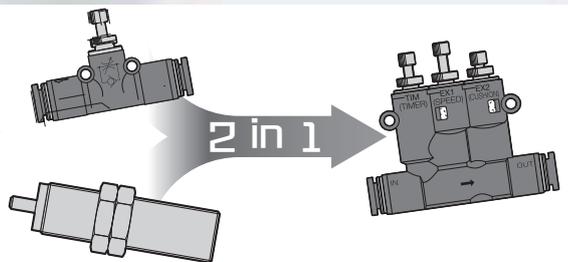


A flow control valve regulating the speed of a cylinder as well as **simulating** the functionality of a **shock absorber**.

2-stage Speed Controller

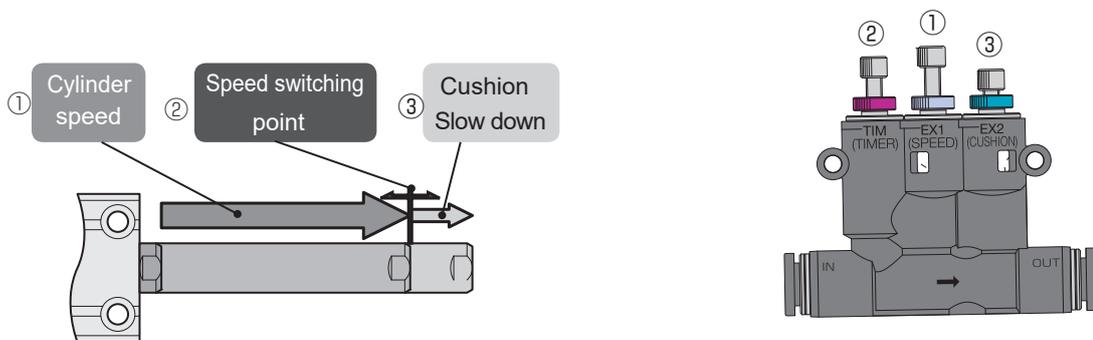


- **Shock Absorbers are no longer needed**
The flow control valve regulates the speed of a cylinder as well as simulates the functionality of a shock absorber.



- **Cylinder speed, Cushion stroke speed and the switching point of the speed are adjusted by three needles.**

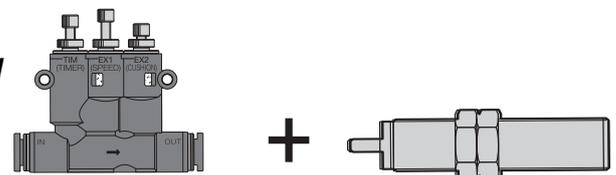
- **The cushion stroke is adjustable**



- **The life cycle is 3 times or more as long as the standard shock absorbers**
Saving maintenance time and cost

Application example – optimal for opening/closing the door of machine tools

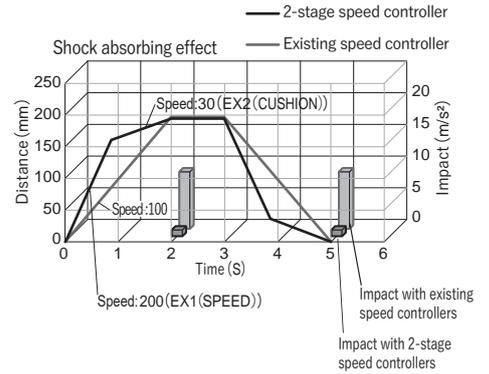
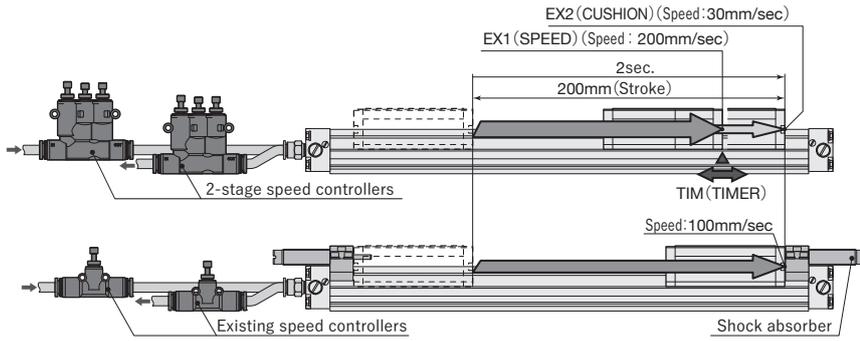
- **Double shock absorbers (shock absorber + 2-stage speed controller) reduce shock and vibration significantly while increasing the shock absorber life.**
The combination with a 2-stage speed controller reduces downtime and maintenance costs while providing perfect shock absorbing.



2-stage Speed Controller

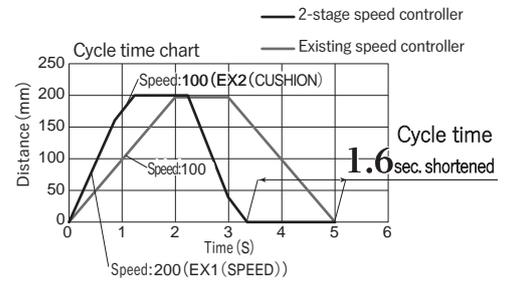
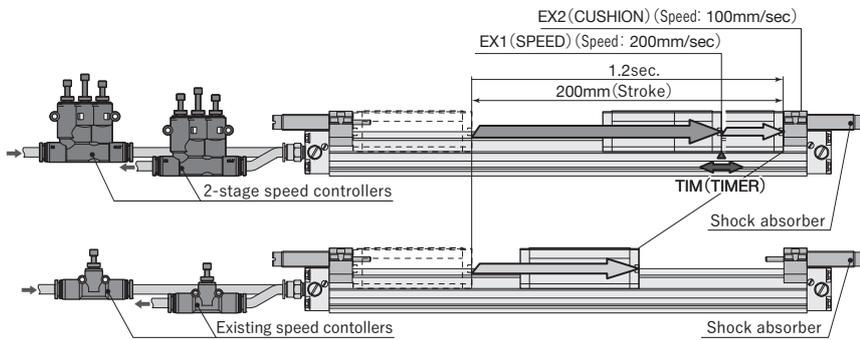
Examples

1. In case of making impact 1/9 (Speed 1/3) with existing cycle time



2. Shorten the cycle time with using existing shock absorbers

(Set the speed of cylinder 2 times higher than the one of the existing cylinder for 80% of the stroke from the point of origin and at the same speed for 20% of stroke towards the end)



Model designation (Example)

BJS U 4H

①. Tube O.D.

Code	Standard type								Large flow type		
	inch				mm				mm		
Code	5/32	1/4	5/16	3/8	4	6	8	10	4H	6H	8H
Tube O.D.	5/32"	1/4"	5/16"	3/8"	ø4	ø6	ø8	ø10	ø4	ø6	ø8

Type : U (Union Straight)

2-stage Speed Controller

Model designation of Accessory (Example)

BJS B 6

①. Applicable models

Code	4	6	8	10
Applicable models	BJSU5/32 BJSU4	BJSU1/4 BJSU6 BJSU4H	BJSU5/16 BJSU8 BJSU6H	BJSU3/8 BJSU10 BJSU8H

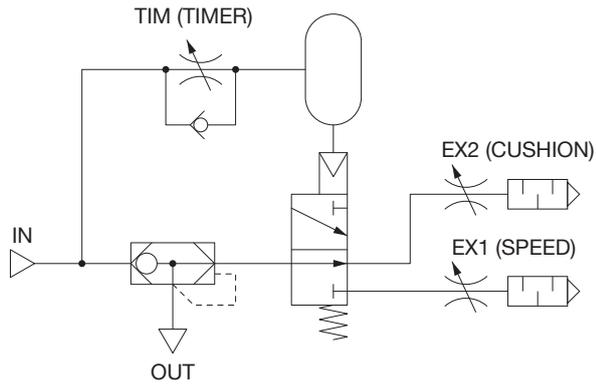
Bracket

2-stage Speed Controller

Specifications

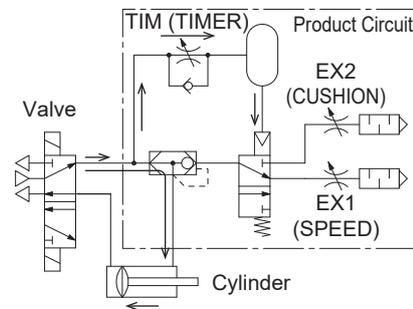
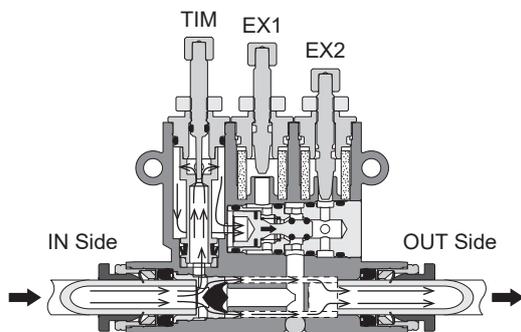
Fluid medium	Air
Operating pressure range	29~145psi (0.2~1.0MPa)
Operating temp. range	32~140°F (0~60°C) (No freezing)

Pneumatic symbol

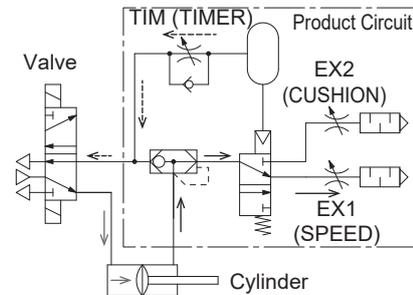
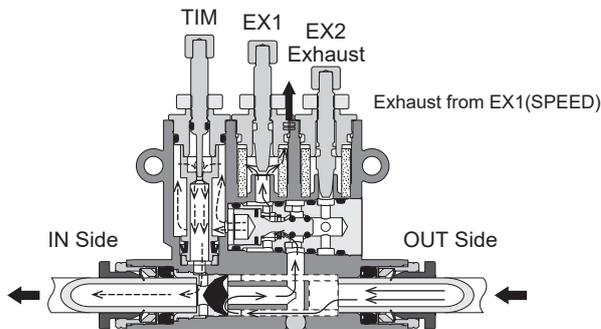


Motion diagram

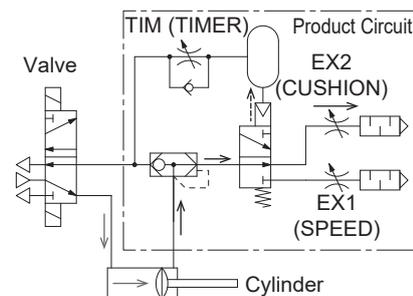
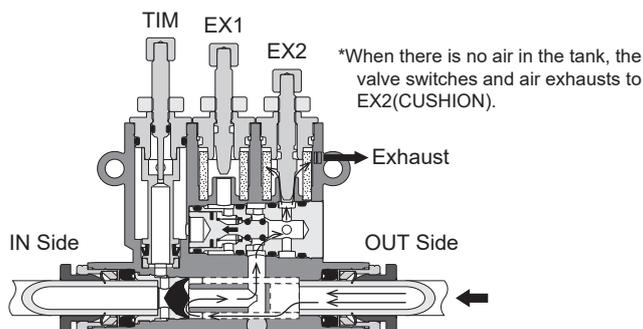
①. Free flow (IN → OUT) state



②. Exhaust 1 (OUT → EX1) state



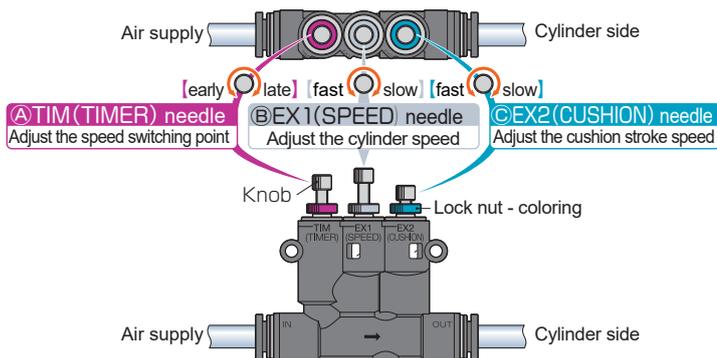
③. Exhaust 2 (OUT → EX2) state



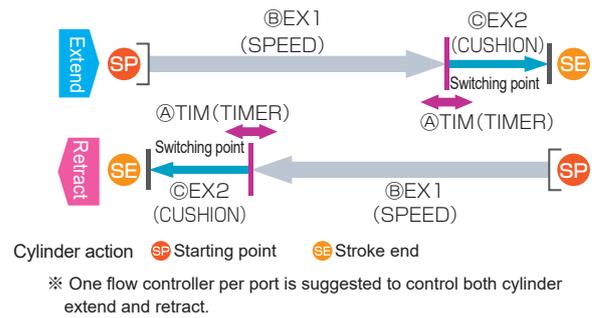
2-stage Speed Controller

Speed adjusting method

Function of each needle



Controlling details



Speed adjusting method

1. Install the product. Connect tube from cylinder port to the OUT side of the product.
2. Before carrying out the speed adjustment, fully open **TIM** (Lock nut color (*after this: indicated as LNC): Pink) and **EX1** (LNC: Silver) needles by turning them counterclockwise and completely close **EX2** (LNC: Blue) needle by tuning it clockwise.
3. Adjust the 2nd (braking) speed with **EX2** (LNC: Blue) needle. Actuate the cylinder by gradually opening the **EX2** (LNC: Blue) needle so that the piston moves and reaches to stroke-end. Tighten the lock nut while holding the needle head in order not to change the adjusted speed.
4. Adjust the shift (brake) timing with **TIM** (LNC: Pink) needle. Close **TIM** (LNC: Pink) needle gradually so that the brake (shock absorber function) works near the stroke-end. Do not turn the **TIM** (LNC: Pink) needle to near full close position or close the needle quickly from full open position, otherwise speed shifting effect (brake or shock absorbing function) does not work.
5. To decelerate the operating speed of the cylinder, adjust **EX1** (LNC: Silver) needle and readjust **TIM** (LNC: Pink) needle again.
6. Fine-tune all of the needles. Then tighten the lock nuts firmly while holding the needle heads of **TIM** (LNC: Pink) and **EX1** (LNC: Silver) in order not to change the adjusted setting.

Tips for the adjustment

- Fix the pressure and the length of tube before adjusting these needles, so that the setting of this product will not be affected.
- As for speed adjusting process ①~③, adjust two controls together at the both sides of the cylinder, then adjust them separately for process ④~⑥.
- Fully open **EX1** needle (accelerate cylinder) and nearly fully close **EX2** needle (strengthen a brake), when the timing of a brake is difficult to sense.
- Adjust the timing of a brake with sufficient distance from the stroke end.
- Adjust all needles over again if encountering a problem.

Safety instructions manual

Warnings

1. Adjust a speed of an actuator by referring to Speed adjusting method above. Inappropriate procedure may result in rapid action or jumping out of an actuator.

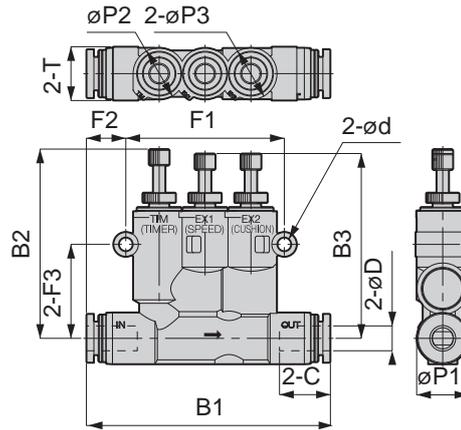
Cautions

1. Since the speed controller is designed to tolerate some leakage, avoid using on an application requiring complete air tightness.
2. During braking (shock absorbing) process, thrust of a cylinder is reduced by back pressure till the residual air in cylinder is exhausted completely.
3. Air leak around a cylinder may affect the speed adjustment.
4. Do not block the exhaust ports during the adjustment and operation.
5. In the following cases, please be aware that the set-up shock absorbing may not function properly as desired.
 - ① In a case where the residual air pressure in the cylinder is exhausted and the cylinder position changes for example by its own weight, the shock absorbing function may not work properly on first stroke when supplying pressurized air again.
*BJSU uses the air in the product or cylinder as conventional speed controller does. Therefore, for the first stroke without back pressure in the cylinder, the above situation may be observed.
 - ② Depending on the performance of cylinder (such as a piston sliding characteristics, air tightness of a cylinder), shock absorbing operation may not function satisfactorily: the shock absorbing start point is possibly deviated.
6. The shock absorbing start point may change from the initial setting, depending on the operating conditions (fluid medium characteristics and standby time, etc.). Adjust TIM needle with enough margin based on the actual operating conditions and readjust it if necessary.
7. Momentary chattering of a main valve spool due to the back pressure from exhaust may cause noise, depending on the conditions such as supply pressure, settings of EX1 and EX2 needles.

Appearance drawing

BJSU Union Straight

RoHS compliant



● Standard type

Unit : mm

Model code	Tube O.D. ϕD	B1	B2		B3		Tube end C	$\phi P1$	$\phi P2$	$\phi P3$	T	ϕd	F1	F2	F3	Effective area (mm ²)			Weight (g)	CAD File
			max.	min.	max.	min.										IN→OUT	OUT→EX1	OUT→EX2		
BJSU5/32	5/32"	51.1	38.4	34.7	37.1	34.4	14.9	10	10	10	10.4	3.3	32	9.2	18.9	2.6	1.0	1.0	21	BJSU5_32
BJSU1/4	1/4"	58.5	47	41.9	44.7	40.8	17	12.5	12.5	12.5	13	3.3	38	9.5	22.7	4.5	2.0	2.0	33	BJSU1_4
BJSU5/16	5/16"	65.6	53.8	48.7	52	49	18.1	14.5	12.5	14.5	15	3.3	43	11.1	29.5	5.0	2.6	2.6	52	BJSU5_16
BJSU3/8	3/8"	80.5	54.2	50.2	54.1	49.7	20.2	17.6	17.7	17.7	18	4.3	54	13.1	32.7	13	7.4	7.4	80	BJSU3_8
BJSU4	4	51.1	38.4	34.7	37.1	34.4	14.9	10	10	10	10.4	3.3	32	9.2	18.9	2.6	1.0	1.0	21	BJSU4
BJSU6	6	58.5	47	41.9	44.7	40.8	17	12.5	12.5	12.5	13	3.3	38	9.5	22.7	4.5	2.0	2.0	33	BJSU6
BJSU8	8	65.6	53.8	48.7	52	49	18.1	14.5	12.5	14.5	15	3.3	43	11.1	29.5	5.0	2.6	2.6	52	BJSU8
BJSU10	10	80.5	54.2	50.2	54.1	49.7	20.2	17.6	17.7	17.7	18	4.3	54	13.1	32.7	13	7.4	7.4	80	BJSU10

*Release ring color : Black for mm type. White for inch type.

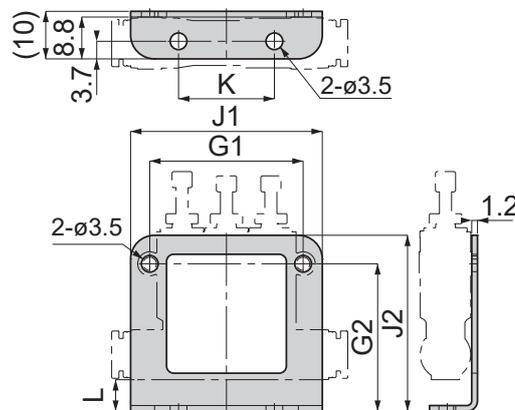
● Large flow type

Unit : mm

Model code	Tube O.D. ϕD	B1	B2		B3		Tube end C	$\phi P1$	$\phi P2$	$\phi P3$	T	ϕd	F1	F2	F3	Effective area (mm ²)			Weight (g)	CAD File
			max.	min.	max.	min.										IN→OUT	OUT→EX1	OUT→EX2		
BJSU4H	4	60.6	47	41.9	44.7	40.8	14.9	12.5	12.5	12.5	13	3.3	38	10.5	22.7	3.5	2.0	2.0	39	BJSU4H
BJSU6H	6	68.9	53.8	48.7	52	49	17	14.5	12.5	14.5	15	3.3	43	12.8	29.5	4.7	2.6	2.6	59	BJSU6H
BJSU8H	8	85.3	54.2	50.2	54.1	49.7	18.2	17.6	17.7	17.7	18	4.3	54	15.5	32.7	12.7	7.4	7.4	89	BJSU8H

Appearance drawing of Accessory

BJSB Bracket

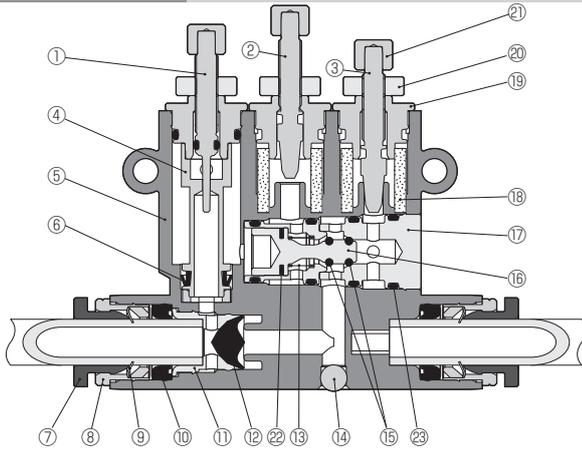


Unit : mm

Model code	G1	G2	J1	J2	K	L	Weight (g)	Applicable Model Code
BJSB4	32	31	40	37	20	7.1	9.8	BJSU4, BJSU5/32
BJSB6	38	36.5	45	44	20	7.6	13	BJSU6, BJSU1/4, BJSU4H
BJSB8	43	43.5	51	51	20	6.8	16	BJSU8, BJSU5/16, BJSU6H
BJSB10	54	47	62	55.2	30	6.8	19	BJSU10, BJSU3/8, BJSU8H

2-stage Speed Controller

Construction



No.	Parts	Material
①	Timer (TIM) needle	Special stainless steel
②	Speed (EX1) needle	Electroless nickel-plated brass
③	Cushion (EX2) needle	Electroless nickel-plated brass
④	Inner ring	Electroless nickel-plated brass
⑤	Resin body	PBT
⑥	Diaphragm	HNBR
⑦	Release-ring	POM
⑧	Guide-ring	Electroless nickel-plated brass
⑨	Lock-claws	Stainless steel
⑩	Elastic sleeve	NBR
⑪	Valve retainer	Aluminum
⑫	Valve element	HNBR
⑬	Spring	Stainless steel
⑭	Stopper	Stainless steel (*1)
⑮	Main spool O-ring	HNBR
⑯	Main valve spool	Aluminum
⑰	Main spool guide	Aluminum
⑱	Silencer	PVF
⑲	Needle guide	Electroless nickel-plated brass
⑳	Lock nut (*3)	Aluminum
㉑	Knob	Electroless nickel-plated brass
㉒	Spool seal packing	NBR (*2)
㉓	Fixed O-ring	NBR

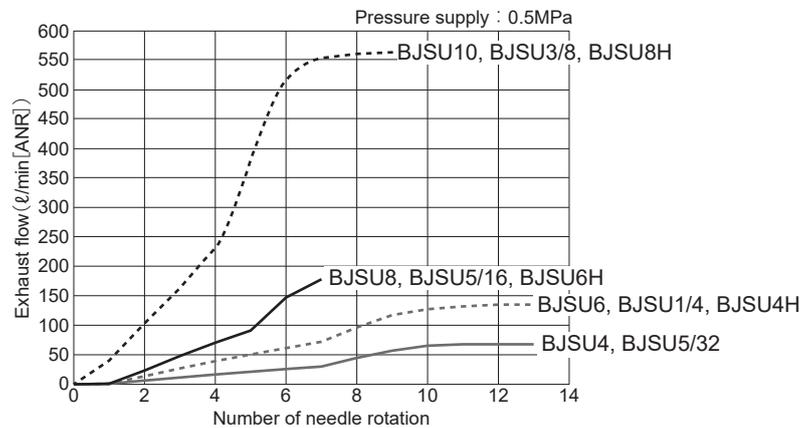
*1. Electroless nickel-plated brass for tube O.D $\phi 10\text{mm}$ / $\phi 3/8\text{inch}$ of standard type and $\phi 8\text{mm}$ of large ow type.

*2. HNBR for tube O.D $\phi 4\text{mm}$ and $\phi 5/32\text{inch}$.

*3. Classified the lock nut by color according to the roles of needles.

Needle	Timer needle (TIM)	Speed needle (EX1)	Cushion needle (EX2)
Lock nut color	Pink	Silver	Blue

Exhaust flow characteristic



■ Table of applicable max. cylinder tube bore

	Model code	Applicable max. cylinder tube bore (mm)
Standard type	BJSU4	$\phi 20$
	BJSU6	$\phi 25$
	BJSU8	$\phi 32$
	BJSU10	$\phi 50$
	BJSU5/32	$\phi 20$
	BJSU1/4	$\phi 25$
	BJSU5/16	$\phi 32$
	BJSU3/8	$\phi 50$
Large ow type	BJSU4H	$\phi 25$
	BJSU6H	$\phi 32$
	BJSU8H	$\phi 50$

*Applicable max. cylinder tube bore is the max. bore when using with pressure supply: 0.5MPa and cylinder speed: 500mm/sec.