IAGD

Integrated Gas Supply System

Overview

A process gas supply system with improved space-saving and maintainability. We handle everything from design to manufacturing according to the customer's desired flow.

Features

Two sizes available to match flow rate and size (1.125", 1.5")

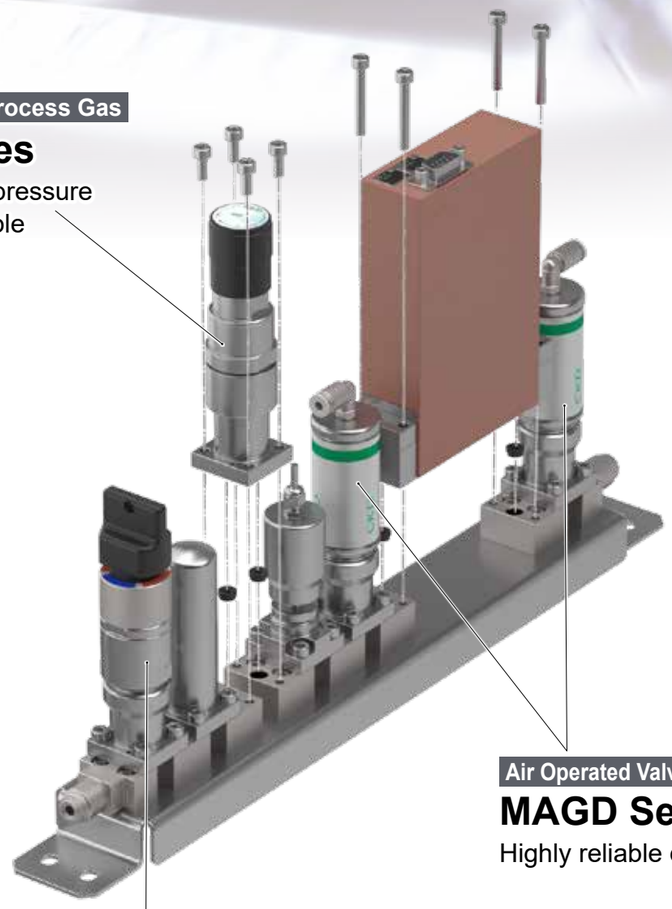
High durability valves available

- MAGD□-R-HD
- MAGD□-HDF
- MAGD□-A

CONTENTS

Integrated type of the highly reliable AGD series

A process gas supply system that has perfected space-saving and maintainability. By creating an optimal layout according to customer requirements, we achieve significant space savings compared to systems configured with welded fittings.



Regulator for Process Gas

PGM Series

High-precision pressure control is possible

Air Operated Valve for Process Gas

MAGD Series

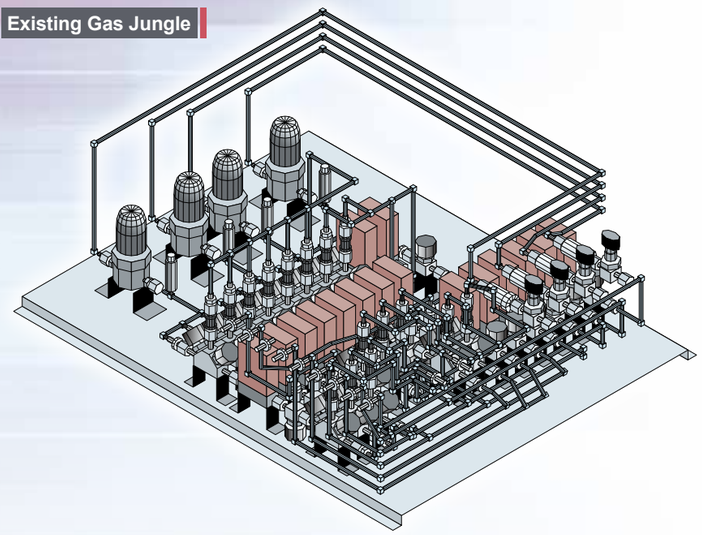
Highly reliable diaphragm design

Manual Valve for Process Gas

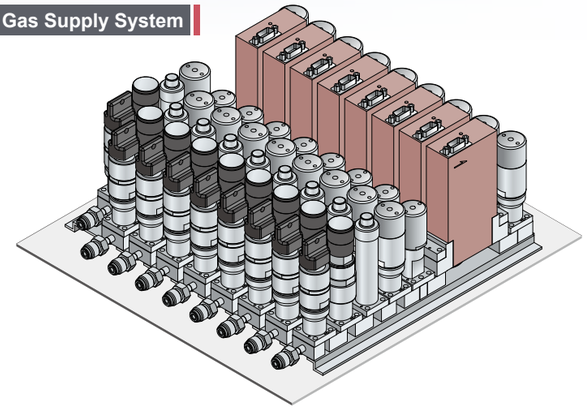
MMGD Series

Long-selling model with a proven track record

Existing Gas Jungle



Integrated Gas Supply System



Reduced Footprint

- 60% less footprint
- Volume 16% compared with conventional models

Improved Workability

- Parts can be attached and detached in one direction from the top of the component parts
- Simplified heating

Improved Reliability

- CS seal/Double seal used

Improved Corrosion Resistance (Contamination-free)

- Welding area reduced by more than 80%

By drastically reducing the number of welds, we have significantly reduced potential sources of contamination compared to conventional systems.

Improved Purge Characteristics

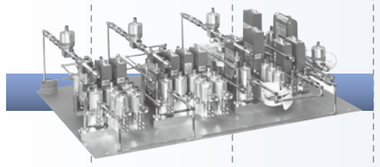
- Construction of a flow path with an extremely small internal volume and dead volume
- Improved purging

Promotion of Standardization

- Implementation of standardization for component parts

History of Integrated Gas Supply Systems

1990 1995 2000 2005 2010 2015 2020 2025

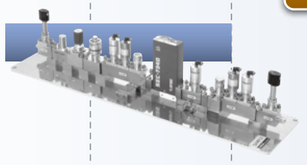


IAGD
CS seal *Discontinued

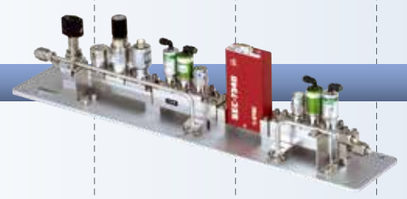
Commercialized ahead of the world
Evolved with miniaturization and higher functionality

1.5 in / 1.125 in SEMI standard compliant

IAGD2
CS seal
*Discontinued

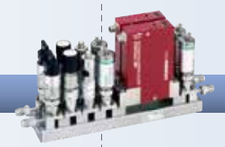


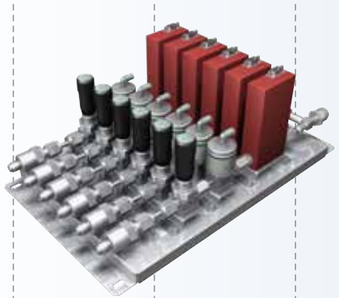
IAGD3
1.5 in CS seal



IAGD4
1.5 in Double seal

IAGD5
1.125 in Double seal





Clean Unit

FICS

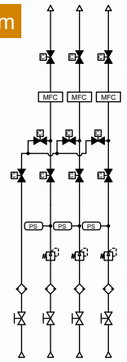
A unit product that combines fine system components and clean equipment.
Please inquire for details.

Production Flow of Integrated Gas Supply System

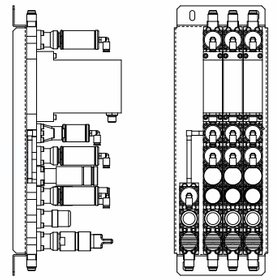
Layout

We create a layout based on the customer's specifications and flow diagram.

Flow Diagram



Layout Diagram

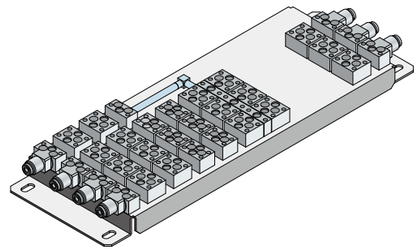


Parts Procurement

Based on customer specifications, we select and arrange the manufacturers and models of the equipment to be used.

Assembly 1

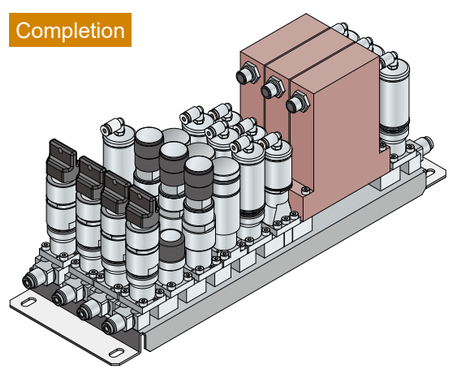
The base block is positioned and mounted using a jig.



Assembly 2

The integrated components are mounted.

Completion



Inspection

Integrated Gas System Series
IAGD

Components for Integrated Gas Supply System
Air Operated Valve for IAGD5 (1.125" size)

MAGD5 Series

Special Specifications

Main Features

Integrated type of the highly reliable AGD series

Model No. Notation Method

MAGD5 - R - 02A - W - 1 2

- MAGD5: Model No.
- 02A: ❶ Valve Shape
- W: 1.125" Double seal (Nominal 6.35)
- 1: ❷ Actuation Method (V1)
- 2: ❸ Actuation Method (V2)

*1: Mounting bolts, gaskets, and air fittings for actuator operation are not included. Please purchase them separately.
*2: Customers who wish to have mounting bolts included, please consult with our sales office.

❶Valve Shape

Content			Code
Cv Value	Valve Shape		
0.1	Single Block	D-type Valve (2-Port)	01D
		X-type Valve (3-Port)	01X
		Y-type Valve (3-Port)	01Y
	Dual Block	A-type Valve (3-Port)	02A
0.26	Single Block	D-type Valve (2-Port)	11D
	Dual Block	A-type Valve (3-Port)	12A

Note) For detailed flow diagrams and interface positions, please refer to P. 95.

❷Actuation Method (V1)

Code	Content
1	NC Type
2	NO Type
3	NC Type (with Proximity Sensor, 2-wire (energized when valve closed))
4	NO Type (with Proximity Sensor, 2-wire (energized when valve open))
5	NC Type (with Proximity Sensor, 2-wire (energized when valve open))
6	NO Type (with Proximity Sensor, 2-wire (energized when valve closed))

Note) Other sensor specifications are available as options.

❸Actuation Method (V2)

Code	Content
1	NC Type
2	NO Type
3	NC Type (with Proximity Sensor, 2-wire (energized when valve closed))
4	NO Type (with Proximity Sensor, 2-wire (energized when valve open))
5	NC Type (with Proximity Sensor, 2-wire (energized when valve open))
6	NO Type (with Proximity Sensor, 2-wire (energized when valve closed))

Note) Other sensor specifications are available as options.

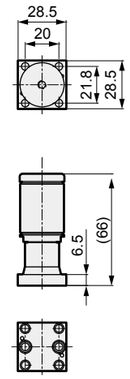
Specifications

Item			MAGD5-R-0□	MAGD5-R-1□
Applicable Fluid			Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)			1.3×10^{-6} to 0.99	1.3×10^{-6} to 0.7
Fluid temperature °C			-10 to 80	
Ambient Temperature °C			-10 to 80	
Valve Seat Leakage Pa·m³/s (He)			1.3×10^{-9} or less	1.0×10^{-10} or less
External Leakage Pa·m³/s (He)			2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)			0.1	0.26
Connection Method			1.125" Double seal (Nominal 6.35)	
Operating Pressure	MPa	NC	0.4 to 0.6	
		NO	0.4 to 0.5	
Pilot Port			M5	
Material	Body		SUS316L	
	Diaphragm		Ni-Co Alloy	
	Seat		PCTFE	

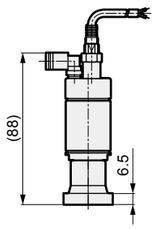
External Dimensions

Single Block

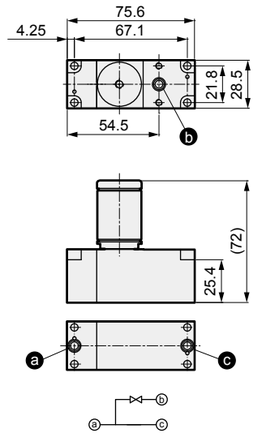
●MAGD5-R-01D



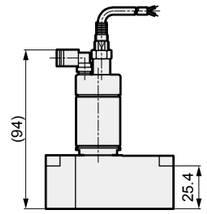
(with Proximity Sensor)



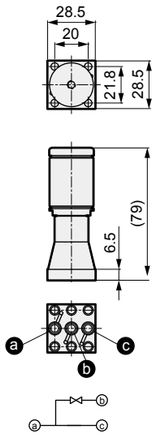
●MAGD5-R-01X



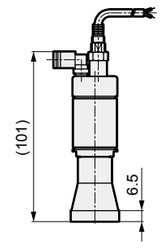
(with Proximity Sensor)



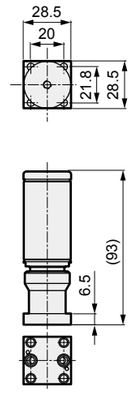
●MAGD5-R-01Y



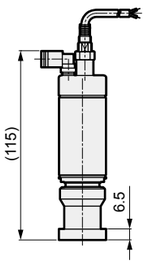
(with Proximity Sensor)



●MAGD5-R-11D

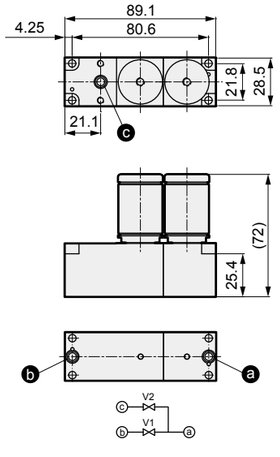


(with Proximity Sensor)

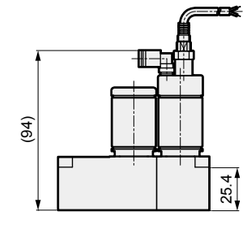


Dual Block

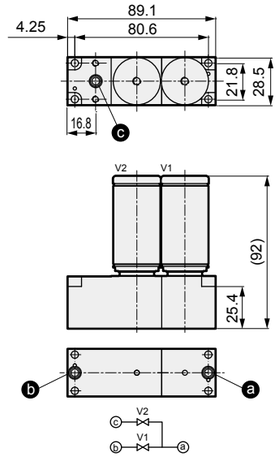
●MAGD5-R-02A



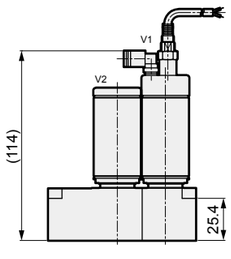
(with Proximity Sensor)



●MAGD5-R-12A



(with Proximity Sensor)



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
High Durability Air Operated Valve
Special Specifications

Main Features

Special coating on the actuator achieves high response stability.

Specifications

Item	MAGD□-R-HD-0□	MAGD□-R-HD-1□
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)	$1.3x10^{-6}$ to 0.99	
Fluid temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-10}$ or less $1.3x10^{-9}$ or less	
External Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less	
Cv Value (at 23°C, under pressure)	0.1	0.26
Connection Method	1.125" & 1.5" Double seal	
Operating Pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Pilot Port	M5	
Durability	Results: 30 million cycles or more	

Specifications

Item	MAGD□-HDF-1□	MAGD□-HDF-2□
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)	$1.3x10^{-6}$ to 0.5	
Fluid temperature °C	20 to 200 *1	
Operating Ambient Temperature °C	20 to 150	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-10}$ or less (at 23°C)	
External Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less	
Cv Value (at 23°C, under pressure)	0.26	0.65
Connection Method	1.125" & 1.5" Double seal, 3/8" Double seal, 1.5" High-Flow C-Seal	
Operating Pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Pilot Port	M5	
Durability	Results: 30 million cycles or more	

*1: Actuator section must be 150°C or less.

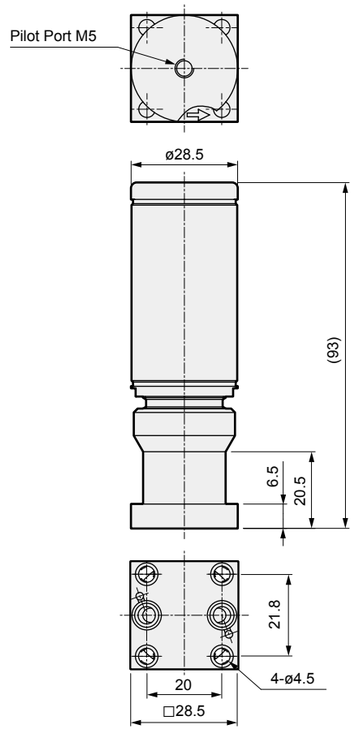
Specifications

Item	MAGD□-A
Applicable Fluid	Inert gas / Process gas
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.5
Fluid temperature °C	150 to 200 *1
Operating Ambient Temperature °C	20 to 150
Storage Ambient Temperature °C	-10 to 80
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-7}$ or less (at 200°C)
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less
Cv Value (at 200°C, under negative pressure)	0.4 or more
Connection Method	1.5" Double seal, 3/8" Double seal, 1.5" High-Flow C-Seal
Actuation Method	NC Type (Normally Closed)
Operating Pressure MPa	0.4 to 0.6
Pilot Port	M5
Durability	Results: 100 million cycles or more

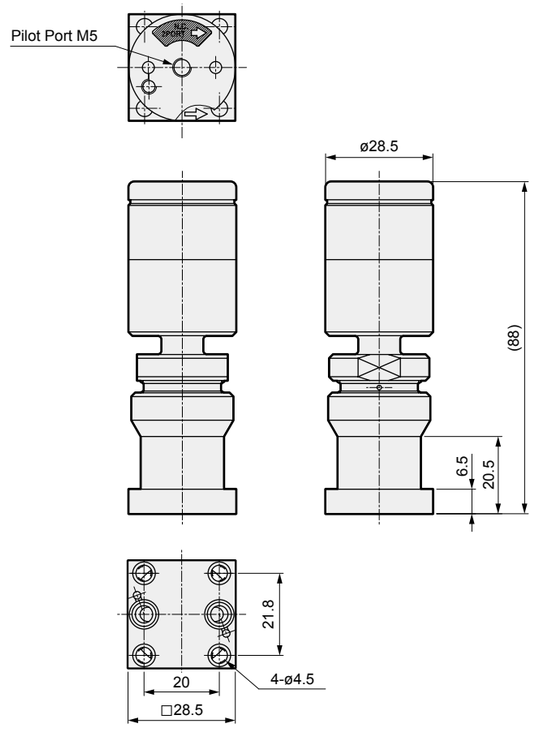
*1: Actuator section must be 150°C or less.

External Dimensions

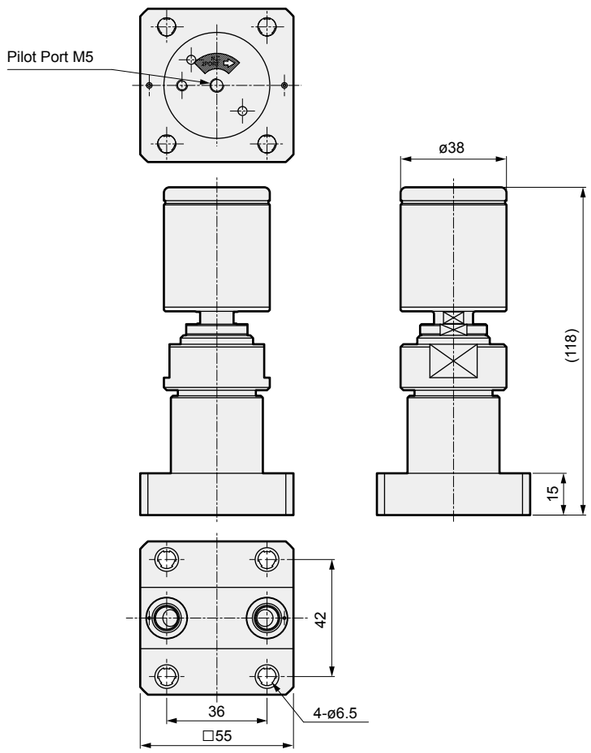
●MAGD5-R-HD-11D



●MAGD5-HDF-11D



●MAGD4-A



Components for Integrated Gas Supply System
Regulator for Process Gas

Special Specifications

Main Features

Industry-leading sealing performance, hysteresis, and repeatability.

Specifications

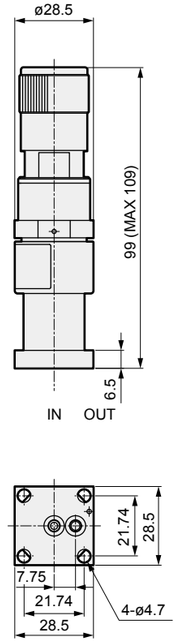
Item						
	PGM-	30V	30	50	-	100
	PGM-H-	-	–	-	60	100
	PGM-2H-	30V	30	-	60	100
Applicable Fluid		Inert gas / Process gas				
Max. working pressure	MPa	1.0				
Setting Pressure	MPa	-0.07 to 0.21	0 to 0.21	0 to 0.35	0 to 0.42	0 to 0.7
Fluid temperature	°C	-5 to 40 (2H is 20 to 50)				
Valve Seat Leakage	Pa·m³/s (He)	$1.0x10^{-8}$ or less (2 H is $2.0x10^{-8}$ or less)				
External Leakage	Pa·m³/s (He)	$2.8x10^{-12}$ or less				
Proof Pressure	MPa	1.5				
Ambient Temperature	°C	-5 to 40 (2H is 20 to 50)				
Storage Ambient Temperature	°C	-5 to 60				
Gas-wetted Surface Treatment		Electrolytic polishing specification				
Connection Method		PGM, PGM-H : Integrated System Compatible (PGM-□-1, 2, 3, 4, 5) PGM-2H- : Integrated System Compatible (PGM-2H-□-6, 7)				
Weight	kg	0.39 (PGM-□-4) 0.82 (PGM-2H-□-7)				

Note) Refer to P. 78 for model No. Notation Method.

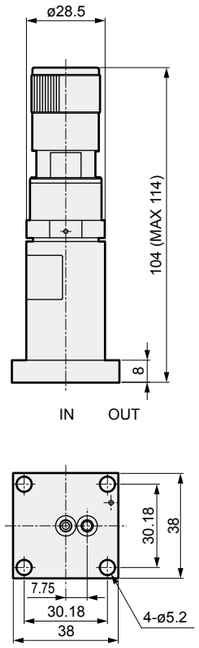
External Dimension Drawings

Note) Flow direction is indicated by an arrow on the body.

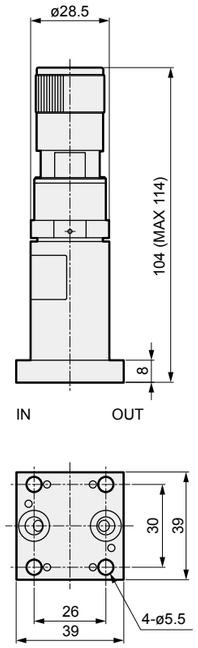
●PGM-□-1
(1.125" C seal)



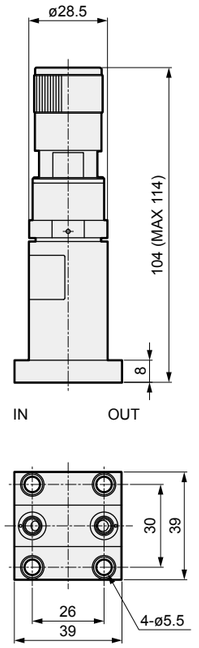
●PGM-□-2
(1.5" C seal)



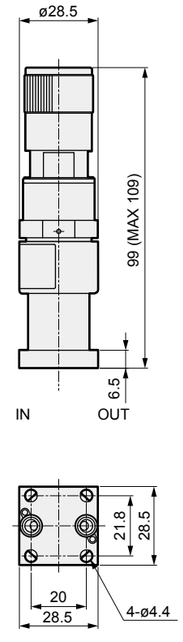
●PGM-□-3
(1.5" CS seal)



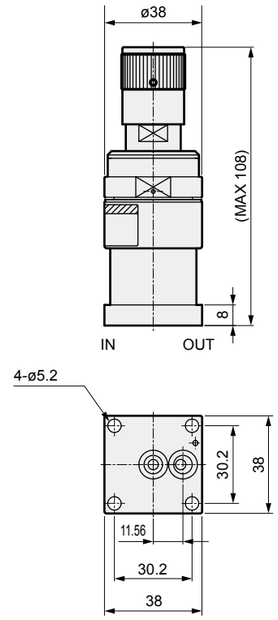
●PGM-□-4
(1.5" W seal)



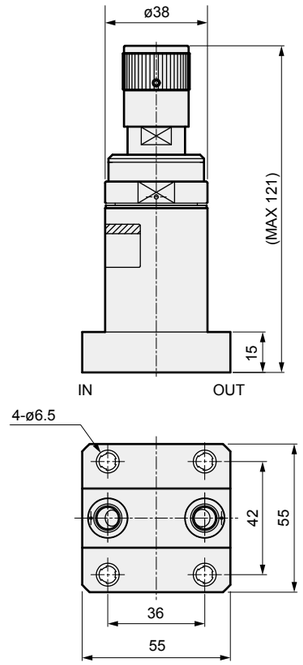
●PGM-□-5
(1.125" Double seal)



●PGM-2H-□-6
(1.5" high flow C seal)



●PGM-2H-□-7
(3/8" W seal)



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Manual Valve for IAGD5 (1.125" size)

MMGD5 Series

Special Specifications

Model No. Notation Method

MMGD5 - R - 11D - W - D - K

- MMGD5: Model No.
- R: Single Block D-type Valve (2-Port)
- 11D: 1.125" Double seal (Nominal 6.35)
- W: Double-Action Type
- D: ❶ Handle Color
- K: ❶ Handle Color

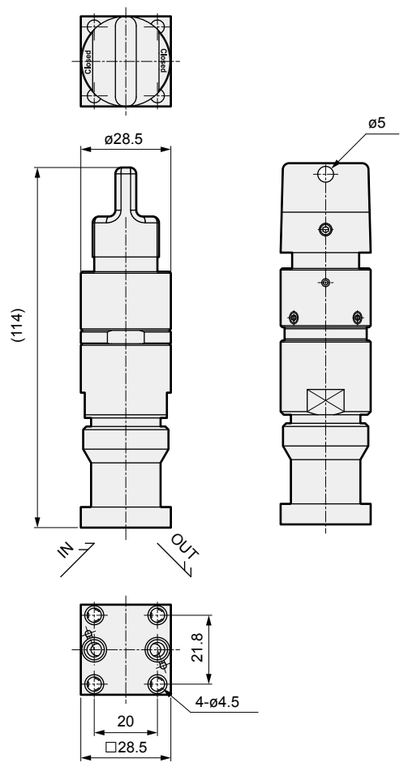
❶Handle Color

Code	Content
K	Black
R	Red
B	Blue
Y	Yellow
GR	Gray
W	White
O	Orange
YG	Yellow-Green

Specifications

Item		MMGD5-R
Applicable Fluid		Inert gas / Process gas
Operating Pressure Pa (abs) to MPa (G)		1.3x10^{-6} to 0.99
Fluid temperature	°C	5 to 80
Ambient Temperature	°C	5 to 80
Valve Seat Leakage	Pa·m³/s (He)	1.0x10^{-10} or less
Valve Seat Leakage	Pa·m³/s (He)	2.8x10^{-12} or less
Cv Value		0.26
Connection Method		1.125" Double seal (Nominal 6.35)
Material	Body	SUS316L
	Diaphragm	Ni-Co Alloy
	Seat	PCTFE

External Dimensions



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Flow Control Valve for IAGD5 (1.125" size)

MFGD5 Series

Special Specifications

Model No. Notation Method

MFGD5 - 11D - W - 1

- MFGD5: Model No.
- 11D: Single Block D-type Valve (2-Port)
- W: 1.125" Double seal (Nominal 6.35)
- 1: ❶ Cv Value (Adjustment Range)

*1: Mounting bolts and gaskets are not included. Please purchase them separately.
*2: Customers who wish to have mounting bolts included, please consult with our sales office.

❶Cv Value (Adjustment Range)

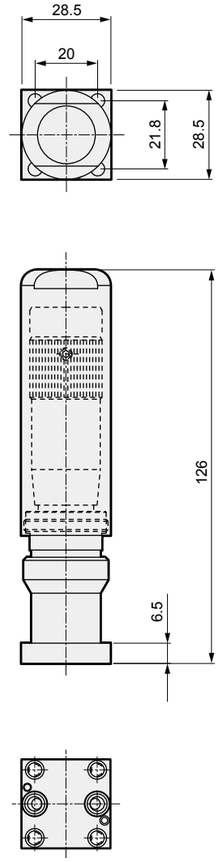
Code	Content
1	0.003 to 0.03
4	0.02 to 0.2

Specifications

Item		MFGD5-11D-W-1	MFGD5-11D-W-4
Applicable Fluid		Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)		1.3x10^{-6} to 0.7	
Fluid temperature	°C	-10 to 80	
Ambient Temperature	°C	-10 to 80	
Valve Seat Leakage		1/100 or less of the max. Cv value	
Valve Seat Leakage	Pa·m³/s (He)	2.8x10^{-12} or less	
Cv Value (Adjustment Range)		0.003 to 0.03	0.02 to 0.2
Connection Method		1.125" Double seal (Nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Ni-Co Alloy	

Note) The product comes with a cover.

External Dimensions



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Check Valve for IAGD5 (1.125" size)

MCGP5 Series

Special Specifications

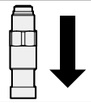
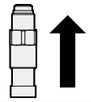
Model No. Notation Method

MCGP5 - **01D-W** - **023** - **KA**

- MCGP5: Model No.
- 01D-W: ❶ Shape
- 023: Cracking Pressure 2.3 kPa
- KA: Seat material: Kalrez®

*1: Mounting bolts and gaskets are not included. Please purchase them separately.
*2: Customers who wish to have mounting bolts included, please consult with our sales office.

❶ Shape

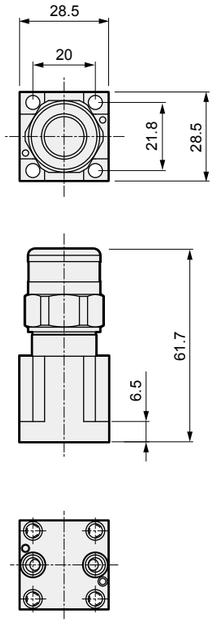
Code	Content		
01D-W	Single Block D-type Valve (2-Port) 1.125" Double seal (Nominal 6.35)		
F1	Flow Direction	From JXR fitting side to Double seal side	
F2		From Double seal side to JXR fitting side	

Specifications

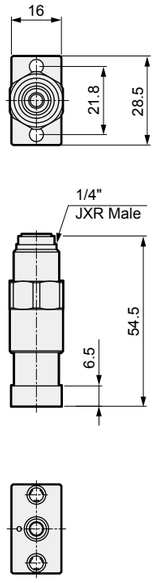
Item		MCGP5-01D	MCGP5-F
Applicable Fluid		Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature	°C	-10 to 80	
Ambient Temperature	°C	-10 to 80	
Valve Seat Leakage	Pa·m³/s (He)	4.7×10^{-8} or less	
Valve Seat Leakage	Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (Max.)		0.25	
Connection Method		1.125" Double seal (Nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Kalrez®	
	Spring	SUS316	

External Dimensions

●MCGP5-01D



●MCGP5-F□



Kalrez® is a registered trademark of DuPont.

Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Other Parts for **IAGD5**

Gasket

Name	Model No.
1.125" Double seal Gasket (Nominal 6.35)	IAGD5-UGC-6.35GR

Mounting Bolt for 1.125" Double seal

Name	Model No.	Applicable Parts
Hexagon Socket Head Cap Screw for 1.125" Double seal (M4x10, 1 pc.)	IAGD5-BOLT-M4x10	MAGD5-R-01D MAGD5-R-01Y MAGD5-R-11D MMGD5-1DV2-D MCGP5-01D MCGP5-F□ MFGD5-11D IAGD5-BYPASS IAGD5-BLIND-SW
Hexagon Socket Head Cap Screw for 1.125" Double seal (M4x30, 1 pc.)	IAGD5-BOLT-M4x30	MAGD5-R-01X MAGD5-R-02A FC-PA785CT-BW-TC (Hitachi Metals MFC) FC-PA786CT-BW-TC (Hitachi Metals MFC) DN780□-BW (Hitachi Metals MFC) SEC-Z5□ (HORIBA STEC MFC)

Please inquire for details on applicable parts.

Maintenance Tools

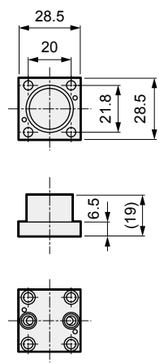
(Torque driver, bit for torque driver, T-handle ball point hex wrench, tweezers (gasket installation tool), scissors, storage box, 1 of each)

Name	Model No.
Maintenance Tool Set	IAGD5-MAINTENANCE3

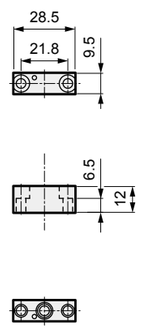
For usage instructions, please refer to the instruction manual.

Top Mount Block

●IAGD5-BYPASS
(for 20 mm pitch between)

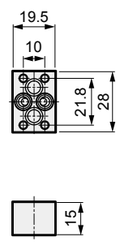


●IAGD5-BLIND-SW

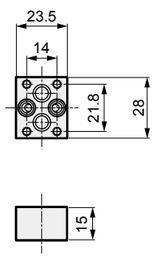


Base Block

●IAGD5-BF-V10-SW
(10 mm between)



●IAGD5-BF-V14-SW
(14.0 mm between)



Components for Process Gas

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Components for Integrated Gas Supply System, IAGD5 Series

Design / Selection

1. Confirmation of Specifications

Warning

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Please be sure to confirm the specifications of this product and its compatibility with your system before use.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Mounting

Warning

■Incorrect mounting and piping will result in product trouble, may cause trouble in the user's system, and may result in death or serious injury. The user is responsible for making sure that the operator has read the instruction manual and fully comprehends the system. After mounting, perform a proper functional inspection to ensure it is installed correctly.

Caution

■This product is assembled in class 10 and class 100 cleanrooms after precision cleaning treatment. Open the clean pack inside the packaging in a clean environment immediately before mounting.

■Fittings When mounting the product, touching the gas contact parts (body interior, seal surface) may result in adherence of foreign matter and contamination of high purity gas. Be careful not to touch the gas-wetted parts of this product during mounting.

4. Securing Space

Caution

■Secure sufficient space for installation, removal, piping and wiring work.

■Secure sufficient space for maintenance and inspection.

5. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

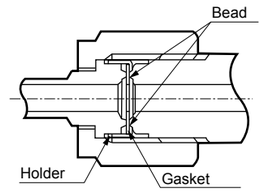
■Use the driving solenoid valve connected to the drive unit according to the specifications or applications.

■As for operating air, use air or inert gas passed through a filter with a filtration rating of 5 μm or more.

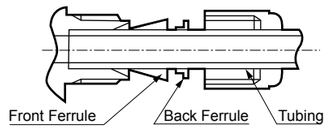
■Make sure that there is no Fittings foreign materials, scratches or burrs on the seal section before tightening the tube with the following procedures.

①Fitting Tightening Method

● JXR Fitting (when the gasket material is nickel/SUS316)
Hand-tighten the nut until the gasket contacts the bead surface, then use a tool to tighten it an additional 1/8 turn. (For other materials, please consult with us)



● Double Ferrule Fitting
Confirm that the front ferrule, back ferrule and nuts are properly attached, and then insert the tube until it contacts the back of the body. Tighten the nuts as far as possible by hand, and then tighten 1 $^{1}/_{4}$ turn with a tool.



②After tightening the fitting, be sure to perform a leak test to confirm there are no leaks.

6. Baking

Caution

■Baking temperature should be within the specified temperature range of the product. Perform baking with the valve in the fully open state.

7. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

8. During Use

Warning

■Use this product within the specifications range.

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

9. Maintenance and Inspection

Warning

■Operate in accordance with the instruction manual.

■Always turn the power OFF and release any fluids or pressure before starting work.

■Fully replace the residual gas with inert gas, etc., before starting work so that it does not affect people or the surrounding components.

■After work, always carry out a leak test, and confirm that there are no leaks.

■Do not disassemble the valve.
If the product is disassembled without authorization and then repaired or reused, it will no longer be covered by the product warranty.