

Air-Operated Ball Valve

CHB/CHBF/CHG Series

Instruction Manual

SM-9227-A/8



- Be sure to read this instruction manual before using the product.
- In particular, read the safety instructions carefully.
- Keep this instruction manual in a safe place so that it can be taken out and read immediately when needed.

Introduction

Thank you for purchasing our **air-operated "CHB/CHBF/CHG Series."** This instruction manual describes basic matters such as installation and usage to ensure that this product performs to its full potential. Read it carefully and use the product correctly. Keep this instruction manual in a safe place to avoid losing it.

The specifications and appearance described in this instruction manual are subject to change without notice.

- This product is intended for persons who have basic knowledge of materials, fluids, piping, electricity, etc. for when using control valves (solenoid valves, motor-operated valves, air-operated valves, etc.). We are not responsible for any accidents caused by persons without knowledge of control valves or without sufficient training who select or use this product.
- There are so many different uses for the product that it is impossible for us to keep track of them all. Depending on the application and method, fluid, piping, and other conditions, performance may not be achieved or an accident may occur. It is the customer's responsibility to check the product specifications and determine how to use the product according to their purpose and usage.

To Use This Product Safely

When designing or manufacturing equipment using this product, you have an obligation to manufacture safe equipment. To do that, make sure that safety can be ensured for the equipment's mechanical mechanisms, air pressure control circuits or water control circuits, and the systems that electrically control them.

Be sure to observe all applicable organization standards, laws, regulations, etc. regarding safety related to equipment design and management.

ISO 4414, JIS B 8370, JFPS 2008 (latest editions of each standard)

High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety regulations, organization standards, laws and regulations, etc.

To use our products safely, it is important to select, use, handle, maintain, and manage them properly. To ensure the safety of equipment, be sure to observe the warnings and precautions described in this instruction manual.

Although various safety measures have been implemented for this product, improper handling by the customer may lead to an accident. To prevent this from happening:

Be sure to read this instruction manual carefully and fully understand its contents before using the product.

To clearly indicate the extent of harm or damage and the likelihood of it occurring, precautions are divided into three categories: "Danger," "Warning," and "Caution."

 Danger	Cases where improper handling could result in imminent danger of death or serious injury.
 Warning	Cases where improper handling may result in death or serious injury.
 Caution	Cases where improper handling may result in injury to people or damage to property.

Even the matters described under "Caution" may lead to serious consequences depending on the situation.

All safety precautions contain important information, so be sure to observe them.

Other general precautions and usage tips are indicated by the following icon.



Indicates general precautions and usage tips.

Product Precautions

Warning

Handling should be performed by persons with sufficient knowledge and experience.

This product has been designed and manufactured as equipment and a component for general industrial machinery.

Use the product within its specifications.

The product cannot be used outside its specifications. In addition, never modify or add to the product.

This product is intended for use in devices and parts for general industrial machinery, and is therefore not suitable for use under the following conditions and environments.

(If you consult us before adopting the product and understand its specifications, it will be applicable. However, even in this case, please take safety measures to avoid danger in case of malfunction.)

- Use in equipment or applications that come into direct contact with atomic energy, railways, aviation, ships, vehicles, medical equipment, beverages, food, etc.
- Use in applications requiring safety, such as entertainment equipment, emergency shutdown circuits, press machines, brake circuits, and equipment for safety measures.
- Use in applications where significant impacts on people or property are expected and where safety is particularly important.

Never handle this product or remove any pipes or equipment until safety has been confirmed.

- Before inspecting or servicing machinery or equipment, make sure that the safety of all systems involving this product has been ensured. Also, turn OFF the energy sources (air supply and water supply) and the power to the relevant equipment, exhaust any compressed air in the system, and take care to avoid water leakage and electrical leakage.
- Even when the product is not operating, there may be hot or live parts present, so be careful when handling the product and removing pipes and equipment.
- Before starting or restarting machinery or equipment that uses pneumatic equipment, be sure to check that the safety of the system is ensured by taking measures, including measures to prevent the machinery or equipment from jumping out.

Design and Selection Precautions

Warning

Do not use this product as an emergency shutoff valve or for other safety assurance purposes.

This product is not designed as an emergency shutoff valve or any other safety assurance valve. In such a system, please take measures to ensure safety before using it.

It is the customer's responsibility to confirm the specifications of this product and its compatibility with their system before selecting and using the equipment.

Incorrect equipment selection and handling can cause problems not only with this product but also with your system.

Disposal Precautions

Caution

When disposing of the product, comply with waste disposal and cleaning laws and have a professional waste disposal company handle the disposal.

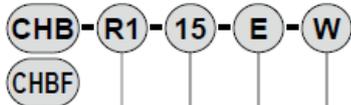
Table of Contents

Introduction	i
To Use This Product Safely	ii
Product Precautions	iii
Design and Selection Precautions.....	iv
Disposal Precautions	iv
Table of Contents	v
1. Product Overview	1
1.1 Model designation.....	1
1.2 Specifications.....	3
1.3 Internal Structure	5
2. Installation	9
2.1 Installation Environment	9
2.2 Unpacking	10
2.3 Installation Method.....	10
2.4 Piping Method	11
2.5 Wiring Method.....	14
3. How to Use	15
3.1 Check before Use (Post-Installation Check)	16
3.2 Precautions	17
3.3 Manual Operation	17
4. Maintenance and Inspection	18
4.1 Maintenance parts	18
4.2 Disassembly and Assembly Methods	19
4.2.1 Disassembly Method.....	20
4.2.2 Assembly Method.....	21
5. Troubleshooting	22
5.1 Causes of problems and remedies for them	22
6. Warranty Policy	23
6.1 Warranty Terms.....	23
6.2 Warranty Period	23

1. Product Overview

1.1 Model designation

Model designation method



Model number

Ⓐ Actuator

Ⓑ Connection port size
*1

Ⓒ Body material

Ⓓ Limit switch
*2
*3

Symbol	Description	Model number	
		CHB (standard bore)	CHBF (full bore)
Ⓐ Actuator			
No symbol	Double acting type	•	•
R1	Single acting type NC (normally closed)	•	•
R2	Single acting type NO (normally open)	•	•
Ⓑ Connection port size			
10	Rc 3/8	•	
15	Rc 1/2	•	•
20	Rc 3/4	•	•
25	Rc1	•	•
32	Rc1 1/4	•	•
40	Rc1 1/2	•	•
50	Rc2	•	
Ⓒ Body material			
No symbol	Bronze	•	•
E	Stainless	•	•
N	Stainless Lubrication-prohibited specifications	•	•
Ⓓ Limit switch			
No symbol	Without switch	•	•
H	Detects when valve is open	•	•
V	Detects when valve is closed	•	•
W	With 2 switches	•	•

* 1: For connection port size 10, it is full bore, but the model number is CHB.

* 2: Limit switches for CHB-R*-40/50 and CHBF-R*-32/40 are made to order.

* 3: Omron Corporation D4E-1G20N

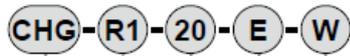
<Model designation example>

CHB-R1-15-E-W

Model name: CHB (standard bore)

- Ⓐ Actuator : Single acting type NC (normally closed)
- Ⓑ Connection port size : Rc1/2
- Ⓒ Body material :Stainless steel
- Ⓓ Limit switch : With 2 switches

Model designation method



Model number

Ⓐ Actuator

Ⓑ Connection port size

Ⓒ Body material

Ⓓ Limit switch
*1
*2

Symbol	Description
Ⓐ Actuator	
No symbol	Double acting type
R1	Single acting type, normally B-C flow path
R2	Single acting type, normally A-C flow path
Ⓑ Connection port size	
15	Rc1/2
20	Rc3/4
25	Rc1
32	Rc1 1/4
40	Rc1 1/2
50	Rc2
Ⓒ Body material	
No symbol	Bronze
E	Stainless steel
N	Stainless steel, lubrication-prohibited specification
Ⓓ Limit switch	
No symbol	Without switch
H	A-C flow path detection
V	B-C flow path detection
W	With 2 switches

* 1: Limit switches for CHG-R*-40/50 are made to order.

* 2: Omron Corporation D4E-1G20N

<Model designation example>

CHG-R1-20-E-W

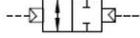
Model name: CHG

- Ⓐ Actuator : Single acting type, normally B-C flow path
- Ⓑ Connection port size : Rc3/4
- Ⓒ Body material :Stainless steel
- Ⓓ Limit switch : With 2 switches

1.2 Specifications

JIS symbol

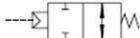
- CHB / CHBF
(double acting type)



- CHB-R1
CHBF-R1
(Single acting - NC)



- CHB-R2
CHBF-R2
(Single acting - NO)



Common specifications

Item	Double acting type		Single acting type	
	CHB (standard bore) CHBF (full bore)		CHB-R* (standard bore) CHBF-R* (full bore)	
Operating method	Air-operated type: Double acting type		Air-operated type: Single acting type	
Fluid	Water, air, oil (500 mm ² /s or less)			
Operating pressure	MPa	0–1.0		
Withstand pressure (water pressure)	MPa	2.0		
Fluid temperature	°C	0–80 (without freezing)		
Ambient temperature	°C	-10–60 (without freezing)		
Operating environment	Indoor			
Mounting orientation	Free			
Frequency	times/min	1 or less		
Rotary actuator	Pilot fluid	Compressed air		
	Lubrication	Not required (when lubricating, use turbine oil type 1, ISO VG32)		
	Withstand pressure (by water pressure)	MPa	1.5	
	Operating pressure	MPa	0.35–0.7	0.4–0.7
	Fluid temperature	°C	5–60	
	Connection port size		Rc1/8	Rc1/8

Model-specific specifications

Model number	Item	Connection port size	Orifice diameter (mm)	Cv value	Mass (kg)	
					Double acting type	Single acting type
Standard bore	CHB-(R*)10	Rc3/8	10	10	1.0	1.0
	CHB-(R*)15	Rc1/2	10	6	1.0	1.0
	CHB-(R*)20	Rc3/4	15	16	1.2	1.2
	CHB-(R*)25	Rc1	20	29	1.3	2.1
	CHB-(R*)32	Rc1 1/4	25	50	2.0(2.1)	2.4(2.5)
	CHB-(R*)40	Rc1 1/2	32	98	2.5(2.6)	4.6(4.7)
Full bore	CHB-(R*)50	Rc2	40	125	3.2(3.3)	5.4(5.5)
	CHBF-(R*)15	Rc1/2	15	23	1.1(1.1)	1.2(1.2)
	CHBF-(R*)20	Rc3/4	20	51	1.3(1.3)	2.1(2.1)
	CHBF-(R*)25	Rc1	25	66	2.0(2.0)	2.4(2.4)
	CHBF-(R*)32	Rc1 1/4	32	114	2.5(2.5)	4.7(4.7)
	CHBF-(R*)40	Rc1 1/2	40	176	3.2(3.2)	5.4(5.4)

Note 1: CHB-(R*)10 is full bore.

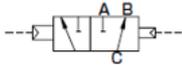
Note 2: For models with limit switches, the mass is +0.2 kg with one switch and +0.3 kg with two switches.

Note 3: The limit switches for CHB-R*40/50 and CHBF-R*32/40 are made to order.

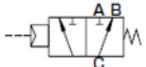
() indicates stainless steel body

JIS symbol

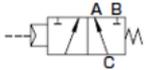
●CHG (double acting type)



●CHG-R1 (single acting normally B-C flow path)



●CHG-R2 (single acting normally A-C flow path)



Common specifications

Item	CHG (double acting type)	CHG-R* Single acting type	
Operating method	Air-operated type: Double acting type	Air-operated type: Single acting type	
Fluid	Water, air, oil (500 mm ² /s or less)		
Operating pressure	MPa	0-1.0	
Withstand pressure (by water pressure)	MPa	2.0	
Fluid temperature	°C	0-80 (without freezing)	
Ambient temperature	°C	-10-60 (without freezing)	
Operating environment	Indoor		
Mounting orientation	Free		
Frequency	times/min	1 or less	
Pressure direction	Limited to C port pressurization		
Flow path type	Water mixing type (90° rotation switching method)		
Rotary actuator	Pilot fluid	Compressed air	
	Lubrication	Not required (when lubricating, use turbine oil type 1, ISO VG32)	
	Withstand pressure (by water pressure)	MPa	1.5
	Operating pressure	MPa	0.35-0.7
	Fluid temperature	°C	5-60
	Connection port size	Rc1/8	Rc1/8

Model-specific specifications

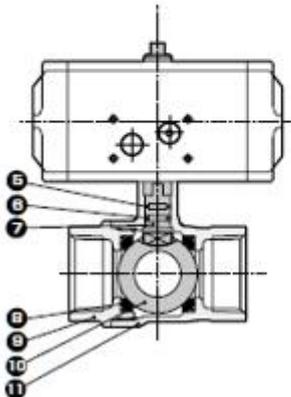
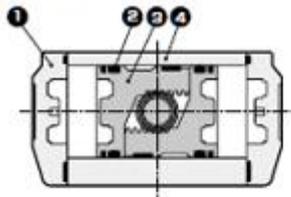
Model number	Item	Connection port size	Orifice diameter (mm)	Cv value	Mass (kg)	
					Double acting type	Single acting type
CHG-(R*)15		Rc1/2	10	3	1.0	1.1
CHG-(R*)20		Rc3/4	14	6	1.2	1.3
CHG-(R*)25		Rc1	19	11	1.4	2.2
CHG-(R*)32		Rc1 1/4	23	16	2.2	2.6
CHG-(R*)40		Rc1 1/2	30	28	2.7	4.9
CHG-(R*)50		Rc2	38	47	3.5	5.6

Note 1: For models with limit switches, the mass is +0.2 kg with one switch and +0.3 kg with two switches.
 Note 2: The limit switches for CHG-R*-40/50 are made to order.

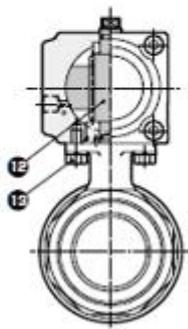
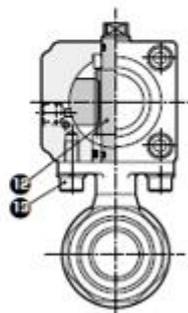
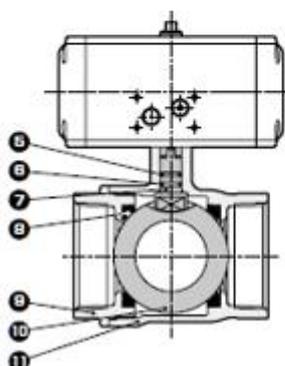
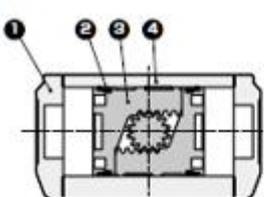
1.3 Internal Structure

Internal structure and parts list: CHB / CHBF series

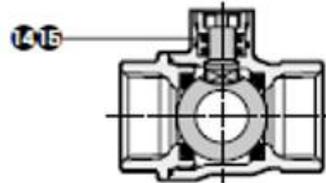
● CHB-10 · 15 · 20 · 25
CHBF-15 · 20



● CHB-32 · 40 · 50
CHBF-25 · 32 · 40



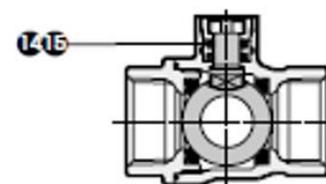
● Lubrication-prohibited specifications (ball valve section)
CHB-10/15/20/25-**N**



Part number	Part name	Material
1	Cylinder cap	ADC12 Aluminum die casting
2	O-ring	NBR Nitrile rubber
3	Piston	ADC12 Aluminum die casting
4	Cylinder body	A6063 Aluminum
5	O-ring	NBR(FKM) Nitrile rubber (fluoro rubber)
6	O-ring	FKM Fluorocarbon rubber
7	Shaft	SUS303 (SUS304) Stainless steel
8	Valve seat	PTFE Polytetrafluoroethylene resin
9	Valve cap	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
10	Valve ball	C3771, Cr plating (SUS304) Yellow brass, chrome plating (stainless)
11	Valve body	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
12	Stem	SUS303 Stainless steel
13	Hexagon socket head bolt	SUSXM7 Stainless steel
14	O-ring	FKM Fluorocarbon rubber
15	Seal ring	UHMW-PE Ultra-high molecular weight polyethylene

() indicates stainless steel body

● Lubrication-prohibited specifications (ball valve section)
CHB-32/40/50-**N**

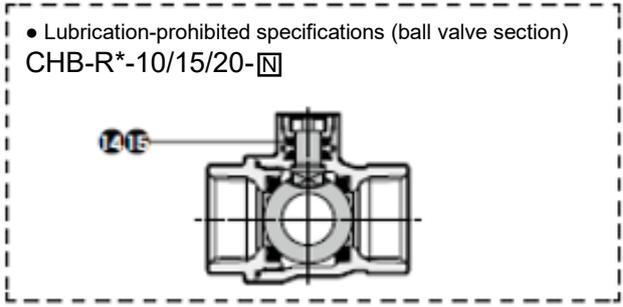
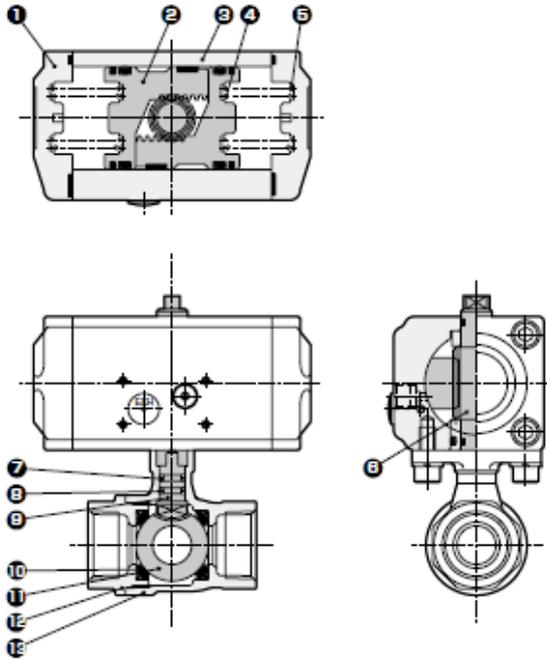


Part number	Part name	Material
1	Cylinder cap	ADC12 Aluminum die casting
2	O-ring	NBR Nitrile rubber
3	Piston	ADC12 Aluminum die casting
4	Cylinder body	A6063 Aluminum
5	O-ring	NBR(FKM) Nitrile rubber (fluorocarbon rubber)
6	O-ring	FKM Fluorocarbon rubber
7	Shaft	SUS303 (SUS304) Stainless steel
8	Valve seat	PTFE Polytetrafluoroethylene resin
9	Valve cap	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
10	Valve ball	C3771, Cr plating (SUS304) Yellow brass, chrome plating (stainless steel)
11	Valve body	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
12	Stem	SUS303 Stainless steel
13	Hexagon bolt	SUSXM7 Stainless steel
14	O-ring	FKM Fluorocarbon rubber
15	Seal ring	UHMW-PE Ultra-high molecular weight polyethylene

() indicates stainless steel body

Internal structure and parts list: CHB-R* and CHBF-R* series

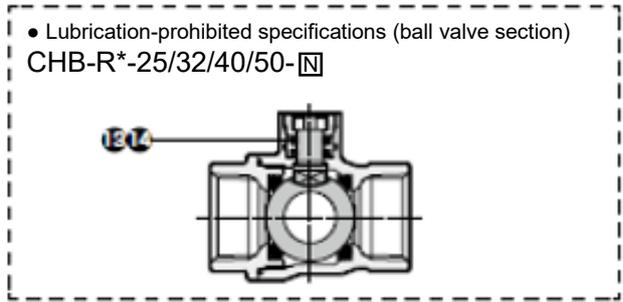
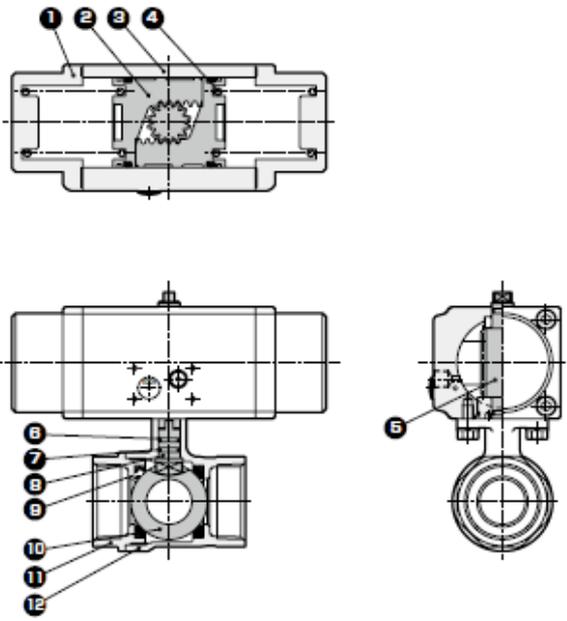
● CHB-R* - 10 · 15 · 20
CHBF-R* - 15



Part number	Part name	Material
1	Cylinder cap	ADC12 Aluminum die casting
2	Piston	ADC12 Aluminum die casting
3	Cylinder body	A6063 Aluminum
4	Spring	SWP Piano wire
5	Spring	SWP Piano wire
6	Stem	SUS303 Stainless steel
7	O-ring	NBR (FKM) Nitrile rubber (fluorocarbon rubber)
8	O-ring	FKM Fluorocarbon rubber
9	Shaft	SUS303 (SUS304) Stainless steel
10	Valve seat ring	PTFE Polytetrafluoroethylene resin
11	Valve ball	C3771, Cr plating (SUS304) Yellow brass, chrome plating (stainless steel)
12	Valve cap	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
13	Valve body	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
14	O-ring	FKM Fluorocarbon rubber
15	Seal ring	UHMW-PE Ultra-high molecular weight polyethylene

() indicates stainless steel body

● CHB-R* - 25 · 32 · 40 · 50
CHBF-R* - 20 · 25 · 32 · 40

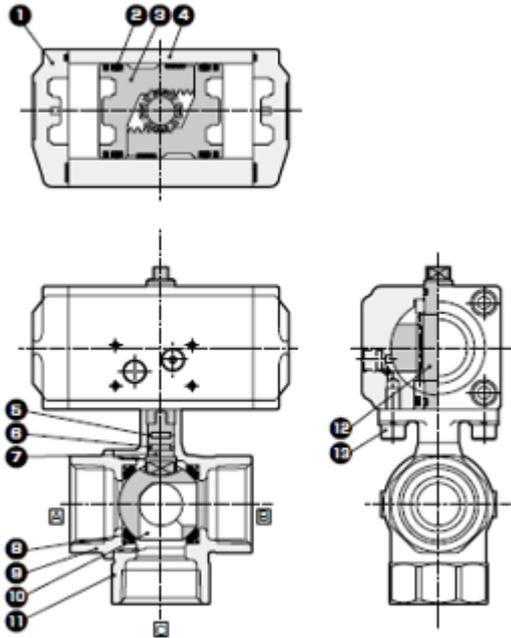


Part number	Part name	Material
1	Cylinder cap	ADC12 Aluminum die casting
2	Piston	ADC12 Aluminum die casting
3	Cylinder body	A6063 Aluminum
4	Spring	SWP Piano wire
5	Stem	SUS303 Stainless steel
6	O-ring	NBR (FKM) Nitrile rubber (fluorocarbon rubber)
7	O-ring	FKM Fluorocarbon rubber
8	Shaft	SUS303 (SUS304) Stainless steel
9	Valve seat ring	PTFE Polytetrafluoroethylene resin
10	Valve ball	C3771, Cr plating (SUS304) Yellow brass, chrome plating (stainless steel)
11	Valve cap	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
12	Valve body	CAC408 / CAC407 (SCS13) Bronze casting (stainless steel casting)
13	O-ring	FKM Fluorocarbon rubber
14	Seal ring	UHMW-PE Ultra-high molecular weight polyethylene

() indicates stainless steel body

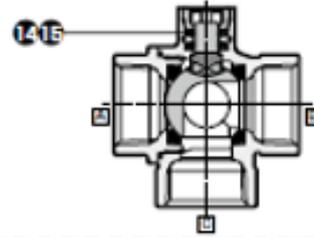
Internal structure and parts list: CHG series

● CHG-15 · 20 · 25



● Lubrication-prohibited specifications (ball valve section)

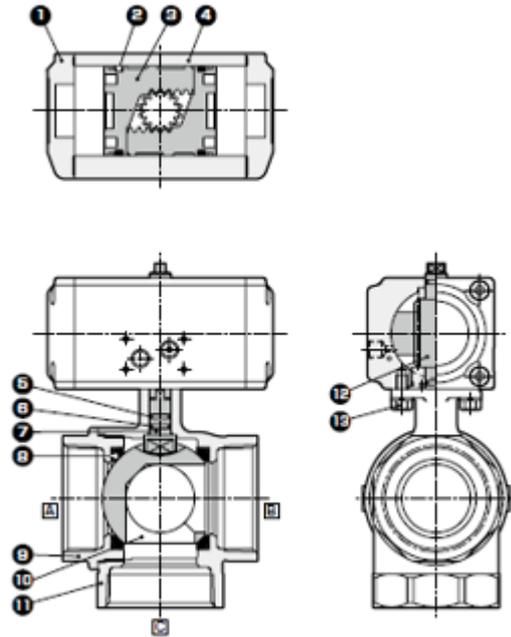
CHG-15/20/25-**N**



Part number	Part name	Material	
1	Cylinder cap	ADC12	Aluminum die casting
2	O-ring	NBR	Nitrile rubber
3	Piston	ADC12	Aluminum die casting
4	Cylinder body	A6063	Aluminum
5	O-ring	NBR (FKM)	Nitrile rubber (fluorocarbon rubber)
6	O-ring	FKM	Fluorocarbon rubber
7	Shaft	SUS303 (SUS304)	Stainless steel
8	Valve seat ring	PTFE	Polytetrafluoroethylene resin
9	Valve cap	CAC408 (SCS13)	Bronze casting (stainless steel casting)
10	Valve ball	C3771, Cr plating (SUS304)	Yellow brass, chrome plating (stainless steel)
11	Valve body	CAC408 (SCS13)	Bronze casting (stainless steel casting)
12	Stem	SUS303	Stainless steel
13	Hexagon socket head bolt	SUSXM7	Stainless steel
14	O-ring	FKM	Fluorocarbon rubber
15	Seal ring	UHMW-PE	Ultra-high molecular weight polyethylene

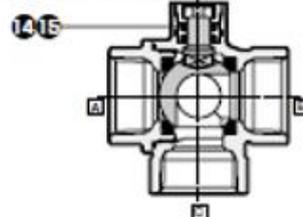
() indicates stainless steel body

● CHG-32 · 40 · 50



● Lubrication-prohibited specifications (ball valve section)

CHG-32/40/50-**N**

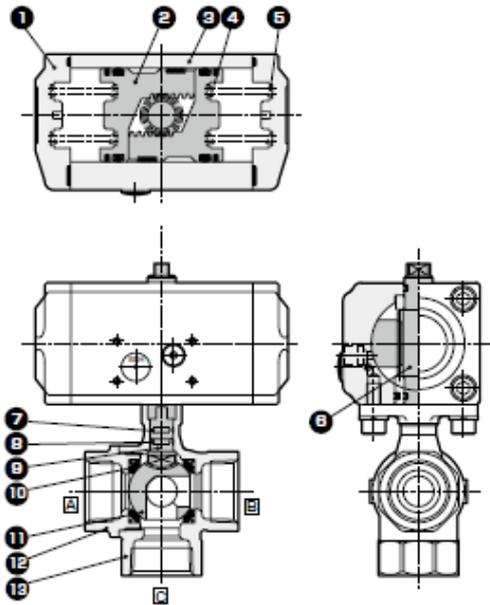


Part number	Part name	Material	
1	Cylinder cap	ADC12	Aluminum die casting
2	O-ring	NBR	Nitrile rubber
3	Piston	ADC12	Aluminum die casting
4	Cylinder body	A6063	Aluminum
5	O-ring	NBR (FKM)	Nitrile rubber (fluorocarbon rubber)
6	O-ring	FKM	Fluorocarbon rubber
7	Shaft	SUS303 (SUS304)	Stainless steel
8	Valve seat ring	PTFE	Polytetrafluoroethylene resin
9	Valve cap	CAC408 (SCS13)	Bronze casting (stainless steel casting)
10	Valve ball	C3771, Cr plating (SUS304)	Yellow brass, chrome plating (stainless steel)
11	Valve body	CAC408 (SCS13)	Bronze casting (stainless steel casting)
12	Stem	SUS303	Stainless steel
13	Hexagon bolt	SUSXM7	Stainless steel
14	O-ring	FKM	Fluorocarbon rubber
15	Seal ring	UHMW-PE	Ultra-high molecular weight polyethylene

() indicates stainless steel body

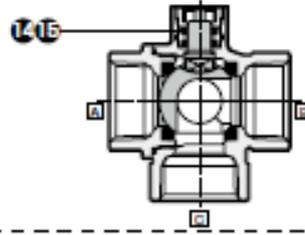
Internal structure and parts list: CHG-R* series

● CHG-R*-15 · 20



● Lubrication-prohibited specifications (ball valve section)

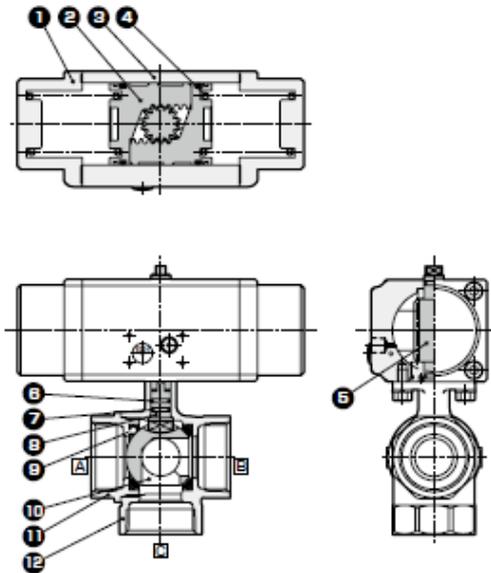
CHG-R*-15/20-**N**



Part number	Part name	Material
1	Cylinder cap	ADC12 Aluminum die casting
2	Piston	ADC12 Aluminum die casting
3	Cylinder body	A6063 Aluminum
4	Spring	SWP Piano wire
5	Spring	SWP Piano wire
6	Stem	SUS303 Stainless steel
7	O-ring	NBR (FKM) Nitrile rubber (fluorocarbon rubber)
8	O-ring	FKM Fluorocarbon rubber
9	Shaft	SUS303 (SUS304) Stainless steel
10	Valve seat ring	PTFE Polytetrafluoroethylene resin
11	Valve ball	C3771, Cr plating (SUS304) Yellow brass, chrome plating (stainless steel)
12	Valve cap	CAC408 (SCS13) Bronze casting (stainless steel casting)
13	Valve body	CAC408 (SCS13) Bronze casting (stainless steel casting)
14	O-ring	FKM Fluorocarbon rubber
15	Seal ring	UHMW-PE Ultra-high molecular weight polyethylene

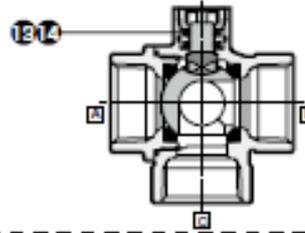
() indicates stainless steel body

● CHG-R*-25 · 32 · 40 · 50



● Lubrication-prohibited specifications (ball valve section)

CHG-R*-25/32/40-50-**N**



Part number	Part name	Material
1	Cylinder cap	ADC12 Aluminum die casting
2	Piston	ADC12 Aluminum die casting
3	Cylinder body	A6063 Aluminum
4	Spring	SWP Piano wire
5	Stem	SUS303 Stainless steel
6	O-ring	NBR (FKM) Nitrile rubber (fluorocarbon rubber)
7	O-ring	FKM Fluorocarbon rubber
8	Shaft	SUS303 (SUS304) Stainless steel
9	Valve seat ring	PTFE Polytetrafluoroethylene resin
10	Valve ball	C3771, Cr plating (SUS304) Yellow brass, chrome plating (stainless steel)
11	Valve cap	CAC408 (SCS13) Bronze casting (stainless steel casting)
12	Valve body	CAC408 (SCS13) Bronze casting (stainless steel casting)
13	O-ring	FKM Fluorocarbon rubber
14	Seal ring	UHMW-PE Ultra-high molecular weight polyethylene

() indicates stainless steel body

2. Installation

2.1 Installation Environment

Warning

If you are using the product outside of the specified specifications or for special purposes, consult us regarding the specifications.

Avoid direct exposure to water or cutting oil.

- If water or cutting oil gets on the ball valve, it may cause malfunction.
- The installation location may be outdoors as long as the protective structure permits. However, take measures such as resin piping to avoid direct sunlight and protect against lightning damage.

Do not use the product in an atmosphere containing explosive or corrosive gases.

Do not use the product in humid environments.

Doing so could cause condensation to occur due to temperature changes.

If there is a risk of freezing, take measures such as draining the water and keeping the product warm.

Condensation may occur due to temperature changes.

Caution

Protect the inside of the valve from dust.

- If there is a lot of dust in the surrounding area, install a silencer or elbow fitting facing downwards on the pilot air exhaust port of the valve to protect it from dust.
-

When tightening or redoing piping, secure the product in place.

- When piping on the body side, fix the body. When piping on the cap side, fix the cap.
- Be careful not to overtighten the piping.



- When using the product in cold regions, take appropriate measures to prevent freezing.
- This product cannot be used outdoors. Protect it by installing it inside a cover or panel.
- Do not use the ball valve in an environment subject to vibration or inertial forces.

2.2 Unpacking

⚠ Caution

Do not remove the piping port protection or take the product out of the plastic bag until just before piping.

If the piping port protection is removed or if the product is taken out of the plastic bag before piping work, foreign matter may enter through the piping port and cause malfunction or failure.

- Check that the model No. of the product you ordered is the same as the model No. indicated on the product.
- Check that there is no external damage to the product.
- When storing the valve, keep it in the individual box to prevent foreign matter from entering, and remove it from the box before piping.

2.3 Installation Method

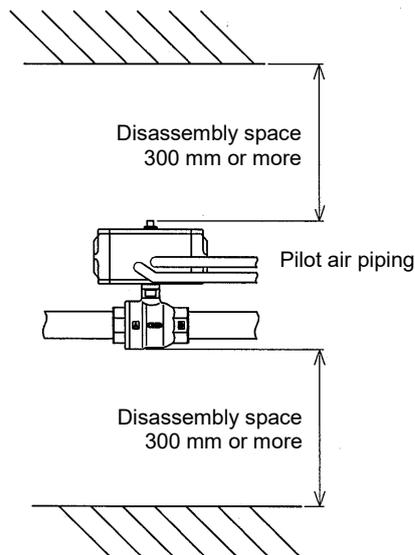
⚠ Caution

Be sure to read this instruction manual carefully and understand its contents before installing the product.

When handling or installing the product, secure the body.

After installation, check for piping leaks to ensure proper installation.

- The mounting orientation is free.
- Carry out piping in such a way that the ball valve side and the pilot air supply port are as shown in the diagram below.
- Ensure sufficient space is available for safe work during maintenance and troubleshooting.



- The exhaust cap attached to the breathing hole of the single acting actuator is a rubber plug to prevent incorrect piping, so it can be used without removing the exhaust cap. However, in locations where water droplets, oil, etc. may splash on the product, take appropriate protective measures to prevent water from entering, such as removing the exhaust cap and installing a downward-facing elbow.
- To secure the valve, use the piping support on the ball valve section.
- When controlling fluid inside a tank, install the piping slightly above the bottom of the tank.

2.4 Piping Method

⚠ Caution

Do not apply force to the actuator when piping.
When tightening or reconnecting pipes, secure the product.
Secure and support the piping so that piping load and vibration are not directly applied to the valve.
When supplying fluid after piping connection is completed, make sure that sudden high pressure is not applied.
 Insufficient pipe connections can lead to accidents such as pipes coming loose or fluid leaking.

■ Pipe cleaning

Before piping, flush with air at 0.3 MPa or higher to remove foreign matter such as dust, metal powder, rust, and sealing tape.

■ Removal of foreign matter

Remove any dirt or foreign matter in the fluid as this may cause malfunction or leakage. Install a strainer (approximately 80 to 100 mesh) in front of the ball valve. Also, install a filter with a rating of 5 μm or less in the pilot circuit.

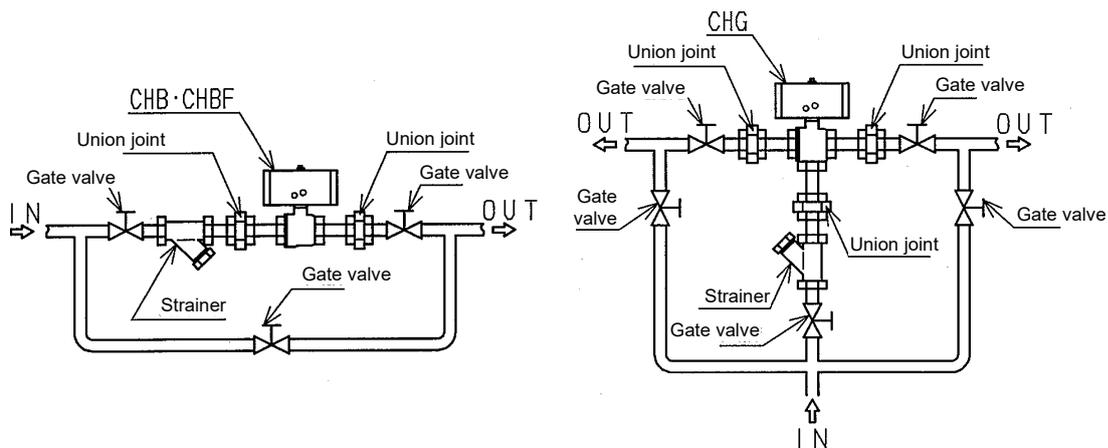
■ Fluid supply port when piping

When piping, connect the body side and pilot air side supply ports as shown in the table below.

Supply ports on the body side and pilot air side

Operating method	Ball valve side supply port	Pilot air supply port
2-port valve, double acting type	A or B	OPEN and CLOSED
2-port valve, single acting type	A or B	IN
3-port valve, double acting type	C	A-C and B-C
3-port valve, single acting type	C	IN

We recommend the example piping shown below.



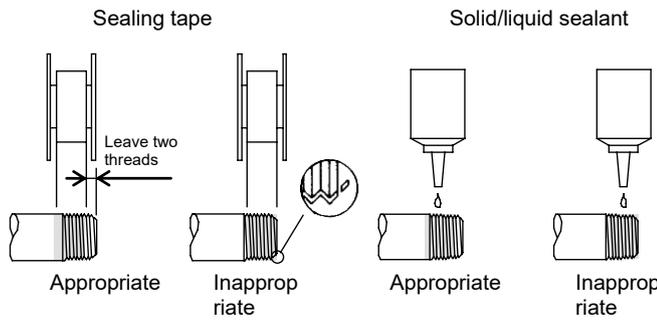
For ease of maintenance and inspection, use union joints or flange joints and provide a bypass pipe.

■ Sealant

Apply seal tape or sealant at least two threads in from the tip of the thread. If the sealant protrudes beyond the threads of the pipe, pieces of sealing tape or remaining sealant may get inside the valve, causing it to malfunction.

If you use seal tape, wrap it in the opposite direction to the threads and press it down with your fingertips to make sure it adheres tightly to them.

If you use a liquid sealant, be careful not to let it come into contact with resin parts. Otherwise, the resin parts may be damaged, causing failure or malfunction. Do not apply sealant to the female thread side.



■ Tightening

- When piping to the valve, be sure to hold the cap or body with a wrench or vise, and then screw it in.
- When piping, refer to the table below for the tightening torque.

Recommended tightening torque for pilot air port piping

Pipe connection port size	Recommended tightening torque (N·m)
Rc1/8	7-9

Recommended tightening torque for main port piping

Pipe connection port size	Recommended tightening torque (N·m)
Rc3/8	31-33
Rc1/2	41-43
Rc3/4	62-65
Rc1	83-86
Rc1 1/4	97-100
Rc1 1/2	104-108
Rc2	132-136

■ Lubrication

This valve can also be used without lubrication. A lubricator is not required. However, if you lubricate, use turbine oil type 1, ISO VG32 (additive-free).

If lubrication is stopped midway, the initial lubricant will be lost, which may cause malfunction. Therefore be sure to continue lubrication so that the lubricant does not run out.

■ Pilot air drain measures

Compressed air contains a large amount of drainage components (water, oxidized oil, tar, foreign matter, etc.). These can significantly reduce the accuracy of pneumatic equipment. As drain countermeasures, improve the air quality by dehumidifying with an after-cooler dryer, removing foreign matter with a filter, or removing tar with a tar removal filter.

■ Prevention of dust entry

If there is a lot of dust in the surrounding area, install a silencer or filter on the pilot air exhaust port or breathing hole side to prevent dust from entering. Dust can cause malfunctions and fluid leaks.

■ Solenoid valve for pilot operation

Please use our solenoid valves.

•Recommended solenoid valves

Double acting type: Pilot-operated 4-port valve, pilot-operated 5-port valve, and 4G series

Single acting type: Direct-acting 3-port valve, Selex valve, and 3PB2 series

(For details, refer to the dedicated catalog.)

■ Pilot operation peripheral equipment (tubes and fittings)

Use the solenoid valve for pilot operation according to its specifications and applications.

(For details, refer to the dedicated catalog.)

2.5 Wiring Method

Warning

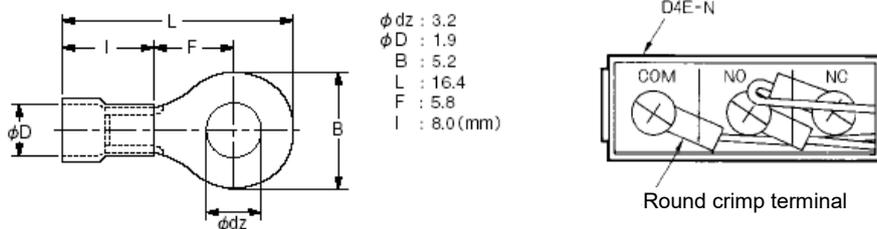
Before carrying out electrical wiring, read this instruction manual carefully and make sure you fully understand it.

The operator needs to have sufficient knowledge to understand the product's structure and operating principles and ensure safety.

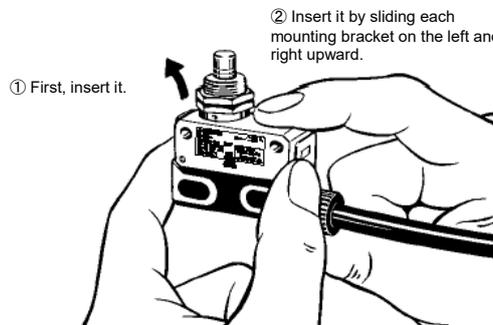
■ Wiring method (only when limit switch is equipped)

- When wiring a screw terminal, use a cabtyre cord with an outer diameter of 7 mm and a nominal cross-sectional area of 0.75 mm², and perform the wiring through an insulated round crimp terminal for M3.

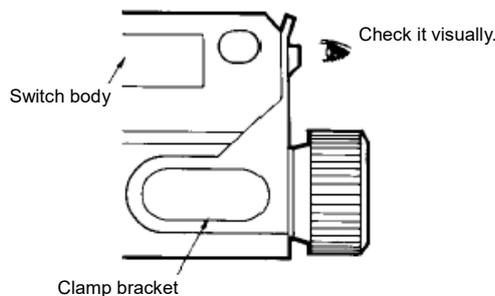
Round crimp terminal dimensions
Wiring method



- When attaching the one-touch connector to the switch body, slide the mounting bracket upward with your finger to insert it into the clamp.



- When attaching the one-touch connector to the switch body, slide the mounting bracket upward with your finger to insert it into the clamp.



- If it is fully inserted, it will not come out easily.

3. How to Use

Warning

Do not use this product as an emergency shutoff valve or for other safety assurance purposes.

This product is not designed as an emergency shutoff valve or other safety valve. In such a system, please take measures to ensure safety before using the product.

Take necessary measures in advance to prevent any adverse effects on people or property in the event of a malfunction of this product.

Liquid seal

When flowing a liquid, if the circuit is liquid-sealed, the pressure may increase due to temperature changes and the product may not operate. Install a relief valve on the system to prevent it from becoming a liquid-sealed circuit.

Do not use any fluid other than that specified in the specifications.

Check the control fluid checklist in the catalog to verify compatibility with the fluid before use.

If the fluid used is of poor quality, such as containing powder, sludge, or foreign matter, the durability of the ball seat will be significantly reduced. If the ball seat loses its sealing ability, it will no longer be able to control the fluid. Carry out regular maintenance or take appropriate measures.

Do not use it in an explosive atmosphere.

If used in an explosive atmosphere, select from the explosion-proof solenoid valve series.

Fluid temperature

Use within the fluid temperature range specified in the specifications.

Surrounding environment

Do not use it in an atmosphere containing corrosive gases or gases that may attack the constituent materials.

Do not use it near heat sources or in locations where it will be exposed to radiant heat.

Use it within the ambient temperature range.

If using it in cold regions, take appropriate anti-freeze measures.

Do not touch the electrical wiring connections (bare live parts) with your hands or body while the power is on.

There is a risk of electric shock.

Caution

Use it within the specified pressure range.

To prevent water hammer, throttle the exhaust side using a silencer-equipped metering valve and a speed controller.

Be sure to observe the operating frequency. If the specified value is exceeded, the service life will be shortened.

Do not touch the stem at the top of the actuator when it is operating.

The product can generally be used with a fluid up to 500 mm²/s in viscosity, but characteristics may vary depending on the type of liquid, so please consult us.

Be sure to observe the pressure direction of the 3-port valve (pressure to port C only).

3.1 Check before Use (Post-Installation Check)

Warning

Before a visual inspection, close the main valve and drain the fluid inside.
Before checking the power supply and insulation resistance, turn the power OFF.
 Check while taking sufficient care to prevent electric shock.

■ Appearance check

- Press the valve with your hand to make sure it is securely fastened to the piping.
- Check that threaded parts such as bolts, nuts, and screws are not loose.

■ Leak check

- Pressurize the pilot air and check for leaks at the piping connections.
- Pressurize the fluid and check for leaks at the piping connections.
- To check for leaks, we recommend supplying compressed air (0.3 to 0.5 MPa), applying soapy water, and checking for the presence of bubbles.

■ Electricity check (only when limit switch is equipped)

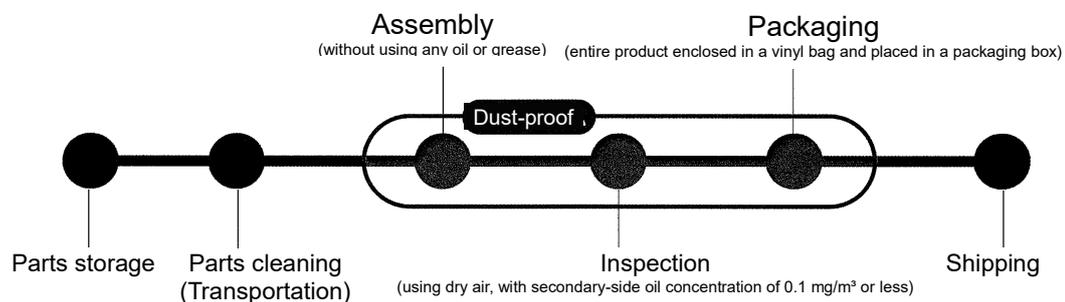
Limit switch rating

Rated voltage (V)	Non-inductive load (A)			
	Resistive load		Lamp load	
	Normally closed	Normally open	Normally closed	Normally open
AC250	5		1.5	
DC30	5		—	

- Use a load power of 0.8 W or more. Using the limit switch in a microload circuit may result in poor contact.
- The above values indicate steady-state current.
- A lamp load is assumed to have 10 times the inrush current.
- The maximum inrush current is 10A.
- Please contact us if you are using the limit switch for a small load.
- The limit switch is Omron Corporation's D4E-1G20N. For details, refer to the manufacturer's catalog.

3.2 Precautions

- Do not use the ball valve as a foothold or place a heavy object on it.
 - Observe the fluid operating pressure, operating temperature range, and ambient operating temperature range.
 - If the product has not been used for a long time, perform a trial run before use.
 - If you notice any abnormalities, refer to “5 Troubleshooting.”
- About lubricant-prohibited products (lubricant-prohibited specifications)
At CKD, we have established the following assembly system to achieve a high level of lubricant-prohibition.
Handle the product with sufficient care.



3.3 Manual Operation

Warning

In the event of a power outage or an emergency such as an abnormal operation, switch to manual operation.

A single acting type cannot be manually operated.

A single acting type has a spring built into the actuator, so it cannot be operated manually.

■ Manual operation method

- Turn off the pilot air and release any residual pressure inside the actuator, then fully apply an adjustable wrench to the stem at the top of the actuator and turn it slowly.

4. Maintenance and Inspection

Warning

Before carrying out maintenance or inspection, read this instruction manual carefully and understand its contents.

4.1 Maintenance parts

■ Ball valve

Replace it if any abnormalities such as leakage, sticking of the valve, or delayed operation are observed during use.

As a guideline, it can be operated 50,000 times.

■ Actuator

Replace it if any abnormalities such as leakage or malfunction are found during use.

As a guideline, it can be operated 200,000 times.

■ Limit switch (optional)

Replace the switch if any abnormalities such as reset failure or oxidation of the contacts are found during use.

As a guideline, it can be operated 500,000 times.

4.2 Disassembly and Assembly Methods

Warning

Before disassembly, close the main valve and drain the fluid inside.

Perform disassembly and assembly with the power turned off.

Otherwise, there is a risk of electric shock.

When disassembling, be careful not to let the spring fly out.

There is a risk of injury.

Never disassemble the single-acting actuator.

It contains a strong spring, so if it is disassembled, the spring may fly out and cause a hazard.

Caution

Do not disassemble the ball valve.

- Once disassembled, the product performance may no longer be guaranteed, so replace the ball valve instead.

Do not disassemble the actuator.

- The actuator uses press-fitted parts. Once removed, it cannot be reused.



Any defects caused by disassembly or replacement of the product or parts will not be covered by the warranty.

4.2.1 Disassembly Method

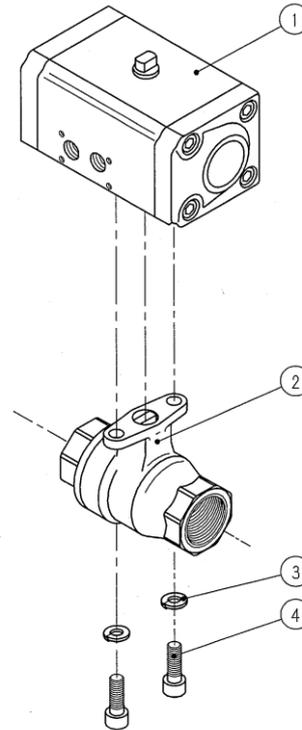
■ Valve disassembly

- 1 Remove the hexagon socket head bolts or hexagon head bolts ④ and the spring washers ③.
- 2 Lift up the actuator assembly ①.

Part number	Part name	Quantity
1	Actuator assembly	1
2	Ball valve	1
3	Spring washer	2
4	Hexagon socket head bolt (*1) Hexagon bolt (*2)	2

1: For CHB-10 to 25, CHB-R-10 to 20, CHBF-15 to 20, CHBF-R*-15 CHG-15 to 25, and CHG-R*-15 to 20

2: For CHB-32 to 50, CHB-R-25 to 50, CHBF-25 to 40, CHBF-R*-20 to 40, CHG-32 to 50, and CHG-R*-25 to 50

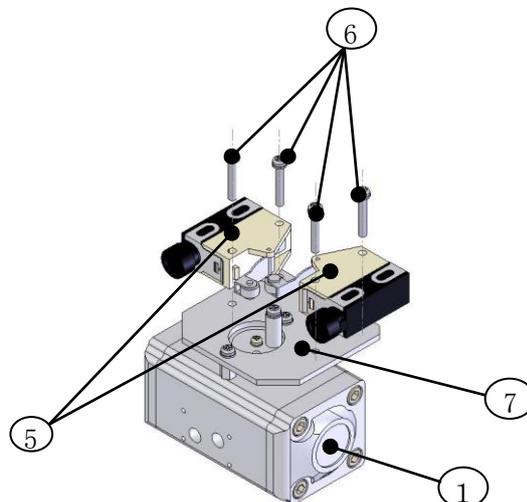


■ Disassembly of limit switch (optional)

- 1 Remove the cross recessed pan head screws with spring washers ⑥.
- 2 Remove the limit switch ⑤.

Part number	Part name	Quantity
5	Limit switch	2(1)
6	Cross recessed pan head screw with spring washers	4(2)
7	LS mounting plate	1

() indicates when there is one limit switch: H for valve open detection and V for valve closed detection.



4.2.2 Assembly Method

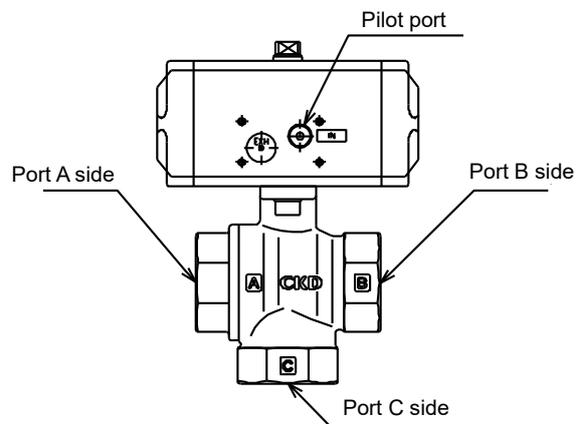
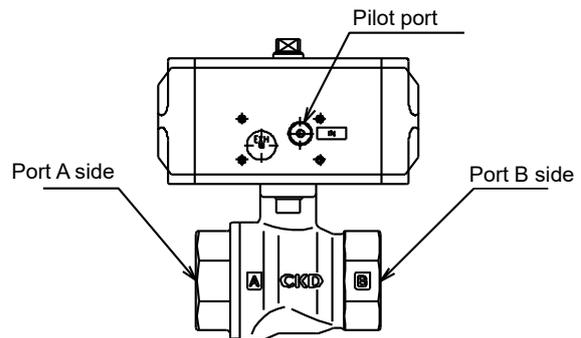
■ Valve assembly

- 1 Place the actuator assembly ① onto the ball valve ②.
In so doing, align the orientation of the actuator stem with that of the ball valve shaft. Align the orientation of the stem with that of the ball valve shaft.
- 2 Tighten the hexagon socket head bolts or hexagon bolts ④ and the spring washers ③, two each.

(Tightening torque: 4.5 to 5.5 N·m)

■ Assembly of limit switch (optional)

Attach the limit switch ⑤ to the LS mounting plate ⑦ with the cross recessed pan head screws with spring washers ⑥.
(Tightening torque: 1.18 to 1.37 N·m)



5. Troubleshooting

5.1 Causes of problems and remedies for them

If this product does not operate as intended, inspect it according to the table below.

Malfunction	Cause	Corrective action
Valve does not operate	The operating pressure to the actuator is low.	Set to the specified operating pressure range.
	The operating pressure of the actuator has not switched.	Check the operating valve.
	The control fluid pressure is too high.	Set to the specified pressure range.
	The control fluid viscosity is too high.	Reduce the viscosity to 500 mm ² /s or less.
	Foreign matter in the control fluid.	Replace the ball valve.
	Foreign matter stuck to the valve seat or valve ball.	
It operates, but not normally.	The operating pressure to the actuator is low.	Set to the specified operating pressure range.
	The control fluid pressure is too high.	Set to the specified pressure range.
	Foreign matter in the control fluid.	Replace the ball valve.
	Foreign matter stuck to the valve seat ring or valve ball.	
It is leaking. (Valve does not close completely.)	Foreign matter in the control fluid.	Replace the ball valve.
	Valve seat ring wear.	
	Incorrect pressurization direction. (Pressurized from port A or port B in the CHG)	Change to pressurization from port C (COM).

If you have any other questions, consult your nearest CKD sales office or distributor.

6. Warranty Policy

6.1 Warranty Terms

■ Warranty coverage

If a failure occurs during the following warranty period that is clearly our responsibility, we will provide a replacement product or necessary replacement parts, or repair the product at our factory free of charge. However, the following cases will be excluded from the scope of this warranty.

- Cases where the product is handled or used under conditions or environments other than those described in the catalog, specifications, or instruction manual
- Cases where the failure is caused by improper use or mismanagement, such as careless handling
- Cases where the cause of the failure is due to reasons other than this product
- Cases where the product is used in a way other than its intended use
- Cases where the cause is modifications or repairs that we are not involved in
- Cases where the damage could have been avoided if your company's machinery or equipment into which this product was incorporated had the functions or structures normally expected in the industry.
- Cases where the cause is unforeseeable with the technology in use at the time of delivery
- Cases where the cause is a natural disaster or other disaster that is not our responsibility

Please note that the warranty mentioned here refers to the product itself and does not cover any damage triggered by the malfunction of the product.

■ Compatibility check

It is the customer's responsibility to verify the compatibility of our products with the systems, machines, and equipment used by the customer.

■ Others

This warranty clause sets out the basic terms.

If the warranty details stated in individual specification drawings or specifications differ from this warranty clause, the specification drawings or specifications will take precedence.

6.2 Warranty Period

The warranty period for this product is one year after delivery to your designated location.