



Magnetically Coupled Rodless Cylinders

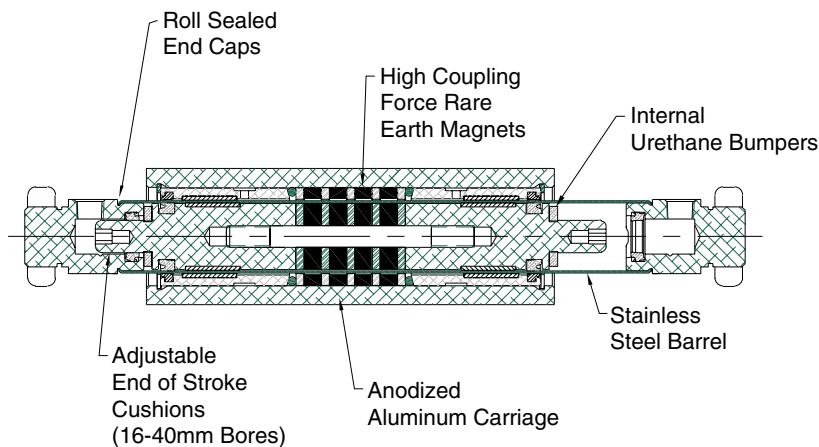
MC1 & MC2 Standard Carriage Series

- 50% Space Savings Over Conventional Cylinders
- Two Magnet Coupling Strength Options
- 6 Bore Sizes
- 304 Stainless Steel Barrel
- Compressed Air or Low Pressure Hydraulic Service
- Rare Earth Magnets for Greater Coupling Forces



MC3, MC4 & MC5 Externally Guided Series

- Higher Load Capacity
- Non-Rotating Linear Travel
- NuMate Interface Capabilities for Multi Axis Motions
- Stroke Adjustment Kits
- Precision Linear Ball Bearings
- Position Sensing Switches



Magnetically Coupled Rodless Cylinders

Specifications

Bore Sizes	12 16 20 25 32 40
Series	Standard and Guided Carriages
Working Pressure:	Up to 7 Bar / 100 PSIG
Ambient Temperature Range:	-20° to +60° C (-4° to +140° F)
Medium:	Filtered Compressed Air With or Without Lubrication and Low Pressure Hydraulic*
Standard Stroke Lengths:	Non-Guided up to 2540 mm (100 inches) Guided up to 1524 mm (60 inches)
Velocity:	Up to 1 Meter / Second (3.28 Feet / Second)

* Consult Factory for Cylinder Rating



MCR Series Magnetically Coupled Rodless Cylinders

How To Order

MC1 12 0024 A 6 D A 2

Series Identifier

- MC1 = Magnetically Coupled Rodless Cylinder Standard Coupling Strength
- MC2 = Magnetically Coupled Rodless Cylinder Lower Coupling Strength
- MC3 = Magnetically Coupled Rodless Cylinder Hardened Steel Shafts
- MC4 = Magnetically Coupled Rodless Cylinder Stainless Steel Shafts**
- MC5 = Magnetically Coupled Rodless Cylinder Single End Supply Hollow Steel Shafts**
**Stainless steel shafts, includes all stainless hardware
***Not available in 12mm bore

Bore Size

- 12 = 12 millimeters c/w 10-32 UNF ports
- 16 = 16 millimeters c/w 10-32 UNF ports
- 20 = 20 millimeters c/w 1/8" NPT ports
- 25 = 25 millimeters c/w 1/8" NPT ports
- 32 = 32 millimeters c/w 1/8" NPT ports
- 40 = 40 millimeters c/w 1/4" NPT ports

Full Inches or Millimeters of Stroke

Note: This section requires four digits
For Example: 24 inches would be entered as 0024 and 1000 millimeters would be entered as 1000

Fractional Inches of Stroke

(if ordering cylinder stroke in millimeters, place the letter 'M' in this box)

- A = 0" F = 5/8"
- B = 1/8" G = 3/4"
- C = 1/4" H = 7/8"
- D = 3/8" M = millimeters
- E = 1/2"

Shock Absorbers & Stroke ADJ. Kit*****

- 1 = Shocks Only
- 2 = No Shocks
- 3 = Right Side Adj. Stroke Kit with Shocks*****
- 4 = Left Side Adj. Stroke Kit with Shocks*****
- 5 = Right & Left Side Adj. Stroke Kits with Shocks
- 6 = Right Side Adj. Stroke Kit, no Shocks
- 7 = Left Side Adj. Stroke Kit, no Shocks
- 8 = Right & Left Side Adj. Stroke Kits, no Shocks
- *****Stroke adder required
- *****Kit includes two shocks

Adapters and Options

- A = No Adapter
- B = NPT Male/BSP Female Port Adapter
- C = "Numate" Adapter Plate
- D = Fittings (B) and "Numate" Adapter Plate
- E = No Cushions (MC1 & MC2)
- G = Male Grease Nipple
- H = Hydraulic
- 5 = Ports in Pos. #5

Sensing Position

- A = Single Position Right
- B = Single Position Left
- C = Both Right & Left
- D = No Sensing
- E = Switch Rail

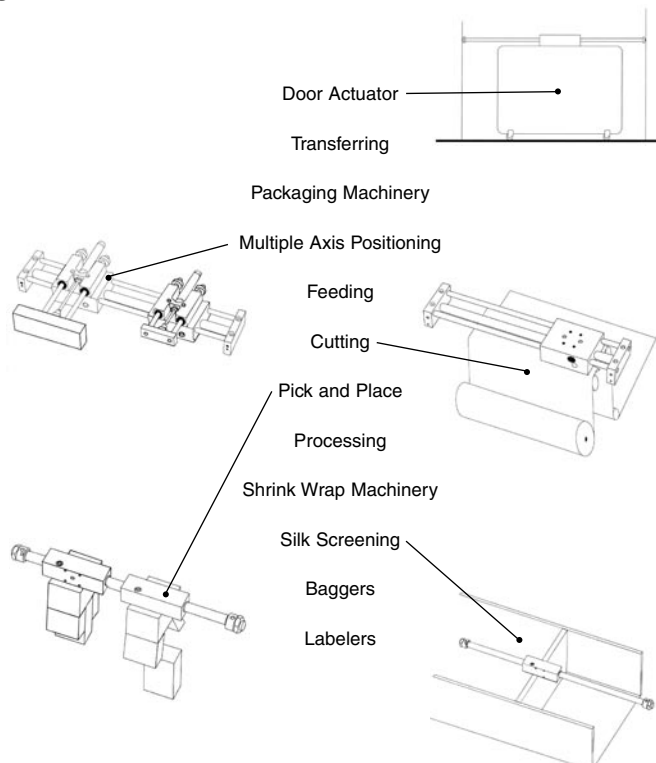
Sensing Type

- Standard Cord
- 1 = Hall Effect PNP (Sourcing) - magnet sensing
- 2 = Hall Effect NPN (Sinking) - magnet sensing
- 3 = Reed Switch - magnet sensing
- 4 = Prox Switch on Cylinder - PNP (Sourcing)****
- 5 = Prox Switch on cylinder - NPN (Sinking)****
- 6 = No Sensing

Quick Disconnect Switch

- Z = Hall Effect PNP (Sourcing) - magnet sensing
- Y = Hall Effect NPN (Sinking) - magnet sensing
- X = Reed Switch - magnet sensing
- W = Prox Switch - PNP (Sourcing)****
- V = Prox Switch - NPN (Sinking)****
- ****Only available on the linear guided units (MC3-MC5).

Typical Applications





MC1 and MC2 Series

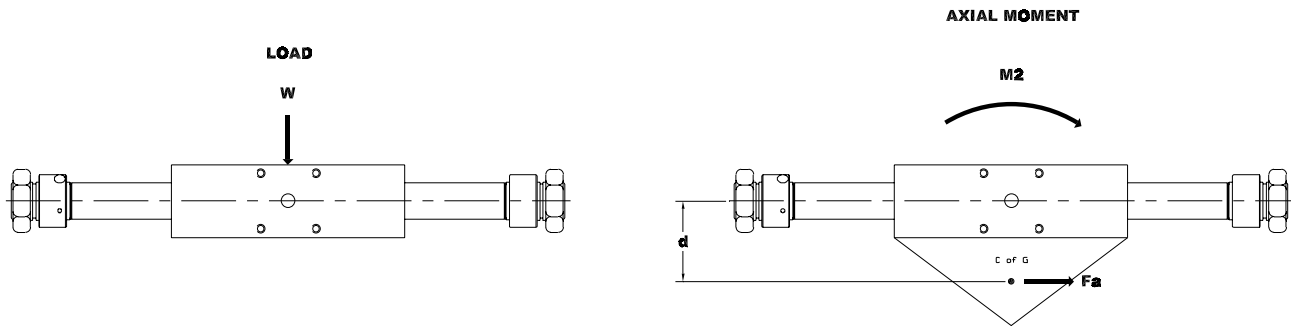
MC1 & MC2 Series

Medium	Compressed air (filtered, lubricated or unlubricated) and hydraulics
Design	Magnetically coupled non-guided cylinder line
Max. operating range	7 bar / 100 psi
Temperature range	-20° to 60° C / -4° to 140° F

Material **Carriage, End cap:** Anodized Aluminum, **Bearings:** Thermoplastic, **Tube:** Stainless Steel, **Seals & O-rings:** Polyurethane & Buna, **Magnets:** Rare Earth, **Fasteners:** Zinc Plated, **Needle Valve:** Brass

Diameter	in	Stroke mm	Port Size*	Effective force at 100 psi/7 bar ibf (N)	Breakaway force of magnetic coupling		Basic weight of zero stroke cylinder		Weight Adder per Unit of Stroke	
					MCI ibf (N)	MC2 ibf (N)	lbs	(kgs)	lbs	(kgs)
12 mm	.39 to .48	10 to 1220	10-32	18 (77.8)	25 (111.2)	18 (80.1)	0.600	(0.272)	0.010	(0.004)
16 mm	.39 to .50	10 to 2500	10-32	31 (138.8)	40 (177.9)	27 (120.1)	1.220	(0.553)	0.014	(0.006)
20 mm	.39 to .50	10 to 2500	1/8 NPT	49 (216.7)	75 (333.6)	44 (195.7)	1.850	(0.839)	0.018	(0.008)
25 mm	.39 to .50	10 to 2500	1/8 NPT	76 (338.6)	110 (485.0)	80 (355.9)	2.790	(1.266)	0.029	(0.013)
32 mm	.39 to .50	10 to 2500	1/8 NPT	125 (554.9)	175 (778.4)	105 (467.1)	4.670	(2.118)	0.034	(0.015)
40 mm	.39 to .50	10 to 2500	1/4 NPT	195 (866.8)	236 (1049.8)	150 (667.2)	8.050	(3.651)	0.045	(0.020)

Dimensions = inches & (in parenthesis) = millimeters • Force = pound force & (in parenthesis) = Newton



Load vs. Stroke - Non guided (MC1 & MC2) Maximum Static Load

DIAMETER	STROKE INCHES (mm)									
	6 (152.4)	12 (304.8)	18 (457.2)	20 (508.0)	32 (812.8)	36 (914.4)	42 (1066.8)	48 (1219.2)	54 (1371.6)	60 (1524.0)
	STATIC LOAD lbs (N)									
12 mm	8 (35.6)	8 (35.6)	8 (35.6)	8 (35.6)	8 (35.6)	7 (29.8)	5 (22.2)	4 (17.8)	-	-
16 mm	12 (53.4)	12 (53.4)	12 (53.4)	12 (53.4)	12 (53.4)	12 (53.4)	11 (48.9)	9 (38.7)	7 (31.0)	6 (25.8)
20 mm	19 (84.5)	19 (84.5)	19 (84.5)	19 (84.5)	19 (84.5)	19 (84.5)	19 (84.5)	16 (71.6)	13 (57.8)	11 (47.6)
25 mm	27 (120.1)	27 (120.1)	27 (120.1)	27 (120.1)	27 (120.1)	27 (120.1)	27 (120.1)	27 (120.1)	27 (120.1)	21 (94.7)
32 mm	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)	37 (164.6)
40 mm	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)

Maximum Dynamic Moment

DIAMETER	STROKE INCHES (mm)								DIAMETER	MAXIMUM AXIAL MOMENT M2 IN-LBS (Nm)
	66 (1676.4)	72 (1828.8)	78 (1981.2)	84 (2133.6)	90 (2286.0)	96 (2438.4)	100 (2540.0)	12 mm		
	STATIC LOAD lbs (N)								16 mm	21 (2.3)
12 mm	-	-	-	-	-	-	-	-	20 mm	34 (3.9)
16 mm	5 (21.4)	4 (18.2)	3.5 (15.6)	3 (13.3)	3 (12.0)	2 (10.7)	2 (9.8)	25 mm	55 (6.2)	
20 mm	9 (40.0)	8 (34.2)	6 (27.1)	6 (25.4)	5 (22.2)	5 (20.0)	4 (18.2)	32 mm	84 (9.5)	
25 mm	18 (80.1)	16 (68.9)	14 (60.0)	12 (52.5)	10 (46.3)	9 (41.4)	9 (38.3)	40 mm	128 (14.4)	
32 mm	37 (164.6)	37 (164.6)	32 (143.7)	28 (124.5)	25 (110.3)	22 (97.9)	20 (90.7)			
40 mm	47 (209.1)	47 (209.1)	47 (209.1)	47 (209.1)	46 (206.0)	41 (183.3)	38 (169.9)			

Axial Moment = M2 = Fa x d

Fa = Applied Force

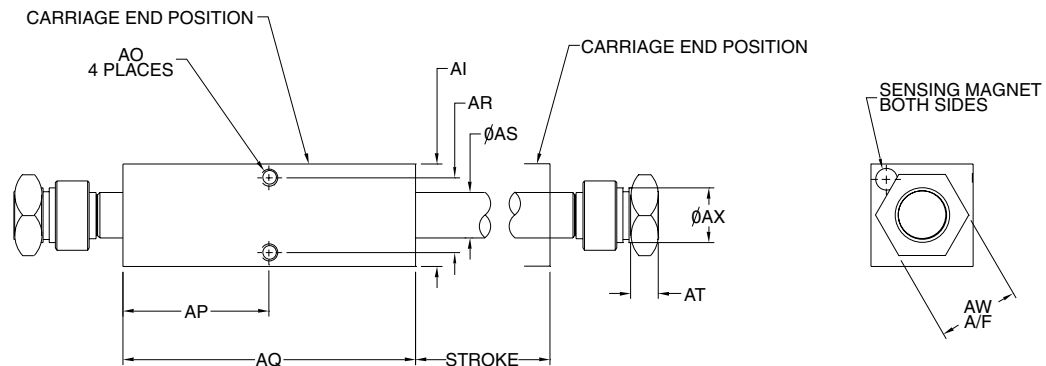
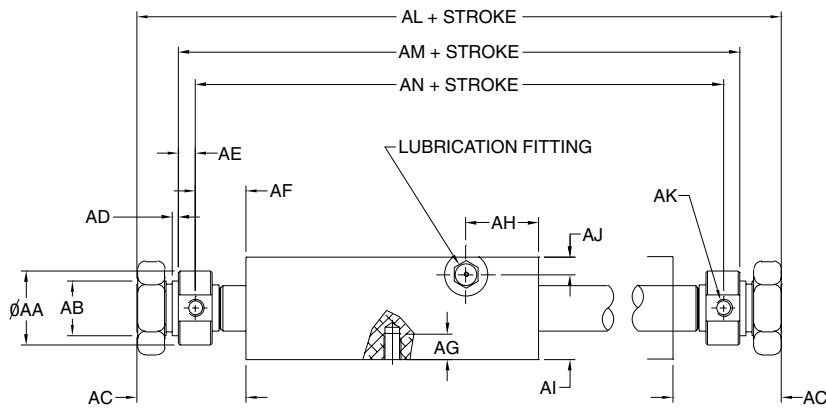
d = Distance from Center of the Bore, of the cylinder, to the Center of Gravity of the Load



MCR Series Magnetically Coupled Rodless Cylinders

NUMATICS®

MC1 and MC2 Series Non-Guided Unit 12mm Bore



Dimensions

dimensions = inches (dimensions in parenthesis = millimeters)

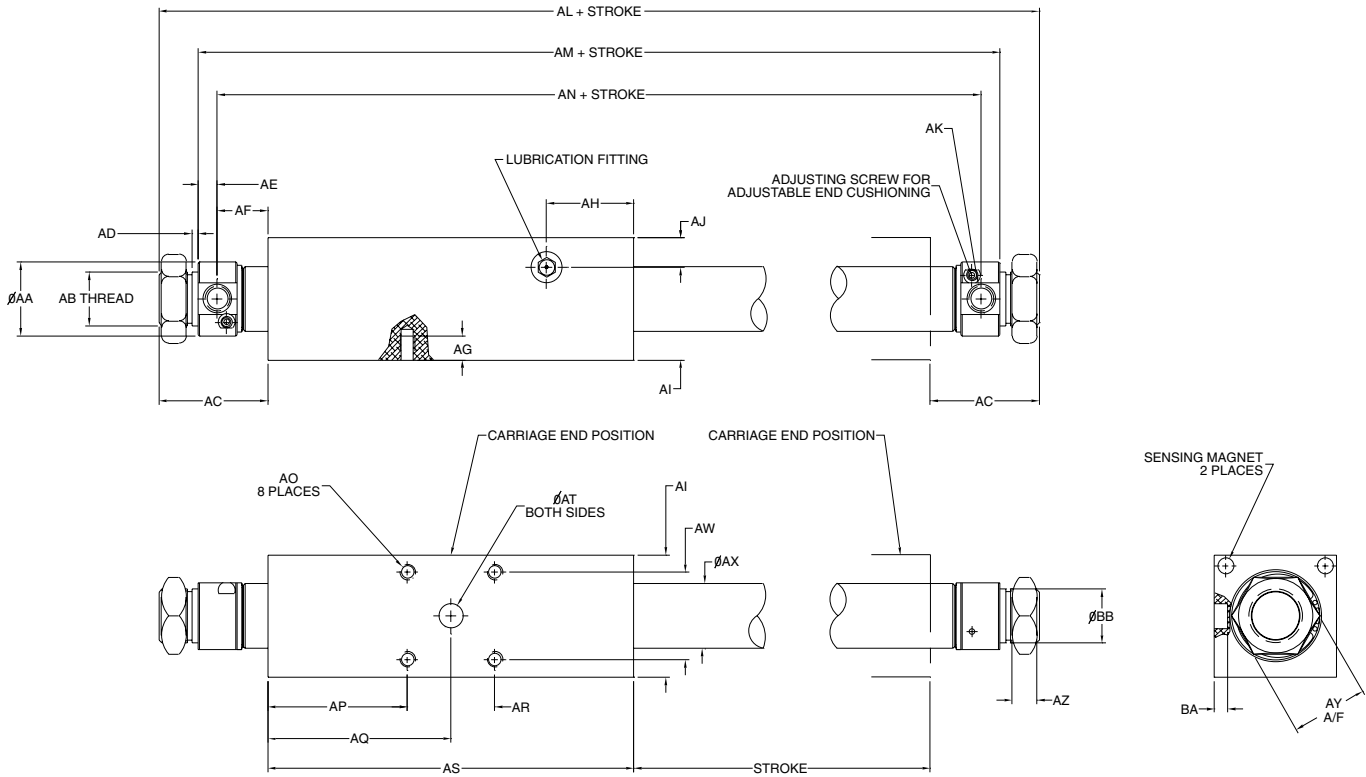
BORE in. (mm)	AA in. (mm)	AB mm	AC in. (mm)	AD in. (mm)	AE in. (mm)	AF in. (mm)	AG in. (mm)	AH in. (mm)
12 mm	0.86 (21.7)	M16 x 1.5	1.26 (31.9)	0.07 (1.8)	0.20 (5.1)	0.58 (14.8)	0.38 (9.5)	0.84 (21.4)

BORE in. (mm)	AI in. (mm)	AJ in. (mm)	AK in.	AL in. (mm)	AM in. (mm)	AN in. (mm)	AO mm	AP in. (mm)
12 mm	1.18 (30.0)	0.21 (5.2)	#10-32 UNF	5.90 (150.0)	4.95 (125.7)	4.55 (115.6)	M5 x .8	1.69 (43.0)

BORE in. (mm)	AQ in. (mm)	AR in. (mm)	AS in. (mm)	AT in. (mm)	AW in. (mm)	AX in. (mm)
12 mm	3.39 (86.0)	0.87 (22.1)	0.52 (13.3)	0.32 (8.0)	0.95 (24.0)	0.63 (16.0)



MC1 and MC2 Series Non-Guided Unit 16mm – 40mm Bore



Dimensions

dimensions = inches (dimensions in parenthesis = millimeters)

DIAMETER	AA	AB	AC	AD	AE	AF	AG	AH	AI
16 mm	0.90 (22.7)	M16 x 1.5	1.49 (37.7)	0.07 (1.8)	0.63 (16.1)	0.38 (9.6)	0.32 (8.0)	1.26 (32.0)	1.41 (36.0)
20 mm	1.30 (33.0)	M22 x 1.5	1.66 (42.0)	0.07 (1.8)	0.31 (7.7)	0.72 (18.2)	0.32 (8.0)	1.34 (34.0)	1.66 (42.0)
25 mm	1.19 (30.2)	M22 x 1.5	1.76 (44.7)	0.10 (2.5)	0.31 (7.7)	0.82 (20.9)	0.39 (10.0)	1.41 (35.8)	1.97 (50.0)
32 mm	1.56 (39.5)	M30 x 1.5	1.97 (50.0)	0.10 (2.5)	0.36 (9.1)	0.96 (24.4)	0.50 (12.7)	1.68 (42.5)	2.34 (59.5)
40 mm	1.80 (45.7)	M38 x 1.5	2.49 (63.2)	0.10 (2.5)	0.48 (12.2)	1.38 (35.0)	0.63 (16.0)	1.97 (50.0)	2.91 (74.0)

DIAMETER	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
16 mm	0.29 (7.4)	#10-32 UNF	7.89 (200.5)	6.94 (176.4)	5.68 (144.2)	M5 x .8	1.95 (49.5)	2.47 (62.5)	1.02 (26.0)
20 mm	0.40 (10.1)	1/8-27 NPTF	8.63 (219.2)	7.36 (187.0)	6.75 (171.4)	M5 x .8	2.03 (51.5)	2.66 (67.5)	1.26 (32.0)
25 mm	0.48 (12.2)	1/8-27 NPTF	9.44 (239.7)	8.17 (207.5)	7.56 (192.0)	M6 x 1.0	2.25 (57.0)	2.96 (75.0)	1.41 (35.8)
32 mm	0.56 (14.2)	1/8-27 NPTF	10.63 (270.0)	9.36 (237.6)	8.61 (218.6)	M6 x 1.0	2.40 (61.0)	3.34 (84.9)	1.89 (47.9)
40 mm	0.97 (24.7)	1/4-18 NPTF	12.85 (326.4)	11.59 (294.4)	10.63 (270.0)	M8 x 1.25	2.95 (75.0)	3.94 (100.0)	1.97 (50.0)

DIAMETER	AS	AT	AW	AX	AY	AZ	BA	BB
16 mm	4.92 (125.0)	0.32 (8.0)	1.02 (26.0)	0.68 (17.3)	0.95 (24.0)	0.32 (8.0)	0.16 (4.0)	0.63 (16.0)
20 mm	5.32 (135.0)	0.32 (8.0)	1.26 (32.0)	0.84 (21.3)	1.24 (31.5)	0.40 (10.2)	0.12 (3.0)	0.87 (22.0)
25 mm	5.91 (150.0)	0.39 (10.0)	1.41 (35.8)	1.04 (26.5)	1.24 (31.5)	0.40 (10.2)	0.22 (5.5)	0.87 (22.0)
32 mm	6.69 (169.8)	0.39 (10.0)	1.89 (47.9)	1.32 (33.6)	1.65 (42.0)	0.32 (8.0)	0.18 (4.4)	1.18 (30.0)
40 mm	7.87 (200.0)	0.47 (12.0)	2.21 (56.0)	1.64 (41.6)	1.97 (50.0)	0.32 (8.0)	0.18 (4.5)	1.50 (38.0)

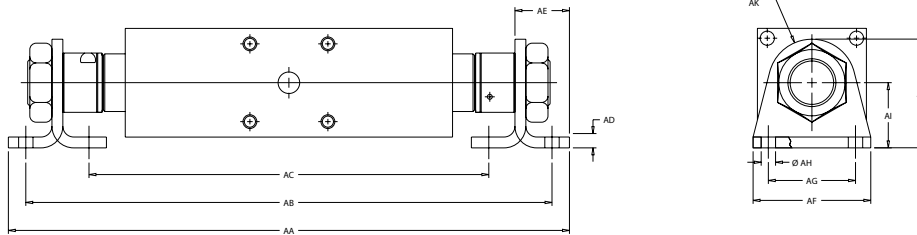


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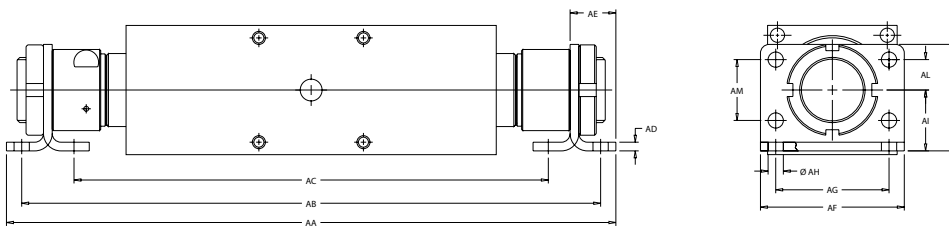
NUMATICS®

MC1 and MC2 Series Mounting Accessories – Foot Mount 16 mm through 40 mm Bore Sizes

MC1 & MC2 - 12 MM THROUGH TO 25 MM BORE FOOT MOUNT



MC1 & MC2 - 32 MM AND 40 MM BORE FOOT MOUNT



Dimensions

dimensions = inches (dimensions in parenthesis = millimeters)

DIAMETER	AA	AB	AC	AD	AE	AF	AG	AH	AI
12 mm	6.52 (165.7)	6.05 (153.7)	4.16 (105.7)	0.16 (3.9)	0.79 (19.9)	1.65 (42.0)	1.26 (32.0)	0.22 (5.5)	0.79 (19.9)
16 mm	8.62 (216.4)	8.05 (204.4)	6.16 (156.4)	0.16 (3.9)	0.79 (19.9)	1.65 (42.0)	1.26 (32.0)	.022 (5.5)	0.79 (19.9)
20 mm	9.33 (236.9)	8.70 (220.9)	6.41 (162.9)	0.20 (5.0)	0.98 (24.9)	2.13 (54.0)	1.58 (40.0)	0.26 (6.6)	0.98 (24.9)
25 mm	10.14 (257.5)	9.51 (241.5)	7.22 (183.5)	0.20 (5.0)	0.98 (24.9)	2.13 (54.0)	1.58 (40.0)	0.26 (6.6)	0.98 (24.9)
32 mm	11.01 (279.6)	10.46 (265.6)	8.57 (217.6)	0.16 (3.9)	0.83 (21.0)	2.60 (65.9)	2.05 (51.9)	0.28 (7.0)	1.10 (27.9)
40 mm	13.95 (354.4)	13.16 (334.4)	10.41 (264.4)	0.20 (5.0)	1.18 (29.9)	3.46 (87.9)	2.36 (59.9)	0.35 (8.9)	13.0 (32.9)

DIAMETER	AJ	AK	AL	AM
12 mm	13.2 (33.4)	0.53 (13.4)	–	–
16 mm	1.32 (33.4)	0.53 (13.4)	–	–
20 mm	1.69 (43.0)	0.71 (18.0)	–	–
25 mm	1.69 (43.0)	0.71 (18.0)	–	–
32 mm	1.93 (48.9)	–	0.55 (13.9)	1.10 (27.9)
40 mm	2.28 (58.0)	–	0.59 (15.0)	1.18 (29.9)

Foot Mounting for MC1 and MC2 Cylinders

DIAMETER	12 & 16	20 & 25	32	40
	155-115	155-116	155-138*	155-139*

*The 32 and 40mm Brackets are a combination Foot and Flange Mount

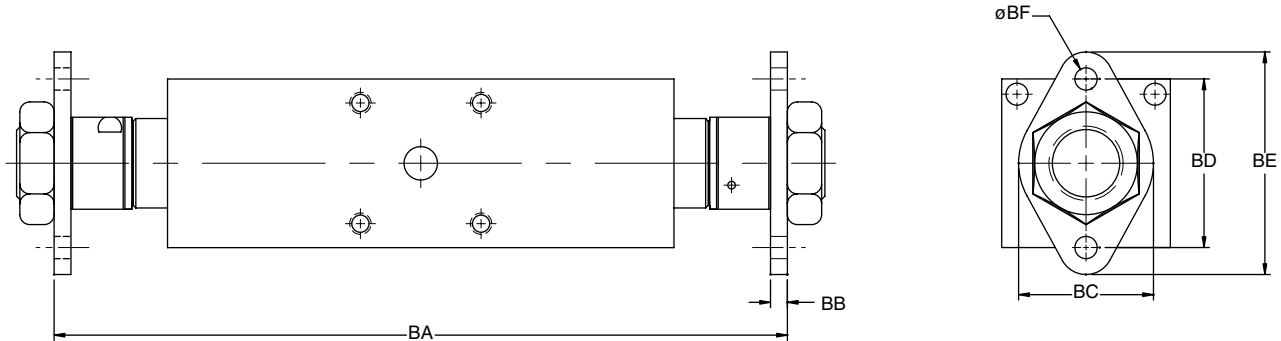
Nuts for Mounting Accessories**

BORE	12 & 16	20 & 25	32	40
	128-343	128-344	128-228	128-229

**End cap nuts are included with the MC1 and MC2 Series



MC1 and MC2 Series Mounting Accessories – Flange Mount



Dimensions

dimensions = inches (dimensions in parenthesis = millimeters)

DIAMETER	BA	BB	BC	BD	BE	BF
12 mm	5.26 (133.7)	0.16 (3.9)	1.18 (29.9)	1.58 (40.0)	2.05 (51.9)	0.22 (5.5)
16 mm	7.26 (184.4)	0.16 (3.9)	1.18 (29.9)	1.58 (40.0)	2.05 (51.9)	0.22 (5.5)
20 mm	7.75 (196.9)	0.20 (5.0)	1.58 (40.0)	1.97 (50.0)	2.60 (65.9)	0.26 (6.6)
25 mm	8.56 (217.5)	0.20 (5.0)	1.58 (40.0)	1.97 (50.0)	2.60 (65.9)	0.26 (6.6)
32 mm	–	–	–	–	–	–
40 mm	–	–	–	–	–	–

Flange Mounting for MC1 and MC2 Cylinders

DIAMETER	12 & 16	20 & 25	32	40
	155-112	155-113	155-138*	155-139*

*Foot and Flange Mounting

Nuts for Mounting Accessories***

DIAMETER	12 & 16	20 & 25	32	40
	128-343	128-344	128-228	128-229

***Nuts are included with the MC1 & MC2 Series

