

## 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.

### 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

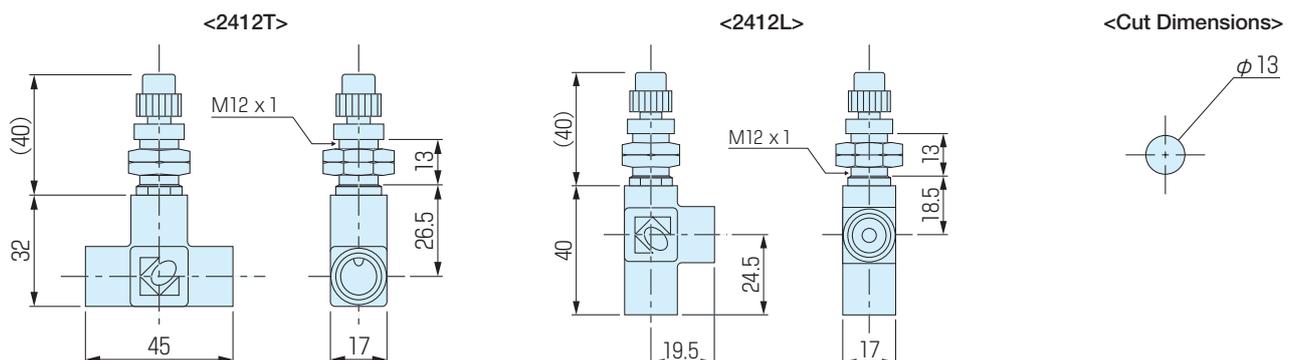
### Standard Specifications

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)

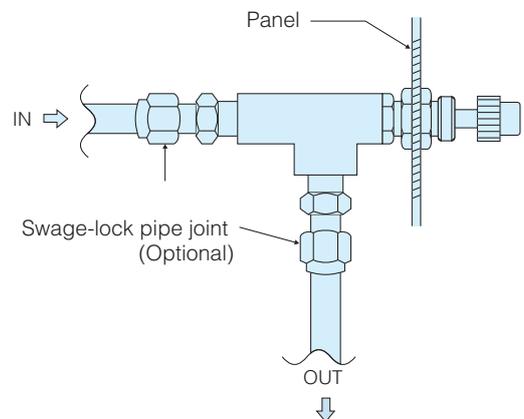
### Optional Specifications

- Connection opening
- Materials not included in the standard specifications

### Dimensions



### Layout Example with Model 2412



## 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

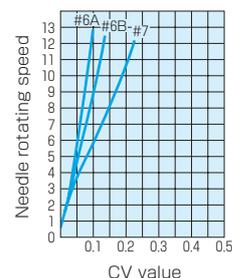
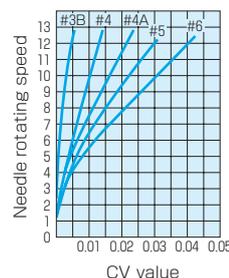
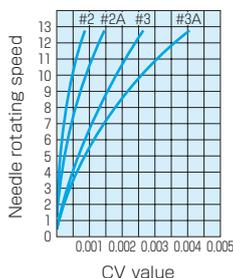
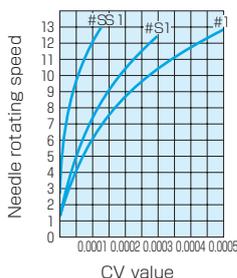
Needle #	Supply pressure (MPa) (Air at 20°C)							Supply pressure (MPa) (Water at 20°C)		
	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.05	0.1	0.15
#SS1	0.023	0.047	0.078	0.11	0.15	0.19	0.22	—	—	—
#S1	0.08	0.11	0.20	0.27	0.34	0.40	0.47	—	—	—
#1	0.15	0.23	0.36	0.51	0.65	0.79	0.93	0.00145	0.0026	0.0036
#2	0.34	0.46	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	—

\* 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. (L/MIN)

\* 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

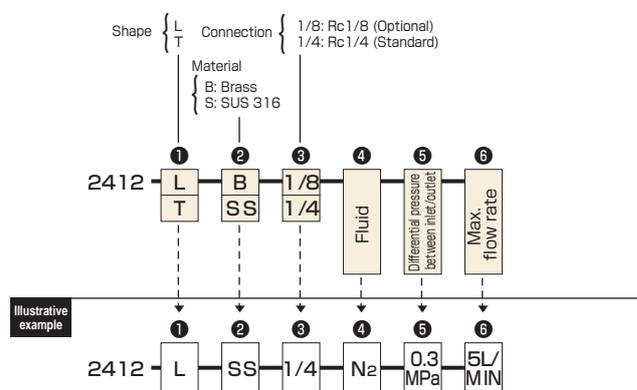
Needle #	Max. CV value
#SS1	0.00012
#S1	0.00028
#1	0.00058
#2	0.0012
#2A	0.0016
#3	0.0033
#3A	0.0048
#3B	0.0063
#4	0.016
#4A	0.028
#5	0.035
#6	0.078
#6A	0.10
#6B	0.13
#7	0.28



## 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.

## 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.