

Solenoid valve

Operating manual

Series
model 150
model 160



Version BA-2017.09.08 EN
Print-No. 301 215
TR MA DE Rev001

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5
32602 Vlotho
Germany
Phone: +49 (0) 5733-799-0
Fax: +49 (0) 5733-799-5000
E-mail: contact@asv-stuebbe.de
Internet: www.asv-stuebbe.com

We reserve the right to make technical changes.

Read carefully before use.
Save for future use.



Table of contents

1 About this document	3	8 Troubleshooting	14
1.1 Target groups	3	9 Appendix	15
1.2 Other applicable documents	3	9.1 Technical specifications	15
1.3 Warnings and symbols	4	9.1.1 Working pressure	15
2 General safety instructions	5	9.1.2 Pressure and temperature limits	15
2.1 Intended use	5	9.1.3 Tightening torques	15
2.2 General safety instructions	5	9.2 Connection diagrams	15
2.2.1 Obligations of the operating company	5	9.2.1 Type 150 connection diagrams	15
2.2.2 Obligations of personnel	5	9.2.2 Type 160 connection diagrams	15
2.3 Specific hazards	5	9.3 Plug assignment	15
2.3.1 Hazardous media	5		
3 Layout and Function	6		
3.1 Type plate	6		
3.2 Description	6		
3.3 Layout	7		
3.3.1 Type 150	7		
3.3.2 Type 160	7		
3.4 Direction of flow	8		
4 Transport, Storage and Disposal	8		
4.1 Unpacking and inspection on delivery	8		
4.2 Transportation	8		
4.3 Storage	8		
4.4 Disposal	9		
5 Installation and connection	10		
5.1 Preparing for installation	10		
5.1.1 Check operating conditions	10		
5.2 Planning pipelines	10		
5.2.1 Designing pipelines	10		
5.3 Installing fitting in pipe	10		
5.3.1 Fixed connection with solvent welding/fusion spigot ends	10		
5.3.2 Connection with internal thread fixed	10		
5.3.3 Insulate fitting	11		
5.4 Connect fitting to electrical system	11		
5.5 Performing the hydrostatic test	11		
6 Operation	11		
6.1 Commissioning	11		
7 Maintenance	12		
7.1 Servicing	12		
7.2 Maintenance	12		
7.2.1 Removing fitting	12		
7.2.2 Changing magnetic coil of type 150	12		
7.2.3 Changing magnetic coil of type 160	12		
7.3 Replacement parts and return	13		

List of figures

Fig. 1	Type plate (example)	6
Fig. 2	Type 150 layout	7
Fig. 3	Type 160 layout	7
Fig. 4	Fitting with directional arrow (example)	8
Fig. 5	Connection diagram (NO) (normally open), type 150	15
Fig. 6	Connection diagram (NC) (normally closed), type 150	15
Fig. 7	Connection diagram (NO) (normally open), type 160	15
Fig. 8	Connection diagram (NC) (normally closed), type 160	15
Fig. 9	connector plug	15

List of tables

Tab. 1	Other application documents, purpose and where found	3
Tab. 2	Warnings and symbols	4
Tab. 3	Troubleshooting	14
Tab. 4	Tightening torques	15

1 About this document

This manual

- is part of the fitting
- applies to all series referred to
- describes safe and proper operation during all operating phases

1.1 Target groups

Operating company

- Responsibilities:
 - Keep this manual available at the place of operation, also for future use.
 - Ensure that employees read and observe this manual and other applicable documents, especially the safety instructions and warnings.
 - Observe any additional country-specific rules and regulations that relate to the system.

Qualified personnel, fitter

- Mechanics qualification:
 - Qualified employees with additional training for fitting the respective pipework.
- Electrical qualification:
 - Qualified electrician
- Responsibility:
 - Read, observe and follow this manual and the other applicable documents, especially all safety instructions and warnings.

1.2 Other applicable documents

<p>To download: Resistance lists Resistance of materials used to chemicals</p>	 <p>www.asv-stuebbe.de/pdf_resistance/300051.pdf</p>
	<p>To download: Type 150 data sheet Technical specifications, conditions of operation</p> <p>www.asv-stuebbe.de/pdf_datasheets/301203.pdf</p>
<p>To download: Type 160 data sheet Technical specifications, conditions of operation</p>	 <p>www.asv-stuebbe.de/pdf_datasheets/301209.pdf</p>
	<p>To download: CE declaration of conformity Conformity with standards</p> <p>www.asv-stuebbe.de/pdf_DOC/301227.pdf</p>

Tab. 1 Other application documents, purpose and where found

1.3 Warnings and symbols

Symbol	Meaning
 DANGER	<ul style="list-style-type: none"> • Immediate acute risk • Death, serious bodily harm
 WARNING	<ul style="list-style-type: none"> • Potentially acute risk • Death, serious bodily harm
 CAUTION	<ul style="list-style-type: none"> • Potentially hazardous situation • Minor injury
NOTE	<ul style="list-style-type: none"> • Potentially hazardous situation • Material damage
	Safety warning sign ► Take note of all information highlighted by the safety warning sign and follow the instructions to avoid injury or death.
►	Instruction
1., 2., ...	Multiple-step instructions
✓	Precondition
→	Cross reference
	Information, notes

Tab. 2 Warnings and symbols

2 General safety instructions

 The manufacturer accepts no liability for damages caused by disregarding any of the documentation.

2.1 Intended use

- Only use the fitting to shut off pipes for appropriate media (→ Resistance list).
- Adhere to the operating limits (→ Data sheet)
- Use fitting only for solid-free media.
- Type 160: Difference of at least 0.3 bar required

2.2 General safety instructions

 Read and observe the following regulations before carrying out any work.

2.2.1 Obligations of the operating company

Safety-conscious operation

- Only operate the fitting if it is in perfect technical condition and only use it as intended, staying aware of safety and risks, and in adherence to the instructions in this manual.
- Ensure that the following safety aspects are observed and monitored:
 - Intended use
 - Statutory or other safety and accident-prevention regulations
 - Safety regulations governing the handling of hazardous substances
 - Applicable standards and guidelines in the country where the pump is operated
- Make personal protective equipment available.

Qualified personnel

- Make sure all personnel tasked with work on the fitting have read and understood this manual and all other applicable documents, especially the safety, maintenance and repair information, before they start any work.
- Organize responsibilities, areas of competence and the supervision of personnel.
- The following work should be carried out by specialist technicians only:
 - Installation, repair and maintenance work
 - Work on the electrical system
- Make sure that trainee personnel only work on the fitting under supervision of specialist technicians.

2.2.2 Obligations of personnel

- Observe the instructions on the fitting and keep them legible, e.g. type plate, identification marking for fluid connections.
- Only carry out work on the fitting if the following requirements are met:
 - System is empty
 - System has been flushed
 - System is depressurized
 - System has cooled down
 - System is secured against being switched back on again
- Do not make any modifications to the device.

2.3 Specific hazards

2.3.1 Hazardous media

- When handling hazardous media (e.g. hot, flammable, explosive, toxic, hazardous to health or the environment), observe the safety regulations for the handling of hazardous substances.
- Use personal protective equipment when carrying out any work on the fitting.
- Collect leaking pumped liquid and residues in a safe manner and dispose of in accordance with environmental regulations.

3 Layout and Function

3.1 Type plate

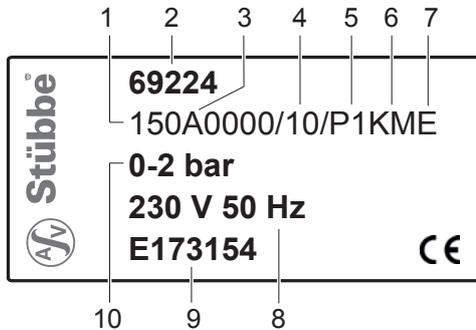


Fig. 1 Type plate (example)

- 1 Type 150 / 160
- 2 ID number
- 3 Control function (**A** = NO / **B** = NC)
- 4 Nominal diameter [mm]
- 5 Materials (**P1** = PVC / **P2** = PP / **P4** = PTFE)
- 6 Process connection (**KM** = adhesive socket end / **SM** = fusion socket / **G38** = threaded socket end 3/8 / **G12** = threaded socket end 1/2)
- 7 Elastomer (**E** = EPDM / **F** = FPM / **T** = PTFE)
- 8 Operating voltage / operating frequency
- 9 Serial number
- 10 Pressure range (dependent on nominal width in Type 150)

Device types

- Type 150
- Type 160

3.2 Description

The fitting is a solenoid valve. The fitting is used for opening and closing conduits. The fitting can be supplied normally closed or normally open.

Type 150

The fitting is directly operated.

Type 160

The fitting is pilot operated. The fitting requires a differential pressure between inlet and outlet of 0.3 bar for opening and closing.

Versions available:

- Type 150
 - Directly operated with PTFE rubber boot-sealed plunger space
 - DIN EN 175301-803 connector plug form A with built-in rectifier
- Type 160
 - Pilot operated
 - Sealed plunger space
 - DIN EN 175301-803 connector plug form A without rectifier
- Mounting position:
 - Magnetic coil preferably upwards
 - Install valve horizontally or vertically in conduit
- Valve functions:
 - closed when de-energized (NC)
 - open when de-energized (NO)
- Direction of flow as per direction of arrow on valve body (→ 3.4 Direction of flow, Page 8).

3.3 Layout

3.3.1 Type 150

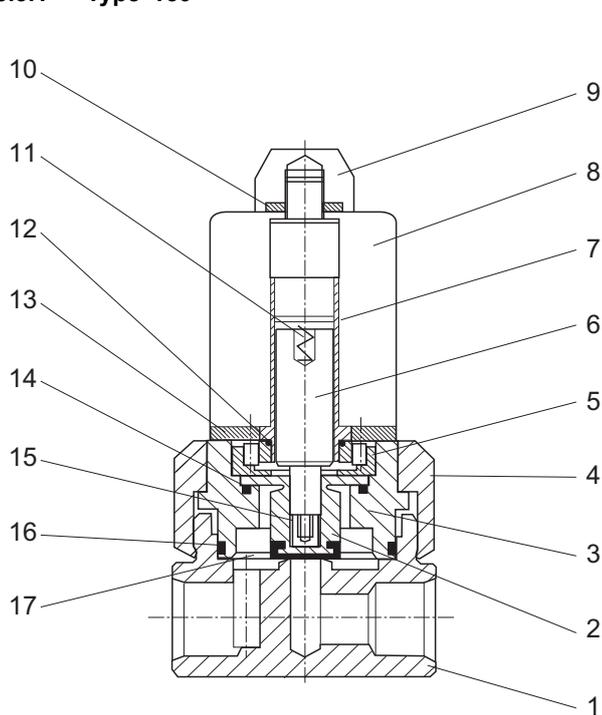


Fig. 2 Type 150 layout

- 1 valve body
- 2 bellows
- 3 intermediate element
- 4 union nut
- 5 intermediate ring
- 6 plunger
- 7 plunger guide tube
- 8 magnet coil
- 9 cap nut
- 10 gasket
- 11 pressure spring
- 12 O-ring
- 13 flat sealing ring
- 14 O-ring
- 15 threaded bush
- 16 O-ring
- 17 seal bonnet

3.3.2 Type 160

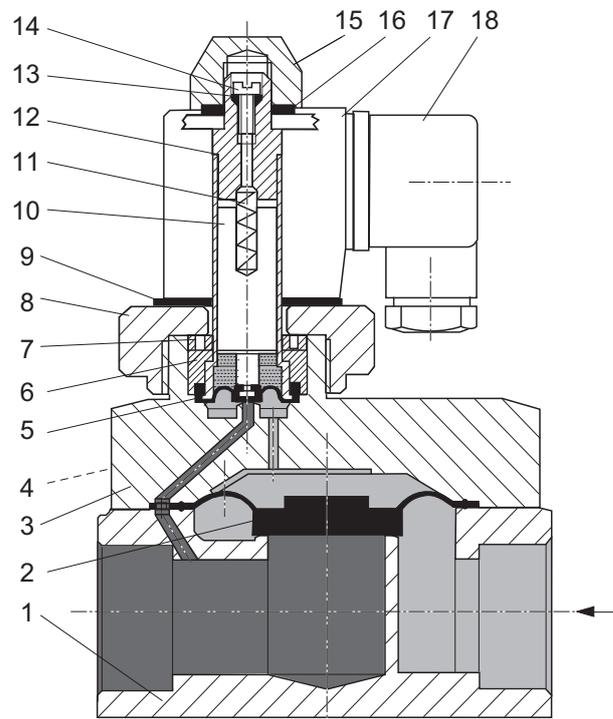


Fig. 3 Type 160 layout

- 1 valve body
- 2 membrane
- 3 cover
- 4 screw
- 5 pilot diaphragm
- 6 pressure disc
- 7 lift limitation
- 8 union nut
- 9 flat sealing ring
- 10 plunger
- 11 pressure spring
- 12 plunger guide tube
- 13 O-ring
- 14 oil screw
- 15 cap nut
- 16 gasket
- 17 magnet coil
- 18 connector plug

3.4 Direction of flow

 The direction of flow can be identified by the arrow on the fitting.

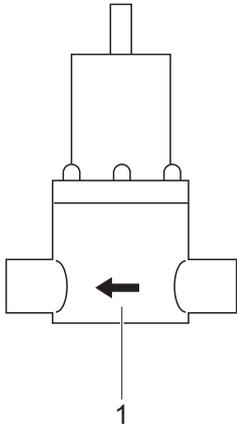


Fig. 4 Fitting with directional arrow (example)

1 Directional arrow

4 Transport, Storage and Disposal

4.1 Unpacking and inspection on delivery

1. Unpack the fitting when received and inspect it for transport damage.
2. Report any transport damage to the manufacturer immediately.
3. Ensure that the information on the type plate agrees with the order/design data.
4. For immediate installation, dispose of packaging material according to local regulations.
 - For later installation, leave the fitting in the original packaging.

4.2 Transportation

1. If possible, transport fitting (including drive) in original packaging.
2. Lift fitting manually for transport. For weight specifications (→ data sheet).

4.3 Storage

NOTE

Material damage due to inappropriate storage!

- ▶ Store the fitting properly.
-
- ▶ Make sure the storage room meets the following conditions:
 - Dry
 - Frost-free
 - Vibration-free
 - Not in direct sunlight
 - Storage temperature +10 °C to +60 °C

4.4 Disposal

 Plastic parts can be contaminated by poisonous or radioactive media to such an extent that cleaning will not be sufficient.

WARNING

Risk of poisoning and environmental damage from medium.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
 - ▶ Before disposing of the fitting:
 - Collect escaping medium and dispose separately according to local regulations.
 - Neutralize residues of medium in the fitting.
 - ▶ Remove plastic parts and dispose of them in accordance with local regulations.
-
- ▶ Dispose of fitting in accordance with local regulations.

5 Installation and connection

5.1 Preparing for installation

5.1.1 Check operating conditions

1. Ensure the design of the fitting is consistent with the purpose intended:
 - Materials used (→ type plate).
 - Medium (→ order and design data).
2. Ensure the required operating conditions are met:
 - Resistance of body and seal material to the medium (→ resistance lists).
 - Media temperature (→ Data sheet).
 - Operating pressure (→ Data sheet).
3. Consult with the manufacturer regarding any other use of the device.

5.2 Planning pipelines

5.2.1 Designing pipelines

WARNING

Risk of poisoning and environmental damage from medium.

Leaks due to impermissible pipework forces.

- ▶ Ensure that the fitting is not subject to any pulling or thrusting forces or bending moments.

1. Plan pipes safely:
 - No pulling or thrusting forces
 - No bending moments
 - Adjust for changes in length due to temperature changes (compensators, expansion shanks)
 - Observe direction of flow
 - Observe installation position and installation direction of the fitting
2. Dimensions (→ Data sheet).
3. Provide dirt arresters for trouble-free operation.

5.3 Installing fitting in pipe

WARNING

Risk of poisoning and environmental damage from medium.

Leak due to faulty installation.

- ▶ Installation work on the pipes should only be performed by technicians who have been specially trained for the pipework in question.

NOTE

Material damage from incorrect installation of fitting!

- ▶ Install fitting vertically or horizontally.
- ▶ Install fitting with the magnetic coil preferably aligned upwards.

NOTE

Material damage due to contamination of the fitting!

- ▶ Make sure no contamination reaches the fitting.
- ▶ Flush the pipe with a neutral medium.

 The fitting is installed according to the connection type of the pipes.

 For connection with solvent welding/fusion spigot ends: Use suitable solvent welding/fusion socket ends.

 Observe direction of flow (→ [3.4 Direction of flow, Page 8](#)).

5.3.1 Fixed connection with solvent welding/fusion spigot ends

1. Prepare pipe ends according to connection type.
2. Align fitting with the magnetic coil preferably upwards.
3. Adhesively apply or weld fitting with solvent welding/fusion socket ends.

5.3.2 Connection with internal thread fixed

1. Prepare pipe ends according to connection type.
2. Align fitting with the magnetic coil preferably upwards.
3. Screw pipe ends with fitting.

5.3.3 Insulate fitting

- ✓ Fitting is installed in pipe

 The fitting housing can be insulated to avoid medium-related temperature differences.

- ▶ Insulate fitting housing as needed. In doing so, ensure the following:
 - Magnetic coil is free in order to avoid heat accumulation.
 - Use suitable insulation material for fitting housing.

5.4 Connect fitting to electrical system

- ✓ Power supply switched off and secured against being switched back on again.

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out by qualified electricians only.
- ▶ Switch off system power supply and secure it against being switched back on again.

NOTE

Danger of overheating from wrong plug!

- ▶ Mount only rectifier connectors on Type 150.
1. Ensure correct current type and voltage before electrical connection (→ data sheet).
 2. Ensure that the plug connection is protected against permanent dampness. Provide cover as needed.
 3. Connecting cable to connector (→ 9.3 Plug assignment, Page 15).
 4. Insert connector into connector socket of the fitting.

5.5 Performing the hydrostatic test

 Pressure test using neutral medium, e.g. water.

1. Pressurize the fitting, ensuring
 - Test pressure < permissible system pressure
 - Test pressure < 1.5 PN
 - Test pressure < PN + 5 bar
2. Check the fitting for leaks.

6 Operation

6.1 Commissioning

- ✓ Fitting correctly installed and connected

WARNING

Risk of injury and poisoning due to medium spraying out.

- ▶ Use personal protective equipment when carrying out any work on the fitting.

NOTE

AC magnets can be destroyed by overheating!

- ▶ When commissioning the fitting with AC magnet, ensure that the magnetic coil is mounted on the plunger guide tube.
1. For the type 160 ensure that there is a differential pressure of at least 0.3 bar between valve inlet and valve outlet.
 2. After the first loads from pressure and operating temperature, check that the fitting is not leaking.

7 Maintenance

WARNING

Risk of injury and poisoning due to hazardous media liquids!

- ▶ Use personal protective equipment when carrying out any work on the fitting.

7.1 Servicing

1. Visual and function check (every three months):
 - Normal operating conditions unchanged
 - No leaks
 - No unusual operating noises or vibrations
2. Clean fitting with a moist cloth if necessary.

7.2 Maintenance

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out by qualified electricians only.

WARNING

Risk of injury and poisoning due to hazardous or hot media.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
- ▶ Safely collect the media and dispose of it in accordance with environmental regulations.

WARNING

Risk of injury during disassembly!

- ▶ Wear protective gloves, components can be very sharp-edged due to wear or damage.
- ▶ Remove components with springs (e.g. pneumatic drive) carefully, since spring tension can cause components to be ejected.

7.2.1 Removing fitting

1. Ensure that:
 - System is empty
 - System has been flushed
 - System is depressurized
 - System has cooled down
 - System is secured against being switched back on again
2. Remove fitting from the pipe.
3. Decontaminate fitting if required.
 - Dead space in the fitting may still contain medium.

7.2.2 Changing magnetic coil of type 150

- ✓ System is switched off and secured against being switched back on again

 Follow the section drawing for disassembly (→ [3.3.1 Type 150, Page 7](#)).

1. Remove connector from fitting.
2. Unscrew cap nut (9).
3. Remove gasket (10). Dispose of defective gasket.
4. Remove magnetic coil (8). Dispose of defective magnetic coil.
5. Install new magnetic coil (8).
6. Mount gasket (10).
7. Tighten cap nut (9) (→ [9.1.3 Tightening torques, Page 15](#)).
8. Connect fitting to electrical system (→ [5.4 Connect fitting to electrical system, Page 11](#)).
9. Performing the hydrostatic test (→ [5.5 Performing the hydrostatic test, Page 11](#)).

7.2.3 Changing magnetic coil of type 160

- ✓ System is switched off and secured against being switched back on again

 Follow the section drawing for disassembly (→ [3.3.2 Type 160, Page 7](#)).

1. Remove connector from fitting.
2. Unscrew cap nut (15).
3. Remove gasket (16). Dispose of defective gasket.
4. Remove magnetic coil (17). Dispose of defective magnetic coil.
5. Install new magnetic coil (17).
6. Mount gasket (16).
7. Tighten cap nut (15) (→ [9.1.3 Tightening torques, Page 15](#)).
8. Connect fitting to electrical system (→ [5.4 Connect fitting to electrical system, Page 11](#)).
9. Performing the hydrostatic test (→ [5.5 Performing the hydrostatic test, Page 11](#)).

7.3 Replacement parts and return

1. Have the following information ready to hand when ordering spare parts (→ type plate).
 - Fitting type
 - ID number
 - Nominal pressure and diameter
 - Body and seal material
2. Please complete and enclose the document of compliance for returns
(→ www.asv-stuebbe.com/service/downloads).



3. Only use spare parts from ASV Stübbe.

8 Troubleshooting

⚠ WARNING

Risk of injury and poisoning due to hazardous or hot media.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
- ▶ Safely collect the media and dispose of it in accordance with environmental regulations.

Consult with the manufacturer regarding faults which are not identified in the following table, or which cannot be traced to the indicated causes.

Error	Possible cause ¹	Corrective action
Valve does not close	Rated voltage is still present	▶ Check control voltage.
	Incorrectly installed	▶ Install fitting in accordance with direction of flow. When doing so follow arrow marking on fitting (→ 3.4 Direction of flow, Page 8).
	Differential pressure between valve input and valve outlet too low ²	▶ Ensure that there is a differential pressure of at least 0.3 bar between valve inlet and valve outlet.
	Plunger disabled	▶ Change fitting.
Valve does not open	Operating pressure too high	▶ Check operating pressure and adjust permissible operating pressure if necessary (→ data sheet).
	Connection voltage is cut or insufficient	▶ Check supply voltage. ▶ Check cable connection and if necessary cable correctly.
	Rated voltage and coil voltage different	▶ Ensure that the fitting is suitable for the intended use. Check specifications of the fitting (→ data sheet).
	Magnetic coil defective	▶ Type 150: Install new magnetic coil (→ 7.2.2 Changing magnetic coil of type 150, Page 12). ▶ Type 160: Install new magnetic coil (→ 7.2.3 Changing magnetic coil of type 160, Page 12).
	Rectifier defective ³	▶ Fit new rectifier connector (→ 5.4 Connect fitting to electrical system, Page 11).
	Plunger disabled	▶ Change fitting.
Medium escaping at pipe connection	Pipe connection leaking	▶ Check pipe connection at the fitting and tighten if necessary. Use new seal as needed.

Tab. 3 Troubleshooting

- 1) Faults apply for standard valve (NC) normally closed
- 2) applies to Type 160
- 3) applies to Type 150

9 Appendix

9.1 Technical specifications

 Technical data (→ Data sheet).

9.1.1 Working pressure

 Operating pressure (→ Data sheet).

9.1.2 Pressure and temperature limits

 Pressure and temperature limits (→ data sheet).

9.1.3 Tightening torques

Description	Size	Tightening torque
Cap nut	SW 24	hand-tight

Tab. 4 Tightening torques

9.2 Connection diagrams

9.2.1 Type 150 connection diagrams

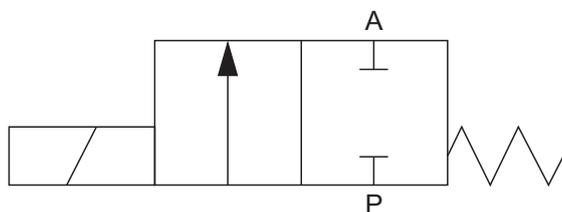


Fig. 5 Connection diagram (NO) (normally open), type 150

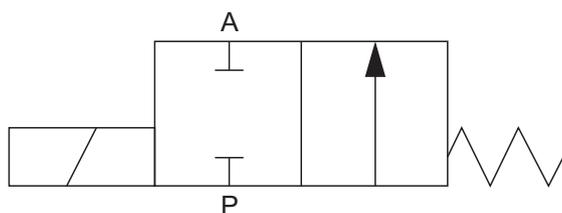


Fig. 6 Connection diagram (NC) (normally closed), type 150

9.2.2 Type 160 connection diagrams

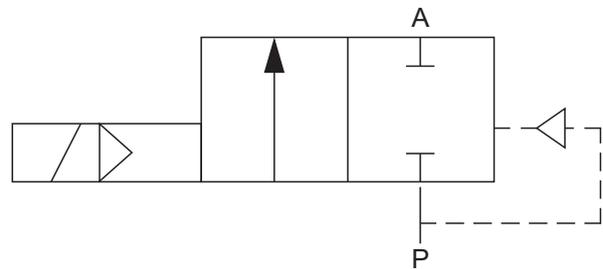


Fig. 7 Connection diagram (NO) (normally open), type 160

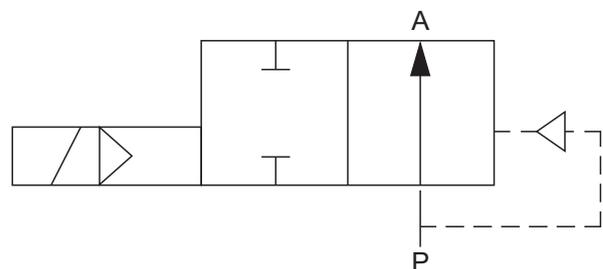


Fig. 8 Connection diagram (NC) (normally closed), type 160

9.3 Plug assignment

 DIN EN 175301-803 plug socket. The polarity of the connections (1,3) has no effect on operation.

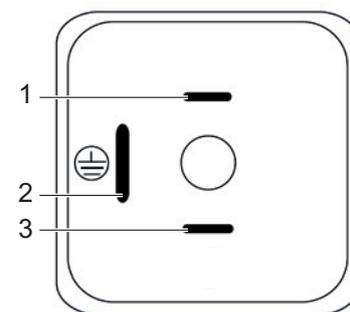


Fig. 9 connector plug

- 1 control voltage
- 2 earth
- 3 control voltage

