Fujikin

MINUCON®

Diaphragm-Type Mini Control Valves

MINUCON are pneumatically operated control valves which embody the full manufacturing strength of Fujikin. Their precise control and reliable operation make them suitable for precision flow control in various research experiments and process lines. The Cv value can accommodate a wide range, from 0.0000015 to 5.

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Main Features

Use of a positioner achieves precise control with hysteresis of 1.5% or less (2% or less for Cv values of less than 0.00025)

⑥ Highly sensitive diaphragm actuator for superior control performance

⑤ Compact design using multi-spring system (M3-type)

④ The gland has a double seal of PTFE packing and fluororubber O-ring

② The inner valve is made of SUS316 + BISHILITE® cladding for excellent wear resistance.

① Accommodates a wide range of Cv values from 0.0000015 to 5

③ Forged stainless steel (SUSF316) body which is also compatible with Ministry-certified high-pressure gas products

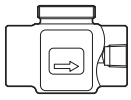
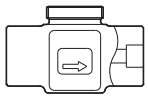
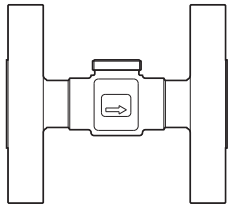
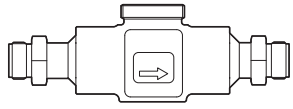
*Note that due to product improvements, materials used and dimensions may change without notice.

Specifications

Main Body

1 Body

- Available in three pressure classes: 14.7 MPa, 29.4 MPa and 49 MPa; the globe type is standard.
- The standard material is SUSF316.
- Compatible with Ministry-certified high-pressure products.

Connection Type	Threaded (Rc)	Socket Weld	Flange (JIS)	Flange (ANSI, JPI)	Other (inquire for details)
Diameter	1/4B, 3/8B, 1/2B, 3/4B, 1B		10 A, 15 A 20 A, 25 A	15 A, 20 A, 25 A	UJR fitting connection (metal gasket-type) 
*1 Pressure Class (Design Pressure)	14.7 MPa, 29.4 MPa, 49 MPa		10 K, 20 K, 30 K 40 K, 63 K	150, 300, 600 900, 1500	
Shape (Globe-Type)			 *2		Two compression ring-type connection 

*1 The maximum operating pressure varies depending on the temperature. Please check the Temperature-Pressure Rating (p. 10).
*2 For flange connections, Fujikin manufactures RF- and RJ-types.

2 Bonnet Types

- The standard type has a union bonnet structure, and all wetted parts are made of SUS316.
- Gaskets are made of metal (SUS316).
- If the Cv value is 0.7 or more and the fluid is liquid or steam, a guided stem is required.
- The high-temperature type is equipped with a heat dissipation fin and can handle fluids up to 500°C.
- The low-temperature type has an extension structure that prevents the gland from overcooling and can be used with liquid hydrogen (-253°C).

Bonnet Types		Operating Temperature Range	
		Cv value of 0.7 or more	Cv value of 0.5 or less
Standard Types	PTFE Gland Packing	–25 to +150 ˚C	–50 to +150 ˚C
	C-PTFE Gland Packing	–25 to +230 ˚C	–50 to +230 ˚C
High-Temperature Type (Bonnet with Heat Dissipation Fin)		–25 to +500 ˚C	–50 to +500 ˚C
Low Temperature Type (Extension Bonnet)		–253 to +150 ˚C	

3 Gland Construction

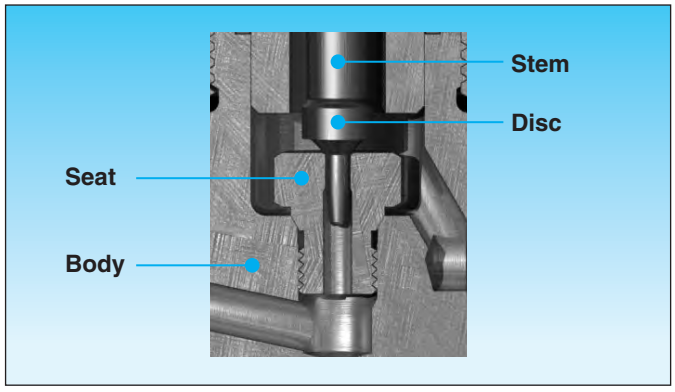
- The M3 type comes standard with a double seal consisting of a PTFE V-packing and a fluororubber O-ring.
- The M2 and UN types come standard with a PTFE V-packing, but they can also be fitted with a double seal structure with an O-ring.
- The packing can be made of carbon-filled PTFE (C-PTFE) for high temperatures up to 230°C.
- Bellows seals (optional, see p. 8) are also available.

4 Oil-Free Specifications

- Oxygen-free oil is supported as standard.
- Manufacture according to oil-free specifications (first-class oil-free) can also be accommodated, but a thin layer of fluorine-based grease will be applied to the O-ring and threads of the inner valve.

Inner Valve

The inner valve is threadedly connected to the body and stem and comes standard with a durable seat that allows the seat and disc to be replaced (excluding Cv value 5, low temperature ON-OFF valves).



Actuator

- **The M3 and M2 types are spring-back-type, so even if the air source is lost, the valve will operate in the fully open or fully closed position.**
- **Select the optimal actuator based on the Cv value, operating pressure, and application. See p. 12**

Positioner

- **The use of a positioner enables precise control with hysteresis of 1.5% or less (2% FS or less for Cv values of less than 0.00025).**
- **Choose from an electro-pneumatic positioner or pneumatic-pneumatic positioner, depending on the application. See p. 8**
- **The electro-pneumatic positioner is also available in a standard, pressure-resistant, explosion-proof construction (Exd II BT6); hydrogen-compatible, pressure-resistant, explosion-proof construction (Exd II B+H2T6); or intrinsically safe, explosion-proof construction (Exia II CT6).**

Usable Fluids

- **Inert gases, such as nitrogen, helium, air and carbon dioxide, and oxygen**
- **Flammable gases (hydrogen, methane, ethylene, etc.)**
- **Toxic gases (carbon monoxide, butadiene, etc.)**
- **Water, fuel oil, liquefied gas, etc.**
- **However, the following fluids cannot be used.**
  •Fluids that corrode the materials of wetted parts (body, bonnet, inner valve, gland)
  •Slurries, fluids containing solids
- **Customers who require special materials should refer to p. 8.**

Other

- **Also accommodates the installation (optional) of regulators, limit switches, solenoid valves, etc. See p. 9**

Inner Valve Specifications

Material	SUS316 + Stellite cladding (standard)		
Flow Characteristics	EQ% (Equal Percent)	Linear	ON-OFF
Cv Value	0.0000015 to 5		0.25 to 5
Rangeability	Cv value of 0.00025 or more 20:1 (standard) Cv value less than 0.00025 10:1 (standard)		
Allowable Leakage (at time of shipment) (ratio to rated Cv value)	1×10^{-4}		5×10^{-7}

Actuator Specifications

Actuator Type		M3-Type	M2-Type	UN-Type
Actuation Type		Diaphragm-Type Direct action-type/Reverse action-type		Manual
Actuator Outer Diameter		ϕ146	ϕ200	ϕ68 (handle diameter)
Supply Pressure				
	EQ% / Linear	140 kPa/240 kPa/400 kPa/ 20 to 100 kPa		
	ON–OFF	100 kPa / 400 kPa	200 kPa / 400 kPa	
Air Pipe Connection		Rc1/4		
Material				
	Yoke	ADC12	AC2A	A5052
	Cover	ADC12	AC2A	
	Diaphragm	Cloth-reinforced nitrile rubber		
	Handle			ADC12
Paint		Baked paint		
	Yoke	Silver	Silver	Silver
	Cover	Blue	Blue	
Maximum Operating Pressure		49 MPa	110 MPa	49 MPa
Ambient Temperature		–10 to +60 °C		
Rated Lift				
EQ% Linear	Cv Value 0.00015 or less	6 mm		
EQ% Linear	Cv Value 0.00025 to 3	8 mm		
EQ% Linear	Cv Value 5	10 mm		
	ON–OFF	5 mm		
Hysteresis				
	Without Positioner	15% F.S. or less		
	With Positioner	1.5% F.S. or less (2% F.S. or less for Cv values of less than 0.00025)		
Linearity				
	Without Positioner	15% F.S. or less		
	With Positioner	5% F.S. or less		

Product Number System

Product Number	Actuator				–	Main Body				–	Valve Characteristics and Cv Value Rangeability			–	Accessories
	E	M3	D	2	–	1	15	H	D	–	E	07	R2	–	V
	①	②	③	④		⑤	⑥	⑦	⑧		⑨	⑩	⑪		⑫

Actuator

	①	②	③	④	Notes
Positioner Type	None				No positioner
	P				Equipped with pneumatic-pneumatic positioner (manufactured by SIEMENS AG)
	E				Equipped with electro-pneumatic positioner (XE151-type manufactured by 3S Co., Ltd.) (Pressure-resistant explosion-proof: Exd II BT6-compliant)
	E1				Equipped with electro-pneumatic positioner (XE161-type manufactured by 3S Co., Ltd.) (Hydrogen-compatible pressure-resistant explosion-proof: Exd II B+H2T6-compliant type)
	E32				Equipped with electro-pneumatic positioner (Smart Positioner, Model 3730-2, manufactured by SAMSON K.K.) (Self-diagnostic functionality-equipped, intrinsically safe explosion-proof: Exia II CT6)
	E33				Equipped with electro-pneumatic positioner (Smart Positioner, Model 3730-3, manufactured by SAMSON K.K.) (Self-diagnostic functionality- and HART® communication-equipped)
	E53				Equipped with electro-pneumatic positioner (Smart Positioner, Model 3731-3, manufactured by SAMSON K.K.) (Self-diagnostic functionality- and HART® communication-equipped, pressure-resistant explosion-proof: Exd II CT6)
Actuator Type		M2			ϕ220 mm actuator
		M3			ϕ146 mm actuator
		UN			No actuator, manual-type
Actuation Type			None		Manual-type
			D		Direct action-type
			R		Reverse action-type
Operating Pressure (no-positioner type) Supply Pressure (with-positioner type)				None	100 kPa (ON-OFF), 20 to 100 kPa/140 kPa (EQ%, Linear)
				2	240 kPa
				4	400 kPa

Main Body

	⑤	⑥	⑦	⑧	Notes
Connection Type	1				Threaded, globe-type
	2				Flanged, globe-type
	3				Threaded, angle-type
	4				Flanged, angle-type
	5				Socket weld (SW), globe-type
	6				Socket weld (SW), angle-type
	7				Union, globe-type
	8				Union, angle-type
	9				Two compression ring-type fitting, globe-type
	0				Two compression ring-type fitting, angle-type
Pressure Class Rating Flange Marking *JPI flange product numbers: "A" → "JP."		15			14.7 MPa Type
		30			29.4 MPa Type
		50			49 MPa Type
		J1			JIS 10K
		J2			JIS 20K
		J3			JIS 30K
		J4			JIS 40K
		J6			JIS 63K
		A2			ANSI 150 (JPI 150)*
		A3			ANSI 300 (JPI 300)*
		A6			ANSI 600 (JPI 600)*
		A9			ANSI 900 (JPI 900)*
		A15			ANSI 1500 (JPI 1500)*
Gland and Bonnet Construction			None		M3-type: V-packing + O-ring M2-type, UN-type: V-packing
			W		V-packing + O-ring (M2-type, UN-type)
			B		Bellows-type
			H		High-temperature-type
			C		Low-temperature-type
Nominal Diameter				B	1/4B(8A)
				C	3/8B(10A)
				D	1/2B(15A)
				E	3/4B(20A)
				F	1B(25A)

<Product Number Display Example>
◆115HB: Rc1/4 connection, 14.7 MPa, high-temperature-type
◆2JP3BD: JPI300 15A flange connection, bellows-type

◆ When shipping products, the product number may end with #A, #B, etc. This indicates the revision history of the product specifications.

Cv Value and Valve Characteristics

	⑨	⑩	⑪	Notes
Valve Characteristics	O			ON-OFF
	E			EQ%
	L			Linear
Cv Value		01 | 40		The numbers 01 to 40 correspond to Cv values 0.0000015 to 5 (see table below).
Rangeability			R1 | R10	Product numbers R1 to R10 correspond to 10:1 to 100:1 (see table below).

Please refer to the table below for the combinations of valve characteristics, Cv value, and rangeability that can be manufactured.

<Product Number Display Example>
◆ 006: ON-OFF, CV value 0.7
◆ E15R4: EQ%, CV value 0.025, rangeability 40:1

◆ List of Cv Value Number, Rangeability, and Available Inner Valve Combinations

Valve Characteristics	ON-OFF	EQ%, Linear									
Rangeability		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
		10:1	20:1	30:1	40:1	50:1	60:1	70:1	80:1	90:1	100:1
Cv Value No.	Cv Value										
01	5	■		■	■	■	■	■	■	■	■
02	3	■		■	■	■	■	■	■	■	■
03	2	■		■	■	■	■	■	■	■	■
04	1.5	■		■	■	■	■	■	■	■	■
05	1	■		■	■	■	■	■	■	■	■
06	0.7	■		■	■	■	■	■	■	■	■
07	0.5	■		■	■	■	■	■	■	■	■
08	0.35	■		■	■	■	■	■	■	■	■
09	0.25	■		■	■	■	■	■	■	■	■
10	0.15			■	■	■	■	■	■	■	■
11	0.1			■	■	■	■	■	■	■	■
12	0.07			■	■	■	■	■	■	■	■
13	0.05			■	■	■	■	■	■		
14	0.035			■	■	■	■				
15	0.025			■	■	■	■				
16	0.015			■	■						
17	0.01			■	■						
18	0.007			■	■	■	■	■	■	■	■
19	0.005			■	■	■	■	■	■	■	■
20	0.0035			■	■	■	■	■	■	■	■
21	0.0025			■	■	■	■	■	■	■	■
22	0.0015			■	■	■	■	■	■		
23	0.001			■	■	■	■	■	■		
24	0.0007			■	■	■	■	■			
25	0.0005			■	■	■	■	■			
26	0.00035			■	■	■	■	■			
27	0.00025			■	■	■	■	■			
28	0.00015		■	■	■						
29	0.0001		■	■	■						
30	0.00007		■	■	■						
31	0.00005		■	■							
32	0.000035		■	■							
33	0.000025		■	■							
34	0.000015		■	■							
35	0.00001		■								
36	0.000007		■								
37	0.000005		■								
38	0.0000035		■								
39	0.0000025		■								
40	0.0000015		■								

■ Inner valves with the combinations highlighted in blue can be manufactured.

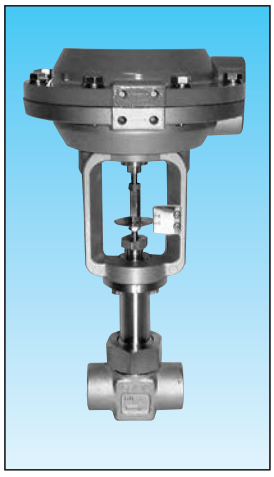
Accessories

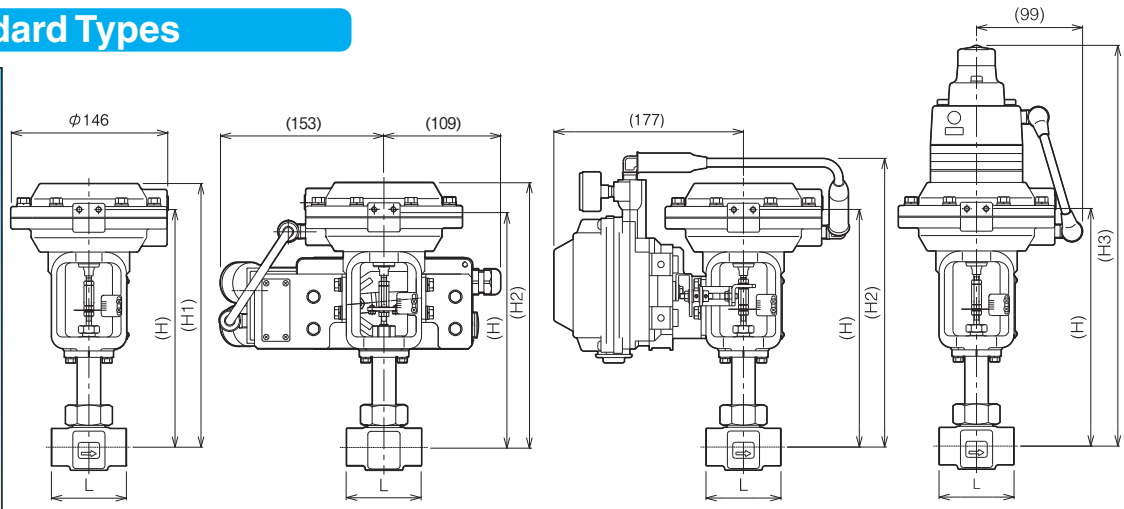
⑫	Notes
AS	Regulator
L*	Limit switch
V*	Solenoid valve
***	Special specifications (indicated by three letters)

*: Indicates separately specified accessories.

M3-Type

Standard Types



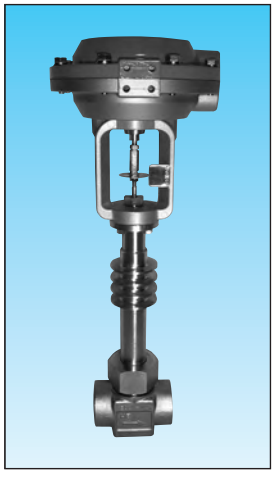


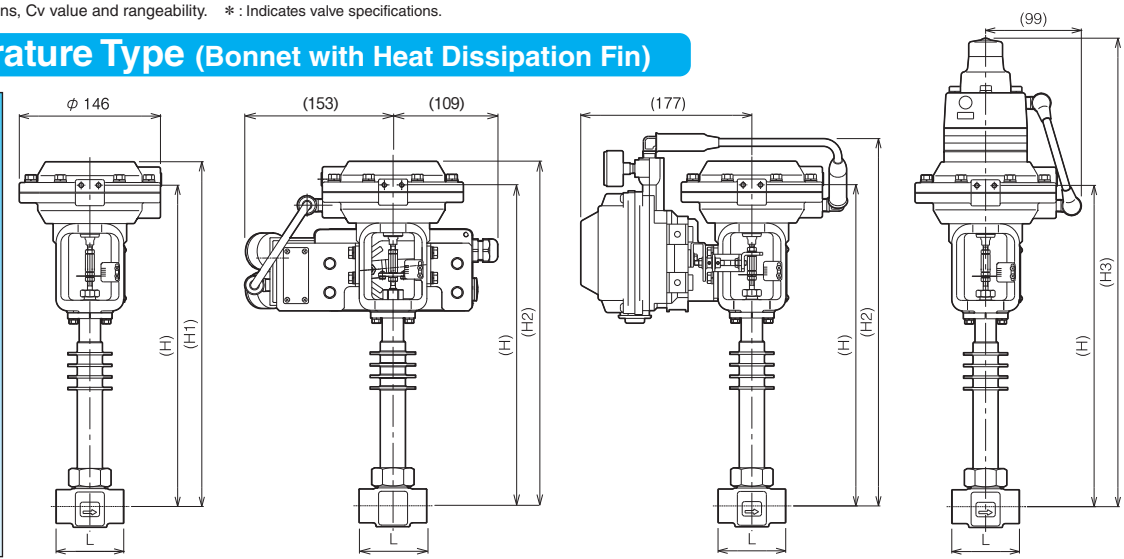
No Positioner | Equipped with Electro-Pneumatic Positioner (SAMSON K.K.) | Equipped with Electro-Pneumatic Positioner (3S Co., Ltd.) | Equipped with Pneumatic-Pneumatic Positioner (SIEMENS AG)

Common Specifications					No Positioner			Equipped with Electro-Pneumatic Positioner [(SAMSON K.K.) 3730]			Equipped with Electro-Pneumatic Positioner (3S Co., Ltd.)			Equipped with Pneumatic-Pneumatic Positioner (SIEMENS AG)		
Body Type	Body Connection	Cv Value	Dimensions [mm]		Product Number		Dimensions [mm]	Product Number		Dimensions [mm]	Product Number		Dimensions [mm]	Product Number		Dimensions [mm]
			H	L	Direct Action-Type	Reverse Action-Type	H1	Direct Action-Type	Reverse Action-Type	H2	Direct Action-Type	Reverse Action-Type	H2	Direct Action-Type	Reverse Action-Type	H3
14.7 MPa Type	Rc1/4 - 1/2	0.5 or less	222	70	M3D-115*	M3R-115*	246	E3∗M3D-115*	E3∗M3R-115*	246	EM3D-115*	EM3R-115*	270	PM3D-115*	PM3R-115*	374
	Rc1/4 - 1	0.7 or more	226	100			250			250			274			378
	SW1/4 - 1/2B	0.5 or less	222	90	M3D-515*	M3R-515*	246	E3∗M3D-515*	E3∗M3R-515*	246	EM3D-515*	EM3R-515*	270	PM3D-515*	PM3R-515*	374
	SW1/4 - 1B	0.7 or more	226	110			250			250			274			378
29.4 MPa Type	Rc1/4 - 1/2	0.5 or less	230	80	M3D-130*	M3R-130*	254	E3∗M3D-130*	E3∗M3R-130*	254	EM3D-130*	EM3R-130*	278	PM3D-130*	PM3R-130*	382
	Rc1/4 - 1	0.7 or more	231	100			255			255			279			383
	SW1/4 - 1/2B	0.5 or less	230	90	M3D-530*	M3R-530*	254	E3∗M3D-530*	E3∗M3R-530*	254	EM3D-530*	EM3R-530*	278	PM3D-530*	PM3R-530*	382
	SW1/4 - 1B	0.7 or more	231	110			255			255			279			383
49 MPa Type	Rc1/4 - 1/2	0.5 or less	235	100	M3D-150*	M3R-150*	260	E3∗M3D-150*	E3∗M3R-150*	260	EM3D-150*	EM3R-150*	283	PM3D-150*	PM3R-150*	388
	SW1/4 - 1/2B	0.5 or less	235	110	M3D-550*	M3R-550*	260	E3∗M3D-550*	E3∗M3R-550*	260	EM3D-550*	EM3R-550*	283	PM3D-550*	PM3R-550*	388

*: Indicates the main body specifications, Cv value and rangeability. ∗ : Indicates valve specifications.

High-Temperature Type (Bonnet with Heat Dissipation Fin)



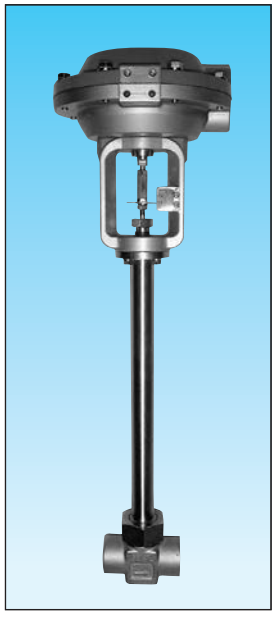


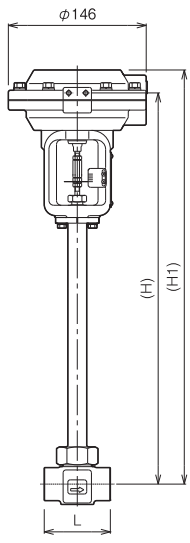
No Positioner | Equipped with Electro-Pneumatic Positioner (SAMSON K.K.) | Equipped with Electro-Pneumatic Positioner (3S Co., Ltd.) | Equipped with Pneumatic-Pneumatic Positioner (SIEMENS AG)

Common Specifications					No Positioner			Equipped with Electro-Pneumatic Positioner [(SAMSON K.K.) 3730]			Equipped with Electro-Pneumatic Positioner (3S Co., Ltd.)			Equipped with Pneumatic-Pneumatic Positioner (SIEMENS AG)		
Body Type	Body Connection	Cv Value	Dimensions [mm]		Product Number		Dimensions [mm]	Product Number		Dimensions [mm]	Product Number		Dimensions [mm]	Product Number		Dimensions [mm]
			H	L	Direct Action-Type	Reverse Action-Type	H1	Direct Action-Type	Reverse Action-Type	H2	Direct Action-Type	Reverse Action-Type	H2	Direct Action-Type	Reverse Action-Type	H3
14.7 MPa Type	Rc1/4 - 1/2	0.5 or less	332	70	M3D-115H*	M3R-115H*	356	E3∗M3D-115H*	E3∗M3R-115H*	356	EM3D-115H*	EM3R-115H*	380	PM3D-115H*	PM3R-115H*	484
	Rc1/4 - 1	0.7 or more	337	100			361			361			385			489
	SW1/4 - 1/2B	0.5 or less	332	90	M3D-515H*	M3R-515H*	356	E3∗M3Dv515H*	E3∗M3R-515H*	356	EM3D-515H*	EM3R-515H*	380	PM3D-515H*	PM3R-515H*	484
	SW1/4 - 1B	0.7 or more	337	110			361			361			385			489
29.4 MPa Type	Rc1/4 - 1/2	0.5 or less	330	80	M3D-130H*	M3R-130H*	354	E3∗M3D-130H*	E3∗M3R-130H*	354	EM3D-130H*	EM3R-130H*	378	PM3D-130H*	PM3R-130H*	482
	Rc1/4 - 1	0.7 or more	342	100			366			366			390			494
	SW1/4 - 1/2B	0.5 or less	330	90	M3D-530H*	M3R-530H*	354	E3∗M3D-530H*	E3∗M3R-530H*	354	EM3D-530H*	EM3R-530H*	378	PM3D-530H*	PM3R-530H*	482
	SW1/4 - 1B	0.7 or more	342	110			366			366			390			494
49 MPa Type	Rc1/4 - 1/2	0.5 or less	312	100	M3D-150H*	M3R-150H*	336	E3∗M3D-150H*	E3∗M3R-150H*	336	EM3D-150H*	EM3R-150H*	360	PM3D-150H*	PM3R-150H*	464
	SW1/4 - 1/2B	0.5 or less	312	110	M3D-550H*	M3R-550H*	336	E3∗M3D-550H*	E3∗M3R-550H*	336	EM3D-550H*	EM3R-550H*	360	PM3D-550H*	PM3R-550H*	464

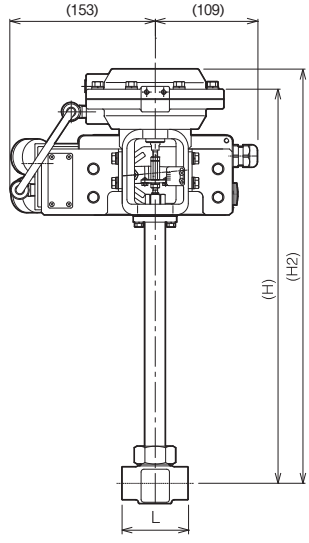
*: Indicates the main body specifications, Cv value and rangeability. ∗ : Indicates valve specifications.

Low Temperature Type (Extension Bonnet)

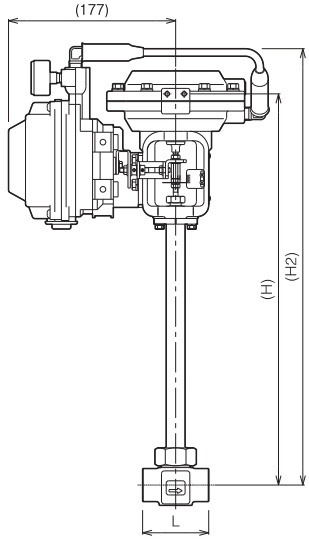




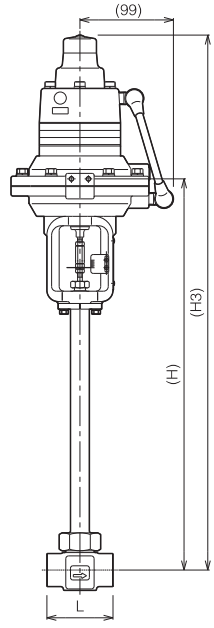
No Positioner



Equipped with Electro-Pneumatic Positioner (SAMSON K.K.)



Equipped with Electro-Pneumatic Positioner (3S Co., Ltd.)



Equipped with Pneumatic-Pneumatic Positioner (SIEMENS AG)

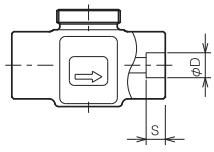
Common Specifications					No Positioner			Equipped with Electro-Pneumatic Positioner [(SAMSON K.K.) 3730]			Equipped with Electro-Pneumatic Positioner (3S Co., Ltd.)			Equipped with Pneumatic-Pneumatic Positioner (SIEMENS AG)		
Body Type	Body Connection	Cv Value	Dimensions [mm]		Product Number		Dimensions [mm]	Product Number		Dimensions [mm]	Product Number		Dimensions [mm]	Product Number		Dimensions [mm]
			H	L	Direct Action-Type	Reverse Action-Type	H1	Direct Action-Type	Reverse Action-Type	H2	Direct Action-Type	Reverse Action-Type	H2	Direct Action-Type	Reverse Action-Type	H3
14.7 MPa Type	Rc1/4 - 1/2	0.5 or less	414	70	M3D-115C*	M3R-115C*	439	E3∗M3D-115C*	E3∗M3R-115C*	439	EM3D-115C*	EM3R-115C*	463	PM3D-115C*	PM3R-115C*	567
	Rc1/4 - 1	0.7 or more	419	100			443			443			467			571
	SW1/4 - 1/2B	0.5 or less	414	90	M3D-515C*	M3R-515C*	439	E3∗M3D-515C*	E3∗M3R-515C*	439	EM3D-515C*	EM3R-515C*	463	PM3D-515C*	PM3R-515C*	567
	SW1/4 - 1B	0.7 or more	419	110			443			443			467			571
29.4 MPa Type	Rc1/4 - 1/2	0.5 or less	417	80	M3D-130C*	M3R-130C*	442	E3∗M3D-130C*	E3∗M3R-130C*	442	EM3D-130C*	EM3R-130C*	466	PM3D-130C*	PM3R-130C*	570
	Rc1/4 - 1	0.7 or more	429	100			453			453			478			581
	SW1/4 - 1/2B	0.5 or less	417	90	M3D-530C*	M3R-530C*	442	E3∗M3D-530C*	E3∗M3R-530C*	442	EM3Dv530C*	EM3R-530C*	466	PM3D-530C*	PM3R-530C*	570
	SW1/4 - 1B	0.7 or more	429	110			453			453			478			581
49 MPa Type	Rc1/4 - 1/2	0.5 or less	414	100	M3D-150C*	M3R-150C*	439	E3∗M3D-150C*	E3∗M3R-150C*	439	EM3D-150C*	EM3R-150C*	462	PM3D-150C*	PM3R-150C*	462
	SW1/4 - 1/2B	0.5 or less	414	110	M3D-550C*	M3R-550C*	439	E3∗M3D-550C*	E3∗M3R-550C*	439	EM3D-550C*	EM3R-550C*	462	PM3D-550C*	PM3R-550C*	462

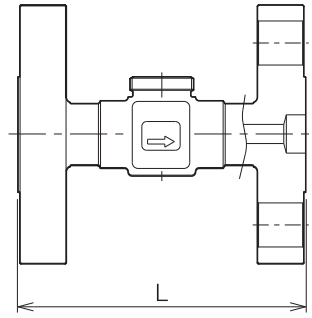
*: Indicates the main body specifications, Cv value and rangeability. ∗ : Indicates valve specifications.

SW (Socket Weld) Body Connection Dimensions

Unit [mm]

Nominal Diameter	D	S
1/4B	14.3	10
3/8B	17.8	13
1/2B	22.2	
3/4B	27.7	16
1B	34.5	





Flange-Type Body (RF-Type)

Flange Connection Body Face-to-Face Dimensions

JIS Standard Flange (L)

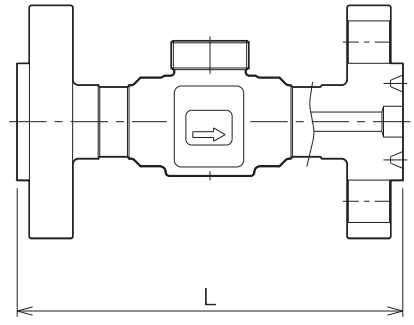
Unit [mm]

Cv Value	Nominal Pressure	RF Flange Diameter			
		10A	15A	20A	25A
0.5 or less	10 K, 20 K, 30 K, 40 K, 63 K	150			
0.7 or more	10 K, 20 K	150			
	30 K	150			180
	40 K, 63 K	150	180		

ANSI / JPI Standard Flange (L)

Unit [mm]

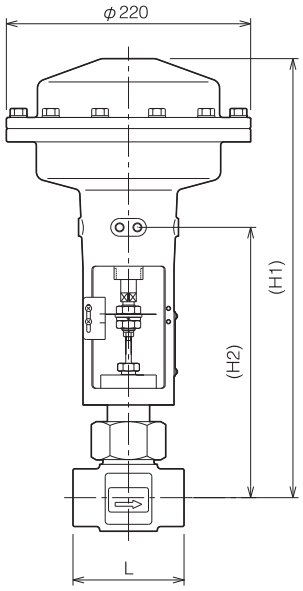
Cv Value	Class	RF Flange Diameter			RJ Flange Diameter		
		15A	20A	25A	15A	20A	25A
0.5 or less	150, 300, 600	150			150		
	900, 1500	200			200		
0.7 or more	150	150			150		
	300	150			180		
	600	180			180		
	900, 1500	200			200		



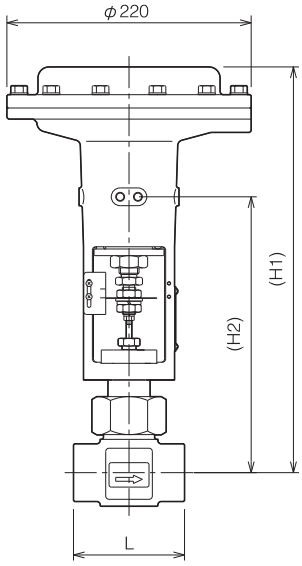
Flange-Type Body (RJ-Type)

M2-Type

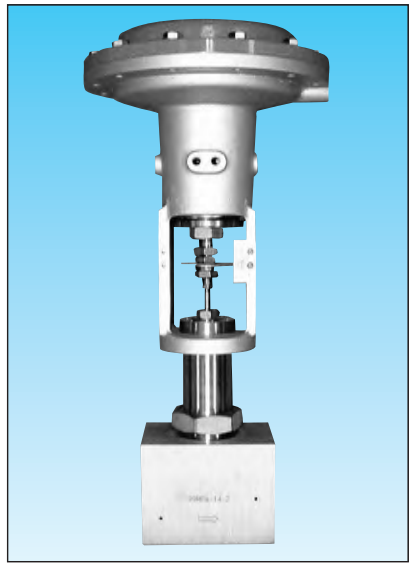
- **This is a high-power type that can handle ultra-high pressure while maintaining precise control.**



Direct Action-Type



Reverse Action-Type



110 MPa ultra-high pressure MINUCON for hydrogen equipment

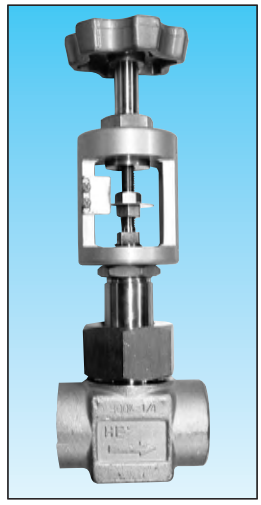
Pressure Class	Body Connection	Cv Value	Actuation Type	Product Number	Dimensions [mm]		
					H1	H2	L
14.7 MPa	Rc1/4 - 1/2	0.5 or less	Direct Action-Type	M2D-115*	396	244	70
	Rc1/4 - 1	0.7 or more			391	239	100
29.4 MPa	Rc1/4 - 1/2	0.5 or less		M2D-130*	410	258	80
	Rc1/4 - 1	0.7 or more			396	244	100
49 MPa	Rc1/4 - 1/2	0.5 or less		M2D-150*	432	280	100
14.7 MPa	Rc1/4 - 1/2	0.5 or less	Reverse Action-Type	M2R-115*	366	249	70
	Rc1/4 - 1	0.7 or more			361	244	100
29.4 MPa	Rc1/4 - 1/2	0.5 or less		M2R-130*	379	262	80
	Rc1/4 - 1	0.7 or more			366	249	100
49 MPa	Rc1/4 - 1/2	0.5 or less		M2R-150*	402	285	100

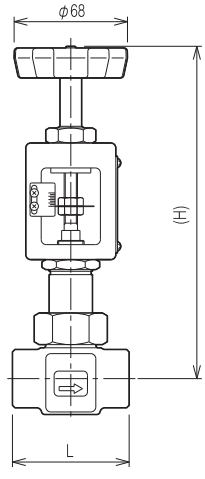
*: Indicates valve specifications.

- **Also available with P/P positioners and E/P positioners.**
- **Also available with 110 MPa ultra-high pressure MINUCON. Please don't hesitate to inquire.**

UN-Type (Manual MINUCON)

- **Ultra-precise flow control technology for manual valves.**
- **For flow rate and pressure adjustment which is difficult with conventional manual valves.**





Pressure Class	Body Connection	Cv Value	Product Number	Dimensions [mm]	
				H	L
14.7 MPa	Rc1/4 - 1/2	0.5 or less	UN-115*	200	70
	Rc1/4 - 1	0.7 or more		205	100
29.4 MPa	Rc1/4 - 1/2	0.5 or less	UN-130*	213	80
	Rc1/4 - 1	0.7 or more		216	100
49 MPa	Rc1/4 - 1/2	0.5 or less	UN-150*	234	100

*: Indicates valve specifications.

Accessories & Options

Wetted Part Material

- Products can also be manufactured using the following materials to suit the fluid you will be using.
- Please feel free to contact us regarding other materials.

1 Body

SUS316L, nickel alloy (Hastelloy B-2, C-22, C-276-equivalent), zirconium, titanium, titanium alloys, etc.

2 Inner Valve

Material	Notes
SUS316L	For Cv values of 0.007 or less, Stellite® cladding will be used.
SUS630	For wear resistance when cavitation occurs (only compatible with Cv values of 0.01 or more)
Tungsten carbide + SUS316	
Nickel alloy	Only compatible with Cv values of 0.01 or more
Zirconium	
Titanium, titanium alloys	

3 Gland Packing

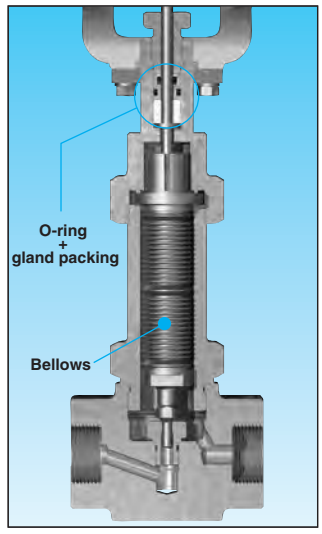
C-PTFE, PFA, and combination packings

4 O-Ring

EPDM, HNBR, Kalrez®, etc.

Bellows Seal

- Highly reliable construction of bellows seal + gland packing + O-ring.
- The stem and bellows are welded together to form a single unit.
- For applications requiring strict control, such as when using toxic gases.



Type	0.98 MPa Type	4.9 MPa Type
Design Pressure	0.98 MPa	4.9 MPa
Material	SUS316L	Inconel 718

Positioner

- Essential for precise control of control valves. Choose from pneumatic-pneumatic (P/P) or electro-pneumatic (E/P).
- If equipped with a pneumatic-pneumatic (P/P) positioner, the specified opening can be obtained by inputting an air signal. The top-mounted design saves space.
- If equipped with an electro-pneumatic (E/P) positioner, the valve operates according to an electrical signal. It is compatible with pressure-resistant explosion-proof (Exd II BT6), hydrogen-compatible pressure-resistant explosion-proof (Exd II B+ H2T6), intrinsically safe explosion-proof (Exia II CT6), etc., construction.
- Smart-type (intelligent-type equipped with a microprocessor) electro-pneumatic (E/P) positioners are also available.

*1: Indicates the operating temperature range of the positioner alone.
Ambient temperature of -10 to +60°C when attached to the valve.

(Note) Please contact us with any requests regarding operating speed (time constant).

Positioner-Equipped MINUCON® Specification List

Item	Pneumatic-Pneumatic (P/P) Positioner		Electro-Pneumatic (E/P) Positioner				
Manufacturer	SIEMENS AG		SAMSON K.K.			3S Co., Ltd.	
Model No.	73N12F (Direct action-type)	73N-B1 (Reverse action-type)	3730-2	3730-3	3731-3	XE151-SB4/F6	XE161-SB4/F6
Supply Air Pressure	140 to 400 kPa		140 to 400 kPa			140 to 400 kPa	
Input Signal	20 to 100 kPa		DC 4 to 20 mA			DC 4 to 20 mA	
Supply Pressure Connection Port	1/4NPT		1/4NPT (Optional: G1/4)			Rc1/4 (Pressure gauge connection port: Rc1/8)	
Electrical Wiring Connection Port	–		M20×1.5		1/2NPT (Optional: M20×1.5)	G1/2 (Optional: 1/2NPT)	
External Conductor Lead-in-Type	–		Conduit lead-in-type		Pressure-resistant packing-type	Conduit pressure-resistant threaded connection-type, pressure-resistant packing-type	
Ambient Temperature*1	–40 to +82 °C		–20 to +80 °C		–40 to +80 °C	–20 to +60 °C	
Hysteresis	–		0.3% F.S. or less *2			0.5 % F.S. *2	
Sensitivity *3	0.25 % F.S.		0.1 % F.S. *2			0.2 % F.S. *2	
Explosion-Proof Construction	–		Compatible with intrinsically safe explosion-proof *4 Exia II CT6	Non-explosion-proof	Pressure-resistant explosion-proof Exd II CT6	Pressure-resistant explosion-proof Exd II BT6	Hydrogen-compatible pressure-resistant explosion-proof Exd II B+H2T6
Air Consumption	7 NL / min	17 NL / min	1.83 NL / min			5 NL / min	
	Supply pressure: 140 kPa, Input signal: 63 kPa		Regardless of supply air pressure			Supply pressure: 140 kPa, Output pressure: 50%	
Mass	Approx. 1 kg		Approx. 1 kg		Approx. 2.5 kg	Approx. 2.6 kg	
Material	Aluminum die-cast		Aluminum die-cast (external exposed parts: stainless steel)			Body: Aluminum die-cast (special anodized) Cover: PBT resin (glass fiber reinforced)	
Notes	–		Smart positioner (an intelligent positioner equipped with a microprocessor)			–	
			Equipped with self-diagnostic functionality				
			–	Equipped with HART® Communication			
			Opening transmission functionality (optional)				
			Proximity limit switch (mechanical switch) (optional)		–		
			Software limit switch		Software limit switch (optional)		
Appearance							

*2: Performance of the positioner alone. *3: Indicates the precision (fineness) of the positioner lift.
*4: Unless otherwise specified, products are manufactured to be intrinsically safe and explosion-proof. Non-explosion-proof types are also available, so please contact us for details.

REMINDER	
	The supply air should be clean and free of oil and moisture. Also, the pressure should be stable.
	Using dry nitrogen gas instead of an air source may accelerate deterioration of the sealing material.

Filter-Equipped Regulators

- **The required value for the MINUCON will be set to the air supply pressure of your facility.**

		Manufacturer and Model Number	
		SAMSON K.K.	3S Co., Ltd.
Supply Pressure	240 kPa or less	4708–53	XR–104
	400 kPa		XR–108
Main Specifications	Ambient Temperature *1	–25 to +80 ˚C	–20 to +83 ˚C
	Air Connection Port	1/4NPT	Rc1/4 (Design pressure: Rc1/8)
	Filter Element	Polypropylene nonwoven cloth element: 20 µm	Polypropylene nonwoven cloth element: 5 µm
	Max. Supply Pressure	1.2 MPa	0.9 MPa
	Mass	0.48 Kg	0.26 Kg

*1: Indicates the operating temperature of the regulator alone. Ambient temperature of -10 to +60 °C when attached to the valve.

Solenoid Valve

- **Intake and exhaust of the supply air is performed electrically.**
- **When ordering, please specify what explosion-proofing construction and power supply specifications you want.**

Model No.

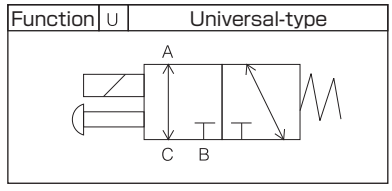
Manufacturer: Kaneko Sangyo Co., Ltd.

Explosion-Proof Construction	Model No.	
	AC 100 V	DC 24 V
General	M00U-8-A12PG	M00U-8-D12PG
d2G4	M00U-8-AE12PU	M00U-8-DE12PU
Exd II CT6	MOOU-8-E22POA-SA	

Main Specifications

Item	Details
Fluid	Clean Air
Fluid Temperature	–20 to +60 ˚C
Ambient Temperature *1	–20 to +60 ˚C
Operating Pressure	0-0.7 MPa
Air Connection Port	Rc 1/4
Cv Value	0.084

*1: Indicates the operating temperature of the solenoid valve alone. Ambient temperature of -10 to +60°C when attached to the valve.



JIS symbol

Limit Switches

- **An electrical signal is used to detect valve opening/closing.**
- **Roller lever-type actuator shape**
- **Conduit is G1/2**
- **When ordering, please specify what explosion-proofing construction and applications (fully open detection, fully closed detection, both-sides detection) you want.**

Model No.

Manufacturer: Azbil Corporation

Explosion-Proof Construction	Model No.
General/Waterproof	1LS19-JS
Exde II CT6X	1LX7001-J

***If you would like to install equipment other than those listed above, please contact us.**

Selection Guide

Selection follows the process below.

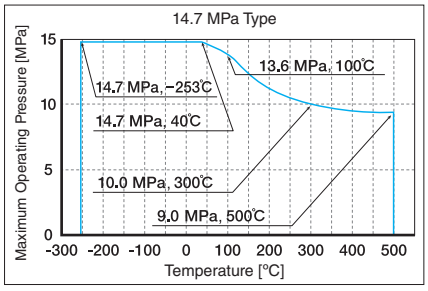
1 Complete the Detailed Order Form

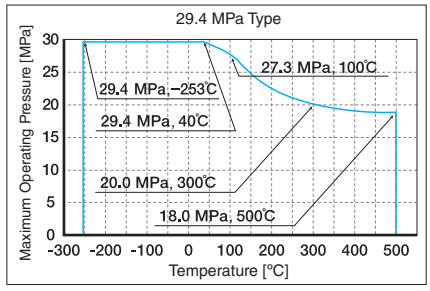
Enter the fluid requirements (fluid name, pressure, etc.), gland seal requirements, and drive unit specifications (actuation type, paint color, etc.) in the Detailed Order Form (P13).

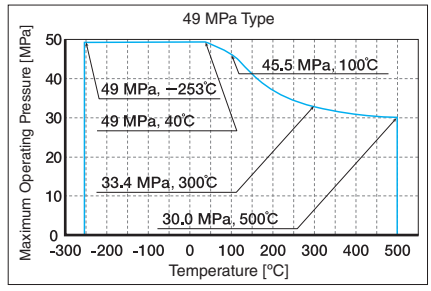
2 Check the Temperature-Pressure Rating

Check that the temperature and pressure requirements are within the rating range of the applicable standard.

- **Threaded, socket weld, union, and two compression ring-type fitting connections → Check the Temperature-Pressure Rating diagram below.**
- **Flange connection → Follow the rating table of the individual standard (JIS, JPI, ANSI).**







3 Cv Value Calculation

Calculate the Cv value for all anticipated usage requirements to determine the maximum and minimum Cv values.

- **What is Cv value?**
  Cv value is one of the capacity coefficients for valves and other equipment and is defined in the JIS standard as "a numerical value expressed in US gal/min that represents the flow rate of fresh water at a temperature of 60°F (15°C) that flows through a valve when the pressure difference is 1 LB (pound) /inch² (= 1 psi) over a specific travel (operating range)."

Cv Value Calculation Formula

Fluid \ Differential Pressure Conditions		$P_2 > \frac{P_1}{2}$	$P_2 \leqq \frac{P_1}{2}$	Explanation of Symbols
Liquid	General	$Cv=0.366Q_L\sqrt{\frac{G_L}{P_1-P_2}}$	Same as left	Q_L [m³/h]: Liquid flow rate Q_G [m³/h(normal)]: Gas flow rate under standard conditions (15 °C, 0.1013 MPa abs) Q_S [kg/h]: Steam flow rate P_1 [MPa abs]: Primary absolute pressure *2 P_2 [MPa abs]: Secondary absolute pressure *2 K_v: Viscosity correction factor *1 t[°C]: Fluid temperature G_L: Specific gravity of liquid (water = 1) G_G: Specific gravity of gas (air = 1) S [°C]: Steam superheated temp. X: Steam dryness fraction (dry saturated steam X = 1)
	High Viscosity *1	$Cv=0.366Q_LK_V\sqrt{\frac{G_L}{P_1-P_2}}$	Same as left	
Gas		$Cv=\frac{Q_G}{4140}\sqrt{\frac{G_G(273+t)}{(P_1-P_2)P_2}}$	$Cv=\frac{Q_G}{2070P_1}\sqrt{G_G(273+t)}$	
Steam	Saturated Steam	$Cv=\frac{Q_S}{197.8\sqrt{(P_1-P_2)P_2}}$	$Cv=\frac{Q_S}{98.91P_1}$	
	Superheated Steam	$Cv=\frac{Q_S}{197.8\sqrt{(P_1-P_2)P_2}}(1+0.0013S)$	$Cv=\frac{Q_S}{98.91P_1}(1+0.0013S)$	
	Wet Steam	$Cv=\frac{Q_SX}{197.8\sqrt{(P_1-P_2)P_2}}$	$Cv=\frac{Q_SX}{98.91P_1}$	

***1 For liquids with a kinematic viscosity of 20 mPa·s or more and a calculated Cv value of 0.01 or less, a viscosity correction calculation is required. Please contact us if your fluid specifications require viscosity correction.**

***2 Please use the pressure closest to the valve. If calculations are performed using pressure at a point far from the valve, large errors may occur in the calculation results due to such factors as the effects of pressure loss in the piping.**

IMPORTANT	The Cv value calculation is a standard for valve selection and should be treated as a reference value. In reality, there may be differences between the calculated result and the actual value due to specific piping and usage conditions.

4 Valve Characteristics Selection

Choose from EQ%, Linear, and ON-OFF.

◆ Linear characteristic (straight-line flow characteristic)

A characteristic in which valve lift and flow rate (Cv value) are proportional. With a linear characteristic, a 10% increase in valve stroke also increases the Cv value by 10%. Suitable for temperature control, open loop control, etc. Select this in such cases as when the differential pressure before and after the valve is almost constant or large.

◆ EQ% characteristic (equal ratio-type characteristic)

A characteristic in which the ratio of change in flow rate to a change in unit stroke is constant throughout the entire stroke. For example, if the rangeability is 20:1, the Cv value increases by approximately 35% for every 10% increase in the valve stroke, and if the rangeability is 50:1, the Cv value increases by approximately 48%. Suitable for pressure control, closed-loop control, etc. Select this in such cases as when there is a large friction loss in the piping system, when the differential pressure changes greatly depending on the valve opening, or when it is expected to be used at flow rates much smaller than the normal flow rate (with a linear characteristic, the unit sensitivity becomes very high in the small flow rate range, making it prone to instability).

5 Determine the Rated Cv Value

From the calculated maximum Cv value, select the rated Cv value taking into account the safety factor.
Multiply the maximum calculated Cv value by the safety factor according to the valve characteristics.

① ON - OFF ···· 2
② EQ % ····· 1.5
③ Linear ····· 1.2

Select a Cv value such that (Maximum calculated Cv value) x (Safety factor) < (Rated Cv value). (See the table at right for the Cv values we manufacture.)

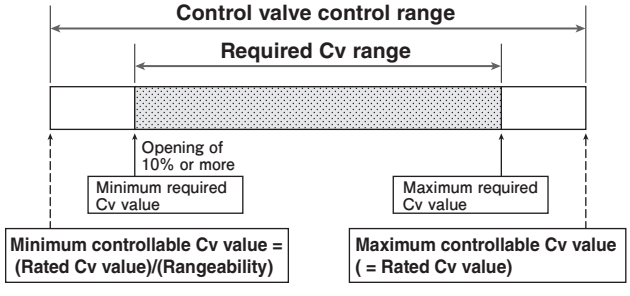
REMINDER

For customers who select a Cv value of 0.007 or less

Since discs with a Cv value of 0.007 or less have a diameter of 1 mm or less, even the smallest metal fragments can get caught between the disc and seat and cause the disc to break. Therefore, be sure to install a filter with an element of 10 µm or less in the upstream piping.

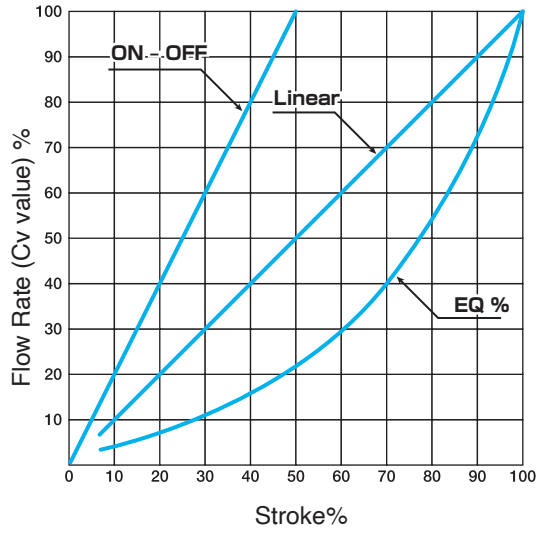
6 Determine the Rangeability

The value of (Rated Cv value)/(Minimum calculated Cv value) is the rangeability required for control. Select the minimum calculated Cv value so that it can control in the range of 10% or more of opening.
(See the table at right for the rangeability values we manufacture.)



IMPORTANT

MINUCON has tolerances for the planned Cv value for each opening. When determining the rated Cv value, please select one with some margin.



◆ ON-OFF characteristic

A characteristic of an ON-OFF valve. It is also known as quick-opening characteristic.
This characteristic allows a large flow rate to flow as soon as the valve first opens and ensures the rated Cv value at around 50% of the opening.

List of Cv Value, Rangeability, and Possible Combinations

Valve Characteristics	ON-OFF	EQ%, Linear									
Rangeability		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
		10:1	20:1	30:1	40:1	50:1	60:1	70:1	80:1	90:1	100:1
Cv Value No.	Cv Value										
01	5	■		■	■	■	■	■	■	■	■
02	3	■		■	■	■	■	■	■	■	■
03	2	■		■	■	■	■	■	■	■	■
04	1.5	■		■	■	■	■	■	■	■	■
05	1	■		■	■	■	■	■	■	■	■
06	0.7	■		■	■	■	■	■	■	■	■
07	0.5	■		■	■	■	■	■	■	■	■
08	0.35	■		■	■	■	■	■	■	■	■
09	0.25	■		■	■	■	■	■	■	■	■
10	0.15			■	■	■	■	■	■	■	■
11	0.1			■	■	■	■	■	■	■	■
12	0.07			■	■	■	■	■	■	■	■
13	0.05			■	■	■	■	■	■		
14	0.035			■	■	■	■				
15	0.025			■	■	■	■				
16	0.015			■	■						
17	0.01			■	■						
18	0.007			■	■	■	■	■	■	■	■
19	0.005			■	■	■	■	■	■	■	■
20	0.0035			■	■	■	■	■	■	■	■
21	0.0025			■	■	■	■	■	■	■	■
22	0.0015			■	■	■	■	■	■		
23	0.001			■	■	■	■	■	■		
24	0.0007			■	■	■	■				
25	0.0005			■	■	■	■				
26	0.00035			■	■	■	■				
27	0.00025			■	■	■	■				
28	0.00015		■	■	■						
29	0.0001		■	■	■						
30	0.00007		■	■	■						
31	0.00005		■	■							
32	0.000035		■	■							
33	0.000025		■	■							
34	0.000015		■	■							
35	0.00001		■								
36	0.000007		■								
37	0.000005		■								
38	0.0000035		■								
39	0.0000025		■								
40	0.0000015		■								

■ Inner valves with the combinations highlighted in blue can be manufactured.

7 Select the Actuator Type

The required size and operating pressure of the actuator are determined by the operating pressure and the selected Cv value. Select from the table below, "Cv Value and Usable Pressure."

Cv Value and Usable Pressure

◆ M3-Type Actuator — **Unit [MPa]**

		Cv Value	0.035 or less	0.05 - 0.25	0.35 - 0.5	0.7	1	1.5	2	3	5
No Positioner	ON-OFF Valve	Operating pressure 100 kPa	—	20	12	10	7	5	3	2	1
		Operating pressure 400 kPa	—	49	48	29.4	28	20	12	8	4
	Operating pressure 20 - 100 kPa	Primary pressure max. value	14.7	10	6	5	3.5	2.5	1.5	1	0.5
		Secondary pressure max. value	6	6	6	5	3.5	2.5	1.5	1	0.5
With Positioner	Supply pressure 140 kPa	Primary pressure max. value	22.5	15	9	7.5	5.3	3.8	2.3	1.5	0.75
		Secondary pressure max. value	9	9	9	7.5	5.3	3.8	2.3	1.5	0.75
	Supply pressure 240 kPa	Primary pressure max. value	45	30	18	15	10.5	7.5	4.5	3	1.5
		Secondary pressure max. value	18	18	18	15	10.5	7.5	4.5	3	1.5
	Supply pressure 400 kPa	Primary pressure max. value	49	49	36	29.4	21	15	9	6	3
		Secondary pressure max. value	36	36	36	29.4	21	15	9	6	3

For low-temperature bonnet types and those with bellows seals, select an operating pressure of 400 kPa or more if no positioner is used, and a supply pressure of 240 kPa or more if a positioner is used.

◆ M2-Type Actuator — **Unit [MPa]**

		Cv Value	0.035 or less	0.05 - 0.25	0.35 - 0.5	0.7	1	1.5	2	3	5
No Positioner	ON-OFF Valve	Operating pressure 200 kPa	—	80	48	29.4	28	20	12	8	4
		Operating pressure 400 kPa	—	90.2	90.2	29.4	29.4	29.4	24	16	8
With Positioner	Supply pressure 240 kPa	Primary pressure max. value	90.2	60	36	29.4	21	15	9	6	3
		Secondary pressure max. value	36	36	36	29.4	21	15	9	6	3
	Supply pressure 400 kPa	Primary pressure max. value	90.2	90.2	72	29.4	29.4	29.4	18	12	6
		Secondary pressure max. value	72	72	72	29.4	29.4	29.4	18	12	6

8 Check the Connection Diameter

Select the appropriate valve connection diameter based on the selected Cv value. Use the "Cv Value and Diameter Applicable Range" table to check.

Cv Value and Diameter Applicable Range

The Cv values that can be manufactured for each diameter are as follows.

Diameter	1/4B (8A)	3/8B (10A)	1/2B (15A)	3/4B (20A)	1B (25A)
Cv Value	0.7 or less	1 or less	3 or less	5 or less	5 or less

9 Select Accessories & Options

Select the necessary accessories and options.
For details, please refer to pages 8 and 9.

IMPORTANT

Incorrect selection and handling of equipment may lead to system troubles and accidents.
Therefore, when selecting equipment, please carefully consider the compatibility of each device with the system in which it will be used and the conditions of use, and make your selection at your own discretion and responsibility.
Furthermore, when handling the equipment, please be sure to understand the specifications before using.

MINUCON® Detailed Order Form

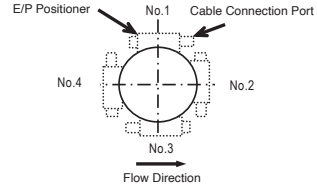
		Ordering Number	
		Instruction Number	
Customer Name		Quantity	Units
End User		Desired Delivery Date	
Equipment Used		TAG No.	
Product Number		Previously Delivered Product Serial Number	

Design Pressure [MPa G]		
Design Temperature [°C]		
Maximum Shutoff Differential Pressure [MPa]		
Connection	Type	◯ Threaded ◯ Socket Weld ◯ Flange ◯ Fitting ( ) ◯ Other ( )
	Nominal Diameter / Standard	
Type		◯ Globe ◯ Angle
Body Material		◯ SUS316 or SUSF316 (Fujikin Standard) ◯ Other ( )
Seat / Disc Material		◯ SUS316 + Stellite Cladding (Fujikin Standard) ◯ Other ( )
Bonnet Type		◯ Fujikin Standard ◯ Extension ◯ Heat Dissipation Fin-Equipped
Gland Seal Type		◯ Gland Packing + O-ring ( ) ◯ Bellows Seal
Valve Characteristics		◯ Linear ◯ EQ% ◯ ON–OFF
Cv Value		( ) ◯ Customer selection ◯ Fujikin selection
Rangeability		( ) : 1 ◯ Customer selection ◯ Fujikin selection
High-Pressure Gas Ministry Certification		◯ Required ◯ Not Required
Oil-Free		◯ No Specification (Class 2 Oil-free) ◯ Class 1 Oil-free Note) For Class 1 Oil-free, the threads of the disc and seat and the gasket are thinly coated with fluorine-based grease to prevent seizure.

Fluid Specifications

		MAX FLOW	NOR FLOW	MIN FLOW
Fluid	◯ GAS ◯ LIQ ◯ STEAM			
Flow Rate (If not listed, fill in)				
Valve Inlet Pressure [MPa G]				
Valve Outlet Pressure [MPa G]				
Valve Differential Pressure [MPa]				
Temperature [°C]				
Specific Gravity [H2O = 1, AIR = 1]				
Viscosity [mm²/s, mPa·s]				

Drive Unit Specifications

Actuation Type		◯ Direct Action (N.O) ◯ Reverse Action (N.C)
Positioner	Input Signal	◯ E/P (Electro-Pneumatic Positioner): 4 - 20 mA ◯ P/P (Pneumatic-Pneumatic Positioner): 20 - 100 kPa ◯ No Positioner (Signal Pressure 20 - 100 kPa)
	Explosion-Proof Construction	◯ Intrinsically Safe Explosion-Proof (Exia) ◯ Pressure-Resistant, Explosion-Proof (Exd) ◯ Not Required
	Explosion-Proof Standard	[ ] Ex.) T II S (Japan), ATEX (Europe), etc.
	Options	◯ Opening Transmission Functionality ◯ Self-Diagnostic Functionality, HART Communication ◯ Not Required
Supply Pressure (Operating Pressure)		[kPa]
E/P Positioner Actuator Mounting Position (Fujikin Standard is No.1)		◯ No.1 ◯ No.2 ◯ No.3 ◯ No.4
		
Paint Color	Cover	◯ Cobalt Blue: Munsell No. 10B4/10 (Fujikin Standard) ◯ Other ( )
	Yoke	◯ Silver (Fujikin Standard) ◯ Other ( )
	Paint Specifications	◯ Baked Paint (Fujikin Standard) ◯ Other ( )

Accessories

Regulator		◯ Required (3S) ◯ Not Required
Solenoid Valve (Kaneko Sangyo)		◯ General (M00U-8-A12P G) ◯ AC100V ◯ DC24V ◯ Explosion-Proof (M00U-8-AE12PU) ◯ Hydrogen-Compatible Explosion-Proof (M00U-8-E22P0A-SA) ◯ Not Required
Limit Switches (Azbil)		◯ General (1LS19-JS) ◯ Not Required ◯ Explosion-Proof ◯ Open Side ◯ Closed Side ◯ Both Open & Closed Side
Explosion-Proof Accessories (for Positioners)		◯ Pressure-Resistant Explosion-Proof Cable Gland for Positioners External diameter of cable used ( ) mm ◯ Intrinsically Safe Barrier for Positioners ◯ Not Required

Standard Test Items		Pressure resistance test using water, airtightness test using foaming liquid, valve seat leakage test, operation test, flow characteristic test (control valves only) If you have any other standard testing requirements, please write them in the Notes column. (RT testing, taking photos during testing, etc.)
Valve Seat Leakage Test Allowable Leakage (at time of shipment) Ratio to Rated Cv Value	Fujikin Standard	◯ Control Valve 1 x 10^{-4} or less ◯ ON-OFF Valve 5 x 10^{-7} or less

Notes

Important Notes about Form Completion

*1 Although we will still manufacture products even if the name of the fluid cannot be disclosed, we cannot guarantee their performance after use.

*2 The flow rate unit for gas [m³/h (normal)] is based on atmospheric pressure at 15°C (0.1013 MPa).

*3 In the Fluid Specifications section, write the requirements for MAX, NOR, and MIN FLOW in the same column.

*4 When specifying the flow rate, please select or write the units.

*5 For explosion-proof equipment, barriers and cable glands must be prepared separately.

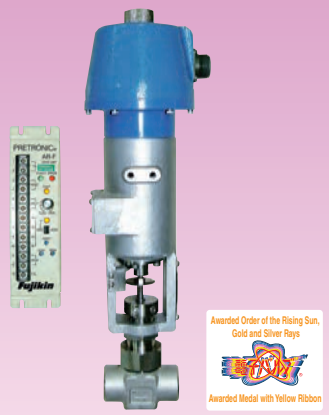
Customer Seal of Approval			Approval	Sales Representative's Seal
		Fujikin		

Other Products

SR100

Features
- Electronic valves
- Proportional solenoid-driven
- High-speed response

AR2000



Features
- Electronic valves
- Explosion-proof-compatible
- Stepping motor-driven
- High resolution 2000:1(FS)

SR100E

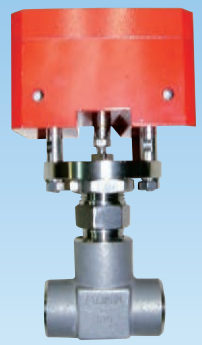
2006 3th Monodzukuri Grand Award for Parts Incentive Award

Features
- Electronic valves
- Proportional solenoid-driven
- Simplified the functions of the SR100

COSMIX™

Features
- Wetted parts made of ceramic
- Good abrasion resistance
- Excellent chemical resistance

AP・APR Series



Features
- High-pressure cylinder valve
- Compact design
- Soft seal type

PRE-UBV Series

Features
- Electric ball valve
- Open/close signal detection function

FCS® Thermal Series FCST1000

Features
- Multi-gas- and multi-range-compatible Mass Flow Controller Thermal Series
- Ultra-fast response time
- DeviceNet™ communication-compatible

FCS® Thermal Series FCST2000

Features
- High-precision Mass Flow Controller Thermal Series
- Equipped with a high-performance sensor
- Highly reliable diaphragm valve
- DeviceNet™ communication-compatible

FCS® Pressure Series

2007 4th Monodzukuri Grand Award for Parts Incentive Award

Features
- Flow Control System Pressure Series
- Control flow rate is not affected by supply pressure fluctuations
- Fast response time of 0.5 seconds or less
- DeviceNet™ communication-compatible

CAT: No.MINUE_25