Operating instructions

for solenoid valve of the series

Typ 210
Typ 210a
Typ 214
Typ 215
Typ 216
Typ 220
Typ 221
Typ 240
Typ 242
Typ 246
Typ 310
Typ 314
Typ 317

Read carefully before use.
Store in a safe place for future reference.
Subject to technical modifications.

Table of contents

1 About these instructions

These instructions

- Are part of the valve
- Are applicable for Series 210, 210a, 214, 215, 216, 220, 221, 240, 242, 246, 310, 314 and 317
- Describe the safe and correct operation of the valve
- Are available for downloading from the website

1.1 Target group

Operator

- These instructions must be kept available at the place of use, including for future applications.
- Employees must be encouraged to read and observe these instructions.
- Additional country-specific or plant-specific regulations and rules must be observed.

Personnel

- Skilled workers with additional qualifications for installing the respective pipeline system.
- Electrician
- Read these instructions as well as all other applicable documents.

1.2 Other applicable documents

- Data sheet
  If not available, the data sheet must be requested from the manufacturer.

1.3 Guarantee

AWS accepts no liability if operators or third parties:

- Disregard this document
- Do not use the product properly
- Carry out interventions of any type whatsoever to the product (alterations, modifications, etc.)

Malfunctions that can be attributed to contamination or wear, as well as wearing parts (e.g. seals), are not covered by the warranty.

1.4 Warning notices and symbols

	**DANGER** **High risk** Denotes an imminent danger that will result in serious injuries or death if not avoided.

	**WARNING** **Medium risk** Denotes a possibly dangerous situation that may result in serious injuries or death if not avoided.

	**CAUTION** **Low risk** Denotes a possibly dangerous situation that may result in slight or minor injuries if not avoided.

	**NOTE** **Instruction** Denotes a possibly dangerous situation that may cause damage to property if not avoided.

2 General safety instructions

	NOTE
	**Liability** The manufacturer accepts no liability for damage resulting from the failure to observe the complete documentation.

2.1 Intended use

- The valve must be used exclusively for shutting off pipelines carrying suitable media
- Observe the operating limits
- Use the armature exclusively for media that are free of solid matter

2.2 General safety instructions

	NOTE
	**Information** Read and observe the following regulations before carrying out any activities.

2.2.1 Duties of the operator

Safety-conscious working

- Only operate the valve if it is in technically flawless condition, for its intended application and keeping safety and potential dangers in mind in accordance with these instructions.
- Ensuring adherence and supervision:
  - Intended use
  - Statutory or other safety and accident-prevention regulations
  - Safety regulations for handling dangerous substances
  - Applicable standards and directives of the respective country of use
- Supply personal protective equipment

Personnel qualifications

- Make sure that personnel tasked with carrying out activities using the valve have read and understood these instructions and all other applicable documents before starting work, especially safety, maintenance and repair information.
- Manage the responsibilities, competencies and supervision of personnel.
- Only qualified technical personnel are to be permitted to carry out the following work:
  - Installation, repair and maintenance work
  - Work on the electrical system
- Only allow trainee personnel to work on the valve under the supervision of qualified technical personnel

WARNING

Unqualified personnel
Improper handling can result in serious personal injuries or damage to property. The work described here must only be carried out by qualified personnel.

2.2.2 Duties of the personnel

- Instructions on the valve itself should be observed and kept in a legible state, e.g. type label.
- Only work on the valve if the following prerequisites are met:
  - System is drained
  - System is flushed
  - System is de-pressurised
  - System is cooled
  - System is secured against reactivation
- Do not make modifications to the device

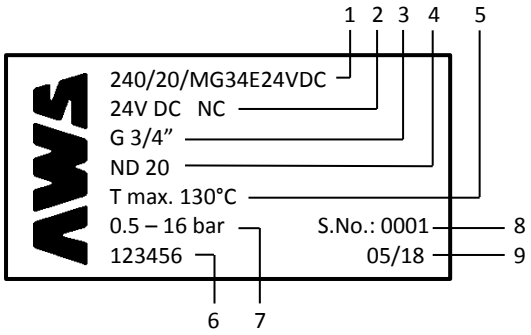
2.3 Special dangers

2.3.1 Duties of the personnel

- When handling dangerous media (e.g. hot, flammable, explosive, toxic, harmful, environmentally hazardous), always observe the safety regulations governing the handling of dangerous substances.
- During all work on the valve, wear personal protective equipment.
- Leakages and residues must be safely contained and disposed of in an environmentally-safe manner.

3 Design and function

3.1 Type label



Layout of the type label:
(similar picture)

1 Article
2 Supply voltage
3 Connection
4 Nominal diameter
5 Medium temperature
6 Commission number
7 Pressure range
8 Serial number
9 Date of manufacture

3.2 Description

The metal valve is a seat valve and is used for opening and closing pipelines. It is fully automatic and glandless and therefore practically maintenance-free.

- Available as normally closed (NC) or normally open (NO) variants.
- Connector complies with DIN EN 175301-803 form A.
  - Type 210 and Type 310 with DIN EN 175301-803 form B
- Flow direction as per direction arrow on the valve body.
- Valves are not suitable for back pressure.
- Fitting position:
  - Solenoid coil ideally at the top.
  - Fit valve horizontally or vertically into the line.

Typ 210 / 210a / 214 / 215 / 216

The valve is a direct-controlled seat valve. No differential pressure is required for opening or closing.

Typ 246

The valve is a servo-controlled seat valve with plunger and requires a differential pressure to open and close of 0,5 bar between inlet and outlet.

Type 220/240

The valve is servo-controlled and requires a differential pressure to open and close.
Type 220 requires a differential pressure of 0.1 bar between the inlet and outlet.
Type 240 requires a differential pressure of 0.5 bar between the inlet and outlet.

Type 221/242

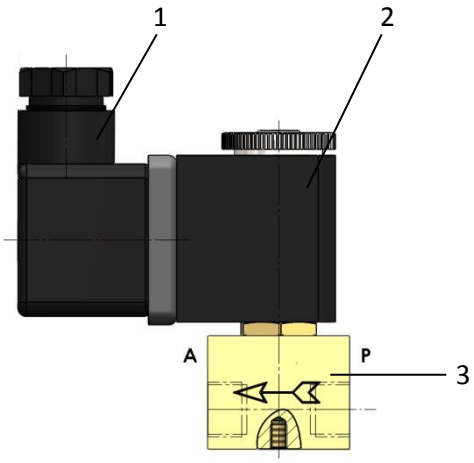
The valve is servo-controlled with positive lift. No differential pressure is required for opening and closing.

Typ 310 / 314 / 317

The valve is a direct-controlled seat valve. No differential pressure is required for opening or closing.

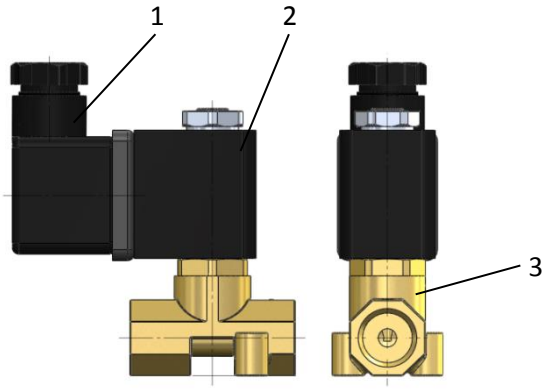
3.3 Design

3.3.1 Type 210



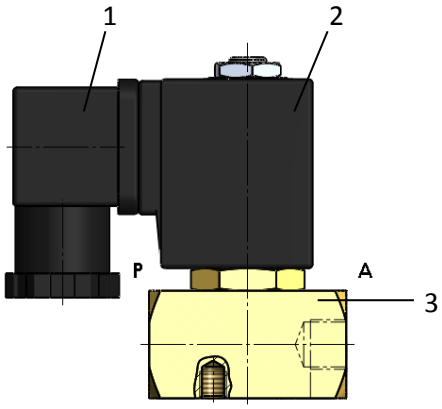
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.2 Type 210a



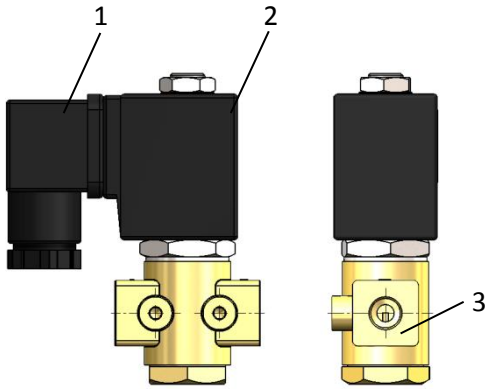
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass
	Seal material	NBR, EPDM or FKM

3.3.3 Type 214



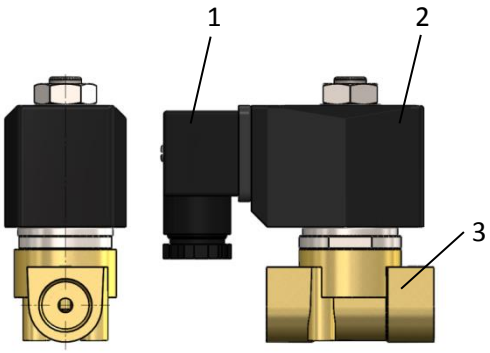
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.4 Type 215



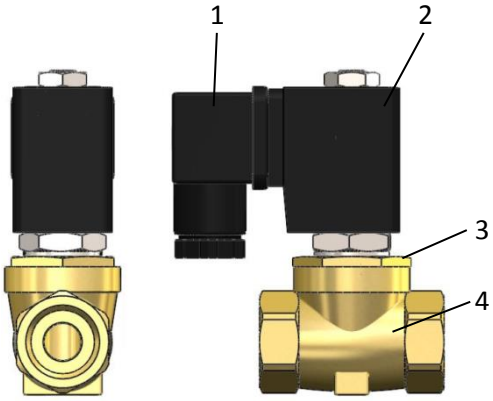
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.5 Type 216



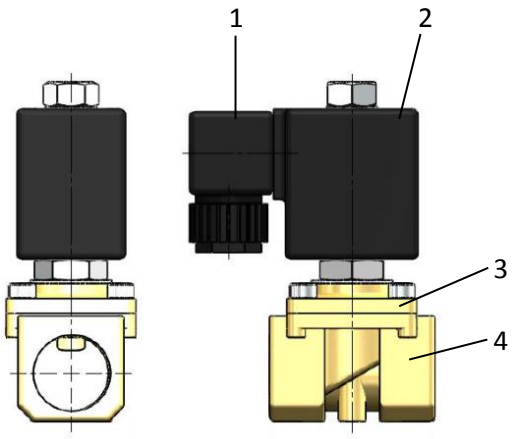
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.6 Type 220



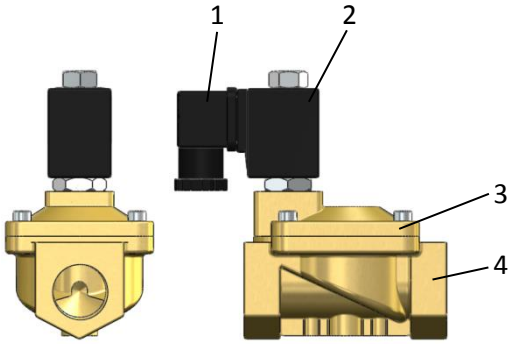
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	Brass or stainless steel
4	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.7 Type 221



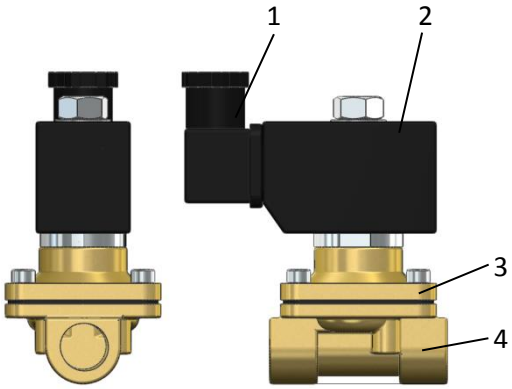
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	Brass or stainless steel
4	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.8 Type 240



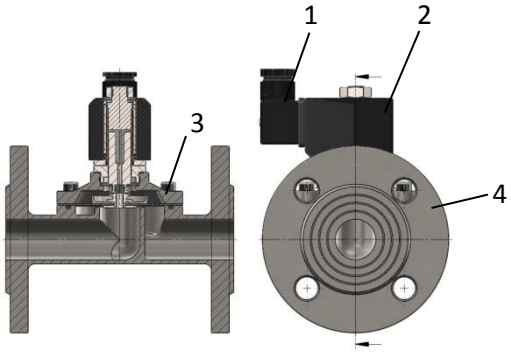
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	Brass or stainless steel
4	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.9 Type 242



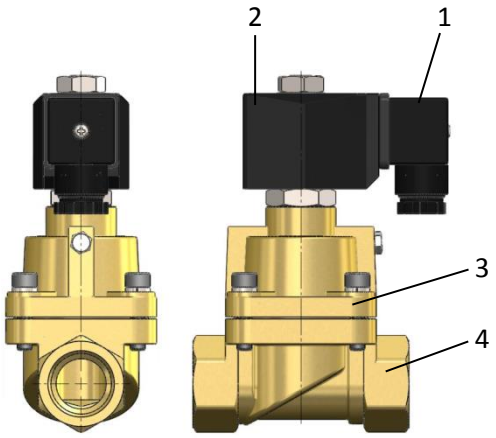
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	Brass or stainless steel
4	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.10 Type 242 FL



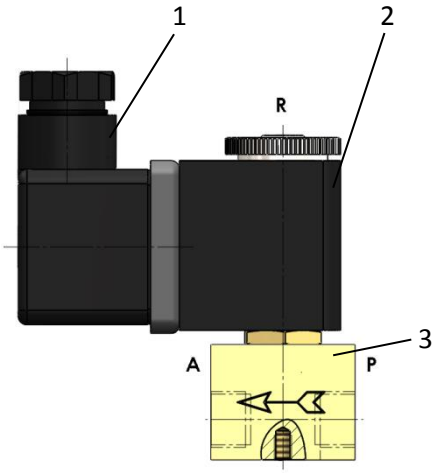
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	stainless steel
4	Valve body	stainless steel
	Seal material	NBR, EPDM or FKM

3.3.11 Type 246



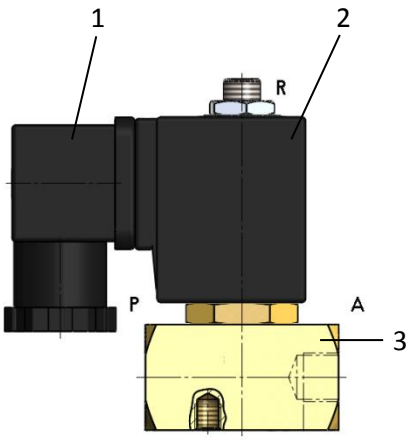
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	Brass or stainless steel
4	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.12 Type 310



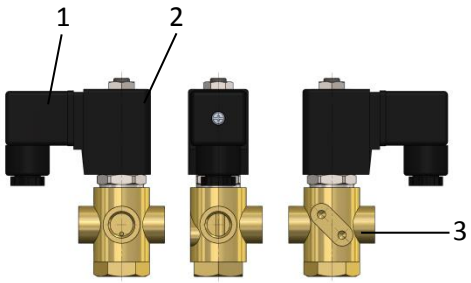
POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Cover	Brass or stainless steel
4	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.13 Type 314



POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

3.3.14 Type 317



POS	Designation	Material
1	Connector	Plastic
2	Coil housing	Plastic or metal
3	Valve body	Brass or stainless steel
	Seal material	NBR, EPDM or FKM

4 Transport, storage and disposal

4.1 Unpacking

- On receipt of the valve, unpack it, check it for signs of transport damage and ensure that it is complete.
- Transport damage or missing components must be reported to the manufacturer immediately.
- Make sure that the type label information matches the order and design data.
- When installing the product, dispose of the packaging material in accordance with the applicable local regulations.

4.2 Transport

- Wherever possible, transport the valve in the original packaging
- Lift the valve by hand for transport purposes (see data sheet for weight information)

4.3 Storage

NOTE
Improper storage can cause damage to property Store the valve properly.

You must ensure that the storage location fulfils the necessary conditions, such as:

- Dry
- Frost-free
- Free from vibrations
- No direct sunlight
- Storage temperature range +10°C to +50°C

4.4 Disposal

NOTE

Contamination
Plastic components may be contaminated by toxic or radioactive media to such an extent that cleaning is not sufficient.

WARNING

Danger of poisoning and environmental damage from the medium
During all work on the armature, wear personal protective equipment.
Prior to disposing of the valve, contain any leaking medium and dispose of it separately in accordance with the applicable local regulations. Medium residues in the armature must be neutralised.
Dismantle plastic parts and dispose of them in accordance with the applicable local regulations.

The valve must be disposed of in accordance with the applicable local regulations.

5 Installation and connection

5.1 Preparing the installation

5.1.1 Checking conditions of use

- Make sure that the valve design is suitable for the intended use:
  - Materials used
  - Medium
- Ensures the necessary conditions of use
  - The resistance of the materials used for the body and seals against the medium
  - Media temperature
  - Operating pressure
- Agree any other use with the manufacturer

5.2 Planning pipelines

5.2.1 Designing pipelines

WARNING

Danger of poisoning and environmental damage from the medium
Leakage due to leaks caused by impermissible pipeline forces.
Make sure that no tensile or compressive forces and no bending moments act on the armature.

- Plan pipelines with safety in mind
  - Ensure there are no tensile or compressive forces
  - Ensure there are no bending moments
  - Compensate for changes in length caused by temperature fluctuations
  - Observe the direction of flow
  - Pay close attention to the fitting position and direction of the valve
  - Apply suitable measures to prevent pressure surges
- Dimensions (3.3 Design and dimensions)
- Fit dirt traps to ensure proper functioning

5.3 Fitting the valve to a pipeline

WARNING

De-pressurised fitting.
Only fit the valve to de-pressurised pipelines.

WARNING

Danger of poisoning and environmental damage from the medium
Leakage due to incorrect installation.
Installation work on the pipelines must only be carried out by skilled workers who are trained for the respective pipeline system.

NOTE

Improper installation of the valve can cause damage to property
Fit the armature horizontally or vertically.
Ideally, fit the armature with the solenoid coil pointing upwards.

NOTE

Contamination in the valve can cause damage to property
Make sure that no contamination can enter the armature.
Flush the pipeline with a neutral medium.

The procedure used to fit the armature is determined by the type of connection to the pipeline.

5.3.1 Threaded connection

- Screw the threaded connection onto the pipe in accordance with the applicable standard.
- Use suitable sealing materials depending on the design and intended purpose.

5.3.2 Connection with flange

- Check that the sealing face is free of damage and clean.
- Carefully align the flange in front of the threaded joint.
- Centre the seals (use suitable sealing material).
- Connect the valve flange and pipe flange with the seal and suitable bolts.
- Tighten the bolts cross-wise. Use all of the flange holes!
- Only use permissible joining elements.

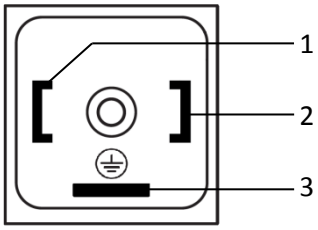
5.4 Electrical connection

	DANGER
	Danger to life due to electric shock Only allow an electrician to work on the electrical system. Switch off the power supply to the system and secure it to prevent it from being accidentally switched on again. Connect protective conductors.

- Before making the electrical connection, check that the current type and voltage are correct (see data sheet).
- Make sure that the device plug connection is protected against constant moisture. If necessary, fit a protective cover.
- Connect the cable to the device.
- Connect protective conductors.
- Insert device plug into connector on the valve.

5.4.1 Plug assignment

	HINWEIS
	Plug Plug according to DIN EN 175301-803.



1 Supply voltage
2 Supply voltage
3 Protective earth conductor

5.5 Carry out a pressure check

	NOTE
	Medium pressure check Carry out the pressure check using a neutral medium (e.g. water).

- Pressurise the valve. When doing so, ensure that:
  - Test pressure < permissible system pressure
  - Test pressure < 1.5 PN
- Check that the valve is leak-tight.

6 Operation

6.1 Commissioning

The valve must be correctly assembled and connected.

	**WARNING**
	Danger of poisoning and environmental damage from the medium Leakage due to leaks caused by impermissible pipeline forces. Make sure that no tensile or compressive forces and no bending moments act on the armature.

	**WARNING**
	Hot surfaces Solenoid and valve body heat up during operation. Risk of burning when touching hot surfaces. Wear protective gloves.

	**NOTE**
	Overheating will destroy the alternating voltage solenoids When commissioning the valve equipped with an alternating voltage solenoid, make sure that the solenoid coil is mounted on the plunger guide.

- Please ensure that the required differential pressure is applied between valve inlet and valve outlet for the corresponding valve types.
- After it is first exposed to pressure and operating temperatures, check that the valve is leak-tight.

7 Maintenance and repairs

	**WARNING**
	Risk of injury and poisoning by media During all work on the valve, wear personal protective equipment.

	**WARNING**
	Hot surfaces Solenoid and valve body heat up during operation. Risk of burning when touching hot surfaces. Wear protective gloves.

7.1 Maintenance

- Visual and functional inspection (quarterly):
  - No change in normal operating states
  - Leak-tightness
  - No unusual operating noises and vibrations
- If necessary, clean valve with a damp cloth.

NOTE

Adjust maintenance intervals
The maintenance intervals must be adjusted in line with the applicable operating conditions. This is the responsibility of the operator.

7.2 Repairs

DANGER

Danger to life due to electric shock
Only allow an electrician to work on the electrical system.

WARNING

Risk of injury and poisoning due to dangerous or hot media
During all work on the valve, wear personal protective equipment. Any medium leaks must be safely contained and disposed of in an environmentally-safe manner.

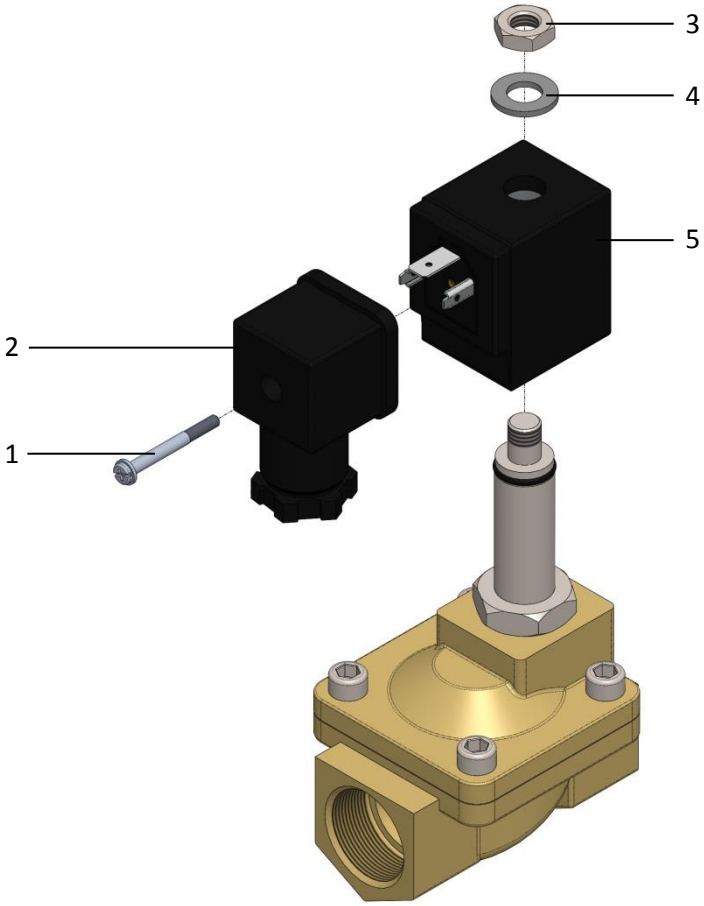
WARNING

Risk of injury during disassembly work
Wear protective gloves; components can become extremely sharp as a result of wear or damage.
Components fitted with springs must be removed with great care as the spring tension can cause components to be hurled out.

7.2.1 Removing valves

- Make sure that:
  - System is drained
  - System is flushed
  - System is de-pressurised
  - System is cooled
  - System is secured against reactivation
  - Valve de-energized
- Remove valve from the pipeline.
- If necessary, decontaminate valve.
  - Empty spaces in the valve may still contain medium.

7.2.2 Replacing solenoid coils



1. Loosen bolt (1) and remove device plug (2) from the valve.
2. Unscrew nut (3) and remove washer (4).
4. Remove solenoid coil (5). Dispose of faulty solenoid coil correctly.
5. Fit new solenoid coil (5).
6. Refit the individual parts in reverse order.
7. Connect armature to power supply (5.4 Connecting the armature to the power supply).
8. Conduct pressure check (5.5 Conducting the pressure check).

7.3 Spare parts

- Keep the following information ready for ordering spare parts.
  - Valve type
  - Article number
  - Nominal pressure and diameter
  - Materials of body and seals
- Only use spare parts supplied by AWS Apparatebau.

7.4 Returns

- Seal all valve openings (e.g. with protective film).
- A clearance declaration must be completed and enclosed with the returns.

7.5 Packaging

NOTE

Unsuitable packaging
The valve may be damaged if unsuitable packaging is used.
Always use the original packaging and handle the product with care.

AWS accepts no responsibility for damage caused by the use of unsuitable packaging!

8 Fault elimination

	**WARNING**
	Risk of injury and poisoning by media During all work on the valve, wear personal protective equipment. Any medium leaks must be safely contained and disposed of in an environmentally-safe manner.

	**WARNING**
	Hot surfaces Solenoid and valve body heat up during operation. Risk of burning when touching hot surfaces. Wear protective gloves.

Faults that are not mentioned in the table below or which cannot be attributed to the causes specified should be discussed with the manufacturer.

Faults	**Cause of fault** [1]	**Troubleshooting**
Valve leaky	Valve seat leaky	Replace valve.
Valve does not close	Nominal voltage is still applied	Check control voltage.
	Incorrectly fitted	Fit armature to the valve in accordance with the flow direction.
	Differential pressure between valve inlet and valve outlet too low [2]	Make sure that the required differential pressure between the valve inlet and valve outlet is applied.
	Plunger blocked	Replace armature.
Valve does not open	Operating pressure too high	Check operating pressure and, if necessary, set permissible operating pressure.
	Supply voltage interrupted or too low	Check power supply. Check cable connection.
	Nominal voltage and coil voltage do not match	Make sure that the valve is suitable for the intended use.
	Solenoid coil faulty	Fit new solenoid coil (see 7.2.2).
	Plunger blocked	Replace armature
Medium leaking from pipeline connection	Pipeline connection leaky	Check pipeline connection to the armature. If necessary, replace the seal.

1) Faults apply to standard valves (NC) normally closed
2) Applies to Type 220 and 240

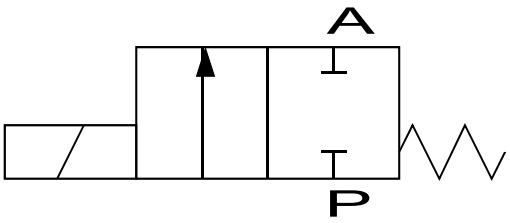
9 Appendix

9.1 Technical data

Please refer to the data sheet for technical data such as the operating pressure or the operating temperature. If the data sheet is not available, request it from the manufacturer.

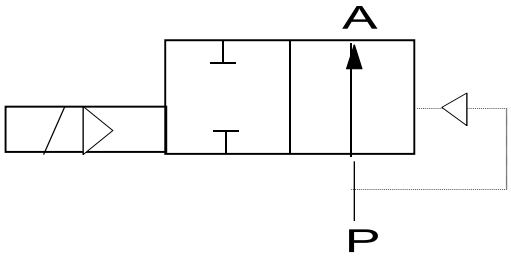
9.2 Circuit diagrams

9.2.1 Circuit diagrams Type 210 / 210a / 214 / 216



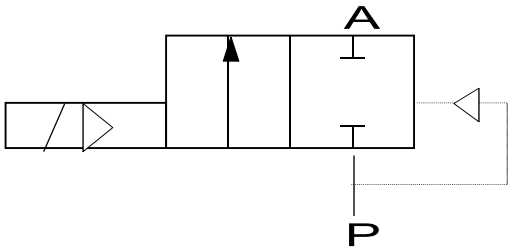
Switching function: NC (normally closed)

- Type 215



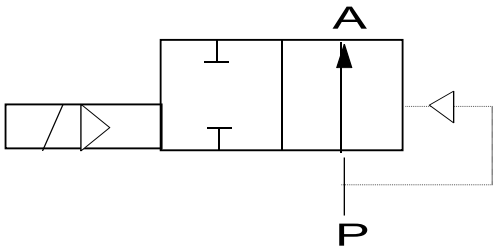
Switching function: NO (normally open)

9.2.2 Circuit diagrams Type 220 / 221 / 240 / 242 / 246



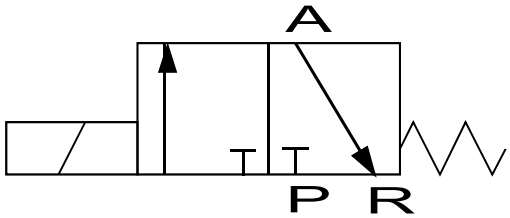
Switching function: NC (normally closed)

- Typ 240 / 242



Switching function: NO (normally open)

9.2.3 Circuit diagrams Type 310 / 314 / 317



Switching function: NC (normally closed)

9.3 Declaration of conformity

EU - Konformitätserklärung

EU - Declaration of conformity

Die Firma
The company

AWS Apparatebau Arnold GmbH
Zimmerbachstraße 51
D - 74676 Niedernhall-Waldzimmern
Tel.: +49 7940 9308 – 200
E-Mail: info@aws-apparatebau.de

erklärt in alleiniger Verantwortung als Hersteller, dass für die Produkte unter den folgenden Typenbezeichnungen
declares in own responsibility as manufacturer, that for products with the following type designations

210, 210a, 214, 214a, 215, 216, 217, 220, 221, 239, 240, 242, 246, 310, 311, 314

die Konformität zu den nachfolgend genannten Richtlinien festgestellt wurde:
the conformity to below mentioned directives has been established:

2014/68/EU – Druckgeräterichtlinie / *Pressure Equipment Directive*
2014/35/EU – Niederspannungsrichtlinie / *Low Voltage Directive*
2011/65/EU – RoHS-Richtlinie / *RoHS Directive*

Ebenso stehen die Ersatzteile für die oben genannten Produkte im Einklang mit den aufgeführten Richtlinien, sofern diese anwendbar sind.
Likewise, the spare parts for the above mentioned products are in accordance with the listed directives, provided they are applicable.

Hinweis in Bezug auf die Druckgeräterichtlinie:
Note regarding the Pressure Equipment Directive:

Die Konformität wurde nach Modul A bewertet.
Bei oben aufgeführten Ventilen ≥ DN 32 handelt es sich um Druckgeräte nach Kategorie I. Diese Ventile dürfen nicht mit instabilen Gasen betrieben werden.
Bei oben aufgeführten Ventilen ≤ DN 25 handelt es sich um Druckgeräte nach Artikel 4, Absatz 3 (Gute Ingenieurspraxis), auf denen bestimmungsgemäß keine CE Kennzeichnung angebracht werden darf.
The conformity has been assessed according to module A.
Above mentioned valves ≥ DN 32 are pressure equipment within category 1. These valves must not be operated with unstable gases.
Above mentioned valves ≤ DN 25 are pressure equipment within article 4, paragraph 3 (sound engineering practice), which must not bear the CE marking.

Niedernhall, 09.06.2021
Ort, Datum
Location, date

i.A. D. Zuber — Konstruktionsleiter
Design Manager

Notes

Imprint

Manufacturer	AWS Apparatebau Arnold GmbH Zimmerbachstrasse 51 74676 Niedernhall-Waldzimmern Germany Phone: +49 (0) 7940 9308 200 Fax: +49 (0) 7940 9308 212 E-mail: info@aws-apparatebau.de Website: www.aws-apparatebau.de
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Translation	These operating instructions in English are a translation of the original German operating instructions. Operating instructions in other languages are also translations of the original German operating instructions. In the event of discrepancies between the different versions, the information contained in the original operating instructions in German shall apply.

Read carefully before use.
Store in a safe place for future reference.
Subject to technical modifications.

AWS Apparatebau Arnold GmbH
www.aws-apparatebau.de

Ihr Partner für:
> Rückschlagklappen
> Ventiltechnik
> Baugruppenmontage

Your partner for:
> Check-valves
> Valve technology
> Apparatus construction

Zimmerbachstrasse 51
74676 Niedernhall – Waldzimmern
Phone: +49 7940 9308 – 0
Info@aws-apparatebau.de

Zimmerbachstrasse 51
D - 74676 Niedernhall – Waldzimmern
Phone: +49 7940 9308 – 0
Info@aws-apparatebau.de