Suction Cup

New

RoHS

Flat Type with Ribs | Bellows Type ø20, ø25, ø32, ø40, ø50

2.5-Stage Bellows Type ø32, ø40, ø50

Suitable for the adsorption transfer of corrugated cardboard, etc., requiring abrasion resistance

Material: FS61 (Fluoro-based rubber) improves abrasion resistance

* More than 4 times the abrasion resistance of SMC's urethane suction cups

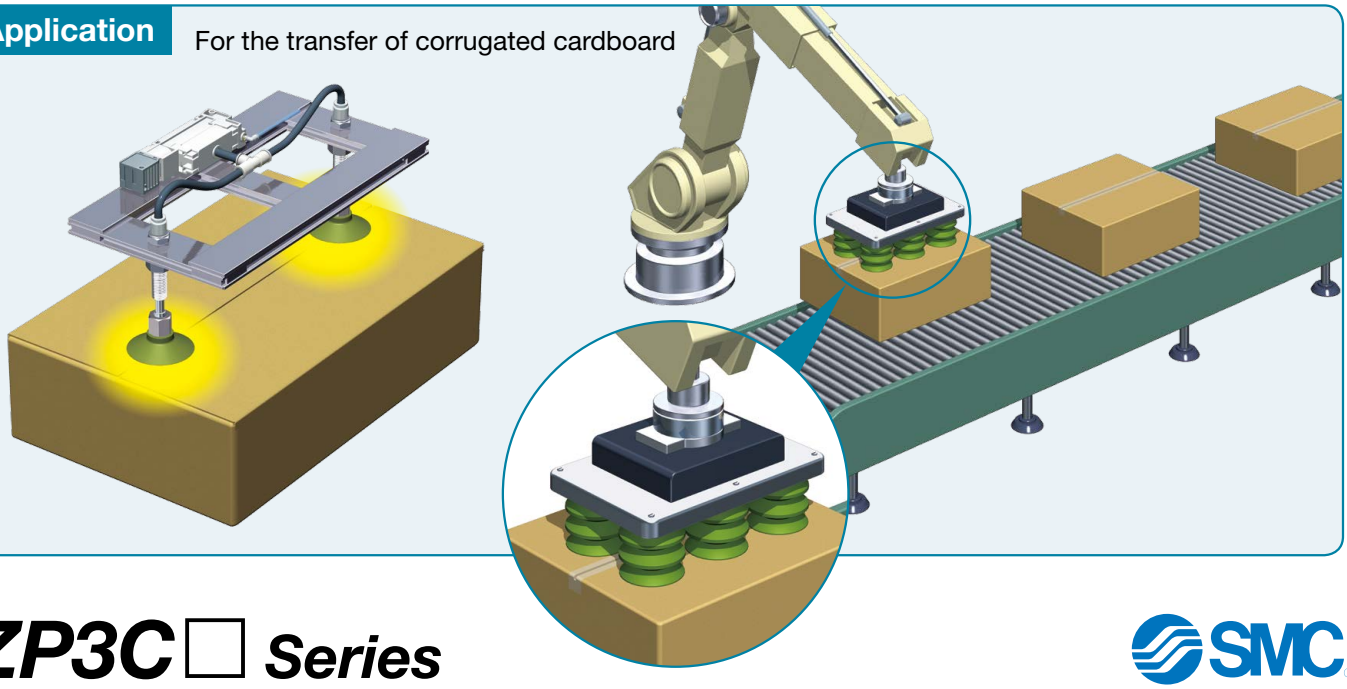
Reduced suction of foreign matter, such as paper particles, due to mesh filter p. 1

Can be replaced without tools

2.5-stage bellows type p. 1

Optional inner ring and retainer

Application For the transfer of corrugated cardboard



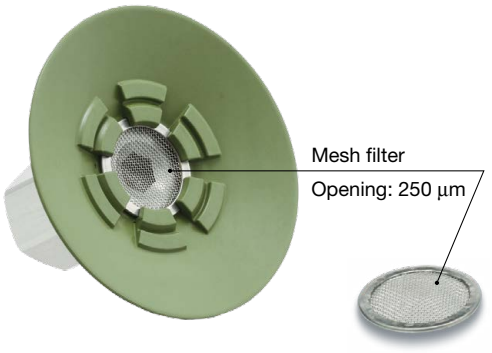
ZP3C□ Series

SMC

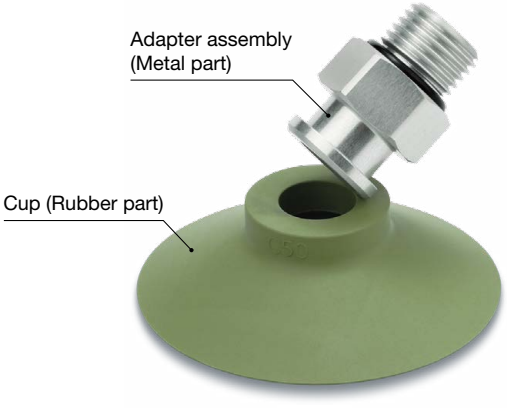
CAT.ES100-177A

Reduced suction of foreign matter due to mesh filter

- Reduced suction of foreign matter into the vacuum pump and ejector
- The cup and mesh filter can be replaced without tools.

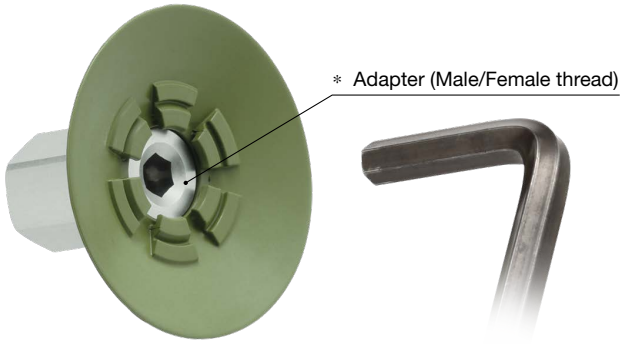


The separation and disposal of the metal and rubber parts is possible.

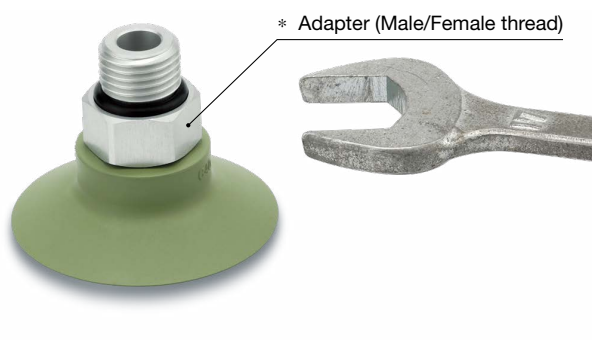


Compatible with 2 types of mounting tools

- Mounting with a hexagon wrench



- Mounting with a standard wrench



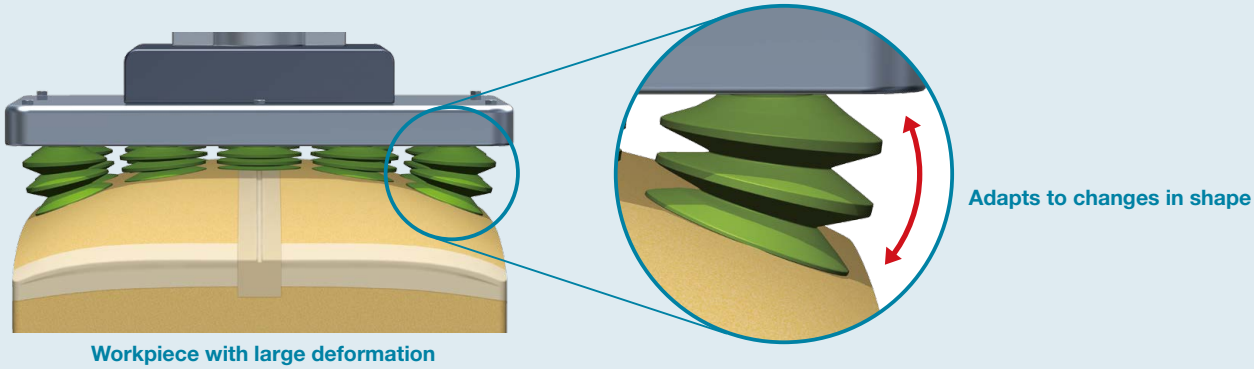
2.5-Stage Bellows Type

The large stroke is suitable for workpieces with:

- **Differences in height**
- **Steps**
- **Inclined surfaces**
- **Soft workpieces requiring cushioning**

■ Adapts to changes in shape after adsorption

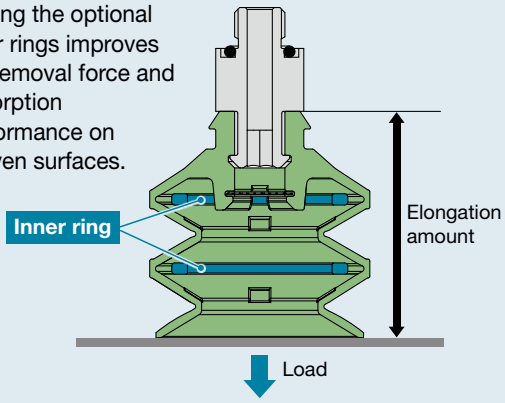
It is effective when adsorbing the corrugated cardboard that has low rigidity and experiences deformation.

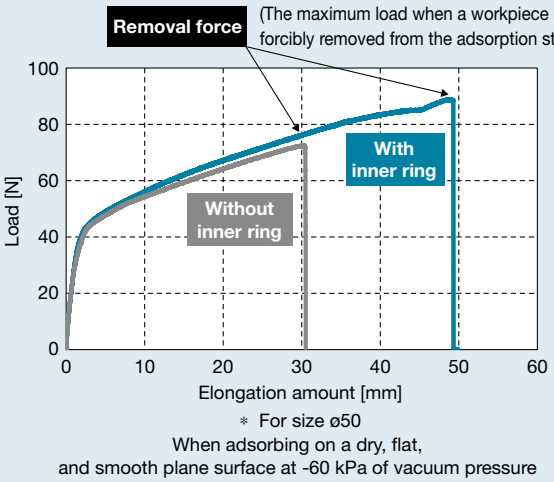


2.5-Stage Bellows Type

Optional inner ring

Adding the optional inner rings improves the removal force and adsorption performance on uneven surfaces.

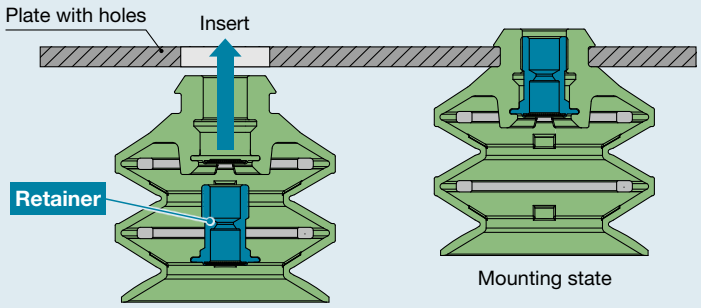




∗ For size ø50
When adsorbing on a dry, flat, and smooth plane surface at -60 kPa of vacuum pressure

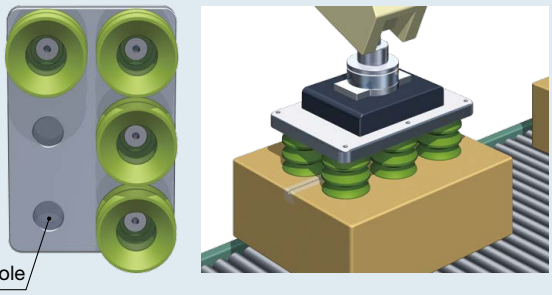
With retainer

Direct installation without tools

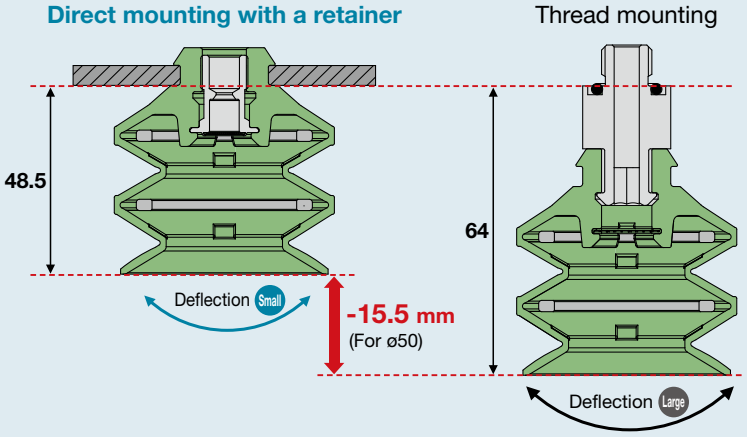


Insert the cup into the mounting hole by pushing in the retainer

Multiple mounting examples

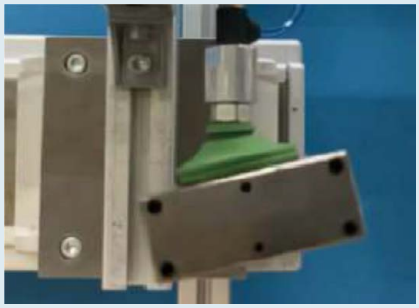


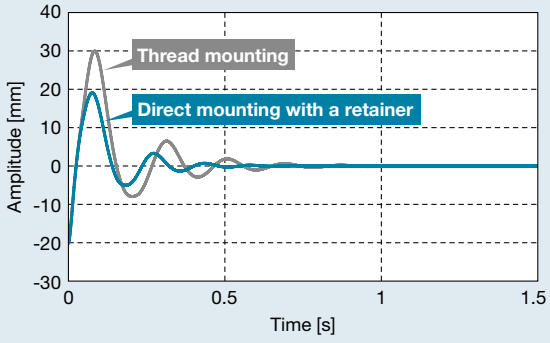
Reduced height: space saving and reduces deflection of the workpiece during transfer.



Improved cycle time

Reduced settling time during acceleration/deceleration



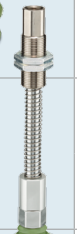


Variations

Flat Type with Ribs, Bellows Type

Mounting	Type	Vacuum inlet direction	Connection			Vacuum inlet	
			Type	Cup diameter		Cup diameter	
				ø20, ø25, ø32	ø40, ø50	ø20, ø25, ø32	ø40, ø50
With adapter 	Thread mounting	Vertical	Male thread	M8 x 1	M10 x 1	Use the connection thread.	
				G1/8	G1/4		
			Female thread	G1/8	G1/4		
With buffer 	Plate mounting	Vertical	Male thread	M14 x 1	M18 x 1.5	Rc1/8	
		Lateral				M5 x 0.8	

2.5-Stage Bellows Type

Mounting	Type	Vacuum inlet direction	Connection			Vacuum inlet	
			Type	Cup diameter		Cup diameter	
				ø32	ø40, ø50	ø32	ø40, ø50
With adapter 	Thread mounting	Vertical	Male thread	M8 x 1	M10 x 1	Use the connection thread.	
				G1/8	G1/4		
			Female thread	G1/8	G1/4		
With buffer 	Plate mounting	Vertical	Male thread	M14 x 1	M18 x 1.5	Rc1/8	
		Lateral				M5 x 0.8	
With retainer 	Direct mounting	–	Direct mounting onto the plate	Mounting hole dia.: ø13.5 Plate thickness t: 3.0	Mounting hole dia.: ø20.5 Plate thickness t: 3.0	–	

CONTENTS

Suction Cup

Flat Type with Ribs **Bellows Type**

ZP3C Series

2.5-Stage Bellows Type

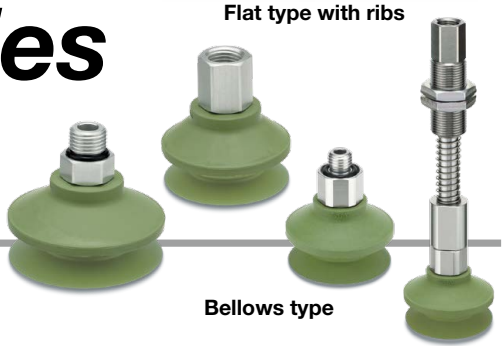
ZP3C2 Series

Suction Cup

Flat Type with Ribs | Bellows Type

ZP3C Series

Flat type with ribs



Bellows type

How to Order

Cup unit ZP3C– 20 C FS

With adapter ZP3C– T 20 C FS –MF–A8

With buffer ZP3C– T 20 C FS JB 10 –MF

❶ ❷ ❸ ❹ ❺ ❻ ❼

● Cup material: FS61

❶ Vacuum inlet direction

Nil	Cup unit
T	Vertical
Y∗1	Lateral

∗1 Only selectable for the type with a buffer

❷ Cup diameter

20	ø20
25	ø25
32	ø32
40	ø40
50	ø50

❸ Cup form

C	Flat type with ribs
B	Bellows type

❹ Buffer specifications

JB	Rotating, With bushing

❺ Buffer stroke

Stroke [mm]	Cup diameter [mm]	
	ø20 to ø32	**ø40, ø50**
10	●	●
20	●	–
30	●	●
50	–	●

❻ Mesh filter

Nil	Without mesh filter
MF	With mesh filter

❼ Connection thread

Type	Thread	Symbol	Size	Cup diameter [mm]	
				ø20 to ø32	**ø40, ø50**
Thread mounting	Male thread	**A8**	M8 x 1	●	–
		A10	M10 x 1	–	●
		AG01	G1/8	●	–
		AG02	G1/4	–	●
	Female thread	**BG01**	G1/8	●	–
		BG02	G1/4	–	●

∗ Use the connection thread for the vacuum inlet.

Specifications

Material Specifications

Material	FS61 (Fluoro-based rubber)
Color of rubber	Green
Rubber hardness (Shore A: ±5°)	65
Operating temperature range∗1	0°C to 200°C
Ambient temperature	0°C to 150°C

∗1 Surface temperature of the workpiece to be adsorbed

Cup Specifications

Form	Cup diameter	Effective adsorption area [cm^2]	Adsorption force∗1 [N]	Removal force∗2 [N]	Internal capacity [cm^3]
Flat type with ribs	**ø20**	1.7	10.0	18.3	1.0
	ø25	2.0	11.8	25	1.3
	ø32	2.3	13.9	34.6	1.7
	ø40	6.1	36.7	58.2	4.3
	ø50	7.1	42.4	79.4	6.9
Bellows type	**ø20**	2.3	13.7	17	3.1
	ø25	2.8	16.6	25.9	5.4
	ø32	3.0	17.9	30.4	8.0
	ø40	4.7	27.9	47	17.7
	ø50	6.5	39.3	69.6	26.8

∗1 The adsorption force is a theoretical value calculated by: effective adsorption area x vacuum pressure (-60 [kPa]).
∗2 The removal force is a measured value when adsorbing on a dry, flat, and smooth surface at -60 kPa of vacuum pressure.

Adapter Specifications

Connection	Male thread		Female thread	
Cup diameter	**ø20 to ø32**	**ø40, ø50**	**ø20 to ø32**	**ø40, ø50**
Connection thread	M8 x 1 G1/8	M10 x 1 G1/4	G1/8	G1/4
Vacuum inlet	Use the connection thread.			

Buffer Specifications

Cup diameter		**ø20 to ø32**			**ø40, ø50**		
Non-rotating specification		JB: Rotating, With bushing					
Stroke		10	20	30	10	30	50
Connection thread		M14 x 1			M18 x 1.5		
Spring reaction force [N]	**At 0 stroke**	3.0			5.0		
	At full stroke	4.5	5.0	5.2	6.5	8.5	10.5

Mesh Filter Specifications

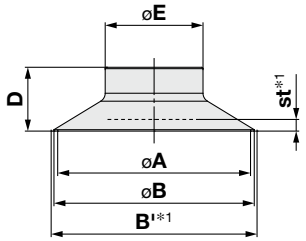
Mesh filter	60
Opening	250 μm

Dimensions

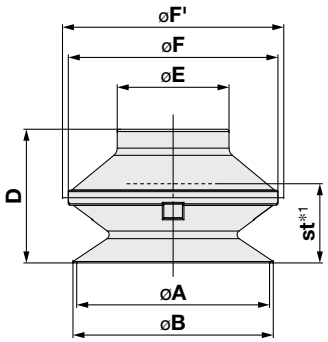
Single unit

ZP3C – 20 C FS
❶ ❷

Flat type with ribs



Bellows type

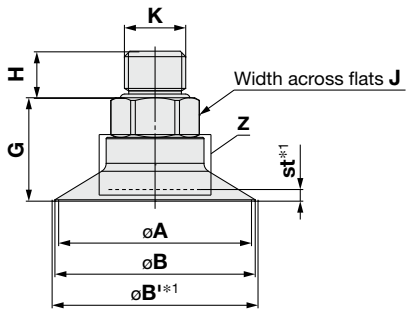


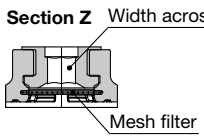
	Model			A	B	B'*1	D	E	F	F'*1	st*1	Weight [g]
	❶ Cup diameter	❷ Cup form	Cup material									
ZP3C	20	C	FS	21.4	23	23.3	10	15	—	—	2	2.2
	25			26.4	28	28.4			—	—		2.7
	32			31.4	33	33.5	11		—	—	2.5	3.5
	40			41.4	43	44.2	13.7	21	—	—		7.9
	50			51.4	52.7	53.9	14.7		—	—	3.5	11.6
	20	B		21.4	23	—	17	15	24	26	8	3.6
	25			26.4	28	—	20	17	29	31	11	5.7
	32			31.4	33	—	21.8		35	37	12.8	8.4
	40			41.4	43	—	28.7	24	45	47.5	16	17.7
	50			51.4	53	—	30.7	25	55	57.5	18	26.6

*1 Achieved vacuum pressure: Reference at –85 [kPa]

Dimensions

With adapter Flat type with ribs/Male thread





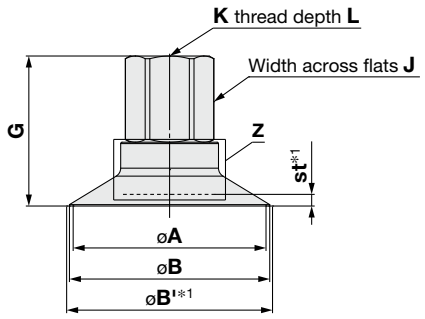
ZP3C – T 20 C FS – MF – A8
❶ ❷ ❸

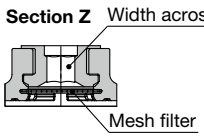
❸ Connection thread (Male thread)		Cup diameter [mm]	
		ø20 to ø32	ø40, ø50
A8	M8 x 1	○	–
A10	M10 x 1	–	○
AG01	G1/8	○	–
AG02	G1/4	–	○

Model							A	B	B'*1	G	H	J	K	M	st*1	Min. hole diameter	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Mesh filter	❸ Connection thread											
ZP3C	T	20	C	FS	Nil MF	A8	21.4	23	23.3	20	6.5	14	M8 x 1	4	2	4	7.7
		25					26.4	28	28.4								8.1
		32					31.4	33	33.5	21					2.5		8.9
		40				A10	41.4	43	44.2	22.2		17	M10 x 1	6		6	16.2
		50					51.4	52.7	53.9	23.2					3.5		19.9
		20				AG01	21.4	23	23.3	17	7.5	14	G1/8	4	2	4	7.0
		25					26.4	28	28.4								7.4
		32					31.4	33	33.5	18					2.5		8.2
		40				AG02	41.4	43	44.2	22.2	10	17	G1/4	6		7.1	17.7
		50					51.4	52.7	53.9	23.2					3.5		21.5

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

With adapter Flat type with ribs/Female thread





ZP3C – T 20 C FS – MF – BG01
❶ ❷ ❸

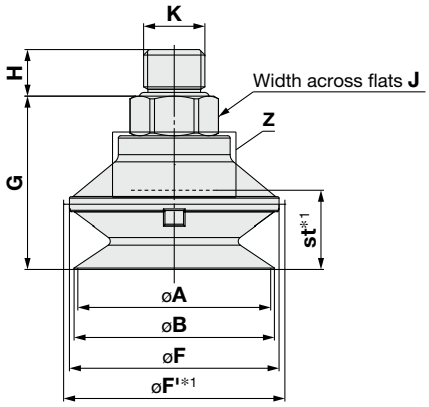
❸ Connection thread (Female thread)		Cup diameter [mm]	
		ø20 to ø32	ø40, ø50
BG01	G1/8	○	–
BG02	G1/4	–	○

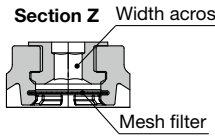
Model							A	B	B'*1	G	J	K	L	M	st*1	Min. hole diameter	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Mesh filter	❸ Connection thread											
ZP3C	T	20	C	FS	Nil MF	BG01	21.4	23	23.3	24.5	14	G1/8	7.4	4	2	4	7.9
		25					26.4	28	28.4								8.4
		32					31.4	33	33.5	25.5					2.5		9.2
		40				BG02	41.4	43	44.2	32.2	17	G1/4	11	6		7.1	18.4
		50					51.4	52.7	53.9	33.2					3.5		22.1

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

Dimensions

With adapter Bellows type/Male thread





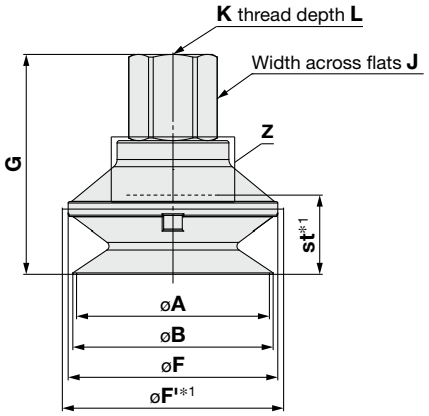
ZP3C – T 20 B FS – MF – A8
❶ ❷ ❸

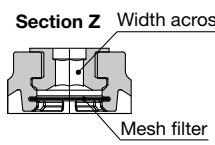
❸ Connection thread (Male thread)		Cup diameter [mm] ø20 to ø32	ø40, ø50
A8	M8 x 1	○	–
A10	M10 x 1	–	○
AG01	G1/8	○	–
AG02	G1/4	–	○

Model							A	B	F	F*1	G	H	J	K	M	st*1	Min. hole diameter	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Mesh filter	❸ Connection thread												
ZP3C	T	20	B	FS	Nil MF	A8	21.4	23	24	26	27	6.5	14	M8 x 1	4	8	4	9.1
		25					26.4	28	29	31	30					11		11.1
		32					31.4	33	35	37	31.8					12.8		13.8
		40				A10	41.4	43	45	47.5	37.2		17	M10 x 1	6	16	6	25.9
		50					51.4	53	55	57.5	39.2					18		34.9
		20				AG01	21.4	23	24	26	24	7.5	14	G1/8	4	8	4	8.4
		25					26.4	28	29	31	27					11		10.4
		32					31.4	33	35	37	28.8					12.8		13.1
		40				AG02	41.4	43	45	47.5	37.2	10	17	G1/4	6	16	7.1	27.5
		50					51.4	53	55	57.5	39.2					18		36.4

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

With adapter Bellows type/Female thread





ZP3C – T 20 B FS – MF – BG01
❶ ❷ ❸

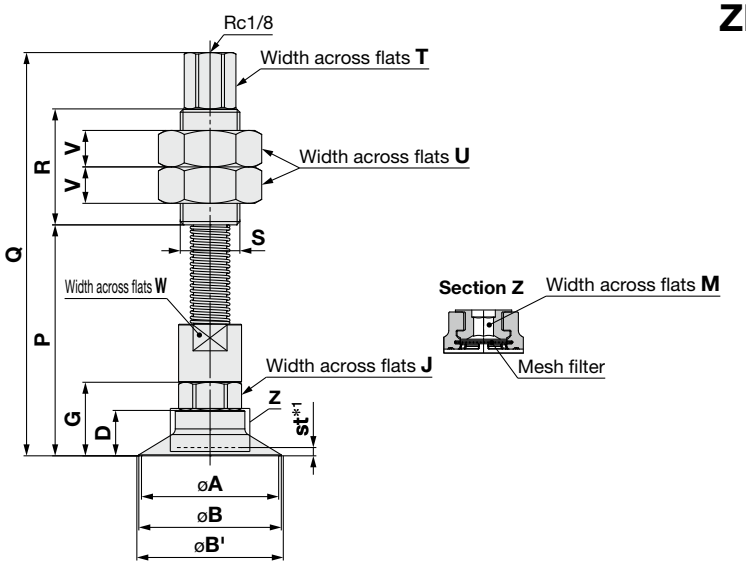
❸ Connection thread (Female thread)		Cup diameter [mm] ø20 to ø32	ø40, ø50
BG01	G1/8	○	–
BG02	G1/4	–	○

Model							A	B	F	F*1	G	J	K	L	M	st*1	Min. hole diameter	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Mesh filter	❸ Connection thread												
ZP3C	T	20	B	FS	Nil MF	BG01	21.4	23	24	26	31.5	14	G1/8	7.4	4	8	4	9.3
		25					26.4	28	29	31	34.5					11		11.4
		32					31.4	33	35	37	36.3					12.8		14.1
		40				BG02	41.4	43	45	47.5	47.2	17	G1/4	11	6	16	7.1	28.2
		50					51.4	53	55	57.5	49.2					18		37.1

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

Dimensions

With buffer **Flat type with ribs/Vacuum inlet direction: Vertical**



ZP3C – T ❶20 C FS ❷JB ❸10 – ❹MF

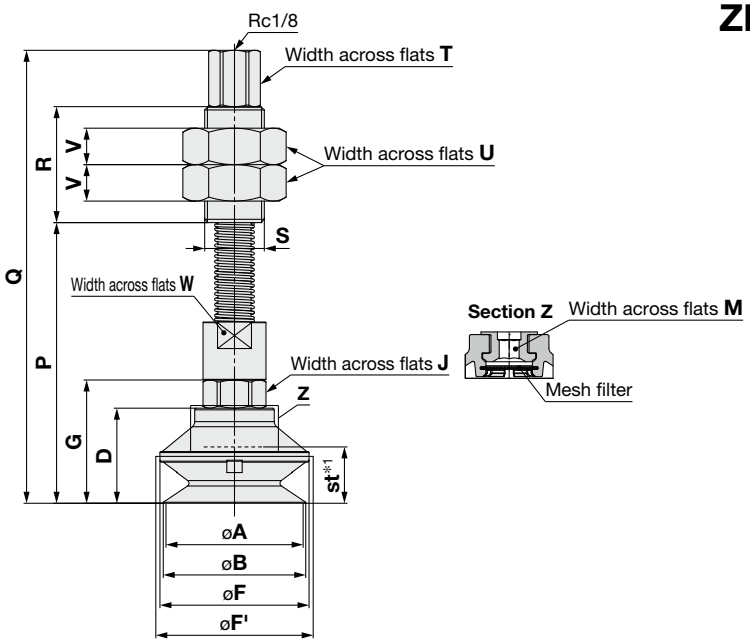
❷	
JB	Rotating, With bushing

Model								A	B	B'*1	D	G	J	M	P	Q	R	S	T	U	V	W	st*1	Min. hole dia.	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Buffer spec.	❸ Buffer stroke	❹ Mesh filter																		
ZP3C	T	20	C	FS	JB	10	Nil MF	21.4	23	23.3	10	20	14	4	66	111	30	M14 x 1	12	19	4	13	2	3	81.2
						20									78	123									85.5
						30									91	136									90.3
		25				10		26.4	28	28.4					66	111									81.6
						20									78	123									86.0
						30									91	136									90.7
		32				10		31.4	33	33.5	11	21			67	112							2.5		82.4
						20									79	124									86.8
						30									92	137									91.5
		40				10		41.4	43	44.2	13.7	22.2	17	6	69.7	121.7	35	M18 x 1.5	14	27	11	16			207.2
						30									94.7	146.7									221.7
						50									114.7	166.7									233.2
		50				10		51.4	52.7	53.9	14.7	23.2			70.7	122.7							3.5		210.9
						30									95.7	147.7									222.5
						50									115.7	167.7									236.9

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

Dimensions

With buffer **Bellows type/Vacuum inlet direction: Vertical**



ZP3C – T 20 B FS JB 10 – MF
❶ ❷ ❸ ❹

JB	Rotating, With bushing

Model								A	B	D	F	F'*1	G	J	M	P	Q	R	S	T	U	V	W	st*1	Min. hole dia.	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Buffer spec.	❸ Buffer stroke	❹ Mesh filter																			
ZP3C	T	20	B	FS	JB	10	Nil MF	21.4	23	17	24	26	27	14	4	73	118	30	M14 x 1	12	19	4	13	8	3	82.5
						20										85	130									86.9
						30										98	143									91.7
		25				10		26.4	28	20	29	31	30			76	121							11		84.6
						20										88	133									89.0
						30										101	146									93.7
		32				10		31.4	33	21.8	35	37	31.8			77.8	122.8							12.8		87.3
						20										89.8	134.8									91.7
						30										102.8	147.8									96.4
		40				10		41.4	43	28.7	45	47.5	37.2	17	6	84.7	136.7	35	M18 x 1.5	14	27	11	16	16		217.0
						30										109.7	161.7									231.5
						50										129.7	181.7									242.9
		50				10		51.4	53	30.7	55	57.5	39.2			86.7	138.7							18		225.9
						30										111.7	163.7									240.4
						50										131.7	183.7									251.8

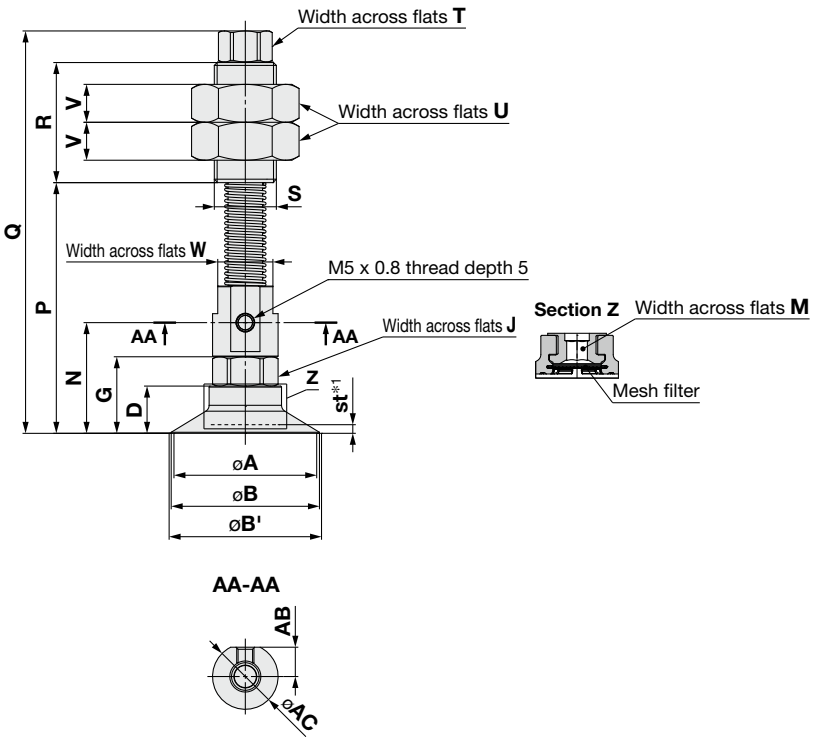
*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

Dimensions

With buffer **Flat type with ribs/Vacuum inlet direction: Lateral**

ZP3C – Y 20 C FS JB 10 – MF
❶ ❷ ❸ ❹

❷	
JB	Rotating, With bushing



Model								A	B	B'*1	D	G	J	M	N	P	Q	R	S	T	U	V	W	AB	AC	st*1	Min. hole dia.	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Buffer spec.	❸ Buffer stroke	❹ Mesh filter																					
ZP3C	Y	20	C	FS	JB	10	Nil MF	21.4	23	23.3	10	20	14	4	29	66	104	30	M14 x 1	12	19	4	14	6.5	15	2	4	81.7
						20										78	116											86.7
						30										91	129											92.2
		25				10		26.4	28	28.4						66	104											82.1
						20										78	116											87.1
						30										91	129											92.6
		32				10		31.4	33	33.5	11	21			30	67	105									2.5		82.9
						20										79	117											87.9
						30										92	130											93.4
		40				10		41.4	43	44.2	13.7	22.2	17	6	32.1	72.7	116.7	35	M18 x 1.5	14	27	11	16	8.5	19		6	205.6
						30										97.7	141.7											221.5
						50										117.7	161.7											234.0
		50				10		51.4	52.7	53.9	14.7	23.2			33.1	73.7	117.7									3.5		209.3
						30										98.7	142.7											225.2
						50										118.7	162.7											237.8

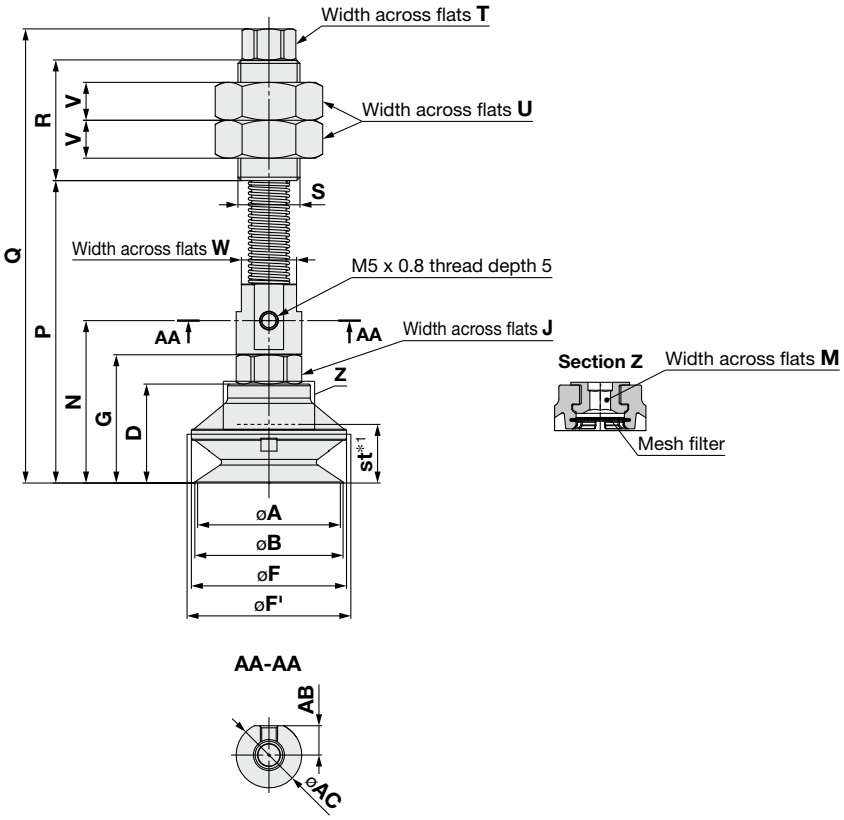
*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

Dimensions

With buffer **Bellows type/Vacuum inlet direction: Lateral**

ZP3C – Y 20 B FS JB 10 – MF
❶ ❷ ❸ ❹

❷	
JB	Rotating, With bushing



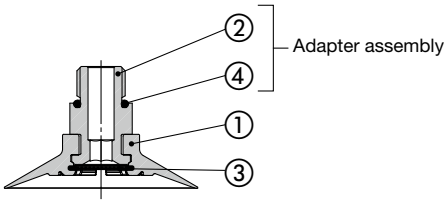
Model								A	B	D	F	F'*1	G	J	M	N	P	Q	R	S	T	U	V	W	AB	AC	st*1	Min. hole dia.	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Cup form	Cup material	❷ Buffer spec.	❸ Buffer stroke	❹ Mesh filter																						
ZP3C	Y	20	B	FS	JB	10	Nil MF	21.4	23	17	24	26	27	14	4	36	73	111	30	M14 x 1	12	19	4	14	6.5	15	8	4	83.0
						20											85	123											88.1
						30											98	136											93.5
		25				10		26.4	28	20	29	31	30			39	76	114									11		85.1
						20											88	126											90.1
						30											101	139											95.6
		32				10		31.4	33	21.8	35	37	31.8			40.8	77.8	115.8									12.8		87.8
						20											89.8	127.8											92.8
						30											102.8	140.8											98.3
		40				10		41.4	43	28.7	45	47.5	37.2	17	6	47.1	87.7	131.7	35	M18 x 1.5	14	27	11	16	8.5	19	16	6	215.4
						30											112.7	156.7											231.2
						50											132.7	176.7											243.8
		50				10		51.4	53	30.7	55	57.5	39.2			49.1	89.7	133.7									18		224.3
						30											114.7	158.7											240.2
						50											134.7	178.7											252.7

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the mesh filter. For the type with a mesh filter, add the weight of the parts separately. (Refer to page 14.)

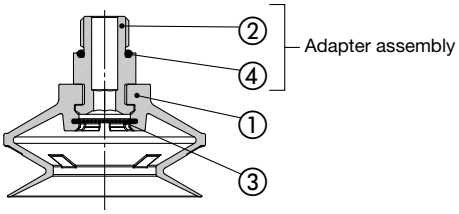
Suction Cup *ZP3C Series*
Construction

With adapter

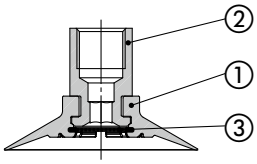
ZP3C-T□CFS-MF-A□



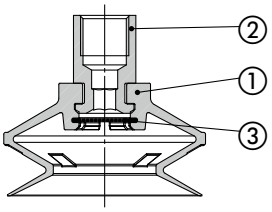
ZP3C-T□BFS-MF-A□



ZP3C-T□CFS-MF-BG□



ZP3C-T□BFS-MF-BG□

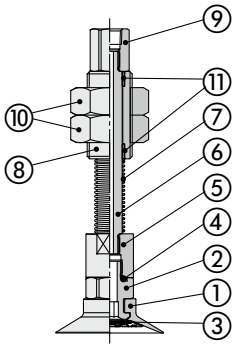


Component Parts

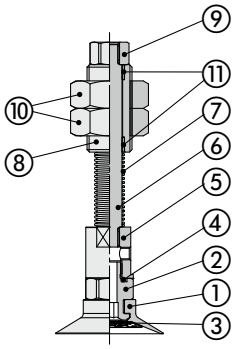
No.	Description	Material	Note
1	**Cup**	FS61 (Fluoro-based rubber)	Color: Green
2	**Adapter**	Aluminum alloy (Clear anodized)	
3	**Mesh filter**	Stainless steel	With mesh filter
4	**O-ring**	NBR	

With buffer

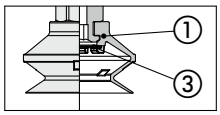
ZP3C-T□CFSJB□-□



ZP3C-Y□CFSJB□-□



ZP3C-T,Y□BFSJB□-□



Component Parts

No.	Description	Material	Note
1	**Cup**	FS61 (Fluoro-based rubber)	Color: Green
2	**Adapter**	Aluminum alloy (Clear anodized)	
3	**Mesh filter**	Stainless steel	With mesh filter
4	**O-ring**	NBR	
5	**Adapter**	Aluminum alloy (Clear anodized)	
6	**Piston rod**	Structural steel (Hard chrome plating)	
7	**Return spring**	Stainless steel	
8	**Buffer body**	Brass (Electroless nickel plating)	
9	**Buffer adapter**	Brass (Electroless nickel plating)	
10	**Nut**	Steel (Zinc chromated)	
11	**Bushing**	—	

Replacement Parts
Mesh Filter Unit

Part number	Applicable cup dia.	Weight [g]
ZPMF-60-D11	ø20 to ø32	0.2
ZPMF-60-D18	ø40, ø50	0.5

Suction Cup *ZP3C Series*
Mounting Bracket Assembly

Adapter Assembly: Vacuum Inlet Direction **Vertical** T Type/ZP3C-T

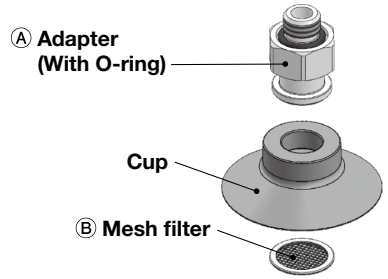
Product part no.

ZP3C - T ① (C/B) FS □ - ②

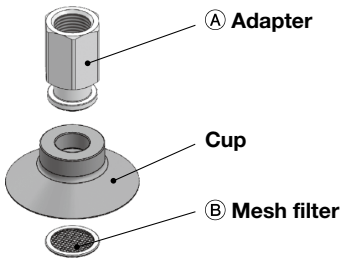
- ① Cup diameter
- (C/B) Cup form (C: Flat type with ribs/B: Bellows type)
- FS Cup material
- □ Mesh filter
- ② Connection thread (Male/Female thread)

Component parts

ZP3C-T□ (C/B) FS-□-A□



ZP3C-T□ (C/B) FS-□-BG□



			Symbol	① Cup diameter symbol				
				20	25	32	40	50
Ⓐ Adapter (Single unit)	② Connection thread	Male thread	M8 x 1	A8	ZP3CA-T3-A8		—	
			M10 x 1	A10	—		ZP3CA-T4-A10	
			G1/8	AG01	ZP3CA-T3-AG01		—	
			G1/4	AG02	—		ZP3CA-T4-AG02	
		Female thread	G1/8	BG01	ZP3CA-T3-BG01		—	
			G1/4	BG02	—		ZP3CA-T4-BG02	
Ⓑ Mesh filter (Single unit)				ZPMF-60-D11			ZPMF-60-D18	

Buffer Assembly: Vacuum Inlet Direction **Vertical** T Type/ZP3C-T, Lateral Y Type/ZP3C-Y

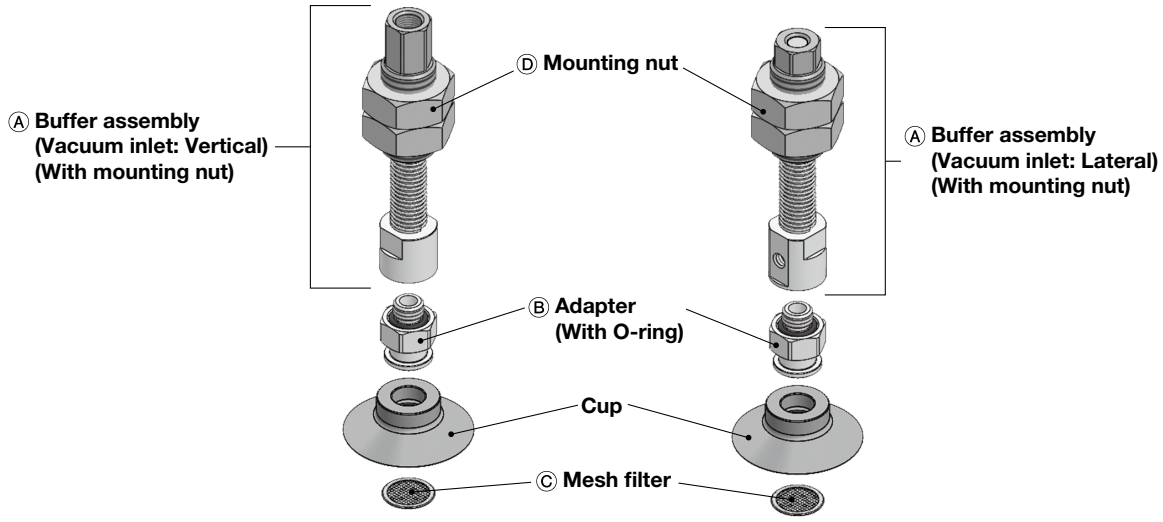
Product part no.

ZP3C - (T/Y) ① (C/B) FS JB ② - (Nil/MF)

- ① Cup diameter
- (C/B) Cup form (C: Flat type with ribs/B: Bellows type)
- FS Cup material
- ② Buffer stroke
- (Nil/MF) Mesh filter

Component parts

ZP3C-T□ (C/B) FSJB□-□ ZP3C-Y□ (C/B) FSJB□-□



		Symbol	① Cup diameter symbol				
			20	25	32	40	50
Ⓐ Buffer assembly (With mounting nut)	② Buffer stroke	10	ZP3EB- (T/Y) JB10			ZP3EB- (T/Y) 1JB10	
		20	ZP3EB- (T/Y) JB20			—	
		30	ZP3EB- (T/Y) JB30			ZP3EB- (T/Y) 1JB30	
		50	—			ZP3EB- (T/Y) 1JB50	
Ⓑ Adapter (Single unit)			ZP3CA-T3-A8			ZP3CA-T4-A10	
Ⓒ Mesh filter (Single unit)			ZPMF-60-D11			ZPMF-60-D18	
Ⓓ Mounting nut (Single unit)		M14 x 1	ZPNA-M14			—	
		M18 x 1.5	—			NT-05	

Suction Cup

2.5-Stage Bellows Type

ZP3C2 Series

How to Order

Cup unit	ZP3C2-		32	J2	FS					R
With retainer	ZP3C2-	D	32	J2	FS					R
With adapter	ZP3C2-	T	32	J2	FS			MF	A8	R
With buffer	ZP3C2-	Y	32	J2	FS	JB	10	MF		R
		❶	❷	❸	❹	❺	❻	❼	❽	❾

● Cup material: FS61

❶ Mounting

D	Direct mounting

❷ Vacuum inlet direction

Nil	Cup unit
T	Vertical
Y∗1	Lateral

∗1 Only selectable for the type with a buffer

❸ Cup diameter

32	ø32
40	ø40
50	ø50

❹ Cup form

J2	2.5-stage bellows type

❺ Buffer specifications

JB	Rotating, With bushing

❻ Buffer stroke

Stroke [mm]	Cup diameter [mm]	
	ø32	**ø40, ø50**
10	●	●
20	●	–
30	●	●
50	–	●

❼ Mesh filter

Nil	Without mesh filter
MF	With mesh filter

∗ For the type with a retainer, the filter will come with the product as standard.

❽ Connection thread

Type	Thread	Symbol	Size	Cup diameter [mm]	
				ø32	**ø40, ø50**
Thread mounting	Male thread	**A8**	M8 x 1	●	–
		A10	M10 x 1	–	●
		AG01	G1/8	●	–
		AG02	G1/4	–	●
	Female thread	**BG01**	G1/8	●	–
		BG02	G1/4	–	●

∗ Use the connection thread for the vacuum inlet.

❾ Inner ring

Nil	Without inner ring
R	With inner ring

Specifications

Material Specifications

Cup	**Material**	FS61 (Fluoro-based rubber)
	Color of rubber	Green
	Rubber hardness (Shore A: ±5°)	65
	Operating temperature range∗1	0°C to 200°C
	Ambient temperature	0°C to 150°C
Inner ring	**Material**	POM
	Ambient temperature	0°C to 90°C

∗1 Surface temperature of the workpiece to be adsorbed

Cup Specifications

Cup diameter	Effective adsorption area [cm^2]	Adsorption force∗1 [N]	Removal force∗2 [N]		Internal capacity [cm^3]
			Without inner ring	With inner ring	
ø32	2.6	15.8	31.6	34.8	13.0
ø40	4.8	28.7	52.6	62.1	27.9
ø50	8.1	48.9	74.2	89.7	50.6

∗1 The adsorption force is a theoretical value calculated by: effective adsorption area x vacuum pressure (-60 [kPa]).
∗2 The removal force is a measured value when adsorbing on a dry, flat, and smooth surface at -60 kPa of vacuum pressure.

Adapter Specifications

Connection	Male thread		Female thread	
Cup diameter	**ø32**	**ø40, ø50**	**ø32**	**ø40, ø50**
Connection thread	M8 x 1 G1/8	M10 x 1 G1/4	G1/8	G1/4
Vacuum inlet	Use the connection thread.			

Buffer Specifications

Cup diameter		**ø32**			**ø40, ø50**		
Non-rotating specification		JB: Rotating, With bushing					
Stroke [mm]		10	20	30	10	30	50
Connection thread		M14 x 1			M18 x 1.5		
Spring reaction force [N]	**At 0 stroke**	3.0			5.0		
	At full stroke	4.5	5.0	5.2	6.5	8.5	10.5

Filter Specifications

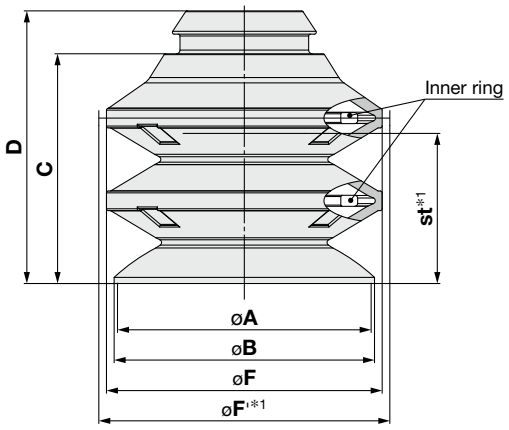
Mounting	With adapter	With retainer∗1
Mesh	60	—
Opening	250 μm	Hole diameter: 200 μm

∗1 For the type with a retainer, etched filters are used.

Dimensions

Single unit

ZP3C2 – 32 J2 FS – R
❶ ❷



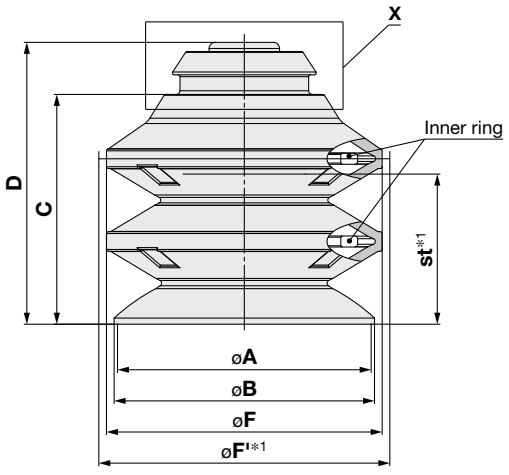
Model					A	B	C	D	F	F'*1	st*1	*2 Weight [g]
	❶ Cup diameter	Form	Cup material	❷ Inner ring								
ZP3C2	32	J2	FS	Nil R	31.4	33	30	36	35	36.9	20.3	14.5
	40				41.4	42.5	37.5	44.5	45	47.5	25.5	28.9
	50				51.4	53	48.5	55.5	55	57.4	33.5	49.5

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the inner ring. For the type with inner rings, add the weight of the parts separately. (Refer to page 23.)

With retainer Direct mounting

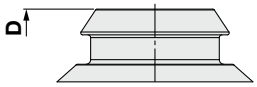
ZP3C2 – D 32 J2 FS – R
❶ ❷

ZP3C2-D40J2FS-□



Section X

ZP3C2-D□J2FS-□



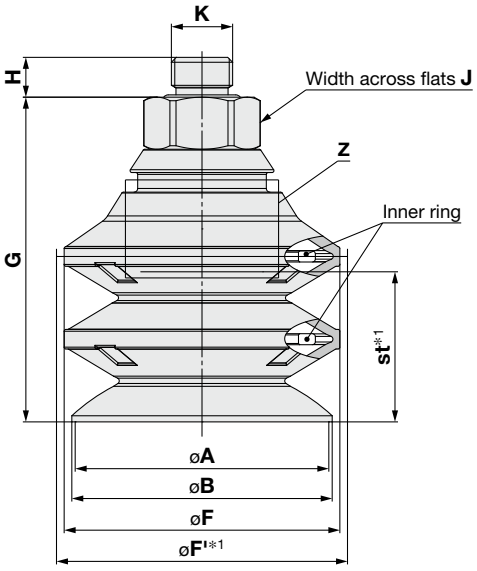
Recommended mounting plate dimensions

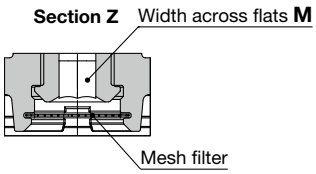
Model						A	B	C	D	F	F'*1	AD	st*1	Min. hole diameter	*2 Weight [g]
	Mounting	❶ Cup diameter	Form	Cup material	❷ Inner ring										
ZP3C2	D	32	J2	FS	Nil R	31.4	33	30	36	35	36.9	13.5	20.3	ø2.6	15.4
		40				41.4	42.5	37.5	46	45	47.5	20.5	25.5		32.8
		50				51.4	53	48.5	55.5	55	57.4		33.5		53.4

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weight of the inner ring. For the type with inner rings, add the weight of the parts separately. (Refer to page 23.)

Dimensions

With adapter Thread mounting: Male thread





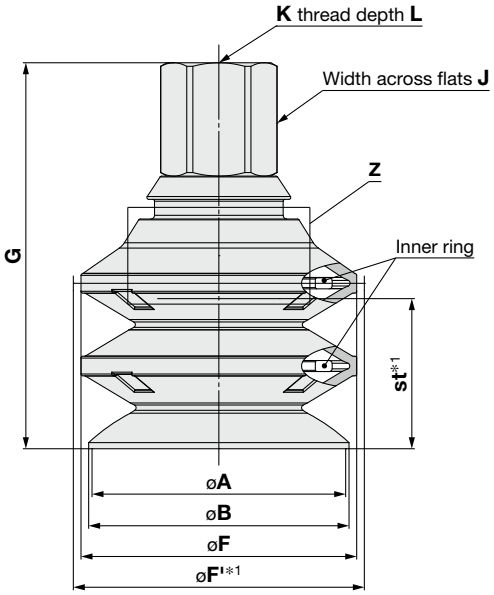
ZP3C2 – T 32 J2 FS – MF – A8 – R
❶ ❷ ❹

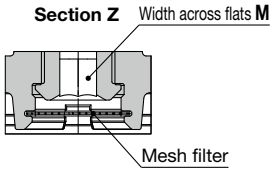
❸ Connection thread (Male thread)		Cup diameter [mm]	
		ø32	ø40, ø50
A8	M8 x 1	○	–
A10	M10 x 1	–	○
AG01	G1/8	○	–
AG02	G1/4	–	○

Model								A	B	F	F'*1	G	H	J	K	M	st*1	Min. hole diameter	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Form	Cup material	❷ Mesh filter	❸ Connection thread	❹ Inner ring												
ZP3C2	T	32	J2	FS	Nil MF	A8	Nil R	31.4	33	35	36.9	46	6.5	14	M8 x 1	4	20.3	ø4.1	20.3
						AG01						43	7.5		G1/8				19.6
		40				A10		41.4	42.5	45	47.5	53	6.5	17	M10 x 1	6	25.5	ø6.1	38.2
						AG02							10		G1/4				40.4
		50				A10		51.4	53	55	57.4	64	6.5		M10 x 1		33.5		58.8
						AG02							10		G1/4				61.0

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weights of the mesh filter and inner ring. For the type with a mesh filter and inner rings, add the weights of the parts separately. (Refer to page 23.)

With adapter Thread mounting: Female thread





ZP3C2 – T 32 J2 FS – MF – BG01 – R
❶ ❷ ❹

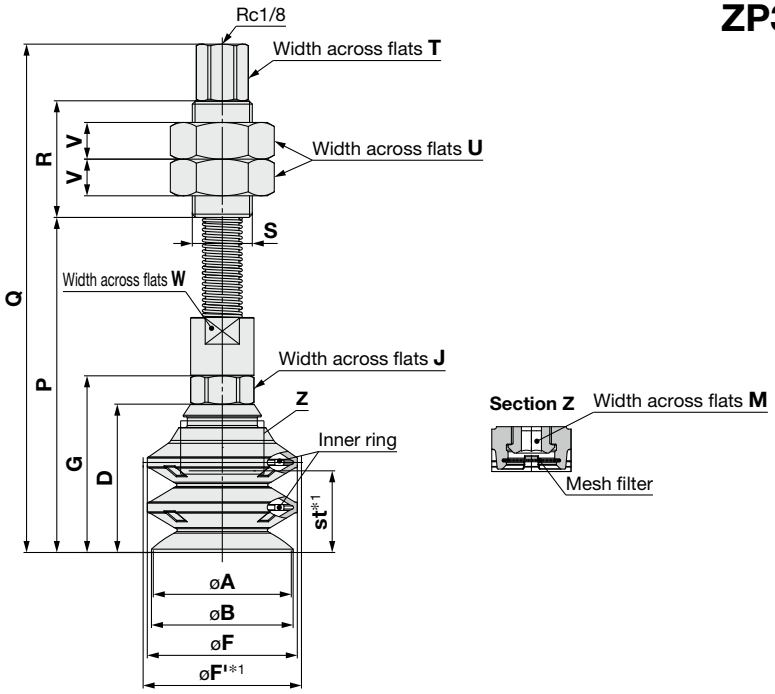
❸ Connection thread (Female thread)		Cup diameter [mm]	
		ø32	ø40, ø50
BG01	G1/8	○	–
BG02	G1/4	–	○

Model								A	B	F	F'*1	G	J	K	L	M	st*1	Min. hole diameter	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Form	Cup material	❷ Mesh filter	❸ Connection thread	❹ Inner ring												
ZP3C2	T	32	J2	FS	Nil MF	BG01	Nil R	31.4	33	35	36.9	50.5	14	G1/8	7.4	4	20.3	ø4.1	20.5
		40				BG02		41.4	42.5	45	47.5	63	17	G1/4	11	6	25.5	ø6.1	40.6
		50						51.4	53	55	57.4	74					33.5		61.2

*1 Achieved vacuum pressure: Reference at –85 [kPa]
*2 This does not include the weights of the mesh filter and inner ring. For the type with a mesh filter and inner rings, add the weights of the parts separately. (Refer to page 23.)

Dimensions

With buffer **Vacuum inlet direction: Vertical**



ZP3C2 – T 32 J2 FS JB 10 – MF – R

❶ ❷ ❸ ❹ ❺

❷ **Buffer specifications**

JB	Rotating, With bushing

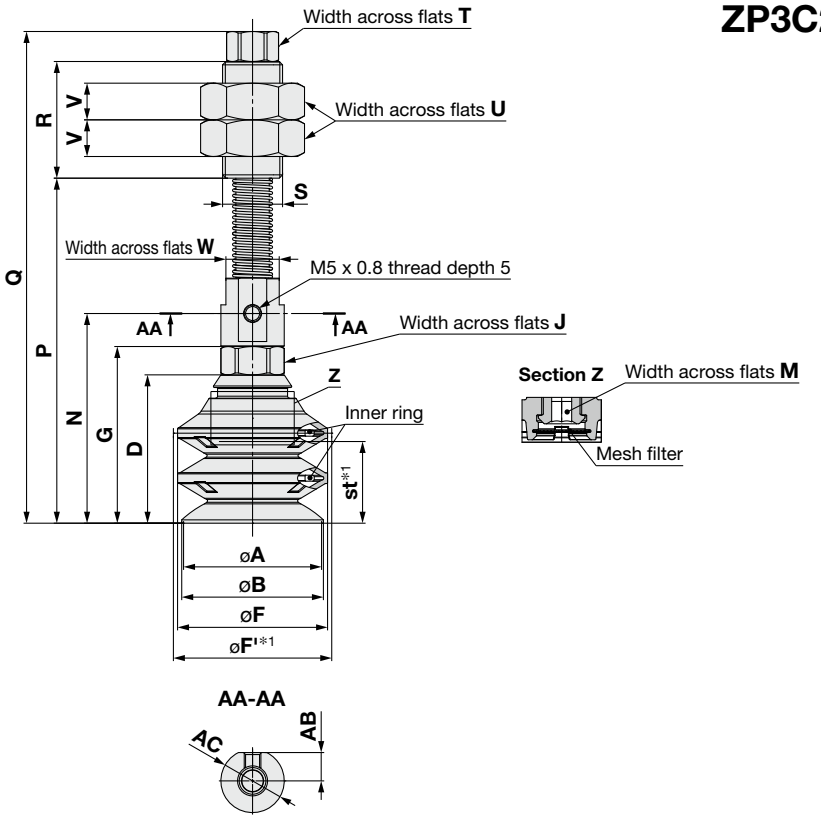
Model									A	B	D	F	F'*1	G	J	M	P	Q	R	S	T	U	V	W	st*1	Min. hole dia.	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Form	Cup material	❷ Buffer spec.	❸ Buffer stroke	❹ Mesh filter	❺ Inner ring																			
ZP3C2	T	32	J2	FS	JB	10	Nil MF	Nil R	31.4	33	36	35	36.9	46	14	4	92	137	30	M14 x 1	12	19	4	13	20.3	ø3	93.7
						20											104	149									98.1
						30											117	162									102.9
		40				10			41.4	42.5	44.5	45	47.5	53	17	6	100.5	152.5	35	M18 x 1.5	14	27	11	16	25.5		229.3
						30											125.5	177.5									243.8
						50											145.5	197.5									255.3
		50				10			51.4	53	55.5	55	57.4	64			111.5	163.5							33.5		249.9
						30											136.5	188.5									264.4
						50											156.5	208.5									275.8

*1 Achieved vacuum pressure: Reference at –85 [kPa]

*2 This does not include the weights of the mesh filter and inner ring. For the type with a mesh filter and inner rings, add the weights of the parts separately. (Refer to page 23.)

Dimensions

With buffer **Vacuum inlet direction: Lateral**



ZP3C2 – Y 32 J2 FS JB 10 – MF – R

❶ ❷ ❸ ❹ ❺

❷ **Buffer specifications**

JB	Rotating, With bushing

Model									A	B	D	F	F'*1	G	J	M	N	P	Q	R	S	T	U	V	W	AB	AC	st*1	Min. hole dia.	*2 Weight [g]
	Vacuum inlet direction	❶ Cup diameter	Form	Cup material	❷ Buffer spec.	❸ Buffer stroke	❹ Mesh filter	❺ Inner ring																						
ZP3C2	Y	32	J2	FS	JB	10	Nil MF	Nil R	31.4	33	36	35	36.9	46	14	4	55	92	130	30	M14 x 1	12	19	4	14	6.5	15	20.3	ø4.1	94.2
						20												104	142											99.3
						30												117	155											104.8
		40				10			41.4	42.5	44.5	45	47.5	53	17	6	62.9	103.5	147.5	35	M18 x 1.5	14	27	11	16	8.5	19	25.5	ø6.1	227.7
						30												128.5	172.5											243.6
						50												148.5	192.5											256.1
		50				10			51.4	53	55.5	55	57.4	64			73.9	114.5	158.5											248.3
						30												139.5	183.5									33.5		264.1
						50												159.5	203.5											276.7

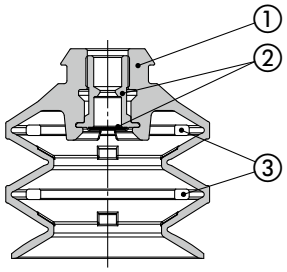
*1 Achieved vacuum pressure: Reference at –85 [kPa]

*2 This does not include the weights of the mesh filter and inner ring. For the type with a mesh filter and inner rings, add the weights of the parts separately. (Refer to page 23.)

Suction Cup *ZP3C2 Series*
Construction

With retainer

ZP3C2-D□J2FS-□

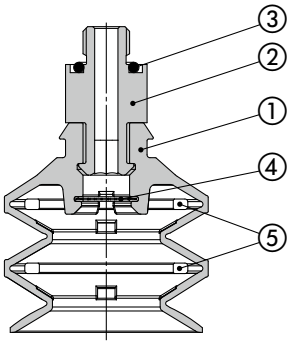


Component Parts

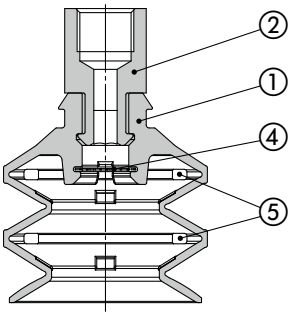
No.	Description	Material	
1	**Cup**	FS61 (Fluoro-based rubber)	
2	**Retainer assembly**	Aluminum alloy (Anodized)	Etched filter: Stainless steel
3	**Inner ring**	POM	

With adapter

ZP3C2-T□J2FS-□-A□-□



ZP3C2-T□J2FS-□-B□-□

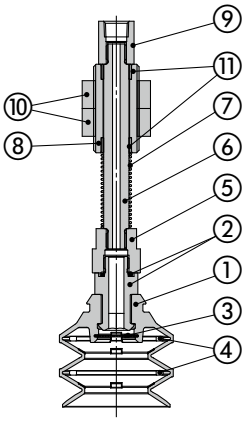


Component Parts

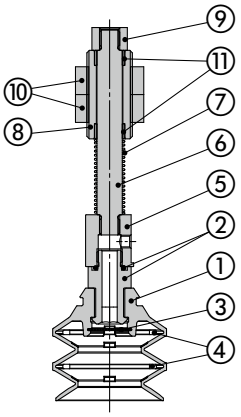
No.	Description	Material
1	**Cup**	FS61 (Fluoro-based rubber)
2	**Adapter**	Aluminum alloy (Anodized)
3	**O-ring**	NBR
4	**Mesh filter**	Stainless steel
5	**Inner ring**	POM

With buffer

ZP3C2-T□J2FSJB□-□-□



ZP3C2-Y□J2FSJB□-□-□



Component Parts

No.	Description	Material	
1	**Cup**	FS61 (Fluoro-based rubber)	
2	**Adapter assembly**	Aluminum alloy (Anodized)	O-ring: NBR
3	**Mesh filter**	Stainless steel	
4	**Inner ring**	POM	
5	**Adapter**	Aluminum alloy (Anodized)	
6	**Piston rod**	Structural steel (Hard chrome plating)	
7	**Return spring**	Stainless steel	
8	**Buffer body**	Brass (Electroless nickel plating)	
9	**Buffer adapter**	Brass (Electroless nickel plating)	
10	**Nut**	Steel (Zinc chromated)	
11	**Bushing**	—	

Replacement Parts
Mesh Filter Unit

Part no.	Applicable cup diameter [mm]		Weight [g]
	ø32	**ø40, ø50**	
ZPMF-60-D11	●	—	0.2
ZPMF-60-D18	—	●	0.5

Inner Ring (Set of 2 pcs.)

Part no.	Applicable cup diameter [mm]	Weight [g]
ZP3C2-32-R	ø32	1.2
ZP3C2-40-R	ø40	1.4
ZP3C2-50-R	ø50	2.6

Suction Cup *ZP3C2 Series*
Mounting Bracket Assembly

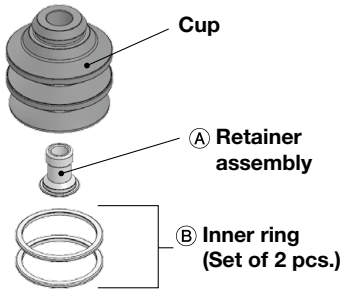
Retainer Assembly

Product part no.

ZP3C2 - D ① J2 FS - (Nil/R)

- ① Cup diameter
- J2 Cup form
- FS Cup material
- (Nil/R) Inner ring

Component parts



	① Cup diameter		
	32	40	50
Ⓐ Retainer assembly	ZP3C2A-D3	ZP3C2A-D4	
Ⓑ Inner ring (Set of 2 pcs.)	ZP3C2-32-R	ZP3C2-40-R	ZP3C2-50-R

Adapter Assembly: Vacuum Inlet Direction **Vertical** T Type/ZP3C2-T

Product part no.

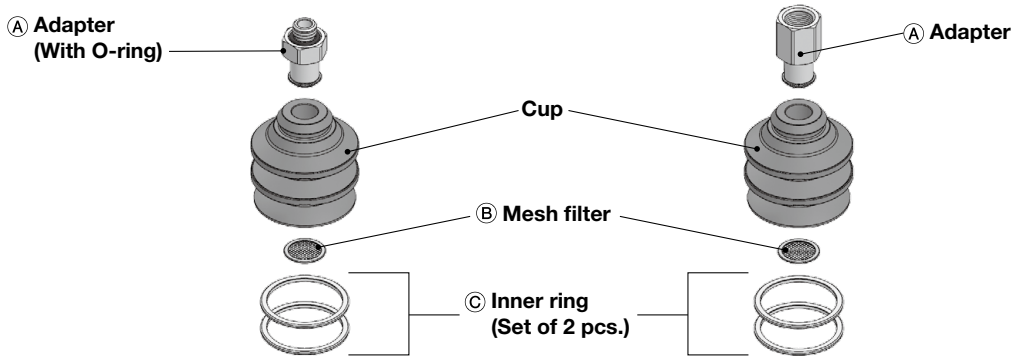
ZP3C2 - T ① J2 FS - (Nil/MF) - ② - (Nil/R)

- ① Cup diameter
- J2 Cup form
- FS Cup material
- (Nil/MF) Mesh filter
- ② Connection thread
- (Nil/R) Inner ring

Component parts

ZP3C2-T□J2FS-□-A□-□

ZP3C2-T□J2FS-□-B□-□



			Symbol	① Cup diameter		
				32	40	50
Ⓐ Adapter (Single unit) ② Connection thread	Male thread	M8 x 1.0	A8	ZP3C2A-T3-A8	—	
		M10 x 1.0	A10	—	ZP3C2A-T4-A10	
		G1/8	AG01	ZP3C2A-T3-AG01	—	
		G1/4	AG02	—	ZP3C2A-T4-AG02	
	Female thread	G1/8	BG01	ZP3C2A-T3-BG01	—	
		G1/4	BG02	—	ZP3C2A-T4-BG02	
Ⓑ Mesh filter (Single unit)				ZPMF-60-D11	ZPMF-60-D18	
Ⓒ Inner ring (Set of 2 pcs.)				ZP3C2-32-R	ZP3C2-40-R	ZP3C2-50-R

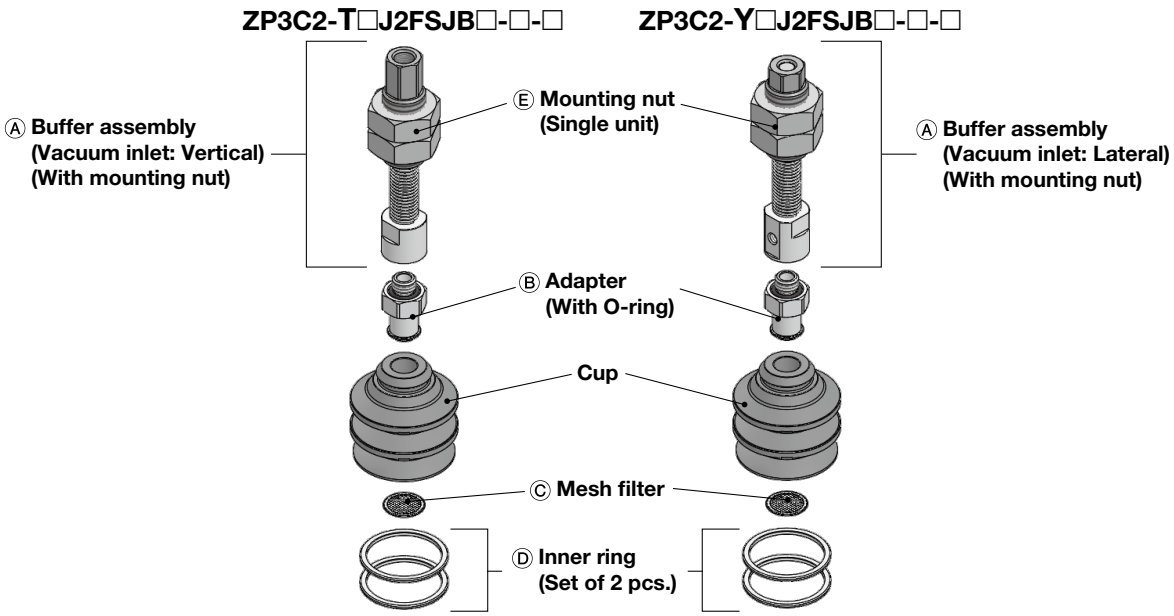
Buffer Assembly: Vacuum Inlet Direction **Vertical** T Type/ZP3C2-T, Lateral Y Type/ZP3C2-Y

Product part no.

ZP3C2 - (T/Y) ① J2 FS JB ② - (Nil/MF) - (Nil/R)

- ① Cup diameter
- J2 Cup form
- FS Cup material
- JB Buffer specifications
- ② Buffer stroke
- (Nil/MF) Mesh filter
- (Nil/R) Inner ring

Component parts



		Symbol	① Cup diameter		
			32	40	50
Ⓐ Buffer assembly (With mounting nut)	② Buffer stroke	10	ZP3EB- (T/Y) JB10	ZP3EB- (T/Y) 1JB10	
		20	ZP3EB- (T/Y) JB20	—	
		30	ZP3EB- (T/Y) JB30	ZP3EB- (T/Y) 1JB30	
		50	—	ZP3EB- (T/Y) 1JB50	
Ⓑ Adapter (Single unit)			ZP3C2A-T3-A8	ZP3C2A-T4-A10	
Ⓒ Mesh filter (Single unit)			ZPMF-60-D11	ZPMF-60-D18	
Ⓓ Inner ring (Set of 2 pcs.)			ZP3C2-32-R	ZP3C2-40-R	ZP3C2-50-R
Ⓔ Mounting nut (Single unit)		M14 x 1	ZPNA-M14	—	
		M18 x 1.5	—	NT-05	

ZP3C□ Series
Suction Cup/Specific Product Precautions

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.

Design

1. When handling workpieces that are permeable or prone to vacuum leakage, there will be a drop in vacuum pressure.
Make sure to take the drop in vacuum pressure into account when selecting the appropriate products.

Check whether the target vacuum pressure can be reached with the actual equipment before use.

Mounting

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.

When using a product equipped with a buffer, if the buffer is tightened to a torque beyond the appropriate tightening torque range, the buffer may malfunction.

With Adapter (Male thread type)

Model	Connection thread size	Proper tightening torque [N·m]
ZP3C□-T□(C/B/J2)FS-□-A8-□	M8 x 1.0	4.5 to 5.5
ZP3C□-T□(C/B/J2)FS-□-A10-□	M10 x 1.0	8 to 10
ZP3C□-T□(C/B/J2)FS-□-AG01-□	G1/8	3 to 5
ZP3C□-T□(C/B/J2)FS-□-AG02-□	G1/4	8 to 12

With Adapter (Female thread type)

Model	Connection thread size	Proper tightening torque [N·m]
ZP3C□-T□(C/B/J2)FS-□-BG01-□	G1/8	3 to 5
ZP3C□-T□(C/B/J2)FS-□-BG02-□	G1/4	8 to 12

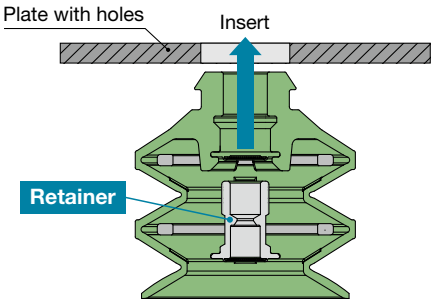
With Buffer

Model	Connection thread size	Proper tightening torque [N·m]
ZP3C□-(T/Y)(20 to 32)(C/B/J2)FSJB□-□-□	M14 x 1	6.5 to 7.5
ZP3C□-(T/Y)(40/50)(C/B/J2)FSJB□-□-□	M18 x 1.5	28 to 32

How to Mount/Remove the Retainer

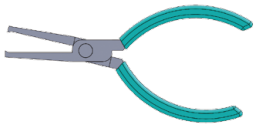
1. Mounting

After mounting the cup onto the plate, insert the retainer.



2. Removing

<Tool examples>
· Relay pliers
· End nippers



Handling

1. Periodically inspect the mesh filter.

An adsorbing malfunction may be caused by the clogging of the mesh filter.

2. When the suction cup is pressed, make sure it stays within the stroke range.

If this product is used with a stroke exceeding the maximum stroke, the cup may be broken or may reach the end of its service life earlier.

3. Suction cups are consumable. Please replace them when cracks or deformation is confirmed during periodic maintenance.

⚠ 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.

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

SMC Corporation