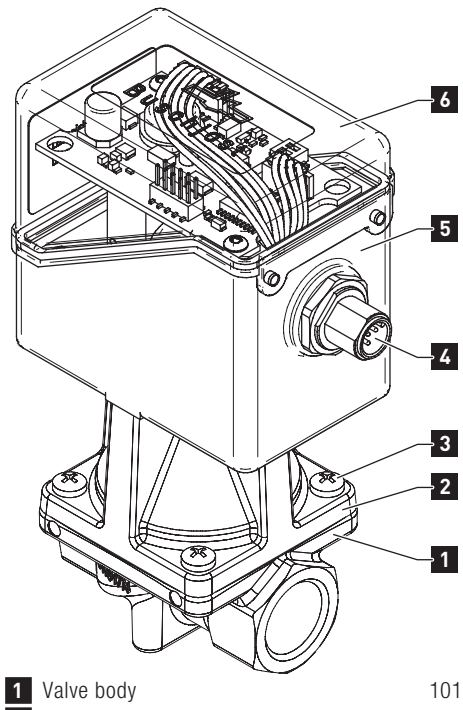
Operation manual – Motor control valve with drive 9668

Document-No. EN1377058BA Revision: 2

Keep documentation for future use!



1	Valve body	101
2	Valve cover	111
3	Cover screws	112
4	M12 plug, pre-assembled	1007
5	Drive housing	1001
6	Drive housing cover	1002

1 About this documentation

This operation manual guides you to mount, operate, maintain and replace motor control valves from series 82880 with the digital linear drive 9668.

→ Carefully read this operation manual prior to mounting the valve.
→ 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 following motor control valves:

- 8288**200**.9668.02400 (G 1/2)
- 8288**300**.9668.02400 (G 3/4)
- 8288**400**.9668.02400 (G 1)
- Variants (unequal **00**.9668; refer to **4**)
- Special products (**859xxxx**.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 information about the valve and its application
1	constant part number (document)
1	flexible part number (section)

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

given limits or fixed value

1.5 Intended use

The motor control valve is solely intended to control or stop a fluid flow within approved operating limits.

Comply with these conditions of use:

- Only use the motor control valve in the commercial sector.
- You must not use the motor control valve outdoors.
- You must not the motor control valve in EX-protected areas.

1.6 Improper use

Only operate the valve within approved operating limits.

In the following cases it is prohibited to operate the valve:

- The valve is not suitable for the intended purpose in permanent operation.
- The valve is operated with fluids that are not permitted.
- The permitted temperature and pressure ranges are exceeded.
- The Alarm LED is not visible.
- Damages or malfunctions were detected but the valve remains in operation.
- The valve has been modified without authorization 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 valve.
- Nonobservance of operation manual or information included in the data sheet.

1.7 Obligations of the operator

Product

→ Comply with all applicable regulations over the entire life cycle of the valve.
→ Initiate a risk assessment of the overall installation to detect potential dangers that can be caused due to the combination of the valve with other components.

Persons

→ Initiate the instruction of each person who is working with the valve. The applicable regulations about occupational safety and accident prevention needs to be known and applied.

Documentation

→ This documentation must be fully read and understood.
→ The instructions given in this operation manual must always be observed.
→ This documentation must be available at any time.

1.8 Personnel qualification

→ Persons who work on or with the valve 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 valve and the plant.

Operating personnel must be instructed on operational sequences and procedures.

Operating personnel must know its responsibilities regarding the work to be performed.

Trained specialists must possess profound knowledge in mechanical engineering, electrical engineering, hydraulic and pneumatic.

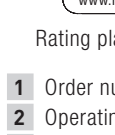
Trained specialists must be authorized to commission, ground and designate devices, systems and power circuits according to the standards of safety technology.

Trained specialists must possess profound knowledge about design and principle of operation of the valves and the plant.

2 General safety instructions

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

⚠ WARNING



Danger from pressurized pipelines
Pressurized pipelines may burst resulting in injuries.

→ Depressurize the pipe system prior to working on the valve.

Residual risks

kg	Weight of the valve **Phases:** transport, storage, assembly, maintenance, disposal **Risk:** falling off, tipping over **PPE:** protective footwear

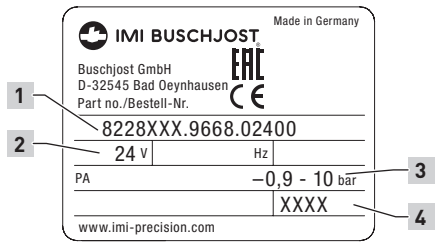
3 Avoid damage to property

NOTICE

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

→ Make sure that the given temperature limits are exceeded in permanent operation.
→ Install a design with a lifted drive if a higher operating temperature is necessary.

4 Identifying the valve



Rating plate (example)

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

Variants

Variant key (...XX.9668...)

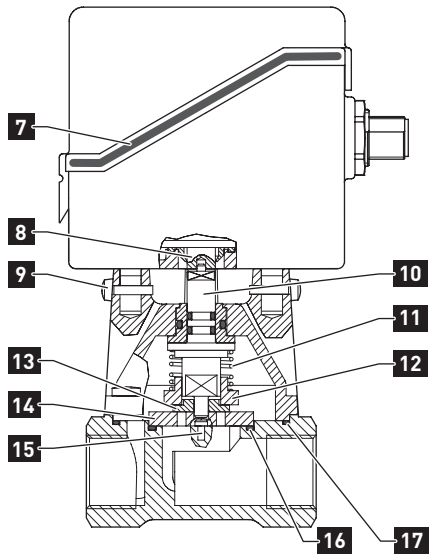
14	seat seal made of EPDM
33	additional materials and surfaces free of silicone
60	seat seal made o FPM, K_{VS} 1.1
61	seat seal made of EPDM, K_{VS} 1.1
62–64*	maximum pressure: 10 bar
65–67*	K_{VS} 3.4 (drive until 200 Ncm)
68–70, 75*	all wetted parts free of oil and grease
71–74*	lifted drive position (spacer)

*further specification: refer to data sheet

5 Transport and storage

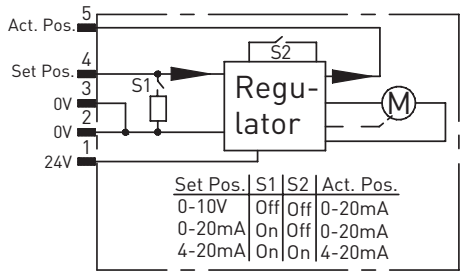
→ Only transport and store valve inside its delivery packaging.
→ Protect valve from impacts or falling down.
→ Keep storage temperature as constant as possible to avoid the formation of condensation.
→ Store the drive always with attached housing cover.

6 Product overview



Sectional view (G1 housing)

7	Sealing of the drive housing cover	1004
8	Adjusting element	
9	Fixing screws for drive	9900
10	Valve spindle	105
11	Compression spring	109
12	Holding device	106
13	upper control disc (lock)	104
14	untere control disc (opening)	103
15	Pins	108
16	O-ring (seat seal)	107
17	O-ring (cover seal)	102



Connection diagram
(refer to inside of the housing cover)

7 Principle of Operation

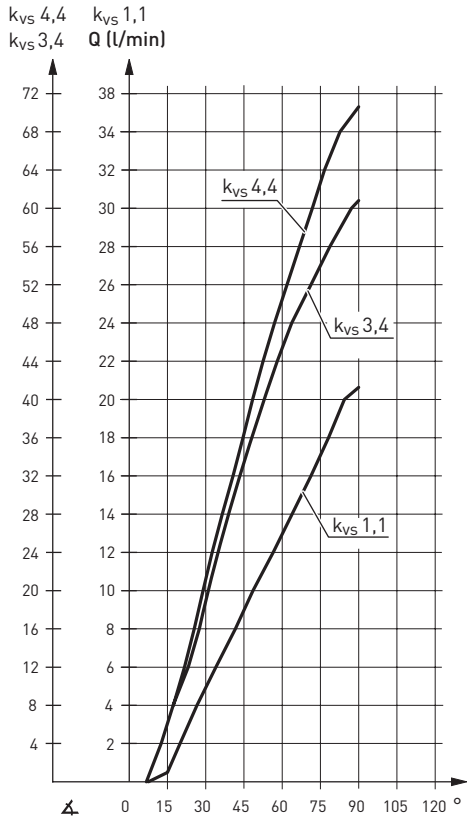
The motor control valve is made as seat valve with two adjustable control discs as closure element.

The valve is controlled by a motorized actuator. The motorized actuator turns the upper control disc via the valve spindle. The fluid stream is finely dosed or completely locked by rotation of the control discs.

Positioning characteristics

The diagram shows characteristics of the standard control discs. The graphs show the flow rate in relation to the actuating angle.

- Control disc k_{VS} 4.4 ($Q_{max.}$ 70 l/min)
- Control disc k_{VS} 3.4 ($Q_{max.}$ 61 l/min)
- Control disc k_{VS} 1.1 ($Q_{max.}$ 20.5 l/min)



Characteristics k_{VS} 1.1 / k_{VS} 3.4 / k_{VS} 4.4
fluid: water Δp: 1 bar

8 Mounting

Dimensions (mm)

Valve type	Length	Width	Height
82882XX (G 1/2)	65	55	147
82883XX (G 3/4)	95	70	164
82884XX (G 1)	95	70	164

Mounting position

Drive vertically upwards (±60 °)

Flow direction

see arrow on valve body 1

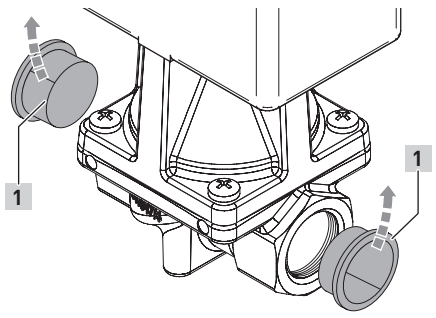
8.1 Preparation

→ Check the valve for externally visible damages.
→ Make sure that there is enough free space for dismantling the valve or the drive in case of maintenance.
→ Clean the pipe system prior to mounting the valve.

8.2 Mounting motor control valve

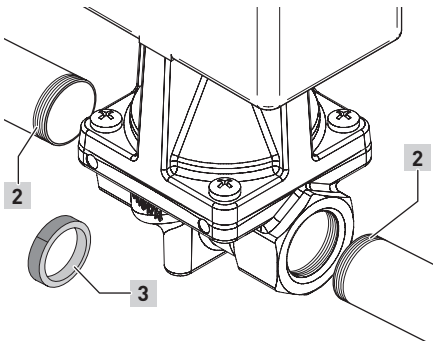
→ Mount the valve to the designated pipeline. Comply with existing connections.

1. Take valve out of the packaging immediately prior to mounting.
2. Take out the blanking plugs 1 from valve inlet and valve outlet.



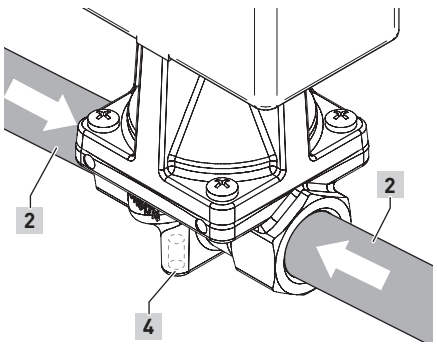
Take out blanking plugs

3. Install a strainer in front of the valve inlet if necessary.
4. Firmly seal pipeline's thread 2 with an appropriate sealing material (e.g. PTFE sealing tape 3).



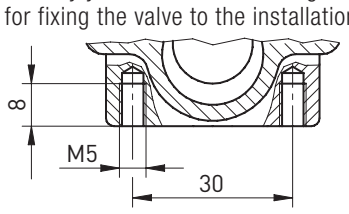
Firmly seal thread of the pipeline

5. Arrange the valve according to the flow direction of the pipeline.
6. Attach the pipelines to the valve.
NOTICE Make sure not to distort the valve body.
7. Attach pipelines threads to the valve's connection threads



Attach pipelines to valve

8. Only for G 1/2 housing: Underneath the valve body you find two connecting threads 4 for fixing the valve to the installation.



Dimensions of M5 connecting threads

8.3 Connecting drive 9668 electrically

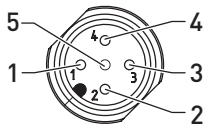
NOTICE

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

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

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

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



Assignment (A encoding, five-pin)

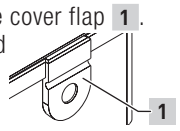
1	Supply voltage 24 Volt
2	Supply voltage 0 Volt
3	Reference potential for set point input and actuator feedback output
4	Set point input
5	Actuator feedback output

2. Make sure that the M12 connector 4 is firmly sealed. Tighten the clamping nut of the M12 junction box.

8.4 Adjusting set point input

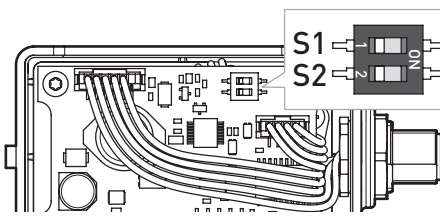
info In delivered state the switches S1 and S2 are in OFF position.

1. Open valve cover 6 at the cover flap 1.
NOTICE You must not bend up the cover flap not more than 25°.



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 the electronically components.
Set the set point input via switches S1 and S2 at the printed-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 – drive 9668

3. Firmly close the drive housing cover 6 to restore protection of the terminal compartment. The sealing 7 of the drive housing cover must be placed inside the guide groove between drive housing and drive housing cover The cover flap 1 must firmly snap in.

9 Operation

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

9.1 Distance to sources of interference

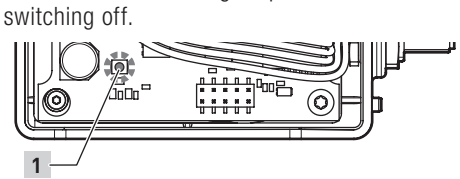
NOTICE

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

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

9.2 Protection from overload

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



Alarm LED – drive 9668

→ Briefly disconnect the step motor 9668 from power supply to stop the automatically switching off.

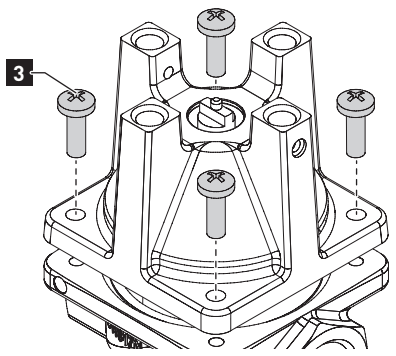
10 Replacing spare parts

⚠ CAUTION

Risk of injury caused through the installation of wrong parts
Installation of wrong components may lead to early wear and early failure of the component. This increases the risk of injury.

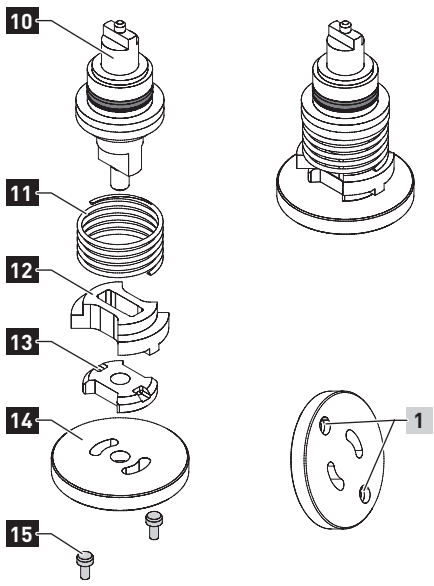
→ Ensure that only original spare parts are installed.
→ Specify the valve number when ordering a spare part kit.

1. ⚠ CAUTION Depressurize the pipe system. Disconnect drive from power supply.
2. Loosen fixing screws 9 and pull drive in upward direction.
3. Loosen cover screws 3 and take off valve cover 2.



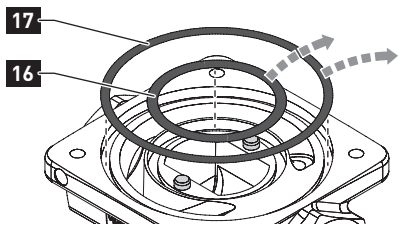
Take off valve cover

4. Take out all components from valve cover.



Overview – components at the valve spindle

5. Take out o-rings 16 and 17. Clean the valve body and put new o-rings.

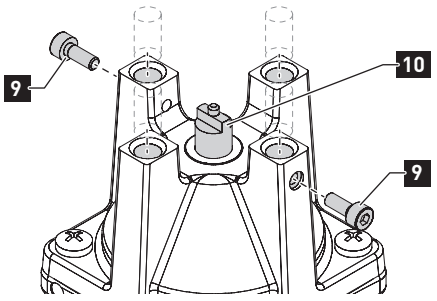


Replace o-rings

6. Replace the valve spindle 10 and compression spring 11.
7. Put components 12 to 14 according to figure onto valve spindle.
8. Feed the preassembled valve spindle 10 into valve body 1. Inside valve body are two pins 15. These pins must placed in the two holes 1 of the lower control disc 14.
9. Put the valve cover 2 on valve body. Tighten four cover screws 3.

11 Replacing drive 9668

1. Disconnect drive from power supply and loosen junction box.
2. Loosen fixing screws 9 and pull drive in upward direction.
3. Manually turn valve 10 spindle parallel to the flow direction Use combination pliers where appropriate. NOTICE If the drive is mounted turned 90° the control signals have the opposite effect.
4. Put the new drive 9668 parallel to the flow direction on the valve cover 2. The adjusting element 8 must interlink into valve spindle 7. Valve cover 2 and drive must be mounted flush.



Fix drive 9668 to valve

5. Tighten both fixing screws 9.

Tightening torque: 1 Nm

6. Connect drive 9668 electrically as described in section 8.3.

12 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:** automatically 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 cover and clean valve parts
Spindle blocked	**Spindle will not turn**
Possible cause: control discs has been jammed **Remedy:** unmount drive and turn valve spindle through 180° manually	**Possible cause:** Drive does not interlink **Remedy:** loose both fixing screws; fix drive flush to the valve cover

13 Decommissioning

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

1. ⚠ CAUTION Depressurize the pipe system. Drain and vent the pipeline.
2. Disconnect drive 9668 from power supply.
3. Unmount motor control valve from pipeline.
4. Drain the valve completely.
5. Clean and dry the valve.

14 Disposal

→ Dispose the valve or a drive after decommissioning. Follow the ideas of recycling and environmental sustainability.
→ Observe the applicable regulatory requirements.
→ Dismantle the valve or a drive and lead recyclable materials to proper recycling:

Component	Disposal
Valve body, spindle, spring, gear	Metal recycling
Drive housing, holding device	industrial waste (similar category to domestic refuse)
Printed-circuit board, servomotor	Electrical waste recycling

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