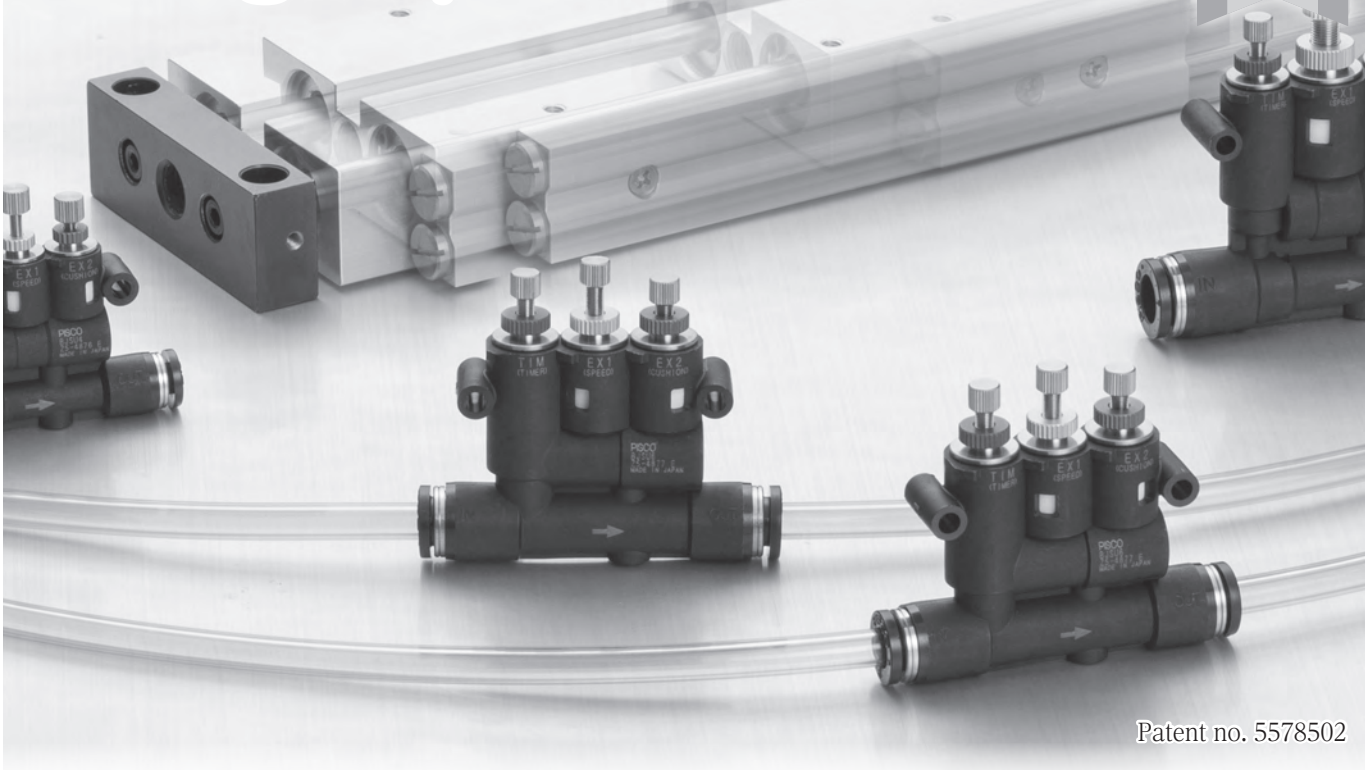
A speed controller that enables same control as the cylinder with shock absorber

2-stage Speed Controller

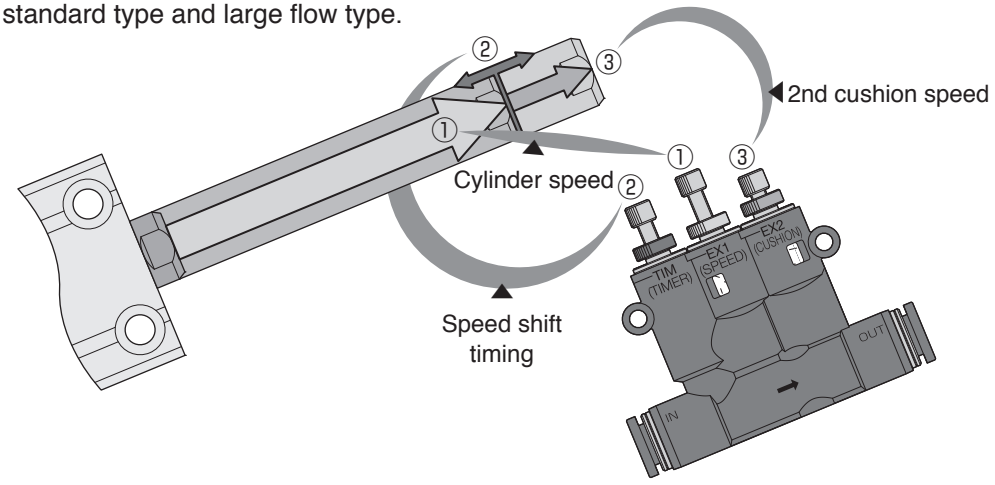
NEW LINEUP



Characteristics

The new variation of 2- stage speed controller, that enables the 2-stage control of cylinder speed by three needle operations, will be introduced.

- Applicable tube dia.: ø10mm and ø3/8 inch size are added. Max. cylinder tube bore.: ø50mm.
- Large flow type, that can be used for applicable cylinder tube bore of one size up, are added. (Tube size: ø4, ø6, ø8mm) Please refer to the below comparison table of applicable max cylinder tube bore of standard type and large flow type.



■ Comparison table of applicable max cylinder tube bore of standard type (conventional model) and large flow type

Standard type (conventional model)			Large flow type	
Model code	Applicable max. cylinder tube bore (㎜)	→	Model code	Applicable max. cylinder tube bore (㎜)
BJSU4	ø20	→	BJSU4H	ø25 (Available for one size up, compared to conventional type.)
BJSU6	ø25	→	BJSU6H	ø32 (Available for one size up, compared to conventional type.)
BJSU8	ø32	→	BJSU8H	ø50 (Available for two size up, compared to conventional type.)

Classified the three lock nuts by color according to the roles. It enables reliable operation.

Model designation (Example)

BJS U 4H
①

①. Tube dia.

	Standard type								Large flow type		
	mm				inch				mm		
Code	4	6	8	10	5/32	1/4	5/16	3/8	4H	6H	8H
Tube dia. (㎜)	ø4	ø6	ø8	ø10	ø3.97	ø6.35	ø7.94	ø9.53	ø4	ø6	ø8
Max. cylinder bore (㎜)	ø20	ø25	ø32	ø50	ø20	ø25	ø32	ø50	ø25	ø32	ø50

Type : U (Union Straight)

2-stage Speed Controller

Model designation of Accessory (Example)

BJS B 6
①

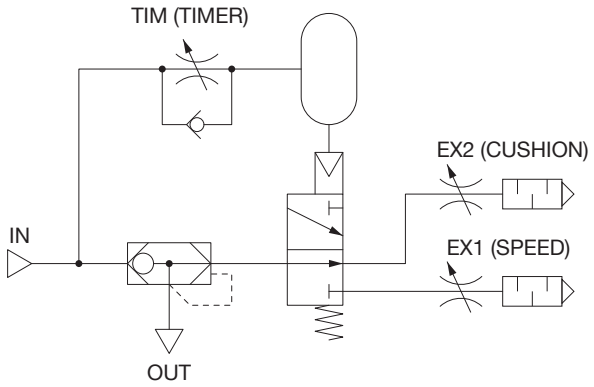
①.Applicable models

Code	6	8	10
Applicable models	BJSU4H	BJSU6H	BJSU10 BJSU3/8 BJSU8H

Bracket

2-stage Speed Controller

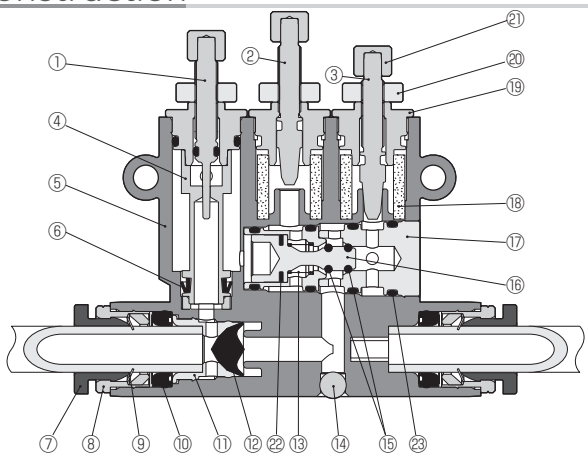
Pneumatic symbol



Specifications

Fluid medium	Air
Operating pressure range	0.2~1.0MPa
Operating temp. range	0~60°C (No freezing)

Construction



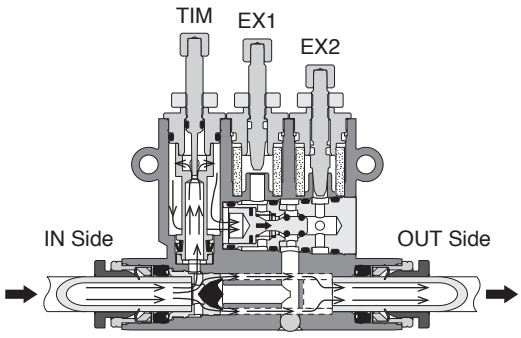
No.	Parts	Material
①	Timer (TIM) needle	Special stainless steel
②	Speed (EX1) needle	Electroless nickel-plated brass
③	Cushion (EX2) needle	Electroless nickel-plated brass
④	Inner ring	Electroless nickel-plated brass
⑤	Resin body	PBT
⑥	Diaphragm	HNBR
⑦	Release-ring	POM
⑧	Guide-ring	Electroless nickel-plated 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

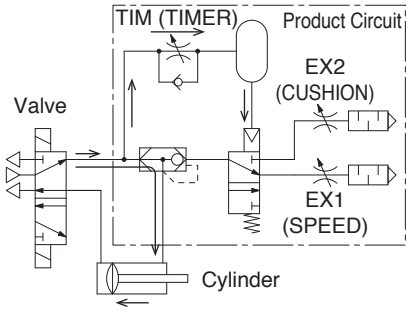
*1. Electroless nickel-plated brass for tube O.D ø10mm / ø3/8inch of standard type and ø8mm of large flow type.
*2. HNBR for tube O.D ø4mm and ø5/32inch.
*3. Classified the lock nut by color according to the roles of needles.

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

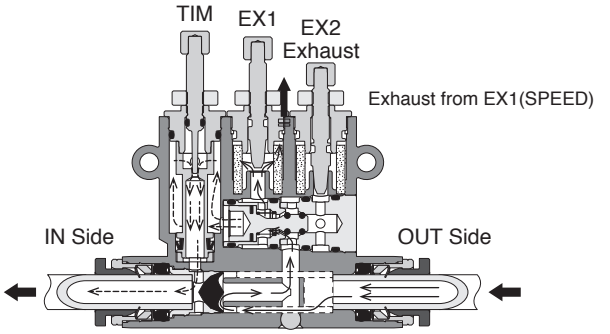
Motion diagram

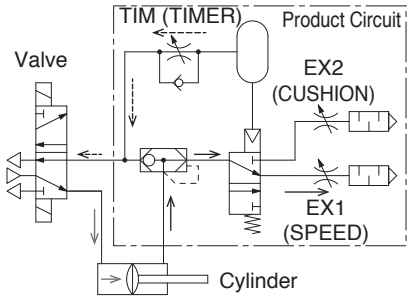
①.Free flow (IN→OUT) state



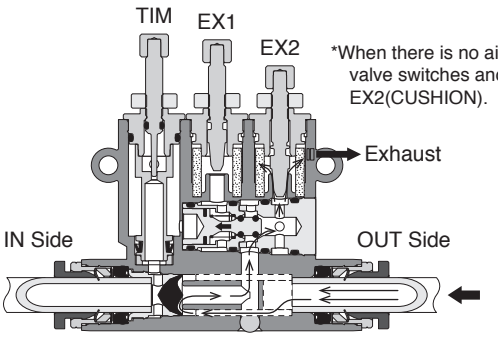


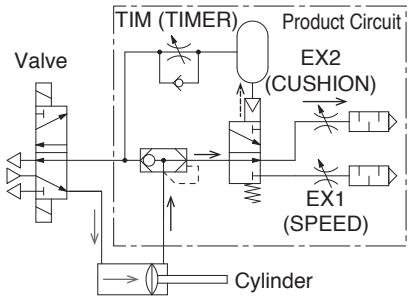
②.Exhaust 1 (OUT→EX1) state





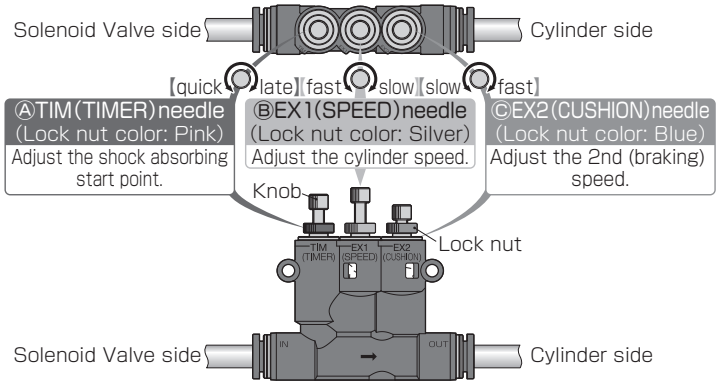
③.Exhaust 2 (OUT→EX2) state



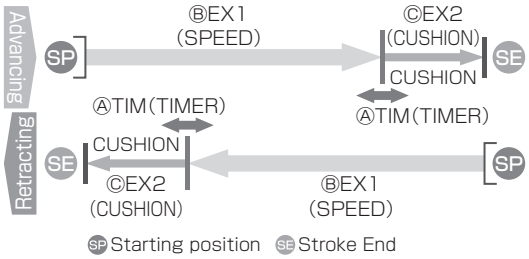


Speed adjusting method

■ Function of each needle



■ Controlling details



*For advancing and retracting motion of the cylinder, 1 each BJSU speed controller is necessary in above mentioned control.

■ 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.

ℹ 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

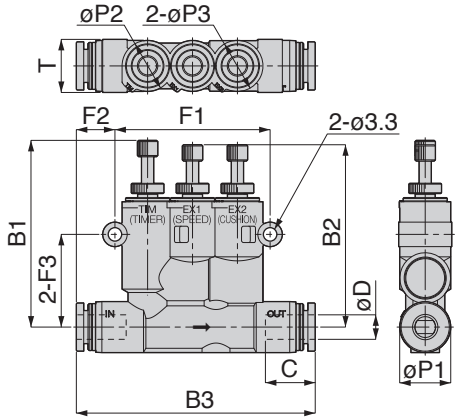
1. Adjust a speed of an actuator by referring to Speed adjusting method above. Inappropriate procedure may result in rapid action or jumping out of an actuator.

⚠ 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



● Standard type

Unit：mm

Model code	Tube O.D. øD	B1		B2		B3	øP1	øP2	øP3	Tube end C	F1	F2	F3	ød	T	Effective area (㎟)			Weight (g)
		max.	min.	max.	min.											IN→OUT	OUT→EX1	OUT→EX2	
BJSU10	10	54.2	50.2	54.1	49.7	80.5	17.6	17.7	17.7	20.2	54	13.1	32.7	4.3	18	13	7.4	7.4	80
BJSU3/8	3/8	54.2	50.2	54.1	49.7	80.5	17.6	17.7	17.7	20.2	54	13.1	32.7	4.3	18	13	7.4	7.4	80

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

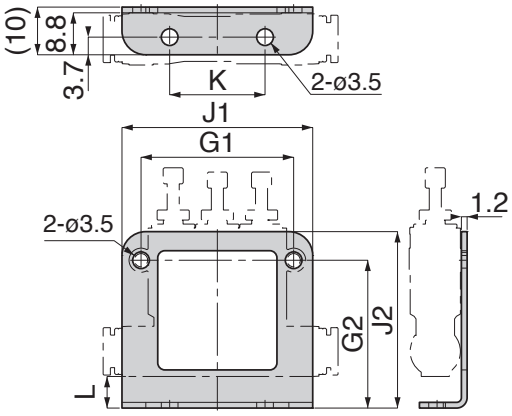
● Large flow type

Unit：mm

Model code	Tube O.D. øD	B1		B2		B3	øP1	øP2	øP3	Tube end C	F1	F2	F3	ød	T	Effective area (㎟)			Weight (g)
		max.	min.	max.	min.											IN→OUT	OUT→EX1	OUT→EX2	
BJSU4H	4	47	41.9	44.7	40.8	60.6	12.5	12.5	12.5	14.9	38	10.5	22.7	3.3	13	3.5	2.0	2.0	39
BJSU6H	6	53.8	48.7	52	49	68.9	14.5	12.5	14.5	17	43	12.8	29.5	3.3	15	4.7	2.6	2.6	59
BJSU8H	8	54.2	50.2	54.1	49.7	85.3	17.6	17.7	17.7	18.2	54	15.5	32.7	4.3	18	12.7	7.4	7.4	89

Appearance drawing of Accessory

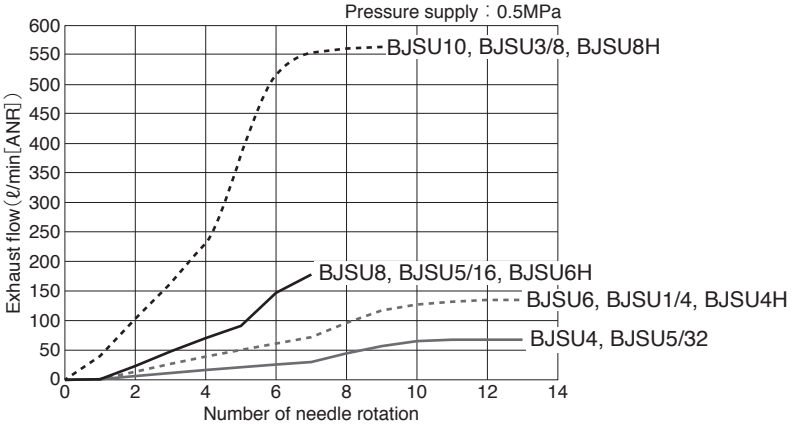
BJSB Bracket



Unit：mm

Model code	G1	G2	J1	J2	K	L	Weight (g)	Applicable Model Code
BJSB6	38	36.5	45	44	20	7.6	13	BJSU4H
BJSB8	43	43.5	51	51	20	6.8	16	BJSU6H
BJSB10	54	48.2	62	55.2	30	6.7	19	BJSU10, BJSU3/8, BJSU8H

Exhaust flow characteristic



■ Table of applicable max. cylinder tube bore

Model code		Applicable max. cylinder tube bore (㎜)
Standard type	BJSU4	ø20
	BJSU6	ø25
	BJSU8	ø32
	BJSU10	ø50
	BJSU5/32	ø20
	BJSU1/4	ø25
	BJSU5/16	ø32
	BJSU3/8	ø50
Large flow type	BJSU4H	ø25
	BJSU6H	ø32
	BJSU8H	ø50

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