

Vacuum Pad Bellows Type KPT Series



Handles workpieces with no damage

Vacuum Pad

Bellows Type

KPT Series

Perfect for handling workpieces with slanted suction surfaces
 The thrust of the cylinder or robot is not directly applied to the workpiece

Features

1

The bellows structure conforms to the angles and heights of suction surfaces, and handles workpieces with no damage.

2

1.5 fold type (KPTB) has 12 sizes from ϕ 2.5 to 50 [0.098 to 1.969].

2.5 fold type (KPTC) has 7 sizes from ϕ 5 to 42 [0.197 to 1.654].

Pad material of either NBR or silicon is available.

Choose mounting brackets with lateral piping or vertical piping.

Integrated spring (buffer) is also available.

Vacuum pad
 Bellows type

Product size variations

Pad diameter (mm [in])	2.5 [0.098]	4 [0.157]	5 [0.197]	6 [0.236]	7 [0.276]	8 [0.315]	9 [0.354]	10 [0.394]	15 [0.591]	19 [0.748]	20 [0.787]	25 [0.984]	30 [1.181]	32 [1.260]	35 [1.378]	40 [1.575]	42 [1.654]	50 [1.969]
KPTB (1.5 fold type)	○	○	—	○	—	○	—	○	○	—	○	○	○	—	○	○	—	○
KPTC (2.5 fold type)	—	—	○	—	○	—	○	—	○	○	—	—	—	○	—	—	○	—
Horizontal piping Spring stroke mm [in]	3 [0.118]	3 [0.118]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	6 [0.236]	7 [0.276]	7 [0.276]	7 [0.276]	7 [0.276]	7 [0.276]	7 [0.276]
Vertical piping Spring stroke mm [in]	3 [0.118]	3 [0.118]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	9 [0.354]	9 [0.354]	9 [0.354]	9 [0.354]	9 [0.354]	9 [0.354]



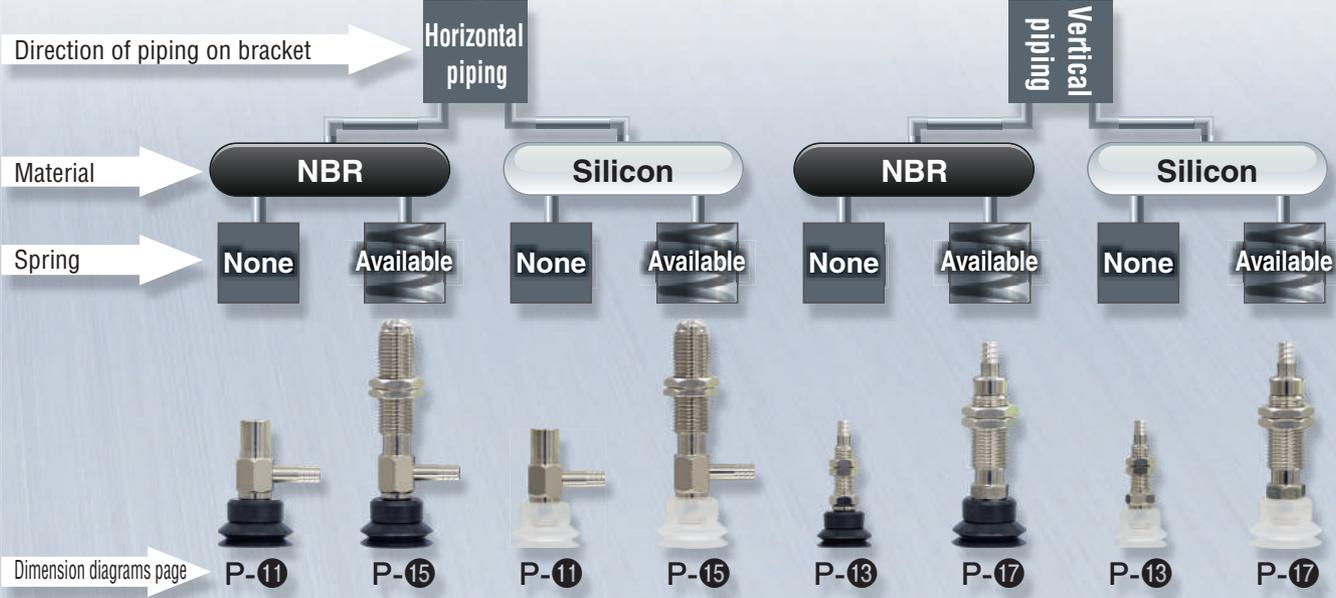
KOGANEI



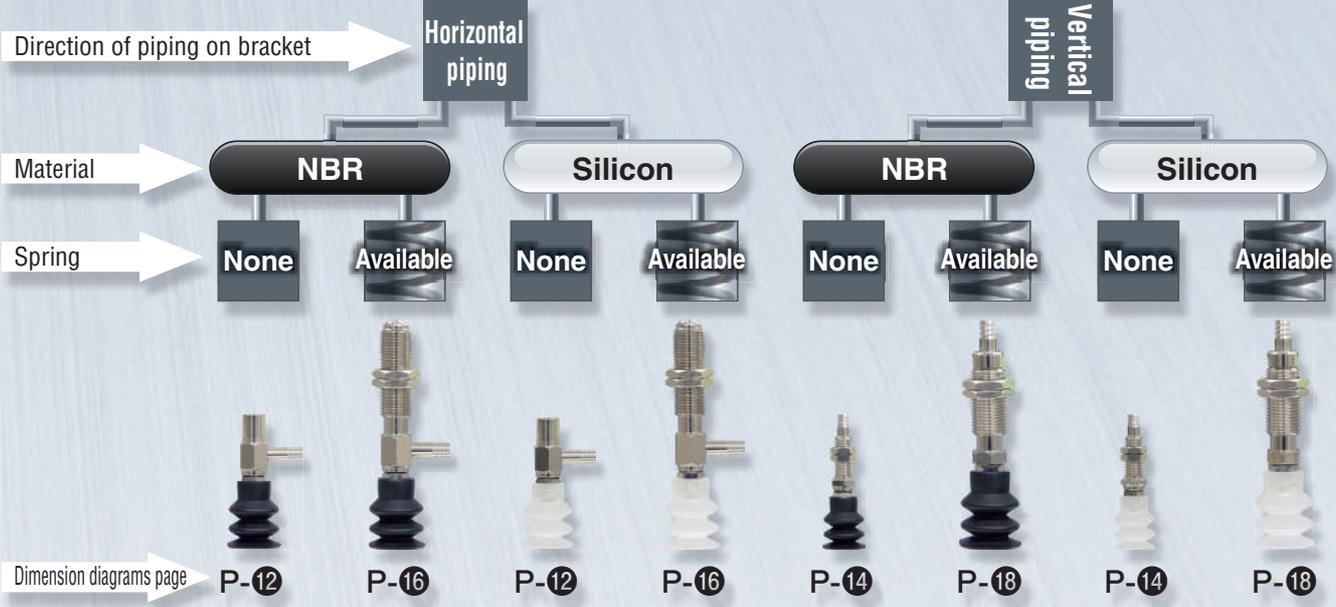
CAUTION

Read the Safety Precautions on page 3 before using this product.

KPTB (1.5 fold)



KPTC (2.5 fold)



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

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

Follow the Safety Precautions in ISO4414 (Pneumatic fluid power—General rules and safety requirements for systems and their components), JIS B 8370 (Pneumatic system regulations), and other safety regulations.

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

 DANGER	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.
 WARNING	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.
 CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. Minor or semi-serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 ATTENTION	While there is no chance of injury, these points should be observed for appropriate use of the product.

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

- In the selection and handling of the equipment, the system designer or other responsible person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, Owner's Manual and other literature before commencing operation. Incorrect handling is dangerous.
- After reading the Owner's Manual, etc., always store them where they are easily available for reference to users of this product.
- If transferring or lending the product to another person, always attach the Owner's Manual, etc., to the product where they are easily visible, 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 cases. Read the Catalog and Owner's 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. Mechanical devices 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 advanced stages of safety. It could cause 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 installing the product, always firmly support and secure it (including the workpiece) in place. Injury could result if the product overturns, falls, or is operated abnormally.
- Never attempt to modify the product. It could result in abnormal operation leading to injury, electric shock, fire, etc.
- Never attempt inappropriate disassembly, assembly, or repair of the product relating to its basic inner construction, performance, or functions. It could result in injury.
- While the product is in operation, avoid touching it with your hands or otherwise approaching too close. Also, do not attempt to make any adjustments to internal or attached mechanisms (such as adjusting the position the product is mounted), or to perform any type of adjustment while the product is in operation. Falling, dropping, or abnormal operation of the product creates the risk of personal injury.

 **WARNING**

- Because Koganei products may be used under a wide variety of conditions, decisions concerning conformance with a particular system should be made upon the careful evaluation by the person in charge of system design. Assurances concerning expected system performance and safety are the responsibility of the designer who decides system conformity. Be sure to use the latest catalogs and technical materials to study and evaluate specification details, to consider the possibility of machine breakdown, and to configure a system that ensures safety and reliability, such as by using fail-safes.

- Do not use the product in excess of its specification range. Using the product outside of its specified range could result in product breakdowns, stop of functions, or damage. It could also drastically reduce the operating life.
- Before supplying air to the product and starting operation, always conduct a safety check within the range of machine operations. Unintentional supply of air could result in injury caused by contact with moving parts.
- Do not throw the product into fire. The product could explode and/or release toxic gases.
- Do not sit on the product, place your foot on it, or place other objects on it. Doing so creates the risk of injury due to tripping or the product tipping over or falling, and erratic or runaway operation due to damage or breakage to the product.
- Before doing maintenance inspections, repairs, or replacement of any parts, always completely cut off all air and vacuum pressure connections, and confirm that the pressure in the product and connected pipes is atmospheric pressure. In particular, be aware that pressure remains in vacuum pumps and air tanks. Residual vacuum inside the piping could cause the workpiece to fall and cause an injury.
- Use safety circuits or system designs to prevent damage to machinery or injury to personnel when the machine is shut down abnormally due to emergency stop or power failure.
- Always check the catalog and other reference materials for correct product piping. Improper piping creates the risk of damage to and abnormal operation of the actuator.
- Do not use the product near the ocean, in direct sunlight, near mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions or stop functions. (except for ozone resistant products)
- When the product has been idle for over 48 hours or has been in storage, it is possible that the contacting parts may have become stuck leading to operating delays or sudden movements. For these initial operations, always run a test operation before use to check that operating performance is normal.

- Do not use the product in locations subject to direct sunlight (ultraviolet radiation); in locations subjected to high temperature or humidity; in locations where dust, salt, or iron particles are present; or in locations with media and/or an ambient atmosphere that includes organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, acids, etc. Such uses could lead to loss of functions within a short period, sudden degradation in performance, or reduced operating life. For information about materials, see Major Parts and Materials.

CAUTION

- When installing the product, leave room for adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- Do not scratch, dent, or deform the product by climbing on it, using it as a step, or placing objects on top of it. Doing so could damage or break the product, resulting in operation shutdown or degraded performance.
- Post "Work in Progress" signs when doing installations, adjustments, or other work, so that air or electricity is not supplied unintentionally. Unintended power supply can cause electric shock and sudden operation, creating the risk of personal injury.
- Air leakage from pneumatic equipment is not zero. Designs should take into consideration the capacity and retention time required for an application, such as retention of pressure (as well as vacuum). A reduction in retaining force could cause a workpiece to fall or slip out of position and damage the equipment or cause injury.

ATTENTION

- When considering using the product for applications that demand extreme safety, such as aviation facilities, combustion equipment, leisure equipment, safety devices, or in other ways predicted to greatly affect assets or human lives, or in situations or environments not described in the Catalog or Owner's Manual, etc., take sufficient safety precautions, such as by allowing ample rating and performance margins for the application and by implementing adequate safety measures, such as fail-safes. Also, be sure to consult us about such applications.
- Use protective covers, etc., to isolate moving parts, such as mechanical equipment, so direct contact with a person's body is not possible.
- Do not arrange controls such that workpieces fall if there is a power failure. Configure controls to prevent workpieces from falling in case of power failure or emergency stop of the machine.
- When handling the product, wear protective gloves, safety glasses, safety shoes, etc., as required to maintain safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfactory, to prevent accidents from happening.
- For inquiries about the product, contact your nearest Koganei sales office or Koganei overseas department. The address and telephone number are shown on the back cover of this catalog.

OTHERS

- Always observe the following items.
 1. When using this product in pneumatic systems, always use genuine Koganei parts or compatible parts (recommended parts).
When doing maintenance or repairs, always use genuine Koganei parts or compatible parts (recommended parts).
Always observe the required methods.
 2. Never inappropriately disassemble or assemble the product in relation to its basic construction, performance, or functions.

Koganei bears no responsibility if all safety precautions are not properly observed.

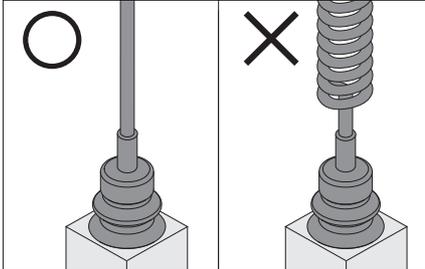
Handling Instructions and Precautions



Vacuum pad

Piping

To reduce piping resistance, make them straight and the length of the piping as short as possible, and avoid spiral piping.



Storage

1. Vacuum pads (including the rubber of the pads) use a variety of rubbers. Rubber degrades when exposed to direct sunlight, oil, water, ozone, etc. Store the pads indoors, enclosed in a polyethylene bag, until immediately before use.
2. The storage temperature should be room temperature.
3. As a guideline, the storage period is 2 years from the date of manufacture.

Product

Depending on the type of rubber, there are cases when uneven spots appear on the outside of the rubber pad; however, these have no effect on performance.

Replacing the rubber pad

Rubber pads are replaced by "screwing" or "inserting", depending on the pad size.

<Screwing method>

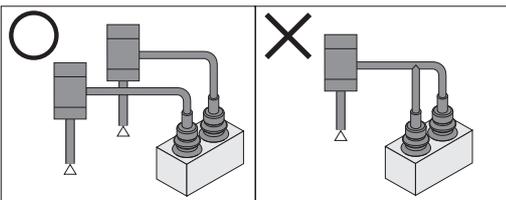
Applicable sizes are KPTB-10 to 50, and KPTC-32 to 42. When attaching rubber pads, gradually screw in the mounting screws. After the brackets, rubber pad, and mounting screw have been fit, tighten the mounting screw half a turn (180°) more.

<Inserting method>

Applicable sizes are KPTB-6 to 8, and KPTC-5 to 19. When attaching rubber pads, first install the mounting screw to the bracket (tightening torque is 1.47 N·m [13.011 in·lbf]) and then attach the pad. Note that KPTB-2.5 to 4 have no mounting screws. Attach the pad directly to the bracket.

General precautions

1. Use 1 vacuum pad with 1 micro ejector and 1 vacuum valve. Using 2 or more makes it easier for suction failures to occur and extends the time required to reach the set degree of vacuum.



2. When attaching piping to vacuum pads that have brackets with integrated springs, applying excessive force to the main unit will cause faulty spring operation and uneven wear on sliding parts.
3. When using models with integrated springs, do not allow the spring stroke to go to full stroke.
4. Do not use excessive force to press the pad onto the workpiece. Position the pad so it is within its range of deformation, otherwise cracks, and pad deformations occur more quickly.

5. Design with sufficient leeway as the mounting screw for the brackets or the mounting screw for the rubber pad may loosen and fall out when using the pad to move workpieces in circular motions. Also, attention is especially required for suction when the workpiece's center of mass is shifted, so check this thoroughly.
6. Vacuum pads are made of rubber, so an increase in the number of operations to suction and release workpieces causes wear and may cause them to stick to workpieces or to stick to the pad part. If the pad is damaged, worn, or cracked, replace it immediately.

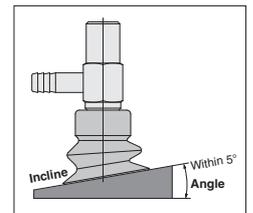
Tightening torque

Be sure to use the tightening torque values shown in the following table for threaded connections and nuts when mounting the units, brackets, and vacuum pads.

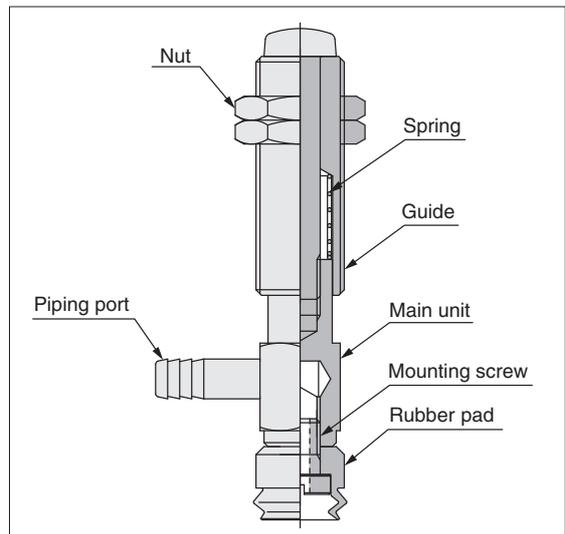
Model	Screw size	Tightening torque (N·m [in·lbf])
KPTBHF-2.5-□, KPTBHF-4-□	M3×0.5	0.29 [2.567]
KPTBHF-6-□ to KPTBHF-25-□	M4×0.7	0.69 [6.107]
KPTCHF-5-□ to KPTCHF-19-□		
KPTBHS-2.5-□, KPTBHS-2.5-□	M5×0.5	0.59 [5.222]
KPTBVF-2.5-□, KPTBVF-4-□	M5×0.5	3.43 [30.359]
KPTBVS-2.5-□, KPTBVS-4-□	M6×0.75	1.96 [17.348]
KPTBHF-30-□ to KPTBHF-50-□	M8×1	6.86 [60.718]
KPTCHF-32-□, KPTCHF-42-□		
KPTBVF-6-□ to KPTBVF-25-□	M8×1.25	6.86 [60.718]
KPTCVF-5-□ to KPTCVF-19-□		
KPTBVF-30-□ to KPTBVF-50-□	M10×1.5	21.57 [190.9]
KPTCVF-32-□, KPTCVF-42-□		
KPTBHS-6-□ to KPTBHS-25-□		
KPTBVS-6-□ to KPTBVS-25-□		
KPTCHS-5-□ to KPTCHS-19-□	M11×1	8.83 [78.154]
KPTCVS-5-□ to KPTCVS-19-□		
KPTBHS-30-□ to KPTBHS-50-□	M14×1.5	12.75 [112.9]
KPTBVS-30-□ to KPTBVS-50-□		
KPTCHS-32-□, KPTCHS-42-□		
KPTCVS-32-□, KPTCVS-42-□		

Possible suction angle

If the suction surface is on an inclined workpiece, the guideline for the angle to which a bellows pad can suction is 5° or less, however, it varies according to the workpiece and operating conditions, so use it as a reference value.



Parts names



Vacuum pad Bellows Type

KPT Series



Specifications

● 1.5 fold type, horizontal piping

Item	Model	Horizontal piping, fixed			Horizontal piping, integrated spring type		
		KPTBHF-□-□			KPTBHS-□-□		
Pad diameter ^{Note 1}	mm [in.]	2.5 [0.098] · 4 [0.157]	6 [0.236] · 8 [0.315] · 10 [0.394] · 15 [0.591] · 20 [0.787] · 25 [0.984]	30 [1.181] · 35 [1.378] · 40 [1.575] · 50 [1.969]	2.5 [0.098] · 4 [0.157]	6 [0.236] · 8 [0.315] · 10 [0.394] · 15 [0.591] · 20 [0.787] · 25 [0.984]	30 [1.181] · 35 [1.378] · 40 [1.575] · 50 [1.969]
Tube diameter ^{Note 2}	mm [in.]	4×2.5 [0.157×0.098]	6×4 [0.236×0.157]		4×2.5 [0.157×0.098]	6×4 [0.236×0.157]	
Variation of stroke by spring	mm [in.]	—			3 [0.118]	6 [0.236]	7 [0.276]
Spring return force (1/2 stroke)	N [lbf]	—			1.1 [0.247]	1.0 [0.225]	3.5 [0.787]
Major materials	Main unit	Brass (nickel plated)			Brass (nickel plated)		
	Guide	—			Brass (nickel plated)		
	Spring	—			Stainless steel		
	Nut	—			Brass (nickel plated)		
	Rubber pad (color)	Synthetic rubber: NBR (black)/silicon (white)					

● 1.5 fold type, vertical piping

Item	Model	Vertical piping, fixed			Vertical piping, integrated spring		
		KPTBVF-□-□			KPTBVS-□-□		
Pad diameter ^{Note 1}	mm [in.]	2.5 [0.098] · 4 [0.157]	6 [0.236] · 8 [0.315] · 10 [0.394] · 15 [0.591] · 20 [0.787] · 25 [0.984]	30 [1.181] · 35 [1.378] · 40 [1.575] · 50 [1.969]	2.5 [0.098] · 4 [0.157]	6 [0.236] · 8 [0.315] · 10 [0.394] · 15 [0.591] · 20 [0.787] · 25 [0.984]	30 [1.181] · 35 [1.378] · 40 [1.575] · 50 [1.969]
Tube diameter ^{Note 2}	mm [in.]	4×2.5 [0.157×0.098]	6×4 [0.236×0.157]		4×2.5 [0.157×0.098]	6×4 [0.236×0.157]	
Variation of stroke by spring	mm [in.]	—			3 [0.118]	5 [0.197]	9 [0.354]
Spring return force (1/2 stroke)	N [lbf]	—			2.4 [0.540]	1.0 [0.225]	4.9 [1.102]
Major materials	Main unit	Brass (nickel plated)			Brass (nickel plated)		
	Guide	—			Brass (nickel plated)		
	Spring	—			Stainless steel		
	Nut	Brass (nickel plated)			Brass (nickel plated)		
	Rubber pad (color)	Synthetic rubber: NBR (black)/silicon (white)					

● 2.5 fold type, horizontal piping

Item	Model	Horizontal piping, fixed		Horizontal piping, integrated spring type	
		KPTCHF-□-□		KPTCHS-□-□	
Pad diameter ^{Note 1}	mm [in.]	5 [0.197] · 7 [0.276] · 9 [0.354] · 15 [0.591] · 19 [0.748]	32 [1.260] · 42 [1.654]	5 [0.197] · 7 [0.276] · 9 [0.354] · 15 [0.591] · 19 [0.748]	32 [1.260] · 42 [1.654]
Tube diameter ^{Note 2}	mm [in.]	6×4 [0.236×0.157]			
Variation of stroke by spring	mm [in.]	—		6 [0.236]	7 [0.276]
Spring return force (1/2 stroke)	N [lbf]	—		1.0 [0.225]	3.5 [0.787]
Major materials	Main unit	Brass (nickel plated)		Brass (nickel plated)	
	Guide	—		Brass (nickel plated)	
	Spring	—		Stainless steel	
	Nut	—		Brass (nickel plated)	
	Rubber pad (color)	Synthetic rubber: NBR (black)/silicon (white)			

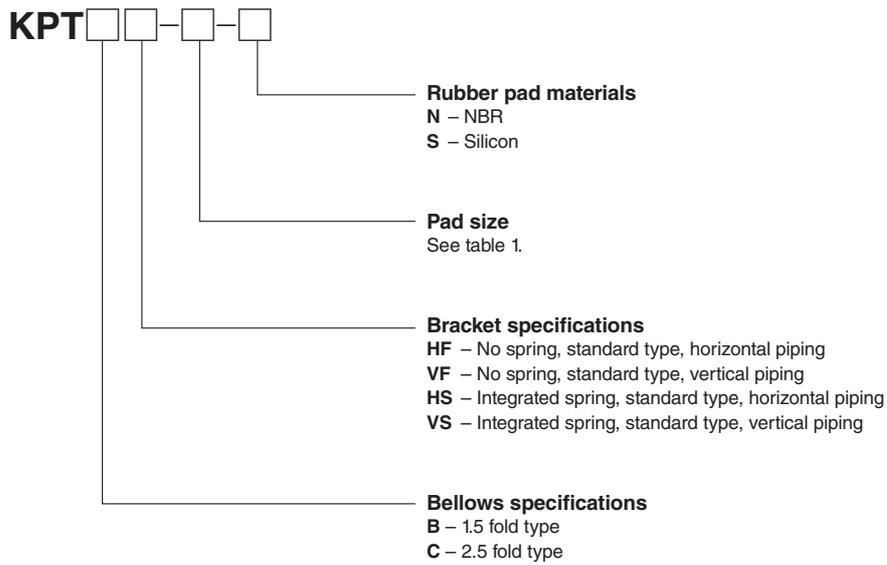
● 2.5 fold type, vertical piping

Item	Model	Vertical piping, fixed		Vertical piping, integrated spring	
		KPTCVF-□-□		KPTCVS-□-□	
Pad diameter ^{Note 1}	mm [in.]	5 [0.197] · 7 [0.276] · 9 [0.354] · 15 [0.591] · 19 [0.748]	32 [1.260] · 42 [1.654]	5 [0.197] · 7 [0.276] · 9 [0.354] · 15 [0.591] · 19 [0.748]	32 [1.260] · 42 [1.654]
Tube diameter ^{Note 2}	mm [in.]	6×4 [0.236×0.157]			
Variation of stroke by spring	mm [in.]	—		5 [0.197]	9 [0.354]
Spring return force (1/2 stroke)	N [lbf]	—		1.0 [0.225]	4.9 [1.102]
Major materials	Main unit	Brass (nickel plated)		Brass (nickel plated)	
	Guide	—		Brass (nickel plated)	
	Spring	—		Stainless steel	
	Nut	Brass (nickel plated)		Brass (nickel plated)	
	Rubber pad (color)	Synthetic rubber: NBR (black)/silicon (white)			

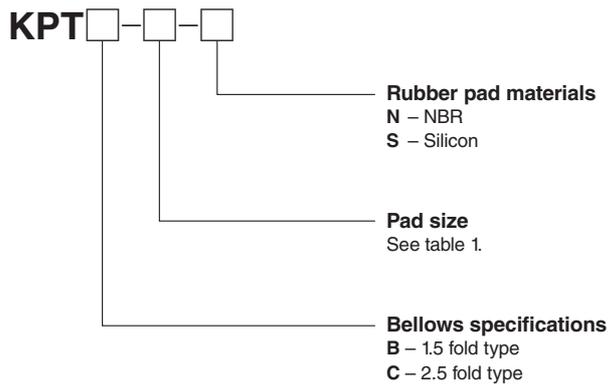
Note 1: The bracket is common to all the pad sizes that appear in the cell for the pad diameter. (Some of the mounting screws for the rubber pads are different.)

2: Use urethane tubes for the tubes.

● Vacuum pad models (with brackets)



● Models of rubber pads (no brackets)



● Additional parts

• Mounting screw models

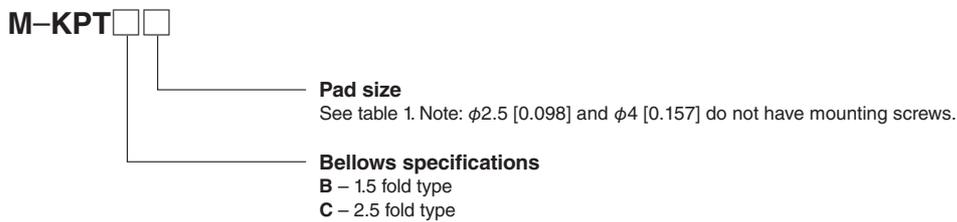


Table 1 (Pad sizes)

Pad diameter (mm [in])	2.5 [0.098]	4 [0.157]	5 [0.197]	6 [0.236]	7 [0.276]	8 [0.315]	9 [0.354]	10 [0.394]	15 [0.591]	19 [0.748]	20 [0.787]	25 [0.984]	30 [1.181]	32 [1.260]	35 [1.378]	40 [1.575]	42 [1.654]	50 [1.969]
Type																		
KPTB (1.5 fold type)	○	○	—	○	—	○	—	○	○	—	○	○	○	—	○	○	—	○
KPTC (2.5 fold type)	—	—	○	—	○	—	○	—	○	○	—	—	—	○	—	—	○	—

Materials and suitability of rubber pads

Item Material	Hardness Hs	Operating temperature range °C [°F]	Tensile strength N/cm ²	Stretch %	Oil resistance (Gasoline)	Oil resistance (Benzol)	Weather resistance	Ozone resistance	Alkali resistance	Acid resistance	Water resistance	Wear resistance	Electric insulation	Tear resistance
NBR (N)	60±5	0 to 100 [32 to 212]	1970	740	◎	△	○	×	○	○	◎	◎	○	○
Silicon (S)	50±5	-30 to 200 [-22 to 392]	830	300	△	△	◎	◎	◎	△	○	×	◎	×

Remark: ◎ Optimal, ○ Can be used depending on conditions, △ Not suitable, × Not usable

Note: This table indicates the general characteristics of rubber. Give careful consideration to various conditions before use.

Theoretical lifting force

N [lbf]

Pad diameter mm [in.]	Pad surface area cm ² [in ²]	Degree of vacuum kPa [inHg]							
		-93.3 [-27.561]	-80 [-23.632]	-66.7 [-19.703]	-53.3 [-15.745]	-40 [-11.816]	-26.7 [-7.887]	-13.3 [-3.929]	
2.5 [0.098]	0.049 [0.008]	0.457 [0.103]	0.392 [0.088]	0.327 [0.074]	0.261 [0.059]	0.196 [0.044]	0.131 [0.029]	0.065 [0.015]	
4 [0.157]	0.126 [0.020]	1.176 [0.264]	1.008 [0.227]	0.840 [0.189]	0.672 [0.151]	0.504 [0.113]	0.336 [0.076]	0.168 [0.038]	
5 [0.197]	0.196 [0.030]	1.829 [0.411]	1.568 [0.352]	1.307 [0.294]	1.045 [0.235]	0.784 [0.176]	0.523 [0.118]	0.261 [0.059]	
6 [0.236]	0.283 [0.044]	2.64 [0.593]	2.26 [0.508]	1.89 [0.425]	1.51 [0.339]	1.13 [0.254]	0.76 [0.171]	0.38 [0.085]	
7 [0.276]	0.385 [0.060]	3.59 [0.807]	3.08 [0.692]	2.57 [0.578]	2.05 [0.461]	1.54 [0.346]	1.03 [0.232]	0.51 [0.115]	
8 [0.315]	0.503 [0.078]	4.69 [1.054]	4.02 [0.904]	3.36 [0.755]	2.68 [0.602]	2.01 [0.452]	1.34 [0.301]	0.67 [0.151]	
9 [0.354]	0.636 [0.099]	5.93 [1.333]	5.09 [1.144]	4.24 [0.953]	3.39 [0.762]	2.54 [0.571]	1.70 [0.382]	0.85 [0.191]	
10 [0.394]	0.785 [0.122]	7.32 [1.646]	6.28 [1.412]	5.24 [1.178]	4.18 [0.940]	3.14 [0.706]	2.10 [0.472]	1.04 [0.234]	
15 [0.591]	1.767 [0.274]	16.49 [3.707]	14.14 [3.179]	11.79 [2.650]	9.42 [2.118]	7.07 [1.589]	4.72 [1.061]	2.35 [0.528]	
19 [0.748]	2.835 [0.439]	26.5 [5.957]	22.7 [5.103]	18.9 [4.249]	15.1 [3.394]	11.3 [2.540]	7.6 [1.708]	3.8 [0.854]	
20 [0.787]	3.142 [0.487]	29.3 [6.587]	25.1 [5.642]	21.0 [4.721]	16.8 [3.777]	12.6 [2.832]	8.4 [1.888]	4.2 [0.944]	
25 [0.984]	4.909 [0.761]	45.8 [10.296]	39.3 [8.835]	32.7 [7.351]	26.2 [5.890]	19.6 [4.406]	13.1 [2.945]	6.5 [1.461]	
30 [1.181]	7.069 [1.096]	66.0 [14.837]	56.6 [12.724]	47.2 [10.611]	37.7 [8.475]	28.3 [6.362]	18.9 [4.249]	9.4 [2.113]	
32 [1.260]	8.042 [1.247]	75.0 [16.860]	64.3 [14.455]	53.6 [12.049]	42.9 [9.644]	32.2 [7.239]	21.5 [4.833]	10.7 [2.405]	
35 [1.378]	9.621 [1.491]	89.8 [20.187]	77.0 [17.310]	64.2 [14.432]	51.3 [11.532]	38.5 [8.655]	25.7 [5.777]	12.8 [2.877]	
40 [1.575]	12.57 [1.948]	117.3 [26.369]	100.6 [22.615]	83.8 [18.838]	67.0 [15.062]	50.3 [11.307]	33.6 [7.553]	16.7 [3.754]	
42 [1.654]	13.85 [2.147]	129.2 [29.044]	110.8 [24.908]	92.4 [20.772]	73.8 [16.590]	55.4 [12.454]	37.0 [8.318]	18.4 [4.136]	
50 [1.969]	19.63 [3.043]	183.1 [41.161]	157.0 [35.294]	130.9 [29.426]	104.6 [23.514]	78.5 [17.647]	52.4 [11.780]	26.1 [5.867]	

Remarks: Safety factors for lifting force of bellows type pads are set as follows.

Horizontal lifting : 10 ×

Vertical lifting : Not allowed

Note: Values in the above table are calculated.

Mass

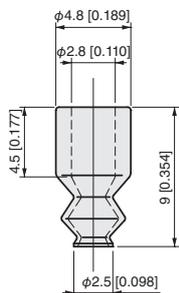
g [oz]

Item	Pad diameter	2.5	4	5	6	7	8	9	10	15	19	20	25	30	32	35	40	42	50
		[0.098]	[0.157]	[0.197]	[0.236]	[0.276]	[0.315]	[0.354]	[0.394]	[0.591]	[0.748]	[0.787]	[0.984]	[1.181]	[1.260]	[1.378]	[1.575]	[1.654]	[1.969]
1.5 fold type (KPTB)	NBR (KPTB-□-N)	0.1 [0.004]	0.1 [0.004]	—	0.2 [0.01]	—	0.3 [0.01]	—	0.6 [0.02]	0.9 [0.03]	—	1.8 [0.06]	3.2 [0.11]	5.6 [0.20]	—	8.2 [0.29]	12 [0.42]	—	21 [0.74]
	Silicon (KPTB-□-S)	0.1 [0.004]	0.1 [0.004]	—	0.2 [0.01]	—	0.2 [0.01]	—	0.5 [0.02]	0.8 [0.03]	—	1.7 [0.06]	2.9 [0.10]	5.0 [0.18]	—	7.5 [0.26]	10 [0.35]	—	20 [0.71]
2.5 fold type (KPTC)	NBR (KPTC-□-N)	—	—	0.2 [0.01]	—	0.3 [0.01]	—	0.8 [0.03]	—	1.6 [0.06]	2.3 [0.08]	—	—	10 [0.35]	—	—	—	21 [0.74]	—
	Silicon (KPTC-□-S)	—	—	0.2 [0.01]	—	0.3 [0.01]	—	0.7 [0.02]	—	1.4 [0.05]	2.0 [0.07]	—	—	—	8.8 [0.31]	—	—	19 [0.67]	—
Bracket (HF specifications)	KPTBHF-□	2.7 [0.10]	2.7 [0.10]	—	14.6 [0.51]	—	14.7 [0.52]	—	13.9 [0.49]	13.9 [0.49]	—	14.6 [0.51]	14.6 [0.51]	32.6 [1.15]	—	32.6 [1.15]	32.8 [1.16]	—	41.5 [1.46]
	KPTCHF-□	2.7 [0.10]	2.7 [0.10]	14.6 [0.51]	—	14.6 [0.51]	—	14.9 [0.53]	—	14.9 [0.53]	14.9 [0.53]	—	—	—	39.0 [1.38]	—	—	39.0 [1.38]	—
Bracket (VF specifications)	KPTBVF-□	8.1 [0.29]	8.1 [0.29]	—	13.6 [0.48]	—	13.7 [0.48]	—	12.9 [0.46]	12.9 [0.46]	—	13.3 [0.47]	13.3 [0.47]	31.4 [1.11]	—	31.4 [1.11]	31.6 [1.11]	—	40.3 [1.42]
	KPTCVF-□	8.1 [0.29]	8.1 [0.29]	13.6 [0.48]	—	13.6 [0.48]	—	13.9 [0.49]	—	13.9 [0.49]	13.9 [0.49]	—	—	—	37.8 [1.33]	—	—	37.8 [1.33]	—
Bracket (HS specifications)	KPTBHS-□	5.4 [0.19]	5.4 [0.19]	—	47.6 [1.68]	—	47.7 [1.68]	—	46.9 [1.65]	46.9 [1.65]	—	47.6 [1.68]	47.6 [1.68]	72.9 [2.57]	—	72.9 [2.57]	73.1 [2.58]	—	81.8 [2.89]
	KPTCHS-□	5.4 [0.19]	5.4 [0.19]	47.6 [1.68]	—	47.6 [1.68]	—	47.9 [1.69]	—	47.9 [1.69]	47.9 [1.69]	—	—	—	79.3 [2.80]	—	—	79.3 [2.80]	—
Bracket (VS specifications)	KPTBVS-□	9.6 [0.34]	9.6 [0.34]	—	25.0 [0.88]	—	25.1 [0.89]	—	24.3 [0.86]	24.3 [0.86]	—	24.7 [0.87]	24.7 [0.87]	49.1 [1.73]	—	49.1 [1.73]	49.3 [1.74]	—	58.0 [2.05]
	KPTCVS-□	9.6 [0.34]	9.6 [0.34]	25.0 [0.88]	—	25.0 [0.88]	—	25.3 [0.89]	—	25.3 [0.89]	25.3 [0.89]	—	—	—	55.5 [1.96]	—	—	55.5 [1.96]	—
Additional Parts (Mounting screw)	M-KPTB□	—	—	—	2.2 [0.08]	—	2.3 [0.08]	—	1.5 [0.05]	1.5 [0.05]	—	1.9 [0.07]	1.9 [0.07]	3.6 [0.13]	—	3.6 [0.13]	3.8 [0.13]	—	12.5 [0.44]
	M-KPTC□	—	—	2.2 [0.08]	—	2.2 [0.08]	—	2.5 [0.09]	—	2.5 [0.09]	2.5 [0.09]	—	—	—	10 [0.35]	—	—	10 [0.35]	—

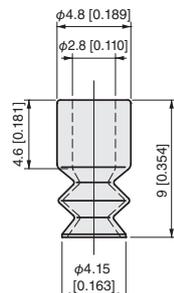
Note: □ indicates pad diameter. For the total weight of pads with brackets, add the weights of the pad and the bracket.

KPTB-□

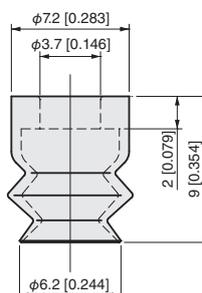
● 2.5



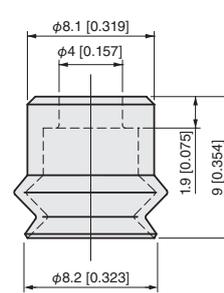
● 4



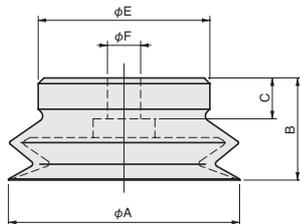
● 6



● 8

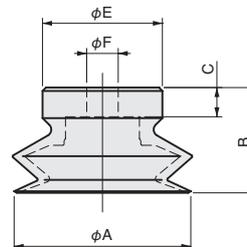


● 10-15-20



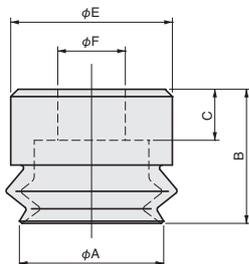
Model of pad	Item	A	B	C	E	F
KPTB-10-□		9.8 [0.386]	9.2 [0.362]	3.5 [0.138]	11 [0.433]	4.5 [0.177]
KPTB-15-□		15.5 [0.610]	11 [0.433]	3.5 [0.138]	12 [0.472]	4.5 [0.177]
KPTB-20-□		20.2 [0.795]	13.1 [0.516]	4.6 [0.181]	15.1 [0.594]	4.4 [0.173]

● 25-30-35



Model of pad	Item	A	B	C	E	F
KPTB-25-□		25.8 [1.016]	15.5 [0.610]	4.5 [0.177]	17.5 [0.689]	4.6 [0.181]
KPTB-30-□		31 [1.220]	17.8 [0.701]	7.4 [0.291]	20 [0.787]	5.8 [0.228]
KPTB-35-□		36.1 [1.421]	18 [0.709]	7.7 [0.303]	25 [0.984]	5.8 [0.228]

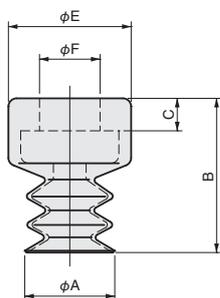
● 40-50



Model of pad	Item	A	B	C	E	F
KPTB-40-□		40.4 [1.591]	18 [0.709]	7 [0.276]	30 [1.181]	5.8 [0.228]
KPTB-50-□		50.6 [1.992]	19.5 [0.768]	7.2 [0.283]	40 [1.575]	8 [0.315]

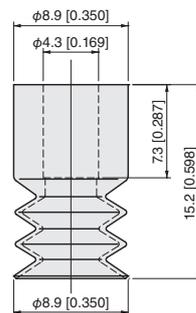
KPTC-□

● 5-7

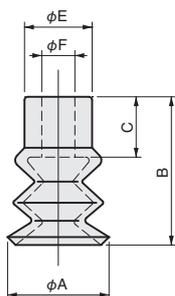


Model of pad \ Item	A	B	C	E	F
KPTC-5-□	5.5 [0.217]	9.5 [0.374]	2 [0.079]	7.5 [0.295]	3.7 [0.146]
KPTC-7-□	7.2 [0.283]	9.9 [0.390]	2 [0.079]	7.5 [0.295]	3.8 [0.150]

● 9

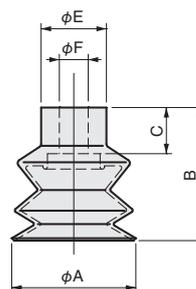


● 15-19



Model of pad \ Item	A	B	C	E	F
KPTC-15-□	15 [0.591]	22.1 [0.870]	9 [0.354]	10 [0.394]	4.9 [0.193]
KPTC-19-□	19.2 [0.756]	23.2 [0.913]	8.1 [0.319]	11.4 [0.449]	4.6 [0.181]

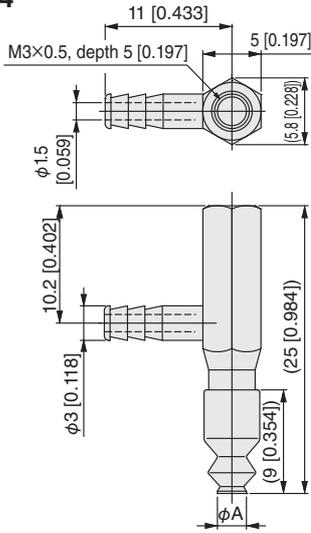
● 32-42



Model of pad \ Item	A	B	C	E	F
KPTC-32-□	33.6 [1.323]	37.3 [1.469]	13 [0.512]	18 [0.709]	8 [0.315]
KPTC-42-□	42.4 [1.669]	46 [1.811]	13 [0.512]	20 [0.787]	8 [0.315]

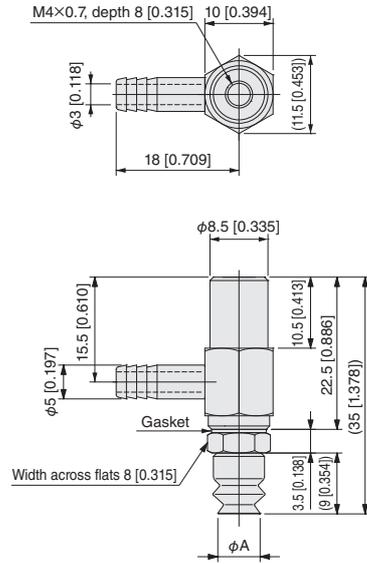
KPTBHF-□-□

● **2.5-4**



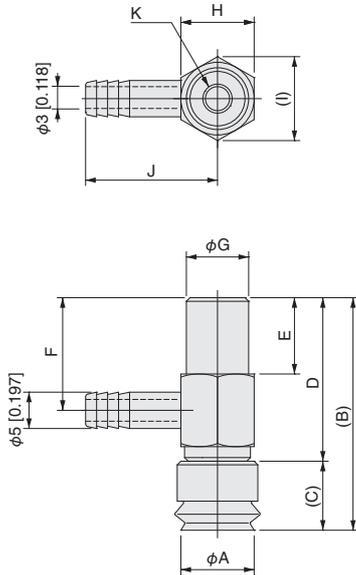
Model	Item	A
KPTBHF-2.5-□		2.5 [0.098]
KPTBHF-4-□		4.15 [0.163]

● **6-8**

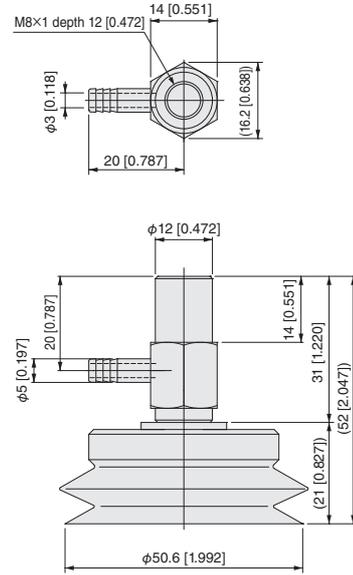


Model	Item	A
KPTBHF-6-□		6.2 [0.244]
KPTBHF-8-□		8.2 [0.323]

● **10-15-20-25-30-35-40**



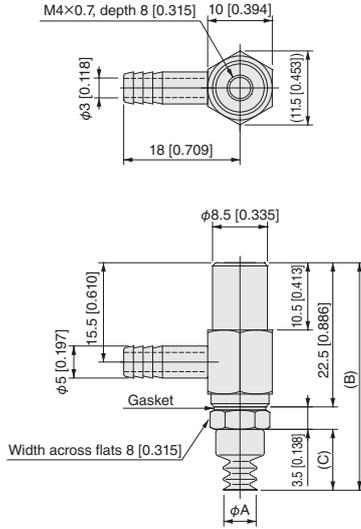
● **50**



Model	Item	A	B	C	D	E	F	G	H	I	J	K
KPTBHF-10-□		9.8 [0.386]	31.7 [1.248]	9.2 [0.362]	22.5 [0.886]	10.5 [0.413]	15.5 [0.610]	8.5 [0.335]	10 [0.394]	11.5 [0.453]	18 [0.709]	M4×0.7 Depth 8 [0.315]
KPTBHF-15-□		15.5 [0.610]	33.5 [1.319]	11 [0.433]	22.5 [0.886]	10.5 [0.413]	15.5 [0.610]	8.5 [0.335]	10 [0.394]	11.5 [0.453]	18 [0.709]	M4×0.7 Depth 8 [0.315]
KPTBHF-20-□		20.2 [0.795]	35.6 [1.402]	13.1 [0.516]	22.5 [0.886]	10.5 [0.413]	15.5 [0.610]	8.5 [0.335]	10 [0.394]	11.5 [0.453]	18 [0.709]	M4×0.7 Depth 8 [0.315]
KPTBHF-25-□		25.8 [1.016]	38 [1.496]	15.5 [0.610]	22.5 [0.886]	10.5 [0.413]	15.5 [0.610]	8.5 [0.335]	10 [0.394]	11.5 [0.453]	18 [0.709]	M4×0.7 Depth 8 [0.315]
KPTBHF-30-□		31 [1.220]	48.8 [1.921]	17.8 [0.701]	31 [1.220]	14 [0.551]	20 [0.787]	12 [0.472]	14 [0.551]	16.2 [0.638]	20 [0.787]	M8×1 Depth 12 [0.472]
KPTBHF-35-□		36.1 [1.421]	49 [1.929]	18 [0.709]	31 [1.220]	14 [0.551]	20 [0.787]	12 [0.472]	14 [0.551]	16.2 [0.638]	20 [0.787]	M8×1 Depth 12 [0.472]
KPTBHF-40-□		40.4 [1.591]	49 [1.929]	18 [0.709]	31 [1.220]	14 [0.551]	20 [0.787]	12 [0.472]	14 [0.551]	16.2 [0.638]	20 [0.787]	M8×1 Depth 12 [0.472]

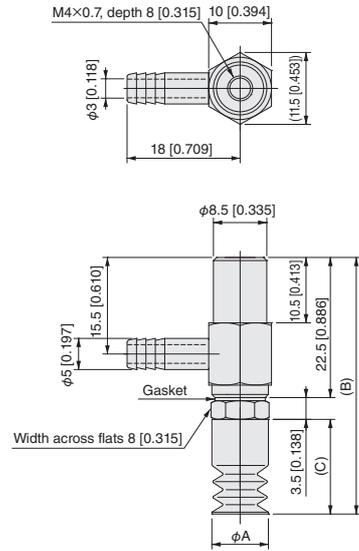
KPTCHF-□-□

● 5-7



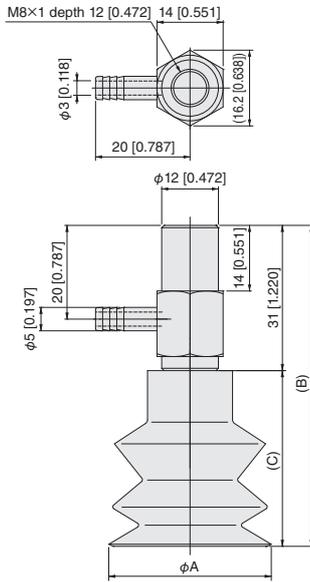
Model	Item	A	B	C
KPTCHF-5-□		5.5 [0.217]	35.5 [1.398]	9.5 [0.374]
KPTCHF-7-□		7.2 [0.283]	35.9 [1.413]	9.9 [0.390]

● 9-15-19



Model	Item	A	B	C
KPTCHF-9-□		8.9 [0.350]	41.2 [1.622]	15.2 [0.598]
KPTCHF-15-□		15 [0.591]	48.1 [1.894]	22.1 [0.870]
KPTCHF-19-□		19.2 [0.756]	49.2 [1.937]	23.2 [0.913]

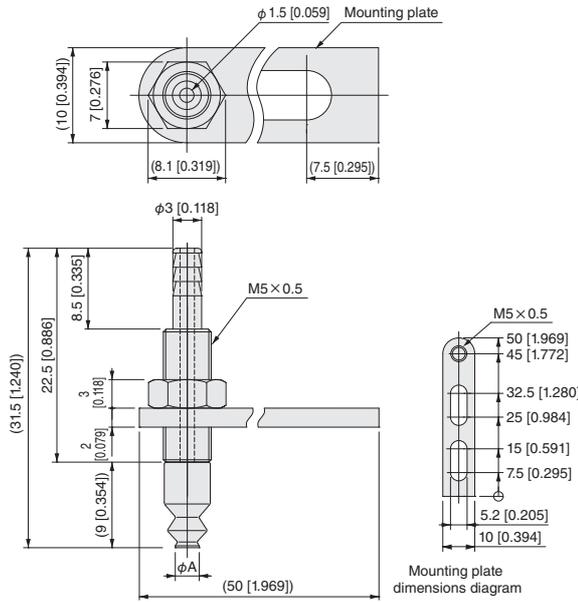
● 32-42



Model	Item	A	B	C
KPTCHF-32-□		33.6 [1.323]	68.3 [2.689]	37.3 [1.469]
KPTCHF-42-□		42.4 [1.669]	77 [3.031]	46 [1.811]

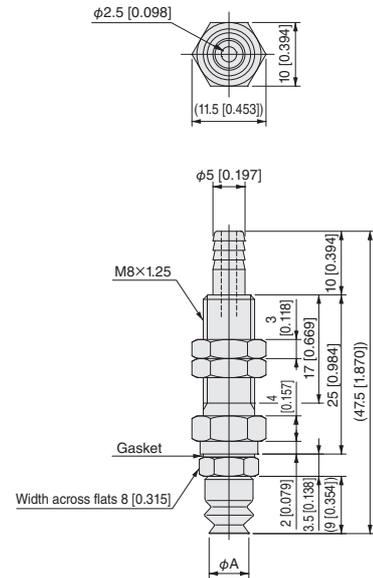
KPTBVF-□-□

● **2.5-4**



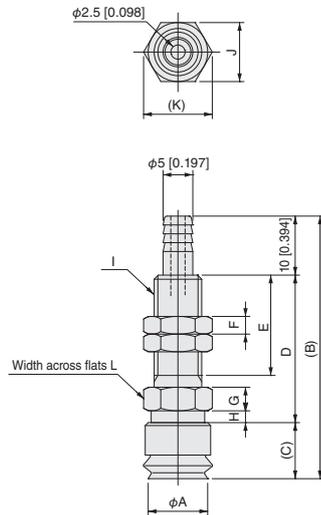
Model	Item	A
KPTBVF-2.5-□	2.5	0.098
KPTBVF-4-□	4.15	0.163

● **6-8**

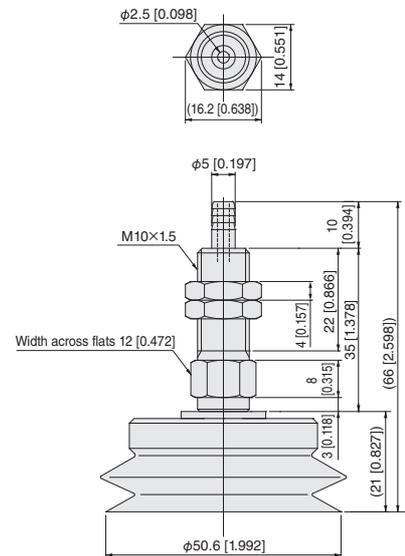


Model	Item	A
KPTBVF-6-□	6.2	0.244
KPTBVF-8-□	8.2	0.323

● **10-15-20-25-30-35-40**



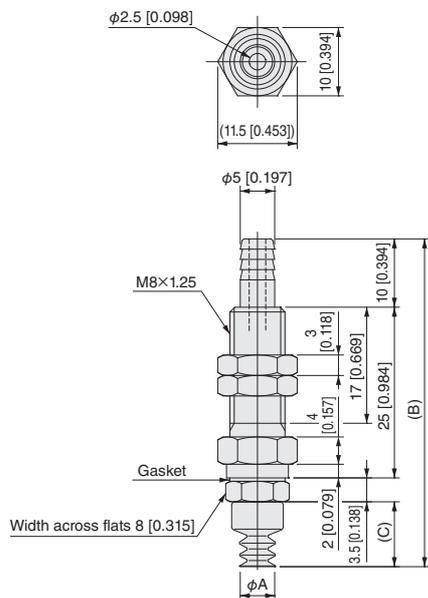
● **50**



Model	Item	A	B	C	D	E	F	G	H	I	J	K	L										
KPTBVF-10-□	9.8	0.386	44.2	1.740	9.2	0.362	25	0.984	17	0.669	3	0.118	4	0.157	2	0.079	M8×1.25	10	0.394	11.5	0.453	10	0.394
KPTBVF-15-□	15.5	0.610	46	1.811	11	0.433	25	0.984	17	0.669	3	0.118	4	0.157	2	0.079	M8×1.25	10	0.394	11.5	0.453	10	0.394
KPTBVF-20-□	20.2	0.795	48.1	1.894	13.1	0.516	25	0.984	17	0.669	3	0.118	4	0.157	2	0.079	M8×1.25	10	0.394	11.5	0.453	10	0.394
KPTBVF-25-□	25.8	1.016	50.5	1.988	15.5	0.610	25	0.984	17	0.669	3	0.118	4	0.157	2	0.079	M8×1.25	10	0.394	11.5	0.453	10	0.394
KPTBVF-30-□	31	1.220	62.8	2.472	17.8	0.701	35	1.378	22	0.866	4	0.157	8	0.315	3	0.118	M10×1.5	14	0.551	16.2	0.638	12	0.472
KPTBVF-35-□	36.1	1.421	63	2.480	18	0.709	35	1.378	22	0.866	4	0.157	8	0.315	3	0.118	M10×1.5	14	0.551	16.2	0.638	12	0.472
KPTBVF-40-□	40.4	1.591	63	2.480	18	0.709	35	1.378	22	0.866	4	0.157	8	0.315	3	0.118	M10×1.5	14	0.551	16.2	0.638	12	0.472

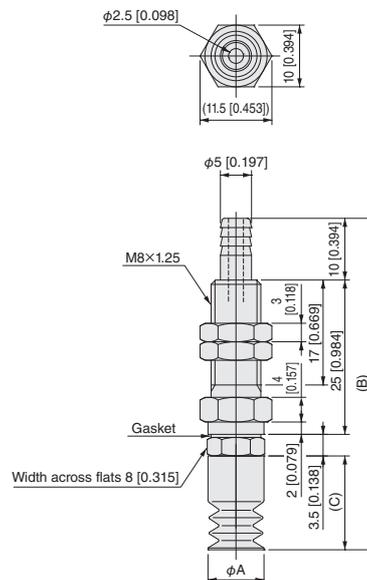
KPTCVF-□-□

● 5-7



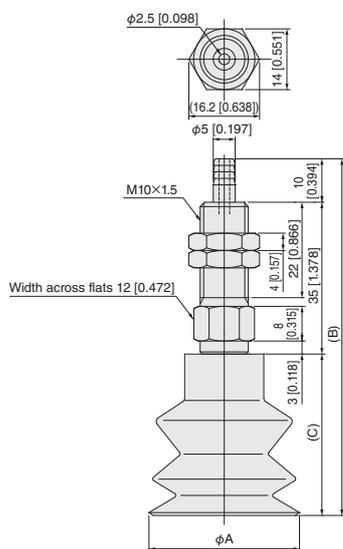
Model	Item	A	B	C
KPTCVF-5-□		5.5 [0.217]	48 [1.890]	9.5 [0.374]
KPTCVF-7-□		7.2 [0.283]	48.4 [1.906]	9.9 [0.390]

● 9-15-19



Model	Item	A	B	C
KPTCVF-9-□		8.9 [0.350]	53.7 [2.114]	15.2 [0.598]
KPTCVF-15-□		15 [0.591]	60.6 [2.386]	22.1 [0.870]
KPTCVF-19-□		19.2 [0.756]	61.7 [2.429]	23.2 [0.913]

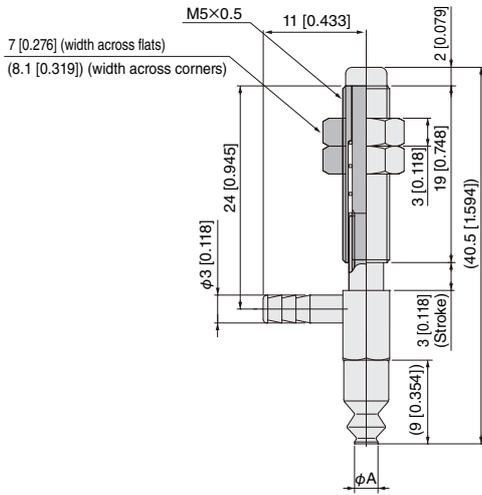
● 32-42



Model	Item	A	B	C
KPTCVF-32-□		33.6 [1.323]	82.3 [3.240]	37.3 [1.469]
KPTCVF-42-□		42.4 [1.669]	91 [3.583]	46 [1.811]

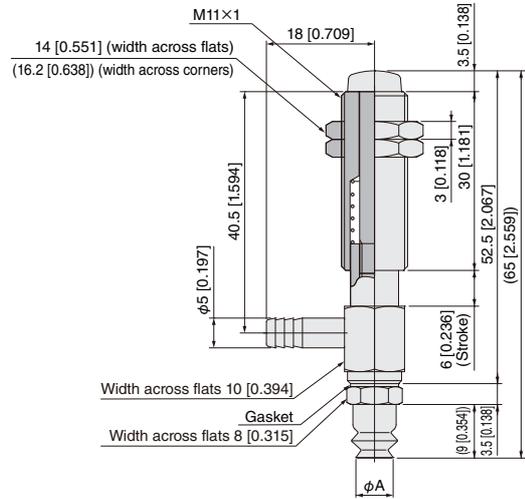
KPTBHS-□-□

● 2.5-4



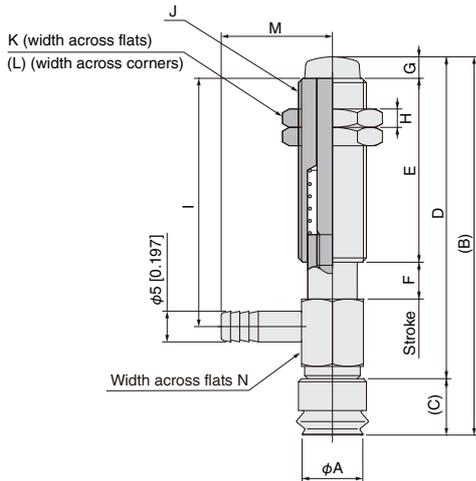
Model	Item	A
KPTBHS-2.5-□		2.5 [0.098]
KPTBHS-4-□		4.15 [0.163]

● 6-8

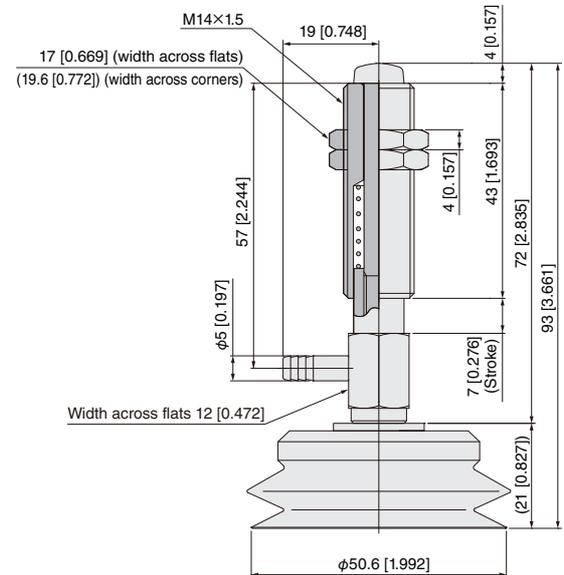


Model	Item	A
KPTBHS-6-□		6.2 [0.244]
KPTBHS-8-□		8.2 [0.323]

● 10-15-20-25-30-35-40



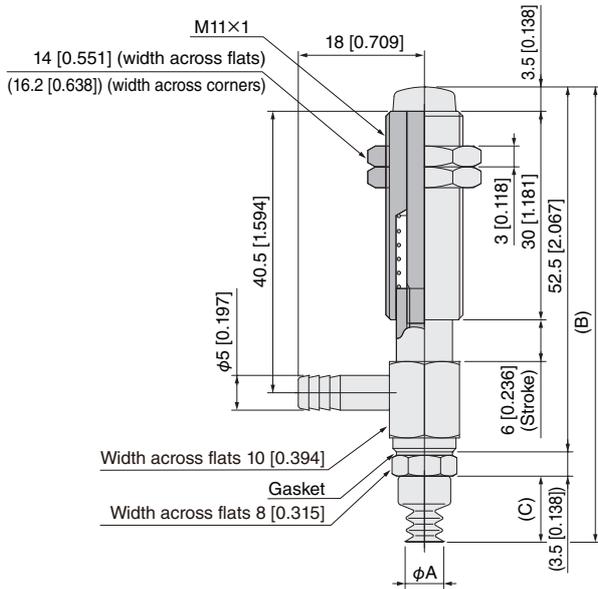
● 50



Model	Item	A	B	C	D	E	F	G	H	I	J	K	L	M	N
KPTBHS-10-□		9.8 [0.386]	61.7 [2.429]	9.2 [0.362]	52.5 [2.067]	30 [1.181]	6 [0.236]	3.5 [0.138]	3 [0.118]	40.5 [1.594]	M11x1	14 [0.551]	16.2 [0.638]	18 [0.709]	10 [0.394]
KPTBHS-15-□		15.5 [0.610]	63.5 [2.500]	11 [0.433]	52.5 [2.067]	30 [1.181]	6 [0.236]	3.5 [0.138]	3 [0.118]	40.5 [1.594]	M11x1	14 [0.551]	16.2 [0.638]	18 [0.709]	10 [0.394]
KPTBHS-20-□		20.2 [0.795]	65.6 [2.583]	13.1 [0.516]	52.5 [2.067]	30 [1.181]	6 [0.236]	3.5 [0.138]	3 [0.118]	40.5 [1.594]	M11x1	14 [0.551]	16.2 [0.638]	18 [0.709]	10 [0.394]
KPTBHS-25-□		25.8 [1.016]	68 [2.677]	15.5 [0.610]	52.5 [2.067]	30 [1.181]	6 [0.236]	3.5 [0.138]	3 [0.118]	40.5 [1.594]	M11x1	14 [0.551]	16.2 [0.638]	18 [0.709]	10 [0.394]
KPTBHS-30-□		31 [1.220]	89.8 [3.535]	17.8 [0.701]	72 [2.835]	43 [1.693]	7 [0.276]	4 [0.157]	4 [0.157]	57 [2.244]	M14x1.5	17 [0.669]	19.6 [0.772]	19 [0.748]	12 [0.472]
KPTBHS-35-□		36.1 [1.421]	90 [3.543]	18 [0.709]	72 [2.835]	43 [1.693]	7 [0.276]	4 [0.157]	4 [0.157]	57 [2.244]	M14x1.5	17 [0.669]	19.6 [0.772]	19 [0.748]	12 [0.472]
KPTBHS-40-□		40.4 [1.591]	90 [3.543]	18 [0.709]	72 [2.835]	43 [1.693]	7 [0.276]	4 [0.157]	4 [0.157]	57 [2.244]	M14x1.5	17 [0.669]	19.6 [0.772]	19 [0.748]	12 [0.472]

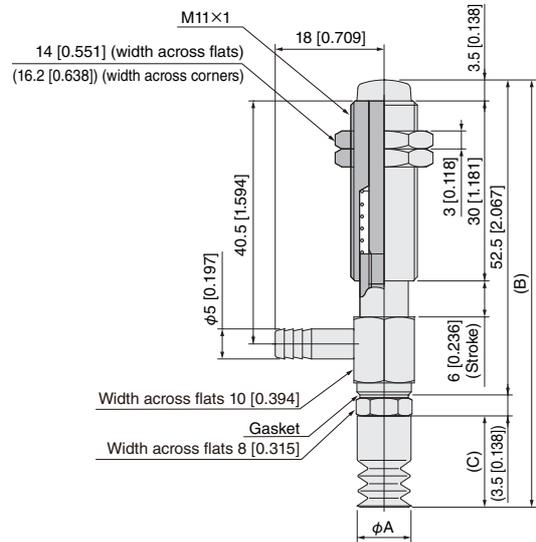
KPTCHS-□-□

● **5-7**



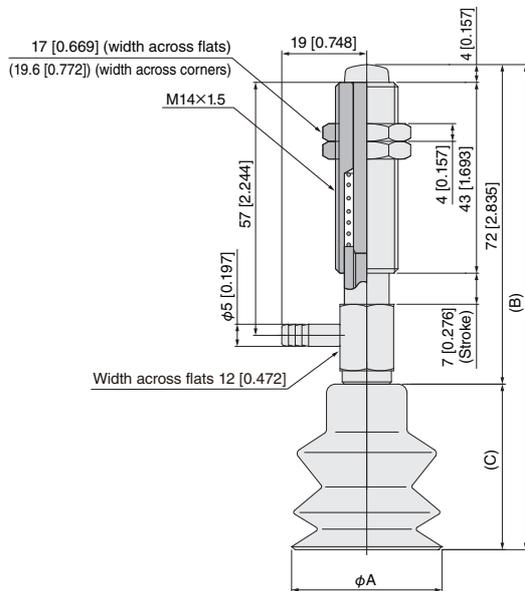
Model \ Item	A	B	C
KPTCHS-5-□	5.5 [0.217]	65.5 [2.579]	9.5 [0.374]
KPTCHS-7-□	7.2 [0.283]	65.9 [2.594]	9.9 [0.390]

● **9-15-19**



Model \ Item	A	B	C
KPTCHS-9-□	8.9 [0.350]	71.2 [2.803]	15.2 [0.598]
KPTCHS-15-□	15 [0.591]	78.1 [3.075]	22.1 [0.870]
KPTCHS-19-□	19.2 [0.756]	79.2 [3.118]	23.2 [0.913]

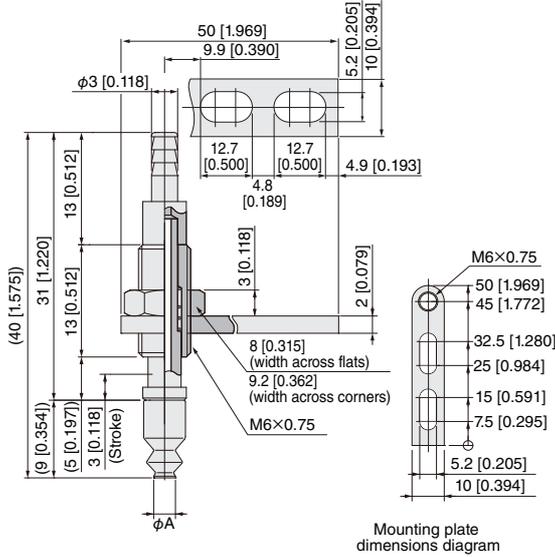
● **32-42**



Model \ Item	A	B	C
KPTCHS-32-□	33.6 [1.323]	109.3 [4.303]	37.3 [1.469]
KPTCHS-42-□	42.4 [1.669]	118 [4.646]	46 [1.811]

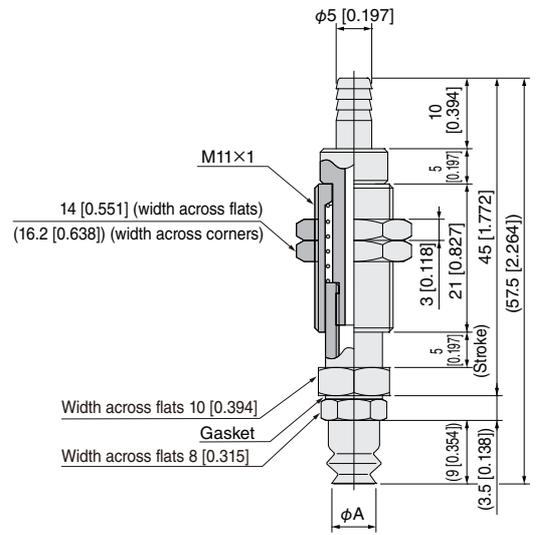
KPTBVS-□-□

● 2.5-4



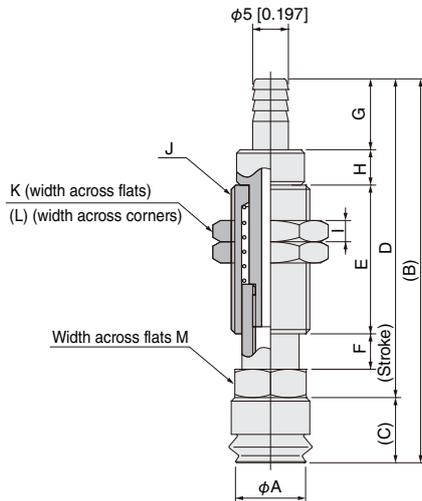
Model	Item	A
KPTBVS-2.5-□		2.5 [0.098]
KPTBVS-4-□		4.15 [0.163]

● 6-8

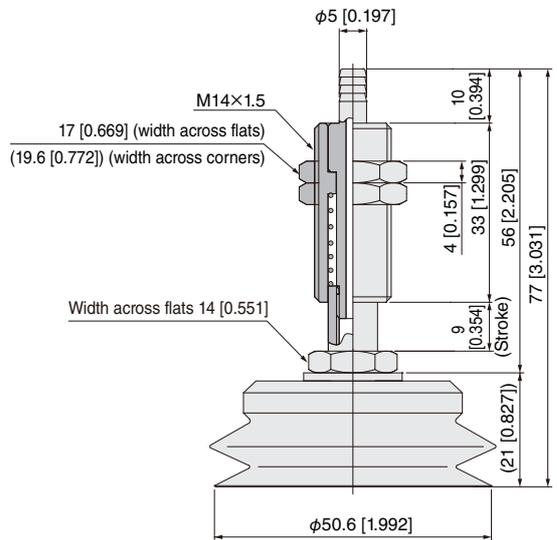


Model	Item	A
KPTBVS-6-□		6.2 [0.244]
KPTBVS-8-□		8.2 [0.323]

● 10-15-20-25-30-35-40



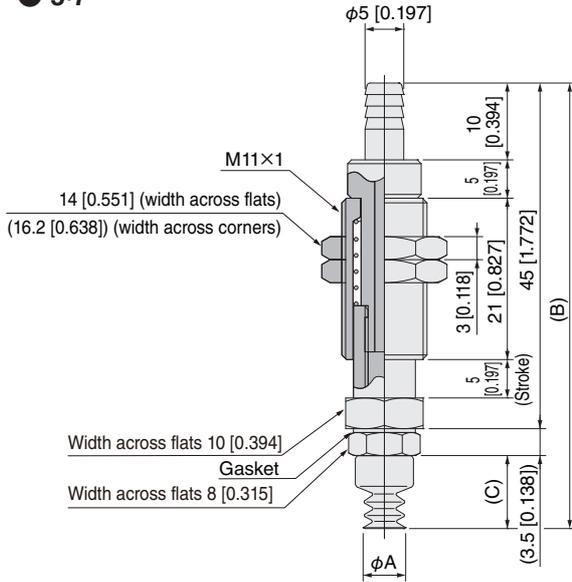
● 50



Model	Item	A	B	C	D	E	F	G	H	I	J	K	L	M
KPTBVS-10-□		9.8 [0.386]	54.2 [2.134]	9.2 [0.362]	45 [1.772]	21 [0.827]	5 [0.197]	10 [0.394]	5 [0.197]	3 [0.118]	M11×1	14 [0.551]	16.2 [0.638]	10 [0.394]
KPTBVS-15-□		15.5 [0.610]	56 [2.205]	11 [0.433]	45 [1.772]	21 [0.827]	5 [0.197]	10 [0.394]	5 [0.197]	3 [0.118]	M11×1	14 [0.551]	16.2 [0.638]	10 [0.394]
KPTBVS-20-□		20.2 [0.795]	58.1 [2.287]	13.1 [0.516]	45 [1.772]	21 [0.827]	5 [0.197]	10 [0.394]	5 [0.197]	3 [0.118]	M11×1	14 [0.551]	16.2 [0.638]	10 [0.394]
KPTBVS-25-□		25.8 [1.016]	60.5 [2.382]	15.5 [0.610]	45 [1.772]	21 [0.827]	5 [0.197]	10 [0.394]	5 [0.197]	3 [0.118]	M11×1	14 [0.551]	16.2 [0.638]	10 [0.394]
KPTBVS-30-□		31 [1.220]	73.8 [2.906]	17.8 [0.701]	56 [2.205]	33 [1.299]	9 [0.354]	10 [0.394]	—	4 [0.157]	M14×1.5	17 [0.669]	19.6 [0.772]	14 [0.551]
KPTBVS-35-□		36.1 [1.421]	74 [2.913]	18 [0.709]	56 [2.205]	33 [1.299]	9 [0.354]	10 [0.394]	—	4 [0.157]	M14×1.5	17 [0.669]	19.6 [0.772]	14 [0.551]
KPTBVS-40-□		40.4 [1.591]	74 [2.913]	18 [0.709]	56 [2.205]	33 [1.299]	9 [0.354]	10 [0.394]	—	4 [0.157]	M14×1.5	17 [0.669]	19.6 [0.772]	14 [0.551]

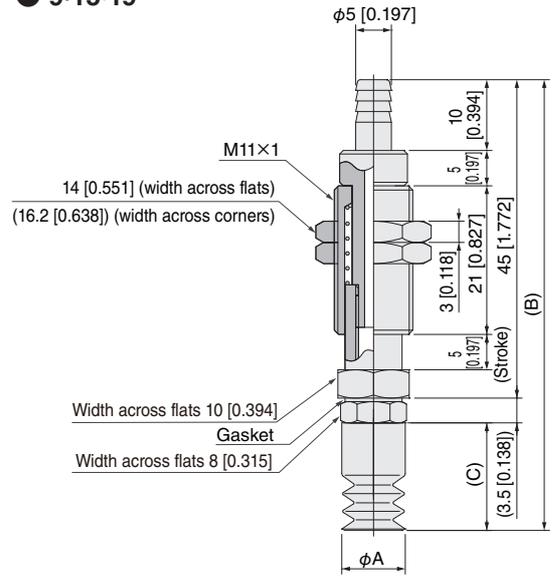
KPTCVS-□-□

● 5-7



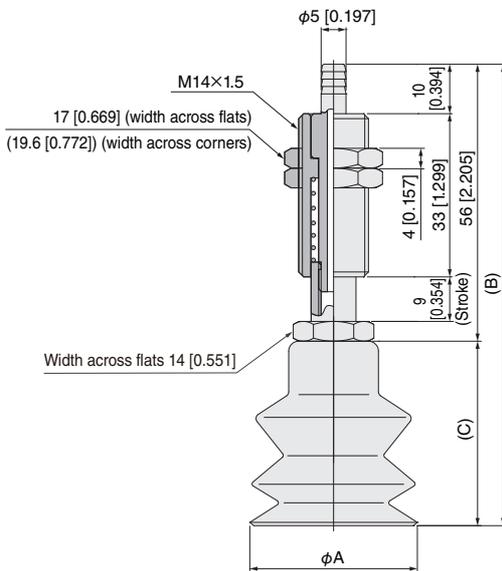
Model \ Item	A	B	C
KPTCVS-5-□	5.5 [0.217]	58 [2.283]	9.5 [0.374]
KPTCVS-7-□	7.2 [0.283]	58.4 [2.299]	9.9 [0.390]

● 9-15-19



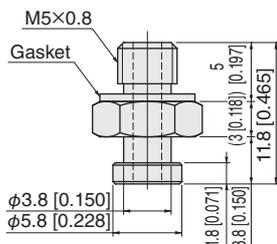
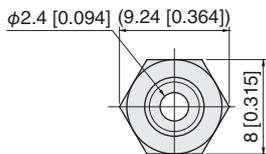
Model \ Item	A	B	C
KPTCVS-9-□	8.9 [0.350]	63.7 [2.508]	15.2 [0.598]
KPTCVS-15-□	15 [0.591]	70.6 [2.780]	22.1 [0.870]
KPTCVS-19-□	19.2 [0.756]	71.7 [2.823]	23.2 [0.913]

● 32-42

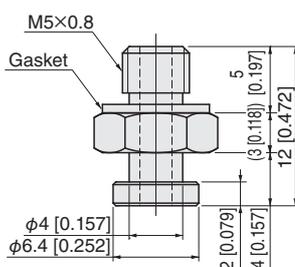
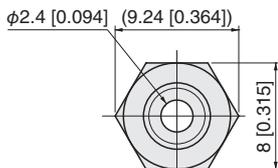


Model \ Item	A	B	C
KPTCVS-32-□	33.6 [1.323]	93.3 [3.673]	37.3 [1.469]
KPTCVS-42-□	42.4 [1.669]	102 [4.016]	46 [1.811]

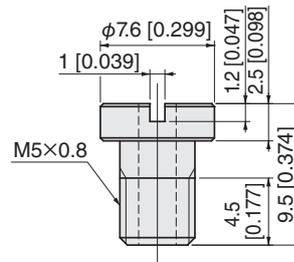
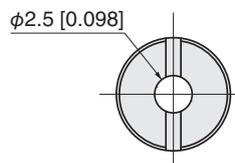
● M-KPTB6
M-KPTC5
M-KPTC7



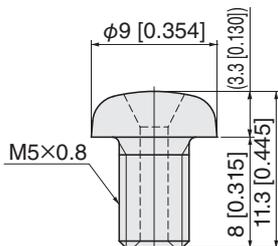
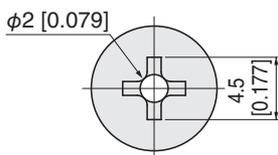
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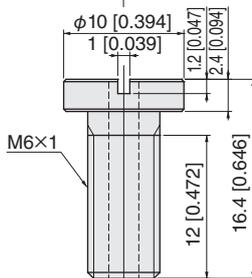
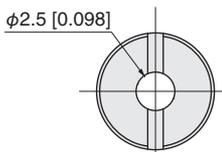
● M-KPTB10
M-KPTB15



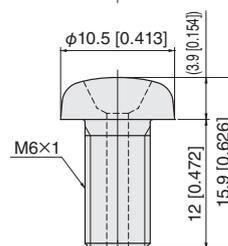
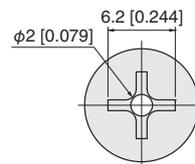
● M-KPTB20
M-KPTB25



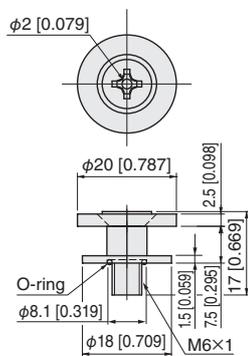
● M-KPTB30
M-KPTB35



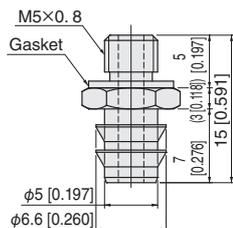
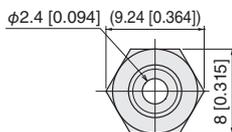
● M-KPTB40



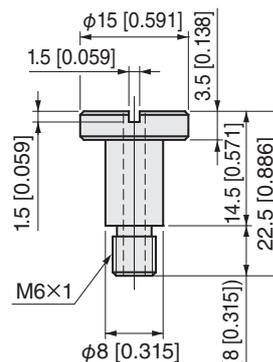
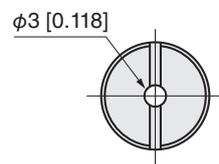
● M-KPTB50



● M-KPTC9
M-KPTC15
M-KPTC19



● M-KPTC32
M-KPTC42



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MEMO

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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.

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

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