



Operating manual

Solenoid-Valve

Series EVO/EVSO

Normally opened

EN





Operating manual

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1.0 General remarks

This operating manual includes instructions to assemble and operate the 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 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 opened NO, spring-loaded automatic blow-off valve with solenoid actuator.

Working pressure:	1 - EVO	0 - 1 bar (0 - 100 kPa)
	4 - EVO	0 - 4 bar (0 - 400 kPa)
	6 - EVO	0 - 6 bar (0 - 600 kPa)
	10 - EVO	0 - 10 bar (0 - 1000 kPa)
	16 - EVSO	0 - 16 bar (0 - 1600 kPa)
	25 - EVSO	0 - 25 bar (0 - 2500 kPa)
	40 - EVSO	0 - 40 bar (0 - 4000 kPa)

Fitting position: vertical or horizontal drive

Medium temperature: -20 °C to + 60 °C (253 K to 333 K)

Ambient temperature: -20 °C to + 60 °C (253 K to 333 K)

Working pressure: 40 - EVSO 5NH 0 - 40 bar (0 - 4000 kPa)

Fitting position: vertical or horizontal drive

Medium temperature: -30 °C to + 140 °C (243 K to 413 K)

Ambient temperature: -20 °C to + 60 °C (253 K to 333 K)

Switching cycles: see operating instructions solenoid drive





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Threaded connection at DIN ISO 228-1

Connection G	1/4 (2)	3/8 (3)	1/2 (5)	3/4 (7)	1 (10)	1 1/4 (12)	1 1/2 (15)	2 (20)	Test pressure (*) PT
1 - EVO	X	X	X	X	X	-	-	-	PT 6
4 - EVO	X	X	X	X	-	-	-	-	PT 10
6 - EVO	-	X	X	-	-	-	-	-	PT 10
10 - EVO	-	-	-	-	X	-	-	-	PT 16
16 - EVSO	-	-	X(#)	-	-	-	-	-	PT 25
25 - EVSO	-	-	X(#)	-	-	-	-	-	PT 40
40 - EVSO	-	-	X(#)	X(#)	-	-	-	-	PT 40

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

(#) Option with welding flanges 1/2, DN15 = 5N; 3/4, DN20 = 7N

X Type examination EU/2016/426, CE-0085AS0561, O Acceptance test certificate 3.2 possible, - not available

Flange connection measures acc. to DIN EN 1092-2 / ANSI

Flange DN ANSI	PN	15 (5N) 1/2"	20 (7N) 3/4"	25 (10N) 1"	32 (12N) 1 1/4"	40 (15N) 1 1/2"	50 (20N) 2"	65 (25N) 2 1/2"	80 (30N) 3"	100 4"	Test pressure (*) PT
1 - EVO	16	X	X	X	X	X	X	-	-	-	PT 6
40 - EVSO	40	X	-	-	-	-	-	-	-	-	PT 40

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

X Type examination EU/2016/426, CE-0085AS0561, O Acceptance test certificate 3.2 possible, - not available

Voltage:

VDC 12 – 440 (-15% to +10%)

VAC 24 – 500 (-15% to +10%)

Protection type:

IP54 or 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 solenoid-valves EVO and EVSO are used for the throughput of a medium without control energy and for discharging a leakage gas volume.

The valves are suitable for gases of the 1st, 2nd and 3rd gas families to DIN EN 437 and for neutral gases and as a variant with material design for aggressive gases such as e.g. biogas, sewage plant gas or dump gas.

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.**

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-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 screwed cable glands, appliance plugs or add-on units. The valve can be transported at ring nuts, flange borings or by means of a belt under the solenoid drive.

Transport the 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 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 solenoid-valves in the EVO and EVSO series are direct-acting, normally opened NO, spring-loaded automatic blow off valves with solenoid actuator.

The sectional drawing part 11.1 in Fig. 1 - Fig. 9 shows the valve construction.





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4.1 Function

By switching on the solenoid drive, the solenoid core (207) is drawn against the upper part (106). The pressure spring (503) is pressed and the valve disc (200) closes the valve cross section. The valve is closed.

The valve opened by switching off, interruption or failure of power energy to solenoid drive. Due to press of the pressure spring (503) the valve disc (200) opens. The valve is open.

4.2 Technical data

Closing times: 0,3 – 0,7s depends upon nominal width

Opening times: < 1s

Solenoid-drive types MG...

Connection G	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
1 - EVO	3803 0801	004	004	005-3	008-2	-	-	-
4 - EVO	005-3	005-3	005-3	008-2	-	-	-	-
6 - EVO	-	005-3	005-3	-	-	-	-	-
10 - EVO	-	-	-	-	012	-	-	-
16 - EVSO	-	-	008-2	-	-	-	-	-
25 - EVSO	-	-	008-2	-	-	-	-	-
40 - EVSO	-	-	010	010	-	-	-	-

Flange DN	15	20	25	32	40	50	65	80	100
Flange ANSI	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
1 - EVO	008-2	008-2	010	012	014	016	-	-	-
40 - EVSO	018	-	-	-	-	-	-	-	-

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
Torsion Nm	20	35	50	85	125	160	200	250 ¹⁾	325 ¹⁾	400 ¹⁾	-	-	-
Bending Nm	35	70	105	225	340	475	610	1100	1600	2400	5000	6000	7600

¹⁾ 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
Torque Nm	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
Torque Nm	5	11	22	39	70	110	150

4.3 Marking

The type sign on the solenoid 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
- Solenoid drive type
- Electr. performance
- Voltage
- Frequency
- Protection type





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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 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.
- 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.

For shut-off / blow-off valves: Install dirt trap upstream of the valve.

Observe the direction of flow.

The mesh size of the dirt trap must have the following properties:

- be smaller than 1.5 mm
- a test mandrel of 1 mm diameter to pass and not allow.

If two valves are combined to form a group, one dirt trap installed upstream of the first valve is sufficient. The Uni-Geräte dirt traps of the SFR Series are approved for use together with the solenoid-valves in accordance with EU/2016/426.



NOTICE!

Please 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!





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- 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

Solenoid-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.

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.





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7.2 Troubleshooting plan

Malfunction	Possible causes	Remedy
No flow	Valve does not open	Switch off solenoid drive (800) Check, if there is still any residual voltage
	Protective caps were not removed	Remove protective caps
Low flow rate	Clogging in the pipework system	Check pipework system
	Contaminated strainer	Filter clean/exchange
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 does not close	Working pressure too high	Compare working pressure with the data on the rating plate
Flange fracture (valve/ pipework)	Screws not tightened uniformly, mating flanges not aligned	Align pipework. 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!

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)

8.1 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!

During the visual inspection, pay attention to the following points:

1. Damage to the valve seat (100).
2. Damage to the valve disc sealing (400)
3. Wear of the guide rings (206)

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

If the sealing element becomes damaged (only applies to flange version Fig. 1), the spare parts kit should be used.





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Flange version

Fig. 1 1-EVO 5NHR - 20NHR...

Unscrew hex. head screws (900/2) and de-install housing flange (108/2) including lock washer (905/2). Remove upper part of housing (106) from solenoid core (207). Afterwards remove bolt (902/1) together with SL-retainer (949/2) and de-install solenoid core (207) with spring cap (203), spring guide pin (204) and pressure spring (503) putting them onto a clean pad.

Loosen hex. head screws (900/1) and unscrew housing flange (108/1) with lock washer (905/1) from the valve chamber (100). Completely remove valve disc (200; 201; 202; 205; 400; 403/1; 902/2; 943; 949/1) from valve chamber (100).



NOTICE!

Before assembly, replace flat gasket (402/1/2).



CAUTION!

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

Assemble the valve in the reverse order to the dismantling.

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

Fig. 2 40-EVSO 5NHR..

Replace the complete valve

Thread version

Fig. 3 1-EVO 2R...

Fig. 4 1-EVO 3-10R... ; 4-EVO 2-7R...

Fig. 5 6-EVO 3/5R...

Fig. 6 10-EVO 10R...

Fig. 7 16-EVSO 5R...

Fig. 8 25-EVSO 5R...

Fig. 9 40-EVSO 5/7R...

Replace the complete valve





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9.0 Garantie

Umfang und Zeitraum der Gewährleistung ist in der zum Zeitpunkt der Lieferung gültigen Ausgabe der „Allgemeinen Geschäftsbedingungen der Fa. Uni-Geräte E. Mangelmann Elektrotechnische Fabrik GmbH“ oder abweichend davon im Kaufvertrag selbst angegeben.

Wir leisten Gewähr für eine dem jeweiligen Stand der Technik und dem bestätigten Verwendungszweck entsprechenden Fehlerfreiheit.

Für Schäden, die durch unsachgemäße Behandlung oder Nichtbeachtung dieser Betriebs- und Montageanleitung, der Unfallverhütungsvorschriften, der Normen EN, DIN, VDE und anderen Regelwerken entstehen, können keine Gewährleistungsansprüche bzw. Schadensersatzansprüche geltend gemacht werden.

Schäden, die während des Betriebes oder durch vom Datenblatt oder anderen Vereinbarungen abweichenden Einsatzbedingungen entstehen, unterliegen ebenso nicht der Gewährleistung.

Berechtigte Beanstandungen werden durch Nacharbeit von uns oder durch von uns beauftragte Fachbetriebe beseitigt.

Über die Gewährleistung hinausgehende Ansprüche sind ausgeschlossen. Anspruch auf Ersatzlieferung besteht nicht.

Wartungsarbeiten, Einbau von Fremdteilen, Änderung der Konstruktion, sowie natürlicher Verschleiß sind von der Gewährleistung ausgeschlossen.

Etwaige Transportschäden sind nicht uns, sondern **unverzüglich** Ihrer zuständigen Güterabfertigung, der Bahn oder dem Spediteur zu melden, da sonst Ersatzansprüche an diese Unternehmen verloren gehen.

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 valve (mechanical part).

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

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



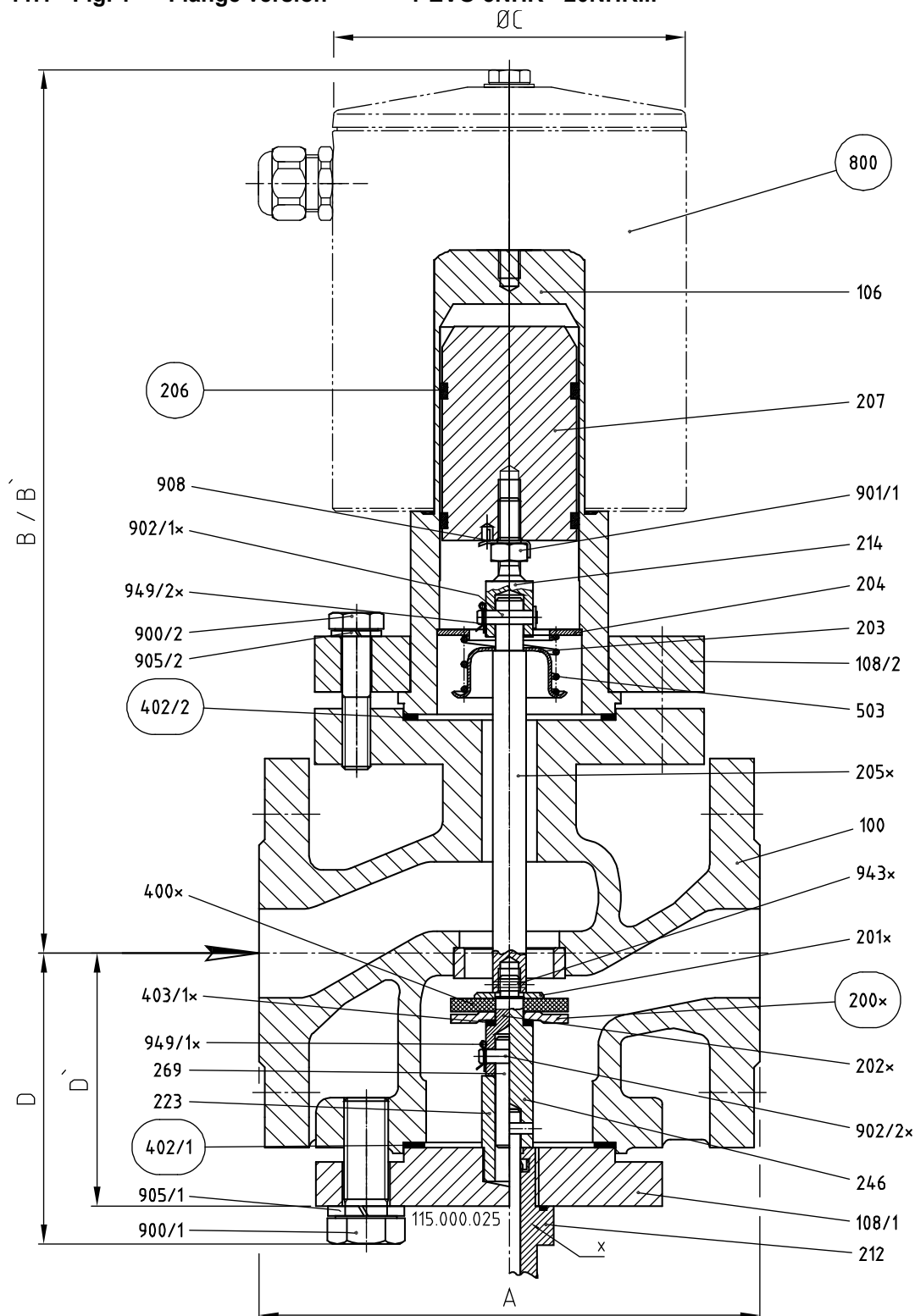


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11.0 Drawing

11.1 Fig. 1 Flange version

1-EVO 5NHR - 20NHR...



O = Spare part kit

X = Option limit switch mounting

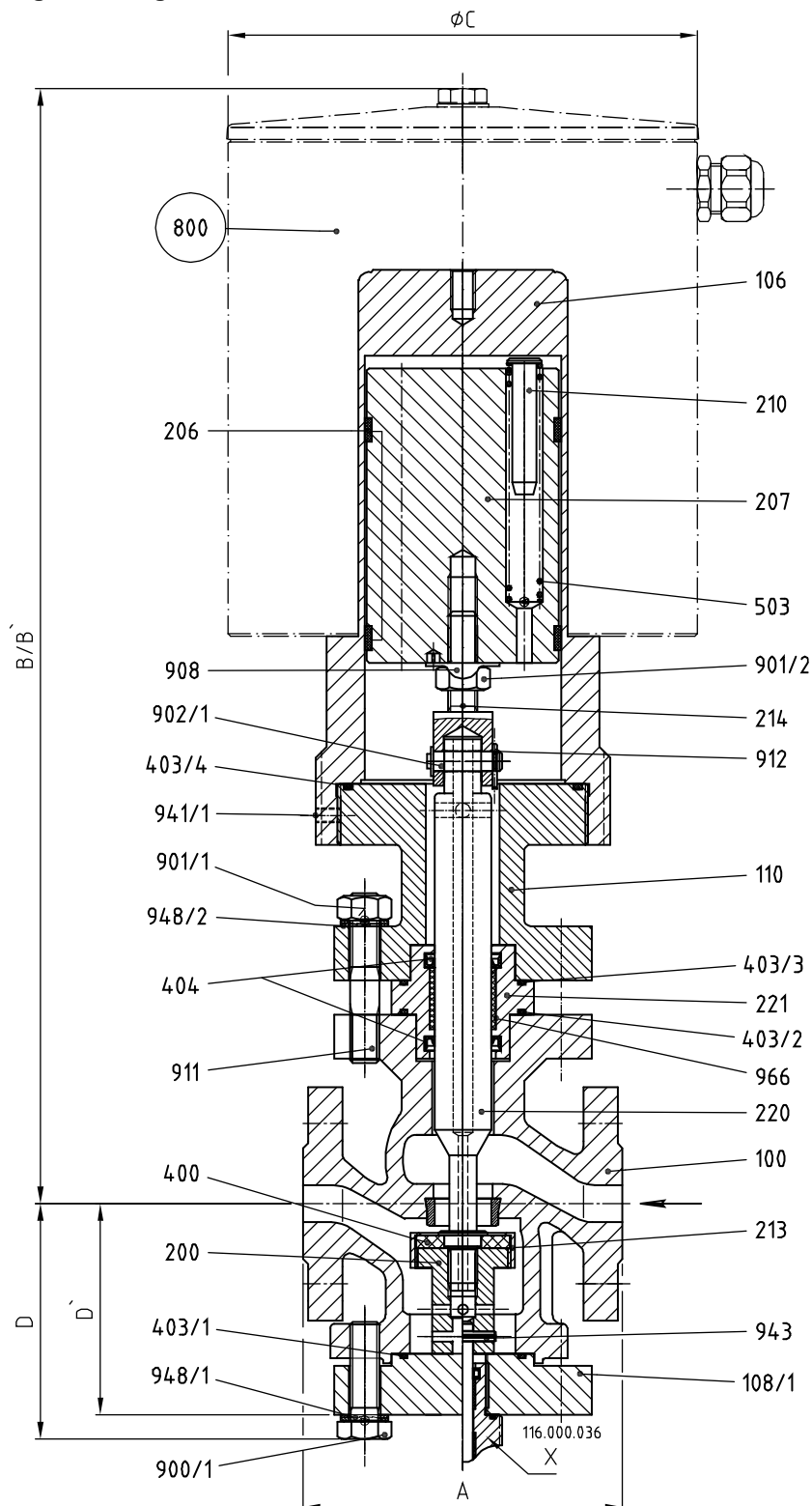
(...x) supplied as a complete unit





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Fig.2 Flange version 40-EVSO 5NHR...



O = Spare part kit

X = Option limit switch mounting





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Fig.3 Thread version 1-EVO 2R

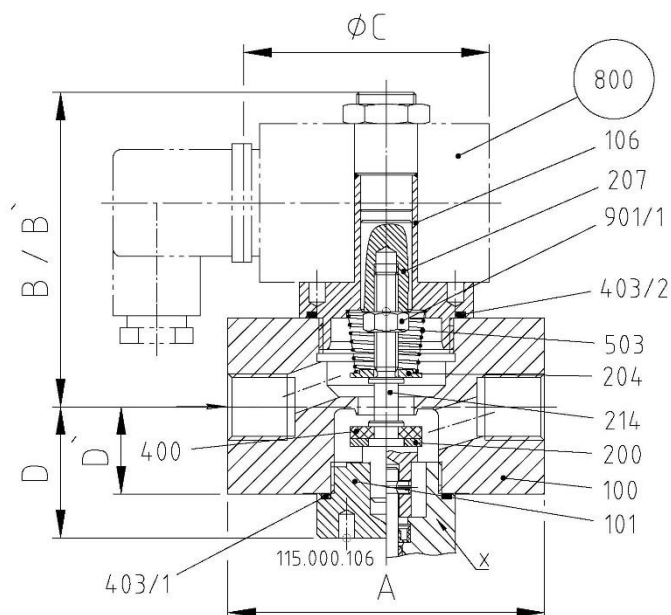
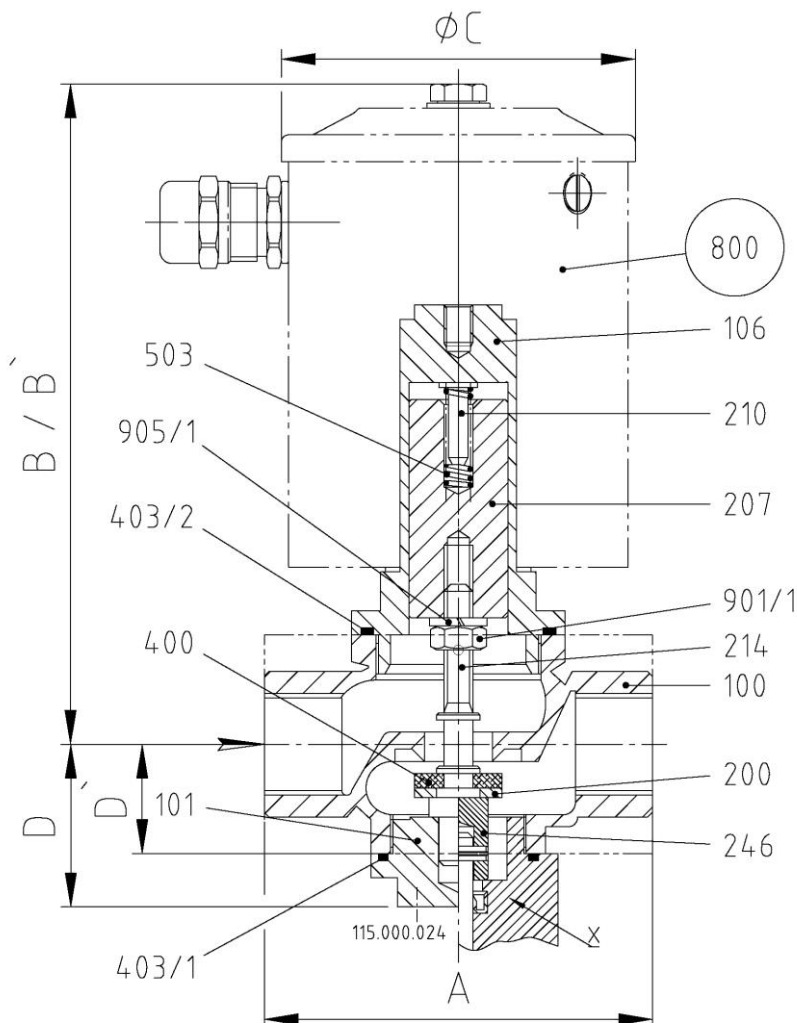


Fig.4 Thread version 1-EVO 3-10R; 4- EVO 2-7R





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Fig.5 Thread version

6- EVO 3/5R

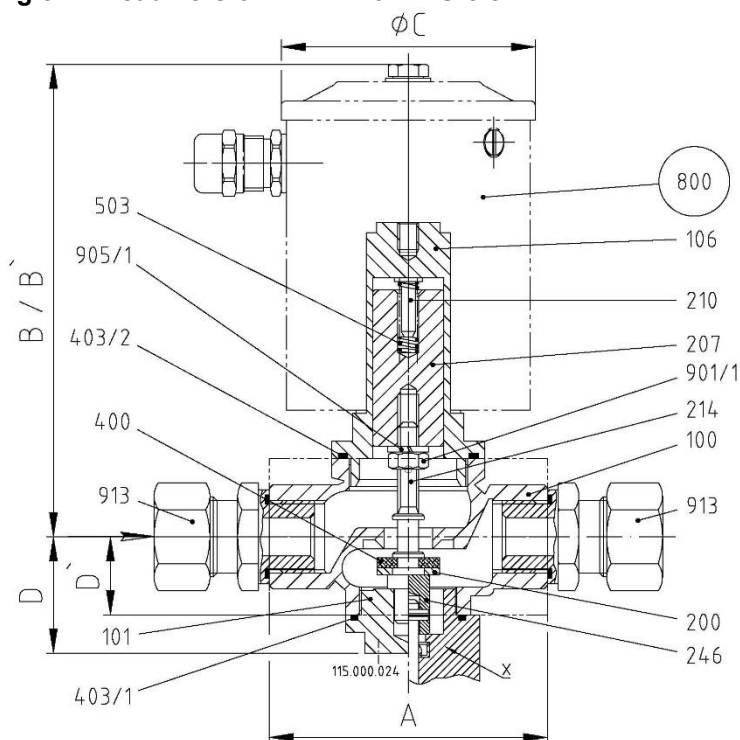
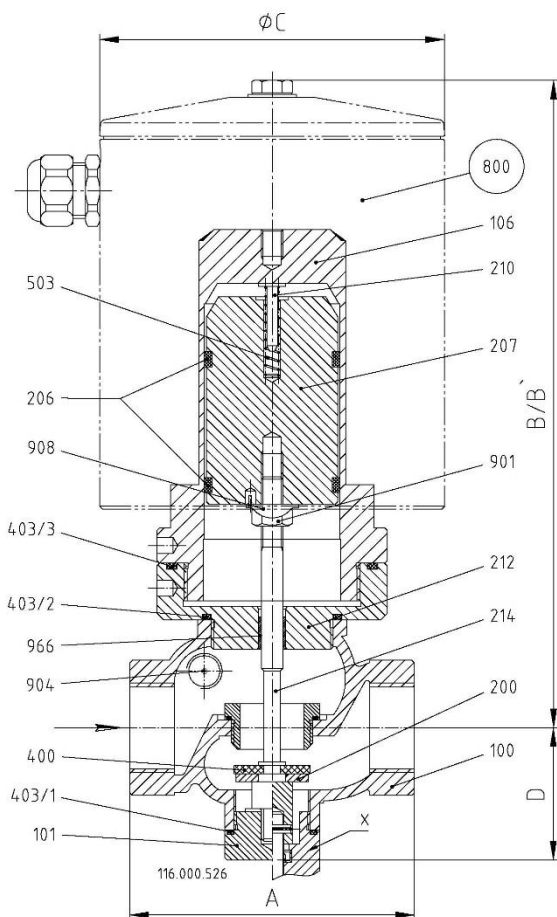


Fig.6 Thread version

10- EVO 10R





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Fig.7 Thread version

16- EVSO 5R

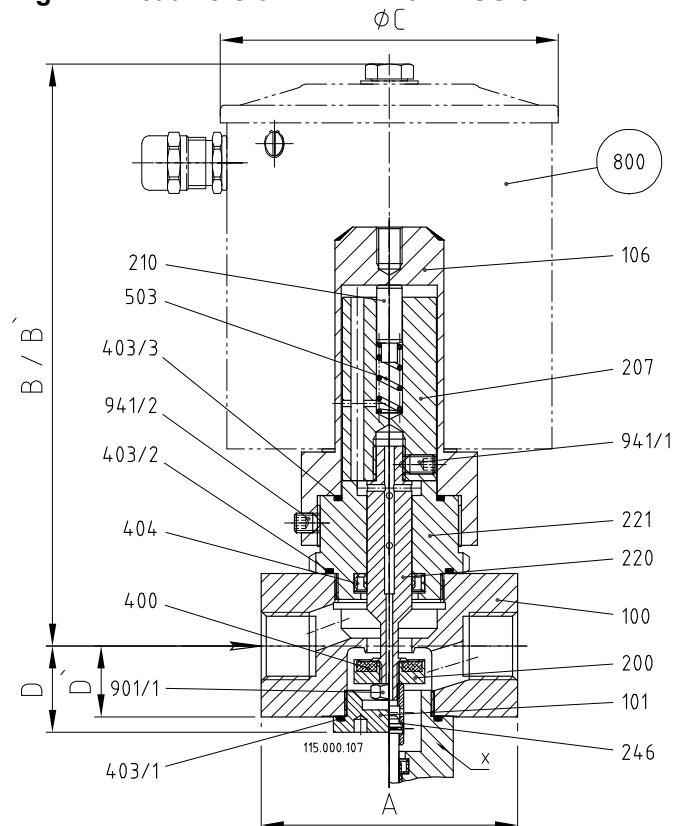
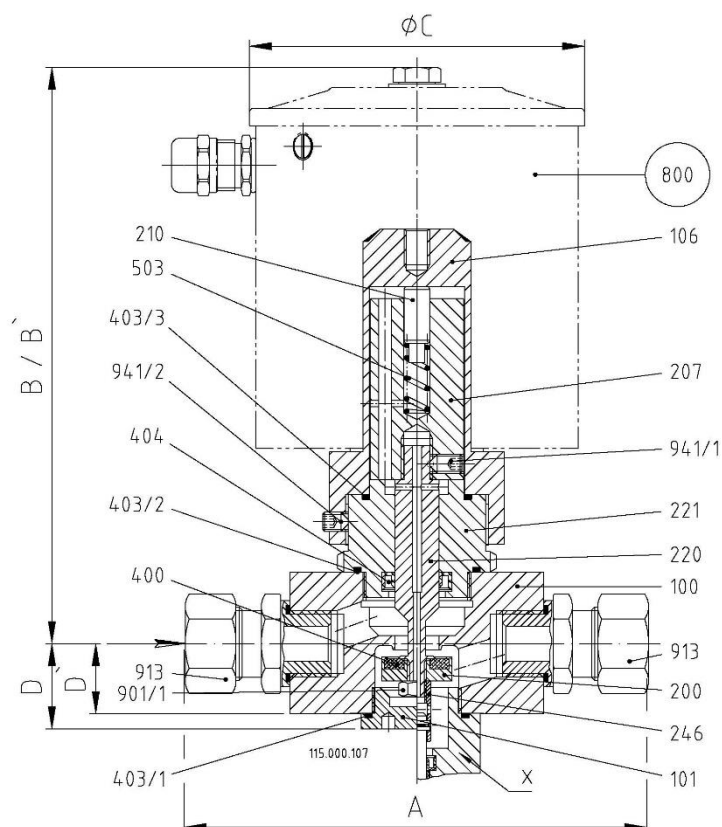


Fig.8 Thread version

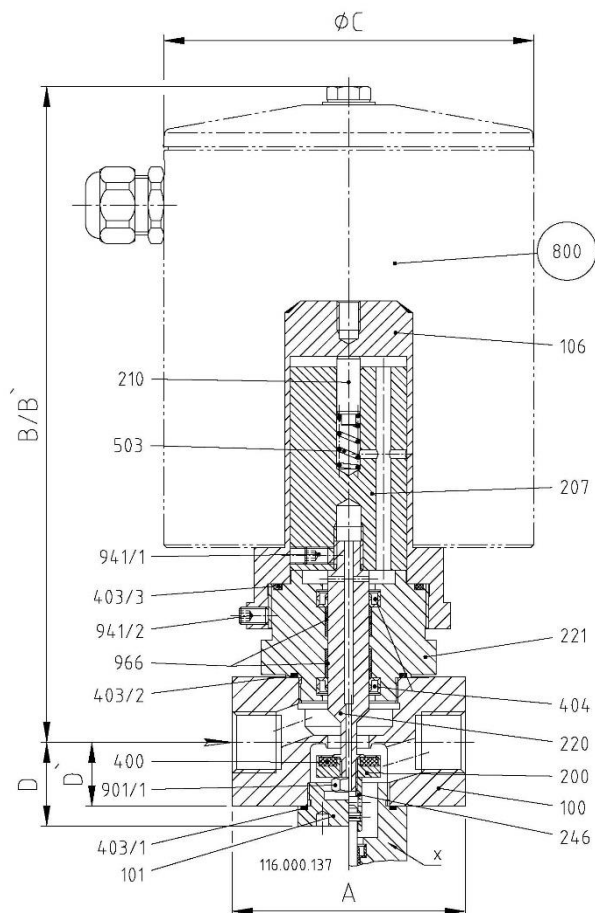
25- EVSO 5R





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Fig.9 Thread version 40- EVSO 5/7R



11.2 List of parts

Pos./ Item	Stück/ Qty.	Benennung	Description
100	1	Ventilgehäuse	valve chamber
106	1	Gehäuseoberteil	upper part of housing
108/x	1	Gehäuseflansch	housing flange
110/x	1	Distanzstück	spacer
115	1	Dichtplatte	sealing board
120	1	Endschalter-Gehäuse	limit switch housing
200	1	Ventilteller	valve disk
200/1	1	Ventilteller	valve disk
200/2	1	Ventilteller	valve disk
200/3	1	Ventilteller	valve disk
201	1	Tellerscheibe	disc plate
205	1	Ventilspindel	valve spindle
206	2	Führungsring	guide ring
207	1	Magnetkern	solenoid core
209	1	Abwurfbolzen	discharge bolt
210	1/3/4	Federbolzen	spring bolt
212	1	Spindelführung	spindle guide
214	1	Ventilstift	valve pin
218	1	Zweiteiliger Ring	two-piece ring
219/x	1	Spindelmutter	spindle nut
227	1	Verdrehschutz	distort protection
243	1	Endschalterspindel	limit switch spindle
246	1	Verbindungsstück Endschalter	connction piece limit switch





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Pos./ Item	Stück/ Qty.	Benennung	Description
249	1	Endschalter Konsolenhalter	limit switch console owner
400	1	Ventiltellerdichtung	valve disk sealing
402	1	Flachdichtung	gasket
402/1	1	Flachdichtung	gasket
402/2	1	Flachdichtung	gasket
403/1	1/2/4	O-Ring	o-ring
403/2	1/2	O-Ring	o-ring
403/3	2	O-Ring	o-ring
404	1/2	Lippenring	lip-ring
405	1	Abstreifring	scraper ring
406	2	Packung	packing
407	1	Staubschutzmembrane	dust guard membrane
503	1/3/4	Druckfeder	pressure spring
504	1	Faltenbalg	expansion bellows
504/1	1	Faltenbalg	expansion bellows
504/2	1	Faltenbalg	expansion bellows
507	1	Faltenbalgstück	bellow piece
509	1	Distanzring	distance ring
512	1/2	Endschalterkonsole	limit switch console
513	1/2	Endschalterbetätigung	switch actuator
516	1	Faltenbalggehäuse	housing of expansion bellows
523	1	Montagehalter	assembly bracket
709	1	Anschlußkabel	connecting cable
714	1/2	Leitungsdose	line socket
716	1	Klemmkasten	terminal box
800	1	Magnet-Antrieb	solenoid drive
803	1/2	Endschalter	limit switch
900/x	4/8/12	Sechskantschraube	hexagon head screw
901/1	1/2/4	Sechskantmutter	hexagon nut
901/2	1/2/4	Sechskantmutter	hexagon nut
901/3	1	Sechskantmutter	hexagon nut

Spare parts

Version	Fig.	Type	Spare parts
Flange version	1	1- EVO 5N(H)R - 20N(H)R..	Spare part kit, Solenoid drive (800)
	2	40- EVSO 5NHR...	Solenoid drive (800)
Thread version	3	1- EVO 2R	Solenoid drive (800)
	4	1- EVO 3-10R	Solenoid drive (800)
		4- EVO 2-7R	
	5	6- EVO 3/5R	Solenoid drive (800)
	6	10- EVO 10R	Solenoid drive (800)
	7	16- EVSO 5R	Solenoid drive (800)
	8	25- EVSO 5R	Solenoid drive (800)
	9	40- EVSO 5/7R	Solenoid drive (800)





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Dimension with standard solenoid drive

Connection G	Dim.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Installation length	A	60	80(140*)	80(140*)	95**	105	-	-	-
1-EVO **	B	80	136	136	143	190	-	-	-
	B`	140	196	196	203	265	-	-	-
	ØC	62	83	83	83	106	-	-	-
	D	31	34	34	42	56	-	-	-
	D`	20	23	23	30	39	-	-	-
4-EVO **	B	136	137	137	165	-	-	-	-
	B`	196	197	197	240	-	-	-	-
	ØC	83	83	83	106	-	-	-	-
	D	31	34	34	42	-	-	-	-
	D`	20	23	23	30	-	-	-	-
6-EVO *	B	-	137	137	-	-	-	-	-
	B`	-	197	197	-	-	-	-	-
	ØC	-	83	83	-	-	-	-	-
	D	-	34	34	-	-	-	-	-
	D`	-	23	23	-	-	-	-	-
10-EVO	B	-	-	-	-	240	-	-	-
	B`	-	-	-	-	335	-	-	-
	ØC	-	-	-	-	127	-	-	-
	D	-	-	-	-	49	-	-	-
	D`	-	-	-	-	-	-	-	-
16/25-EVSO *	B	-	-	180	-	-	-	-	-
	B`	-	-	255	-	-	-	-	-
	ØC	-	-	106	-	-	-	-	-
	D	-	-	28	-	-	-	-	-
	D`	-	-	23	-	-	-	-	-
40-EVSO	B	-	-	221	226	-	-	-	-
	B`	-	-	310	310	-	-	-	-
	ØC	-	-	127	127	-	-	-	-
	D	-	-	30	30	-	-	-	-
	D`	-	-	23	23	-	-	-	-

* (140*) = Connection by linear threaded screw connection

** Installation length A = 105 mm for valve chamber made of stainless steel

Flange DN	Dim.	15	20	25	32	40	50	65	80	100
Installation length	A ¹⁾	130	150	160	180	200	230	290	310	350
Flange ANSI	Dim.	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
Installation length	A ²⁾	108	118	127	140	165	203	216	241	292
1-EVO	B	212	212	303	321	388	400	-	-	-
	B`	287	287	393	420	508	535	-	-	-
	ØC	106	106	127	127	153	153	-	-	-
	D	84	84	84	103	103	111	-	-	-
	D`	74	74	74	89	89	97	-	-	-
40-EVSO	B	454	-	-	-	-	-	-	-	-
	B`	603	-	-	-	-	-	-	-	-
	ØC	194	-	-	-	-	-	-	-	-
	D	84	-	-	-	-	-	-	-	-
	D`	74	-	-	-	-	-	-	-	-

A¹⁾ = Dimension at DIN (resp. flanges ANSI and dimension DIN or flanges and dimension at DIN)

A²⁾ = Dimension at ANSI 150lbs (see data sheet on our website armature installation length 225.100.026)

B` = Dimension for removing the solenoid drive

