

Vacuum pad VSP

■ Pneumatic components



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○: Option

	Pad shape	Holder shape		Pad size	Pad material	Free holder (swinging)	Position locking valve	Page	
		With buffer	Vacuum outlet						
Vacuum pad	Compact vacuum pad: VSP-M* various pads shapes · Space conserved by downsizing existing holder	<Small> None (fixed type)	Top/joint	● Standard small type (ø0.7, ø1, ø1.5, ø2, ø3, ø4) is added to conventional pad type series	● Material for compact type Nitrile rubber, silicon rubber, urethane rubber, Fluoro rubber, antistatic silicon rubber, Antistatic butadiene rubber, Food Sanitation Law compliant NBR		○	246	
	Side/joint								
	Direct mount type								
	Standard type (General type): VSP-*R · Ideal for thick, flat work pieces	None (fixed type)	Top/joint	ø1, ø2, ø3, ø4, ø6, ø8, ø10, ø15, ø20, ø25, ø30, ø40, ø50, ø60, ø80, ø100, ø150, ø200	Nitrile rubber, silicon rubber, Urethane rubber, fluoro rubber, Antistatic silicon rubber, Antistatic butadiene rubber, Food Sanitation Law compliant NBR		○	○	258
			Side/joint						
			Direct mount type						
		None (with stopper)	Top/joint						
		Side/joint							
		Direct mount type							
	Standard type (Deep type): VSP-*A · Ideal for picking up round balls, etc.	None (fixed type)	Top/joint	ø15, ø20, ø25, ø30, ø40, ø50, ø60, ø80, ø100	Nitrile rubber, silicon rubber, Urethane rubber, fluoro rubber, Antistatic silicon rubber, Antistatic butadiene rubber, Food Sanitation Law compliant NBR		○	○	258
Side/joint									
Direct mount type									
None (with stopper)		Top/joint							
Side/joint									
Direct mount type									
Sponge type: VSP-*S · Ideal for workpieces with uneven surfaces, such as exterior walls	None (fixed type)	Top/joint	ø10, ø15, ø20, ø20, ø30, ø35, ø50, ø70, ø100	Cloroplane rubber		○	○	280	
		Side/joint							
		Direct mount type							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Bellows type: VSP-*B · Ideal for soft workpieces, such as paper or vinyl-packed products	None (fixed type)	Top/joint	ø10, ø20, ø30, ø40, ø50, ø80	Nitrile rubber, Silicon rubber, Antistatic silicon rubber		○	○	290	
		Side/joint							
		Direct mount type							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Multi-level bellows type: VSP-*W · Ideal for transferring inclined work pieces or vinyl-packed products	None (fixed type)	Top/joint	ø10, ø20, ø30, ø40, ø50	Nitrile rubber, Silicon rubber, Food Sanitation Law compliant NBR		○	○	300	
		Side/joint							
		Direct mount type							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Oval type: VSP-*E · Ideal for workpieces with limited suction space, such as IC circuit boards	None (fixed type)	Top/joint	4 x 10, 4 x 20, 4 x 30, 5 x 10, 5 x 20, 5 x 30, 6 x 10, 6 x 20, 6 x 30, 8 x 20, 8 x 30	Nitrile rubber, Silicon rubber, Antistatic butadiene rubber		○	○	310	
		Side/joint							
		Direct mount type							
	None (screw fixed type)	Top/joint							
	Side/joint								
	Direct mount type								
Soft type: VSP-*L · Ideal for unloading molded parts, and transferring delicate workpieces	None (fixed type)	Top/joint	ø4, ø6, ø8, ø10, ø15, ø20, ø30, ø40	Nitrile rubber, silicon rubber, Fluoro silicon rubber, Antistatic silicon rubber		○	○	324	
		Side/joint							
		Side/joint (Direct mounting type)							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Soft bellows type: VSP-*LB · Ideal for unloading molded parts, and picking up paper, etc.	None (fixed type)	Top/joint	ø6, ø8, ø10, ø15, ø20	Nitrile rubber, Silicon rubber		○	○	338	
		Side/joint							
		Side/joint (Direct mounting type)							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Nonskid type: VSP-*K* · Ideal of workpieces covered with oil, such as pressed parts	None (fixed type)	Top/joint	ø10, ø20, ø30, ø40, ø50	Oil-resistant NBR		○	○	352	
		Side/joint							
		Direct mount type							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Thin type: VSP-*P · Ideal for transferring thin workpieces, such as photocopy paper and vinyl	None (fixed type)	Top/joint	ø8, ø10, ø15, ø20	Nitrile rubber, Fluoro silicon rubber		○	○	360	
		Side/joint							
		Direct mount type							
	Provided (with stopper)	Top/joint							
	Side/joint								
	Direct mount type								
Long stroke: VSP various pads shapes · Ideal when distance from pad to workpiece is not specific	None (fixed type)	Top/joint	● Corresponding pad shape Standard type (general), Bellows type, Oval type Standard type (deep), Nonskid type, Sponge type	● Compatible stroke 10mm, 15mm, 20mm, 30mm, 40mm, 50mm		○	○	368	
		Side/joint							

Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

Long stroke

Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

Long stroke

How to select vacuum pad

Theoretical lift force (General pad)

■ Theoretical lift force is obtained with the pad area and the vacuum generated when using that pad.

<kPa, N display>

$$W = \frac{C \times P}{101} \times 10.13 \times f$$

W: Theoretical lift force (N)

C: Pad area (cm²)

P: Vacuum (-kPa)

f: Safety factor

<mmHg, kg display>

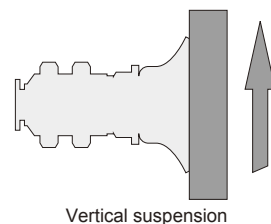
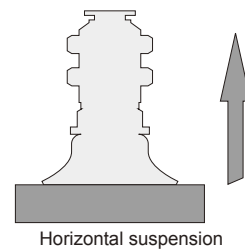
$$W = \frac{C \times P}{760} \times 1.0332 \times f$$

W: Theoretical lift force (kg)

C: Pad area (cm²)

P: Vacuum (-mmHg)

f: Safety factor



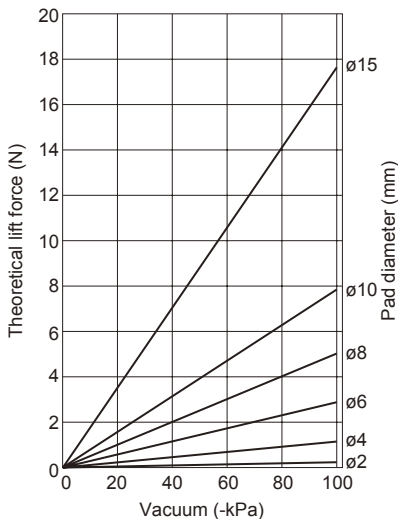
*1: When using a sponge pad, the value is calculated with the inner diameter of the sponge pad so see the separate table.

*2: Due to the characteristics of the pad, the lift force of the bellows type (multistage bellows) and soft type (soft bellows) pad may differ from the theoretical lift force.

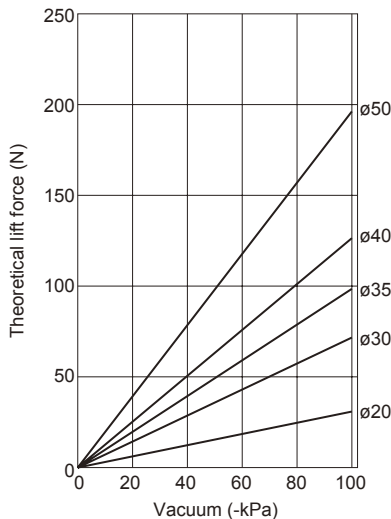
*3: The theoretical lift force is a value calculated under static conditions. When actually using the value, provide a 1/4 safety factor for the horizontal suspension, and a 1/8 safety factor for a vertical suspension. Acceleration when moving must also be considered. (Refer to the drawing at right.)

● General pad (rubber pad)

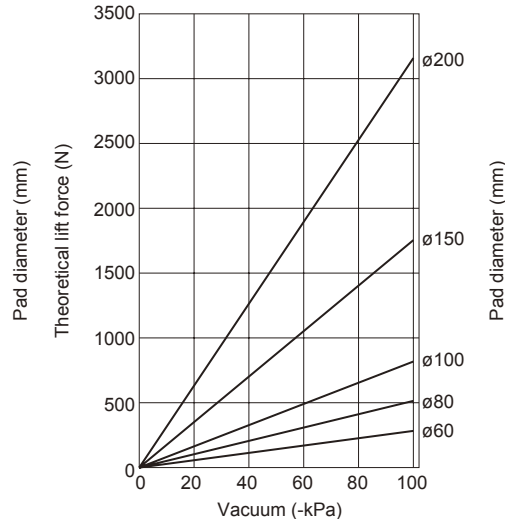
· Pad diameter: ø2mm to ø15mm



· Pad diameter: ø20mm to ø50mm

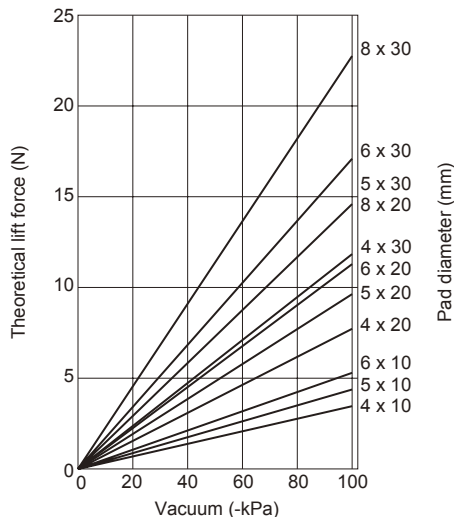


· Pad diameter: ø60mm to ø200mm



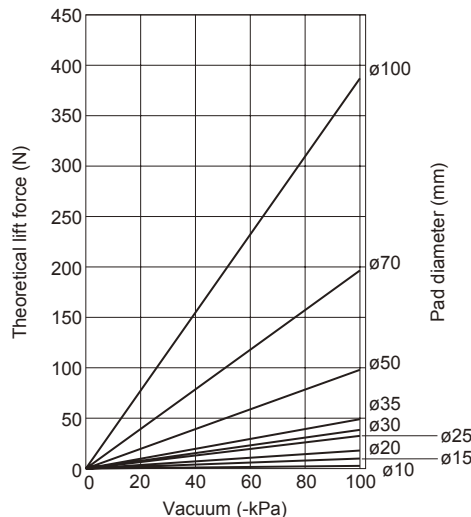
● Oval pad

· Pad diameter: * x 10mm, * x 20mm, * x 30mm



● Sponge pad

· Pad diameter: ø10mm to ø100mm



Selection guide

Characteristics of each pad

Pad material		Nitrile rubber	Silicon rubber	Urethane rubber	Fluorine rubber	Fluoro silicon rubber	Butadiene rubber (low-resistance type)	Cloroplane rubber (sponge type)
		NBR	Si	U	FKM	FSi	BR	CR
Item								
Pad color		Black ^{*2}	White	Blue	Gray	Light blown	Black	Black
Properties	Surface hardness (Shear A)	40 to 60	40 to 50	60	60	40	60	-
	High temperature working limit temperature	110	180	60	230	180	100	80
	Low temperature working limit temperature	-30	-40	-20	-10	-50	-50	-45
	Weather resistance	△	◎	○	○	○	○	○
	Ozone resistance	△	◎	◎	◎	◎	X	○
	Acid resistance	△	○	X	◎	○	△	△
	Alkaline resistance	○	◎	X	X	◎	○	◎
	Oil resistance	(Gasoline, light oil)	◎	△	◎	◎	△	X
(Benzene, toluene)		△	△	△	◎	△	X	△

Reading the evaluation ⇒ ◎: Best, ○: Appropriate, △: Acceptable, X: Incompatible

*1: The surface resistance rate of the low resistance pad is 200 Ω or less.

*2: Food Sanitation Law compliant pads are in gray.

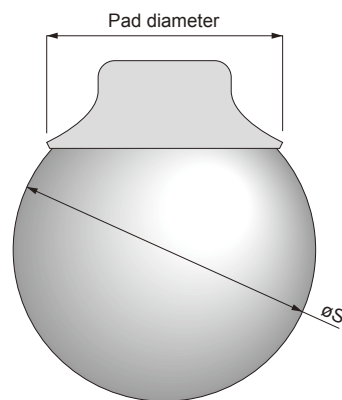
Note 1: The listed properties are the characteristics of typical synthetic rubber used for pad materials.

Note 2: The working limit temperature is an instant temperature. This must be carefully confirmed if the temperature continues for a set time.

Sucking up a spherical surface (deep pad)

Minimum pickup diameter

Pad diameter (mm)	ø15	ø20	ø25	ø30	ø40	ø50	ø60	ø80	ø100
Sphere diameter (ø Smm)	20	30	40	50	80	100	120	160	200



Vacuum pad

Pad diameter conformity table according to material

Material Pad diameter	N Nitrile						
	Standard (general type)	Standard (deep type)	Bellows type	Multi-level bellows	Soft type	Soft bellows	Thin type
1	●						
2	●						
3	●						
4	●				●		
6	●				●	●	
8	●				●	●	●
10	●		●	●	●	●	●
15	●	●			●	●	●
20	●	●	●	●	●	●	●
25	●	●					
30	●	●	●	●	●		
35							
40	●	●	●	●	●		
50	●	●	●	●			
60	●	●					
70							
80	●	●	●				
100	●	●					
150	●						
200	●						

Material Pad diameter	S Silicon					FS Fluoro silicon		
	Standard (general type)	Standard (deep type)	Bellows type	Multi-level bellows	Soft type	Soft bellows	Soft type	Thin type
1	●							
2	●							
3	●							
4	●				●		●	
6	●				●	●	●	
8	●				●	●	●	●
10	●		●	●	●	●	●	●
15	●	●			●	●	●	●
20	●	●	●	●	●	●	●	●
25	●	●						
30	●	●	●	●	●		●	
35								
40	●	●	●	●	●		●	
50	●	●	●	●				
60	●	●						
70								
80	●	●	●					
100	●	●						
150	●							
200	●							

Material Pad diameter	U Urethane		F Fluorine rubber		SE Antistatic rubber			E Antistatic rubber (low-resistance type)
	Standard (general type)	Standard (deep type)	Standard (general type)	Standard (deep type)	Standard (general type)	Bellows type	Soft type	Standard (general type)
1	●		●		●			●
2	●		●		●			●
3	●		●		●			●
4	●		●		●		●	●
6	●		●		●		●	●
8	●		●		●		●	●
10	●		●		●	●	●	●
15	●	●	●	●	●		●	●
20	●	●	●	●	●	●	●	●
25	●	●	●	●	●			●
30	●	●	●	●	●	●	●	●
35								
40	●	●	●	●	●	●	●	●
50	●	●	●	●	●	●		●
60	●	●	●	●				
70								
80	●	●	●	●				
100	●	●	●	●				
150	●		●					
200	●		●					

Material Pad diameter	G Food Sanitation Law compliant NBR			Cloroplane rubber	KNH Oil-resistant NBR
	Standard (general type)	Standard (deep type)	Multi-level bellows	Sponge type	Nonskid type
1	●				
2	●				
3	●				
4	●				
6	●				
8	●				
10	●		●	●	●
15	●	●		●	
20	●	●	●	●	●
25	●	●		●	
30	●	●	●	●	●
35				●	
40	●	●	●		●
50	●		●	●	●
60					
70				●	
80					
100				●	
150					
200					

Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

Long stroke



Vacuum pad for retort packed
Vacuum pad multi-level bellows type

VSP-*W* Series

● Pad diameter: $\varnothing 10$ to $\varnothing 50$

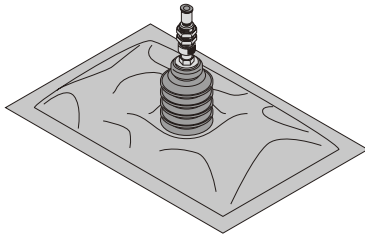


Features

- Flexibly handle the transfer of inclined work pieces or vinyl-packaged products.
 - Pad diameter: $\varnothing 10\text{mm}$, $\varnothing 20\text{mm}$, $\varnothing 30\text{mm}$, $\varnothing 40\text{mm}$, $\varnothing 50\text{mm}$
 - Pad material: nitrile rubber, silicon rubber, Food Sanitation Law compliant NBR
 - Holder shape: 5 types

Application

- Retort pack or bag-packed food



Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

Long stroke

How to order * Refer to the table on pages 302 to 308 for the model combination.

● Vacuum pad only / multi-level bellows type



● Pad rubber only / multi-level bellows type



A Holder shape

B Pad diameter

C Pad shape

D Pad material

E Frame

F Port size/shape

G Position locking valve

Symbol	Descriptions
A Holder shape	
A	Fixed type top vacuum outlet
B	Fixed type side vacuum outlet
C	With buffer top vacuum outlet
D	With buffer side vacuum outlet
F	Direct mount type with buffer
B Pad diameter	
See Appendix Table 1 for the pad diameter.	
C Pad shape	
W	Multi level bellows type
D Pad material	
N	Nitrile rubber
S	Silicon rubber
G	Food Sanitation Law compliant NBR
E Frame	
Blank	Without frame
F Port size/shape	
6	ø6 push-in joint
6T	ø6 barbed joint
G Position locking valve Page 422	
V	With position locking valve
Blank	Without

Appendix Table 1

Pad diameter					
Symbol	10	20	30	40	50
Pad diameter (mm)	ø10	ø20	ø30	ø40	ø50

⚠ Note on model no. selection

Note 1: Refer to page 422 for the position locking valve (V).

Note 2: See the list of target vacuum pads (page 424) for details on applicable pad sizes and shapes.

Characteristic of pad materials

Item	Nitrile rubber	Silicon rubber		
	NBR	Si		
Pad color	Black *1	White		
Properties	Surface hardness (Shear A)	40 to 60	40 to 50	
	High temperature working limit temperature	110	180	
	Low temperature working limit temperature	-30	-40	
	Weather resistance	△	◎	
	Ozone resistance	△	◎	
	Acid resistance	△	○	
	Alkaline resistance	○	◎	
	Oil resistance	(Gasoline, light oil)	◎	△
		(Benzene, toluene)	△	△

Reading the evaluation → ◎: Best, ○: Appropriate, △: Acceptable, X: Incompatible
*1: Food Sanitation Law compliant pads are gray.

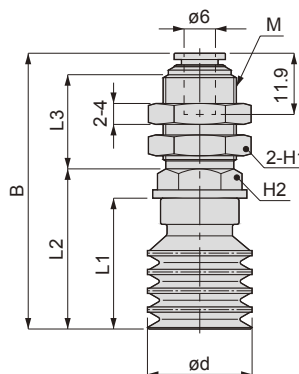
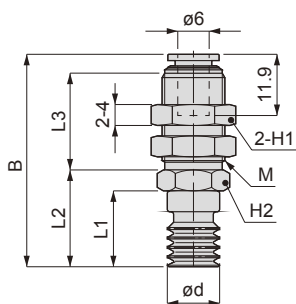
Note 1: The listed properties are the characteristics of typical synthetic rubber used for pad materials.

Note 2: The working limit temperature is an instant temperature. This must be carefully confirmed if the temperature continues for a set time.

Dimensions (fixed type, top vacuum outlet VSP-A)

- Push-in joint type VSP-A**W-6
 - VSP-A10W*-6

- VSP-A20 to 50W*-6

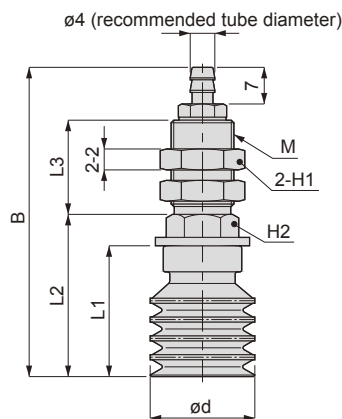
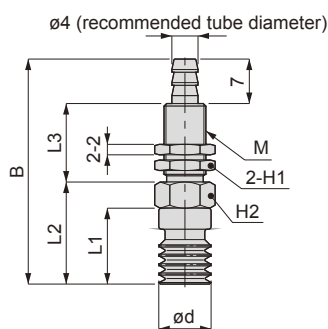


Unit: mm

Model No.	Pad diameter ød	M	B	L1	L2	L3	Opposite side H1	Opposite side H2	Weight (g)
VSP-A 10W*-6	10	M12 x 1	40.8	14.5	18.5	18.5	14	12	21.5
VSP-A 20W*-6	20	M14 x 1	52.9	25	30.6	18	17	14	37
VSP-A 30W*-6	30	M14 x 1	66.4	38.5	44.1	18	17	14	43
VSP-A 40W*-6	40	M14 x 1	72.9	45	50.6	18	17	14	52.5
VSP-A 50W*-6	50	M14 x 1	83.9	56	61.6	18	17	14	64

- Barbed joint type VSP-A**W-6T
 - VSP-A10W*-6T

- VSP-A20 to 50W*-6T



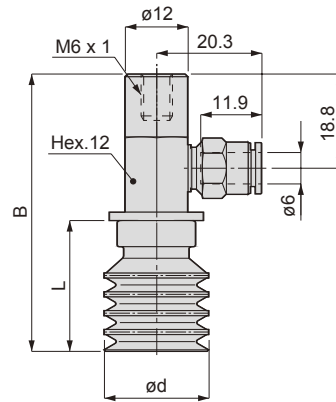
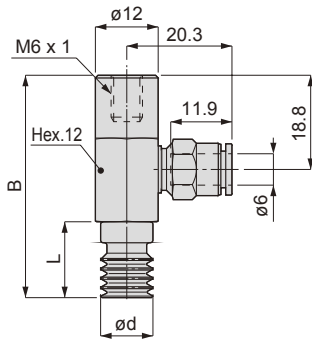
Unit: mm

Model No.	Pad diameter ød	M	B	L1	L2	L3	Opposite side H1	Opposite side H2	Weight (g)
VSP-A 10W*-6T	10	M8 x 0.75	43	14.5	19.5	15	10	10	12
VSP-A 20W*-6T	20	M12 x 1	59	25	31	18	14	12	30.5
VSP-A 30W*-6T	30	M12 x 1	72.5	38.5	44.5	18	14	12	36.5
VSP-A 40W*-6T	40	M12 x 1	79	45	51	18	14	12	46
VSP-A 50W*-6T	50	M12 x 1	90	56	62	18	14	12	57.5

Dimensions (fixed type, side outlet VSP-B)

- Push-in joint type VSP-B**W-6
 - VSP-B10W*-6T

· VSP-B20 to 50W*-6T

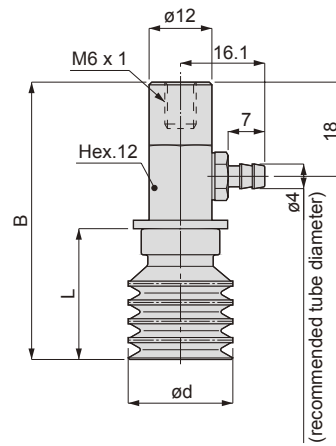
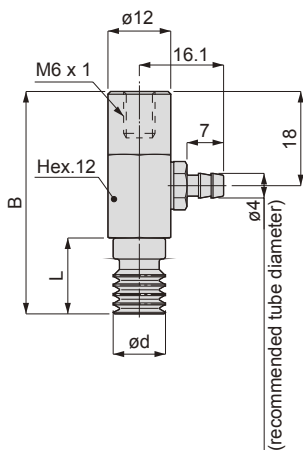


Unit: mm

Model No.	Pad diameter ϕd	B	L	Weight (g)
VSP-B 10W*-6	10	42.5	14.5	30.5
VSP-B 20W*-6	20	53	25	34.5
VSP-B 30W*-6	30	66.5	38.5	40.5
VSP-B 40W*-6	40	73	45	50
VSP-B 50W*-6	50	84	56	61.5

- Barbed joint type VSP-A**-6T
 - VSP-B10W*-6T

· VSP-B20 to 50W*-6T



Unit: mm

Model No.	Pad diameter ϕd	B	L	Weight (g)
VSP-B 10W*-6T	10	42.5	14.5	29
VSP-B 20W*-6T	20	53	25	32.5
VSP-B 30W*-6T	30	66.5	38.5	38.5
VSP-B 40W*-6T	40	73	45	48
VSP-B 50W*-6T	50	84	56	59.5

Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

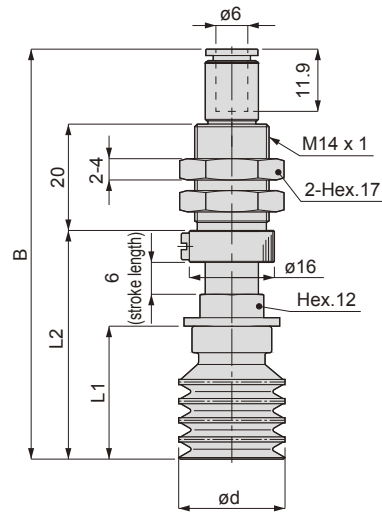
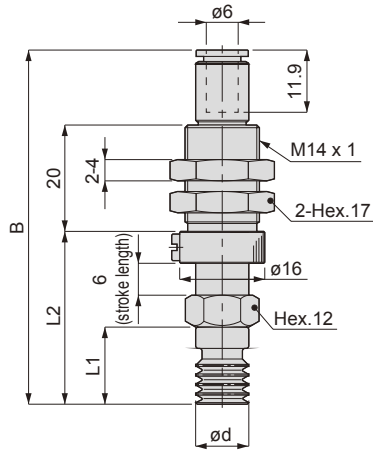
Thin

Long stroke

Dimensions (fixed type, top vacuum outlet VSP-C)

- Push-in joint type VSP-C**W-6
- VSP-C10W*-6

- VSP-C20 to 50W*-6



Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

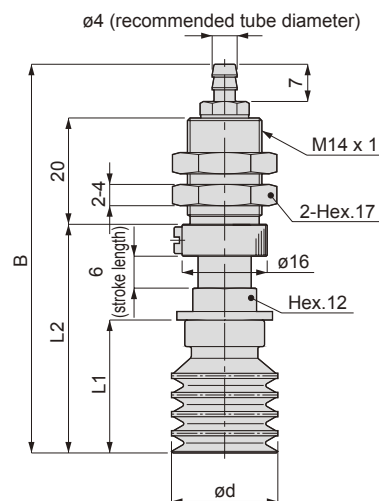
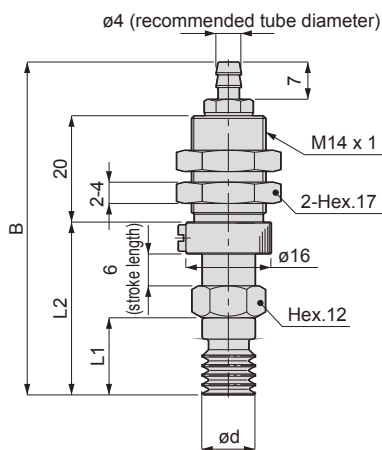
Long stroke

Unit: mm

Model No.	Pad diameter ϕd	B	L1	L2	Spring force (N)	Weight (g)
VSP-C 10W*-6	10	66.8	14.5	32.5	5 to 7	36
VSP-C 20W*-6	20	77.3	25	43	8 to 12	40
VSP-C 30W*-6	30	90.8	38.5	56.5	8 to 12	46.5
VSP-C 40W*-6	40	97.3	45	63	8 to 12	56
VSP-C 50W*-6	50	108.3	56	74	8 to 12	67

- Barbed joint type VSP-C**W-6T
- VSP-C10W*-6T

- VSP-C20 to 50W*-6T



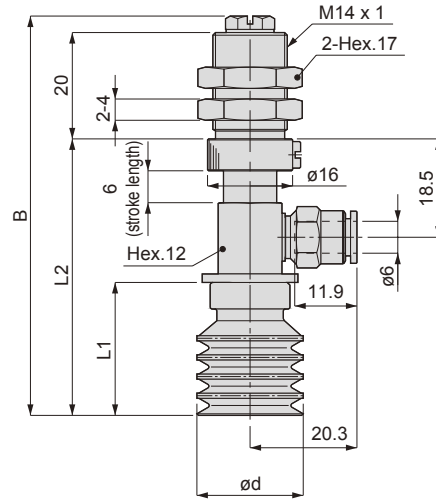
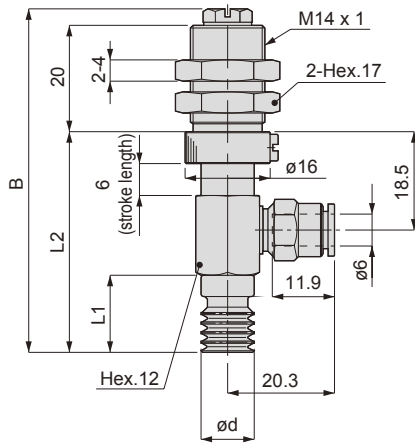
Unit: mm

Model No.	Pad diameter ϕd	B	L1	L2	Spring force (N)	Weight (g)
VSP-C 10W*-6T	10	62.6	14.5	32.5	5 to 7	34
VSP-C 20W*-6T	20	73.1	25	43	8 to 12	38
VSP-C 30W*-6T	30	86.6	38.5	56.5	8 to 12	44
VSP-C 40W*-6T	40	93.1	45	63	8 to 12	53.5
VSP-C 50W*-6T	50	104.1	56	74	8 to 12	65

Dimensions (with buffer, side vacuum outlet VSP-D)

- Push-in joint type VSP-D**W-6
 - VSP-D10W*-6

- VSP-D20 to 50W*-6

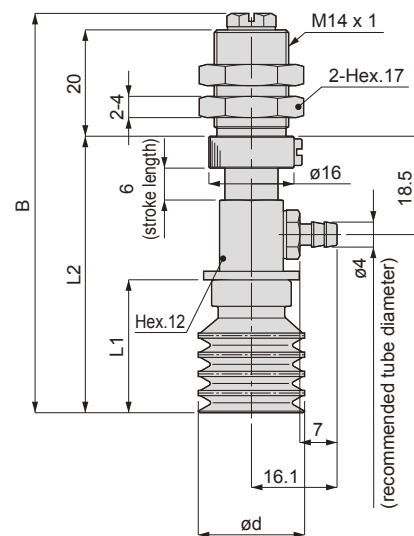
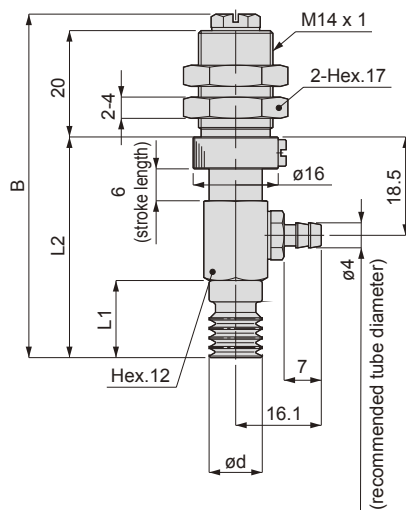


Unit: mm

Model No.	Pad diameter ød	B	L1	L2	Spring force (N)	Weight (g)
VSP-D 10W*-6	10	64.6	14.5	41.5	5 to 7	48
VSP-D 20W*-6	20	75.1	25	52	8 to 12	52
VSP-D 30W*-6	30	88.6	38.5	65.5	8 to 12	58
VSP-D 40W*-6	40	95.1	45	72	8 to 12	67.5
VSP-D 50W*-6	50	106.1	56	83	8 to 12	79

- Barbed joint type VSP-D**W-6T
 - VSP-D10W*-6T

- VSP-D20 to 50W*-6T

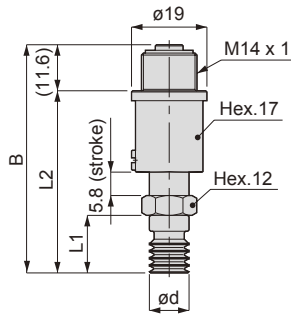


Unit: mm

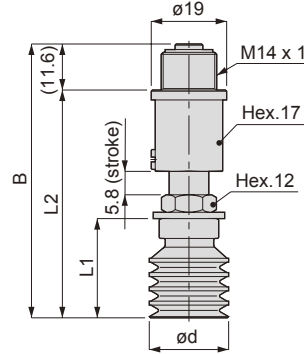
Model No.	Pad diameter ød	B	L1	L2	Spring force (N)	Weight (g)
VSP-D 10W*-6T	10	64.6	14.5	41.5	5 to 7	48
VSP-D 20W*-6T	20	75.1	25	52	8 to 12	52
VSP-D 30W*-6T	30	88.6	38.5	65.5	8 to 12	58
VSP-D 40W*-6T	40	95.1	45	72	8 to 12	67.5
VSP-D 50W*-6T	50	106.1	56	83	8 to 12	79

Dimensions (direct mount type with buffer)

● VSP-F10W*



● VSP-F20 to 50W*



Unit: mm

Model No.	Pad diameter ød	B	L1	L2	Spring force (N)	Weight (g)
VSP-F10W*	10	57.5	14.5	45.8	9 to 13	56.5
VSP-F20W*	20	69	25	57.3	9 to 13	59.5
VSP-F30W*	30	82.5	38.5	70.8	9 to 13	65.5
VSP-F40W*	40	89	45	77.3	9 to 13	75.5
VSP-F50W*	50	100	56	88.3	9 to 13	86.5

Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

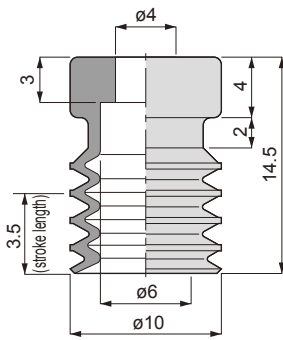
Nonskid

Thin

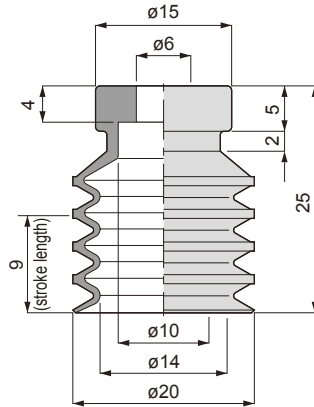
Long stroke

Dimensions for only pad type

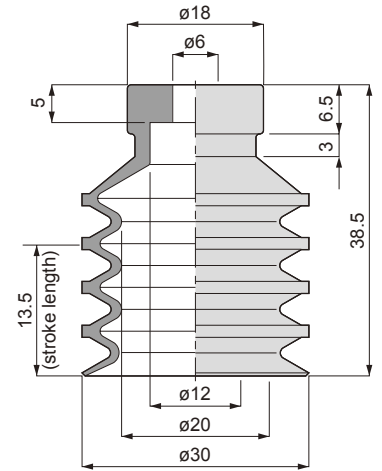
● VSPG-10W*



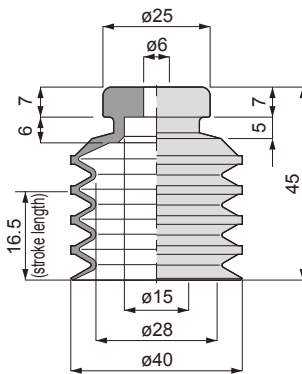
● VSPG-20W*



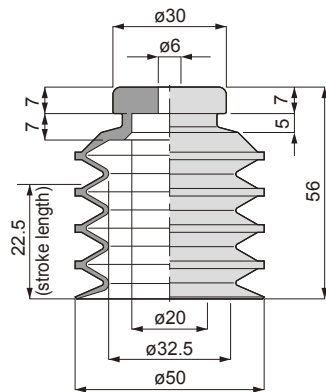
● VSPG-30W*



● VSPG-40W*



● VSPG-50W*



Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

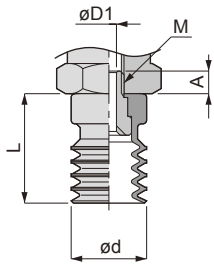
Nonskid

Thin

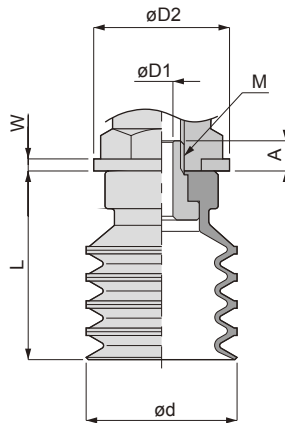
Long stroke

Detailed drawing of pad and holder fixing section

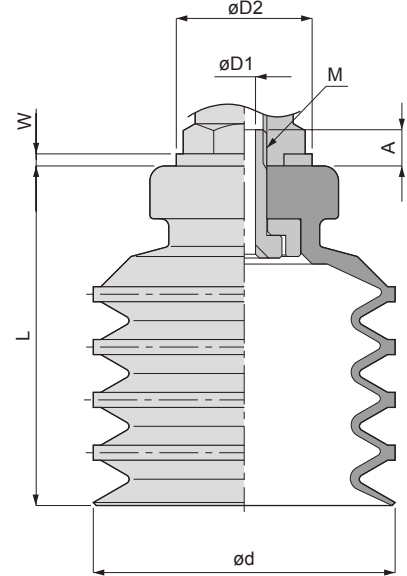
● VSPG-10W*



● VSPG-20/30W*



● VSPG-40/50W*



Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

Long stroke

Unit: mm

Model No.	Pad diameter ød	L	Lip inner height K	Set screw M	A	øD1	øD2	W
VSPG-10W*	10	14.5	-	M4 x 0.7	3.5	2	-	-
VSPG-20W*	20	25	-	M6 x 1	4.5	3	18	1.6
VSPG-30W*	30	38.5	-	M6 x 1	5.5	3	18	1.6
VSPG-40W*	40	45	-	M6 x 1	5.3	3	22	1.6
VSPG-50W*	50	56	-	M6 x 1	5.3	3	22	1.6

Vacuum pad

Compact

General/Deep

Sponge

Bellows

Multi-level bellows

Oval

Soft

Soft bellows

Nonskid

Thin

Long stroke