

<p>Vacuum Cups</p>	<p><a href="http://www.parker.com/pneu/vaccup">www.parker.com/pneu/vaccup</a></p>		<p><b>A</b> Vacuum Cups</p>
<p>Vacuum Generators</p>	<p><a href="http://www.parker.com/pneu/vacgen">www.parker.com/pneu/vacgen</a></p>		<p><b>B</b> Generators</p>
<p>Pressure Sensors</p>	<p><a href="http://www.parker.com/pneu/sensors">www.parker.com/pneu/sensors</a></p>		<p><b>C</b> Sensors</p>
<p>Safety Guide, Offer of Sale</p>			<p><b>D</b> Vacuum Accessories</p>

Section A

[www.parker.com/pneu/vaccup](http://www.parker.com/pneu/vaccup)



Technical

PFG  
Flat

PBG  
Bellows

P5V-CFS  
Flat

PJG Short  
Bellows

PCG  
Multiple  
Bellows

PUGB  
Flat Swivel

Cup  
Fittings

<b>A</b>	<b>Technical</b>
	<b>PCG Flat</b>
<b>PCG Bellows</b>	
<b>P5V-CFS Flat</b>	
<b>PJG Short Bellows</b>	
<b>PCG Multiple Bellows</b>	
<b>PUGB Flat Swivel</b>	
<b>Cup Fittings</b>	

**Technical Information**      Lifting Forces, Cup Diameters, Material Specifications      **A3 - A5**

**PFG Flat**      Precision molded single lip flat cup for smooth or slightly curved surfaces.      **A6 - A19**  
 Low profile design makes flat pads ideal for fast response.



Cup Sizes: 5mm to 200mm

**PBG Bellows**      Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products.      **A20 - A32**



Cup Sizes: 10mm to 150mm

**P5V-CFS Flat**      Precision molded double lip flat cup for slightly curved surfaces. Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed. Outer ribs prevent the cup lip from being cut.      **A33**



Cup Sizes: 50mm to 300mm

**PJG Short Bellows**      Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products. Shorter stroke provides fast response.      **A34 - A47**



Cup Sizes: 6mm to 80mm

**PCG Multiple Bellows**      Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces. 2-1/2 bellows design minimizes contact pressure applied to products.      **A48 - A58**



Cup Sizes: 5mm to 90mm

**PUGB Flat Swivel**      30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products. Rigid stem or level compensator provides good stability for horizontal lift.      **A59 - A63**



Cup Sizes: 60mm to 100mm

**Cup Screws**      Cup screws.      **A64**

**Cup Fitting Assemblies**      Cup / Fitting Cross Reference.      **A64 - A68**

**Specifications**

Cup material should be considered for temperature resistance, chemical resistance, oil resistance, abrasion resistance, markless properties 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°	0° to +60°	-30° to +140°	-60° to +250°	-10° to +130°	-20° to +75°
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	—	—	5 to 15	—
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

A

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

<b>A</b>	Technical
	Flat
Flat	Bel lows
Flat	Short
Flat	Multiple
Flat	Swivel
Flat	Cup
Flat	Fittings

**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 ( $a_g = 9.81 \text{ m/sec}^2$ ). 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 ( $\text{kgm/sec}^2$ ). The force can be calculated by measuring the effect of a change in acceleration on a mass.

Newton's Law:  $F(N) = \text{mass}(kg) \times a_g(\text{m/sec}^2)$

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

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

**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 ( $\text{m/sec}^2$ ) 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:

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

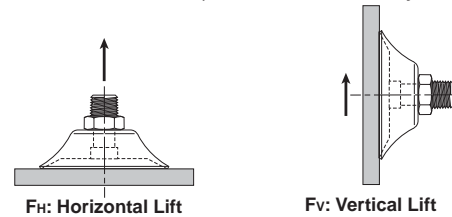
This is considered an average acceleration.

**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.



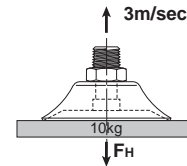
**Horizontal lifting force**

Apply Newton's Law to calculate the force on a 10kg mass with a change in acceleration of  $3\text{m/sec}^2$  and a safety factor of 2.

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

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

$$FH = 256.2 \text{ N}$$



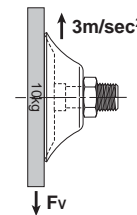
**Vertical lifting force**

Apply Newton's Law to calculate the force on a 10kg mass with a dry surface, a change in acceleration of  $3\text{m/sec}^2$  and a safety factor of 4.

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

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

$$FV = 512.4 \text{ N}$$



**Combined vertical lift and horizontal motion**

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

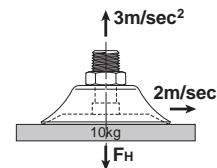
$$FM(N) = \sqrt{FV^2 + FH^2}$$

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

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

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

$$FM = 268.2 \text{ N}$$



**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.

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

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.**

**Theoretical lifting force per cup lbf (N)**

Cup		Vacuum level								
		3 inHg -1.5 PSIG 10.2 kPa	6 inHg -3 PSIG 20.3 kPa	9 inHg -4.5 PSIG 30.5 kPa	12 inHg -6 PSIG 40.6 kPa	15 inHg -7.5 PSIG 50.8 kPa	18 inHg -9 PSIG 61 kPa	21 inHg -10.5 PSIG 71.1 kPa	24 inHg -12 PSIG 81.3 kPa	27 inHg -13.5 PSIG 91.4 kPa
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)	6.609 (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)

**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.

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

D (mm) = Diameter of Cup  
m (kg) = Mass  
 $a_g = 9.81 \text{ m/sec}^2$

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

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.

**A**

Technical

PBG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings



A

Exceptional for any smooth flat or surface that will benefit 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°	0° to +60°	-60° to +250°	-10° to +130°	-20° to +75°
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	—	5 to 15	—

\* 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**



Ø 120/200 only

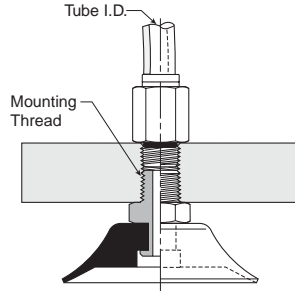
- Flat surface, thin section
- Flat surface, any section
- Slightly bowed surface, thin section
- Slightly bowed surface, any section
- Metal sheet handling
- Corrugated sheet handling
- High lifting force
- Vertical lift

**PFTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, 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	<b>PFTM-5A-NBR-M5</b>	<b>PFG-5A-NBR</b>	PFTM-5A-SI-M5	<b>PFG-5A-SI</b>	<b>FTM-5A-M5H</b>
5	1/8 BSPP	<b>PFTM-5A-NBR-G1</b>	<b>PFG-5A-NBR</b>	PFTM-5A-SI-G1	<b>PFG-5A-SI</b>	<b>FTM-5A-G1</b>
6	M5	<b>PFTM-6A-NBR-M5</b>	<b>PFG-6A-NBR</b>	PFTM-6A-SI-M5	<b>PFG-6A-SI</b>	<b>FTM-5A-M5H</b>
6	1/8 BSPP	<b>PFTM-6A-NBR-G1</b>	<b>PFG-6A-NBR</b>	PFTM-6A-SI-G1	<b>PFG-6A-SI</b>	<b>FTM-5A-G1</b>
8	M5	<b>PFTM-8A-NBR-M5</b>	<b>PFG-8A-NBR</b>	PFTM-8A-SI-M5	<b>PFG-8A-SI</b>	<b>FTM-5A-M5H</b>
8	1/8 BSPP	<b>PFTM-8A-NBR-G1</b>	<b>PFG-8A-NBR</b>	PFTM-8A-SI-G1	<b>PFG-8A-SI</b>	<b>FTM-5A-G1</b>
10	M5	<b>PFTM-10A-NBR-M5</b>	<b>PFG-10A-NBR</b>	PFTM-10A-SI-M5	<b>PFG-10A-SI</b>	<b>FTM-5A-M5H</b>
10	1/8 BSPP	<b>PFTM-10A-NBR-G1</b>	<b>PFG-10A-NBR</b>	PFTM-10A-SI-G1	<b>PFG-10A-SI</b>	<b>FTM-5A-G1</b>
15	M5	<b>PFTM-15A-NBR-M5</b>	<b>PFG-15A-NBR</b>	PFTM-15A-SI-M5	<b>PFG-15A-SI</b>	<b>FTM-5A-M5H</b>
15	1/8 BSPP	<b>PFTM-15A-NBR-G1</b>	<b>PFG-15A-NBR</b>	PFTM-15A-SI-G1	<b>PFG-15A-SI</b>	<b>FTM-5A-G1</b>
20	1/8 BSPP	<b>PFTM-20B-NBR-G1</b>	<b>PFG-20B-NBR</b>	PFTM-20B-SI-G1	<b>PFG-20B-SI</b>	<b>FTM-20B-G1H</b>
20	1/4 BSPP	<b>PFTM-20B-NBR-G2</b>	<b>PFG-20B-NBR</b>	<b>PFTM-20B-SI-G2</b>	<b>PFG-20B-SI</b>	<b>FTM-20B-G2</b>
20	M10	PFTM-20B-NBR-M10	<b>PFG-20B-NBR</b>	PFTM-20B-SI-M10	<b>PFG-20B-SI</b>	FTM-20B-M10
20	1/8 NPT	<b>PFTM-20B-NBR-N1</b>	<b>PFG-20B-NBR</b>	PFTM-20B-SI-N1	<b>PFG-20B-SI</b>	<b>FTM-20B-N1</b>
30	1/8 BSPP	<b>PFTM-30-NBR-G1</b>	<b>PFG-30-NBR</b>	PFTM-30-SI-G1	PFG-30-SI	<b>FTM-20B-G1H</b>
30	1/4 BSPP	<b>PFTM-30-NBR-G2</b>	<b>PFG-30-NBR</b>	PFTM-30-SI-G2	PFG-30-SI	<b>FTM-20B-G2</b>
30	M10	PFTM-30-NBR-M10	<b>PFG-30-NBR</b>	PFTM-30-SI-M10	PFG-30-SI	FTM-20B-M10
30	1/8 NPT	<b>PFTM-30-NBR-N1</b>	<b>PFG-30-NBR</b>	PFTM-30-SI-N1	PFG-30-SI	<b>FTM-20B-N1</b>
40	1/8 BSPP	<b>PFTM-40-NBR-G1</b>	<b>PFG-40-NBR</b>	PFTM-40-SI-G1	PFG-40-SI	<b>FTM-20B-G1H</b>
40	1/4 BSPP	<b>PFTM-40-NBR-G2</b>	<b>PFG-40-NBR</b>	PFTM-40-SI-G2	PFG-40-SI	<b>FTM-20B-G2</b>
40	M10	PFTM-40-NBR-M10	<b>PFG-40-NBR</b>	PFTM-40-SI-M10	PFG-40-SI	FTM-20B-M10
40	1/8 NPT	<b>PFTM-40-NBR-N1</b>	<b>PFG-40-NBR</b>	PFTM-40-SI-N1	PFG-40-SI	<b>FTM-20B-N1</b>
50	1/8 BSPP	<b>PFTM-50-NBR-G1</b>	<b>PFG-50-NBR</b>	PFTM-50-SI-G1	PFG-50-SI	<b>FTM-50-G1H</b>
50	1/4 BSPP	<b>PFTM-50-NBR-G2</b>	<b>PFG-50-NBR</b>	PFTM-50-SI-G2	PFG-50-SI	<b>FTM-50-G2</b>
50	1/8 NPT	PFTM-50-NBR-N1	<b>PFG-50-NBR</b>	PFTM-50-SI-N1	PFG-50-SI	FTM-50-N1
60	1/4 BSPP	<b>PFTM-60-NBR-G2</b>	<b>PFG-60-NBR</b>	PFTM-60-SI-G2	PFG-60-SI	<b>FTM-60-G2</b>
60	M10	PFTM-60-NBR-M10	<b>PFG-60-NBR</b>	PFTM-60-SI-M10	PFG-60-SI	FTM-60-M10
60	1/4 NPT	<b>PFTM-60-NBR-N2</b>	<b>PFG-60-NBR</b>	PFTM-60-SI-N2	PFG-60-SI	<b>FTM-60-N2</b>
80	1/4 BSPP	<b>PFTM-80-NBR-G2</b>	<b>PFG-80-NBR</b>	PFTM-80-SI-G2	PFG-80-SI	<b>FTM-60-G2</b>
80	M10	PFTM-80-NBR-M10	<b>PFG-80-NBR</b>	PFTM-80-SI-M10	PFG-80-SI	FTM-60-M10
80	1/4 NPT	<b>PFTM-80-NBR-N2</b>	<b>PFG-80-NBR</b>	PFTM-80-SI-N2	PFG-80-SI	<b>FTM-60-N2</b>
95	1/4 BSPP	<b>PFTM-95-NBR-G2</b>	<b>PFG-95-NBR</b>	PFTM-95-SI-G2	PFG-95-SI	<b>FTM-60-G2</b>
95	M10	PFTM-95-NBR-M10	<b>PFG-95-NBR</b>	PFTM-95-SI-M10	PFG-95-SI	FTM-60-M10
95	1/4 NPT	<b>PFTM-95-NBR-N2</b>	<b>PFG-95-NBR</b>	PFTM-95-SI-N2	PFG-95-SI	<b>FTM-60-N2</b>

Most popular.



**A**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings



A

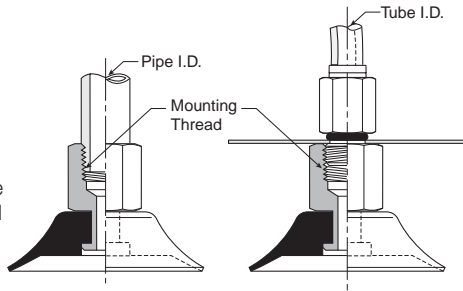
**PFTF Series Female Thread Connector**

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G 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	<b>PFTF-5A-NBR-M5</b>	PFG-5A-NBR	<b>PFTF-5A-SI-M5</b>	PFG-5A-SI	<b>FTF-5A-M5</b>
5	1/8 BSPP	<b>PFTF-5A-NBR-G1</b>	PFG-5A-NBR	<b>PFTF-5A-SI-G1</b>	PFG-5A-SI	<b>FTF-5A-G1</b>
6	M5	<b>PFTF-6A-NBR-M5</b>	PFG-6A-NBR	<b>PFTF-6A-SI-M5</b>	PFG-6A-SI	<b>FTF-5A-M5</b>
6	1/8 BSPP	<b>PFTF-6A-NBR-G1</b>	PFG-6A-NBR	<b>PFTF-6A-SI-G1</b>	PFG-6A-SI	<b>FTF-5A-G1</b>
8	M5	<b>PFTF-8A-NBR-M5</b>	PFG-8A-NBR	<b>PFTF-8A-SI-M5</b>	PFG-8A-SI	<b>FTF-5A-M5</b>
8	1/8 BSPP	<b>PFTF-8A-NBR-G1</b>	PFG-8A-NBR	<b>PFTF-8A-SI-G1</b>	PFG-8A-SI	<b>FTF-5A-G1</b>
10	1/8 BSPP	<b>PFTF-10A-NBR-G1</b>	PFG-10A-NBR	<b>PFTF-10A-SI-G1</b>	PFG-10A-SI	<b>FTF-5A-G1</b>
10	M5	<b>PFTF-10A-NBR-M5</b>	PFG-10A-NBR	<b>PFTF-10A-SI-M5</b>	PFG-10A-SI	<b>FTF-5A-M5</b>
15	1/8 BSPP	<b>PFTF-15A-NBR-G1</b>	PFG-15A-NBR	<b>PFTF-15A-SI-G1</b>	PFG-15A-SI	<b>FTF-5A-G1</b>
15	M5	<b>PFTF-15A-NBR-M5</b>	PFG-15A-NBR	<b>PFTF-15A-SI-M5</b>	PFG-15A-SI	<b>FTF-5A-M5</b>
20	1/8 BSPP	<b>PFTF-20B-NBR-G1</b>	PFG-20B-NBR	<b>PFTF-20B-SI-G1</b>	PFG-20B-SI	<b>FTF-20B-G1</b>
30	1/8 BSPP	<b>PFTF-30-NBR-G1</b>	PFG-30-NBR	<b>PFTF-30-SI-G1</b>	PFG-30-SI	<b>FTF-20B-G1</b>
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	<b>PFTF-40-NBR-G1</b>	PFG-40-NBR	<b>PFTF-40-SI-G1</b>	PFG-40-SI	<b>FTF-20B-G1</b>
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	<b>PFTF-60-NBR-G2</b>	PFG-60-NBR	PFTF-60-SI-G2	PFG-60-SI	<b>FTF-60-G2</b>
60	1/4 NPT	<b>PFTF-60-NBR-N2</b>	PFG-60-NBR	PFTF-60-SI-N2	PFG-60-SI	<b>FTF-60-N2</b>
80	1/4 BSPP	<b>PFTF-80-NBR-G2</b>	PFG-80-NBR	PFTF-80-SI-G2	PFG-80-SI	<b>FTF-60-G2</b>
80	1/4 NPT	<b>PFTF-80-NBR-N2</b>	PFG-80-NBR	PFTF-80-SI-N2	PFG-80-SI	<b>FTF-60-N2</b>
95	1/4 NPT	<b>PFTF-95-NBR-N2</b>	PFG-95-NBR	PFTF-95-SI-N2	PFG-95-SI	<b>FTF-60-N2</b>
95	1/4 BSPP	<b>PFTF-95-NBR-G2</b>	PFG-95-NBR	PFTF-95-SI-G2	PFG-95-SI	<b>FTF-60-G2</b>
120	1/2 BSPP	PFTF-120-NBR-G4	PFG-120-NBR	PFTF-120-SI-G4	PFG-120-SI	<b>FTF-120-G4</b>
120	1/2 NPT	PFTF-120-NBR-N4	PFG-120-NBR	PFTF-120-SI-N4	PFG-120-SI	<b>FTF-120-N4</b>
150	1/2 NPT	<b>PFTF-150-NBR-G4</b>	PFG-150-NBR	PFTF-150-SI-G4	PFG-150-SI	<b>FTF-120-G4</b>
150	1/2 NPT	<b>PFTF-150-NBR-N4</b>	PFG-150-NBR	PFTF-150-SI-N4	PFG-150-SI	<b>FTF-120-N4</b>
200	1/2 BSPP	<b>PFTF-200-NBR-G4</b>	PFG-200-NBR	PFTF-200-SI-G4	PFG-200-SI	<b>FTF-120-G4</b>
200	1/2 NPT	<b>PFTF-200-NBR-N4</b>	PFG-200-NBR	PFTF-200-SI-N4	PFG-200-SI	<b>FTF-120-N4</b>

■ Most popular.

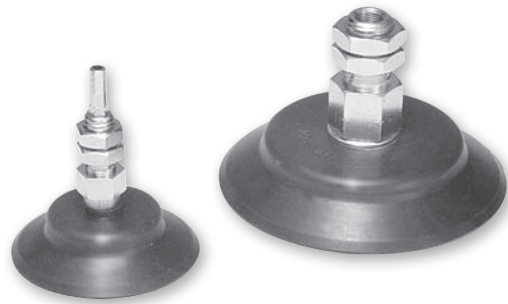
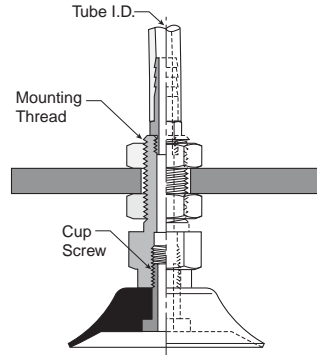


**PFTK Series Barbed Bulkhead**

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	<b>PFTK-5A-NBR</b>	<b>PFG-5A-NBR</b>	<b>PFTK-5A-SI</b>	<b>PFG-5A-SI</b>	<b>FTK-5A</b>
6	Barb	<b>PFTK-6A-NBR</b>	<b>PFG-6A-NBR</b>	<b>PFTK-6A-SI</b>	<b>PFG-6A-SI</b>	<b>FTK-5A</b>
8	Barb	<b>PFTK-8A-NBR</b>	<b>PFG-8A-NBR</b>	<b>PFTK-8A-SI</b>	<b>PFG-8A-SI</b>	<b>FTK-5A</b>
10	Barb	<b>PFTK-10A-NBR</b>	<b>PFG-10A-NBR</b>	<b>PFTK-10A-SI</b>	<b>PFG-10A-SI</b>	<b>FTK-5A</b>
15	Barb	<b>PFTK-15-NBR</b>	<b>PFG-15-NBR</b>	<b>PFTK-15-SI</b>	<b>PFG-15-SI</b>	<b>FTK-15</b>
20	Barb	<b>PFTK-20-NBR</b>	<b>PFG-20-NBR</b>	<b>PFTK-20-SI</b>	<b>PFG-20-SI</b>	<b>FTK-20</b>
30	Barb	<b>PFTK-30-NBR</b>	<b>PFG-30-NBR</b>	<b>PFTK-30-SI</b>	<b>PFG-30-SI</b>	<b>FTK-25</b>
40	Barb	<b>PFTK-40-NBR</b>	<b>PFG-40-NBR</b>	<b>PFTK-40-SI</b>	<b>PFG-40-SI</b>	<b>FTK-25</b>
50	Barb	<b>PFTK-50-NBR</b>	<b>PFG-50-NBR</b>	<b>PFTK-50-SI</b>	<b>PFG-50-SI</b>	<b>FTK-50</b>
60	1/8 BSPP	<b>PFTK-60-NBR-G1</b>	<b>PFG-60-NBR</b>	<b>PFTK-60-SI-G1</b>	<b>PFG-60-SI</b>	<b>FTK-60-G1</b>
60	1/8 NPT	<b>PFTK-60-NBR-N1</b>	<b>PFG-60-NBR</b>	<b>PFTK-60-SI-N1</b>	<b>PFG-60-SI</b>	<b>FTK-60-N1</b>
80	1/8 BSPP	<b>PFTK-80-NBR-G1</b>	<b>PFG-80-NBR</b>	<b>PFTK-80-SI-G1</b>	<b>PFG-80-SI</b>	<b>FTK-60-G1</b>
80	1/8 NPT	<b>PFTK-80-NBR-N1</b>	<b>PFG-80-NBR</b>	<b>PFTK-80-SI-N1</b>	<b>PFG-80-SI</b>	<b>FTK-60-N1</b>
95	1/8 BSPP	<b>PFTK-95-NBR-G1</b>	<b>PFG-95-NBR</b>	<b>PFTK-95-SI-G1</b>	<b>PFG-95-SI</b>	<b>FTK-60-G1</b>
95	1/8 NPT	<b>PFTK-95-NBR-N1</b>	<b>PFG-95-NBR</b>	<b>PFTK-95-SI-N1</b>	<b>PFG-95-SI</b>	<b>FTK-60-N1</b>

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

■ Most popular.



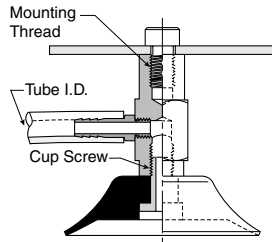
**PFYK Series 90° Barbed Adapter**

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	<b>PFYK-5A-NBR</b>	<b>PFG-5A-NBR</b>	<b>PFYK-5A-SI</b>	<b>PFG-5A-SI</b>	<b>FYK-5A</b>
6	Barb	<b>PFYK-6A-NBR</b>	<b>PFG-6A-NBR</b>	<b>PFYK-6A-SI</b>	<b>PFG-6A-SI</b>	<b>FYK-5A</b>
8	Barb	<b>PFYK-8A-NBR</b>	<b>PFG-8A-NBR</b>	<b>PFYK-8A-SI</b>	<b>PFG-8A-SI</b>	<b>FYK-5A</b>
10	Barb	<b>PFYK-10A-NBR</b>	<b>PFG-10A-NBR</b>	<b>PFYK-10A-SI</b>	<b>PFG-10A-SI</b>	<b>FYK-5A</b>
15	Barb	<b>PFYK-15-NBR</b>	<b>PFG-15-NBR</b>	<b>PFYK-15-SI</b>	<b>PFG-15-SI</b>	<b>FYK-15</b>
20	Barb	<b>PFYK-20-NBR</b>	<b>PFG-20-NBR</b>	<b>PFYK-20-SI</b>	<b>PFG-20-SI</b>	<b>FYK-20</b>
30	Barb	<b>PFYK-30-NBR</b>	<b>PFG-30-NBR</b>	<b>PFYK-30-SI</b>	<b>PFG-30-SI</b>	<b>FYK-25</b>
40	Barb	<b>PFYK-40-NBR</b>	<b>PFG-40-NBR</b>	<b>PFYK-40-SI</b>	<b>PFG-40-SI</b>	<b>FYK-25</b>
50	Barb	<b>PFYK-50-NBR</b>	<b>PFG-50-NBR</b>	PFYK-50-SI	PFG-50-SI	<b>FYK-50</b>
60	1/8 BSPP	PFYK-60-NBR-G1	<b>PFG-60-NBR</b>	PFYK-60-SI-G1	PFG-60-SI	FYK-60-G1
60	1/8 NPT	<b>PFYK-60-NBR-N1</b>	<b>PFG-60-NBR</b>	PFYK-60-SI-N1	PFG-60-SI	<b>FYK-60-N1</b>
80	1/8 BSPP	PFYK-80-NBR-G1	<b>PFG-80-NBR</b>	PFYK-80-SI-G1	PFG-80-SI	FYK-60-G1
80	1/8 NPT	<b>PFYK-80-NBR-N1</b>	<b>PFG-80-NBR</b>	PFYK-80-SI-N1	PFG-80-SI	<b>FYK-60-N1</b>
95	1/8 BSPP	PFYK-95-NBR-G1	<b>PFG-95-NBR</b>	PFYK-95-SI-G1	PFG-95-SI	FYK-60-G1
95	1/8 NPT	<b>PFYK-95-NBR-N1</b>	<b>PFG-95-NBR</b>	PFYK-95-SI-N1	PFG-95-SI	<b>FYK-60-N1</b>
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	<b>PFYK-120-NBR-N1</b>	<b>PFG-120-NBR</b>	PFYK-120-SI-N1	PFG-120-SI	<b>FYK-120-N1</b>
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	<b>PFYK-150-NBR-N1</b>	<b>PFG-150-NBR</b>	PFYK-150-SI-N1	PFG-150-SI	<b>FYK-120-N1</b>
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	<b>PFYK-200-NBR-N1</b>	<b>PFG-200-NBR</b>	PFYK-200-SI-N1	PFG-200-SI	<b>FYK-120-N1</b>

Most popular.



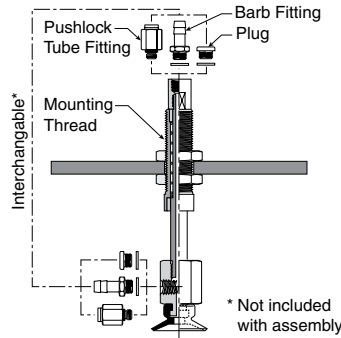
**PFTYS Series Bulkhead Level Compensator**

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)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
5	M5	10	.14 (.61)	.26 (1.17)	<b>PFTYS5A10NBRM5</b>	<b>PFG-5A-NBR</b>	<b>PFTYS5A10SIM5</b>	<b>PFG-5A-SI</b>	<b>TYS-5A-10</b>
5	M5	15	.15 (.64)	.26 (1.17)	<b>PFTYS5A15NBRM5</b>	<b>PFG-5A-NBR</b>	<b>PFTYS5A15SIM5</b>	<b>PFG-5A-SI</b>	<b>TYS-5A-15</b>
6	M5	10	.14 (.61)	.26 (1.17)	<b>PFTYS6A10NBRM5</b>	<b>PFG-6A-NBR</b>	<b>PFTYS6A10SIM5</b>	<b>PFG-6A-SI</b>	<b>TYS-5A-10</b>
6	M5	15	.15 (.64)	.26 (1.17)	<b>PFTYS6A15NBRM5</b>	<b>PFG-6A-NBR</b>	<b>PFTYS6A15SIM5</b>	<b>PFG-6A-SI</b>	<b>TYS-5A-15</b>
8	M5	10	.14 (.61)	.26 (1.17)	<b>PFTYS8A10NBRM5</b>	<b>PFG-8A-NBR</b>	<b>PFTYS8A10SIM5</b>	<b>PFG-8A-SI</b>	<b>TYS-5A-10</b>
8	M5	15	.15 (.64)	.26 (1.17)	<b>PFTYS8A15NBRM5</b>	<b>PFG-8A-NBR</b>	<b>PFTYS8A15SIM5</b>	<b>PFG-8A-SI</b>	<b>TYS-5A-15</b>
10	M5	10	.11 (.49)	.13 (.59)	<b>PFTYS10A10NBRM5</b>	<b>PFG-10A-NBR</b>	<b>PFTYS10A10SIM5</b>	<b>PFG-10A-SI</b>	<b>TYS-5A-10</b>
10	M5	15	.11 (.49)	.13 (.59)	<b>PFTYS10A15NBRM5</b>	<b>PFG-10A-NBR</b>	<b>PFTYS10A15SIM5</b>	<b>PFG-10A-SI</b>	<b>TYS-5A-15</b>
15	M5	10	.11 (.49)	.13 (.59)	<b>PFTYS15A10NBRM5</b>	<b>PFG-15A-NBR</b>	<b>PFTYS15A10SIM5</b>	<b>PFG-15A-SI</b>	<b>TYS-5A-10</b>
15	M5	15	.11 (.49)	.13 (.59)	<b>PFTYS15A15NBRM5</b>	<b>PFG-15A-NBR</b>	<b>PFTYS15A15SIM5</b>	<b>PFG-15A-SI</b>	<b>TYS-5A-15</b>
20	M5	15	.56 (2.5)	.79 (3.4)	<b>PFTYS20B15NBRM5</b>	<b>PFG-20B-NBR</b>	<b>PFTYS20B15SIM5</b>	<b>PFG-20B-SI</b>	<b>TYS-20B-15</b>
20	M5	30	.56 (2.5)	1.2 (4.9)	<b>PFTYS20B30NBRM5</b>	<b>PFG-20B-NBR</b>	<b>PFTYS20B30SIM5</b>	<b>PFG-20B-SI</b>	<b>TYS-20B-30</b>
30	M5	15	.56 (2.5)	.79 (3.4)	<b>PFTYS3015NBRM5</b>	<b>PFG-30-NBR</b>	<b>PFTYS3015SIM5</b>	<b>PFG-30-SI</b>	<b>TYS-20B-15</b>
30	M5	30	.56 (2.5)	1.2 (4.9)	<b>PFTYS3030NBRM5</b>	<b>PFG-30-NBR</b>	<b>PFTYS3030SIM5</b>	<b>PFG-30-SI</b>	<b>TYS-20B-30</b>
40	M5	15	.56 (2.5)	.79 (3.4)	<b>PFTYS4015NBRM5</b>	<b>PFG-40-NBR</b>	<b>PFTYS4015SIM5</b>	<b>PFG-40-SI</b>	<b>TYS-20B-15</b>
40	M5	30	.56 (2.5)	1.2 (4.9)	<b>PFTYS4030NBRM5</b>	<b>PFG-40-NBR</b>	<b>PFTYS4030SIM5</b>	<b>PFG-40-SI</b>	<b>TYS-20B-30</b>
50	M5	15	.56 (2.5)	1.2 (4.9)	<b>PFTYS5015NBRM5</b>	<b>PFG-50-NBR</b>	<b>PFTYS5015SIM5</b>	<b>PFG-50-SI</b>	<b>TYS-50-15</b>
50	M5	30	.67 (2.9)	1.4 (5.9)	<b>PFTYS5030NBRM5</b>	<b>PFG-50-NBR</b>	<b>PFTYS5030SIM5</b>	<b>PFG-50-SI</b>	<b>TYS-50-30</b>
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	<b>PFTYS6030NBRN1</b>	<b>PFG-60-NBR</b>	<b>PFTYS6030SIN1</b>	<b>PFG-60-SI</b>	<b>TYS-60-30</b>
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	<b>PFTYS6050NBRN1</b>	<b>PFG-60-NBR</b>	<b>PFTYS6050SIN1</b>	<b>PFG-60-SI</b>	<b>TYS-60-50</b>
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	<b>PFTYS8030NBRN1</b>	<b>PFG-80-NBR</b>	<b>PFTYS8030SIN1</b>	<b>PFG-80-SI</b>	<b>TYS-60-30</b>
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	<b>PFTYS8050NBRN1</b>	<b>PFG-80-NBR</b>	<b>PFTYS8050SIN1</b>	<b>PFG-80-SI</b>	<b>TYS-60-50</b>
95	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	<b>PFTYS9530NBRN1</b>	<b>PFG-95-NBR</b>	<b>PFTYS9530SIN1</b>	<b>PFG-95-SI</b>	<b>TYS-60-30</b>
95	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	<b>PFTYS9550NBRN1</b>	<b>PFG-95-NBR</b>	<b>PFTYS9550SIN1</b>	<b>PFG-95-SI</b>	<b>TYS-60-50</b>
120	1/4 NPT	20	3.6 (15.6)	6.8 (29)	<b>PFTYS12020NBRN2</b>	<b>PFG-120-NBR</b>	<b>PFTYS12020SIN2</b>	<b>PFG-120-SI</b>	<b>TYS-120-20</b>
120	1/4 NPT	70	3.4 (14.7)	6.8 (29)	<b>PFTYS12070NBRN2</b>	<b>PFG-120-NBR</b>	<b>PFTYS12070SIN2</b>	<b>PFG-120-SI</b>	<b>TYS-120-70</b>
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	<b>PFTYS15020NBRN2</b>	<b>PFG-150-NBR</b>	<b>PFTYS15020SIN2</b>	<b>PFG-150-SI</b>	<b>TYS-120-20</b>
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	<b>PFTYS15070NBRN2</b>	<b>PFG-150-NBR</b>	<b>PFTYS15070SIN2</b>	<b>PFG-150-SI</b>	<b>TYS-120-70</b>
200	1/4 NPT	20	3.6 (15.6)	6.8 (29)	<b>PFTYS20020NBRN2</b>	<b>PFG-200-NBR</b>	<b>PFTYS20020SIN2</b>	<b>PFG-200-SI</b>	<b>TYS-120-20</b>
200	1/4 NPT	70	3.4 (14.7)	6.8 (29)	<b>PFTYS20070NBRN2</b>	<b>PFG-200-NBR</b>	<b>PFTYS20070SIN2</b>	<b>PFG-200-SI</b>	<b>TYS-120-70</b>

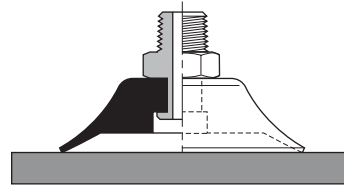
Most popular.



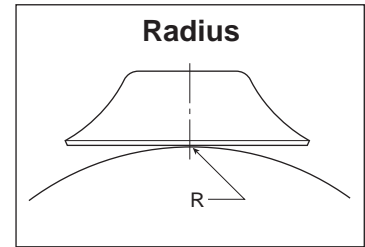
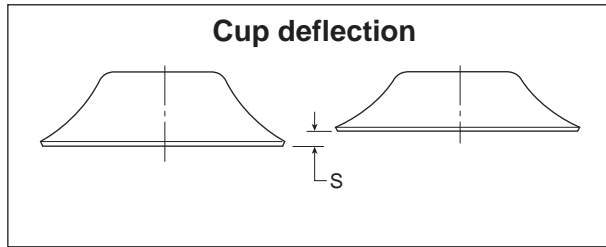
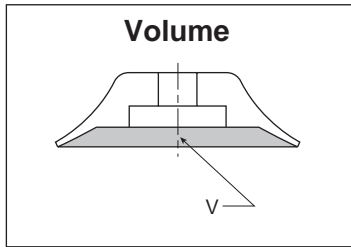
A

**Applications**

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



**Main data for fat PFG cups**

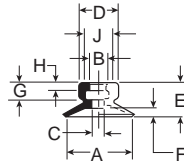


Model number	Cup diameter inches (mm)	Area cm <sup>2</sup>	Volume (V) liters	Lifting force @60% (N)		Cup deflection (S) mm	Radius (R) mm
PFG-5A-*	.20 (5)	0.20	0.000005	1.20	0.6	0.5	3.5
PFG-6A-*	.24 (6)	0.28	0.000008	1.70	0.85	1.0	4.0
PFG-8A-*	.31 (8)	0.50	0.00003	3.10	1.5	1.4	5.0
PFG-10A-*	.39 (10)	0.79	0.00007	4.80	2.4	1.5	6.0
PFG-15-*	.59 (15)	1.77	0.0004	10.8	5.4	1.9	6.0
PFG-15A-*	.59 (15)	1.77	0.0004	10.8	5.4	1.9	6.0
PFG-20-*	.79 (20)	3.14	0.0008	19.2	9.6	2.3	9.0
PFG-20B-*	.79 (20)	3.14	0.0008	19.2	9.6	2.3	13.0
PFG-30-*	1.18 (30)	7.07	0.0018	43.2	21.6	2.0	26
PFG-40-*	1.57 (40)	12.60	0.004	76.9	38.5	3.5	37
PFG-50-*	1.97 (50)	19.60	0.007	120	60	4.0	41
PFG-60-*	2.36 (60)	28.30	0.0090	173	87	5.0	70
PFG-80-*	3.15 (80)	50.30	0.025	308	154	6.0	100
PFG-95-*	3.74 (95)	70.90	0.035	434	267	6.0	150
PFG-120-*	4.72 (120)	113.00	0.078	692	346	6.0	365
PFG-150-*	5.91 (150)	176.70	0.177	1081	541	9.0	380
PFG-200-*	7.87 (200)	314.20	0.425	1922	961	13.0	430

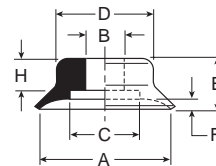
\* Cup material

**PFG Series Replacement Cup Dimensions**

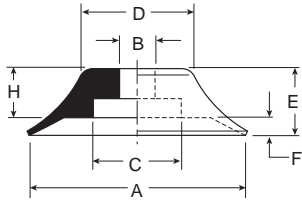
**PFG-5A  
PFG-15A**



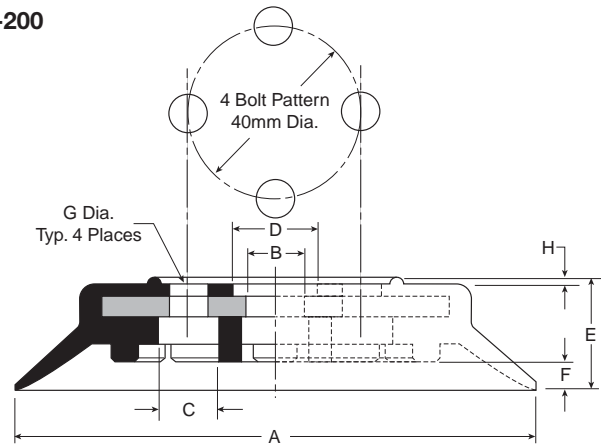
**PFG-15 thru  
PFG-40**



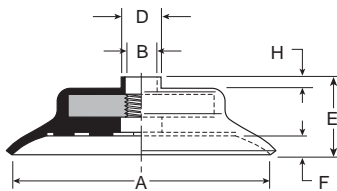
**PFG-50**



**PFG-120 thru  
PFG-200**



**PFG-60 thru  
PFG-95**



Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PFG-5A-*	.20 (5)	.16 (4)	.06 (1.4)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-6A-*	.24 (6)	.16 (4)	.08 (2)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-8A-*	.31 (8)	.16 (4)	.08 (2)	.31 (8)	.28 (7)	.05 (1.2)	.16 (4)	.08 (2)	.24 (6)
PFG-10A-*	.39 (10)	.16 (4)	.08 (2)	.33 (8.5)	.30 (7.5)	.06 (1.5)	.16 (4)	.08 (2)	.24 (6)
PFG-15-*	.59 (15)	—	.31 (7.8)	.47 (12)	.31 (8)	.07 (1.9)	—	—	—
PFG-15A-*	.59 (15)	.16 (4)	.08 (2)	.35 (9)	.31 (8)	.08 (2)	.16 (4)	.08 (2)	.24 (6)
PFG-20-*	.79 (20)	.18 (4.6)	.43 (11)	.59 (15)	.39 (10)	.09 (2.3)	—	.18 (4.5)	—
PFG-20B-*	.79 (20)	.24 (6)	.43 (11)	.59 (15)	.49 (12.5)	.09 (2.3)	—	.28 (7)	—
PFG-30-*	1.18 (30)	.24 (6)	.43 (11)	.55 (14)	.47 (12)	.08 (2)	—	.28 (7)	—
PFG-40-*	1.57 (40)	.24 (6)	.43 (11)	.94 (24)	.55 (14)	.16 (4)	—	.28 (7)	—
PFG-50-*	1.97(50)	.31 (8)	.79 (20)	1.06 (27)	.59 (15)	.14 (3.5)	—	.28 (7)	—
PFG-60-*	2.36 (60)	M10x1.25	—	.79 (12.5)	.73 (18.5)	.20 (5)	—	.10 (2.5)	—
PFG-80-*	3.15 (80)	M10x1.25	—	.79 (12.5)	.81 (20.5)	.24 (6)	—	.10 (2.5)	—
PFG-95-*	3.74 (95)	M10x1.25	—	.79 (12.5)	.83 (21)	.24 (6)	—	.10 (2.5)	—
PFG-120-*	4.72 (120)	.55 (14)	.55 (14)	.79 (20)	1.00 (25.5)	.24 (6)	4xØ8.7xØ40	.059 (1.5)	—
PFG-150-*	5.91 (150)	.51(13)	.55 (14)	.79 (20)	1.28 (32.5)	.35 (9)	4xØ8.7xØ40	.059 (1.5)	—
PFG-200-*	7.87 (200)	.51 (13)	.47 (12)	.79 (20)	1.48 (37.5)	.51 (13)	4xØ8.7xØ40	.059 (1.5)	—

Inches (mm)  
\* Cup material

**A**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

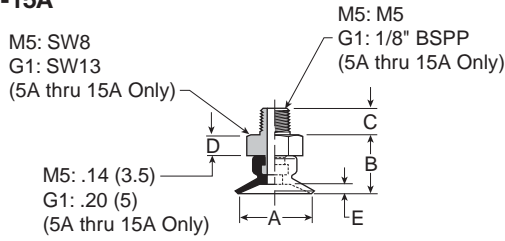
PCG Multiple Bellows

PUGB Flat Swivel

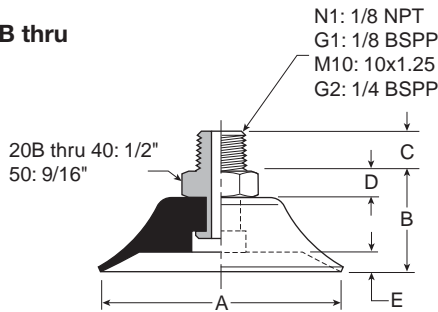
Cup Fittings

**A**

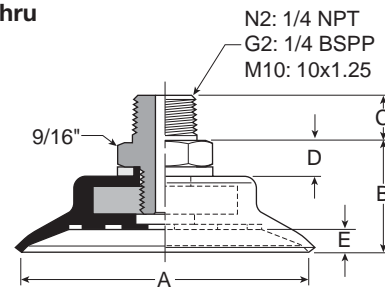
**PFTM-5A thru  
PFTM-15A**



**PFTM-20B thru  
PFTM-50**



**PFTM-60 thru  
PFTM-95**

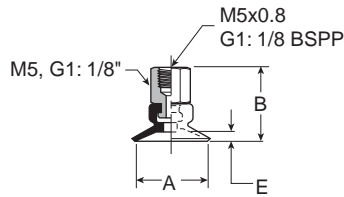


Model number	ØA	B	C (M3)	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PFTM-5A-*†	.20 (5)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-6A-*†	.24 (6)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-8A-*†	.31 (8)	.41 (10.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.05 (1.2)
PFTM-10A-*†	.39 (10)	.43 (11)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.06 (1.5)
PFTM-15A-*†	.59 (15)	.45 (11.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.08 (2)
PFTM-20B-*†	.79 (20)	.69 (17.5)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.10 (2.5)
PFTM-30-*†	1.18 (30)	.67 (17)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.08 (2)
PFTM-40-*†	1.57 (40)	.75 (19)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.14 (3.5)
PFTM-50-*†	1.97 (50)	.79 (20)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.16 (4)
PFTM-60-*†	2.36 (60)	.90 (23)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.20 (5)
PFTM-80-*†	3.15 (80)	.98 (25)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)
PFTM-95-*†	3.74 (95)	1.00 (25.5)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)

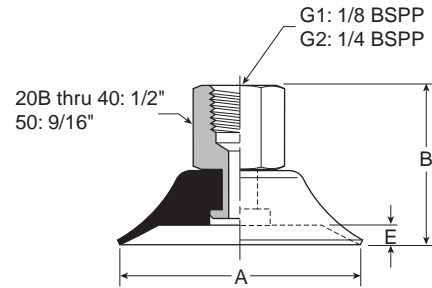
Inches (mm)  
\* Cup material  
† Thread size

**Dimensions**

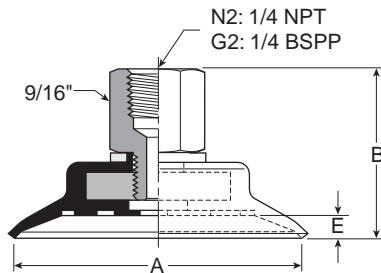
**PFTF-5A thru  
PFTF-15A**



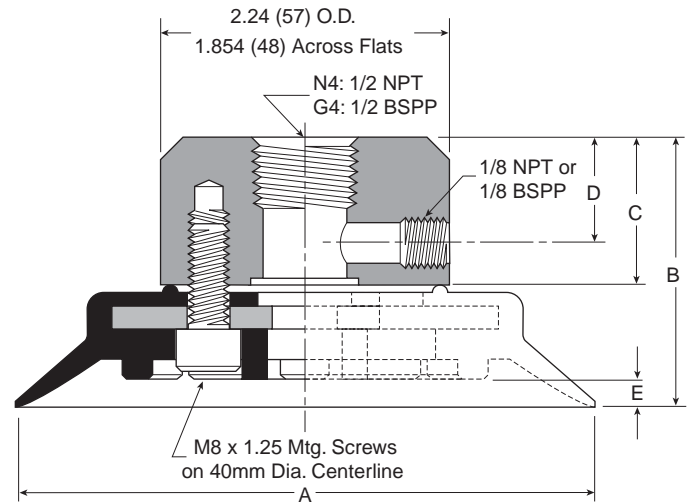
**PFTF-20B thru  
PFTF-50**



**PFTF-60 thru  
PFTF-95**



**PFTF-120 thru  
PFTF-200**



Model number	ØA	B	B (M5)	C	D	E
PFTF-5A-*†	.20 (5)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-6A-*†	.24 (6)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-8A-*†	.31 (8)	.59 (15)	.83 (21)	—	—	.05 (1.2)
PFTF-10A-*†	.39 (10)	.57 (14.5)	.81 (20.5)	—	—	.06 (1.5)
PFTF-15A-*†	.59 (15)	.63 (16)	.87 (22)	—	—	.08 (2)
PFTF-20B-*†	.79 (20)	1.04 (26.5)	—	—	—	.10 (2.5)
PFTF-30-*†	1.18 (30)	1.02 (26)	—	—	—	.08 (2)
PFTF-40-*†	1.57 (40)	1.10 (28)	—	—	—	.16 (4)
PFTF-50-*†	1.97 (50)	1.14 (29)	—	—	—	.16 (4)
PFTF-60-*†	2.36 (60)	1.40 (35.5)	—	—	—	.20 (5)
PFTF-80-*†	3.15 (80)	1.48 (37.5)	—	—	—	.24 (6)
PFTF-95-*†	3.74 (95)	1.50 (38)	—	—	—	.24 (6)
PFTF-120-*†	4.72 (120)	1.83 (46.5)	—	.94 (24)	.51 (13)	.24 (6)
PFTF-150-*†	5.91 (150)	2.11 (53.5)	—	.94 (24)	.51 (13)	.35 (9)
PFTF-200-*†	7.87 (200)	2.30 (58.5)	—	.94 (24)	.51 (13)	.51 (13)

Inches (mm)  
\* Cup material  
† Thread size

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings



**Dimensions**

**A**

Technical

PFG  
Flat

PBG  
Bellows

PSV-CFS  
Flat

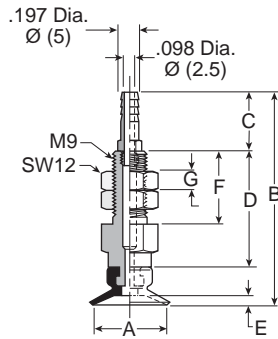
PJG Short  
Bellows

PCG  
Multiple  
Bellows

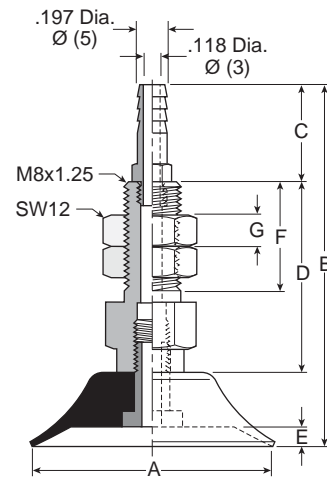
PUGB  
Flat Swivel

Cup  
Fittings

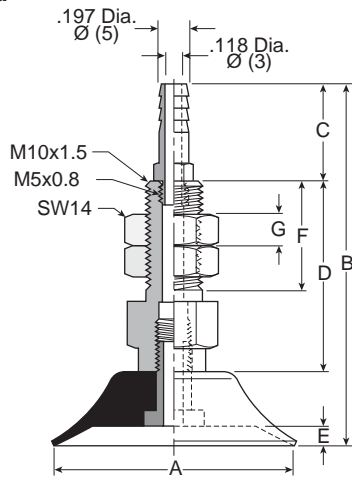
**PFTK-5A thru  
PFTK-10A**



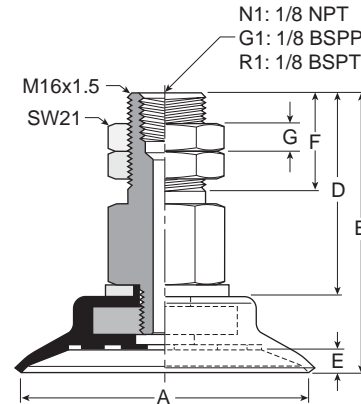
**PFTK-15 thru  
PFTK-20**



**PFTK-30 thru  
PFTK-50**



**PFTK-60 thru  
PFTK-95**

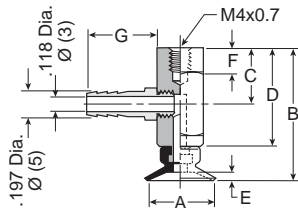


Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PFTK-5A-*	.20 (5)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-6A-*	.24 (6)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-8A-*	.31 (8)	1.22 (31)	.39 (10)	.55 (14)	.05 (1.2)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-10A-*	.39 (10)	1.81 (46)	.63 (16)	.88 (22.5)	.06 (1.5)	.61 (15.5)	.12 (3)	.53 (15)
PFTK-15-*	.59 (15)	1.81 (46)	.63 (16)	.86 (22)	.07 (1.9)	.59 (15)	.12 (3)	.71 (20)
PFTK-20-*	.79 (20)	1.89 (48)	.63 (16)	.86 (22)	.09 (2.3)	.59 (15)	.20 (5)	.71 (20)
PFTK-30-*	1.18 (30)	2.36 (60)	.63 (16)	1.26 (32)	.08 (2)	.71 (20)	.20 (5)	1.41 (40)
PFTK-40-*	1.57 (40)	2.44 (62)	.63 (16)	1.26 (32)	.14 (3.5)	.71 (20)	.20 (5)	1.41 (40)
PFTK-50-*	1.97 (50)	2.48 (63)	.63 (16)	1.26 (32)	.16 (4)	.71 (20)	.20 (5)	1.77 (50)
PFTK-60- <sup>†</sup>	2.36 (60)	2.30 (58.5)	—	1.67 (42.5)	.20 (5)	.79 (20)	.24 (6)	4.59 (130)
PFTK-80- <sup>†</sup>	3.15 (80)	2.38 (60.5)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	6.00 (170)
PFTK-95- <sup>†</sup>	3.74 (95)	2.40 (61)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	7.77 (220)

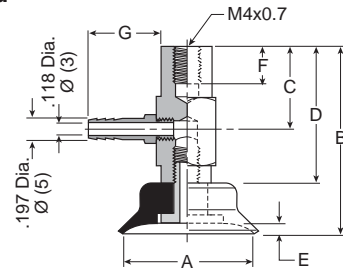
Inches (mm)  
 \* Cup material  
<sup>†</sup> Vacuum port

**Dimensions**

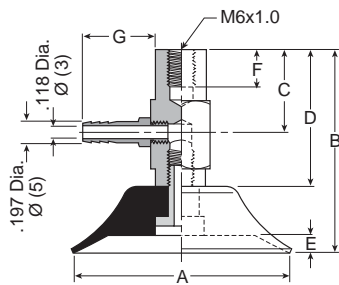
**PFYK-5A thru  
 PFYK-10A**



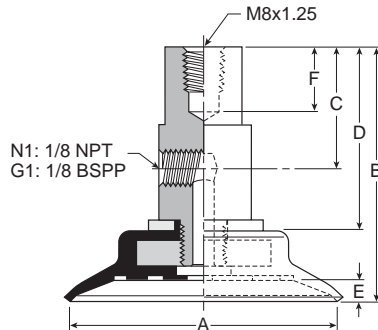
**PFYK-15 thru  
 PFYK-20**



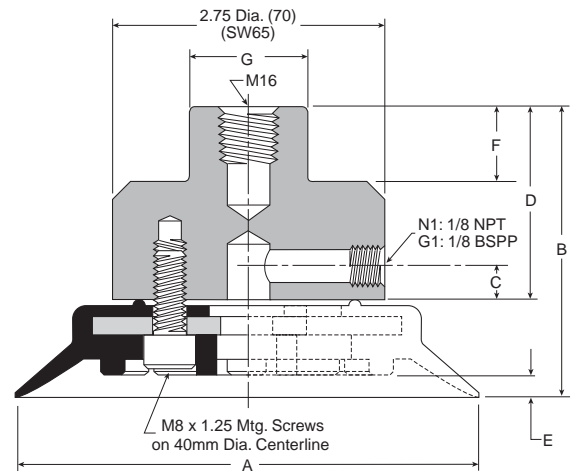
**PFYK-30 thru  
 PFYK-50**



**PFYK-60 thru  
 PFYK-95**



**PFYK-120 thru  
 PFYK-200**



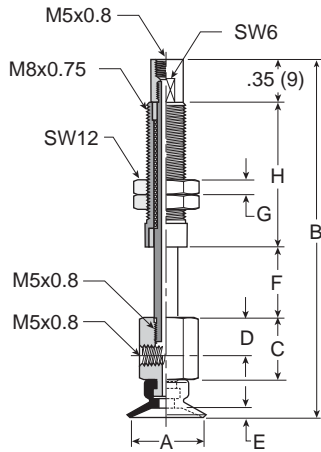
Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PFYK-5A-*	.20 (5)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-6A-*	.24 (6)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-8A-*	.31 (8)	1.16 (29.5)	.51 (13)	.89 (22.5)	.05 (1.2)	.24 (6)	.63 (16)	.56 (16)
PFYK-10A-*	.39 (10)	1.18 (30)	.51 (13)	.89 (22.5)	.06 (1.5)	.24 (6)	.63 (16)	.56 (16)
PFYK-15-*	.59 (15)	1.18 (30)	.55 (14)	.87 (22)	.07 (1.9)	.24 (6)	.63 (16)	.71 (20)
PFYK-20-*	.79 (20)	1.26 (32)	.55 (14)	.87 (22)	.09 (2.3)	.24 (6)	.63 (16)	.71 (20)
PFYK-30-*	1.18 (30)	1.73 (44)	.79 (20)	1.26 (32)	.08 (2)	.31 (8)	.63 (16)	1.41 (40)
PFYK-40-*	1.57 (40)	1.81 (46)	.79 (20)	1.26 (32)	.14 (3.5)	.31 (8)	.63 (16)	1.77 (50)
PFYK-50-*	1.97 (50)	1.85 (47)	.79 (20)	1.26 (32)	.16 (4)	.31 (8)	.63 (16)	1.94 (55)
PFYK-60-*.†	2.36 (60)	2.30 (58.5)	1.10 (28)	1.57 (40)	.20 (5)	.43 (11)	—	4.24 (120)
PFYK-80-*.†	3.15 (80)	2.38 (60.5)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	5.65 (160)
PFYK-95-*.†	3.74 (95)	2.40 (61)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	7.42 (210)
PFYK-120-*.†	4.72 (120)	2.94 (75.5)	.47 (12)	1.97 (50)	.24 (6)	.79 (20)	1.18 Dia. (30)	22.6 (640)
PFYK-150-*.†	5.91 (150)	3.25 (82.5)	.47 (12)	1.97 (50)	.35 (9)	.79 (20)	1.18 Dia. (30)	32.1 (910)
PFYK-200-*.†	7.87 (200)	3.44 (87.5)	.47 (12)	1.97 (50)	.51 (13)	.79 (20)	1.18 Dia. (30)	42.4 (1200)

Inches (mm)  
 \* Cup material  
 † Vacuum port

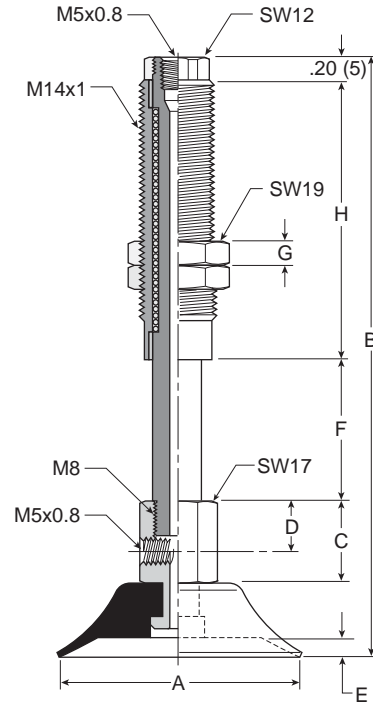
<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

**Dimensions**

**PFTYS5A thru  
PFTYS15A**



**PFTYS20B thru  
PFTYS50**

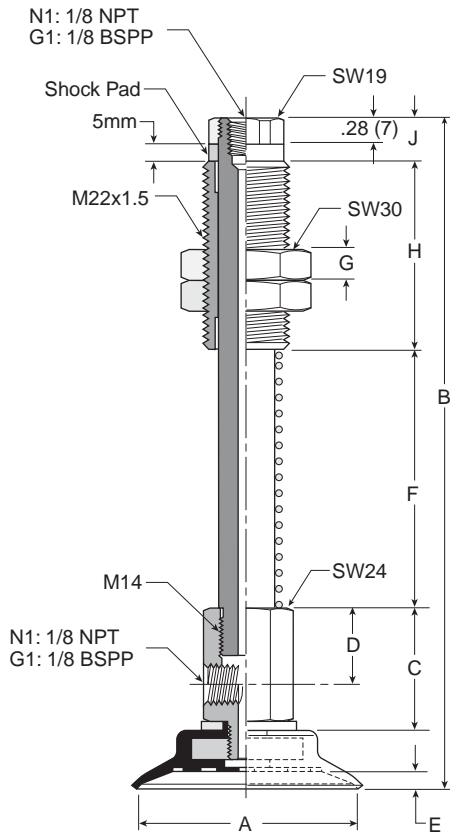


Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PFTYS5A10 <sup>††</sup>	.20 (5)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS5A15 <sup>††</sup>	.20 (5)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS6A10 <sup>††</sup>	.24 (6)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS6A15 <sup>††</sup>	.24 (6)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS8A10 <sup>††</sup>	.31 (8)	2.44 (62)	.51 (13)	.31 (8)	.05 (1.2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS8A15 <sup>††</sup>	.31 (8)	2.93 (74.5)	.51 (13)	.31 (8)	.05 (1.2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS10A10 <sup>††</sup>	.39 (10)	2.48 (63)	.51 (13)	.31 (8)	.06 (1.5)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS10A15 <sup>††</sup>	.39 (10)	2.95 (75)	.51 (13)	.31 (8)	.06 (1.5)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS15A10 <sup>††</sup>	.59 (15)	2.50 (63.5)	.51 (13)	.31 (8)	.08 (2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS15A15 <sup>††</sup>	.59 (15)	2.97 (75.5)	.51 (13)	.31 (8)	.08 (2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS20B15 <sup>††</sup>	.79 (20)	3.37 (85.5)	.67 (17)	.39 (10)	.09 (2.3)	.59 (15)	.20 (5)	1.42 (36)	2.5 (71)
PFTYS20B30 <sup>††</sup>	.79 (20)	4.82 (122.5)	.67 (17)	.39 (10)	.09 (2.3)	1.18 (30)	.20 (5)	2.28 (58)	3.4 (96)
PFTYS3015 <sup>††</sup>	1.18 (30)	3.35 (85)	.67 (17)	.39 (10)	.08 (2)	.59 (15)	.20 (5)	1.42 (36)	2.5 (72)
PFTYS3030 <sup>††</sup>	1.18 (30)	4.80 (122)	.67 (17)	.39 (10)	.08 (2)	1.18 (30)	.20 (5)	2.28 (58)	3.5 (97)
PFTYS4015 <sup>††</sup>	1.57 (40)	3.43 (87)	.67 (17)	.39 (10)	.14 (3.5)	.59 (15)	.20 (5)	1.42 (36)	2.7 (76)
PFTYS4030 <sup>††</sup>	1.57 (40)	4.88 (124)	.67 (17)	.39 (10)	.14 (3.5)	1.18 (30)	.20 (5)	2.28 (58)	3.6 (101)
PFTYS5015 <sup>††</sup>	1.97 (50)	3.46 (88)	.67 (17)	.39 (10)	.16 (4)	.59 (15)	.20 (5)	1.42 (36)	3.0 (85)
PFTYS5030 <sup>††</sup>	1.97 (50)	4.92 (125)	.67 (17)	.39 (10)	.16 (4)	1.18 (30)	.20 (5)	2.28 (58)	3.9 (110)

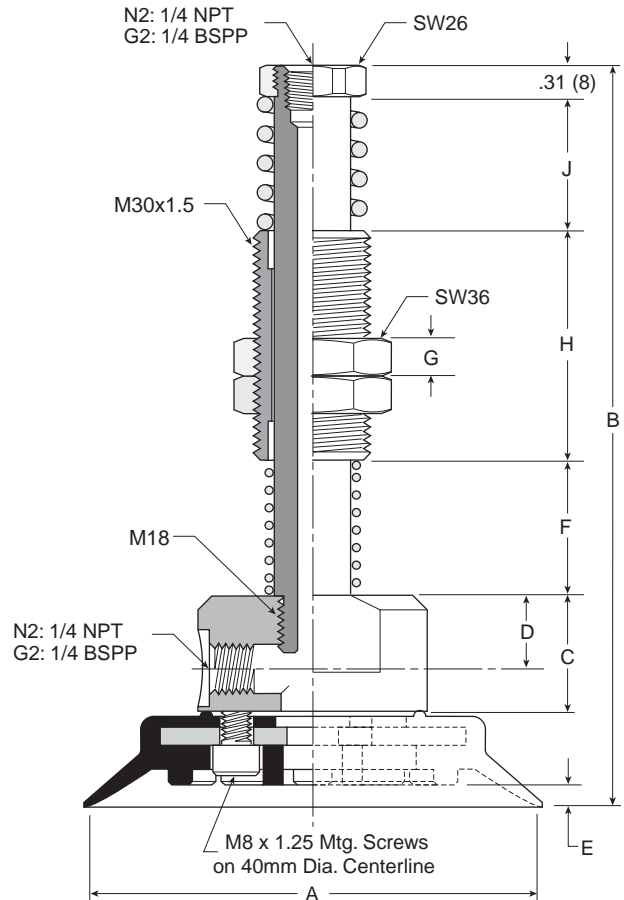
Inches (mm)  
<sup>\*</sup> Cup material  
<sup>†</sup> Vacuum port

**Dimensions**

**PFTYS60 thru  
PFTYS95**



**PFTYS120 thru  
PFTYS200**



**A**

Technical

PFG  
Flat

PBG  
Bellows

P5V-CFS  
Flat

PJG Short  
Bellows

PCG  
Multiple  
Bellows

PUGB  
Flat Swivel

Cup  
Fittings

Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PFTYS6030**	2.36 (60)	6.02 (153)	1.28 (32.5)	.78 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	9.7 (282)
PFTYS6050**	2.36 (60)	7.01 (178)	1.28 (32.5)	.78 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.2 (316)
PFTYS8030**	3.15 (80)	6.10 (155)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	11 (310)
PFTYS8050**	3.15 (80)	7.09 (180)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	12.2 (344)
PFTYS9530**	3.74 (95)	6.12 (156)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12.4 (350)
PFTYS9550**	3.74 (95)	7.11 (181)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.6 (384)
PFTYS12020**	4.72 (120)	7.56 (192)	1.28 (32.5)	.71 (18)	.24 (6)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	41.2 (1165)
PFTYS12070**	4.72 (120)	10.12 (257)	1.28 (32.5)	.71 (18)	.24 (6)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	44 (1246)
PFTYS15020**	5.91 (150)	7.83 (199)	1.28 (32.5)	.71 (18)	.35 (9)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	49 (1389)
PFTYS15070**	5.91 (150)	10.39 (264)	1.28 (32.5)	.71 (18)	.35 (9)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	52 (1471)
PFTYS20020**	7.87 (200)	8.03 (204)	1.28 (32.5)	.71 (18)	.51 (13)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	62 (1755)
PFTYS20070**	7.87 (200)	10.59 (269)	1.28 (32.5)	.71 (18)	.51 (13)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	64.9 (1836)

Inches (mm)  
\* Cup material  
† Vacuum port

**Features**

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°	-20° to +75°
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
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**Ordering Information**

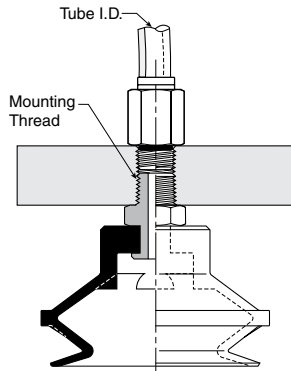
**PBTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, 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	<b>PBTM-10A-NBR-M5</b>	PBG-10A-NBR	PBTM-10A-SI-M5	PBG-10A-SI	FTM-5A-M5H
10	1/8 BSPP	<b>PBTM-10A-NBR-G1</b>	PBG-10A-NBR	PBTM-10A-SI-G1	PBG-10A-SI	FTM-5A-G1
15	M5	<b>PBTM-15A-NBR-M5</b>	PBG-15A-NBR	PBTM-15A-SI-M5	PBG-15A-SI	FTM-5A-M5H
15	1/8 BSPP	<b>PBTM-15A-NBR-G1</b>	PBG-15A-NBR	PBTM-15A-SI-G1	PBG-15A-SI	FTM-5A-G1
20	1/8 BSPP	<b>PBTM-20B-NBR-G1</b>	PBG-20B-NBR	PBTM-20B-SI-G1	PBG-20B-SI	FTM-20B-G1H
20	1/4 BSPP	<b>PBTM-20B-NBR-G2</b>	PBG-20B-NBR	PBTM-20B-SI-G2	PBG-20B-SI	FTM-20B-G2
20	M10	PBTM-20B-NBR-M10	<b>PBG-20B-NBR</b>	PBTM-20B-SI-M10	<b>PBG-20B-SI</b>	FTM-20B-M10
20	1/8 NPT	<b>PBTM-20B-NBR-N1</b>	PBG-20B-NBR	PBTM-20B-SI-N1	PBG-20B-SI	FTM-20B-N1
30	1/8 BSPP	<b>PBTM-30-NBR-G1</b>	PBG-30-NBR	PBTM-30-SI-G1	PBG-30-SI	FTM-20B-G1H
30	1/4 BSPP	<b>PBTM-30-NBR-G2</b>	PBG-30-NBR	PBTM-30-SI-G2	PBG-30-SI	FTM-20B-G2
30	M10	PBTM-30-NBR-M10	<b>PBG-30-NBR</b>	PBTM-30-SI-M10	<b>PBG-30-SI</b>	FTM-20B-M10
30	1/8 NPT	<b>PBTM-30-NBR-N1</b>	PBG-30-NBR	PBTM-30-SI-N1	PBG-30-SI	FTM-20B-N1
40	1/8 BSPP	<b>PBTM-40-NBR-G1</b>	PBG-40-NBR	PBTM-40-SI-G1	PBG-40-SI	FTM-20B-G1H
40	1/4 BSPP	<b>PBTM-40-NBR-G2</b>	PBG-40-NBR	PBTM-40-SI-G2	PBG-40-SI	FTM-20B-G2
40	M10	PBTM-40-NBR-M10	<b>PBG-40-NBR</b>	PBTM-40-SI-M10	<b>PBG-40-SI</b>	FTM-20B-M10
40	1/8 NPT	<b>PBTM-40-NBR-N1</b>	PBG-40-NBR	PBTM-40-SI-N1	PBG-40-SI	FTM-20B-N1
50	1/8 BSPP	<b>PBTM-50-NBR-G1</b>	PBG-50-NBR	PBTM-50-SI-G1	PBG-50-SI	FTM-50-G1H
50	1/4 BSPP	<b>PBTM-50-NBR-G2</b>	PBG-50-NBR	PBTM-50-SI-G2	PBG-50-SI	FTM-50-G2
50	1/8 NPT	PBTM-50-NBR-N1	<b>PBG-50-NBR</b>	PBTM-50-SI-N1	PBG-50-SI	FTM-50-N1
75	1/4 BSPP	<b>PBTM-75-NBR-G2</b>	PBG-75-NBR	PBTM-75-SI-G2	PBG-75-SI	FTM-60-G2
75	M10	PBTM-75-NBR-M10	<b>PBG-75-NBR</b>	PBTM-75-SI-M10	PBG-75-SI	FTM-60-M10
75	1/4 NPT	<b>PBTM-75-NBR-N2</b>	PBG-75-NBR	PBTM-75-SI-N2	PBG-75-SI	FTM-60-N2

Most popular.



**A**

Technical

PBG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

**PBTF Series Female Thread Connector**

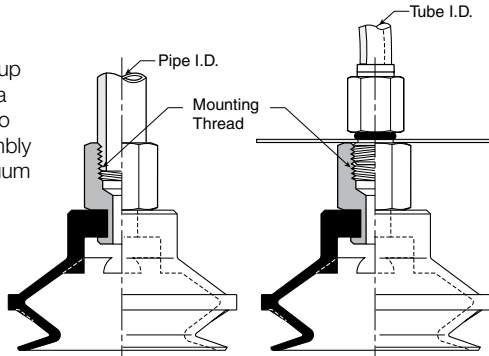
Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads. Fitting material: aluminum.

**A**

**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	<b>PBTF-10A-NBR-G1</b>	PBG-10A-NBR	<b>PBTF-10A-SI-G1</b>	PBG-10A-SI	<b>FTF-5A-G1</b>
10	M5	<b>PBTF-10A-NBR-M5</b>	PBG-10A-NBR	<b>PBTF-10A-SI-M5</b>	PBG-10A-SI	<b>FTF-5A-M5</b>
15	1/8 BSPP	<b>PBTF-15A-NBR-G1</b>	PBG-15A-NBR	<b>PBTF-15A-SI-G1</b>	PBG-15A-SI	<b>FTF-5A-G1</b>
15	M5	<b>PBTF-15A-NBR-M5</b>	<b>PBG-15A-NBR</b>	<b>PBTF-15A-SI-M5</b>	PBG-15A-SI	<b>FTF-5A-M5</b>
20	1/8 BSPP	<b>PBTF-20B-NBR-G1</b>	<b>PBG-20B-NBR</b>	<b>PBTF-20B-SI-G1</b>	<b>PBG-20B-SI</b>	<b>FTF-20B-G1</b>
30	1/8 BSPP	<b>PBTF-30-NBR-G1</b>	<b>PBG-30-NBR</b>	<b>PBTF-30-SI-G1</b>	<b>PBG-30-SI</b>	<b>FTF-20B-G1</b>
30	1/4 BSPP	PBTF-30-NBR-G2	<b>PBG-30-NBR</b>	PBTF-30-SI-G2	<b>PBG-30-SI</b>	FTF-20B-G2
40	1/8 BSPP	<b>PBTF-40-NBR-G1</b>	<b>PBG-40-NBR</b>	<b>PBTF-40-SI-G1</b>	<b>PBG-40-SI</b>	<b>FTF-20B-G1</b>
40	1/4 BSPP	PBTF-40-NBR-G2	<b>PBG-40-NBR</b>	PBTF-40-SI-G2	<b>PBG-40-SI</b>	FTF-20B-G2
50	1/8 BSPP	PBTF-50-NBR-G1	<b>PBG-50-NBR</b>	PBTF-50-SI-G1	<b>PBG-50-SI</b>	FTF-50-G1
50	1/4 BSPP	PBTF-50-NBR-G2	<b>PBG-50-NBR</b>	PBTF-50-SI-G2	<b>PBG-50-SI</b>	FTF-50-G2
75	1/4 BSPP	PBTF-75-NBR-G2	<b>PBG-75-NBR</b>	PBTF-75-SI-G2	PBG-75-SI	<b>FTF-60-G2</b>
75	1/4 NPT	<b>PBTF-75-NBR-N2</b>	<b>PBG-75-NBR</b>	PBTF-75-SI-N2	PBG-75-SI	<b>FTF-60-N2</b>
110	1/2 BSPP	<b>PBTF-110-NBR-G4</b>	<b>PBG-110-NBR</b>	<b>PBTF-110-SI-G4</b>	<b>PBG-110-SI</b>	<b>FTF-120-G4</b>
110	1/2 NPT	<b>PBTF-110-NBR-N4</b>	<b>PBG-110-NBR</b>	<b>PBTF-110-SI-N4</b>	<b>PBG-110-SI</b>	<b>FTF-120-N4</b>
150	1/2 BSPP	<b>PBTF-150-NBR-G4</b>	<b>PBG-150-NBR</b>	PBTF-150-SI-G4	PBG-150-SI	<b>FTF-120-G4</b>
150	1/2 NPT	<b>PBTF-150-NBR-N4</b>	<b>PBG-150-NBR</b>	PBTF-150-SI-N4	PBG-150-SI	<b>FTF-120-N4</b>

■ Most popular.

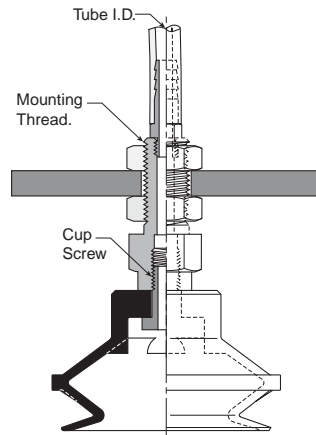


**PBTK Series Barbed Bulkhead**

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	<b>PBTK-10A-NBR</b>	<b>PBG-10A-NBR</b>	<b>PBTK-10A-SI</b>	<b>PBG-10A-SI</b>	<b>FTK-5A</b>
15	Barb	<b>PBTK-15A-NBR</b>	<b>PBG-15A-NBR</b>	<b>PBTK-15A-SI</b>	<b>PBG-15-SI</b>	<b>FTK-5A</b>
20	Barb	PBTK-20-NBR	<b>PBG-20-NBR</b>	PBTK-20-SI	<b>PBG-20-SI</b>	FTK-20
30	Barb	<b>PBTK-30-NBR</b>	<b>PBG-30-NBR</b>	<b>PBTK-30-SI</b>	<b>PBG-30-SI</b>	<b>FTK-25</b>
40	Barb	<b>PBTK-40-NBR</b>	<b>PBG-40-NBR</b>	<b>PBTK-40-SI</b>	<b>PBG-40-SI</b>	<b>FTK-25</b>
50	Barb	<b>PBTK-50-NBR</b>	<b>PBG-50-NBR</b>	<b>PBTK-50-SI</b>	<b>PBG-50-SI</b>	<b>FTK-50</b>
75	1/8 BSPP	<b>PBTK-75-NBR-G1</b>	<b>PBG-75-NBR</b>	PBTK-75-SI-G1	<b>PBG-75-SI</b>	<b>FTK-60-G1</b>
75	1/8 NPT	<b>PBTK-75-NBR-N1</b>	<b>PBG-75-NBR</b>	PBTK-75-SI-N1	PBG-75-SI	<b>FTK-60-N1</b>

■ Most popular.



**A**

Technical

PBG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings



**A**

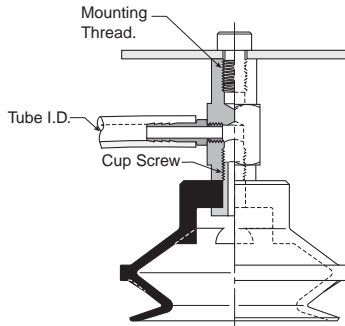
**PBYK Series 90° Barbed Adapter**

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	<b>PBYK-10A-NBR</b>	<b>PBG-10A-NBR</b>	<b>PBYK-10A-SI</b>	<b>PBG-10A-SI</b>	<b>FYK-5A</b>
15	Barb	<b>PBYK-15A-NBR</b>	<b>PBG-15A-NBR</b>	<b>PBYK-15A-SI</b>	<b>PBG-15A-SI</b>	<b>FYK-15</b>
20	Barb	<b>PBYK-20-NBR</b>	<b>PBG-20-NBR</b>	<b>PBYK-20-SI</b>	<b>PBG-20-SI</b>	<b>FYK-20</b>
30	Barb	<b>PBYK-30-NBR</b>	<b>PBG-30-NBR</b>	<b>PBYK-30-SI</b>	<b>PBG-30-SI</b>	<b>FYK-25</b>
40	Barb	<b>PBYK-40-NBR</b>	<b>PBG-40-NBR</b>	<b>PBYK-40-SI</b>	<b>PBG-40-SI</b>	<b>FYK-25</b>
50	Barb	PBYK-50-NBR	PBG-50-NBR	PBYK-50-SI	PBG-50-SI	FYK-50
75	1/8 BSPP	PBYK-75-NBR-G1	<b>PBG-75-NBR</b>	PBYK-75-SI-G1	PBG-75-SI	FYK-60-G1
75	1/8 NPT	<b>PBYK-75-NBR-N1</b>	<b>PBG-75-NBR</b>	PBYK-75-SI-N1	PBG-75-SI	<b>FYK-60-N1</b>
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	<b>PBYK-150-NBR-G1</b>	<b>PBG-150-NBR</b>	PBYK-150-SI-G1	PBG-150-SI	<b>FYK-120-G1</b>
150	1/8 NPT	<b>PBYK-150-NBR-N1</b>	<b>PBG-150-NBR</b>	PBYK-150-SI-N1	PBG-150-SI	<b>FYK-120-N1</b>

■ Most popular.



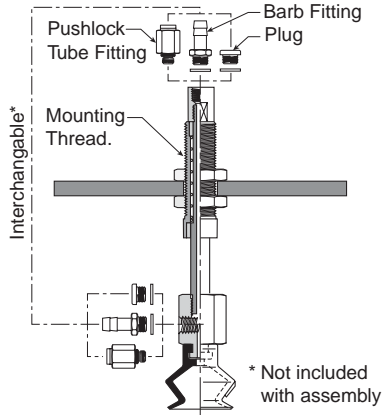
**PBTYS Series Bulkhead Level Compensator**

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 interchangeable connectors & plugs for port connections.



Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
10	M5	10	.11 (.49)	.13 (.59)	<b>PBTYS10A10NBRM5</b>	<b>PBG-10A-NBR</b>	PBTYS10A10SIM5	PBG-10A-SI	<b>TYS-5A-10</b>
10	M5	15	.11 (.49)	.13 (.59)	<b>PBTYS10A15NBRM5</b>	<b>PBG-10A-NBR</b>	PBTYS10A15SIM5	PBG-10A-SI	<b>TYS-5A-15</b>
15	M5	10	.11 (.49)	.13 (.59)	<b>PBTYS15A10NBRM5</b>	<b>PBG-15A-NBR</b>	PBTYS15A10SIM5	PBG-15A-SI	<b>TYS-5A-10</b>
15	M5	15	.11 (.49)	.13 (.59)	<b>PBTYS15A15NBRM5</b>	<b>PBG-15A-NBR</b>	PBTYS15A15SIM5	PBG-15A-SI	<b>TYS-5A-15</b>
20	M5	15	.56 (2.5)	.79 (3.4)	<b>PBTYS20B15NBRM5</b>	<b>PBG-20B-NBR</b>	PBTYS20B15SIM5	PBG-20B-SI	<b>TYS-20B-15</b>
20	M5	30	.56 (2.5)	1.2 (4.9)	<b>PBTYS20B30NBRM5</b>	<b>PBG-20B-NBR</b>	PBTYS20B30SIM5	PBG-20B-SI	<b>TYS-20B-30</b>
30	M5	15	.56 (2.5)	.79 (3.4)	<b>PBTYS3015NBRM5</b>	<b>PBG-30-NBR</b>	PBTYS3015SIM5	PBG-30-SI	<b>TYS-20B-15</b>
30	M5	30	.56 (2.5)	1.2 (4.9)	<b>PBTYS3030NBRM5</b>	<b>PBG-30-NBR</b>	PBTYS3030SIM5	PBG-30-SI	<b>TYS-20B-30</b>
40	M5	15	.56 (2.5)	.79 (3.4)	<b>PBTYS4015NBRM5</b>	<b>PBG-40-NBR</b>	PBTYS4015SIM5	PBG-40-SI	<b>TYS-20B-15</b>
40	M5	30	.56 (2.5)	1.2 (4.9)	<b>PBTYS4030NBRM5</b>	<b>PBG-40-NBR</b>	PBTYS4030SIM5	PBG-40-SI	<b>TYS-20B-30</b>
50	M5	15	.56 (2.5)	1.2 (4.9)	<b>PBTYS5015NBRM5</b>	<b>PBG-50-NBR</b>	PBTYS5015SIM5	PBG-50-SI	<b>TYS-50-15</b>
50	M5	30	.67 (2.9)	1.4 (5.9)	<b>PBTYS5030NBRM5</b>	<b>PBG-50-NBR</b>	PBTYS5030SIM5	PBG-50-SI	<b>TYS-50-30</b>
75	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	<b>PBTYS7530NBRN1</b>	<b>PBG-75-NBR</b>	PBTYS7530SIN1	PBG-75-SI	<b>TYS-60-30</b>
75	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	<b>PBTYS7550NBRN1</b>	<b>PBG-75-NBR</b>	PBTYS7550SIN1	PBG-75-SI	<b>TYS-60-50</b>
110	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PBTYS12020NBRN2	PBG-110-NBR	PBTYS11020SIN2	PBG-110-SI	TYS-120-20
110	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PBTYS12070NBRN2	PBG-110-NBR	PBTYS11070SIN2	PBG-110-SI	<b>TYS-120-70</b>
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PBTYS15020NBRN2	<b>PBG-150-NBR</b>	PBTYS15020SIN2	PBG-150-SI	TYS-120-20
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	<b>PBTYS15070NBRN2</b>	<b>PBG-150-NBR</b>	PBTYS15070SIN2	PBG-150-SI	<b>TYS-120-70</b>

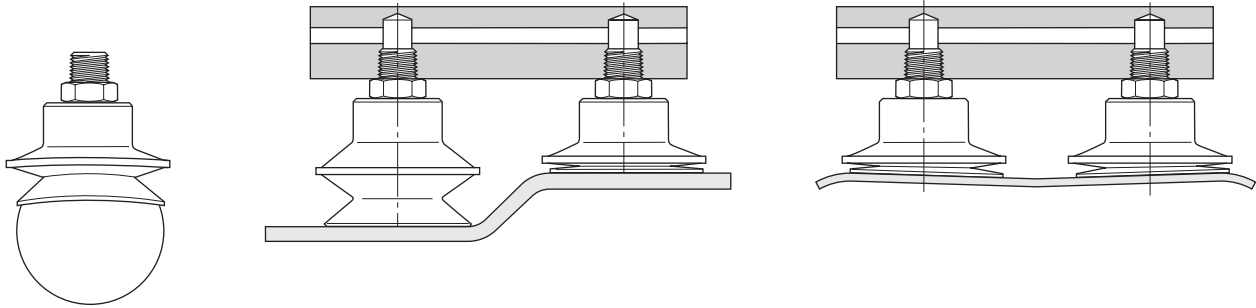
■ Most popular.



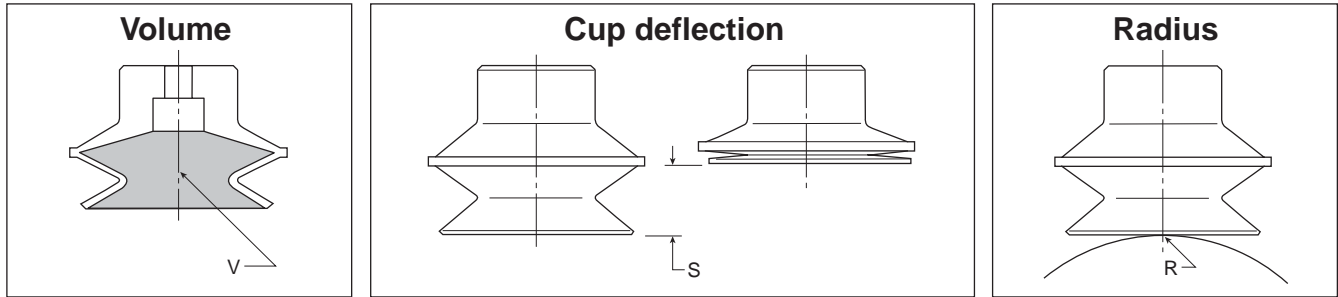
A

Applications

- Round objects
- Uneven surfaces
- Curved product
- Level compensation
- Flexible product
- Soft seal lip



Main data for bellows PBG cups

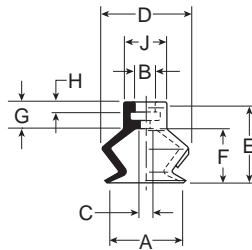


Model number	Cup diameter inches (mm)	Area cm <sup>2</sup>	Volume (V) liters	Lifting force @60% (N)		Cup deflection (S) (mm)	Radius (R) (mm)
PBG-10A-*	.39 (10)	0.79	.0002	4.80	—	.16 (4)	4
PBG-15A-*	.59 (15)	1.77	.0007	10.80	—	.24 (6)	6
PBG-20-*	.79 (20)	3.14	.001	19.20	—	.35 (9)	8
PBG-20B-*	.79 (20)	3.14	.001	19.20	—	.35 (9)	8
PBG-30-*	1.18 (30)	7.07	.004	43.2	—	.51 (13)	15
PBG-40-*	1.57 (40)	12.60	.009	76.9	—	.51 (13)	30
PBG-50-*	1.97 (50)	19.60	.026	120	—	.79 (20)	40
PBG-75-*	2.95 (75)	44.02	.076	270	—	.87 (22)	70
PBG-110-*	4.33 (110)	95.00	.111	434	—	1.14 (29)	100
PBG-150-*	5.91 (150)	176.70	.260	1081	—	1.50 (38)	130

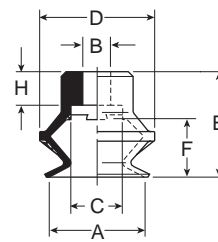
\* Cup material

**PBG Series Replacement Cup Dimensions**

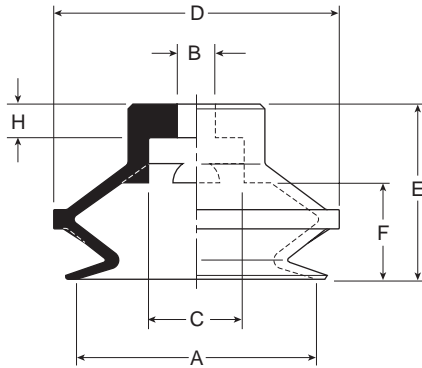
**PBG-10A and  
PBG-20B**



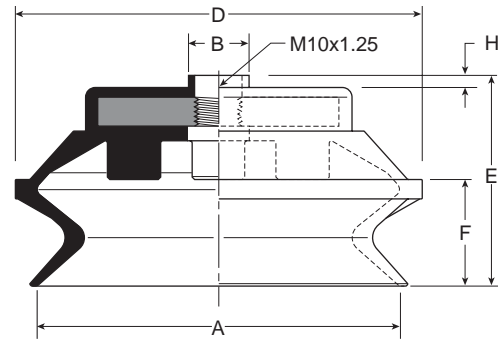
**PBG-20 thru  
PBG-40**



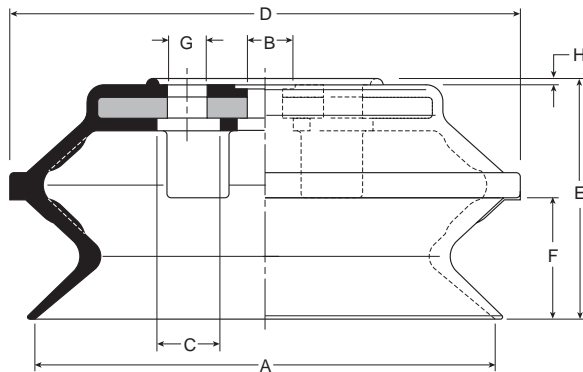
**PBG-50**



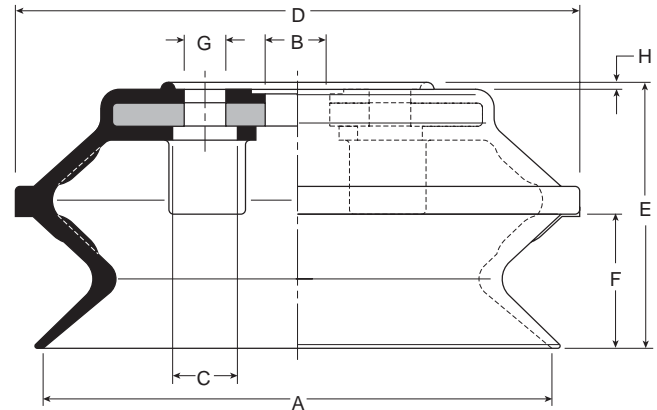
**PBG-75**



**PBG-110**



**PBG-150**



Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PBG-10A-*	.42 (10.6)	.16 (4)	.08 (2)	.49 (12.4)	.53 (13.5)	.30 (7.5)	.24 (6)	.08 (2)	.24 (6)
PBG-15A-*	.59 (15)	.16 (4)	.16 (4)	.67 (17)	.63 (16)	.39 (10)	.24 (6)	.08 (2)	.24 (6)
PBG-20B-*	.79 (20)	.24 (6)	.43 (10.8)	.94 (24)	.87 (22)	.47 (12)	—	.28 (7)	—
PBG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.94 (24)	.77 (19.5)	.47 (12)	—	.18 (4.5)	—
PBG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	1.42 (36)	1.20 (30.5)	.67 (17)	—	.28 (7)	—
PBG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.81 (46)	1.20 (30.5)	.61 (15.5)	—	.28 (7)	—
PBG-50-*	1.97(50)	.31 (7.8)	.78 (19.8)	2.34 (59.5)	1.44 (36.5)	.79 (20)	—	.28 (7)	—
PBG-75-*	2.95 (75)	.49 (12.5)	—	3.31 (84)	1.71 (43.5)	.87 (22)	—	.10 (2.5)	—
PBG-110-*	4.33 (110)	.55 (14)	.55 (14)	4.80 (122)	2.26 (57.5)	1.14 (29)	—	.059 (1.5)	—
PBG-150-*	5.91 (150)	.79 (20)	.55 (14)	6.57 (167)	3.01 (76.5)	1.50 (38)	4xØ9xØ40	.059 (1.5)	—

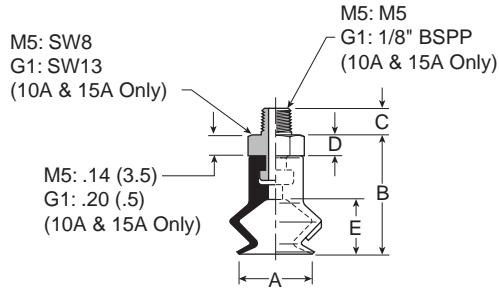
Inches (mm)  
\* Cup material

<b>A</b>
Technical
PBG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

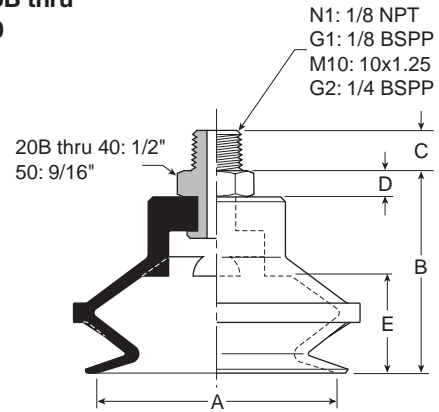
- A**
- Technical
- PFG Flat
- PBG Bellows
- PSV-CFS Flat
- PUG Short Bellows
- PCG Multiple Bellows
- PUGB Flat Swivel
- Cup Fittings

**Dimensions**

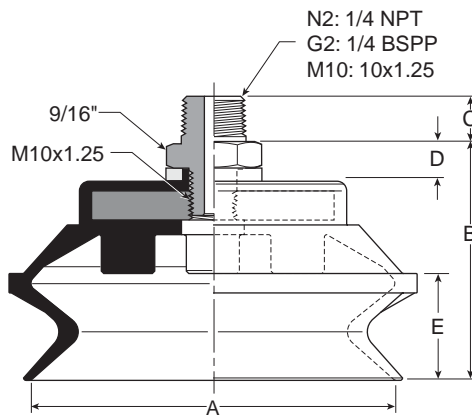
**PBTM-10A thru PBTM-15**



**PBTM-20B thru PBTM-50**



**PBTM-75**

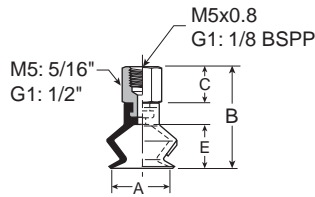


Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PBTM-10A-* <sup>†</sup>	.39 (10)	.67 (17)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.30 (7.5)
PBTM-15A-* <sup>†</sup>	.59 (15)	.77 (19.5)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.39 (10)
PBTM-20B-* <sup>†</sup>	.79 (20)	1.06 (27)	—	.31 (8)	.39 (10)	—	.20 (5)	.47 (12)
PBTM-30-* <sup>†</sup>	1.18 (30)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.67 (17)
PBTM-40-* <sup>†</sup>	1.57 (40)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.61 (15.5)
PBTM-50-* <sup>†</sup>	1.97 (50)	1.63 (41.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.79 (20)
PBTM-75-* <sup>†</sup>	3.74 (95)	1.99 (50.5)	—	—	.39 (10)	.59 (15)	.28 (7)	.87 (22)

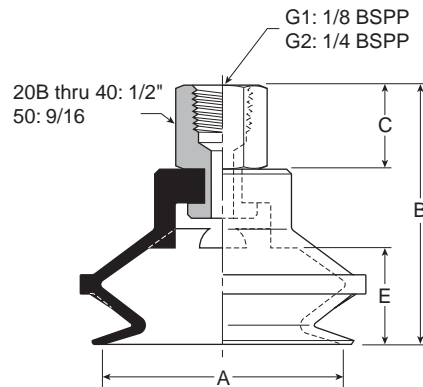
Inches (mm)  
 \* Cup material  
 † Thread size

**Dimensions**

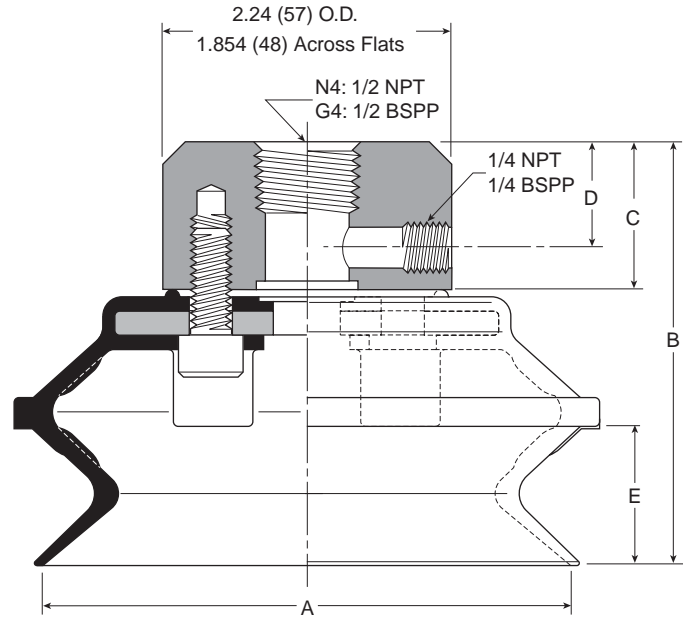
**PBTF-10A thru  
 PBTF-15A**



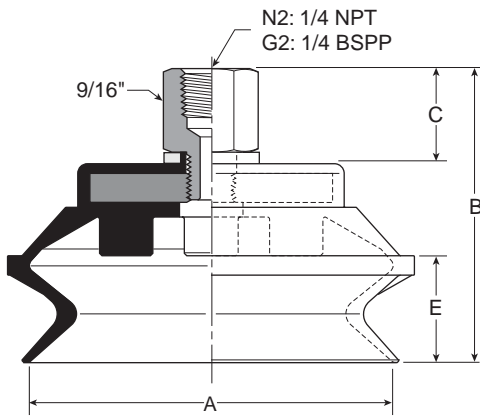
**PBTF-20B thru  
 PBTF 50**



**PBTF-110 thru  
 PBTF-150**



**PBTF-75**



Model number	ØA	B	B (M5)	C	C (M5)	D	E
PBTF-10A-*.†	.39 (10)	.85 (21.5)	1.08 (27.5)	.31 (8)	.55 (14)	—	.30 (7.5)
PBTF-15A-*.†	.59 (15)	.94 (24)	1.18 (30)	.31 (8)	.55 (14)	—	.39 (10)
PBTF-20B-*.†	.79 (20)	1.42 (36)	—	.55 (14)	—	—	.47 (12)
PBTF-30-*.†	1.18 (30)	1.75 (44.5)	—	.55 (14)	—	—	.70 (17)
PBTF-40-*.†	1.57 (40)	1.75 (44.5)	—	.55 (14)	—	—	.61 (15.5)
PBTF-50-*.†	1.97 (50)	1.99 (50.5)	—	.55 (14)	—	—	.79 (20)
PBTF-75-*.†	3.74 (95)	2.38 (60.5)	—	.77 (19.5)	—	—	.87 (22)
PBTF-110-*.†	4.72 (120)	3.07 (78)	—	.94 (24)	—	.51 (13)	1.14 (29)
PBTF-150-*.†	5.91 (150)	3.82 (97)	—	.94 (24)	—	.51 (13)	1.50 (38)

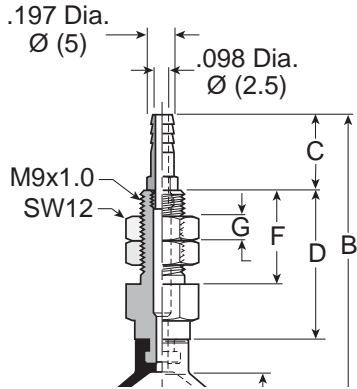
Inches (mm)  
 \* Cup material  
 † Thread size

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

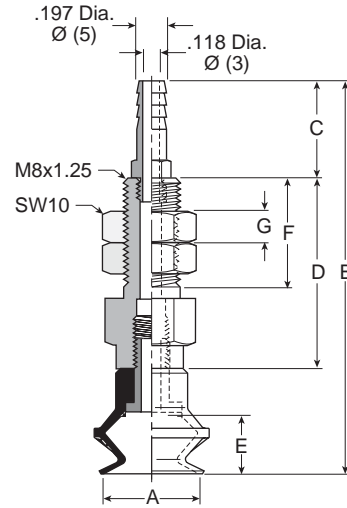
**Dimensions**

**A**

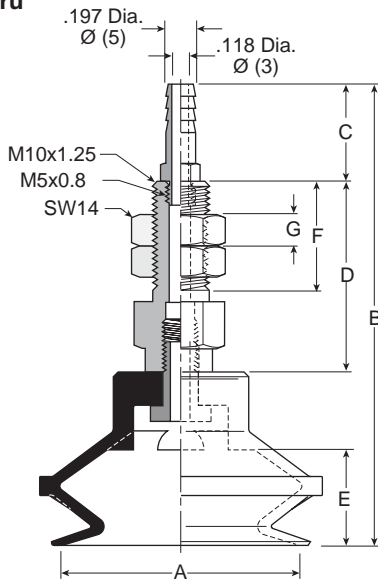
**PBTK-10A thru  
 PBTK-15A**



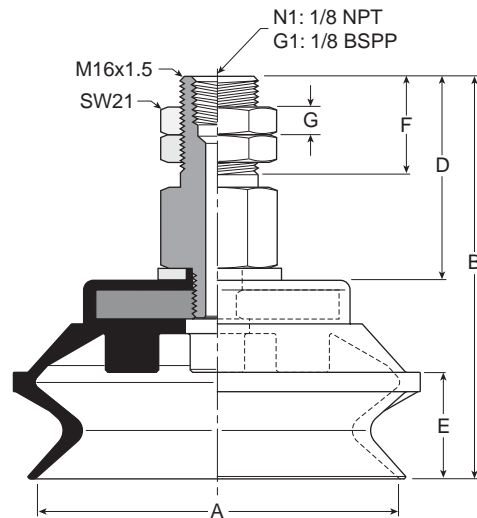
**PBTK-20**



**PBTK-30 thru  
 PBTK-50**



**PBTK-75**

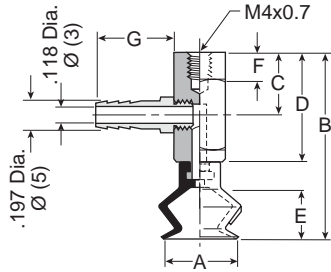


Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBTK-10A-*	.39 (10)	2.05 (52)	.39 (10)	.89 (22.5)	.30 (7.5)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-15A-*	.59 (15)	2.15 (54.5)	.39 (10)	.89 (22.5)	.39 (10)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-20-*	.79 (20)	2.26 (57.5)	.63 (16)	.87 (22)	.47 (12)	.24 (6)	.59 (15)	.7 (21)
PBTK-30-*	1.18 (30)	3.09 (78.5)	.63 (16)	1.26 (32)	.67 (17)	.24 (6)	.79 (20)	1.6 (45)
PBTK-40-*	1.57 (40)	3.09 (78.5)	.63 (16)	1.26 (32)	.61 (15.5)	.24 (6)	.79 (20)	1.7 (48)
PBTK-50-*	1.97 (50)	3.33 (84.5)	.63 (16)	1.26 (32)	.79 (20)	.24 (6)	.79 (20)	2.2 (62)
PBTK-75-*,†	3.74 (95)	3.29 (83.5)	—	1.67 (42.5)	.87 (22)	.43 (11)	—	6.5 (186)

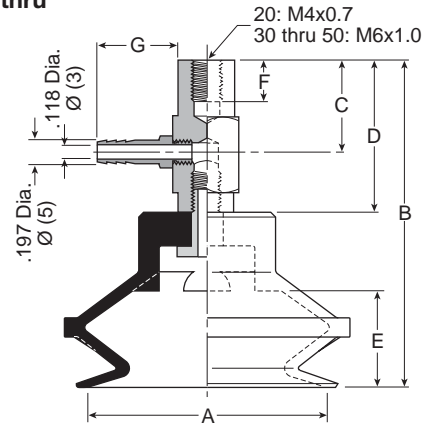
Inches (mm)  
 \* Cup material  
 † Vacuum port

**Dimensions**

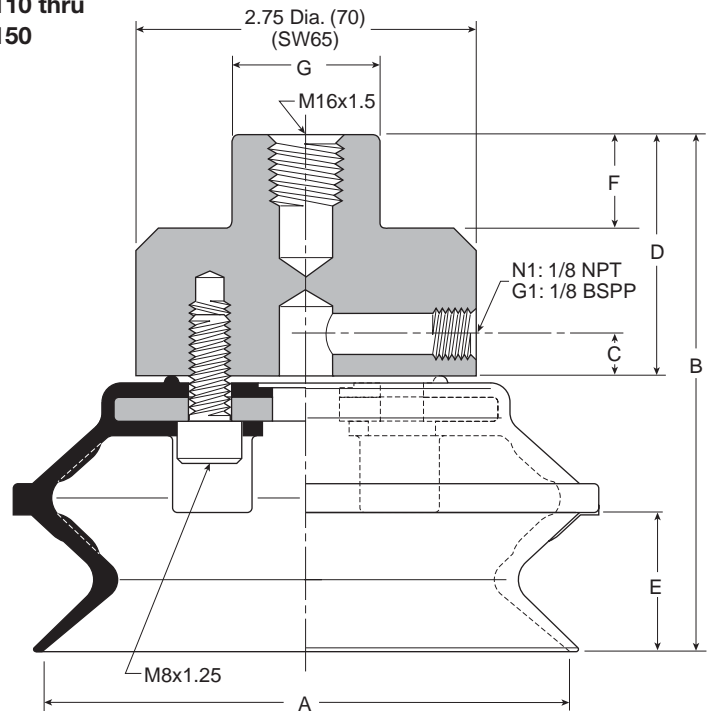
**PBYK-10A thru  
PBYK-15A**



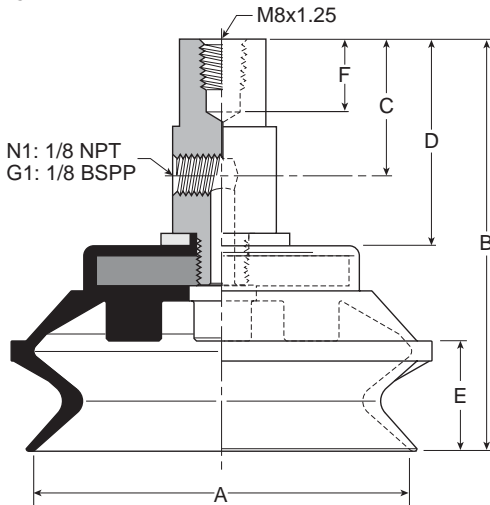
**PBYK-20 thru  
PBYK-50**



**PBYK-110 thru  
PBYK-150**



**PBYK-75**



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBYK-10A-*	.39 (10)	1.42 (36)	.51 (13)	.89 (22.5)	.29 (7.5)	.24 (6)	.63 (16)	.6 (16)
PBYK-15A-*	.59 (15)	1.52 (38.5)	.51 (13)	.89 (22.5)	.39 (10)	.24 (6)	.63 (16)	.6 (16)
PBYK-20-*	.79 (20)	1.63 (41.5)	.55 (14)	.87 (22)	.47 (12)	.24 (6)	.63 (16)	.7 (21)
PBYK-30-*	1.18 (30)	2.46 (62.5)	.79 (20)	1.26 (32)	.67 (17)	.24 (6)	.63 (16)	1.6 (45)
PBYK-40-*	1.57 (40)	2.46 (62.5)	.79 (20)	1.26 (32)	.61 (15.5)	.24 (6)	.63 (16)	2.0 (58)
PBYK-50-*	1.97 (50)	2.70 (68.5)	.79 (20)	1.26 (32)	.78 (20)	.24 (6)	.63 (16)	2.4 (67)
PBYK-75-*,†	3.74 (95)	3.29 (83.5)	1.10 (28)	1.67 (42.5)	.86 (22)	.43 (11)	—	6.9 (176)
PBYK-110-*,†	4.72 (120)	4.17 (106)	.47 (12)	1.97 (50)	1.14 (29)	.79 (20)	1.18 Dia. (30)	26.4 (670)
PBYK-150-*,†	5.91 (150)	4.92 (125)	.47 (12)	1.97 (50)	1.50 (38)	.79 (20)	1.18 Dia. (30)	46.5 (1180)

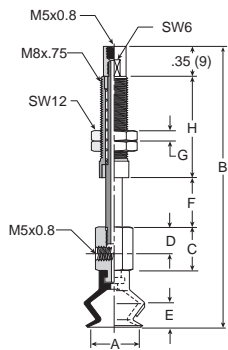
Inches (mm)  
\* Cup material  
† Vacuum port

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

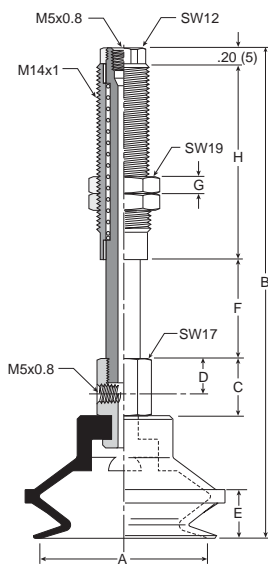


**Dimensions**

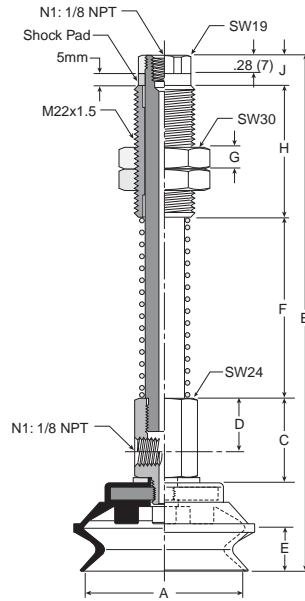
**PBTYS10A thru  
PBTYS15A1**



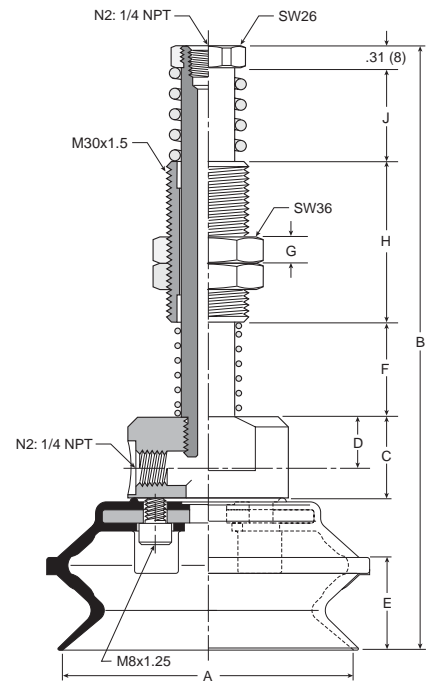
**PBTYS20B thru  
PBTYS50**



**PBTYS75**



**PBTYS110 thru  
PBTYS150**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PBTYS10A10*	.39 (10)	2.70 (68.5)	.51 (13)	.31 (8)	.30 (7.5)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS10A15*	.39 (10)	3.19 (81)	.51 (13)	.31 (8)	.30 (7.5)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS15A10*	.59 (15)	2.80 (71)	.51 (13)	.31 (8)	.39 (10)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS15A15*	.59 (15)	3.29 (83.5)	.51 (13)	.31 (8)	.39 (10)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS20B15*	.79 (20)	3.90 (99)	.67 (17)	.39 (10)	.47 (12)	.59 (15)	.20 (5)	1.42 (36)	—	2.5 (72)
PBTYS20B30*	.79 (20)	5.36 (136)	.67 (17)	.39 (10)	.47 (12)	1.18 (30)	.20 (5)	2.28 (58)	—	3.4 (97)
PBTYS3015†	1.18 (30)	4.07 (103.5)	.67 (17)	.39 (10)	.67 (17)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS3030†	1.18 (30)	5.53 (140.5)	.67 (17)	.39 (10)	.67 (17)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (102)
PBTYS4015†	1.57 (40)	4.07 (103.5)	.67 (17)	.39 (10)	.61 (15.5)	.59 (15)	.20 (5)	1.42 (36)	—	2.9 (83)
PBTYS4030†	1.57 (40)	5.53 (140.5)	.67 (17)	.39 (10)	.61 (15.5)	1.18 (30)	.20 (5)	2.28 (58)	—	3.8 (108)
PBTYS5015†	1.97 (50)	4.31 (109.5)	.67 (17)	.39 (10)	.78 (20)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS5030†	1.97 (50)	5.77 (146.5)	.67 (17)	.39 (10)	.78 (20)	1.18 (30)	.20 (5)	2.28 (58)	—	4.3 (122)
PBTYS7530†	2.95 (75)	7.01 (178)	1.28 (32.5)	.78 (20)	.87 (22)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12 (339)
PBTYS7550†	2.95 (75)	7.99 (203)	1.28 (32.5)	.78 (20)	.87 (22)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13 (373)
PBTYS11020†	4.33 (110)	8.82 (224)	1.18 (30)	.71 (18)	1.14 (29)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	42 (1194)
PBTYS11070†	4.33 (110)	11.38 (289)	1.18 (30)	.71 (18)	1.14 (29)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	45 (1276)
PBTYS15020†	5.91 (150)	9.57 (243)	1.18 (30)	.71 (18)	1.50 (38)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	60 (1704)
PBTYS15070†	5.91 (150)	12.13 (308)	1.18 (30)	.71 (18)	1.50 (38)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	63 (1786)

Inches (mm)  
\* Cup material  
† Vacuum port

**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**

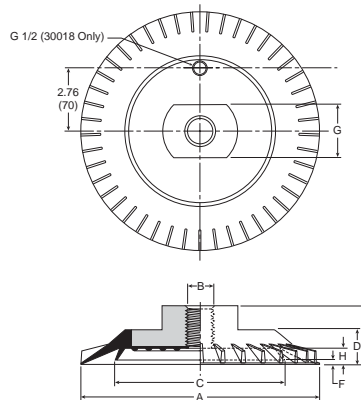
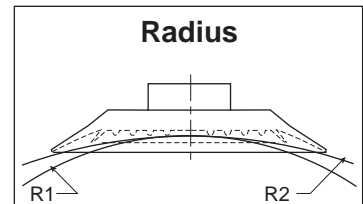
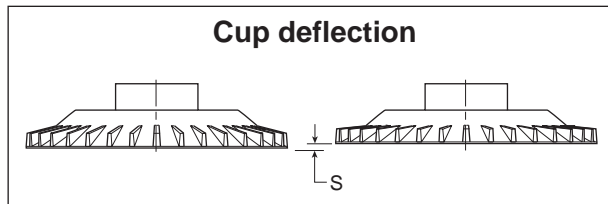
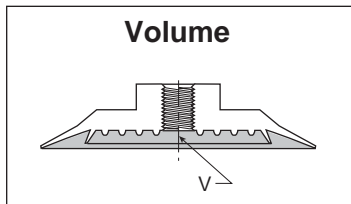
These suction cups are ideal for applications where the product may flex when being lifted. All cups have a double sealing lip and cleats to increase holding capacity. The top of the cup has a ribbed outer lip to prevent it from rolling over the surface to be lifted.

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 <sup>2</sup>	Cup volume (V) liters	Deflection (S) (mm)	Radius R (mm)	
						R1*	R2**
50	1/8 BSPP	P5V-CFS05011N	19.6	.001	.16 (4)	3.86 (98)	3.15 (80)
100	3/8 BSPP	<b>P5V-CFS10013N</b>	78.5	.0667	.30 (8)	10.00 (254)	6.34 (161)
150	1/2 BSPP	P5V-CFS15014N	176.7	.2083	.43 (11)	12.17 (309)	9.92 (252)

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



**Dimensions**

Model number	ØA	B	ØC	D	E	F	G	H
P5V-CFS50*	1.97 (50)	G1/8	1.38 (35)	0.43 (11)	0.71 (18)	0.087 (2.2)	0.51 (13)	0.146 (3.7)
P5V-CFS100*	3.94 (100)	G3/8	2.83 (72)	0.71 (18)	1.10 (28)	0.197 (5)	0.87 (22)	0.295 (7.5)
P5V-CFS150*	5.91 (150)	G1/2	4.17 (106)	1.02 (26)	1.65 (42)	0.276 (7)	1.06 (27)	0.43 (11)

Inches (mm)  
 \* Cup material

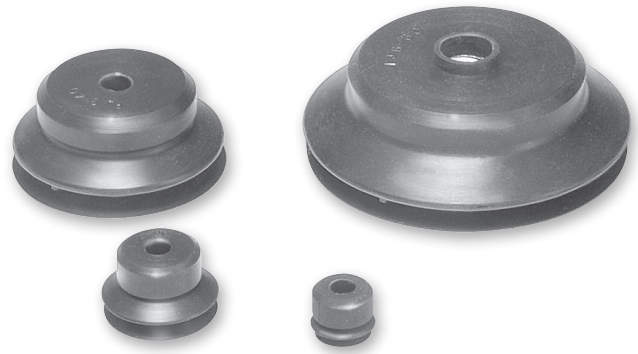
Most popular.



**Features**

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°	0° to +60°	-60° to +250°	-10° to +130°
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	—	5 to 15

\* ESD: Electric Static Dissipative Material

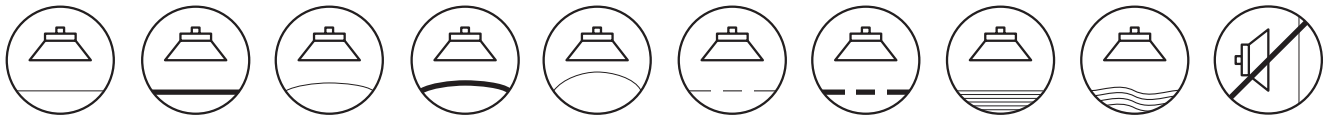
**How to order**

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**

Technical

PFG Flat

PBG Bellows

PSV-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

**Ordering Information**

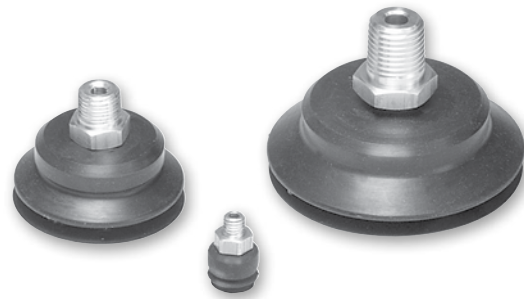
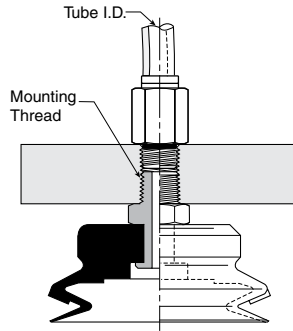
**PJTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, 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	<b>PJTM-6-SI-M5</b>	PJG-6-SI	FTM-5A-M5H
6	1/8 BSPP	PJTM-6-NBR-G1	PJG-6-NBR	<b>PJTM-6-SI-G1</b>	PJG-6-SI	FTM-5A-G1
8	M5	<b>PJTM-8-NBR-M5</b>	PJG-8-NBR	PJTM-8-SI-M5	PJG-8-SI	FTM-5A-M5H
8	1/8 BSPP	<b>PJTM-8-NBR-G1</b>	PJG-8-NBR	PJTM-8-SI-G1	PJG-8-SI	FTM-5A-G1
10	M5	<b>PJTM-10-NBR-M5</b>	PJG-10-NBR	PJTM-10-SI-M5	PJG-10-SI	TN-PF-15-M5
15	M5	<b>PJTM-15-NBR-M5</b>	PJG-15-NBR	PJTM-15-SI-M5	PJG-15-SI	TN-PF-15-M5
20	M5	PJTM-20-NBR-M5	PJG-20-NBR	<b>PJTM-20-SI-M5</b>	PJG-20-SI	TN-PF-20-M5
30	1/8 BSPP	<b>PJTM-30-NBR-G1</b>	PJG-30-NBR	PJTM-30-SI-G1	PJG-30-SI	FTM-20B-G1H
30	1/4 BSPP	<b>PJTM-30-NBR-G2</b>	PJG-30-NBR	PJTM-30-SI-G2	PJG-30-SI	FTM-20B-G2
30	M10	<b>PJTM-30-NBR-M10</b>	PJG-30-NBR	PJTM-30-SI-M10	PJG-30-SI	FTM-20B-M10
30	1/8 NPT	<b>PJTM-30-NBR-N1</b>	PJG-30-NBR	PJTM-30-SI-N1	PJG-30-SI	FTM-20B-N1
40	1/8 BSPP	<b>PJTM-40-NBR-G1</b>	PJG-40-NBR	PJTM-40-SI-G1	PJG-40-SI	FTM-20B-G1H
40	1/4 BSPP	<b>PJTM-40-NBR-G2</b>	PJG-40-NBR	PJTM-40-SI-G2	PJG-40-SI	FTM-20B-G2
40	M10	PJTM-40-NBR-M10	<b>PJG-40-NBR</b>	PJTM-40-SI-M10	PJG-40-SI	FTM-20B-M10
40	1/8 NPT	<b>PJTM-40-NBR-N1</b>	PJG-40-NBR	PJTM-40-SI-N1	PJG-40-SI	FTM-20B-N1
50	1/8 BSPP	<b>PJTM-50-NBR-G1</b>	PJG-50-NBR	<b>PJTM-50-SI-G1</b>	PJG-50-SI	FTM-50-G1H
50	1/4 BSPP	<b>PJTM-50-NBR-G2</b>	PJG-50-NBR	<b>PJTM-50-SI-G2</b>	PJG-50-SI	FTM-50-G2
50	1/8 NPT	PJTM-50-NBR-N1	<b>PJG-50-NBR</b>	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	<b>FTM-60-G2</b>
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	<b>FTM-60-N2</b>
80	1/4 BSPP	PJTM-80-NBR-G2	PJG-80-NBR	PJTM-80-SI-G2	PJG-80-SI	<b>FTM-60-G2</b>
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	<b>FTM-60-N2</b>

Most popular.



**A**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

**Ordering Information**

**PJG Short Bellows Vacuum Cups**

**A**

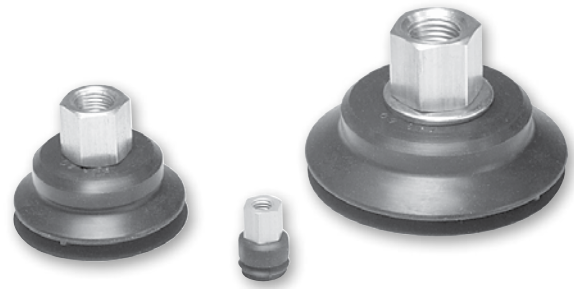
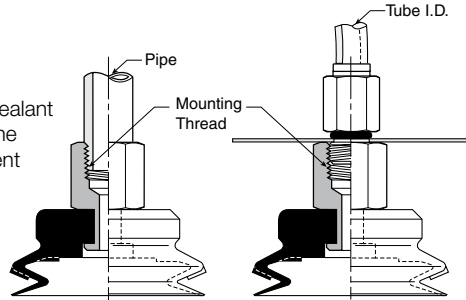
**PJTF Series Female Thread Connector**

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G 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	<b>PJTF-6-SI-M5</b>	PJG-6-SI	FTF-5A-M5
6	1/8 BSPP	PJTF-6-NBR-G1	PJG-6-NBR	<b>PJTF-6-SI-G1</b>	PJG-6-SI	FTF-5A-G1
8	M5	PJTF-8-NBR-M5	PJG-8-NBR	<b>PJTF--8-SI-M5</b>	PJG-8-SI	FTF-5A-M5
8	1/8 BSPP	PJTF-8-NBR-G1	PJG-8-NBR	<b>PJTF--8-SI-G1</b>	PJG-8-SI	FTF-5A-G1
10	M5	<b>PJTF-10-NBR-M5</b>	PJG-10-NBR	PJTF-10-SI-M5	PJG-10-SI	FTF-5A-M5
10	1/8 BSPP	<b>PJTF-10-NBR-G1</b>	PJG-10-NBR	PJTF-10-SI-G1	PJG-10-SI	FTF-5A-G1
15	M5	<b>PJTF-15-NBR-M5</b>	PJG-15-NBR	PJTF-15-SI-M5	PJG-15-SI	FTF-5A-M5
15	1/8 BSPP	<b>PJTF-15-NBR-G1</b>	PJG-15-NBR	PJTF-15-SI-G1	PJG-15-SI	FTF-5A-G1
30	1/8 BSPP	<b>PJTF-30-NBR-G1</b>	PJG-30-NBR	<b>PJTF-30-SI-G1</b>	PJG-30-SI	FTF-20B-G1
30	1/4 BSPP	PJTF-30-NBR-G2	PJG-30-NBR	PJTF-30-SI-G2	<b>PJG-30-SI</b>	FTF-20B-G2
40	1/8 BSPP	<b>PJTF-40-NBR-G1</b>	PJG-40-NBR	PJTF-40-SI-G1	PJG-40-SI	<b>FTF-20B-G1</b>
40	1/4 BSPP	PJTF-40-NBR-G2	<b>PJG-40-NBR</b>	PJTF-40-SI-G2	PJG-40-SI	FTF-20B-G2
50	1/8 BSPP	PJTF-50-NBR-G1	<b>PJG-50-NBR</b>	<b>PJTF-50-SI-G1</b>	<b>PJG-50-SI</b>	FTF-50-G1
50	1/4 BSPP	PJTF-50-NBR-G2	<b>PJG-50-NBR</b>	<b>PJTF-50-SI-G2</b>	<b>PJG-50-SI</b>	FTF-50-G2
60	1/4 BSPP	<b>PJTF-60-NBR-G2</b>	PJG-60-NBR	PJTF-60-SI-G2	PJG-60-SI	<b>FTF-60-G2</b>
60	1/4 NPT	<b>PJTF-60-NBR-N2</b>	PJG-60-NBR	PJTF-60-SI-N2	PJG-60-SI	<b>FTF-60-N2</b>
80	1/4 BSPP	PJTF-80-NBR-G2	PJG-80-NBR	PJTF-80-SI-G2	PJG-80-SI	<b>FTF-60-G2</b>
80	1/4 NPT	PJTF-80-NBR-N2	PJG-80-NBR	PJTF-80-SI-N2	PJG-80-SI	<b>FTF-60-N2</b>

Most popular.



**Ordering Information**

**PJG Short Bellows Vacuum Cups**

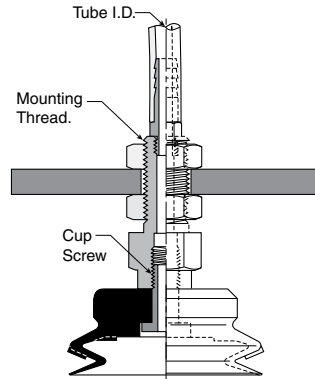
**PJTK Series Barbed Bulkhead**

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	<b>PJTK-6-SI</b>	<b>PJG-6-SI</b>	<b>FTK-5A</b>
8	Barb	<b>PJTK-8-NBR</b>	<b>PJG-8-NBR</b>	<b>PJTK-8-SI</b>	<b>PJG-8-SI</b>	<b>FTK-5A</b>
10	Barb	<b>PJTK-10-NBR</b>	<b>PJG-10-NBR</b>	<b>PJTK-10-SI</b>	<b>PJG-10-SI</b>	<b>FTK-15</b>
15	Barb	<b>PJTK-15-NBR</b>	<b>PJG-15-NBR</b>	<b>PJTK-15-SI</b>	<b>PJG-15-SI</b>	<b>FTK-15</b>
20	Barb	PJTK-20-NBR	PJG-20-NBR	<b>PJTK-20-SI</b>	<b>PJG-20-SI</b>	<b>FTK-20</b>
30	Barb	<b>PJTK-30-NBR</b>	<b>PJG-30-NBR</b>	<b>PJTK-30-SI</b>	<b>PJG-30-SI</b>	<b>FTK-25</b>
40	Barb	<b>PJTK-40-NBR</b>	<b>PJG-40-NBR</b>	PJTK-40-SI	PJG-40-SI	<b>FTK-25</b>
50	Barb	<b>PJTK-50-NBR</b>	<b>PJG-50-NBR</b>	<b>PJTK-50-SI</b>	<b>PJG-50-SI</b>	<b>FTK-50</b>
60	1/8 BSPP	PJTK-60-NBR-G1	PJG-60-NBR	PJTK-60-SI-G1	PJG-60-SI	<b>FTK-60-G1</b>
60	1/8 NPT	PJTK-60-NBR-N1	PJG-60-NBR	PJTK-60-SI-N1	PJG-60-SI	<b>FTK-60-N1</b>
80	1/8 BSPP	PJTK-80-NBR-G1	PJG-80-NBR	PJTK-80-SI-G1	PJG-80-SI	<b>FTK-60-G1</b>
80	1/8 NPT	PJTK-80-NBR-N1	PJG-80-NBR	PJTK-80-SI-N1	PJG-80-SI	<b>FTK-60-N1</b>

■ Most popular.



**A**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

**Ordering Information**

**PJG Short Bellows Vacuum Cups**

**A**

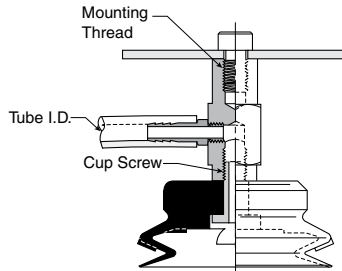
**PJYK Series 90° Barbed Adapter**

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	<b>PJYK-6-SI</b>	<b>PJG-6-SI</b>	<b>FYK-5A</b>
8	Barb	<b>PJYK-8-NBR</b>	<b>PJG-8-NBR</b>	<b>PJYK-8-SI</b>	<b>PJG-8-SI</b>	<b>FYK-5A</b>
10	Barb	PJYK-10-NBR	PJG-10-NBR	<b>PJYK-10-SI</b>	<b>PJG-10-SI</b>	<b>FYK-15</b>
15	Barb	PJYK-15-NBR	PJG-15-NBR	<b>PJYK-15-SI</b>	<b>PJG-15-SI</b>	<b>FYK-15</b>
20	Barb	PJYK-20-NBR	PJG-20-NBR	PJYK-20-SI	PJG-20-SI	FYK-20
30	Barb	<b>PJYK-30-NBR</b>	<b>PJG-30-NBR</b>	<b>PJYK-30-SI</b>	<b>PJG-30-SI</b>	<b>FYK-25</b>
40	Barb	<b>PJYK-40-NBR</b>	<b>PJG-40-NBR</b>	PJYK-40-SI	PJG-40-SI	<b>FYK-25</b>
50	Barb	<b>PJYK-50-NBR</b>	<b>PJG-50-NBR</b>	<b>PJYK-50-SI</b>	<b>PJG-50-SI</b>	<b>FYK-50</b>
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	<b>FYK-60-N1</b>
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	<b>FYK-60-N1</b>

■ Most popular.



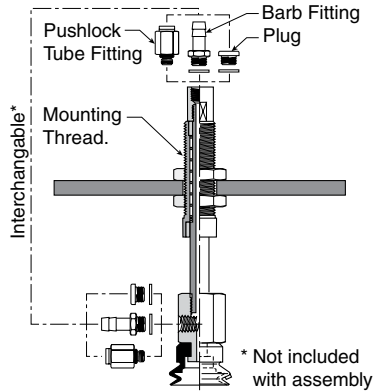
**PJTYS Series Bulkhead Level Compensator**

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 interchangeable connectors & plugs for port connections.



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

■ Most popular.

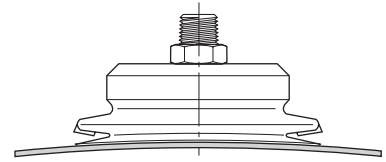
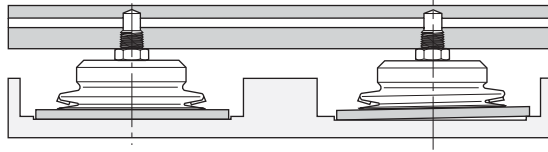
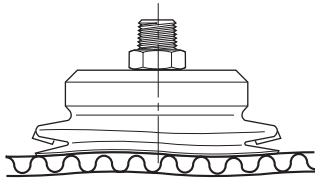




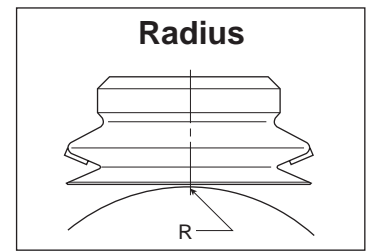
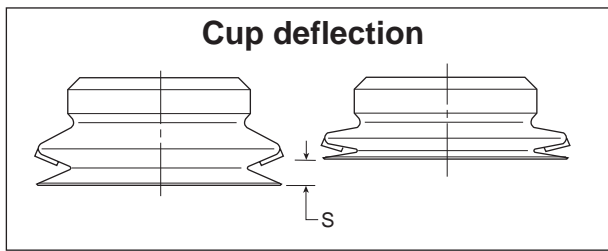
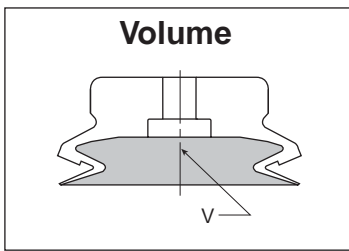
A

Applications

- High speed packaging
- Level compensation for small electronic components
- Flexible product
- Soft seal lip



Main data for short bellows PJG cups

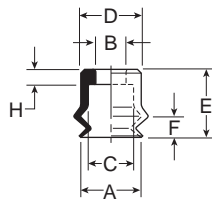


Model number	Cup diameter inches (mm)	Area cm <sup>2</sup>	Volume (V) liters	Lifting force @ 60% (N)		Cup deflection (S) mm	Radius R (mm)
PJG-6-*	.24 (6)	.28	0.000016	1.70	—	4.2	4.0
PJG-8-*	.31 (8)	.50	0.00007	3.10	—	4.0	5.0
PJG-10-*	.39 (10)	0.79	0.00017	4.80	—	3.0	6.0
PJG-15-*	.59 (15)	1.77	0.0005	10.8	—	3.3	10.0
PJG-20-*	.79 (20)	3.14	0.0012	19.2	—	5.5	13.0
PJG-30-*	1.18 (30)	7.07	0.003	43.2	—	7.0	26.0
PJG-40-*	1.57 (40)	12.6	0.005	76.9	—	7.2	37.0
PJG-50-*	1.97 (50)	19.6	0.008	120	—	9.0	41.0
PJG-60-*	2.36 (60)	28.3	0.020	173	—	8.0	70.0
PJG-80-*	3.15 (80)	50.3	0.040	308	—	9.5	100.0

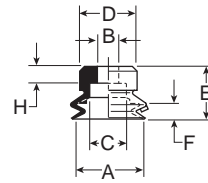
\*Cup material

**PJG Series Replacement Cup Dimensions**

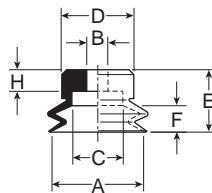
**PJG-6 and  
 PJG-8**



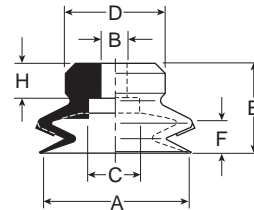
**PJG-10 and  
 PJG-15**



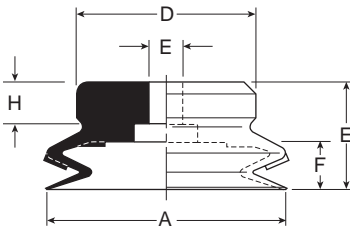
**PJG-20**



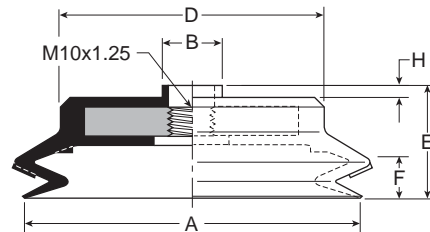
**PJG-30 thru  
 PJG-40**



**PJG-50**



**PJG-60 thru  
 PJG-80**



Model number	ØA	ØB	ØC	ØD	E	F	H
PJG-6-*	.24 (6)	.16 (4)	.24 (6)	.30 (7.5)	.35 (9)	.17 (4.2)	.08 (2)
PJG-8-*	.31 (8)	.16 (4)	.24 (6)	.31 (8)	.35 (9)	.16 (4)	.08 (2)
PJG-10-*	.39 (10)	.18 (4.6)	.31 (7.8)	.43 (11)	.37 (9.5)	.12 (3)	.14 (3.5)
PJG-15-*	.59 (15)	.18 (4.6)	.31 (7.8)	.47 (12)	.43 (11)	.13 (3.3)	.14 (3.5)
PJG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.59 (15)	.51 (13)	.22 (5.5)	.18 (4.5)
PJG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	.78 (20)	.71 (18)	.28 (7)	.28 (7)
PJG-35-*	1.38 (35)	.23 (5.8)	.43 (10.8)	.98 (25)	.71 (18)	.28 (7)	.28 (7)
PJG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.18 (30)	.71 (18)	.28 (7.2)	.28 (7)
PJG-50-*	1.97 (50)	.31 (7.8)	.78 (19.8)	1.57 (40)	.79 (20)	.35 (9)	.28 (7)
PJG-60-*	2.36 (60)	.49 (12.5)	—	1.77 (45)	.89 (22.5)	.31 (8)	.10 (2.5)
PJG-70-*	2.75 (70)	.49 (12.5)	—	2.17 (55)	.93 (23.5)	.37 (9.5)	.10 (2.5)
PJG-80-*	3.15 (80)	.49 (12.5)	—	2.68 (68)	.93 (23.5)	.37 (9.5)	.10 (2.5)

Inches (mm)  
 \* Cup material

**A**

Technical

PFG  
 Flat

PBG  
 Bellows

P5V-CFS  
 Flat

PJG Short  
 Bellows

PCG  
 Multiple  
 Bellows

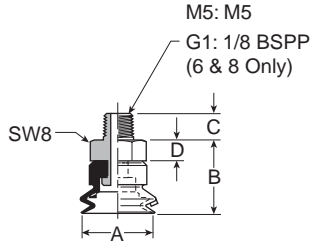
PUGB  
 Flat Swivel

Cup  
 Fittings

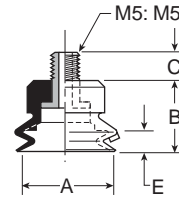
**Dimensions**

**A**

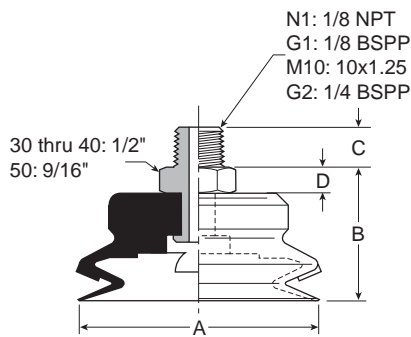
**PJTM-6 and  
 PJTM-8**



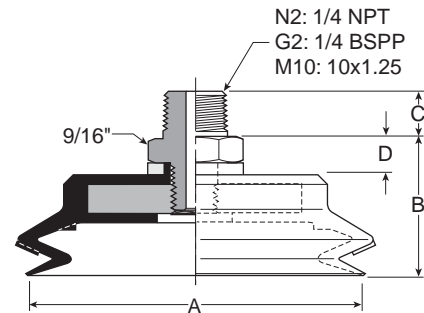
**PJTM-10 thru  
 PJTM-20**



**PJTM-30 thru  
 PJTM-50**



**PJTM-60 thru  
 PJTM-80**

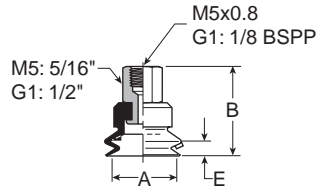


Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D
PJTM-6-*†	.24 (6)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-8-*†	.31 (8)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-10-*†	.39 (10)	.37 (9.5)	.20 (5)	—	—	—	—
PJTM-15-*†	.59 (15)	.43 (11)	.20 (5)	—	—	—	—
PJTM-20-*†	.79 (20)	.51 (13)	.20 (5)	—	—	—	—
PJTM-30-*†	1.18 (30)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-40-*†	1.57 (40)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-50-*†	1.97 (50)	.98 (25)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-60-*†	2.36 (60)	1.06 (27)	—	—	.39 (10)	.59 (15)	.28 (7)
PJTM-80-*†	3.15 (80)	1.10 (28)	—	—	.39 (10)	.59 (15)	.28 (7)

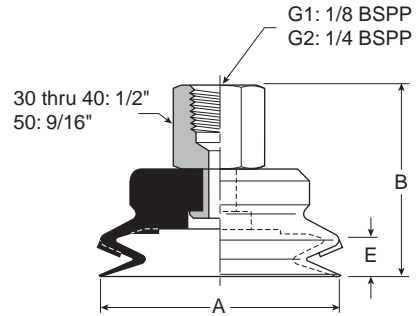
Inches (mm)  
 \* Cup material  
 † Thread size

**Dimensions**

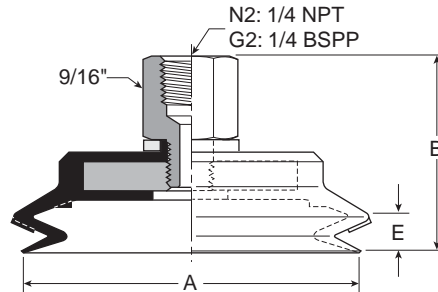
**PJTF-6 and  
 PJTF-8**



**PJTF-30 thru  
 PJTF-50**



**PJTF-60 thru  
 PJTF-80**



Model number	ØA	B	B (M5)	E
PJTF-6-*.†	.24 (6)	.79 (20)	.55 (14)	.16 (4)
PJTF-8-*.†	.31 (8)	.79 (20)	.55 (14)	.16 (4)
PJTF-10-*.†	.39 (10)	.79 (20)	.55 (14)	.12 (3)
PJTF-15-*.†	.59 (15)	.79 (20)	.55 (14)	.13 (3.3)
PJTF-30-*.†	1.18 (30)	1.25 (32)	—	.28 (7)
PJTF-40-*.†	1.57 (40)	1.25(32)	—	.28 (7.2)
PJTF-50-*.†	1.97 (50)	1.34 (34)	—	.35 (9)
PJTF-60-*.†	2.36 (60)	1.56 (39.5)	—	.31 (8)
PJTF-80-*.†	3.15 (80)	1.59 (40.5)	—	.37 (9.5)

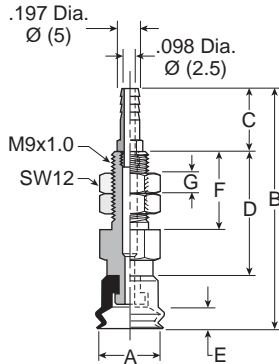
Inches (mm)  
 \* Cup material  
 † Thread size

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

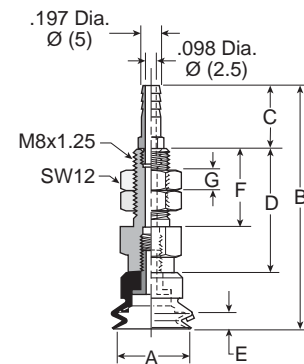
**Dimensions**

**A**

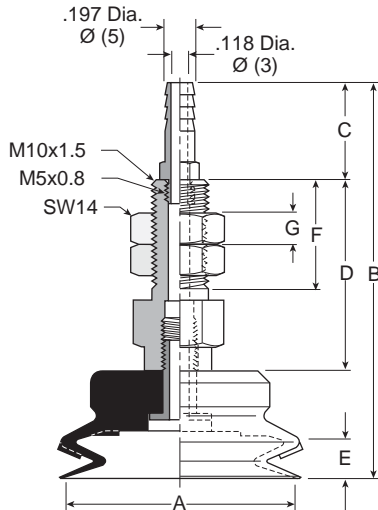
**PJTK-6 and  
 PJTK-8**



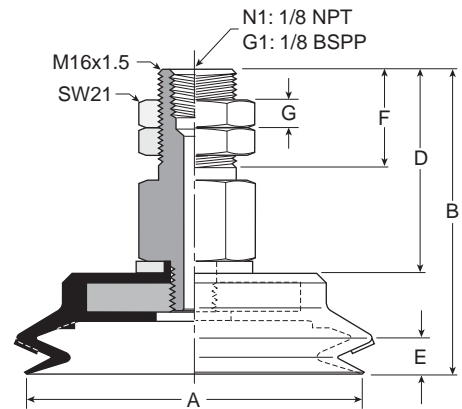
**PJTK-10 thru  
 PJTK-20**



**PJTK-30 thru  
 PJTK-50**



**PJTK-60 thru  
 PJTK-80**

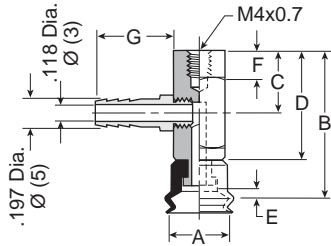


Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJTK-6-*	.24 (6)	1.30 (33)	.39 (10)	.55 (14)	.17 (4.2)	.47 (12)	.12 (3)	.4 (11)
PJTK-8-*	.31 (8)	1.30 (33)	.39 (10)	.55 (14)	.16 (4)	.47 (12)	.12 (3)	.4 (11)
PJTK-10-*	.39 (10)	1.87 (47.5)	.63 (16)	.87 (22)	.12 (3)	.59 (15)	.12 (3)	.5 (14)
PJTK-15-*	.59 (15)	1.93 (49)	.63 (16)	.87 (22)	.13 (3.3)	.59 (15)	.12 (3)	.5 (15)
PJTK-20-*	.79 (20)	2.01 (51)	.63 (16)	.87 (22)	.22 (5.5)	.59 (15)	.20 (5)	.6 (17)
PJTK-30-*	1.18 (30)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7)	.79 (20)	.20 (5)	1.5 (42)
PJTK-40-*	1.57 (40)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7.2)	.79 (20)	.20 (5)	1.6 (44)
PJTK-50-*	1.97 (50)	2.68 (68)	.63 (16)	1.26 (32)	.35 (9)	.79 (20)	.20 (5)	25.0 (58)
PJTK-60-*.†	2.36 (60)	2.46 (62.5)	—	1.67 (42.5)	.31 (8)	.79 (20)	.24 (6)	5.1 (144)
PJTK-80-*.†	3.15 (80)	2.50 (63.5)	—	1.67 (42.5)	.37 (9.5)	.79 (20)	.24 (6)	6.7 (190)

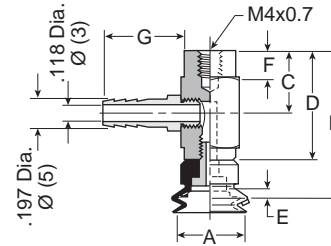
Inches (mm)  
 \* Cup material  
 † Vacuum port

**Dimensions**

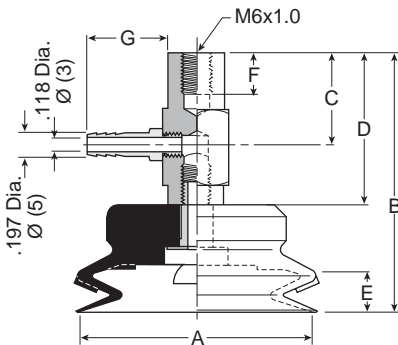
**PJYK-6 and  
 PJYK-8**



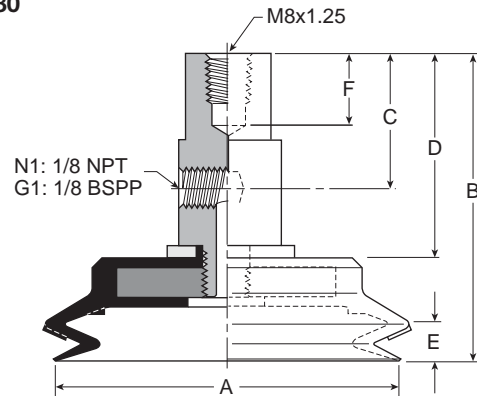
**PJYK-10 thru  
 PJYK-20**



**PJYK-25 thru  
 PJYK-50**



**PJYK-60 thru  
 PJYK-80**



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJYK-6-*	.24 (6)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJYK-8-*	.31 (8)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJYK-10-*	.39 (10)	1.24 (31.5)	.55 (14)	.87 (22)	.12 (3)	.24 (6)	.63 (16)	.59 (17)
PJYK-15-*	.59 (15)	1.30 (33)	.55 (14)	.87 (22)	.13 (3.3)	.24 (6)	.63 (16)	.63 (18)
PJYK-20-*	.79 (20)	1.38 (35)	.55 (14)	.87 (22)	.22 (5.5)	.24 (6)	.63 (16)	.7 (20)
PJYK-30-*	1.18 (30)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7)	.31 (8)	.63 (16)	1.6 (46)
PJYK-40-*	1.57 (40)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7.2)	.31 (8)	.63 (16)	1.7 (48)
PJYK-50-*	1.97 (50)	2.05 (52)	.79 (20)	1.26 (32)	.35 (9)	.31 (8)	.63 (16)	2.2 (62)
PJYK-60-*,†	2.36 (60)	2.46 (62.5)	1.10 (28)	1.67 (42.5)	.31 (8)	.43 (11)	—	4.9 (139)
PJYK-80-*,†	3.15 (80)	2.50 (63.5)	1.10 (28)	1.67 (42.5)	.37 (9.5)	.43 (11)	—	6.5 (185)

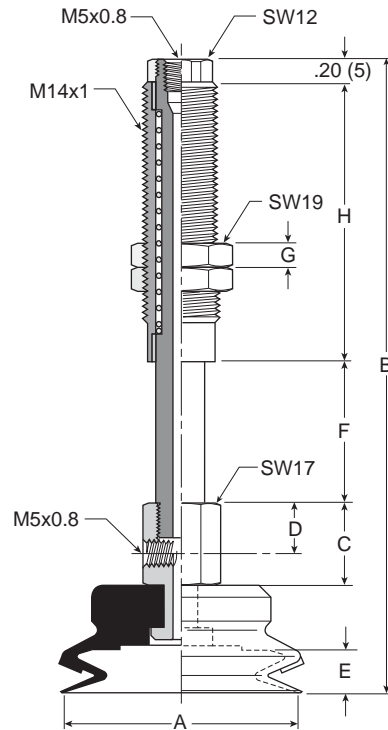
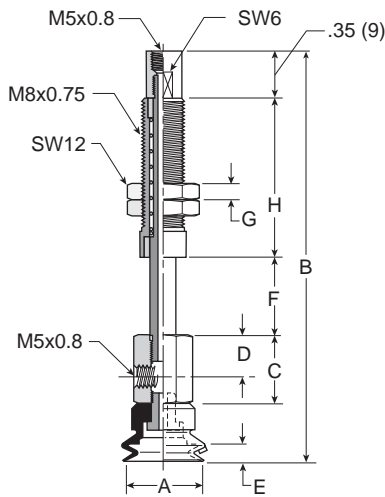
Inches (mm)  
 \* Cup material  
 † Vacuum port

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

**Dimensions**

**PJTYS10 thru  
PJTYS20**

**PJTYS30 thru  
PJTYS50**

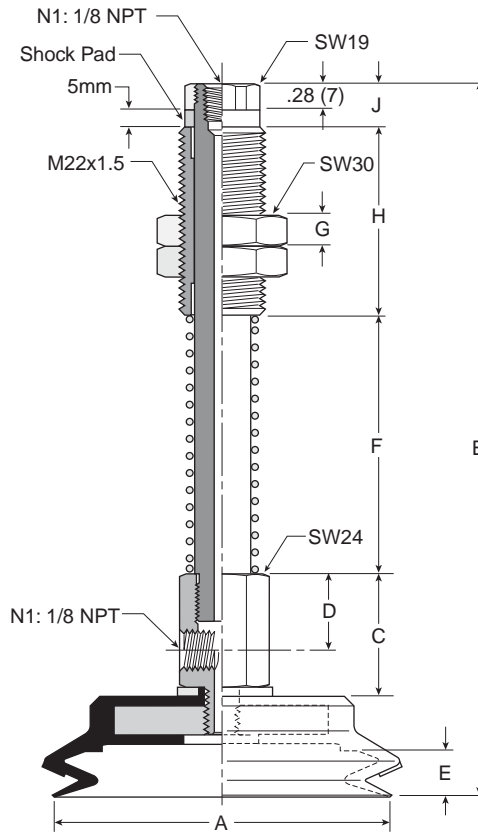


Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PJTYS1010**†	.39 (10)	2.52 (64)	.51 (13)	.31 (8)	.12 (3)	.39 (10)	.20 (5)	.91 (23)	1.1 (31)
PJTYS1015**†	.39 (10)	3.01 (76.5)	.51 (13)	.31 (8)	.12 (3)	.59 (15)	.20 (5)	1.20 (30.5)	1.2 (33.5)
PJTYS1510**†	.59 (15)	2.60 (66)	.51 (13)	.31 (8)	.13 (3.3)	.39 (10)	.20 (5)	.91 (23)	1.1 (32)
PJTYS1515**†	.59 (15)	3.07 (78)	.51 (13)	.31 (8)	.13 (3.3)	.59 (15)	.20 (5)	1.20 (30.5)	1.3 (34.5)
PJTYS2010**†	.79 (20)	2.83 (72)	.51 (13)	.31 (8)	.22 (5.5)	.39 (10)	.20 (5)	.91 (23)	1.1 (32)
PJTYS2015**†	.79 (20)	4.29 (109)	.51 (13)	.31 (8)	.22 (5.5)	.59 (15)	.20 (5)	1.20 (30.5)	1.3 (34.5)
PJTYS3015**†	1.18 (30)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	2.6 (74)
PJTYS3030**†	1.18 (30)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	3.5 (99)
PJTYS3515**†	1.38 (35)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	2.7 (76.5)
PJTYS3530**†	1.38 (35)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	3.6 (101.5)
PJTYS4015**†	1.57 (40)	3.58 (91)	.67 (17)	.39 (10)	.28 (7.2)	.59 (15)	.20 (5)	1.42 (36)	2.8 (78.5)
PJTYS4030**†	1.57 (40)	5.04 (128)	.67 (17)	.39 (10)	.28 (7.2)	1.18 (30)	.20 (5)	2.28 (58)	3.7 (103.5)
PJTYS5015**†	1.97 (50)	3.66 (93)	.67 (17)	.39 (10)	.35 (9)	.59 (15)	.20 (5)	1.42 (36)	3.3 (94)
PJTYS5030**†	1.97 (50)	5.12 (130)	.67 (17)	.39 (10)	.35 (9)	1.18 (30)	.20 (5)	2.28 (58)	4.2 (119)

Inches (mm)  
\*\* Cup material  
† Vacuum port

**Dimensions**

**PJTYS60 thru  
PJTYS80**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PJTYS6030 <sup>†</sup>	2.36 (60)	6.18 (157)	1.18 (30)	.79 (20)	.31 (8)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	10.4 (294)
PJTYS6050 <sup>††</sup>	2.36 (60)	7.17 (182)	1.18 (30)	.79 (20)	.31 (8)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.6 (328)
PJTYS8030 <sup>††</sup>	3.15 (80)	6.22 (158)	1.18 (30)	.79 (20)	.37 (9.5)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	11.9 (338)
PJTYS8050 <sup>††</sup>	3.15 (80)	7.20 (183)	1.18 (30)	.79 (20)	.37 (9.5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.1 (372)

Inches (mm)  
<sup>††</sup> Cup material  
<sup>†</sup> Vacuum port

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings



**Features**

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°	0° to +60°	-60° to +250°	-10° to +130°	-20° to +75°
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	—	5 to 15	—

\* 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**

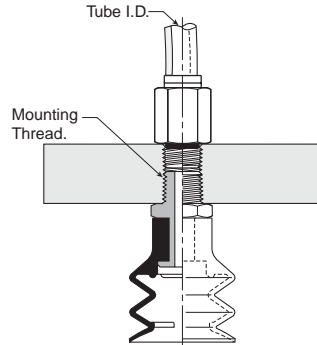
Flat surface, any section	Bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, any section	Soft material	Metal sheet handling	Corrugated sheet handling	Differences in heights and levels	Not for vertical lift

**PCTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, 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	<b>PCTM-5-SI-M5</b>	PCG-5-SI	FTM-5A-M5H
7	M5	<b>PCTM-7-NBR-M5</b>	PCG-7-NBR	PCTM-7-SI-M5	PCG-7-SI	FTM-5A-M5H
10	M5	<b>PCTM-10-NBR-M5</b>	PCG-10-NBR	PCTM-10-SI-M5	PCG-10-SI	CTM-10-M5H
10	G1	<b>PCTM-10-NBR-G1</b>	PCG-10-NBR	PCTM-10-SI-G1	PCG-10-SI	CTM-10-G1H
15	M5	<b>PCTM-15-NBR-M5</b>	PCG-15-NBR	PCTM-15-SI-M5	PCG-15-SI	CTM-10-M5H
15	G1	<b>PCTM-15-NBR-G1</b>	PCG-15-NBR	PCTM-15-SI-G1	PCG-15-SI	CTM-10-G1H
20	M5	<b>PCTM-20-NBR-M5</b>	PCG-20-NBR	PCTM-20-SI-M5	PCG-20-SI	CTM-10-M5H
20	G1	<b>PCTM-20-NBR-G1</b>	PCG-20-NBR	PCTM-20-SI-G1	PCG-20-SI	CTM-10-G1H
30	G1	<b>PCTM-30-NBR-G1</b>	PCG-30-NBR	PCTM-30-SI-G1	PCG-30-SI	CTM-30-G1H
30	G2	PCTM-30-NBR-G2	<b>PCG-30-NBR</b>	PCTM-30-SI-G2	PCG-30-SI	CTM-30-G2
30	N1	<b>PCTM-30-NBR-N1</b>	PCG-30-NBR	PCTM-30-SI-N1	PCG-30-SI	CTM-30-N1
40	G1	<b>PCTM-40-NBR-G1</b>	PCG-40-NBR	PCTM-40-SI-G1	PCG-40-SI	CTM-30-G1H
40	G2	<b>PCTM-40-NBR-G2</b>	PCG-40-NBR	PCTM-40-SI-G2	PCG-40-SI	CTM-30-G2
40	N1	<b>PCTM-40-NBR-N1</b>	PCG-40-NBR	PCTM-40-SI-N1	PCG-40-SI	CTM-30-N1
60	G1	<b>PCTM-60-NBR-G1</b>	PCG-60-NBR	PCTM-60-SI-G1	PCG-60-SI	CTM-30-G1H
60	N1	<b>PCTM-60-NBR-N1</b>	PCG-60-NBR	PCTM-60-SI-N1	PCG-60-SI	CTM-30-N1
90	G2	PCTM-90-NBR-G2	<b>PCG-90-NBR</b>	PCTM-90-SI-G2	PCG-90-SI	CTM-90-G2
90	N2	PCTM-90-NBR-N2	<b>PCG-90-NBR</b>	PCTM-90-SI-N2	PCG-90-SI	CTM-90-N2

■ Most popular.



**A**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

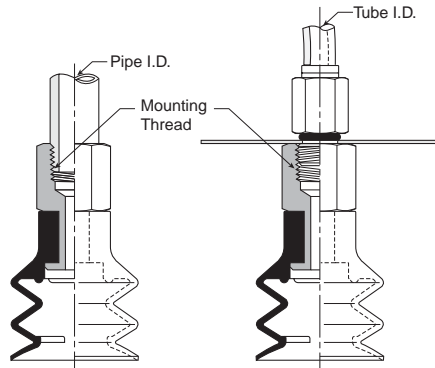
**A**

**PCTF Series Female Thread Connector**

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G 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	<b>PCTF-5-SI-M5</b>	PCG-5-SI	<b>FTF-5A-M5</b>
7	M5	PCTF-7-NBR-M5	<b>PCG-7-NBR</b>	<b>PCTF-7-SI-M5</b>	PCG-7-SI	<b>FTF-5A-M5</b>
10	1/8 BSPP	PCTF-10-NBR-G1	<b>PCG-10-NBR</b>	PCTF-10-SI-G1	<b>PCG-10-SI</b>	CTF-10-G1
15	1/8 BSPP	PCTF-15-NBR-G1	<b>PCG-15-NBR</b>	PCTF-15-SI-G1	<b>PCG-15-SI</b>	CTF-10-G1
20	1/8 BSPP	PCTF-20-NBR-G1	<b>PCG-20-NBR</b>	PCTF-20-SI-G1	<b>PCG-20-SI</b>	CTF-10-G1
30	1/8 BSPP	PCTF-30-NBR-G1	<b>PCG-30-NBR</b>	PCTF-30-SI-G1	<b>PCG-30-SI</b>	CTF-30-G1
30	1/8 NPT	PCTF-30-NBR-N1	<b>PCG-30-NBR</b>	PCTF-30-SI-N1	<b>PCG-30-SI</b>	CTF-30-N1
40	1/8 BSPP	PCTF-40-NBR-G1	<b>PCG-40-NBR</b>	PCTF-40-SI-G1	<b>PCG-40-SI</b>	CTF-30-G1
40	1/8 NPT	PCTF-40-NBR-N1	<b>PCG-40-NBR</b>	PCTF-40-SI-N1	<b>PCG-40-SI</b>	CTF-30-N1
60	1/8 NPT	PCTF-60-NBR-N1	<b>PCG-60-NBR</b>	PCTF-60-SI-N1	<b>PCG-60-SI</b>	CTF-30-G1
60	1/4 NPT	PCTF-60-NBR-N1	<b>PCG-60-NBR</b>	PCTF-60-SI-N1	<b>PCG-60-SI</b>	CTF-30-N1
90	1/4 BSPP	PCTF-90-NBR-G2	<b>PCG-90-NBR</b>	PCTF-90-SI-G2	<b>PCG-90-SI</b>	CTF-90-G2
90	1/4 NPT	PCTF-90-NBR-N2	<b>PCG-90-NBR</b>	PCTF-90-SI-N2	<b>PCG-90-SI</b>	CTF-90-N2

■ Most popular.

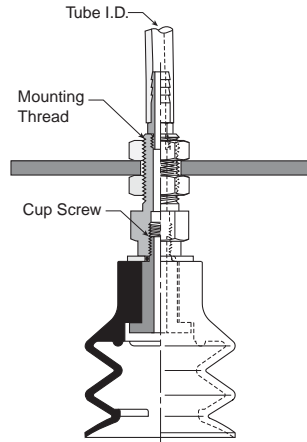


**PCTK Series Barbed Bulkhead**

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	<b>PCTK-5-NBR</b>	<b>PCG-5-NBR</b>	<b>PCTK-5-SI</b>	<b>PCG-5-SI</b>	<b>FTK-5A</b>
7	Barb	<b>PCTK-7-NBR</b>	<b>PCG-7-NBR</b>	<b>PCTK-7-SI</b>	<b>PCG-7-SI</b>	<b>FTK-5A</b>
10	Barb	<b>PCTK-10-NBR</b>	<b>PCG-10-NBR</b>	<b>PCTK-10-SI</b>	<b>PCG-10-SI</b>	<b>CTK-10</b>
15	Barb	<b>PCTK-15-NBR</b>	<b>PCG-15-NBR</b>	<b>PCTK-15-SI</b>	<b>PCG-15-SI</b>	<b>CTK-10</b>
20	Barb	<b>PCTK-20-NBR</b>	<b>PCG-20-NBR</b>	<b>PCTK-20-SI</b>	<b>PCG-20-SI</b>	<b>CTK-10</b>
30	Barb	<b>PCTK-30-NBR</b>	<b>PCG-30-NBR</b>	<b>PCTK-30-SI</b>	<b>PCG-30-SI</b>	<b>CTK-30</b>
40	Barb	<b>PCTK-40-NBR</b>	<b>PCG-40-NBR</b>	<b>PCTK-40-SI</b>	<b>PCG-40-SI</b>	<b>CTK-30</b>
60	Barb	<b>PCTK-60-NBR</b>	<b>PCG-60-NBR</b>	<b>PCTK-60-SI</b>	<b>PCG-60-SI</b>	<b>CTK-30</b>
90	NPT	<b>PCTK-90-NBR-N1</b>	<b>PCG-90-NBR</b>	PCTK-90-SI-N1	PCG-90-SI	<b>CTK-90-N1</b>
90	BSPP	PCTK-90-NBR-G1	<b>PCG-90-NBR</b>	PCTK-90-SI-G1	PCG-90-SI	CTK-90-G1

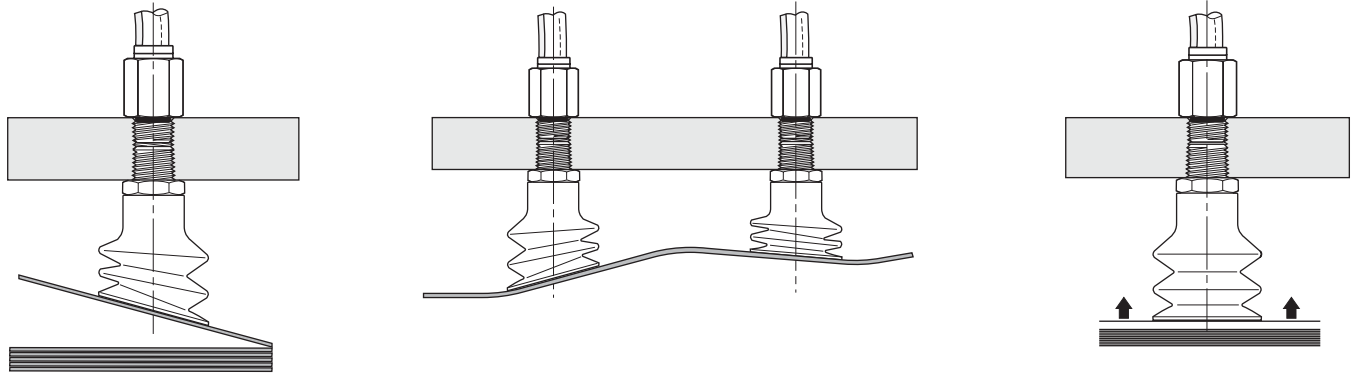
■ Most popular.



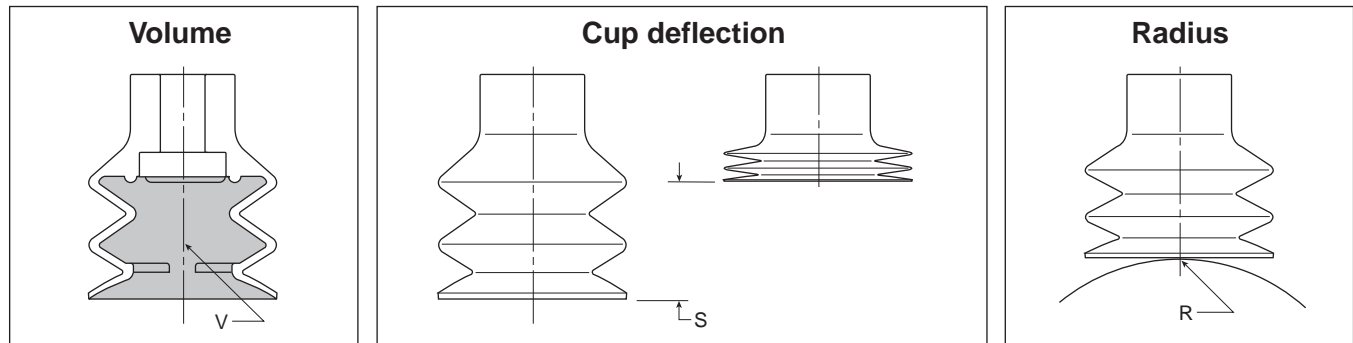
A

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

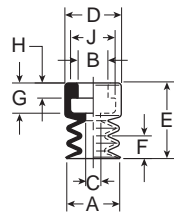


Model number	Cup diameter inches (mm)	Area cm <sup>2</sup>	Volume (V) liters	Lifting force @ 60% (N)		Cup deflection (S) (mm)	Radius (R) (mm)
PCG-5-*	.20 (5)	.20	.00003	1.20	—	3	3.5
PCG-7-*	.28 (7)	.39	.00004	2.40	—	3	4.0
PCG-10-*	.39 (10)	.79	.0001	4.80	—	3	5.0
PCG-15-*	.59 (15)	1.77	.0009	10.8	—	10	6.0
PCG-20-*	.79 (20)	3.14	.002	19.2	—	10	8.0
PCG-30-*	1.18 (30)	7.07	.009	43.2	—	14.5	20.0
PCG-40-*	1.57 (40)	12.6	.018	76.9	—	22	30.0
PCG-60-*	2.36 (60)	28.3	.072	173	—	27	55.0
PCG-90-*	3.54 (90)	63.6	.1639	389	—	42	80.0

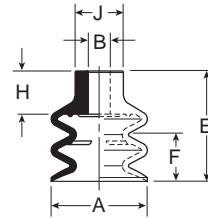
\* Cup material

**PCG Series Replacement Cup Dimensions**

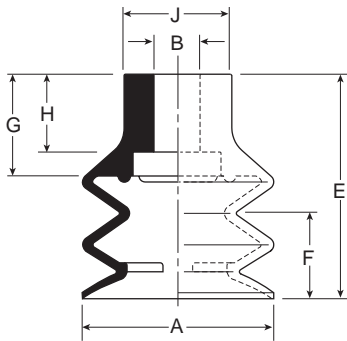
**PCG-5 and  
 PCG-7**



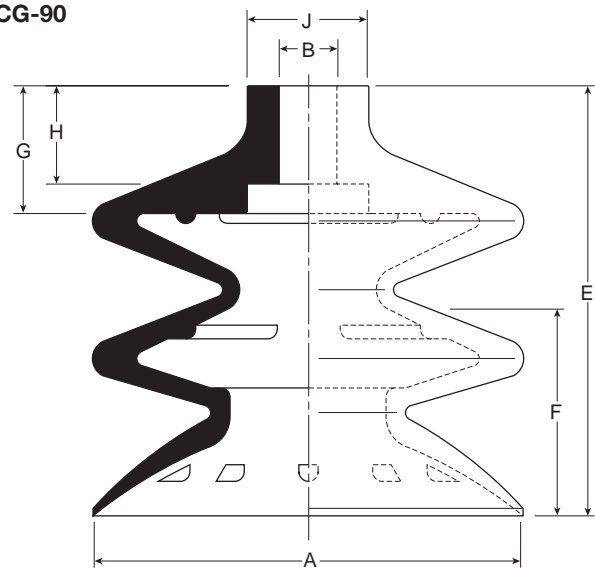
**PCG-10 thru  
 PCG-20**



**PCG-30 thru  
 PCG-60**



**PCG-90**



Model number	ØA	ØB	ØC	ØD	E	F	G	H	J
PCG-5-*	.20 (5)	.16 (4)	.08 (2)	.30 (7.5)	.37 (9.5)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-7-*	.28 (7)	.16 (4)	.08 (2)	.30 (7.5)	.39 (10)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-10-*	.35 (9)	.20 (5)	—	—	.59 (15)	.12 (3)	.28 (7)	—	.35 (9)
PCG-15-*	.60 (15.2)	.20 (5)	—	—	.90 (22)	.39 (10)	.35 (9)	—	.39 (10)
PCG-20-*	.79 (20)	.20 (5)	—	—	.91 (23)	.39 (10)	.35 (9)	—	.39 (10)
PCG-30-*	1.26 (32)	.31 (8)	—	—	1.48 (37.5)	.57 (14.5)	.67 (17)	.51 (13)	.71 (18)
PCG-40-*	1.65 (42)	.31 (8)	—	—	1.81 (46)	.87 (22)	.67 (17)	.51 (13)	.79 (20)
PCG-60-*	2.44 (62)	.31 (8)	—	—	2.17 (55)	1.06 (27)	.71 (18)	.51 (13)	.85 (21.5)
PCG-90-*	3.46 (88)	.47 (12)	—	—	3.44 (87.5)	1.65 (42)	1.02 (26)	.79 (20)	.98 (25)

Inches (mm)  
 \* Cup material

**A**

Technical

PFG  
 Flat

PBG  
 Bellows

P5V-CFS  
 Flat

PJG Short  
 Bellows

PCG  
 Multiple  
 Bellows

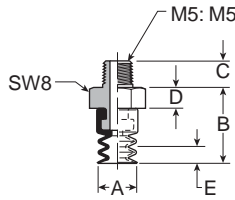
PUGB  
 Flat Swivel

Cup  
 Fittings

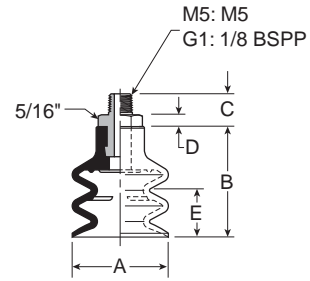
A
Technical
PFG Flat
PBG Bellows
PSV-CFS Flat
PUG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

**Dimensions**

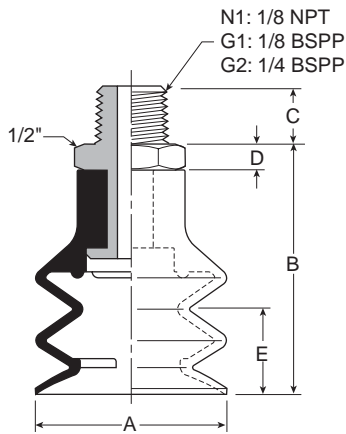
**PCTM-5 and  
PCTM-7**



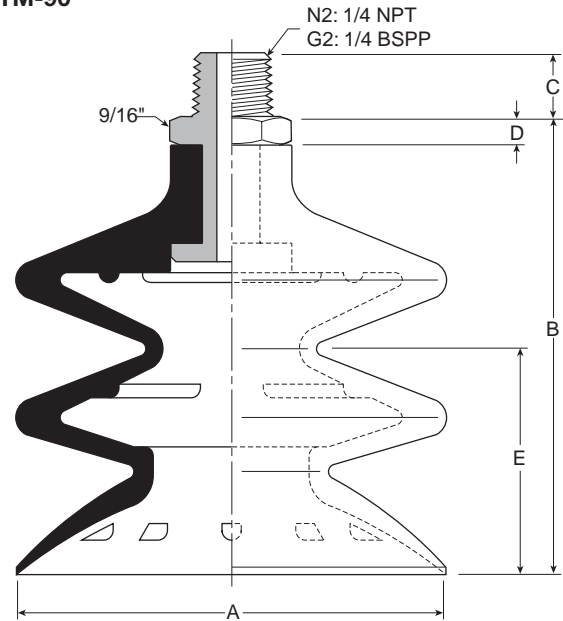
**PCTM-10 thru  
PCTM-20**



**PCTM-30 thru  
PCTM-60**



**PCTM-90**

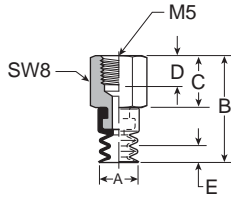


Model number	ØA	B	C (M5)	C (N1 / G1)	C M10 / G2)	C (N2)	D	E
PCTM-5-*†	.20 (5)	.51 (13)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-7-*†	.28 (7)	.53 (13.5)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-10-*†	.35 (9)	.69 (17.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.12 (3)
PCTM-15-*†	.60 (15.2)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-20-*†	.79 (20)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-30-*†	1.26 (32)	1.67 (42.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.57 (14.5)
PCTM-40-*†	1.65 (42)	2.01 (51)	—	.31 (8)	.39 (10)	—	.20 (5)	.87 (22)
PCTM-60-*†	2.44 (62)	2.36 (60)	—	.31 (8)	.39 (10)	—	.20 (5)	1.06 (27)
PCTM-90-*†	3.46 (88)	3.64 (92.5)	—	—	.39 (10)	.59 (15)	.20 (5)	1.65 (42)

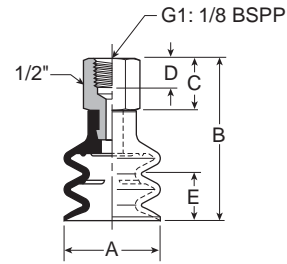
Inches (mm)  
\* Cup material  
† Thread size

**Dimensions**

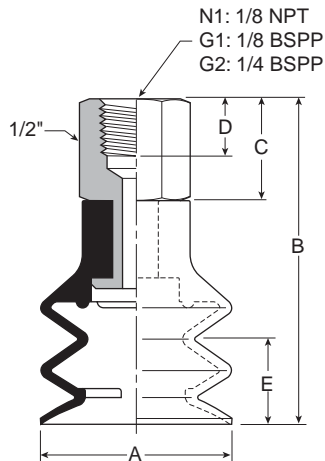
**PCTF-5 and  
PCTF-7**



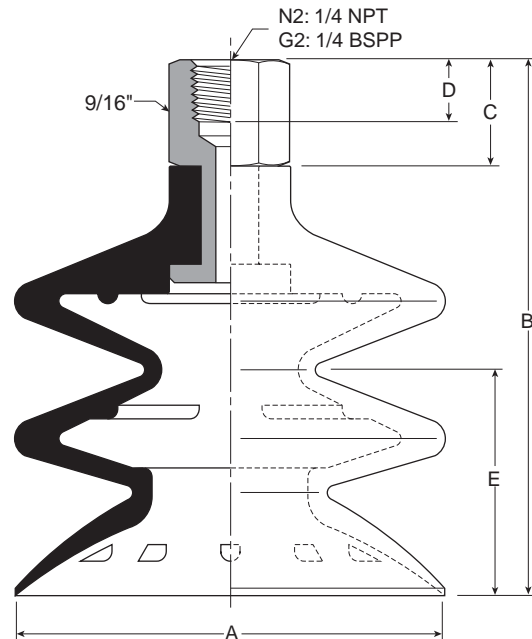
**PCTF-10 thru  
PCTF-20**



**PCTF-30 thru  
PCTF-60**



**PCTF-90**



Model number	ØA	B	C	D	E
PCTF-5*†	.20 (5)	.85 (21.5)	.47 (12)	.31 (8)	.12 (3)
PCTF-7*†	.28 (7)	.87 (22)	.47 (12)	.31 (8)	.12 (3)
PCTF-10*†	.35 (9)	1.06 (27)	.47 (12)	.31 (8)	.12 (3)
PCTF-15*†	.60 (15.2)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-20*†	.79 (20)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-30*†	1.26 (32)	2.03 (51.5)	.55 (14)	.31 (8)	.57 (14.5)
PCTF-40*†	1.65 (42)	2.36 (60)	.55 (14)	.31 (8)	.87 (22)
PCTF-60*†	2.44 (62)	2.72 (69)	.55 (14)	.31 (8)	1.06 (27)
PCTF-90*†	3.46 (88)	4.13 (105)	.69 (17.5)	.39 (10)	1.65 (42)

Inches (mm)  
\* Cup material  
† Thread size

**A**

Technical

PFG  
Flat

PBG  
Bellows

P5V-CFS  
Flat

PJG Short  
Bellows

PCG  
Multiple  
Bellows

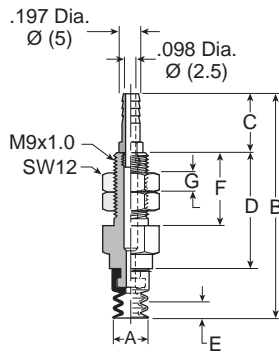
PUGB  
Flat Swivel

Cup  
Fittings

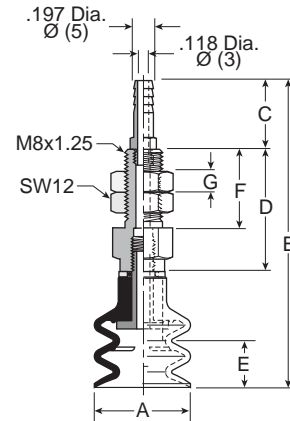


**Dimensions**

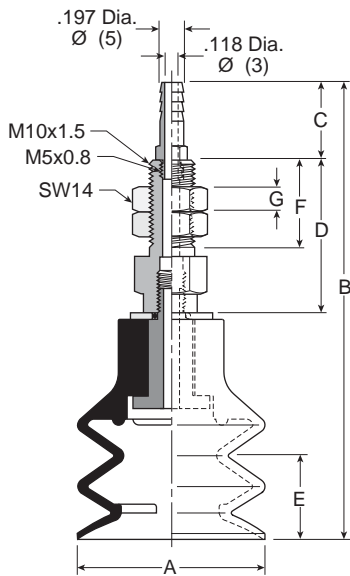
**PCTK-5 and  
PCTK-7**



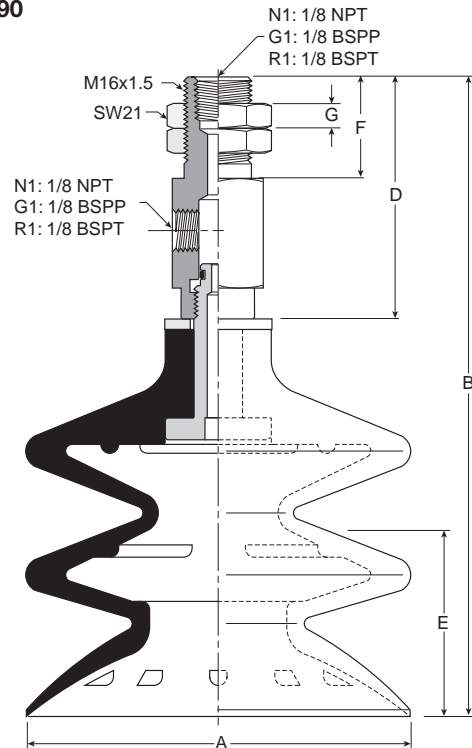
**PCTK-10 thru  
PCTK-20**



**PCTK-30 thru  
PCTK-60**



**PCTK-90**



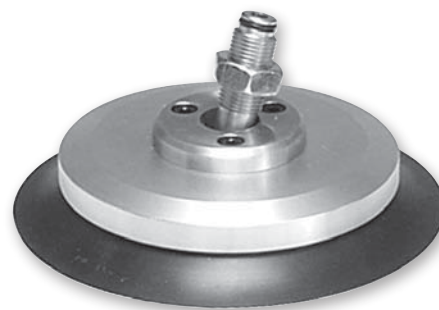
Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PCTK-5-*	.20 (5)	1.32 (33.5)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-7-*	.28 (7)	1.34 (34)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-10-*	.35 (9)	2.21 (56.2)	.63 (16)	.88 (22.5)	.12 (3)	.59 (15)	.16 (4)	.78 (22)
PCTK-15-*	.60 (15.2)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-20-*	.79 (20)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-30-*	1.26 (32)	3.42 (86.8)	.63 (16)	1.26 (32)	.57 (14.5)	.79 (20)	.20 (5)	1.62 (46)
PCTK-40-*	1.65 (42)	3.75 (95.3)	.63 (16)	1.26 (32)	.86 (22)	.79 (20)	.20 (5)	1.94 (55)
PCTK-60-*	2.44 (62)	4.11 (104.3)	.63 (16)	1.26 (32)	1.06 (27)	.79 (20)	.20 (5)	3.00 (85)
PCYK-90-*	3.46 (88)	5.70 (144.8)	.91 (23)	2.17 (55)	1.65 (42)	.43 (11)	—	10.58 (300)

Inches (mm)  
\* Cup material  
† Vacuum port

**Features**

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**

- PUTK 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**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

**A**

Technical

PFG  
Flat

PBG  
Bellows

PSV-CFS  
Flat

PJG Short  
Bellows

PCG  
Multiple  
Bellows

PUGB  
Flat Swivel

Cup  
Fittings

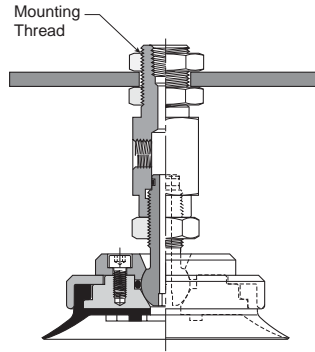
**PUTK Series Barbed Bulkhead**

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 NPT	<b>PUTK-60-NBR-N1</b>	<b>PUGB-60-NBR</b>	<b>PUG-60-NBR</b>	<b>UTK-60-N1</b>
80	1/8 NPT	<b>PUTK-80-NBR-N1</b>	<b>PUGB-80-NBR</b>	<b>PUG-80-NBR</b>	<b>UTK-60-N1</b>
100	1/8 NPT	<b>PUTK-100-NBR-N1</b>	<b>PUGB-100-NBR</b>	<b>PUG-100-NBR</b>	<b>UTK-60-N1</b>

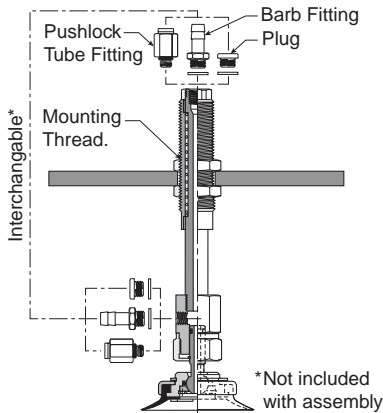
**PUTYS Series Bulkhead Level Compensator**

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 interchangeable connectors & plugs for port connections.



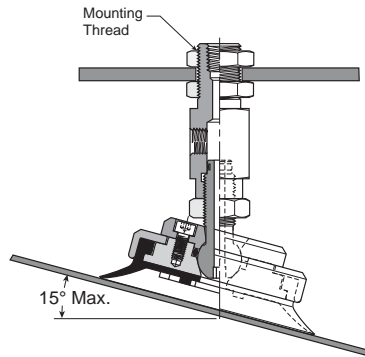
Cup diameter (mm)	Vacum port	Stroke (mm)	Spring compression Force lbf (N)	PUTYS assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only NBR	Level compensator P/N
			0%    100%				
60	1/8 NPT	30	1.6 (6.8)    3.6 (15.6)	<b>PUTYS6030NBRN1</b>	<b>PUGB-60-NBR</b>	PUG-60-NBR	<b>UTYS-60-30</b>
60	1/8 NPT	50	1.9 (8.3)    4.5 (19.6)	<b>PUTYS6050NBRN1</b>	<b>PUGB-60-NBR</b>	PUG-60-NBR	<b>UTYS-60-50</b>
80	1/8 NPT	30	1.6 (6.8)    3.6 (15.6)	<b>PUTYS8030NBRN1</b>	<b>PUGB-80-NBR</b>	PUG-80-NBR	<b>UTYS-60-30</b>
80	1/8 NPT	50	1.9 (8.3)    4.5 (19.6)	<b>PUTYS8050NBRN1</b>	<b>PUGB-80-NBR</b>	PUG-80-NBR	<b>UTYS-60-50</b>
100	1/8 NPT	30	1.6 (6.8)    3.6 (15.6)	<b>PUTYS10030NBRN1</b>	<b>PUGB-100-NBR</b>	PUG-100-NBR	<b>UTYS-60-30</b>
100	1/8 NPT	50	1.9 (8.3)    4.5 (19.6)	<b>PUTYS10050NBRN1</b>	<b>PUGB-100-NBR</b>	PUG-100-NBR	<b>UTYS-60-50</b>

Most popular.

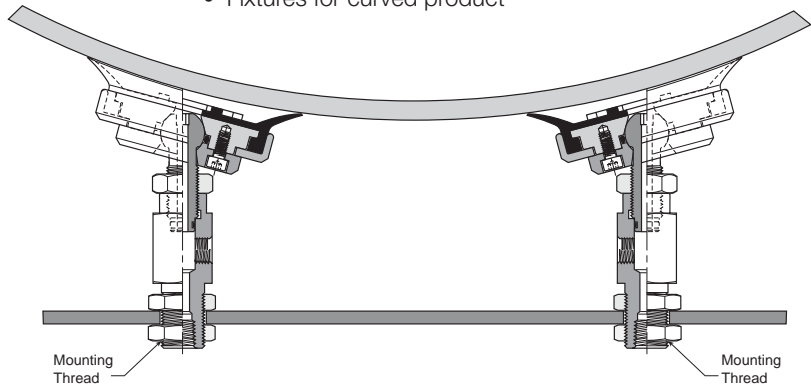


**Applications**

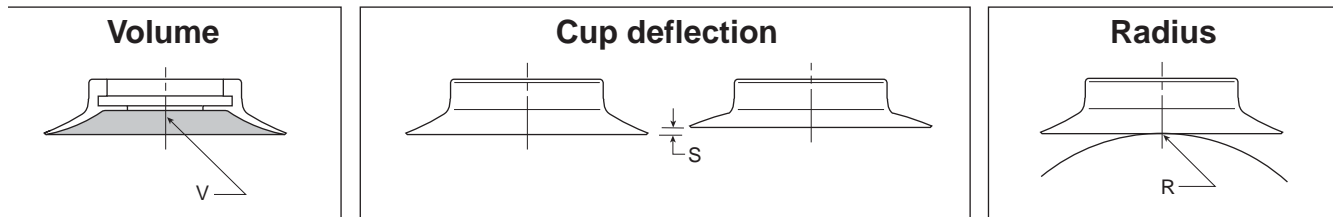
- Angles pickup



- Fixtures for curved product



**Main data for swivel bellows PUG cups**



Model number	Cup diameter inches (mm)	Area cm <sup>2</sup>	Volume (V) liters	Lifting force @ 60% (N)		Cup deflection (S) mm	Radius R (mm)
PUGB-60-*	2.36 (60)	28.3	0.0090	173	—	5	70
PUGB-80-*	3.15(80)	50.3	0.025	308	—	6	100
PUGB-100-*	3.94 (100)	78.5	0.045	480	—	6	150

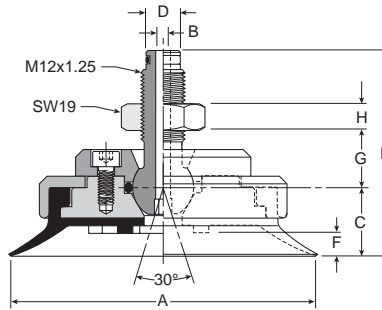
\* Cup material

<b>A</b>
Technical
PFG Flat
PBG Bellows
P5V-CFS Flat
PJG Short Bellows
PCG Multiple Bellows
PUGB Flat Swivel
Cup Fittings

**A**

**PUGB Series Barbed Bulkhead Dimensions**

**PUGB-60 thru  
PUGB-100**

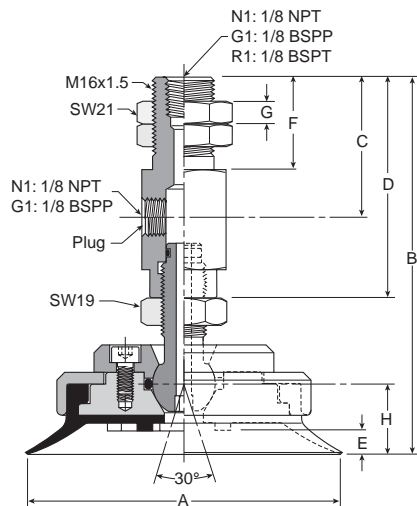


Model number	ØA	ØB	C	ØD	E	F	G	H
PUGB-60-*	2.36 (60)	.15 (3.9)	.63 (16)	.35 (9)	2.05 (52)	.20 (5)	.59 (15)	.28 (7)
PUGB-80-*	3.15 (80)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)
PUGB-100-*	3.94 (100)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)

Inches (mm)  
\* Cup material

**PUTK Series Barbed Bulkhead Dimensions**

**PUTK-60 thru  
PUTK-100**



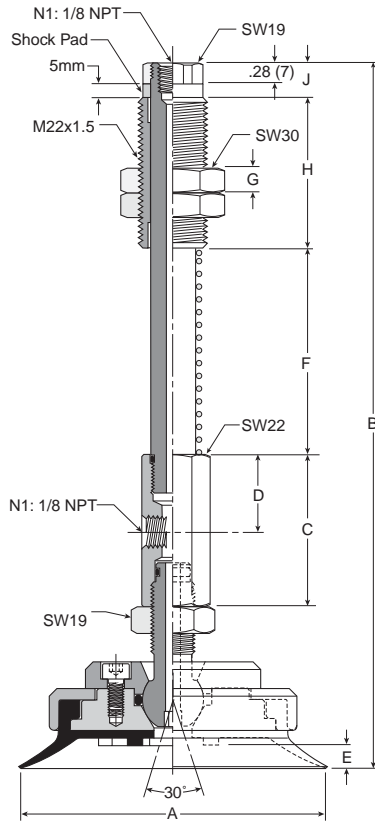
Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PUTK-60-*	2.36 (60)	3.66 (93)	.63 (16)	1.89 (48)	.20 (5)	.91 (23)	.24 (6)	.63 (16)	12.4 (352)
PUTK-80-*	3.15 (80)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	15.7 (444)
PUTK-100-*	3.94 (100)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	20.0 (568)

Inches (mm)  
\* Cup material



**Dimensions**

**PUTYS60 thru  
 PUTYS100**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PUTYS6030*	2.36 (60)	7.28 (185)	1.57 (40)	.79 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	17.2 (487)
PUTYS6050*	2.36 (60)	8.27 (210)	1.57 (40)	.79 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	18.4 (521)
PUTYS8030*	3.15 (80)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	19.7 (559)
PUTYS8050*	3.15 (80)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	20.1 (595)
PUTYS10030*	1.18 (30)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	25.7 (729)
PUTYS10050*	1.18 (30)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	26.7 (756)

Inches (mm)  
 \* Cup material

**A**

Technical

PFG  
Flat

PBG  
Bellows

P5V-CFS  
Flat

PJG Short  
Bellows

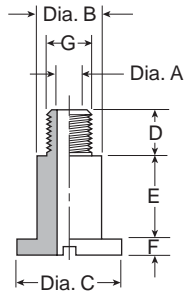
PCG  
Multiple  
Bellows

PUGB  
Flat Swivel

Cup  
Fittings

**Cup screws**

**A**



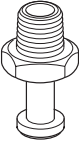
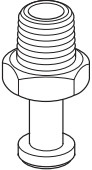
Part number	A	B	C	D	E	F	G
TN-PF-15-M5	.10 (2.5)	.20 (5)	.31 (8)	.22 (5.5)	.06 (1.5)	(2)	M5
TN-PF-20-M5	.10 (2.5)	.20 (5)	.43 (11)	.24 (6)	.12 (3)	(2)	M5
TN-PF-25-M6	.14 (3.5)	.33 (8.5)	.55 (14)	.24 (6)	.43 (11)	(2)	M6
TN-PF-50-M6	.14 (3.5)	.31 (8)	.79 (20)	.24 (6)	.24 (6)	(2)	M6
TN-PF-50-M8	.16 (4)	.31 (8)	.79 (20)	.39 (10)	.20 (5)	(2)	M8
TN-PF-10-M5	.10 (2.5)	.12 (3)	.24 (6)	.22 (5.5)	.08 (2)	(2)	M5
TN-PF-30-M6	.13 (3.4)	.31 (8)	.59 (15)	.41 (10.5)	.41 (10.5)	(3)	M6
TN-PC-30-M8	.15 (3.9)	.31 (8)	.29 (15)	.47 (12)	.39 (10)	(3)	M8
TN-PC-90-M12	.15 (3.9)	.47 (12)	.98 (25)	.43 (11)	.75 (19)	(5)	M12

Inches (mm)

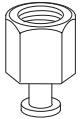
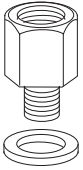
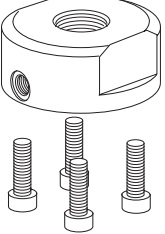
**Male threaded cup fittings**

	Cup fitting	Cup series	Cup assembly	Vacuum port
	FTM-5A-M5H	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-G1H	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-20B-N1	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 NPT
	FTM-20B-G2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-20B-M10	PFG / PBG / PJG	PFTM / PBTM / PJTM	M10
	FTM-50-N1	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 NPT
	FTM-50-G1H	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-50-G2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-60-N2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/4 NPT
	FTM-60-G2	PFG / PBG / PJG	PFTM / PBTM / PJTM	1/8 BSPP
	FTM-60-M10	PFG / PBG / PJG	PFTM / PBTM / PJTM	M10
	CTM-10-M5H	PCG	PCTM	M5
	CTM-10-N1	PCG	PCTM	1/8 NPT
	CTM-10-G1H	PCG	PCTM	1/8 BSPP

**Male threaded cup fittings**

	Cup fitting	Cup series	Cup assembly	Vacuum port
	CTM-30-N1	PCG	PCTM	1/8 NPT
	CTM-30-G1H	PCG	PCTM	1/8 BSPP
	CTM-30-G2	PCG	PCTM	1/8 BSPP
	CTM-90-N2	PCG	PCTM	1/4 NPT
	CTM-90-G2	PCG	PCTM	1/8 BSPP

**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	1/8 BSPP
	FTF-50-G1	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/8 BSPP
	FTF-50-G2	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/8 BSPP
	FTF-60-N2	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/4 NPT
	FTF-60-G2	PFG / PBG / PJG	PFTF / PBTF / PJTF	1/8 BSPP
	FTF-120-N4	PFG / PBG	PFTF / PBTF	1/2 NPT
	FTF-120-G4	PFG / PBG	PFTF / PBTF	1/2 BSPP
	CTF-10-G1	PCG	PCTF	1/8 BSPP

**A**

Technical

PFG  
Flat

PBG  
Bellows

P5V-CFS  
Flat

PJG Short  
Bellows

PCG  
Multiple  
Bellows

PUGB  
Flat Swivel

Cup  
Fittings



**A**

Technical

PFG  
Flat

PBG  
Bellows

PSV-CFS  
Flat

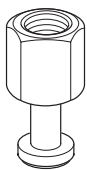
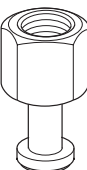
PJG Short  
Bellows

PCG  
Multiple  
Bellows



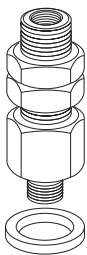



PUGB  
Flat Swivel

Cup  
Fittings

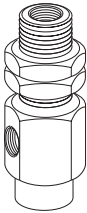
**Female threaded cup fittings**

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

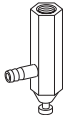

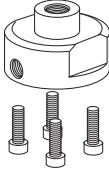
**Bulkhead cup fittings**

	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 / PAG	PFTK / PBTK / PJTK / PATK	Barb Fitting
	FTK-50	PFG / PBG / PJG	PFTK / PBTK / PJTK	Barb Fitting
	FTK-60-N1	PFG / PBG / PJG	PFTK / PBTK / PJTK	1/8 NPT
	FTK-60-G1	PFG / PBG / PJG	PFTK / PBTK / PJTK	1/8 BSPP
	CTK-10	PCG	PCTK	Barb Fitting
	CTK-30	PCG	PCTK	Barb Fitting
	UTK-20	PUGB	PUTK	Barb Fitting
	UTK-40			


**Bulkhead cup fittings**

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

**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-N1	PFG / PBG / PJG	PFYK / PBYK / PJYK	1/8 NPT
	FYK-60-G1			
	FYK-120-N1	PFG / PBG	PFYK / PBYK	1/8 NPT
	FYK-120-G1			

**Level compensators**

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

**A**

Technical

PFG Flat

PBG Bellows

P5V-CFS Flat

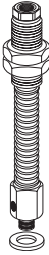
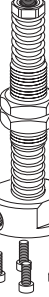
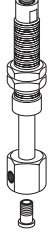
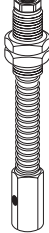
PJG Short Bellows

PCG Multiple Bellows

PUGB Flat Swivel

Cup Fittings

**Level compensators**

	Assembly part number	Cup series	Cup assembly	Compensator only	Cup fitting	
<b>A</b>		TYS-60-30		TYS-M14-25-N		
		—————	PFG / PBG / PJG	PFTYS / PBTYS / PJTYS	—————	FTY-60/95
Technical		TYS-60-50		TYS-M14-45-N		
PF6 Flat		TYS-120-20	PFG / PBG	PFTYS / PBTYS	TYS110/200M1820	FTY-120-N2
PB6 Bellows			TYS-120-70	PFG / PBG	PFTYS / PBTYS	TYS110/200M1870
PSV-CFS Flat		JTYS-10-10		NAPJYS-10-10-K		
PJ6 Short Bellows		—————	PJG	PJTYS	—————	TN-PF-15-M5
PC6 Multiple Bellows			JTYS-10-15		NAPJYS-10-15-K	
PUGB Flat Swivel		UTYS-60-30		TYS-M14-25-N		
Cup Fittings		—————	PUGB	PUTYS	—————	UTY-60-M14-N1
			UTYS-60-50		TYS-M14-45-N	

# Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

## WARNING:

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS (“PRODUCTS”) CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:**

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

## 1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See [www.iso.org](http://www.iso.org) for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
  - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
  - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
  - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
  - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com), for telephone numbers of the appropriate technical service department.

## 2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
  - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
  - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
  - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

D

Safety Guide,  
Offer of Sale

**2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
  - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
  - Consult product labeling or product literature for pressure rating limitations.

### 3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

**3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

**3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at [www.parker.com](http://www.parker.com).

**3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

### 4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

**4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.

**4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at [www.parker.com](http://www.parker.com).

**4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)

- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
  - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
  - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
  - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
  - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

**Caution: Leak detection solutions should be rinsed off after use.**

**4.5. Routine Maintenance Issues:**

- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

**4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

**4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:

- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

**4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:

- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

**4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

## Offer of Sale

The goods, services or work (referred to as the "Products") offered by **Parker-Hannifin Corporation**, its subsidiaries, groups, divisions, and authorized distributors ("Seller") are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller's offer by any customer ("Buyer") is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer's order for any Products specified in Buyer's purchase document or Seller's offer, proposal or quote ("Quote") attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

- 1. Terms and Conditions.** Seller's willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document or other communication issued by Buyer.
- 2. Price; Payment.** Prices stated on Seller's Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller's Credit Department). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. Shipment; Delivery; Title and Risk of Loss.** All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferral of shipment at Buyer's request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.
- 4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.
- 6. LIMITATION OF LIABILITY.** IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE WITHIN A REASONABLE PERIOD OF TIME. **IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**
- 7. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 8. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 9. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
- 10. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller retains a security interest in all Products delivered to Buyer and this agreement is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.
- 11. Improper Use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs

(including attorney fees and defense costs), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

**12. Cancellations and Changes.** Buyer may not cancel or modify or cancel any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change Product features, specifications, designs and availability.

**13. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

**14. Force Majeure.** Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

**15. Waiver and Severability.** Failure to enforce any provision of this agreement will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

**16. Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

**17. Governing Law.** This agreement and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

**18. Indemnity for Infringement of Intellectual Property Rights.** Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

**19. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

**20. Compliance with Laws.** Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act") and the U.S. Food Drug and Cosmetic Act ("FDCA"), each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

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