

Hydrogen Compatible Product Guide

**Contributing to the safe utilization of
the Next-Generation Energy**



HYDROGEN

Contributing to the safe utilization

CKD contributes to the safe use of the next-generation energy for the realization of a decarbonized society

of the Next-Generation Energy



HYDROGEN

High Reliability

- Verified for hydrogen gas and implemented design changes
- Implemented parts management is different from other products
- Compliant with various gas combustion standards (select models)

Diverse lineup to match applications

<p>Gas Combustion</p> <p>Burners Industrial Furnaces Boilers</p> <p>P3</p>	<p>General Purpose Components</p> <p>Burners Boilers FC Generators</p> <p>P6</p>
<p>Process Gases</p> <p>FC Generators H₂ Extractors Inspection Machines</p> <p>P5</p>	<p>Sensing and Control</p> <p>Burners Industrial Furnaces Boilers FC Generators H₂ Extractors Inspection Machines</p> <p>P5</p>

Contributing to safe use

We also offer total ancillary components that contribute to safe use

<p>Nitrogen Gas Extraction</p> <p>P7</p>	<p>Explosion-Proof</p> <p>P7</p>
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Burners	Industrial Furnaces	Boilers	FC Generators	H ₂ Extractors	Inspection Machines

Hydrogen gas compatible components

Gas Combustion Systems

Gas cutoff valve (quick open)

VNA Series

Gas cutoff valve (slow open)

VLA Series

VNA Series



VLA Series



Double cutoff compliant with low pressure (5 kPa) to medium pressure (45 kPa) specifications

- For a wide range of gas pressures ranging from low pressure to medium pressure.
- Flow rate adjustment (caloric change) is easy, adjustable even after installation.
- The DC driven actuator with rectifier has eliminated noise and coil burnout for safety.

	Specifications
Port size	Rp1/2 to Rp2 1/2
Working press. kPa	0 to 5, 20, 30, 45
Rated voltage	100 VAC, 200 VAC
Major applications	Gas boilers
	Drying furnaces
	Industrial furnaces
	Hydrogen related equip.
	Gas absorption water coolers/heaters

Gas cutoff valve (quick open)

DSG Series

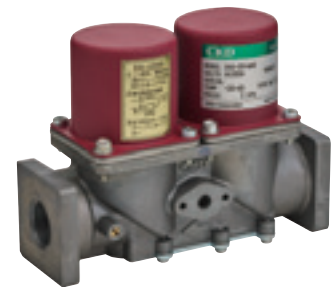
Dual Gas cutoff valve (quick open)

DSG-W Series

DSG Series



DSG-W Series



Double cutoff compliant with pressure (5 kPa) to medium pressure (45 kPa) specifications

- The DC driven actuator with rectifier has eliminated noise and coil burnout for safety.
- Built-in strainer for a structure that stops foreign matter such as foreign materials in front of the valve during piping.
- Equipped with JIS standard wire piping screws, making electrical wiring easy too.

	Specifications
Port size	Rp1/2 to Rp1
Working press. kPa	0 to 5
Rated voltage	100 VAC, 200 VAC
Major applications	Gas boilers
	Drying furnaces
	Industrial furnaces
	Hydrogen related equip.
	Gas absorption water coolers/heaters

Solenoid relief valve

VNR Series

NO ideal for gas relief line of industrial combustion equipment

- The DC driven actuator with rectifier has eliminated noise and coil burnout for safety.
- Equipped with a robust dedicated terminal box with JIS standard conduit thread, making electrical wiring easy too.



	Specifications	Major applications
Port size	Rp1/2 to Rp1	Industrial furnaces
Working press. kPa	0 to 20	Drying furnaces
Rated voltage	100 VAC, 200 VAC	Hydrogen related equip.

Intermediate pressure gas combination valve

GHV Series

Integrated structure/space-saving Compact integration of two solenoid valves, including a governor function

- Integrated double cutoff.
- Up to medium pressure (up to 50kPa) allowed.
- Solenoid valve with built-in governor + solenoid valve, solenoid valve + solenoid valve, solenoid valve + solenoid valve (slow open) can be selected.



	Specifications	Major applications
Port size	Rp1 to Rp2	Gas boilers
Working press. kPa	0 to 50	Drying furnaces
Rated voltage	100 VAC, 200 VAC	Industrial furnaces
		Hydrogen related equip.
		Gas absorption water coolers/heaters

* Appearance may differ.

Medium pressure gas cutoff valve (quick open)

VNM Series

Medium pressure gas cutoff valve (slow open)

VLM Series

VNM Series



VLM Series



Lightweight, compact and reliable safety shut-off valve that uses a solenoid valve drive method

- Equipped with a robust dedicated terminal box with JIS standard conduit thread, making electrical wiring easy too.
- The DC driven actuator with rectifier has eliminated noise and coil burnout for safety.
- Equipped with a pressure switch/pressure gauge mountable connection port on the body.

	Specifications
Port size	Flange (JIS 10K RF) 25A
Working press. MPa	0 to 0.3
Rated voltage	100 VAC, 200 VAC

Major applications	Gas boilers	Gas absorption water coolers/heaters
	Industrial furnaces	Hydrogen related equip.

Medium pressure gas combination cutoff valve

GRV Series (Japan only release)



Achieves stable pressure even at flow rates

- Large flow rate/space saving
- Supports up to medium pressure B (up to 0.3MPa).
- Slow open/quick shut with hydraulic drive.
- Supports a wide pressure adjusting range (10kPa to 150kPa).

	Specifications	
Control method	Press. reduction control	ON/OFF control
Secondary side orifice	ø15, ø25, ø40	
Port size	Flange (JIS 10K RF) 40A	
Working press. MPa	0 to 0.3	
Rated voltage	100 VAC, 200 VAC	

Major applications	Gas boilers	Gas absorption water coolers/heaters
	Industrial furnaces	Hydrogen related equip.

Fluid operated 2-position cutoff valve

HK1 Series

**Highly reliable built-in rotor/ hydraulic pump
Ideal for cutoff valve and main gas lines**



- Indicator for checking valve open/close state.
- Integrated strainer prevents foreign matter from being caught in pipes.

	Specifications	Major applications
Port size	Rp1 1/2 to Rp2, Flange	Gas boilers Drying furnaces
Working press. MPa	0 to 0.4	Industrial furnaces
Rated voltage	100 VAC, 200 VAC	Hydrogen related equip.

Fluid operated 2-position cutoff valve

HS Series

Highly reliable shutdown valve with integrated motor/hydraulic pump and large flow rate even with low pressure (202 to 449m³/h (AIR))



- Actuator with integrated motor and hydraulic pump.
- Indicator for checking valve open/closed states.
- Lightweight aluminum body

	Specifications	Major applications
Port size	Flange (JIS 10K RF) 50A	Gas boilers Gas absorption water coolers/heaters
Working press. MPa	0 to 0.18	Industrial furnaces
Rated voltage	100 VAC, 200 VAC	Hydrogen related equip.

Hydrogen gas compatible components

Flow Rate Controller

Compact flow rate controller

FCM Series

Compact, high-speed and multi-functional

- Equipped with high-speed response micro-machined sensor chip.
- Built-in microcomputer achieves high precision and multiple functions.
- Equipped digital display makes control status visible at a glance.



	Specifications
Flow rate range L/min	0 to 2, 5, 10, 20
Port size	Rc, UNF, double barbed, JXR male
Input signal	0-10V, 0- 5 V, 4- 20 mA, Parallel 10 bit
Output signal	1-5V, switch, error
communication option	RS-485, IO-Link

Major applications

Gas boilers

Industrial furnaces

Hydrogen related equip.

Components for Process Gases

Air operated valve for process gases

AGD Series

Diaphragm valve created in pursuit of contamination control

- Zero particle generation is achieved with optimal seal structure and improved surface roughness.
- Flow path is electrolytic polished-type.
- High corrosion resistant and long service life Ni-Co alloy diaphragm is used.



	Specifications	Major applications
Actuation	NC, NO	Semiconductor processing
Port size	1/4" JXR male fitting, Female fitting	Hydrogen related equip.
Working press. MPa	1.3 x 10 ⁻⁶ to 0.99	

Regulator for process gases

PGM Series

High-performance regulator for process gases that use metal diaphragms

- Poppet structure prevents outflow and controls negative pressure.
- Ultra high purity gas compatible clean level.
- Vibration measures have been implemented using a newly developed vibration prevention mechanism.



	Specifications	Major applications
Port size	JXR male fitting, Female fitting	Semiconductor processing
Set pressure MPa	0 to 0.7	Hydrogen related equip.
Working press. MPa	1.3 x 10 ⁻⁶ to 0.99	

Manual valve for process gas

MGD Series

A manual valve that inherits the basic performance of air operated valves

Manual valve for process gas

OGD Series

Just turn the handle to close the valve

- Handle shaped to generate optimal internal sealing force.
- Stopper mechanism to prevent diaphragm damage due to excessive tightening. (MGD)
- Valve open/closed state is clear at a glance from the direction of the handle & top surface indicator. (OGD)



MGD Series



OGD Series

	Specifications
Port size	JXR male fitting, female fitting, double barbed fitting
Working press. MPa	1.3 x 10 ⁻⁶ to 0.99
Major applications	Semiconductor processing
	Hydrogen related equip.

Special-Order Product

Contact CKD Sales for details about this product. After confirming the usage, compatibility will be evaluated.

Direct acting 2, 3-port solenoid valve (Multi-fit valve)

FFB/FFG Series

Integrating the functions required for fluid control valves into a single body

- High corrosion-resistant material is used in the connection part to improve corrosion resistance.
- Equipped with a full-wave rectifier to prevent coil burnout due to overcurrent.
- Energy saving achieved.
- Adopts a quiet structure that prevents metallic noise.



	Specifications
Type	2-port, 3-port, manifold
Port size	Rc, G, NPT
Max. working press. MPa	1.4 (Differs depending on the specifications)

Proportional solenoid valve

A2-6500 Series

Step-less control of the flow rate in proportion to the current

- Conventionally difficult fine flow rate control is possible.
- Contributes to energy saving through proportional control.



	Specifications
Control flow rate L/min	0 to 100
Control current mA	0 to 330 (12 VDC), 0 to 165 (24 VDC)

Air operated 2-port valve

SAB Series

Reliable and resistant against foreign matter. Can be used with a wide variety of fluids.

- Cylinder actuation by external pilot.
- With its completely air operated structure, this valve can be used in a flammable atmosphere.
- Series also available with solenoid valve for cylinder drive.



	Specifications
Type	NC, NO, Double acting
Port size	Rc, G, NPT, flange
Max. working press. MPa	0 to 1

Inline clean filter

FCS500 Series

Our proprietary hollow fiber membrane provides innovative filter performance

- Hollow fiber membrane element has enabled 0.01 μm high precision filtration and 99.99% removal ratio.
- Considerably longer service life. Approximately five times longer than the flat membrane type.
- Parts are all degreased and cleaned. The manufacturing processes from assembling to packaging are performed in clean rooms.



	Specifications
Port size	Rc1/8, Rc1/4
Working press. MPa	0.05 to 1

Related products

Gas Generator

Nitrogen gas extraction unit

NS/NSU Series

- High-purity nitrogen necessary for oxidation- and explosion-proof applications is easily separated and refined from compressed air.
- New horizontally mounted installation with improved flexibility is available.
- Can be used in a wide range of nitrogen concentration from 90% to 99.9%.
- The ideal model can be selected from the 17 flow rates and 25 lineup. Continuous monitoring of nitrogen supply with inline oxygen monitor and flow meter.



Intrinsic Safety Explosion-Proof Control Valve

Intrinsically safe explosion-proof pilot operated 3, 5-port valve

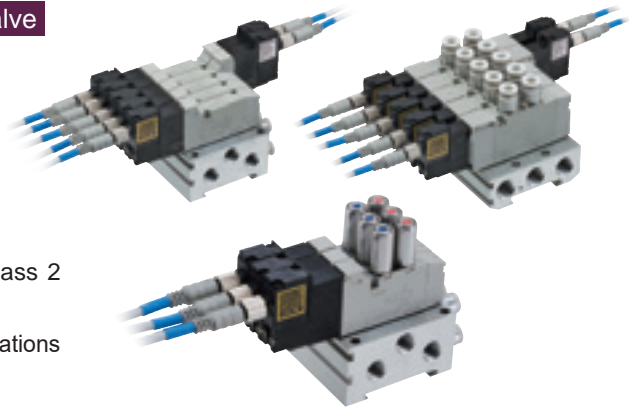
4GD/E * * 0EJ Series

[Japan Explosion-Proof Certification Product]

Certification No.: DEK 19.0049

Explosion-proof performance: Ex ib IIC T4 GB

- Usable in Class 1 hazardous areas (Type 1 locations) and Class 2 hazardous locations (Type 2 locations).
- The explosion-proof solenoid valve supports various flow rate variations of 4 sizes including the smallest class valve width of 10mm.
- Can be used in hydrogen, acetylene, and city gas atmospheres.



Flow Rate Sensor

Compact flow rate sensor

FSM3 Series

- Five types of gases can be measured with just one unit.
- Gas switching function (air, nitrogen, argon, carbon dioxide, gas mixture (Ar: CO₂(8:2)))
An oxygen-dedicated model with oil-prohibited specifications is also available.
- For the stainless steel body, JXR fitting, double barbed fitting and screw-in types are provided as standard.



JXR fitting



Double barbed fitting



Screw-in



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