Variable Secondary Pressure Flow Controller (Not subject to outlet pressure variations)

MODEL 2203 SERIES

A flow controller is a differential pressure regulator designed to control minute gas flows with precision and keep a certain constant flow rate. Model 2203 Variable Secondary Pressure Flow Controller is a control valve that keeps mass flows at a constant rate under a given constant level of supply pressure even when the load pressure on the secondary side (outlet side) fluctuates, and its construction is designed so that the performance of its precision control over flows to the set flow rate is maintained by the incorporated precision needle valve without being affected by such fluctuations.

Features

- **Stable flow control**
  A non-rotary needle valve composed of high-precision components ensures smooth control of minute flows.
- **Not subject to load pressure fluctuations**
  The incorporated precision needle valve protects flows from being affected by secondary or outlet pressure fluctuations, so the product is a 'must-be' tool in the first stage of any flow control line.
- **Cleanliness ensured**
  All the components are super-cleaned before assembly so that the product can be safely used even on instruments for analysis for which cleanliness is essential.

Applications

- Gas chromatographs
- Environmental instrumentation systems
- Gas mixing systems in various fields

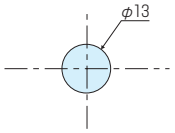
Standard Specifications

Model	2203
Flow rating	10 ML/MIN - 20 L/MIN
Control accuracy	Within ±1.0% of the set value to load pressure fluctuations (on condition of 0.05 MPa or more of inlet/outlet differential pressure)
Needle valve rotating speed for adjustment	Approx. 12-13 turns
Max. operating pressure	(A) 0.8MPa (SS) 0.95MPa
Max. working temperature	(A) 70°C (SS) 120°C
Materials of parts exposed to fluids	A: Al, Brass, POM, NBR SS: SUS 316, Viton, fluorocarbon resin
Connection end	M8+Rc1/8

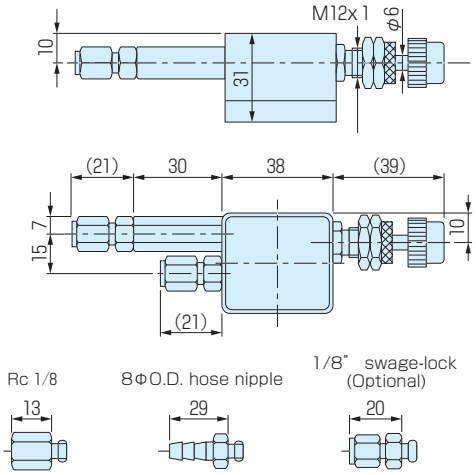
Optional Items

- IN side filter joint Model 2300B
- Connection joint

Panel cut



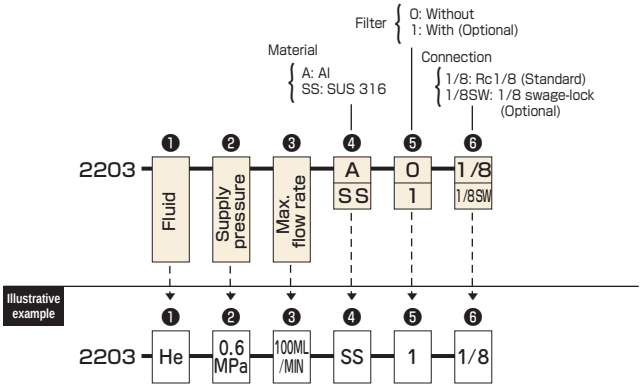
Dimensions



Notes:

- For information on available types of connection ends and filter joints other than those standard.
- You may specify the supply pressure, fluid and flow rate of your equipment for our selection of the type that most suits your requirements.
- Use the values on Table of Rated Flow Ranges for reference purposes only.

Ordering



* Refer to "Ordering" and "Illustrative Example" when placing an order or requesting a quotation. Fill in the blanks in the "Order/Quotation Request Card" at the end of the catalog, and send the card by fax.

Variable Secondary Pressure Flow Controller (Not subject to outlet pressure variations)

MODEL 2203 SERIES

A flow controller is a differential pressure regulator designed to control minute gas flows with precision and keep a certain constant flow rate. Model 2203 Variable Secondary Pressure Flow Controller is a control valve that keeps mass flows at a constant rate under a given constant level of supply pressure even when the load pressure on the secondary side (outlet side) fluctuates, and its construction is designed so that the performance of its precision control over flows to the set flow rate is maintained by the incorporated precision needle valve without being affected by such fluctuations.

Features

- **Stable flow control**
  A non-rotary needle valve composed of high-precision components ensures smooth control of minute flows.
- **Not subject to load pressure fluctuations**
  The incorporated precision needle valve protects flows from being affected by secondary or outlet pressure fluctuations, so the product is a 'must-be' tool in the first stage of any flow control line.
- **Cleanliness ensured**
  All the components are super-cleaned before assembly so that the product can be safely used even on instruments for analysis for which cleanliness is essential.

Applications

- Gas chromatographs
- Environmental instrumentation systems
- Gas mixing systems in various fields

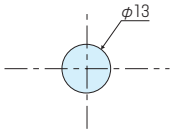
Standard Specifications

Model	2203
Flow rating	10 ML/MIN - 20 L/MIN
Control accuracy	Within ±1.0% of the set value to load pressure fluctuations (on condition of 0.05 MPa or more of inlet/outlet differential pressure)
Needle valve rotating speed for adjustment	Approx. 12-13 turns
Max. operating pressure	(A) 0.8MPa (SS) 0.95MPa
Max. working temperature	(A) 70°C (SS) 120°C
Materials of parts exposed to fluids	A: Al, Brass, POM, NBR SS: SUS 316, Viton, fluorocarbon resin
Connection end	M8+Rc1/8

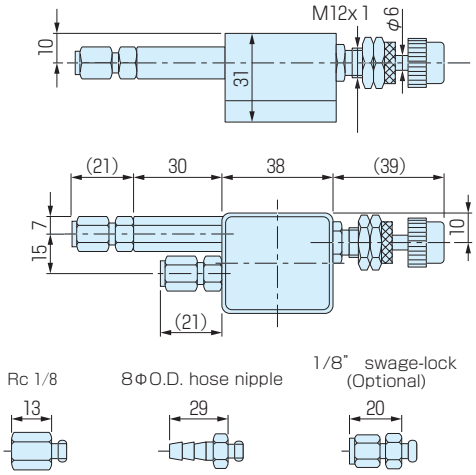
Optional Items

- IN side filter joint Model 2300B
- Connection joint

Panel cut



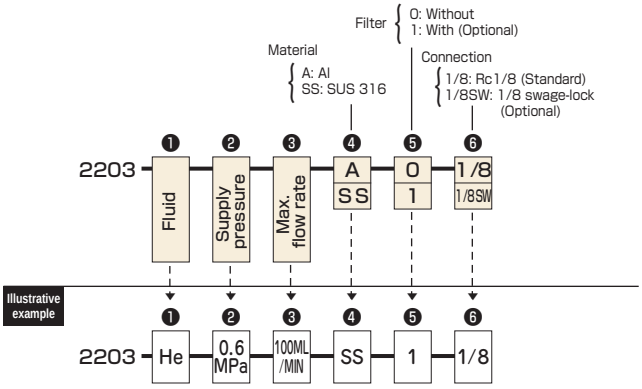
Dimensions



Notes:

- For information on available types of connection ends and filter joints other than those standard.
- You may specify the supply pressure, fluid and flow rate of your equipment for our selection of the type that most suits your requirements.
- Use the values on Table of Rated Flow Ranges for reference purposes only.

Ordering



* Refer to "Ordering" and "Illustrative Example" when placing an order or requesting a quotation. Fill in the blanks in the "Order/Quotation Request Card" at the end of the catalog, and send the card by fax.

Variable Primary Pressure Flow Controller (Not subject to supply pressure variations)

MODEL 2204 SERIES

Model 2204 Variable Primary Pressure Flow Controller is a control valve that always keeps flows at a constant rate under a given constant level of secondary pressure (outlet pressure) even when the primary pressure (inlet pressure) fluctuates. The built-in precision needle valve accurately controls flows to the set flow rate, including ultra-minute flows.

Features

- **Stable flow control**
  A non-rotary needle valve composed of high-precision components ensures smooth control of even ultra-minute flows.
- **Not subject to supply pressure fluctuations**
  Flows are protected from being affected by primary pressure (supply pressure) fluctuations, under a given constant level of secondary pressure (outlet pressure).
- **Cleanliness ensured**
  All the high-precision components are super-cleaned before assembly so that the product can be safely used even on high-sensitivity instruments for analysis for which cleanliness is essential.

Applications

- Physical and chemical appliances
- Control of the second-stage operation of pumps
- Various instruments for analysis
- Environmental instrumentation systems

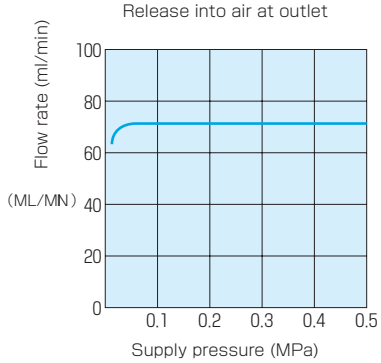
Standard Specifications

Flow rating	10 ML/MIN - 10 L/MIN
Control accuracy	Within ±2% of the set flow value to pressure fluctuations in a range of 0.3 MPa when the primary pressure (input pressure) varies between 0.07 MPa and 0.8 MPa.
Regulating screw rotating speed	12-13 turns
Max. operating pressure	0.8MPa
Max. working temperature	(A) 70°C (SS) 120°C
Materials of parts exposed to fluids	A: Al, Brass, POM, NBR, SUS 316 SS: SUS 316, Viton, fluorocarbon resin
Connection end	Rc1/8 (M8+Rc1/8)

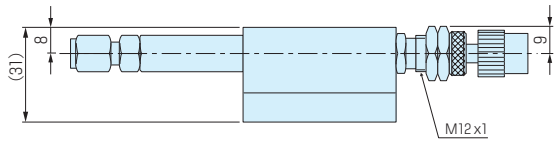
Optional Items

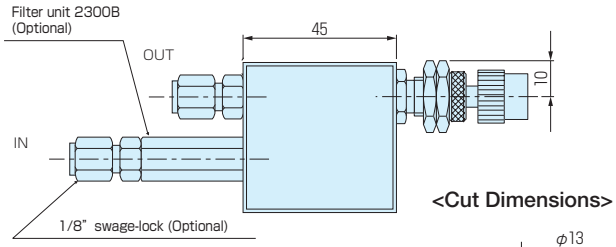
- IN side filter joint Model 2300
- Connection joint

Control Characteristic Curve



Dimensions





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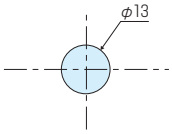
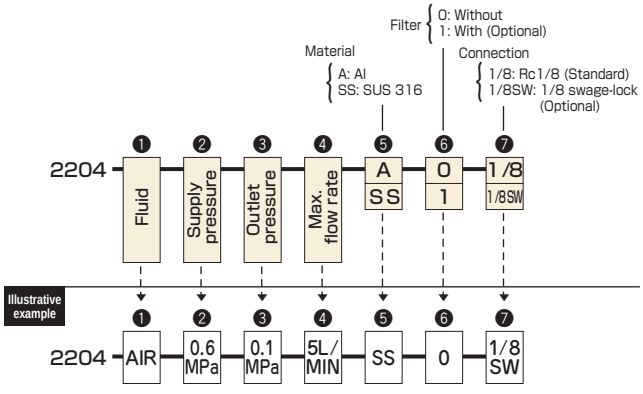


Notes:

- You may specify the fluid, pressure and flow rate of your equipment for our selection of the type that most suits your requirements. Use the values on Table of Rated Flow Ranges for reference purposes only.
- At least an inlet/outlet pressure difference of 0.07 MPa is required.

Ordering



* Refer to "Ordering" and "Illustrative Example" when placing an order or requesting a quotation. Fill in the blanks in the "Order/Quotation Request Card" at the end of the catalog, and send the card by fax.

Simplified Panel-mount Miniature Needle Valve
MODEL 2400 SERIES

This is a miniature needle valve at an affordable price with simplified construction that allows easy control of operation for fine regulation of gases and liquids. Its simplified structure is comprised of the components that are the minimum requirement, avoiding overspecification.

Features

- **Panel-mount miniature type**
  Compact, space-saving, and ideal for mounting on the instrumentation board
- **Compatible with both gases and liquids**
- **All precision-machined components are perfectly cleaned before assembly to ensure cleanliness of the product for the customer's use with peace of mind.**

Applications

- For flowmeters and pressure gauges
- For pollution-related instruments and analyzers
- For gas/liquid flow controls at laboratory
- For integration into instrumentation boards
- For sampling systems

Standard Specifications

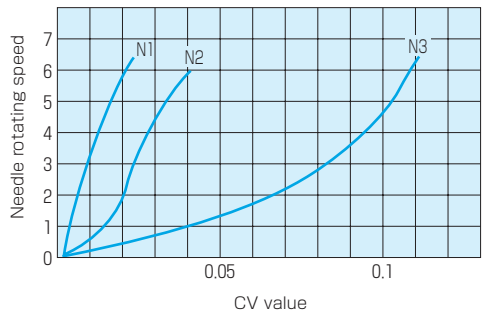
Regulating screw rotating speed	Approx. 12 turns (Effective turns: 5-12)
Type of needle	Three types
Max. operating pressure	0.6MPa
Materials of parts exposed to fluids	B: Brass, NBR, SUS 303, POM S: SUS 304, Viton, SUS 303, fluorocarbon resin
Connection end	Rc1/4
Flow rating	See the table below.

Table of Rated Flow Ranges (Reference)

Due to operating conditions and instrumental errors, there may be differences between the values indicated in this table and those that are actually used by the customer. Please use these values for reference only.

Needle #	Max. CV value	Supply pressure (MPa)(Air at 20°) 0.01	0.05	0.1	0.2	0.3	Supply pressure (MPa)(Water at 20°) 0.05	0.1	0.15
N1	0.018	1.6	5.0	7.5	12.0	15.0	0.16	0.24	0.31
N2	0.03	3.8	9.0	13.0	21.0	27.0	0.26	0.42	0.86
N3	0.13	12.0	31.0	55.0	90	120	1.2	1.8	2.5

CV Values

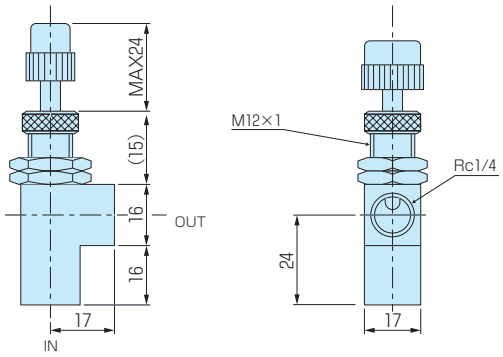


Notes:

- Refer to Model 2400D on page 109 for large capacity valve.
- If you are not sure which needle you should use for your equipment, please indicate the fluid, pressure and flow rate of your equipment on the Order Form. We can suggest you the needle number most suitable for your equipment.
- Connection openings not included in the standard specifications.

Dimensions

<2400L>



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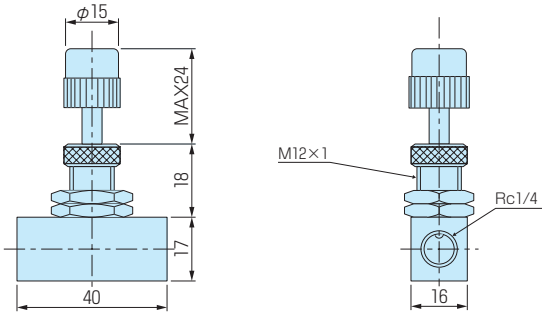

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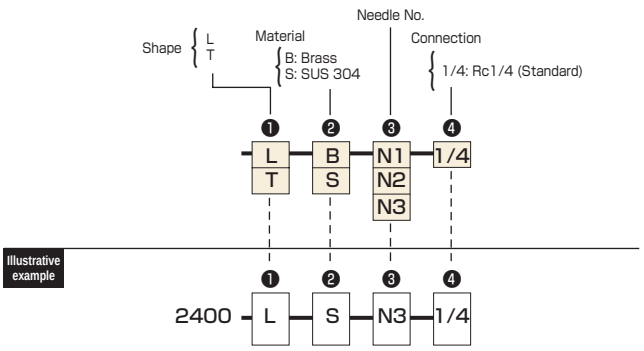


* Refer to "Ordering" and "Illustrative Example" when placing an order or requesting a quotation. Fill in the blanks in the "Order/Quotation Request Card" at the end of the catalog, and send the card by fax.

Multiple Rotation Type Large Capacity Simplified Needle Valve
MODEL 2400D SERIES

Of all our products with a very small flow controlling function, this is a comparatively large flow control valve. This is a low-cost needle valve with a simple structure.

Features

- Precision machining ensures satisfactory control characteristics.
- In comparison with commercial simplified types, the number of revolutions of this needle valve is a maximum of 12 revolutions, permitting very smooth flow control.

Standard Specifications

Number of adjusting screw revolutions	Approx. 8–10 revolutions
Types of needle	2 types
Max. operating pressure	1MPa
Materials of parts in contact with fluids	(A) Al, Brass, NBR, POM, SUS303 (S) SUS304, Viton®, SUS303, fluorocarbon resin
End connection	Rc3/8 Rc1/4
Flow rating	See the table below.

Flow rating (Reference table)

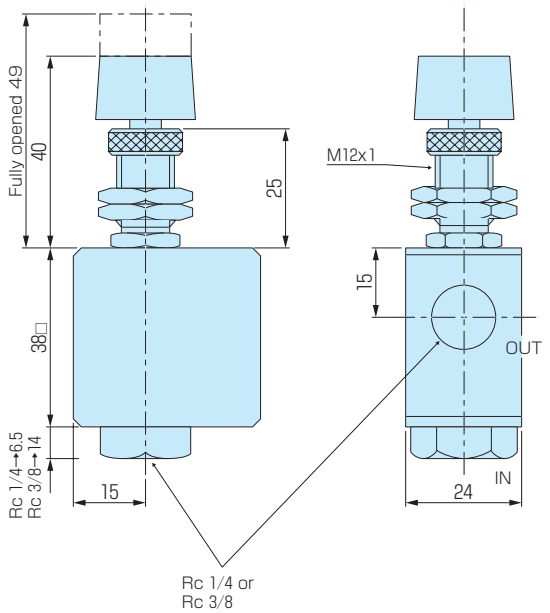
The actual flow may be different from the values shown in the table depending on the operating conditions and instrument errors. Please use these values for reference only.

Outlet side open to Air at 20°C

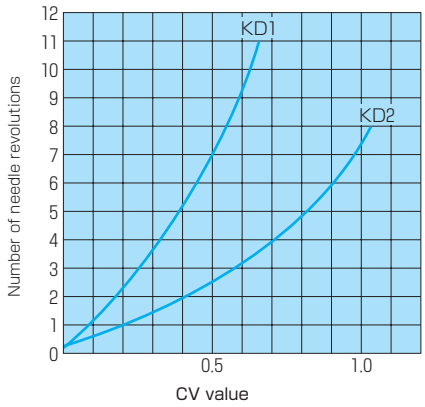
Needle No.	Max. CV value	Supply pressure (MPa)				
		0.01	0.05	0.1	0.2	0.3
KD1	0.68	70	215	295	440	—
KD2	1.0	85	280	400	—	—

Unit: L/MIN

Dimensions



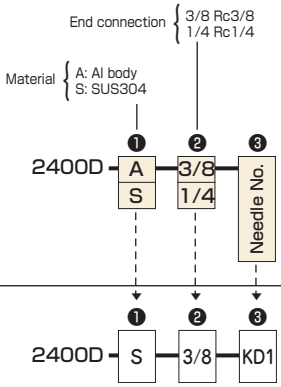
CV value



Purchasing

- Refer to Model 2400 on page 106 for control of small flow.
- If you find it difficult to select a needle number, advise us of the name of the fluid, pressure, and flow, and we will select an appropriate valve.

Ordering



* Refer to “Ordering” and “Illustrative Example” when placing an order or requesting a quotation. Fill in the blanks in the “Order/Quotation Request Card” at the end of the catalog, and send the card by fax.

Precision Needle Valve w/Non-rotary Needle
MODEL 2412 SERIES

This needle valve has been designed to control minute gas and liquid flows with precision and ease. Design allows the rotation of the regulating screw to transform into linear motion of the needle without subjecting the needle to gaps and/or vibrations produced by the screw, so smooth, stable flows can be ensured.

2412L 2412T

Features

- **Capable of controlling ultra-minute flows**
  Very accurate, stable control of ultra-minute flows up to 1 ML/MIN possible
- **Wide variations of needle type**
  15 types of needles are available for your choice of the type that best suits your needs.
- **Needle of non-rotary structure**
  Because this valve is constructed so that the rotation of the regulating screw is transformed into linear motion of the needle, the valve has a longer life in addition to superior control performance.
- **Superior temperature characteristic (15-35°C)**
  The valve counts on an outstanding temperature characteristic (flow fluctuations remain within an insignificant range of 0.3%/°C to ambient temperature variations) thanks to the temperature compensation system incorporated in the valve's needle and orifice. This temperature compensation system is a utility model of KOFLOC registered at the United States Patent and Trademark Office. (Optional specification for needles #SS1 to #3B-BS)
  This temperature compensation system is applicable to gases only, and not to liquids, because the viscosity of a liquid may fluctuate depending upon the temperature conditions.

Applications

- **For accurate control of minute flows of gases and liquids**

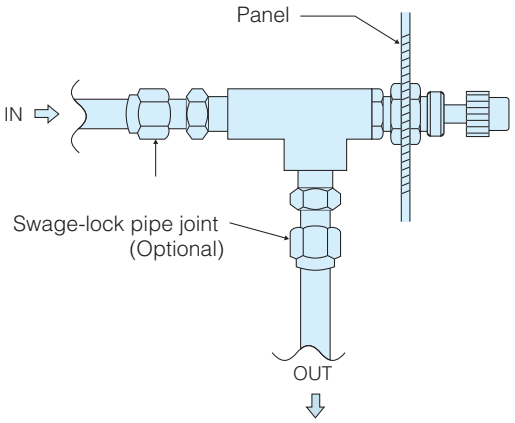
Standard Specifications

Rated flow ranges	See Table of Rated Flow Ranges on page 103.
Rotating speed	Approx. 12 turns
Max. operating pressure	1.0MPa
Max. operating temperature	(B) 70°C (SS) 120°C
Materials of parts exposed to fluids	B: Brass, POM, NBR SS: SUS 316, Viton, fluorocarbon resin
Fluids	Gasses and liquids
Connection opening	Rc1/4 (Standard)

Optional Specifications

- **Connection opening**
- **Materials not included in the standard specifications**

Layout Example with Model 2412



Dimensions

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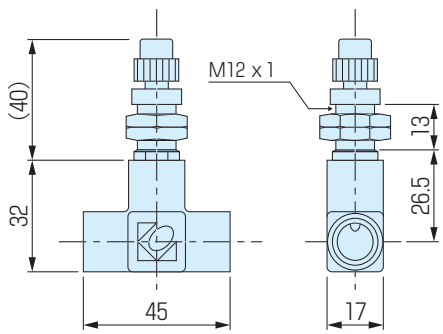

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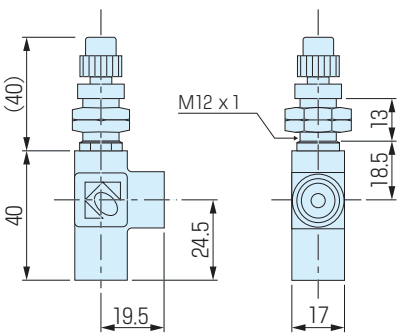

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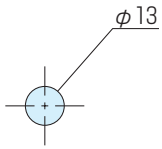


Table of Rated Flow Ranges (Reference)

Due to operating conditions and instrumental errors, there may be differences in the range of 80% to 130% between the values indicated in this table and those that are actually used by the customer. Please use these values for reference only.

Flow rate when the outlet valve is totally opened to release flows into air

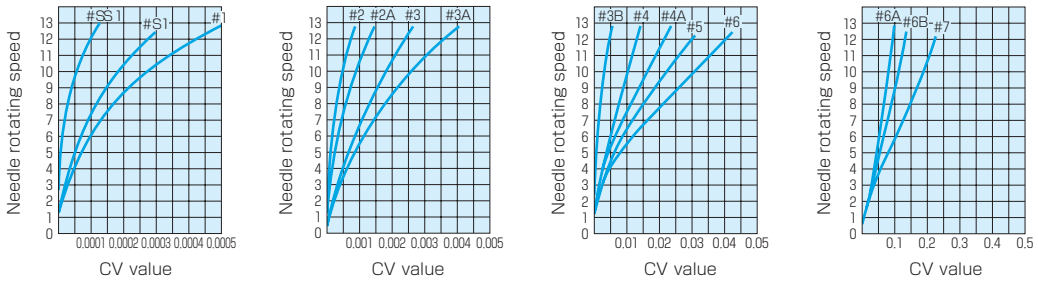
Needle #	Supply pressure (MPa) (Air at 20℃)							Supply pressure (MPa) (Water at 20℃)		
	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.05	0.1	0.15
#SS1	0.023	0.047	0.078	0.11	0.15	0.19	0.22	—	—	—
#S1	0.08	0.11	0.20	0.27	0.34	0.40	0.47	—	—	—
#1	0.15	0.23	0.36	0.51	0.65	0.79	0.93	0.00145	0.0026	0.0036
#2	0.34	0.46	0.71	1.0	1.2	1.5	1.75	0.0076	0.012	0.0153
#2A	0.45	0.65	1.0	1.3	1.65	2.0	2.3	0.0132	0.0195	0.0245
#3	0.9	1.3	2.0	2.6	3.25	3.9	4.6	0.0260	0.0390	0.0510
#3A	1.25	1.9	2.75	3.65	4.5	5.3	6.4	0.0365	0.0546	0.0740
#3B	1.85	2.5	3.7	5.0	6.0	7.2	8.3	0.053	0.0760	0.0980
#4	4.3	6.2	9.0	12.0	15.0	18.3	22.0	0.124	0.188	0.234
#4A	8.0	11.0	15.0	21.0	26.0	31.0	36.0	0.228	0.336	0.417
#5	10.0	14.0	21.0	27.0	33.0	40.0	46.0	0.294	0.435	0.576
#6	22.0	31.0	45.0	60.0	75.0	92.0	105.0	0.564	0.834	1.100
#6A	30.0	41.0	60.0	80.0	100	118	138	0.774	1.190	—
#6B	38.0	53.0	82.0	106	135	160	185	1.280	1.950	—
#7	80.0	110	160	215	260	285	310	1.840	2.890	—

(L/MIN)

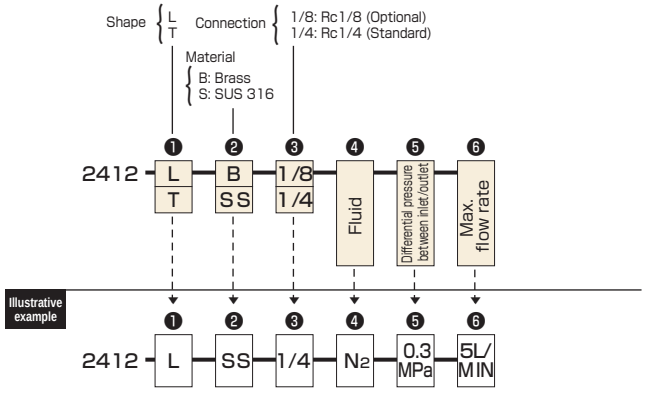
* Due to operating conditions and instrumental errors, there may be differences between the values indicated in the table above and those that are actually used by the customer.
* The values shown in the table above are data for Model 2412L for illustrative purposes only. As compared with the 2412L, flows on the 2412T will run less smooth when the flow rate increases. It is therefore recommended that the 2412L be used for flows of 5 L/MIN or more.

CV Values

Needle #	Max. CV value
#SS1	0.00012
#S1	0.00028
#1	0.00058
#2	0.0012
#2A	0.0016
#3	0.0033
#3A	0.0048
#3B	0.0063
#4	0.016
#4A	0.028
#5	0.035
#6	0.078
#6A	0.10
#6B	0.13
#7	0.28



Ordering



* Refer to “Ordering” and “Illustrative Example” when placing an order or requesting a quotation. Fill in the blanks in the “Order/Quotation Request Card” at the end of the catalog, and send the card by fax.

Notes:

- For large flows, please refer to Model 2412D (page 108).
- We can suggest you the needle most suitable for your equipment if the pressure, fluid, flow rate and other operating conditions of your equipment are known. Please use the above table for reference only.
- Connection openings not included in the standard specifications.

Large Capacity Precision Needle Valve (for Stable Control)
MODEL 2412D SERIES

This large capacity needle valve exhibits high performance in precision control of comparatively large flow. The needle valve is a larger version of our precision needle valve (Model 2412) that has time-tested reliability, and is suitable for stable control in a comparatively large flow range of 50–300 l/min (0.1 MPa).

Features

- The rotational motion of the flow control screw is changed into a linear motion to ensure smooth flow control without causing a screw gap.
- The completely clean inside of the valve permits clean flow control.
- Special grease is used for the section not in contact with liquid to ensure outstanding durability.

Standard Specifications

Number of adjusting screw revolutions	Approx. 8–12 revolutions
Type of needle	3 types
Max. operating pressure	1MPa
Materials of parts in contact with fluids	(A) Brass, Al, NBR, POM (SS) SUS316, Viton®, fluorocarbon resin
End connection	Rc3/8 Rc1/4
Flow rating	See the table below.

Flow rating (Reference table)

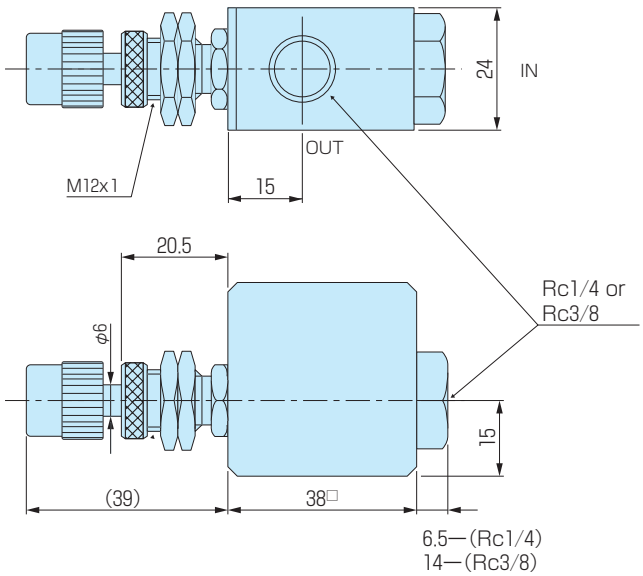
The actual flow may be different from the values shown in the table depending on the operating conditions and instrument errors. Please use these values for reference only.

Outlet side open to air at 20°C

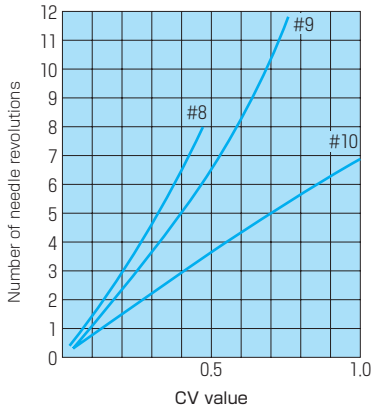
Needle No.	Max. CV value	Supply pressure (MPa)				
		0.01	0.05	0.1	0.2	0.3
#8	0.48	50	135	200	280	370
#9	0.83	65	235	320	480	—
#10	1.06	80	300	440	—	—

Unit: L/MIN

Dimensions



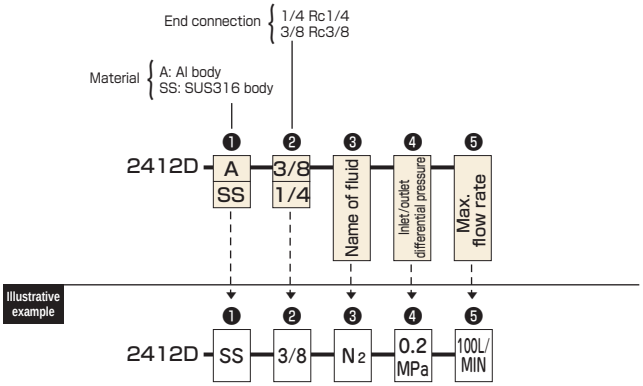
CV value



Purchasing

- Refer to Model 2412 on page 102 for control of very small flow.
- If you find it difficult to select a needle number, advise us of the name of the fluid, pressure, and flow, and we will select an appropriate valve.

Ordering



* Refer to “Ordering” and “Illustrative Example” when placing an order or requesting a quotation. Fill in the blanks in the “Order/Quotation Request Card” at the end of the catalog, and send the card by fax.

Multidial Type Precision Needle Valve (Ideal for restriction of flows by dial control operation)

MODEL 2412M SERIES

This is an enhanced model of the KOFLOC Precision Needle Valve Model 2412 (see page 102), which now incorporates a multidial that allows the user to set desired flow rates by dial operations. This valve makes the most of the rotation-to-flow linearity and repeatability performance of the 2412 needle.

Features

- Since a precision needle valve usually has superior flow characteristics and repeatability, it can be used in place of a needle valve flowmeter.
- Wide variations are available for both the needle valve (Type T, Type L, and so on) and the multidial (Standard Type, Round Type, and so on).
  Note: No scale calibration is required for the multidial.

Applications

- Detection of deteriorated filters
- Substitute for a flowmeter
- Detection of fluctuations of flow path resistance

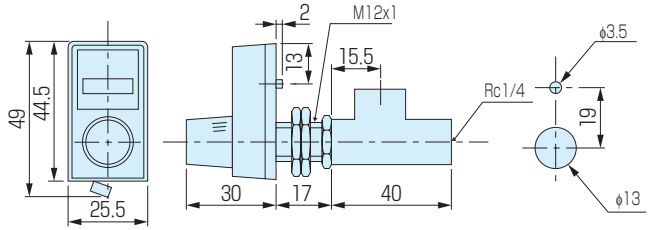
Standard Specifications

Regulating screw rotating speed	Multidial: 10 turns (Overscale possible)
	Needle valve: Approx. 12 turns
Multidial scale	3-digit setting (000-999)
Multidial type	A: Standard multidial B: Round multidial
Connection end	Rc1/4; Rc1/8 (Optional)
Flow rating	See Table of Rated Flow Ranges for Model 2412 on page 103.

Dimensions

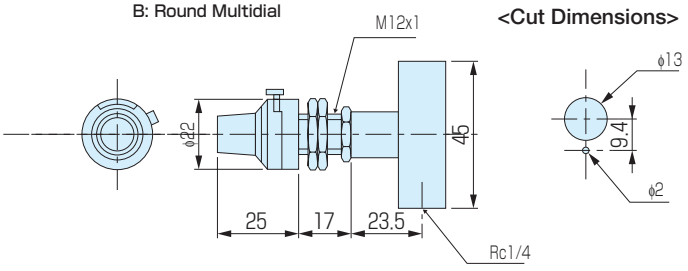
<2412MAL>
A: Standard Multidial

<Cut Dimensions>



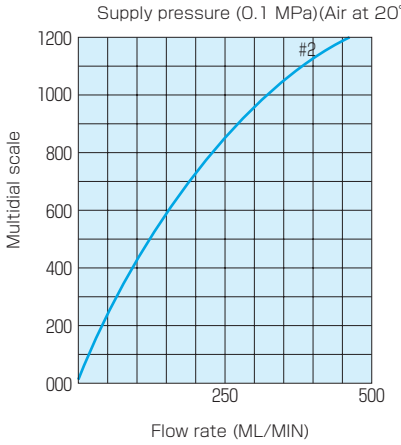
<2412MBT>
B: Round Multidial

<Cut Dimensions>



2412MAT 2412MBL

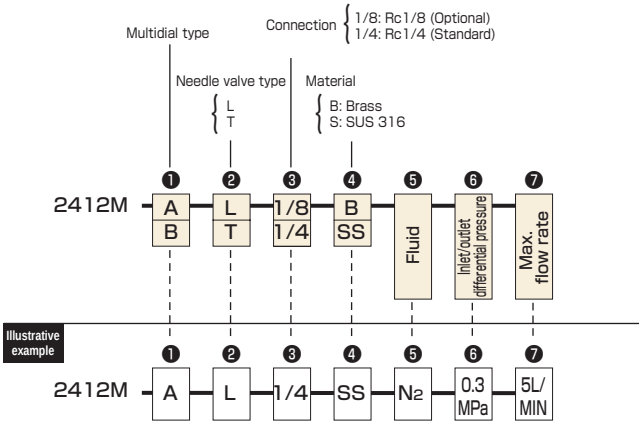
Example of Characteristic Curve



Notes:

- For flow rating, please see Table of Rated Flow Ranges for Model 2412 on page 103.
- You may specify the fluid and pressure flow of your equipment for our selection of the type that most suits your requirements.
- For information on available connection end types other than standard ones.
- The 2412M valve opens when it turns in the direction reverse to the 2412.

Ordering



* Refer to "Ordering" and "Illustrative Example" when placing an order or requesting a quotation. Fill in the blanks in the "Order/Quotation Request Card" at the end of the catalog, and send the card by fax.

Bellows Needle Valve (for rigid control of leaks)
MODEL 2450 SERIES

This bellows seal type needle valve has been specifically developed so that it can satisfy the requirements for such areas in which leak is a concern of vital importance. Model 2450 Bellows Needle Valve has a construction to drastically prevent fluid leaks. In addition, it is outstanding in heat resistance and corrosion resistance, so the customer can use it with peace of mind not only in such adverse conditions where high vacuum, high pressure, high temperature or extremely low temperature is present but also for corrosive, toxic or costly fluids.

2450L 2450T

Features

- **Stringent leak test (2 x 10^{-8} Pam^3/sec)**
  100% leak test is conducted before shipping, using a helium leak detector.
- **Use of a precision needle**
  The incorporated non-rotary type needle provides precise, smooth control of minute flows.
- **Compatible with both gases and liquids**
- **Superior temperature characteristic**
  Flows are scarcely affected by ambient temperature fluctuations, remaining within an insignificant range of flow variations.
  This superior temperature characteristic is applicable to gases only, and not to liquids, because the viscosity of a liquid may greatly vary depending upon the temperature conditions.

Applications

- For vacuum systems
- For semiconductor manufacturing lines
- For production lines where toxic or corrosive gases are present

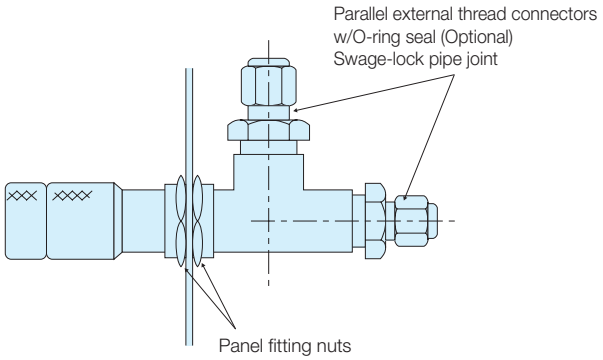
Standard Specifications

Rated flow ranges	See Table of Rated Flow Ranges on page 105.
Regulating screw rotating speed	Approx. 13-16 turns
Max. operating pressure	1MPa
Upper limit of working temperature	120°C
Fluids	Gases and liquids
Materials of parts exposed to fluids	SUS 316, Viton (joint), fluorocarbon resin
Connection end	1/4 swagelok (for joint) * Optional: 1/8SW

Optional Items

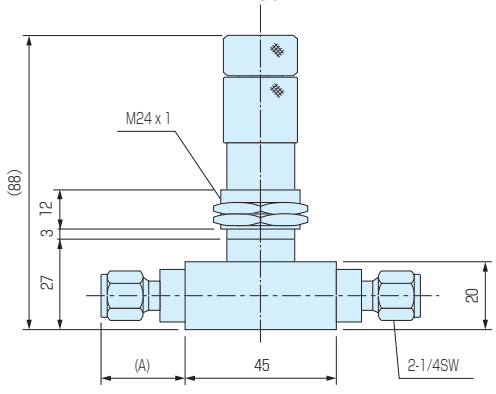
- **Special types of joints** (Please contact us for consultation.)

Layout Example with Model 2450



Dimensions

<2450T>



A joint is used for (A).

(A: 1/4 Swagelok: 25)

<2450L>

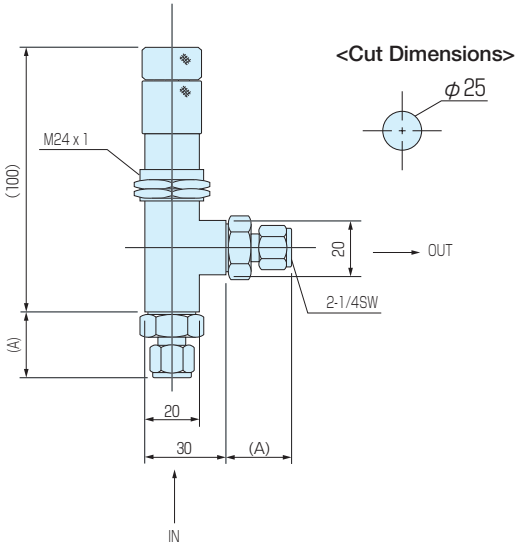


Table of Rated Flow Ranges (Reference)

Due to operating conditions and instrumental errors, there may be differences in the range of 80% to 130% between the values indicated in this table and those that are actually used by the customer. Please use these values for reference only.

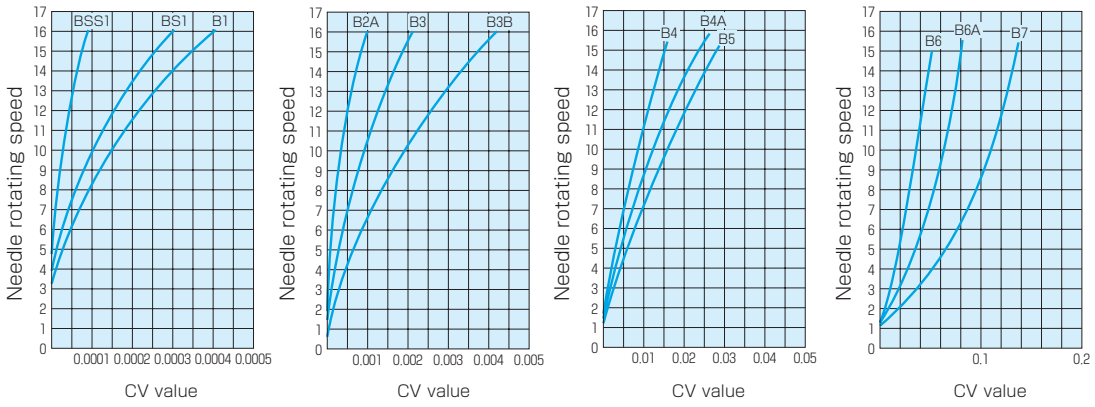
Flow rate when the outlet valve is totally opened to release flows into air

Needle #	Supply pressure (MPa) (Air at 20℃)							Supply pressure (MPa) (Water at 20℃)		
	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.05	0.1	0.15
BSS1	0.016	0.032	0.058	0.086	0.115	0.14	0.18	—	—	—
BS1	0.074	0.12	0.20	0.28	0.34	0.44	0.52	—	—	—
B1	0.10	0.16	0.24	0.34	0.42	0.53	0.60	—	—	—
B2	0.12	0.19	0.29	0.41	0.50	0.63	0.72	0.0010	0.0017	0.0024
B2A	0.25	0.39	0.60	0.82	1.05	1.30	1.50	0.010	0.015	0.018
B3	0.67	0.98	1.55	2.10	2.65	3.20	3.70	0.019	0.029	0.037
B3B	1.10	1.7	2.5	3.4	4.3	5.1	5.9	0.034	0.05	0.067
B4	4.4	6.3	9.4	12.0	16.0	19.2	22.0	0.15	0.21	0.27
B4A	6.7	9.8	13.9	19.0	24.0	27.9	31.6	0.23	0.32	0.40
B5	7.8	11.3	16.5	20.0	28.0	33.0	38.0	0.26	0.35	0.46
B6	15.3	20.5	32.0	44.0	55.0	68.0	80.0	0.46	0.66	0.79
B6A	21.0	32.0	51.0	70.0	90.0	110	128	0.72	1.0	1.15
B7	40.0	55.0	100	130	170	195	230	1.18	1.7	1.95

(L/MIN)

CV Values

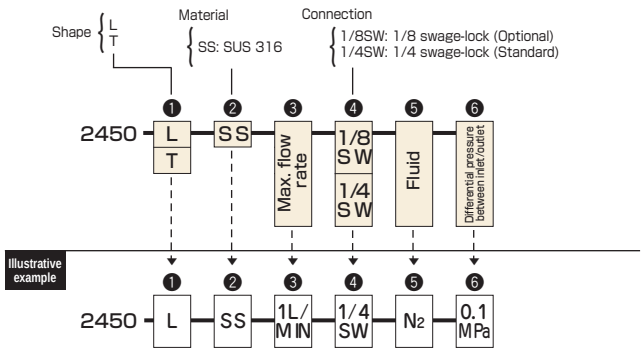
Needle #	Max. CV value
BSS1	0.00008
BS1	0.0003
B1	0.0004
B2	0.0005
B2A	0.00098
B3	0.0025
B3B	0.0043
B4	0.016
B4A	0.025
B5	0.028
B6	0.051
B6A	0.08
B7	0.14



Notes:

- We can suggest you the needle number most suitable for your equipment if the pressure, fluid, flow rate and other operating conditions of your equipment are known. Please use the above table for reference only.

Ordering



* Refer to “Ordering” and “Illustrative Example” when placing an order or requesting a quotation. Fill in the blanks in the “Order/Quotation Request Card” at the end of the catalog, and send the card by fax.

All-Teflon Constant Flow Valve for Liquids/Chemicals

MODEL 2600 SERIES

This constant flow valve has been developed for control of water and chemical flows. It maintains liquid flows constant against fluctuations of both primary and secondary pressures.

Features

- **Outstanding control of liquid flows at a constant rate**
  A valve composed of high-precision components ensures smooth control of flows.
- **Not affected by pressure variations**
  Flows are maintained at a constant rate against fluctuations of both primary and secondary pressures.
- **Non-metal material (PTFE) used for the wetted part**
  This resin (PTFE) is perfect for a part apt to be easily damaged by metal ions.
- **Small flows from 100-500 ml/min controllable**
  Minute flows are also controllable optionally.
- **Model 2600, all-Teflon type, is compatible with practically all chemicals thanks to the use of a Perfluoro O-ring.**
  (There are some operating conditions to be met according to the type of chemical. Be sure to contact us for information before placing your purchase order.)
- **Bubblers (air bubble purge taps) provided in the upper/lower diaphragm chambers**
  Air bubble purge at the initial flow setting stage of operation provides the most accurate possible control.

Applications

- **Ultrapure water analyzers**
- **Environmental instrumentation systems; food/chemical industry equipment**
- **Ultrapure water and chemical mixing systems**

Standard Specifications

	Model 2600-T
Fluid	Liquids (Mainly H_2O)
Flow rating Control accuracy	100-500 ML/MIN 0.1-1 L/MIN
	Within ±3% of the set value
Operating differential pressure	0.1 MPa or more
Operating pressure	0.1-0.5 MPa
Proof pressure	0.7MPa
Materials of parts exposed to fluids	fluorocarbon resin, Perfluoro
Max. operating temperature	15°C-35°C
Connection end	Rc 1/4

Note: The control accuracy is guaranteed only when the fluid temperature is constant, because the viscosity varies with temperature.
Contact us for the detailed specifications.

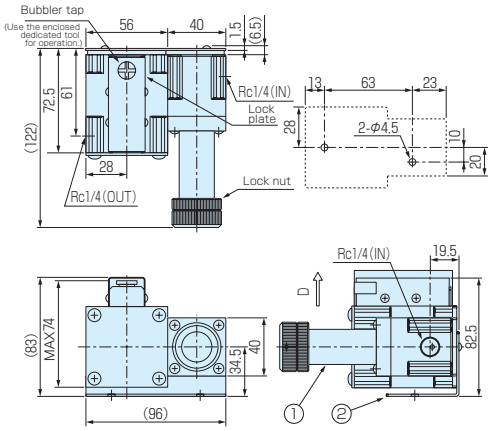
Optional Specifications

Custom-ordered flow ranges as well as types for special fluids are optionally available. Please contact us for information.

* The specifications above are subject to change without prior notice.
Install a filter or the like on the IN side to prevent entry of foreign substances.

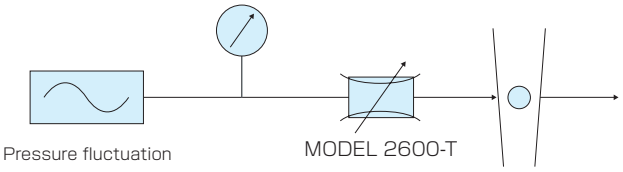
2600T

Dimensions



Connection Example with Model 2600

When the primary pressure fluctuates



Ordering

T: PTFE

Model — Material — Rated flow

MODEL2600	T	500ML/MIN 1L/MIN

Illustrative example

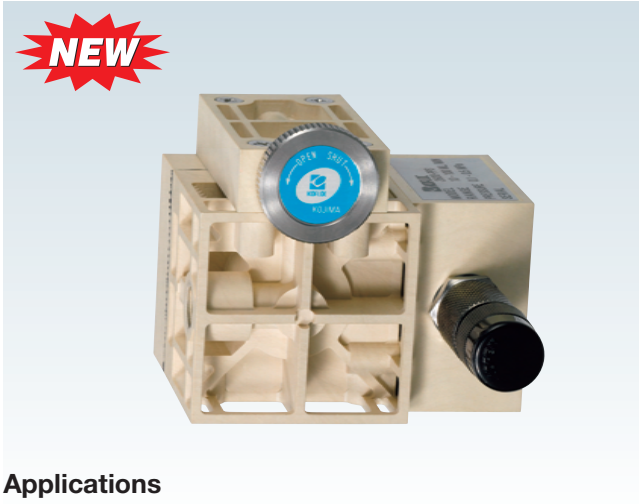
❶	❷	❸
MODEL2600	T	1L/MIN

* Refer to “Ordering” and “Illustrative Example” when placing an order or requesting a quotation. Fill in the blanks in the “Order/Quotation Request Card” at the end of the catalog, and send the card by fax.

Constant Flow Valve for Liquid
MODEL 2600-PPS SERIES

RoHS compatible

This constant flow valve has been developed for use with liquids. It can control the liquid flow rate irrespective of pressure fluctuations on the primary and secondary sides. It can be used for hot water, as well.



Features

- **Excellent constant flow valve characteristics for liquids**
  The valve composed of high-precision parts permits smooth control.
- **Immune to the effects of pressure fluctuations**
  The constant flow rate is maintained irrespective of pressure fluctuations on the primary and secondary (outlet) sides.
- **Control is possible from a very small flow rate in the 10 ml/min range.**
- **An air-bleeding structure has been adopted for both upper and lower diaphragm chambers.**
  Air bleeding during initial flow rate setting permits high-accuracy control.

Applications

- Analyzer
- Environmental instrumentation equipment
- Liquid mixer

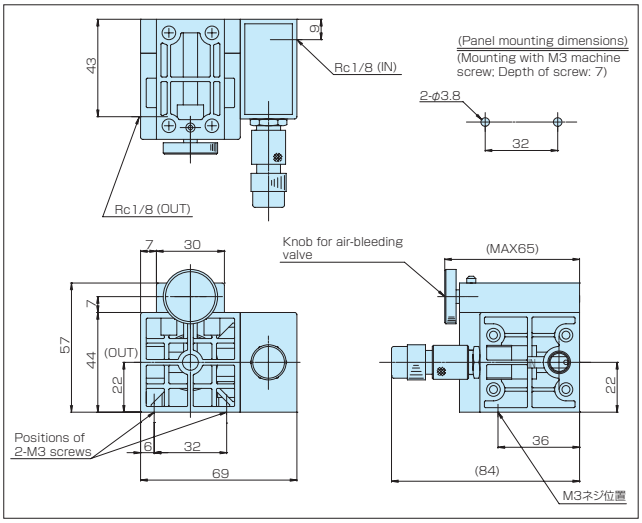
C

Standard Specifications

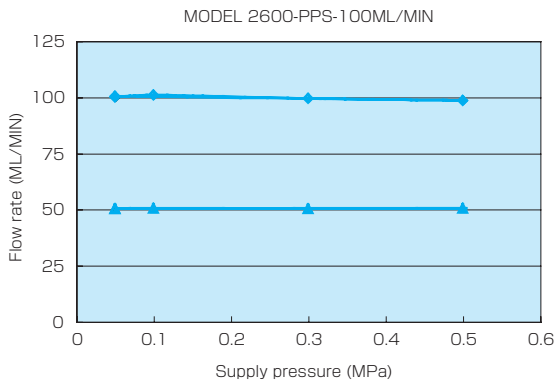
	MODEL 2600-PPS
Fluid	H_2O
Flow rating (under H_2O calibration conditions)	1-10 ML/MIN
	10-100 ML/MIN
	0.1-1 L/MIN
Control accuracy Note)	±3% FS
Operating differential pressure	0.1 MPa or more
Operating pressure	0.1-0.5 MPa
Proof pressure	0.7MPa
Materials of parts in contact with fluids	PPS (containing 30% glass), SUS316, fluororubber, fluororesin
Operating temperature	0-50°C
End connection	Rc1/8

Note: The accuracy of control is guaranteed when the temperature of the liquid being measured is constant, because viscosity changes according to the temperature. Please contact us for the details regarding specifications.

Dimensions

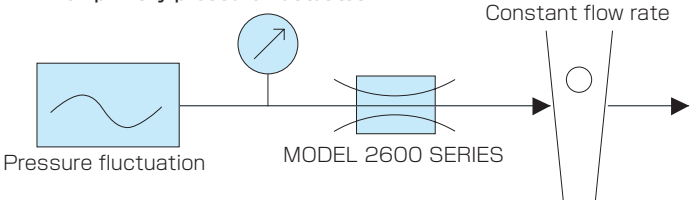


Example of Special Characteristics

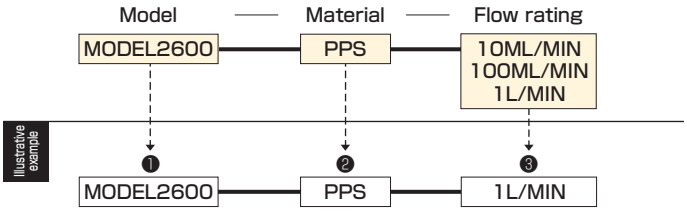


Example of Use

When primary-pressure fluctuates



Ordering



Special Specifications

- Please contact us for other ranges and other kinds of fluid.

Note: The above specifications are subject to change owing to circumstances.
Install a filter, etc. on the IN side to prevent foreign substances from entering the equipment.

Constant Flow Valve for Liquid
MODEL 2600 SERIES

This is a constant flow valve developed for liquids, and maintains a constant liquid flow irrespective of pressure changes on the primary and secondary sides.

Features

- **Excellent constant flow valve for liquids**
  The valve is made of high-precision parts for smooth control.
- **Immune to pressure changes**
  The valve keeps the flow constant irrespective of changes in the primary- and secondary-side (outlet-side) pressure.
- **Control of very small flow from 10 ml/min**
- **Upper and lower diaphragm chambers equipped with air-breathers**
  Air breathing during initial flow setting permits high-accuracy control.

Applications

- Analyzers
- Environmental measuring instruments
- Liquid mixing equipment

Standard Specifications

	Model 2600-S	PVC
Fluid	H_2O	H_2O
Flow rating (at H_2O calibration condition)	1-10 ML/MIN	1-10 ML/MIN
	10-100 ML/MIN	10-100 ML/MIN
	0.1-1 L/MIN	0.1-1 L/MIN
Control accuracy Note 1	±3% F.S.	±3% F.S.
Operating differential pressure	0.1 MPa or more	
Operating pressure	0.1-0.5 MPa	
Proof pressure	0.7 MPa	
Materials of parts in contact with fluids	SUS 316, Viton, fluorocarbon resin	PVC, SUS 316, NBR, Viton
Operating temperature	15-35°C	
End connection	Rc 1/4	Rc 1/8

Note: The control accuracy is guaranteed only when the fluid temperature is constant, because the viscosity varies with temperature.
Contact us for the detailed specifications.

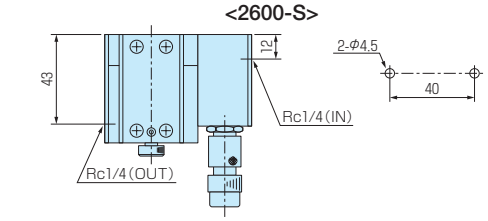
Special Specifications

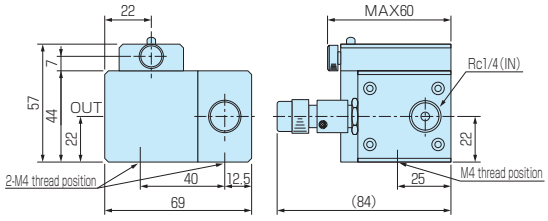
Contact us for other ranges and other types of fluids.

Note: The above specifications are subject to change.
Install a filter or the like on the IN side to prevent entry of foreign substances.

Dimensions

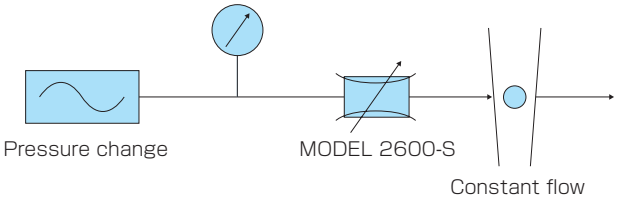
<2600-S>





Example of use

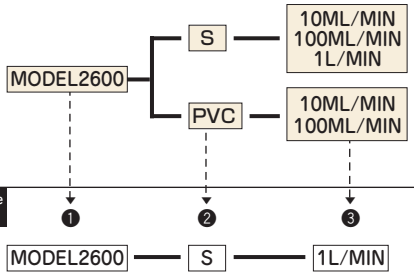
When primary-side pressure changes



Ordering

S : SUS316
PVC : PVC

Model — Material — Flow rating



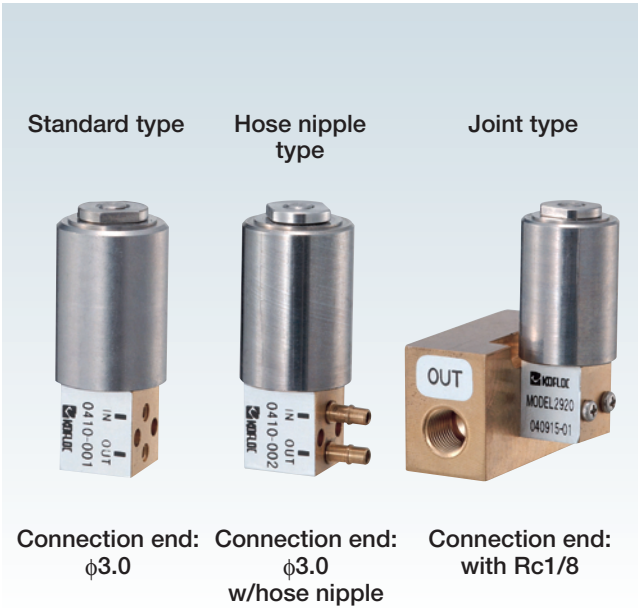
* Refer to "Ordering" and "Illustrative Example" when placing an order or requesting a quotation. Fill in the blanks in the "Order/Quotation Request Card" at the end of the catalog, and send the card by fax.

Small Proportional Solenoid Valve
MODEL 2900 SERIES

This small, or rather miniature, proportional solenoid valve maintains flow control characteristics of hysteresis within 15% (full-scale current) and is perfect for automatic gas flow control of gas chromatographs and various other analyzers. Because of its superior resolution, Model 2900 is also ideal for control of precision control of pressure.

Features

- High-performance proportional valve for a single power source ultra-compact in size, light in weight
- Low power consumption (2 W)
- Annealed magnetic materials, together with a specially designed flat spring, perfectly eliminate flow fluctuations caused by vibrations due to plunger run-outs and frictions.
- The incorporated magnetic yoke is annealed after precutting (and not bending) to remove magnetic flux passage interference, thereby to enhance magnetic power.
- Minimum hysteresis available in the industry (within 15%)
- Patent applied for (United States Patent and Trademark Office)



Connection end: φ3.0 | Connection end: φ3.0 w/hose nipple | Connection end: with Rc1/8

C

Standard Specifications

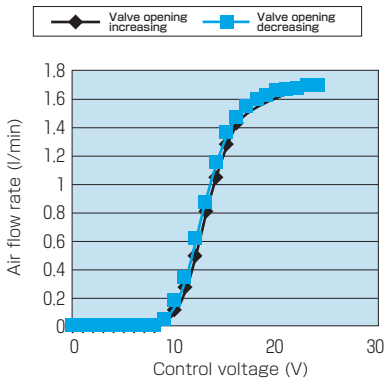
Model		2900 Series			
		2910 *1	2920	2930	2940
Orifice diameter (φ)		0.076	0.25	0.76	1.27
Pressure	Proof pressure	980kPa			
	Operating differential pressure	0-980kPa	0-980kPa	0-690kPa	0-480kPa
Control	Power supply	24VDC±10% (PWC*2 control available)			
	Control voltage range	7VDC-20VDC			
	Power consumption	Max. 2W			
	Hysteresis	15% or less (full-scale current)			
Filter		20μ (IN, OUT)		Without filter	
Working temperature range		0°C-50°C *3			
Retention temperature range		–5°C-70°C			
Materials of parts exposed to gases		BsBM (C3604), SUS 430F, Viton, SUS 316			
Size (mm)		□13 x 15 + φ19 x 48			
Connection end		φ3.0 (Standard)			
Weight		Approx. 60 g (Approx. 200 g for type with Rc1/8)			

*1: Custom-ordered model. Contact us for information on details.
*2: PWC = Pulse Width Coding
*3: Temperature coefficient of the Model 2900 coil copper wire resistance is Rt = RoC° (1+0.004xt°C). If you need to use voltage values for control, use the product in the environment where ambient temperature does not vary in large measure. Where there are large variations in ambient temperature, it is recommended to use current control.

Flow Control Characteristic Curve (Example)

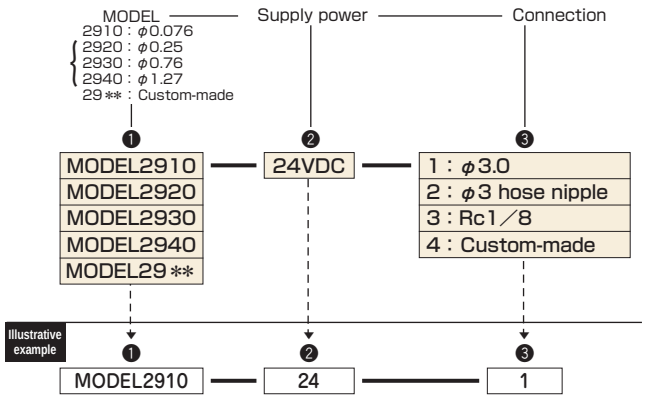
Model 2920

Supply pressure: 0.20 MPa



Ordering

* You may specify the operating conditions (see the example below) of your equipment for our selection of the orifice diameter type that best suits your requirements.
Operating conditions: Fluid - Supply pressure - Max. flow



Note 1: The specifications and overall size above are subject to change without prior notice.
Note 2: Applicable calibration conditions depend upon the type of gas. Please contact us for consultation.
Note 3: Specify the load value of the outlet pressure, if any.

Toggle Valve (Stop Valve with Small Retention Section)
MODEL 5500 SERIES

The KOFLOC toggle valve is a shutoff valve developed for quick, reliable opening/closing operation. The special structure with a valve section and special O-ring excels in durability, while ultra-cleanliness assures high-sensitivity analysis.

5500L 5500T

Features

- Lifting by 90 degrees and tilting for quick opening/closing.
- Precision machining ensures high air-tightness.
- The dead space has been minimized.
- The valve can be used for both gas and liquid.
- This panel-mount type for easy mounting on a panel is compact and ideal for instrumentation.

Applications

- Scientific instruments, analyzers, and environmental measuring instruments
- Compact portable measuring instruments
- Instrumentation panel boards and various testing devices

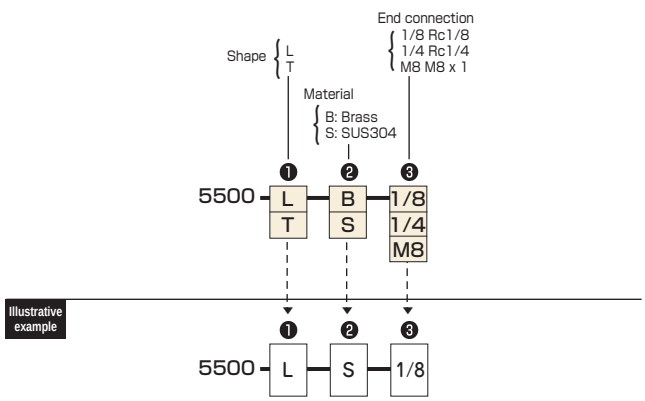
Standard Specifications

Opening/closing operation	90° toggle type
Orifice dia.	ϕ1.5
CV value	0.06
Max. operating pressure	0.8MPa
Materials of parts in contact with fluids	(B) Brass, Viton, NBR, Al (S) SUS304, Viton
End connection dia.	M8 × 1 (Option: Rc 1/8 and Rc 1/4)
Mounting	Panel-mount

Special Specifications

- Joint other than standard joint.

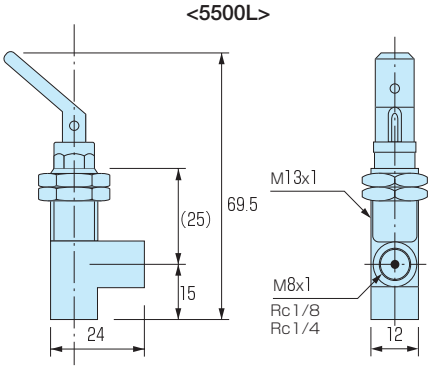
Ordering



* Refer to “Ordering” and “Illustrative Example” when placing an order or requesting a quotation. Fill in the blanks in the “Order/Quotation Request Card” at the end of the catalog, and send the card by fax.

Dimensions

<5500L>



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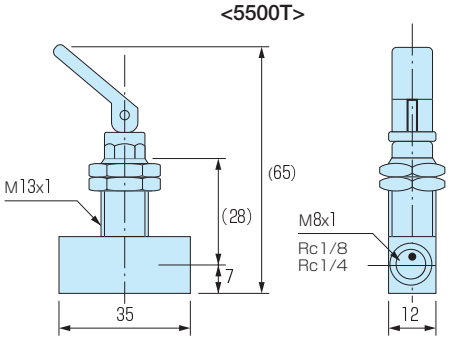

Purchasing

- Refer to page 99 for the relationship between the CV value and pressure/flow.