CKD

SM－377197－A

INSTRUCTION MANUAL

SPEED CONTROL VALVE

SC3P

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

For Safety Use

This product incorporates a number of safety measures. However, in order to prevent accidents and ensure safety, please observe the following instructions:

① Who should operate this product

This oil mist filter is designed and manufactured as a general industrial machinery component to be operated only by qualified personnel with an appropriate background in the material, piping, wiring, and mechanism of this product.(ISO 4414 *1 JIS B 8370 *2)

② How to select the right model

There are so many applications for CKD products that it is impossible to list which model should used for every one of these possible applications. Be sure to select the right model for your needs.

Note that an unsuitable product may not only fail to obtain the be sired performance but may also result in an accident.

③ Special safety signs

Be sure to familiarize yourself with the handling instructions described in this manual before installation and use.

The following three signs are used in this publication to indicate different levels of harm and urgency that may result from mishandling. Be sure you understand the meaning of each sign before continuing to read this manual.

⚠ **DANGER** : Failure to pay attention to DANGER notices may cause a situation that results in a fatality or serious injury and that requires urgent addressing.

⚠ **WARNING** : Failure to pay attention to WARNING notices may result in a fatality or serious injury.

⚠ **CAUTION** : Failure to pay attention to WARNING notices may result in injury or damage to equipment or facilities.

*1) ISO 4414 : Pneumatic fluid power ··· Recommendations for the application of equipment to transmission and control systems.

*2) JIS B 8370 : General rule for pneumatic systems.

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SC3P series
Speed controller
Manual No. SM-377197-A

1. PRODUCT

1.1 Specification

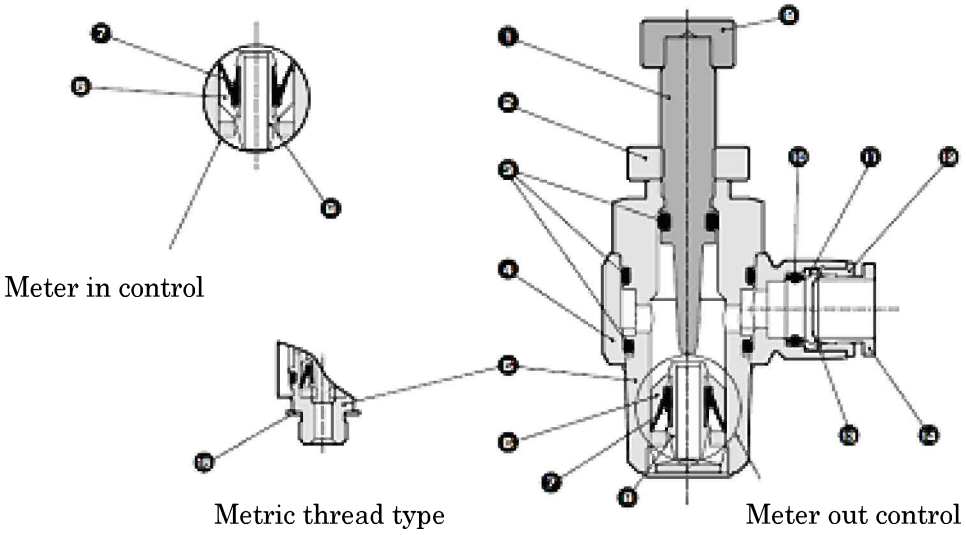
Model / Item		SC3P-M5		SC3P-6			SC3P-8		
Applicable tube outer dia. mm		4 dia.	6 dia.	4 dia.	6 dia.	8 dia.	6 dia.	8 dia.	10 dia.
Working fluid		Compressed air							
Max. working pressure MPa		0.9							
Min. working pressure MPa		0.1							
Proof pressure MPa		1.5							
Fluid temperature ℃		5 to 60 (Not be frozen) Note2							
Port size		M5		R1/8			R1/4		
Weight g		7	7.6	17	17	20	33	36	39
Number of needle turn times		7 or more		12 or more			13 or more		
Free flow	Flow rate Note 1 ℓ/min (ANR)	50		200		230	390	400	
	Effective cross-sectional area mm²	0.8		3		3.5	5.9	6	
Con-trolled flow	Flow rate Note 1 ℓ/min (ANR)	70		150			270		
	Effective cross-sectional area mm²	1.1		2.3			4		

Model / Item		SC3P-10				SC3P-15		
Applicable tube outer dia. mm		ϕ6	ϕ8	ϕ10	ϕ12	ϕ8	ϕ10	ϕ12
Working fluid		Compressed air						
Max. working pressure MPa		0.9						
Min. working pressure MPa		0.1						
Proof pressure MPa		1.35						
Fluid temperature ℃		5 to 60 (Not be frozen) Note2						
Port size		R3/8				R1/2		
Weight g		63	63	66	69	95	98	101
Number of needle turn times		13 or more						
Free flow	Flow rate Note 1 ℓ/min (ANR)	600	800		840	1140	1380	
	Effective cross-sectional area mm²	9	12		12.5	17	21	
Con-trolled flow	Flow rate Note 1 ℓ/min (ANR)	550	850	920		1100	1450	1600
	Effective cross-sectional area mm²	8	12.8	14		16.5	22	24

Note 1. The flow rate atmospheric conversion rate at 0.5MPa.
Note 2. The adiabatic expansion may cause freezing depending on the quality (dew point) of the air.

1.2 Internal structure drawing and major parts list

SC3P

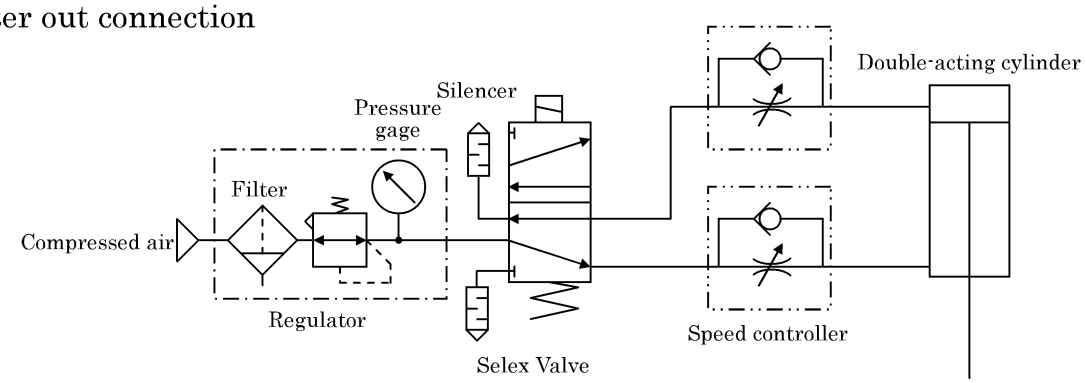


No.	Part name	Material
1	Needle	Stainless steel
2	Lock nut	Stainless steel
3	O-ring	NBR
4	Resin body	PP
5	Metal body	Stainless steel
6	Basket	PP
7	Packing	HNBR
8	Inside	Stainless steel
9	Knob	Stainless steel
10	Elastic sleeve	NBR
11	Lock ring	Stainless steel
12	Guide ring	Stainless steel
13	Lock claws	Stainless steel
14	Release ring	POM
15	Gasket	POM

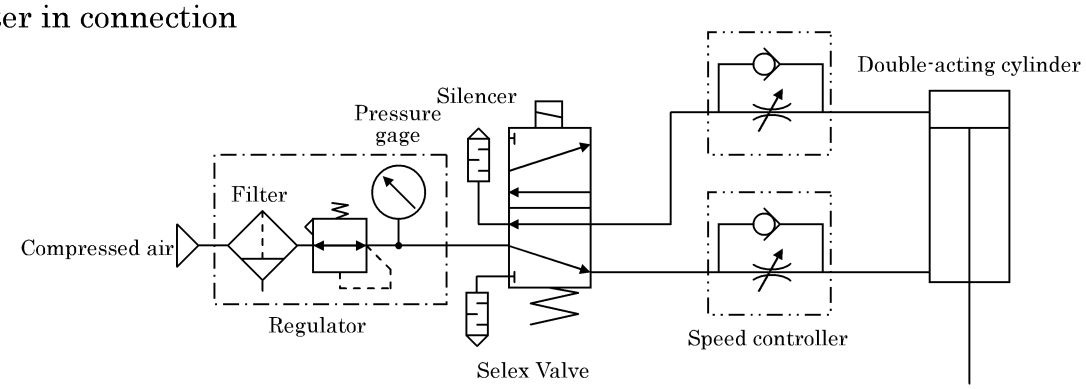
1.3 Fundamental circuit

The fundamental circuit diagram or speed controller is as per shown below.

1) Meter out connection



2) Meter in connection



2. SAFETY PRECAUTIONS FOR INSTALLATION AND REPLACEMENT

⚠ WARNING :

1) Always use the product under the specified conditions.
2) Before replacing the joint or a tube connected to it, stop the air supply and make sure that no residual pressure is present inside the pneumatic circuit.
3) When connecting a tube to the joint, insert the tube firmly until it makes contact with the tube end piece of the joint. Make sure that the tube will not come out of the joint before running the system.
4) When installing the product, ensure the correct flow of the medium through the product. Note the danger of reversing the flow: the speed control will be disabled and the actuator will project.
5) To control the speed, gradually open the needle valve starting from the fully closed position. Turn the needle clockwise to close the valve; counter-clockwise to open.

3. CAUTION

1) The Speed controller is designed to be used in a pneumatic system; do not use it with a medium other than compressed air.
2) Use the speed controller with specified tubes and CKD's plastic plugs (GWP or GWJP series). Never use a metallic plug because it may cause problems.

   Tube outside diameter precision :

   Nylon and soft nylon tubes : ±0.1mm or better

   Polyurethane tubes : +0.1mm, Newurethane tubes : −0.2mm or better

   The hardness of the tube has to be 93° or more. Do not use a tube that does not satisfy the outside diameter precision and hardness requirements. If you do, the tube may be disconnected due to a lack of chucking force or it may be difficult to insert the tube into the joint. If you have to use a tube or a plug that does not satisfy the above requirements, consult us before using it.
3) Before connecting a tube to the speed controller, cut the tube end in the radial direction (perpendicularly to the length) using a tube cutter.
4) Before connecting a tube to a pneumatic device, be sure to flush the tube.
5) Do not bend a tube at a radius smaller than the minimum allowable bending radius.(See Table 1)

Table 1 Minimum allowable bending radius of tubes

Model No. / Tube size	Minimum bending radius (mm)			
	FH-3224	F-15※※	U-95※※	NU-※※
3.2 dia.	Approx.21	Approx.10	7	—
4 dia.	—	Approx.10	10	12
6 dia.	—	Approx.20	20	26
8 dia.	—	Approx.30	30	36
10 dia,	—	Approx.40	40	42
12 dia.	—	Approx.55	50	52

6) Do not twist, pull, or try to move the joint or the tubes connected to it.

3
CAUTION

7) Avoid using the speed controller in an environment that makes the speed controller susceptible to vibrations or shocks.
8) Avoid using the speed controller in a hot or humid environment or outdoors, or where it is exposed to direct sunlight.
9) Avoid using the speed controller at a location where it may be splashed by cutting oil, coolant oil, spatters, etc.
10) Take care not to wear or damage tubes by careless use. A tube, when stressed, may disfigure or fracture.
11) Do not store tubes in a hot or humid environment or where they are exposed to direct sunlight. The storage temperature should not exceed 40℃.
12) Wherever a tube may whip when accidentally disconnected, prevent whipping by binding tubes together or install a safety cover.
13) Do not use the speed controller in piping for a constantly rotating or vibrating mechanism.
14) After completing the piping, do not apply a high pneumatic pressure suddenly but gradually increase the pressure of compressed air.
15) After completing the piping, check each speed controller in the piping system for air leakage before supplying compressed air.
16) Tighten to the correct torque when connecting pipes.(Table 2 lists)

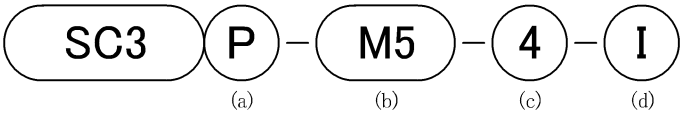
Table 2.
Lock nut recommended tightening torque

Thread size	Tightening torque (N·m)
M5	1.0～1.5
R1/8	7～9
R1/4	12～14
R3/8	22～24
R1/2	28～30

17) Astopper mechanism prevents the needle from turning beyond the number of turns specified in the catalog. Do not attempt to turn the needle beyond this point; doing so may cause a fracture.
18) The product allows a small amount of external and internal leaks of the compressed air, which does not affect the product performance under normal conditions. If you intend to use the product under special conditions that may increase the leaks, be sure to consult us first.
19) The needle valve allows a minimal amount of leak even at the fully closed position.
20) The product can be rotated at any angle when installed. However, do not subject the product to constant rotation or rocking.
21) Chemical resistance is equivalent to SUS440. It cannot be used when the chemical resistance beyond this is required.
22) Please be sure to ask use in the atmosphere which is easy to corrode. It becomes a cause of breakage of the main part of a joint according to conditions.

4. HOW TO ORDER

SC3P



(a) Type		(b) Port size		(c) Applicable tube outer diameter						
P	Stainless steel type	M5	M5×0.8			Port size				
		6	R1/8			M5	6	8	10	15
		8	R1/4	4	4 dia.	●	●			
		10	R3/8	6	6 dia.	●	●	●	●	
		15	R1/2	8	8 dia.		●	●	●	●
				10	10 dia.			●	●	●
				12	12 dia.				●	●

(d) Option	
No code	Meter out type
I	Meter in type

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