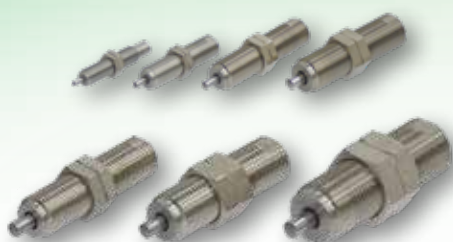


# Linear Orifice® Shock Absorber Series

**NEW**

## KSHY Series

Side load resistant  
Linear Orifice® Shock Absorber



- No need for an angle of eccentricity adaptor
- Each size can withstand up to 10°
- Maximum of more than 2 million operation cycles!

\* Specifications in inches are not available.



### KSHP Series

#### Adjustment Type Shock Absorber

- Shortened takt time
- Uses NSF certified H1 oil (non silicon)
- Maximum of more than 3million operation cycles!



### KSHJ Series

#### Fixed type Shock Absorber

- 18 sizes and 132 models
- Supports a wide variety of impact masses
- Maximum of more than 2million operation cycles!  
(800,000 operation cycles for M30 and higher)



### KSHC Series

#### Clean Room Specification Shock Absorber

- Low dust emissions and Class 5 equivalent  
(FED-STD Class 100 equivalent)
- Non silicon
- Maximum of more than 2million operation cycles!

KSHP series can solve the problems for users worried about **fine tuning absorption of impacts!**

# Introducing **the KSHP Series** of **Adjustment Type Linear Orifice® Shock Absorber**

\* "Linear Orifice" is a registered trademark of Koganei Corporation.

## **New release of our first adjustment type linear orifice models!**

Shorten operation cycle times by adjusting the absorbing capacity of the end of strokes.

## **Possible to fine tune for both impact speed and load for proper shock absorption!**

Our own construction makes fine tuning easy and **minimizes extreme changes** in shock absorbing capacity.

## **Maximum of more than 3 million operation cycles!**

Linear orifice construction provides longer life.

\* "M24" model 8 hundred thousand operation cycles.

## **Compliant with H1 grade food equipment specifications!**

Uses NSF H1 grade oil (non silicon).

### **Scaled from 0 to 6**

**Numbers are easy to see and indelible**

Set to 6 on the scale for maximum absorption  
Set to 0 on the scale for minimum absorption

### **Adjusting knob**

Can be rotated to the left or right

### **Red mark**

Align the red mark to a value on the scale

### **Lock screw**

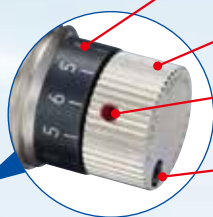
Lock the adjusting knob in position by tightening the lock screw after completing adjustment (excluding KSHP6 and KSHP8)

### **Scaled from 0 to 6 (adjusting knob)**

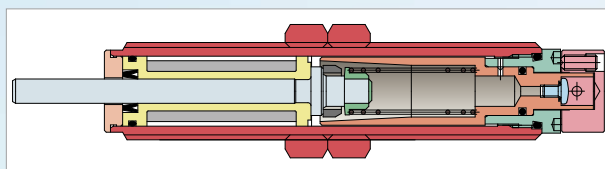
Set to 6 on the scale for maximum absorption  
Set to 0 on the scale for minimum absorption

### **Key slot on body**

Align a value on the scale to the key slot



**For KSHP6 and KSHP8**



Wide range of variations  
**M6 to M42**  
12 sizes 13 models





Wide range of variations  
**1/4-32 UNEF to 1 3/4-12UN**  
11 sizes 29 models






KSHP6×4 KSHP8×6 KSHP10×8 KSHP12×10 KSHP14×12 KSHP16×15 KSHP18×20 KSHP20×22 KSHP25×25 KSHP30×30 KSHP36×50 KSHP42×50

## List of linear orifice shock absorber products

[Specifications in mm]

	Basic mounting type	Durable angle of eccentricity	Adjustable type	Clean specification	Options		
Size	KSHJ	KSHY	KSHP	KSHC	Cap	Stopper nut	Side mount
M4 × 0.5	●			●	 Plastic cap		
M6 × 0.75	●	●	●	●			
M8 × 0.75	●	●	●	●			
M8 × 1	●	●	●	●			
M10 × 1	●	●	●	●			
M12 × 1	●	●	●	●			
M14 × 1.5	●	●	●	●			
M16 × 1.5	●	●	●	●			
M18 × 1.5	●		●				
M20 × 1.5	●	●	●	●			
M22 × 1.5	●				 Rubber cap * Only for KSHP 12 to 42		
M25 × 1.5	●		●	●			
M25 × 2	●						
M27 × 1.5	●						
M27 × 3	●						
M30 × 1.5	●		●				
M33 × 1.5	●						
M36 × 1.5	●		●				
M42 × 1.5	●		●				
M45 × 1.5	●						
M48 × 2	●						

[Specifications in inches]





	Basic mounting type	Adjustable type	Clean specification	Options	
Size	KSHJ	KSHP	KSHC	Cap	Stopper nut
10-32 UNF	●		●	 Plastic cap	
1/4-32 UNEF	●	●	●		
5/16-32 UNEF	●	●	●		
3/8-32 UNEF	●	●	●		
7/16-28 UNEF	●	●	●		
1/2-20 UNF	●	●	●		
9/16-18 UNF	●	●	●		
3/4-16 UNF	●	●	●		
1-12 UNF	●	●	●		
1 1/4-12 UNF	●	●			
1 3/8-12 UNF	●	●		 Rubber cap * Only for KSHP 12 to 42	
1 3/4-12 UN	●	●			

Before selecting and using the products, please read all the "Safety Precautions" carefully to ensure proper product use.

The Safety Precautions described below are to help you use the product safely and correctly, and to prevent injury or damage to you, other people, and assets.

Be sure to observe these safety precautions together with the following safety regulations of ISO4414 (Pneumatic fluid power - General rules and safety requirements for systems and their components), and JIS B 8370 (General rules relating to systems).

The directions are ranked according to degree of potential danger or damage: "DANGER", "WARNING", "CAUTION" and "ATTENTION."

 <b>DANGER</b>	Indicates situations that can be clearly predicted as dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 <b>WARNING</b>	Indicates situations that, while not immediately dangerous, could become dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 <b>CAUTION</b>	Indicates situations that, while not immediately dangerous, could become dangerous. Failure to avoid the situation creates the risk of minor or semi-serious injury. It could also result in damage or destruction of assets.
 <b>ATTENTION</b>	It could also result in damage or destruction of assets. appropriate use of the product.

## ■ This product was designed and manufactured for use in general industrial machinery.

- When selecting and handling equipment, the system designer or another person with sufficient knowledge and experience should always read the "Safety Precautions", "catalog", "instruction manual", and other literature before commencing operation. Improper handling is dangerous.
- After reading the instruction manual, catalog, and other documentation, always place them in a location that allows easy availability for reference to users of this product.
- Whenever transferring or lending the product to another person, always attach the catalog, instruction manual, and other information to the product where they are easily visible in order to ensure that the new user can use the product safely and properly.
- The danger, warning and caution items listed under these "Safety Precautions" do not cover all possible contingencies. Read the catalog and instruction manual carefully, and always keep safety first.

### **DANGER**

- Do not use the product for the purposes listed below:
  1. Medical equipment related to maintenance or management of human lives or bodies.
  2. Machines or equipment designed for the purpose of moving or transporting people.
  3. Critical safety components in mechanical devices.

This product has not been planned or designed for purposes that require high levels of safety. Using the product in any of the ways described above creates the risk of loss of human life.
- Do not use the product in locations with or near dangerous substances such as flammable or ignitable substances. This product is not explosion-proof. It could ignite or burst into flames.
- When mounting the product and workpiece, always make sure they are firmly supported and secured in place. Ensure the mounting material is strong enough. If the product falls over, is dropped, or breaks, it may result in injury.
- Never attempt to modify the product in any way. Doing so can cause an abnormal operation and create the risk of injury, etc.
- Never attempt inappropriate disassembly, assembly or repair of the product relating to basic construction, or to its performance or to functions. This can lead to injury, etc.
- Do not splash water on the product. Spraying it with water, washing it, or using it under water could result in malfunction leading to injury, etc.
- While the product is in operation, avoid touching it with your hands or otherwise approaching too close. Also, do not mount shock absorbers or make adjustments while the equipment is in operation. The equipment may move suddenly, possibly resulting in injury.

### **WARNING**

- Do not use the product in excess of its specification range. Doing so creates the risk of product breakdown, loss of function, or damage. It could also drastically reduce operating life.
- 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 injury.
- When conducting any kind of operation for the product, such as maintenance, inspection, repair, or replacement, always turn off the air supply and power to the equipment and make sure that the equipment is completely stopped.
- When mounting the product, always follow the handling instructions and precautions. Also when mounting the product, before operation, check that the mounting nut is tightened and not loose and then operate the product. If the mounting nut is loose, etc., this will result in damage to the equipment and accidents.
- Do not allow the product to be thrown into fire. The product could explode, ignite, and/or release toxic gases.

- Do not apply a load to the product, or place other objects on it. It could lead to damaged or broken products that result in degraded performance, function stops, etc.
- If the product has not been used for over 30 days, it is possible that the contacting parts may have become stuck, leading to abnormal operation at impact. Check for proper operation a minimum of once every 30 days.
- Do not use the product at the beach in direct sunlight, near mercury lamps, or near equipment that generates ozone. Ozone causes rubber components to deteriorate resulting in reduced performance, or a limitation or stop of functions.

### **CAUTION**

- Do not use in locations that are subject to direct sunlight (ultraviolet rays); locations with high humidity and temperature, dust, salt, or iron powder; or in locations with fluids and/or ambient atmosphere that include organic solvents, phosphate ester type hydraulic oil, sulfur dioxide, chlorine gas, acids, etc. It could lead to early shutdown of some functions, a sudden degradation of performance, and a reduced operating life. For information about materials, see Major Parts and Materials.
- When installing the product, be sure to allow adequate work space around it. Failure to do so will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- When transporting or mounting a heavy product, firmly support the product using a lift or support, or use multiple people to ensure personal safety. Also, wear protective gloves and use safety shoes etc. for protection as necessary.
- Always post an "operations in progress" sign for installations, adjustments, or other operations, to avoid unintentional supplying of air or electrical power, etc. Unintentional supplying of air or electrical power can cause the equipment to operate and may result in injury.
- Never apply lubrication to the product sliding parts. This leads to changes in the physical properties and deterioration of the materials used, resulting in reduced functionality.
- Attempting to use the shock absorber with a cap over the specification range could result in damage to the cap or to its flying off and causing personal injury. Moreover, if cracks or fractures appear in the cap, replace it as quickly as possible.
- Always wash your hands thoroughly after touching the oil or grease used on the shock absorber. There is a danger that the grease or oil from your hands will get on the cigarette and burn, releasing toxic gases, as you smoke the cigarette.
- As a means to prevent vibration, do not use the product at a high frequency that exceeds the value in the catalog. It could drastically reduce the product's operating life.
- When using the shock absorber, gradually increase the speed of the impact object. Suddenly increasing the speed when using the shock absorber may damage the device or injure someone.





### ATTENTION

- Whenever considering use of this product in situations or environments not specifically noted in the catalog or instruction manual, or in applications where safety is an important requirement such as in aircraft equipment, combustion equipment, leisure equipment, safety equipment, and other places where human life or assets may be greatly affected, take adequate safety precautions such as allowing plenty of margin for ratings and performance, or fail-safe measures. Contact the sales department of Koganei regarding use in such applications.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately, according to the "Law Regarding the Disposal and Cleaning of Waste" or other local governmental rules and regulations, as industrial waste. Incinerating the special oil in the KSHC series (clean specification) or the KSHJ series (short stroke type) generates hazardous fluorine (HF), which is corrosive and toxic. Because of this, incineration must be done in an incinerator that has neutralizing equipment that can handle acids. For large amounts, ask a registered waste disposal company.
- The product can exhibit degraded performance and function over its operating life. Always conduct daily inspections and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
- When handling the product, wear protective gloves, safety glasses, safety shoes, and other protective clothing.
- The maximum absorption in the specifications are for a normal temperature (20 to 25°C [68 to 77°F]). Be aware that performance and characteristics change depending on the operating temperature.
- The shock absorber's absorption capacity changes depending on the speed of the impacting object. Use the product within the ranges of the selection graphs.
- For inquiries about the product, consult your nearest Koganei sales office or Koganei Overseas Department. The addresses and telephone numbers are shown on the back cover of this catalog.



### Other

- Always observe the following items.
  1. When using this product in a system, use only genuine Koganei parts or equivalent (recommended) parts. When conducting maintenance and repairs, always use genuine Koganei parts or compatible parts (recommended parts). Always observe the prescribed methods and procedures.
  2. Never attempt unauthorized disassembly or assembly of the product relating to its basic construction, its performance, or its functions.

Koganei shall not be held responsible for any problems that occur as a result of these items not being properly observed.

### Warranty and General Disclaimer

#### 1. Warranty Period

Koganei warrants this product for a period of no more than 1 year from delivery.

\* However, some products have a 2-year warranty; contact your nearest Koganei sales office or the Koganei Technical Service Center for details.

#### 2. Scope of Warranty and General Disclaimer

- (1) When a product purchased from Koganei or from an authorized Koganei distributor malfunctions during the warranty period in a way that is found to be attributable to Koganei responsibility, Koganei will repair or replace the product free of charge. Even if a product is still within the warranty period, its durability is determined by its operation cycles and other factors. Contact your nearest Koganei sales office or the Koganei overseas department for details.
- (2) The Koganei product warranty covers only the product itself. Therefore, Koganei is not responsible for incidental losses (repair of the product, various expenses required for replacement, etc.) caused by breakdown, loss of function, or loss of performance of Koganei products.
- (3) Koganei shall not be held responsible for any losses or for any damage to other machinery caused by breakdown, loss of function, or loss of performance of Koganei products.
- (4) Koganei shall not be held responsible for any losses due to use or storage of the product in a way that is outside of the product specifications prescribed in Koganei catalogs and the instruction manual, and/or due to actions that violate the mounting, installation, adjustment, maintenance and other safety precautions.
- (5) Koganei shall not be held responsible for any losses caused by breakdown of the product due to factors outside the responsibility of Koganei, including but not limited to fire, natural disaster, the actions of third parties, and intentional actions or errors by you.

# Adjustment Type Linear Orifice® Shock Absorber KSHP Series

Introducing the **adjustable** linear orifice!  
Long **3 million cycle** operating life! (M42 Exc.)  
Uses NSF certified **H1 oil** (non silicon)



KSHJ

KSHY

KSHP

KSHC

Additional Parts

## Handling Instructions and Precautions



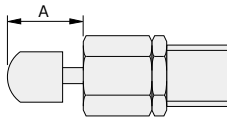
### General precautions

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 5. 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. You cannot mount two or more adjustable type shock absorbers in parallel to boost the absorption capacity (it is difficult to adjust the capacity evenly).
3. If using a shock absorber with a plastic or rubber 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 stopper nut in a position such that  $A \leq$  the stroke of the shock absorber. Furthermore, you can use a shock absorber that has a plastic cap without a stopper nut (-S) or external stopper, but, over the long-term, the stop location will change due to cap deformation and wear.



4. Rubber caps are consumable parts. The service life will vary depending on conditions of the application, replace these parts according to their condition.
5. If using a shock absorber with a rubber cap for lateral impacts, such as eccentric or swing impacts, note that the rubber cap may come off or be damaged.
6. When mounting the shock absorber, always use the following maximum tightening torque guidelines. Tightening using excessive force may result in damage.

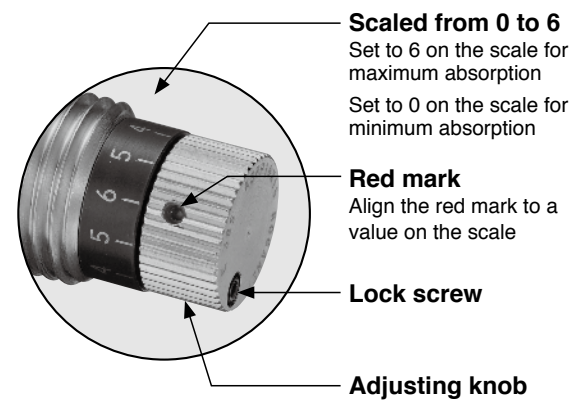
Model	Maximum tightening torque	
	N · m	in · lbf
<b>KSHP6 × 4 (C)(-F11)</b>	0.85	7.523
<b>KSHP8 × 6 (C)(-11)(-F11)</b>	2.5	22.128
<b>KSHP10 × 8 (C)(-F11)</b>	6.5	57.532
<b>KSHP11 × 8 (C)-F11</b>	—	57.5
<b>KSHP12 × 10 (C,R)(-F11)</b>	8.0	70.808
<b>KSHP14 × 12 (C,R)(-F11)</b>	12.0	106.2
<b>KSHP16 × 15 (C,R)</b>	20.0	—
<b>KSHP18 × 20 (C,R)(-F11)</b>	25.0	221.3
<b>KSHP20 × 22 (C,R)</b>	30.0	—
<b>KSHP25 × 25 (C,R)(-F11)</b>	42.0	371.7
<b>KSHP30 × 30 (C,R)(-F11)</b>	60.0	531.1
<b>KSHP36 × 50 (C,R)(-F11)</b>	72.0	637.3
<b>KSHP42 × 50 (C,R)(-F11)</b>	85.0	752.3

7. Ensure that the hardness of the surface directly impacting the piston rod of the shock absorber is over HRc40 hardness (excluding models with rubber or plastic caps).
8. Be aware that performance and characteristics change depending on the operating temperature.

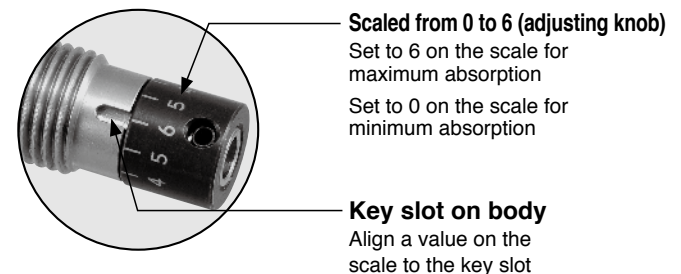


### Adjusting the shock absorbing capacity

1. For the **KSHP10** to **KSHP42** models, align the red mark on the adjusting knob to the 6 on the scale. For the **KSHP6** and **KSHP8** models, align the 6 on the scale to the key slot on the body.
2. For large impacts on collision or if a long time is required for a full stroke, reduce the value on the scale gradually.
3. Always tighten the lock screw to fix the knob in place after completing adjustment. (excluding **KSHP6** and **KSHP8**)

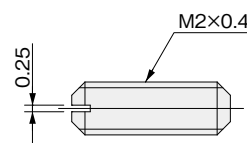


#### For KSHP6 and KSHP8

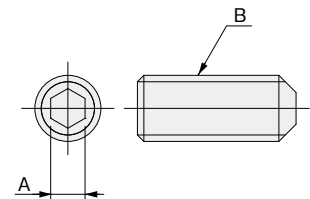


#### ● Lock screw dimensions mm [in]

##### For KSHP 10 to 14



##### For KSHP 16 to 42



Model	Symbol	A	B
<b>KSHP16 to 18</b>		1.3	M2.5×0.45
<b>KSHP20 to 42</b>		1.5	M3×0.5



## How to select shock absorbers

### 1. Confirm the thrust

Confirm the thrust that is used, and then check the prospective shock absorbers from the table of recommended cylinder bore sizes on page 49. If a shock absorber that is smaller than the recommended shock absorber is used, the shock absorber being used may be damaged in fewer operation cycles than is guaranteed.

### 2. Confirm the kinetic energy

Confirm I and II below, and then check page 49 for the selection graphs for prospective shock absorbers from [1. Confirm the thrust]. (\*)

I Impact object mass:  $m$  [kg]

II Impact speed:  $v$  [m/s]

Because “ $v$ ” is the impact speed, not the average speed, when using a cylinder,

$$v = m [\text{cylinder stroke}] \div s [\text{operating time}] \times 2$$

Select a model in which I and II fit within the range enclosed by the capacity curves.

If multiple models are applicable, use the model that is closest to both the capacity curves and the operating conditions. The further the model you select is from the capacity curves and the operating conditions, the slower it will tend to be.

### 3. Confirm other specifications

Confirm that such specifications as the maximum operating frequency, maximum absorption capacity per unit of time, angle of eccentricity, and operating temperature range are within the range for the shock absorber that you selected.

\* The value for the kinetic energy,  $E$ , can be found by doing the following calculation. However, the shock absorber's capacity for absorption changes depending on the impact speed. When the shock absorber is doing low-speed operations, it has less drag than when it is doing high-speed operations.

The maximum absorption capacity that is noted in the specifications is reached only at the maximum impact speed.

Therefore, do not choose a shock absorber by comparing  $E$  to the maximum absorption capacity; confirm the capacity using the selection graph.

$$E = \frac{1}{2} mv^2$$

$E$ : Kinetic energy (J)

$m$ : Impact object mass [kg]

$v$ : Impact speed (m/s)

### Range in the selection graph

Vertical axis range :

$$\text{Maximum impact speed} \geq v \text{ Impact speed (operating condition)}$$

Horizontal axis range :

$$\text{Shock absorber's maximum absorption capacity at the impact speed (v = m/s)} \geq \frac{E}{\text{Kinetic energy (operating condition)}}$$

Calculating the thrust energy is not necessary because the size of the shock absorber is limited by the thrust in step 1.

## Koganei's selectable content

You can also select equipment from Koganei's homepage.

Visit <http://www.koganei.co.jp>.

The results of selections using the method above may differ from the results of selections for the selectable content on our homepage. If this happens, please contact us.

## Example of selecting a shock absorber

[Operating conditions]

① Bore size of the cylinder being used:  $\phi 16$

② Cylinder stroke: 100 mm = 0.1 m

③ Pressure applied to the cylinder: 0.6 MPa

④ Cylinder's operating time: 0.4 s

⑤ Impact object mass: 10 kg

### 1. Confirm the thrust

Either calculate or find the thrust in the cylinder thrust table on page 49.

The cylinder thrust based on ① and ③ is about 121 N.

Cylinder thrust	100.5N	<	120.6N	<	126N
Cylinder bore size	$\phi 16$		$\phi 16$		$\phi 20$
Applied pressure	0.5MPa		0.6MPa		0.4MPa

As mentioned above, although the cylinder being used is  $\phi 16$ , the pressure applied to the cylinder exceeds 0.5 MPa, so consider the  $\phi 20$  cylinder (lower than 0.4 MPa) and check the table of recommended cylinder bore sizes on page 49.

The following are prospective models.

- KSHP10 $\times$ 8
- KSHP12 $\times$ 10
- KSHP14 $\times$ 12
- KSHP16 $\times$ 15
- KSHP18 $\times$ 20
- KSHP20 $\times$ 22

### 2. Confirm the kinetic energy

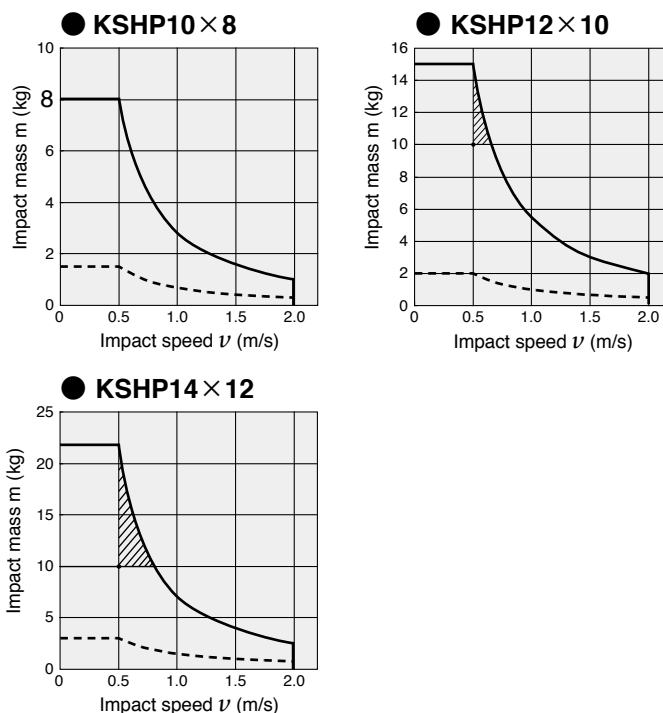
I The impact object mass  $m = 10$  kg from ⑤

II Find the impact speed,  $v$ , from ② and ④.

$$v = ② 0.1 \text{ m} \div ④ 0.4 \text{ s} \times 2$$

$$= 0.5 \text{ m/s}$$

According to the selection graphs on page 44, the shock absorber with the optimum absorption capacity for operating conditions is KSHP12 $\times$ 10.



• KSHP10 $\times$ 8 has an insufficient absorption capacity.

• The absorption capacities for all of the other shock absorbers are higher than that of KSHP12 $\times$ 10, so they do not fall within the operating conditions and capacity curves.

### 3. Confirm other specifications

Verify that other operating conditions, such as the maximum operating frequency, maximum absorption capacity per unit of time, angle of eccentricity, and operating temperature range, are within the specified ranges for KSHP12 $\times$ 10.



## Selection Guidelines

### Recommended cylinder bore size

Cylinder bore Model	φ4	φ6	φ8	φ10	φ12	φ16	φ20	φ25	φ32	φ40	φ50	φ63	φ80	φ100	φ125
KSHP6×4 (-F11)	◇	◇	◎	◎	○										
KSHP8×6 (-11)(-F11)		◇	◇	◎	◎	○									
KSHP10×8 (-F11)			◇	◇	◎	◎	○								
KSHP11×8-F11			◇	◇	◎	◎	○								
KSHP12×10 (-F11)				◇	◇	◎	◎	○							
KSHP14×12 (-F11)					◇	◇	◎	◎	○						
KSHP16×15						◇	◇	◎	◎	○					
KSHP18×20 (-F11)							◇	◇	◎	◎					
KSHP20×22							◇	◇	◎	◎	○				
KSHP25×25 (-F11)								◇	◇	◎	◎	○			
KSHP30×30 (-F11)									◇	◇	◎	◎	○		
KSHP36×50 (-F11)										◇	◇	◎	◎	○	
KSHP42×50 (-F11)											◇	◇	◎	◎	○

◇ : 0.3 MPa or higher    ◎ : 0.5 MPa or lower    ○ : 0.4 MPa or lower

Note 1: If a shock absorber that is smaller than the recommended shock absorber is used, the shock absorber being used may be damaged in fewer operation cycles than the value that is guaranteed.

Note 2: KSHP11×8 has only inch specifications.

### Cylinder thrust

N [lbf.]

Bore size mm [in.]	Pressure area mm <sup>2</sup> [in. <sup>2</sup> ]	Air pressure MPa [psi.]								
		0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	0.8 [116]	0.9 [131]
φ4	12.6 [0.020]	1.3 [0.292]	2.5 [0.562]	3.8 [0.854]	5 [1.124]	6.3 [1.416]	7.5 [1.686]	8.8 [1.978]	10.1 [2.270]	11.3 [2.540]
φ6	28.3 [0.044]	2.8 [0.629]	5.7 [1.281]	8.5 [1.911]	11.3 [2.540]	14.1 [3.170]	17.0 [3.822]	19.8 [4.451]	22.6 [5.080]	25.4 [5.710]
φ8	50.3 [0.078]	5 [1.124]	10.1 [2.270]	15.1 [3.394]	20.1 [4.518]	25.1 [5.642]	30.2 [6.789]	35.2 [7.913]	40.2 [9.037]	45.2 [10.161]
φ10	78.5 [0.122]	7.9 [1.776]	15.7 [3.529]	23.6 [5.305]	31.4 [7.059]	39.3 [8.835]	47.1 [10.588]	55 [12.364]	62.8 [14.117]	70.7 [15.893]
φ12	113 [0.175]	11.3 [2.540]	22.6 [5.080]	33.9 [7.621]	45.2 [10.161]	56.5 [12.701]	67.9 [15.264]	79.2 [17.804]	90.5 [20.344]	101.8 [22.885]
φ16	201 [0.312]	20.1 [4.518]	40.2 [9.037]	60.3 [13.555]	80.4 [18.074]	100.5 [22.592]	121 [27.201]	141 [31.697]	161 [36.193]	181 [40.689]
φ20	314 [0.487]	31.4 [7.059]	62.8 [14.117]	94.2 [21.176]	126 [28.325]	157 [35.294]	188 [42.262]	220 [49.456]	251 [56.425]	283 [63.618]
φ25	491 [0.761]	49.1 [11.038]	98.2 [22.075]	147 [33.046]	196 [44.061]	245 [55.076]	295 [66.316]	344 [77.331]	393 [88.346]	442 [99.362]
φ32	804 [1.246]	80.4 [18.074]	161 [36.193]	241 [54.177]	322 [72.386]	402 [90.370]	483 [108.6]	563 [126.6]	643 [144.5]	724 [162.8]
φ40	1257 [1.948]	126 [28.325]	251 [56.425]	377 [84.750]	503 [113.1]	628 [141.2]	754 [169.5]	880 [197.8]	1005 [225.9]	1131 [254.2]
φ50	1963 [3.043]	196 [44.061]	393 [88.346]	589 [132.4]	785 [176.5]	982 [220.8]	1178 [264.8]	1374 [308.9]	1571 [353.2]	1767 [397.2]
φ63	3117 [4.831]	312 [70.138]	623 [140.1]	935 [210.2]	1247 [280.3]	1559 [350.5]	1870 [420.4]	2182 [490.5]	2494 [560.7]	2806 [630.8]
φ80	5027 [7.792]	503 [113.1]	1005 [225.9]	1508 [339.0]	2011 [452.1]	2513 [564.9]	3016 [678.0]	3519 [791.1]	4021 [903.9]	4524 [1017]
φ100	7854 [12.174]	785 [176.5]	1571 [353.2]	2356 [529.6]	3142 [706.3]	3927 [882.8]	4712 [1059]	5498 [1236]	6283 [1412]	7069 [1589]
φ125	12272 [19.022]	1227 [275.8]	2454 [551.7]	3682 [827.7]	4909 [1104]	6136 [1379]	7363 [1655]	8590 [1931]	9817 [2207]	11045 [2483]

## Selection Guidelines

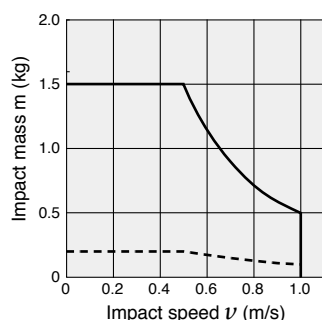
### Cautions for using the selection graphs

1. The selection graphs are calculated with a cylinder operating air pressure of 0.5 MPa.
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.
3. Select a shock absorber that is as close to, yet within, the capacity line(s).
4. You can select them on the Koganei home page. Go to <http://www.koganei.co.jp>  
The results of selections using our catalog may differ from the results of selections on our homepage.

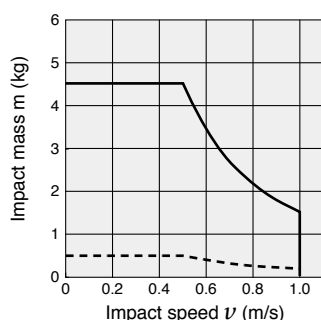
### ■ Selection graph

— Graph when calibrated to 6  
- - - - - Graph when calibrated to 0 (guideline)

#### ● KSHP6×4 (-F11)

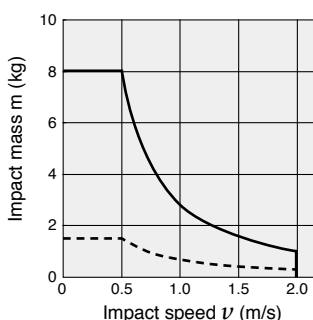


#### ● KSHP8×6 (-F11)

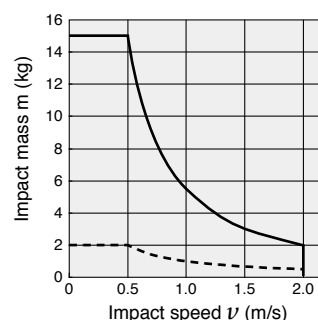


#### ● KSHP10×8 (-F11)

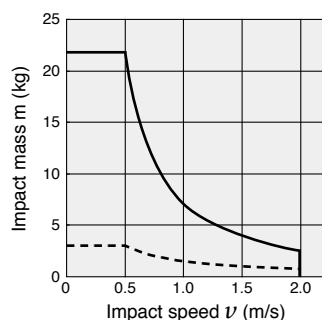
#### ● KSHP11×8-F11



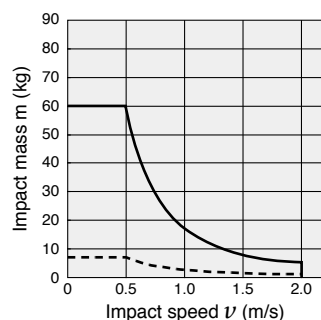
#### ● KSHP12×10 (-F11)



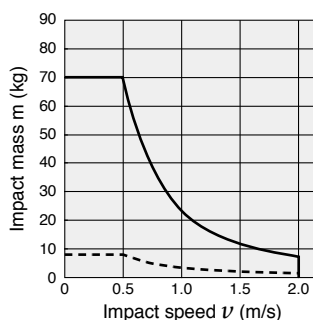
#### ● KSHP14×12 (-F11)



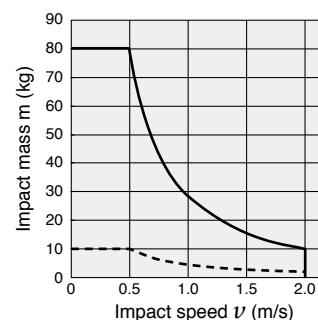
#### ● KSHP16×15



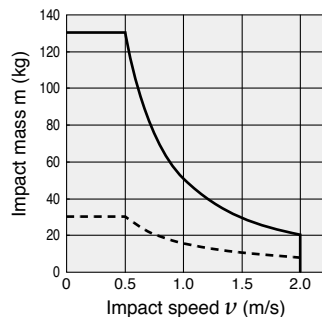
#### ● KSHP18×20 (-F11)



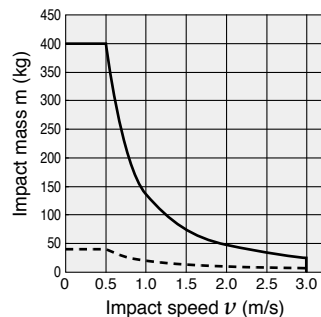
#### ● KSHP20×22



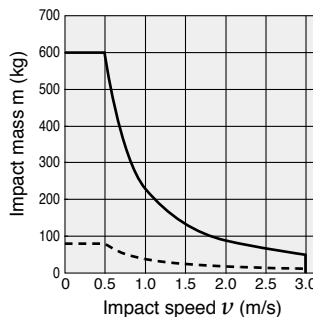
#### ● KSHP25×25 (-F11)



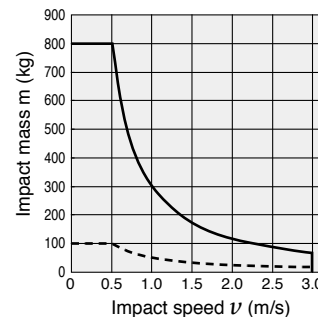
#### ● KSHP30×30 (-F11)



#### ● KSHP36×50 (-F11)

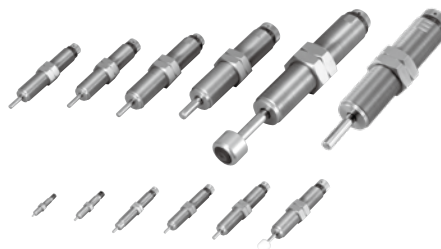


#### ● KSHP42×50-F11



# Linear orifice shock absorber

## KSHP Series



### Specifications

Model (in inches)		KSHP6 × 4 (KSHP6 × 4-F11)	KSHP8 × 6, KSHP8 × 6-11 (KSHP8 × 6-F11)
Item			
Maximum absorption capacity	J(in.lbs)	0.25 (2.213)	0.75 (6.638)
Absorption stroke	mm(in.)	4 (0.157)	6 (0.236)
Impact speed range	m/s(ft/s)	0.1 to 1 (0.33 to 3.28)	
Maximum operating cycle	cycle/min	50	
Maximum absorption capacity per unit of time	J/min (in.lbs/min)	7.5 (66.4)	22.5 (199.3)
Spring return force <sup>Note1</sup>	N	2.6	2.9
Deflection angle		1° or less	
Operating temperature range <sup>Note2</sup>	°C(°F)	0 to 60 (32 to 140)	

Model (in inches)		KSHP10 × 8 (KSHP10 × 8-F11, KSHP11 × 8-F11)	KSHP12 × 10 (KSHP12 × 10-F11)	KSHP14 × 12 (KSHP14 × 12-F11)
Item				
Maximum absorption capacity	J(in.lbs)	2 (17.701)	4 (35.403)	5 (44.254)
Absorption stroke	mm(in.)	8 (0.315)	10 (0.394)	12 (0.472)
Impact speed range	m/s(ft/s)	0.1 to 2 (0.33 to 6.56)		
Maximum operating cycle	cycle/min	50		
Maximum absorption capacity per unit of time	J/min (in.lbs/min)	60 (531.4)	120 (1062.7)	150 (1328.4)
Spring return force <sup>Note1</sup>	N	6.5	9.6	9.0
Deflection angle		1° or less		
Operating temperature range <sup>Note2</sup>	°C(°F)	0 to 60 (32 to 140)		

Model (in inches)		KSHP16 × 15	KSHP18 × 20 (KSHP18 × 20-F11)	KSHP20 × 22
Item				
Maximum absorption capacity	J(in.lbs)	10	15 (132.8)	20
Absorption stroke	mm(in.)	15	20 (0.787)	22
Impact speed range	m/s(ft/s)	0.1 to 2 (0.33 to 6.56)		
Maximum operating cycle	cycle/min	40		
Maximum absorption capacity per unit of time	J/min (in.lbs/min)	240	360 (3188.2)	360
Spring return force <sup>Note1</sup>	N	20.5	23.0	18.4
Deflection angle		3° or less		
Operating temperature range <sup>Note2</sup>	°C(°F)	0 to 60 (32 to 140)		

Model (in inches)		KSHP25 × 25 (KSHP25 × 25-F11)	KSHP30 × 30 (KSHP30 × 30-F11)	KSHP36 × 50 (KSHP36 × 50-F11)
Item				
Maximum absorption capacity	J(in.lbs)	40 (354.0)	110 (973.6)	200 (1770)
Absorption stroke	mm(in.)	25 (0.984)	30 (1.181)	50 (1.969)
Impact speed range	m/s(ft/s)	0.1 to 2 (0.33 to 6.56)	0.1 to 3 (0.33 to 9.84)	
Maximum operating cycle	cycle/min	30	20	15
Maximum absorption capacity per unit of time	J/min (in.lbs/min)	720 (6376.3)	1320 (11690)	1800 (15940.8)
Spring return force <sup>Note1</sup>	N	32.3	42.3	65.8
Deflection angle		3° or less		
Operating temperature range <sup>Note2</sup>	°C(°F)	0 to 60 (32 to 140)		

Model (in inches)		KSHP42 × 50 (KSHP42 × 50-F11)
Item		
Maximum absorption capacity	J(in.lbs)	300 (2655)
Absorption stroke	mm(in.)	50 (1.969)
Impact speed range	m/s(ft/s)	0.1 to 3 (0.33 to 9.84)
Maximum operating cycle	cycle/min	10
Maximum absorption capacity per unit of time	J/min (in.lbs/min)	2000 (17712.0)
Spring return force <sup>Note1</sup>	N	64.2
Deflection angle		3° or less
Operating temperature range <sup>Note2</sup>	°C(°F)	0 to 60 (32 to 140)

Note1: The spring return force is the force of the piston rod when it returns from a full stroke. It is not stable, so cannot be used as other than rod return.

Note2: The shock absorber's shock absorbing capacity fluctuates based on speed and ambient temperature.

Use the product within the ranges of the selection graphs (impact mass, impact speed diagram) on page 50.

Note3: KSHP11 has only inch specifications.

\* The maximum tightening torque of KSHP11 is different from that of KSHP10. See page 47 for details on the maximum tightening torque.

Note4: KSHP16 × 15 and KSHP20 × 22 do not have inch specifications.

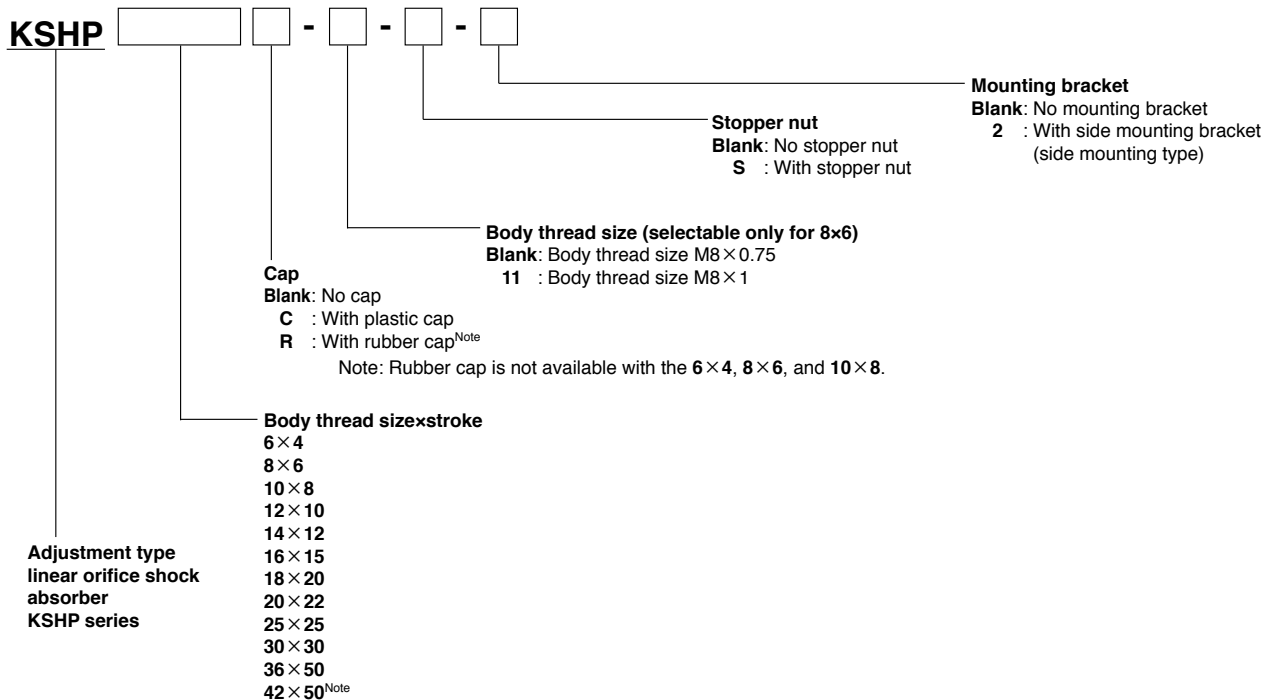
## Mass (Specifications in mm)

Model	Main unit <sup>Note</sup>	Additional mass		Additional parts' mass		
		With plastic cap	With rubber cap	Mounting nut (1 ea.)	Stopper nut	Side mounting bracket
KSHP6 × 4	5.1	0.2	—	0.4	2	8
KSHP8 × 6 (-11)	11.3(11.5)	0.5	—	0.6(0.9)	4	12
KSHP10 × 8	26.5	0.7	—	1.2	7	15
KSHP12 × 10	43.5	1.1	1.2	1.9	8	22
KSHP14 × 12	66.5	1.1	1.8	4.0	15	41
KSHP16 × 15	98.5	1.6	3.4	6.6	28	65
KSHP18 × 20	144	4.1	5.3	8.8	37	100
KSHP20 × 22	186	5.4	6.9	12.2	55	110
KSHP25 × 25	360	5.3	5.7	23.0	95	360
KSHP3 × 30	569	50	49	32.5	140	455
KSHP36 × 50	1130	110	109	95.5	330	2650
KSHP42 × 50	1515	110	109	93.0	320	2400

Calculation example: The mass of KSHP10 × 8C-S-2 (with cap, stopper, and side mount) is  
 $26.5 + 0.7 + 7 + 15 = 49.2\text{g}$

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

## Order Codes (specifications in mm)



Note: KSHP42 × 50 is a built-to-order product. Contact us about turnaround times, prices, or other information.

## Additional Parts (no specifications in inches)

### • Rubber cap

R - KSH - M [ ]



**Thread size**  
 12: For KSHP12  
 14: For KSHP14  
 16: For KSHP16  
 18: For KSHP18  
 20: For KSHP20  
 25: For KSHP25  
 30: For KSHP30  
 36: For KSHP36  
 42: For KSHP42

### • Mounting nut

(M4 to M20: 1 pack has 10 units)  
 (M25 to M42: 1 pack has 2 units)

N - KSH - M [ ]



**Thread size**  
 6: For KSHP6  
 8: For KSHP8  
 8-11: For KSHP8-11  
 10: For KSHP10  
 12: For KSHP12  
 14: For KSHP14  
 16: For KSHP16  
 18: For KSHP18  
 20: For KSHP20  
 25: For KSHP25  
 30: For KSHP30  
 36: For KSHP36  
 42: For KSHP42

### • Stopper nut

S - KSH - M [ ]



**Thread size**  
 6: For KSHP6  
 8: For KSHP8  
 8-11: For KSHP8-11  
 10: For KSHP10  
 12: For KSHP12  
 14: For KSHP14  
 16: For KSHP16  
 18: For KSHP18  
 20: For KSHP20  
 25: For KSHP25  
 30: For KSHP30  
 36: For KSHP36  
 42: For KSHP42

### • Side mounting bracket

2 - KSH - M [ ]



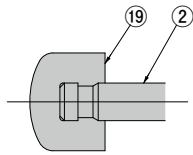
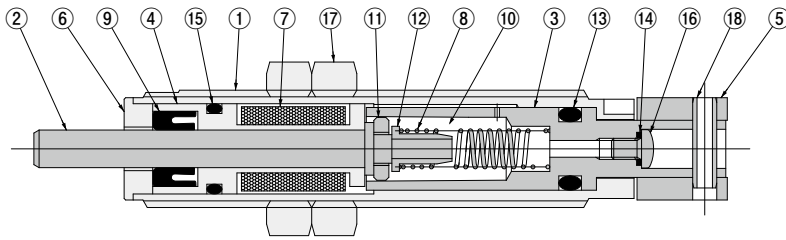
**Thread size**  
 6: For KSHP6  
 8: For KSHP8  
 8-11: For KSHP8-11  
 10: For KSHP10  
 12: For KSHP12  
 14: For KSHP14  
 16: For KSHP16  
 18: For KSHP18  
 20: For KSHP20  
 25: For KSHP25  
 30: For KSHP30  
 36: For KSHP36  
 42: For KSHP42

\* For the dimension diagrams of the additional parts, see pages 72 to 76.  
 \* The stopper nut and side mount are made from mild steel (nickel plated).



## Inner Construction and Major Parts and Materials

●M6,M8 size (11/4-32 UNEF, 5/16-32 UNEF) \* The inch sizes are inside the ( ).

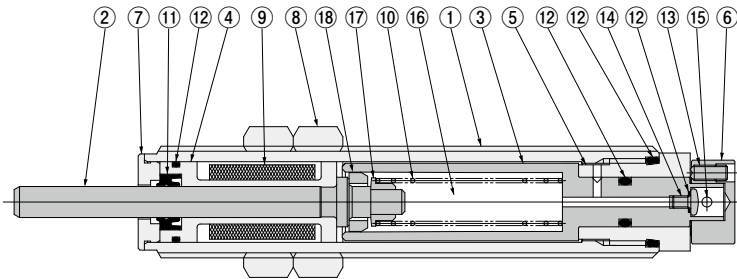


With plastic cap (C)

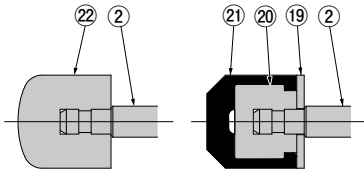
No	Name	Materials
①	Body	Stainless steel
②	Piston rod	Stainless steel
③	Inner tube	Stainless steel
④	Sleeve	Copper alloy
⑤	Adjusting knob	Copper alloy (black electroplated)
⑥	Plug	Stainless steel
⑦	Accumulator	Synthetic rubber
⑧	Spring	Spring steel
⑨	Rod seal	Synthetic rubber
⑩	Oil	Special oil (H1 compliant)
⑪	Piston ring	Copper alloy
⑫	Collar	Copper alloy
⑬	O-ring	Synthetic rubber
⑭	O-ring	Synthetic rubber
⑮	O-ring <sup>Note</sup>	Synthetic rubber
⑯	Screw	Mild steel (nickel plated)
⑰	Mounting nut	Mild steel (nickel plated)
⑱	Spring pin	Steel (oxide film)
⑲	Cap	Plastic (POM)

Note: Not available for KSHP6x4.

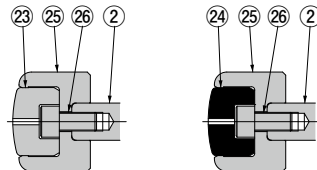
●M10 to M42 size (3/8-32 UNEF to 1 3/4-12 UN) \* The inch sizes are inside the ( ).



For KSHP 30 × 30 and KSHP 42 × 50



With plastic cap (C) With rubber cap (R)



With plastic cap (C) With rubber cap (R)

No.	Name	Materials
①	Body	Free-cutting steel (nickel plated)
②	Piston rod <sup>Note1</sup>	Steel (nickel plated)
③	Inner tube	Stainless steel
④	Sleeve	Copper alloy
⑤	Housing	Mild steel (black electroplated)
⑥	Adjusting knob	Copper alloy (nickel plated)
⑦	Plug	Stainless steel
⑧	Mounting nut	Mild steel (nickel plated)
⑨	Accumulator	Synthetic rubber
⑩	Spring	Spring steel
⑪	Rod seal	Synthetic rubber
⑫	O-ring	Synthetic rubber
⑬	Lock screw <sup>Note2</sup>	Steel (oxide film)
⑭	Screw <sup>Note3</sup>	Mild steel (zinc plated)
⑮	Spring pin	Steel (oxide film)
⑯	Oil	Special oil (H1 compliant)
⑰	Collar <sup>Note4</sup>	Stainless steel
⑱	Piston ring	Stainless steel
⑲	Washers <sup>Note5</sup>	Stainless steel
⑳	Cap	Plastic (POM)
㉑	Rubber cap	Urethane rubber
㉒	Cap	Plastic (POM)
㉓	Cap	Plastic (POM)
㉔	Rubber cap	Urethane rubber
㉕	Metal cap	Stainless steel
㉖	Hexagon socket head screw	Stainless steel

Note 1: KSHP 10 to 12 are stainless steel

2: KSHP 10 to 14 are slotted lock screws.

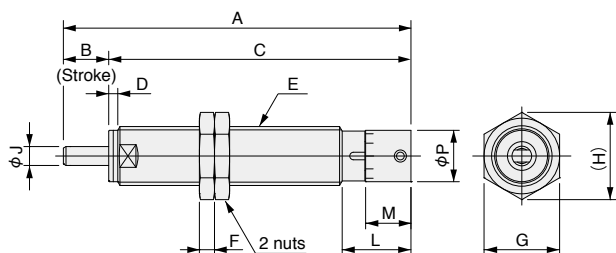
3: KSHP 30 to 42 are stainless steel with button head screw

4: KSHP 10 are copper alloy and KSHP 12 to 14 are sintered metal

5: KSHP 18 to 20 only

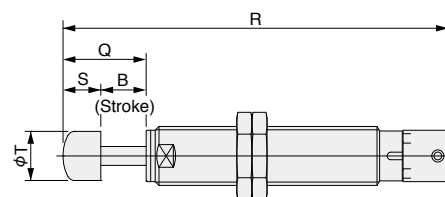
## Dimensions (mm)

●No rod end cap: **KSHP**□×□



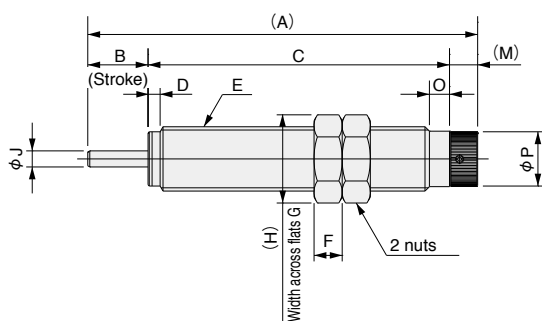
●With rod end cap

With plastic cap: **KSHP**□×□**C**



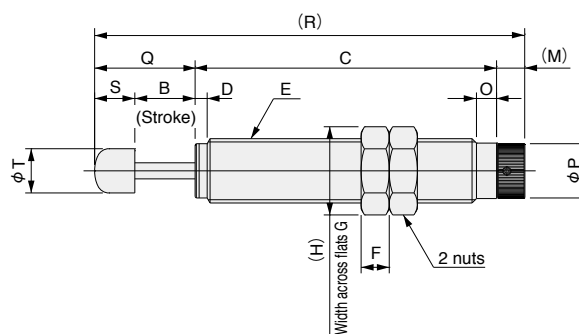
Model	Symbol	A	B	C	D	E	F	G	H	J	L	M	P	Q	R	S	T
<b>KSHP6×4 (C)</b>		36	4	32	0.5	M6×0.75	2	8	9.2	2	6.5	5.4	5	8	40	4	4.6
<b>KSHP8×6 (C)</b>		46	6	40	1.2	M8×0.75	2	10	11.5	2.5	9	6	6.8	11	51	5	6.5
<b>KSHP8×6 (C)-11</b>		46	6	40	1.2	M8×1	3	10	11.5	2.5	9	6	6.8	11	51	5	6.5

●No rod end cap: **KSHP**□×□

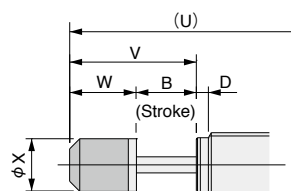


●With rod end cap

With plastic cap: **KSHP**□×□**C**

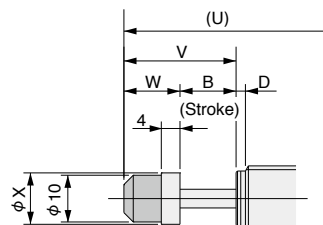


With rubber cap: **KSHP**□×□**R**



Note: Rubber cap is not available with the **KSHP10×8**

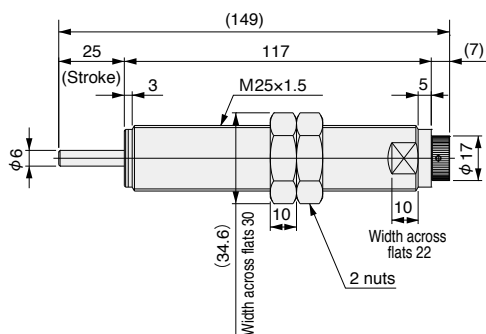
With rubber cap: For the **KSHP14×12R**



Model	Symbol	A	B	C	D	E	F	G	H	J	M	O	P	Q	R	S	T	U	V	W	X
<b>KSHP10×8 (C)</b>		69	8	56	6	M10×1	3	12	13.9	3	5	4	8.7	16	77	8	8	—	—	—	—
<b>KSHP12×10 (C,R)</b>		75	10	60	2	M12×1	4	14	16.2	3	5	4	10.7	20	85	10	10	85	20	10	10
<b>KSHP14×12 (C,R)</b>		87	12	70	2	M14×1.5	5	17	19.6	4	5	4	10.7	22	97	10	11	99	24	12	11
<b>KSHP16×15 (C,R)</b>		97	15	75	3	M16×1.5	7	19	21.9	4	7	5	13.5	25	107	10	11	113.5	31.5	16.5	13
<b>KSHP18×20 (C,R)</b>		116	20	89	3	M18×1.5	8	21	24.2	5	7	5	13.5	35	131	15	15	131.7	35.7	15.7	15
<b>KSHP20×22 (C,R)</b>		121	22	92	3	M20×1.5	8	24	27.7	5	7	5	17	40	139	18	16	139.2	40.2	18.2	16

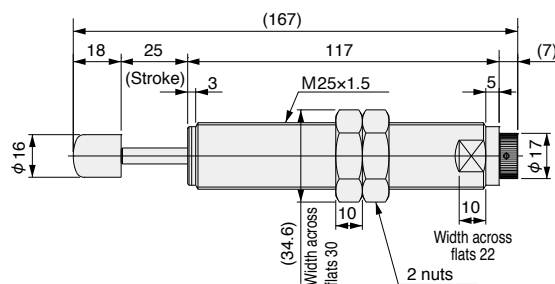
## Dimensions (mm)

### ● No rod end cap: **KSHP25 × 25**

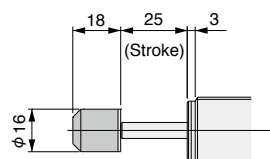


### ● With rod end cap

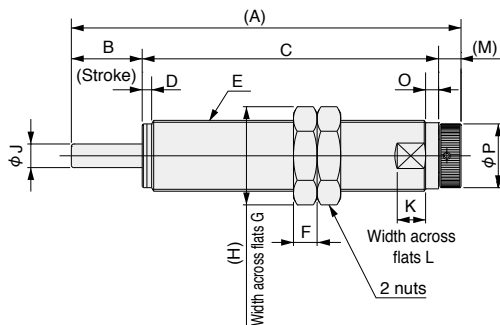
#### With plastic cap: **KSHP25 × 25C**



#### With rubber cap: **KSHP25 × 25R**



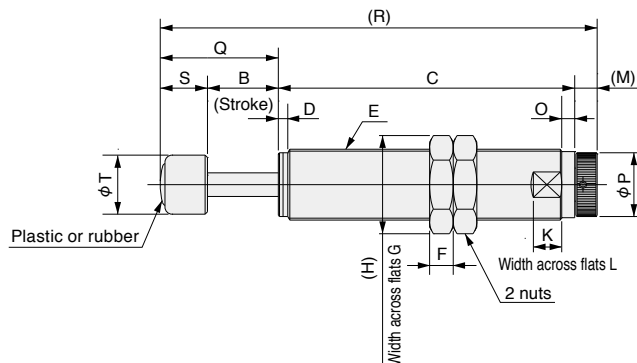
### ● No rod end cap: **KSHP□ × □**



### ● With rod end cap

#### With plastic cap: **KSHP□ × □C**

#### With rubber cap: **KSHP□ × □R**



Model	Symbol	A	B	C	D	E	F	G	H	J	K	L	M	O	P	Q	R	S	T
KSHP30 × 30 (C,R)		165	30	125.5	4	M30 × 1.5	10	36	41.6	10	12	28	9.5	5.5	27	50	185	20	25
KSHP36 × 50 (C,R)		229	50	169.5	5	M36 × 1.5	15	46	53.1	12	12	33	9.5	6	27	55	254	25	32
KSHP42 × 50 (C,R)		235.5	50	173	5	M42 × 1.5	15	50	57.7	12	20	38	12.5	7	38	75	260.5	25	32

## Mass (Specifications in inches)

Model	Main unit <sup>Note1</sup>	Additional mass		Additional parts' mass	
		With plastic cap	With rubber cap	Mounting nut (1 ea.)	Stopper nut
<b>KSHP6×4-F11</b>	0.2	0.007	—	0.04	0.1
<b>KSHP8×6-F11</b>	0.5	0.02	—	0.06	0.2
<b>KSHP10×8-F11</b>	0.9	0.02	—	0.07	0.4
<b>KSHP11×8-F11</b>	1.2	0.02	—	0.08	0.4
<b>KSHP12×10-F11</b>	1.7	0.04	0.04	0.1	0.5
<b>KSHP14×12-F11</b>	2.6	0.04	0.06	0.2	0.7
<b>KSHP18×20-F11</b>	5.9	0.1	0.2	0.4	2.5
<b>KSHP25×25-F11</b>	13.2	0.2	0.2	1.1	4.4
<b>KSHP30×30-F11</b>	22.2	1.8	1.7	1.3	5.5
<b>KSHP36×50-F11</b>	35.3	3.9	3.8	3.0	9.8
<b>KSHP42×50-F11</b>	63.0	3.9	3.8	3.4	10.8

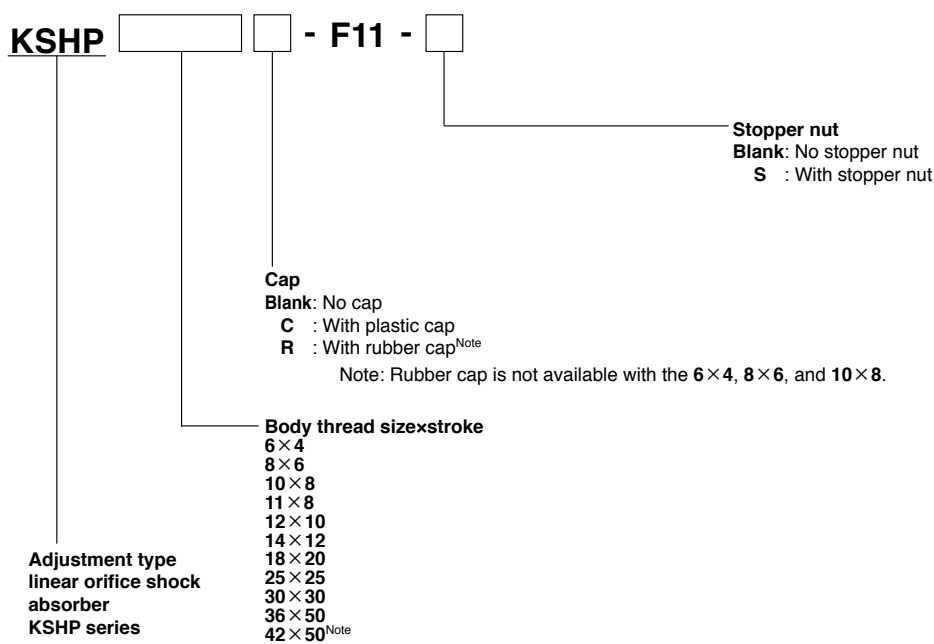
Calculation example: The mass of KSHP10x8C-S-2 (with cap and stopper) is

$$0.9 + 0.02 + 0.4 = 1.32\text{oz}$$

Note1: The weight of the main unit includes the weight of 2 mounting nuts.

Note2: KSHP11x8 has only inch specifications.

## Order Codes (specifications in inches)



Note: **KSHP42×50** is a built-to-order product. Contact us about turnaround times, prices, or other information.

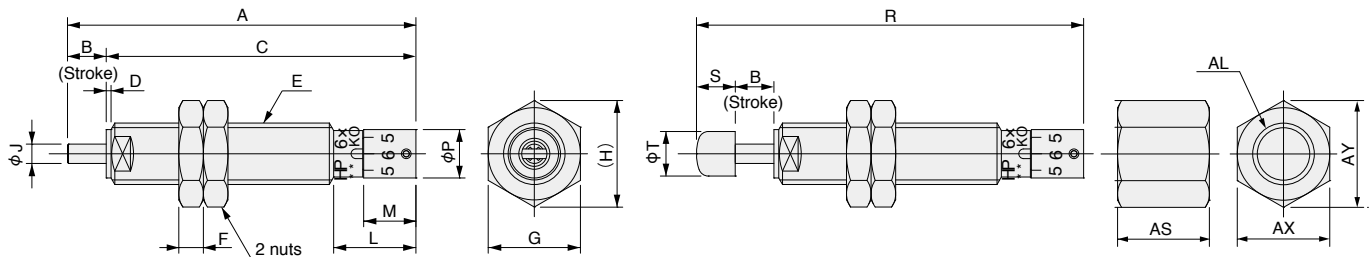


## Dimensions (in)

● No rod end cap: **KSHP**□ × □

● With rod end cap

With plastic cap: **KSHP**□ × □**C**

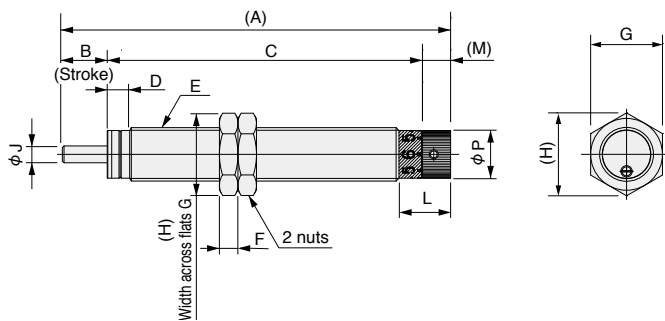


Model	Symbol	A	B	C	D	E	F	G	H	J	L	M	P	R	S
<b>KSHP6 × 4 (C)-F11</b>		1.417	0.157	1.26	0.02	1/4-32 UNEF	0.1	3/8	0.433	0.079	0.335	0.213	0.197	1.575	0.157
<b>KSHP8 × 6 (C)-F11</b>		1.811	0.236	1.575	0.047	5/16-32 UNEF	0.13	7/16	0.505	0.098	0.358	0.236	0.268	2.008	0.197

Model	Symbol	T	AL	AS	AX	AY
<b>KSHP6 × 4 (C)-F11</b>		0.181	1/4-32 UNEF	0.4	3/8	0.433
<b>KSHP8 × 6 (C)-F11</b>		0.256	5/16-32 UNEF	7/16	7/16	0.505

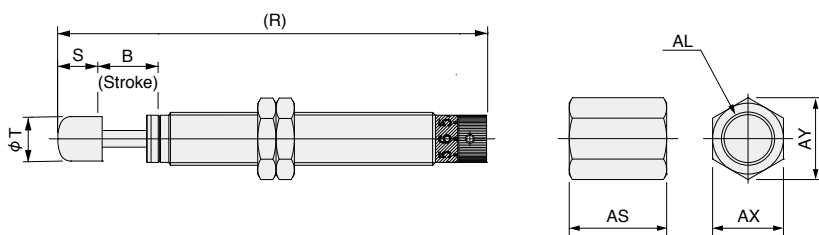
● No rod end cap: **KSHP**□ × □



● With rod end cap

With plastic cap: **KSHP**□ × □**C**

With rubber cap: **KSHP**□ × □**R**



Note: Rubber cap is not available with the **KSHP10×8**, **KSHP11×8**

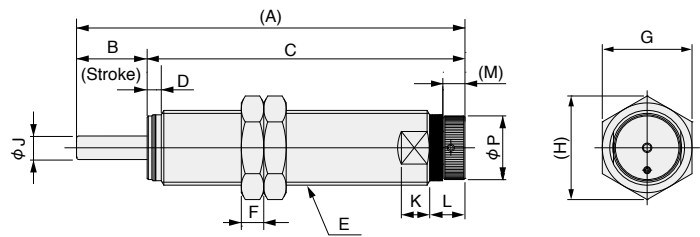
Model	Symbol	A	B	C	D	E	F	G	H	J	L	M	P	R	S
<b>KSHP10 × 8 (C)-F11</b>		2.724	0.315	2.409	0.157	3/8-32 UNEF	0.13	1/2	0.577	0.118	0.362	0.197	0.335	3.039	0.315
<b>KSHP11 × 8 (C)-F11</b>		2.724	0.315	2.409	0.157	7/16-28 UNEF	0.15	9/16	0.65	0.118	0.362	0.197	0.343	3.039	0.315
<b>KSHP12 × 10 (C,R)-F11</b>		2.961	0.394	2.567	0.157	1/2-20 UNF	0.15	5/8	0.722	0.118	0.362	0.197	0.421	3.354	0.394
<b>KSHP14 × 12 (C,R)-F11</b>		3.433	0.472	2.961	0.157	9/16-18 UNF	7/32	11/16	0.794	0.157	0.362	0.197	0.421	3.827	0.394
<b>KSHP18 × 20 (C,R)-F11</b>		4.575	0.787	3.787	0.197	3/4-16 UNF	1/4	15/16	1.082	0.197	0.48	0.276	0.531	5.165	0.591
<b>KSHP25 × 25 (C,R)-F11</b>		5.874	0.984	4.89	0.197	1-12 UNF	3/8	1 1/4	1.443	0.236	0.48	0.276	0.669	6.583	0.709

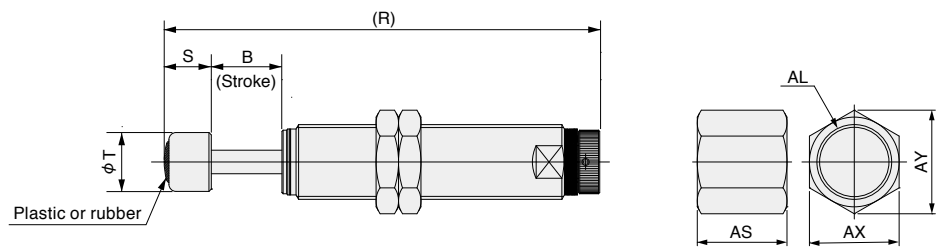
Model	Symbol	T	X	Y	AL	AS	AX	AY
<b>KSHP10 × 8 (C)-F11</b>		0.315	—	—	3/8-32 UNEF	11/16	1/2	0.577
<b>KSHP11 × 8 (C)-F11</b>		0.315	—	—	7/16-28 UNEF	11/16	9/16	0.65
<b>KSHP12 × 10 (C,R)-F11</b>		0.394	0.394	0.394	1/2-20 UNF	11/16	5/8	0.722
<b>KSHP14 × 12 (C,R)-F11</b>		0.433	0.433	0.472	9/16-18 UNF	3/4	11/16	0.794
<b>KSHP18 × 20 (C,R)-F11</b>		0.591	0.591	0.618	3/4-16 UNF	1 1/2	15/16	1.082
<b>KSHP25 × 25 (C,R)-F11</b>		0.63	0.63	0.709	1-12 UNF	1 1/2	1 1/4	1.443

Dimensions (in)

●No rod end cap: **KSHP**□ × □



●With rod end cap  
With plastic cap: **KSHP**□ × □**C**  
With rubber cap: **KSHP**□ × □**R**



Model	Symbol	A	B	C	D	E	F	G	H	J	K	L	M	P	R	S
<b>KSHP30 × 30 (C,R)-F11</b>		6.496	1.181	5.315	0.236	1 1/4-12 UNF	3/8	1 1/2	1.732	0.394	0.472	0.591	0.354	1.063	7.283	0.787
<b>KSHP36 × 50 (C,R)-F11</b>		9.016	1.969	7.047	0.276	1 3/8-12 UNF	5/8	1 11/16	1.948	0.472	0.472	0.61	0.354	1.063	10	0.984
<b>KSHP42 × 50 (C,R)-F11</b>		9.272	1.969	7.303	0.276	1 3/4-12 UN	5/8	2	2.309	0.472	0.787	0.768	0.472	1.496	10.256	0.984

Model	Symbol	T	AL	AS	AX	AY
<b>KSHP30 × 30 (C,R)-F11</b>		0.984	1 1/4-12 UNF	1 1/2	1 1/2	1.732
<b>KSHP36 × 50 (C,R)-F11</b>		1.26	1 3/8-12 UNF	2	1 11/16	1.948
<b>KSHP42 × 50 (C,R)-F11</b>		1.26	1 3/4-12 UN	2	2	2.309

# Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

**Warranty Period** The warranty period is 180 days from the date of delivery.

**Koganei Responsibility** If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

**Limitations**

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

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