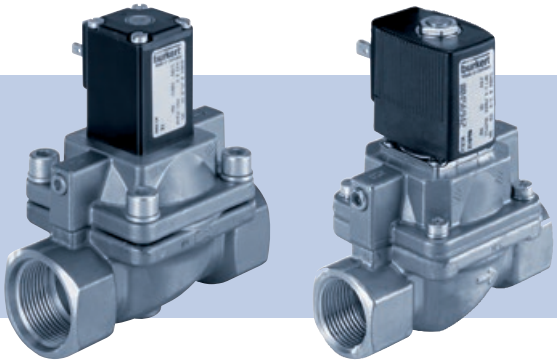
bürkert
FLUID CONTROL SYSTEMS

Type 5404

2/2 way solenoid valve
2/2-Wege-Magnetventil
Électrovanne 2/2 voies



Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

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1 OPERATING INSTRUCTIONS

The operating instructions contain important information.

- Read the operating instructions carefully and follow the safety instructions in particular, and also observe the operating conditions.
- 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 Symbols

▸ Designates an instruction to prevent risks.

→ 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!

2 INTENDED USE

Incorrect use of the solenoid valve Type 5404 can be dangerous to people, nearby equipment and the environment.

- The device is designed to control, shut off and meter neutral media up to a viscosity of 21 mm^2/s.
- In areas at risk of explosion, only use devices approved for use in those areas. These devices are labeled with a separate Ex type label. For use in areas at risk of explosion, note the information provided on the separate Ex type label and the separate explosion-related operating instructions included in the scope of supply.
- Provided the cable plug is connected and installed correctly, the device satisfies protection class IP65 in accordance with DIN EN 60529 / IEC 60529.
- Use according to the permitted data, operating conditions and conditions of use specified in the contract documents and operating instructions.
- Correct transportation, correct storage and installation and careful use and maintenance are essential for reliable and problem-free operation.
- Use the device only as intended.

2.1 Definition of therm “device”

In these operating instructions, the term “device” always refers to the solenoid valve Type 5404.

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.

Danger of 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.

Risk of burns/Risk of fire if used continuously through 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 function is in perfect working order.

Risk of short-circuit/escape of media through leaking screw joints.

- Ensure seals are seated correctly.
- Carefully screw valve and connection lines together.

General hazardous situations.

To prevent injury, ensure that:

- The device may be operated only when in perfect condition and in consideration of the operating instructions.
- Do not make any changes and do not subject the device to mechanical loads.
- Secure system against unintentional activation.
- Installation, operation and maintenance may only be performed by qualified specialists.

- Install the device according to the regulations applicable in the country.
- After an interruption in the power supply or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- Observe the general rules of technology.

4 TECHNICAL DATA

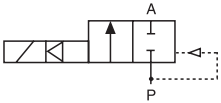
4.1 Operating conditions

The following values are indicated on the type label:

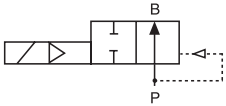
- Voltage (Tolerance ±10 %) / Current type
- Coil power consumption (active power in W - at operating temperature)
- Pressure range
- Body material: Brass (MS), cast iron (GG)
- Seal material: PTFE + FKM (EF), PTFE + EPDM (EA), PTFE + Graphite (EG), EPDM + Graphite (AG)

Circuit function 2/2-way valve:

A (NC)



B (NO)

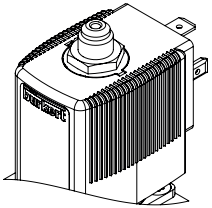


Protection class: IP65 in accordance with DIN EN 60529 / IEC 60529 with cable plug, e.g. Bürkert Type 2518

Special instructions for valves circuit function B (NO) with deaeration connection G1/8 on the coil (CF05):

The deenergized valve is open. The medium also flows off via the deaeration connection on the coil.

Valves of this design are therefore suitable for relieving compressors only.



4.2 Conformity

The device conforms with the EU Directives according to the EU Declaration of Conformity (if applicable).

4.3 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).

4.4 Application conditions

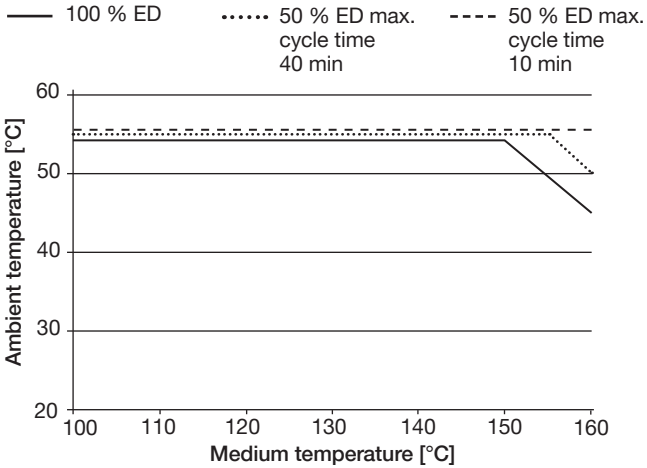
Ambient temperature: max. +55 °C

Permitted medium temperature depending on coil material and seal material:

Coil material	Type	Seal material	Medium temperature
Epoxide	5404 NA38	PTFE + FKM	-10...+120 °C
Epoxide	5404 NA38	PTFE + EPDM	-30...+130 °C
Epoxide	5404 NA07+NA38	PTFE + Graphite	-40...+160°C*
Epoxide	5404 NA07+NA38	EPDM + Graphite	-30...+135 °C
Polyamide	5404	PTFE + FKM	-10...+100 °C

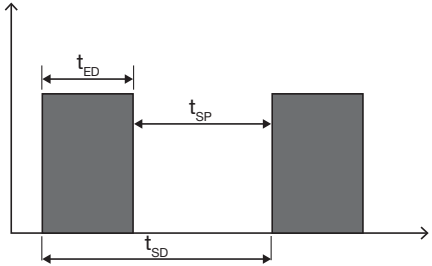
NA38: Coil for higher temperatures
NA07: Steam version

* Observe temperature derating for steam version NA07.



Characteristic values intermittent operation:

t_{SD} – Cycle time
t_{ED} – Duty cycle
t_{SP} – De-energized pause
ED – Relative duty cycle
SH – Switching frequency



$$t_{SD}[s] = \frac{60}{SH\left[\frac{1}{min}\right]}$$

$$t_{ED}[s] = \frac{ED[\%]}{100} \times t_{SD}[s]$$

$$t_{SP}[s] = t_{SD}[s] - t_{ED}[s]$$

Observe for values with UL/UR approval:

Medium	Seal designation	Medium temperature	Ambient temperature
Air, inert gas	EF (PTFE + FKM)	-10...+110 °C	-10...+55 °C
Water		0...+100 °C	0...+55 °C
Water (Fire Protection Service Valve, var. Code PE48)		+5...+90 °C	+5...+55 °C
Air, inert gas, (var. code NA07)	EG (PTFE + Graphit)	-40...+160 °C	-40...+45 °C
		-40...+150 °C	-40...+55 °C
Water ,steam (var. code NA07)	EG (PTFE + Graphit)	0...+160 °C	0...+45 °C
		0...+150 °C	0...+55 °C
oxygen (var. code NL02)	EF (PTFE + FKM)	-10...+60 °C	-10...+55 °C
No. 2 fuel oil		-10...+110 °C	-10...+55 °C

Operating duration: Unless otherwise indicated on the type label, the solenoid system is suitable for continuous operation. Observe temperature derating for steam version NA07.

Important information for functional reliability during continuous operation: If standstill for a long period at least 1-2 activations per day are recommended.

Service life: High switching frequency and high pressures reduce the service life

Permitted media depending on seal material:

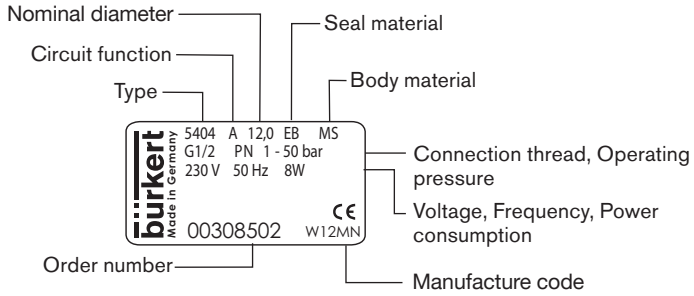
Seal material	Permitted media
PTFE + FKM	Neutral media such as compressed air, water, hydraulic oil, Oxygen[1)], hot air, hot oils, oils with additives, Per solutions
PTFE + EPDM	Cold and warm water, oil and grease-free media
PTFE + Graphite	Hot water and steam

[1)] for special design NL02 only

NOTE!

If liquid media is used with high differential pressures, water hammer can occur.

4.5 Type label



5 INSTALLATION

DANGER!

Risk of injury from high pressure and discharge of medium.

- 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 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.

5.1 Before installation

Installation position: any, actuator preferably upwards.

→ Check pipelines for dirt and clean.

→ Install a dirt filter before the valve inlet (≤ 500 µm).

5.2 Installation

NOTE!

Caution risk of breakage.

- Do not use the coil as a lever arm.

→ Hold the device using a suitable tool on the body and screw into the pipeline.

Valve body must not be installed under tension.
Sealing material must not get into the device.

→ Observe direction of flow:
The arrow on the body indicates the direction of flow.

5.3 Electrical connection of the cable plug

WARNING!

Risk of injury due to electrical shock.

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

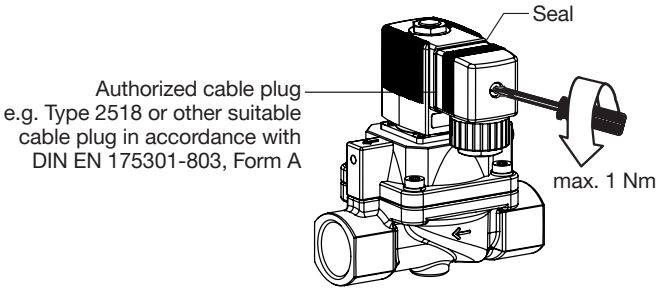
If the protective conductor is not connected, there is a risk of electric shock.

- Always connect protective conductor and check electrical continuity between coil and body.

→ Tighten cable plug (authorized cable plug see data sheet), observing maximal torque 1 Nm.

→ Check that seal is fitted correctly.

→ Connect protective conductor and check electrical continuity between coil and body.



6 MAINTENANCE, TROUBLESHOOTING

DANGER!

Risk of injury from high pressure and discharge of medium.

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

WARNING!

Risk of injury from improper maintenance.

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

6.1 Installation of the coil

WARNING!

Risk of injury due to electrical shock.

- Before reaching into the system, switch off the power supply and secure to prevent reactivation.

If the protective conductor contact between the coil and body is missing or if coil incorrectly installed, there is danger of electrical shock.

- Check protective conductor contact after installing the coil.
- During installation ensure that the coil is situated firmly on the body cover so that the protective conductor connection of the coil is connected to the valve body.

WARNING!

Escaping medium.

When a sticking nut is loosened, medium may escape.

- Do not tighten sticking nut any further.

Overheating, risk of fire.

If the protective conductor contact between the coil and body is missing, there is danger of electrical shock.

- Check protective conductor contact after installing the coil.

→ Connect coil body to the core guide pipe.

→ Screw on coil with nut. Observe the tightening torques in the following table.

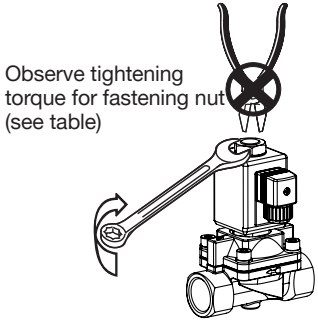
→ Check protective conductor.

NOTE!

Device will be damaged if the wrong tools are used.

If other tools are used (e.g. pliers), the device may be damaged.

- Always use a wrench to tighten nut.



Type	DN	Tightening torques [Nm]	Fastening the coil
5404	12...25	4.5...5.5	Nut
5404 MX13	12	15...16	Nut
5404	32...40	1.3...1.7	Screw M4
5404 NA07	32...40	15...16	Nut

6.2 Malfunctions

If malfunctions occur, check whether:

- the device has been installed according to the instructions,
- the electrical and fluid connections are correct,
- the device is not damaged,
- all screws have been tightened,
- the voltage and pressure have been switched on,
- the pipelines are clean,
- the power supply is adequately high.

Possible cause if the valve does not switch:

- Short circuit or coil interrupted.
- Inadequate power supply.
- Core or core area dirty.
- Medium pressure outside the permitted pressure range.

Possible cause if the valve does not close:

- Internal space of the valve is dirty.

7 SPARE PARTS

CAUTION!

Risk of injury and 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 only original accessories and original spare parts from Bürkert.

7.1 Ordering spare parts

The following spare part are available for the Type 5404:

- Coil set (Pos. 1)
- Wearing parts set pilot control (Pos. 2)
- Wearing parts set fitting (Pos. 3)

Order the spare parts sets quoting the position and the order number of the device.

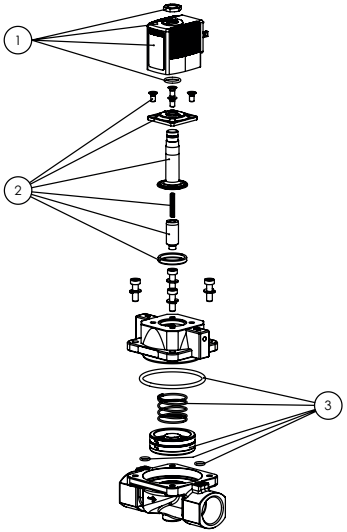
7.2 Tightening torques

Type	DN	Cover screws [Nm]	Flange screws [Nm]
5404	12	2.1...2.3	2.1...2.3
5404 MX13	12	1.5...2.0	1.5...2.0
5404 NA07	13	3...4	1.5...2.0
5404	20	6...7	1.5...2.0
5404	25	9...11	1.5...2.0

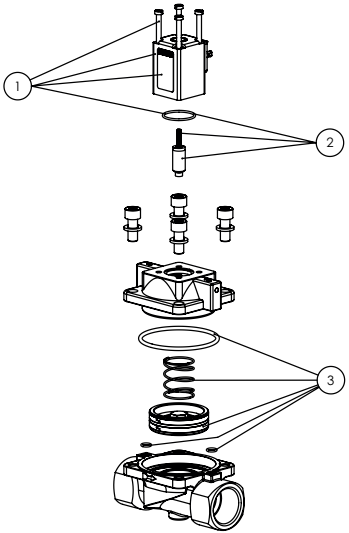
Type	DN	Cover screws [Nm]	Coil screwed as a block [Nm]	Plug with pipe [Nm]
5404	32	9...11	1.3...1.7	-
5404 NA07	32	9...11	-	80...85
5404	40	9...11	1.3...1.7	-
5404 NA07	40	9...11	-	80...85

7.3 Overview of spare parts

Type 5404,
DN12 to DN25



Type 5404,
DN32 to DN50



8 TRANSPORT, STORAGE, DISPOSAL

NOTE!

Transport damages when inadequately protected devices.

- During transportation protect the device against wet and dirt in shock-resistant packaging.
- Avoid 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 … +80 °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 regulations on disposal and the environment.

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