CKD

SM－5107－A

INSTRUCTION MANUAL

SHOCK KILLER

SCK

- 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.

2nd

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (ISO 4414 *1, JIS B 8370 *2).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, **read this operation manual carefully for proper operation.**

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ CAUTION:

- Before performing an overhaul inspection on the actuator, deactivate residual pressure completely.
- While the actuator is operating, do not step into or place hands in the driving mechanism.
- To prevent an electric shock, do not touch the electric wiring connection (exposed live parts) of the actuator equipped with a solenoid valve or switch.
  Perform an overhaul inspection with the power off. Also, do not touch these live parts with wet hands.

*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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SCK
Shock killer
Manual No. SM-5107-A

Revision: Nov. 28. 2002

1. PRODUCT

1.1 Specification

1) SCK-0.005 to 8

Model Code / Item		SCK-00 -0.005	SCK-00 -0.01	SCK-00 -0.03	SCK-00 -0.3	SCK-00 -0.6	SCK-00 -1.2	SCK-00 -2.6	SCK-00 -6.5	SCK-00 -8
Type, Classification		No adjuster, Spring return type			With adjuster, Spring return type					
Maximum absorption energy	J	0.049	0.098	0.294	2.94	5.88	11.8	25.5	63.7	78.4
Stroke	mm	7	10	10	10	10	15	15	25	25
Maximum absorption energy per hour	KJ/hr	0.135	0.27	0.98	8.1	10.8	21.6	39	78	86.4
Maximum Collision speed	m/s	1.0	1.0	1.0	1.0	1.5	2.0	2.0	2.5	2.5
Maximum Frequency of repetition	times/min	45	45	45	45	30	30	25	20	18
Working ambient temperature	℃	-10 to 80								
Required Strength of mounting bracket	N	13	18	54	540	1000	1400	3100	4600	5700
Recoiling time	S	0.3 or less	0.3 or less	0.3 or less	0.4 or less	0.4 or less	0.4 or less	0.4 or less	0.5 or less	0.5 or less
Product mass	kg	0.02	0.04	0.07	0.2	0.2	0.32	0.32	0.63	0.63
Recoiling force N	At released	1.2	2.0	5.9	5.9	5.9	6.9	6.9	12.0	12.0
	In compression	2.6	5.0	10.5	11.3	11.3	17.2	17.2	30.0	30.0

2) SCK-12 to 1.0M

Model Code / Item		SCK-00 -12	SCK-00 -20	SCK-00 -30	SCK-00 -40	SCK-00 -60	SCK-00 -0.25M	SCK-00 -0.5M	SCK-00 -1.0M
Type, Classification		With adjuster, Spring return type					With adjuster, Spring return type (thread pitch, large)		
Maximum absorption energy	J	118	196	294	392	588	3.43	11.8	74.5
Stroke	mm	25	40	60	70	70	10	15	30
Maximum absorption energy per hour	KJ/hr	86.4	108	126	120	144	9.2	21.2	80.5
Maximum Collision speed	m/s	3.0	3.0	3.0	3.0	4.0	1.0	2.0	2.5
Maximum Frequency of repetition	times/min	12	9	7	5	4	45	30	18
Working ambient temperature	℃	-10 to 80							
Required Strength of mounting bracket	N	8600	9000	9000	10000	15000	630	1440	4560
Recoiling time	S	0.5 or less	0.6 or less	0.6 or less	0.6 or less	0.6 or less	0.4 or less	0.4 or less	0.5 or less
Product mass	kg	1.17	1.25	1.39	1.45	2.05	0.05	0.13	0.39
Recoiling force N	At released	20.0	20.0	20.0	20.0	29.0	3.9	5.5	7.6
	In compression	39.0	51.0	68.0	75.0	84.0	8.4	11.5	21.0

Note: Use the minimum absorption energy at one-fifth or more of the maximum absorption energy.

2. CAUTION

2.1 Selection of Appropriate Model

1) Select the model of sufficient capacity of max. energy absorption based on the calculated energy of impact to shock killer.
2) Beware of the fact that every stroke of each model is not necessarily utilized to its full extent.

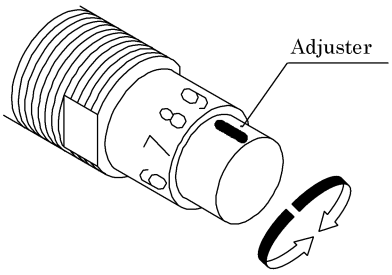
2.2 Combination with other functions

1) In case of driving with cylinder, make use the speed controller to cylinder to control speed effectively.
2) Make use of the cushioning function of cylinder at its stroke end.

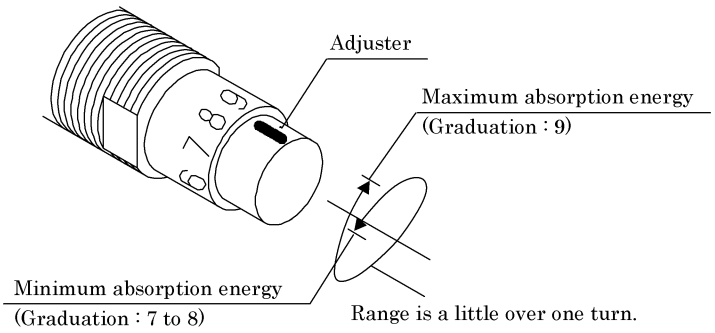
3. OPERATION

Adjusting device is provided to each model of SCK-00-0.3 to SCK-00-60. Adjust the volume of absorbing energy as follows.
(Beware No adjuster is provided to models SCK-00-0.005 and SCK-00-0.01.)

① Set adjuster marking to graduation "9" of grading ring (Position of maximum absorption energy).



② Turn adjuster knob to appropriate graduation upon charging working pressure to the system. (Carry out fine adjustments for a couple of times during trial operations.)



Maximum absorption energy is set at graduation "9" by turning the knob clockwise and Min. energy absorption is set at graduation "7 to 8" after passing "9" while turning knob counterclockwise.

- Note1 : Either prolongation of actuating time or sometimes halting motion may be observed when setting energy absorption excessively against load.
- Note2 : Set the knob at each graduation where detent functions, as it is provided to prevent knob from unintentional slipping off of set position.
- Note3 : Avoid turning the adjuster too much by force.

4. INSTALLATION

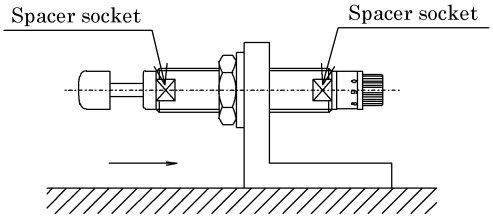
Outer diameter of body are fully threaded. Sockets for Allen wrench (bar spanner) are provided at both ends of body. Make use of this thread to mount it on a bracket.

4.1 Sizes of thread and spanner socket

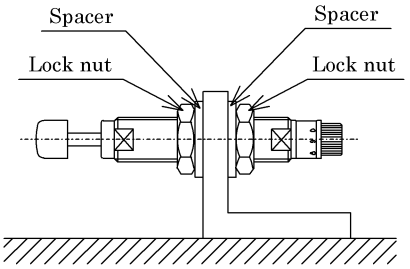
Model	SCK-00 -0.005	SCK-00 -0.01	SCK-00 -0.03	SCK-00 -0.3	SCK-00 -0.6	SCK-00 -1.2	SCK-00 -2.6	SCK-00 -6.5	SCK-00 -8
Thread size	M10×1.0	M12×1.0	M16×1.0	M20×1.0	M20×1.0	M25×1.5	M25×1.5	M30×1.5	M30×1.5
Spanner width	9	11	15	17	17	24	24	27	27

Model	SCK-00 -12	SCK-00 -20	SCK-00 -30	SCK-00 -40	SCK-00 -60	SCK-00 -0.25M	SCK-00 -0.5M	SCK-00 -1.0M
Thread size	M40×1.5	M40×1.5	M40×1.5	M40×1.5	M45×1.5	M45×1.5	M20×1.5	M27×3.0
Spanner width	38	38	38	38	43.5	13	17	24

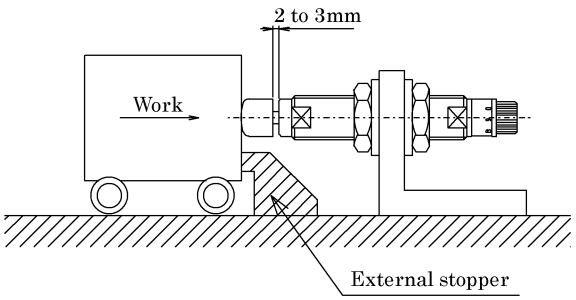
4.2 Mounting procedures and position adjustment



1) Screw the body through bracket making use of the thread on the outer body of shock killer till appropriate position.



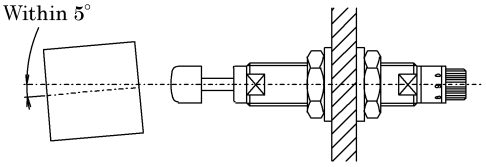
2) Tentatively tighten lock nut on both sides.

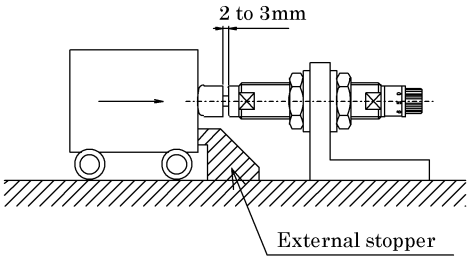


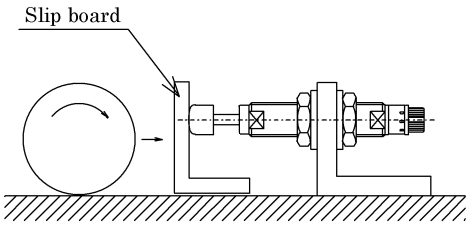
3) Position adjustment and final tightening
Set the position of killer so as to retain 2 to 3mm residual stroke when work is held stopped by an external stopper.
Give final tightening to lock nuts.

4.3 Cautions while mounting it

1) Mount it aligning with load.
   Mount it so as to bear colliding object at center of rod while aligning direction of rod center movement with that of object motion. Keep collision angle within 5° .
2) Retain residual stroke of 2 to 3mm at final stop of load.
   It is necessary to have an external stopper installed to provide 2 to 3mm of residual stroke of shock killer for its protection. It is particularly true when propulsion is fairly large or it is perpendicular drop motion.
3) Intermediate slip board for rolling object
   Provide an intermediate slip board when rolling object is to collide to prevent rod from receiving turning force of load.
4) Keep piston rod free from scratch or foreign particles.







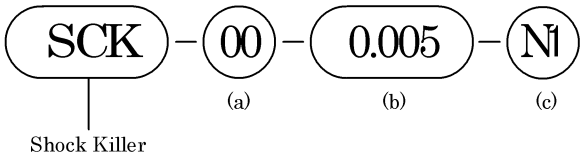
5. MAINTENANCE

5.1 Periodic Inspection

Carry out periodic inspections on the following items.
Replace shock killer in its entirety should be there any damage, as the structure makes it unable to accomplish disassembling for repair work.

Inspection Item	Remedies
Unable to absorb entire shock at its stroke end.	(1) Set adjuster to higher graduation. (2) Replace shock killer if the remedy above is unable to absorb it entirely.
It stops within the stroke or repulses.	(1) Set adjuster to lower graduation.
Inadequate return of piston rod.	(1) Replace shock killer itself.

6. HOWTO ORDER



(a) Mounting		(b) Series		(c) Option	
Symbol	Description	Symbol	Maximum absorption energy	Symbol	Description
00	Basic type	0.005	0.049 J	N1	w / Stop nut
FA	Flange type	0.01	0.098 J		
		0.03	0.294 J		
		0.3	2.94 J		
		0.6	5.88 J		
		1.2	11.8 J		
		2.6	25.5 J		
		6.5	63.7 J		
		8	78.4 J		
		12	118 J		
		20	196 J		
		30	294 J		
		40	392 J		
		60	588 J		
		0.25M	3.43 J		
		0.5M	11.8 J		
		1.0M	74.5 J		

- HOW TO ORDER EXAMPLE
  SCK-00-0.03
  It denotes to be a Shock killer: SCK series, Mounting: basic type, Maximum absorption energy is 0.3N·m