

Vacuum Pad / Bellows Type

2.5-stage
5.5-stage $\varnothing 20$, $\varnothing 25$, $\varnothing 32$, $\varnothing 40$, $\varnothing 50$

New

A flat attachment
has been added. **p. 1**
For reducing wrinkles



For the adsorption transfer of workpieces with flexible soft film packaging

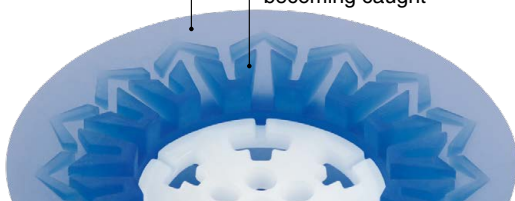
Thin film skirt and special shaped ribs

Thin film skirt

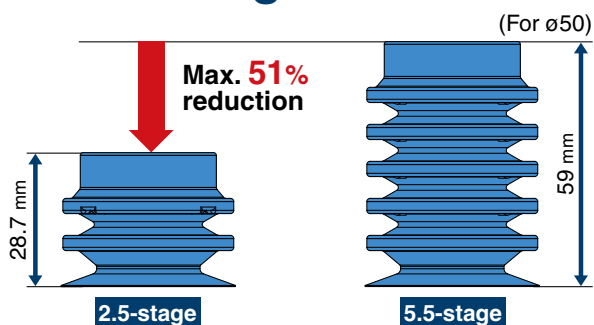
Adapts to changes in soft packaging shape

Special ribs

Vacuum leakage reduced by improved sealing effect
Prevent the skirt from becoming caught



Overall length reduced



The pad and attachment are made of materials compliant with the FDA (U.S. Food and Drug Administration) dissolution test as well as Japan Food Sanitation Act standards.

Blue colored pad

Easy to distinguish the vacuum pad by color during contamination inspection

2.5-Stage Bellows Type



5.5-Stage Bellows Type

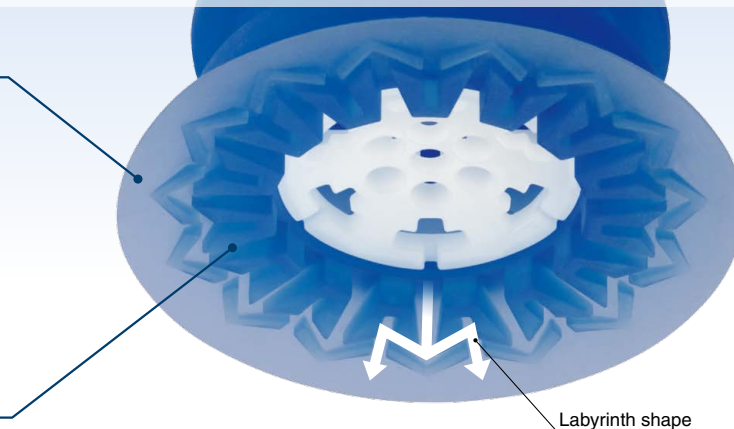
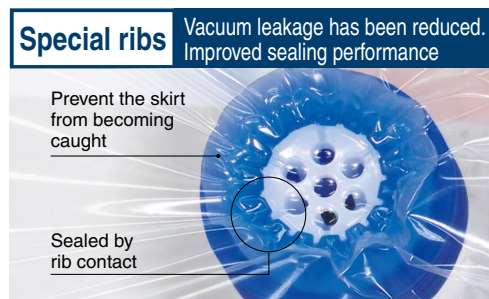


ZP3P-JT Series

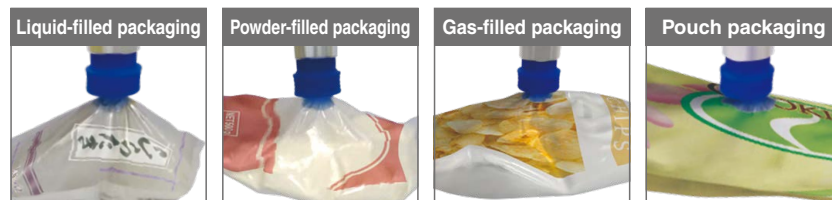


CAT.ES100-128C ^(A)

Allows for the transfer of unstable workpieces such as film-packaged liquids or powders



Application examples



Bellows Type

2.5-stage

Prevents the suction of foreign matter

Mesh attachment

- Stainless steel mesh at suction port*1
- Prevents the intrusion of foreign matter into piping
- Easy to check for clogging and easy to clean
- Reduced suction filter element replacement frequency

*1 The mesh will not fall off because it is integrally molded into the attachment.

Expanded hole size

Attachment

- Expanded hole size to ensure suction flow rate
- Compatible with vacuum blower pumps
- G3/8 and G1/2 standardized for the direct mounting/male thread type
- Min. opening hole size of the adapter: $\phi 11.5$ (Pad diameter: $\phi 32$, $\phi 40$, or $\phi 50$)

Reduced deflection during transfer before adsorption

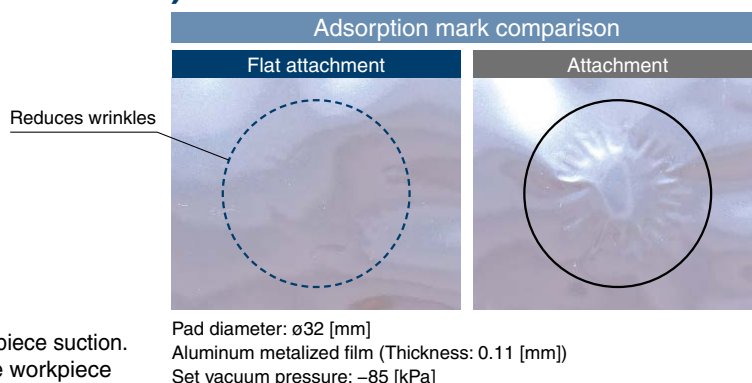
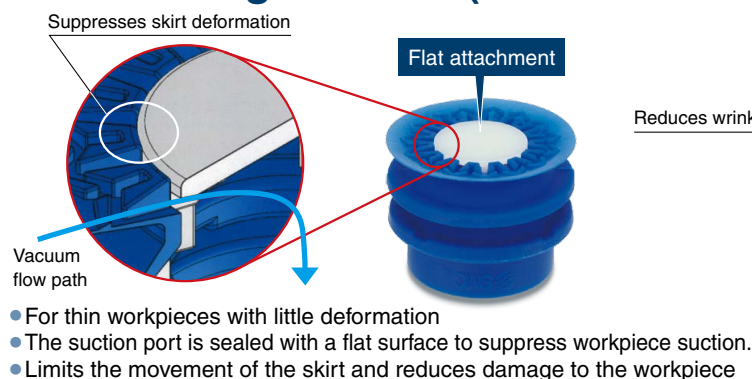
Acceleration/ deceleration: 4G

2.5-Stage Bellows Type

5.5-Stage Bellows Type

Reduced deflection

For reducing wrinkles (Flat attachment)



Bellows Type

5.5-stage

Guide attachment

Deformation of the pad and deflection of the workpiece during adsorption transfer are reduced.

With guide attachment



Small deformation and deflection

Without guide attachment



Large deformation and deflection

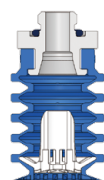
Guide attachment



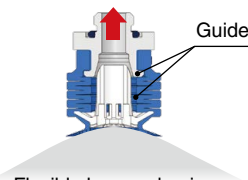
Transfer conditions

Pad diameter: $\phi 40$ [mm], Workpiece mass: 700 [g], Supply pressure: -85 [kPa], Acceleration/Deceleration: 4 [G]

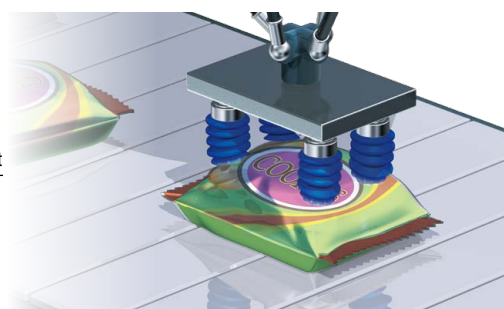
Before adsorption Vacuum OFF



During adsorption Vacuum ON



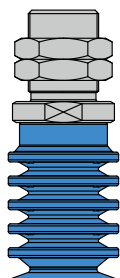
Flexible bag packaging



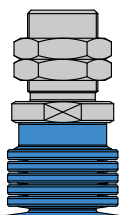
Multi-stage stroke

- Adaptable to changes in workpiece height and angle
- Reduced impact on the contents

Before adsorption Vacuum OFF



During adsorption Vacuum ON



Stroke

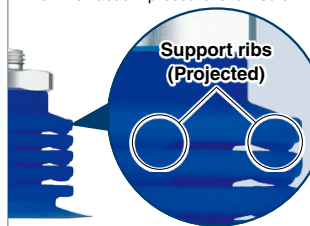
Stroke [mm]

$\phi 20$	10
$\phi 25$	12
$\phi 32$	16
$\phi 40$	20
$\phi 50$	26

* Achieved vacuum pressure: Reference at -85 [kPa]

Sticking is prevented.

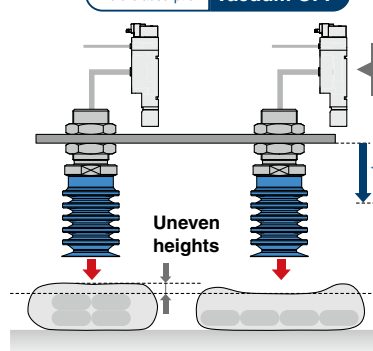
Support ribs prevent the sticking of the bellows. This reduces returning failure when the vacuum pressure is turned off.



Application examples

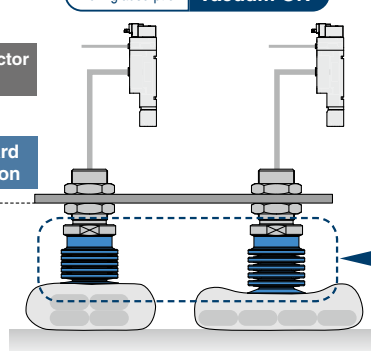
Workpieces of varying heights can be adsorbed by the stroke.

Before adsorption Vacuum OFF



Uneven heights

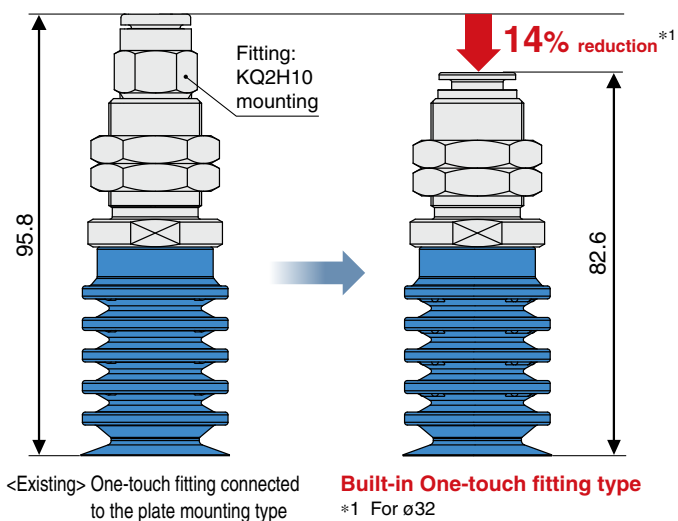
During adsorption Vacuum ON



Low-resilience bellows reduce the impact applied to the workpiece.

Standardized built-in One-touch fitting type

Reduced overall length, assembly, and labor time



Applicable tubing O.D.

Bore size	Pad diameter
ø8	ø20
	ø25
ø10	ø32
	ø40
	ø50

* Same for both the 2.5-stage and the 5.5-stage



Variations

2.5-Stage Bellows Type			Connection thread	Vacuum inlet	Pad diameter				
					ø20	ø25	ø32	ø40	ø50
Pad unit			—		—	●	●	●	●
Direct mounting (Male thread)			Male thread	G1/8	*1	●	●	●	●
				G1/4	*1	●	●	●	●
				G3/8	*1	●	●	●	●
				G1/2	*1	●	●	●	●
Direct mounting (Female thread)			Female thread	G1/8	*1	●	●	●	●
				G1/4	*1	●	●	●	●
Plate mounting (Male/Female thread)			Male thread	M16 x 1	Rc, NPT1/8	●	●	●	●
				M20 x 1	Rc, NPT1/4	●	●	●	●
Plate mounting (Male thread/ One-touch fitting)			Male thread	M16 x 1	ø8	●	●	●	●
				M20 x 1	ø10	●	●	●	●

*1 Same as the connection thread

5.5-Stage Bellows Type			Connection thread	Vacuum inlet	Pad diameter				
					ø20	ø25	ø32	ø40	ø50
Pad unit			—		—	●	●	●	●
Direct mounting (Male thread)			Male thread	G1/8	*1	●	●	●	●
				G1/4	*1	●	●	●	●
Direct mounting (Female thread)			Female thread	G1/8	*1	●	●	●	●
				G1/4	*1	●	●	●	●
Plate mounting (Male/Female thread)			Male thread	M16 x 1	Rc, NPT1/8	●	●	●	●
				M20 x 1	Rc, NPT1/4	●	●	●	●
Plate mounting (Male thread/ One-touch fitting)			Male thread	M16 x 1	ø8	●	●	●	●
				M20 x 1	ø10	●	●	●	●

*1 Same as the connection thread

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5.5-Stage Bellows Type

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2.5-Stage Bellows Type

5.5-Stage Bellows Type

Construction

Mounting Bracket
Assembly

Specific Product
Precautions



Vacuum Pad

2.5-Stage Bellows Type

ZP3P-JT Series

How to Order



Pad unit

ZP3P – **20** **JT** **2** **SF** – **W**

With adapter

ZP3P **1** – **T** **20** **JT** **2** **SF** – **W** – **AG01** – **5**

● Bellows type
2.5-stage
● Silicone rubber

1 Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

2 Pad diameter

20	ø20
25	ø25
32	ø32
40	ø40
50	ø50

3 Attachment

W	With attachment
WM	With mesh attachment
WF	With flat attachment

With adapter

4 Connection thread/5 Vacuum inlet

4 Connection thread				5 Vacuum inlet			Pad diameter [mm]	
Type	Thread	Symbol	Size	Thread	Symbol	Size	ø20, ø25	ø32, ø40, ø50
Direct mounting	Male thread	AG01	G1/8	—	Nil	—*1	●	●
		AG02	G1/4				●	●
		AG03	G3/8				●	●
		AG04	G1/2				—	●
	Female thread	BG01	G1/8	—	Nil	—*1	●	—
		BG02	G1/4				—	●
Plate mounting	Male thread	A16	M16 x 1	Female thread	B01	Rc1/8	●	—
				One-touch fitting*2	BN01	NPT1/8		
					08	ø8		
		A20	M20 x 1	Female thread	B02	Rc1/4	—	●
				One-touch fitting*2	BN02	NPT1/4		
					10	ø10		

*1 Use the connection thread.

*2 Built-in One-touch fitting type

Pad, adapter assembly, and mounting nuts are included but do not come assembled.

Specifications

Operating temperature range		–30 to 90°C*1
Pad	Material	Silicone rubber*2, *3
	Color	Blue
	Hardness (Shore A: ±5°)	40
Attachment	Material	Synthetic resin*4, *5/Stainless steel*6
	Color	White
	Mesh	Mesh: 60/Opening: 280 μm

*1 –5 to 60 [°C] for the vacuum inlet with One-touch fitting

*2 Uses a material compliant with a dissolution test of the FDA (U.S. Food and Drug Administration) regulation 21CFR§177.2600 for "Rubber articles intended for repeated use."

*3 Uses a material compliant with the standards for "Rubber apparatus (excluding baby drinking apparatus) and containers/packaging" (D3) (Partial revision: Japanese Ministry of Health, Labour, and Welfare Notification No. 595, 2012) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

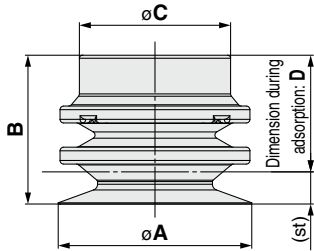
*4 Uses materials complaint with FDA (U.S. Food and Drug Administration) 21CFR§177

*5 Uses materials compliant with the standards for "Synthetic resin apparatus and containers/packaging" (D2) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

*6 Stainless steel included only for mesh attachment

Dimensions/Models

Pad unit

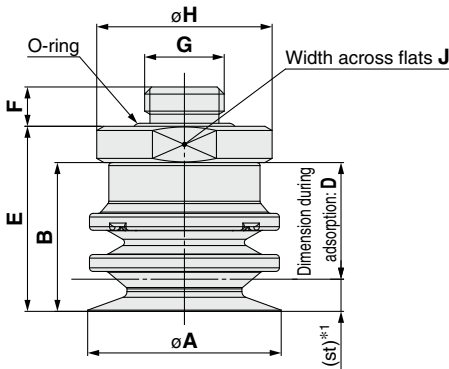


ZP3P - [20] JT2SF - [W]
① ②

Model						A	B	C	D	(st)*1	Weight [g]
① Pad dia.	Form	Number of bellows stages	Material	② Attachment							
ZP3P	20	JT	2	SF	W WM WF	20	17.7	16	15.2	2.5	2.8
	25					25	18.8		15.8	3	3.5
	32					32	24.6	25	20.6	4	8.3
	40					40	26.9		21.9	5	11
	50					50	28.7		22.2	6.5	13.8

*1 (st) indicates achieved vacuum pressure: Reference at -85 [kPa]

With adapter Direct mounting type (Male thread)



*1 Same dimension as the pad unit

ZP3P [] - T [20] JT2SF - [W] - [AG01]
① ② ③ ④

① Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

④ Connection thread (Male thread)

AG01	G1/8
AG02	G1/4
AG03	G3/8
AG04	G1/2

Model								E	F	G	H	J	Weight [g]		Min. opening hole size of the adapter	
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Attachment	④ Connection thread						Aluminum	Stainless steel		
ZP3P	Nil S	T	20	JT	2	SF	W WM WF	AG01	21.7	5.5	G1/8	18	17	6.5	13.8	ø5
								AG02	22.7	6.5	G1/4	23	21	9.4	22.2	ø6.2
								AG03	23.7	7.5	G3/8	29	27	15.9	41.6	
								AG01	22.8	5.5	G1/8	18	17	7.2	14.6	ø5
								AG02	23.8	6.5	G1/4	23	21	10.3	23	ø6.2
								AG03	24.8	7.5	G3/8	29	27	17.2	42.4	
			AG01					30.6	5.5	G1/8	29	27	21.9	48.9	ø5.7	
			AG02						6.5	G1/4			21.6	48	ø8	
			AG03						7.5	G3/8			20.9	45.5	ø11.5	
			AG04					31.6	9	G1/2	32	30	27.8	66.2		
			AG01					32.9	5.5	G1/8	29	27	24.6	51.6	ø5.7	
			AG02						6.5	G1/4			24.4	50.7	ø8	
			AG03						7.5	G3/8			23.6	48.2	ø11.5	
			AG04					33.9	9	G1/2	32	30	30.5	68.9		
			AG01					34.7	5.5	G1/8	29	27	27.4	54.4	ø5.7	
			AG02						6.5	G1/4			27.1	53.5	ø8	
			AG03						7.5	G3/8			26.4	51	ø11.5	
			AG04					35.7	9	G1/2	32	30	33.3	71.7		

2.5-Stage Bellows Type

5.5-Stage Bellows Type

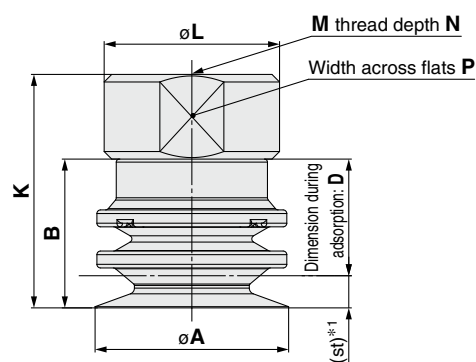
Construction

Mounting Bracket Assembly

Specific Product Precautions

Dimensions/Models

With adapter Direct mounting type (Female thread)



*1 Same dimension as the pad unit

ZP3P - T 20 JT2SF - W - BG01

1 Adapter material

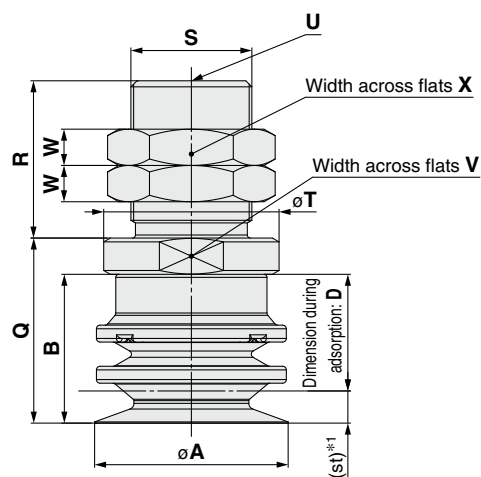
Nil	Aluminum
S	Stainless steel (Stainless steel 304)

4 Connection thread (Female thread)

BG01	G1/8
BG02	G1/4

Model								K	L	M	N	P	Weight [g]		Min. opening hole size of the adapter	
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Attachment	④ Conection thread						Aluminum	Stainless steel		
ZP3P	Nil S	T	20	JT	2	SF	W WM WF	BG01	28.7	18	G1/8	7.4	17	9.2	22.1	ø5
			29.8					10	22.9							
			BG02					38.6	29	G1/4	11	27	31.1	77	ø8	
			40.9					33.7					79.7			
			42.7					36.7					82.6			

With adapter Plate mounting type (Male/Female thread)



*1 Same dimension as the pad unit

ZP3P - T 20 JT2SF - W - A16 - B01

1 Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

Connection thread (Male thread)

A16	M16 x 1
A20	M20 x 1

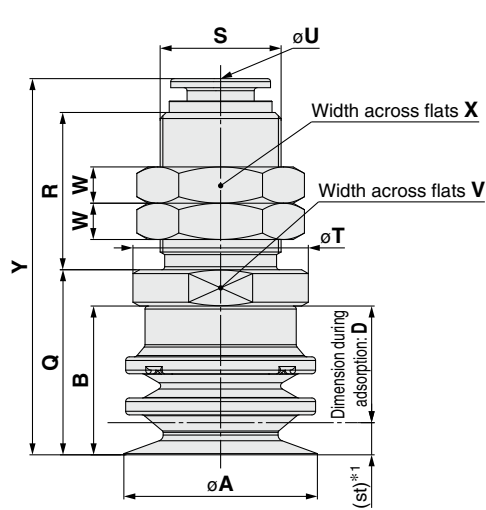
5 Vacuum inlet (Female thread)

B01	Rc1/8
BN01	NPT1/8
B02	Rc1/4
BN02	NPT1/4

Model										Q	R	S	T	U	V	W	X	Weight [g]		Min. opening hole size of the adapter
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Attachment	④ Connection thread	⑤ Vacuum inlet	Aluminum									Stainless steel		
ZP3P	Nil S	T	20	JT	2	SF	W WM WF	A16	B01	21.7	22	M16 x 1	18	Rc1/8	17	5	19	24	49.7	ø5
			BN01							23.8				46						
			B01						22.8	24.7				50.5						
			BN01							24.6				46.8						
			32					A20	B02	30.6	26	M20 x 1	29	Rc1/4	27	6	24	54.3	108	ø8
			BN02							54.1				107						
			B02						32.9	56.7				110.7						
			BN02							56.5				109.7						
			B02						34.7	59.8				113						
			BN02							59.7				113						
40																				
50																				

Dimensions/Models

With adapter Plate mounting type (Male thread/One-touch fitting)



ZP3P - T 20 JT2SF - W - A16 - 08

1 Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

4 Connection thread (Male thread)

A16	M16 x 1
A20	M20 x 1

5 Vacuum inlet (One-touch fitting)

08	ø8
10	ø10

*1 Same dimension as the pad unit

Model										Q	R	S	T	U	V	W	X	Y	Weight [g]		Min. opening hole size of the adapter
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Attachment	④ Connection thread	⑤ Vacuum inlet	Aluminum										Stainless steel		
ZP3P	Nil S	T	20	JT	2	SF	W WM WF	A16	08	21.7	22	M16 x 1	18	8	17	5	19	48.6	24.8	45.8	ø5
			25							22.8								49.7	25.6	46.6	
			32					A20	10	30.6	26	M20 x 1	29	10	27	6	24	62	56.7	111	ø7.5
			40							32.9								64.3	58.9	113.7	
			50							34.7								66.1	62	116	

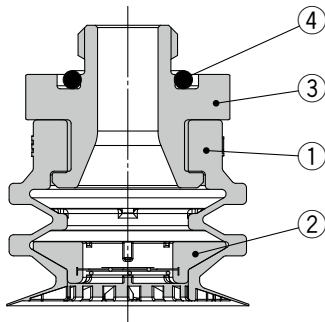
Vacuum Pad **ZP3P-JT Series**

2.5-Stage Bellows Type

Construction

Direct mounting type (Male thread)

ZP3P□-T□JT2SF-□-A□



Direct mounting type (Female thread)

ZP3P□-T□JT2SF-□-B□

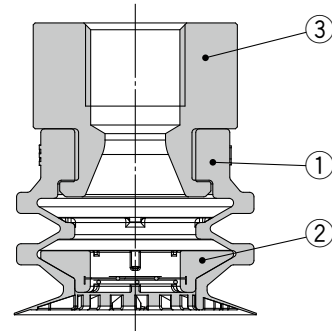


Plate mounting (Male/Female thread)

ZP3P□-T□JT2SF-□-A□-B□

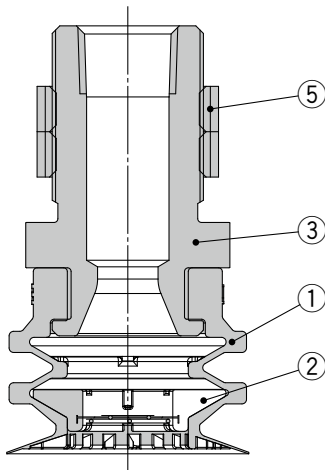
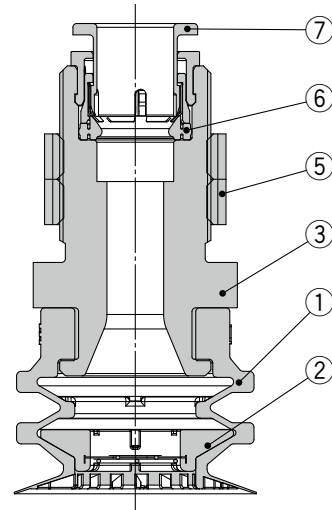


Plate mounting (Male thread/One-touch fitting)

ZP3P□-T□JT2SF-□-A□-□



Component Parts

No.	Description	Material (Surface treatment)	Note
1	Bellows pad	Silicone rubber*1 *2	
2	Attachment	Synthetic resin*3 *4	
	Flat attachment		
	Mesh attachment	Synthetic resin/Stainless steel	
3	Adapter	Aluminum alloy (Anodized)	ZP3P-T□
		Stainless steel	ZP3PS-T□
4	O-ring	Silicone rubber	
5	Mounting nut	Steel (Trivalent zinc chromated)	ZP3P-T□
		Stainless steel	ZP3PS-T□
6	Seal	NBR	ZP3P-T□
		FKM	ZP3PS-T□
7	Cassette	—	

*1 Uses a material compliant with a dissolution test of the FDA (U.S. Food and Drug Administration) regulation 21CFR§177.2600 for "Rubber articles intended for repeated use."

*2 Uses a material compliant with the standards for "Rubber apparatus (excluding baby drinking apparatus) and containers/packaging" (D3) (Partial revision: Japanese Ministry of Health, Labour, and Welfare Notification No. 595, 2012) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

*3 Uses materials complaint with FDA (U.S. Food and Drug Administration) 21CFR§177

*4 Uses materials compliant with the standards for "Synthetic resin apparatus and containers/packaging" (D2) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

Replacement Parts

Pad Unit (Without attachment)

Part number	Applicable pad dia.
ZP3P-20JT2SF	ø20
ZP3P-25JT2SF	ø25
ZP3P-32JT2SF	ø32
ZP3P-40JT2SF	ø40
ZP3P-50JT2SF	ø50

Attachment Unit

Part number	Applicable pad dia.
ZP3PW-20JT2	ø20
ZP3PW-25JT2	ø25
ZP3PW-32JT2	ø32
ZP3PW-40JT2	ø40
ZP3PW-50JT2	ø50

Mesh Attachment Unit

Part number	Applicable pad dia.
ZP3PWM-20JT2	ø20
ZP3PWM-25JT2	ø25
ZP3PWM-32JT2	ø32
ZP3PWM-40JT2	ø40
ZP3PWM-50JT2	ø50

Flat Attachment Unit

Part number	Applicable pad dia.
ZP3PWF-20JT2	ø20
ZP3PWF-25JT2	ø25
ZP3PWF-32JT2	ø32
ZP3PWF-40JT2	ø40
ZP3PWF-50JT2	ø50

Specific Product
Precautions

Mounting Bracket
Assembly

Construction

5.5-Stage Bellows Type

2.5-Stage Bellows Type



Vacuum Pad

5.5-Stage Bellows Type

ZP3P-JT Series

How to Order



Pad unit ZP3P - **20** JT 5 SF - WG

With adapter ZP3P **1** - T **20** JT 5 SF - **AG01** - **4**

* With guide attachment

• Bellows type • 5.5-stage • Silicone rubber • With guide attachment

1 Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

2 Pad diameter

20	ø20
25	ø25
32	ø32
40	ø40
50	ø50

With adapter

3 Connection thread/4 Vacuum inlet

3 Connection thread				4 Vacuum inlet			Pad diameter [mm]	
Type	Thread	Symbol	Size	Thread	Symbol	Size	ø20, ø25	ø32 to ø50
Direct mounting	Male thread	AG01	G1/8	—	Nil	—*1	●	●
		AG02	G1/4				—	●
	Female thread	BG01	G1/8				●	—
		BG02	G1/4				—	●
Plate mounting	Male thread	A16	M16 x 1	Female thread	B01	Rc1/8	●	—
					BN01	NPT1/8		
				One-touch fitting*2	08	ø8		
		A20	M20 x 1	Female thread	B02	Rc1/4	—	●
					BN02	NPT1/4		
				One-touch fitting*2	10	ø10		

*1 Use the connection thread.

*2 Built-in One-touch fitting type

Pad, adapter assembly, and mounting nuts are included but do not come assembled.

Specifications

Operating temperature range		−30 to 90°C*1
Pad	Material	Silicone rubber*2, *3
	Color	Blue
	Hardness (Shore A: ±5°)	40
Guide attachment	Material	Synthetic resin*4, *5
	Color	White

*1 −5 to 60 [°C] for the vacuum inlet with One-touch fitting

*2 Uses a material compliant with a dissolution test of the FDA (U.S. Food and Drug Administration) regulation 21CFR§177.2600 for "Rubber articles intended for repeated use."

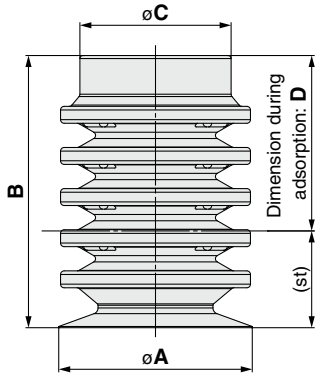
*3 Uses a material compliant with the standards for "Rubber apparatus (excluding baby drinking apparatus) and containers/packaging" (D3) (Partial revision: Japanese Ministry of Health, Labour, and Welfare Notification No. 595, 2012) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

*4 Uses materials complaint with FDA (U.S. Food and Drug Administration) 21CFR§177

*5 Uses materials compliant with the standards for "Synthetic resin apparatus and containers/packaging" (D2) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

Dimensions/Models

Pad unit



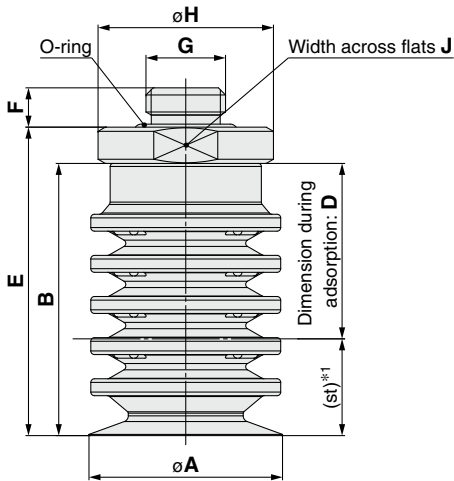
ZP3P - [20] JT5SF - WG

①

Model						A	B	C	D	(st)*1	Weight [g]
① Pad dia.	Form	Number of bellows stages	Material	Attachment							
ZP3P	20	JT	5	SF	WG	20	31.2	16	21.2	10	4.6
	25					25	35		23	12	6.3
	32					32	45	25	29	16	14.8
	40					40	51.5		31.5	20	20.3
	50					50	59		33	26	26.9

*1 (st) indicates achieved vacuum pressure: Reference at -85 [kPa]

With adapter Direct mounting type (Male thread)



*1 Same dimension as the pad unit

ZP3P [] - T [20] JT5SF - [AG01]

①

②

③

① Adapter material

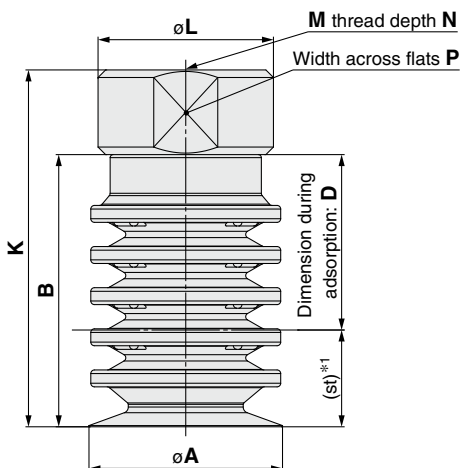
Nil	Aluminum
S	Stainless steel (Stainless steel 304)

③ Connection thread (Male thread)

AG01	G1/8
AG02	G1/4

Model							E	F	G	H	J	Weight [g]		Min. opening hole size of the adapter
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Connection thread						Aluminum	Stainless steel	
ZP3P	Nil S	T	JT	5	SF	AG01	35.2	5.5	G1/8	18	17	8.3	15.6	ø5
						AG01	39					10.1	17.4	
						AG01	51	5.5	G1/8	29	27	28.4	55.4	ø5.7
						AG02						6.5	G1/4	28.2
						AG01	57.5	5.5	G1/8			33.9	60.9	ø5.7
						AG02						6.5	G1/4	33.7
						AG01	65	5.5	G1/8			40.5	67.5	ø5.7
						AG02						6.5	G1/4	40.2

With adapter Direct mounting type (Female thread)



*1 Same dimension as the pad unit

ZP3P [] - T [20] JT5SF - [BG01]

①

②

③

① Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

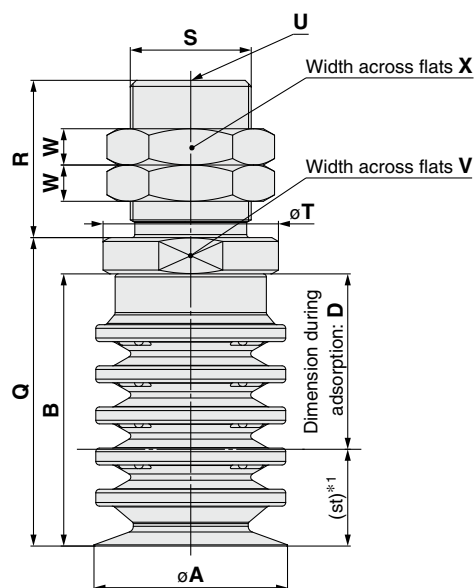
③ Connection thread (Female thread)

BG01	G1/8
BG02	G1/4

Model							K	L	M	N	P	Weight [g]		Min. opening hole size of the adapter	
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Connection thread						Aluminum	Stainless steel		
ZP3P	Nil S	T	20	JT	5	SF	BG01	42.2	18	G1/8	7.4	17	11	23.9	ø5
			46					12.8					25.7		
			BG02				59	29	G1/4	11	27	37.7	83.6	ø8	
							65.5					43.2	89.1		
							73					49.8	95.7		

Dimensions/Models

With adapter Plate mounting type (Male/Female thread)



*1 Same dimension as the pad unit

ZP3P - T 20 JT5SF - A16 - B01

① Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

③ Connection thread (Male thread)

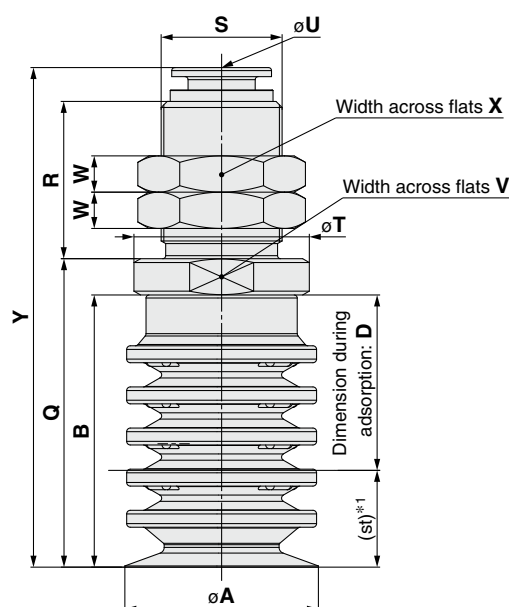
A16	M16 x 1
A20	M20 x 1

④ Vacuum inlet (Female thread)

B01	Rc1/8
BN01	NPT1/8
B02	Rc1/4
BN02	NPT1/4

Model								Q	R	S	T	U	V	W	X	Weight [g]		Min. opening hole size of the adapter			
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Connection thread	④ Vacuum inlet									Aluminum	Stainless steel				
ZP3P	Nil S	T	20	JT	5	SF	A16	B01	35.2	22	M16 x 1	18	Rc1/8	17	5	19	25.8	51.5	ø5		
								BN01					NPT1/8				25.7	47.9			
								B01	39				Rc1/8				27.5	53.2			
								BN01					NPT1/8				27.4	49.6			
			32				40	50	A20	B02	51	26	M20 x 1	29	Rc1/4	27	6	24	60.8	114	ø8
										BN02					NPT1/4				60.6	114	
										B02	57.5				Rc1/4				66.3	120	
										BN02					NPT1/4				66.1	119	
		40					B02	65	Rc1/4	72.9	126	72.7	126								
							BN02			NPT1/4											

With adapter Plate mounting type (Male thread/One-touch fitting)



*1 Same dimension as the pad unit

ZP3P - T 20 JT5SF - A16 - 08

① Adapter material

Nil	Aluminum
S	Stainless steel (Stainless steel 304)

③ Connection thread (Male thread)

A16	M16 x 1
A20	M20 x 1

④ Vacuum inlet (One-touch fitting)

08	ø8
10	ø10

Model								Q	R	S	T	U	V	W	X	Y	Weight [g]		Min. opening hole size of the adapter	
① Adapter material	Vacuum inlet direction	② Pad dia.	Form	Number of bellows stages	Material	③ Connection thread	④ Vacuum inlet										Aluminum	Stainless steel		
ZP3P	Nil S	T	20	JT	5	SF	A16	08	35.2	22	M16 x 1	18	8	17	5	19	62.1	26.6	47.5	ø5
			25					39	65.9								28.4	49.3		
			32					51	82.4								63.2	117		
			40				A20	10	57.5	26	M20 x 1	29	10	27	6	24	88.9	68.4	122	ø7.5
			50						65								96.4	75.1	129	

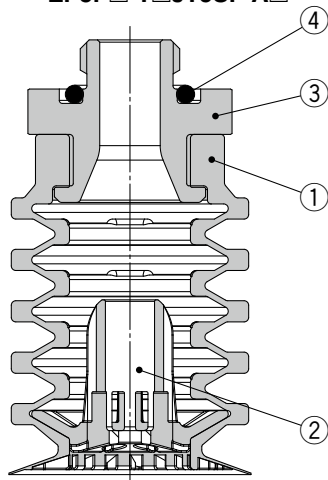
Vacuum Pad ZP3P-JT Series

5.5-Stage Bellows Type

Construction

Direct mounting type (Male thread)

ZP3P□-T□JT5SF-A□



Direct mounting type (Female thread)

ZP3P□-T□JT5SF-B□

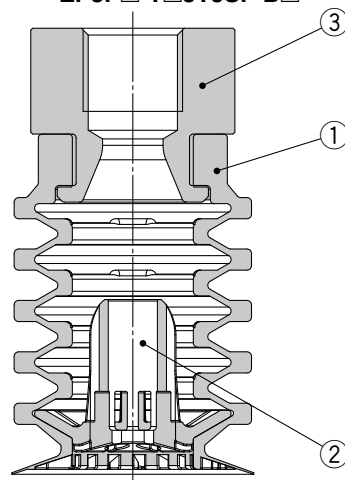


Plate mounting type (Male/Female thread)

ZP3P□-T□JT5SF-A□-B□

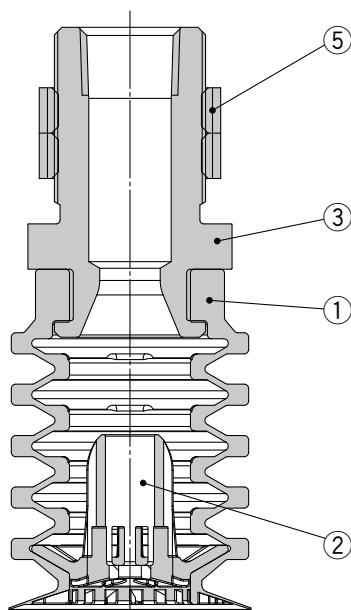
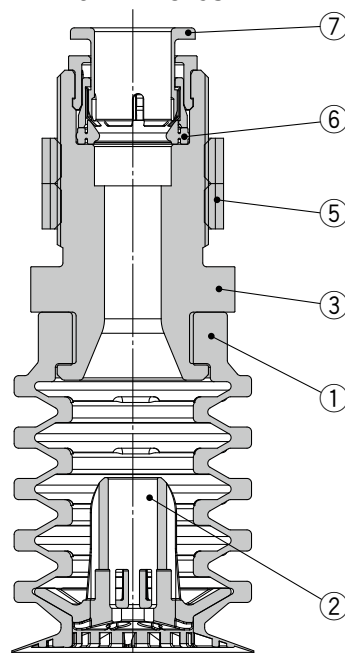


Plate mounting type (Male thread/One-touch fitting)

ZP3P□-T□JT5SF-A□-□



Component Parts

No.	Description	Material (Surface treatment)	Note
1	Bellows pad	Silicone rubber*1 *2	
2	Guide attachment	Synthetic resin*3 *4	
3	Adapter	Aluminum alloy (Anodized)	ZP3P-T□
		Stainless steel	ZP3PS-T□
4	O-ring	Silicone rubber	
5	Mounting nut	Steel (Trivalent zinc chromated)	ZP3P-T□
		Stainless steel	ZP3PS-T□
6	Seal	NBR	ZP3P-T□
		FKM	ZP3PS-T□
7	Cassette	—	

*1 Uses a material compliant with a dissolution test of the FDA (U.S. Food and Drug Administration) regulation 21CFR§177.2600 for "Rubber articles intended for repeated use."

*2 Uses a material compliant with the standards for "Rubber apparatus (excluding baby drinking apparatus) and containers/packaging" (D3) (Partial revision: Japanese Ministry of Health, Labour, and Welfare Notification No. 595, 2012) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

*3 Uses materials complaint with FDA (U.S. Food and Drug Administration) 21CFR§177

*4 Uses materials compliant with the standards for "Synthetic resin apparatus and containers/packaging" (D2) in Section 3 "Apparatus and Containers/Packaging" of the Japan Food Sanitation Act, Article 18 "Specifications and Standards for Food and Food Additives, etc." (Japanese Ministry of Health and Welfare Notification No. 370, 1959)

Replacement Parts

Pad Unit (Without guide attachment)

Part number	Applicable pad dia.
ZP3P-20JT5SF	ø20
ZP3P-25JT5SF	ø25
ZP3P-32JT5SF	ø32
ZP3P-40JT5SF	ø40
ZP3P-50JT5SF	ø50

Guide Attachment Unit

Part number	Applicable pad dia.
ZP3PWG-20JT5	ø20
ZP3PWG-25JT5	ø25
ZP3PWG-32JT5	ø32
ZP3PWG-40JT5	ø40
ZP3PWG-50JT5	ø50

2.5-Stage Bellows Type

5.5-Stage Bellows Type


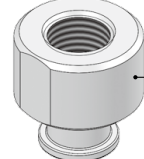
Construction

Mounting Bracket Assembly

Specific Product Precautions

Vacuum Pad *ZP3P-JT Series* Mounting Bracket Assembly

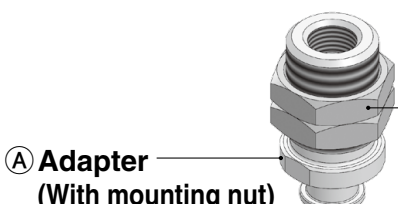
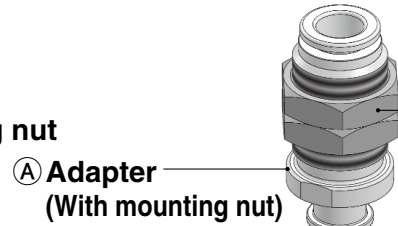
Adapter Assembly: Direct Mounting Type

Product part number	2.5-stage ZP3P <input type="checkbox"/> - T ^① JT2SF - <input type="checkbox"/> - ^② 5.5-stage ZP3P <input type="checkbox"/> - T ^① JT5SF - <input type="checkbox"/> - ^②			Adapter material (Aluminum/Stainless steel) Pad diameter Connection thread (Male/Female thread) Attachment
Component parts	Male thread  ① Adapter (With O-ring)		Female thread  ① Adapter	

① Adapter	② Connection thread	Type	Size	Symbol	① Pad diameter symbol				
					20	25	32	40	50
① Adapter	② Connection thread	Male thread	G1/8	AG01	ZP3P <input type="checkbox"/> A-T1JT-AG01		ZP3P <input type="checkbox"/> A-T2JT-AG01		
			G1/4	AG02	ZP3P <input type="checkbox"/> A-T1JT-AG02*1		ZP3P <input type="checkbox"/> A-T2JT-AG02		
			G3/8	AG03	ZP3P <input type="checkbox"/> A-T1JT-AG03*1		ZP3P <input type="checkbox"/> A-T2JT-AG03*1		
			G1/2	AG04	—		ZP3P <input type="checkbox"/> A-T2JT-AG04*1		
① Adapter	② Connection thread	Female thread	G1/8	BG01	ZP3P <input type="checkbox"/> A-T1JT-BG01		—		
			G1/4	BG02	—		ZP3P <input type="checkbox"/> A-T2JT-BG02		

*1 2.5-stage bellows only

Adapter Assembly: Plate Mounting Type

Product part number	2.5-stage ZP3P <input type="checkbox"/> - T ^① JT2SF - <input type="checkbox"/> - ^② - ^③ 5.5-stage ZP3P <input type="checkbox"/> - T ^① JT5SF - <input type="checkbox"/> - ^② - ^③			Adapter material (Aluminum/Stainless steel) Pad diameter Attachment Vacuum inlet Connection thread (Male thread)
Component parts	Male/Female thread  ① Adapter (With mounting nut)		Male thread/One-touch fitting  ① Adapter (With mounting nut)	

① Adapter	② Connection thread	Type	Size	Symbol	③ Vacuum inlet	Type	Size	Symbol	① Pad diameter symbol				
						20	25	32	40	50			
② Mounting nut (Single unit) (Sales unit: 10 pcs.)	Male thread	M16 x 1	A16	③ Vacuum inlet	Female thread	Rc1/8	B01	ZP3P□A-T1JT-A16-B01		—			
						NPT1/8	BN01	ZP3P□A-T1JT-A16-BN01		—			
						One-touch fitting	ø8	08	ZP3P□A-T1JT-A16-08		—		
		M20 x 1	A20		Female thread	Rc1/4	B02	—		ZP3P□A-T2JT-A20-B02			
						NPT1/4	BN02	—		ZP3P□A-T2JT-A20-BN02			
						One-touch fitting	ø10	10	—		ZP3P□A-T2JT-A20-10		
	Adapter material	Aluminum	M16 x 1		KQ08-P01A		—						
			M20 x 1		—		KQ10-P01A						
		Stainless steel	M16 x 1		ZPSNA-M16A		—						
			M20 x 1		—		ZPSNA-M20						



ZP3P-JT Series

Vacuum Pad / Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: <https://www.smcworld.com>

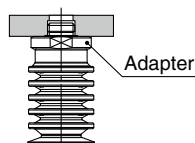
Operating Precautions

⚠ Caution

1. When mounting the product, tighten with the tightening torque shown in the table below.

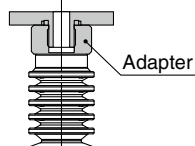
If excessive or insufficient tightening torque is applied, sealing failure or loose screws may result.

Direct mounting type
(Male thread)



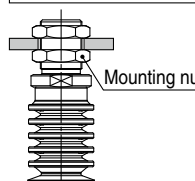
Product part number	Connection thread size	Proper tightening torque [N·m]
ZP3P□-T□JT□-□-AG01	G1/8	3 to 5
ZP3P□-T□JT□-□-AG02	G1/4	8 to 12
ZP3P□-T□JT2-□-AG03	G3/8	15 to 20
ZP3P□-T□JT2-□-AG04	G1/2	20 to 25

Direct mounting type
(Female thread)



Product part number	Connection thread size	Proper tightening torque [N·m]
ZP3P□-T□JT□-□-BG01	G1/8	3 to 5
ZP3P□-T□JT□-□-BG02	G1/4	8 to 12

Plate mounting type
(Male/Female thread
(Male thread/One-touch fitting))



Product part number	Connection thread size	Proper tightening torque [N·m]
ZP3P□-T□JT□-□-A16-□	M16 x 1	7 to 9
ZP3P□-T□JT□-□-A20-□	M20 x 1	14 to 17

2. Depending on the achieved vacuum pressure, the theoretical lifting force may exceed the strength of the vacuum pad, deforming or breaking the pad.

The safety factor should be 16 times or more of the theoretical lifting force for horizontal lifting, and it should be 25 times or more for vertical lifting.

[Calculation of theoretical lifting force]

$$W = P \times S \times 0.1 \times \frac{1}{t}$$

W: Lifting force [N]

P: Vacuum pressure [kPa]

S: Pad area [cm²]

t: Safety factor Horizontal lifting: 16 or more
Vertical lifting: 25 or more

3. When a bagged workpiece is lifted, the skirt changes its shape according to the changing shape of the workpiece.

As the vacuum pad skirt changes its shape, the actual lifting force may be below the theoretical lifting force. Before use, please conduct testing with the customer's actual equipment.

4. Mount the attachment for use.

Without the attachment, the vacuum pad will be easily deformed, resulting in adsorption failure.

5. When the vacuum pad is pressed onto the workpiece, make sure it stays within the stroke range.

When the max. stroke is exceeded, the guide attachment may contact the adapter, leading to malfunction.

6. When the attachment is inserted into the vacuum pad, the attachment may damage or break the skirt if it is pulled with excessive force as the skirt is very thin.

Vacuum pad damage or breakage may lead to adsorption failure.

7. When the achieved vacuum pressure is low (approx. -20 [kPa]), the vacuum pad does not completely operate its stroke.

When a 5.5-stage bellows is used, and vacuum pressure is approx. -20 [kPa], the guide function cannot be used effectively because the guide attachment cannot be pulled up into the adapter.

8. Use the product within the operating temperature range.

The heat resistant temperature of the attachment (made of synthetic resin) is 90°C.

Operate within the specified operating temperature range (-30 to 90°C).

9. Do not interfere with the vacuum pad stroke with an external stopper.

The vacuum pad will become deformed, resulting in adsorption failure or breakage. In some cases, the workpiece will separate from the pad and fall.

10. Vacuum pads are consumable. Please replace them when cracks, wear, or deformation is confirmed during periodic maintenance.

11. Before use, please check the transfer conditions with the customer's actual equipment.

Products are confirmed as transferable under SMC's specific testing conditions in the table below, but these are not guaranteed values. The transfer ability varies depending on the workpiece material, the friction between the pad and workpiece, moment, wind, vibration, etc. Testing with the customer's actual equipment is necessary.

· SMC's Specific Testing Conditions (Reference)

Pad diameter	Number of bellows stages	Workpiece		Adsorption conditions		Horizontal transfer conditions	
		Material	Load [kg]	Ejector part number	Supply pressure [kPa]	Speed [mm/s]	Acceleration/Deceleration [G]
ø20	5.5-stage	Aluminum metalized film	0.17	ZH15D	-85	1000	2
ø25			0.27				3
ø32			0.5				3
ø40			0.7				4
ø50			1.1				4

* Adsorption is confirmed for 1 stroke, not for a back and forth or repeated operation.

12. When supplying vacuum release air, do so at a release flow rate of 110 L/min (ANR) or less. Failure to do so may result in damage to the vacuum pads.

2.5-Stage Bellows Type

5.5-Stage Bellows Type

Construction

Mounting Bracket Assembly

Specific Product Precautions



ZP3P-JT Series

Vacuum Pad / Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

Handling


Caution


13. For the type with a flat attachment, the vacuum pad may shrink if the vacuum pressure is turned ON before a workpiece is adsorbed. The conditions for vacuum pad shrinkage (stroke x 10%) are shown below.


Pad diameter	Suction flow [L/min(ANR)]
ø20	10
ø25	25
ø32	25
ø40	40
ø50	65

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.

Use in non-manufacturing industries is not allowed.

Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country. The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Suction cups (Vacuum pads) are excluded from this 1 year warranty.**

A suction cup (vacuum pad) is a consumable part, so it is warranted for a year after it is delivered.


Also, even within the warranty period, the wear of a product due to the use of the suction cup (vacuum pad) or failure due to the deterioration of rubber material are not allowed by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Revision History

- Edition B** * The 2.5-stage bellows type has been added.
* Plate mounting (One-touch fitting) has been added to the 5.5-stage bellows type.
* The number of pages has been increased from 12 to 16.
- Edition C** * A flat attachment has been added.
* The number of pages has been increased from 16 to 20.

 **Safety Instructions** Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.