Vacuum Cups

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Section A

www.parker.com/pneu/vaccup

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Specifications

Cup material should be considered for temperature resistance, chemical resistance, oil resistance, abrasion resistance, markless properities and electrical properties.

	NBR	NBRE	CR	SI	SIE	U
Suction cup material	Nitrile	Nitrile ESD*	Chloroprene	Silicon	Silicon ESD*	Urethane
Operating temperature (°C)	-20° to +120°	-30° to +120°	-30° to +140°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	Green	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	–	800 to 1000	–	–	800 to 1000	–
Wear resistance	• • • • •	• • • • •	• • • • •	• •	• •	• • • • • •
Tear strength	• • • •	• • • •	• • • • •	•	•	• • • • • •
Aging resistance	• • • •	• • • •	• • • • •	• • • • • •	• • • • • •	• • • • • •
Ozone resistance	• • • •	• • • •	• • • • •	• • • • • •	• • • • • •	• • • • • •
Gasoline resistance	• • • • • •	• • • • • •	• • • • •	• • • •	• • • •	• • • • • •
Oil resistance	• • • • • •	• • • • • •	• • • • •	• • • • • •	• • • • • •	• • • • •
Acid resistance	• • •	• • •	• • • • •	• • •	• • •	•
Alkali resistance	• • • •	• • • •	• • • • •	• • •	• • •	•
Chemical resistance	• • •	• • •	• • • •	• •	• •	• • • • • •
Mechanical resistance	• • • •	• • • •	• • • •	• • • •	• • • •	• • • • •

• • • • • • = excellent; • • • • • = very good; • • • • = good; • • • = medium; • • = poor; • = not recommended

* ESD: Electric Static Dissipative Material

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Selecting the proper vacuum cup

⚠ CAUTION:

Selecting the type of vacuum cup, material, and size suitable for an application is important to the overall vacuum system. Calculating the forces involved for each application is recommended to determine the vacuum cup size. It should be noted that these calculations are basic theoretical guidelines and each application must be tested for actual results. With all vacuum applications, certain practical assumptions concerning cup materials, environmental conditions, and product characteristics to name a few, may not be consistent with the performance. Again, the user should determine the efficiency, performance, and safety factor of the cup selection.

Calculating pad diameter and forces

Mass

The term mass is a quantity of matter and its ability to resist motion when acted on by an external force. The magnitude of an object is represented as a certain number of kilograms (kg) and is symbolized as "m". The easiest way to determine the mass of an object is to measure the weight with a scale within the earth's gravitational field ($a_g = 9.81 m/sec^2$). Likewise, outside of any gravitational field, a mass could potentially be weightless.

Forces

For vacuum applications, force is a vector quantity in a defined direction either horizontal or vertical. The standard international unit of force is measured in Newtons (N) which is the equivalent of (kgm/sec^2). The force can be calculated by measuring the effect of a change in acceleration on a mass.

Newtons Law: $F(N) = mass(kg) \times a_g(m/sec^2)$

Consider an object with a mass of 10kg. The gravitational force on this object would be:

$F(N) = 10kg \times 9.81 m/sec^2 = 98.1\ N$

Acceleration

Acceleration is the change in velocity of a moving object. Acceleration is a vector, a directional quantity expressed in units of meters per second squared (m/sec^2) and symbolized as "*a*". To explain the magnitude of acceleration consider an object with a change in velocity of 2 meters per second (m/sec) over a 4 second time frame. The acceleration can be calculated with:

$$a = \frac{\triangle \text{ velocity}}{\text{time}} \qquad a = \frac{6 m/sec}{2\ sec} \qquad a = 3 m/sec^2$$

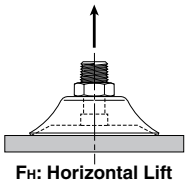
This is considered an average acceleration.

Coefficient of friction

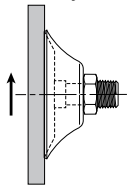
Certain values for coefficient of friction should be taken into consideration when calculating the combined forces in motion. Actual values between suction cups and surfaces are difficult to determine. Therefore, coefficient of friction values from published charts, should be used as a reference to adjust the safety factors accordingly.

Lifting forces

When calculating lifting forces, safety factors of 2 for horizontal lifts and 4 for vertical lifts are minimum values. Applications with irregular shapes, difficult surfaces, and backward motions will require increased safety factors.



FH: Horizontal Lift



FV: Vertical Lift

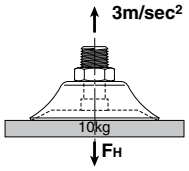
Horizontal lifting force

Apply Newtons Law to calculate the force on a 10kg mass with a change in acceleration of $3 m/sec^2$ and a safety factor of 2.

$FH(N) = mass(kg) \times (a_g + a) \times SH$

$FH(N) = 10kg \times (9.81 m/sec^2 + 3 m/sec^2) \times 2$

$FH = 256.2\ N$



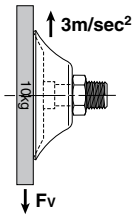
Vertical lifting force

Apply Newtons Law to calculate the force on a 10kg mass with a dry surface, a change in acceleration of $3 m/sec^2$ and a safety factor of 4.

$FV(N) = mass(kg) \times (a_g + a) \times Sv$

$FV(N) = 10kg \times (9.81 m/sec^2 + 3 m/sec^2) \times 4$

$FV = 512.4\ N$



Combined vertical lift and horizontal motion

Calculate the force on a 10kg mass with a dry surface, a change in acceleration of $3 m/sec^2$, and a change in travel acceleration of $2 m/sec^2$.

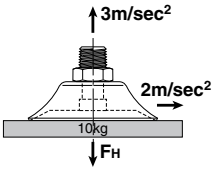
$$FM(N) = \sqrt{FV^2 + FH^2}$$

$$FM(N) = \sqrt{[(10kg \times 2 m/sec^2) \times 4]^2 + [10kg \times (9.81 m/sec^2 + 3 m/sec^2) \times 2]^2}$$

$$FM(N) = \sqrt{(80 kgm/sec^2)^2 + [256 kgm/sec^2]^2}$$

$$FM(N) = \sqrt{6400 kgm/sec^2 + 65{,}536 kgm/sec^2}$$

$$FM = 268.2\ N$$



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Analyze the forces

Using the previous examples, consider an application where 4 cups have been selected to transfer the product.

Take the Horizontal Lifting Force (FH) of 256.2 N and divide by the number of cups (4) to obtain the individual force for each cup.

$$\frac{256.2\ (N)}{4} = 64.05\ N\ /\ Cup$$

Referring to the chart below, at 60% vacuum, select a force greater than 64.05 N. The appropriate selection is a 40mm diameter cup which has a theoretical lifting force of 76.9 N.

The same calculation can be applied to the Vertical Lifting Force and the Forces in Motion examples to determine the cup diameter.

To convert Pounds (lbf) to Newton (N), multiply lbf x 4.4.

Calculate the diameter of the cup

Calculate the cup diameter for horizontal lift at 60% of full vacuum using the information from the previous page.

$$D = 35.7 \sqrt{\frac{m\ (a_g + a) \times S}{Pv \times n}}$$

$$D = 35.7 \sqrt{\frac{10\ (9.81 + 3) \times 2}{61 \times 4}}$$

D (mm) = Diameter of Cup
m (kg) = Mass
a_g = 9.81m/sec^2
a = Motion Acceleration
S = Safety Factor
Pv (kPa) = Operating Vacuum Pressure
n = number of Cups

D = 36.58 mm

Referring to the chart below, at 60% vacuum, select a cup diameter equal to or greater than 37mm. The appropriate selection is a 40mm diameter cup which has a theoretical lifting force of 76.9 N.

Theoretical lifting force per cup lbf (N)

Cup		Vacuum level								
		3 inHg	6 inHg	9 inHg	12 inHg	15 inHg	18 inHg	21 inHg	24 inHg	27 inHg
		-1.5 PSIG	-3 PSIG	-4.5 PSIG	-6 PSIG	-7.5 PSIG	-9 PSIG	-10.5 PSIG	-12 PSIG	-13.5 PSIG
Diameter mm	Area cm²	10.2 kPa	20.3 kPa	30.5 kPa	40.6 kPa	50.8 kPa	61 kPa	71.1 kPa	81.3 kPa	91.4 kPa
		10%	20%	30%	40%	50%	60%	70%	80%	90%
1.5	0.01	0.004 (0.02)	0.008 (0.04)	0.008 (0.04)	0.014 (0.06)	0.018 (0.08)	0.022 (0.10)	0.026 (0.12)	0.032 (0.14)	0.032 (0.14)
2	0.03	0.007 (0.03)	0.013 (0.06)	0.022 (0.10)	0.029 (0.13)	0.036 (0.16)	0.043 (0.19)	0.049 (0.22)	0.056 (0.25)	0.063 (0.28)
3.5	0.10	0.022 (0.10)	0.045 (0.20)	0.065 (0.29)	0.088 (0.39)	0.110 (0.49)	0.133 (0.59)	0.155 (0.69)	0.175 (0.78)	0.198 (0.88)
5	0.20	0.045 (0.20)	0.090 (0.40)	0.135 (0.60)	0.180 (0.80)	0.225 (1.00)	0.270 (1.20)	0.315 (1.40)	0.360 (1.60)	0.405 (1.80)
6	0.28	0.065 (0.29)	0.130 (0.58)	0.196 (0.87)	0.270 (1.20)	0.315 (1.40)	0.382 (1.70)	0.450 (2.00)	0.517 (2.30)	0.585 (2.60)
7	0.39	0.088 (0.39)	0.175 (0.78)	0.265 (1.18)	0.360 (1.60)	0.450 (2.00)	0.540 (2.40)	0.607 (2.70)	0.697 (3.10)	0.787 (3.50)
8	0.50	0.117 (0.52)	0.229 (1.02)	0.346 (1.54)	0.450 (2.00)	0.585 (2.60)	0.697 (3.10)	0.809 (3.60)	0.922 (4.10)	1.034 (4.60)
10	0.79	0.180 (0.80)	0.360 (1.60)	0.540 (2.40)	0.719 (3.20)	0.899 (4.00)	1.079 (4.80)	1.259 (5.60)	1.439 (6.40)	1.619 (7.20)
15	1.77	0.404 (1.80)	0.809 (3.60)	1.216 (5.41)	1.619 (7.20)	2.023 (9.00)	2.428 (10.8)	2.833 (12.6)	2.237 (14.4)	3.642 (16.2)
18	2.55	0.585 (2.60)	1.169 (5.20)	1.751 (7.79)	2.338 (10.4)	2.923 (13.0)	3.507 (15.6)	4.069 (18.1)	4.676 (20.8)	5.238 (23.3)
20	3.14	0.719 (3.20)	1.439 (6.40)	2.158 (9.60)	2.878 (12.8)	3.597 (16.0)	4.316 (19.2)	5.036 (22.4)	5.755 (25.6)	6.474 (28.8)
25	4.91	1.124 (5.00)	2.248 (10.0)	3.372 (15.0)	4.496 (20.0)	5.620 (25.0)	6.744 (30.0)	7.868 (35.0)	8.992 (40.0)	10.116 (45.0)
30	7.07	1.619 (7.20)	3.237 (14.4)	4.856 (21.6)	6.474 (28.8)	8.093 (36.0)	9.712 (43.2)	11.330 (50.4)	12.949 (57.6)	14.568 (64.8)
35	9.62	2.203 (9.80)	4.406 (19.6)	5.598 (29.4)	8.813 (39.2)	11.016 (49.0)	13.241 (58.9)	15.422 (68.6)	17.648 (78.5)	19.828 (88.2)
40	12.6	2.900 (12.9)	5.755 (25.6)	8.655 (38.5)	11.510 (51.2)	14.388 (64.0)	17.288 (76.9)	20.143 (89.6)	23.155 (103)	25.853 (115)
50	19.6	4.519 (20.1)	8.992 (40.0)	13.511 (60.1)	17.985 (80.0)	22.481 (100)	26.977 (120)	31.473 (140)	35.969 (160)	40.466 (180)
60	28.3	6.497 (28.9)	12.949 (57.6)	19.446 (86.5)	25.853 (115)	32.372 (144)	38.892 (173)	45.411 (202)	51.931 (231)	58.226 (259)
75	44.2	10.161 (45.2)	20.233 (90.0)	30.349 (135)	40.466 (180)	50.582 (225)	60.698 (270)	70.815 (315)	80.931 (360)	91.048 (405)
80	50.3	11.555 (51.4)	22.931 (102)	34.621 (154)	46.086 (205)	57.551 (256)	69.241 (308)	80.706 (359)	92.172 (410)	103.637 (461)
90	63.6	14.635 (65.1)	29.225 (130)	43.838 (195)	58.226 (259)	72.838 (324)	87.451 (389)	102.063 (454)	116.676 (519)	131.064 (583)
95	70.9	16.299 (72.5)	32.372 (144)	48.784 (217)	64.970 (289)	81.156 (361)	97.567 (434)	113.753 (506)	129.940 (578)	146.126 (650)
110	95.0	21.851 (97.2)	43.613 (194)	65.419 (291)	87.001 (387)	108.808 (484)	130.614 (581)	152.421 (678)	174.227 (775)	195.809 (871)
120	113.1	26.078 (116)	51.706 (230)	77.784 (346)	103.637 (461)	129.490 (576)	155.568 (692)	181.421 (807)	207.274 (922)	233.127 (1037)
150	176.7	40.690 (181)	80.931 (360)	121.622 (541)	161.862 (720)	202.328 (900)	243.019 (1081)	283.259 (1260)	323.950 (1441)	364.191 (1620)
200	314.2	72.164 (321)	143.878 (640)	216.041 (961)	287.531 (1279)	359.919 (1601)	432.083 (1922)	503.797 (2241)	575.961 (2562)	647.449 (2880

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Exceptional for any smooth flat or surface that will benifit from stability and fast response of the cup design.
This is a multi-versatile and multi-industry cup. Typical applications could be chip mounting, electrical components, semiconductor chips, glass, injection mold, sheet metal, press transfer, fixtures, woodworking.

Features

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Universal flat design for most smooth surface applications
- Stable vertical / horizontal lift
- Strong low profile design for fast response needed for short cycles
- 5mm to 200mm diameters
- Bottom cleats on 60 to 200mm diameters

Styles

- PFTM series male thread connector
- PFTF series female thread connector
- PFTK series barbed bulkhead
- PFYK series 90° barbed adapter
- PFTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	**NBR**	**NBRE**	**SI**	**SIE**	**U**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000	—

* ESD: Electric Static Dissipative Material

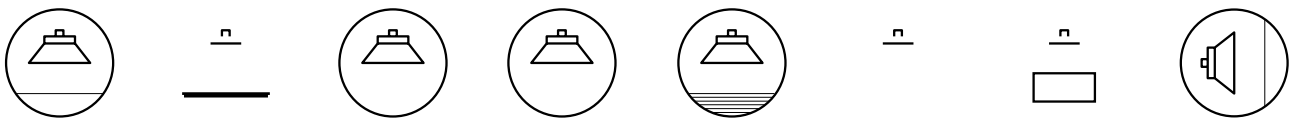
How to order

Cups Assemblies and replacement cups are specified by Cup Diameter and Material. Standard Nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with Urethane (U), replace (NBR) with (U) in the part number. PFTM-20B-NBR-G1 becomes PFTM-20B-U-G1. Inquire with factory for availability.

Application guide

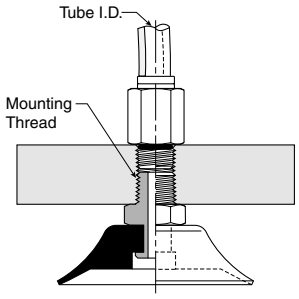
Flat - Smooth surface



Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Metal sheet handling	Corrugated sheet handling	High lifting force	Vertical lift

PFTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. BSPP, NPT metric threads.
Fitting material: aluminum.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PFTM-5A-NBR-M5	PFG-5A-NBR	PFTM-5A-SI-M5	PFG-5A-SI	FTM-5A-M5
5	1/8 BSPP	PFTM-5A-NBR-G1	PFG-5A-NBR	PFTM-5A-SI-G1	PFG-5A-SI	FTM-5A-G1
6	M5	PFTM-6A-NBR-M5	PFG-6A-NBR	PFTM-6A-SI-M5	PFG-6A-SI	FTM-5A-M5
6	1/8 BSPP	PFTM-6A-NBR-G1	PFG-6A-NBR	PFTM-6A-SI-G1	PFG-6A-SI	FTM-5A-G1
8	M5	PFTM-8A-NBR-M5	PFG-8A-NBR	PFTM-8A-SI-M5	PFG-8A-SI	FTM-5A-M5
8	1/8 BSPP	PFTM-8A-NBR-G1	PFG-8A-NBR	PFTM-8A-SI-G1	PFG-8A-SI	FTM-5A-G1
10	M5	PFTM-10A-NBR-M5	PFG-10A-NBR	PFTM-10A-SI-M5	PFG-10A-SI	FTM-5A-M5
10	1/8 BSPP	PFTM-10A-NBR-G1	PFG-10A-NBR	PFTM-10A-SI-G1	PFG-10A-SI	FTM-5A-G1
15	M5	PFTM-15A-NBR-M5	PFG-15A-NBR	PFTM-15A-SI-M5	PFG-15A-SI	FTM-5A-M5
15	1/8 BSPP	PFTM-15A-NBR-G1	PFG-15A-NBR	PFTM-15A-SI-G1	PFG-15A-SI	FTM-5A-G1
20	1/8 BSPP	PFTM-20B-NBR-G1	PFG-20B-NBR	PFTM-20B-SI-G1	PFG-20B-SI	FTM-20B-G1
20	1/4 BSPP	PFTM-20B-NBR-G2	PFG-20B-NBR	PFTM-20B-SI-G2	PFG-20B-SI	FTM-20B-G2
20	M10	PFTM-20B-NBR-M10	PFG-20B-NBR	PFTM-20B-SI-M10	PFG-20B-SI	FTM-20B-M10
20	1/8 NPT	PFTM-20B-NBR-N1	PFG-20B-NBR	PFTM-20B-SI-N1	PFG-20B-SI	FTM-20B-N1
30	1/8 BSPP	PFTM-30-NBR-G1	PFG-30-NBR	PFTM-30-SI-G1	PFG-30-SI	FTM-20B-G1
30	1/4 BSPP	PFTM-30-NBR-G2	PFG-30-NBR	PFTM-30-SI-G2	PFG-30-SI	FTM-20B-G2
30	M10	PFTM-30-NBR-M10	PFG-30-NBR	PFTM-30-SI-M10	PFG-30-SI	FTM-20B-M10
30	1/8 NPT	PFTM-30-NBR-N1	PFG-30-NBR	PFTM-30-SI-N1	PFG-30-SI	FTM-20B-N1
40	1/8 BSPP	PFTM-40-NBR-G1	PFG-40-NBR	PFTM-40-SI-G1	PFG-40-SI	FTM-20B-G1
40	1/4 BSPP	PFTM-40-NBR-G2	PFG-40-NBR	PFTM-40-SI-G2	PFG-40-SI	FTM-20B-G2
40	M10	PFTM-40-NBR-M10	PFG-40-NBR	PFTM-40-SI-M10	PFG-40-SI	FTM-20B-M10
40	1/8 NPT	PFTM-40-NBR-N1	PFG-40-NBR	PFTM-40-SI-N1	PFG-40-SI	FTM-20B-N1
50	1/8 BSPP	PFTM-50-NBR-G1	PFG-50-NBR	PFTM-50-SI-G1	PFG-50-SI	FTM-50-G1
50	1/4 BSPP	PFTM-50-NBR-G2	PFG-50-NBR	PFTM-50-SI-G2	PFG-50-SI	FTM-50-G2
50	1/8 NPT	PFTM-50-NBR-N1	PFG-50-NBR	PFTM-50-SI-N1	PFG-50-SI	FTM-50-N1
60	1/4 BSPP	PFTM-60-NBR-G2	PFG-60-NBR	PFTM-60-SI-G2	PFG-60-SI	FTM-60-G2
60	M10	PFTM-60-NBR-M10	PFG-60-NBR	PFTM-60-SI-M10	PFG-60-SI	FTM-60-M10
60	1/4 NPT	PFTM-60-NBR-N2	PFG-60-NBR	PFTM-60-SI-N2	PFG-60-SI	FTM-60-N2
80	1/4 BSPP	PFTM-80-NBR-G2	PFG-80-NBR	PFTM-80-SI-G2	PFG-80-SI	FTM-60-G2
80	M10	PFTM-80-NBR-M10	PFG-80-NBR	PFTM-80-SI-M10	PFG-80-SI	FTM-60-M10
80	1/4 NPT	PFTM-80-NBR-N2	PFG-80-NBR	PFTM-80-SI-N2	PFG-80-SI	FTM-60-N2
95	1/4 BSPP	PFTM-95-NBR-G2	PFG-95-NBR	PFTM-95-SI-G2	PFG-95-SI	FTM-60-G2
95	M10	PFTM-95-NBR-M10	PFG-95-NBR	PFTM-95-SI-M10	PFG-95-SI	FTM-60-M10
95	1/4 NPT	PFTM-95-NBR-N2	PFG-95-NBR	PFTM-95-SI-N2	PFG-95-SI	FTM-60-N2

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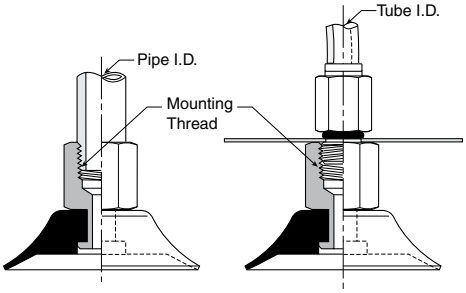
PFTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. BSPP, NPT threads.

Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PFTF-5A-NBR-M5	PFG-5A-NBR	PFTF-5A-SI-M5	PFG-5A-SI	FTF-5A-M5
5	1/8 BSPP	PFTF-5A-NBR-G1	PFG-5A-NBR	PFTF-5A-SI-G1	PFG-5A-SI	FTF-5A-G1
6	M5	PFTF-6A-NBR-M5	PFG-6A-NBR	PFTF-6A-SI-M5	PFG-6A-SI	FTF-5A-M5
6	1/8 BSPP	PFTF-6A-NBR-G1	PFG-6A-NBR	PFTF-6A-SI-G1	PFG-6A-SI	FTF-5A-G1
8	M5	PFTF-8A-NBR-M5	PFG-8A-NBR	PFTF-8A-SI-M5	PFG-8A-SI	FTF-5A-M5
8	1/8 BSPP	PFTF-8A-NBR-G1	PFG-8A-NBR	PFTF-8A-SI-G1	PFG-8A-SI	FTF-5A-G1
10	1/8 BSPP	PFTF-10A-NBR-G1	PFG-10A-NBR	PFTF-10A-SI-G1	PFG-10A-SI	FTF-5A-G1
10	M5	PFTF-10A-NBR-M5	PFG-10A-NBR	PFTF-10A-SI-M5	PFG-10A-SI	FTF-5A-M5
15	1/8 BSPP	PFTF-15A-NBR-G1	PFG-15A-NBR	PFTF-15A-SI-G1	PFG-15A-SI	FTF-5A-G1
15	M5	PFTF-15A-NBR-M5	PFG-15A-NBR	PFTF-15A-SI-M5	PFG-15A-SI	FTF-5A-M5
20	1/8 BSPP	PFTF-20B-NBR-G1	PFG-20B-NBR	PFTF-20B-SI-G1	PFG-20B-SI	FTF-20B-G1
30	1/8 BSPP	PFTF-30-NBR-G1	PFG-30-NBR	PFTF-30-SI-G1	PFG-30-SI	FTF-20B-G1
30	1/4 BSPP	PFTF-30-NBR-G2	PFG-30-NBR	PFTF-30-SI-G2	PFG-30-SI	FTF-20B-G2
40	1/8 BSPP	PFTF-40-NBR-G1	PFG-40-NBR	PFTF-40-SI-G1	PFG-40-SI	FTF-20B-G1
40	1/4 BSPP	PFTF-40-NBR-G2	PFG-40-NBR	PFTF-40-SI-G2	PFG-40-SI	FTF-20B-G2
50	1/8 BSPP	PFTF-50-NBR-G1	PFG-50-NBR	PFTF-50-SI-G1	PFG-50-SI	FTF-50-G1
50	1/4 BSPP	PFTF-50-NBR-G2	PFG-50-NBR	PFTF-50-SI-G2	PFG-50-SI	FTF-50-G2
60	1/4 BSPP	PFTF-60-NBR-G2	PFG-60-NBR	PFTF-60-SI-G2	PFG-60-SI	FTF-60-G2
60	1/4 NPT	PFTF-60-NBR-N2	PFG-60-NBR	PFTF-60-SI-N2	PFG-60-SI	FTF-60-N2
80	1/4 BSPP	PFTF-80-NBR-G2	PFG-80-NBR	PFTF-80-SI-G2	PFG-80-SI	FTF-60-G2
80	1/4 NPT	PFTF-80-NBR-N2	PFG-80-NBR	PFTF-80-SI-N2	PFG-80-SI	FTF-60-N2
95	1/4 NPT	PFTF-95-NBR-N2	PFG-95-NBR	PFTF-95-SI-N2	PFG-95-SI	FTF-60-N2
95	1/4 BSPP	PFTF-95-NBR-G2	PFG-95-NBR	PFTF-95-SI-G2	PFG-95-SI	FTF-60-G2
120	1/2 BSPP	PFTF-120-NBR-G4	PFG-120-NBR	PFTF-120-SI-G4	PFG-120-SI	FTF-120-G4
120	1/2 NPT	PFTF-120-NBR-N4	PFG-120-NBR	PFTF-120-SI-N4	PFG-120-SI	FTF-120-N4
150	1/2 NPT	PFTF-150-NBR-G4	PFG-150-NBR	PFTF-150-SI-G4	PFG-150-SI	FTF-120-G4
150	1/2 NPT	PFTF-150-NBR-N4	PFG-150-NBR	PFTF-150-SI-N4	PFG-150-SI	FTF-120-N4
200	1/2 BSPP	PFTF-200-NBR-G4	PFG-200-NBR	PFTF-200-SI-G4	PFG-200-SI	FTF-120-G4
200	1/2 NPT	PFTF-200-NBR-N4	PFG-200-NBR	PFTF-200-SI-N4	PFG-200-SI	FTF-120-N4

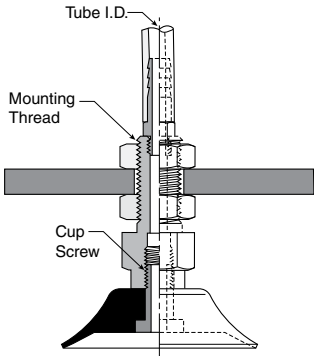
A

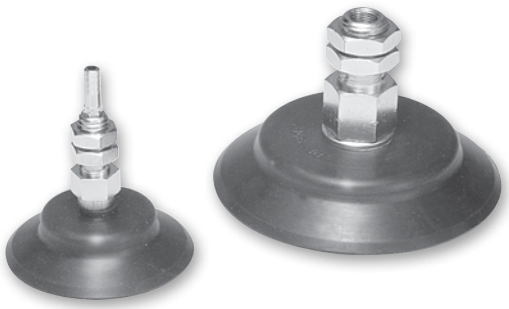
PFTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.





Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PFTK-5A-NBR	PFG-5A-NBR	PFTK-5A-SI	PFG-5A-SI	FTK-5A
6	Barb	PFTK-6A-NBR	PFG-6A-NBR	PFTK-6A-SI	PFG-6A-SI	FTK-5A
8	Barb	PFTK-8A-NBR	PFG-8A-NBR	PFTK-8A-SI	PFG-8A-SI	FTK-5A
10	Barb	PFTK-10A-NBR	PFG-10A-NBR	PFTK-10A-SI	PFG-10A-SI	FTK-5A
15	Barb	PFTK-15-NBR	PFG-15-NBR	PFTK-15-SI	PFG-15-SI	FTK-15
20	Barb	PFTK-20-NBR	PFG-20-NBR	PFTK-20-SI	PFG-20-SI	FTK-20
30	Barb	PFTK-30-NBR	PFG-30-NBR	PFTK-30-SI	PFG-30-SI	FTK-25
40	Barb	PFTK-40-NBR	PFG-40-NBR	PFTK-40-SI	PFG-40-SI	FTK-25
50	Barb	PFTK-50-NBR	PFG-50-NBR	PFTK-50-SI	PFG-50-SI	FTK-50
60	1/8 BSPP	PFTK-60-NBR-G1	PFG-60-NBR	PFTK-60-SI-G1	PFG-60-SI	FTK-60-G1
60	1/8 NPT	PFTK-60-NBR-N1	PFG-60-NBR	PFTK-60-SI-N1	PFG-60-SI	FTK-60-N1
80	1/8 BSPP	PFTK-80-NBR-G1	PFG-80-NBR	PFTK-80-SI-G1	PFG-80-SI	FTK-60-G1
80	1/8 NPT	PFTK-80-NBR-N1	PFG-80-NBR	PFTK-80-SI-N1	PFG-80-SI	FTK-60-N1
95	1/8 BSPP	PFTK-95-NBR-G1	PFG-95-NBR	PFTK-95-SI-G1	PFG-95-SI	FTK-60-G1
95	1/8 NPT	PFTK-95-NBR-N1	PFG-95-NBR	PFTK-95-SI-N1	PFG-95-SI	FTK-60-N1

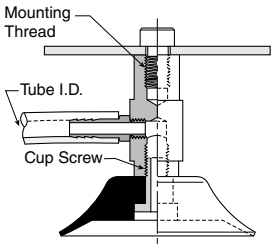
A

PFYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt thru a plate or “L” bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



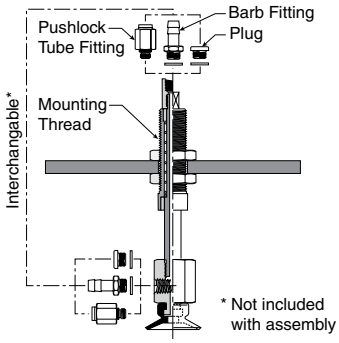
Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PFYK-5A-NBR	PFG-5A-NBR	PFYK-5A-SI	PFG-5A-SI	FYK-5A
6	Barb	PFYK-6A-NBR	PFG-6A-NBR	PFYK-6A-SI	PFG-6A-SI	FYK-5A
8	Barb	PFYK-8A-NBR	PFG-8A-NBR	PFYK-8A-SI	PFG-8A-SI	FYK-5A
10	Barb	PFYK-10A-NBR	PFG-10A-NBR	PFYK-10A-SI	PFG-10A-SI	FYK-5A
15	Barb	PFYK-15-NBR	PFG-15-NBR	PFYK-15-SI	PFG-15-SI	FYK-15
20	Barb	PFYK-20-NBR	PFG-20-NBR	PFYK-20-SI	PFG-20-SI	FYK-20
30	Barb	PFYK-30-NBR	PFG-30-NBR	PFYK-30-SI	PFG-30-SI	FYK-25
40	Barb	PFYK-40-NBR	PFG-40-NBR	PFYK-40-SI	PFG-40-SI	FYK-25
50	Barb	PFYK-50-NBR	PFG-50-NBR	PFYK-50-SI	PFG-50-SI	FYK-50
60	1/8 BSPP	PFYK-60-NBR-G1	PFG-60-NBR	PFYK-60-SI-G1	PFG-60-SI	FYK-60-G1
60	1/8 NPT	PFYK-60-NBR-N1	PFG-60-NBR	PFYK-60-SI-N1	PFG-60-SI	FYK-60-N1
80	1/8 BSPP	PFYK-80-NBR-G1	PFG-80-NBR	PFYK-80-SI-G1	PFG-80-SI	FYK-60-G1
80	1/8 NPT	PFYK-80-NBR-N1	PFG-80-NBR	PFYK-80-SI-N1	PFG-80-SI	FYK-60-N1
95	1/8 BSPP	PFYK-95-NBR-G1	PFG-95-NBR	PFYK-95-SI-G1	PFG-95-SI	FYK-60-G1
95	1/8 NPT	PFYK-95-NBR-N1	PFG-95-NBR	PFYK-95-SI-N1	PFG-95-SI	FYK-60-N1
120	1/8 BSPP	PFYK-120-NBR-G1	PFG-120-NBR	PFYK-120-SI-G1	PFG-120-SI	FYK-120-G1
120	1/8 NPT	PFYK-120-NBR-N1	PFG-120-NBR	PFYK-120-SI-N1	PFG-120-SI	FYK-120-N1
150	1/8 BSPP	PFYK-150-NBR-G1	PFG-150-NBR	PFYK-150-SI-G1	PFG-150-SI	FYK-120-G1
150	1/8 NPT	PFYK-150-NBR-N1	PFG-150-NBR	PFYK-150-SI-N1	PFG-150-SI	FYK-120-N1
200	1/8 BSPP	PFYK-200-NBR-G1	PFG-200-NBR	PFYK-200-SI-G1	PFG-200-SI	FYK-120-G1
200	1/8 NPT	PFYK-200-NBR-N1	PFG-200-NBR	PFYK-200-SI-N1	PFG-200-SI	FYK-120-N1

PFTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

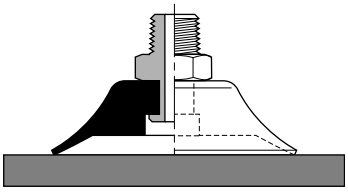


Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
5	M5	10	.14 (.61)	.26 (1.17)	PFTYS5A10NBRM5	PFG-5A-NBR	PFTYS5A10SIM5	PFG-5A-SI	FTYS-5A-10-M5
5	M5	15	.15 (.64)	.26 (1.17)	PFTYS5A15NBRM5	PFG-5A-NBR	PFTYS5A15SIM5	PFG-5A-SI	FTYS-5A-15-M5
6	M5	10	.14 (.61)	.26 (1.17)	PFTYS6A10NBRM5	PFG-6A-NBR	PFTYS6A10SIM5	PFG-6A-SI	FTYS-5A-10-M5
6	M5	15	.15 (.64)	.26 (1.17)	PFTYS6A15NBRM5	PFG-6A-NBR	PFTYS6A15SIM5	PFG-6A-SI	FTYS-5A-15-M5
8	M5	10	.14 (.61)	.26 (1.17)	PFTYS8A10NBRM5	PFG-8A-NBR	PFTYS8A10SIM5	PFG-8A-SI	FTYS-5A-10-M5
8	M5	15	.15 (.64)	.26 (1.17)	PFTYS8A15NBRM5	PFG-8A-NBR	PFTYS8A15SIM5	PFG-8A-SI	FTYS-5A-15-M5
10	M5	10	.11 (.49)	.13 (.59)	PFTYS10A10NBRM5	PFG-10A-NBR	PFTYS10A10SIM5	PFG-10A-SI	FTYS-5A-10-M5
10	M5	15	.11 (.49)	.13 (.59)	PFTYS10A15NBRM5	PFG-10A-NBR	PFTYS10A15SIM5	PFG-10A-SI	FTYS-5A-15-M5
15	M5	10	.11 (.49)	.13 (.59)	PFTYS15A10NBRM5	PFG-15A-NBR	PFTYS15A10SIM5	PFG-15A-SI	FTYS-5A-10-M5
15	M5	15	.11 (.49)	.13 (.59)	PFTYS15A15NBRM5	PFG-15A-NBR	PFTYS15A15SIM5	PFG-15A-SI	FTYS-5A-15-M5
20	M5	15	.56 (2.5)	.79 (3.4)	PFTYS20B15NBRM5	PFG-20B-NBR	PFTYS20B15SIM5	PFG-20B-SI	FTYS-20B-15-M5
20	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS20B30NBRM5	PFG-20B-NBR	PFTYS20B30SIM5	PFG-20B-SI	FTYS-20B-30-M5
30	M5	15	.56 (2.5)	.79 (3.4)	PFTYS3015NBRM5	PFG-30-NBR	PFTYS3015SIM5	PFG-30-SI	FTYS-20B-15-M5
30	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS3030NBRM5	PFG-30-NBR	PFTYS3030SIM5	PFG-30-SI	FTYS-20B-30-M5
40	M5	15	.56 (2.5)	.79 (3.4)	PFTYS4015NBRM5	PFG-40-NBR	PFTYS4015SIM5	PFG-40-SI	FTYS-20B-15-M5
40	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS4030NBRM5	PFG-40-NBR	PFTYS4030SIM5	PFG-40-SI	FTYS-20B-30-M5
50	M5	15	.56 (2.5)	1.2 (4.9)	PFTYS5015NBRM5	PFG-50-NBR	PFTYS5015SIM5	PFG-50-SI	FTYS-50-15-M5
50	M5	30	.67 (2.9)	1.4 (5.9)	PFTYS5030NBRM5	PFG-50-NBR	PFTYS5030SIM5	PFG-50-SI	FTYS-50-30-M5
60	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PFTYS6030NBRG1	PFG-60-NBR	PFTYS6030SIG1	PFG-60-SI	FTYS-60-30-G1
60	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PFTYS6050NBRG1	PFG-60-NBR	PFTYS6050SIG1	PFG-60-SI	FTYS-60-50-G1
80	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PFTYS8030NBRG1	PFG-80-NBR	PFTYS8030SIG1	PFG-80-SI	FTYS-60-30-G1
80	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PFTYS8050NBRG1	PFG-80-NBR	PFTYS8050SIG1	PFG-80-SI	FTYS-60-50-G1
95	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PFTYS9530NBRG1	PFG-95-NBR	PFTYS9530SIG1	PFG-95-SI	FTYS-60-30-G1
95	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PFTYS9550NBRG1	PFG-95-NBR	PFTYS9550SIG1	PFG-95-SI	FTYS-60-50-G1
120	1/4 BSPP	20	3.6 (15.6)	6.8 (29)	PFTYS12020NBRG2	PFG-120-NBR	PFTYS12020SIG2	PFG-120-SI	FTYS-120-20-G2
120	1/4 BSPP	50	3.4 (14.7)	6.8 (29)	PFTYS12050NBRG2	PFG-120-NBR	PFTYS12050SIG2	PFG-120-SI	FTYS-120-50-G2
150	1/4 BSPP	20	3.6 (15.6)	6.8 (29)	PFTYS15020NBRG2	PFG-150-NBR	PFTYS15020SIG2	PFG-150-SI	FTYS-120-20-G2
150	1/4 BSPP	50	3.4 (14.7)	6.8 (29)	PFTYS15050NBRG2	PFG-150-NBR	PFTYS15050SIG2	PFG-150-SI	FTYS-120-50-G2
200	1/4 BSPP	20	3.6 (15.6)	6.8 (29)	PFTYS20020NBRG2	PFG-200-NBR	PFTYS20020SIG2	PFG-200-SI	FTYS-120-20-G2
200	1/4 BSPP	50	3.4 (14.7)	6.8 (29)	PFTYS20050NBRG2	PFG-200-NBR	PFTYS20050SIG2	PFG-200-SI	FTYS-120-50-G2

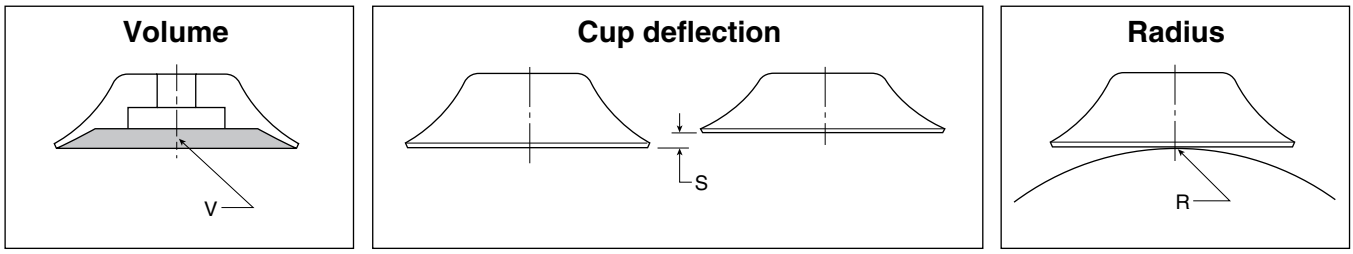
A

Applications

- Products with smooth surfaces
- Products with minimum flex
- Products that will not permanently deform



Main data for fat PFG cups



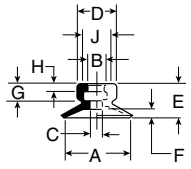
Model number	Cup diameter mm	Area cm^2	Volume (V) liters	Lifting force @60% (N)		Cup deflection (S) mm	Radius (R) mm
PFG-5A-*	5	0.20	0.000005	1.20	0.6	0.5	3.5
PFG-6A-*	6	0.28	0.000008	1.70	0.85	1.0	4.0
PFG-8A-*	8	0.50	0.00003	3.10	1.5	1.4	5.0
PFG-10A-*	10	0.79	0.00007	4.80	2.4	1.5	6.0
PFG-15-*	15	1.77	0.0004	10.8	5.4	1.9	6.0
PFG-15A-*	15	1.77	0.0004	10.8	5.4	1.9	6.0
PFG-20-*	20	3.14	0.0008	19.2	9.6	2.3	9.0
PFG-20B-*	20	3.14	0.0008	19.2	9.6	2.3	13.0
PFG-30-*	30	7.07	0.0018	43.2	21.6	2.0	26
PFG-40-*	40	12.60	0.004	76.9	38.5	3.5	37
PFG-50-*	50	19.60	0.007	120	60	4.0	41
PFG-60-*	60	28.30	0.0090	173	87	5.0	70
PFG-80-*	80	50.30	0.025	308	154	6.0	100
PFG-95-*	95	70.90	0.035	434	267	6.0	150
PFG-120-*	120	113.00	0.078	692	346	6.0	365
PFG-150-*	150	176.70	0.177	1081	541	9.0	380
PFG-200-*	200	314.20	0.425	1922	961	13.0	430

* Cup material

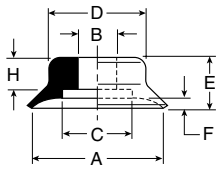
A

PFG Series Replacement Cup Dimensions

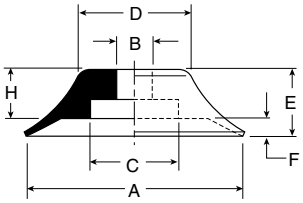
PFG-5A
PFG-15A



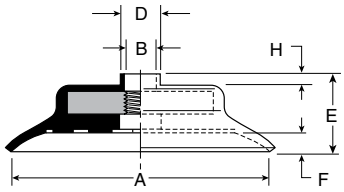
PFG-15 thru
PFG-40



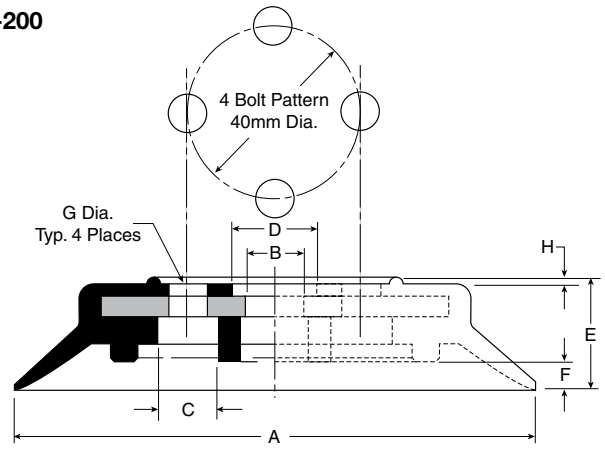
PFG-50



PFG-60 thru
PFG-95



PFG-120 thru
PFG-200



Dimensions (mm)

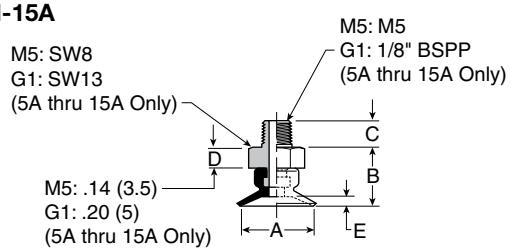
Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PFG-5A-*	5	4	1.4	7.5	6.5	.8	4	2	6
PFG-6A-*	6	4	2	7.5	6.5	.8	4	2	6
PFG-8A-*	8	4	2	8	7	1.2	4	2	6
PFG-10A-*	10	4	2	8.5	7.5	1.5	4	2	6
PFG-15-*	15	—	7.8	12	8	1.9	—	—	—
PFG-15A-*	15	4	2	9	8	2	4	2	6
PFG-20-*	20	4.6	11	15	10	2.3	—	4.5	—
PFG-20B-*	20	6	11	15	12.5	2.3	—	7	—
PFG-30-*	30	6	11	14	12	2	—	7	—
PFG-40-*	40	6	11	24	14	4	—	7	—
PFG-50-*	50	8	20	27	15	3.5	—	7	—
PFG-60-*	60	M10x1.25	—	12.5	18.5	5	—	2.5	—
PFG-80-*	80	M10x1.25	—	12.5	20.5	6	—	2.5	—
PFG-95-*	95	M10x1.25	—	12.5	21	6	—	2.5	—
PFG-120-*	120	14	14	20	25.5	6	4xØ8.7xØ40	1.5	—
PFG-150-*	150	13	14	20	32.5	9	4xØ8.7xØ40	1.5	—
PFG-200-*	200	13	12	20	37.5	13	4xØ8.7xØ40	1.5	—

* Cup material

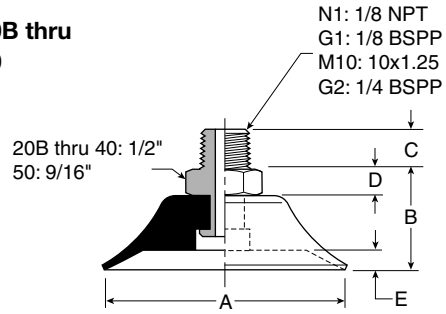
A

Dimensions

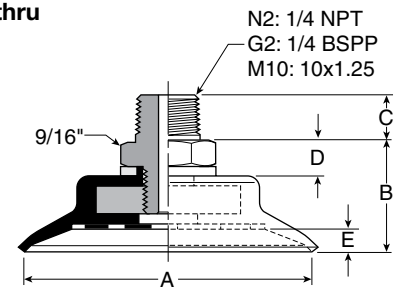
PFTM-5A thru PFTM-15A



PFTM-20B thru PFTM-50



PFTM-60 thru PFTM-95



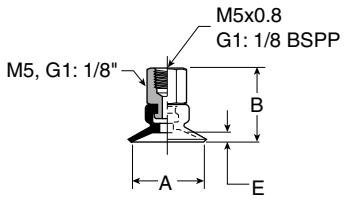
Dimensions (mm)

Model number	ØA	B	C (M3)	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PFTM-5A-*-†	5	10	—	4.5	8	—	—	See Dwg.	8
PFTM-6A-*-†	6	10	—	4.5	8	—	—	See Dwg.	8
PFTM-8A-*-†	8	10.5	—	4.5	8	—	—	See Dwg.	1.2
PFTM-10A-*-†	10	11	—	4.5	8	—	—	See Dwg.	1.5
PFTM-15A-*-†	15	11.5	—	4.5	8	—	—	See Dwg.	2
PFTM-20B-*-†	20	17.5	—	—	8	10	—	5	2.5
PFTM-30-*-†	30	17	—	—	8	10	—	5	2
PFTM-40-*-†	40	19	—	—	8	10	—	5	3.5
PFTM-50-*-†	50	20	—	—	8	10	—	5	4
PFTM-60-*-†	60	23	—	—	—	10	15	7	5
PFTM-80-*-†	80	25	—	—	—	10	15	7	6
PFTM-95-*-†	95	25.5	—	—	—	10	15	7	6

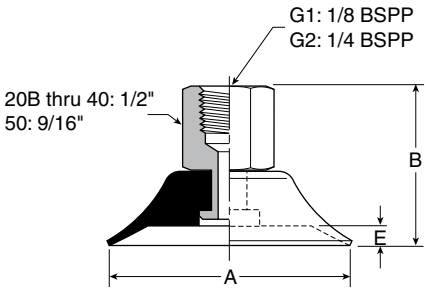
* Cup material
† Thread size

Dimensions

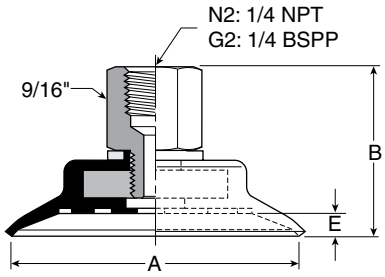
PFTF-5A thru PFTF-15A



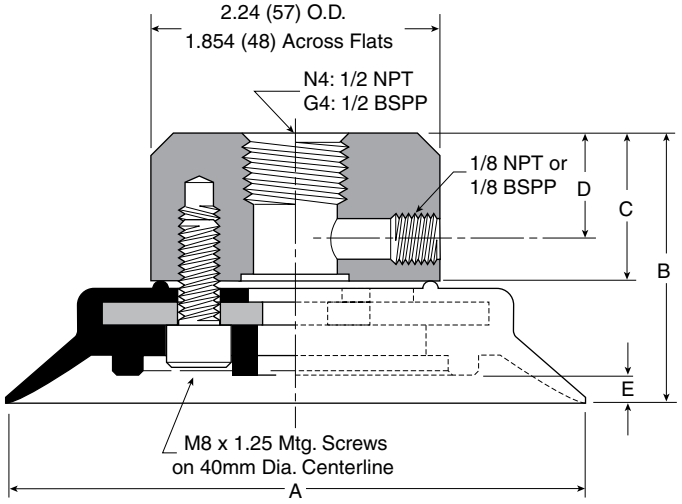
PFTF-20B thru PFTF-50



PFTF-60 thru PFTF-95



PFTF-120 thru PFTF-200



Dimensions (mm)

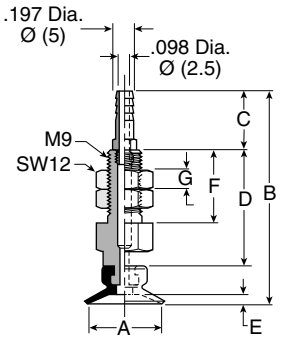
Model number	ØA	B	B (M5)	C	D	E
PFTF-5A-*-†	5	14.5	20.5	—	—	.8
PFTF-6A-*-†	6	14.5	20.5	—	—	.8
PFTF-8A-*-†	8	15	21	—	—	1.2
PFTF-10A-*-†	10	14.5	20.5	—	—	1.5
PFTF-15A-*-†	15	16	22	—	—	2
PFTF-20B-*-†	20	26.5	—	—	—	2.5
PFTF-30-*-†	30	26	—	—	—	2
PFTF-40-*-†	40	28	—	—	—	4
PFTF-50-*-†	50	29	—	—	—	4
PFTF-60-*-†	60	35.5	—	—	—	5
PFTF-80-*-†	80	37.5	—	—	—	6
PFTF-95-*-†	95	38	—	—	—	6
PFTF-120-*-†	120	46.5	—	24	13	6
PFTF-150-*-†	150	53.5	—	24	13	9
PFTF-200-*-†	200	58.5	—	24	13	13

* Cup material
† Thread size

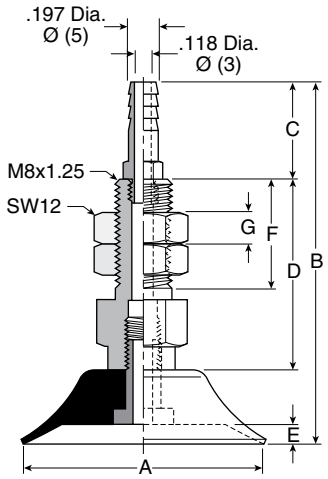
A

Dimensions

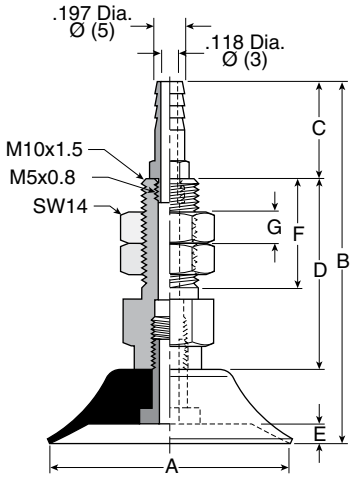
PFTK-5A thru PFTK-10A



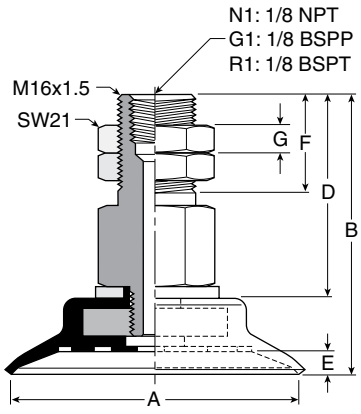
PFTK-15 thru PFTK-20



PFTK-30 thru PFTK-50



PFTK-60 thru PFTK-95



Dimensions (mm)

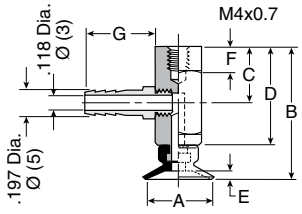
Model number	ØA	B	C	D	E	F	G	Wt g
PFTK-5A-*	5	30.5	10	14	.8	15.5	3	11
PFTK-6A-*	6	30.5	10	14	.8	15.5	3	11
PFTK-8A-*	8	31	10	14	1.2	15.5	3	11
PFTK-10A-*	10	46	16	22.5	1.5	15.5	3	15
PFTK-15-*	15	46	16	22	1.9	15	3	20
PFTK-20-*	20	48	16	22	2.3	15	5	20
PFTK-30-*	30	60	16	32	2	20	5	40
PFTK-40-*	40	62	16	32	3.5	20	5	40
PFTK-50-*	50	63	16	32	4	20	5	50
PFTK-60-*-†	60	58.5	—	42.5	5	20	6	130
PFTK-80-*-†	80	60.5	—	42.5	6	20	6	170
PFTK-95-*-†	95	61	—	42.5	6	20	6	220

* Cup material
† Vacuum port

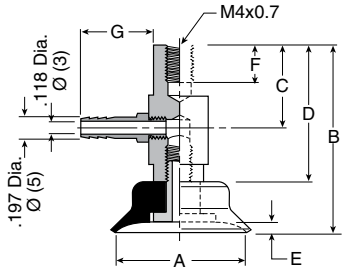
A

Dimensions

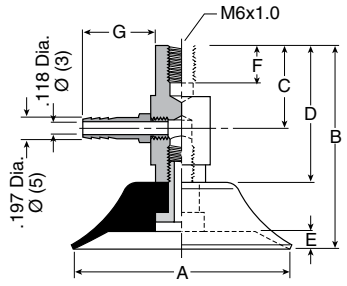
PFYK-5A thru PFYK-10A



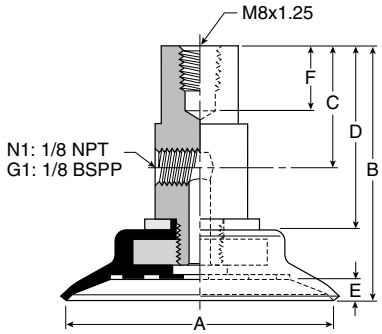
PFYK-15 thru PFYK-20



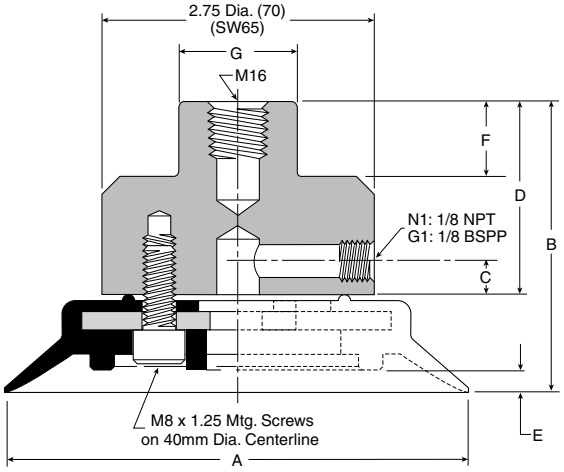
PFYK-30 thru PFYK-50



PFYK-60 thru PFYK-95



PFYK-120 thru PFYK-200



Dimensions (mm)

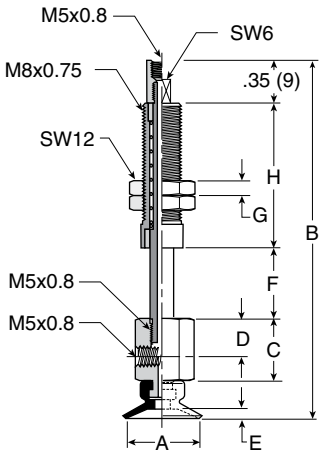
Model number	ØA	B	C	D	E	F	G	Wt g
PFYK-5A-*	5	29	13	22.5	.8	6	16	16
PFYK-6A-*	6	29	13	22.5	.8	6	16	16
PFYK-8A-*	8	29.5	13	22.5	1.2	6	16	16
PFYK-10A-*	10	30	13	22.5	1.5	6	16	16
PFYK-15-*	15	30	14	22	1.9	6	16	20
PFYK-20-*	20	32	14	22	2.3	6	16	20
PFYK-30-*	30	44	20	32	2	8	16	40
PFYK-40-*	40	46	20	32	3.5	8	16	50
PFYK-50-*	50	47	20	32	4	8	16	55
PFYK-60-*-†	60	58.5	28	40	5	11	—	120
PFYK-80-*-†	80	60.5	28	40	6	11	—	160
PFYK-95-*-†	95	61	28	40	6	11	—	210
PFYK-120-*-†	120	75.5	12	50	6	20	Dia. 30	640
PFYK-150-*-†	150	82.5	12	50	9	20	Dia. 30	910
PFYK-200-*-†	200	87.5	12	50	13	20	Dia. 30	1200

* Cup material
† Vacuum port

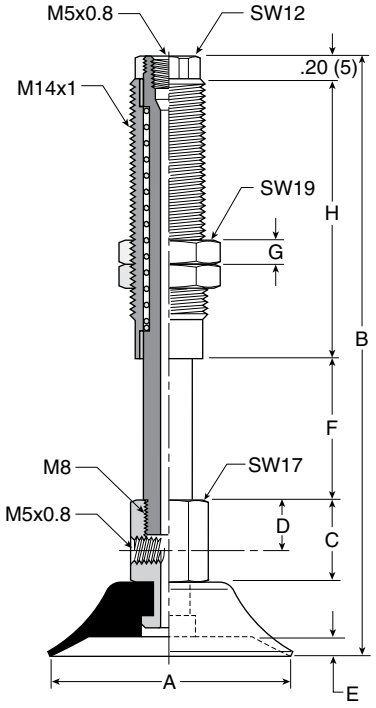
A

Dimensions

PFTYS5A thru PFTYS15A



PFTYS20B thru PFTYS50



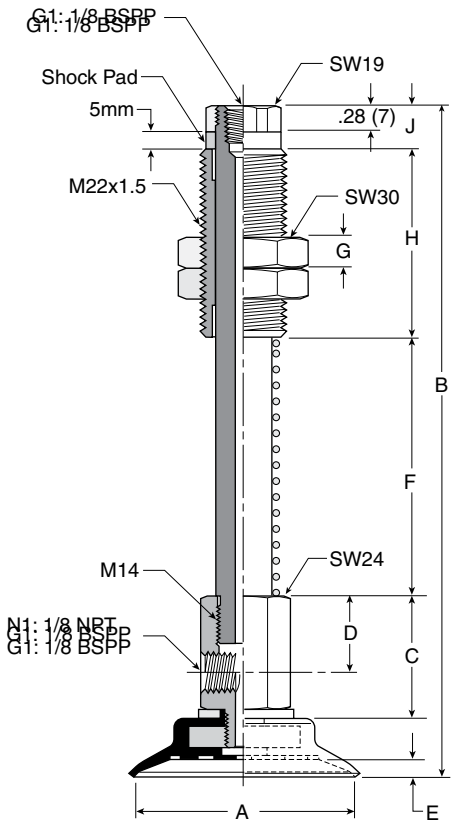
Dimensions (mm)

Model number	ØA	B	C	D	E	F	G	H	Wt g
PFTYS5A10*†	5	61.5	13	8	.8	10	3	23	18.5
PFTYS5A15*†	5	74	13	8	.8	15	3	30.5	21
PFTYS6A10*†	6	61.5	13	8	.8	10	3	23	18.5
PFTYS6A15*†	6	74	13	8	.8	15	3	30.5	21
PFTYS8A10*†	8	62	13	8	1.2	10	3	23	18.5
PFTYS8A15*†	8	74.5	13	8	1.2	15	3	30.5	21
PFTYS10A10*†	10	63	13	8	1.5	10	3	23	18.5
PFTYS10A15*†	10	75	13	8	1.5	15	3	30.5	21
PFTYS15A10*†	15	63.5	13	8	2	10	3	23	18.5
PFTYS15A15*†	15	75.5	13	8	2	15	3	30.5	21
PFTYS20B15*†	20	85.5	17	10	2.3	15	5	36	71
PFTYS20B30*†	20	122.5	17	10	2.3	30	5	58	96
PFTYS3015*†	30	85	17	10	2	15	5	36	72
PFTYS3030*†	30	122	17	10	2	30	5	58	97
PFTYS4015*†	40	87	17	10	3.5	15	5	36	76
PFTYS4030*†	40	124	17	10	3.5	30	5	58	101
PFTYS5015*†	50	88	17	10	4	15	5	36	85
PFTYS5030*†	50	125	17	10	4	30	5	58	110

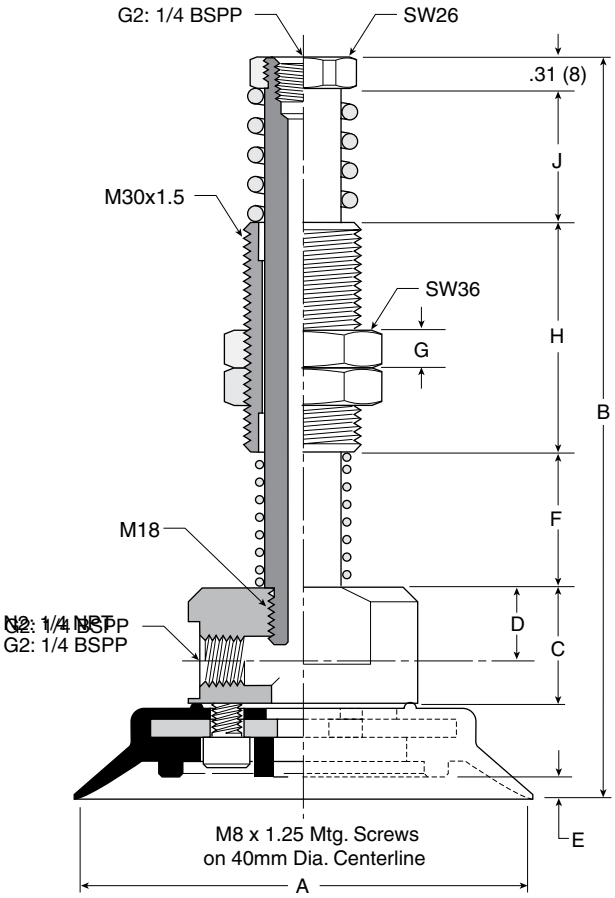
* Cup material
† Vacuum port

Dimensions

PFTYS60 thru PFTYS95



PFTYS120 thru PFTYS200



Dimensions (mm)

Model number	ØA	B	C	D	E	F	G	H	J	Wt g
PFTYS6030*†	60	153	32.5	20	5	45	10	50	12	282
PFTYS6050*†	60	178	32.5	20	5	70	10	50	12	316
PFTYS8030*†	80	155	32.5	20	6	45	10	50	12	310
PFTYS8050*†	80	180	32.5	20	6	70	10	50	12	344
PFTYS9530*†	95	156	32.5	20	6	45	10	50	12	350
PFTYS9550*†	95	181	32.5	20	6	70	10	50	12	384
PFTYS12020*†	120	192	32.5	18	6	35	10	60	35	1165
PFTYS12070*†	120	257	32.5	18	6	100	10	60	35	1246
PFTYS15020*†	150	199	32.5	18	9	35	10	60	35	1389
PFTYS15070*†	150	209	32.5	18	9	75	10	60	35	1471
PFTYS20020*†	200	204	32.5	18	13	35	10	60	35	1755
PFTYS20070*†	200	264	32.5	18	13	100	10	60	35	1836

* Cup material
† Vacuum port

A

These cups are for curved, corrugated, lightly textured surfaces and flexible product. Under vacuum, the bellow cup will collapse on contact and lift the product for a short distance. This inherent performance facilitates lifting and destack operations by breaking the vacuum between stacked product. The bellow style adds level compensation for applications that have inconsistent stack heights or uneven surfaces. The inclusive 30-degree rotation of the bellow helps maintain the vacuum seal when lifting sheet products that flex. Because of it's shape however the bellows suction cup is not very well suitable for applications involving lifting vertical surfaces.

Features

- Bellows design for level compensation within restricted clearances
- Sheet separation for flexible and stacked products
- Soft seal lip for flexible products
- 10mm to 150mm diameters

Styles

- PBTM series male thread connector
- PBTF series female thread connector
- PBTK series barbed bulkhead
- PBYK series 90° barbed adapter
- PBTYS series bulkhead level compensator

Specifications

Cup material	**Nitrile**	**Silicon**	**Urethane**
Material code	**NBR**	**SI**	**U**
Operating temperature (°C)	-20° to +120°	-60° to +250°	-30° to +120°
Color	Black	White	Blue
Hardness, shore A (°Sh)	55 ±5	55 ±5	55 ±5

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PBTM-20B-NBR-G1 becomes PBTM-20B-U-G1. Inquire with factory for availability.

Application guide

Bellows

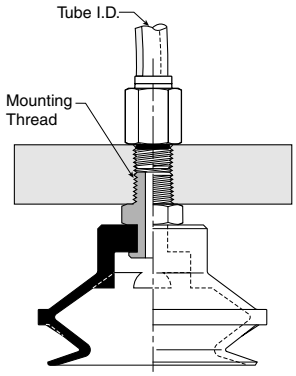
Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Bowed surface, any section	Soft porous material, any section	Differences in heights and levels	Corrugated sheet handling	Not for vertical lift	Metal sheet handling

PBTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. BSPP, NPT metric threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	M5	PBTM-10A-NBR-M5	PBG-10A-NBR	PBTM-10A-SI-M5	PBG-10A-SI	FTM-5A-M5
10	1/8 BSPP	PBTM-10A-NBR-G1	PBG-10A-NBR	PBTM-10A-SI-G1	PBG-10A-SI	FTM-5A-G1
15	M5	PBTM-15A-NBR-M5	PBG-15A-NBR	PBTM-15A-SI-M5	PBG-15A-SI	FTM-5A-M5
15	1/8 BSPP	PBTM-15A-NBR-G1	PBG-15A-NBR	PBTM-15A-SI-G1	PBG-15A-SI	FTM-5A-G1
20	1/8 BSPP	PBTM-20B-NBR-G1	PBG-20B-NBR	PBTM-20B-SI-G1	PBG-20B-SI	FTM-20B-G1
20	1/4 BSPP	PBTM-20B-NBR-G2	PBG-20B-NBR	PBTM-20B-SI-G2	PBG-20B-SI	FTM-20B-G2
20	M10	PBTM-20B-NBR-M10	PBG-20B-NBR	PBTM-20B-SI-M10	PBG-20B-SI	FTM-20B-M10
20	1/8 NPT	PBTM-20B-NBR-N1	PBG-20B-NBR	PBTM-20B-SI-N1	PBG-20B-SI	FTM-20B-N1
30	1/8 BSPP	PBTM-30-NBR-G1	PBG-30-NBR	PBTM-30-SI-G1	PBG-30-SI	FTM-20B-G1
30	1/4 BSPP	PBTM-30-NBR-G2	PBG-30-NBR	PBTM-30-SI-G2	PBG-30-SI	FTM-20B-G2
30	M10	PBTM-30-NBR-M10	PBG-30-NBR	PBTM-30-SI-M10	PBG-30-SI	FTM-20B-M10
30	1/8 NPT	PBTM-30-NBR-N1	PBG-30-NBR	PBTM-30-SI-N1	PBG-30-SI	FTM-20B-N1
40	1/8 BSPP	PBTM-40-NBR-G1	PBG-40-NBR	PBTM-40-SI-G1	PBG-40-SI	FTM-20B-G1
40	1/4 BSPP	PBTM-40-NBR-G2	PBG-40-NBR	PBTM-40-SI-G2	PBG-40-SI	FTM-20B-G2
40	M10	PBTM-40-NBR-M10	PBG-40-NBR	PBTM-40-SI-M10	PBG-40-SI	FTM-20B-M10
40	1/8 NPT	PBTM-40-NBR-N1	PBG-40-NBR	PBTM-40-SI-N1	PBG-40-SI	FTM-20B-N1
50	1/8 BSPP	PBTM-50-NBR-G1	PBG-50-NBR	PBTM-50-SI-G1	PBG-50-SI	FTM-50-G1
50	1/4 BSPP	PBTM-50-NBR-G2	PBG-50-NBR	PBTM-50-SI-G2	PBG-50-SI	FTM-50-G2
50	1/8 NPT	PBTM-50-NBR-N1	PBG-50-NBR	PBTM-50-SI-N1	PBG-50-SI	FTM-50-N1
75	1/4 BSPP	PBTM-75-NBR-G2	PBG-75-NBR	PBTM-75-SI-G2	PBG-75-SI	FTM-60-G2
75	M10	PBTM-75-NBR-M10	PBG-75-NBR	PBTM-75-SI-M10	PBG-75-SI	FTM-60-M10
75	1/4 NPT	PBTM-75-NBR-N2	PBG-75-NBR	PBTM-75-SI-N2	PBG-75-SI	FTM-60-N2

A

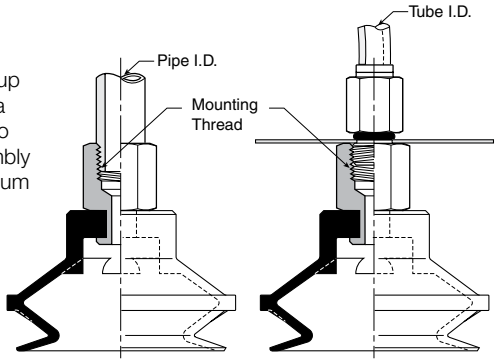
PBTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. BSPP, NPT metric threads.

Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



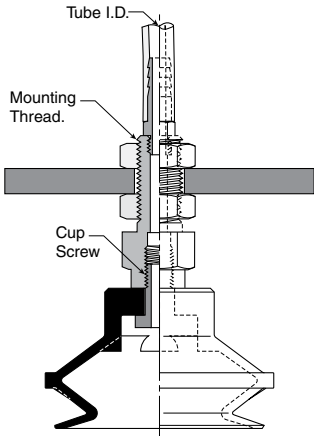
Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	1/8 BSPP	PBTF-10A-NBR-G1	PBG-10A-NBR	PBTF-10A-SI-G1	PBG-10A-SI	FTF-5A-G1
10	M5	PBTF-10A-NBR-M5	PBG-10A-NBR	PBTF-10A-SI-M5	PBG-10A-SI	FTF-5A-M5
15	1/8 BSPP	PBTF-15A-NBR-G1	PBG-15A-NBR	PBTF-15A-SI-G1	PBG-15A-SI	FTF-5A-G1
15	M5	PBTF-15A-NBR-M5	PBG-15A-NBR	PBTF-15A-SI-M5	PBG-15A-SI	FTF-5A-M5
20	1/8 BSPP	PBTF-20B-NBR-G1	PBG-20B-NBR	PBTF-20B-SI-G1	PBG-20B-SI	FTF-20B-G1
20	1/8 NPT	PBTF-20B-NBR-N1	PBG-20B-NBR	PBTF-20B-SI-N1	PBG-20B-SI	FTF-20B-N1
30	1/8 BSPP	PBTF-30-NBR-G1	PBG-30-NBR	PBTF-30-SI-G1	PBG-30-SI	FTF-20B-G1
30	1/8 NPT	PBTF-30-NBR-N1	PBG-30-NBR	PBTF-30-SI-N1	PBG-30-SI	FTF-20B-N1
30	1/4 BSPP	PBTF-30-NBR-G2	PBG-30-NBR	PBTF-30-SI-G2	PBG-30-SI	FTF-20B-G2
40	1/8 BSPP	PBTF-40-NBR-G1	PBG-40-NBR	PBTF-40-SI-G1	PBG-40-SI	FTF-20B-G1
40	1/8 NPT	PBTF-40-NBR-N1	PBG-40-NBR	PBTF-40-SI-N1	PBG-40-SI	FTF-20B-N1
40	1/4 BSPP	PBTF-40-NBR-G2	PBG-40-NBR	PBTF-40-SI-G2	PBG-40-SI	FTF-20B-G2
50	1/8 BSPP	PBTF-50-NBR-G1	PBG-50-NBR	PBTF-50-SI-G1	PBG-50-SI	FTF-50-G1
50	1/4 BSPP	PBTF-50-NBR-G2	PBG-50-NBR	PBTF-50-SI-G2	PBG-50-SI	FTF-50-G2
50	1/8 NPT	PBTF-50-NBR-N1	PBG-50-NBR	PBTF-50-SI-N1	PBG-50-SI	FTF-50-N1
75	1/4 BSPP	PBTF-75-NBR-G2	PBG-75-NBR	PBTF-75-SI-G2	PBG-75-SI	FTF-60-G2
75	1/4 NPT	PBTF-75-NBR-N2	PBG-75-NBR	PBTF-75-SI-N2	PBG-75-SI	FTF-60-N2
110	1/2 BSPP	PBTF-110-NBR-G4	PBG-110-NBR	PBTF-110-SI-G4	PBG-110-SI	FTF-120-G4
110	1/2 NPT	PBTF-110-NBR-N4	PBG-110-NBR	PBTF-110-SI-N4	PBG-110-SI	FTF-120-N4
150	1/2 BSPP	PBTF-150-NBR-G4	PBG-150-NBR	PBTF-150-SI-G4	PBG-150-SI	FTF-120-G4
150	1/2 NPT	PBTF-150-NBR-N4	PBG-150-NBR	PBTF-150-SI-N4	PBG-150-SI	FTF-120-N4

PBTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting materials: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	PBTK-10A-NBR	PBG-10A-NBR	PBTK-10A-SI	PBG-10A-SI	FTK-5A
15	Barb	PBTK-15A-NBR	PBG-15A-NBR	PBTK-15A-SI	PBG-15-SI	FTK-5A
20	Barb	PBTK-20-NBR	PBG-20-NBR	PBTK-20-SI	PBG-20-SI	FTK-20
30	Barb	PBTK-30-NBR	PBG-30-NBR	PBTK-30-SI	PBG-30-SI	FTK-25
40	Barb	PBTK-40-NBR	PBG-40-NBR	PBTK-40-SI	PBG-40-SI	FTK-25
50	Barb	PBTK-50-NBR	PBG-50-NBR	PBTK-50-SI	PBG-50-SI	FTK-50
75	1/8 BSPP	PBTK-75-NBR-G1	PBG-75-NBR	PBTK-75-SI-G1	PBG-75-SI	FTK-60-G1
75	1/8 NPT	PBTK-75-NBR-N1	PBG-75-NBR	PBTK-75-SI-N1	PBG-75-SI	FTK-60-N1

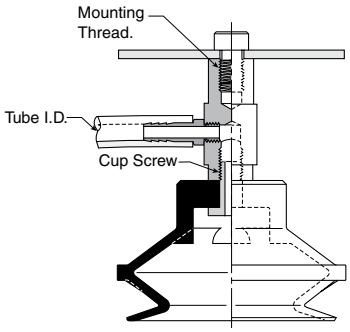
A

PBYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or “L” bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	PBYK-10A-NBR	PBG-10A-NBR	PBYK-10A-SI	PBG-10A-SI	FYK-5A
15	Barb	PBYK-15A-NBR	PBG-15A-NBR	PBYK-15A-SI	PBG-15A-SI	FYK-15
20	Barb	PBYK-20-NBR	PBG-20-NBR	PBYK-20-SI	PBG-20-SI	FYK-20
30	Barb	PBYK-30-NBR	PBG-30-NBR	PBYK-30-SI	PBG-30-SI	FYK-25
40	Barb	PBYK-40-NBR	PBG-40-NBR	PBYK-40-SI	PBG-40-SI	FYK-25
50	Barb	PBYK-50-NBR	PBG-50-NBR	PBYK-50-SI	PBG-50-SI	FYK-50
75	1/8 BSPP	PBYK-75-NBR-G1	PBG-75-NBR	PBYK-75-SI-G1	PBG-75-SI	FYK-60-G1
75	1/8 NPT	PBYK-75-NBR-N1	PBG-75-NBR	PBYK-75-SI-N1	PBG-75-SI	FYK-60-N1
110	1/8 BSPP	PBYK-110-NBR-G1	PBG-110-NBR	PBYK-110-SI-G1	PBG-110-SI	FYK-120-G1
110	1/8 NPT	PBYK-110-NBR-N1	PBG-110-NBR	PBYK-110-SI-N1	PBG-110-SI	FYK-120-N1
150	1/8 BSPP	PBYK-150-NBR-G1	PBG-150-NBR	PBYK-150-SI-G1	PBG-150-SI	FYK-120-G1
150	1/8 NPT	PBYK-150-NBR-N1	PBG-150-NBR	PBYK-150-SI-N1	PBG-150-SI	FYK-120-N1

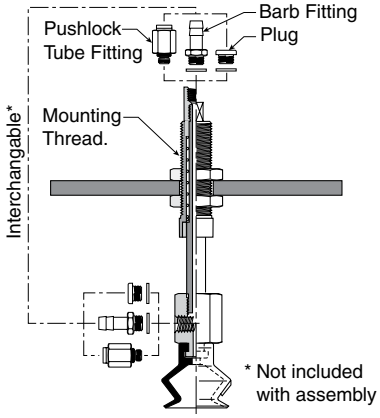
A

PBTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.
Shown are interchangable connectors & plugs for port connections.

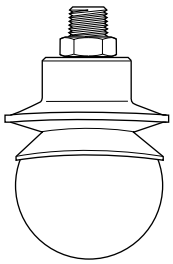


Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	Cup material Nitrile assemlby (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
10	M5	10	.11 (.49)	.13 (.59)	PBTYS10A10NBRM5	PBG-10A-NBR	PBTYS10A10SIM5	PBG-10A-SI	FTYS-5A-10-M5
10	M5	15	.11 (.49)	.13 (.59)	PBTYS10A15NBRM5	PBG-10A-NBR	PBTYS10A15SIM5	PBG-10A-SI	FTYS-5A-15-M5
15	M5	10	.11 (.49)	.13 (.59)	PBTYS15A10NBRM5	PBG-15A-NBR	PBTYS15A10SIM5	PBG-15A-SI	FTYS-5A-10-M5
15	M5	15	.11 (.49)	.13 (.59)	PBTYS15A15NBRM5	PBG-15A-NBR	PBTYS15A15SIM5	PBG-15A-SI	FTYS-5A-15-M5
20	M5	15	.56 (2.5)	.79 (3.4)	PBTYS20B15NBRM5	PBG-20B-NBR	PBTYS20B15SIM5	PBG-20B-SI	FTYS-20B-15-M5
20	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS20B30NBRM5	PBG-20B-NBR	PBTYS20B30SIM5	PBG-20B-SI	FTYS-20B-30-M5
30	M5	15	.56 (2.5)	.79 (3.4)	PBTYS3015NBRM5	PBG-30-NBR	PBTYS3015SIM5	PBG-30-SI	FTYS-20B-15-M5
30	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS3030NBRM5	PBG-30-NBR	PBTYS3030SIM5	PBG-30-SI	FTYS-20B-30-M5
40	M5	15	.56 (2.5)	.79 (3.4)	PBTYS4015NBRM5	PBG-40-NBR	PBTYS4015SIM5	PBG-40-SI	FTYS-20B-15-M5
40	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS4030NBRM5	PBG-40-NBR	PBTYS4030SIM5	PBG-40-SI	FTYS-20B-30-M5
50	M5	15	.56 (2.5)	1.2 (4.9)	PBTYS5015NBRM5	PBG-50-NBR	PBTYS5015SIM5	PBG-50-SI	FTYS-50-15-M5
50	M5	30	.67 (2.9)	1.4 (5.9)	PBTYS5030NBRM5	PBG-50-NBR	PBTYS5030SIM5	PBG-50-SI	FTYS-50-30-M5
75	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PBTYS7530NBRG1	PBG-75-NBR	PBTYS7530SIG1	PBG-75-SI	FTYS-60-30-G1
75	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PBTYS7550NBRG1	PBG-75-NBR	PBTYS7550SIG1	PBG-75-SI	FTYS-60-50-G1
110	1/4 BSPP	20	3.6 (15.6)	6.8 (29)	PBTYS12020NBRG2	PBG-110-NBR	PBTYS11020SIG2	PBG-110-SI	FTYS-120-20-G2
110	1/4 BSPP	50	3.4 (14.7)	6.8 (29)	PBTYS12050NBRG2	PBG-110-NBR	PBTYS11050SIG2	PBG-110-SI	FTYS-120-50-G2
150	1/4 BSPP	20	3.6 (15.6)	6.8 (29)	PBTYS15020NBRG2	PBG-150-NBR	PBTYS15020SIG2	PBG-150-SI	FTYS-120-20-G2
150	1/4 BSPP	50	3.4 (14.7)	6.8 (29)	PBTYS15050NBRG2	PBG-150-NBR	PBTYS15050SIG2	PBG-150-SI	FTYS-120-50-G2

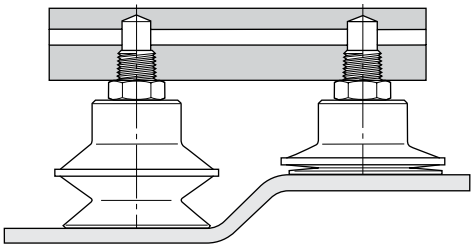
A

Applications

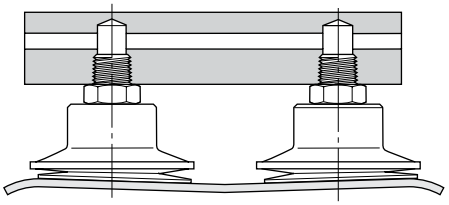
- Round objects



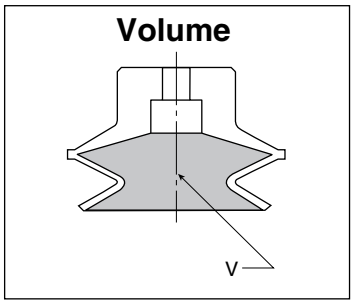
- Uneven surfaces
- Curved product
- Level compensation

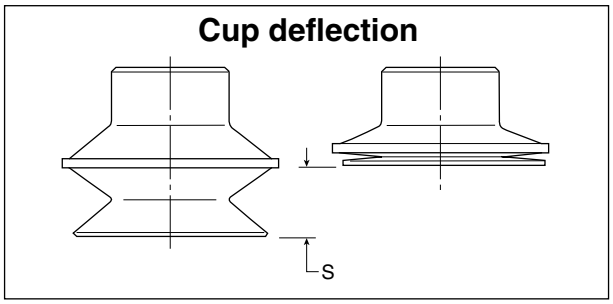


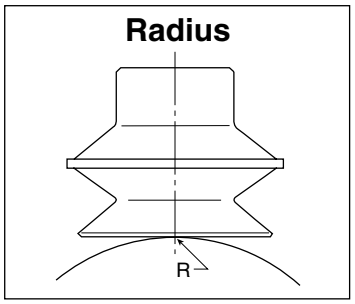
- Flexible product
- Soft seal lip



Main data for bellows PBG cups







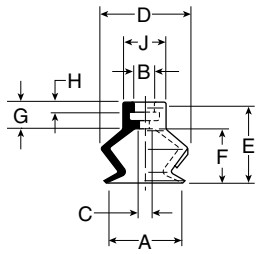
Model number	Cup diameter mm	Area cm²	Volume (V) liters	Lifting force @60% (N)		Cup deflection (S) mm	Radius (R) mm
PBG-10A-*	10	0.79	.0002	4.80	—	4	4
PBG-15A-*	15	1.77	.0007	10.80	—	6	6
PBG-20-*	20	3.14	.001	19.20	—	9	8
PBG-20B-*	20	3.14	.001	19.20	—	9	8
PBG-30-*	30	7.07	.004	43.2	—	13	15
PBG-40-*	40	12.60	.009	76.9	—	13	30
PBG-50-*	50	19.60	.026	120	—	20	40
PBG-75-*	75	44.02	.076	270	—	22	70
PBG-110-*	110	95.00	.111	434	—	29	100
PBG-150-*	150	176.70	.260	1081	—	38	130

* Cup material

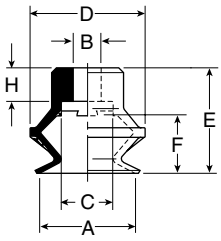
A

PBG Series Replacement Cup Dimensions

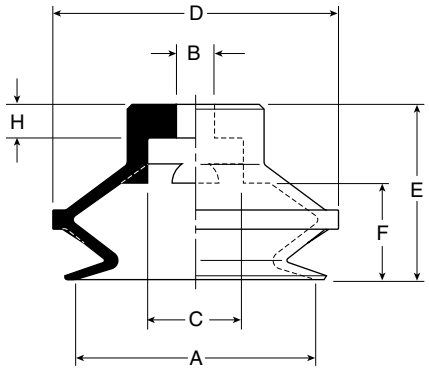
PBG-10A and PBG-20B



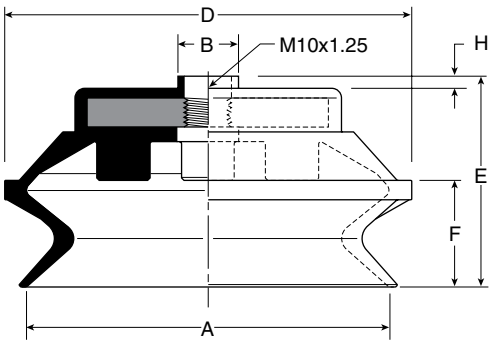
PBG-20 thru PBG-40



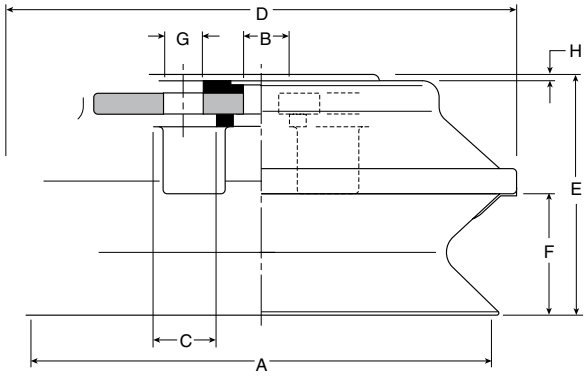
PBG-50



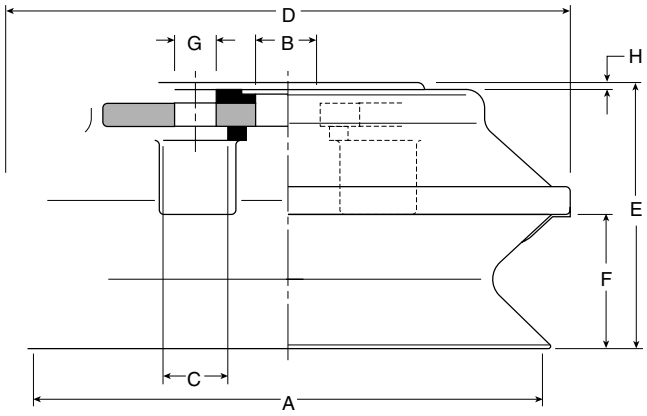
PBG-75



PBG-110



PBG-150



Dimensions (mm)

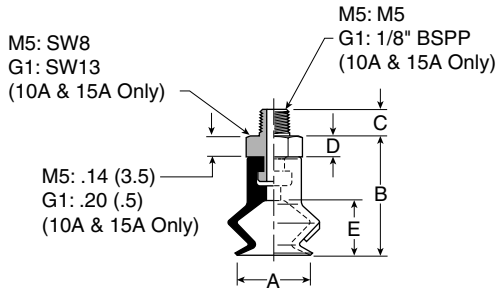
Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PBG-10A-*	10.6	4	2	12.4	13.5	7.5	6	2	6
PBG-15A-*	15	4	4	17	16	10	6	2	6
PBG-20B-*	20	6	10.8	24	22	12	—	7	—
PBG-20-*	20	4.6	10.8	24	19.5	12	—	4.5	—
PBG-30-*	30	5.8	10.8	36	30.5	17	—	7	—
PBG-40-*	40	5.8	10.8	46	30.5	15.5	—	7	—
PBG-50-*	50	7.8	19.8	59.5	36.5	20	—	7	—
PBG-75-*	75	12.5	—	84	43.5	22	—	2.5	—
PBG-110-*	110	14	14	122	57.5	29	—	1.5	—
PBG-150-*	150	20	14	167	76.5	38	4xØ9xØ40	1.5	—

* Cup material

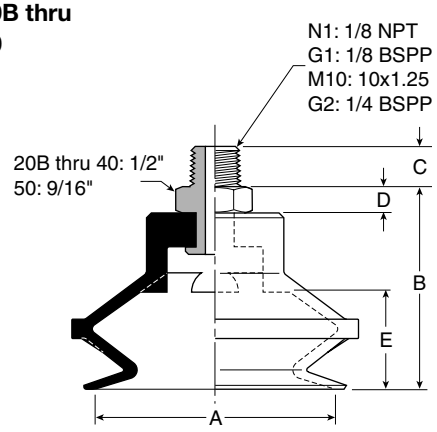
A

Dimensions

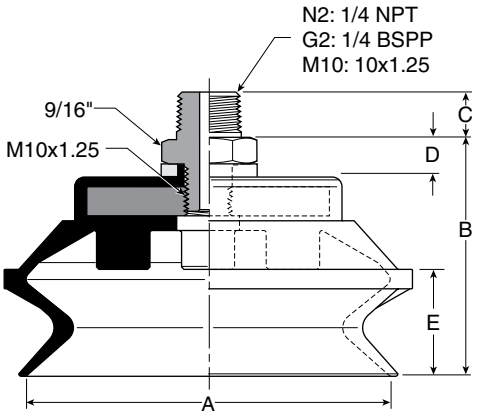
PBTM-10A thru PBTM-15



PBTM-20B thru PBTM-50



PBTM-75



Dimensions (mm)

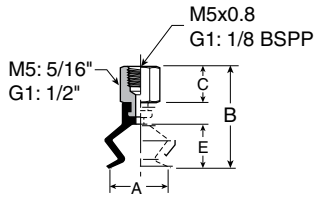
Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PBTM-10A-*-†	10	17	4.5	8	—	—	See Dwg.	7.5
PBTM-15A-*-†	15	19.5	4.5	8	—	—	See Dwg.	10
PBTM-20B-*-†	20	27	—	8	10	—	5	12
PBTM-30-*-†	30	35.5	—	8	10	—	5	17
PBTM-40-*-†	40	35.5	—	8	10	—	5	15.5
PBTM-50-*-†	50	41.5	—	8	10	—	5	20
PBTM-75-*-†	95	50.5	—	—	10	15	7	22

* Cup material
† Thread size

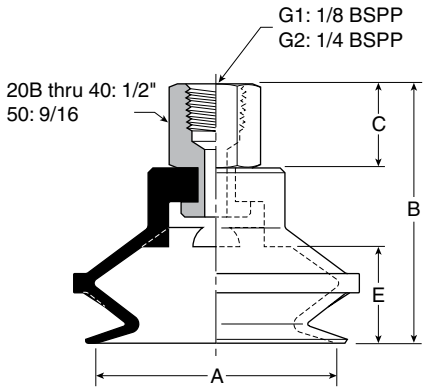
A

Dimensions

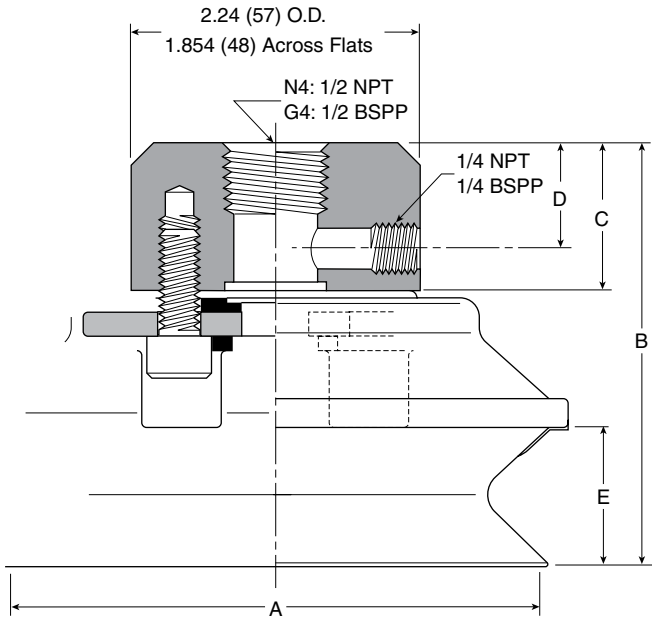
PBTF-10A thru
PBTF-15A



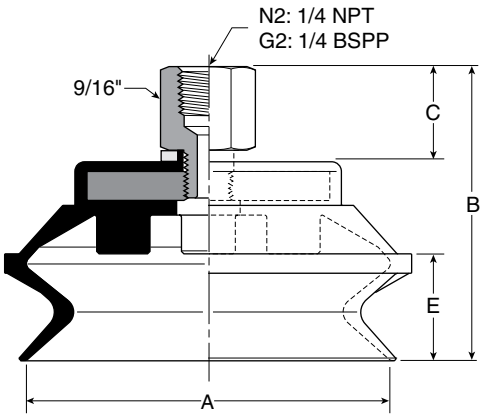
PBTF-20B thru
PBTF 50



PBTF-110 thru
PBTF-150



PBTF-75



Dimensions (mm)

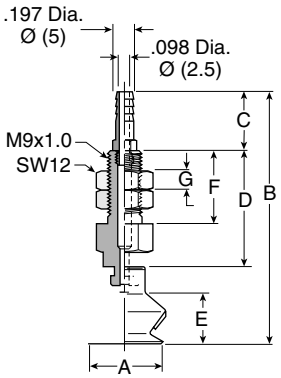
Model number	ØA	B	B (M5)	C	C (M5)	D	E
PBTF-10A-*-†	10	21.5	27.5	8	14	—	7.5
PBTF-15A-*-†	15	24	30	8	14	—	10
PBTF-20B-*-†	20	36	—	14	—	—	12
PBTF-30-*-†	30	44.5	—	14	—	—	17
PBTF-40-*-†	40	44.5	—	14	—	—	15.5
PBTF-50-*-†	50	50.5	—	14	—	—	20
PBTF-75-*-†	95	60.5	—	19.5	—	—	22
PBTF-110-*-†	120	78	—	24	—	13	29
PBTF-150-*-†	150	97	—	24	—	13	38

* Cup material
† Thread size

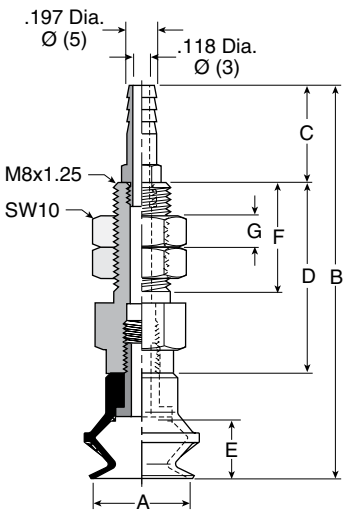
A

Dimensions

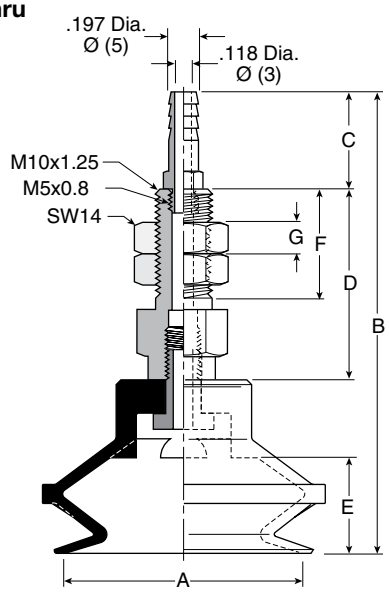
PBTK-10A thru PBTK-15A



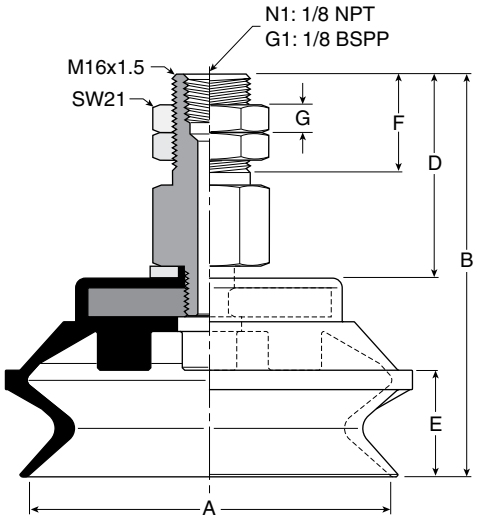
PBTK-20



PBTK-30 thru PBTK-50



PBTK-75



Dimensions (mm)

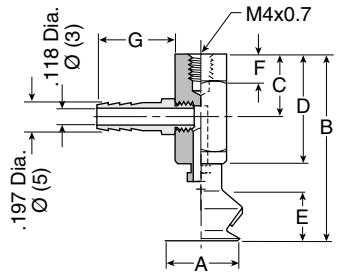
Model number	ØA	B	C	D	E	F	G	Wt g
PBTK-10A-*	10	52	10	22.5	7.5	6	15.5	15
PBTK-15A-*	15	54.5	10	22.5	10	6	15.5	15
PBTK-20-*	20	57.5	16	22	12	6	15	21
PBTK-30-*	30	78.5	16	32	17	6	20	45
PBTK-40-*	40	78.5	16	32	15.5	6	20	48
PBTK-50-*	50	84.5	16	32	20	6	20	62
PBTK-75-*-†	95	83.5	—	42.5	22	11	—	186

* Cup material
† Vacuum port

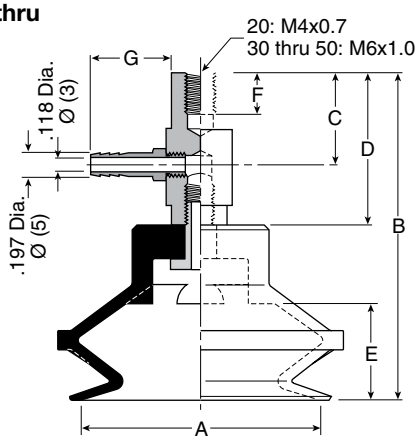
A

Dimensions

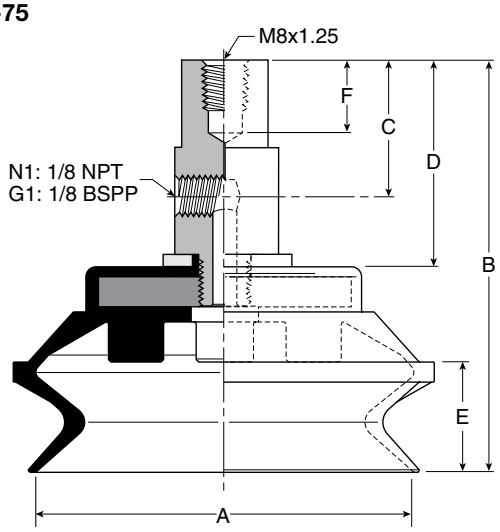
PBYK-10A thru PBYK-15A



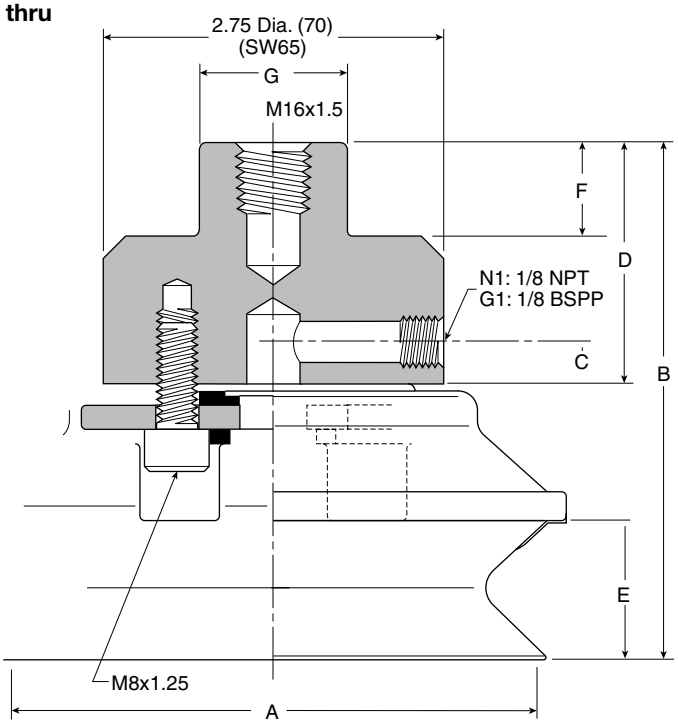
PBYK-20 thru PBYK-50



PBYK-75



PBYK-110 thru PBYK-150



Dimensions (mm)

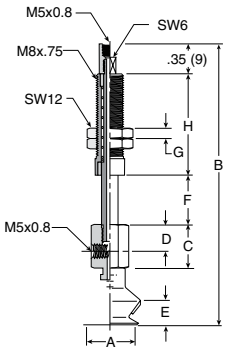
Model number	ØA	B	C	D	E	F	G	Wt g
PBYK-10A-*	10	36	13	22.5	7.5	6	16	16
PBYK-15A-*	15	38.5	13	22.5	10	6	16	16
PBYK-20-*	20	41.5	14	22	12	6	16	21
PBYK-30-*	30	62.5	20	32	17	6	16	45
PBYK-40-*	40	62.5	20	32	15.5	6	16	58
PBYK-50-*	50	68.5	20	32	20	6	16	67
PBYK-75-*-†	95	83.5	28	42.5	22	11	—	176
PBYK-110-*-†	120	106	12	50	29	20	Dia. 30	670
PBYK-150-*-†	150	125	12	50	38	20	Dia. 30	1180

* Cup material
† Vacuum port

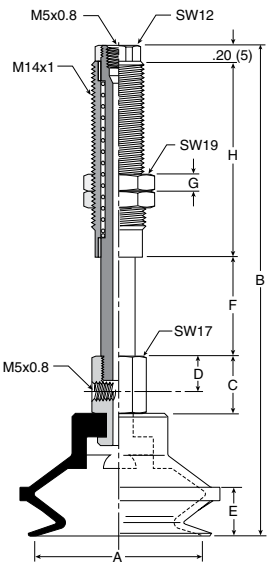
A

Dmensions

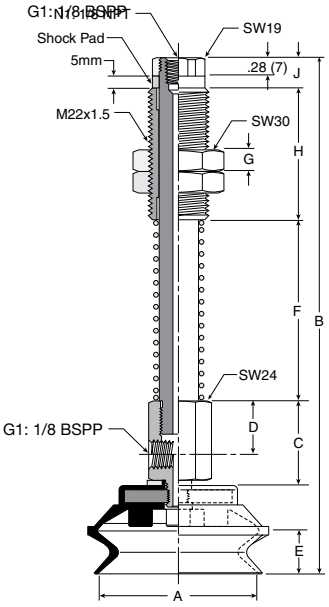
PBTYS10A thru PBTYS15A1



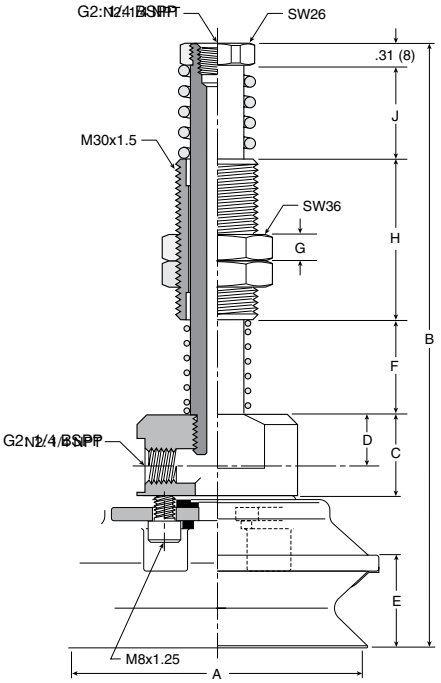
PBTYS20B thru PBTYS50



PBTYS75



PBTYS110 thru PBTYS150



Dimensions (mm)

Model number	ØA	B	C	D	E	F	G	H	J	Wt g
PBTYS10A10*	10	68.5	13	8	7.5	10	3	23	—	18.5
PBTYS10A15*	10	81	13	8	7.5	15	3	30.5	—	21
PBTYS15A10*	15	71	13	8	10	10	3	23	—	18.5
PBTYS15A15*	15	83.5	13	8	10	15	3	30.5	—	21
PBTYS20B15*	20	99	17	10	12	15	5	36	—	72
PBTYS20B30*	20	136	17	10	12	30	5	58	—	97
PBTYS3015*†	30	103.5	17	10	17	15	5	36	—	97
PBTYS3030*†	30	140.5	17	10	17	30	5	58	—	102
PBTYS4015*†	40	103.5	17	10	15.5	15	5	36	—	83
PBTYS4030*†	40	140.5	17	10	15.5	30	5	58	—	108
PBTYS5015*†	50	109.5	17	10	20	15	5	36	—	97
PBTYS5030*†	50	146.5	17	10	20	30	5	58	—	122
PBTYS7530*†	75	178	32.5	20	22	45	10	50	12	339
PBTYS7550*†	75	203	32.5	20	22	70	10	50	12	373
PBTYS11020*†	110	224	30	18	29	35	10	60	35	1194
PBTYS11070*†	110	289	30	18	29	100	10	60	35	1276
PBTYS15020*†	150	243	30	18	38	35	10	60	35	1704
PBTYS15070*†	150	308	30	18	38	100	10	60	35	1786

* Cup material
† Vacuum port

A

The PAG Cups are ideal for paper feeding, plastic bags and foil. The choice between the 20A & 20B, 30 & 30B is application dependent. The 20A & 30B cups have a thinner lip design than the 20B & 30 cups. This thinner lip design is more suited to products with micron thickness.

Features

- Bellows design for level compensation within restricted clearances
- Sheet separation for flexible and stacked products
- Soft seal lip for flexible products
- 10mm to 50mm diameters

Styles

- PATM Series Male Thread Connector
- PATK Series Barbed Bulkhead
- PAYK Series 90° Barbed Adapter

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	**NBR**	**NBRE**	**SI**	**SIE**	**U**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	–	800 to 1000	–	800 to 1000	–

* ESD: Electric Static Dissipative Material

How to order

Cups Assemblies and replacement cups are specified by Cup Diameter and Material. Standard Nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with Urethane (U), replace (NBR) with (U) in the part number. PFTM-20B-NBR-G1 becomes PFTM-20B-U-G1. Inquire with factory for availability.

Application guide

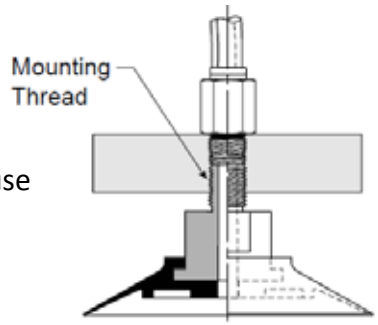
Thin – Smooth Surfaces

Flat surface, thin section

A

PATM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket.
Fitting Material: Aluminium.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

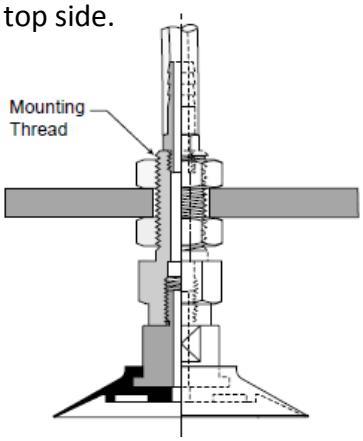
Cup Diameter (mm)	Vacuum Port	Complete Assembly Nitrile (NBR)	Replacement Cup Nitrile (NBR)	Complete Assembly Silicon (SI)	Replacement Cup Silicon (SI)	Replacement cup fitting
10	M5	PATM-10A-NBR-M5	PAG-10A-NBR	PATM-10A-SI-M5	PAG-10A-SI	FTM-5A-M5
15	M5	PATM-15A-NBR-M5	PAG-15A-NBR	PATM-15A-SI-M5	PAG-15A-SI	FTM-5A-M5
20	M5	PATM-20A-NBR-M5	PAG-20A-NBR	PATM-20A-SI-M5	PAG-20A-SI	FTM-5A-M5
25*	M6		PAG-25-NBR		PAG-25-SI	
30*	M6		PAG-30-NBR		PAG-30-SI	
40*	M6		PAG-40-NBR		PAG-40-SI	
50*	M6		PAG-50-NBR		PAG-50-SI	

* : From diameter 25 to 50, the PAG cup include the cup fitting

A

PATK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Nickel plated brass materials.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

Cup Diameter (mm)	Vacuum Port	Complete Assembly Nitrile (NBR)	Replacement Cup Nitrile (NBR)	Complete Assembly Silicon (SI)	Replacement Cup Silicon (SI)	Replacement cup fitting
10	Bard	PATK-10A-NBR	PAG-10A-NBR	PATK-10A-SI	PAG-10A-SI	FTK-5A
15	Bard	PATK-15A-NBR	PAG-15A-NBR	PATK-15A-SI	PAG-15A-SI	FTK-5A
20	Bard	PATK-20A-NBR	PAG-20A-NBR	PATK-20A-SI	PAG-20A-SI	FTK-5A
25	Bard	PATK-25-NBR	PAG-25-NBR	PATK-25-SI	PAG-25-SI	FTK-20B
30	Bard	PATK-30-NBR	PAG-30-NBR	PATK-30-SI	PAG-30-SI	FTK-20B
40	Bard	PATK-40-NBR	PAG-40-NBR	PATK-40-SI	PAG-40-SI	FTK-20B
50	Bard	PATK-50-NBR	PAG-50-NBR	PATK-50-SI	PAG-50-SI	FTK-20B

A

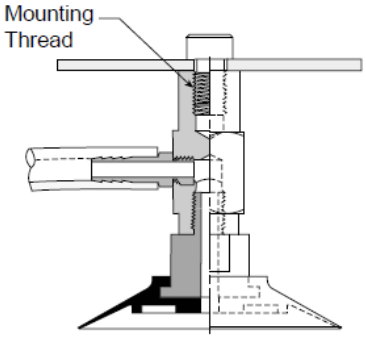
PAYK Series 90° Barbed Adapte

Side stem connectors allow you to secure the stem with a bolt through a plate or “L” bracket to allow the tube connection from the side port. Nickel plated brass materials.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

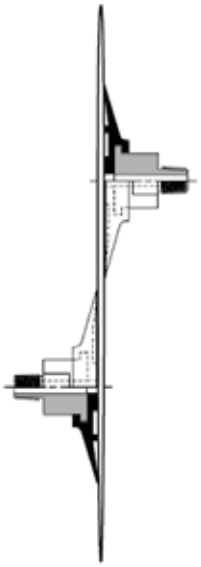


Cup Diameter (mm)	Vacuum Port	Complete Assembly Nitrile (NBR)	Replacement Cup Nitrile (NBR)	Complete Assembly Silicon (SI)	Replacement Cup Silicon (SI)	Replacement cup fitting
10	Bard	PAYK-10A-NBR	PAG-10A-NBR	PAYK-10A-SI	PAG-10A-SI	FYK-5A
15	Bard	PAYK-15A-NBR	PAG-15A-NBR	PAYK-15A-SI	PAG-15A-SI	FYK-5A
20	Bard	PAYK-20A-NBR	PAG-20A-NBR	PAYK-20A-SI	PAG-20A-SI	FYK-5A
25	Bard	PAYK-25-NBR	PAG-25-NBR	PAYK-25-SI	PAG-25-SI	FYK-20B
30	Bard	PAYK-30-NBR	PAG-30-NBR	PAYK-30-SI	PAG-30-SI	FYK-20B
40	Bard	PAYK-40-NBR	PAG-40-NBR	PAYK-40-SI	PAG-40-SI	FYK-20B
50	Bard	PAYK-50-NBR	PAG-50-NBR	PAYK-50-SI	PAG-50-SI	FYK-20B

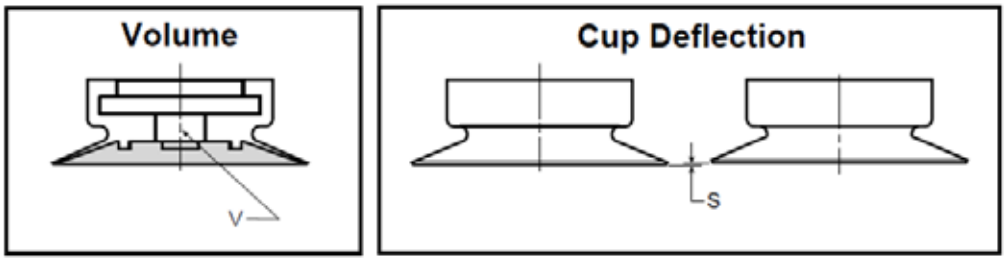
Applications

- Products With Smooth Surfaces
- Products With Micron Thickness

- When Opening Plastic or Paper Bags, Offset Cups



Main data for fat PAG cups



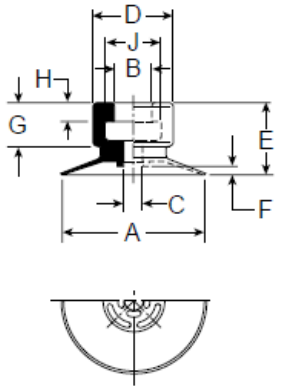
Model Number	Cup Diameter [mm]	Area [cm²]	Cup Deflection [S] [mm]
PAG-10A-*	10	0,79	0,6
PAG-15A-*	15	1,77	0,9
PAG-20A-*	20	3,14	1,2
PAG-25-*	25	4,91	1,5
PAG-30-*	30	7,07	1,8
PAG-40-*	40	12,60	2,4
PAG-50-*	40	19,60	3,0

Millimeter
* Cup Material

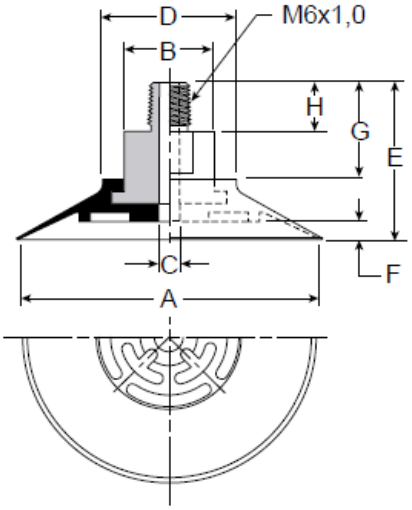
A

PAG Series Replacement Cup Dimensions

PAG-10A and PAG-20A



PAG-25 thru PAG-50



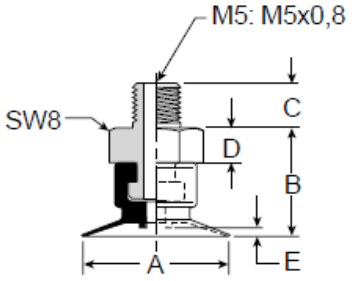
Model Number	ØA	ØB	ØC	ØD	E	F	G	H	J
PAG-10A-*	10	4	2	8,5	7,5	0,6	4	2	6
PAG-15A-*	15	4	2	8,5	7,5	0,9	4	2	6
PAG-20A-*	20	4	2	9	10	1,2	4	2	6
PAG-25-*	25	26	3	22	26	1,5	16	8	—
PAG-30-*	30	26	3	22	26	1,8	16	8	—
PAG-40-*	40	26	3	22	26	2,4	16	8	—
PAG-50-*	50	26	3	22	26	3	16	8	—

Millimeter
* Cup Material

A

Dimensions

PATM-10A thru PATM-20A



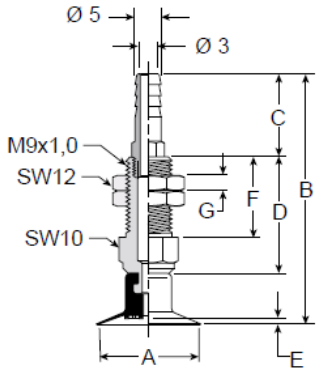
Model Number	ØA	B	C	D	E	F	G	H
PATM-10A-*-†	10	11	4,5	3,5	0,6	—	—	—
PATM-15A-*-†	15	11	4,5	3,5	0,9	—	—	—
PATM-20A-*-†	20	13,5	4,5	3,5	1,2	—	—	—

Millimeter
* Cup Material
† Thread Size

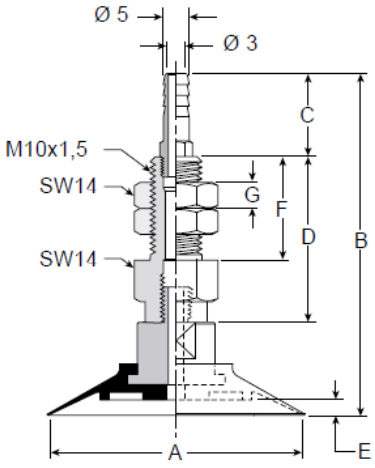
A

Dimensions

PATK-10A thru
PATK-20A



PATK-25 thru
PATK-50

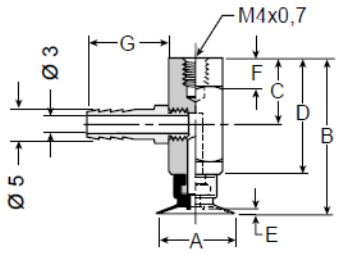


Model Number	ØA	B	C	D	E	F	G
PATK-10A-*	10	46	16	22,5	0,6	15,5	3
PATK-15A-*	15	46	16	22,5	0,9	15,5	3
PATK-20A-*	20	48,5	16	22,5	1,2	15,5	3
PATK-25-*	25	66,2	16	32,2	1,5	20	5
PATK-30-*	30	66,2	16	32,2	1,8	20	5
PATK-40-*	40	66,2	16	32,2	2,4	20	5
PATK-50-*	50	66,2	16	32,2	3	20	5

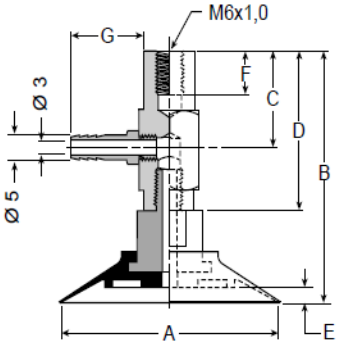
Millimeter
* Cup Material

Dimensions

PAYK-10A thru
PAYK-20A



PAYK-25 thru
PAYK-50



Model Number	ØA	B	C	D	E	F	G
PAYK-10A-*	10	30	13	22,5	0,6	6	16
PAYK-15A-*	15	30	13	22,5	0,9	6	16
PAYK-20A-*	20	32,4	20	22,5	1,2	6	16
PAYK-25-*	25	50	20	32	1,5	8	16
PAYK-30-*	30	50	20	32	1,8	8	16
PAYK-40-*	40	50	20	32	2,4	8	16
PAYK-50-*	50	50	20	32	3	8	16

Millimeter
* Cup Material

A

Features

- Double sealing lips for flexible sheet handling
- Vacuum cup grooves on underside increase holding area
- Resists acceleration and deceleration shear forces
- Strong low profile for fast response
- Metal insert fitting for stable vertical and horizontal lifts

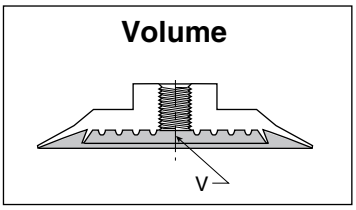
Applications

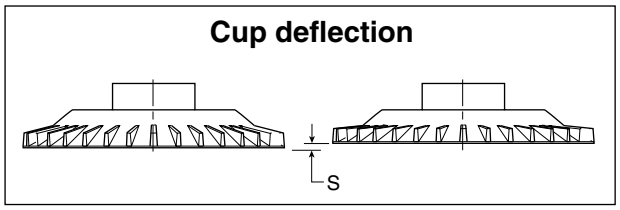
These suction cups are ideal for applications where the product may flex when being lifted. All cups have a double sealing lip and cleats to increase holding capacity.
The top of the cup has a ribbed outer lip to prevent it from rolling over the surface to be lifted.

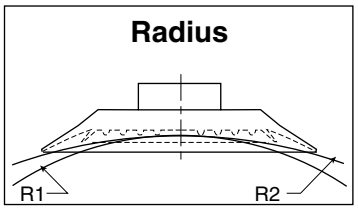
Dual sealing lips provide 2 seals for vacuum. As the product flexes, the outer lip seal may break, but the inner lip seal will hold the degree of vacuum for continued lifting capacity. In these types of applications, sizing should be done on the inner diameter cup dimension.

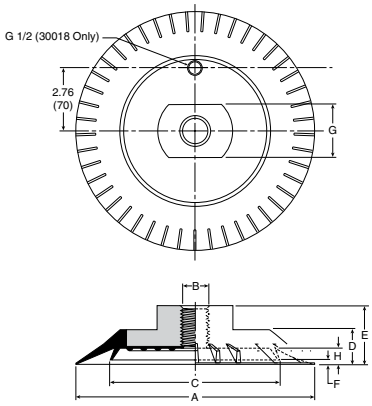
Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Area*** cm^2	Cup volume (V) liters	Deflection (S) (mm)	Radius R (mm)	
						R1*	R2**
50	1/8 BSPP	P5V-CFS05011N	19.6	.001	4	98	80
100	3/8 BSPP	P5V-CFS10013N	78.5	.0667	8	254	161
150	1/2 BSPP	P5V-CFS15014N	176.7	.2083	11	309	252

* Minimum permissible radius for lifting using inner lip.
** Minimum permissible radius for lifting using outer lip.
*** Area based on outer cup diameter









Dimensions (mm)

Model number	ØA	B	ØC	D	E	F	G	H
P5V-CFS50*	50	G1/8	35	11	18	2.2	13	3.7
P5V-CFS100*	100	G3/8	72	18	28	5	22	7.5
P5V-CFS150*	150	G1/2	106	26	42	7	27	11

* Cup material

A

Versatile bellow cup design provides increased sealing lip and level compensation for products with irregular, smooth, curved surfaces, or flexible sheets.

The short stroke bellow suction cup has an extra thin sealing edge and shorter stroke versus the traditional bellows for faster response. The cups are good for corrugated and smooth surfaces.

Features

- Short bellows for fast response
- More lip seal contact for corrugated, textured surfaces
- Soft sealing lip
- 6mm to 80mm

Styles

- PJTM series male thread connector
- PJTF series female thread connector
- PJTK series barbed bulkhead
- PJYK series 90° barbed adapter
- PJTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*
Material code	**NBR**	**NBRE**	**SI**	**SIE**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°
Color	Black	Black / Blue Dot	White	Black / Red Dot
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000

* ESD: Electric Static Dissipative Material

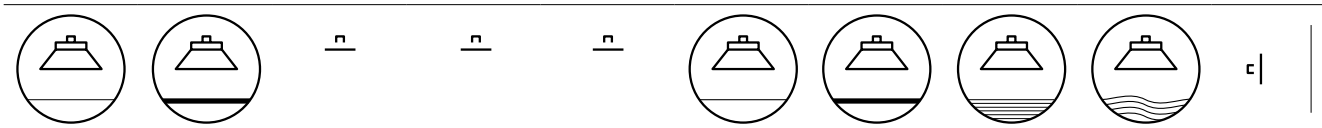
How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with silicon ESD (SIE), replace (NBR) with (SIE) in the part number. PJTM-20B-NBR-G1 becomes PJTM-20B-SIE-G1. Inquire with factory for availability.

Application guide

Short Bellows

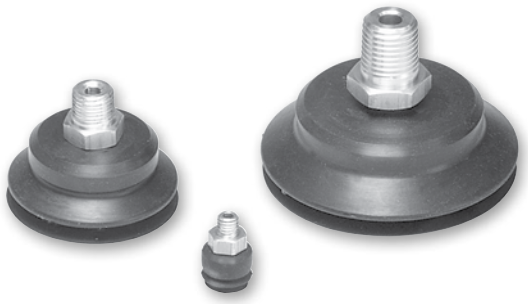


Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Soft porous material, thin section	Soft porous material, any section	Metal sheet handling	Corrugated sheet handling	Not for vertical lift

A

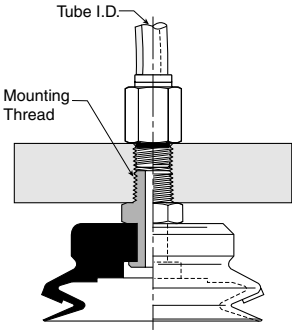
PJTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. BSPP, NPT metric threads.
Fitting material: aluminum.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile	Replacement cup Nitrile (NB)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	PJTM-6-NBR-M5	PJG-6-NBR	PJTM-6-SI-M5	PJG-6-SI	FTM-5A-M5
6	1/8 BSPP	PJTM-6-NBR-G1	PJG-6-NBR	PJTM-6-SI-G1	PJG-6-SI	FTM-5A-G1
8	M5	PJTM-8-NBR-M5	PJG-8-NBR	PJTM-8-SI-M5	PJG-8-SI	FTM-5A-M5
8	1/8 BSPP	PJTM-8-NBR-G1	PJG-8-NBR	PJTM-8-SI-G1	PJG-8-SI	FTM-5A-G1
10	M5	PJTM-10-NBR-M5	PJG-10-NBR	PJTM-10-SI-M5	PJG-10-SI	TN-PF-15-M5
15	M5	PJTM-15-NBR-M5	PJG-15-NBR	PJTM-15-SI-M5	PJG-15-SI	TN-PF-15-M5
20	M5	PJTM-20-NBR-M5	PJG-20-NBR	PJTM-20-SI-M5	PJG-20-SI	TN-PF-20-M5
30	1/8 BSPP	PJTM-30-NBR-G1	PJG-30-NBR	PJTM-30-SI-G1	PJG-30-SI	FTM-20B-G1
30	1/4 BSPP	PJTM-30-NBR-G2	PJG-30-NBR	PJTM-30-SI-G2	PJG-30-SI	FTM-20B-G2
30	M10	PJTM-30-NBR-M10	PJG-30-NBR	PJTM-30-SI-M10	PJG-30-SI	FTM-20B-M10
30	1/8 NPT	PJTM-30-NBR-N1	PJG-30-NBR	PJTM-30-SI-N1	PJG-30-SI	FTM-20B-N1
40	1/8 BSPP	PJTM-40-NBR-G1	PJG-40-NBR	PJTM-40-SI-G1	PJG-40-SI	FTM-20B-G1
40	1/4 BSPP	PJTM-40-NBR-G2	PJG-40-NBR	PJTM-40-SI-G2	PJG-40-SI	FTM-20B-G2
40	M10	PJTM-40-NBR-M10	PJG-40-NBR	PJTM-40-SI-M10	PJG-40-SI	FTM-20B-M10
40	1/8 NPT	PJTM-40-NBR-N1	PJG-40-NBR	PJTM-40-SI-N1	PJG-40-SI	FTM-20B-N1
50	1/8 BSPP	PJTM-50-NBR-G1	PJG-50-NBR	PJTM-50-SI-G1	PJG-50-SI	FTM-50-G1
50	1/4 BSPP	PJTM-50-NBR-G2	PJG-50-NBR	PJTM-50-SI-G2	PJG-50-SI	FTM-50-G2
50	1/8 NPT	PJTM-50-NBR-N1	PJG-50-NBR	PJTM-50-SI-N1	PJG-50-SI	FTM-50-N1
60	1/4 BSPP	PJTM-60-NBR-G2	PJG-60-NBR	PJTM-60-SI-G2	PJG-60-SI	FTM-60-G2
60	M10	PJTM-60-NBR-M10	PJG-60-NBR	PJTM-60-SI-M10	PJG-60-SI	FTM-60-M10
60	1/4 NPT	PJTM-60-NBR-N2	PJG-60-NBR	PJTM-60-SI-N2	PJG-60-SI	FTM-60-N2
80	1/4 BSPP	PJTM-80-NBR-G2	PJG-80-NBR	PJTM-80-SI-G2	PJG-80-SI	FTM-60-G2
80	M10	PJTM-80-NBR-M10	PJG-80-NBR	PJTM-80-SI-M10	PJG-80-SI	FTM-60-M10
80	1/4 NPT	PJTM-80-NBR-N2	PJG-80-NBR	PJTM-80-SI-N2	PJG-80-SI	FTM-60-N2

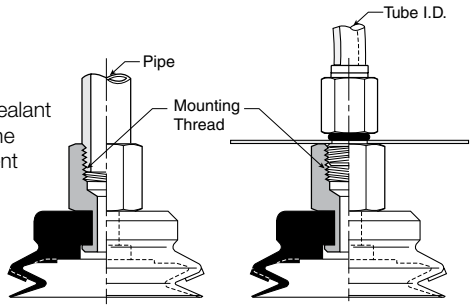
PJTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. BSPP, NPT metric threads.

Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile	Replacement cup Nitrile (NB)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	PJTF-6-NBR-M5	PJG-6-NBR	PJTF-6-SI-M5	PJG-6-SI	FTF-5A-M5
6	1/8 BSPP	PJTF-6-NBR-G1	PJG-6-NBR	PJTF-6-SI-G1	PJG-6-SI	FTF-5A-G1
8	M5	PJTF-8-NBR-M5	PJG-8-NBR	PJTF--8-SI-M5	PJG-8-SI	FTF-5A-M5
8	1/8 BSPP	PJTF-8-NBR-G1	PJG-8-NBR	PJTF--8-SI-G1	PJG-8-SI	FTF-5A-G1
10	M5	PJTF-10-NBR-M5	PJG-10-NBR	PJTF-10-SI-M5	PJG-10-SI	FTF-5A-M5
10	1/8 BSPP	PJTF-10-NBR-G1	PJG-10-NBR	PJTF-10-SI-G1	PJG-10-SI	FTF-5A-G1
15	M5	PJTF-15-NBR-M5	PJG-15-NBR	PJTF-15-SI-M5	PJG-15-SI	FTF-5A-M5
15	1/8 BSPP	PJTF-15-NBR-G1	PJG-15-NBR	PJTF-15-SI-G1	PJG-15-SI	FTF-5A-G1
30	1/8 BSPP	PJTF-30-NBR-G1	PJG-30-NBR	PJTF-30-SI-G1	PJG-30-SI	FTF-20B-G1
30	1/4 BSPP	PJTF-30-NBR-G2	PJG-30-NBR	PJTF-30-SI-G2	PJG-30-SI	FTF-20B-G2
40	1/8 BSPP	PJTF-40-NBR-G1	PJG-40-NBR	PJTF-40-SI-G1	PJG-40-SI	FTF-20B-G1
40	1/4 BSPP	PJTF-40-NBR-G2	PJG-40-NBR	PJTF-40-SI-G2	PJG-40-SI	FTF-20B-G2
50	1/8 BSPP	PJTF-50-NBR-G1	PJG-50-NBR	PJTF-50-SI-G1	PJG-50-SI	FTF-50-G1
50	1/4 BSPP	PJTF-50-NBR-G2	PJG-50-NBR	PJTF-50-SI-G2	PJG-50-SI	FTF-50-G2
60	1/4 BSPP	PJTF-60-NBR-G2	PJG-60-NBR	PJTF-60-SI-G2	PJG-60-SI	FTF-60-G2
60	1/4 NPT	PJTF-60-NBR-N2	PJG-60-NBR	PJTF-60-SI-N2	PJG-60-SI	FTF-60-N2
80	1/4 BSPP	PJTF-80-NBR-G2	PJG-80-NBR	PJTF-80-SI-G2	PJG-80-SI	FTF-60-G2
80	1/4 NPT	PJTF-80-NBR-N2	PJG-80-NBR	PJTF-80-SI-N2	PJG-80-SI	FTF-60-N2

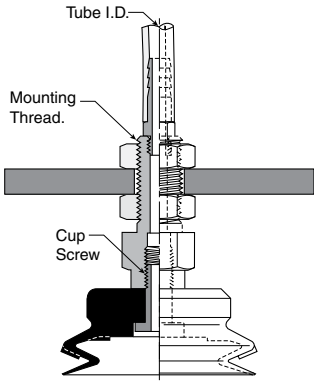
A

PJTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile	Replacement cup Nitrile (NB)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	PJTK-6-NBR	PJG-6-NBR	PJTK-6-SI	PJG-6-SI	FTK-5A
8	Barb	PJTK-8-NBR	PJG-8-NBR	PJTK-8-SI	PJG-8-SI	FTK-5A
10	Barb	PJTK-10-NBR	PJG-10-NBR	PJTK-10-SI	PJG-10-SI	FTK-15
15	Barb	PJTK-15-NBR	PJG-15-NBR	PJTK-15-SI	PJG-15-SI	FTK-15
20	Barb	PJTK-20-NBR	PJG-20-NBR	PJTK-20-SI	PJG-20-SI	FTK-20
30	Barb	PJTK-30-NBR	PJG-30-NBR	PJTK-30-SI	PJG-30-SI	FTK-25
40	Barb	PJTK-40-NBR	PJG-40-NBR	PJTK-40-SI	PJG-40-SI	FTK-25
50	Barb	PJTK-50-NBR	PJG-50-NBR	PJTK-50-SI	PJG-50-SI	FTK-50
60	1/8 BSPP	PJTK-60-NBR-G1	PJG-60-NBR	PJTK-60-SI-G1	PJG-60-SI	FTK-60-G1
60	1/8 NPT	PJTK-60-NBR-N1	PJG-60-NBR	PJTK-60-SI-N1	PJG-60-SI	FTK-60-N1
80	1/8 BSPP	PJTK-80-NBR-G1	PJG-80-NBR	PJTK-80-SI-G1	PJG-80-SI	FTK-60-G1
80	1/8 NPT	PJTK-80-NBR-N1	PJG-80-NBR	PJTK-80-SI-N1	PJG-80-SI	FTK-60-N1

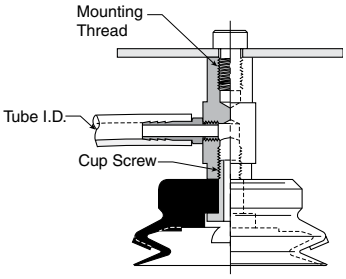
A

PJYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile	Replacement cup Nitrile (NB)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	PJYK-6-NBR	PJG-6-NBR	PJYK-6-SI	PJG-6-SI	FYK-5A
8	Barb	PJYK-8-NBR	PJG-8-NBR	PJYK-8-SI	PJG-8-SI	FYK-5A
10	Barb	PJYK-10-NBR	PJG-10-NBR	PJYK-10-SI	PJG-10-SI	FYK-15
15	Barb	PJYK-15-NBR	PJG-15-NBR	PJYK-15-SI	PJG-15-SI	FYK-15
20	Barb	PJYK-20-NBR	PJG-20-NBR	PJYK-20-SI	PJG-20-SI	FYK-20
30	Barb	PJYK-30-NBR	PJG-30-NBR	PJYK-30-SI	PJG-30-SI	FYK-25
40	Barb	PJYK-40-NBR	PJG-40-NBR	PJYK-40-SI	PJG-40-SI	FYK-25
50	Barb	PJYK-50-NBR	PJG-50-NBR	PJYK-50-SI	PJG-50-SI	FYK-50
60	1/8 BSPP	PJYK-60-NBR-G1	PJG-60-NBR	PJYK-60-SI-G1	PJG-60-SI	FYK-60-G1
60	1/8 NPT	PJYK-60-NBR-N1	PJG-60-NBR	PJYK-60-SI-N1	PJG-60-SI	FYK-60-N1
80	1/8 BSPP	PJYK-80-NBR-G1	PJG-80-NBR	PJYK-80-SI-G1	PJG-80-SI	FYK-60-G1
80	1/8 NPT	PJYK-80-NBR-N1	PJG-80-NBR	PJYK-80-SI-N1	PJG-80-SI	FYK-60-N1

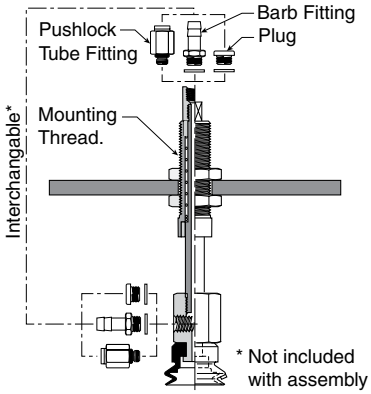
A

PJTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.
Shown are interchangable connectors & plugs for port connections.

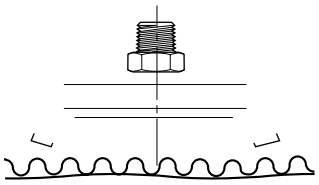


Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	Cup material Nitrile assemlby (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
10	M5	10	.56 (2.5)	1.2 (4.9)	PJTYS1010NBRM5	PJG-10-NBR	PJTYS1010SIM5	PJG-10-SI	JTYS-10-10-M5
10	M5	15	.67 (2.5)	1.4 (5.9)	PJTYS1015NBRM5	PJG-10-NBR	PJTYS1015SIM5	PJG-10-SI	JTYS-10-15-M5
15	M5	10	.56 (2.5)	1.2 (4.9)	PJTYS15A10NBRM5	PJG-15A-NBR	PJTYS15A10SIM5	PJG-15A-SI	JTYS-10-10-M5
15	M5	15	.67 (2.5)	1.4 (5.9)	PJTYS15A15NBRM5	PJG-15A-NBR	PJTYS15A15SIM5	PJG-15A-SI	JTYS-10-15-M5
30	M5	15	.56 (2.5)	.79 (3.4)	PJTYS3015NBRM5	PJG-30-NBR	PJTYS3015SIM5	PJG-30-SI	FTYS-20B-15-M5
30	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS3030NBRM5	PJG-30-NBR	PJTYS3030SIM5	PJG-30-SI	FTYS-20B-30-M5
40	M5	15	.56 (2.5)	.79 (3.4)	PJTYS4015NBRM5	PJG-40-NBR	PJTYS4015SIM5	PJG-40-SI	FTYS-20B-15-M5
40	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS4030NBRM5	PJG-40-NBR	PJTYS4030SIM5	PJG-40-SI	FTYS-20B-30-M5
50	M5	15	.56 (.25)	1.2 (4.9)	PJTYS5015NBRM5	PJG-50-NBR	PJTYS5015SIM5	PJG-50-SI	FTYS-50-15-M5
50	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS5030NBRM5	PJG-50-NBR	PJTYS5030SIM5	PJG-50-SI	FTYS-50-30-M5
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PJTYS6030NBRN1	PJG-60-NBR	PJTYS6030SIN1	PJG-60-SI	FTYS-60-30-G1
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PJTYS6050NBRN1	PJG-60-NBR	PJTYS6050SIN1	PJG-60-SI	FTYS-60-50-G1
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PJTYS8030NBRN1	PJG-80-NBR	PJTYS8030SIN1	PJG-80-SI	FTYS-60-30-G1
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PJTYS8050NBRN1	PJG-80-NBR	PJTYS8050SIN1	PJG-80-SI	FTYS-60-50-G1

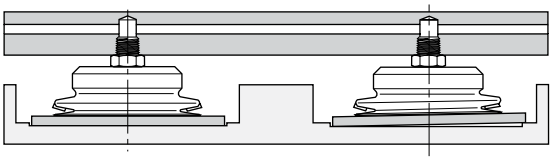
A

Applications

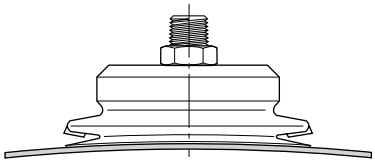
- High speed packaging



- Level compensation for small electronic components

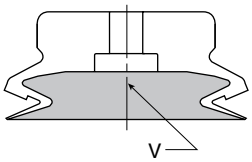


- Flexible product
- Soft seal lip

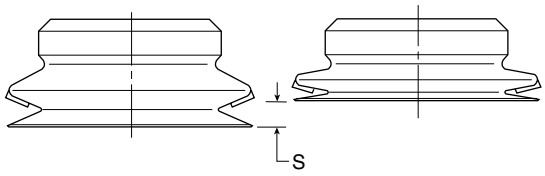


Main data for short bellows PJG cups

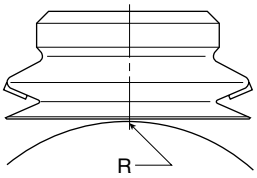
Volume



Cup deflection



Radius



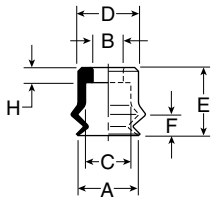
Model number	Cup diameter mm	Area cm²	Volume (V) liters	Lifting force @ 60% (N)		Cup deflection (S) mm	Radius R mm
PJG-6-*	6	.28	0.000016	1.70	—	4.2	4.0
PJG-8-*	8	.50	0.00007	3.10	—	4.0	5.0
PJG-10-*	10	0.79	0.00017	4.80	—	3.0	6.0
PJG-15-*	15	1.77	0.0005	10.8	—	3.3	10.0
PJG-20-*	20	3.14	0.0012	19.2	—	5.5	13.0
PJG-30-*	30	7.07	0.003	43.2	—	7.0	26.0
PJG-40-*	40	12.6	0.005	76.9	—	7.2	37.0
PJG-50-*	50	19.6	0.008	120	—	9.0	41.0
PJG-60-*	60	28.3	0.020	173	—	8.0	70.0
PJG-80-*	80	50.3	0.040	308	—	9.5	100.0

*Cup material

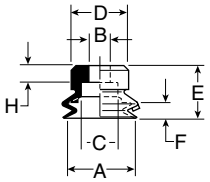
A

PJG Series Replacement Cup Dimensions

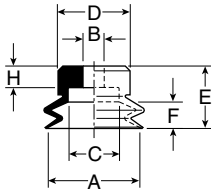
PJG-6 and PJG-8



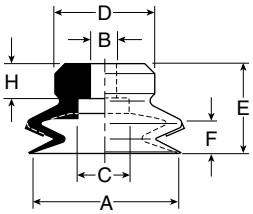
PJG-10 and PJG-15



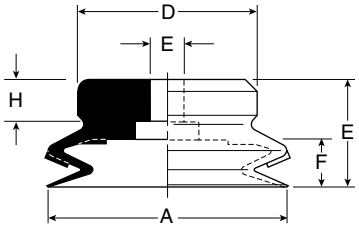
PJG-20



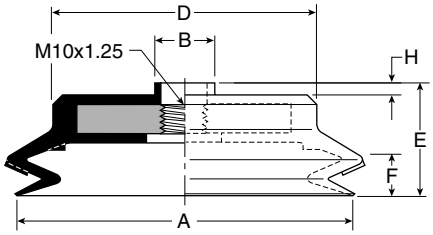
PJG-30 thru PJG-40



PJG-50



PJG-60 thru PJG-80



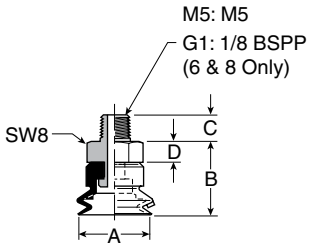
Dimensions (mm)

Model number	ØA	ØB	ØC	ØD	E	F	H
PJG-6-*	6	4	6	7.5	9	4.2	2
PJG-8-*	8	4	6	8	9	4	2
PJG-10-*	10	4.6	7.8	11	9.5	3	3.5
PJG-15-*	15	4.6	7.8	12	11	3.3	3.5
PJG-20-*	20	4.6	10.8	15	13	5.5	4.5
PJG-30-*	30	5.8	10.8	20	18	7	7
PJG-35-*	35	5.8	10.8	25	18	7	7
PJG-40-*	40	5.8	10.8	30	18	7.2	7
PJG-50-*	50	7.8	19.8	40	20	9	7
PJG-60-*	60	12.5	—	45	22.5	8	2.5
PJG-70-*	70	12.5	—	55	23.5	9.5	2.5
PJG-80-*	80	12.5	—	68	23.5	9.5	2.5

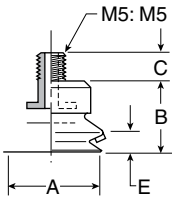
* Cup material

Dimensions

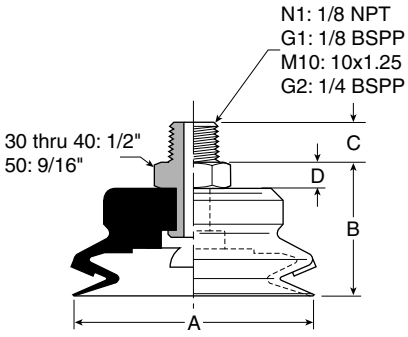
PJTM-6 and PJTM-8



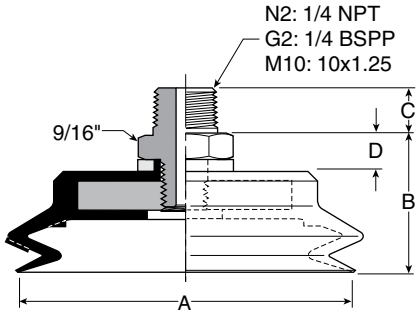
PJTM-10 thru PJTM-20



PJTM-30 thru PJTM-50



PJTM-60 thru PJTM-80



Dimensions (mm)

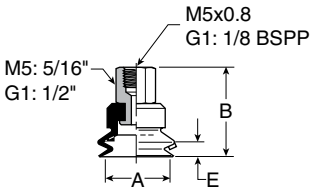
Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D
PJTM-6-*-†	6	12.5	4.5	8	—	—	3.5
PJTM-8-*-†	8	12.5	4.5	8	—	—	3.5
PJTM-10-*-†	10	9.5	5	—	—	—	—
PJTM-15-*-†	15	11	5	—	—	—	—
PJTM-20-*-†	20	13	5	—	—	—	—
PJTM-30-*-†	30	23	—	8	10	—	5
PJTM-40-*-†	40	23	—	8	10	—	5
PJTM-50-*-†	50	25	—	8	10	—	5
PJTM-60-*-†	60	27	—	—	10	15	7
PJTM-80-*-†	80	28	—	—	10	15	7

* Cup material
† Thread size

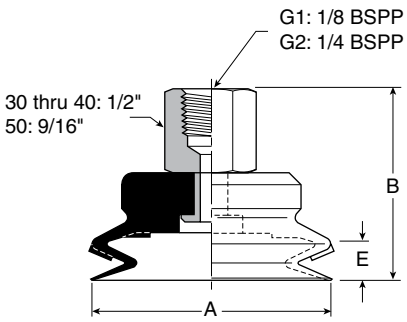
A

Dimensions

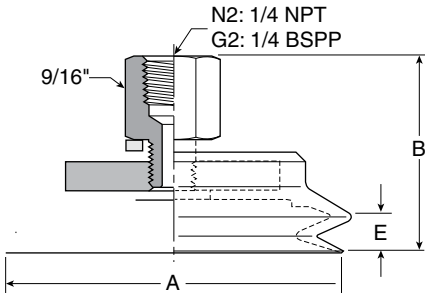
PJTF-6 and PJTF-8



PJTF-30 thru PJTF-50



PJTF-60 thru PJTF-80



Dimensions (mm)

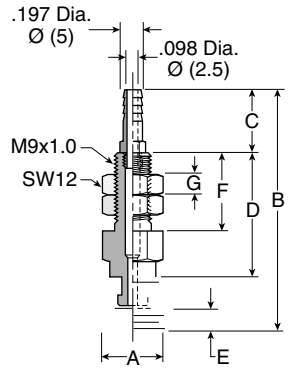
Model number	ØA	B	B (M5)	E
PJTF-6-*-†	6	20	14	4
PJTF-8-*-†	8	20	14	4
PJTF-10-*-†	10	20	14	3
PJTF-15-*-†	15	20	14	3.3
PJTF-30-*-†	30	32	—	7
PJTF-40-*-†	40	32	—	7.2
PJTF-50-*-†	50	34	—	9
PJTF-60-*-†	60	39.5	—	8
PJTF-80-*-†	80	40.5	—	9.5

* Cup material
† Thread size

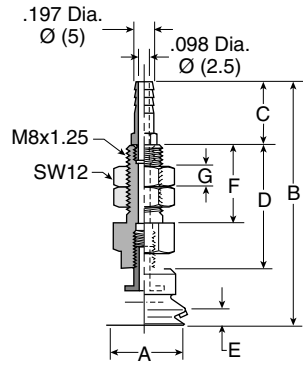
A

Dimensions

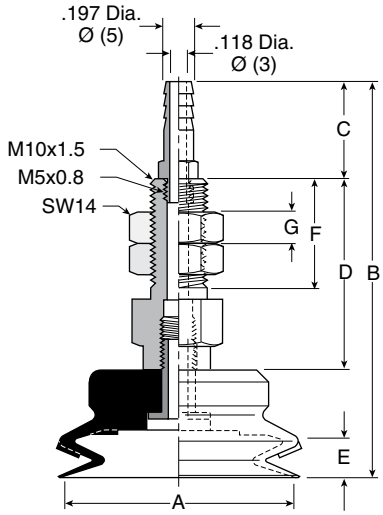
PJTK-6 and PJTK-8



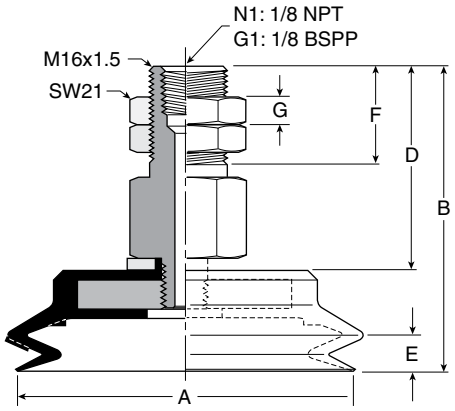
PJTK-10 thru PJTK-20



PJTK-30 thru PJTK-50



PJTK-60 thru PJTK-80



Dimensions (mm)

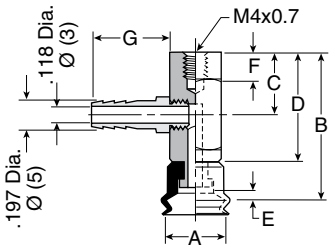
Model number	ØA	B	C	D	E	F	G	Wt g
PJTK-6-*	6	33	10	14	4.2	12	3	11
PJTK-8-*	8	33	10	14	4	12	3	11
PJTK-10-*	10	47.5	16	22	3	15	3	14
PJTK-15-*	15	49	16	22	3.3	15	3	15
PJTK-20-*	20	51	16	22	5.5	15	5	17
PJTK-30-*	30	66	16	32	7	20	5	42
PJTK-40-*	40	66	16	32	7.2	20	5	44
PJTK-50-*	50	68	16	32	9	20	5	58
PJTK-60-*-†	60	62.5	—	42.5	8	20	6	144
PJTK-80-*-†	80	63.5	—	42.5	9.5	20	6	190

* Cup material
† Vacuum port

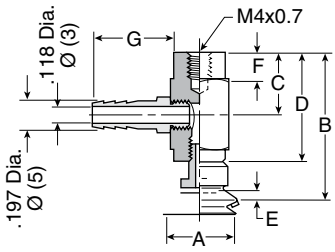
A

Dimensions

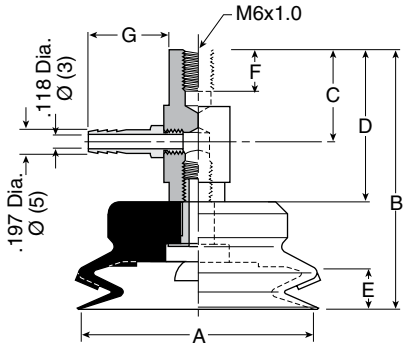
PJYK-6 and PJYK-8



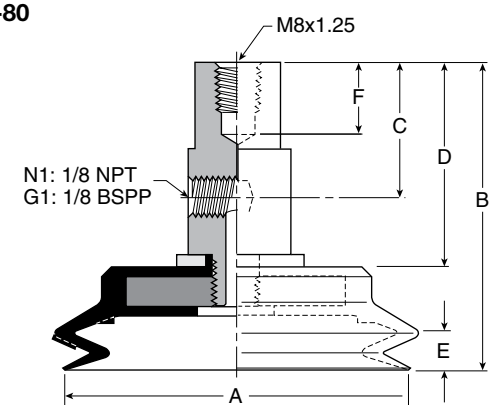
PJYK-10 thru PJYK-20



PJYK-25 thru PJYK-50



PJYK-60 thru PJYK-80



Dimensions (mm)

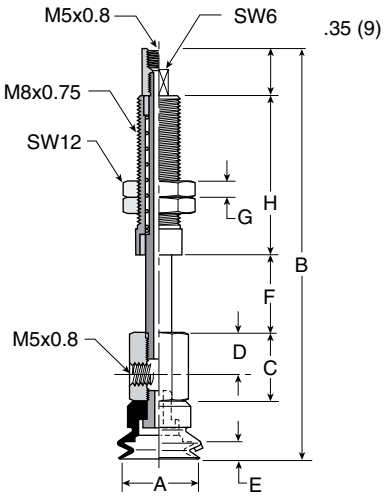
Model number	ØA	B	C	D	E	F	G	Wt g
PJYK-6-*	6	31.5	13	22.5	4.2	6	16	16
PJYK-8-*	8	31.5	13	22	4.2	6	16	16
PJYK-10-*	10	31.5	14	22	3	6	16	17
PJYK-15-*	15	33	14	22	3.3	6	16	18
PJYK-20-*	20	35	14	22	5.5	6	16	20
PJYK-30-*	30	50	20	32	7	8	16	46
PJYK-40-*	40	50	20	32	7.2	8	16	48
PJYK-50-*	50	52	20	32	9	8	16	62
PJYK-60-*-†	60	62.5	28	42.5	8	11	—	139
PJYK-80-*-†	80	63.5	28	42.5	9.5	11	—	185

* Cup material
† Vacuum port

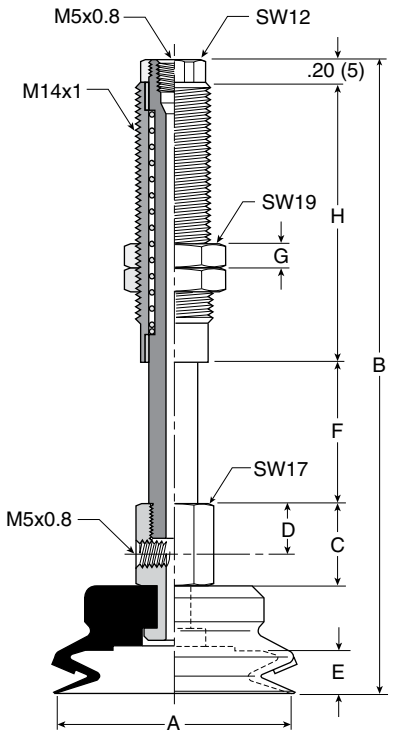
A

Dimensions

PJTYS10 thru PJTYS20



PJTYS30 thru PJTYS50



Dimensions (mm)

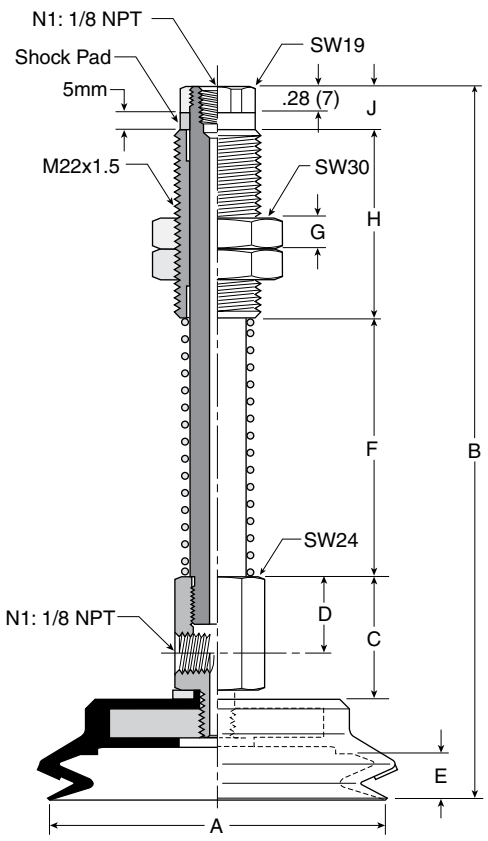
Model number	ØA	B	C	D	E	F	G	H	Wt g
PJTYS1010*†	10	64	13	8	3	10	5	23	31
PJTYS1015*†	10	76.5	13	8	3	15	5	30.5	33.5
PJTYS1510*†	15	66	13	8	3.3	10	5	23	32
PJTYS1515*†	15	78	13	8	3.3	15	5	30.5	34.5
PJTYS2010*†	20	72	13	8	5.5	10	5	23	32
PJTYS2015*†	20	109	13	8	5.5	15	5	30.5	34.5
PJTYS3015*†	30	91	17	10	7	15	5	36	74
PJTYS3030*†	30	128	17	10	7	30	5	58	99
PJTYS3515*†	35	91	17	10	7	15	5	36	76.5
PJTYS3530*†	35	128	17	10	7	30	5	58	101.5
PJTYS4015*†	40	91	17	10	7.2	15	5	36	78.5
PJTYS4030*†	40	128	17	10	7.2	30	5	58	103.5
PJTYS5015*†	50	93	17	10	9	15	5	36	94
PJTYS5030*†	50	130	17	10	9	30	5	58	119

** Cup material
† Vacuum port

A

Dimensions

PJTYS60 thru PJTYS80



Dimensions (mm)

Model number	ØA	B	C	D	E	F	G	H	J	Wt g
PJTYS6030*†	60	157	30	20	8	45	10	50	12	294
PJTYS6050*†	60	182	30	20	8	70	10	50	12	328
PJTYS8030*†	80	158	30	20	9.5	45	10	50	12	338
PJTYS8050*†	80	183	30	20	9.5	70	10	50	12	372

** Cup material
† Vacuum port

A

2-1/2 bellows design minimizes contact pressure applied to the product. The soft seal lip and touch allows the cup to conform to the product's surface to make a vacuum seal.

These multiple bellow cups are designed for applications that require additional level compensation, more flexibility, or minimum back pressure for a "soft touch". The multiple bellow has a soft sealing edge good for a variety of sensitive applications; such as food packaging, CD / DVD, medical packaging, and highly irregular curved surfaces. Cups can also be used to assist with sheet separation in destack operations.

Features

- Soft touch
- Extra level compensation
- Flexible sealing lip for irregular curved surfaces
- 5mm to 90mm in diameter

Styles

- PCTM series male thread connector
- PCTF series female thread connector
- PCTK series barbed bulkhead

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	**NBR**	**NBRE**	**SI**	**SIE**	**U**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000	—

* ESD: Electric Static Dissipative Material

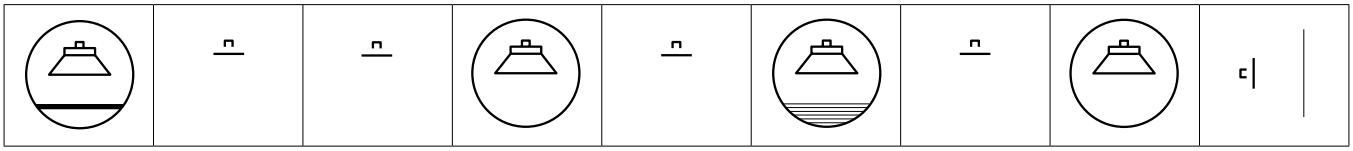
How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PCTM-20B-NBR-G1 becomes PCTM-20B-U-G1. Inquire with factory for availability.

Application guide

2-1/2 Bellows



Flat surface, any section	Bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, any section	Soft material	Metal sheet handling	Corrugated sheet handling	Differences in heights and levels	Not for vertical lift

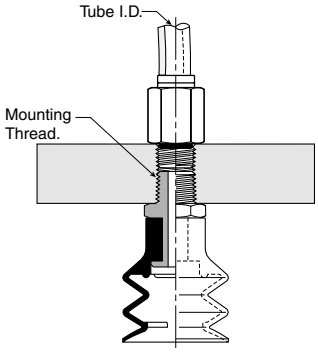
A

PCTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. BSPP, NPT, metric threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PCTM-5-NBR-M5	PCG-5-NBR	PCTM-5-SI-M5	PCG-5-SI	FTM-5A-M5
7	M5	PCTM-7-NBR-M5	PCG-7-NBR	PCTM-7-SI-M5	PCG-7-SI	FTM-5A-M5
10	M5	PCTM-10-NBR-M5	PCG-10-NBR	PCTM-10-SI-M5	PCG-10-SI	CTM-10-M5
10	1/8 BSPP	PCTM-10-NBR-G1	PCG-10-NBR	PCTM-10-SI-G1	PCG-10-SI	CTM-10-G1
15	M5	PCTM-15-NBR-M5	PCG-15-NBR	PCTM-15-SI-M5	PCG-15-SI	CTM-10-M5
15	1/8 BSPP	PCTM-15-NBR-G1	PCG-15-NBR	PCTM-15-SI-G1	PCG-15-SI	CTM-10-G1
20	M5	PCTM-20-NBR-M5	PCG-20-NBR	PCTM-20-SI-M5	PCG-20-SI	CTM-10-M5
20	1/8 BSPP	PCTM-20-NBR-G1	PCG-20-NBR	PCTM-20-SI-G1	PCG-20-SI	CTM-10-G1
30	1/8 BSPP	PCTM-30-NBR-G1	PCG-30-NBR	PCTM-30-SI-G1	PCG-30-SI	CTM-30-G1
30	1/4 BSPP	PCTM-30-NBR-G2	PCG-30-NBR	PCTM-30-SI-G2	PCG-30-SI	CTM-30-G2
30	1/8 NPT	PCTM-30-NBR-N1	PCG-30-NBR	PCTM-30-SI-N1	PCG-30-SI	CTM-30-N1
40	1/8 BSPP	PCTM-40-NBR-G1	PCG-40-NBR	PCTM-40-SI-G1	PCG-40-SI	CTM-30-G1
40	1/4 BSPP	PCTM-40-NBR-G2	PCG-40-NBR	PCTM-40-SI-G2	PCG-40-SI	CTM-30-G2
40	1/8 NPT	PCTM-40-NBR-N1	PCG-40-NBR	PCTM-40-SI-N1	PCG-40-SI	CTM-30-N1
60	1/8 BSPP	PCTM-60-NBR-G1	PCG-60-NBR	PCTM-60-SI-G1	PCG-60-SI	CTM-30-G1
60	1/8 NPT	PCTM-60-NBR-N1	PCG-60-NBR	PCTM-60-SI-N1	PCG-60-SI	CTM-30-N1
90	1/4 BSPP	PCTM-90-NBR-G2	PCG-90-NBR	PCTM-90-SI-G2	PCG-90-SI	CTM-90-G2
90	1/4 NPT	PCTM-90-NBR-N2	PCG-90-NBR	PCTM-90-SI-N2	PCG-90-SI	CTM-90-N2

A

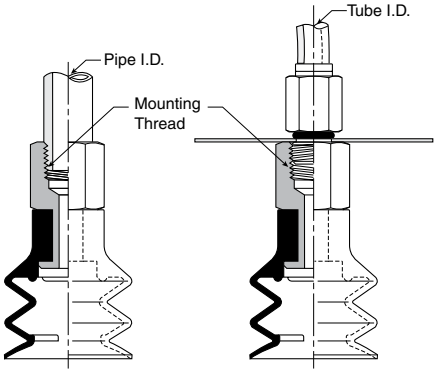
PCTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. BSPP, NPT metric threads.

Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PCTF-5-NBR-M5	PCG-5-NBR	PCTF-5-SI-M5	PCG-5-SI	FTF-5A-M5
7	M5	PCTF-7-NBR-M5	PCG-7-NBR	PCTF-7-SI-M5	PCG-7-SI	FTF-5A-M5
10	1/8 BSPP	PCTF-10-NBR-G1	PCG-10-NBR	PCTF-10-SI-G1	PCG-10-SI	CTF-10-G1
15	1/8 BSPP	PCTF-15-NBR-G1	PCG-15-NBR	PCTF-15-SI-G1	PCG-15-SI	CTF-10-G1
20	1/8 BSPP	PCTF-20-NBR-G1	PCG-20-NBR	PCTF-20-SI-G1	PCG-20-SI	CTF-10-G1
30	1/8 BSPP	PCTF-30-NBR-G1	PCG-30-NBR	PCTF-30-SI-G1	PCG-30-SI	CTF-30-G1
30	1/8 NPT	PCTF-30-NBR-N1	PCG-30-NBR	PCTF-30-SI-N1	PCG-30-SI	CTF-30-N1
40	1/8 BSPP	PCTF-40-NBR-G1	PCG-40-NBR	PCTF-40-SI-G1	PCG-40-SI	CTF-30-G1
40	1/8 NPT	PCTF-40-NBR-N1	PCG-40-NBR	PCTF-40-SI-N1	PCG-40-SI	CTF-30-N1
60	1/8 NPT	PCTF-60-NBR-N1	PCG-60-NBR	PCTF-60-SI-N1	PCG-60-SI	CTF-30-G1
60	1/4 NPT	PCTF-60-NBR-N1	PCG-60-NBR	PCTF-60-SI-N1	PCG-60-SI	CTF-30-N1
90	1/4 BSPP	PCTF-90-NBR-G2	PCG-90-NBR	PCTF-90-SI-G2	PCG-90-SI	CTF-90-G2
90	1/4 NPT	PCTF-90-NBR-N2	PCG-90-NBR	PCTF-90-SI-N2	PCG-90-SI	CTF-90-N2

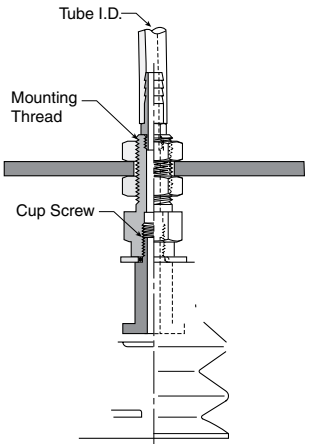
A

PCTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

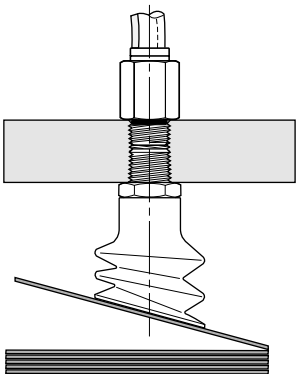
Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



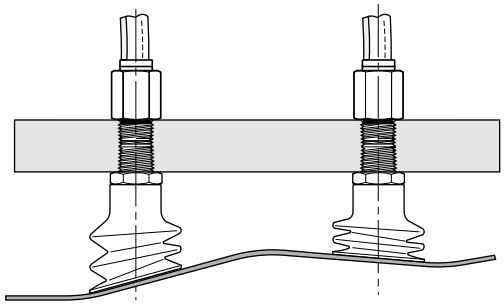
Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PCTK-5-NBR	PCG-5-NBR	PCTK-5-SI	PCG-5-SI	FTK-5A
7	Barb	PCTK-7-NBR	PCG-7-NBR	PCTK-7-SI	PCG-7-SI	FTK-5A
10	Barb	PCTK-10-NBR	PCG-10-NBR	PCTK-10-SI	PCG-10-SI	CTK-10
15	Barb	PCTK-15-NBR	PCG-15-NBR	PCTK-15-SI	PCG-15-SI	CTK-10
20	Barb	PCTK-20-NBR	PCG-20-NBR	PCTK-20-SI	PCG-20-SI	CTK-10
30	Barb	PCTK-30-NBR	PCG-30-NBR	PCTK-30-SI	PCG-30-SI	CTK-30
40	Barb	PCTK-40-NBR	PCG-40-NBR	PCTK-40-SI	PCG-40-SI	CTK-30
60	Barb	PCTK-60-NBR	PCG-60-NBR	PCTK-60-SI	PCG-60-SI	CTK-30
90	NPT	PCTK-90-NBR-N1	PCG-90-NBR	PCTK-90-SI-N1	PCG-90-SI	CTK-90-N1
90	BSPP	PCTK-90-NBR-G1	PCG-90-NBR	PCTK-90-SI-G1	PCG-90-SI	CTK-90-G1

Applications

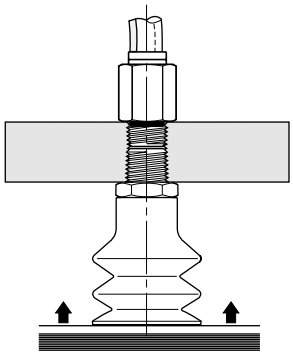
- Destack perimeter separation



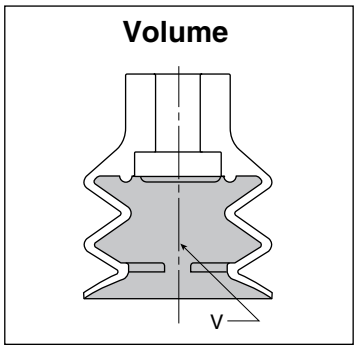
- Level compensation for applications where level compensators do not have adequate space

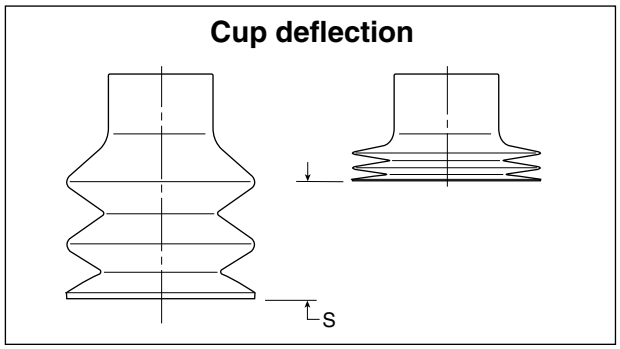


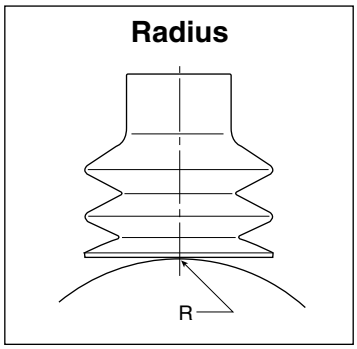
- Controlling downstroke lifts product on contact



Main data for 2-1/2 bellows PCG cups







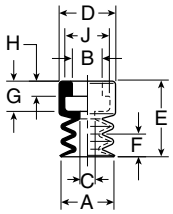
Model number	Cup diameter mm	Area cm^2	Volume (V) liters	Lifting force @ 60% (N)		Cup deflection (S) mm	Radius (R) mm
PCG-5-*	5	.20	.00003	1.20	—	3	3.5
PCG-7-*	7	.39	.00004	2.40	—	3	4.0
PCG-10-*	10	.79	.0001	4.80	—	3	5.0
PCG-15-*	15	1.77	.0009	10.8	—	10	6.0
PCG-20-*	20	3.14	.002	19.2	—	10	8.0
PCG-30-*	30	7.07	.009	43.2	—	14.5	20.0
PCG-40-*	40	12.6	.018	76.9	—	22	30.0
PCG-60-*	60	28.3	.072	173	—	27	55.0
PCG-90-*	90	63.6	.1639	389	—	42	80.0

* Cup material

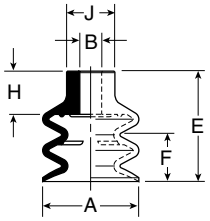
A

PCG Series Replacement Cup Dimensions Dimensions

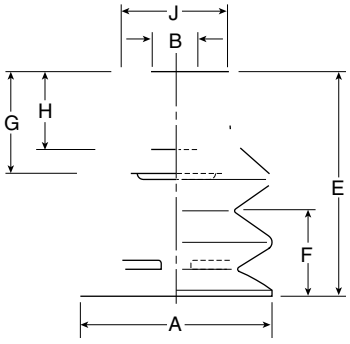
PCG-5 and PCG-7



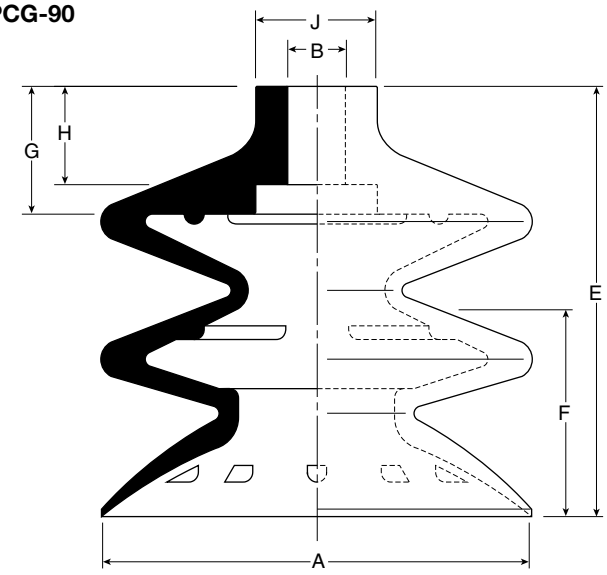
PCG-10 thru PCG-20



PCG-30 thru PCG-60



PCG-90



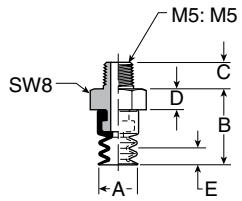
Dimensions (mm)

Model number	ØA	ØB	ØC	ØD	E	F	G	H	J
PCG-5-*	5	4	2	7.5	9.5	3	4	2	6
PCG-7-*	7	4	2	7.5	10	3	4	2	6
PCG-10-*	9	5	—	—	15	3	7	—	9
PCG-15-*	15.2	5	—	—	22	10	9	—	10
PCG-20-*	20	5	—	—	23	10	9	—	10
PCG-30-*	32	8	—	—	37.5	14.5	17	13	18
PCG-40-*	42	8	—	—	46	.22	17	13	20
PCG-60-*	62	8	—	—	55	27	18	13	21.5
PCG-90-*	88	12	—	—	87.5	42	26	20	25

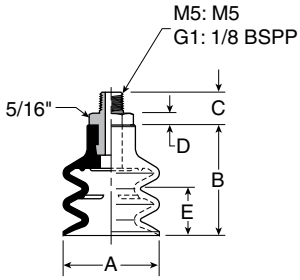
* Cup material

Dimensions

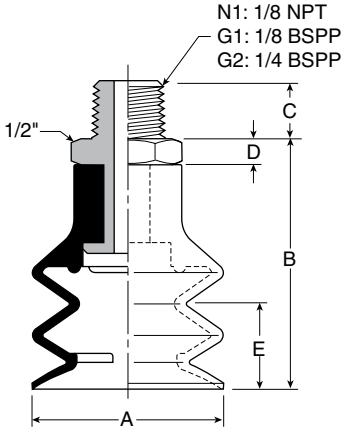
PCTM-5 and PCTM-7



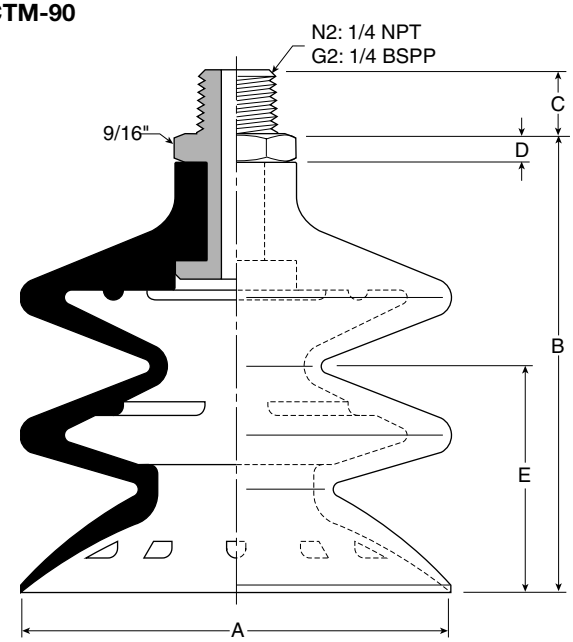
PCTM-10 thru PCTM-20



PCTM-30 thru PCTM-60



PCTM-90



Dimensions (mm)

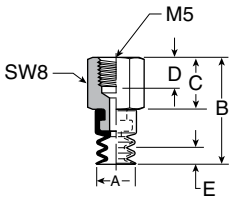
Model number	ØA	B	C (M5)	C (N1 / G1)	C M10 / G2)	C (N2)	D	E
PCTM-5-*-†	5	13	4.5	—	—	—	3.5	3
PCTM-7-*-†	7	13.5	4.5	—	—	—	3.5	3
PCTM-10-*-†	9	17.5	4.5	8	—	—	2.5	3
PCTM-15-*-†	15.2	25.5	4.5	8	—	—	2.5	10
PCTM-20-*-†	20	25.5	4.5	8	—	—	2.5	10
PCTM-30-*-†	32	42.5	—	8	10	—	5	14.5
PCTM-40-*-†	42	51	—	8	10	—	5	22
PCTM-60-*-†	62	60	—	8	10	—	5	27
PCTM-90-*-†	88	92.5	—	—	10	15	5	42

* Cup material
† Thread size

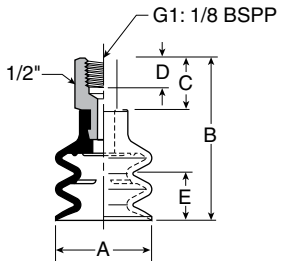
A

Dimensions

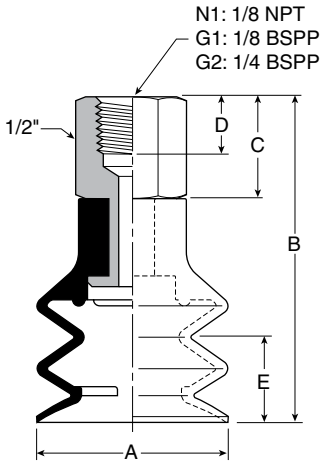
PCTF-5 and PCTF-7



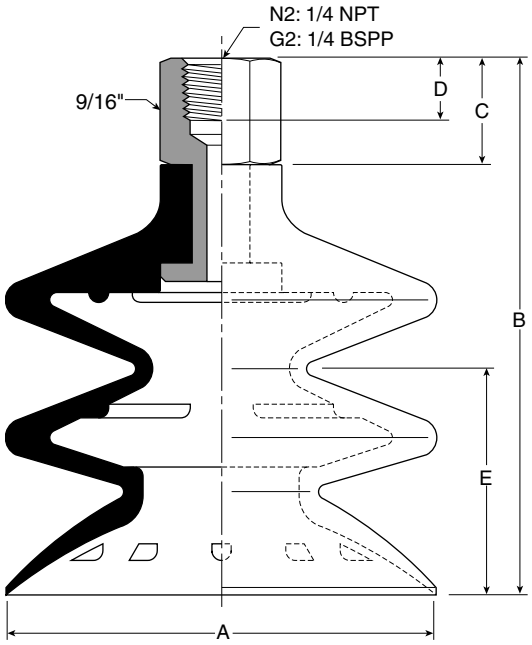
PCTF-10 thru PCTF-20



PCTF-30 thru PCTF-60



PCTF-90



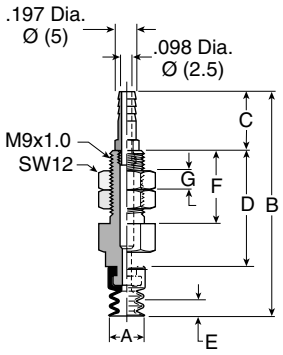
Dimensions (mm)

Model number	ØA	B	C	D	E
PCTF-5*†	5	21.5	12	8	3
PCTF-7*†	7	22	12	8	3
PCTF-10*†	9	27	12	8	3
PCTF-15*†	15.2	35	12	8	10
PCTF-20*†	20	35	12	8	10
PCTF-30*†	32	51.5	14	8	14.5
PCTF-40*†	42	60	14	8	22
PCTF-60*†	62	69	14	8	27
PCTF-90*†	88	105	17.5	10	42

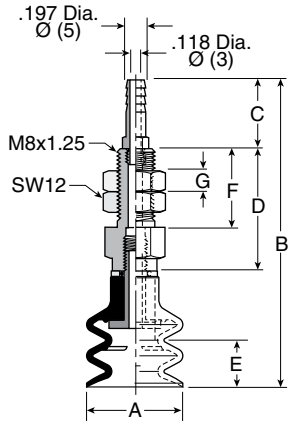
* Cup material
† Thread size

Dimensions

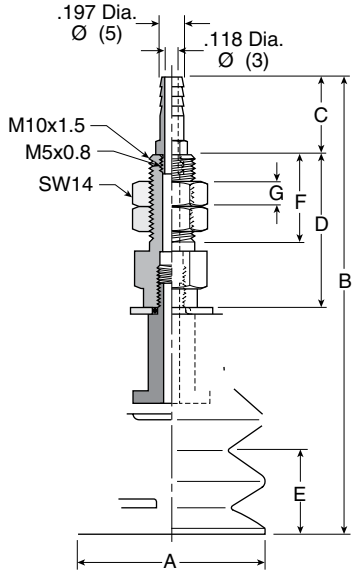
PCTK-5 and PCTK-7



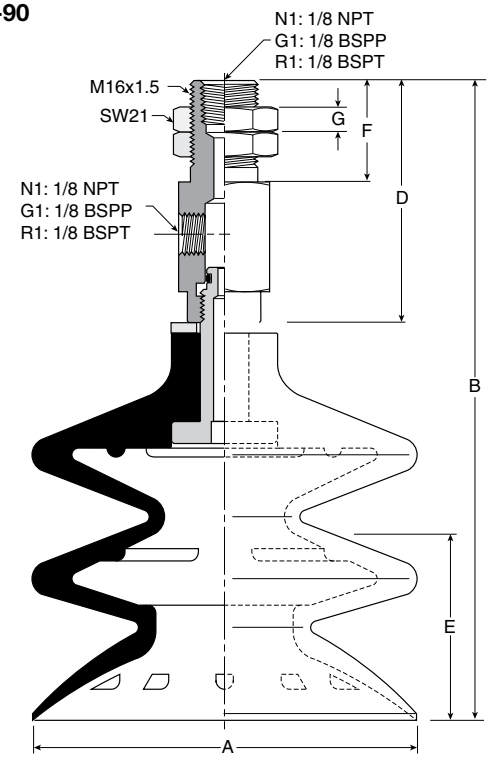
PCTK-10 thru PCTK-20



PCTK-30 thru PCTK-60



PCTK-90



Dimensions (mm)

Model number	ØA	B	C	D	E	F	G	Wt g
PCTK-5-*	5	33.5	10	14	3	12	3	11
PCTK-7-*	7	34	10	14	3	12	3	11
PCTK-10-*	9	56.2	16	22.5	3	15	4	22
PCTK-15-*	15.2	64.2	16	22	10	15	4	22
PCTK-20-*	20	64.2	16	(22	10	15	4	22
PCTK-30-*	32	86.8	16	32	14.5	20	5	46
PCTK-40-*	42	95.3	16	32	22	20	5	55
PCTK-60-*	62	104.3	16	32	27	20	5	85
PCYK-90-*	88	144.8	23	55	42	11	—	300

* Cup material
† Vacuum port

A

30° inclusive swivel, single lip cup for smooth, slightly curved surfaces and flexible products. Rigid construction provides good stability against acceleration and deceleration forces during product transfer.

The single edge swivel cup is for smooth surfaces with slightly curved surfaces or flexible sheets with substantial weights. Typically, lift capacities and break away forces are higher for flat cups which may be necessary for good stability during lift and transfer. The position of the internal swivel joint minimizes moments during lift and transfer. The swivel joint compensates for load and angular misalignment instead of the cup material, prolonging cup life. Maintenance costs are minimized by replacing only the cup portion of the assembly.

Features

- Internal swivel joint design
- 30° Inclusive angle for flexible products
- Increased stability for horizontal lifts
- Lower maintenance costs
- 60mm to 100mm diameters

Styles

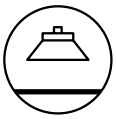
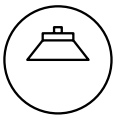
- PUTYK series barbed bulkhead
- PUTYS series bulkhead level compensator

Specifications

Suction cup material	Nitrile (NBR)	Silicon (SI)
Operating temperature (°C)	-20° to +120°	-60° to +250°
Color	Black	White
Hardness, shore A (°Sh)	55 ±5	55 ±5

Application guide

Swivel Bellows

					
Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Metal sheet handling	Not for vertical lift

A

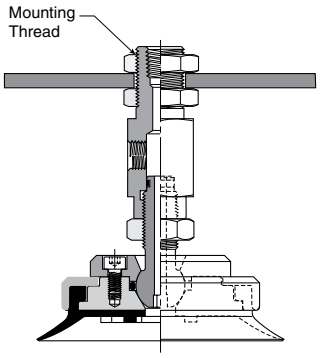
PUTYK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



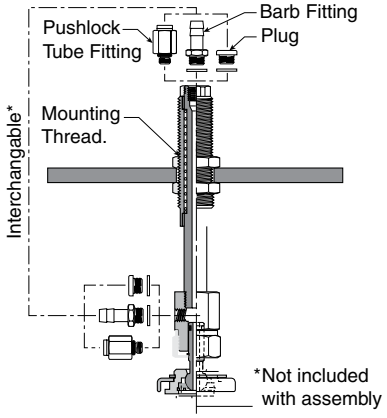
Cup size	Vacum port	Cup material Nitrile assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only (NBR)	Cup fitting
60	1/8 BSPP	PUTYK-60-NBR-G1	PUGB-60-NBR	PUG-60-NBR	UTYK-60-G1
80	1/8 BSPP	PUTYK-80-NBR-G1	PUGB-80-NBR	PUG-80-NBR	UTYK-60-G1
100	1/8 BSPP	PUTYK-100-NBR-G1	PUGB-100-NBR	PUG-100-NBR	UTYK-60-G1

PUTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.
Shown are interchangable connectors & plugs for port connections.

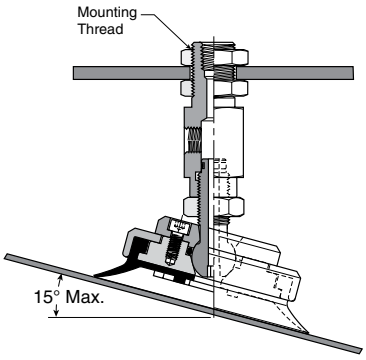


Cup diameter (mm)	Vacum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	PUTYS assemlby (NBR)	Replacement PUGB swivel with cup only	Replacement cup only NBR	Level compensator P/N
60	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PUTYS6030NBRG1	PUGB-60-NBR	PUG-60-NBR	UTYS-60-30-G1
60	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PUTYS6050NBRG1	PUGB-60-NBR	PUG-60-NBR	UTYS-60-50-G1
80	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PUTYS8030NBRG1	PUGB-80-NBR	PUG-80-NBR	UTYS-60-30-G1
80	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PUTYS8050NBRG1	PUGB-80-NBR	PUG-80-NBR	UTYS-60-50-G1
100	1/8 BSPP	30	1.6 (6.8)	3.6 (15.6)	PUTYS10030NBRG1	PUGB-100-NBR	PUG-100-NBR	UTYS-60-30-G1
100	1/8 BSPP	50	1.9 (8.3)	4.5 (19.6)	PUTYS10050NBRG1	PUGB-100-NBR	PUG-100-NBR	UTYS-60-50-G1

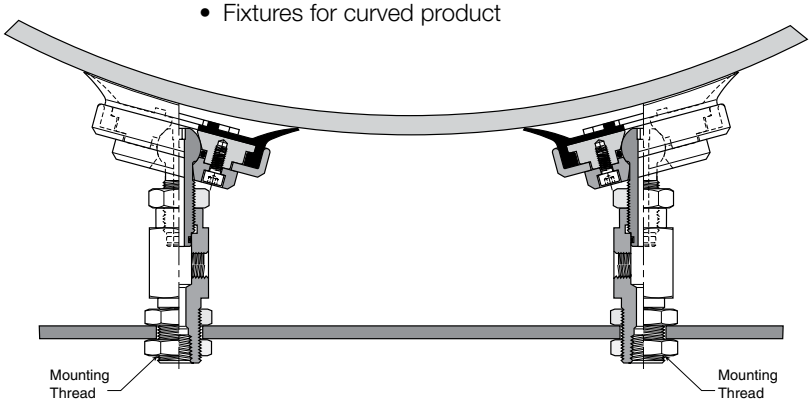
A

Applications

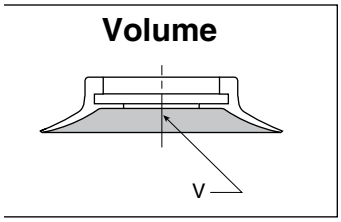
- Angles pickup

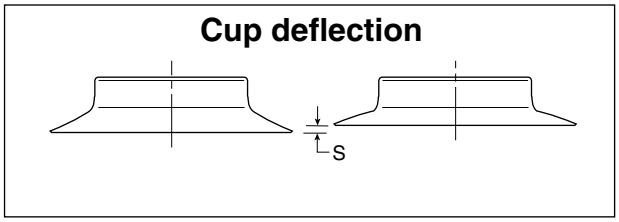


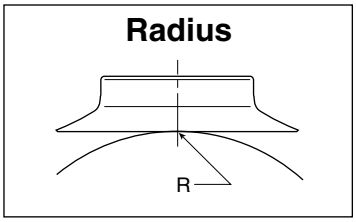
- Fixtures for curved product



Main data for swivel bellows PUG cups







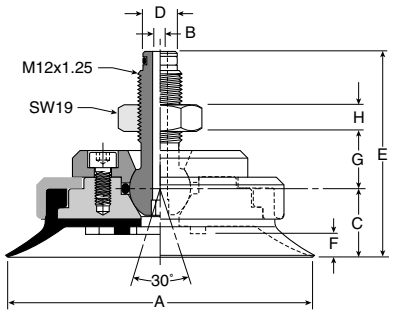
Model number	Cup diameter mm	Area cm^2	Volume (V) liters	Lifting force @ 60% (N)		Cup deflection (S) mm	Radius R (mm)
PUGB-60-*	60	28.3	0.0090	173	—	5	70
PUGB-80-*	80	50.3	0.025	308	—	6	100
PUGB-100-*	100	78.5	0.045	480	—	6	150

* Cup material

A

PUGB Series Barbed Bulkhead Dimensions

PUGB-60 thru
PUGB-100



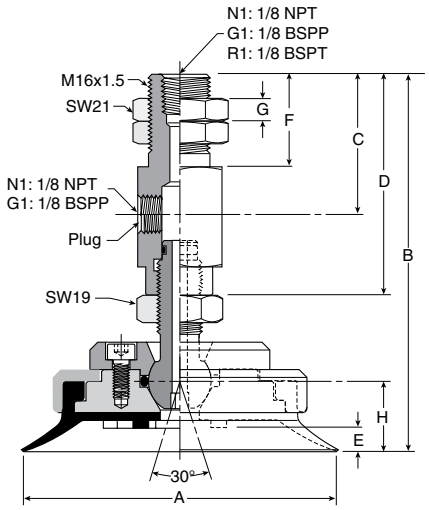
Dimensions (mm)

Model number	ØA	ØB	C	ØD	E	F	G	H
PUGB-60-*	60	3.9	16	9	52	5	15	7
PUGB-80-*	80	3.9	18	9	54	6	15	7
PUGB-100-*	100	3.9	18	9	54	6	15	7

* Cup material

PUTYK Series Barbed Bulkhead Dimensions

PUTYK-60 thru
PUTYK-100



Dimensions (mm)

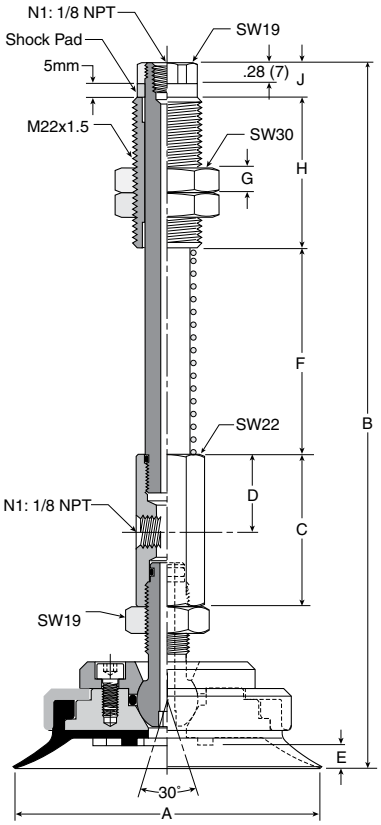
Model number	ØA	B	C	D	E	F	G	H	Wt g
PUTYK-60-*	60	93	16	48	5	23	6	16	352
PUTYK-80-*	80	95	35	55	6	23	6	18	444
PUTYK-100-*	100	95	35	55	6	23	6	18	568

* Cup material

A

Dimensions

PUTYS60 thru PUTYS100



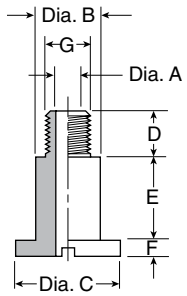
Dimensions (mm)

Model number	ØA	B	C	D	E	F	G	H	J	Wt g
PUTYS6030*	60	185	40	20	5	45	10	50	12	487
PUTYS6050*	60	210	40	20	5	70	10	50	12	521
PUTYS8030*	80	187	40	20	6	45	10	50	12	559
PUTYS8050*	80	212	40	20	6	70	10	50	12	595
PUTYS10030*	30	187	40	20	6	45	10	50	12	729
PUTYS10050*	30	212	40	20	6	70	10	50	12	756

* Cup material

A

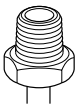
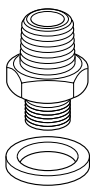
Cup screws



Dimensions (mm)

Part number	A	B	C	D	E	F	G
TN-PF-15-M5	2.5	5	8	5.5	1.5	2	M5
TN-PF-20-M5	2.5	5	11	6	3	2	M5
TN-PF-25-M6	3.5	8.5	14	6	11	2	M6
TN-PF-50-M6	3.5	8	20	6	6	2	M6
TN-PF-50-M8	4	8	20	10	5	2	M8
TN-PF-10-M5	2.5	3	6	5.5	2	2	M5
TN-PF-30-M6	3.4	8	15	10.5	10.5	3	M6
TN-PC-30-M8	3.9	8	15	12	10	3	M8
TN-PC-90-M12	3.9	12	25	11	19	5	M12

Male threaded cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	FTM-5A-M5	PFG / PBG / PJG / PCG	PFTM / PBTM / PJTM / PCTM	M5
	FTM-5A-G1	PFG / PBG / PJG / PCG	PFTM / PBTM / PJTM / PCTM	1/8 BSPP
	FTM-20B-G1	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-20B-G2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-20B-N1	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 NPT
	FTM-20B-M10	PFG / PBG / PJG	PFTM / PBTM / PJTM	M10
	FTM-50-G1	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-50-N1	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 NPT
	FTM-50-G2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-60-G2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-60-N2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/4 NPT
	FTM-60-M10	PFG / PBG / PJG	PFTM / PBTM / PJTM	M10
	CTM-10-M5	PCG	PCTM	M5
	CTM-10-G1	PCG	PCTM	1/8 BSPP
	CTM-10-N1	PCG	PCTM	1/8 NPT

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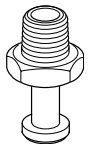
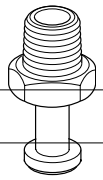
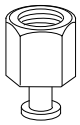
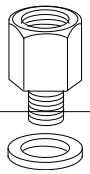
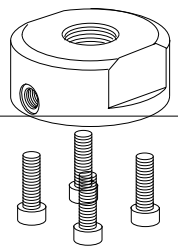
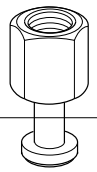
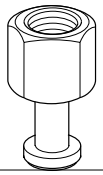
Male threaded cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	CTM-30-G1	PCG	PCTM	1/8 BSPP
	CTM-30-N1	PCG	PCTM	1/8 NPT
	CTM-30-G2	PCG	PCTM	1/8 BSPP
	CTM-90-G2	PCG	PCTM	1/8 BSPP
	CTM-90-N2	PCG	PCTM	1/4 NPT

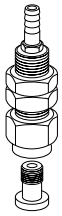
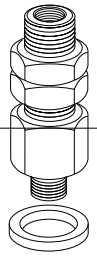
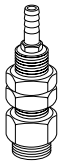
Female threaded cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	FTF-5A-M5	PFG / PBG / PJG	PFTF / PBTF / PJTF	M5
	FTF-5A-G1	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/8 BSPP
	FTF-20B-G1	PFG/ PBG / PJG	PFTF / PBTF / PJTF	1/8 BSPP
	FTF-20B-G2	PFG/ PBG / PJG	PFTF / PBTF / PJTF	1/4 BSPP
	FTF-50-G1	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/8 BSPP
	FTF-50-G2	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/4 BSPP
	FTF-60-G2	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/4 BSPP
	FTF-60-N2	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/4 NPT
	FTF-120-G4	PFG / PBG	PFTF / PBTF	1/2 BSPP
	FTF-120-N4	PFG / PBG	PFTF / PBTF	1/2 NPT
	CTF-10-G1	PCG	PCTF	1/8 BSPP

Female threaded cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	CTF-30-G1	PCG	PCTF	1/8 BSPP
	CTF-30-N1	PCG	PCTF	1/8 NPT
	CTF-90-G2	PCG	PCTF	1/4 BSPP
	CTF-90-N2	PCG	PCTF	1/4 NPT

Bulkhead cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	FTK-5A	PFG / PBG / PJG / PCG / PAG	PFTK / PBTK / PJTK / PCTK / PATK	Barb Fitting
	FTK-15	PFG / PBG / PJG	PFTK / PBTK / PJTK	Barb Fitting
	FTK-20	PFG / PFOG / PBG / PJG	PFTK / PBTK / PJTK	Barb Fitting
	FTK-25	PFG / PFOG / PBG / PJG	PFTK / PBTK / PJTK	Barb Fitting
	FTK-50	PFG / PBG / PJG	PFTK / PBTK / PJTK	Barb Fitting
	FTK-60-G1	PFG / PBG / PJG	PFTK / PBTK / PJTK	1/8 BSPP
	FTK-60-N1	PFG / PBG / PJG	PFTK / PBTK / PJTK	1/8 NPT
	CTK-10	PCG	PCTK	Barb Fitting
		PCG	PCTK	Barb Fitting
	UTYK-20 UTYK-40	PUGB	PUTYK	Barb Fitting

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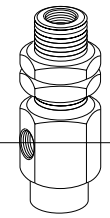
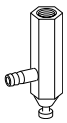
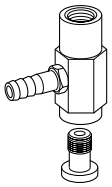
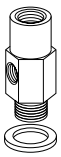
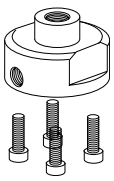
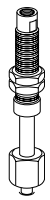
Bulkhead cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	UTYK-60-G1	PUGB	PUTYK	1/8 BSPP
	UTYK-60-R1	PUGB	PUTYK	1/8 BSPT
	UTYK-60-N1	PUGB	PUTYK	1/8 NPT

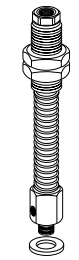
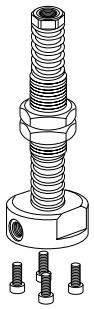
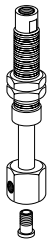
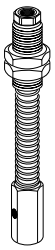
90° cup fittings

	Cup fitting	Cup series	Cup assembly	Vacuum port
	FYK-5A	PFG / PBG / PJG / PCG	PFYK / PBYK / PJYK / PCYK	Barb Fitting
	FYK-15	PFG / PBG / PJG	PFYK / PBYK / PJYK	Barb Fitting
	FYK-20	PFG / PBG / PJG	PFYK / PBYK / PJYK	
	FYK-25	PFG / PBG / PJG	PFYK / PBYK / PJYK	
	FYK-50	PFG / PBG / PJG	PFYK / PBYK / PJYK	
	FYK-60-G1	PFG / PBG / PJG	PFYK / PBYK / PJYK	1/8 BSPP
	FYK-60-N1	PFG / PBG / PJG	PFYK / PBYK / PJYK	1/8 NPT
	FYK-120-G1	PFG / PBG	PFYK / PBYK	1/8 BSPP
	FYK-120-N1	PFG / PBG	PFYK / PBYK	1/8 NPT

Level compensators

	Assembly part number	Cup series	Cup assembly	Compensator only	Cup fitting
	FTYS-2A-3-M3	PFG / PBG / PJG	PFTYS / PBTYS / PJTYS	TYS-M5-3-M5	FTY-2A-M5-M3
	FTYS-2A-15-M3			TYS-M5-15-M5	
	FTYS-5A-10-M5	PFG / PBG	PFTYS / PBTYS	TYS-M5-10-M5	FTY-5A-M5-M5
	FTYS-5A-15-M5			TYS-M5-15-M5	
	FTYS-20B-15-M5	PFG / PBG / PJG	PFTYS / PBTYS / PJTYS	TYS-M8-15-M5	FTY-20B-M8-M5
	FTYS-20B-30-M5			TYS-M8-30-M5	
	FTYS-50-15-M5	PFG / PBG / PJG	PFTYS / PBTYS / PJTYS	TYS-M8-15-M5	FTY-50
	FTYS-50-30-M5			TYS-M8-30-M5	

Level compensators

	Assembly part number	Cup series	Cup assembly	Compensator only	Cup fitting
	FTYS-60-30-G1	PFG / PBG / PJG	PFTYS / PBTYS / PJTYS	TYS-M14-25-G1	FTY-60/95
	FTYS-60-50-G1			TYS-M14-45-G1	
	FTYS-120-20-G2	PFG / PBG	PFTYS / PBTYS	TYS110/200M1820	FTY-120-N2
	FTYS-120-50-G2	PFG / PBG	PFTYS / PBTYS	TYS110/200M1870	FTY-120-N2
	JTYS-10-10-M5	PJG	PJTYS	NAPJYS-10-10-K	TN-PF-15-M5
	JTYS-10-15-M5			NAPJYS-10-15-K	
	UTYS-60-30-G1	PUGB	PUTYS	TYS-M14-25-N	UTY-60-M14-N1
	UTYS-60-50-G1			TYS-M14-45-N	