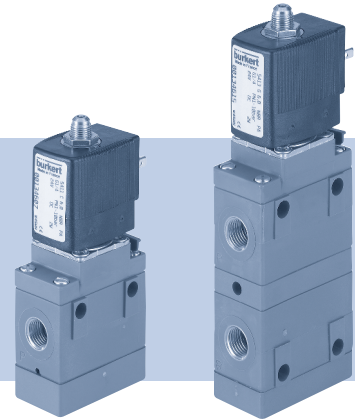


Type 5411, 5413

3/2 or 4/2 way solenoid valve

3/2 oder 4/2-Wege-Magnetventil

Électrovanne 3/2 ou 4/2 voies



Operating Instructions

Bedienungsanleitung

Manuel d'utilisation

1 THE OPERATING INSTRUCTIONS

The operating instructions contain important information.

- ▶ Read the operating instructions carefully and follow the safety instructions in particular.
- ▶ The operating instructions must be available to every user.
- ▶ The liability and warranty for Type 6516 and 6519 are not applicable if the operating instructions are not followed.

1.1 Symbols

- ▶ Designates instructions for risk prevention.
- Designates a procedure which you must carry out.

Warning of injuries:



DANGER!

Imminent danger! Serious or fatal injuries.



WARNING!

Potential danger! Serious or fatal injuries.



CAUTION!

Danger! Minor or moderately severe injuries.

Warns of damage to property:

NOTE!

1.2 Definition of the term

The term "device" used in the instructions always refers to the Type 5411 and 5413.

2 INTENDED USE

Incorrect use of the Type 5411 and 5413 may be a hazard to people, nearby equipment and the surrounding area.

The device is designed for blocking, dosing, filling and venting gaseous media.

- ▶ Use according to the authorized data, operating conditions and conditions of use specified in the contract documents, the data sheet and the operating instructions.
- ▶ Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ Correct transport, correct storage and installation as well as careful use and maintenance are essential for reliable and problem-free operation.
- ▶ Devices without a separate Ex type label may not be used in a potentially explosive area.
- ▶ Use the device only as intended.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any contingencies and events which may arise during assembly, operation and maintenance.



Risk of injury from high pressure.

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

Risk of injury due to electrical shock.

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

Risk of injury from greatly accelerated parts.

- ▶ Before pressurizing the valve, check that all screw connections and screw joints are tight and secure.

Risk of burns or danger of fire during long-term operation due to hot device surface.

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

Risk of injury due to malfunction of valves with alternating current (AC).

Sticking core causes coil to overheat, resulting in a malfunction.

- ▶ Monitor process to ensure flawless functioning.

To prevent injuries:

- ▶ In a hazardous area, the device may be used only in accordance with the specification on the separate Ex type label.
- ▶ To use the device in an explosion-risk area, observe the additional information with safety instructions for the explosion-risk area enclosed with the device or the separate explosion-risk operating instructions
- ▶ Do not make any internal or external changes to the device and safeguard against unintentional actuation.
- ▶ Installation and maintenance work may be carried out only by authorized technicians with the appropriate tools.
- ▶ After an interruption in the electrical or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- ▶ Do not subject the body to mechanical loads.
- ▶ Observe the general accepted technical rules.

4 STRUCTURE AND FUNCTION

Type 5411 and Type 5413 are pilot-controlled servo-piston valves with manual override for single or block installation.

Type 5411: 3/2-way solenoid valve

Type 5413: 4/2-way solenoid valve



A pressure difference of at least 1 bar is required for switching.

5 TECHNICAL DATA



The following values are indicated on the type label:

- Voltage, current type, coil power consumption
- Pressure range
- Body material (PA=Polyamide)
- Seal material (NBR)
- Circuit function and orifice

5.1 Conformity

Type 5411 and 5413 conforms with the EU Directives according to the EU Declaration of Conformity (if applicable).

5.2 Standards

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and / or the EU Declaration of Conformity (if applicable).

5.3 Operating conditions

Ambient temperature max. +55 °C

Degree of protection with cable plug: IP65 in accordance with EN 60529

5.4 Fluidic data

Medium temperature -10+60 °C

Media neutral gaseous media

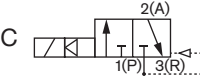
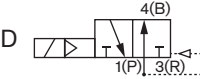
Compressed air quality ISO 8573-1:2010, Class 7.4.4¹⁾

Pressure range see type label
Pressure difference at least 1 bar between ports 1 and 3

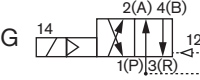
¹⁾ To prevent the expanded compressed air from freezing, its pressure dew point must be at least 10 K lower than the medium temperature.

5.5 Circuit functions

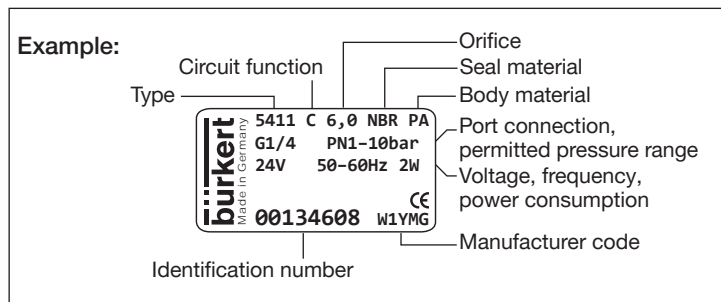
Type 5411

| | |
|---|--|
|  | <p>3/2-way valve Normally inlet port 1 (P/NC) closed, outlet port 2 (A/OUT) connected with exhaust port 3 (R/NO).</p> |
|  | <p>3/2-way valve Normally inlet port 1 (P/NO) connected with outlet port 4 (B/OUT), exhaust port 3 (R/NC) closed.</p> |

Type 5413

| | |
|---|--|
|  | <p>4/2-way valve Normally inlet port 1 (P/NC) connected with outlet port 2 (A/OUT), outlet port 4 (B/OUT) connected with exhaust port 3 (R/NO).</p> |
|---|--|

5.6 Type label



5.7 Mechanical data

| | |
|------------------|------------------|
| Port connections | G1/4 |
| Materials | |
| Body | Polyamide |
| Actuator | Polyamide, Epoxy |
| Seal material | |
| Valve seat | NBR |
| Pilot control | FKM |
| Dimensions | see data sheet |

5.8 Electrical data

| | |
|------------------------|---|
| Connections | DIN EN 175301-803 Form A: for cable plug Type 2508 |
| Operating voltage | see type label |
| Voltage tolerance | ±10 % |
| Power consumption | |
| DC | 2 W |
| AC | 6 W operation, 11 W inrush |
| Nominal operating mode | Continuous operation |

6 ASSEMBLY



DANGER!

Risk of injury from high pressure.

- ▶ Turn off the pressure and vent the lines before loosening lines or valves.

Risk of injury due to electrical shock.

- ▶ Before reaching into the device or the equipment, 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 assembly.

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

Risk of injury from unintentional activation of the system and uncontrolled restart.

- ▶ Secure system against unintentional activation.
- ▶ Following assembly, ensure a controlled restart.

Risk of injury from greatly accelerated parts.

- ▶ Before pressurizing the valve, check that all screw connections and screw joints are tight and secure.

6.1 Pneumatic connection

Installation position: any, preferably with solenoid system face up.

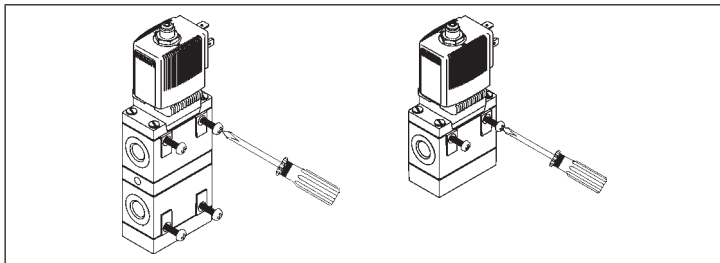
- Check whether pipelines are dirty and clean.
- If required, install a dirt filter upstream of the valve inlet ($\leq 500 \mu\text{m}$).
- Seal with PTFE tape or elastomer seal.



Observe the flow direction of the valve.

- Hold the device by hand on the body and connect to the pipeline. Pay attention to the following:
 - Tightening torque, with brass threaded bushing: max. 8 Nm
 - Tightening torque, without brass threaded bushing: max. 3 Nm
 - Tread length: max. 12 mm
- Do not cover exhaust ports and protect against ingress of dust, water and foreign objects.

6.2 Attaching single valve



→ To attach a single valve, use screws M6 x 40. Tightening torque: max. 2.5 Nm.

6.3 Installation on manifold

Type 5413 can be connected to manifolds with 1 or 2 channels.

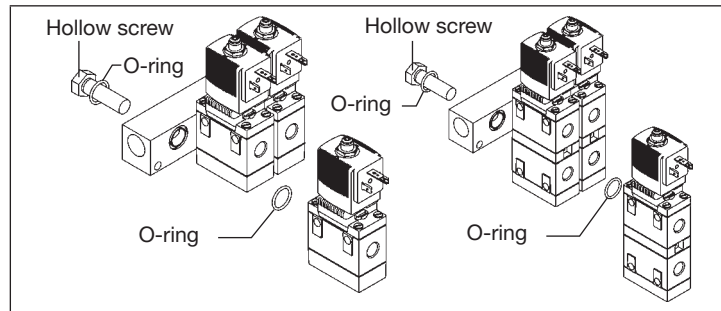


WARNING

Risk of injury due to discharge of medium.

- ▶ Ensure that the connection points are clean.
- ▶ Ensure that the O-rings are seated correctly.

→ Attach valves to manifold using hollow screw and 2 O-rings (see diagram below). Tightening torque: 8 Nm.



6.5 Connection of cable plug to the power supply



WARNING

Risk of injury due to electrical shock.

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

If there is no protective conductor function, there is a risk of an electric shock.

- ▶ Connect protective conductor.
- ▶ Check the protective conductor function of the coil.

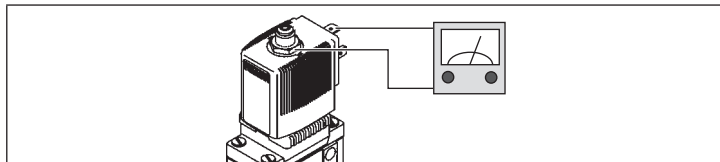
Overheating, risk of fire.

- ▶ Connection of the coil without pre-assembled armature will result in overheating and destroy the coil.
- ▶ Connect the coil with assembled armature only.

→ Check the protective conductor function of the coil (see table).

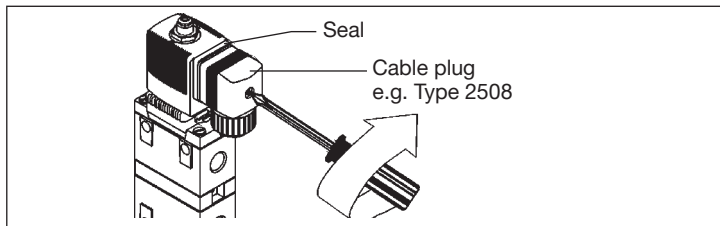
| Resistor | Test voltage | Test current |
|-------------------|--------------|--------------|
| max. 0.1 Ω | 12 V | 1 A |

Tab. 1: Test values protective conductor function



→ Connect terminals.

→ Connect protective conductor.



→ Attach seal and check for correct fit.

→ Mount cable plug and screw tight. Tightening torque: max. 1 Nm.



Note the voltage and current type as specified on the type label.

6.6 Rotation of the coil



WARNING

Risk of injury due to electrical shock.

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

Overheating, risk of fire.

- ▶ Connection of the coil without assembled armature will result in overheating and destroy the coil.
- ▶ Connect the coil with assembled armature only.

If there is no protective conductor function, there is a risk of an electric shock.

- ▶ Check the protective conductor function of the coil.

The coil can be turned by 4 x 90° (for installation on manifold only 2 x 180°).

→ Loosen nut.

→ Turn coil.

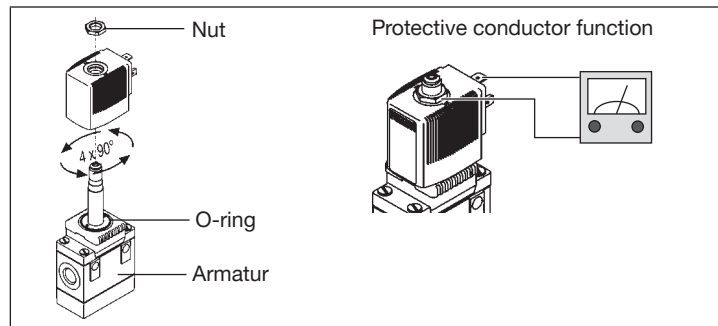
→ Check that seal is fitted correctly.

→ Tighten nut with a open-end wrench. Tightening torque max. 5 Nm.

→ Check the protective conductor function of the coil. (see table).

| Resistor | Test voltage | Test current |
|------------|--------------|--------------|
| max. 0.1 Ω | 12 V | 1 A |

Tab. 2: Test values protective conductor function



7 DISASSEMBLY



DANGER!

Risk of injury from high pressure.

- ▶ Turn off the pressure and vent the lines before loosening lines or valves.

Risk of injury due to electrical shock.

- ▶ Before reaching into the device or the equipment, 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 disassembly.

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

- Turn off the pressure and vent the lines.
- Switch off the power supply.
- Loosen the cable plug.
- Loosen the valve.

8 MAINTENANCE, TROUBLESHOOTING

If the valve is used according to these operating instructions, the valve will operate maintenance-free.



WARNING!

Risk of injury from improper maintenance.

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

Risk of injury due to electrical shock.

- ▶ Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation.

Risk of injury from high pressure.

- ▶ Turn off the pressure and vent the lines before loosening lines or valves.

Risk of injury from unintentional activation of the system and uncontrolled restart.

- ▶ Secure system against unintentional activation.
- ▶ Following maintenance, ensure a controlled restart.

8.1 Malfunctions

If malfunctions occur, check whether:

- the device is not damaged
- the port connections
- the seals
- proper installation
- the voltage and operating pressure
- the pipelines are clean.

Valve does not switch

Possible causes:

- short circuit or coil interrupted
- core or core area dirty
- medium pressure outside the permitted pressure range

Valve does not close

Possible causes:

- inner compartment of the valve is dirty

If the valve still does not switch, please contact your Bürkert Service.

9 SPARE PARTS



CAUTION!

Risk of injury and/or damage by the use of incorrect parts.

Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and the surrounding area.

- ▶ Use original accessories and original spare parts from Bürkert only.

9.1 Ordering spare parts

When ordering spare parts, quote the name of the spare part set (see "[Fig. 1](#)" and "[Fig. 2](#)") as well as the order number of your complete device.

9.2 Overview of spare part sets

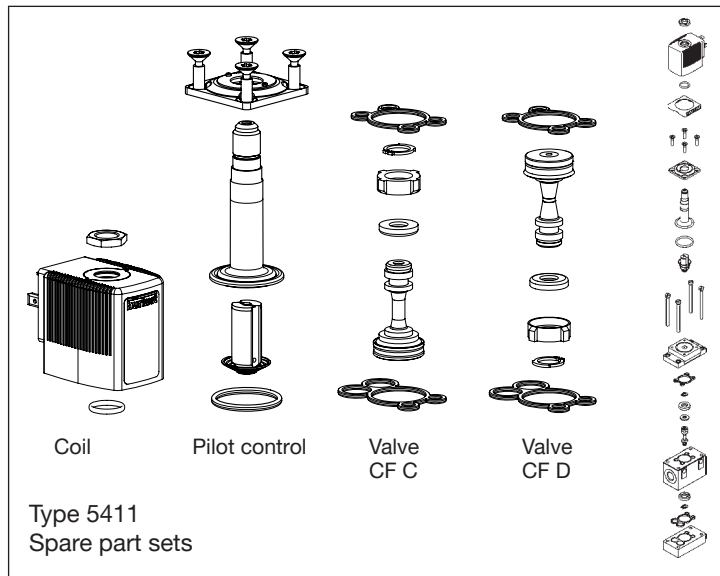


Fig. 1: Spare part sets Type 5411

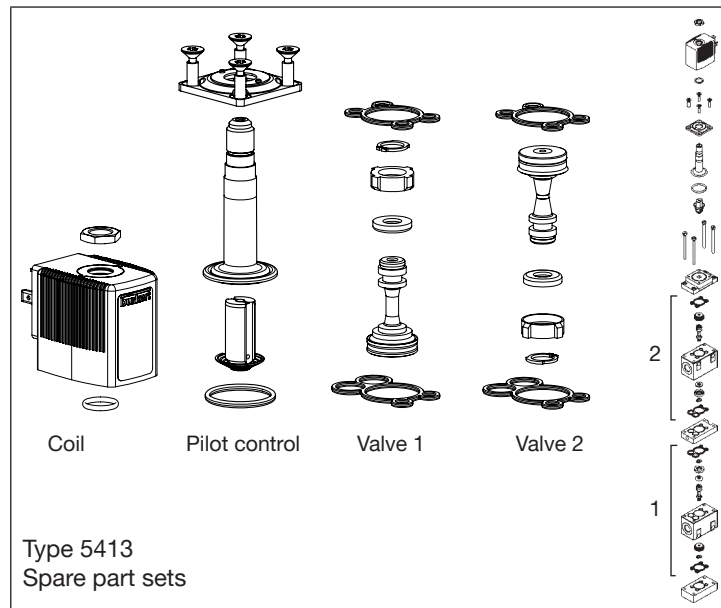


Fig. 2: Spare part sets Type 5413

10 TRANSPORTATION, 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.
- ▶ Protect the electrical interfaces of the coil and the pneumatic connections from damage by placing protective caps on them.

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature $-40\text{ °C} - +80\text{ °C}$.

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.

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
E-mail: info@burkert.com

International address
www.burkert.com

Manuals and data sheets on the Internet: www.burkert.com
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