



# Operating manual

## Flow-Control-Butterfly-Valve **Series MRK Ma** Control valve

EN





# Operating manual

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# Operating manual

## 1.0 General remarks

This operating manual includes instructions to assemble and operate the control valve in the prescribed and safe way. **Additionally, the adequate operating instructions of each special solenoid drive must be considered.**

|                     |                                 |
|---------------------|---------------------------------|
| Series MG...(Xn)... | 220.100.011 DE / 220.100.038 EN |
| Series MG...x       | 220.100.028 DE / 220.100.040 EN |
| Series MG...m       | 220.100.004 DE / 220.100.039 EN |

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 control valve is 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 Control valve data

### Manufacturer:

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

### Designation

Control valve as actuator for controlling without zero obturation with solenoid-actuator.

### Working pressure:

0 – 150 mbar (0 - 15 kPa)

### Medium temperature:

|                |                                       |
|----------------|---------------------------------------|
| MRK Ma...-4    | -20 °C to + 60 °C (253 K to 333 K)    |
| MRK Ma...Ü200  | -20 °C to + 200 °C (253 K to 473 K)   |
| MRK Ma...Ü550  | -20 °C to + 550 °C (253 K to 823 K)   |
| MRK Ma...Ü700  | -20 °C to + 700 °C (253 K to 973 K)   |
| MRK Ma...Ü1000 | -20 °C to + 1000 °C (253 K to 1273 K) |

### Ambient temperature:

-20 °C to + 60 °C (253 K to 333 K)

### Actuation type:

Ma with solenoid-actuator

### Fitting position:

Horizontal pipe vertical solenoid drive  $\pm 5^\circ$ ; with additional order information "W" vertical pipe vertical solenoid drive  $\pm 5^\circ$ .

### Ausführung:

Butterfly plate through passage  
Butterfly plate limit stop (-2)  
(in case of construction with limit stop a „-2“ is added to the model designation e.g. MRK Ma...-4-2)

### Optional:

Special control butterfly plate (55)  
Through passage drawn in

### Switching cycles:

see operating instructions solenoid drive





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**Installation between to flanges** acc. to DIN EN 1092-2 / ANSI

| Type           | 15<br>(5N) | 20<br>(7N) | 25<br>(10N) | 32<br>(12N) | 40<br>(15N) | 50<br>(20N) | 65<br>(25N) | 80<br>(30N) |
|----------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| MRK Ma...-4    | X          | X          | X           | X           | X           | X           | X           | X           |
| MRK Ma...Ü200  | O          | O          | O           | O           | O           | O           | O           | O           |
| MRK Ma...Ü550  | O          | O          | O           | O           | O           | O           | O           | O           |
| MRK Ma...Ü700  | O          | O          | O           | O           | O           | O           | O           | O           |
| MRK Ma...Ü1000 | O          | O          | O           | O           | O           | O           | O           | O           |

X Type examination EU2016/426, CE-0085AR0408

| Type           | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| MRK Ma...-4    | X   | X   | X   | X   | X   | X   | X   | X   |
| MRK Ma...Ü200  | O   | O   | O   | O   | O   | O   | O   | O   |
| MRK Ma...Ü550  | O   | O   | O   | O   | O   | O   | O   | O   |
| MRK Ma...Ü700  | O   | O   | O   | O   | O   | O   | O   | O   |
| MRK Ma...Ü1000 | O   | O   | O   | (*) | (*) | (*) | (*) | (*) |

X Type examination EU2016/426, CE-0085AR0408

(\*) DN 200 – DN 400 on request

## Voltage:

VDC 12 – 440 (-15% to +10%)

VAC 24 – 500 (-15% to +10%)

## Protection type:

IP54 oder IP65

## Frequency:

40 – 60 Hz

## Power:

10 – 4000 W

Details to the electrical data can be found on the type sign and the adequate operating instructions of the solenoid drives.

## 1.2 Application

The flow-control-butterfly-valves MRK Ma are used as actuators for control tasks in the entire firing technology.

The control valves are suitable for gases of the 1st, 2nd and 3rd gas families to DIN EN 437 and for neutral gases and air. As variation with material design for hot air, flue gas, exhaust gas and aggressive gases.

|                |                                            |
|----------------|--------------------------------------------|
| MRK Ma...-4    | Gases of the 1.,2.,3. gas families and air |
| MRK Ma...Ü200  | Hot air / neutral gases                    |
| MRK Ma...Ü550  | Hot air / exhaust gases                    |
| MRK Ma...Ü700  | Hot air / exhaust gases                    |
| MRK Ma...Ü1000 | Flue gas                                   |

If used in other cases, the operator must carefully check if construction/design of control 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 control 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 control 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 control 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 control valve by third persons may cancel and abolish the manufacturer's liability for resulting consequences.

## 2.5 Unauthorized operation

Operational reliability of the delivered control 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.**

## 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.





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- 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-control 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!

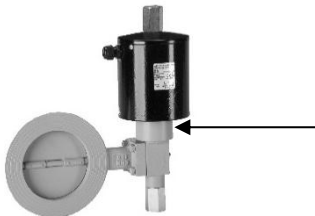
## 3.0 Handling

### 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.

The goods to be transported must be carefully treated. During transport, the control 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 flow-control-butterfly-valve at screwed cable glands, appliance plugs or add-on units.** Transport the flow-control-butterfly-valve with a belt below the solenoid drive (see illustration).



Transport the control valve in a box or on a pallet with soft base and it smoothly on even floor. **Never put valve on attachment parts.**

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

### 3.2 Storage

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

- Storage of the flow-control-butterfly-valve with an opening of approximately 15°.
- 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

- Protect against atmospheric influences such as humidity.
- Appropriate treatment protects against damage.





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## 4.0 Product description

The flow-control-butterfly-valves in the MRK series are control valves as actuators for controlling without zero obturation with solenoid-actuator.

The sectional drawing in section 11.1 shows the butterfly plate - version 11.2 Fig. 1 - Fig. 9 shows the construction.

### 4.1 Function

- NC normally closed MRK Ma...
- NO normally opened MRK Ma...**R**  
(in case of version normally opened a „R“ is added to the model designation e.g. MRK Ma...**R**)

#### Function NC normally closed MRK Ma...

By switching on the solenoid drive (800) the solenoid core (207) is drawn and operates the butterfly plate (232) via the toothed rack (247) and the toothed spindle (248) releasing the set cross section. The flow-control-butterfly-valve is open or moves the butterfly plate (232) into the main flow setting.

In case of switching off, breakdown or interruption of the energy supply to the solenoid drive, the solenoid core (207) withdraws due to the pre-stress of the pressure spring (503) and closes the flow-control-butterfly-valve or moves the butterfly plate (232) into the base flow setting.

#### Function NO normally opened MRK Ma...**R**

By switching on of the solenoid drive (800) the solenoid core (207) is drawn and operates the butterfly plate (232) via the toothed rack (247) and the toothed spindle (248) closing the set cross section. The flow-control-butterfly-valve is closed or moves the butterfly plate (232) into the base flow setting.

In case of switching off, breakdown or interruption of the energy supply to the solenoid drive, the solenoid core (207) withdraws due to the pre-stress of the pressure spring (503) and opens the flow-control-butterfly-valve or moves the butterfly plate (232) into the main flow setting.



#### NOTICE!

To set the base- (G) and main flow (H), see Fig. 5 and Fig.6  
No base flow or main flow is set at the factory.

### 4.2 Technical data

Control: without zero obturation

#### Solenoid-drive types MG...

| Type           | DN         |            |             |             |             |             |             |             |
|----------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                | 15<br>(5N) | 20<br>(7N) | 25<br>(10N) | 32<br>(12N) | 40<br>(15N) | 50<br>(20N) | 65<br>(25N) | 80<br>(30N) |
| MRK Ma...-4    | 012        | 012        | 012         | 012         | 012         | 012         | 012         | 012         |
| MRK Ma...Ü200  | 012        | 012        | 012         | 012         | 012         | 012         | 012         | 012         |
| MRK Ma...Ü550  | 014        | 014        | 014         | 014         | 014         | 014         | 014         | 014         |
| MRK Ma...Ü700  | 016        | 016        | 016         | 016         | 018         | 018         | 018         | 019         |
| MRK Ma...Ü1000 | 018        | 018        | 019         | 019         | 019         | 019         | 019         | 019         |

| Type           | DN  |     |     |     |     |     |       |       |
|----------------|-----|-----|-----|-----|-----|-----|-------|-------|
|                | 100 | 125 | 150 | 200 | 250 | 300 | 350   | 400   |
| MRK Ma...-4    | 012 | 012 | 014 | 016 | 019 | 019 | 019   | 020   |
| MRK Ma...Ü200  | 012 | 012 | 014 | 016 | 019 | 019 | 019   | 020   |
| MRK Ma...Ü550  | 014 | 014 | 016 | 019 | 019 | 019 | 019   | 020A1 |
| MRK Ma...Ü700  | 019 | 019 | 019 | 020 | 020 | 020 | 020A1 | 020A2 |
| MRK Ma...Ü1000 | 019 | 019 | 019 | -   | -   | -   | -     | -     |

Drive types with "A" consist of pickup and holding winding





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## Max. control 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 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
- Solenoid drive type
- Electr. performance
- Voltage
- Frequency
- Protection type

When using solenoid drives for ex-protection zone 1 refer to information in the valid operating instructions

Refer also to section 10.0

## 5.0 Installation

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



#### DANGER!

Safe operation of the control 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 control 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 control valve or other installations.

### 5.2 Installation

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



#### NOTICE!

- The inside of the control valve and the pipeline must be free from foreign particles.
- 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 control 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.

The flow-control-butterfly-valve can be installed with vertical but not suspended solenoid drive. with additional order information "W" in the type designation the flow-control-butterfly-valve can be installed in a vertical pipe with vertical solenoid drive.



## NOTICE!

Observe the solenoid drive 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 control valve (dirt, weld beads, etc.) will inevitably result in leaks.
- Leakage inspection of the installed control 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

Flow-control-butterfly-valves have to be checked at regular intervals for proper function. The intervals for regular inspections have to be defined by the operator according to the operating conditions. Uni-Geräte recommends an external visual inspection once a year and an overhaul of the flow-control-butterfly-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.

### 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.





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## 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                                        | Clogging in the pipework system                               | Check pipework system                                      |
| No external tightness                          | Gaskets damaged                                               | See section 8 or replace flow-control-butterfly-valve      |
| <b>MRK Ma... (version normally closed NC)</b>  |                                                               |                                                            |
| Low flow rate                                  | Flow-control-butterfly-valve does not open / close completely | Check setting of base flow resp. main flow                 |
| Flow-control-butterfly-valve does not open     | Working pressure too high                                     | Compare working pressure with the data on the rating plate |
|                                                | Foreign matter in pipe                                        | Clean pipe                                                 |
|                                                | Solenoid drive without function                               | Switch on solenoid drive                                   |
|                                                | Existing voltage too low                                      | Check voltage                                              |
| Flow-control-butterfly-valve does not close    | Foreign matter in pipe                                        | Clean pipe                                                 |
|                                                | Solenoid drive without function                               | Switch off solenoid drive                                  |
|                                                | Existing voltage too high                                     | Check voltage                                              |
| <b>MRK Ma...R (version normally opened NO)</b> |                                                               |                                                            |
| Low flow rate                                  | Flow-control-butterfly-valve does not open / close completely | Check setting of base flow resp. main flow                 |
| Flow-control-butterfly-valve does not open     | Foreign matter in pipe                                        | Clean pipe                                                 |
|                                                | Solenoid drive without function                               | Switch off solenoid drive                                  |
|                                                | Existing voltage too high                                     | Check voltage                                              |
| Flow-control-butterfly-valve does not close    | Working pressure too high                                     | Compare working pressure with the data on the rating plate |
|                                                | Foreign matter in pipe                                        | Clean pipe                                                 |
|                                                | Solenoid drive without function                               | Switch on solenoid drive                                   |
|                                                | Existing voltage too low                                      | Check voltage                                              |



#### **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 control 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)

## 8.1 Replacement of wear parts

Shut down the valve as described in section 6.2.

Switch off and dismantle the solenoid drive as described in the operating manual of the solenoid drive.



### **DANGER!**

After continuous operation, the solenoid drive may be hot! Danger of burns!

Replace the flow-control-butterfly-valves





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## 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 Explanation on codes and directives

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. Regulation EU/2016/426 and directive 2014/68/EU are of relevance for the control valve (mechanical part).

### Notes on Regulation EU/2016/426 (Gas Appliances Regulation GAR):

The control valves have been developed, manufactured and tested in compliance with the applicable harmonised standard and comply with the relevant requirements of the Regulation EU/2016/426. Unless otherwise stated separately, this has been confirmed by a type examination.

### 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 control valves comply with the fundamental requirements of Directive 2014/68/EU. Control valves in accordance with Article 1 Paragraph 2, f, v or Article 4 paragraph 3 are not allowed to have the CE Mark in accordance with 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.

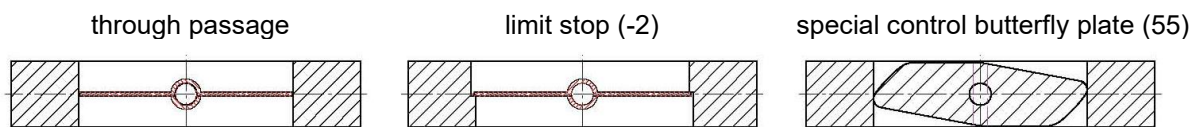




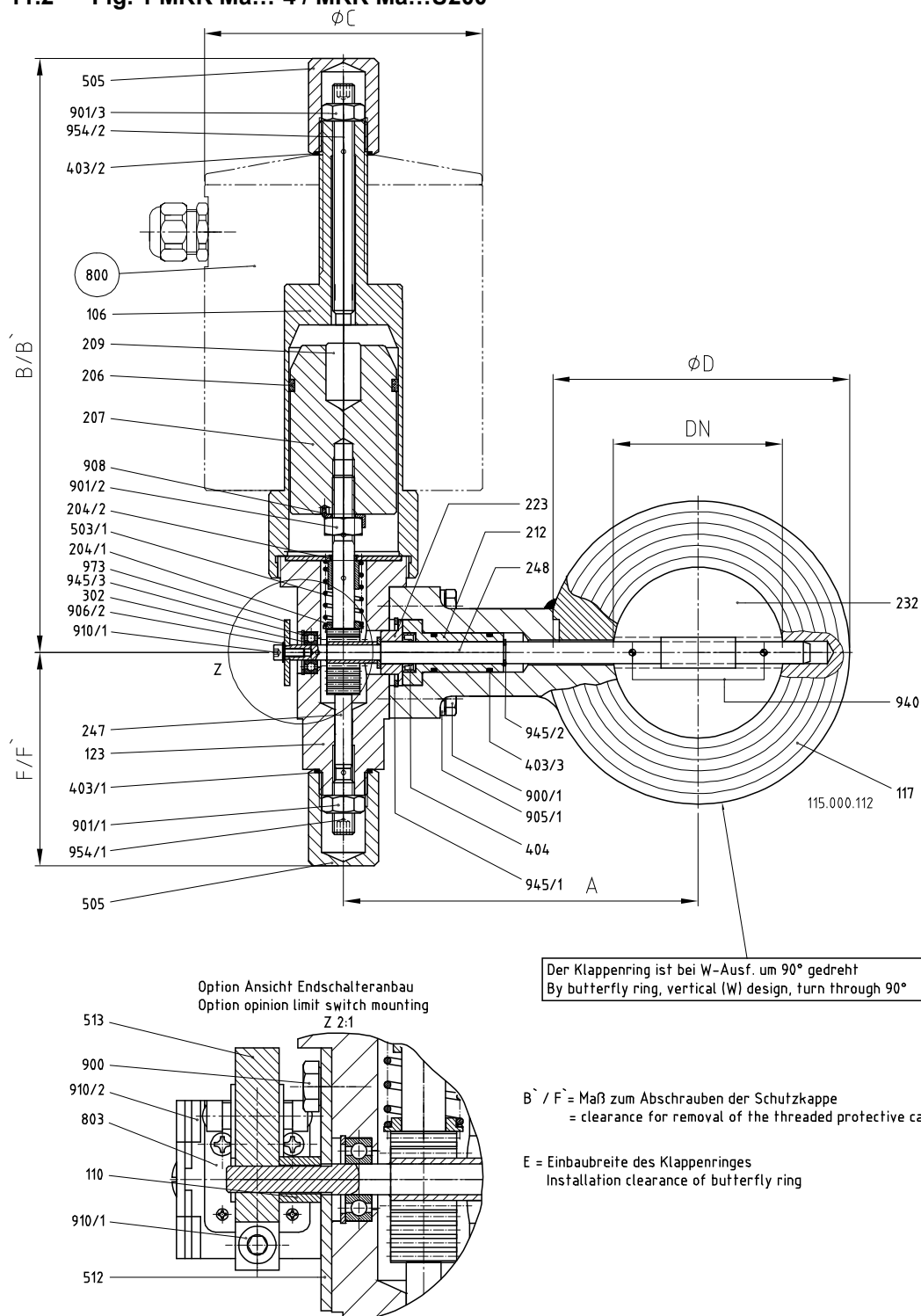
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## 11.0 Drawing

### 11.1 Version butterfly plate



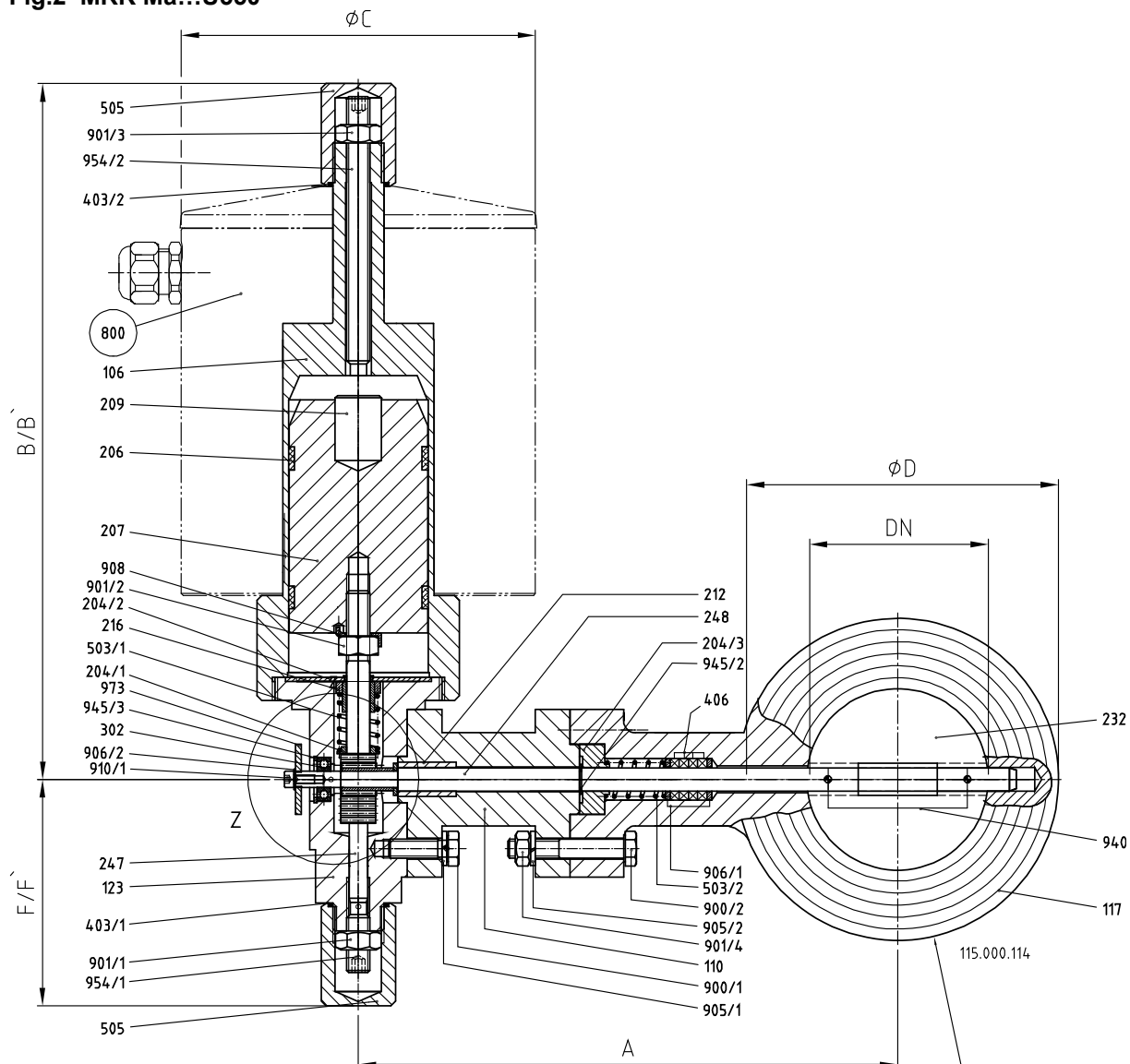
### 11.2 Fig. 1 MRK Ma...-4 / MRK Ma...Ü200



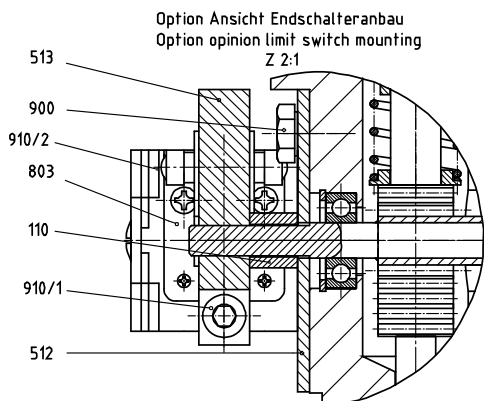


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Fig.2 MRK Ma...Ü550



Der Klappenring ist bei W-Ausf. um 90° gedreht  
By butterfly ring, vertical (W) design, turn through 90°



$B' / F' =$  Maß zum Abschrauben der Schutzkappe  
= clearance for removal of the threaded protective cap

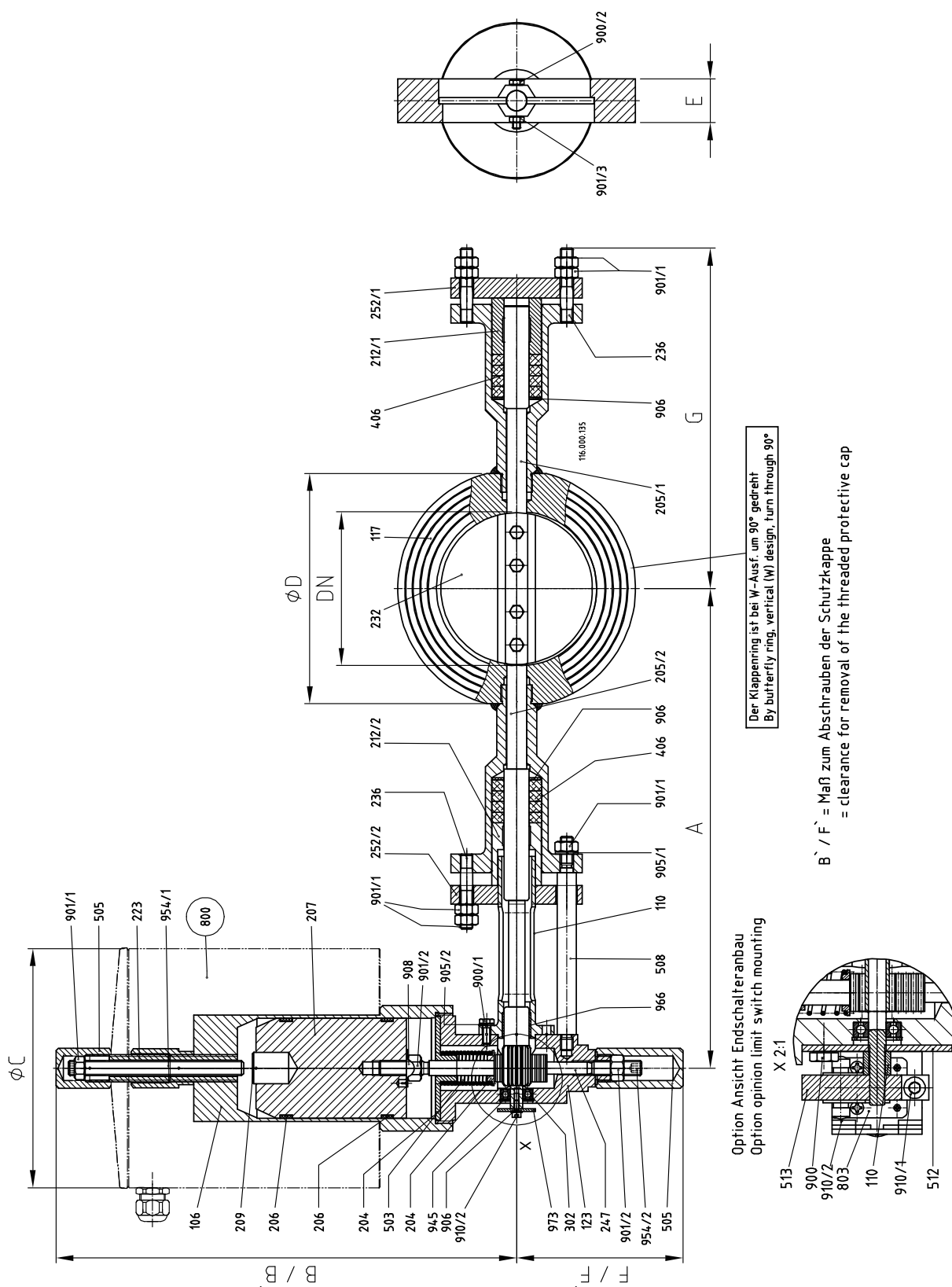
E = Einbaubreite des Klappenringes  
Installation clearance of butterfly ring





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Fig.3 MRK Ma...Ü700







Technical drawing of a butterfly valve assembly, showing a cross-section (A-A) and a side view (B-B).

**Section A-A (1:1):** Shows the butterfly plate (953) and the valve body (910/1, 232/1, 232/2). The plate is turned 90 degrees for the vertical design.

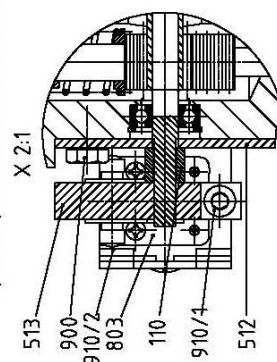
**Section B-B:** Shows the internal components, including the butterfly plate (953), the valve body (910/1, 232/1, 232/2), and the actuator (505, 901/1, 954/1, 223, 800, 106, 209, 210, 503/2, 207, 206, 908, 901/2, 204/2, 503/1, 204/1, 945, 906, 910/2, 973, 302, 247, 123, 901/2, 954/2, 505).

**Dimensions:** A, B/B, C, D, DN, E, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z.

**Notes:**

- Der Klappenring ist bei W.-Ausf. um 90° gedreht!
- By butterfly plate, vertical (W) design, turn through 90°!

Option Ansicht Endschalteranbau  
Option opinion limit switch mounting



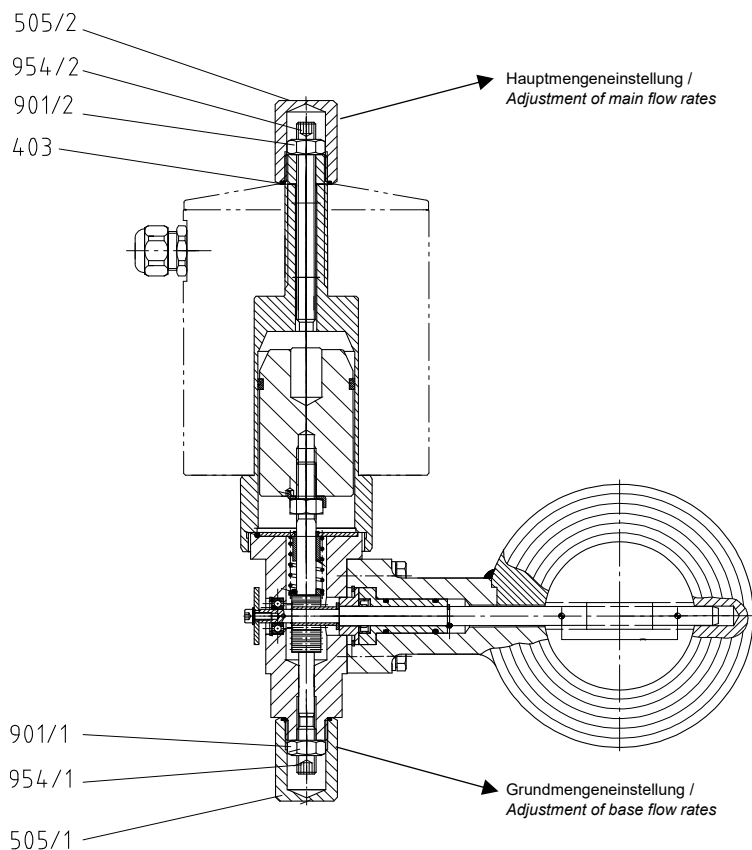
$B' / F' = \text{Maß zum Abschrauben der Schutzkappe}$   
= clearance for removal of the threaded protective cap





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**Abb.5 Main- and base flow setting for solenoid-actuators in standard-version**

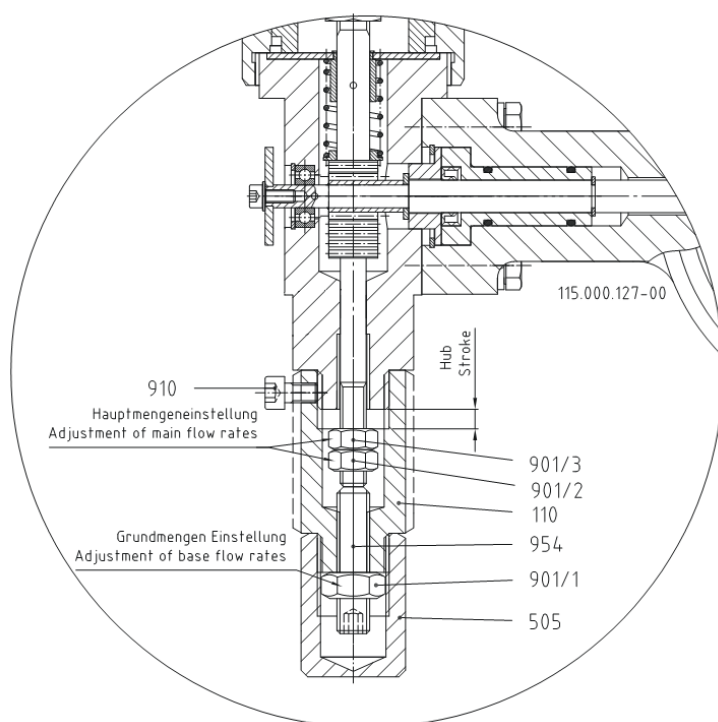


1. Unscrew protective cap (505/1) resp. (505/2).
2. Loosen hex. nut (901/1) resp. (901/2).
3. The desired flow setting can be set by turning the adjusting pin (954/1) (base flow) resp. (954/2) (main flow) clockwise.
4. After setting secure the adjustment pin (954/1) resp. (954/2) against moving using the hex. nut (901/1) resp. (901/2).
5. Screw on protective cap (505/1) resp. (505/2).

**NOTICE:**

Ensure that the O-ring (403) is seated correctly.

**Abb.6 Main- and base flow setting for solenoid-actuators in MG...x-version**



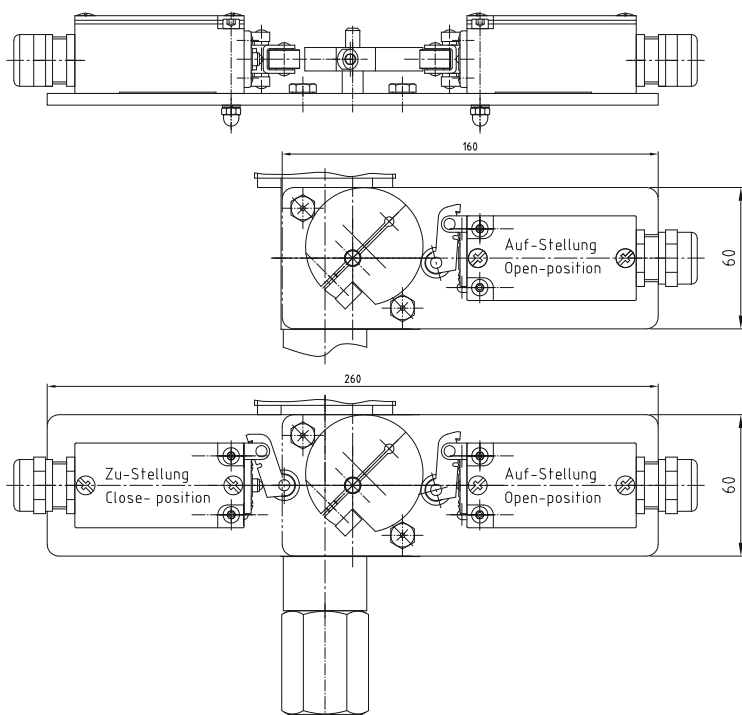
1. Unscrew protective cap (505) resp. loosen cylinder head screw (910) and unscrew spacer (110).
2. Loosen hex. nut (901/1) resp. (901/3).
3. The desired flow setting can be set by turning the adjusting pin (954) (base flow) resp. hex. nut (901/3) (main flow) clockwise.
4. After setting secure the adjustment pin (954) resp. hex. nut (901/3) against moving using the hex. nut (901/1) resp. (901/2).
5. Screw on protective cap (505) resp. screw on spacer (110) and secure via cylinder head screw (910).



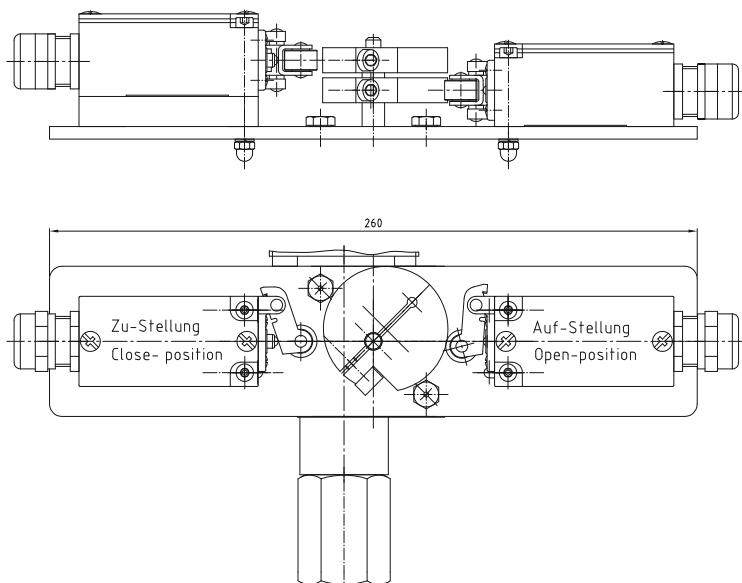


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**Fig.7 Limit switch installation with one or two limit switches - with one limit switch actuation**



**Fig.8 Limit switch installation with two limit switches - with two limit switch actuations**



**Fig.9 MRK Ma... Version with through passage drawn in**





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## 11.3 List of parts

| Pos./ Item | Stück/ Qty. | Benennung          | Description              |
|------------|-------------|--------------------|--------------------------|
| 101        | 1           | Gehäusemutter      | Housing nut              |
| 106        | 1           | Gehäuseoberteil    | Upper part of housing    |
| 110        | 1           | Distanzstück       | Spacer                   |
| 117        | 1           | Klappenring        | Butterfly ring           |
| 123        | 1           | Klappengehäuse     | Butterfly housing        |
| 204/1      | 1           | Federführung       | Spring guide             |
| 204/2      | 1           | Federführung       | Spring guide             |
| 204/3      | 1           | Federführung       | Spring guide             |
| 206        | 2           | Führungsring       | Guide ring               |
| 207        | 1           | Magnetkern         | Solenoid core            |
| 209        | 1           | Abwurfbolzen       | Discharge bolt           |
| 212        | 1           | Spindelführung     | Spindle guide            |
| 216        | 1           | Federteller        | Spring disc              |
| 223/1      | 1           | Buchse             | Bush                     |
| 223/2      | 1           | Buchse             | Bush                     |
| 223/3      | 1           | Buchse             | Bush                     |
| 232        | 1           | Klappenteller      | Butterfly plate          |
| 247        | 1           | Zahnstange         | Toothed rack             |
| 248        | 1           | Zahnspindel        | Toothed spindle          |
| 302        | 1           | Rillenkugellager   | Deep groove ball bearing |
| 402        | 1           | Flachdichtung      | Gasket                   |
| 403/1      | 1           | O-Ring             | O-ring                   |
| 403/2      | 1           | O-Ring             | O-ring                   |
| 403/3      | 2           | O-Ring             | O-ring                   |
| 404        | 1           | Lippenring         | Lip-ring                 |
| 406        | 4           | Packung            | Packing                  |
| 503/1      | 1           | Druckfeder         | Pressure spring          |
| 503/2      | 1           | Druckfeder         | Pressure spring          |
| 505        | 2           | Schutzkappe        | Protective cap           |
| 800        | 1           | Magnetantrieb      | Solenoid drive           |
| 900/1      | 4           | Sechskantschraube  | Hex. head screw          |
| 900/2      | 4           | Sechskantschraube  | Hex.head screw           |
| 901/1      | 1           | Sechskantmutter    | Hex. nut                 |
| 901/2      | 1           | Sechskantmutter    | Hex. nut                 |
| 901/3      | 1           | Sechskantmutter    | Hex. nut                 |
| 901/4      | 4           | Sechskantmutter    | Hex. nut                 |
| 905/1      | 4           | Federring          | Lock washer              |
| 905/2      | 4           | Federring          | Lock washer              |
| 906/1      | 1           | Scheibe            | Washer                   |
| 906/2      | 1           | Scheibe            | Washer                   |
| 908        | 1           | Sicherungsblech    | Locking plate            |
| 910/1      | 1           | Zylinderschraube   | Cylinder head screw      |
| 910/2      | 3           | Zylinderschraube   | Cylinder head screw      |
| 940        | 2/4         | Halbrundniete      | Semi-round rivetting     |
| 945/1      | 1           | Sicherungsring     | Safety ring              |
| 945/2      | 1           | Sicherungsring     | Safety ring              |
| 945/3      | 1           | Sicherungsring     | Safety ring              |
| 947        | 4           | Tellerfeder Pakete | disk spring packages     |
| 953        | 3           | Rundmutter         | Round nut                |
| 954/1      | 1           | Einstellstift      | Adjusting pin            |
| 954/2      | 1           | Einstellstift      | Adjusting pin            |
| 973        | 1           | Skala              | Scale                    |





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## Only by limit switch mounting

| Pos./ Item | Stück/ Qty. | Benennung             | Description          |
|------------|-------------|-----------------------|----------------------|
| 110        | 1           | Distanzstück          | Spacer               |
| 512        | 1           | Endschalterkonsole    | Limit switch console |
| 513        | 1/2         | Endschalterbetätigung | Switch actuator      |
| 803        | 1/2         | Endschalter           | Limit switch         |
| 900        | 2           | Sechskantschraube     | Hex. head screw      |
| 910/1      | 1/2         | Zylinderschraube      | Cylinder head screw  |
| 910/2      | 2/4         | Zylinderschraube      | Cylinder head screw  |

## Spare parts

| Version        | Fig.   | Type            | Spare part           |
|----------------|--------|-----------------|----------------------|
| MRK Ma...-4    | Fig. 1 | MRK Ma 5N - 400 | Solenoid drive (800) |
| MRK Ma...Ü200  | Fig. 1 | MRK Ma 5N - 400 | Solenoid drive (800) |
| MRK Ma...Ü550  | Fig. 2 | MRK Ma 5N - 400 | Solenoid drive (800) |
| MRK Ma...Ü700  | Fig. 3 | MRK Ma 5N - 400 | Solenoid drive (800) |
| MRK Ma...Ü1000 | Fig. 4 | MRK Ma 5N - 150 | Solenoid drive (800) |

## Dimension with standard solenoid-drive

| Type                         | Dim. | DN                 |                      |             |             |             |             |     |
|------------------------------|------|--------------------|----------------------|-------------|-------------|-------------|-------------|-----|
|                              |      | 15 / 20<br>(5N/7N) | 25 / 32<br>(10N/12N) | 40<br>(15N) | 50<br>(20N) | 65<br>(25N) | 80<br>(30N) | 100 |
| MRK Ma...-4<br>MRK Ma...Ü200 | A    | 133                | 139                  | 142         | 147         | 154         | 162         | 172 |
|                              | B    | 255                | 255                  | 272         | 272         | 272         | 272         | 272 |
|                              | B`   | 305                | 305                  | 305         | 305         | 305         | 305         | 305 |
|                              | ØC   | 127                | 127                  | 127         | 127         | 127         | 127         | 127 |
|                              | ØD   | 50                 | 70                   | 92          | 96          | 125         | 140         | 162 |
|                              | E    | 25                 | 25                   | 25          | 25          | 25          | 30          | 30  |
|                              | F    | 92                 | 92                   | 97          | 97          | 97          | 97          | 97  |
|                              | F`   | 140                | 140                  | 140         | 140         | 140         | 140         | 140 |
| MRK Ma...Ü550                | A    | 133                | 139                  | 142         | 147         | 155         | 162         | 172 |
|                              | B    | 285                | 285                  | 285         | 285         | 285         | 285         | 285 |
|                              | B`   | 335                | 335                  | 335         | 335         | 335         | 335         | 335 |
|                              | ØC   | 127                | 127                  | 127         | 127         | 127         | 127         | 127 |
|                              | ØD   | 50                 | 70                   | 90          | 105         | 125         | 140         | 160 |
|                              | E    | 25                 | 25                   | 25          | 25          | 25          | 30          | 30  |
|                              | F    | 92                 | 92                   | 92          | 92          | 92          | 92          | 92  |
|                              | F`   | 140                | 140                  | 140         | 140         | 140         | 140         | 140 |
| MRK Ma...Ü700                | A    | 325                | 337                  | 348         | 354         | 364         | 372         | 385 |
|                              | B    | 297                | 297                  | 370         | 370         | 370         | 370         | 370 |
|                              | B`   | 347                | 347                  | 415         | 415         | 415         | 415         | 415 |
|                              | ØC   | 153                | 153                  | 191         | 191         | 191         | 191         | 191 |
|                              | ØD   | 50                 | 70                   | 90          | 105         | 125         | 140         | 160 |
|                              | E    | 25                 | 25                   | 25          | 25          | 25          | 30          | 30  |
|                              | F    | 133                | 133                  | 133         | 133         | 133         | 133         | 133 |
|                              | F`   | 200                | 200                  | 200         | 200         | 200         | 200         | 200 |
| MRK Ma...Ü1000               | A    | 325                | 361                  | 348         | 355         | 364         | 373         | 385 |
|                              | B    | 297                | 370                  | 370         | 362         | 370         | 370         | 370 |
|                              | B`   | 347                | 415                  | 415         | 415         | 415         | 415         | 415 |
|                              | ØC   | 191                | 191                  | 191         | 191         | 191         | 191         | 191 |
|                              | ØD   | 95                 | 115                  | 140         | 105         | 125         | 140         | 160 |
|                              | E    | 45                 | 45                   | 45          | 45          | 45          | 45          | 55  |
|                              | F    | 133                | 133                  | 133         | 133         | 133         | 133         | 133 |
|                              | F`   | 200                | 200                  | 200         | 200         | 200         | 200         | 200 |
| MRK Ma...Ü1000               | G    | 249                | 284                  | 269         | 273         | 286         | 296         | 304 |





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| Type                                       | Dim       | DN  |     |     |     |     |     |     |
|--------------------------------------------|-----------|-----|-----|-----|-----|-----|-----|-----|
|                                            |           | 125 | 150 | 200 | 250 | 300 | 350 | 400 |
| <b>MRK Ma...-4</b><br><b>MRK Ma...Ü200</b> | <b>A</b>  | 185 | 197 | 236 | 261 | 286 | 336 | 356 |
|                                            | <b>B</b>  | 272 | 318 | 335 | 365 | 365 | 370 | 430 |
|                                            | <b>B`</b> | 305 | 355 | 385 | 415 | 415 | 420 | 480 |
|                                            | <b>ØC</b> | 127 | 153 | 153 | 191 | 191 | 191 | 230 |
|                                            | <b>ØD</b> | 191 | 215 | 270 | 310 | 370 | 428 | 465 |
|                                            | <b>E</b>  | 35  | 35  | 40  | 40  | 45  | 45  | 50  |
|                                            | <b>F</b>  | 97  | 97  | 110 | 110 | 110 | 110 | 110 |
|                                            | <b>F`</b> | 140 | 140 | 160 | 160 | 160 | 160 | 160 |
| <b>MRK Ma...Ü550</b>                       | <b>A</b>  | 255 | 267 | 355 | 380 | 405 | 455 | 520 |
|                                            | <b>B</b>  | 285 | 297 | 360 | 373 | 373 | 373 | 430 |
|                                            | <b>B`</b> | 335 | 347 | 410 | 425 | 425 | 425 | 480 |
|                                            | <b>ØC</b> | 153 | 153 | 191 | 191 | 191 | 191 | 230 |
|                                            | <b>ØD</b> | 190 | 215 | 270 | 320 | 370 | 428 | 465 |
|                                            | <b>E</b>  | 35  | 35  | 40  | 40  | 45  | 45  | 50  |
|                                            | <b>F</b>  | 92  | 92  | 110 | 110 | 110 | 110 | 110 |
|                                            | <b>F`</b> | 140 | 140 | 160 | 160 | 160 | 160 | 160 |
| <b>MRK Ma...Ü700</b>                       | <b>A</b>  | 383 | 396 | 423 | 450 | 475 | 502 | 525 |
|                                            | <b>B</b>  | 370 | 370 | 405 | 409 | 409 | 409 | 430 |
|                                            | <b>B`</b> | 415 | 415 | 446 | 459 | 459 | 459 | 480 |
|                                            | <b>ØC</b> | 191 | 191 | 230 | 230 | 230 | 230 | 230 |
|                                            | <b>ØD</b> | 190 | 215 | 270 | 320 | 370 | 428 | 465 |
|                                            | <b>E</b>  | 35  | 35  | 40  | 40  | 45  | 45  | 50  |
|                                            | <b>F</b>  | 133 | 133 | 133 | 133 | 133 | 133 | 133 |
|                                            | <b>F`</b> | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
|                                            | <b>G</b>  | 275 | 288 | 315 | 340 | 365 | 395 | 415 |
| <b>MRK Ma...Ü1000</b>                      | <b>A</b>  | 383 | 396 | -   | -   | -   | -   | -   |
|                                            | <b>B</b>  | 370 | 370 | -   | -   | -   | -   | -   |
|                                            | <b>B`</b> | 415 | 415 | -   | -   | -   | -   | -   |
|                                            | <b>ØC</b> | 191 | 191 | -   | -   | -   | -   | -   |
|                                            | <b>ØD</b> | 190 | 215 | -   | -   | -   | -   | -   |
|                                            | <b>E</b>  | 55  | 55  | -   | -   | -   | -   | -   |
|                                            | <b>F</b>  | 133 | 133 | -   | -   | -   | -   | -   |
|                                            | <b>F`</b> | 200 | 200 | -   | -   | -   | -   | -   |
|                                            | <b>G</b>  | 306 | 319 | -   | -   | -   | -   | -   |

In the version with through passage drawn in, the nominal diameter is reduced while maintaining the same size.

Example: MRK Ma...25N/20N  
Size: DN 65  
Drawn in: DN 50

