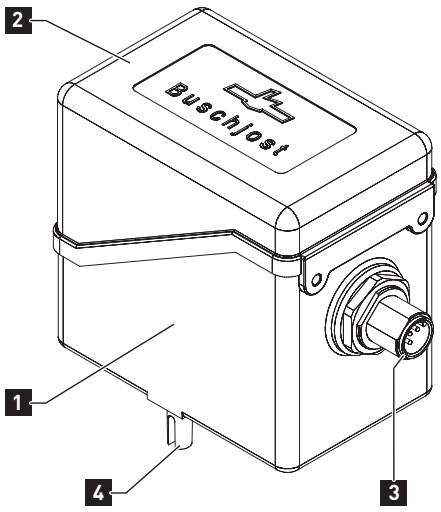
Operation manual – motor drive 9668 with positioner

Document-No. EN0000000.9668.02400BA Rev. 1

Keep documentation for future use!



1 Housing
2 Housing cover
3 M12 plug
4 four pins for positioning the drive

Delivery contents: 1 motor drive 9668 (24 Volt)

Part number 1954609 (step motor)
Buschjost article no. 0000000.9668.02400

Decoding the Buschjost article no.

Valve type	Drive	Voltage, frequency
0000000	9668	02400
–	step motor	24 Volt DC

1 About this documentation

this operation manual guides you to safely mount and replace the 9668 motor drive.

→ Carefully read this operation manual prior to mounting the motor drive.
→ Observe the national regulations for accident prevention and environmental protection in the country where the valve is being used additional to this operation manual.
→ Store the operation manual ensuring easy access for all involved parties.

1.1 Documentation validity

This operation manual applies to motor drive 0000000.9668.02400.

This operation manual is intended for:
Plant operators, installers, maintenance and service technicians.

1.2 Structure of safety instructions

Safety instructions warns against dangerous situations and must be observed in particular. Safety instructions are structured as follows:

SIGNAL WORD

Type of hazard
Consequences of non-observance
→ precautions necessary to avoid the hazard

1.3 Hazard classes (ANSI Z535.6)

⚠ DANGER

Safety information indicates a hazardous situation with high risk which, if not avoided, will certainly result in death or (serious) injury.

⚠ WARNING

Safety information indicates a hazardous situation with moderate risk which, if not avoided, can cause death or severe injury.

⚠ CAUTION

Safety information indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Information indicates a hazardous situation which, if not avoided, could result damage to property.

1.4 Styles and symbols

This documentation uses the following styles and symbols:

•	list
→	instruction
1. 2.	preset order of instructions
info	additional informationen about the valve and its application
1	constant part number (document)
1	flexible part number (section or chapter)

⚠ + DANGER / WARNING / CAUTION;
NOTICE: embedded safety message

given limits or fixed value

1.5 Intended use

The motor drive is designed to be mounted on control valves with an appropriate interface.

Comply with these conditions of use:

- Only use the motor drive in the commercial sector.
- You must **not** use the motor drives outdoors.
- You must **not** the motor drive in EX-protected areas.

1.6 Improper use

Only operate the motor drive within approved operating limits.

In the following cases it is prohibited to operate the motor drive:

- The motor drive is not suitable for the intended purpose in permanent operation.
- The permitted temperature and pressure ranges are exceeded.
- The LED (warning indicator) is not visible.
- Damages or malfunctions were detected but the motor drive remains in operation.
- The motor drive has been modified without authorisation of the manufacturer.
- The safety instructions of this documentation are not observed.

We do not accept any liability for damages caused by improper use.

Our guarantee expires in the following cases:

- undue intervention and altering are done to the motor drive.
- Nonobservance of operation manual or information included in the data sheet.

1.7 Obligations of the distributor/ operator

→ As the distributor, you are responsible for installing the motor drive in compliance with this operation manual.
→ The limits for the particular application of the motor drive must not be exceeded.
→ You are responsible to instruct each person who install or replace the motor drive.

→ Ensure compliance with the following demands:

- This documentation must be fully read and understood.
- This documentation must be available at any time.
- Regulations about occupational safety ad safety engineering must be known.

1.8 Personnel qualification

→ Persons who work on or with the motor drive must be sufficient qualified for this job.
→ Only a trained specialist may perform electric connections, commissioning, maintenance and trouble shooting.
→ A trained specialist must possess profound knowledge in mechanical engineering and electrical engineering and also about the structure and operation of the motorized actuator and the valve to be equipped.

2 General safety instructions

These safety instructions are only related to the single motor drive. In combination with other parts of the system there may be other potential dangers.

→ Compare the details on the rating plate and technical data to the operating data. The limits for the particular application must not be exceeded.

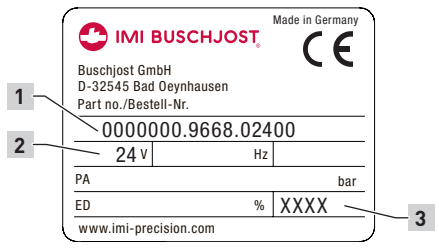
3 Avoid damage to property

NOTICE

Damage of the motor drive
The motor drive may overheat if the permitted temperatures are exceeded.

→ Make sure that the given temperature limits are exceeded in permanent operation.

4 Identifying the motor drive



Rating plate of the motorized actuator

1 Order number
2 Operating voltage
3 Date of manufacture (week/year)

5 Transport and storage

→ Only transport and store the motor drive inside its delivery packaging.
→ Protect motor drive from impacts or falling down.

Avoid during transport:

mechanical loads: impacts, tipping over
Damages to the motor drive housing

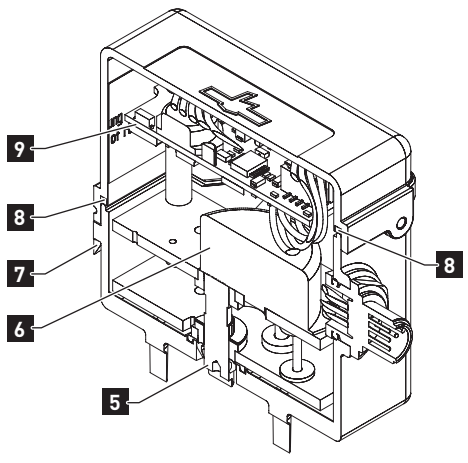
→ Keep storage temperature as constant as possible to avoid the formation of condensation.
→ Store the motor drive always with attached housing cover.

Prolonged storage at +5 °C to +20 °C

Avoid during storage:

thermal stress: permanently increased storage temperatures, frost
chemical load: through solvents, chemicals, acids, fuels, etc. at storage location

6 Product overview



Sectional view

5 Drive shaft
6 Servomotor
7 Cover flap
8 Sealing ring (cover seal)
9 Printed-circuit board

7 Principle of Operation

The servomotor of the motor drive moves the drive shaft according to the specified control signals at an angle of approx. 90°. The actuator shaft engages the counterpart of the valve, which adjusts the flow rate by turning it. The flow rate is determined by the characteristics of the valve.

8 Mounting

Mounting position

Motor drive vertically in upward direction (±60°)

Flow direction

The motor drive must be mounted along the flow direction of the valve.

Dimensions (mm);
refer to dimension sheet (page 2)

Length	Width	Height
83[1]/100[2]	52	74

[1] without M12 plug connector
[2] with M12 plug connector

8.1 Preparing mounting

→ Prepare the valve and the system for mounting. Observe the safety precautions applicable to the respective system.
→ The required measures depend on the installation situation within the system and the used valve.

8.2 Mounting motor drive 9668

1. Manually turn valve spindle along the flow direction. Use combination pliers where appropriate.
   NOTICE If the motor drive is mounted turned 90° away from flow direction the control signals have the opposite effect.
2. Put the new motor drive along the flow direction onto the valve interface. The drive shaft of the motor drive must engage in the valve spindle.
   The valve interface and the motor drive must be flush to each other.
3. Fix the motor drive to the valve using the provided fastening elements. Observe the operation manual of the respective valve.

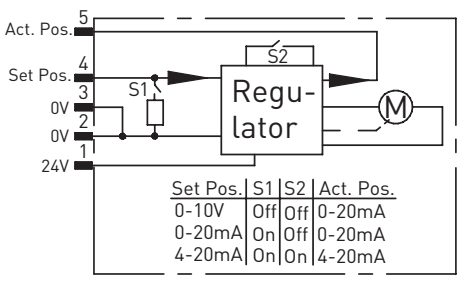
8.3 Connect motor drive 9668 electrically

NOTICE

Disturbance of the electronics
Other live cables may disturb the electronics.

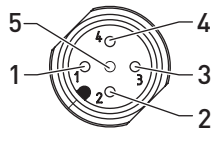
→ Do not lay the connecting cable to motor drive 9668 together with cables that are carrying big currents.

Buschjost offers a suitable junction box with metallic locking. **Article-no. 1704222**



connection diagram
(refer to inside of the housing cover)

1. Connect a preassembled cable. Observe the PIN assignment of the M12 connector.



Pin assignment of the M12 plug

Assignment (A encoding, five-pin)

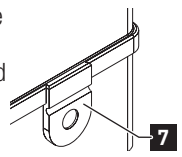
1	Supply voltage 24 Volt
2	Supply voltage 0 Volt
3	Reference potential for set point input and actuator feedback output
4	Set point input
5	Actuator feedback output

2. Make sure that the M12 connector **3** is firmly sealed. Tighten the clamping nut of the M12 junction box.

8.4 Adjust set point input

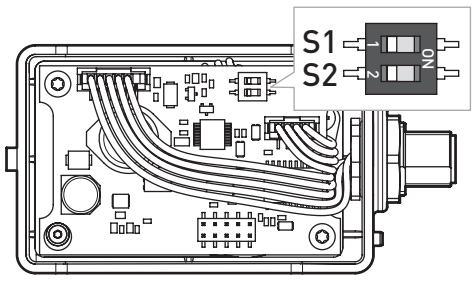
info In delivered state the switches S1 and S2 are in OFF position.

1. Open valve cover **2** at the cover flap **7**.
   NOTICE You must not bend up the cover flap not more than 25° from housing.



2. NOTICE Avoid damages through electrostatic discharge (ESD) by touching a grounded pipeline prior to touching the printed circuit board. You must not directly touch electronic components. Set the set point input via switches S1 and S2 at the circuit board:

Set position	S1	S2	Actuator position
0–10 V	Off	Off	0–20 mA
0–20 mA	On	Off	0–20 mA
4–20 mA	On	On	4–20 mA



Switches S1 and S2 – motor drive 9668

3. Firmly close the drive housing cover **2** to restore protection of the terminal compartment. The sealing ring **8** must be placed between housing **1** and housing cover. The cover flap **7** must firmly snap in.

9 Operation

The motor drive needs a period of five seconds for an actuating angle of 90°.

9.1 Distance to sources of interference

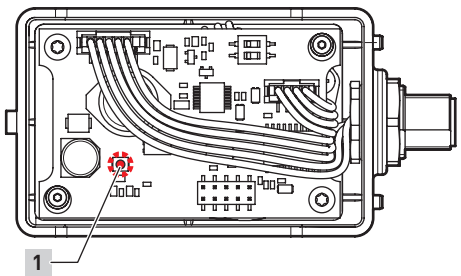
NOTICE

Disturbance of the drive electronics
Electromagnetic sources of interference may affect the drive electronics and lead to blocking of the motor drive.

→ Do not operate the motor drive near to strong sources of interference (for example solenoid coils, transformers, frequency converter).

9.2 Protection from overload

The step motor will be automatically blocked at a load >300 Nm. The Alarm LED **1** on the circuit board will light up red in case of blocking.



Alarm LED – motor drive 9668

→ Briefly disconnect the motor drive 9668 from power supply to stop the automatic blocking.

10 Replacing motor drive 9668

1. Disconnect motor drive from power supply.
2. Disconnect the cable from the M12 connector.
3. Loosen the fixation of the motor drive and lift the motor drive off the valve.
4. Manually turn valve spindle along the flow direction. Use combination pliers where appropriate.
   NOTICE If the motor drive is mounted turned 90° away from flow direction the control signals have the opposite effect.
5. Put the new motor drive along the flow direction onto the valve interface. The drive shaft of the motor drive must engage in the valve spindle.
   The valve interface and the motor drive must be flush to each other.
6. Fix the motor drive to the valve using the provided fastening elements. Observe the operation manual of the respective valve.
7. Connect motor drive 9668 electrically as described in 8.3.

11 Trouble shooting

→ Observe the following table.

Error table

Standstill of the drive	Standstill of the drive
Possible cause: no supply voltage Remedy: Check power supply; check M12 connector and connected cable	possible cause: automatic blocking (Alarm LED lights up) Remedy: Disconnect power supply and switch on again
Standstill of the drive	**Spindle blocked**
possible cause: cables damaged Remedy: Check cable; replace defective cable	possible cause: foreign particles inside valve body Remedy: Unmount valve and clean valve parts
Valve spindle blocked	**Drive shaft does not turn**
possible cause: the valve spindle has got stuck Remedy: Unmount drive and turn valve spindle through 180° manually	possible cause: the drive shaft does not interlink Remedy: Loosen the fixation of the drive; re-mount drive flush to the valve

12 Decommissioning

→ Only trained personnel may proceed decommissioning. It is valid to keep all safety precautions.

1. Disconnect motor drive from power supply.
2. Disconnect the cable from the M12 connector.
3. Loosen the fixation of the motor drive and lift the drive off the valve.

13 Disposal

→ Dispose motor drive 9668 after decommissioning. Follow the ideas of recycling and environmental sustainability.
→ Observe the applicable regulatory requirements.

1. Remove the motor drive 9668 as described in chapter **10** "Decommissioning" (steps 1 to 3).
2. Unmount the motor drive and lead recyclable materials to proper recycling:

Material	Way of disposal
housing, housing cover	industrial waste (similar category to domestic refuse)
printed-circuit board, step motor	electrical waste recycling

14 Technical data

Motor drive 9668

Drive article no.	9668.02400
Design	DC geared motor
Supply voltage	24 V DC ±10%
Power consumption in operation	3.3 W
Full load operation	8.5 W
Duty cycle	100%
Protection class	IP 54 (EN 60529)
Special version	Integrated positioner Setpoint setting: 0-10V/ 20mA, 4-20mA

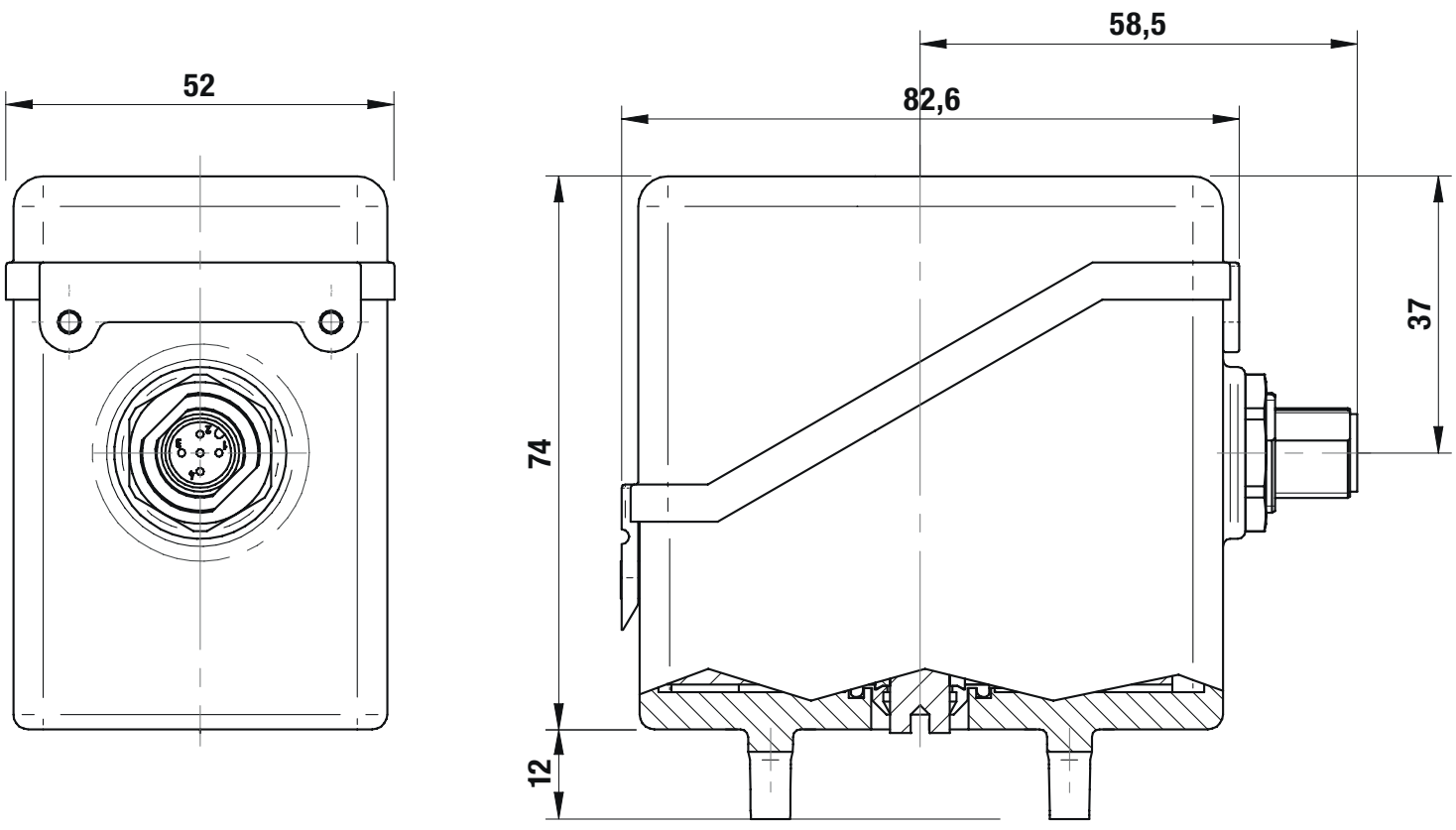
Interface

Electrical connection	M12 plug connector (five-pole)

Materials

Housing	PA66
Gehäusedeckel	PC

14 Dimension sheet



Dimensions – 85913300.0000.00000

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