

AGD□□R-HD/-HDF AGD21R-A

Process Gas Valve, High Durability Type

Overview

This is a process gas valve that meets the high durability demands driven by advancements in miniaturization. Three types are available to meet customer needs.

Features

This high durability valve achieves high-temperature, long-term stable operation.

- AGD□□R-HD
Proven durability of 30 million cycles
- AGD□□R-HDF
Proven durability of 30 million cycles
200°C Compatible
Equipped with a stable response actuator
- AGD21R-A
Proven durability of 100 million cycles
200°C Compatible
Equipped with a stable response actuator
Response deviation of ±2 msec after 100 million cycles
*Proven values



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Valve for process gases
High durability

AGD□□R-HD-HDF Series

AGD21R-A

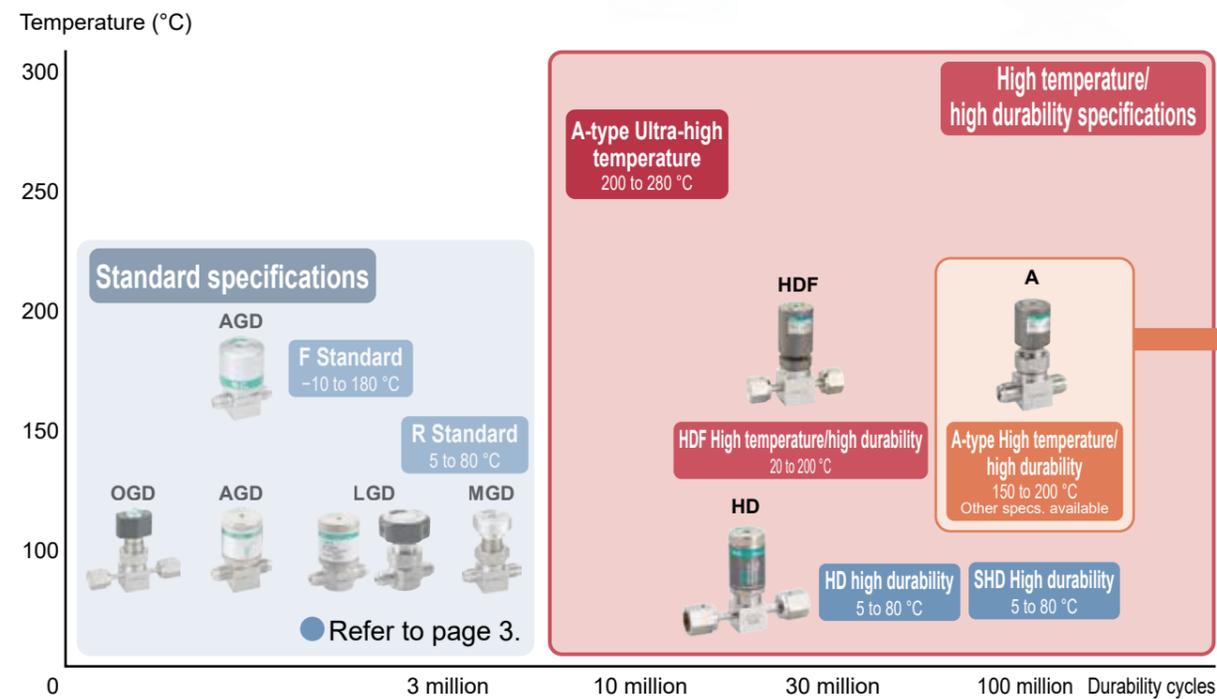
Ideal for ALD processes!

High durability valve with excellent high-temperature performance, high Cv, and stable response.

This is a process gas valve with the high durability required by advancements in miniaturization. Four types are available to meet customer needs.



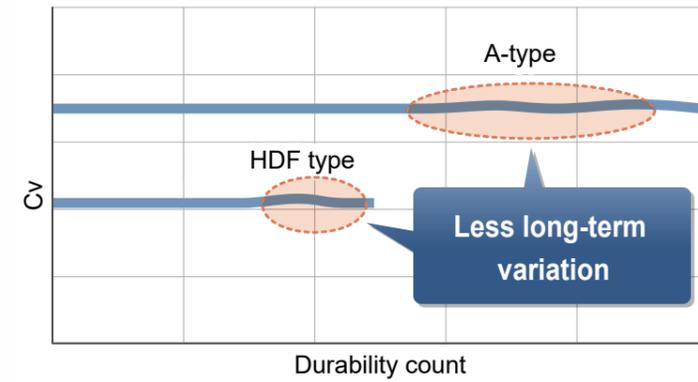
Process Gas Valve Lineup



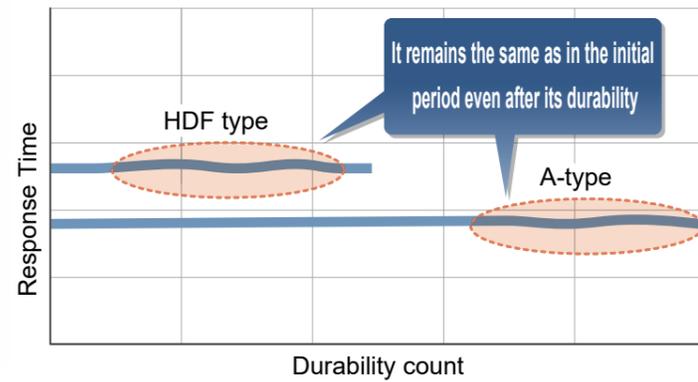
■ **Contributes to process stabilization with long-term stable performance.**

Suppressing Cv value variation leads to a stable gas flow supply, contributing to the stabilization of film deposition quality.

Cv Stability

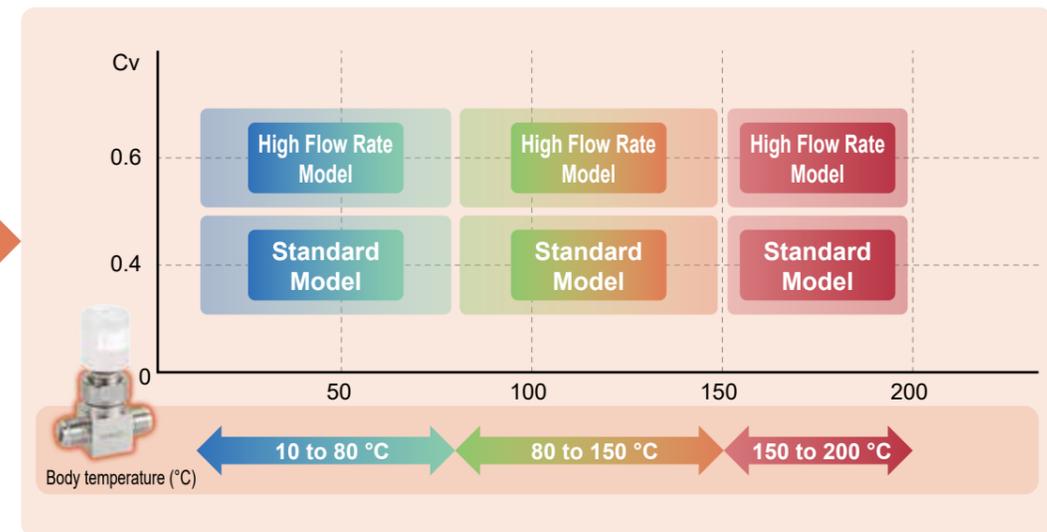


Response Stability



AGD21R-A Series lineup

*For requirements regarding Cv, contact CKD



AGD
OGD
MGD
LGD
High Durability
Other Gas Components
PGM
Regulator
IAGD
Integrated System
AVB
High Vacuum Valve
MVB
High Vacuum Valve
IAYB
Vacu Press Control Sys

AGD
OGD
MGD
LGD
High Durability
Other Gas Components
Regulator
PGM
IAGD
Integrated System
AVB
High Vacuum Valve
MVB
High Vacuum Valve
IAYB
Vacu Press Control Sys



Process Gas Valve, High Durability Type

AGD□□R-HD Series

●Normal temperature specifications

Special Specifications

Model No. Notation Method

AGD0 **1** **R - HD - 4RM**

Model No.

② Connection Method

① Actuation Method

① Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

② Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting

AGD1 **1** **R - HD - 4RM**

Model No.

② Connection Method

① Actuation Method

① Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

② Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting
4S	1/4" Double Ferrule Fitting

Specifications

Item	AGD0□R-HD	AGD1□R-HD
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·m ³ /s (He)	1.0x10 ⁻¹⁰ or less	
External Leakage Pa·m ³ /s (He)	1.3x10 ⁻⁹ or less	
Cv Value (at 23°C, under pressure)	0.1	0.3
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)	
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	
Weight kg	0.16 *1	0.25 *1
Durability	Results: 30 million cycles or more *2	
Option	Block Valve, with Proximity Sensor (OMRON)	

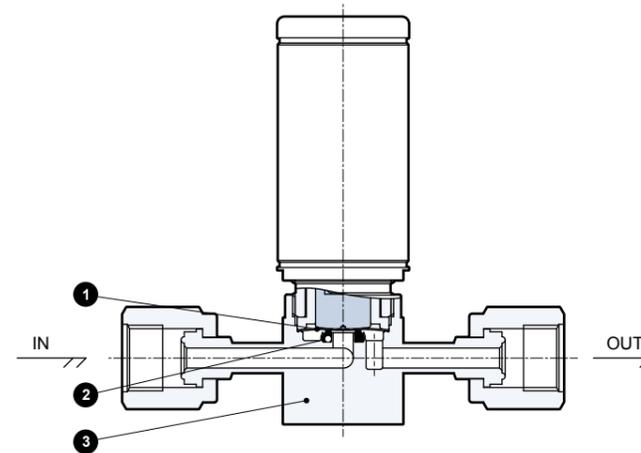
*1: Values for AGD01R-HD-4RM (1/4" JXR male fitting) and AGD11R-HD-4RM (1/4" JXR male fitting).

*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

AGD1□R-HD Series

Internal Structure Diagram, Materials, and External Dimensions

Internal Structure Diagram and Materials



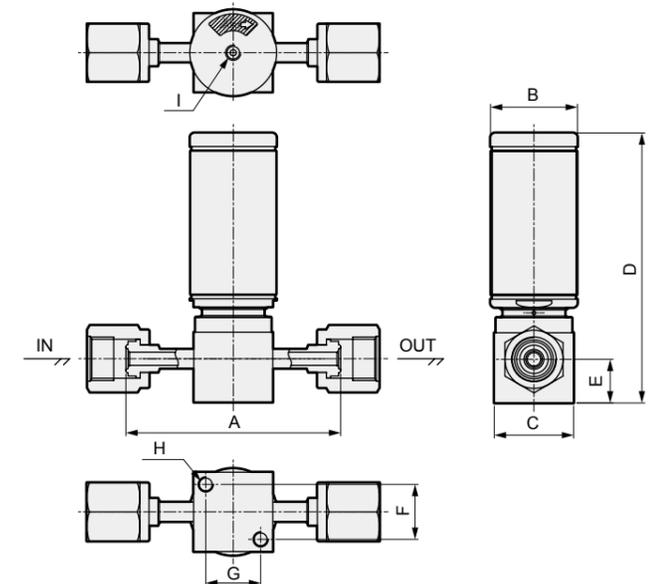
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

AGD□□R-HD-4R

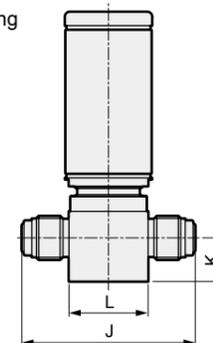
●JXR Female Fitting



Model No.	A	B	C	D	E	F	G	H	I
AGD0□R-HD-4R	66	ø26.2	□21	71	11	14	14	2-M4 Thread Depth 5	M5
AGD1□R-HD-4R	70.6	ø28	□26	89	14.3	18	18	2-M5 Thread Depth 6	M5

AGD□□R-HD-4RM

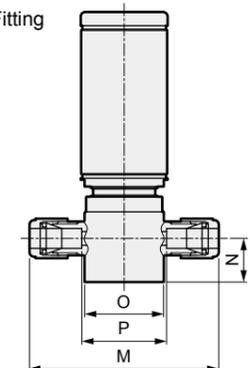
●JXR Male Fitting



Model No.	J	K	L
AGD0□R-HD-4RM	52	11	□21
AGD1□R-HD-4RM	57	14.3	□26

AGD1□R-HD-4S

●Double Ferrule Fitting



Model No.	M	N	O	P
AGD1□R-HD-4S	62	14.3	□26	27.8



Process Gas Valve, High Durability Type

AGD□□R-HDF Series

●High-Temperature Specification

Special Specifications

Model No. Notation Method

AGD1 **1** **R - HDF - 4RM**

Model No.

② Connection Method

① Actuation Method

① Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

② Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting
4S	1/4" Double Ferrule Fitting

AGD2 **1** **R - HDF - 6RM**

Model No.

② Connection Method

① Actuation Method

① Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

② Connection Method

Code	Content
6RM	3/8" JXR Male Fitting
6R	3/8" JXR Female Fitting
6S	3/8" Double Ferrule Fitting

Specifications

Item	AGD1□R-HDF	AGD2□R-HDF
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·m ³ /s (He)	1.0x10 ⁻¹⁰ or less (at 23°C)	
External Leakage Pa·m ³ /s (He)	2.8x10 ⁻¹² or less	
Cv Value (at 23°C, under pressure)	0.3	0.65
Connection Method	1/4" JXR Male Fitting	3/8" JXR Male Fitting
	1/4" JXR Female Fitting	3/8" JXR Female Fitting
	1/4" Double Ferrule Fitting	3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed)	
	NO Type (Normally Open)	
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	
Weight kg	0.3 *2	0.7 *2
Durability	Results: 30 million cycles or more *3	
Option	With Open/Close Detection Sensor	

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

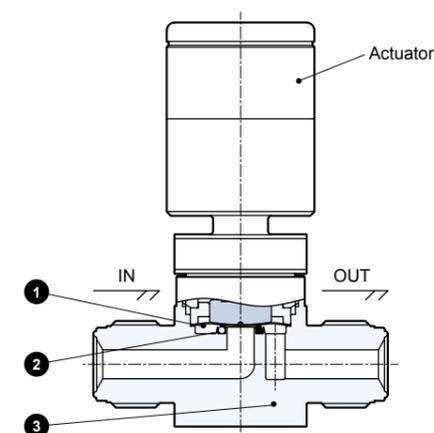
*2: Values for AGD11R-HDF-4RM (1/4" JXR male fitting) and AGD21R-HDF-6RM (3/8" JXR male fitting).

*3: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

AGD□□R-HDF Series

Internal Structure Diagram, Materials, and External Dimensions

Internal Structure Diagram and Materials



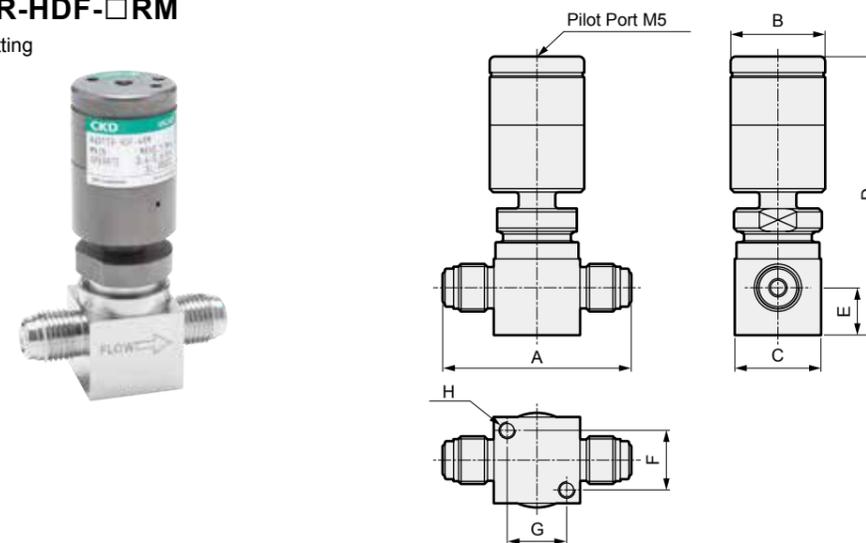
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PFA
3	Body	SUS316L

External Dimensions

AGD□□R-HDF-□RM

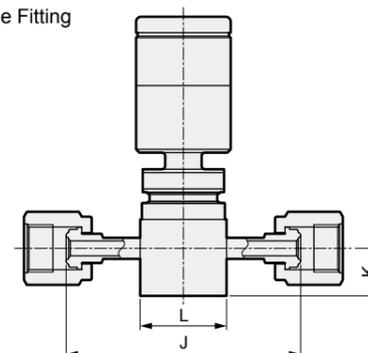
●JXR Male Fitting



Model No.	A	B	C	D	E	F	G	H	I
AGD1□R-HDF-4RM	57	∅28.5	□26	84	14.3	18	18	2-M5 Thread Depth 6	M5
AGD2□R-HDF-6RM	76	∅38	□34	104	16	20.2	20.2	2-M5 Thread Depth 8	M5

AGD□□R-HDF-□R

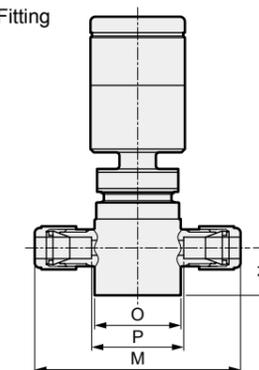
●JXR Female Fitting



Model No.	J	K	L
AGD1□R-HDF-4R	70.6	14.3	□26
AGD2□R-HDF-6R	83	16	□34

AGD□□R-HDF-□S

●Double Ferrule Fitting



Model No.	M	N	O	P
AGD1□R-HDF-4S	62	14.3	□26	27.8
AGD2□R-HDF-6S	80	16	□34	44.3



Process Gas Valve, High Durability Type

AGD21R-A Series

● High temperature limited specifications



Special Specifications

Model No. Notation Method

AGD21R - A - 6RM

Model No.

① Connection Method

① Connection Method

Code	Content
6RM	3/8" JXR Male Fitting
6R	3/8" JXR Female Fitting
6S	3/8" Double Ferrule Fitting

Specifications

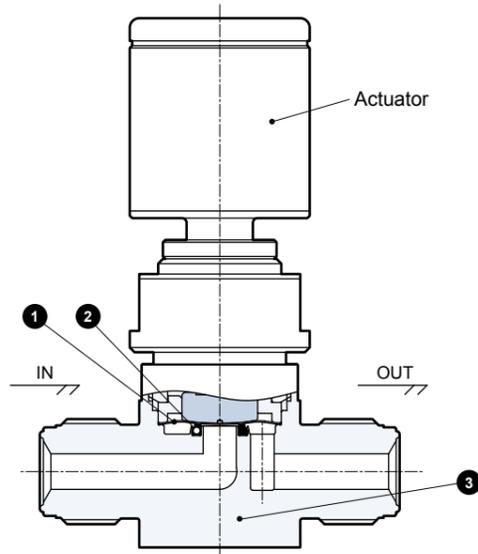
Item	AGD21R-A
Applicable Fluid	Inert gas / Process gas
Operating Pressure Pa (abs) - MPa (G)	1.3x10 ⁻⁶ to 0.5
Fluid temperature °C	150 to 200 *1
Operating Ambient Temperature °C	20 to 150
Storage Ambient Temperature °C	-10 to 80
Valve Seat Leakage Pa·m ³ /s (He)	1.0x10 ⁻⁷ or less (at 200°C)
Valve Seat Leakage Pa·m ³ /s (He)	2.8x10 ⁻¹² or less
Cv Value (at 200°C, under negative pressure)	0.4 or more
Connection Method	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed)
Operating Pressure MPa	0.4 to 0.6
Pilot Port	M5 *2
Weight kg	0.7
Durability	Results: 100 million cycles *3

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

*2: Optional ø4 one-touch fitting available

*3: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PFA
3	Body	SUS316L

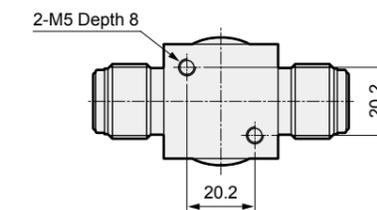
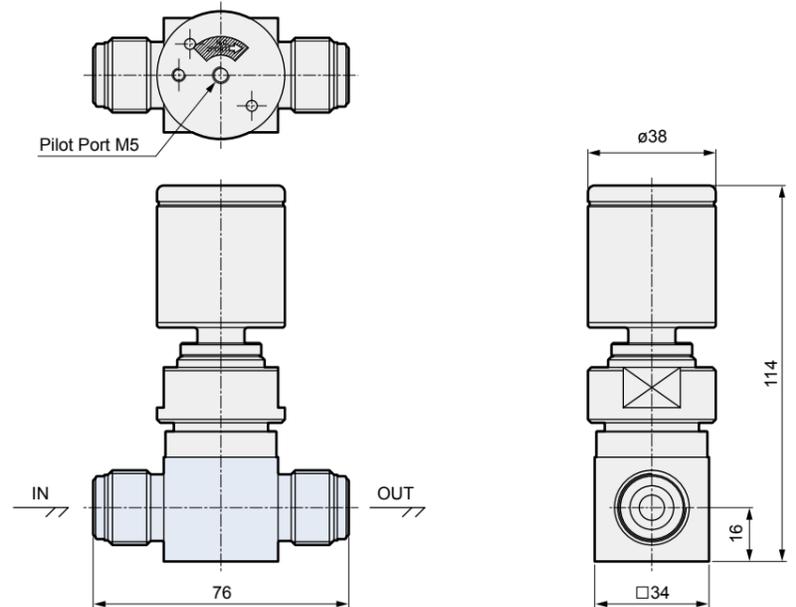
AGD21R-A Series

External Dimensions / Optional Appearance Diagram

External Dimensions

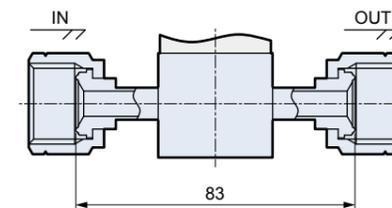
AGD21R-A-6RM

● JXR Male Fitting



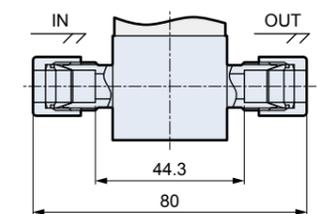
AGD21R-A-6R

● JXR Female Fitting



AGD21R-A-6S

● Double Ferrule Fitting



AGD21R-A Actuator Options

Optional Appearance Diagram

AGD21R-A with Sensor



■ The sensor provides an output for confirming valve operation during opening and closing.

Fiber Sensor
E3NX-FA Series (OMRON)

Special Specifications



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: Process Gas Valve High Durability Type AGD□□R-HD/HDF & AGD21R-A Series

Design / Selection

1. Confirmation of Specifications

Warning

- This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.
- Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.
- 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. Securing Space

Caution

- Secure sufficient space for maintenance and inspection.

4. 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.

5. Purging

Caution

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

6. During Use

Warning

- 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.
- Pay attention to the bending radius of the fiber when installing the product with sensor.
- Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (<https://www.ckd.co.jp/kiki/jp/>) → "Model No." [Instruction Manuals](#)

MEMO

AGD

OGD

MGD

LGD

High Durability

Other Gas Components

Regulator

PGM

IAGD

AVB

MVB

IAVB

Vacu Press Control Sys

Ending