CKD

Nozzle Type Check Valve

CCN Series

INSTRUCTION MANUAL

SM-50826-A/3

- Read this Instruction Manual before using the product.
- Read the safety notes carefully.
- Keep this Instruction Manual in a safe and convenient place for future reference.

CKD Corporation

PREFACE

Thank you for purchasing CKD's **"CCN Series" Nozzle Type Check Valve**.
This Instruction Manual contains basic matters such as installation and usage instructions in order to ensure optimal performance of the product. Please read this Instruction Manual thoroughly and use the product properly.
Keep this Instruction Manual in a safe place and be careful not to lose it.

Product specifications and appearances presented in this Instruction Manual are subject to change without notice.

- The product, which uses control valves such as solenoid valves, motor valves, and air operated valves, is intended for users who have basic knowledge about materials, fluids, piping, and electricity. CKD shall not be responsible for accidents caused by persons who selected or used the product without knowledge or sufficient training with respect to control valves.
- Since there are a wide variety of customer applications, it is impossible for CKD to be aware of all of them. Depending on the application or usage, the product may not be able to exercise its full performance or an accident may occur due to fluid, piping, or other conditions. It is the responsibility of the customer to check the product specifications and decide how the product shall be used in accordance with the application and usage.

SAFETY INFORMATION

When designing and manufacturing any device incorporating the product, the manufacturer has an obligation to ensure that the device is safe. To that end, make sure that the safety of the machine mechanism of the device, the pneumatic or water control circuit, and the electric system that controls such mechanism is ensured.

To ensure the safety of device design and control, observe organization standards, relevant laws and regulations, which include the following:

ISO 4414, JIS B 8370, JFPS 2008 (the latest edition of each standard), the High Pressure Gas Safety Act, the Industrial Safety and Health Act, other safety rules, organization standards, relevant laws and regulations

In order to use our products safely, it is important to select, use, handle, and maintain the products properly.
Observe the warnings and precautions described in this Instruction Manual to ensure device safety.

Although various safety measures have been adopted in the product, customer's improper handling may lead to an accident. To avoid this:

Thoroughly read and understand this Instruction Manual before using the product.

To explicitly indicate the severity and likelihood of a potential harm or damage, precautions are classified into three categories: "DANGER", "WARNING", and "CAUTION".

⚠ **DANGER**	Indicates an imminent hazard. Improper handling will cause death or serious injury to people.
⚠ **WARNING**	Indicates a potential hazard. Improper handling may cause death or serious injury to people.
⚠ **CAUTION**	Indicates a potential hazard. Improper handling may cause injury to people or damage to property.

Precautions classified as "CAUTION" may still lead to serious results depending on the situation.
All precautions are equally important and must be observed.

Other general precautions and tips on using the product are indicated by the following icon.

Indicates general precautions and tips on using the product.

Precautions on Product Use

⚠ WARNING

The product must be handled by a qualified person who has extensive knowledge and experience.

The product is designed and manufactured as a device or part for general industrial machinery.

Use the product within the specifications.

The product must not be used beyond its specifications. Also, the product must not be modified and additional work on the product must not be performed.

The product is intended for use in devices or parts for general industrial machinery. It is not intended for use outdoors or in the conditions or environment listed below.

- In applications for nuclear power, railroad system, aviation, ship, vehicle, medical equipment, and equipment that directly touches beverage or food.
- For special applications that require safety including amusement equipment, emergency shut-off circuit, press machine, brake circuit, and safety measures.
- For applications where life or properties may be adversely affected and special safety measures are required.

(Exception is made if the customer consults with CKD prior to use and understands the specifications of the product. However, even in that case, safety measures must be taken to avoid danger in case of a possible failure.)

Do not handle the product or remove pipes and devices until confirming safety.

- Inspect and service the machine and devices after confirming the safety of the entire system. Also, turn off the energy source (air supply or water supply) and power to the relevant facility. Release compressed air and fluid from the system and use extreme care to avoid water or electric leakage.
- Since there may be hot or live parts even after operation has stopped, use extreme care when handling the product or removing pipes and devices.
- When starting or restarting a machine or device that incorporates pneumatic components, make sure that a safety measure (such as a pop-out prevention mechanism) is in place and system safety is secured.

Precautions on Product Disposal

⚠ CAUTION

When disposing of the product, comply with laws pertaining to disposal and cleaning of wastes and have an industrial waste disposal company dispose of the product.

CONTENTS

1. PRODUCT OVERVIEW

1.1 Model Number Indication

(a) Port size (IN)

(b) Port size (OUT)

(c) Series

Symbol	Description
(a) Port size (IN)	
08F	R1/4
10F	R3/8
08G	G1/4 (Male)
10G	G3/8 (Male)
08H	1/4NPT (Male)
10H	3/8NPT (Male)

(b) Port size (OUT)		**08F**	**10F**	**08G**	**10G**	**08H**	**10H**
4	φ4	●		●		●	
5	φ5	●	●	●	●	●	●
6	φ6		●		●		●
A	Rc1/4	●	●				
B	R1/4	●	●				
C	G1/4(Female)			●	●		
D	G1/4(Male)			●	●		
E	1/4NPT(Female)					●	●
F	1/4NPT(Male)					●	●

(c) Series	
Blank	Standard
FP2	Series for food processing

1.2 Specifications

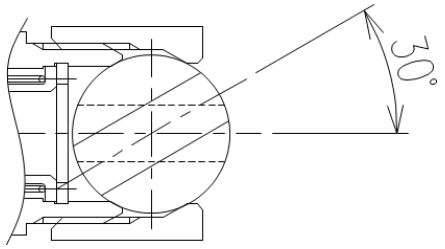
Specifications

Descriptions		CCN	
		Standard	Series for food processing
Working fluid		Coolant Liquid or water or other non-corrosion liquids *1	Water or oil or other non-corrosion liquids *1
Fluid viscosity	mm^2/s	500 or less	
Max. working pressure	MPa	1.0	
Proof pressure(for water pressure)	MPa	2.0	
Fluid temperature	°C	-10 to +60 (no freezing)	-10 to +60 (no freezing) During steam sterilization 130 ° C or less, allowed within 20 minutes or less
Ambient temperature	°C	-10 to +60	
Cracking pressure	kPa	25 (reference value） *2	
Closing pressure	kPa	10 (hydraulic head：1m)	
Mounting orientation		Free *3	

*1：Fluid that does not affect stainless steel (chrom plated) or fluoro rubber.

*2：Cracking pressure refers to the pressure at which a flow rate of 5 mL / min (AIR) is observed.
It may be higher depending on the type and viscosity of the fluid.
If the product is not used for a long period of time, the initial cracking pressure may be higher than the regular cracking pressure.

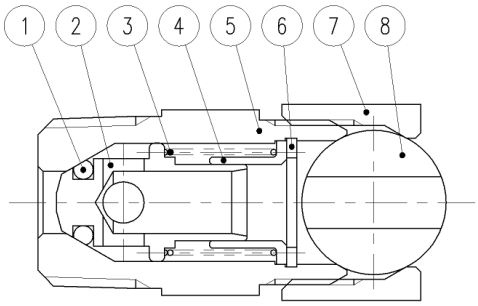
*3：Nozzle adjustment is possible up to 30 degrees.（When OUT options:4,5,6 are selected.）



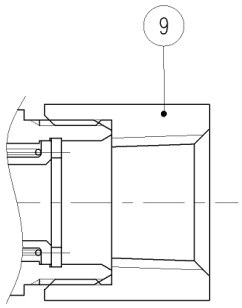
Individual specifications

Item / Model No.	Port size (IN)	Weight (kg)	Orifice diameters (mm)
CCN-08	R1/4, G1/4, 1/4NPT	0.05	5
CCN-10	R3/8, G3/8, 3/8NPT	0.06	6

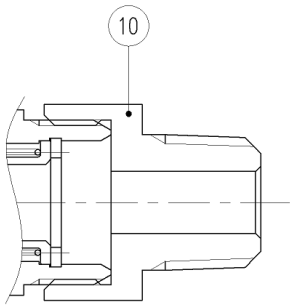
1.3 Internal Structure



OUT option：4・5・6



OUT option：A・C・E



OUT option：B・D・F

No.	Part name	Material	
1	O-ring	FKM	Fluoro rubber
2	Main valve	SUS303	Satinless steel (chrom plated)
3	Spring	SUS304	Satinless steel
4	Valve holder	SUS303	Satinless steel
5	Body	SUS303	Satinless steel
6	Retaining ring c type	SUS304	Satinless steel
7	Cover	SUS303	Satinless steel
8	Nozzle	SUS303	Satinless steel
9	Cover(female screw)	SUS303	Satinless steel
10	Cover(male screw)	SUS303	Satinless steel

2. INSTALLATION

2.1 Environment

⚠ WARNING

Consult CKD about the specifications before using the product outside the designated specifications or for special applications.

Do not use this product in an environment in which corrosive gases could encroach the configuration materials.

Do not use the product in a humid environment.
Condensation may occur due to a change in the temperature.

- When using in a cold area, take proper measures against freezing.
- The product cannot be used outdoors. Protect the product by installing it inside a cover or a case.

2.2 Unpacking

⚠ CAUTION

Do not remove the packing bag until just before piping work.
Otherwise, foreign matter enters from the port and cause malfunction or bad operation.

- Check that the model number ordered and the model number indicated on the product are the same.
- Check the exterior of the product for any damage.
- When storing the product, keep it packaged in the individual package box to prevent foreign matters from entering the valve. Take it out of the box when ready to begin piping.

2.3 Mounting

⚠ CAUTION

Thoroughly read and understand this Instruction Manual before mounting the product.

Hold the body firmly when handling and mounting the product.

Check for leakage from the pipes after mounting the product and confirm that the product has been mounted properly.

- There is no restriction on the mounting orientation.
- Secure sufficient space for working safely during maintenance and troubleshooting.

2.4 Piping

⚠ CAUTION

Before the valve installation, confirm the absence of residual pressure.

Tighten pipes with appropriate torque to prevent screw slack, air leakage and screw damage.

Carry out the piping work after checking the JIS symbols stated on the nameplate attached to the main body.

When performing the piping work, tighten the width across flat part using the tool.

When disconnecting this product from the pipe, loosen the width across flat of the pipe to be disconnected.

Do not apply any lateral load to the main body during mounting and after mounting.

■ Cleaning of piping

Before piping, flush the inside of the pipe with 0.3MPa air, and remove any foreign matter, metal powder, rust and sealing tape, etc.

■ Removal of foreign matter

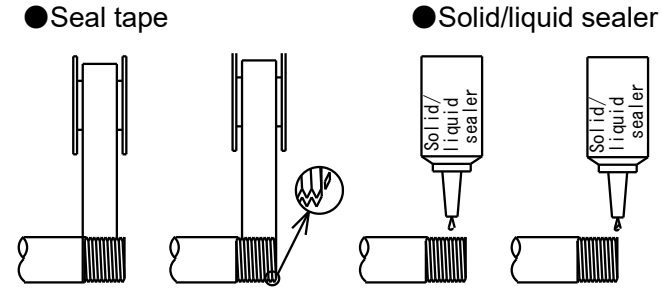
Any dirt or foreign matter in the fluid can prevent the product from functioning correctly.
Install an 80 mesh strainer when passing water, and a 5 μ or less filter when passing air.

■ Piping

Before starting the piping work, check the direction of the flow of the fluid and JIS symbol.

■ Sealer

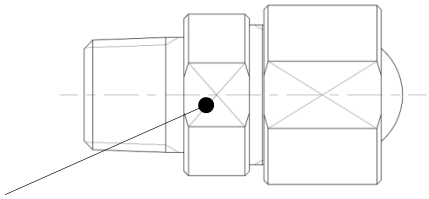
- The sealer shall be used with great care to prevent it from entering the pipes or leaking out.1
- When taping a threaded portion, 1～2 threads at the end of the portion shall be exposed (see Figure 2.1).
- When using liquid sealer, take care not to apply too much sealer. Similarly to the case of taping, threads at the end of the threaded portion shall be exposed.



(Figure 2.1)

■ Tightening

- When piping the product, please use piping the width across flat of the body side (see Figure 2.2).



Width across flat of the body side

（Figure 2.2）

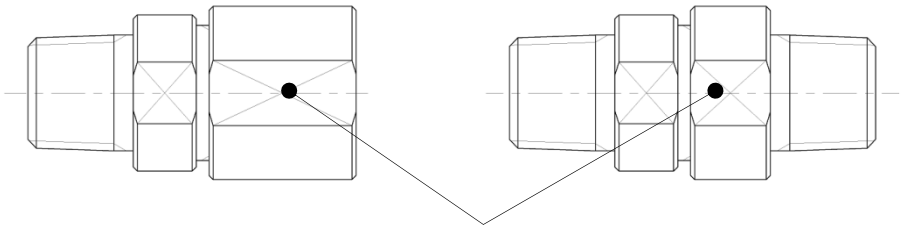
Refer to Table 2.1 for tightening torque at piping.

Table2.1 Recommended tightening torque for product piping

Pipe port size	Recommended tightening torque(N·m)
R1/4, G1/4, 1/4NPT	6 to 8
R3/8, G3/8, 3/8NPT	13 to 15

※Fix the width across flat of the body of the piping side by the tool.

- When using the female screws and male screws of the cover, fix the width across flat of the cover side by the tool (see Figure 2.3).



Width across flat of the cover side

（Figure 2.3）

- Refer to Table 2-2 for tightening torque at piping.※When OUT options: A･B･C･D･E･F are selected.

Table2.2 Recommended tightening torque for cover part piping

OUT side option	Recommended tightening torque(N·m)
A･B･C･D･E･F	6 to 8

3. USAGE

⚠ WARNING

Use it under piping and the pressure condition that chattering is not generated.

The structure of the check valve generates chattering by the Pressure condition. Confirm chattering is not generated before it uses it.

Do not use the product as a valve for ensuring safety such as an emergency shut-off valve.

The product is not designed to be used as a valve for ensuring safety such as an emergency shut-off valve. If using the product for such a system, take appropriate measures in advance to secure safety.

Take necessary measures for preventing people and properties from being affected by a failure of the product.

Confirm the suitability of the fluid to be used before use.

The check valve is not a product that evaluated adaptability of all the coolant liquids. When a lot of chlorines and sulfur are included, it might influence the product composition material. Select it after confirming adaptability. The liquid without the causticity shows the liquid that doesn't influence mutually even if it touches the product composition material. See "1.3 Internal Structure" for the product composition material.

During steam sterilization, do not touch the valve body directly with your hands or body.

When hot fluid flows during steam sterilization, the valve body becomes hot, so do not touch with your hand or body. There is a risk of burns if these coils are touched directly.

⚠ CAUTION

Observe the working pressure range.

Confirm the suitability of the viscosity of the fluid before use.

Generally, the valve can be used with a fluid viscosity of up to 500mm^2/s. However, the properties may differ according to the fluid type.

3.1 Checks to Make Before Use (Checks Made After Mounting)

⚠ WARNING

Close the main cock and discharge the fluid in the valve before performing an appearance check.

■ Appearance check

- Check that the check valve is securely fixed to the piping by pressing it by hand.
- Check that the threaded on the body and cover are not loose.

3.2 Safety Instructions

- Do not put any object on the valve.
- The working pressure range and temperature range of the fluid and ambient temperature range shall be satisfied.
- After it leaves it for a long term, the first cracking pressure might become higher than usual cracking pressure.
- Adjust the nozzle direction as desired.
  Be careful of over tightening the cover after adjustment.

Table3.1 Tightening torque for the cover after nozzle adjustment

Recommended tightening torque(N·m)
1.3 to 1.5

- Refer to “5 TROUBLESHOOTING” if any abnormality occurs.

4. MAINTENANCE AND INSPECTION

⚠ WARNING

Thoroughly read and understand this Instruction Manual before maintenance and inspection.

4.1 Maintenance Parts

■ O-ring, main valve

Replace it with new one if fluid leaks or another abnormal condition is observed.
As a guideline, replace it every three million cycles.

4.2 Periodic Inspection

- In order to use the product under optimum conditions, perform a periodic inspection every six months.
- Always carry out trial run before operation if the product was not used for more than a month.
- For details on inspection, refer to "3.1 Checks to Make Before Use (Checks Made After Mounting)" in this Instruction Manual.

4.3 Disassembling and Assembling

⚠ CAUTION

Close the main cock and discharge the fluid in the valve before disassembling.

4.3.1 Disassembling

1. The disassembly shall be performed with reference to “1.3 Internal Structure”.
2. Detach piping from the check valve.
3. Fix the width across flat of the body side and loosen the cover by rotating the width across flat of the cover to the left with the tool.
4. Remove the Retaining ring c type with the hole snap ring pliers.

4.3.2 Assembling

1. The disassembly shall be performed with reference to “1.3 Internal Structure”.
2. Apply grease to O-ring and the cover screw part.
   ※ For grease, use H1 grease.
3. Insert the main valve body, spring and valve holder in the body and fix the retaining ring c type with the hole snap ring pliers.
4. Fix the width across flat of the body side and refer to Table 4.1 and tighten by turning the width across flat of the cover side to the right with the tool.

Table 4.1 Recommended tightening torque for the cover during reassembly

Model number	Recommended tightening torque (N·m)
CCN-08・10※-4・5・6	1.3 to 1.5
CCN-08・10※-A・B・C・D・E・F	1.3 to 1.5

5. TROUBLESHOOTING

5.1 Problems, Causes, and Solutions

If the product does not operate as intended, check the table below for a possible solution.

Problem	Cause	Solution
Dripping	The hydraulic head pressure applied to the check valve is 0.01 MPa or more.	Pipe so that the hydraulic head of the check valve is 1 m or less.
	Adhesion of the foreign particle to a valve seat.	Flush the interiors to remove foreign particle.
	Retaining ring c type is disengaged.	Make sure that the retaining ring c type is securely engaged in the groove.
The fluid leaks to the outside.	Tightening of this product to piping is loose.	Tighten again with recommended tightening torque.
	Sealer is insufficient.	Apply sealer again.
Flux does not flow	Clogging of flow path with foreign matter.	Flush the interiors to remove foreign particle.
		Disassemble the check valve and clean its inside.

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

6. WARRANTY PROVISIONS

6.1 Warranty Conditions

■ Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified below, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.
However, following failures are excluded from this warranty:

- Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or this Instruction Manual.
- Failure caused by incorrect use such as careless handling or improper management.
- Failure not caused by the product.
- Failure caused by use not intended for the product.
- Failure caused by modifications/alterations or repairs not carried out by CKD.
- Failure that could have been avoided if the customer's machinery or device, into which the product is incorporated, had functions and structures generally provided in the industry.
- Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
- Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.

■ Confirmation of product compatibility

It is the responsibility of the customer to confirm compatibility of the product with any system, machinery, or device used by the customer.

■ Others

The terms and conditions of this warranty stipulate basic matters.
When the terms and conditions of the warranty described in individual specification drawings or the Specifications are different from those of this warranty, the specification drawings or the Specifications shall have a higher priority.

6.2 Warranty Period

The product is warranted for one (1) year from the date of delivery to the location specified by the customer.