GEMÜ B44

Pneumatically operated ball valve

EN **Operating instructions**

further information
webcode: GW-B44

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Contents

1 General information

1.1 Information

- The descriptions and instructions apply to the standard versions. For special versions not described in this document the basic information contained herein applies in combination with any additional special documentation.
- Correct installation, operation, maintenance and repair work ensure faultless operation of the product.
- Should there be any doubts or misunderstandings, the German version is the authoritative document.
- Contact us at the address on the last page for staff training information.

1.2 Symbols used

The following symbols are used in this document:

Symbol	Meaning
●	Tasks to be performed
▶	Response(s) to tasks
–	Lists

1.3 Definition of terms

Working medium

The medium that flows through the GEMÜ product.

1.4 Warning notes

Wherever possible, warning notes are organised according to the following scheme:

SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ▶ Possible consequences of non-observance. ● Measures for avoiding danger.

Warning notes are always marked with a signal word and sometimes also with a symbol for the specific danger.

The following signal words and danger levels are used:

⚠ DANGER

Imminent danger!

▶ Non-observance can cause death or severe injury.

⚠ WARNING

Potentially dangerous situation!

▶ Non-observance can cause death or severe injury.

⚠ CAUTION

Potentially dangerous situation!

▶ Non-observance can cause moderate to light injury.

NOTICE

Potentially dangerous situation!

▶ Non-observance can cause damage to property.

The following symbols for the specific dangers can be used within a warning note:

Symbol	Meaning
	Danger of explosion
	Corrosive chemicals!
	Hot plant components!
	Do not open the actuator!

2 Safety information

The safety information in this document refers only to an individual product. Potentially dangerous conditions can arise in combination with other plant components, which need to be considered on the basis of a risk analysis. The operator is responsible for the production of the risk analysis and for compliance with the resulting precautionary measures and regional safety regulations.

The document contains fundamental safety information that must be observed during commissioning, operation and maintenance. Non-compliance with these instructions may cause:

- Personal hazard due to electrical, mechanical and chemical effects.
- Hazard to nearby equipment.
- Failure of important functions.
- Hazard to the environment due to the leakage of dangerous substances.

The safety information does not take into account:

- Unexpected incidents and events, which may occur during installation, operation and maintenance.
- Local safety regulations which must be adhered to by the operator and by any additional installation personnel.

Prior to commissioning:

1. Transport and store the product correctly.
2. Do not paint the bolts and plastic parts of the product.
3. Carry out installation and commissioning using trained personnel.
4. Provide adequate training for installation and operating personnel.
5. Ensure that the contents of the document have been fully understood by the responsible personnel.
6. Define the areas of responsibility.
7. Observe the safety data sheets.
8. Observe the safety regulations for the media used.

During operation:

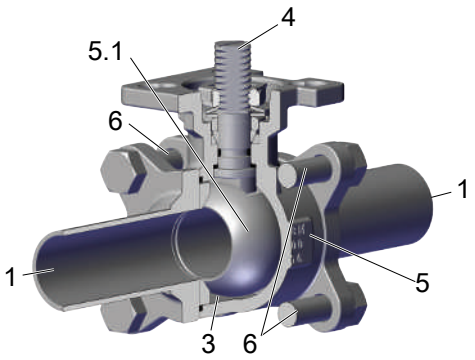
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not described in this document without consulting the manufacturer first.

In cases of uncertainty:

15. Consult the nearest GEMÜ sales office.

3 Product description

3.1 Construction



Item	Name	Materials
5	Ball valve body	ASTM A351/1.4435 (316L)
1	Pipe connections	ASTM A351/1.4435 (316L)
5.1	Ball	ASTM A351/1.4435 (316L)
4	Ball valve shaft	1.4409 (SS316L)
6	Bolt	A2 70
3	Seals	PTFE

3.2 Description

The GEMÜ B44 3-piece 2/2-way metal ball valve is pneumatically operated. The 1.4435 stainless steel alloy material composition used for the ball valve body (compliant with 316L) with a low delta ferrite proportion of < 3% is particularly suited to applications in the supply sector for the pharmaceutical, foodstuffs processing and biotechnology (such as water treatment and sterile steam generation) industries. Only those plastics which are compliant with FDA, USP Class VI and Regulation (EU) No.10/2011 are used for the seals.

3.3 Function

The product is made of metal and is equipped with a low maintenance aluminium piston actuator. It has an optical position indicator and is available in various designs. The product has two operating states: "Closed" and "Open".

4 GEMÜ CONEXO

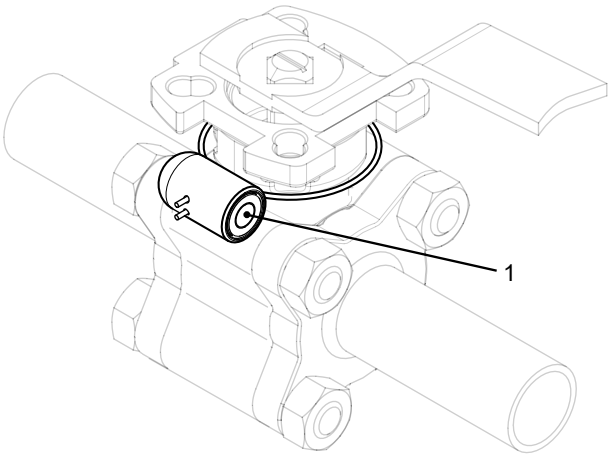
The interaction of valve components that are equipped with RFID chips and an associated IT infrastructure actively increase process reliability.

Thanks to serialization, every valve and every relevant valve component such as the body, actuator or diaphragm, and even automation components, can be clearly traced and read using the CONEXO pen RFID reader. The CONEXO app, which can be installed on mobile devices, not only facilitates and improves the "installation qualification" process, but also makes the maintenance process much more transparent and easier to document. The app actively guides the maintenance technician through the maintenance schedule and directly provides him with all the information assigned to the valve, such as test reports, testing documentation and maintenance histories. The CONEXO portal acts as a central element, helping to collect, manage and process all data.

For further information on GEMÜ CONEXO please visit:
www.gemu-group.com/conexo

Installing the RFID chip

In the corresponding design with CONEXO, this product has an RFID chip for electronic identification purposes. The position of the RFID chip can be seen below.



5 Correct use

Ball valves are used to isolate media flows.

Only clean, liquid or gaseous media must be used, and the body and seal materials used must be resistant to and suitable for this. Contaminated media and / or applications outside of the pressure and temperature data may lead to damage to the body and, in particular, to the seals on the ball valve.

The "Technical data" chapter describes the permissible pressure / temperature range for these ball valves.

⚠ DANGER

Danger of explosion

- ► Danger of death or severe injury.
- ● Only use the product in potentially explosive zones confirmed in the declaration of conformity.

⚠ WARNING

Improper use of the product!

- ► Risk of severe injury or death
- ► Manufacturer liability and guarantee will be void.
- ● Only use the product in accordance with the operating conditions specified in the contract documentation and in this document.

The product GEMÜ B44 is intended for use in potentially explosive areas of zones 1 and 2 with gases, mists or vapours and zones 21 and 22 with combustible dusts in accordance with EU directive 2014/34/EU (ATEX).

The product has the following explosion protection marking:

ATEX:

Gas: Ⓔx II 2G Ex ib IIC T6 Gb

Dust: Ⓔx II 2D Ex ib IIIB T80°C Db

EU type examination certificate: IBExU04ATEX1175 X

Notified body: IBExU, No. 0637

IECEX:

Gas: Ex ib IIC T6 Gb

Dust: Ex ib IIIB T80°C Db

Certificate: IECEx IBE 21.0030 X

The product has been developed in compliance with the following harmonised standards:

- EN IEC 60079-0:2018 (IEC 60079-0, edition 7)
- EN 60079-11:2012 (IEC 60079-11, edition 6)

Use of the product is permissible in the following ambient temperature ranges: -20 °C to +60 °C

For use in potentially explosive areas, the following conditions or operation limits must be observed:

- When using the M12 connector, the differential voltage for isolated intrinsically safe electric circuits must not exceed 30 V. The requirements for cables and lines from EN 60079-14, section 16.2.2, must be taken into account.

- Connectors that are not used must be protected against dust penetration.

Due to the design, in the open and closed position, a low volume of medium may be trapped within the ball or between the ball and the body.

Expansion of the medium due to temperature differences, change in state or a chemical response may lead to a high pressure build-up. In order to prevent unacceptable pressure increases, a special version with pressure-relief hole in the ball is available on request for this case.

NOTICE

Build-up of lint!

► For soft-seated ball valves, due to the relative rotations of the stainless steel ball to the seat seal, slight wear of the PTFE seals must always be anticipated. Despite this, the safety of the ball valve is not affected by any potential build-up of lint and the seal materials are compliant in accordance with FDA directives.

6 Order data

The order data provide an overview of standard configurations.

Please check the availability before ordering. Other configurations available on request.

Products ordered with **bold marked ordering options** are so-called preferred series. Depending on the nominal size, these are available more quickly.

Order codes

1 Type	Code
Ball valve, metal, pneumatically operated, three-piece body, sanitary, checked delta ferrite material and media wetted surfaces according to ASME SF5, ISO 5211, top flange, lockable hand lever, low maintenance spindle seal and blow-out proof shaft, with antistatic unit	B44

2 DN	Code
DN 8	8
DN 10	10
DN 15	15
DN 20	20
DN 25	25
DN 32	32
DN 40	40
DN 50	50
DN 65	65
DN 80	80
DN 100	100

3 Body/ball configuration	Code
2/2-way body	**D**

4 Connection type	Code
Spigot EN 10357 series A/DIN 11866 series A formerly DIN 11850 series 2	17
Spigot SMS 3008	37
Spigot ASME BPE/DIN EN 10357 series C (from 2022 edition)/DIN 11866 series C	**59**
Spigot ISO 1127/DIN EN 10357 series C (2014 edition)/ DIN 11866 series B	60
Clamp ASME BPE	**80**
On one side, clamp ASME BPE corresponding to code 80, on the other side, butt weld spigot code 59, for pipe ASME BPE	93

5 Ball valve material	Code
1.4435/ASTM A351, low ferrite <3% (equivalent to 316L Δ Fe<3%) (body, connection, ball), 1.4409/SS316L (spindle)	C3

6 Seal material	Code
PTFE (FDA certification)	5T
PTFE (FDA certification), cavity filled	5H

7 Control function	Code
Normally closed (NC)	1
Normally open (NO)	2

7 Control function	Code
Double acting (DA)	3

8 Actuator version	Code
Actuator GEMÜ ADA	
Actuator, pneumatic, double-acting, clockwise rotation, ADA0020U F04 S14S11	BU02AA
Actuator, pneumatic, double acting, clockwise rotation, ADA0040U F05 S14S11	BU04AB
Actuator, pneumatic, double acting, clockwise rotation, ADA0080U F05/07S17S14	BU08AC
Actuator, pneumatic, double acting, clockwise rotation, ADA0130U F05/07S17S14	BU13AC
Actuator, pneumatic, double acting, clockwise rotation, ADA0300U F07/10 S22	BU30AD
Actuator GEMÜ ASR	
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0020US08F04 S14S11	AU02FA
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0040US14F04 S14S11	AU04KA
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0040US14F05 S14S11	AU04KB
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0080US14F05/07S17S14	AU08KC
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0130US14F05/07S17S14	AU13KC
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0300US14F07/10 S22	AU30KD
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0500US14F07/10 S22	AU50KD
Actuator, pneumatic, single acting, clockwise rotation, spring closing, ASR0850US14F10/12 S27	AU85KG
Actuator GEMÜ DR	
Actuator, pneumatic, double acting, clockwise rotation, DR0015U F04 S11	DU01AO
Actuator, pneumatic, double acting, clockwise rotation, DR0060U F05/07 S14	DU03AP
Actuator, pneumatic, double acting, clockwise rotation, DR0060U F05/07 S17	DU06AC
Actuator, pneumatic, double acting, clockwise rotation, DR0100U F05/07 S17	DU10AC
Actuator, pneumatic, double acting, clockwise rotation, DR0150U F07/10 S22	DU15AD

8 Actuator version	Code
Actuator, pneumatic, double acting, clockwise rotation, DR0220U F07/10 S22	DU22AD
Actuator GEMÜ SC	
Actuator, pneumatic, single acting, clockwise rotation, spring closing, SC0030U 6F04 S11	SU03KO
Actuator, pneumatic, single acting, clockwise rotation, spring closing, SC0060U 6F05/07 S14	SU06KP
Actuator, pneumatic, single acting, clockwise rotation, spring closing, SC0150U 6F05/07 S17	SU15KC
Actuator, pneumatic, single acting, clockwise rotation, spring closing, SC0220U 6F07/10 S22	SU22KD
Actuator, pneumatic, single acting, clockwise rotation, spring closing, SC0300U 6F07/10 S22	SU30KD
Actuator, pneumatic, single acting, clockwise rotation, spring closing, SC0450U 6F10/12 S27	SU45KG

9 Actuator particulars	Code
General industrial version, aluminium housing, anodised coating 25–35 µm, aluminium end caps, powder coated, C-steel shaft + ENP, A2 screws	0

10 Type of design	Code
Standard	
Ra ≤ 0.4 µm (15 µin.) for media wetted surfaces *), in accordance with DIN 11866 HE4, electropolished internal/external, *) for inner pipe diameter ≤ 6 mm, in spigot Ra ≤ 0.8 µm	1537
K-NO SF5, K-NO 5227, SF5 – Ra max. 0.51 µm (20 µin.) electropolished internal/external, 5227 – thermal separation by mounting kit	7138
K-NO SF5, K-NO 0101, SF5 – Ra max. 0.51 µm (20 µin.) electropolished internal/external, 0101 – media wetted area cleaned to ensure suitability for paint applications	7140
K-NO SF5, K-NO 0104, SF5 – Ra max. 0.51 µm (20 µin.) electropolished internal/external, 0104 – media wetted parts cleaned for high purity media and packed in plastic bag	7141
K-NO SF5, K-NO 0107, SF5 – Ra max. 0.51 µm (20 µin.) electropolished internal/external, 0107 – valve free of oil and grease, media wetted area cleaned	7142
Ra max. 0.38 µm (15 µin.) for media wetted surfaces, in accordance with ASME BPE SF4, electropolished internal/external	SF4
Ra max. 0.51 µm (20 µin.) for media wetted surfaces, in accordance with ASME BPE SF5, electropolished internal/external	SF5

11 Special version	Code
Without	
ATEX certification	X

12 CONEXO	Code
Without	
Integrated RFID chip for electronic identification and traceability	C

Order example

Ordering option	Code	Description
1 Type	B44	Ball valve, metal, pneumatically operated, three-piece body, sanitary, checked delta ferrite material and media wetted surfaces according to ASME SF5, ISO 5211, top flange, lockable hand lever, low maintenance spindle seal and blow-out proof shaft, with antistatic unit
2 DN	15	DN 15
3 Body/ball configuration	D	2/2-way body
4 Connection type	59	Spigot ASME BPE/DIN EN 10357 series C (from 2022 edition)/DIN 11866 series C
5 Ball valve material	C3	1.4435/ASTM A351, low ferrite <3% (equivalent to 316L Δ Fe<3%) (body, connection, ball), 1.4409/SS316L (spindle)
6 Seal material	5T	PTFE (FDA certification)
7 Control function	1	Normally closed (NC)
8 Actuator version	BU02AA	Actuator, pneumatic, double-acting, clockwise rotation, ADA0020U F04 S14S11
9 Actuator particulars	0	General industrial version, aluminium housing, anodised coating 25–35 µm, aluminium end caps, powder coated, C-steel shaft + ENP, A2 screws
10 Type of design		Standard
11 Special version		Without
12 CONEXO		Without

7 Technical data

7.1 Medium

Working medium: Corrosive, inert, gaseous and liquid media and steam which have no negative impact on the physical and chemical properties of the body and seal material.

7.2 Temperature with note

Media temperature: -10 — 220 °C

For media temperatures > 100 °C , we recommend using a mounting kit with adapter between the ball valve and the actuator.

Ambient temperature: -20 — 60 °C

Storage temperature: -60 — 60 °C

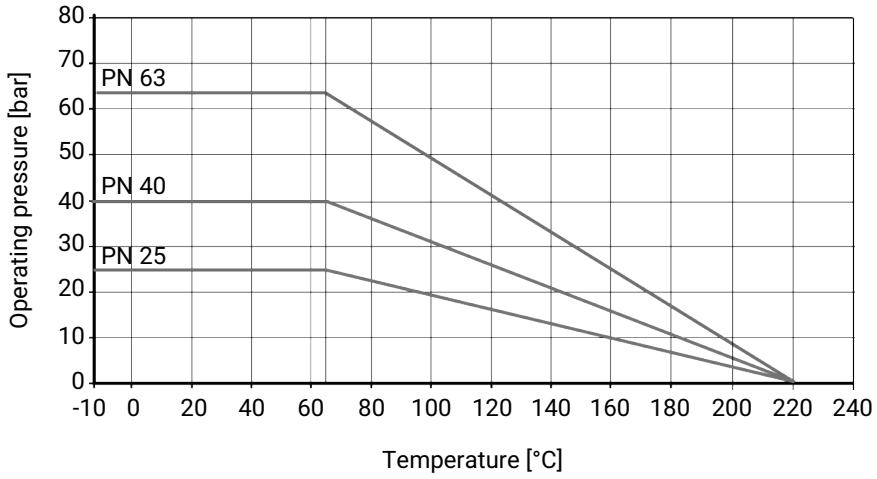
7.3 Pressure

Operating pressure: 0 — 63 bar

Vacuum: Can be used up to a vacuum of 50 mbar (absolute)

These values apply to room temperature and air. The values may deviate for other media and other temperatures.

Pressure/temperature diagram:



Pressure/temperature data in accordance with diagram refers to static operating conditions. Strongly fluctuating or fast-changing parameters can lead to a reduction of the service life. Special applications must be talked through with your technical contact person in advance.

Use the clamped union with the correct pressure rating for a safe and correct pipeline design. Pressure ratings of the clamp alone are generally higher, but do not take into account the fully clamped assembly with gasket

Leakage rate: Leakage rate according to ANSI FCI70 – B16.104

Leakage rate according to EN12266, 6 bar air, leakage rate A

Kv values:

DN	NPS	Connection type (code)		
		17	37, 59, 80, 93	60
8	**1/4"**	7.0	-	7.0
10	**3/8"**	7.0	-	7.0
15	**1/2"**	18.0	9.0	18.0
20	**3/4"**	43.0	26.0	43.0
25	**1"**	77.0	56.0	77.0
32	**1¼"**	95.0	-	95.0
40	**1½"**	206.0	172.0	206.0
50	**2"**	344.0	327.0	344.0
65	**2½"**	602.0	516.0	602.0
80	**3"**	844.0	817.0	844.0
100	**4"**	1462.0	1376.0	1462.0

Cv values in m^3/h

Control pressure: 6 — 8 bar

Pressure rating:

DN	Connection type (code)			
	17	37, 59	60	80, 93
8	-	-	PN63	-
10	PN63	-	PN63	-
15	PN63	PN63	PN63	PN25
20	PN63	PN63	PN63	PN25
25	PN63	PN63	PN63	PN25
32	PN63	-	PN63	-
40	PN63	PN63	PN63	PN25
50	PN63	PN63	PN63	PN16
65	PN40	PN40	PN40	PN16
80	PN40	PN40	PN40	PN10
100	PN25	PN25	PN25	PN10

For clamp connections, the permissible pressures are designed for a temperature of -10 to 140 °C when using suitable clamps and sealing materials.

7.4 Product conformities

Machinery Directive: 2006/42/EC

Pressure Equipment Directive: 2014/68/EU

Food: FDA
Regulation (EC) No. 1935/2004
Regulation (EC) No. 10/2011

Explosion protection: ATEX (2014/34/EU), order code Special version X

ATEX marking: The ATEX marking of the product depends on the respective product configuration with valve body and actuator. It can be found in the product-specific ATEX documentation and the ATEX type plate.

7.5 Mechanical data

90° travel: GEMÜ ADA /ASR: ±5° adjustable (85° - 95°)
GEMÜ DR /SC: 20° adjustable (75° - 95°)

Torques:

DN	NPS	Seal material (code)	
		5T	5H
8	**1/4"**	4	4
10	**3/8"**	4	4
15	**1/2"**	8	12
20	**3/4"**	8	12
25	**1"**	13	19
32	**1¼"**	16	22
40	**1½"**	32	47
50	**2"**	34	51
65	**2½"**	91	105
80	**3"**	104	120
100	**4"**	140	209

Free of oil and grease incl. 25% safety
Torques in Nm

Weight:

Ball valve

DN	NPS	Connection type (code)			
		17	37, 59	60	80, 93
8	**1/4"**	-	-	0.5	-
10	**3/8"**	-	-	0.5	-
15	**1/2"**	0.8	0.5	0.5	0.5
20	**3/4"**	0.8	0.5	0.8	0.5
25	**1"**	1.1	1.0	1.1	1.1
32	**1¼"**	1.6	-	1.6	-
40	**1½"**	2.7	2.1	2.7	2.2
50	**2"**	4.2	3.5	4.2	3.5
65	**2½"**	8.2	7.0	8.2	7.1
80	**3"**	11.6	11.0	11.6	11.8
100	**4"**	24.0	20.0	24.0	20.5

Weights in kg

Actuator type ADA/ASR

Type	ADA double acting	ASR single acting
0020U	1.4	1.5
0040U	2.1	2.3
0080U	3.0	3.7
0130U	3.8	4.8
0200U	5.6	7.3
0300U	8.5	10.8
0500U	11.2	15.4
0850U	16.9	22.2

Weights in kg

Weight:

Actuator type DR/SC

Type	DR Double acting	SC Single acting
0015U	1.0	1.1
0030U	1.6	1.7
0060U	2.7	3.1
0100U	3.7	4.3
0150U	5.2	6.1
0220U	8.0	9.3
0300U	9.8	12.0
0450U	14.0	17.0

Weights in kg

8 Dimensions

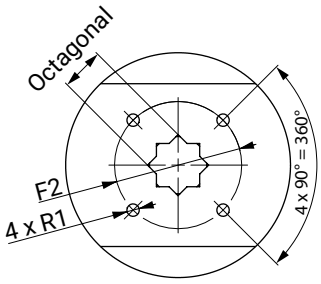
8.1 Actuator dimensions

Note on actuator mounting:
Standard mounting orientation – actuator positioned in-line with piping
Only with flanged connections the actuator is mounted across the piping

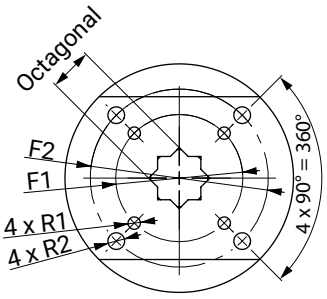
8.1.1 Actuator type ADA/ASR

Actuator flange ISO 5211

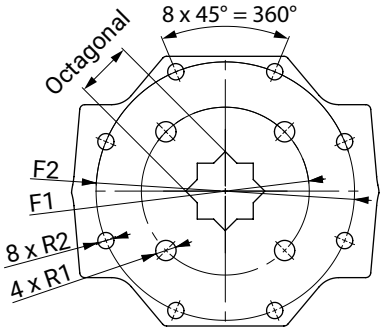
Type 00010, 0020U, 0040U, 0500U, 0750U, 2100U, 2500U



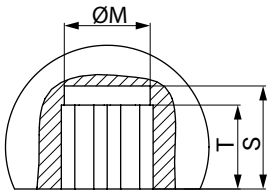
Type 0020U, 0080U, 0130U, 0300U, 0850U, 1200U



Type 4000U

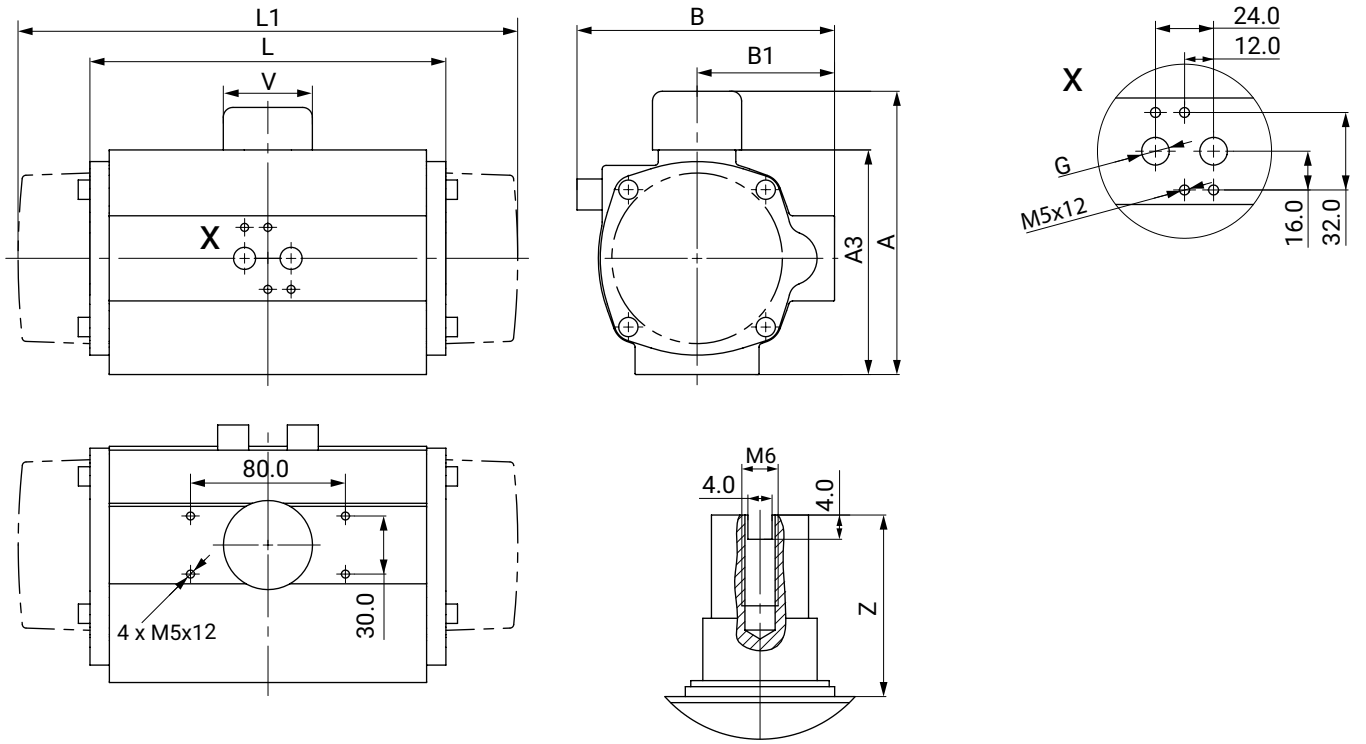


Type 00010 - 4000U



Type	Actuator flange	Octagonal	M	T	S	F1	R1	F2	R2
0020U	F03 / F05	9.0	12.5	10.0	13.0	36.0	M5 x 8.0	50.0	M6 x 10.0
0020U	F04	14.0	18.1	12.0	15.0	42.0	M5 x 8.0	-	-
0020U	F05	14.0	18.1	12.0	16.0	50.0	M6 x 10.0	-	-
0040U	F04	14.0	18.1	12.0	16.0	42.0	M5 x 10.0	-	-
0040U	F05	14.0	18.1	12.0	16.0	50.0	M6 x 10.0	-	-
0080U	F05 / F07	17.0	22.5	19.0	23.0	50.0	M6 x 10.0	70.0	M8 x 16.0
0130U	F05 / F07	17.0	22.5	22.0	27.0	50.0	M6 x 10.0	70.0	M8 x 16.0
0200U	F07 / F10	17.0	22.5	23.0	28.0	70.0	M8 x 16.0	102.0	M10 x 16.0
0300U	F07 / F10	22.0	28.5	24.0	31.0	70.0	M8 x 16.0	102.0	M10 x 16.0
0500U	F10	22.0	28.5	32.0	39.0	102.0	M10 x 16.0	-	-
0850U	F10 / F12	27.0	36.5	39.0	49.0	102.0	M10 x 17.0	125.0	M12 x 20.0

Dimensions in mm



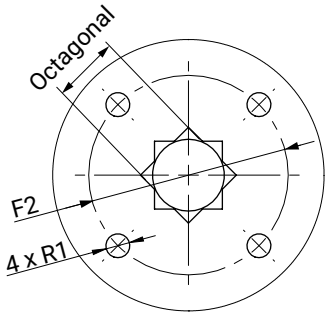
Type	A	A3	B	B1	G	L	L1	V	Z
0020U	96.0	66.0	76.0	48.0	G1/4"	145.0	163.0	40.0	30.0
0040U	115.0	85.0	91.0	56.0	G1/4"	158.0	195.0	40.0	30.0
0200U	165.0	135.0	135.5	78.0	G1/4"	225.0	299.0	40.0	30.0
0500U	199.0	169.0	173.0	96.0	G1/4"	304.0	397.0	40.0	30.0
0850U	221.0	191.0	191.5	106.0	G1/4"	372.0	473.0	40.0	30.0

Dimensions in mm

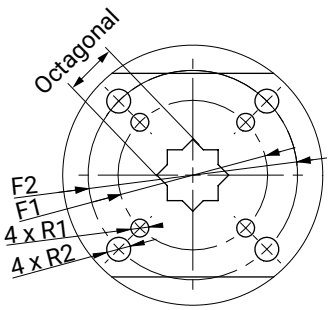
8.1.2 Actuator type DR/SC

Actuator flange ISO5211

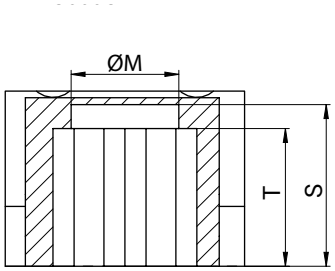
Type 0010U - 0030U
0900U - 4000U



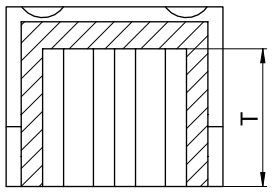
Type 0030U - 1200U, 5000U



Type 0010U - 1200U, 5000U



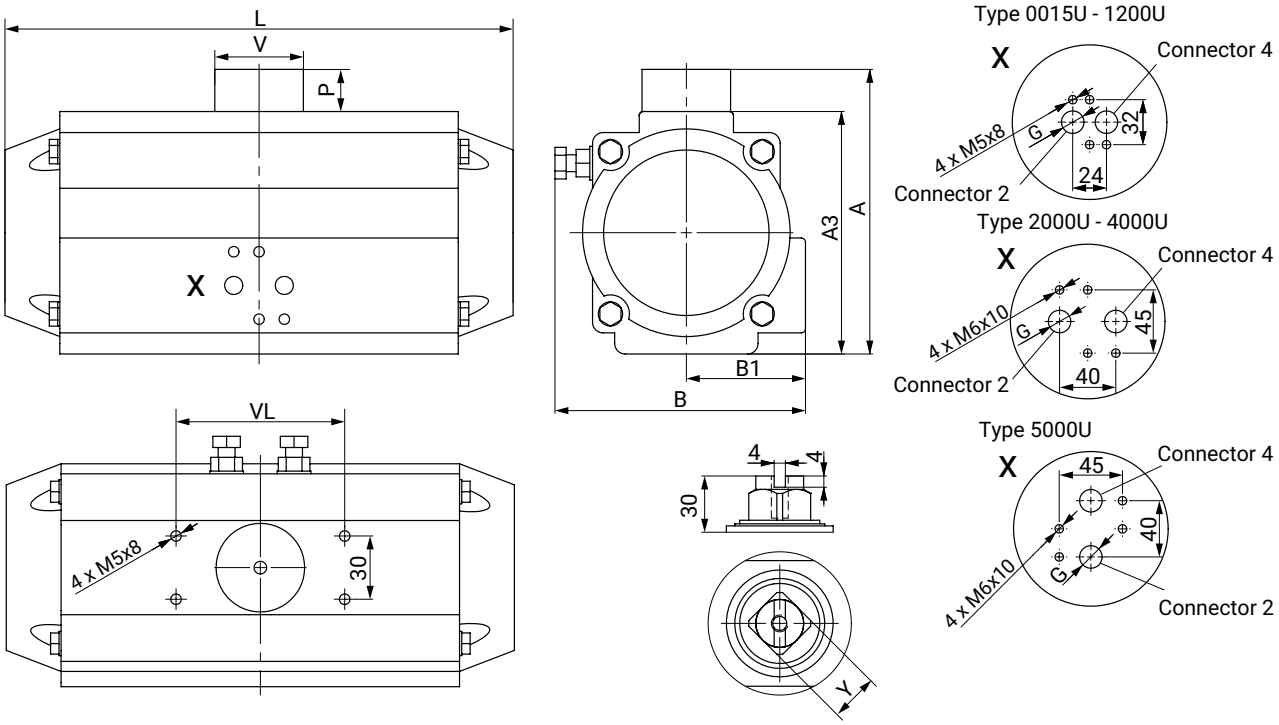
Type 2000U - 4000U



Type	Actuator flange	Octagonal	M	T	S	F1	R1	F2	R2
0015U	F04	11.0	15.5	11.5	13.5	42.0	M5	-	-
0030U	F04	11.0	14.6	14.5	19.0	42.0	M5	-	-
0030U	F05/F07	14.0	18.6	14.5	16.5	50.0	M6	70.0	M8
0060U	F05/F07	14.0	18.6	16.5	19.5	50.0	M6	70.0	M8
0060U	F05/F07	17.0	22.7	17.5	20.0	50.0	M6	70.0	M8
0100U	F05/F07	17.0	23.4	18.5	21.0	50.0	M6	70.0	M8
0150U	F05/F07	17.0	23.4	18.5	25.5	50.0	M6	70.0	M8
0150U	F07/F10	22.0	-	25.0	-	70.0	M8	102.0	M10
0220U	F07/F10	22.0	-	24.0	-	70.0	M8	102.0	M10
0300U	F07/F10	22.0	-	35.0	-	70.0	M8	102.0	M10
0450U	F10/F12	27.0	-	29.0	-	70.0	M10	102.0	M12

Dimensions in mm

Actuator dimensions

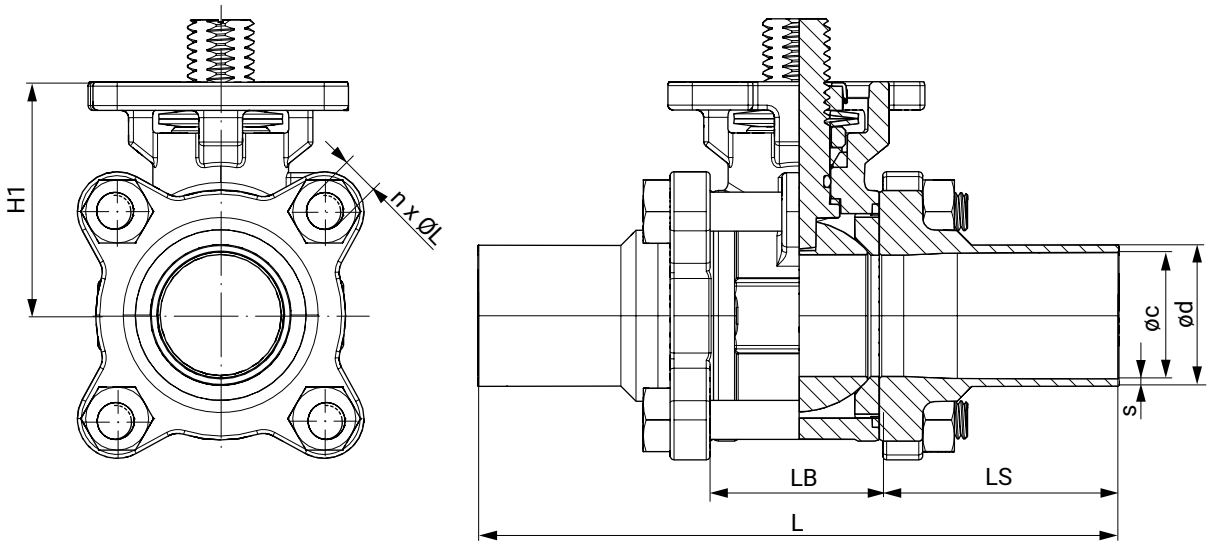


Type	A	A3	B	B1	V	VL	G	P	L	Y
0015U	89.0	69.0	72.0	43.0	42.0	80.0	G1/8"	20.0	136.0	11.0
0030U	105.0	85.0	84.5	48.5	42.0	80.0	G1/8"	20.0	153.5	11.0
0060U	122.0	102.0	93.0	50.5	42.0	80.0	G1/8"	20.0	203.5	17.0
0100U	135.0	115.0	106.0	56.5	42.0	80.0	G1/8"	20.0	241.0	17.0
0150U	147.0	127.0	118.5	63.0	42.0	80.0	G1/4"	20.0	259.0	17.0
0220U	175.0	145.0	136.0	72.0	58.0	80.0	G1/4"	30.0	304.0	27.0
0300U	187.0	157.0	146.5	77.0	58.0	80.0	G1/4"	30.0	333.0	27.0
0450U	207.0	177.0	166.0	86.0	67.5	80.0	G1/4"	30.0	394.5	27.0

Dimensions in mm

8.2 Body dimensions

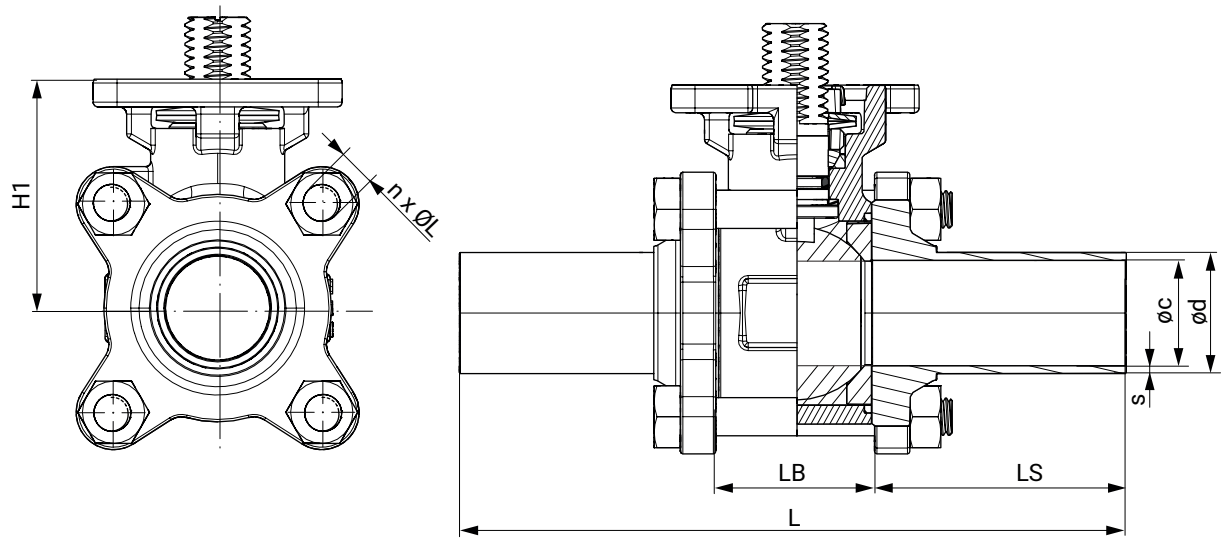
8.2.1 Spigot DIN EN 10357 (connection code 17)



DN	øc	ød	L	LB	LS	H1	n x ØL	s
10	10.0	13.0	120.1	24.3	47.9	37.0	4 x M6	1.5
15	16.0	19.0	140.1	24.3	57.9	37.0	4 x M6	1.5
20	20.0	23.0	140.0	31.2	54.4	40.0	4 x M8	1.5
25	26.0	29.0	152.0	34.0	59.0	48.0	4 x M8	1.5
32	32.0	35.0	165.0	44.0	60.5	53.0	4 x M10	1.5
40	38.0	41.0	190.0	55.0	67.5	63.0	4 x M12	1.5
50	50.0	53.0	203.0	68.9	67.0	72.0	4 x M14	1.5
65	66.0	70.0	254.0	82.0	86.0	92.0	4 x M14	2.0
80	81.0	85.0	280.0	96.0	92.0	102.0	4 x M16	2.0
100	100.0	104.0	308.0	122.0	93.0	132.0	6 x M20	2.0

Dimensions in mm
n = number of bolts

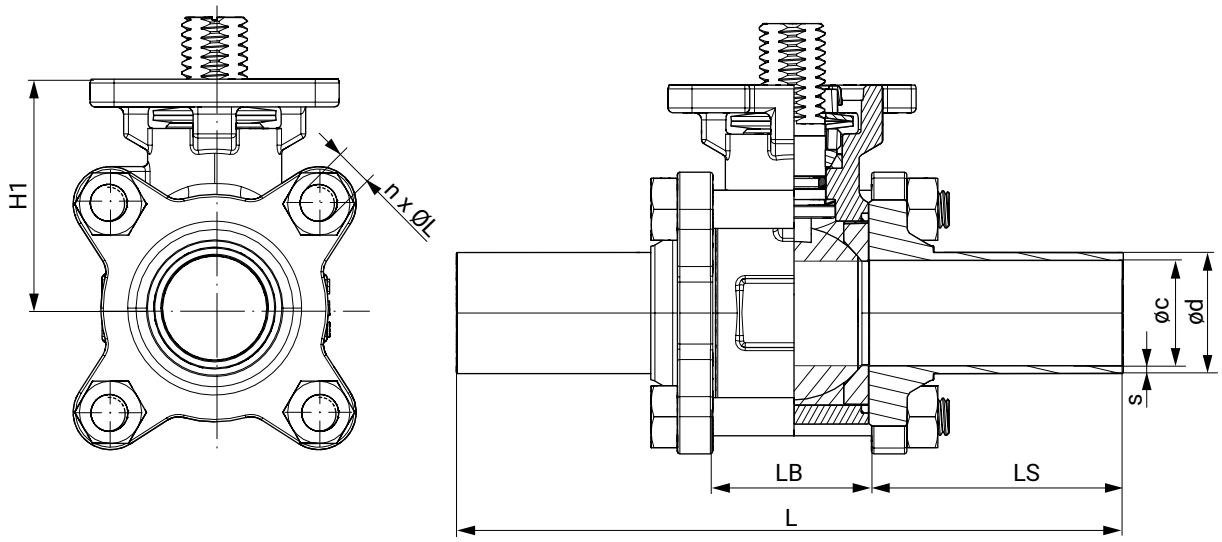
8.2.2 Spigot SMS 3008 (connection code 37)



DN	øc	ød	s	t	L	LB	LS	H1	n x ØL
20	16.0	18.0	1.0	6.1	142.2	28.0	58.6	38.0	4 x M6
25	22.6	25.0	1.2	7.4	162.3	32.1	65.1	48.0	4 x M8
40	35.6	38.0	1.2	8.3	182.2	46.0	68.1	60.0	4 x M12
50	48.6	51.0	1.2	10.2	193.0	59.6	66.7	69.0	4 x M14
65	60.3	63.5	1.6	12.5	254.1	77.1	88.5	89.0	4 x M14
80	72.9	76.1	1.6	14.0	276.9	91.7	92.6	98.0	4 x M16
100	97.6	101.6	2.0	14.5	304.9	118.3	93.3	130.0	6 x M16

Dimensions in mm
n = number of bolts

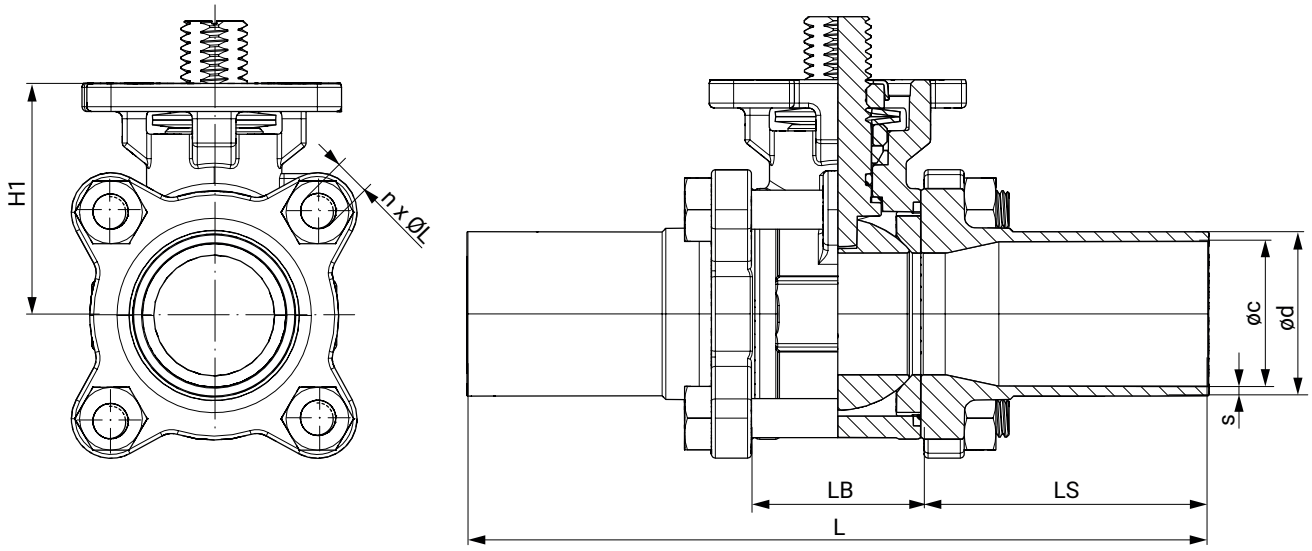
8.2.3 Spigot ASME BPE (connection code 59)



DN	øc	ød	s	L	LB	LS	H1	n x ØL
15	9.40	12.70	1.65	124.40	25.00	49.70	38.00	4 x M6
20	15.70	19.05	1.65	142.20	28.00	58.60	38.00	4 x M6
25	22.10	25.40	1.65	162.30	32.10	65.10	48.00	4 x M8
40	34.80	38.10	1.65	182.20	46.00	68.10	60.00	4 x M12
50	47.50	50.80	1.65	193.00	59.60	66.70	69.00	4 x M14
65	60.20	63.50	1.65	254.10	77.10	88.50	89.00	4 x M14
80	72.90	76.20	1.65	276.90	91.70	92.60	98.00	4 x M16
100	97.40	101.60	2.10	304.90	118.30	93.30	130.00	6 x M16

Dimensions in mm
n = number of bolts

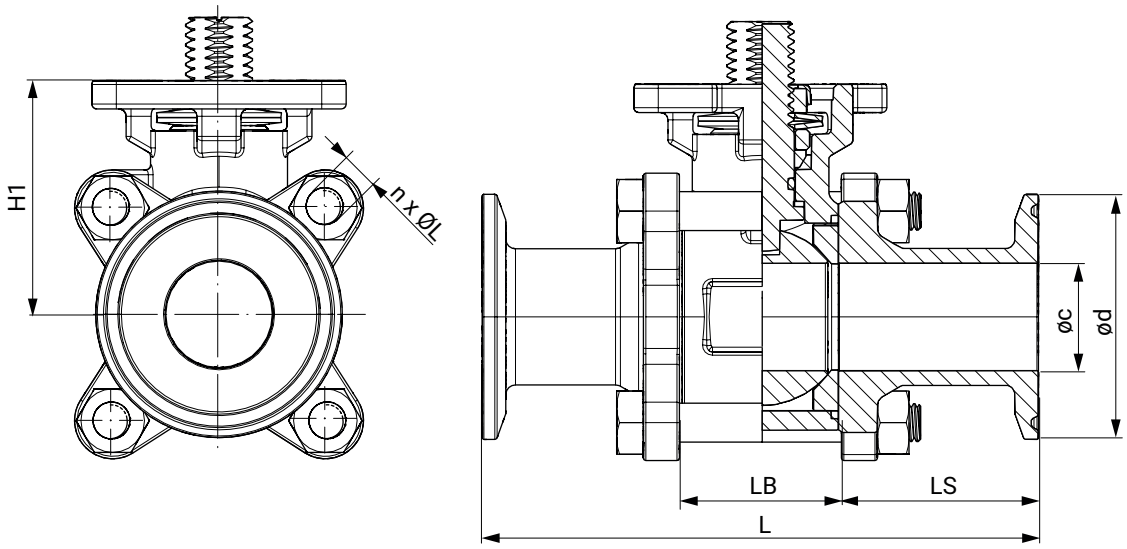
8.2.4 Spigot ISO 1127 / EN 10357 (connection code 60)



DN	øc	ød	s	L	LB	LS	H1	n x ØL
8	10.3	13.5	1.6	120.1	24.3	47.9	37.0	4 x M6
10	14.0	17.2	1.6	120.1	24.3	47.9	37.0	4 x M6
15	18.1	21.3	1.6	140.1	24.3	57.9	37.0	4 x M6
20	23.7	26.9	1.6	140.0	31.2	54.4	40.0	4 x M8
25	29.7	33.7	2.0	152.0	34.0	59.0	48.0	4 x M8
32	38.4	42.4	2.0	165.0	44.0	60.5	53.0	4 x M10
40	44.3	48.3	2.0	190.0	55.0	67.5	63.0	4 x M12
50	56.3	60.3	2.0	203.0	68.9	67.0	72.0	4 x M14
65	72.1	76.1	2.0	254.0	82.0	86.0	92.0	4 x M14
80	84.3	88.9	2.3	280.0	96.0	92.0	102.0	4 x M16
100	109.7	114.3	2.3	308.0	122.0	93.0	132.0	6 x M20

Dimensions in mm
n = number of bolts

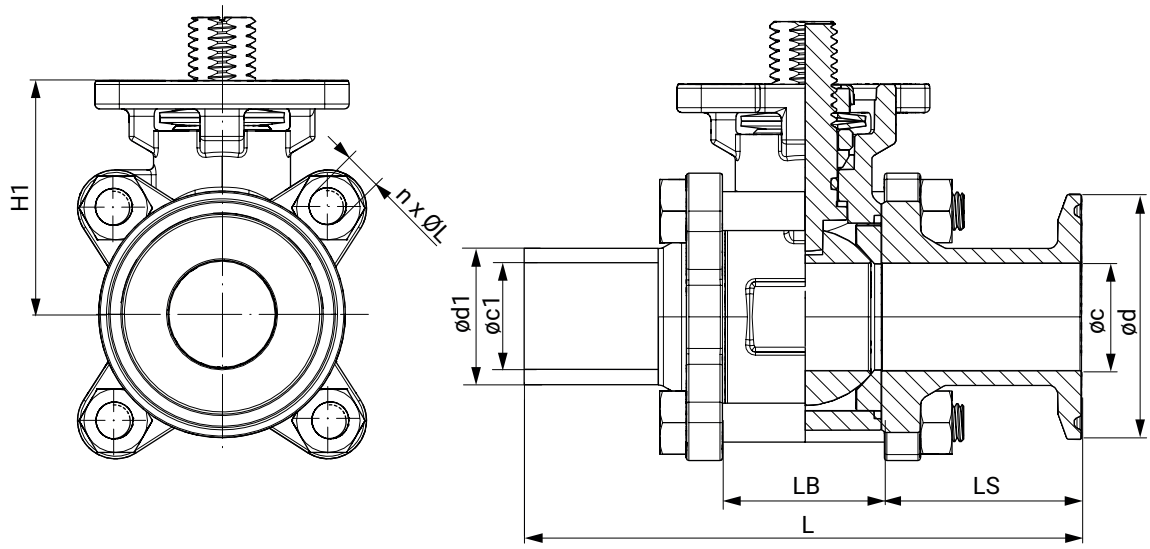
8.2.5 Clamp ASME BPE (connection code 80)



DN	øc	ød	s	L	LB	LS	H1	n x ØL
15	9.4	25.0	1.65	88.8	25.0	31.9	38.0	4 x M6
20	15.8	25.0	1.65	101.6	25.0	38.3	38.0	4 x M6
25	22.1	50.4	1.65	114.3	32.1	41.1	48.0	4 x M8
40	34.8	50.4	1.65	139.8	46.0	46.9	60.0	4 x M12
50	47.5	63.9	1.65	158.8	59.6	49.6	69.0	4 x M14
65	60.2	77.4	1.65	171.5	77.1	47.2	89.0	4 x M14
80	72.9	90.9	1.65	196.3	91.7	52.3	98.0	4 x M16
100	97.4	118.9	2.1	241.3	118.3	61.5	130.0	6 x M16

Dimensions in mm
n = number of bolts

8.2.6 Mixed ends ASME BPE (connection code 93)



DN	øc	ød	øc1	ød1	s	t	L	LB	LS	H1	n x ØL
15	9.4	25.0	9.4	12.7	1.65	6.1	106.6	25.0	49.7	38.0	4 x M6
20	15.8	25.0	15.8	19.0	1.65	6.1	121.9	28.0	58.6	38.0	4 x M6
25	22.1	50.4	22.1	25.4	1.65	7.4	138.3	32.1	65.1	48.0	4 x M8
40	34.8	50.4	34.8	38.1	1.65	8.3	161.0	46.0	68.1	60.0	4 x M12
50	47.5	63.9	47.5	50.8	1.65	10.2	175.9	59.6	66.7	69.0	4 x M14
65	60.2	77.4	60.2	63.5	1.65	12.5	212.8	77.1	88.5	89.0	4 x M14
80	72.9	90.9	72.9	76.2	1.65	14.0	236.6	91.7	92.6	98.0	4 x M16
100	97.4	118.9	97.4	101.6	2.10	14.5	273.1	118.3	93.3	130.0	6 x M16

Dimensions in mm
n = number of bolts

9 Manufacturer's information

9.1 Delivery

- Check that all parts are present and check for any damage immediately upon receipt.

The product's performance is tested at the factory. The scope of delivery is apparent from the dispatch documents and the design from the order number.

9.2 Packaging

The product is packaged in a cardboard box which can be recycled as paper.

9.3 Transport

1. Only transport the product by suitable means. Do not drop. Handle carefully.
2. After the installation dispose of transport packaging material according to relevant local or national disposal regulations / environmental protection laws.

9.4 Storage

1. Store the product free from dust and moisture in its original packaging.
2. Avoid UV rays and direct sunlight.
3. Do not exceed the maximum storage temperature (see chapter "Technical data").
4. Do not store solvents, chemicals, acids, fuels or similar fluids in the same room as GEMÜ products and their spare parts.
5. Close the compressed air connections with protection caps or sealing plugs.
6. Store the ball valves in the "open" position.

10 Installation in piping

10.1 Preparing for installation

⚠ WARNING

The equipment is subject to pressure!

► Risk of severe injury or death
- Depressurize the plant or plant component.
- Completely drain the plant or plant component.

⚠ WARNING

Corrosive chemicals!

► Risk of caustic burns
- Wear appropriate protective gear.
- Completely drain the plant.

⚠ CAUTION

Hot plant components!

► Risk of burns
- Only work on plant that has cooled down.

⚠ CAUTION

Exceeding the maximum permissible pressure!

► Damage to the product
- Provide precautionary measures against exceeding the maximum permitted pressures caused by pressure surges (water hammer).

⚠ CAUTION

Use as step!

► Damage to the product

► Risk of slipping-off
- Choose the installation location so that the product cannot be used as a foothold.
- Do not use the product as a step or a foothold.

NOTICE

Suitability of the product!

► The product must be appropriate for the piping system operating conditions (medium, medium concentration, temperature and pressure) and the prevailing ambient conditions.

NOTICE

Tools!

► The tools required for installation and assembly are not included in the scope of delivery.

● Use appropriate, functional and safe tools.

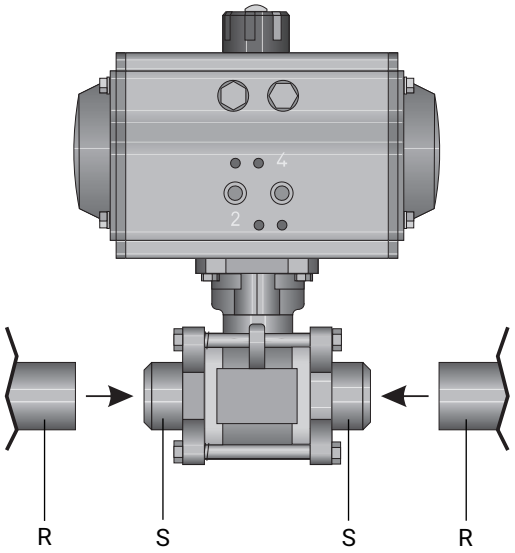
1. Ensure the product is suitable for the relevant application.
2. Check the technical data of the product and the materials.
3. Keep appropriate tools ready.
4. Use appropriate protective gear as specified in plant operator's guidelines.
5. Observe appropriate regulations for connections.
6. Installation work must be performed by trained personnel.
7. Shut off plant or plant component.
8. Secure the plant or plant component against recommissioning.
9. Depressurize the plant or plant component.
10. Completely drain the plant or plant component and allow it to cool down until the temperature is below the media vaporization temperature and cannot cause scalding.
11. Correctly decontaminate, rinse and ventilate the plant or plant component.
12. Lay piping so that the product is protected against transverse and bending forces, and also from vibrations and tension.
13. Only install the product between matching aligned pipes (see chapters below).
14. Installation position: preferably actuator upwards.
15. Direction of the working medium: optional.

10.2 Installation with butt weld spigots

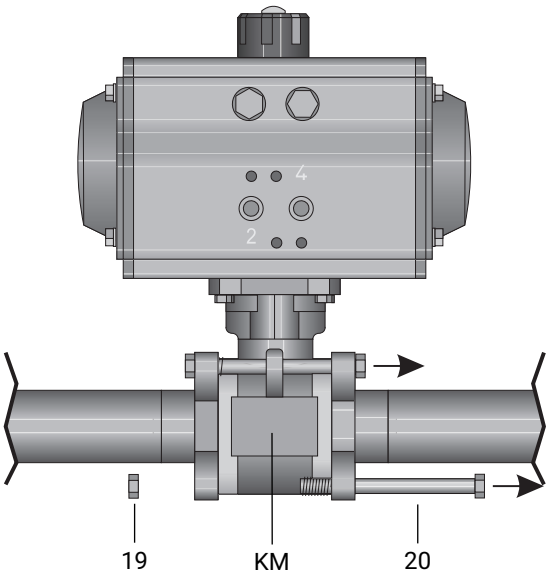
NOTICE

► Adhere to good welding practices!

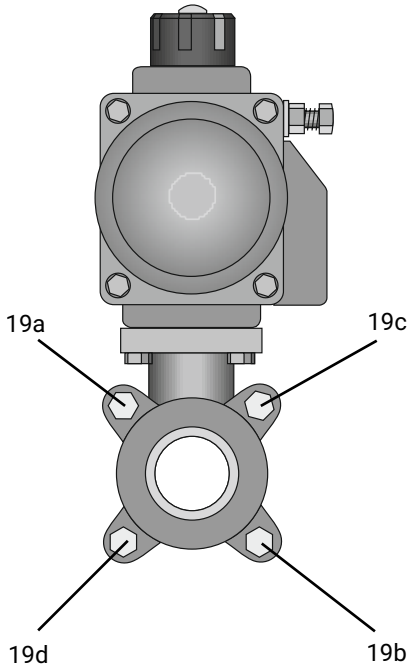
1. **Installation variant:**
   Undo one bolt, remove the other bolts and swivel the centre section aside instead of removing it.



2. Centre and fix butt weld spigots **S** right and left on piping **R**.



3. Fully unscrew the nuts **19**.
4. Pull out the bolts **20**.
5. Remove the centre section **KM**.
6. Weld butt weld spigots **S** right and left to the piping **R**.
7. Allow the butt weld spigots to cool down.
8. Reassemble the ball valve.

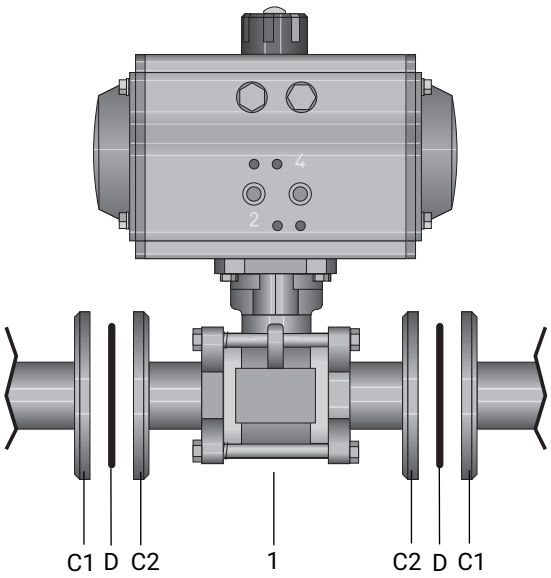


9. Tighten nuts **19a - 19d** diagonally, holding them with a wrench.

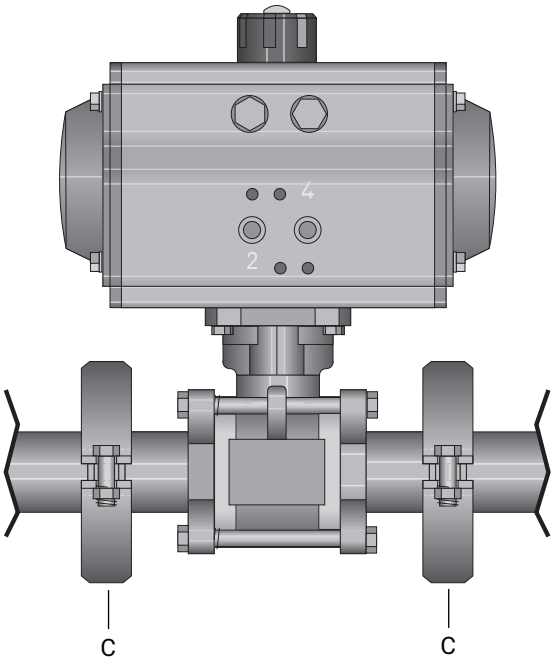
Nominal size	Torque [Nm]
DN8	8
DN10	8
DN15	8
DN20	14
DN25	14
DN32	20
DN40	23
DN50	28
DN65	45
DN80	60
DN100	75

10.3 Installation with clamp connections

1. Ensure sealing surfaces on the connection clamps are clean and undamaged.



2. Carefully align the ball valve body **1** centrally between the pipes with clamps (**C1** and **C2**).
3. Centre the seals **D** accurately. Seals are not included in the scope of delivery.



4. Connect the clamp of the ball valve and the clamp of the piping with the appropriate sealing clamp **C**.
5. Only use connector elements made of approved materials!

10.4 After the installation

- Re-attach or reactivate all safety and protective devices.

11 Pneumatic connection

11.1 Control functions

The following control functions are available:

Control function 1, actuator aligned parallel to the piping, control function Q, actuator aligned across the piping normally closed (NC)

Ball valve resting position: closed by spring force. Activation of the actuator (connector 2) opens the ball valve. When the actuator is vented, the ball valve is closed by spring force.

Control function 2, actuator aligned parallel to the piping, control function U, actuator aligned across the piping normally open (NO)

Ball valve resting position: opened by spring force. Activation of the actuator (connector 4) closes the ball valve. When the actuator is vented, the ball valve is opened by spring force.

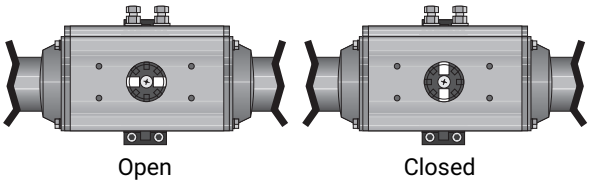
Control function 3, actuator aligned parallel to the piping, control function T, actuator aligned across the piping double acting (DA)

Ball valve resting position: undefined. The ball valve is opened and closed by activating the respective control medium connectors (connector 2: open / connector 4: close).

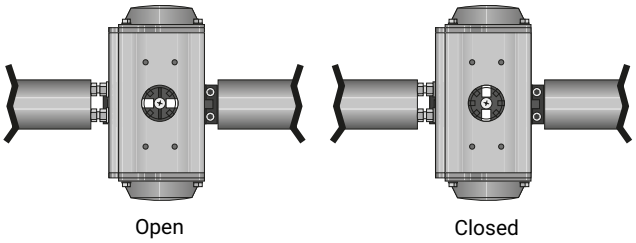
Control functions	Connectors	
	2	4
1 (NC), Q (NC)	+	-
2 (NO), U (NO)	-	+
3 (DA), T (DA)	+	+
+ = available / - = not available (for connectors 2 / 4 see picture in chapter "Connecting the control medium")		

11.2 Optical position indicator

Control function 1, 2, 3



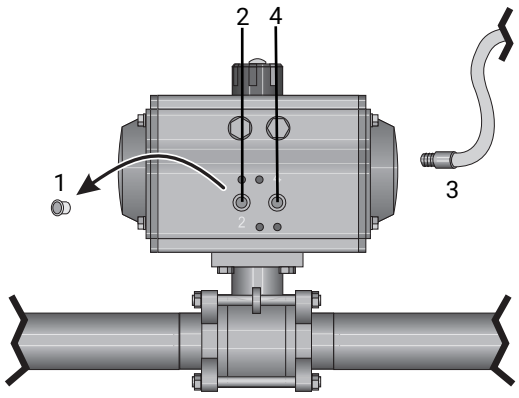
Control function Q, U, T



11.3 Connecting the control medium

1. Use suitable connectors.
2. Connect the control medium lines tension-free and without any bends or knots.

Thread size of the control medium connectors: G1/4

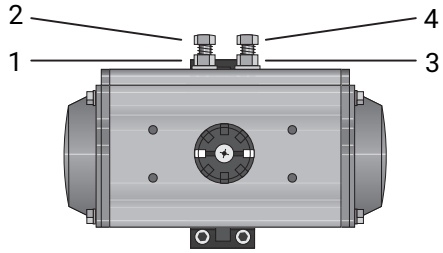


3. Remove the protection cap **1**.
4. Connect the control medium line **3** to connectors **2** and **4** according to the control function.

	Control function	Connectors
1	Normally closed (NC)	2: Control medium (open)
2	Normally open (NO)	4: Control medium (close)
3	Double acting (DA)	2: Control medium (open) 4: Control medium (close)
For connectors 2 / 4 see picture above		

12 Setting the end positions

The end positions can be set by ± 4°.



Setting the 0° end position:

1. Move the ball valve to the closed position.
2. Loosen the lock nut **1**.
3. Set the end position via screw **2**.
4. Tighten the lock nut **1**.

Setting the 90° end position:

5. Move the ball valve to the open position.
6. Loosen the lock nut **3**.
7. Set the end position via screw **4**.
8. Tighten the lock nut **3**.

13 Commissioning

⚠ WARNING

Corrosive chemicals!

► Risk of caustic burns
- Wear appropriate protective gear.
- Completely drain the plant.

⚠ CAUTION

Leakage!

► Emission of dangerous materials
- Provide precautionary measures against exceeding the maximum permitted pressures caused by pressure surges (water hammer).

1. Check the tightness and the function of the product (close and reopen the product).
2. Flush the piping system of new plant and following repair work (the product must be fully open).
   ⇨ Harmful foreign matter has been removed.
   ⇨ The product is ready for use.
3. Commission the product.

14 Operation

Operate the product according to the control function (see also chapter "Pneumatic connection").

15 Troubleshooting

Error	Possible cause	Troubleshooting
The product does not open or does not open fully	Foreign matter in the product	Remove and clean the product
	Control medium not connected	Connect control medium
	Actuator defective	Replace the actuator
The product does not close or does not close fully	Foreign matter in the product	Remove and clean the product
The product is leaking between actuator and valve body, medium is escaping at the valve spindle	Spindle nut or spacer bolt loosened	Tighten spindle nut or spacer bolt
	Wearing parts of spindle seal faulty	Replace wearing parts
Connection between valve body and piping leaking	For clamp connections: Sealing clamp is loose	Retighten sealing clamp
	For clamp connections: Gasket faulty	Replace gasket
	Incorrect installation	Check installation of valve body in piping
Valve body leaking	Incorrect installation	Check installation of valve body in piping
	Bolts of the ball valve body are loose	Retighten bolts

16 Inspection/maintenance

⚠ WARNING

The equipment is subject to pressure!

► Risk of severe injury or death
- Depressurize the plant or plant component.
- Completely drain the plant or plant component.

⚠ CAUTION

Hot plant components!

► Risk of burns
- Only work on plant that has cooled down.

⚠ CAUTION

- Servicing and maintenance work must only be performed by trained personnel.
- Do not extend hand lever. GEMÜ shall assume no liability whatsoever for damages caused by improper handling or third-party actions.
- In case of doubt, contact GEMÜ prior to commissioning.

1. Use appropriate protective gear as specified in plant operator's guidelines.
2. Shut off plant or plant component.
3. Secure against recommissioning.
4. Depressurize the plant or plant component.

Ball valves are maintenance-free. No lubrication or routine maintenance of the ball valve shaft is required. The shaft is guided through a PTFE gland packing in the ball valve body. The shaft seal is pretensioned and self-adjusting. However, the operator must carry out regular visual examinations of the ball valves, dependent on the operating conditions and the potential danger in order to prevent leakage and damage.

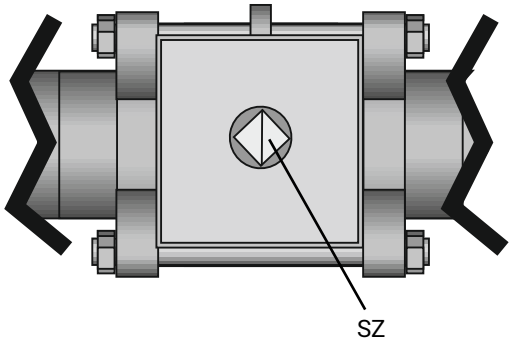
If there is a leakage at the spindle nut, this can generally be rectified by retightening the spindle nut. However, overtightening the spindle nut must be avoided.

Usually, retightening by between 30° and 60° will be sufficient to rectify the leakage.

16.1 General information regarding actuator replacement

NOTICE

The following tools are required for actuator replacement:
- Allen key



1. Check the position of the ball indicated by the groove **SZ** and compare with position indicator, rotate ball valve to correct position if necessary.

⇨ Groove transverse to piping direction:
Ball valve closed.

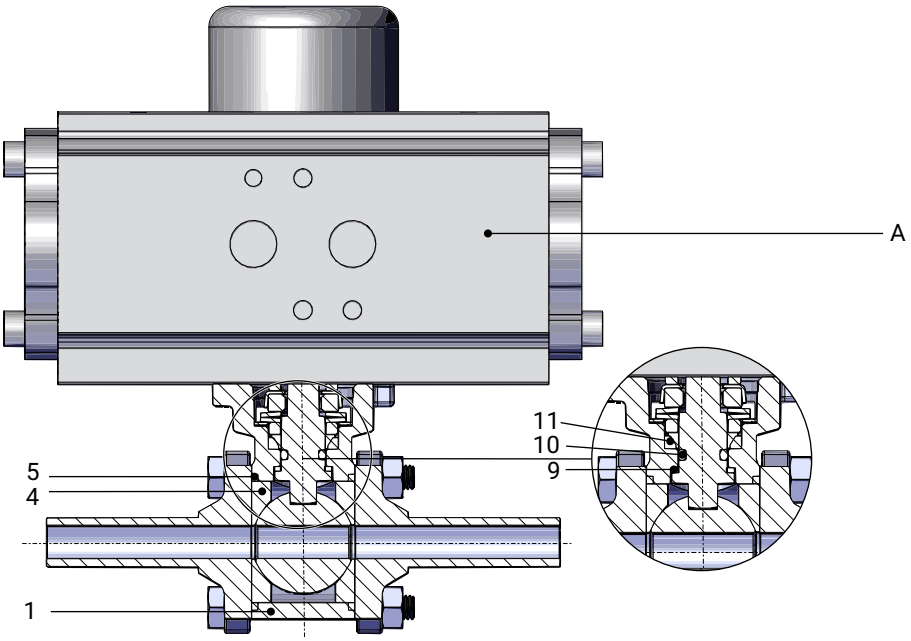
⇨ Groove in piping direction:
Ball valve open.

16.1.1 Replacing the actuator

1. Depressurize the control medium.
2. Unscrew the control medium line(s) on the actuator.

16.2 Spare parts

16.2.1 Spare parts for connection types 17, 60



Item	Name	Order designation	
1	Ball valve body	BB04	
4	Seat seal (2 x)	BB04 SDS	
5	Flange seal (2 x)		
9	Sealing washer spindle		
10	O-ring		
11	V-ring spindle packing		
A	Actuator ADA/ASR, DR/SC	ADA ASR DR SC	Pneumatic actuator, double acting Pneumatic actuator, single acting Pneumatic actuator, double acting Pneumatic actuator, single acting

16.2.2 Spare parts for connection types 59, 80

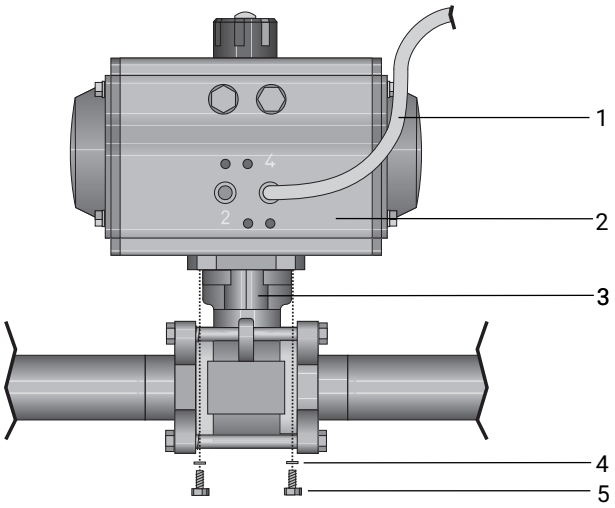
Item	Name	Order designation	
1	Ball valve body	BB04	
4	Seat seal (2 x)	BB04 SDS	
5	Flange seal (2 x)		
9	Sealing washer spindle		
10	O-ring		
11	V-ring spindle packing		
A	Actuator ADA/ASR, DR/SC	ADA ASR DR SC	Pneumatic actuator, double acting Pneumatic actuator, single acting Pneumatic actuator, double acting Pneumatic actuator, single acting

16.3 Removing the actuator from the ball valve body

⚠ DANGER

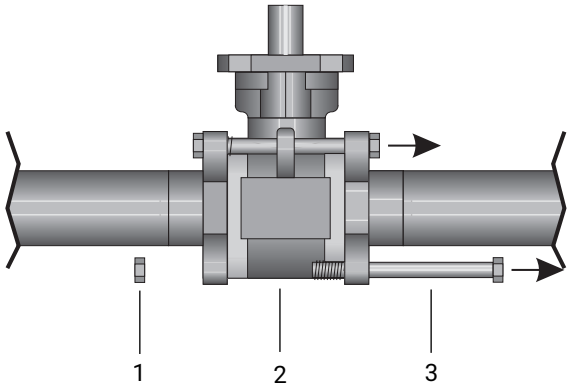
Do not open the actuator!

- ► Risk of severe injury or death!
- ► Manufacturer's warranty will be voided.



1. Depressurize the control medium.
2. Unscrew the control medium line(s) **1** on the actuator.
3. Unscrew the hexagon screws **5**.
4. Do not lose the washers **4**.
5. Remove the actuator **2** from the ball valve body **3**.

16.4 Ball valve disassembly



1. Use appropriate protective gear as specified in plant operator's guidelines.
2. Shut off plant or plant component.
3. Secure against recommissioning.
4. Depressurize the plant or plant component.
5. Fully unscrew the nuts **1**.
6. Pull out the bolts **3**.
7. Remove the ball valve **2**.

NOTICE

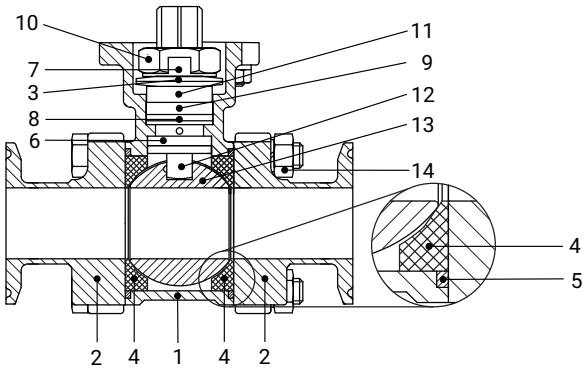
Important:

- ► Clean all parts of contamination (do not damage the parts during cleaning) following removal. Check parts for potential damage; replace if necessary (only use genuine parts from GEMÜ).

16.5 Assembling the spare parts

NOTICE

- ● If a spare part must be replaced, it is recommended to likewise replace all spare parts included in the wearing parts kit.



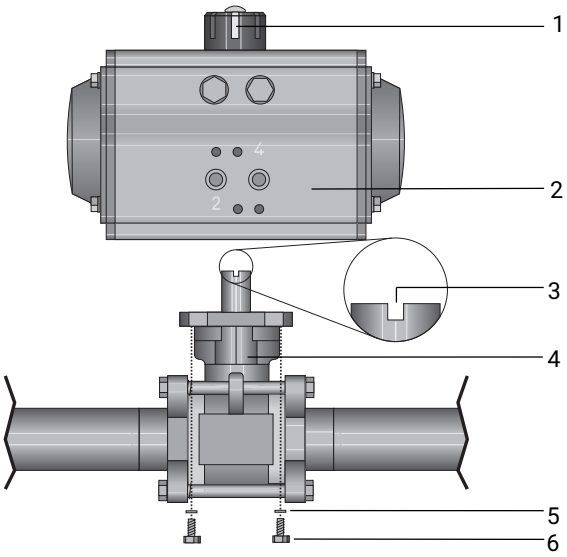
1. Remove the actuator (see chapter "Removing the actuator from the ball valve body").
2. Bend the tab of the lock washer **7**.
3. Unscrew the spindle nut **10**.
4. Remove the spring washers (2 x) **3** and the stainless steel sleeve **11**.
5. Unscrew the nuts **14** from the flange connecting bolts.
6. Remove the lock washers, pull out the boltss, and carefully remove the flange **2** from the ball valve body **1**.
7. Remove the flange seals **5** and seat seals **4** from the ball valve body.
8. Turn the ball **13** with the spindle **12** to the "closed" position and remove the ball from the ball valve body with a slight rotating movement.
9. Press spindle **12** carefully from outside into ball valve body and remove it.
10. Remove the V-ring spindle packings **8** (2x) and **9**.
11. Replace the conical spindle seal **6** and reinsert the spindle into the ball valve body.
12. Place the new V-ring spindle packings **8** (2x) and **9**, the stainless steel sleeve **11**, the spring washers **3** and the lock washer **7** on the spindle and hand-tighten the spindle nut **10**.
13. Bend the tab of lock washer **7** upwards.
14. Turn the spindle **12** so that the ball actuator runs alongside the direction of piping, and push the ball **13** onto the ball actuator with a slight rotating movement.
15. Insert the seat seals **4** and flange seals **5** from both sides.
16. Position the flange **2** on both sides, push the flange connecting bolts through the flange holes, attach the lock washers and tighten the nuts **14** evenly (diagonally in several cycles).
17. Mount the actuator (see chapter "Actuator mounting on the ball valve body").

16.6 Installing the ball valve

NOTICE

► Installation is performed in reverse order as for disassembly (see chapter "Ball valve disassembly").

16.7 Actuator mounting on the ball valve body



1. Ensure that the groove at the square **3** of the ball valve is in correct alignment with the marking **1** of the position indicator, if necessary rotate the square to the correct position.
2. Place the actuator **2** on the square and align, if necessary.
3. Hand-tighten the screws **6** with their washers **5**.
4. Diagonally hand-tighten the screws **6** evenly.
5. Connect the control medium (see chapter "Connecting the control medium").

Tightening torques for upper spindle nut item 10

Nominal size	Torque [Nm]
DN8	9
DN10	9
DN15	9
DN20	9
DN25	15
DN32	15
DN40	25
DN50	25
DN65	30
DN80	30
DN100	40

17 Removal from piping

1. Remove the clamp or screw connections in reverse order to installation.
2. Remove welded or solvent cemented connections using a suitable cutting tool.
3. Observe the safety information and accident prevention regulations.

18 Disposal

1. Pay attention to adhered residual material and gas diffusion from penetrated media.
2. Dispose of all parts in accordance with the disposal regulations/environmental protection laws.

19 Returns

Legal regulations for the protection of the environment and personnel require that the completed and signed return delivery note is included with the dispatch documents. Returned goods can be processed only when this note is completed. If no return delivery note is included with the product, GEMÜ cannot process credits or repair work but will dispose of the goods at the operator's expense.

1. Clean the product.
2. Request a return delivery note from GEMÜ.
3. Complete the return delivery note.
4. Send the product with a completed return delivery note to GEMÜ.

20 Declaration of Incorporation according to 2006/42/EC (Machinery Directive)

Declaration of Incorporation

according to the EC Machinery Directive 2006/42/EC, Annex II, 1.B for partly completed machinery

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany
declare that the following product	
Make	GEMÜ B44
Serial number	from 01.01.2019
Project number	KGH-Metall-pneumatisch 2020
Commercial name:	B44

meets the following essential requirements of the Machinery Directive 2006/42/EC:

1.1.3, 1.1.5, 1.1.7, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6, 1.3., 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.3.9, 1.5.3, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.13, 1.5.14, 1.5.16, 1.6.1, 1.6.3, 1.6.5, 1.7.1.2

We also declare that the specific technical documentation has been compiled in accordance with part B of Annex VII.

Reference of the harmonised standards (or parts thereof) applied in accordance with Article 7(2):

EN ISO 12100:2010-11	Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)
EN 1983:2013	Industrial valves - Steel ball valves

Citation of other technical standards and specifications used:

EN 558:2017-05	Industrial valves – Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems
ISO 5211:2017-03	Industrial valves - Part-turn actuator attachments

The manufacturer or his authorised representative undertake to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery. This transmission takes place:

Electronically

Authorised documentation officer

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG

Fritz-Müller-Straße 6-8

74653 Ingelfingen, Germany

This does not affect the industrial property rights!

Important note! The partly completed machinery may be put into service only if it was determined, where appropriate, that the machinery into which the partly completed machinery is to be installed meets the provisions of this Directive.

2024-04-26

Joachim Brien
Head of BU Industry

21 Declaration of conformity according to 2014/68/EU (Pressure Equipment Directive)

EU Declaration of Conformity

in accordance with 2014/68/EU (Pressure Equipment Directive)

We, the company

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Strasse 6–8
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the safety requirements of the Pressure Equipment Directive 2014/68/EU.

Description of the pressure equipment:	GEMÜ B44
Notified body:	TÜV Rheinland Industrie Service GmbH
Number:	0035
Certificate no.:	01 202 926/Q-02 0036
Conformity assessment procedure:	Module H
Technical standard applied in parts:	EN 1983, AD 2000

Note for products with a nominal size ≤ DN 25:
The products are developed and produced according to GEMÜ process instructions and quality standards which comply with the requirements of ISO 9001 and ISO 14001.
According to Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU these products must not be identified by a CE-label.

The sole responsibility for issuing this declaration of conformity lies with the company GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG.

2024-03-19

Joachim Brien
Head of BU Industry

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Subject to alteration

05.2024 | 88717606