

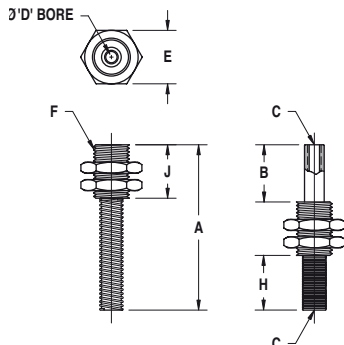
SPRING LEVELERS

- Spring Levelers allow compliance for end-of-arm tools to ensure that all cups make contact. This is especially important when handling large objects such as sheets of plywood that may be warped and the tool has multiple vacuum cups that must make contact.
- Smooth operation – reduces shock to an object that is being lifted
- Lightweight – reduces stress to robotic end effectors
- High flow – maximize performance and holding force for porous objects
- Flexible mounting options for robotic end effectors / EOAT
- Reduces machine indexing when picking up material from a stack

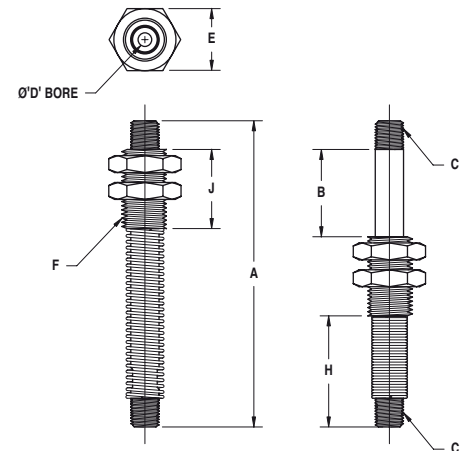


● Spring Levelers: Groups 1, 2, & 3 – NVSL1, NVSL2 & NVSL3

Part Number	A in. (mm)	B-Travel in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F-Thread in. (mm)	H in. (mm)	J in. (mm)	Thickness in. (mm)	Weight oz (g)
NVSL1-20	1.14	0.20	10-32 F				0.19			1.70
NVSL1M-20	(29.00)	(5.10)	(M5 F)				(4.80)			(48)
NVSL1-40	1.54	0.40	10-32 F				0.39			1.80
NVSL1M-40	(39.10)	(10.20)	(M5 F)	0.15	0.75	1/2-20 UNF	(9.90)	0.75	0.43	(51)
NVSL1-80	2.32	0.80	10-32 F	(19.00)	(19.00)		0.77	(19.10)	(10.90)	1.90
NVSL1M-80	(58.90)	(20.30)	(M5 F)				(19.60)			(54)
NVSL1-120	3.11	1.20	10-32 F				1.16			2.10
NVSL1M-120	(79.00)	(30.50)	(M5 F)				(29.50)			(60)
NVSL2-40	2.70	0.40	1/8 NPTM				0.80			2.6 oz
NVSL2M-40	(68.60)	(10.10)	(G1/8 M)				(20.30)			(74)
NVSL2-120	4.27	1.20	1/8 NPTM				1.57			3.20
NVSL2M-120	(108.50)	(30.50)	(G1/8 M)	0.24	0.88	5/8-18 UNF	(39.90)	1.10	0.72	(91)
NVSL2-200	5.83	2.00	1/8 NPTM	(28.00)	(22.20)		2.33	(27.90)	(18.30)	4.00
NVSL2M-200	(148.10)	(50.80)	(G1/8 M)				(59.20)			(113)
NVSL2-280	7.41	2.80	1/8 NPTM				3.11			4.60
NVSL2M-280	(188.20)	(71.10)	(G1/8 M)				(79.00)			(130)
NVSL3-120	4.27	1.20					1.17			5.90
	(108.50)	(30.50)					(29.70)			(117)
NVSL3-200	5.83	2.00					1.93			7.3 oz
	(148.10)	(50.80)					(49.00)			(207)
NVSL3-280	7.41	2.80	1/4 NPTM	0.31	1.13	7/8-14 UNF	2.71	1.50	1.02	8.70
	(188.20)	(71.10)		(7.90)	(28.60)		(68.80)	(38.10)	(25.90)	(247)
NVSL3-360	9.00	3.60					3.50			10.10
	(228.60)	(91.40)					(88.90)			(286)



Spring Leveler Group 1



Spring Leveler Groups 2 & 3

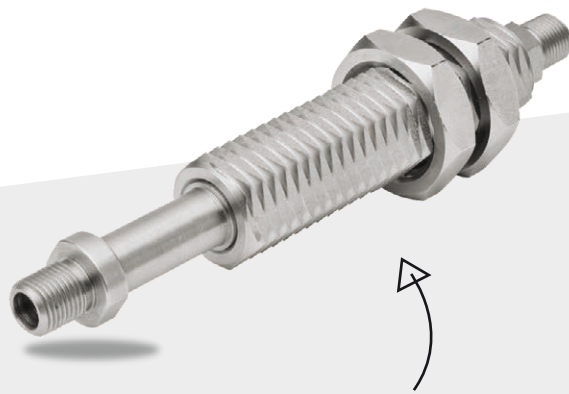
● Custom Vacuum Spring Levelers - NVSL Series

Ideal for OEM engineers and designers

- Creative Engineering
- Precision Manufacturing
- Extensive Application Experience

When off the shelf doesn't work, IMI Norgren's engineering expertise and manufacturing capabilities can provide custom solutions to your specifications.

Whether it's as simple as modifying a standard product, or more complex requiring new products with precise tolerances, or special materials, IMI Norgren has the solution.



Our custom made 303 stainless steel spring leveler, vacuum cup and pump assembly attaches to swivel arm (not shown) for carton erecting application in food industry.



NVP1X-100H vacuum pump with pneumatic blow-off with stainless steel spring leveler.



● Light Duty Spring Leveler Mounting Brackets

NSLBS Series – Mounting brackets for 1" [25mm] extrusions

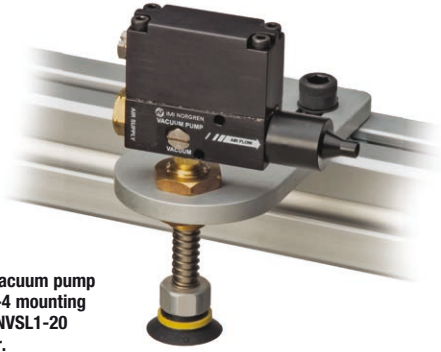
NSLBF Series – Mounting brackets for 1.5" [40mm] extrusions

Ideal applications

- End-of-arm-Tooling
- Robotic assembly
- Electronics
- Pick & place
- Injection Molding – parts removal

Features and benefits

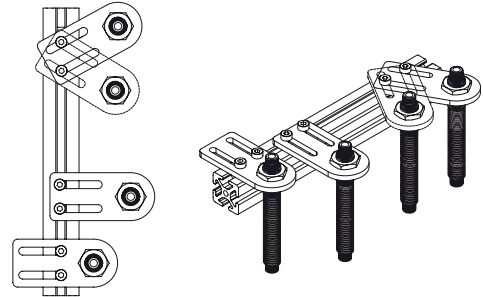
- Simple to assemble, modular
- End-of-Arm Tooling component
- Lightweight – Reduces stress to robotic end effector
- Flexible mounting – Top, sides or bottom of extrusions
- Easily adjusted and repositioned in seconds



NVPOX-60H vacuum pump with NSLBF-4 mounting bracket and NVSL1-20 spring leveler.



Quick change brackets for flexible mounting positions



Flexible mounting positions

Designed for flexible manufacturing operations, NSLBF and NSLBS Series mounting brackets attach to the top, sides or bottom of 1" [25mm] and 1.5" [40mm] extrusions.

Easily mounted and adjusted, the Light Duty Spring Leveler Brackets readily rotate, slide or pivot for accurate part alignment. If the part size or process should change, you can re-position the brackets in a matter of seconds.

Using your extrusions or ours, NSLBF and NSLBS Series mounting brackets connect to our NVSL Series Spring Levelers (see page 12.7) and a variety of our venturi vacuum pumps to create a simple, off-the-shelf End-of-Arm device.

Standard Spring Leveler Brackets:

- 3 Series: Fits NVSL1, 2, 3 spring levelers
- 4 Sizes: 2", 3", 4" and 5" lengths
- Anodized aluminum

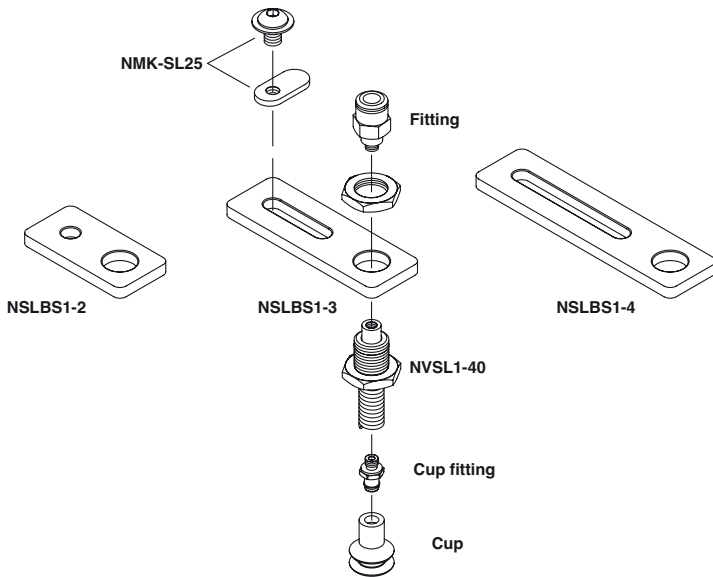
Spring Leveler Bracket Options:

- Spring levelers, vacuum cups and vacuum fittings
- Swivel attachment – Available for Series 3 only
- Mounting hardware: 1/4" (6.5mm) T-slot compatible or 5/16" (10mm) T-slot compatible

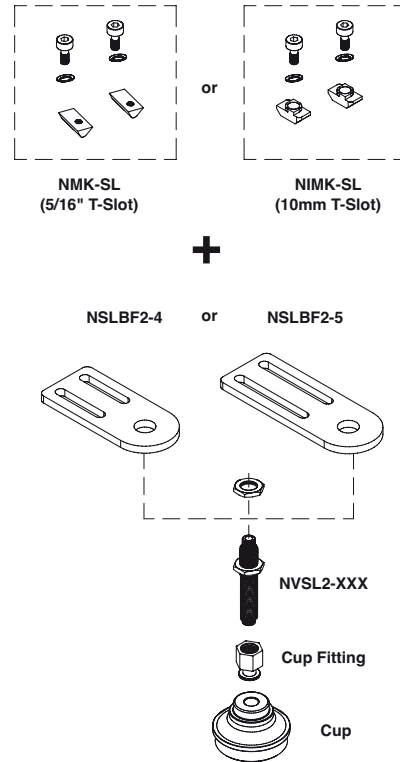
● Light Duty Spring Leveler Mounting Bracket Assemblies:

(IMI Norgren-supplied or customer-supplied extrusions)

NSLBS Series
1" [25mm] extrusion,
1/4" [6.5mm] T-slot compatible



NSLBF Series
1.5" [40mm] extrusion,
5/16" [10mm] T-slot compatible



● How to specify

Bracket Model Number	Size in (mm)	For use with IMI Norgren Spring Levelers
NSLBS1-2	2.00 (50.00)	NVSL1/I-NVSL1-(20, 40, 80, 120)
NSLBS1-3	3.00 (76.20)	NVSL1/I-NVSL1-(20, 40, 80, 120)
NSLBS1-4	4.00 (101.60)	NVSL1/I-NVSL1-(20, 40, 80, 120)
NSLBF1-4	4.00 (101.60)	NVSL1/I-NVSL1-(20, 40, 80, 120)
NSLBF1-5	5.00 (127.00)	NVSL1/I-NVSL1-(20, 40, 80, 120)
NSLBS2-2	2.00 (50.80)	NVSL2/I-NVSL2-(40, 120, 200, 280)
NSLBS2-3	3.00 (76.20)	NVSL2 I-NVSL2-(40, 120, 200, 280)
NSLBS2-4	4.00 (101.60)	NVSL2 I-NVSL2-(40, 120, 200, 280)
NSLBF2-4	4.00 (101.60)	NVSL2 I-NVSL2-(40, 120, 200, 280)
NSLBF2-5	5.00 (127.00)	NVSL2 I-NVSL2-(40, 120, 200, 280)
NSLBF3-4	4.00 (101.60)	NVSL3 I-NVSL3-(120, 200, 280, 360)
NSLBF3-5	5.00 (127.00)	NVSL3 I-NVSL3-(120, 200, 280, 360)
NMK-SL25	N/A	Mounting hardware – 1/4" T-slot
NMK-SL	N/A	Mounting hardware – 5/16" T-slot
NIMK-SL	N/A	Mounting hardware – 10mm T-slot

Helpful hints:

1. Choose cup size/style based on part size and weight.
2. Choose spring leveler based on stroke length and bore size.
3. Choose bracket based on reach requirement 2", 3", 4" or 5".
4. Choose cup fitting based on thread size that matches spring leveler thread size (10-32F, 1/8 NPTM, 1/4 NPTM).

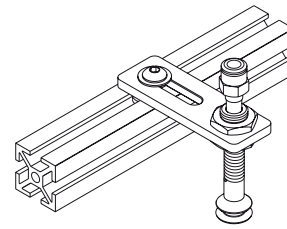
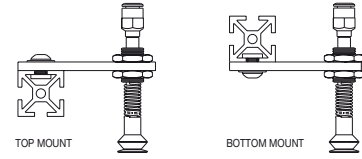
Please order Spring Level Brackets as separate line item(s) based on part number i.e. NSLBF1-4

Please order Spring Levelers as separate line item(s) based on part number i.e. NVSL1-20.

Please order Mounting Hardware as separate line item(s) based on part number i.e. NMK-SL

If you would like parts factory assembled, please specify on order "factory assembled."

● Light Duty Spring Leveler Brackets – Series NSLBS Series



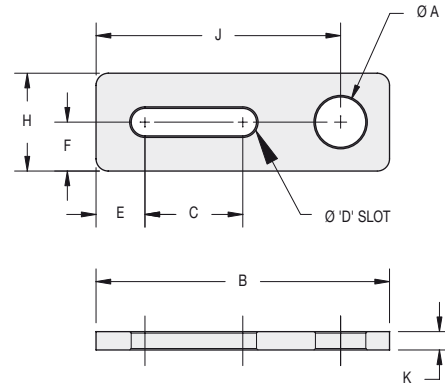
Flexible mounting positions



NSLBS1- (2, 3, 4)
with hardware



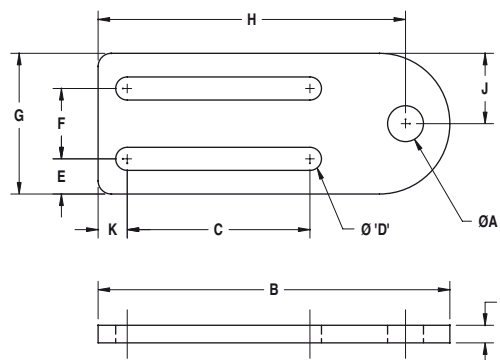
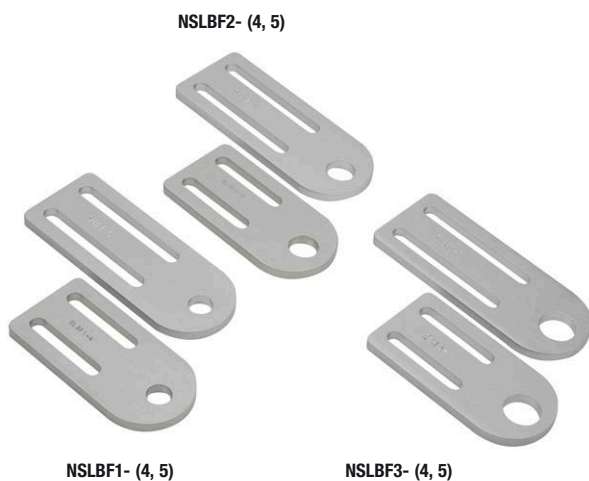
NSLBS2- (2, 3, 4)
with hardware



● Dimensions

Part Number	A-Diameter in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	H in. (mm)	J in. (mm)	K in. (mm)	Weight oz (g)
NSLBS1-2		2.00 (50.80)	0.28 (7.10)					1.50 (38.10)		0.50 (14.20)
NSLBS1-3	0.51 (13.00)	3.00 (76.20)	1.00 (25.40)					2.50 (63.50)		0.80 (22.70)
NSLBS1-4		4.00 (101.60)	2.00 (50.80)					3.50 (88.90)		0.90 (25.50)
NSLBS2-2		2.00 (50.80)	0.28 (7.10)	0.28 (7.10)	0.50 (12.70)	0.50 (12.70)	1.00 (25.40)	1.50 (38.10)	0.19 (4.80)	0.50 (14.20)
NSLBS2-3	0.64 (16.30)	3.00 (76.20)	1.00 (25.40)					2.50 (63.50)		0.80 (22.70)
NSLBS2-4		4.00 (101.60)	2.00 (50.80)					3.50 (88.90)		0.90 (25.50)

● Light Duty Spring Leveler Brackets – Series NSLBF Series



● Dimensions

Part Number	A-Diameter in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	J in. (mm)	K in. (mm)	L in. (mm)	Weight oz (g)
NSLBF1-4	0.51 (13.00)	4.00 (101.60)	1.60 (40.60)					3.37 85.6				2.80 (79.40)
NSLBF1-5	0.51 (13.00)	5.00 (127.00)	2.60 (66.00)					4.37 111.0				2.90 (82.20)
NSLBF2-4	0.64 (16.30)	4.00 (101.60)	1.60 (40.60)					3.37 85.6				2.80 (79.40)
NSLBF2-5	0.64 (16.30)	5.00 (127.00)	2.60 (66.00)	0.33 (8.30)	0.50 (12.70)	1.00 (25.40)	2.00 (50.80)	4.37 111.0	1.00 (25.40)	0.41 (10.40)	0.25 (6.40)	2.80 (79.40)
NSLBF3-4	0.89 (22.60)	4.00 (101.60)	1.60 (40.60)					3.37 85.6				2.30 (65.20)
NSLBF3-5	0.89 (22.60)	5.00 (127.00)	2.60 (66.00)					4.37 (111.00)				2.80 (79.40)

● Heavy Duty Spring Levelers/Level Compensators

Ideal applications

- End-of-Arm Tooling
- Press load and unload
- automotive automation
- Robotic assembly
- Pick & place
- Sheet feeding
- Stamping press transfer

Features and benefits

- Easy to assemble, modular End-of-Arm Tooling components – Minimal design time required
- Durable – Rigid mounting design for heavy, high impact loads
- Smooth operation – Reduces shock to an object that is being lifted
- Lightweight – To maximize robot payload and increase robot speed
- High flow – Maximize performance and holding force for handling porous objects
- Flexible mounting options facilitates
- End-of-Arm Tooling tool design

NSLB40 (2, 3)

Mounting brackets compatible with 1.50" (40 mm) extrusions, 5/16" (10 mm) T-slot



Heavy Duty Spring Levelers lift parts from different horizontal levels or uneven surfaces.

When handling sensitive objects such as fruit, IMI Norgren Spring Levelers feature a soft touch allowing compliance for end-of-arm tools to ensure that all cups make contact. This is especially important when handling large objects such as sheets of plywood that may be warped and the tool has multiple vacuum cups that must make contact.

IMI Norgren's Spring Leveler design surpasses the competition. We offer large thru-bores that allow higher vacuum flow to overcome leakage and for rapid evacuation to ensure safe handling operations

For design flexibility, IMI Norgren offers a large range of sizes and travel lengths 0.20" (5 mm) to 3.6" (91 mm) to accommodate the necessary over-driving by the lifting mechanism to bring all cups in contact.

Recommended for applications which require lifting heavy loads without deflection, IMI Norgren Heavy Duty Spring Levelers include a rigid mounting bracket for a strong, solid connection to 1.50" (40 mm) extrusions.

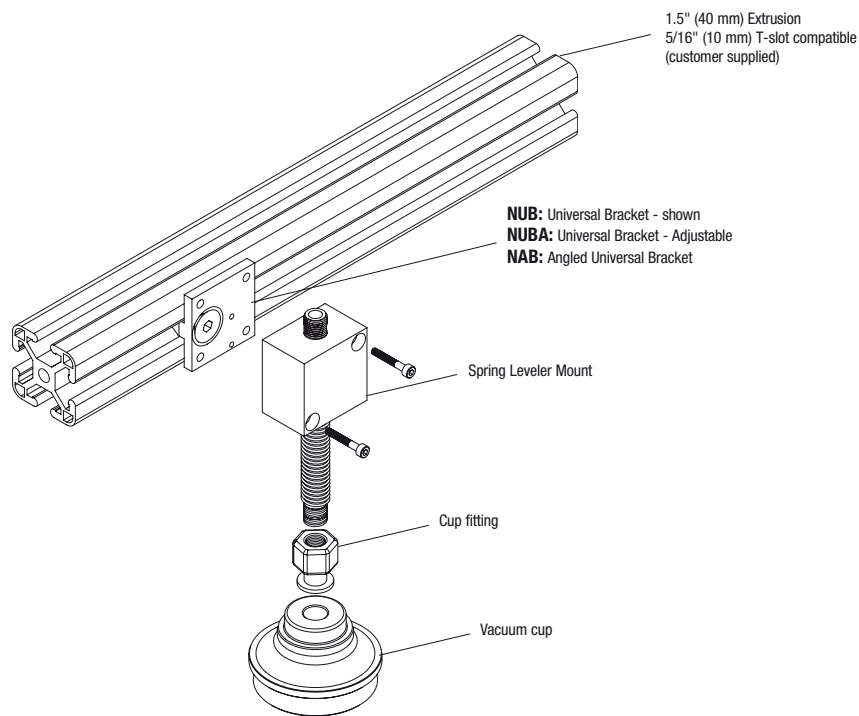
Standard Spring Levelers:

- **2 Series:** 1/8" and 1/4" NPT male thread
- **8 Models:** Travel lengths from 0.40" to 3.60" (10 mm to 91 mm)
- Nickel plated steel shafts, stainless steel springs, high performance bearings and aluminum body

Spring Leveler Options:

- Vacuum cups and vacuum fittings
- Swivel attachment – Available for Series 3 only

● Heavy Duty Spring Leveler Mounting Assembly



● How to specify

Part Number	Heavy Duty Spring Leveler Mounting Assembly
Series 2	
NSLB40/NSLB40M-2-40	0.40" (10.16 mm) travel, 1/8 NPT male thread
NSLB40/NSLB40M-2-120	1.20" (30.48 mm) travel, 1/8 NPT male thread
NSLB40/NSLB40M-2-200	2.00" (50.80 mm) travel, 1/8 NPT male thread
NSLB40/NSLB40M-2-280	2.80" (71.12 mm) travel, 1/8 NPT male thread
Series 3	
NSLB40/NSLB40M-3-120	1.20" (10.16 mm) travel, 1/4 NPT male thread
NSLB40/NSLB40M-3-200	2.00" (30.48 mm) travel, 1/4 NPT male thread
NSLB40/NSLB40M-3-280	2.80" (50.80 mm) travel, 1/4 NPT male thread
NSLB40/NSLB40M-3-360	3.60" (71.12 mm) travel, 1/4 NPT male thread

When ordering spring levelers check the "B" dimension for travel range. Please order spring levelers as separate line items based on part number i.e. NSLB40-2-40

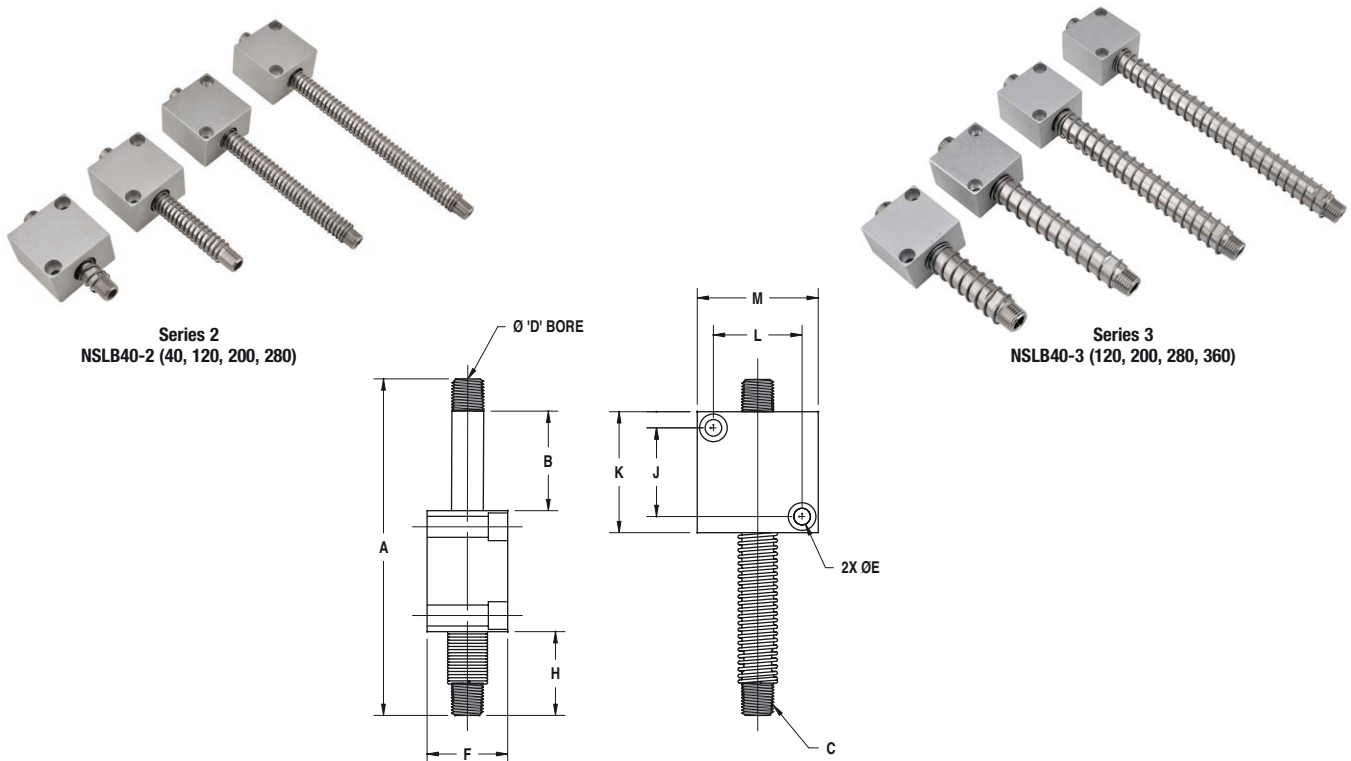
If you would like parts factory assembled, please specify on order "factory assembled."

To attach Heavy Duty Spring Levelers to extrusions, please see Universal Bracket mounting options.

● Heavy Duty Spring Levelers – Series NSLB40-2, NSLB40-3

Part Number	Dimension									Weight oz (g)	
	Series 2	A in. (mm)	B-Travel in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	H in. (mm)	J, L in. (mm)		K, M in. (mm)
NSLB40-2-40 NSLB40M-2-40	2.70 (68.60)	0.40 (10.20)	1/8 NPTM (G1/8 M)					0.40 (10.20)			4.70 (133.20)
NSLB40-2-120 NSLB40M-2-120	4.27 (108.50)	1.20 (30.50)	1/8 NPTM (G1/8 M)	0.24 (6.10)	0.21 (5.20)	1.00 (25.40)		1.17 (29.70)	1.10 (27.90)	1.50 (38.10)	4.70 (133.20)
NSLB40-2-200 NSLB40M-2-200	5.83 (148.10)	2.00 (50.80)	1/8 NPTM (G1/8 M)					1.93 (49.00)			5.30 (150.30)
NSLB40-2-280 NSLB40M-2-280	7.41 (188.20)	2.80 (71.10)	1/8 NPTM (G1/8 M)					2.71 (68.80)			5.9 oz (167.30)

Part Number	Dimension									Weight oz (g)	
	Series 3	A	B-Travel in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	H in. (mm)	J, L in. (mm)		K, M in. (mm)
NSLB40-3-120 NSLB40M-3-120	4.27 (108.50)	1.20 (30.50)	1/4 NPTM (G1/4 M)					1.17 (29.70)			6.90 (195.60)
NSLB40-3-200 NSLB40M-3-200	5.83 (148.10)	2.00 (50.80)	1/4 NPTM (G1/4 M)	0.31 (7.90)	0.21 (5.20)	1.00 (25.40)		1.93 (49.00)	1.10 (27.90)	1.50 (38.10)	7.90 (224.00)
NSLB40-3-280 NSLB40M-3-280	7.41 (188.20)	2.80 (71.10)	1/4 NPTM (G1/4 M)					2.71 (68.80)			9.90 (280.70)
NSLB40-3-360 NSLB40M-3-360	9.00 (228.60)	3.60 (91.40)	1/4 NPTM (G1/4 M)					3.49 (88.60)			11.00 (311.80)



● Adjustable, Fixed Extension Shaft & Mounting Brackets

Ideal applications

- Injection molding
- Pick & place of irregular shaped parts with large surface height differences

Features and benefits

- Easy to assemble, modular End-of-Arm tool components – minimal design time required
- Fixed positioning for consistent indexing and part retention
- Rigid mounting design for heavy, high impact loads
- Smooth operation – reduces shock to an object that is being lifted
- Lightweight – to maximize robot payload and increase robot speed
- High flow – maximize performance and holding force for handling porous objects
- Flexible mounting options facilitates
- End-of-Arm tool design

Adjustable, Fixed Extension Shaft & Bracket is a rigid, non-moving rod that mounts to the top, sides or bottom of 1.5" (40 mm) extrusions. Once the shaft is adjusted to meet a specific height requirement, the bracket is clamped into a fixed position.

Designed for flexible manufacturing operations, the NFEB40 Series is easily repositioned by simply loosening 2 collar screws and sliding the shaft up or down to meet the new height requirements. For added adjustability, add an adjustable universal bracket to slide the NFEB40 left or right.



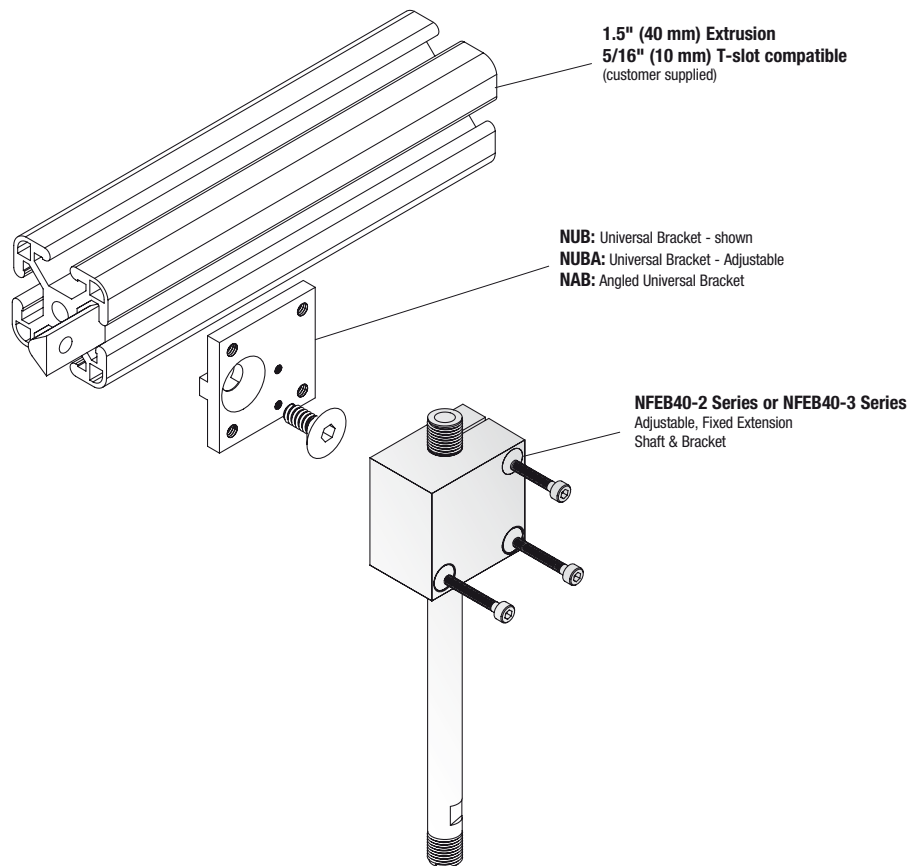
Standard Adjustable, Fixed Extension Shaft & Bracket:

- **2 Series:** 1/8 or 1/4 NPT male
- **8 Shaft Lengths:** 0.40" to 6.7" (10 mm to 170 mm)
- **Mounting:** Split collar design
- **Material:** Nickel plated steel shafts and aluminum body

Adjustable, Fixed Extension Shaft & Bracket Options:

- Wide variety of vacuum cups and vacuum fittings
- Universal brackets for easy attachments and adjustable positioning
- Vacuum cup Swivel attachment – available for Series 3 only

● Adjustable Fixed Length Extension Brackets:
NFEB40- (2, 3) – Configurations and Options:



● How to specify

Part Number	Adjustable, Fixed Extension Shaft & Brackets
Series 2	
NFEB40/NFEB40M-2-40	0.40" (10.16 mm) extension length, 1/8 NPT (G1/8) male
NFEB40/NFEB40M-2-120	1.97" (50.04 mm) extension length, 1/8 NPT (G1/8) male
NFEB40/NFEB40M-2-200	3.51" (89.15 mm) extension length, 1/8 NPT (G1/8) male
NFEB40/NFEB40M-2-280	5.11" (129.8 mm) extension length, 1/8 NPT (G1/8) male
Series 3	
NFEB40/NFEB40M-3-120	1.97" (50.04 mm) extension length, 1/4 NPT (G1/4) male
NFEB40/NFEB40M-3-200	3.51" (89.15 mm) extension length, 1/4 NPT (G1/4) male
NFEB40/NFEB40M-3-280	5.11" (129.80 mm) extension length, 1/4 NPT (G1/4) male
NFEB40/NFEB40M-3-360	6.70" (170.20 mm) extension length, 1/4 NPT (G1/4) male

To specify NFEB40, choose part number based on extension length desired, thru bore diameter and thread size on each end of shaft.

Please order NFEB40's as separate line items based on part number. i.e. NFEB40-2-280. To order metric threads place an "I-" in front of the part number. Example: NFEB40M-2-280.

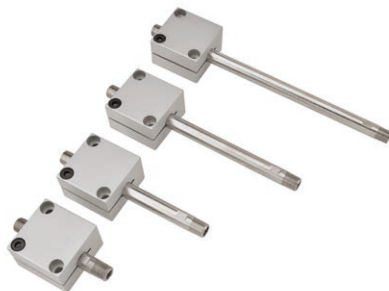
Please order Universal brackets (NUB, NUBA or NAB) as separate line items based on part numbers.

To attach Adjustable, Fixed Extension Shafts & Brackets to extrusions, please see Universal Bracket mounting options.

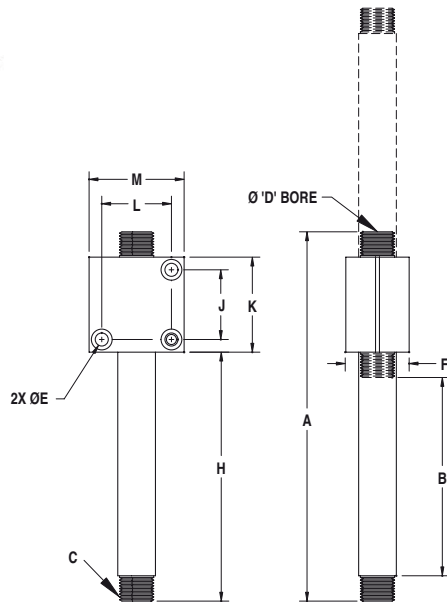
● Adjustable – Fixed Length Extension Shafts & Brackets

Part Number	Dimension		C	D	E	F	H	J, L	K, M	Weight
Series 2	A	B	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	oz (g)
NFEB40-2-40	2.70	0.40	1/8 NPTM				0.80			4.70
NFEB40M-2-40	(68.60)	(10.20)	(G1/8 M)				(20.30)			(133.20)
NFEB40-2-120	4.27	1.97	1/8 NPTM				2.37			4.70
NFEB40M-2-120	(108.50)	(50.00)	(G1/8 M)				(60.20)			(133.20)
NFEB40-2-200	5.83	3.51	1/8 NPTM	0.24	0.21	1.00	3.91	1.10	1.50	5.30
NFEB40M-2-200	(148.10)	(89.20)	(G1/8 M)	(6.10)	(5.20)	(25.40)	(99.30)	(27.90)	(38.10)	(150.30)
NFEB40-2-280	7.41	5.11	1/8 NPTM				5.51			5.90
NFEB40M-2-280	(188.20)	(129.80)	(G1/8 M)				(140.00)			(167.30)

Part Number	Dimension		C	D	E	F	H	J, L	K, M	Weight
Series 3	A	B	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	oz (g)
NFEB40-3-120	4.27	1.97	1/4 NPTM				2.37			6.90
NFEB40M-3-120	(108.50)	(50.00)	(G1/4 M)				(60.20)			(195.60)
NFEB40-3-200	5.83	3.51	1/4 NPTM				3.91			7.90
NFEB40M-3-200	(148.10)	(89.20)	(G1/4 M)				(99.30)			(224.00)
NFEB40-3-280	7.41	5.11	1/4 NPTM	0.31	0.21	1.00	5.51	1.10	1.50	9.90
NFEB40M-3-280	(188.20)	(129.80)	(G1/4 M)	(7.90)	(5.20)	(25.40)	(140.00)	(27.90)	(38.10)	(280.70)
NFEB40-3-360	9.00	6.70	1/4 NPTM				7.10			11.00
NFEB40M-3-360	(228.60)	(170.20)	(G1/4 M)				(180.30)			(311.80)



Series 2
NFEB40-2- (40, 120, 200, 280)



Series 3
NFEB40-3-(120, 200, 280, 360)

● Vacuum Cup Locking Angle Joint

Ideal applications

- Stamping operations (press load and unload)
- Palletizing
- Handling curved and angular objects

Features and benefits

- Durable – rugged all steel design
- Full 40° angular / conical movement (20° in each direction)
- Smooth and secure operation – follows contour of object being lifted
- High flow – maximize performance and holding force for handling porous objects
- Flexible mounting options facilitates
- End-of-Arm Tooling tool design

NCSJ3 Series 3 -
Mounting brackets compatible with 1.5" (40 mm) extrusions, 5/16" (10 mm) T-slot



NCSJ3-14 Vacuum Cup Locking Angle Joint with NSLB40-3 Heavy Duty Spring Leveler & Bracket and Vacuum Cup.



NCSJ3-38

Handling curved surfaces is easy with IMI Norgren's Vacuum Cup Locking Angle Joint. The NCSJ3 angle joints attach to a spring leveler and vacuum cup providing a 40° angular / conical movement. To control the degree of swivel, simply tighten the collar nut located on top of the angle joint to restrict movement.

Developed in conjunction with IMI Norgren spring levelers, the NCSJ3 angle joint assemblies feature exceptionally large flow paths to safely handle porous objects. Depending on height and tooling requirements, Vacuum Cup Locking Angle Joints are interchangeable with the following Series 3 spring levelers:

NVSL3 – Standard spring levelers

NSLB40-3 – Heavy duty spring levelers

NFEB40-3 – Fixed extension shafts & brackets

Note: The retaining nut must be locked into position to seal.

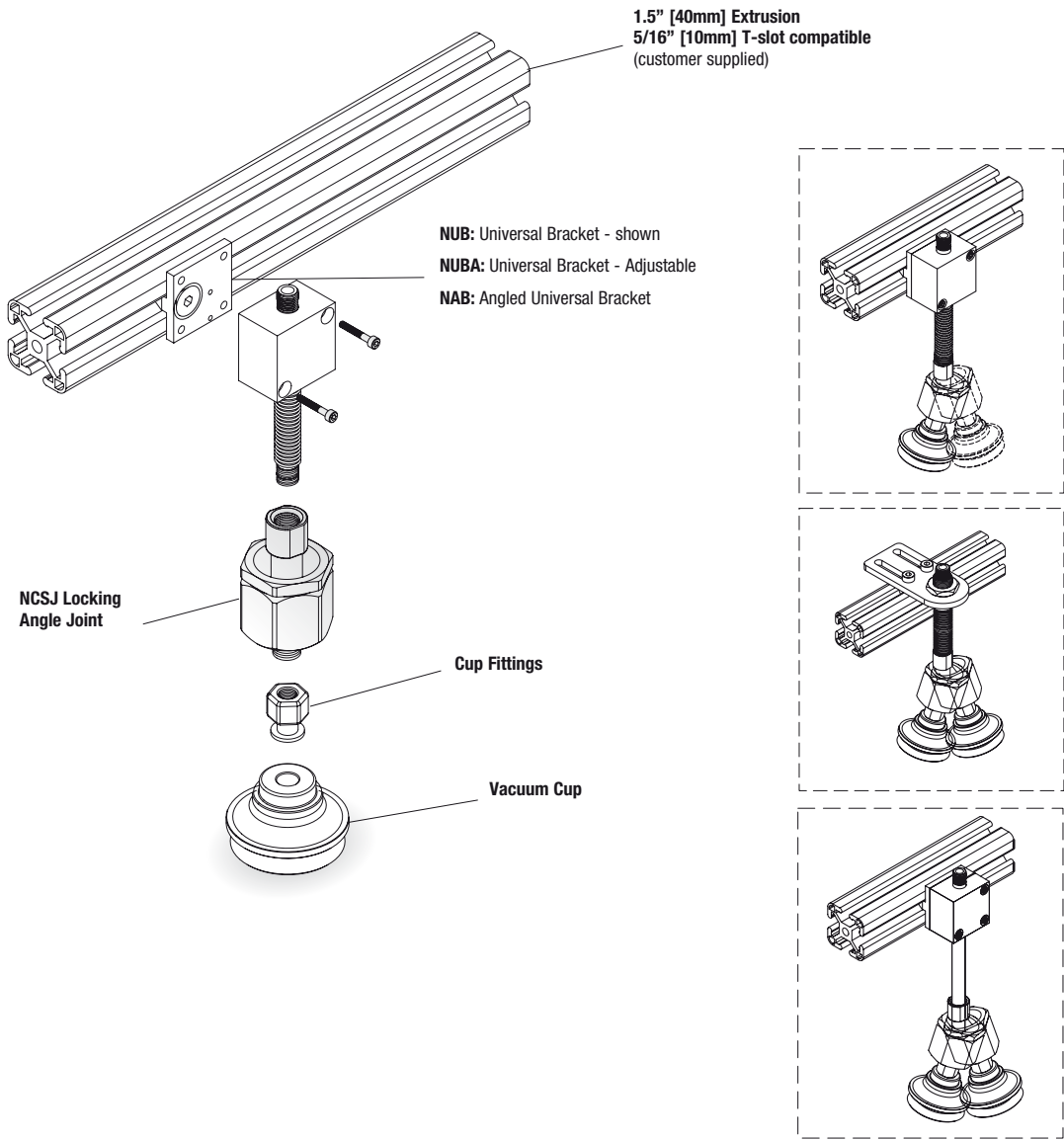
Standard Vacuum Cup Locking Angle Joint:

- 3 Sizes: 1/4, 3/8, 1/2 NPT male threads – mates to a wide variety of vacuum cup fittings
- 1/4 NPTF top port mates to all the 1/4 NPT Series 3 levelers
- Material: Nickel plated steel, Buna-N O-ring

Vacuum Cup Locking Angle Joint Options:

- Variety of vacuum cups and vacuum fittings
- Custom designs and stainless steel construction available for food and wash-down applications. Consult factory.

● Vacuum Cup Locking Angle Joint: NCSJ-3 Series:



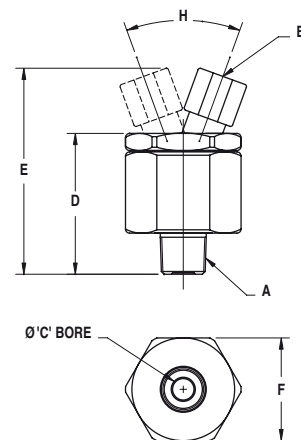
● How to specify

Part Number	Vacuum Cup Locking Angle Joint
NCSJ3-14	1/4 NPT – male thread
NCSJ3-38	3/8 NPT – male thread
NCSJ3-12	1/2 NPT – male thread

Choose the angle joint with the same NPT thread as the vacuum cup fitting.
Order by part number i.e. NCSJ3-38

● Vacuum Cup Locking Angle Joint: Series 3 – NCSJ-3

Part Number	Dimensions							Weight oz (g)
	A Thread in. (mm)	B Thread in. (mm)	C Thru Bore in. (mm)	D in. (mm)	E in. (mm)	F Hex in. (mm)	H Locking Angle in. (mm)	
NCSJ3-14	1/4 NPT			1.96 (49.80)	2.90 (73.70)			11.70 (331.70)
NCSJ3-38	3/8 NPT	1/4 NPT	0.31 (7.90)	2.06 (52.30)	3.00 (76.20)	1.50 (38.10)	40°	12.70 (360)
NCSJ3-12	1/2 NPT			2.06 (52.30)	3.00 (76.20)			12.70 (360)



MOUNTING BRACKETS

● Universal Mounting Brackets – Standard, Adjustable, Angled

- 3 Styles – standard, adjustable or angled with simple erector-set connectivity
- Anodized aluminum – lightweight – reduces stress, extends performance and life of robot
- Modular components add design flexibility – adaptable for all EOAT configurations
- Keyed profile for tight fit – non-rotating – strong holding force
- Mounting kit includes hardware to attach products to extrusions
- Angled brackets have optional adjustment knob, consult factory

Compatible with 1" (25 mm) and 1.5" (40 mm) extrusions



Standard Universal Bracket attaches NVP10-100H to extrusion for halogen bulb pick and place operation.



Universal Bracket(Adjustable) with Vacuum cup/ Manifold block assembly.



Angled Bracket holds NVP10-60M vacuum pump and cup, with exposed fastening screw for quick and easy adjustments.



NUB, NUBA, and NAB brackets.

Universal Mounting Brackets are simple, lightweight connectors that attach IMI Norgren vacuum pumps, vacuum cups, spring levelers and manifold blocks to 1" or 1.5" extrusions.

Available in 3 models, standard, adjustable or angled, our Universal Brackets are keyed to fit securely in 1/4" [6.5mm] or 5/16" [10mm] T-slots, remain square and increase holding force.

Brackets are available with or without mounting hardware.

Standard Universal Bracket: (NUB)

The standard NUB is a fixed position bracket that is tamper resistant. Once the screw is tightened to the extrusion and a product is mounted to the bracket the fastening screw is now covered and inaccessible to adjust.

Universal Bracket Adjustable: (NUBA)

An elongated version of the standard bracket, the NUBA features an exposed fastening screw that enables quick, easy bracket adjustments along the T-slot.

Angled Universal Bracket: (NAB)

For operations that require frequent adjustments, the NAB models are the easiest to re-position. One side of the bracket holds the vacuum pump, the other side of the bracket attaches to the extrusion enabling the bracket assembly to slide along the T-slot for unlimited adjustments. With the pump located on a 90° angle, the fastening screw is easily accessible at all times. Optional adjustment knobs are available for the NAB models.

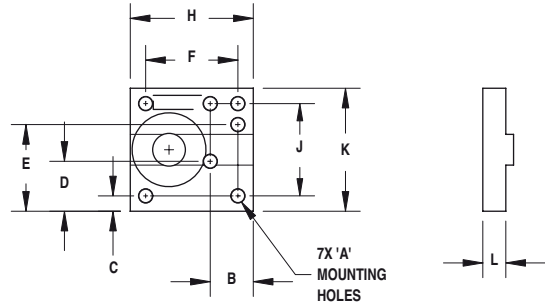
● Universal Brackets and Mounting Kits for 1" Extrusions



Bracket only: NUB18-25



Bracket & Mounting Kit: NMK-NUB18-25



Bracket accepts: NVP00, NVPOX, NVP10 & NVP1X Series pumps and NMB18-25 manifold block.

Part Number		Dimensions								Weight oz (g)
		A- Mtg Holes	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F, J in. (mm)	H, K in. (mm)	L in. (mm)	
NUB18-25	Fits 1/4 T-Slot (Fits 6.5 mm T-Slot)	M3 x 0.5	0.35 (8.90)	0.13 (3.20)	0.41 (10.30)	0.70 (17.80)	0.75 (19.10)	1.00 (25.40)	0.19 (4.70)	0.30 (8.50)

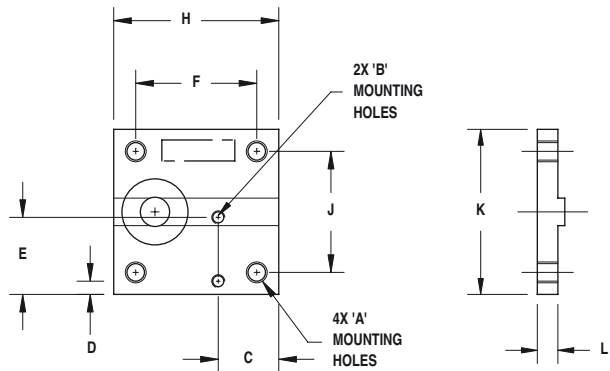
Note 1: Mounting kit includes all hardware to mount pumps and manifold block.
 Note 2: Depending on the pump being mounted, it may be necessary to rotate the bracket 180° from diagram shown.



Bracket only: NUB14-25



Bracket & Mounting Kit: NMK-NUB14-25



Bracket accepts all NVP Series pumps except the NVP00/VPOX Series. Fits All NMB14 Series manifold blocks. (Allows larger pumps to be mounted to 1" extrusions).

Part Number		Dimensions								Weight oz (g)
		A- Mtg Holes	B- Mtg Holes	C in. (mm)	D in. (mm)	E in. (mm)	F, J in. (mm)	H, K in. (mm)	L in. (mm)	
NUB14-25	Fits 1/4 T-Slot (Fits 6.5 mm T-Slot)	10-32	M3 x 0.5	0.55 (14.00)	0.12 (3.00)	0.70 (17.80)	1.10 (27.90)	1.50 (38.10)	0.19 (4.70)	0.70 (19.80)

Note 1: Mounting kit includes all hardware to mount pumps and manifold block.

● How to specify

Bracket only: See Model Numbers: i.e. NUB18-25

Bracket & Mounting Kit: Add "NMK" for mounting kit in front of Model Number i.e. NMKUB18-25

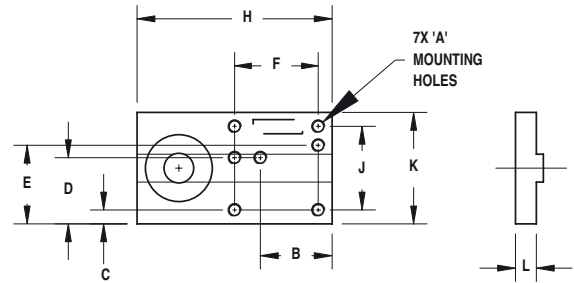
● Universal Brackets (Adjustable) and Mounting Kits for 1" Extrusions



Bracket only: NUBA18-25



Bracket & Mounting Kit: NMK-NUBA18-25



Bracket accepts: NVP00, NVPOX, NVP10 & NVP1X Series pumps and NMB18-25 manifold block.

Part Number		Dimensions									Weight oz (g)
		A- Mtg Holes	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F, J in. (mm)	H in. (mm)	K in. (mm)	L in. (mm)	
NUBA18-25	Fits 1/4 T-Slot (Fits 6.5mm T-Slot)	M3 x 0.5	0.64 (16.40)	0.13 (3.20)	0.60 (15.20)	0.70 (17.8)	0.75 (19.10)	1.75 (44.50)	1.00 (25.40)	0.19 (4.70)	0.50 (14.20)

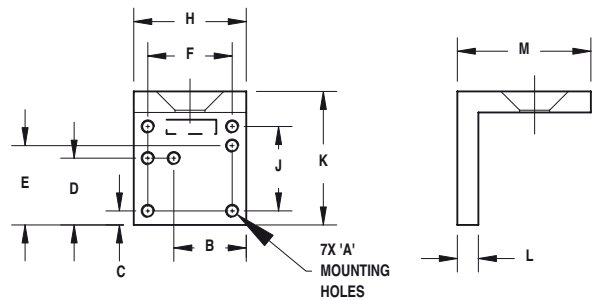
Note 1: Mounting kit includes all hardware to mount pumps and manifold block.



Bracket only: NAB18-25



Bracket & Mounting Kit: NMK-NAB18-25



Bracket accepts: NVP00, NVPOX, NVP10 & NVP1X Series pumps and NMB18-25 manifold block.

Part Number		Dimensions										Weight oz (g)
		A- Mtg Holes	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F, J in. (mm)	H in. (mm)	K in. (mm)	L in. (mm)	M in. (mm)	
NAB18-25	Fits 1/4 T-Slot (Fits 6.5 mm T-Slot)	M3 x 0.5	0.64 (16.40)	0.13 (3.20)	0.60 (15.20)	0.70 (17.80)	0.75 (19.10)	1.00 (25.40)	1.19 (30.20)	0.19	1.19	0.6 oz

Note 1: Mounting kit includes all hardware to mount pumps and manifold block.

● How to specify

Bracket only: See Model Numbers: i.e. NAB18-25

Bracket & Mounting Kit: Add "NMK" for mounting kit in front of Model Number i.e. NMK-NAB18-25

● Universal Brackets and Mounting Kits for 1.5" Extrusions



Bracket only: NUB14-40 (5/16th T-slot)



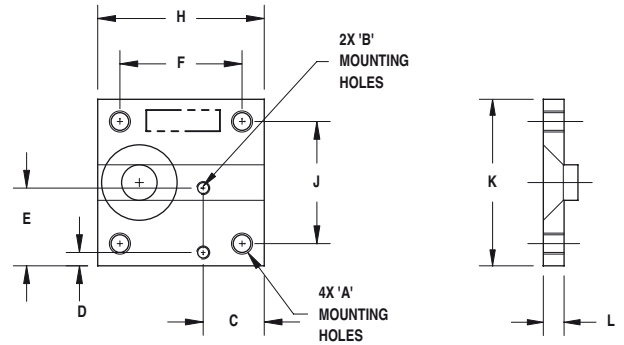
Bracket only: NIUB14-40 (10mm T-slot)



Bracket and Mounting Kit: NMK-NUB14-40 (5/16th T-slot)



Bracket and Mounting Kit: NIMK-NUB14-40 (10mm T-slot)



Accepts all NVP10 Series pumps and above, and NMB14 manifold blocks.

Note 1: Mounting kit includes all hardware to mount pumps and manifold block.

Part Number	A- Mtg Holes	B- Mtg Holes	C in. (mm)	D in. (mm)	E in. (mm)	F, J in. (mm)	H, K in. (mm)	L in. (mm)	Weight oz (g)
NUB14-40 Fits 5/16 T-Slot	10-32	M3 x 0.5	0.55	0.12	0.70	1.10	1.50	0.19	0.70
NIUB14-40 (Fits 10mm T-Slot)			(14.00)	(3.00)	(17.80)	(27.90)	(38.10)	(4.70)	(19.80)

● Universal Brackets (Adjustable) and Mounting Kits for 1.5" Extrusions



Bracket only: NUBA14-40 (5/16th T-slot)



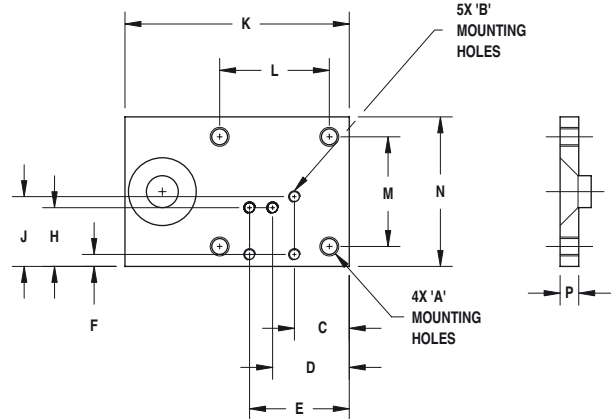
Bracket only: NIUBA14-40 (10mm T-slot)



Bracket and Mounting Kit: NMK-NUBA14-40 (5/16th T-slot)



Bracket and Mounting Kit: NIMK-NUBA14-40 (10mm T-slot)



Accepts all NVP Series pumps and NMB14 Cup Mounts.

Note 1: Mounting kit includes all hardware to mount pumps and manifold block.

Part Number	A- Mtg Holes	B- Mtg Holes	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	H in. (mm)	J in. (mm)	K in. (mm)	L in. (mm)	M in. (mm)	N in. (mm)	P in. (mm)	Weight oz (g)
NUBA14-40 Fits 5/16 T-Slot	10-32	M3 x 0.5	0.55	0.77	1.00	0.12	0.59	0.70	2.25	1.10	1.10	1.50	0.19	1.00
NIUBA14-40 (Fits 10mm T-Slot)			(14.00)	(19.50)	(25.40)	(3.00)	(15.00)	(17.80)	(57.20)	(27.90)	(27.90)	(38.10)	(4.70)	(28.30)

● How to specify

Bracket only: See Model Numbers: i.e. NUB14-40

Bracket & Mounting Kit: Add "NMK" for mounting kit in front of Model Number i.e. NMK-NUB14-40

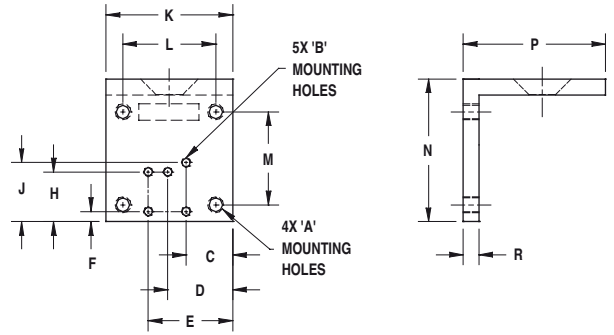
● Angled Brackets and Mounting Kits for 1.5" Extrusions



Bracket only: NAB14-40



Bracket & Mounting Kit: NMK-NAB14-40
Available with optional adjustment knob.
See Bracket Construction Sequence below



Accepts all NVP Series pumps and NMB14 Cup Mounts.

Note 1: Mounting kit includes all hardware to mount pumps and manifold block.

Part Number		Dimensions		C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	H in. (mm)	J in. (mm)	K in. (mm)	L in. (mm)	M in. (mm)	N in. (mm)	P in. (mm)	R in. (mm)	Weight oz (g)
		A- Mtg Holes	B- Mtg Holes													
NAB14-40	Fits 5/16 T-Slot			0.55	0.77	1.00	0.12	0.59	0.70	1.50	1.10	1.50	1.69	1.69	0.19	1.00
NIAB14-40	Fits 10mm T-Slot	10-32	M3 x 0.5	(14.00)	(19.50)	(25.4.0)	(3.00)	(15.00)	(17.80)	(38.10)	(27.90)	(38.10)	(42.80)	(42.80)	(4.70)	(28.30)

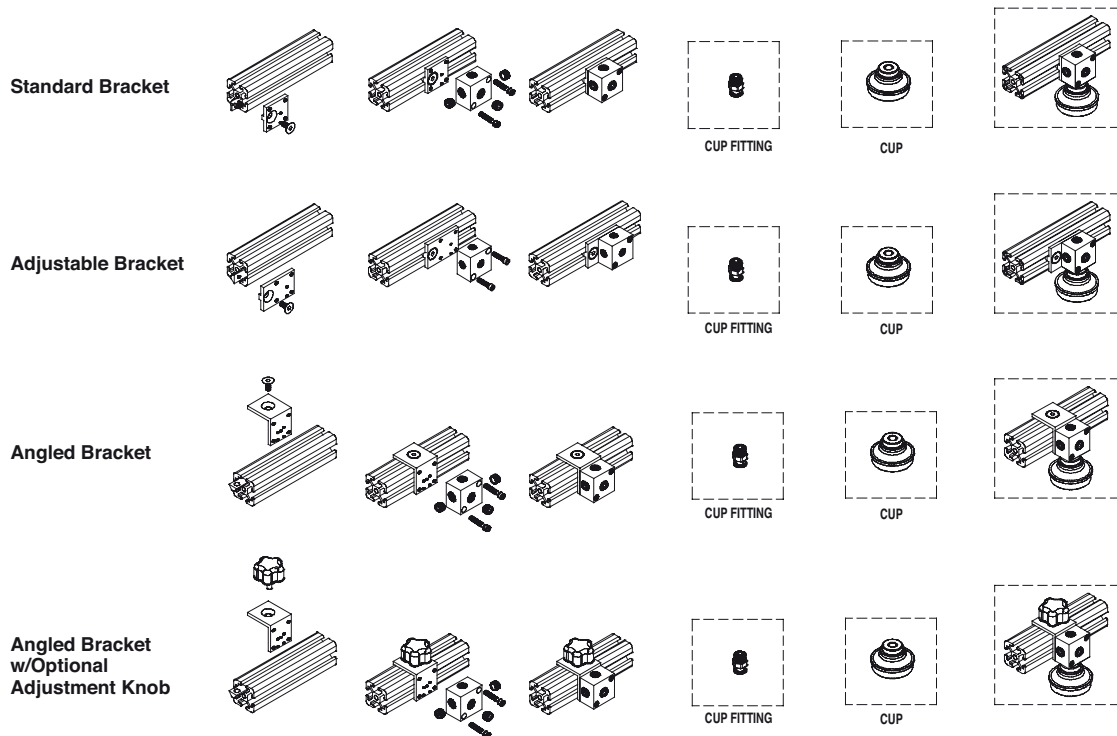
● How to specify

Bracket only: See Model Numbers: i.e. NUB14-40

Bracket & Mounting Kit: Add "NMK" for mounting kit in front of Model Number i.e. NMK-NUB14-40

Bracket & Mounting Kit with Adjustment Knob: NMK-NABK14-40 (angled brackets only)

● Standard, Adjustable & Angled Bracket Construction Sequence:



MANIFOLD BLOCKS

● Vacuum Cup Mount/Manifold Block

Combination Cup Mount and Manifold Block Compatible with 1" (25 mm) and 1.5" (40 mm) extrusions

Ideal applications

- Robotic End Effectors/End-of-Arm Tooling
- Removing products from molds
- Sheet metal transfer
- Palletizing of work pieces
- Nesting fixtures
- Assembly fixtures
- Pick & place

Features and benefits

- Direct mount for cups – maintains consistent height for all cups
- High performance – full vacuum flow out performs competition
- Easy to assemble, modular End-of-Arm Tooling components – minimal design time required
- Flexible design – 5 ports for easy plumbing, allows side entry vacuum, adaptable for all End-of-Arm Tooling configurations
- Square shape – easily mounts to any side of the extrusion, products stay square and flush
- Vacuum lines may be connected in series or home run plumbed to streamline the tooling fixture
- Anodized aluminum – lightweight, extends performance and life of robot, allows higher speeds
- Large thread sizes provides high flow rates for safe handling of porous objects



NMB14-40 Vacuum cup Mount/Manifold Block

Simplify your End-of-Arm tooling devices using our dual purpose NMB Series - Vacuum Cup Mount/Manifold Block. Whether you are mounting vacuum cups to extrusions and/or distributing vacuum to multiple locations, the NMB Series streamlines your design with one multi-functional component.

For design and plumbing flexibility, the NMB Series features five vacuum ports and three mounting options that easily connect vacuum pumps and cups to 5/16" (10 mm) or 1/4" (6.50 mm) T-slot extrusions. Extra vacuum ports allow optional accessories to be directly mounted to the manifold block i.e. vacuum gauges or remotely plumbed such as vacuum switches, sensors or blow-off capabilities.

High vacuum flow is critical for handling porous objects. IMI Norgren offers up to 3/4" NPT ports to ensure high flow paths.

Options:

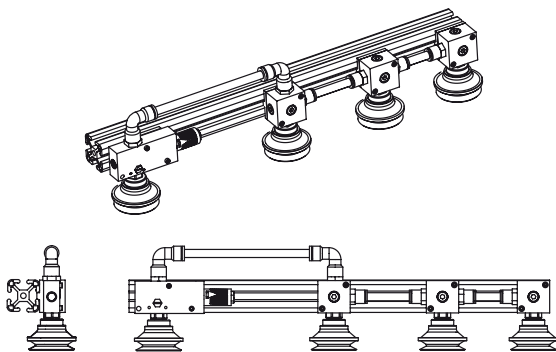
3 Mounting port options: standard, bottom or face mount

9 Models: 1/8 to 3/4 NPT

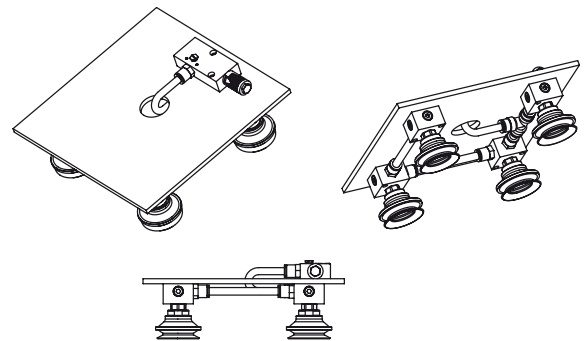
3 Universal brackets: fixed, adjustable or angled



NVP80-200M distributes vacuum to four cup mount/manifold assemblies to pick up corrugated board.

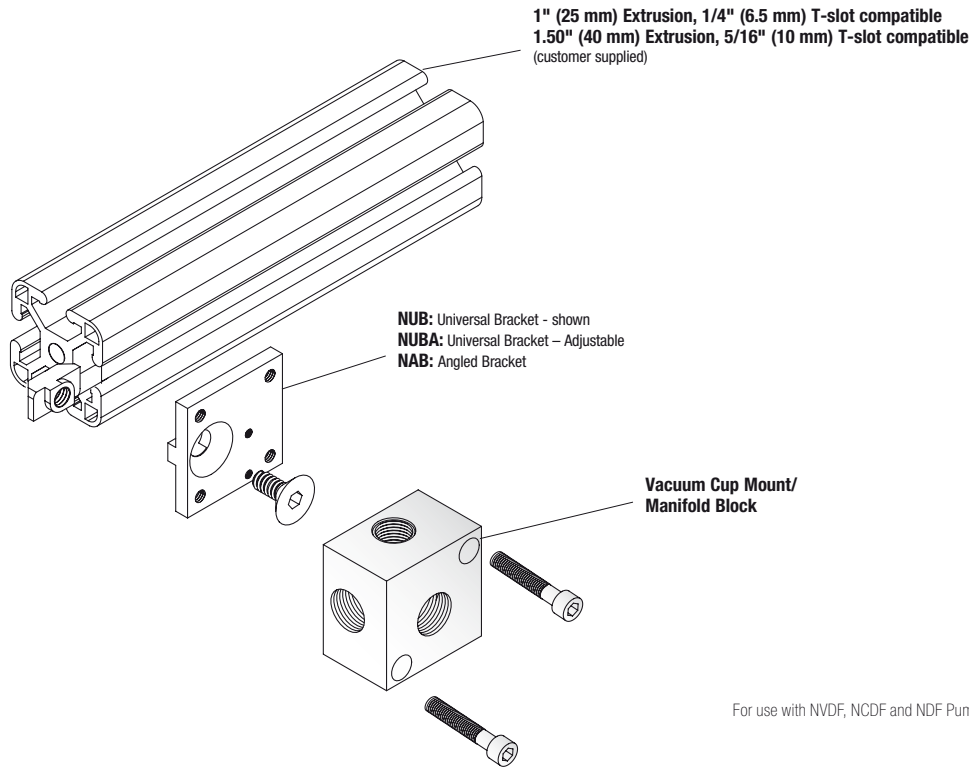


The Vacuum cup mount/manifold easily connects to the T-slot extrusion using a Universal Bracket.



For non T-slot applications, attach the Vacuum cup mount/manifold to the underside of a flat tooling plate head.

● Vacuum Cup Mount/Manifold Configuration & Specifications:



For use with NVDF, NCDF and NDF Pumps

● How to specify

Part Number	Vacuum Cup Mount/Manifold Block
NMB18/NMB18M-25	1/8 NPT [G1/8] – All Female Ports – recommended for 1" (25mm) extrusions
NMB14/NMB14M-40	1/4 NPT [G1/4] – All Female Ports – recommended for 1.5" (40mm) extrusions
NMBB14/NMBB14M-40	1/4 NPT [G1/4] – Bottom Male Port – recommended for 1.5" (40mm) extrusions
NMBB38/NMBB38M-40	3/8 NPT [G3/8] – Bottom Male Port – recommended for 1.5" (40mm) extrusions
NMBB12-40	1/2 NPT [G1/2] – Bottom Male Port – recommended for 1.5" (40mm) extrusions
NMBF14/NMBF14M-40	1/4 NPT [G1/4] – Face Male Port – recommended for 1.5" (40mm) extrusions
NMBF38/NMBF38M-40	3/8 NPT [G3/8] – Face Male Port – recommended for 1.5" (40mm) extrusions
NMBF12/NMBF12M-40	1/2 NPT [G1/2] – Face Male Port – recommended for 1.5" (40mm) extrusions
NMBF34/NMBF34M-40	3/4 NPT [G3/4] – Face Male Port – recommended for 1.5" (40mm) extrusions

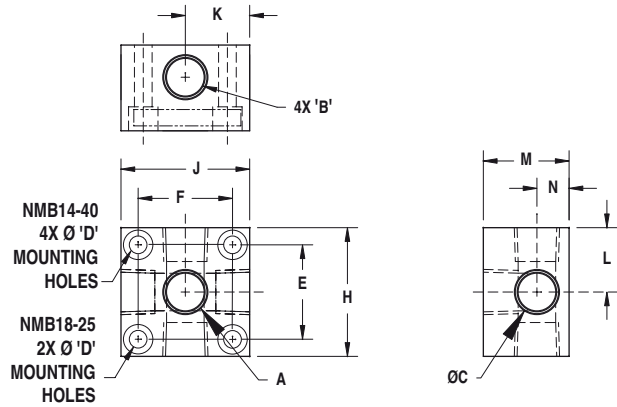
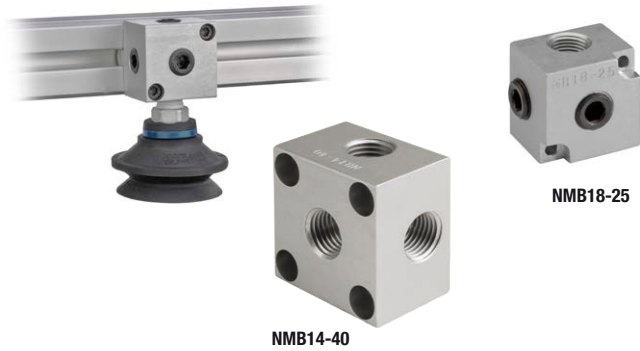
Please note: All vacuum cup mount/manifolds include 3 flush plugs to seal extra ports.

Please order vacuum cup mount/manifolds as separate line items based on part number i.e. NMBB12-40

If you would like parts factory assembled, please specify on order "factory assembled."

To attach Vacuum Cup Mount/Manifold to extrusion, please see Universal Bracket mounting options

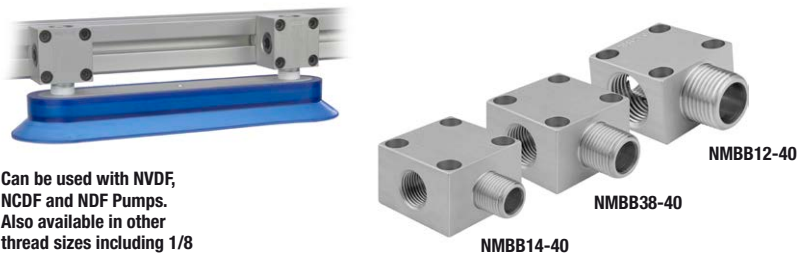
● Vacuum Cup Mount/Manifold – All Female ports: NMB14-40, 18-25



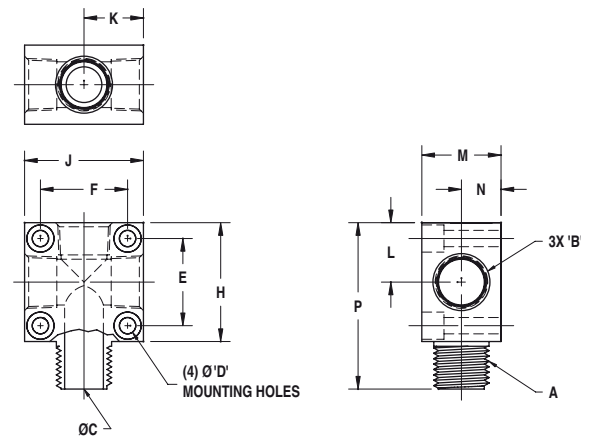
Part Number	Dimensions - Fits 1" (25 mm) Extrusions										Weight oz (g)
	A-Thread	B- Thread	C in. (mm)	D in. (mm)	E, F in. (mm)	H, J in. (mm)	K, L in. (mm)	M in. (mm)	N in. (mm)	P in. (mm)	
NMB18-25	1/8 NPT	1/8 NPT	0.34	0.10	0.75	1.00	0.50	0.75	0.25	N/A	1.20
NMB18M-25	(G 1/8)	(G 1/8)	(8.60)	(3.30)	(19.10)	(25.40)	(12.70)	(19.00)	(6.40)	(N/A)	(34.00)

Part Number	Dimensions - Fits 1.50" (40 mm) Extrusions										Weight oz (g)
	A-Thread	B- Thread	C in. (mm)	D in. (mm)	E, F in. (mm)	H, J in. (mm)	K, L in. (mm)	M in. (mm)	N in. (mm)	P in. (mm)	
NMB14-40	1/4 NPT	1/4 NPT	0.44	0.21	1.10	1.50	0.75	1.00	0.38	N/A	2.60
NMB14M-40	(G 1/4)	(G 1/4)	(11.10)	(5.20)	(27.90)	(38.10)	(19.00)	(25.40)	(9.530)	(N/A)	(73.70)

● Vacuum Cup Mount/Manifold – Bottom Male ports: NMBB(14, 38, 12) -40

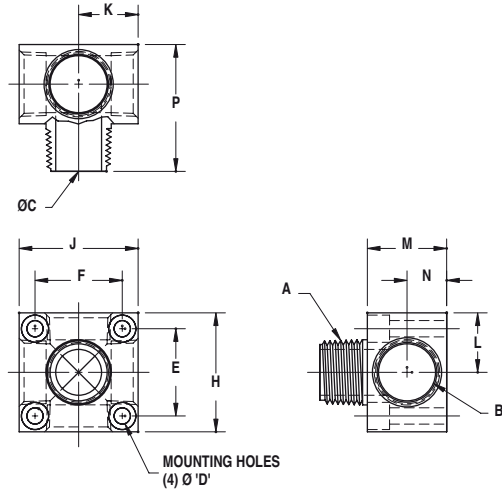
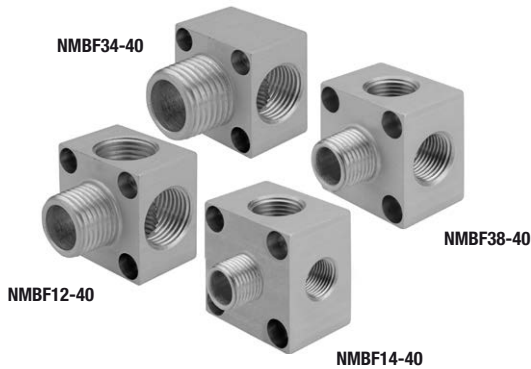


Can be used with NVDF, NCDF and NDF Pumps. Also available in other thread sizes including 1/8 NPT (G 1/8). Consult factory.



Part Number	Dimensions - Fits 1.5" [40mm] Extrusions										Weight oz (g)
	A-Thread	B- Thread	C in. (mm)	D in. (mm)	E, F in. (mm)	H, J in. (mm)	K, L in. (mm)	M in. (mm)	N in. (mm)	P in. (mm)	
NMBB14-40	1/4 NPT	1/4 NPT	0.34							2.00	2.60
NMBB14M-40	(G 1/4)	(G 1/4)	(8.60)							(50.80)	(73.70)
NMBB38-40	3/8 NPT	3/8 NPT	0.45	0.21	1.10	1.50	0.75	1.00	0.50	2.10	2.90
NMBB38M-40	(G 3/8)	(G 3/8)	(11.40)	(5.20)	(27.90)	(38.10)	(19.00)	(25.40)	(12.70)	(53.30)	(82.20)
NMBB12-40	1/2 NPT	1/2 NPT	0.58							2.10	1.90
NMBB12M-40	(G 1/2)	(G 1/2)	(14.70)							(53.30)	(53.90)

● Vacuum Cup Mount/Manifold – Face Male Port: NMBF(14, 38, 12, 34) -40



Can be used with NVDF, NCDF and NDF Pumps. Also available in other thread sizes including 1/8 NPT (G 1/8). Consult factory.

Model #	Dimensions - Fits 1.5" (40 mm) Extrusions										Weight oz (g)
	A-Thread	B- Thread	C in. (mm)	D in. (mm)	E, F in. (mm)	H, J in. (mm)	K, L in. (mm)	M in. (mm)	N in. (mm)	P in. (mm)	
NMBF14-40	1/4 NPT	4 x 1/4 NPT	0.34							1.50	2.60
NMBF14M-40	(G 1/4)	(4 x G 1/4)	(8.60)							(38.10)	(73.70)
NMBF38-40	3/8 NPT	4 x 3/8 NPT	0.45							1.50	2.70
NMBF38M-40	(G 3/8)	(4 x G 3/8)	(11.40)							(38.10)	(76.50)
NMBF12-40	1/2 NPT	4 x 1/2 NPT	0.58	0.21 (5.20)	1.10 (27.90)	1.50 (38.10)	0.75 (19.00)	1.00 (25.40)	0.50 (12.70)	1.60	1.70
NMBF12M-40	(G 1/2)	(4 x G 1/2)	(14.70)							(40.60)	(48.20)
NMBF34-40	3/4 NPT	2 x 3/4 NPT	0.75							1.60	1.80
NMBF34M-40	(G 3/4)	(2 x G 3/4)	(19.10)							(40.60)	(51.00)