bürkert
FLUID CONTROL SYSTEMS

EPS 16 ATEX 1111X, IECEx EPS 16.0049X

Solenoid coil Type ACP016
Magnetspule Typ ACP016
Bobine magnétique Type ACP016



Device with II 2G/D Ex approval
Geräte mit II 2G/D Ex Zulassung
Appareils avec mode de protection II 2G/D Ex

Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

MAN 1000305754 EN Version: CStatus: RL (released | freigegeben) printed: 22.09.2017

We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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1 OPERATING INSTRUCTION

The operating instructions describe the entire life cycle of the device. Keep these instructions in a location which is easily accessible to every user and make these instructions available to every new owner of the device.

Operating instruction contain important information.

- Read the operating instructions carefully and follow the safety instructions in particular.
- Operating instructions must be available to each user.
- The liability and warranty for the device are void if the operating instructions are not followed.

1.1 Definitions of terms

The term “device” used in these instructions applies to the solenoid coil Type ACP016.

In these instructions, the abbreviation “Ex” always refers to “potentially explosive”.

1.2 Symbols

DANGER!

Warns of an immediate danger.

- Failure to observe the warning may result in a fatal or serious injury.

WARNING!

Warns of a potentially dangerous situation.

- Failure to observe the warning may result in serious injuries or death.

CAUTION!

Warns of a possible danger.

- Failure to observe this warning may result in a moderate or minor injury.

NOTE!

Warns of damage to property.

Important tips and recommendations.

Refers to information in these operating instructions or in other documentation.

- designates an instruction to prevent risks.

→ designates a procedure which you must carry out.

2 INTENDED USE

Non-authorized use of the solenoid coil Type ACP016 may be a hazard to people, nearby equipment and the environment.

The solenoid coil Type ACP016 is used to actuate valves which control gaseous or liquid media.

- Use according to the authorized data, operating conditions, and conditions of use specified in the contract documents and operating instructions.
- Use solenoid coil ACP016 only for use in explosion group IIC, category 2G, temperature class T4 or explosion group IIIC, category 2D, T130°C (see specifications on type label for explosion-risk area).
- Use the solenoid coil only for the application cases designated in chapter „6 Application conditions of the devices“ and in conjunction with third-party devices and third-party components recommended or approved by Bürkert.
- The applied protection class is encapsulation Ex “m” for coils with cable connection.
- The ignition protection type for the optionally mounted terminal box is “e” for gas and “t” for dust.
- Correct transportation, correct storage as well as correct assembly, installation, start-up, operation and maintenance are essential for reliable and problem-free operation.
- Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- Use the device only for its intended purpose.

2.1 Explosion protection approval

The explosion protection approval is only valid if you use the odules and components authorized by Bürkert, as described in these operating instructions.
The solenoid coil Type ACP016 may be used only in combination with the valve types released by Bürkert, otherwise the explosion protection approval will be terminated. If you make unauthorized changes to the system, the modules or components, the explosion protection approval will also be void.

The following EU Type Examination Certificates and IECEx certificates

Solenoid coil ACP016:	EPS 16 ATEX 1111X, IECEx EPS 16.0049X
Terminal box:	PTB 15 ATEX 1011 U, IECEx PTB 15.0037 U
were issued by the:	Bureau Veritas Consumer Products Services Germany GmbH Businesspark A96 86842 Türkheim
Production audited by the:	PTB (Physikalisch Technische Bundesanstalt) Bundesallee 100 38116 Braunschweig

The EC Type Examination Certificate is available online at:
www.burkert.com

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not consider any contingencies or incidents which occur during installation, operation and maintenance. The operator is responsible for observing the location-specific safety regulations, also with reference to the personnel.

Risk of injury from high pressure.

- Before working on the system or device, switch off the pressure and vent or drain lines.

Risk of electric shock.

- Before reaching into the device, switch off the power supply and secure to prevent reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of burns and risk of fire if used during long-term operation through hot device surface.

The solenoid coil can get very hot during long-term operation.

- Keep the device away from highly flammable substances and media.
- Do not touch the device with bare hands.

Risk of explosion.

The solenoid coil form a closed system after installation. When used in explosion-risk areas, there is a risk of explosion if the system is opened in the operating state.

- Do not remove or open the system during operation.

Risk of explosion due to electrostatic discharge.

In the event of a sudden discharge from electrostatically charged devices or individuals, there is a risk of an explosion in the explosion-risk area.

- Take suitable measures to ensure that no electrostatic discharges can build up in the explosion-risk area.
- Do not use the device in areas where there are powerful charge-generating processes, mechanical reaming and cutting processes, the spraying of electrons (e.g. in the vicinity of electrostatic coating equipment) as well as pneumatically conveyed dust.
- Clean the device surface by gently wiping it with a damp or anti-static cloth only.

To avoid the risk of explosion, the following must be observed for operation in explosion-risk areas:

- Information on the temperature class, degree of protection and voltage on the type label for explosion-risk areas.
- Repairs may only be performed by the manufacturer.
- The device must not be exposed to any mechanical and/or thermal loads which exceed the limits specified in the operating instructions.
- Before opening the terminal box, disconnect the power supply.
- The applicable safety regulations (including national regulations) as well as general technical standards must be observed during setup and operation.

General hazardous situations.

To prevent injury, ensure:

- Secure system/equipment against unintentional activation.
- Observe the direction of flow during installation.
- After an interruption in the power supply or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- Do not make any internal or external changes on the device and do not subject it to mechanical stress.
- Installation, operation and maintenance may only be performed by qualified specialists.
- The valves must be installed in accordance with the regulations applicable in the country.
- Observe the general rules of technology.

4 GENERAL INFORMATION

4.1 Contact address

Germany

Bürkert Fluid Control Systems
Sales Center
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. + 49 (0) 7940 - 10-91 111
Fax + 49 (0) 7940 - 10-91 448
Email: info@burkert.com

International

Contact addresses can be found on the final pages of the printed operating instructions.

And also on the Internet at:

www.burkert.com

4.2 Warranty

The warranty is only valid if the device is used as intended in accordance with the specified application conditions.

4.3 Information on the Internet

Operating instructions and data sheets for Type ACP016 can be found on the Internet at: www.burkert.com

5 PRODUCT DESCRIPTION

5.1 Structure

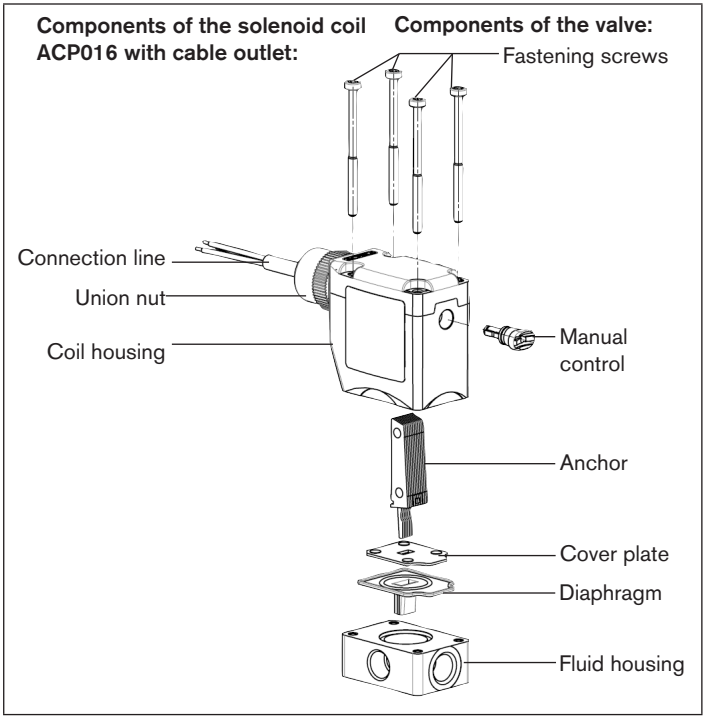


Fig. 1: Valve with solenoid coil Type ACP016 with cable outlet

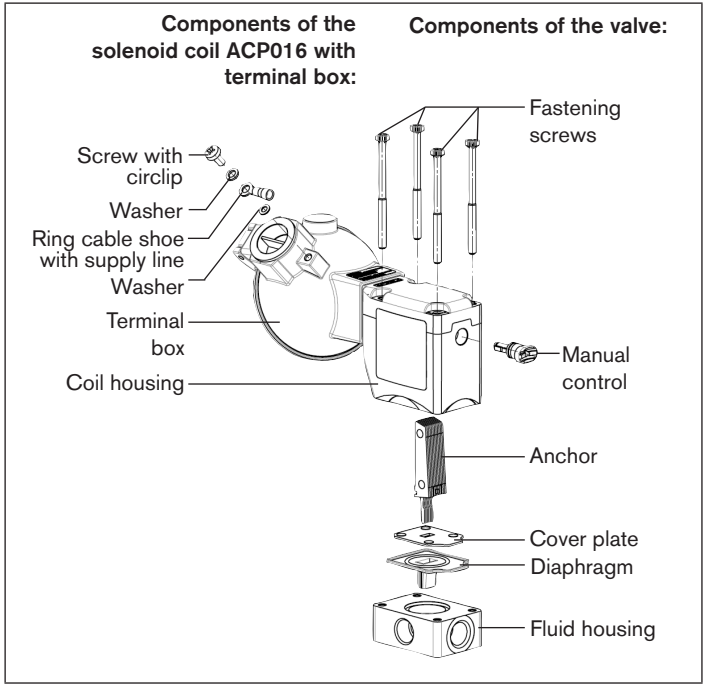


Fig. 2: Valve with solenoid coil Type ACP016 with terminal box

5.2 Solenoid coil with cable outlet

The solenoid coil ACP016 is an electromagnetic actuator for various Bürkert valves. The valve function is based on the connection of the solenoid coil with a fluid housing. Solenoid coil and fluid housing are connected with fastening screws; this is why the solenoid coil ACP016 is included in the solenoid coils which are screwed together as a block.

The fastening screws ensure electrical contact between the fluid housing and solenoid coil.

The solenoid coil housing is composed of epoxy resin.

The power supply is connected via a cable. The cable is permanently integrated in the solenoid coil, the union nut is not intended to be removed. All metallic components are grounded via the protective conductor in the cable.

Actuation is possible with alternating voltage or direct voltage. Do not pay attention to polarity on account of the integrated bridge rectifier.

The solenoid coil also includes electronic power switching for reducing the power consumption during operation.

5.3 Solenoid coil with terminal box

The structure of the solenoid coil is identical to the description under „5.2 Solenoid coil with cable outlet“, however a terminal box is also installed here (see „Fig. 2“). The terminal box is certified with the EU Type Examination Certificate
PTB 15 ATEX 1011 U or IECEx PTB 15.0037 U.

The cable outlet direction can be selected according to the order requirements. The outlet direction can be changed subsequently, however this requires a special tool[1)].

A connection kit for additional potential equalization is enclosed with the terminal box, observe the information in chapter „8.2“

5.4 Proximity switch

Optionally, the solenoid coil features an intrinsically safe proximity switch. The internal code for this variant is CF15.

A suitable proximity switch is approved separately under the certificate PTB 00 ATEX 2048 X / ZELM 03 ATEX 0128 X. The safety data can be found in the technical documentation of the proximity switch.

Proximity switches from other manufacturers may also be used if the proximity switches are designed for the application site and are correctly installed. They are evaluated by the operator.

1) *To do this, please contact your local Bürkert representative.*

6 APPLICATION CONDITIONS OF THE DEVICES

6.1 Avoiding build-up of electrostatic charge

WARNING!

Risk of explosion due to electrostatic discharge.

In the event of a sudden discharge from electrostatically charged devices or individuals, there is a risk of an explosion in the explosion-risk area.

- Take suitable measures to ensure that no electrostatic discharges can build up in the explosion-risk area.
- Do not use the device in areas where there are powerful charge generating processes, mechanical reaming and cutting processes, the spraying of electrons (e.g. in the vicinity of electrostatic coating equipment) as well as pneumatically conveyed dust.
- Clean the device surface by gently wiping it with a damp or antistatic cloth only.

6.2 Block assembly

The solenoid coil with cable outlet can be a block assembly. The grid dimension must be at least 37 mm. Preferably use blocks from the manufacturer.
The solenoid coil with terminal box cannot be a block assembly.

6.3 Operating conditions

The fluid housing performs a cooling function for the solenoid coil. Operate the solenoid coil with fluid housing only. The fluid housing must comply with the following requirements:

Material	Dimensions (L x W x H)
Brass, VA	32 mm x 46 mm x 18 mm
PP, PVDF, PEEK	32 mm x 46 mm x 19 mm
PVC	35 mm x 65 mm x 38 mm
PTFE	35 mm x 76 mm x 38 mm

Tab. 1: Fluid housing

Fluid housings made of the same material with larger dimensions or with the same dimensions made of a material with better thermal conductivity can be used at any time.

6.4 Operating temperature range

For each valve type observe the operating temperature range specified in the electrical data.

6.5 Mechanical hazards

The solenoid coil with terminal box may be operated only in areas which have a low mechanical hazard. They are evaluated by the operator. The solenoid coil with cable outlet may also be used in areas with a high mechanical hazard.

7 TECHNICAL DATA

DANGER!

Risk of explosion.

If the safety data and values specified on the type label are not observed or maintained, hazardous situations may be the consequence.

- Observe the degree of protection and temperature class when using the device.

It is a safety risk to exceed the voltage indicated on the type label, as this may cause the device to overheat.

- Do not connect the device to a voltage which is higher than the one stated on the type label.

It is a safety risk to exceed the max. permitted switching frequency, as this may cause the device to overheat.

- Do not operate the device at a higher than the maximum permitted switching frequency.

7.1 Conformity

The solenoid coil Type ACP016 is compliant with EU directives as stated in the EU Declaration of Conformity (if applicable).

7.2 Standards

The applied standards, which are used to demonstrate conformity with the EU Directives, are listed in the EU-type examination certificate and/ or the EU Declaration of Conformity (if applicable).

7.3 Identification of the solenoid coil with cable outlet

Solenoid coil ACP016 with cable outlet with fluid housing and position of the type label:

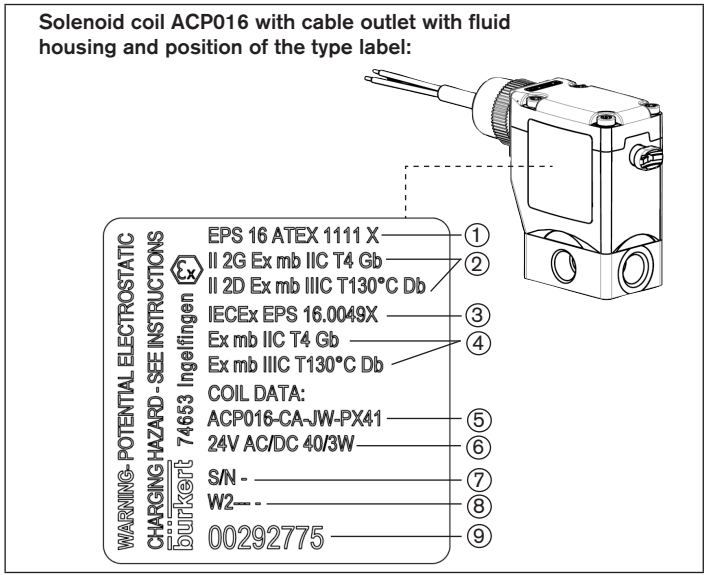


Fig. 3: Location and description of the Ex type label

Key:

Position	Description
1	ATEX, certificate author and certificate number
2	ATEX, Ex identification
3	IECEx, certificate author and certificate number
4	IECEx, Ex identification
5	Type identification (abbreviated version)
6	Nominal voltage, nominal power
7	Serial number
8	Manufacturer, date of manufacture, materials
9	ID number

Tab. 2: Key: Identification of the solenoid coil with cable outlet

7.4 Identification of the solenoid coil with terminal box

NOTE!

Attachment of the terminal box changes the ignition protection type.

Solenoid coil ACP016 with terminal box with fluid housing and the positions of the type labels:

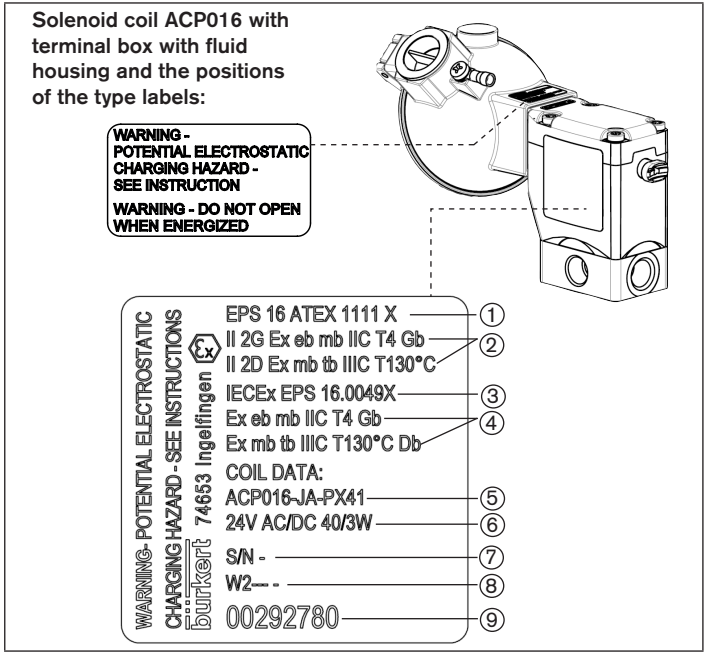


Fig. 4: Location and description of the Ex type labels

Key:

Position	Description
1	ATEX, certificate author and certificate number
2	ATEX, Ex identification
3	IECEx, certificate author and certificate number
4	IECEx, Ex identification
5	Type identification (abbreviated version)
6	Nominal voltage, nominal power
7	Serial number
8	Manufacturer, date of manufacture, materials
9	ID number

Tab. 3: Key: Identification of the solenoid coil with terminal box

7.5 Ignition protection types

The Ex identification complies with the ignition protection types of the particular components used.

	Model	Ex identification	Internal code
ATEX	Cable outlet	II 2G Ex mb IIC T4 Gb II 2D Ex mb IIIC T130°C Db	CA + JWxx[2] + PX41
	Cable outlet with proximity switch[4]		CA + CF15 + JWxx[2] + PX41
	Terminal box	II 2G Ex eb mb IIC T4 Gb II 2D Ex mb tb IIIC T130°C Db	Jx[3] + PX41
	Terminal box with proximity switch[4]		Jx[3] + CF15 + PX41
IECEx	Cable outlet	Ex mb IIC T4 Gb Ex mb IIIC T130°C Db	CA + JWxx[2] + PX41
	Cable outlet with proximity switch[4]		CA + CF15 + JWxx[2] + PX41
	Terminal box	Ex eb mb IIC T4 Gb Ex mb tb IIIC T130°C Db	Jx[3] + PX41
	Terminal box with proximity switch[4]		Jx[3] + CF15 + PX41

Tab. 4: Ex identification

2) *Different cable lengths*
3) *Terminal box, comp. „Tab. 7“*
4) *Proximity switch has separate Ex identification*

7.6 Electrical data

Voltage type	AC/DC
Nominal voltage	24...230 V ±10%
Nominal power	40 W
Reduced nominal power	3 W
Rated current	0.18...1.6 A
Reduced rated current	0.014...0.11 A
Ambient temperature range	-30...+55 °C
Operating mode (according to DIN VDE 0580)	Long-term operation Intermittent operation Short-term operation

Tab. 5: Electrical data

Observe the maximum permitted ambient temperature range indicated for each valve type under operating conditions of the valve.

Maximum switching frequency	30 ^{1}/min
Minimum currentless interval	0.5 s

Tab. 6: Permitted parameters for intermittent operation

DANGER!

Risk of explosion due to overheating.

- Do not connect the device to a voltage which is higher than the one stated on the type label.
- Do not operate the device at a higher than the maximum permitted switching frequency.

7.6.1 Electrical connection

Material[5]:	electron beam cross-linked polyolefin copolymer
Temperature operating range[5]:	–55...+145 °C for fixed installation
Minimum bending radius[5]:	4 x external diameter for fixed installation
External diameter[5]:	6.2 mm
Structure and function:	3 x copper wire 0.75 mm² / LNPE
Halogen-free according to:	IEC 60754-1
Tested according to:	DIN EN 13617-1 for use in gasoline pumps

Variants	Internal code
Permanently installed cable made of electron beam cross-linked polyolefin copolymer	CA + JWxx[6]
Terminal box with internal thread M20 x 1.5	JA
Terminal box with internal thread NPT1/2	JC

Tab. 7: Electrical connection

5) *Information according to the manufacturer*
6) *Different cable lengths*

8 ACCESSORIES

8.1 Cable gland for terminal box

Suitable cable glands are available for use of the terminal box.

Cable gland made of plastic is included in the scope of delivery of the valve. Cable gland made of brass must be ordered separately. Cable glands from other manufacturers may also be used if the cable glands are designed for the application site and are correctly installed. Note that the operating temperature of the cable gland must be at least 15 K above the maximum ambient temperature.

Material	Clamping range	Operating temperature	Order number	Certificate number
Plastic	7...13 mm	-40...+75 °C	773 277	7)
Brass	6...13 mm		773 278	8)
Material	**IP-Protection**	**Dust identification**	**Gas identification**	
Plastic	IP66	II 2D Extb IIIC Db	II 2G Exe IIC Gb	
Brass				

7) *PTB 13 ATEX 1015X; IECEx PTB 13.00034X*
8) *PTB 04 ATEX 1112X; IECEx PTB 13.00027X*

8.2 External grounding connection for terminal box

If solenoid coils feature a terminal box, connection terminals are enclosed for the external grounding connection.

If the potential equalization is not to be connected by a pipeline or by the use of a plastic fitting, the connection can be made via the external grounding connection. Its use is therefore optional and must be assessed by the operator.

The connection capacity of the ring cable lug is 4...6 mm². The connection is made as shown in „Fig. 7“.

9 INSTALLATION AND REMOVAL

DANGER!

Risk of injury from high pressure.

- Before working on the system or device, switch off the pressure and vent or drain lines.

Risk of electric shock.

- Before reaching into the device, switch off the power supply and secure to prevent reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of burns and risk of fire if used during long-term operation through hot device surface.

- Keep the device away from highly flammable substances and media.
- Do not touch the device with bare hands.

Risk of short-circuit due to damaged connection cable.

- The coil connection cable have to be fixed and protected against damage.

Risk of explosion.

The solenoid coil form a closed system after installation. When used in explosion-risk areas, there is a risk of explosion if the system is opened in the operating state.

- The system must not be disassembled during operation.

DANGER!

Risk of explosion due to electrostatic discharge.

In the event of a sudden discharge from electrostatically charged devices or individuals, there is a risk of an explosion in the explosion-risk area.

- Take suitable measures to ensure that no electrostatic discharges can build up in the explosion-risk area.
- Do not use the device in areas where there are powerful charge generating processes, mechanical reaming and cutting processes, the spraying of electrons (e.g. in the vicinity of electrostatic coating equipment) as well as pneumatically conveyed dust.
- Clean the device surface by gently wiping it with a damp or antistatic cloth only.

WARNING!

Risk of injury from improper installation.

- Installation may be carried out by authorized technicians only and with the appropriate tools.
- Secure system from unintentional activation.
- Following assembly, ensure a controlled restart.

9.1 Installation

Detailed installation instructions can be found in the operating instructions of the respective valve and/or online at: www.burkert.com

9.2 Electrical connection

DANGER!

Risk of electric shock.

- Before reaching into the device, switch off the power supply and secure to prevent reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment.

There is a risk of electric shock if there is no electrical contact between the metal parts of the valve and the protective conductor of the coil.

- Always connect the protective conductor.
- Test for continuity between the protective conductor of the coil and the core guide tube of the valve.

If solenoid coils feature a terminal box, also observe the following:

- Insert permanently installed cables and lines only.
- Use a suitable cable and line entry (see chapter „8“). Observe specifications in the enclosed operating instructions.
- In the terminal box connect only wires which have a rated connection between 0.75 mm² and 1.5 mm².
- Tighten terminal screws to 1.2 Nm.
- Lock housing cover properly. Tighten lock screw to 2 Nm.
- Check continuity of the protective conductor connection.
- Before opening the housing cover, disconnect the power supply.
- Connect maximum two conductors to each terminal point.
- Temperature resistance of the cable must be min. 15 K above the max. ambient temperature.
- When using flexible lines, use wire end ferrules.

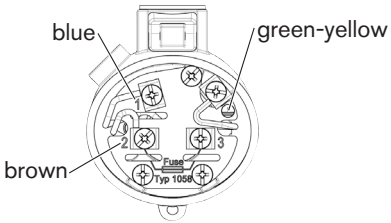
9.2.1 Solenoid coils with cable outlet

The connection cable is encapsulated with the solenoid coil Type ACP016 and cannot be removed.
Observe the indicated voltage according to the type label.

Wire assignment:

Wire color	Terminal assignment
green / yellow	Protective conductor
brown	Phase / positive pole (+)
blue	Neutral conductor / negative pole (-)

9.2.2 Solenoid coils with terminal box



Position	Terminal assignment
⏚	Protective conductor
1	Neutral conductor / negative pole (-)
2	Phase / positive pole (+)

Fig. 5: Terminal box

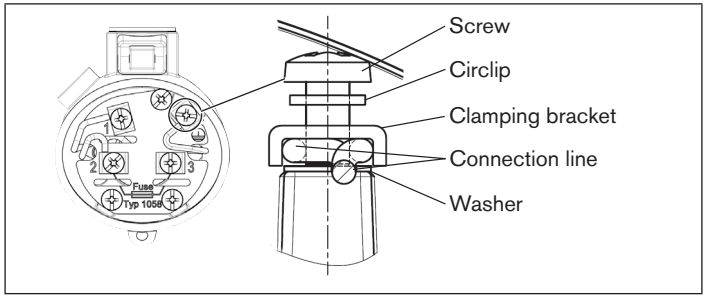


Fig. 6: Protective conductor connection

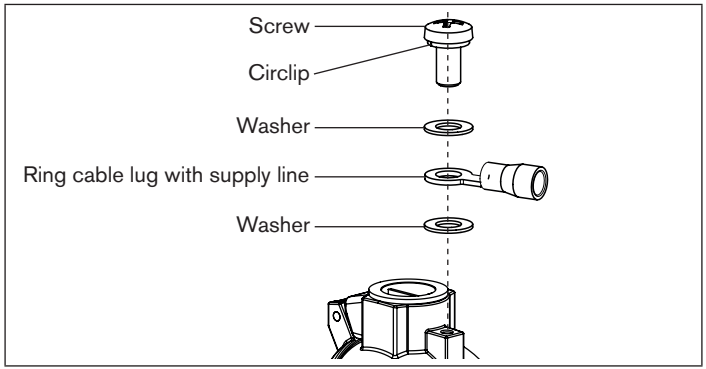


Fig. 7: Connection of external potential equalization

9.3 Removal

DANGER!

Danger – high pressure.

- Before loosening the lines and valves, turn off the pressure and vent the lines.

Risk of electric shock.

- Before reaching into the device, switch off the power supply and secure to prevent reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment.

WARNING!

Risk of injury from improper removal.

- Removal may be carried out by authorized technicians only and with the appropriate tools.

Risk of injury due to media escaping from leaky connections.

- Seal the connection lines carefully.

→ Separate the electrical connections.

→ Separate the valve body from the pipeline.

NOTE!

Malfunctions due to dirt.

- Remove the old PTFE tape from the connections during re-installs. Tape residue must not get into the pipeline.

10 START-UP

WARNING!

Risk of injury from improper operation.

Improper operation may result in injuries as well as damage to the device and the area around it.

- Before start-up, ensure that the operating personnel are familiar with and completely understand the contents of the operating instructions.
- Observe the safety instructions and intended use.
- Only adequately trained personnel may start up the equipment or the device.

Before start-up, ensure that

→ the device has been installed according to the instructions,

→ the connection has been made properly,

→ the device is not damaged,

→ all screws have been tightened.

11 MAINTENANCE, REPAIR, TROUBLESHOOTING

DANGER!

Danger due to improper maintenance and repair work.

Improper maintenance and repair work may result in injuries as well as damage to the device and its environment.

- Only trained technicians may perform maintenance work.
- Perform maintenance work with suitable tools only.
- Have repair work on the device performed by the manufacturer only.
- When maintaining or repairing the system, do not open the valve and do not disconnect the protective conductor connection.

11.1 Troubleshooting

In the event of malfunctions, make sure that

→ the device has been installed according to the instructions,

→ the connection has been made properly,

→ the device is not damaged,

→ the voltage and pressure have been switched on,

→ the pipelines are free,

→ all screws have been tightened.

12 TRANSPORT, STORAGE, DISPOSAL

NOTE!

Transport damage.

Inadequately protected devices may be damaged during transportation.

- Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- Prevent the temperature from exceeding or dropping below the permitted storage temperature.

Incorrect storage may damage the device.

- Store the device in a dry and dust-free location.
- Storage temperature –40...+60 °C.

Damage to the environment caused by device components contaminated with media.

- Dispose of the device and packaging in an environmentally friendly manner.
- Observe applicable disposal and environmental regulations.

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