CKD

SM-50784-A

INSTRUCTION MANUAL

Air operated valve for process gas

LGD□1-□

LGD□2-□

- Read this manual carefully and thoroughly before using this product.
- Pay extra attention to the instructions concerning safety.
- After reading this manual, keep it in a safe and convenient place.

CKD Corporation

1. Safety Precautions

Our products are varieties of control valves such as solenoid valves, electric actuator valves and air-operated valves, and are designed to be used by people who have a basic knowledge of materials, fluids, piping, electricity and the like. We shall accept no responsibility for accidents caused by incorrect selection or usage of our products by people who have no knowledge of, or who have not undergone sufficient training with respect to these products.

The applications for which our customers put our products to use are many and varied and so therefore, it is not possible for us to provide details that cover all such applications.

Depending on the applications or the usage methods, there have been cases where it has not been possible to demonstrate the performance of products and accidents have occurred due to conditions such as the flow medium or piping. Accordingly, it is the customer's responsibility to decide how the product shall be used and to check the products' specifications in accordance with the customer's applications and the usage methods of the products.

While these products are equipped with various safety features, there may be accidents due to the customer's incorrect handling of the products.
To avoid such accidents, **it is strongly advised that the instruction manual be thoroughly read and understood prior to using the product**.

When designing and manufacturing devices using the CKD products, the manufacturer has an obligation to check that the safety of the device's mechanical mechanism, pneumatic control circuit or fluids control circuit, and the system operated by the electrical control that controls these circuits is secured.
It is important to appropriately select, use, handle and service the product to ensure that the CKD product is used safely.
Always observe the warnings and cautions to ensure the safety of the device.
Check that the safety of the device can be ensured, and manufacture a safe device.

⚠ WARNING

1. This product is designed and manufactured as a device and part for general industrial machines. This product must be handled by a well versed and skilled operated.

2. Use the product within the Specifications.

This product cannot be used outside the product's characteristic specifications. Never modify or additionally machine this product.
This product is intended for use in general industrial machines and parts.
It is not intended for use outdoors, or under the following types of conditions or environments.

i. Use for special applications requiring safety including nuclear energy, railway, aircraft, ship, vehicle, medical devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press clutches, brake circuits or safety devices.

ii. Use for applications where human life or assets could be greatly affected, and special safety measures are required.

3. Always observe association standards and regulations, etc., related to the safety of device design and control, etc.

ISO 4414, JIS B 8370 (pneumatic system rules)
Occupational Safety and Sanitation Laws, and other safety rules, association standards and regulations.

4. Never handle, pipe or remove the devices before confirming the safety.

i. Always inspect and service the machine and devices after confirming the safety of the entire system related to this product.

ii. Note that there may be hot sections or charged sections even when operation is stopped.

iii. When inspecting or servicing the device, always cut off the energy source (air supply or water supply), and cut off the power to the relevant facility. Discharge any compressed air from the system, and pay special attention to water leaks and electricity leaks.

iv. When starting or restarting a machine or device that incorporates pneumatic devices, make sure that the system safety, such as the popping out prevention measures, is secured.

5. Always observe the following warnings and cautions to prevent accidents.

■ **The safety precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.**

⚠ **DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency or urgency to a warning.

⚠ **WARNING:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

⚠ **CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "**CAUTION**" may lead to serious results depending on the situation.
In any case, important information that must be observed is explained.

Safe Usage of Our Products

Thank you for purchasing the CKD air operated valve for process gas, model "LGD". The models LGD are air operated valves developed with years of experience to enable use in a variety of fields by many users.

CKD products are manufactured under strict quality control.

Please read this instruction manual to use the CKD product efficiency.

Refer to the latest specification drawings and specifications for details on the inner structure, part lists and specifications.

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2. Cautions on Use

2-1. Design and Selection

⚠ WARNING

i. This product is not designed as a valve to ensure safety such as an emergency shut-off valve. When using in that type of system, always provide other measures to accurately ensure safety.

ii. Incorrect device selection and handling will result in product trouble and may cause trouble in the customer's system. Always make sure that this product's specifications and the customer's system are compatible.

iii. Working fluid

Always check the compatibly of the wetted section material and working fluid before starting use.

iv. Fluid temperature

Observe the fluid temperature given in the specifications.

v. Working pressure

Observe the working pressure given in the specifications.

vi. Atmosphere

Do not use this product in corrosive gas environment, or where the product may be subject to chemicals, salt water, water steam, etc.

Observe the ambient temperature given in the specifications.

vii. Securing maintenance space

Secure enough space for maintenance.

2-2. Installation

⚠ WARNING

Incorrect installation and piping result in product trouble, may cause trouble in the customer's system, and may result in death or serious injury. The customer is responsible for making sure that the system is operated by someone who understands the system and has read the instruction manual thoroughly. After installing the product, carry out an adequate function test and confirm that the installation state is correct.

Installation

⚠ CAUTION

1. This product is assembled in a super clean room after precision cleaning. Always open the clean pack in the packaging box in a clean environment just before installation.
2. When installing this product, be careful not to touch any gas contacting area (valve body interior and fitting seal surface); doing so may lead to adhesion of impurities and contamination of high-purity gas.

Piping

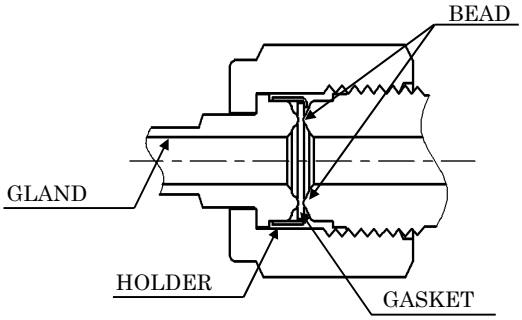
⚠ CAUTION

1. Dirt or burrs in the piping or during the piping work could damage the valve seat or diaphragm seal, and cause leaks. Always remove all dirt and burrs before installing the valve.
2. Check that the connection port direction is correct when piping the product.
3. Pipe so that any tension, compression or bending, etc. caused by the pipe is not applied on the valve body.
4. Operation may fail if the piped tube is bent. Check that piping matches the required length.
5. Please use a solenoid valve to be connected to the actuator for actuation suitable for the specifications and the application.
6. Please use air and inactive gas of coming through a filter with filtration capability of 5 micron meter or more for operation of the valve.
7. Check that there is no dirt, scratches, or burrs get on the seal before tightening the joint in the following procedures.

■Tightening Manual

●Metal Gasket Seal Type Fittings

(1) Insert the gasket with holder to the gland.
This will place and hold the gasket correctly on the bead.
(For a gasket with no holder, insert it to the female nut.)



(2) Assemble each parts, and tighten the nut as much as you can with your fingers. (This position is called the "finger-tight position".)

(3) Hold the body securely and tighten the nut by 1/8 round turn (when the gasket material is nickel / SUS316) from the finger-tight position.
※Please consult your distributor or our contact listed in other materials.

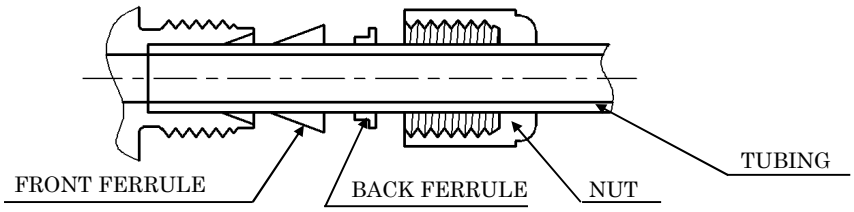
(4) When the fitting needs to be disassembled/retightened, replace the gasket with a new one and tighten the nut 1/8 turn past the finger-tight position (same as the original instruction).

●Dual Joint-Bite Type Fitting

(1) Make sure the front ferrule, back ferrule, and nut are assembled correctly.

(2) Insert the tubing into the fitting all the way in and tighten the nut firmly finger-tight. (This position is called the "finger-tight position".)

(3) Use a tool to tighten the nut 1 and 1/4 turns past the finger-tight position.



(4) If the tightened fitting is to be disassembled and then retightened, mark the make-up position of the nut (on the nut and fitting body) with a marker before loosening and removing the nut. When retightening the nut, tighten the nut slightly past the marked make-up position.

※ When retightening, the nut, do not rotate the nut more than one-half turn past the marked make-up position.

※ Use a SUS304TP or SUS316TP (or equivalent) stainless steel tube that is 1/4 inch (at least 0.71 mm thick) or 3/8 inch (at least 0.89 mm thick) in diameter for the tubing.

■Do the leakage inspection always after completion of tightening the fittings, and make sure there is no leakage.

Baking

⚠ CAUTION

1. During operation, use only within the ambient temperature as listed in the specifications.
2. Fully open the valve when baking.

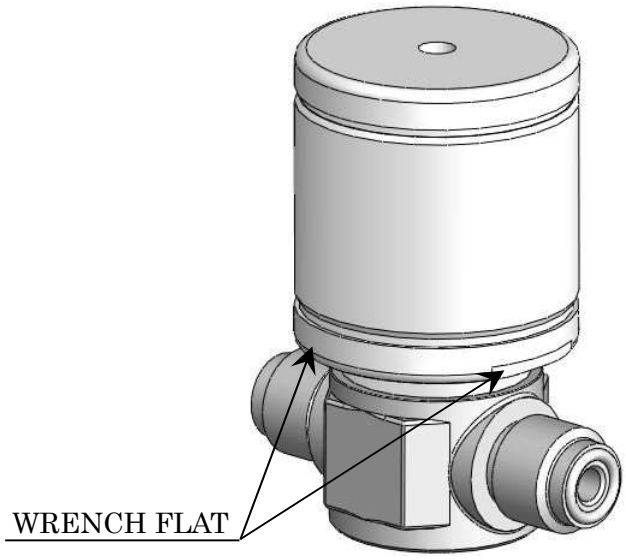
2-3. Cautions at Use

⚠ WARNING

1. Observe the fluid temperature given in the specifications.

⚠ CAUTION

1. Use after verifying compatibility of the wet surface material and the working fluid.
2. Please use air and inactive gas of coming through a filter with filtration capability of 5 micron meter or more for operation of the valve.
3. DO NOT apply wrenches to the wrench flat part.
   If this part is tightened or loosened, we do not guarantee the product performance.



4. Do not use the valves, etc. as footing or place heavy objects on them.
5. If the product has been left unused for a long period of time, always carry out a test operation before starting regular operation.

3. Maintenance and Inspection

⚠ DANGER

1. Always follow the instructions given in the instruction manual.
2. Always turn the fluid and pressure before starting.
3. Before replacing the valve, sufficiently purge out the residual gas in the valves and piping with inert gas, etc., so that devices and people in the area are not affected.
4. After completing the work, always carry out a leak inspection and confirm that there are no leaks.

3-1. Disassembly

⚠ DANGER

DO NOT disassemble the product. If disassembled, we do not guarantee such product.

3-2. Periodic Inspection

⚠ DANGER

To ensure the product is used in the optimum state, carry out a periodic inspection once or twice a year.

(1) Leaks outside of the valve
(2) Leaks from the fitting
(3) Loose and disconnected operation air tubing
(4) Smooth valve operation

3-3. Troubleshooting

If a failure should occur, following are assumed for causes.
Please contact your distributor or our contact listed the back.

	MODE	CAUSE	COUNTERMEASURE
1.	Internal leakage	Jam with foreign materials. Mark, deform on the valve seat.	Please contact your distributor.
2.	External leakage	・Break in a diaphragm. ・Mark on a gasket(ferrule) etc. ・Loose fitting nut.	・Please contact your distributor. ・Please replace the gasket, etc. ・Please replace the gasket, etc. and tighten the nut with the to specified amount.
3.	Malfun-ctioning	・Insufficient operation pressure. ・Failure of a solenoid valve for operation ・Break in an actuator.	・Please set the pressure within the specified value. ・Please replace the solenoid valve for operation. ・Please contact with your distributor.

4. How to Read the Part Number

LGD Ⓐ Ⓑ - Ⓒ

	Series
1	1/4inch Port Size Equivalent
2	1/2inch Port Size Equivalent

	Function
1	Normal Close
2	Normal Open

Ⓒ	Fittings
4RM	1/4 inch JXR Male
4R	1/4 inch JXR Female
4S	1/4 inch Dual Joint-Bite Type
6S	3/8 inch Dual Joint-Bite Type
8RM	1/2 inch JXR Male
8R	1/2 inch JXR Female
8S	1/2 inch Dual Joint-Bite Type

* Series 1 is supplied with a 1/4 inch fitting, and series 2 is supplied with a 3/8 inch, 1/2 inch fitting.

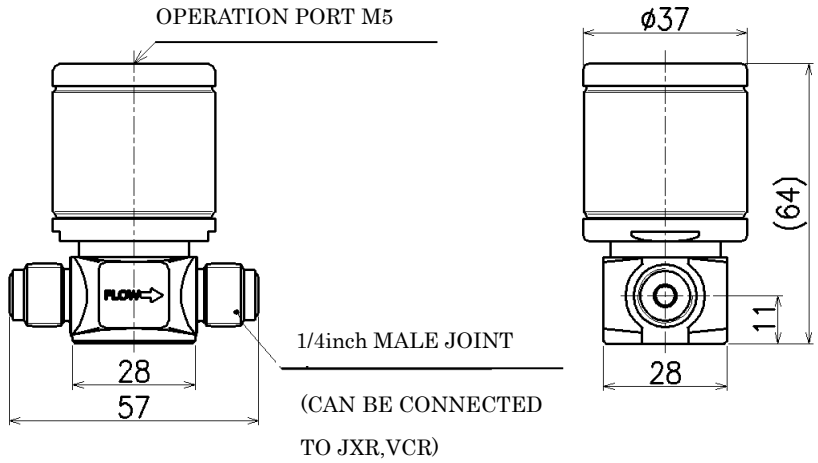
* "R" and "RM" type fittings can be connected with VCR fittings.

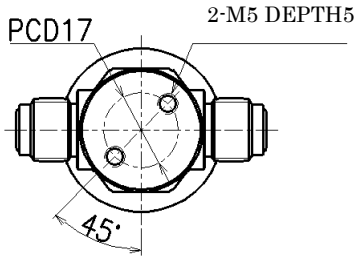
(Part Number Reference Table)

Series (Cv Value)	Function	Fittings	Part Number
1/4 in. Port Size Equivalent (0.3)	NC	1/4 inch JXR Male	LGD11-4RM
		1/4 inch JXR Female	LGD11-4R
		1/4 inch Dual Joint-Bite Type	LGD11-4S
	NO	1/4 inch JXR Male	LGD12-4RM
		1/4 inch JXR Female	LGD12-4R
		1/4 inch Dual Joint-Bite Type	LGD12-4S
3/8 in. Port Size Equivalent (0.65)	NC	3/8 inch Dual Joint-Bite Type	LGD21-6S
	NO	3/8 inch Dual Joint-Bite Type	LGD22-6S
1/2 in. Port Size Equivalent (0.7)	NC	1/2 inch JXR Male	LGD21-8RM
		1/2 inch JXR Female	LGD21-8R
		1/2 inch Dual Joint-Bite Type	LGD21-8S
	NO	1/2 inch JXR Male	LGD22-8RM
		1/2 inch JXR Female	LGD22-8R
		1/2 inch Dual Joint-Bite Type	LGD22-8S

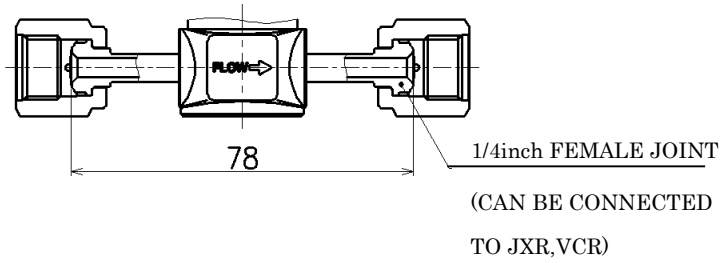
5. Dimensions

- LGD11-4RM
- LGD12-4RM

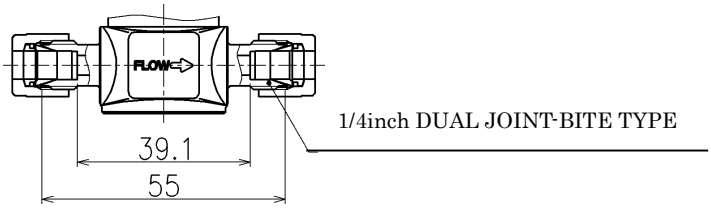




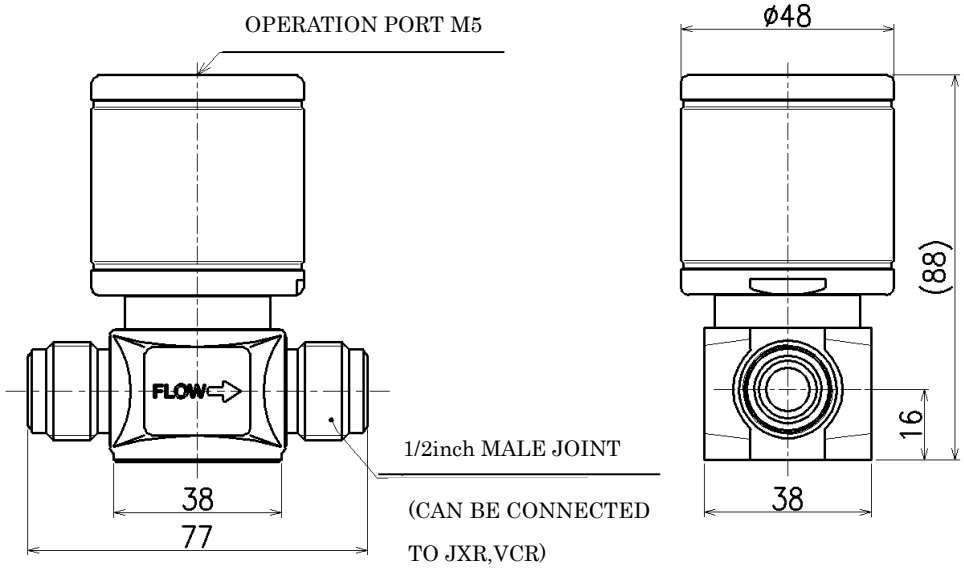
- LGD11-4R
- LGD12-4R

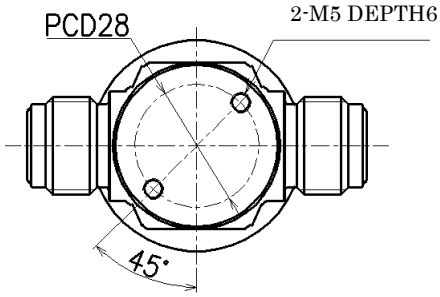


- LGD11-4S
- LGD12-4S

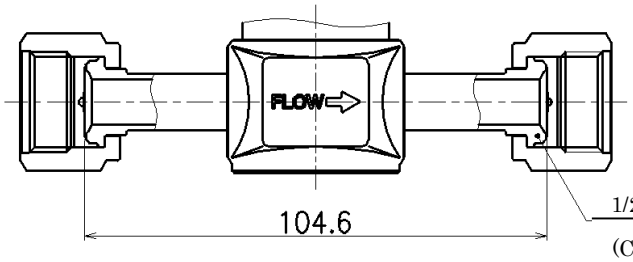


- LGD21-8RM
- LGD22-8RM

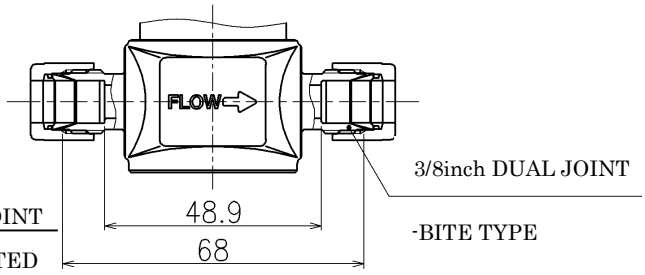




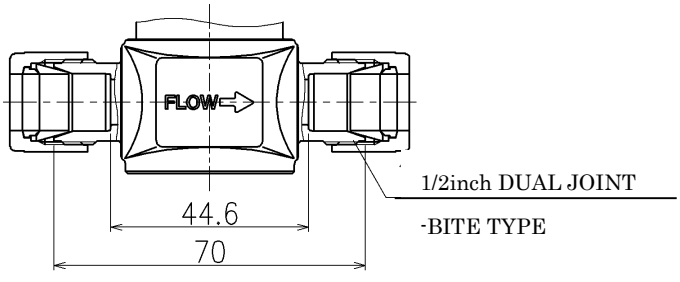
- LGD21-8R
- LGD22-8R



- LGD21-6S
- LGD22-6S



- LGD21-8S
- LGD22-8S



Major Parts Materials-Gas Contacting Area

Part Name	Materials
Body	SUS316L
Diaphragm	Ni-Co Alloy
Valve Seat	PCTFE
Front Ferrule Back Ferrule	SUS316
(Dual Joint-Bite Type)	

-BITE TYPE