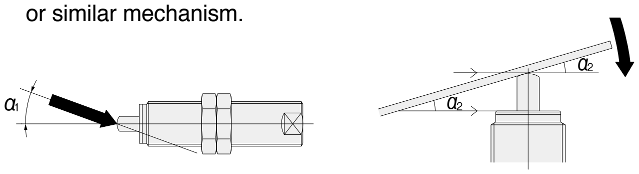
Side load resistant Linear Orifice® Shock Absorber
KSHY Series

General precautions

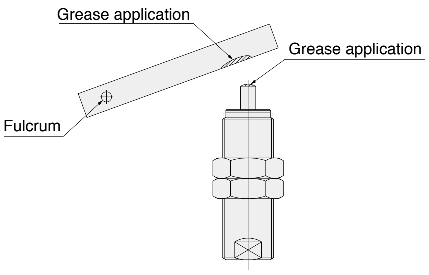
Cover the unit when mounting it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc. Dents, scratches, water, oil, or dust on the piston rod results in damage and decreases service life.

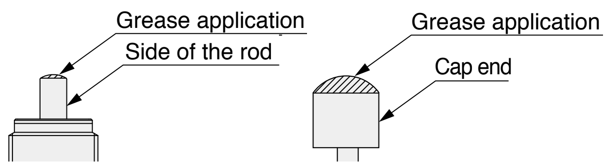
Mounting

1. Keep the angle of eccentricity, resulting from the load direction and the axis of the shock absorber, under the specified values on page 43. If an eccentric load exceeding the specifications is applied, it could result in breakage or impaired returns. If there is concern that an eccentric load exceeding the specified values will be applied, install a guide, or similar mechanism.



2. For swing impacts, the ends of the piston rod and the cap wear down due to the sliding between the contact area and the tip of the shock absorber. Although you can reduce wear by applying grease, observe the following precautions when applying grease.

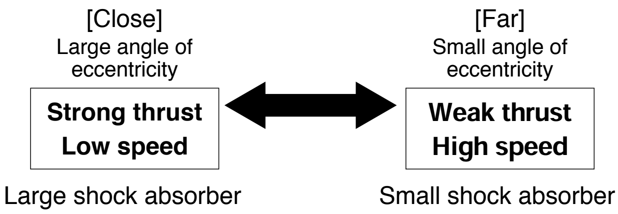




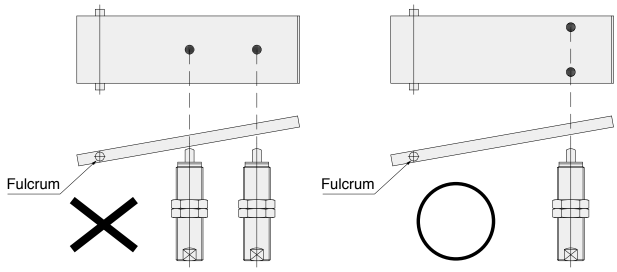
* Grease application: Apply a small amount and spread it thinly.
* Wipe off the grease if it gets stuck to the cap end or the side of the rod.
* If grease gets inside the body of the shock absorber and excessively increases its inner volume, the pressure inside the shock absorber will rise when absorbing an impact and cause damage due to the plug popping out, or other similar situations. Make sure not to apply grease excessively.

3. Ensure that the hardness of the surface directly impacting the piston rod of the shock absorber is over HRc40 hardness (excluding models with cap). We also recommend a surface roughness of Ry6.3 or less.

4. Angle of eccentricity specification shock absorbers can be used very effectively if they are mounted at a position far from the center of rotation. However, use shock absorbers with a thrust stronger than the returning force of the spring (return force of the piston rod).

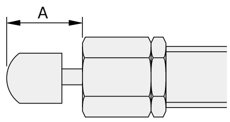


5. Two or more shock absorbers can be mounted in parallel, to boost absorption capacity. However, keep the distances from the center of rotation to each shock absorber equal. Also, have the load applied evenly between each shock absorber.



6. To adjust the capacity with the stroke, adjust the stopper nut (-S) or add an external stopper.

7. If using with a cap, always mount a stopper nut (-S) or an external stopper to ensure that the cap is not subjected to loads at the stroke end. Install the mounting position of the stopper nut such that A ≤ the stroke of the shock absorber. You can use it without a stopper nut or external stopper, but over the long-term, the stop location changes due to cap deformation and wear.



8. The small screw on the back end of the shock absorber should never be loosened or removed. Oil may leak out of the shock absorber leading to a loss of functionality and resulting in damage to the equipment and accidents.

9. When mounting the shock absorber, always use the following maximum tightening torque guidelines. Tightening using excessive force may result in damage.

Model	Maximum tightening torque
KSHY6 × 4 (C)-01,-02	0.85
KSHY8 × 5 (C)-01,-02,-11,-12	2.5
KSHY10 × 6 (C)-01,02	6.5
KSHY12 × 6 (C)-01,02	8.0
KSHY14 × 8 (C)-01,02	12.0
KSHY16 × 8 (C)-01,02	20.0
KSHY20 × 10 (C)-01,02	30.0

10. Be aware that performance and characteristics change depending on the operating temperature.

Selection guidelines

■ How to select durable angle of eccentricity shock absorbers

1. Confirm the thrust
   Choose a shock absorber from its allowable thrust.

↕

2. Confirm the angle of eccentricity
   Confirm that the shock absorber selected in step 1 can be used under the allowable angle of eccentricity.

↓

3. Confirm the absorption capacity
   Confirm that the absorption capacity of the shock absorber is sufficient.

↓

- 3-1. Confirm the impact speed
- 3-2. Confirm the absorption capacity of the shock absorber
- 3-3. Calculate the moment of inertia
- 3-4. Calculate the kinetic energy

4. Confirm other specifications
   Confirm any specifications other than the angle of eccentricity and absorption capacity.

1. Confirm the thrust

The thrust that is applied to the shock absorber (F) should be weaker than the allowable thrust. If a thrust stronger than the allowable thrust is used, the shock absorber may be damaged in fewer operation cycles than the guaranteed life. See page 43 for the values of allowable thrust.

● When using an rotating actuator

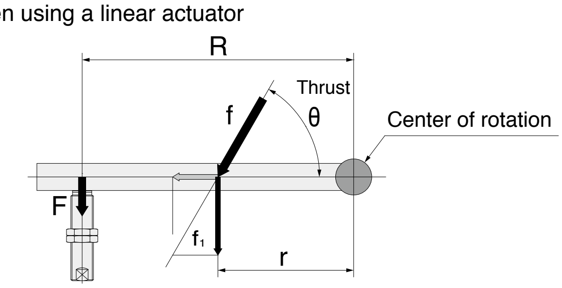
$F = T \div R$

T: Torque of the rotating actuator [N·m]

R: Shock absorber's mounting radius (the distance from the center of rotation to the shock absorber) [m]

F: Force at the point of distance Rm (thrust applied to the shock absorber) [N]

● When using a linear actuator



$f_1 = f \times \sin\theta$

$T = f_1 \times r = F \times R$

$F = (f \times \sin\theta \times r) \div R$

f : Thrust of linear actuator [N]

f_1: Force acting on the direction of rotation [N]

r : Mounting position of actuator's end [m]

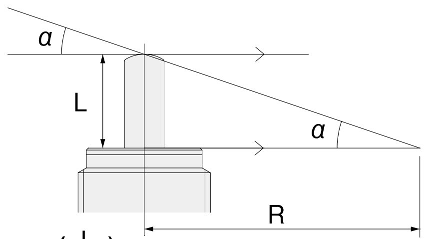
If the value for F is greater than the allowable thrust, do the following countermeasures.

- Use a larger size shock absorber
- Make R, the mounting radius, larger

2. Confirm the angle of eccentricity

Confirm whether the approximate value for angle of eccentricity of the prospective shock absorbers may be less than 10°. Finally, you should check on the device's drawings since, in actuality, the angles for even the same radii may differ, depending on the shapes and the mounting methods.

If a workpiece is installed so that it contacts the plug of the shock absorber, in parallel, at the stroke end, its approximate angle of eccentricity and minimum mounting radius are as follows.
These are not the actual values because the rotating parts have some thickness.
These are reference values for when you are making a selection.



$10° \geqq \alpha = \tan^{-1}\left(\frac{L}{R}\right)$

L: Shock absorber's stroke [mm]

R: Shock absorber's mounting radius [mm]

α : Deflection angle [°]

Model	Stroke[mm]	Allowable angle of eccentricity	Minimum mounting radius [mm]
KSHY6 × 4 (**C**)	4	10° or less	22.7
KSHY8 × 5 (**C**)	5		28.4
KSHY10 × 6 (**C**)	6		34
KSHY12 × 6 (**C**)			
KSHY14 × 8 (**C**)	8		45.4
KSHY16 × 8 (**C**)			
KSHY20 × 10 (**C**)	10		56.7

If the allowable angle of eccentricity is exceeded, do the following countermeasures, and then do [1. Confirm the thrust] again.

- Make R, the mounting radius, larger
- Use a smaller size shock absorber

Continue on the next page →
3. Confirm the absorption capacity
4. Confirm other specifications

3. Confirm the absorption capacity

3-1. Confirm the impact speed

$$\text{Angular velocity } \omega \text{ [rad/s]} = \frac{\text{Swing angle [rad]}}{\text{Target swing time [s]}} \times 2^{\text{Note}}$$

Swing angle [°] $\times \pi \div 180$ = Swing angle [rad] (90°≒1.57rad)

Velocity at the shock absorber's mounting position

V[m/s] =R×ω ≦ Maximum impact speed (1 m/s)

Note: Because the impact speed, not the average speed, is needed, calculate with twice the value of this.

3-2. Confirm the absorption capacity of the shock absorber

If you are using the impact speed, V, found in step 3-1, confirm the exhibited absorption capacity of the shock absorber (e.g. [J]) on the selection graph on page 40. The maximum absorption capacity is reached only when used at the maximum impact speed. The absorption capacity of the shock absorber changes, depending on the operating speed, because the drag of the oil is strong when the flow rate is fast and weak when the flow rate is slow.

3-3. Calculate the moment of inertia

Find the moment of inertia for the impact object I [kg·m^2] to calculate the kinetic energy. If the impact object is rotating, you cannot make a selection by only using the impact object mass because the kinetic energy differs depending on the shape, even if the weight is the same. Calculate the approximate value by referring to the diagram for calculating the moment of inertia (pages 41 to 42).

3-4. Calculate the kinetic energy

Confirm that the kinetic energy of the impact object is less that the absorption capacity of the shock absorber.

Kinetic energy of the impact object $E \text{ [J]} = \frac{1}{2} I\omega^2 \leqq Ex$

Calculating the thrust energy is not necessary because the shock absorber was selected from the allowable thrust in step 1. Assume that the absorption capacity = the allowable kinetic energy.

4. Confirm other specifications

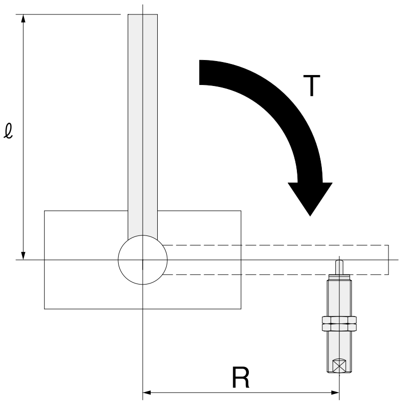
Confirm such specifications as the maximum operating frequency, maximum absorption per unit of time, and operating temperature range.

Selection guidelines

Example selection 1: Using a rotary actuator

<Operating conditions>

When the impact object is a rod



① Torque of rotating actuator: T = 5[N·m]
② Absorber's mounting radius: R = 50[mm] = 0.05[m]
③ Impact object mass: m = 3[kg]
④ Length from the center of rotation to the end of the rod:
ℓ = 120[mm] = 0.12[m]
⑤ Angle of rotation: 90°
⑥ Target swing time: 0.5[s]

1. Confirm the thrust

Find the thrust, F, that is applied to the shock absorber.

F = T ÷ R
= ① 5[N・m] ÷ ② 0.05[m]
= 100[N]

Make a selection from a model (KSHY10 or higher) for an allowable thrust of 100 N or more.

(Refer to page ㊸ for specifications.)

2. Confirm the angle of eccentricity

Confirm whether the angle of eccentricity is less than the allowable angle of eccentricity (10°).

Assume that KSHY10×6 (body thread size: M10, stroke: 6 mm) is used.

$$\alpha = \tan^{-1}\left(\frac{L}{R}\right)$$

$$= \tan^{-1}\left(\frac{6[mm]}{② 50[mm]}\right)$$

≒6.84°<10°

3. Confirm the absorption capacity

3-1. Confirm the impact speed

Calculate the velocity at which the impact object impacts the shock absorber.

Swing angle [°] × π ÷ 180 = Swing angle [rad]

⑤ 90[°] × π ÷ 180≒1.57rad

$$\text{Angular velocity } \omega \text{ [rad/sec]} = \frac{\text{Swing angle [rad]}}{\text{Target swing time [s]}} \times 2$$

$$\omega = \frac{1.57[rad]}{⑥ 0.5[s]} \times 2$$

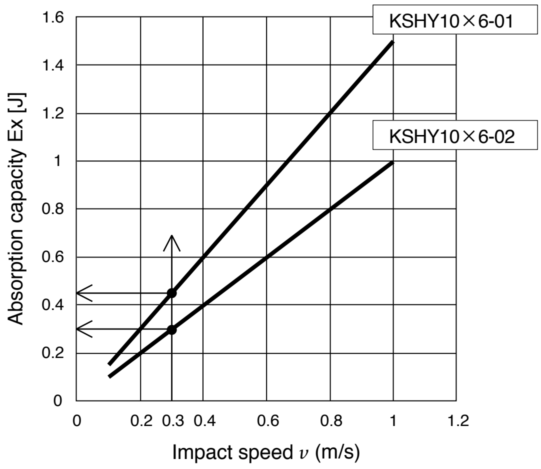
≒6.28[rad/s]

Velocity, V, of the shock absorber's mounting position [m/s]
= R × ω
V = ② 0.05[m] × 6.28[rad/s]
≒0.31[m/s] < 1m/s

3-2. Confirm the absorption capacity of the shock absorber

Assume that you selected V = 0.31 m/s from the selection graph on page ㊵ and confirm the absorption capacity, Ex, that KSHY10×6 exhibits.

● **KSHY10×6**



Values for Ex:
KSHY10×6-01: Approx. 0.45 J
KSHY10×6-02: Approx. 0.3 J

3-3. Calculate the moment of inertia

Find the moment of inertia for the impact object I [kg·m²] to calculate the kinetic energy.

According to "Rod (end is the center of rotation)", the diagram for calculating the moment of inertia (pages ㊶ to ㊷):

$$I = \frac{m\ell^2}{3}$$

$$= \frac{③ 3[kg] \times ④ 0.12[m]^2}{3}$$

= 0.0144[kg・m²]

3-4. Calculate the kinetic energy

Calculate the kinetic energy of the impact object to confirm whether it is less than the absorption capacity of the shock absorber.

$$\text{Kinetic energy of the impact object E [J]} = \frac{1}{2} I\omega^2$$

$$E = \frac{1}{2} \times 0.0144[kg \cdot m^2] \times (6.28[rad/s])^2$$

= 0.28[J]

Values for Ex found in step 3-2:
KSHY10×6-01: Approx. 0.45 J
KSHY10×6-02: Approx. 0.3 J

The shock absorber with the optimum absorption capacity is KSHY10×6-02 because the smaller the gap between the values for E and Ex is, the lower the impact value and the shorter the operating time.

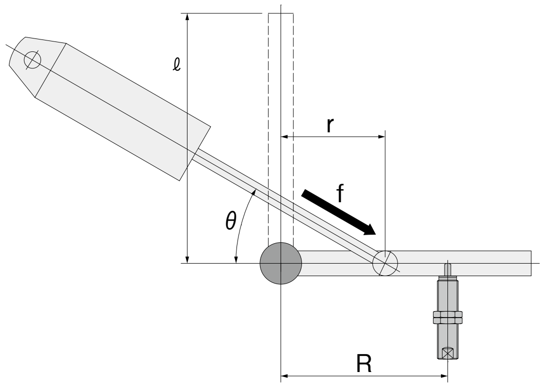
4. Confirm other specifications

Confirm that other operating conditions, such as the maximum operating frequency, maximum absorption capacity per unit of time, and operating temperature range, are within the specified ranges for KSHY10×6-02.

Example selection 2: Using an air cylinder

<Operating conditions>

When the impact object is a rod



① Cylinder thrust: Φ32(0.5MPa)→402[N]
② Cylinder thrust angle: $\theta = 30°$
③ Mounting position of cylinder's end: r = 30[mm] = 0.03[m]
④ Absorber's mounting radius: R = 50[mm] = 0.05[m]
⑤ Impact object mass: m = 3[kg]
⑥ Length from the center of rotation to the end of the rod: ℓ = 120[mm] = 0.12[m]
⑦ Swing angle: 90°
⑧ Target swing time: 0.5[s]

1. Confirm the thrust

Find the thrust, F, that is applied to the shock absorber.

$F = (f \times \sin\theta \times r) \div R$

$= ①\ 402[N] \times ②\ \sin 30° \times ③\ 0.03[m] \div ④\ 0.05[m]$

$= 120.6[N]$

Make a selection from a model (KSHY12 or higher) for an allowable thrust of 120.6 N or more.

(Refer to page 43 for specifications.)

2. Confirm the angle of eccentricity

Confirm whether the angle of eccentricity is less than the allowable angle of eccentricity (10°).

Assume that KSHY12×6 (body thread size: M12, stroke: 6 mm) is used.

$\alpha = \tan^{-1}\left(\frac{L}{R}\right)$

$= \tan^{-1}\left(\frac{6[mm]}{④\ 50[mm]}\right)$

$\fallingdotseq 6.84° < 10°$

3. Confirm the absorption capacity

3-1. Confirm the impact speed

Calculate the velocity at which the impact object impacts the shock absorber.

Swing angle [°] $\times \pi \div 180$ = Swing angle [rad]

⑦ 90[°] $\times \pi \div 180 \fallingdotseq 1.57$rad

Angular velocity ω [rad/sec] $= \frac{\text{Swing angle [rad]}}{\text{Target swing time [s]}} \times 2$

$\omega = \frac{1.57[rad]}{⑧\ 0.5[s]} \times 2$

$\fallingdotseq 6.28[rad/s]$

Velocity, V, of the shock absorber's mounting position [m/s]

$= R \times \omega$

$V = ④\ 0.05[m] \times 6.28[rad/s]$

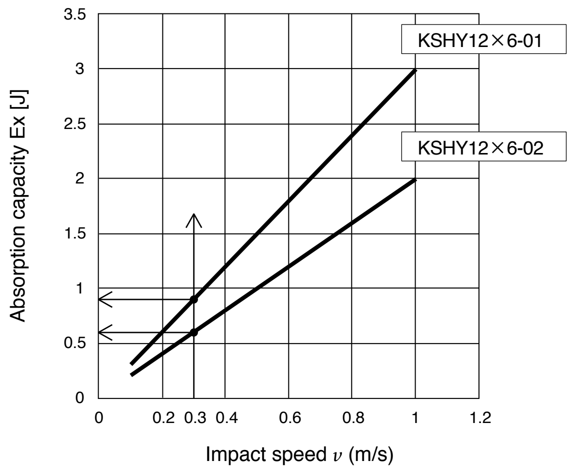
$\fallingdotseq 0.31[m/s] < 1m/s$

3-2. Confirm the absorption capacity of the shock absorber

From the selection graph on page 40:

Assume that you selected V = 0.31 m/s and confirm the absorption capacity, Ex, that KSHY12×6 exhibits.

● KSHY12×6



Values for Ex:
KSHY12×6-01: Approx. 0.9 J
KSHY12×6-02: Approx. 0.6 J

3-3. Calculate the moment of inertia

Find the moment of inertia for the impact object I [kg·m²] to calculate the kinetic energy.

According to "Rod (end is the center of rotation)", the diagram for calculating the moment of inertia (pages 41 to 42):

$I = \frac{m\ell^2}{3}$

$= \frac{⑤\ 3[kg] \times ⑥\ 0.12[m]^2}{3}$

$= 0.0144[kg \cdot m^2]$

3-4. Calculate the kinetic energy

Calculate the kinetic energy of the impact object to confirm whether it is less than the absorption capacity of the shock absorber.

Kinetic energy of the impact object E [J] $= \frac{1}{2} I\omega^2$

$E = \frac{1}{2} \times 0.0144[kg \cdot m^2] \times 6.28[rad/s]^2$

$= 0.28[J]$

Values for Ex found in step 3-2:
KSHY12×6-01: Approx. 0.9 J
KSHY12×6-02: Approx. 0.6 J

The shock absorber with the optimum absorption capacity is KSHY12×6-02 because the smaller the gap between the values for E and Ex is, the lower the impact value and the shorter the operating time.

4. Confirm other specifications

Confirm that other operating conditions, such as the maximum operating frequency, maximum absorption capacity per unit of time, and operating temperature range, are within the specified ranges for KSHY12×6-02.

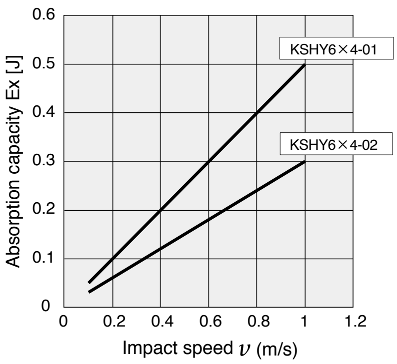
Selection guidelines

Cautions for using the selection graphs

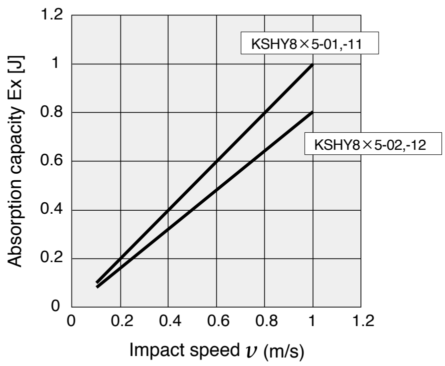
1. Use with an absorption capacity below the capacity curves.
2. The values in the selection graphs are for room temperature (20 to 25°). Be aware that performance and characteristics change depending on the operating temperature.

■Selection graph

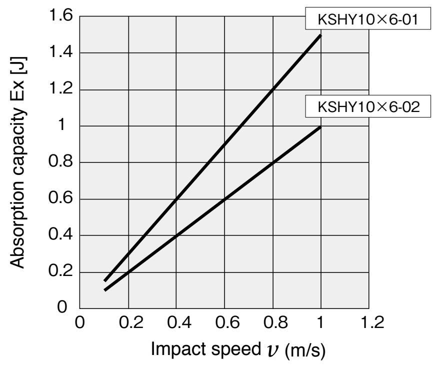
● KSHY6×4



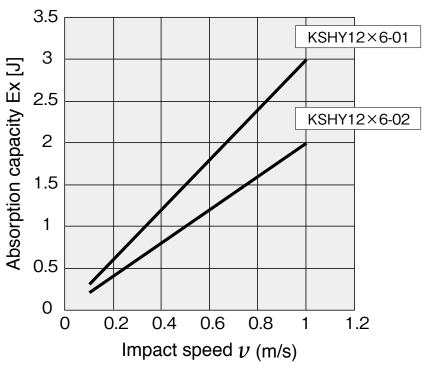
● KSHY8×5



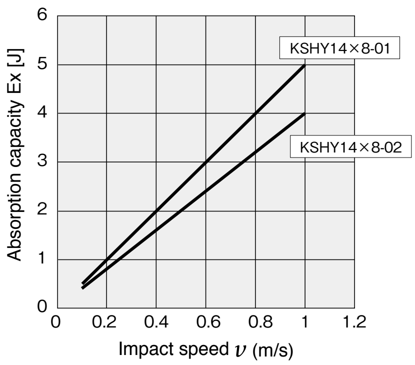
● KSHY10×6



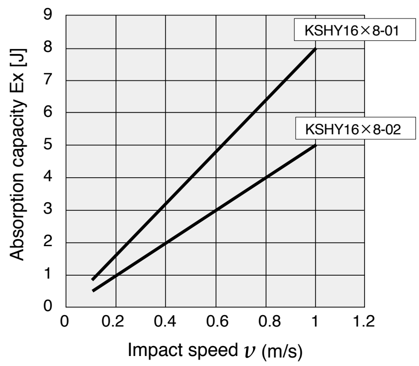
● KSHY12×6



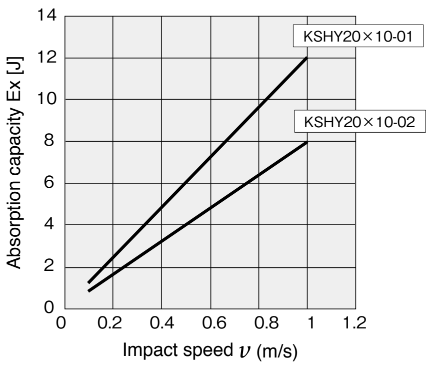
● KSHY14×8



● KSHY16×8



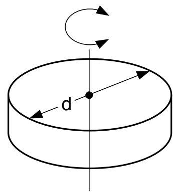
● KSHY20×10



■Diagram for calculating the moment of inertia

[When the rotation axis goes through the workpiece]

●Disk

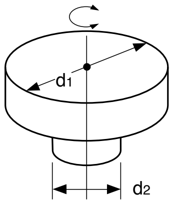


●Diameter d (m)
●Mass m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{md^2}{8}$$

●Stepped disk



●Diameter d_1 (m)
d_2 (m)
●Mass $d_1$part m_1 (kg)
$d_2$part m_2 (kg)

■Moment of inertia I [kg·m²]

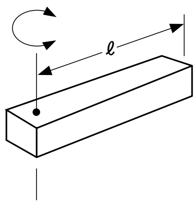
$$I = \frac{1}{8}(m_1d_1^2 + m_2d_2^2)$$

■Radius of rotation

$$\frac{d_1^2 + d_2^2}{8}$$

Remark: The d_2 part can be ignored if it is much smaller compared to the d_1 part.

●Rod (end is the center of rotation)

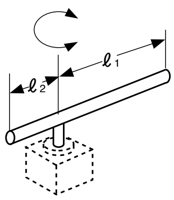


●Rod length ℓ (m)
●Mass m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m\ell^2}{3}$$

●Fine rod

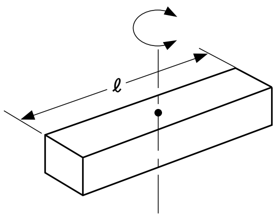


●Rod length ℓ_1 (m)
ℓ_2 (m)
●Mass m_1(kg)
m_2(kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m_1 \cdot \ell_1^2}{3} + \frac{m_2 \cdot \ell_2^2}{3}$$

●Rod (center of gravity is the center of rotation)

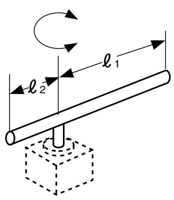


●Rod length ℓ (m)
●Mass m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m\ell^2}{12}$$

●Thin, rectangular plate (rectangular parallelepiped)

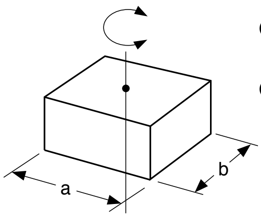


●Plate length a_1 (m)
a_2 (m)
●Edge length b (m)
●Mass m_1 (kg)
m_2(kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m_1}{12}(4a_1^2 + b^2) + \frac{m_2}{12}(4a_2^2 + b^2)$$

●Rectangular parallelepiped

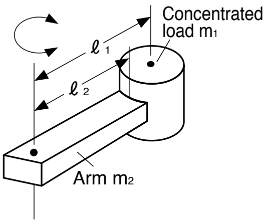


●Edge length a (m)
b (m)
●Mass m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m}{12}(a^2 + b^2)$$

●Concentrated load



- ●Shape of concentrated load
- ●Length to the concentrated load's center of gravity — ℓ_1 (m)
- ●Arm length — ℓ_2 (m)
- ●Mass of the concentrated load — m_1 (kg)
- ●Mass of the arm — m_2 (kg)

■Moment of inertia I [kg·m²]

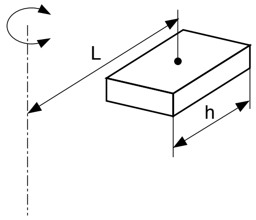
$$I = m_1 k^2 + m_1 \ell_1^2 + \frac{m_2 \ell_2^2}{3}$$

Radius of rotation: k^2 is calculated according to the shape of the concentrated load.

Remark: When m_2 is much smaller compared to m_1, it is okay to calculate $m_2 = 0$.

[When the rotation axis is off set from the workpiece]

●Rectangular parallelepiped



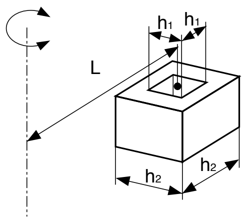
- ●Edge length — h (m)
- ●Distance from the rotation axis to the center of the load — L (m)
- ●Mass — m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{mh^2}{12} + mL^2$$

Remark: Same as for cube

●Hollow rectangular parallelepiped



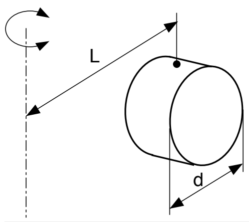
- ●Edge length — h_1 (m), h_2 (m)
- ●Distance from the rotation axis to the center of the load — L (m)
- ●Mass — m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m}{12}(h_2^2 + h_1^2) + mL^2$$

Remark: Cross-section is a cube only

●Cylinder

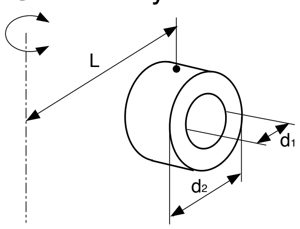


- ●Diameter — d (m)
- ●Distance from the rotation axis to the center of the load — L (m)
- ●Mass — m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{md^2}{16} + mL^2$$

●Hollow cylinder



- ●Diameter — d_1 (m), d_2 (m)
- ●Distance from the rotation axis to the center of the load — L (m)
- ●Mass — m (kg)

■Moment of inertia I [kg·m²]

$$I = \frac{m}{16}(d_2^2 + d_1^2) + mL^2$$

Linear orifice shock absorber

KSHY Series

Specifications

Item \ Model		KSHY6×4-01	KSHY6×4-02	KSHY8×5-01,-11	KSHY8×5-02,-12
Maximum absorption capacity	J	0.5	0.3	1	0.8
Stroke	mm	4		5	
Impact speed range	m/s	0.1 to 1.0			
Allowable thrust		27.5N or less		60.3N or less	
Maximum operating cycle	cycle/min	60			
Maximum absorption capacity per unit of time	J/min	18		36	
Spring return force[Note1]	N	3.5		6.5	
Deflection angle		10° or less			
Operating temperature range[Note2]	℃	0 to 60			

Item \ Model		KSHY10×6-01	KSHY10×6-02	KSHY12×6-01	KSHY12×6-02
Maximum absorption capacity	J	1.5	1	3	2
Stroke	mm	6			
Impact speed range	m/s	0.1 to 1.0			
Allowable thrust		100N or less		157N or less	
Maximum operating cycle	cycle/min	60			
Maximum absorption capacity per unit of time	J/min	45		80	
Spring return force[Note1]	N	8.5		15.5	
Deflection angle		10° or less			
Operating temperature range[Note2]	℃	0 to 60			

Item \ Model		KSHY14×8-01	KSHY14×8-02	KSHY16×8-01	KSHY16×8-02	KSHY20×10-01	KSHY20×10-02
Maximum absorption capacity	J	5	4	8	5	12	8
Stroke	mm	8		8		10	
Impact speed range	m/s	0.1 to 1.0					
Allowable thrust		245N or less		402N or less		628N or less	
Maximum operating cycle	cycle/min	60		40			
Maximum absorption capacity per unit of time	J/min	100		130		200	
Spring return force[Note1]	N	14.5		14.5		21.5	
Deflection angle		10° or less					
Operating temperature range[Note2]	℃	0 to 60					

Note 1: The spring return force cannot be used as a function because it is the return force of the piston rod at full stroke, making it unstable.

Note2: The shock absorbing capacity fluctuates based on speed and ambient temperature. Always use a product that is within the range shown by the solid lines in the graphs on pages ㊵.

Mass

g

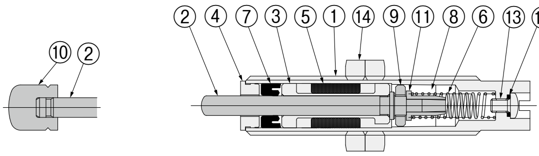
Model	Body[Note]	Additional mass	Additional parts' mass		
		With plastic cap	Mounting nut (1 ea.)	Stopper nut	Side mounting bracket
KSHY6×4-01, -02	4.5	0.2	0.4	3	8
KSHY8×5-01, -11	9	0.4	0.6(0.9)	4	12
KSHY10×6-01, -02	20.1	0.8	1.2	7	15
KSHY12×6-01, 02	32	1.3	1.9	8	22
KSHY14×8-01, 02	53	2.3	4	15	41
KSHY16×8-01, -02	70	2.3	6.6	28	65
KSHY20×10-01, -02	129	5	12.2	55	110

Calculation example: The mass of KSHY10×6C-01-S-2 (with cap, stopper, and side mount) is
20+1.3+7+15 = 43.3g

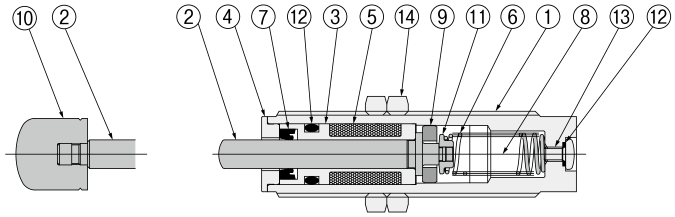
Note: The weight of the main unit includes the weight of 2 mounting nuts.

Inner Construction and Major Parts and Materials

●KSHY6×4



●KSHY8 to 20



No.	Name	Materials
①	Body Note 1	Copper alloy (nickel plated)
②	Piston rod Note 2	Stainless steel,
③	Sleeve	Copper alloy
④	Plug	Stainless steel
⑤	Accumulator	Synthetic rubber
⑥	Spring	Spring steel
⑦	Rod seal	Synthetic rubber
⑧	Oil	Special oil
⑨	Piston ring	Stainless steel,
⑩	Cap	Plastic (POM)
⑪	Collar Note 3	Stainless steel,
⑫	O-ring	Synthetic rubber
⑬	Screw Note 4	Mild steel (zinc plated)
⑭	Mounting nut	Mild steel (nickel plated)

Note1: KSHY6 and 8 are stainless steel
Note2: Shock absorbers with no caps undergo a quenching treatment.
Note3: KSHY6 and 8 are copper alloy
KSHY10 and 12 are sintered metal
Note4: KSHY6 and 8 are nickel plated

Order Codes

KSHY [ ] [ ] - [ ] - [ ] - [ ]

Durable angle of eccentricity specification
Linear orifice Shock absorber
KSHY Series

Body thread size × stroke
6×4
8×5
10×6
12×6
14×8
16×8
20×10

Cap
Blank: No cap
C : With cap

Thread pitch and absorption capacity
01: For heavy loads
02: For light loads
11: For heavy loads with different thread pitches
12: For light loads with different thread pitches
(11 and 12 set to 8×5 only, M8×1)

Stopper nut
Blank: No stopper nut
S : With stopper nut

Mounting bracket
Blank: No mounting bracket
2 : With side mounting bracket
(side mounting type)

Additional Parts

●Mounting nut (1 pack has 10 units)

N - KSH - M [ ]

Thread size
6: KSHY6
8: KSHY8
8-11: KSHY8-11
10: KSHY10
12: KSHY12
14: KSHY14
16: KSHY16
20: KSHY20

●Stopper nut

S - KSH - M [ ]

Thread size
6-L: KSHY6
8: KSHY8
8-11: KSHY8-11
10: KSHY10
12: KSHY12
14: KSHY14
16: KSHY16
20: KSHY20

●Side mounting bracket

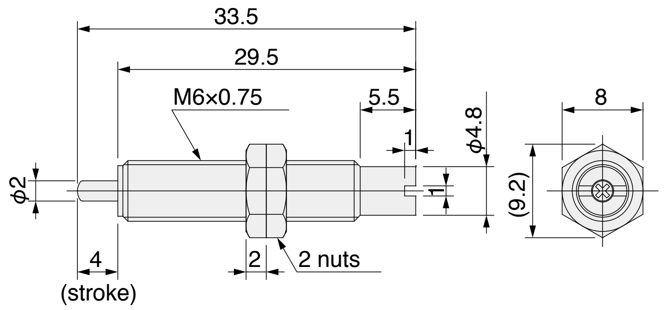
2 - KSH - M [ ]

Thread size
6: KSHY6
8: KSHY8
8-11: KSHY8-11
10: KSHY10
12: KSHY12
14: KSHY14
16: KSHY16
20: KSHY20

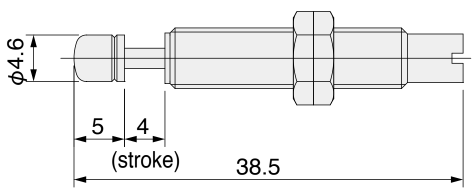
* For the dimension diagrams of the additional parts, see pages 72 to 73.
* The stopper nut and side mount are made from mild steel (nickel plated).

Dimensions (mm)

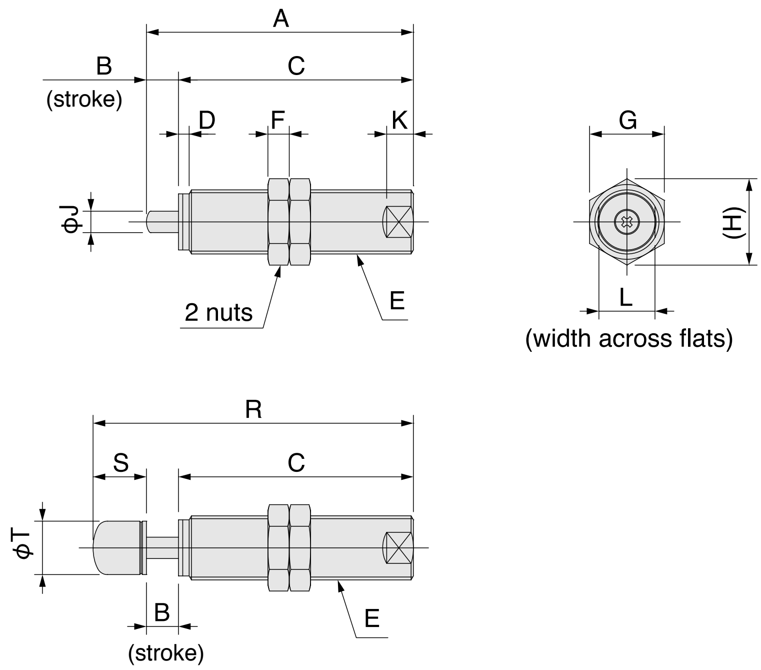
●KSHY6×4-□



●KSHY6×4C-□



●KSHY8 to 20



Model \ Symbol	A	B	C	D	E	F	G	H	J	K	L	R	S	T
KSHY8 × 5 (C)-01,-02	36	5	31	1.2	M8 × 0.75	2	10	11.5	2.5	3	7	42	6	6.5
KSHY8 × 5 (C)-11,-12	36	5	31	1.2	M8 × 1	3	10	11.5	2.5	3	7	42	6	6.5
KSHY10 × 6 (C)-01,-02	46	6	40	2	M10 × 1	3	12	13.9	3	5	8.5	55	9	8
KSHY12 × 6 (C)-01,-02	50	6	44	2	M12 × 1	4	14	16.2	4	5	10.5	60	10	10
KSHY14 × 8 (C)-01,-02	61	8	53	2	M14 × 1.5	5	17	19.6	5	5	12	72	11	11
KSHY16 × 8 (C)-01,-02	61	8	53	3	M16 × 1.5	7	19	21.9	5	7	13	72	11	11
KSHY20 × 10 (C)-01,-02	69	10	59	3	M20 × 1.5	8	24	27.7	6	7	17	84	15	15