



## 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.

### Features

- **Stringent leak test ( $2 \times 10^{-9}$  Pam<sup>3</sup>/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

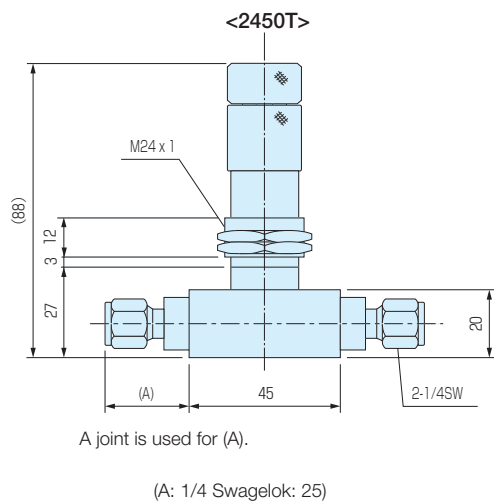
### Standard Specifications

Rated flow ranges	See page 89.
Number of turns of regulating screw	Approx. 13–16 turns (Effective number of turns: 5–16)
Maximum operating pressure	1 MPa
Maximum operating temperature	120°C
Fluids	Gas and liquid
Materials of parts in contact with fluids	SUS316, fluorocarbon resin, FKM
Connection end	1/4 swagelok (for joint) * Optional: 1/8SW

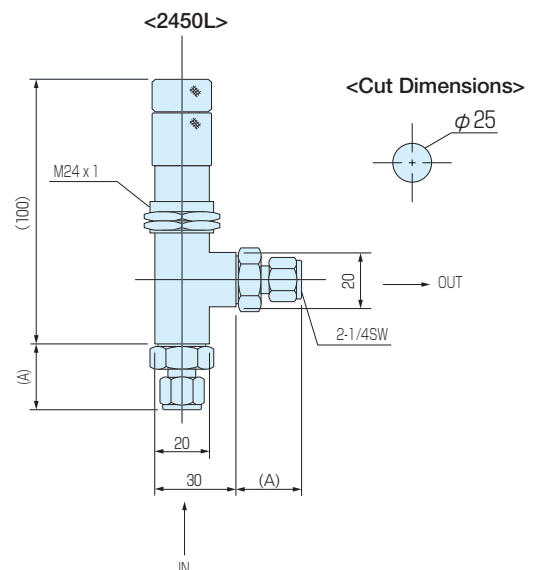
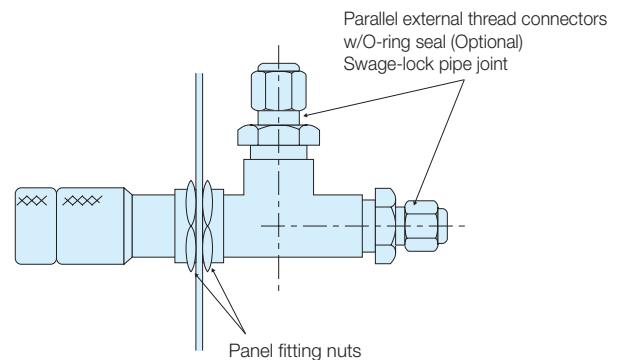
### Optional Items

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

### Dimensions



### Example of Use with Model 2450



## 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.

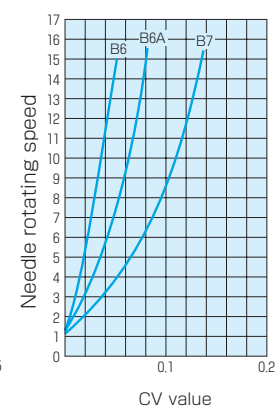
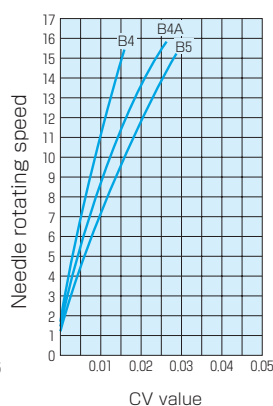
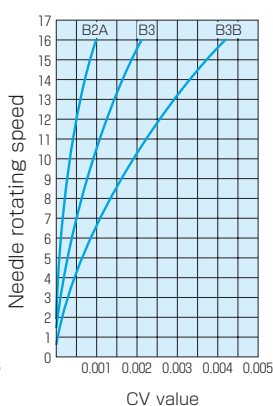
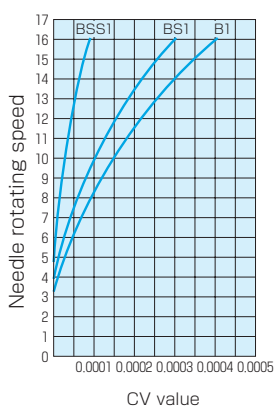
Flow rate when the outlet valve is totally opened to release flows into air

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
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

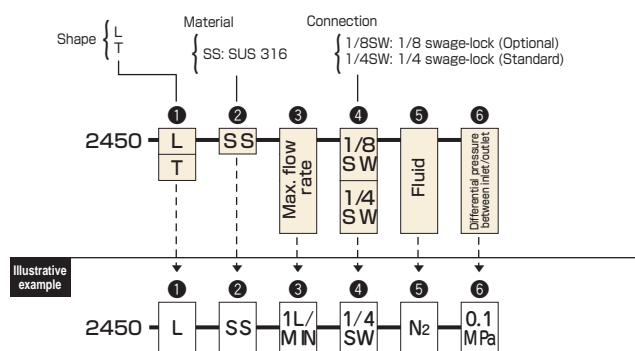
Needle #	Max. CV value
BSS1	0.00008
BS1	0.0003
B1	0.0004
B2	0.0005
B2A	0.00098
B3	0.0025
B3B	0.0043
B4	0.016
B4A	0.025
B5	0.028
B6	0.051
B6A	0.08
B7	0.14



## 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.