy the requirements of 2014/68/EU Article 14 Module H. The valves comply with the fundamental requirements of Directive 2014/68/EU. Valves in according to Article 1 Paragraph 2,f,v or Article 4 paragraph 3 are not allowed to have the CE Mark in according to Article 18.

### Note concerning ex-guideline 2014/34/EU (explosion guideline ATEX):

The product is not subject to guideline 2014/34/EU, since due to the loads occurring during practical operation, there is no effective source of ignition even in case of an error case to be assumed. This also applies to spring loaded components in medium filled rooms. In case of electric drives, sensors or other electric components the application as per 2014/34/EU is to be checked separately.

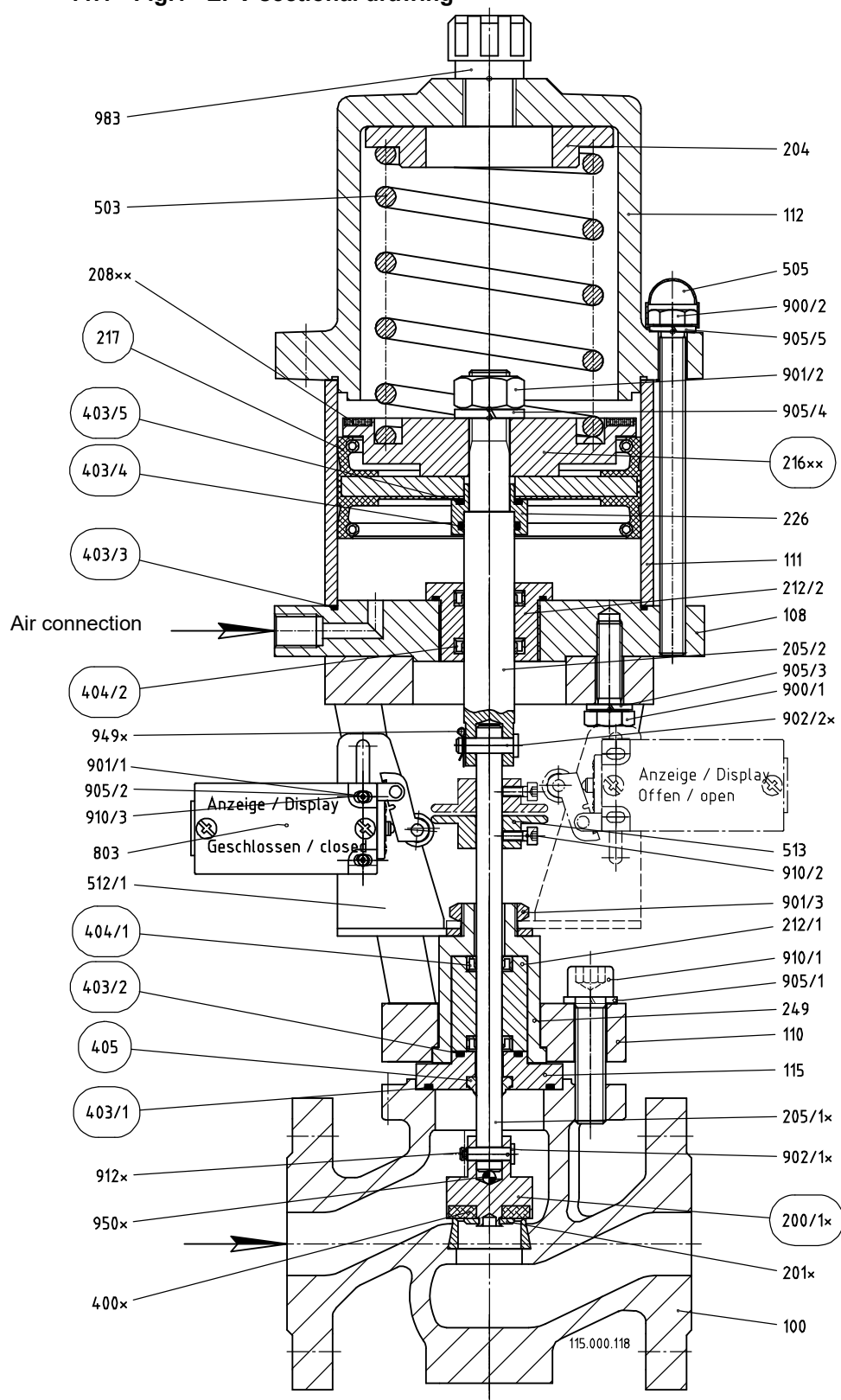




# Operating manual

## 11.0 Drawing

### 11.1 Fig.1 EPV sectional drawing



O = Spare part kit

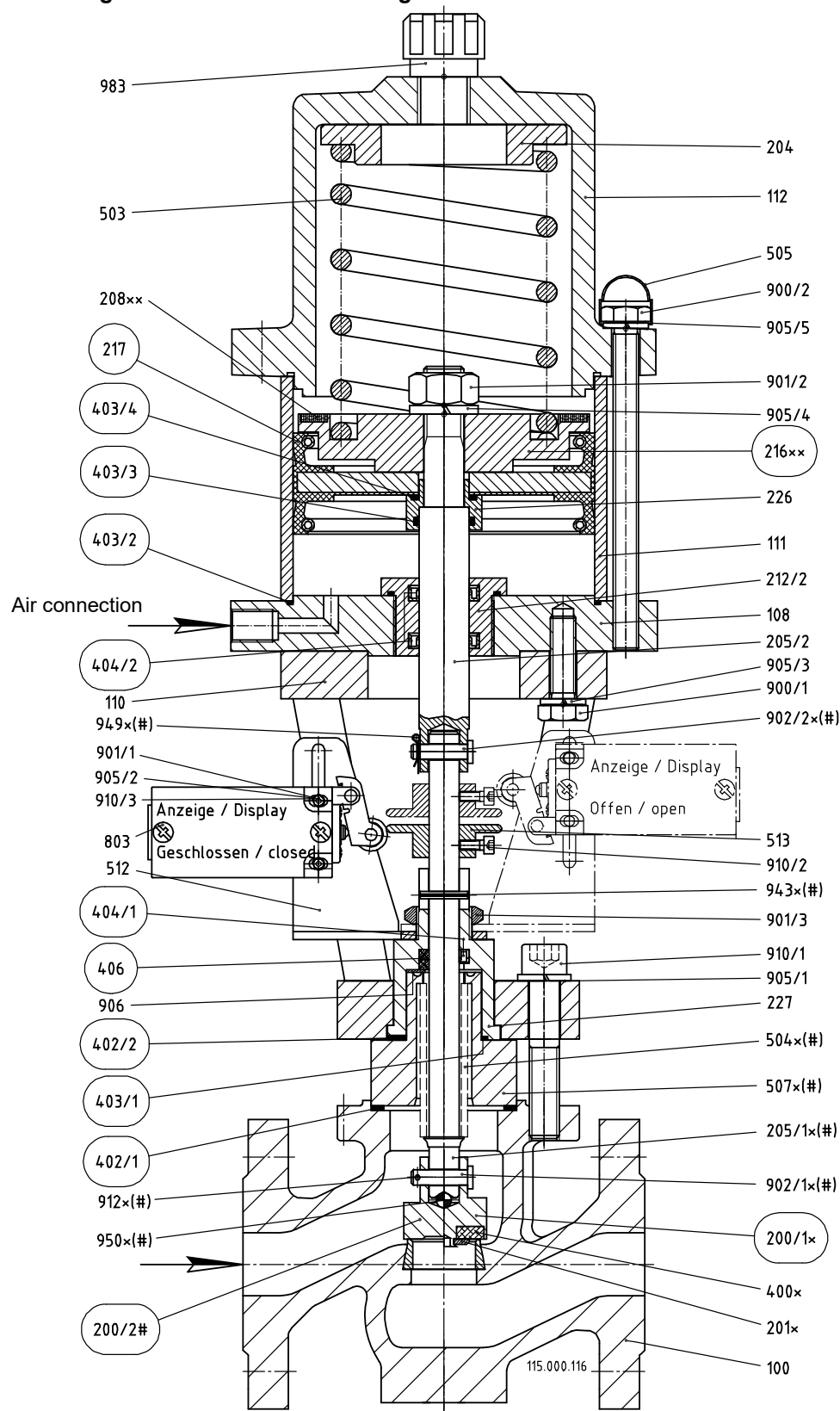
(\* or \*\*) are supplied as a complete unit





# Operating manual

**Fig.2 EPVF sectional drawing**



O = Spare part kit

(\* , \*\* or #) are supplied as a complete unit

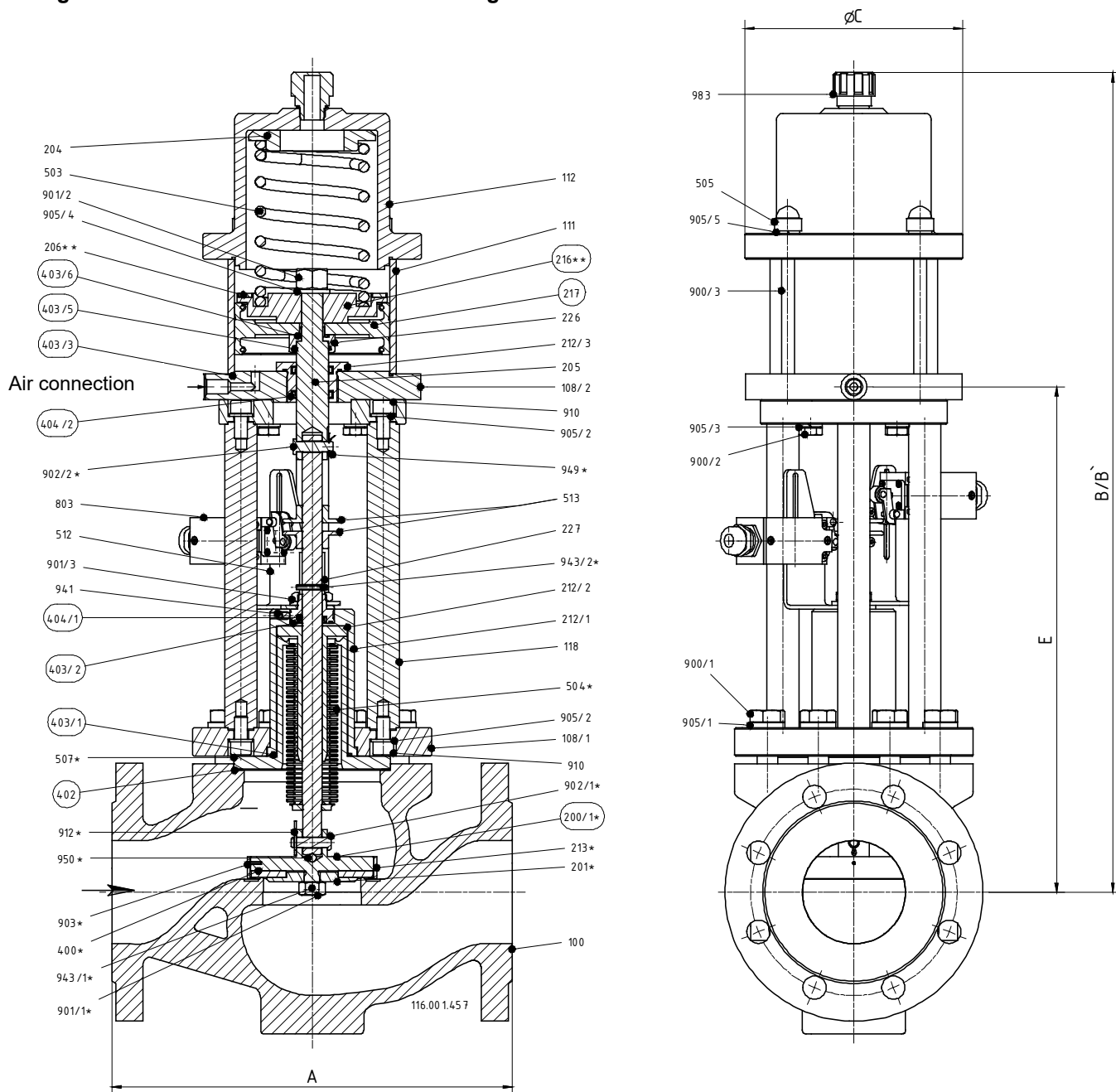






# Operating manual

**Fig.3 6/8-4-EPVF 30NÜ... sectional drawing**



O = Spare part kit  
(\* or \*\*) are supplied as a complete unit

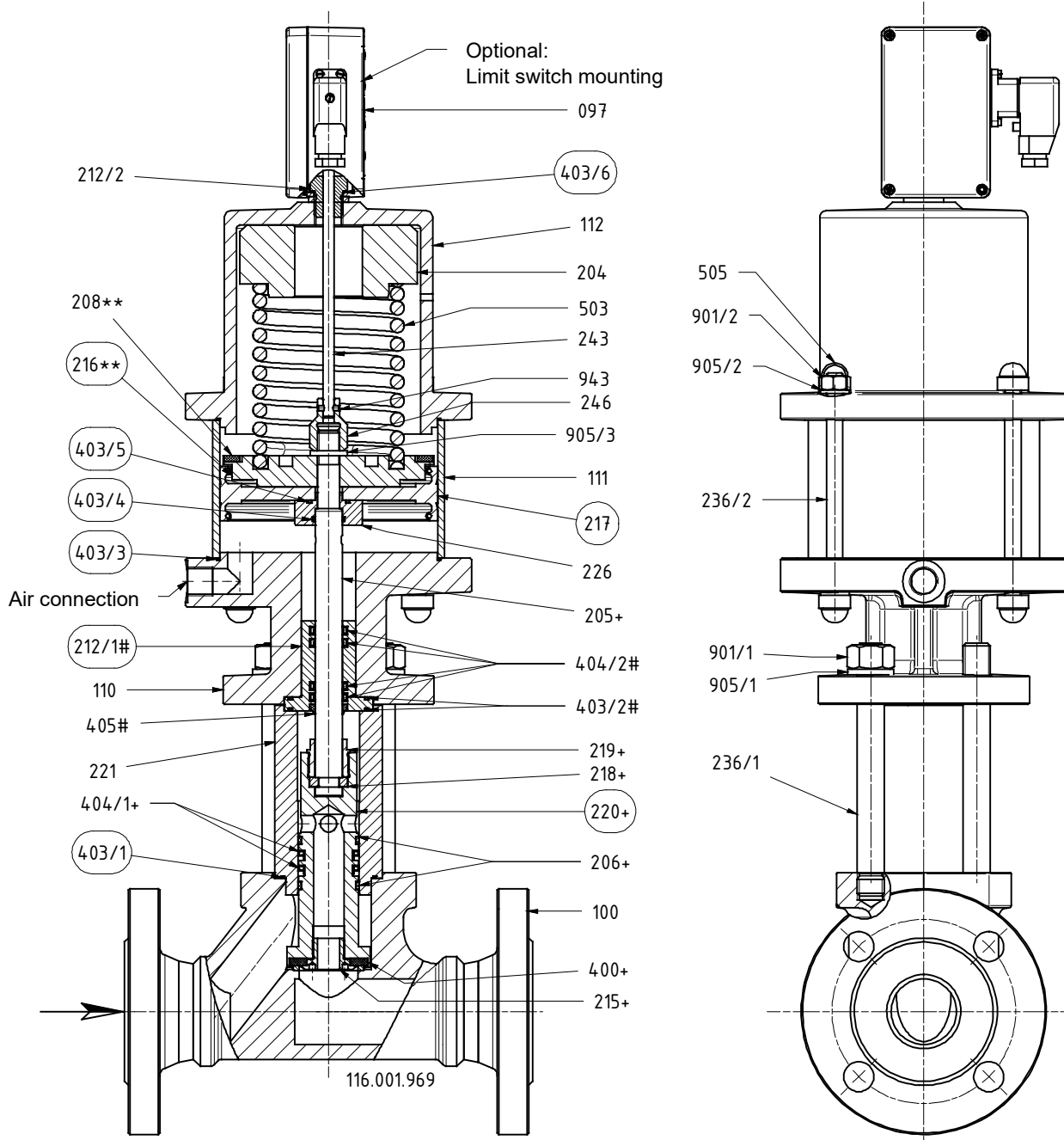






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**Fig.4 45-4 EPV...N.. DN 40 / DN 50 sectional drawing**



O = spare part kit

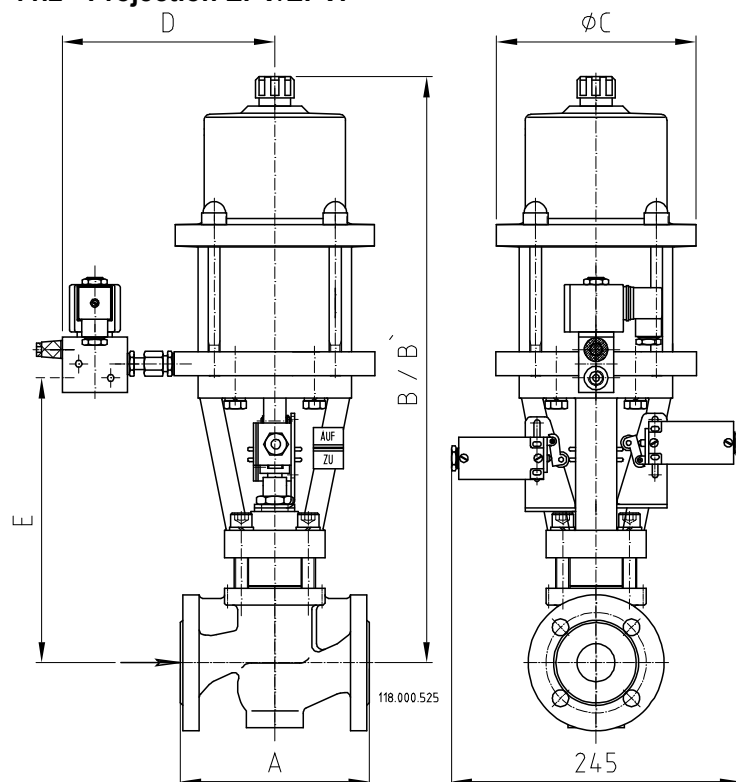
(+, # or \*\*) are supplied as a complete unit



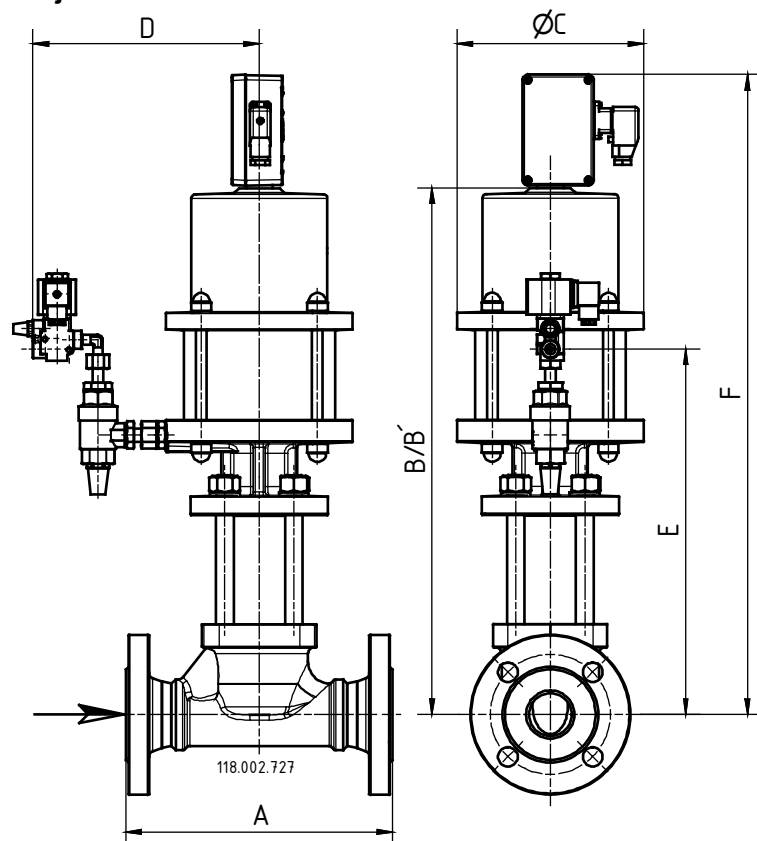


# Operating manual

## 11.2 Projection EPV/EPVF



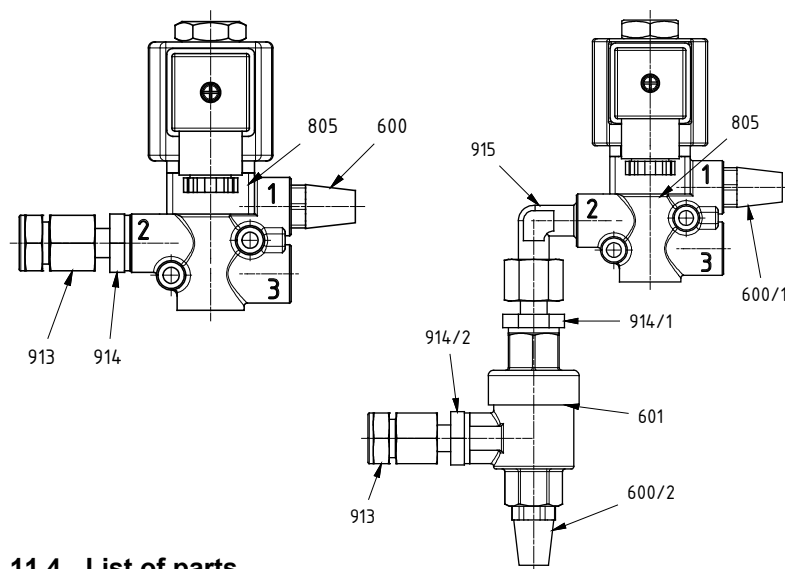
## Projection 45-4 EPV





# Operating manual

## 11.3 Control valve



Connection 1 = Ventilation  
Connection 2 = Drive  
Connection 3 = Control air

## 11.4 List of parts

| Pos./ Item | Stück/ Qty. | Benennung            | Description            |
|------------|-------------|----------------------|------------------------|
| 097        | 1           | Endschalteranbau     | Limit switch mounting  |
| 100        | 1           | Ventilgehäuse        | Valve chamber/ housing |
| 108        | 1           | Gehäuseflansch       | Housing flange         |
| 110        | 1           | Distanzstück         | Spacer                 |
| 111        | 1           | Pneumatikzylinder    | Pneumatic cylinder     |
| 112        | 1           | Federdom             | Spring cap             |
| 115        | 1           | Dichtplatte          | Sealing board          |
| 200/1      | 1           | Ventilteller         | Valve disk             |
| 200/2      | 1           | Ventilteller         | Valve disk             |
| 201        | 1           | Tellerscheibe        | Disk plate             |
| 204        | 1           | Federführung         | Spring guide pin       |
| 205        | 1           | Ventilspindel        | Valve spindle          |
| 205/1      | 1           | Ventilspindel        | Valve spindle          |
| 205/2      | 1           | Ventilspindel        | Valve spindle          |
| 206        | 2           | Führungsring         | Guide ring             |
| 208        | 1           | Schlagdämpfung       | Sound insulation       |
| 212/1      | 1           | Spindelführung       | Spindle guide          |
| 212/2      | 1           | Spindelführung       | Spindle guide          |
| 215        | 1           | Tellerschraube       | Plate screw            |
| 216        | 1           | Federteller          | Spring disk            |
| 217        | 1           | Antriebskolben       | Drive piston           |
| 218        | 1           | Zweiteiliger Ring    | Two-piece ring         |
| 219        | 1           | Spindelmutter        | Spindle nut            |
| 220        | 1           | Ausgleichskolben     | Balance piston         |
| 221        | 1           | Kolbenführung        | Piston guide           |
| 226        | 1           | Dichtstück           | Sealing piece          |
| 227        | 1           | Verdrehschutz        | Torsion protection     |
| 236/1      | 4           | Stiftschraube        | Stud                   |
| 236/2      | 4           | Stiftschraube        | Stud                   |
| 243        | 1           | Endschalterspindel   | Limit switch spindle   |
| 400        | 1           | Ventiltellerdichtung | Valve disk sealing     |
| 402/1      | 1           | Flachdichtung        | Gasket                 |
| 402/2      | 1           | Flachdichtung        | Gasket                 |
| 402/3      | 1           | Flachdichtung        | Basket                 |
| 403/1      | 1           | O-Ring               | O-ring                 |





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| Pos./ Item | Stück/ Qty. | Benennung                      | Description                      |
|------------|-------------|--------------------------------|----------------------------------|
| 403/2      | 1/2         | O-Ring                         | O-ring                           |
| 403/3      | 1           | O-Ring                         | O-ring                           |
| 403/4      | 1           | O-Ring                         | O-ring                           |
| 403/5      | 1           | O-Ring                         | O-ring                           |
| 403/6      | 1           | O-Ring                         | O-ring                           |
| 404/1      | 1/2         | Lippenring                     | Lip-ring                         |
| 404/2      | 2/4         | Lippenring                     | Lip-ring                         |
| 405        | 1           | Abstreifring                   | Scraper ring                     |
| 406        | 2           | Packung                        | Packing                          |
| 503        | 1           | Druckfeder                     | Pressure spring                  |
| 504        | 1           | Faltenbalg                     | Expansion bellows                |
| 505        | 4/8         | Schutzkappe                    | Protective cap                   |
| 507        | 1           | Faltenbalgstück                | Expansion bellows piece          |
| 512        | 1/2         | Endschalterkonsole             | Limit switch console             |
| 513        | 1/2         | Endschalterbetätigung          | Switch actuator                  |
| 600        | 1           | Schalldämpfer                  | Sound absorber                   |
| 803        | 1/2         | Endschalter                    | Limit switch                     |
| 805        | 1           | Steuerventil                   | Control valve                    |
| 900/1      | 4           | Sechskantschraube              | Hex. head screw                  |
| 900/2      | 4           | Sechskantschraube              | Hex. head screw                  |
| 901/1      | 2/4         | Sechskantmutter                | Hex. nut                         |
| 901/2      | 1/8         | Sechskantmutter                | Hex. nut                         |
| 901/3      | 1           | Sechskantmutter                | Hex. nut                         |
| 902/1      | 1           | Bolzen                         | Bolt                             |
| 902/2      | 1           | Bolzen                         | Bolt                             |
| 905/1      | 4           | Federring                      | Lock washer                      |
| 905/2      | 2/4/8       | Federring                      | Lock washer                      |
| 905/3      | 1/4         | Federring                      | Lock washer                      |
| 905/4      | 1           | Federring                      | Lock washer                      |
| 905/5      | 4           | Federring                      | Lock washer                      |
| 906        | 1           | Scheibe                        | Washer                           |
| 910/1      | 4           | Zylinderschraube               | Cylinder screw                   |
| 910/2      | 1/2         | Zylinderschraube               | Cylinder screw                   |
| 910/3      | 2/4         | Zylinderschraube               | Cylinder screw                   |
| 912        | 1           | Splint                         | Split-pin                        |
| 913        | 1           | Gerade Einschraubverschraubung | Linear threaded screw connection |
| 914        | 1           | Gerader Aufsteckstutzen        | Linear put on adapter            |
| 943        | 1           | Spannstift                     | Spring dowel sleeve              |
| 949        | 1           | SL-Sicherung                   | SL-locking                       |
| 950        | 1           | Kugel                          | Ball                             |
| 983        | 1           | Entlüftungsstopfen             | Exhaust plug                     |

## Spare parts

| Type                 | DN            | Fig.   | Spare parts    |
|----------------------|---------------|--------|----------------|
| ..-4-EPV 5N – 30N..  | DN 15 – DN 80 | Fig. 1 | Spare part kit |
| ..-4-EPVF 5N – 25N.. | DN 15 – DN 65 | Fig. 2 | Spare part kit |
| 6/8-4-EPVF 30NÜ..    | DN 80         | Fig. 3 | Spare part kit |
| 45-4 EPV...N...      | DN 40 – DN 50 | Fig. 4 | Spare part kit |





# Operating manual

## Dimension

| Series                      | DN        | A   | ANSI          | B   | B`  | ØC  | D   | E   | F   |
|-----------------------------|-----------|-----|---------------|-----|-----|-----|-----|-----|-----|
| <b>..-4 EPV...NÜ..92/93</b> | <b>15</b> | 130 | <b>1/2"</b>   | 485 | 685 | 170 | 180 | 230 | -   |
|                             | <b>20</b> | 150 | <b>3/4"</b>   | 485 | 685 | 170 | 180 | 230 | -   |
|                             | <b>25</b> | 160 | <b>1"</b>     | 485 | 685 | 170 | 180 | 230 | -   |
|                             | <b>32</b> | 180 | <b>1 1/4"</b> | 492 | 692 | 170 | 180 | 237 | -   |
|                             | <b>40</b> | 200 | <b>1 1/2"</b> | 492 | 692 | 170 | 180 | 237 | -   |
|                             | <b>50</b> | 230 | <b>2"</b>     | 500 | 700 | 170 | 180 | 245 | -   |
|                             | <b>65</b> | 290 | <b>2 1/2"</b> | 510 | 710 | 170 | 180 | 255 | -   |
|                             | <b>80</b> | 310 | <b>3"</b>     | 520 | 720 | 170 | 180 | 265 | -   |
| <b>..-4 EPVF..NÜ..92/93</b> | <b>15</b> | 130 | <b>1/2"</b>   | 496 | 696 | 170 | 180 | 242 | -   |
|                             | <b>20</b> | 150 | <b>3/4"</b>   | 496 | 696 | 170 | 180 | 242 | -   |
|                             | <b>25</b> | 160 | <b>1"</b>     | 496 | 696 | 170 | 180 | 242 | -   |
|                             | <b>32</b> | 180 | <b>1 1/4"</b> | 503 | 703 | 170 | 180 | 250 | -   |
|                             | <b>40</b> | 200 | <b>1 1/2"</b> | 503 | 703 | 170 | 180 | 250 | -   |
|                             | <b>50</b> | 230 | <b>2"</b>     | 511 | 711 | 170 | 180 | 257 | -   |
|                             | <b>65</b> | 290 | <b>2 1/2"</b> | 521 | 721 | 170 | 180 | 267 | -   |
|                             | <b>80</b> | 310 | <b>3"</b>     | 521 | 721 | 170 | 180 | 267 | -   |
| <b>6-4-EPVF 30NÜ...</b>     | <b>80</b> | 310 | <b>3"</b>     | 635 | 835 | 170 | 180 | 392 | -   |
| <b>8-4 EPVF 30NÜ...</b>     | <b>80</b> | 310 | <b>3"</b>     | 668 | 890 | 209 | 238 | 465 | -   |
| <b>45-4 EPV...N..</b>       | <b>40</b> | 260 | <b>1 1/2"</b> | 515 | 606 | 170 | 235 | 400 | 642 |
|                             | <b>50</b> | 300 | <b>2"</b>     | 620 | 711 | 170 | 256 | 412 | 722 |

**A** = Dimension at DIN (resp. flanges ANSI and dimension DIN or flanges and dimension at DIN)

**B`** = Dimension for removing the pneumatic drive

