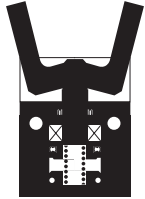
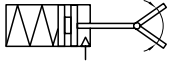


Angular grippers

M/160300/M/11

Single acting Magnetic piston

Ø 8 to 25 mm



- Smooth, accurate movement
- Long uninterrupted service life
- Low weight
- Compact size
- Integral magnets for positional feedback

Technical data

Medium:

Compressed air, filtered/lubricated or non-lubricated

Operation:

Single acting, angular, magnetic piston

Operating pressure:

29 to 101.5 psig (2 to 7 bar)

Ø 8 mm - 52.2 to 101.5 psig (3.6 to 7 bar)

Ø 10 mm - 43.5 to 101.5 psig (3 to 7 bar)

Operating temperature:

+32°F to +140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on three faces

Mechanical life:

~ 5 million cycles before maintenance may be necessary

Operating frequency:

180 cycles per minute maximum

Materials

Body: aluminum alloy

Fingers: carbon steel

Elastomers: nitrile

Barb fittings connections

M3 x 1/8" tube ID, straight barb, part number 29217X303

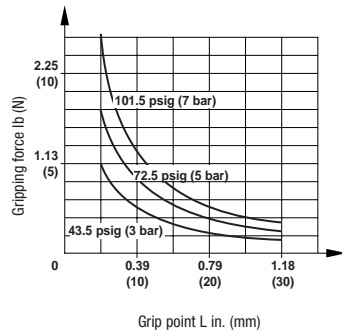
M5 x 1/8" tube ID, straight barb, part number 29217X305

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**	
	Opening	Closing		
M/160305/M/11	0.135 (0.6)	0.225(1)	0.0036	(0.06)
M/160306/M/11	0.225 (1)	0.315(1.4)	0.006	(0.1)
M/160307/M/11	0.63 (2.8)	2.25(10)	0.039	(0.65)
M/160308/M/11	1.35 (6)	4.05(18)	0.078	(1.3)
M/160309/M/11	2.25 (10)	8.55(38)	0.144	(2.4)

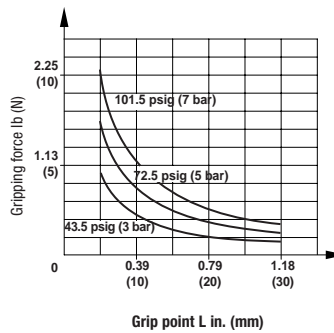
**per cycle

Theoretical closing gripping forces

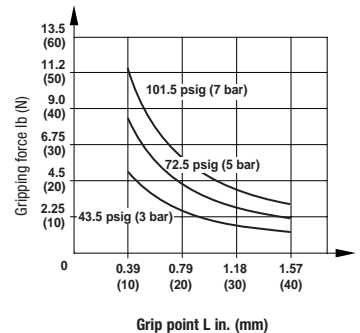
M/160305/M/11



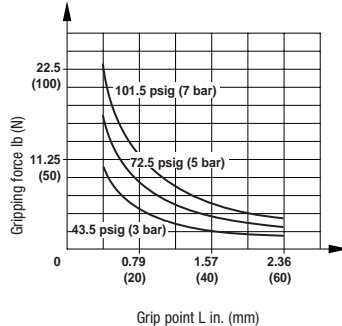
M/160306/M/11



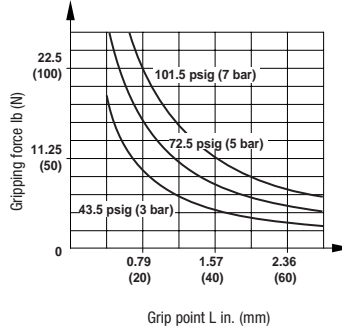
M/160307/M/11



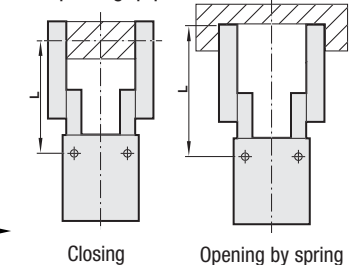
M/160308/M/11



M/160309/M/11



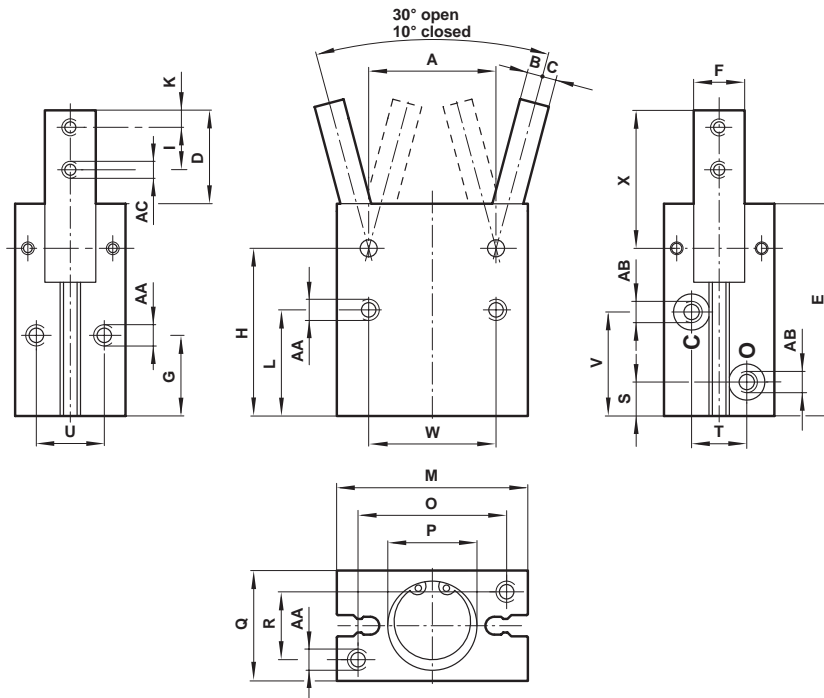
Workpiece grip point



Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/60210/M

Single acting, angular gripper
Magnetic piston, Ø 12 & 20 mm



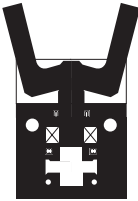
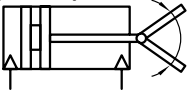
Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160305/M/11	8	12	1.5	2.0	12.5	29	5.5 -0.03	13	24	5.5	2.5
M/160306/M/11	10	14	1.5	2.5	14.5	36	7 -0.03	16	30	6	3
M/160307/M/11	16	24	3	3	17.5	42.5	9 -0.03	18	35	8	3
M/160308/M/11	20	30	3.5	3.5	22	50	12 -0.03	19	39.5	10	4
M/160309/M/11	25	36	4	5	26	58	14 -0.03	21.5	45.5	12	5
Model	Ø	L	M	O	P	Q	R	S	T	U	V
M/160305/M/11	8	18.5	20	15	Ø 9 +0.05 deep 1	13	9	4.5	-	-	14.5
M/160306/M/11	10	20	23	17	Ø 11 +0.05 deep 1.5	16	10	7.5	10	10	19
M/160307/M/11	16	22.5	34	26	Ø 17 +0.05 deep 1.5	22	14	7.5	12	14	22
M/160308/M/11	20	25	45	35	Ø 21 +0.05 deep 1.5	26	16	8	13	16	24.5
M/160309/M/11	25	28.5	52	40	Ø 26 +0.05 deep 1.5	32	20	9	18	20	28
Model	Ø	W	X	AA	AB	AC	kg				
M/160305/M/11	8	15	17.5	M2.5 x 0.45 deep 4.5 (base); M3 x 0.5 deep 3.5 (side); Ø 3.2 (front)	M3 x 0.5	M2.5 x 0.45	0.02				
M/160306/M/11	10	18	20.5	M3 x 0.5 deep 5	M3 x 0.5	M3 x 0.5	0.04				
M/160307/M/11	16	24	25	M4 x 0.7 deep 7	M5 x 0.8	M3 x 0.5	0.10				
M/160308/M/11	20	30	32.5	M5 x 0.8 deep 8	M5 x 0.8	M4 x 0.7	0.18				
M/160309/M/11	25	36	38.5	M6 x 1 deep 10	M5 x 0.8	M5 x 0.8	0.31				

Dimensions in mm

M/160300/M/12

Angular grippers Double acting

Magnetic piston Ø 8 ... 25 mm



- Smooth, accurate movement
- Long uninterrupted service life
- Low weight
- Compact size
- Integral magnets for positional feedback

Technical data

Medium:
Compressed air filtered.,
lubricated or non-lubricated

Operation:

Double acting, angular, magnetic piston

Operating pressure:
14.5 to 101.5 psig (1 to 7 bar)
Ø 8 mm - 31.9 to 101.5 psig (2.2 to 7 bar)

Operating temperature:
32°F to 140°F (0°C to 60°C)
* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on three faces

Mechanical life:
~ 5 million cycles before maintenance may be necessary

Operating frequency:
180 cycles per minute maximum

Materials

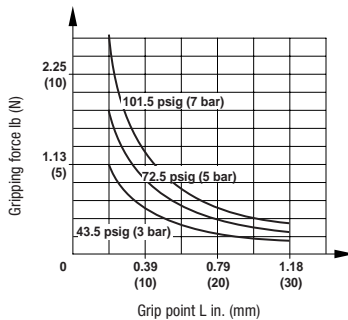
Body: aluminum alloy
Fingers: carbon steel
Elastomers: nitrile

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160305/M/12	0.59 (2.6)	0.36 (1.6)	0.01 (0.15)
M/160306/M/12	0.86 (3.8)	0.56 (2.5)	0.02 (0.3)
M/160307/M/12	3.83 (17)	2.88 (12.8)	0.09 (1.5)
M/160308/M/12	7.20 (32)	5.40 (24)	0.18 (3)
M/160309/M/12	13.95 (62)	10.80 (48)	0.33 (5.5)

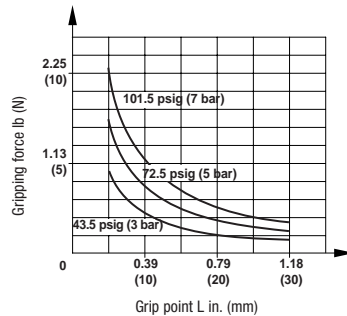
**per cycle

Theoretical closing gripping forces

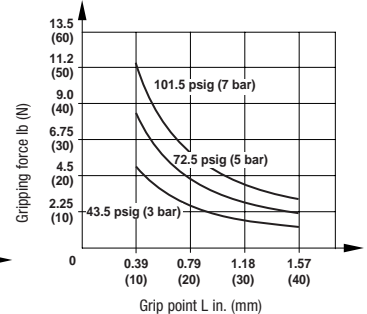
M/160305/M/12



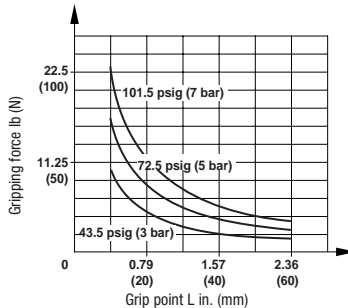
M/160306/M/12



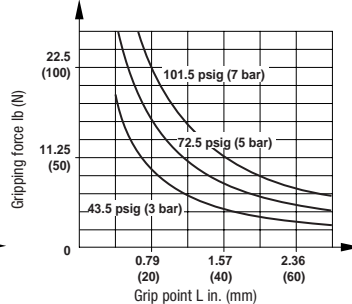
M/160307/M/12



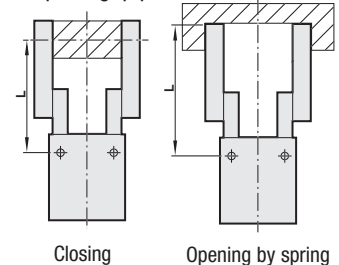
M/160308/M/12



M/160309/M/12



Workpiece grip point

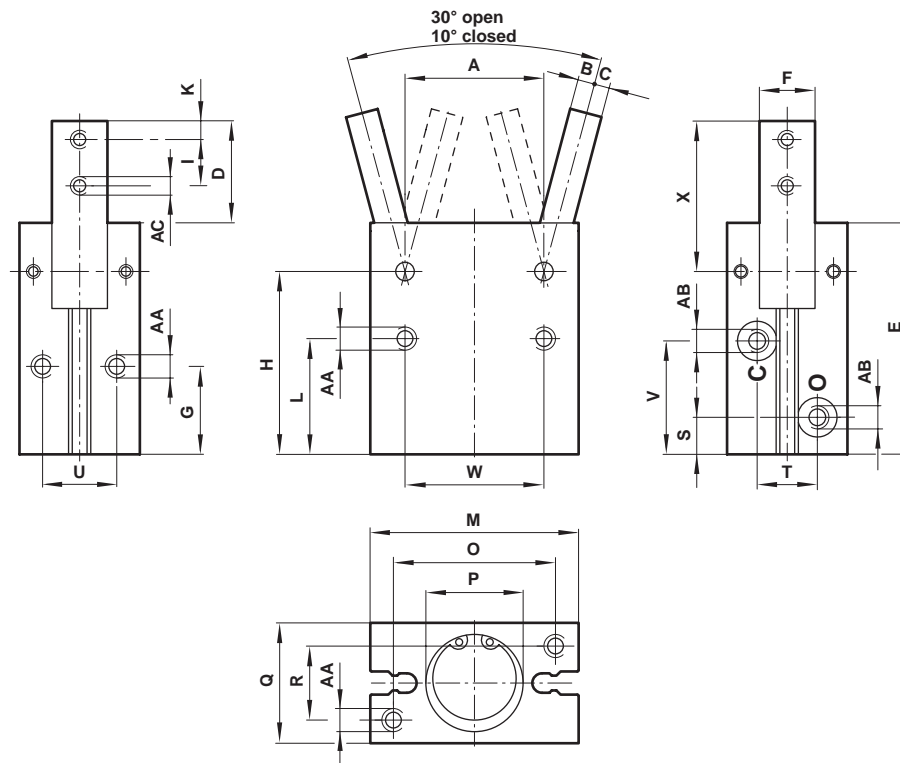


Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160300/M/12

Angular grippers Double acting

Magnetic piston Ø 8 ... 25 mm



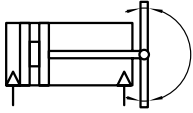
Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160305/M/12	8	12	1.5	2.0	12.5	29	5.5 -0.03	13	24	5.5	2.5
M/160306/M/12	10	14	1.5	2.5	14.5	36	7 -0.03	16	30	6	3
M/160307/M/12	16	24	3	3	17.5	42.5	9 -0.03	18	35	8	3
M/160308/M/12	20	30	3.5	3.5	22	50	12 -0.03	19	39.5	10	4
M/160309/M/12	25	36	4	5	26	58	14 -0.03	21.5	45.5	12	5
Model	Ø	L	M	O	P	Q	R	S	T	U	V
M/160305/M/12	8	18.5	20	15	Ø 9 +0.05 deep 1	13	9	4.5	-	-	14.5
M/160306/M/12	10	20	23	17	Ø 11 +0.05 deep 1.5	16	10	7.5	10	10	19
M/160307/M/12	16	22.5	34	26	Ø 17 +0.05 deep 1.5	22	14	7.5	12	14	22
M/160308/M/12	20	25	45	35	Ø 21 +0.05 deep 1.5	26	16	8	13	16	24.5
M/160309/M/12	25	28.5	52	40	Ø 26 +0.05 deep 1.5	32	20	9	18	20	28
Model	Ø	W	X	AA	AB	AC	kg				
M/160305/M/12	8	15	17.5	M2.5 x 0.45 deep 4.5 (base); M3 x 0.5 deep 3.5 (side); Ø3.2 (front)	M3 x 0.5	M2.5 x 0.45	0.02				
M/160306/M/12	10	18	20.5	M3 x 0.5 deep 5	M3 x 0.5	M3 x 0.5	0.04				
M/160307/M/12	16	24	25	M4 x 0.7 deep 7	M5 x 0.8	M3 x 0.5	0.10				
M/160308/M/12	20	30	32.5	M5 x 0.8 deep 8	M5 x 0.8	M4 x 0.7	0.18				
M/160309/M/12	25	36	38.5	M6 x 1 deep 10	M5 x 0.8	M5 x 0.8	0.31				

Dimensions in mm

M/160330/M/12

180° Angular grippers, Double acting

Magnetic piston, Ø 16 ... 20 mm



- Smooth, accurate movement
- Long, uninterrupted service life
- Low weight
- Compact size
- Integral magnets for positional feedback

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operating pressure:
29 to 101.5 psig (2 to 7 bar)

Operating temperature:
32°F to 140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on three surfaces

Mechanical life:

~ 3 million cycles before maintenance may be necessary

Operating frequency:

100 cycles per minute maximum

Materials

Body: aluminum alloy

Fingers: carbon steel

Slide plate: carbon steel

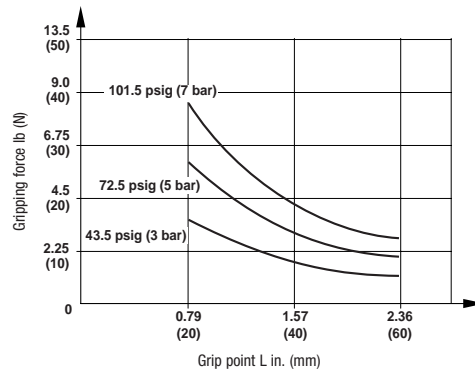
Elastomers: nitrile

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160335/M/12	14.4/L (64/L)	12.38/L (55/L)	0.21(3.5)
M/160336/M/12	30.15/L (134/L)	25.43/L (113/L)	0.48(8.0)

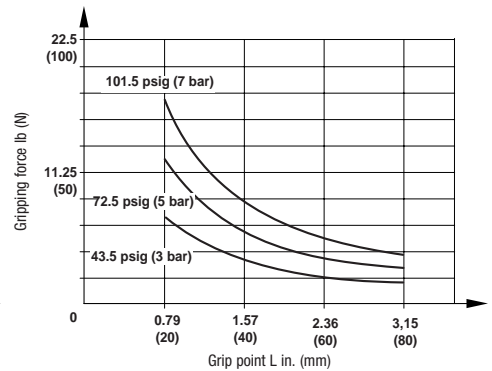
**per cycle

Theoretical closing gripping forces

M/160335/M/12

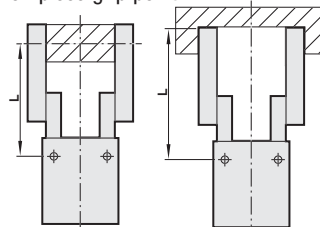


M/160336/M/12



Effective closing gripping forces = Theoretical closing gripping force x 0.85

Workpiece grip point



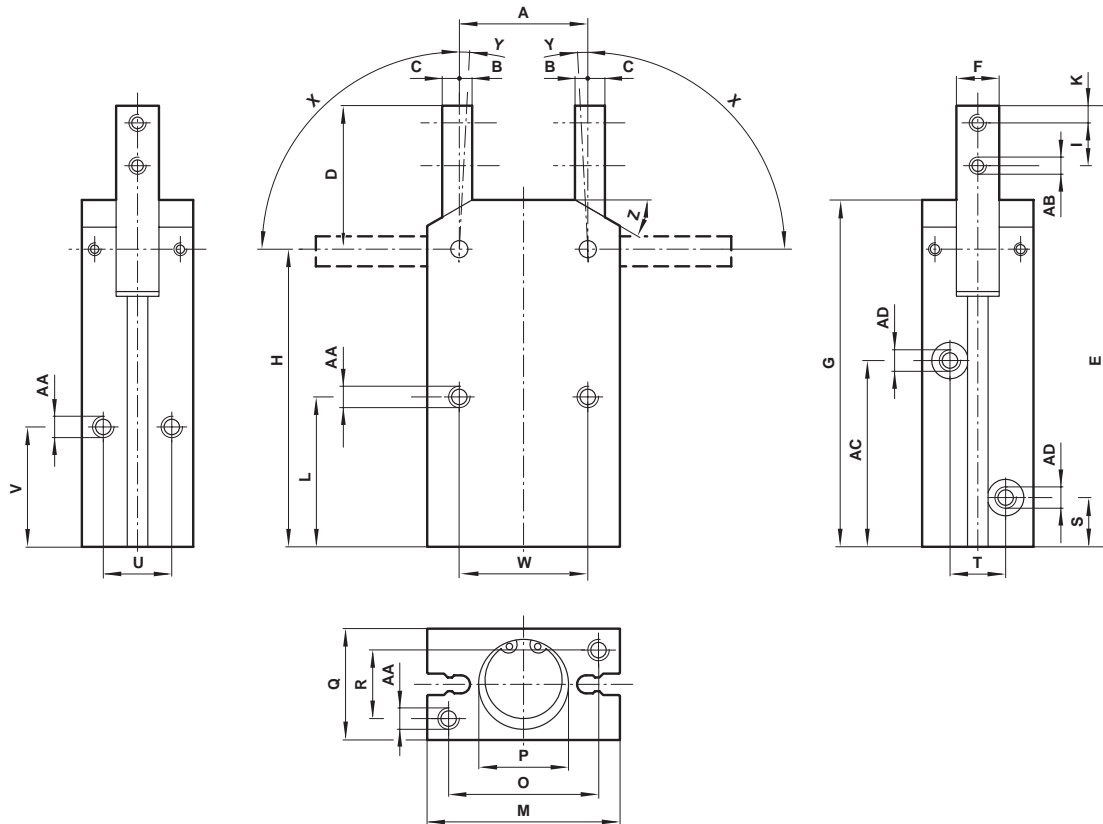
Closing

Opening by spring

M/160330/M/12

180° Angular grippers, Double acting

Magnetic piston, Ø 16 ... 20 mm



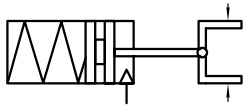
Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160335/M/12	16	24	3	25	28.5	87.5	8 - 0.03	69	59	8	4
M/160336/M/12	20	30	4	3	335	103	10 - 0.03	81	69.5	10	4
Model	Ø	L	M	O	P	Q	R	S	T	U	V
M/160335/M/12	16	30	34	26	Ø 17 + 0.05 deep 1.5	22	14	10.5	12	14	25
M/160336/M/12	20	35	45	35	Ø 21 + 0.05 deep 1.5	26	16	11.5	13	16	28
Model	Ø	W	X	Y	Z	AA	AB	AC	AD	kg	
M/160335/M/12	16	24	90°	3°	30°	M4 x 0.7 deep 7	M3 x 0.5	37.5	M5 x 0.8	0.15	
M/160336/M/12	20	30	90°	3°	30°	M5 x 0.8 deep 8	M4 x 0.7	43.5	M5 x 0.8	0.28	

Dimensions in mm

M/160340/M/11

Parallel grippers., Single acting

Magnetic piston., Ø 10 ... 25 mm



- Ideal for general purpose gripping applications
- Smooth, accurate movement
- Long, uninterrupted service life
- Low weight
- Compact size
- Integral magnets for positional feedback

Technical data

Medium:

Compressed air, filtered., lubricated or non-lubricated

Operation:

Single acting, parallel, magnetic piston

Operating pressure:

36.25 to 101.5 psig (2.5 to 7 bar)
 Ø 10 mm – 50.75 to 101.5 psig (3.5 to 7 bar)

Operating temperature:

32°F to 140°F (0°C to 60°C)
 * Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on three faces

Gripping repeatability:

+/- 0.0004 inches (+/- 0.01 mm)

Mechanical life:

~ 5 million cycles before maintenance may be necessary

Operating frequency:

200 cycles per minute maximum

Materials

Body: aluminum alloy

Top plate: carbon steel

Fingers: carbon steel

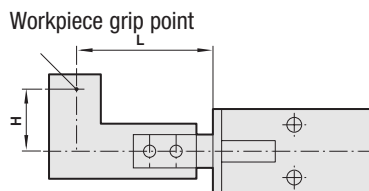
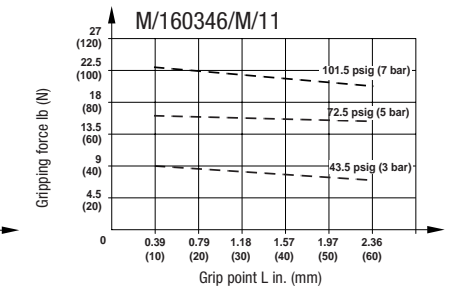
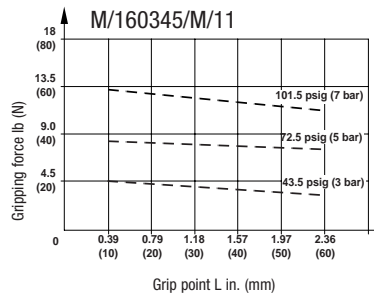
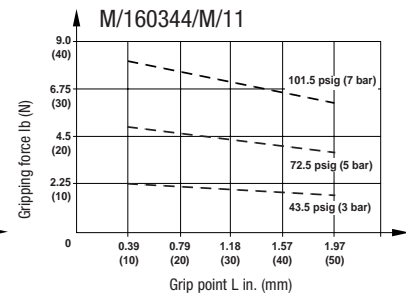
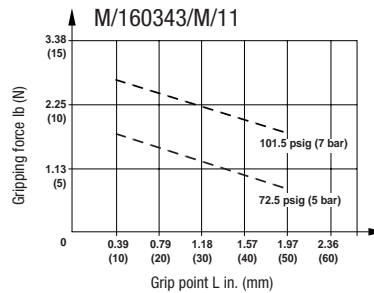
External screws: carbon steel

Elastomers: nitrile

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160343/M/11	0.45 (2)	1.10 (4.9)	0.10 (0.1)
M/160344/M/11	0.88 (3.9)	4.73 (21)	0.65 (0.65)
M/160345/M/11	1.55 (6.9)	8.19 (36.4)	1.40 (1.4)
M/160346/M/11	3.08 (13.7)	12.15 (54)	2.80 (2.8)

**per cycle

Theoretical closing gripping forces



Effective closing gripping forces = Theoretical closing gripping force x 0.85

Criteria of workpiece weight

When chucking a workpiece, weight should be within the range between 1/10 and 1/20 of the above gripping force.

When chucking and then moving a workpiece., the workpiece may protrude or drop. Therefore workpiece weight should be less than the above mentioned value.

(Reference value is 1/30-1/50)

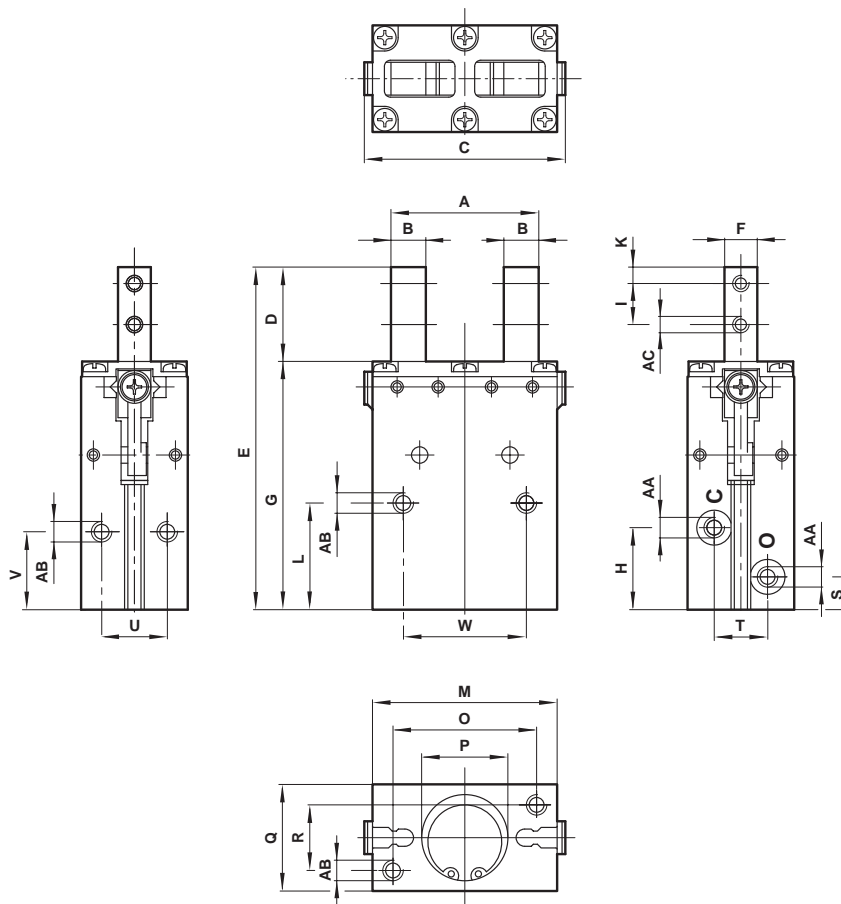
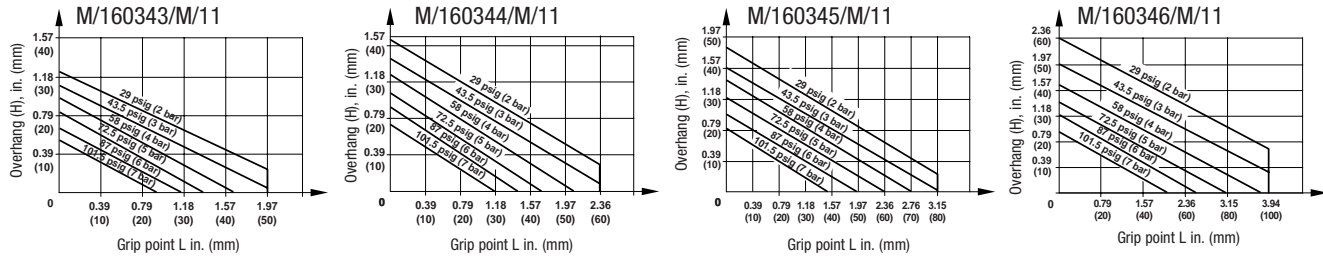
Weight depends on the operational condition, such as material and shape of workpiece or claw, speed and direction of moving workpiece (straight advance, rotation or swing, etc.)

M/160340/M/11

Parallel grippers, Single acting

Magnetic piston, Ø 10 ... 25 mm

Grip point limitation range



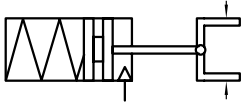
Model	Ø	A	B	C	D	E	F	G	H	I	K					
M/160343/M/11	10	17 + 1.6/-0.2 (open) 13 ± 0.4 (closed)	4.5	25 max.	16.5	59.5	5.5 - 0.03	43	15	6	3					
M/160344/M/11	16	26 + 2.3 (open) 18 + 0.6/-0.2 (closed)	6.5	37.5 max	19	71	7 - 0.03	52	17.5	8	3					
M/160345/M/11	20	36 + 1.5/-0.9 (open) 24 + 0.1/-0.9 (closed)	8.5	49 max	23	83.5	8 - 0.04	60.5	20	10	4					
M/160346/M/11	25	42 + 1.0/-0.7 (open) 28 ± 0.4 (closed)	10	57.5 max	27	95	10 - 0.03	68	23	12	5					
Model	Ø	L	M	O	P	Q	R	S	T	U	V	W	AA	AB	AC	kg
M/160343/M/11	10	20	23	17	Ø 11 + 0.05 deep 1.5	16	10	7.5	10	10	16	18	M3 x 0.5	M3 x 0.5 deep 5	M3 x 0.5	0.05
M/160344/M/11	16	23	34	26	Ø 17 + 0.05 deep 1.5	22	14	7.5	12	14	18	24	M5 x 0.8	M4 x 0.7 deep 7	M3 x 0.5	0.12
M/160345/M/11	20	26	45	35	Ø 21 + 0.05 deep 1.5	26	16	8	13	16	19	30	M5 x 0.8	M5 x 0.8 deep 8	M4 x 0.7	0.22
M/160346/M/11	25	30	52	40	Ø 26 + 0.05 deep 1.5	32	20	9	18	20	22	36	M5 x 0.8	M6 x 1.0 deep 10	M5 x 0.8	0.37

Dimensions in mm

M/160340/M/12

Parallel grippers., Double acting

Magnetic piston, Ø 10 ... 25 mm



- Ideal for general purpose gripping applications
- Smooth, accurate movement
- Long, uninterrupted service life
- Low weight
- Compact size
- Integral magnets for positional feedback

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Double acting, parallel, magnetic piston

Operating pressure:

- 14.5 to 101.5 psig (1 to 7 bar)
- Ø 10 mm - 26.1 to 101.5 psig (1.8 to 7 bar)
- Ø 16 mm - 17.4 to 101.5 psig (1.2 to 7 bar)

Operating temperature: 32°F to 140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on three faces

Gripping repeatability:

+/- 0.0004 inches (+/- 0.01 mm)

Mechanical life:

~ 5 million cycles before maintenance may be necessary

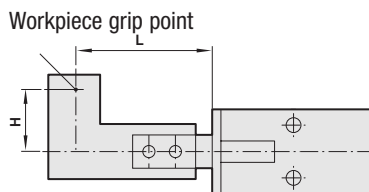
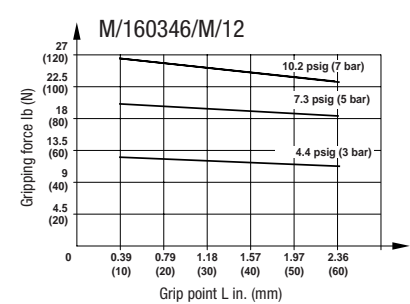
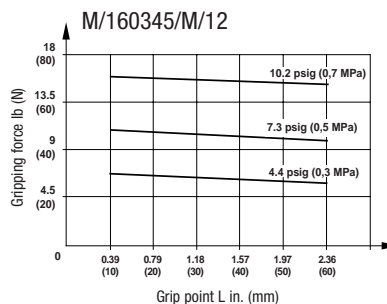
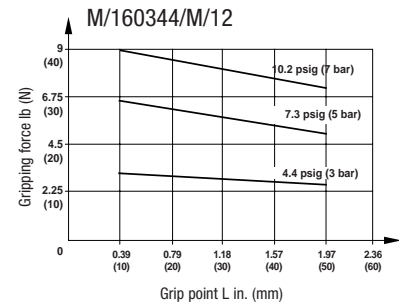
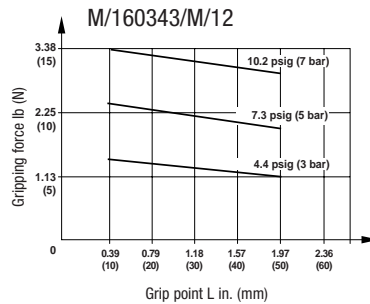
Materials

- Body: aluminum alloy
- Top plate: carbon steel
- Fingers: carbon steel
- External screws: carbon steel
- Elastomers: nitrile

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160343/M/12	3.29 (14.6)	2.12 (9.4)	0.02 (0.3)
M/160344/M/12	7.65 (34)	5.74 (25.5)	0.09 (1.5)
M/160345/M/12	13.70 (60.9)	10.28 (45.7)	0.20 (3.3)
M/160346/M/12	19.58 (87)	15.08 (67)	0.38 (6.4)

**per cycle

Theoretical closing gripping forces



Effective closing gripping forces = Theoretical closing gripping force x 0.85

Criteria of workpiece weight

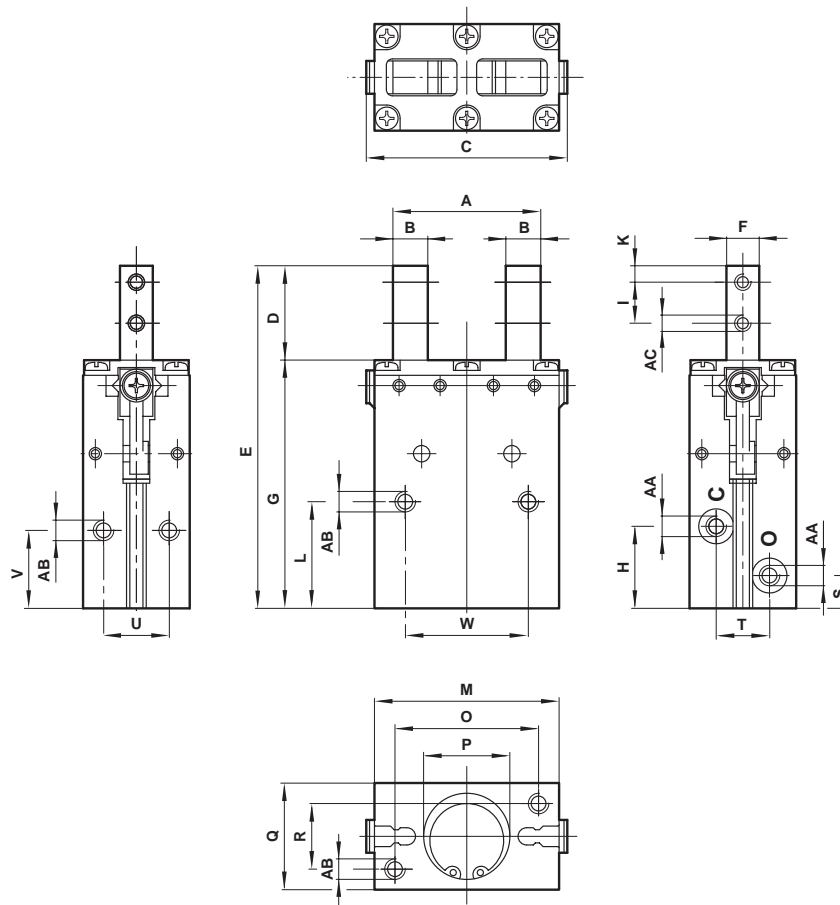
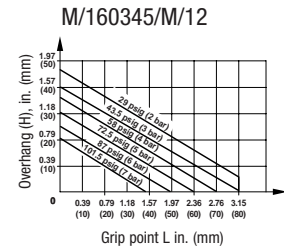
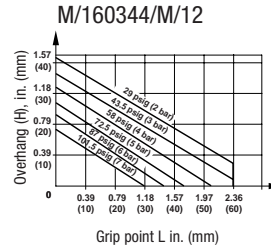
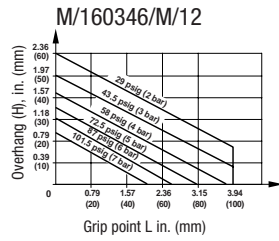
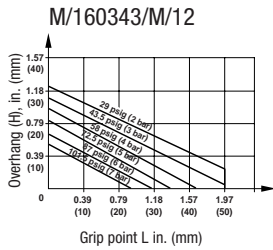
When chucking a workpiece, weight should be within the range between 1/10 and 1/20 of the above gripping force. When chucking and then moving a workpiece, the workpiece may protrude or drop. Therefore, workpiece weight should be less than the above mentioned value. (Reference value is 1/30-1/50) Weight depends on the operational condition, such as material and shape of workpiece or claw, speed and direction of moving workpiece (straight advance, rotation or swing, etc.)

M/160340/M/12

Parallel grippers, Double acting

Magnetic piston, Ø 10 ... 25 mm

Grip point limitation range

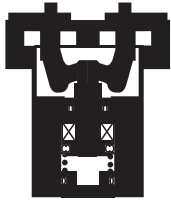
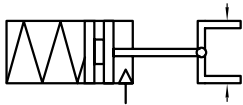


Model	Ø	A	B	C	D	E	F	G	H	I	K					
M/160343/M/12	10	17 + 1.6/-0.2 (open) 13 ± 0.4 (closed)	4.5	25 max.	16.5	59.5	5.5 - 0.03	43	15	6	3					
M/160344/M/12	16	26 + 2.3 (open) 18 + 0.6/-0.2 (closed)	6.5	37.5 max	19	71	7 - 0.03	52	17.5	8	3					
M/160345/M/12	20	36 + 1.5/-0.9 (open) 24 + 0.1/-0.9 (closed)	8.5	49 max	23	83.5	8 - 0.04	60.5	20	10	4					
M/160346/M/12	25	42 + 1.0/-0.7 (open) 28 ± 0.4 (closed)	10	57.5 max	27	95	10 - 0.03	68	23	12	5					
Model	Ø	L	M	O	P	Q	R	S	T	U	V	W	AA	AB	AC	kg
M/160343/M/12	10	20	23	17	Ø 11 + 0.05 deep 1.5	16	10	7.5	10	10	16	18	M3 x 0.5	M3 x 0.5 deep 5	M3 x 0.5	0.05
M/160344/M/12	16	23	34	26	Ø 17 + 0.05 deep 1.5	22	14	7.5	12	14	18	24	M5 x 0.8	M4 x 0.7 deep 7	M3 x 0.5	0.12
M/160345/M/12	20	26	45	35	Ø 21 + 0.05 deep 1.5	26	16	8	13	16	19	30	M5 x 0.8	M5 x 0.8 deep 8	M4 x 0.7	0.22
M/160346/M/12	25	30	52	40	Ø 26 + 0.05 deep 1.5	32	20	9	18	20	22	36	M5 x 0.8	M6 x 1.0 deep 10	M5 x 0.8	0.37

Dimensions in mm

M/160350/M/11

Parallel grippers - precision, Single acting
Magnetic piston, Ø 8 ... 20 mm



- Ideal for applications demanding accuracy and precise repeatability**
- Smooth, accurate movement**
- Long, uninterrupted service life**
- Low weight**
- Compact size**
- Integral magnets for positional feedback**

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Single acting, parallel, magnetic piston

Operating pressure:

101.5 psig (7 bar) maximum -
See website for minimum operating pressures

Operating temperature:
32°F to 140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 2°C

Mounting:

Mounting holes on three faces

Gripping repeatability:

+/- 0.0004 inches (+/- 0.01 mm)

Accuracy to center:

+/- 0.003 inches (+/- 0.07 mm)

Mechanical life:

~ 5 million cycles before maintenance may be necessary

Operating frequency:

120 cycles per minute maximum

Materials

Body: aluminum alloy

Fingers: stainless steel

Guide rail: stainless steel

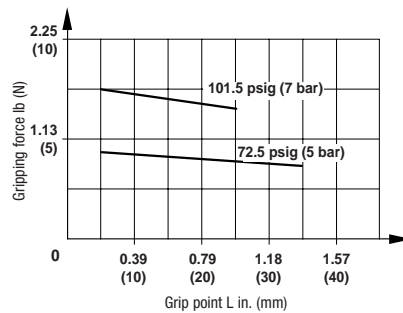
Elastomers: nitrile

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Minimum operating pressure in psig (bar)	Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing		
M/160354/M/11	0.61 (2.7)	0.92 (4.1)	58.00 (4)	0.004 (0.06)
M/160355/M/11	0.54 (2.4)	1.53 (6.8)	50.75 (3.5)	0.010 (0.16)
M/160356/M/11	1.22 (5.4)	4.50 (20)	36.25 (2.5)	0.042 (0.7)
M/160357/M/11	1.64 (7.3)	7.65 (34)	36.25 (2.5)	0.096 (1.6)

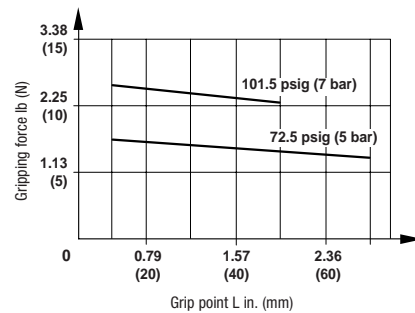
**per cycle

Theoretical closing gripping forces

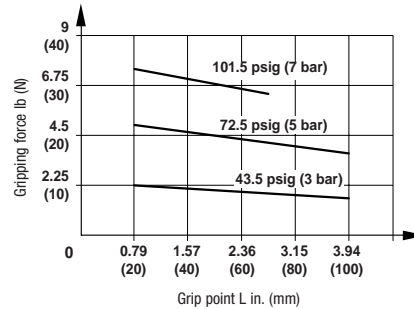
M/160354/M/11



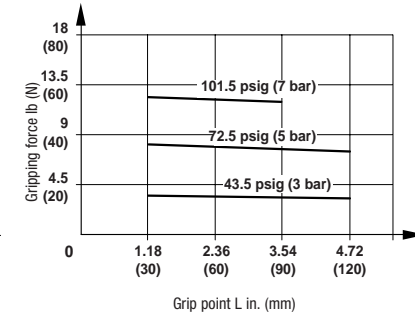
M/160355/M/11



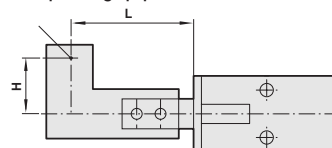
M/160356/M/11



M/160357/M/11



Workpiece grip point



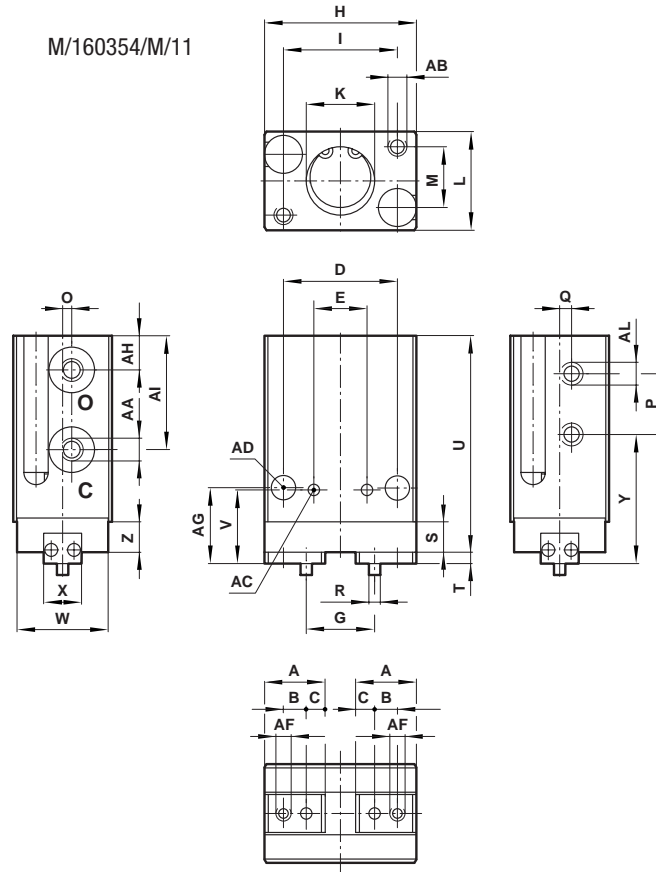
Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160350/M/11

Parallel grippers - precision, Single acting

Magnetic piston, $\varnothing 8 \dots 20$ mm

M/160354/M/11

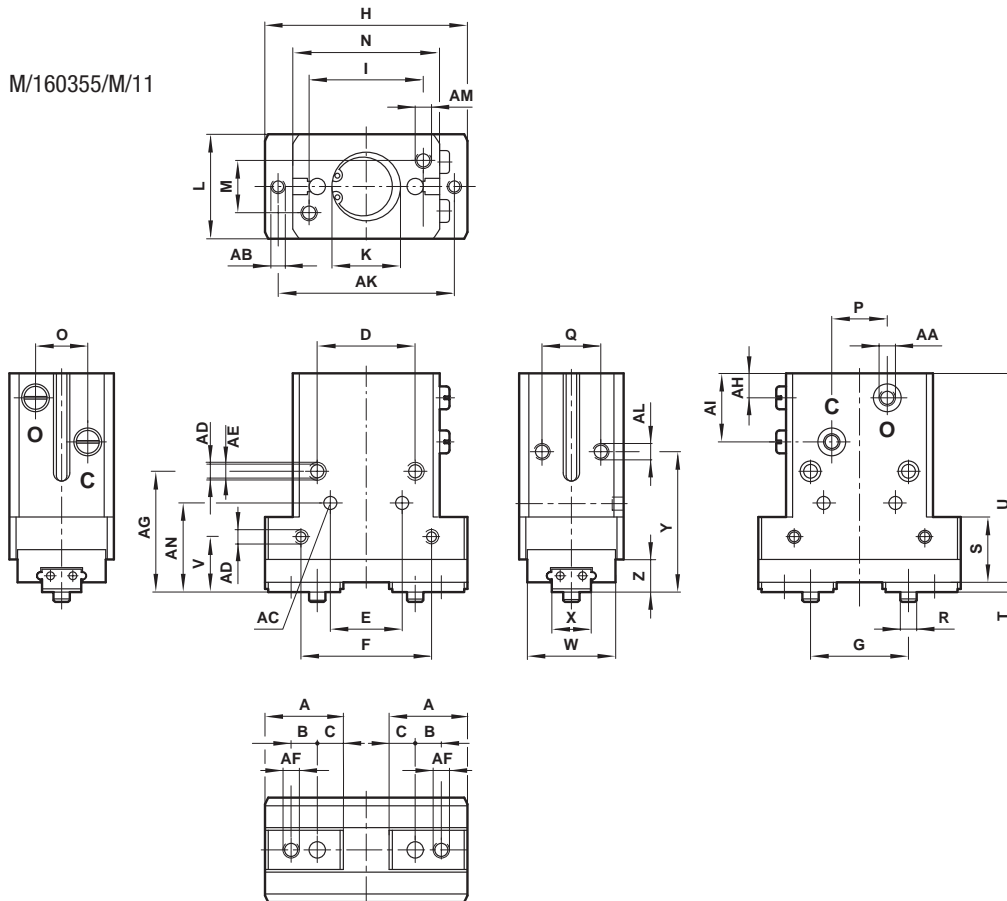


	\varnothing	A	B	C	D	E	G		H	I	K
M/160354/M/11	8	8	3	2.5	15	7 ± 0.03	$9 + 1.5$ (open) $5 + 0.5$ (closed)		20	15	$\varnothing 9 + 0.05$ deep 1
	\varnothing	L	M	O	P	Q	R	S	T	U	
M/160354/M/11	8	13 ± 0.05	9	1.2	8	1.5	$\varnothing 1.5 - 0.03$	4	1.5	28.5	
	\varnothing	V	W	X	Y	Z	AA	AB	AC	AD	
M/160354/M/11	8	9.7	12	5 ± 0.025	17	4	M3 x 0.5	M2.5 x 0.45 deep 4	$\varnothing 1.5 + 0.02$ deep 1	$\varnothing 3.2$	
	\varnothing	AF	AG	AH	AI	AL	kg				
M/160354/M/11	8	M2 x 0.4 deep 3.5	10	4.5	15	M3 x 0.5 deep 3	0.02				

Dimensions in mm

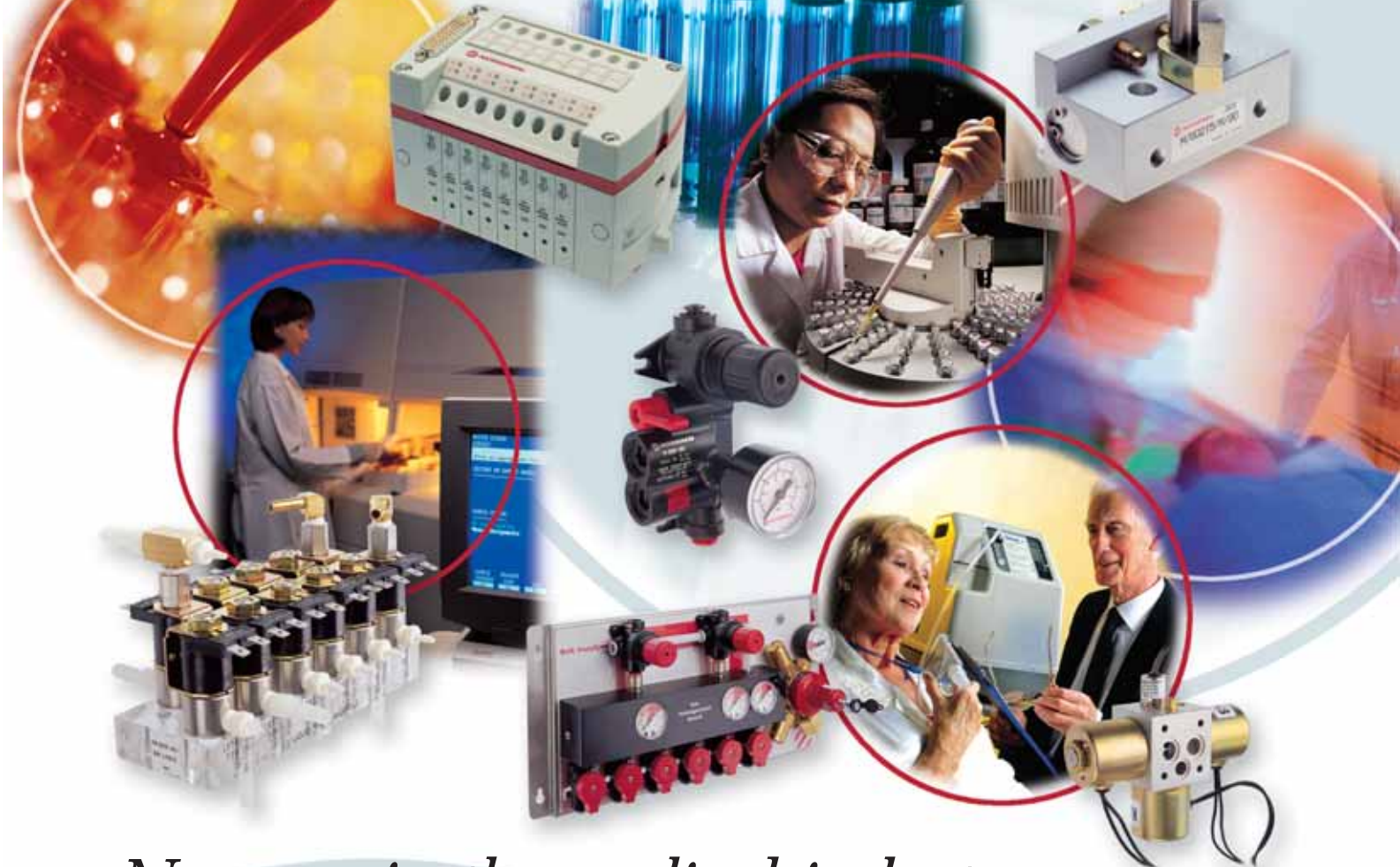
M/160350/M/11

Parallel grippers - precision, Single acting
Magnetic piston, Ø 8 ... 20 mm



Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160355/M/11	10	14.7	5	4.5	17	12 ± 0.03	20	15.5 + 1.5 (open) 9 + 0.5 (closed)	36	17	Ø 11 + 0.05 deep 1.5
M/160356/M/11	16	20	8	6	24	16 ± 0.03	30	22 + 1.8 (open) 12 + 1.3 (closed)	50	26	Ø 17 + 0.05 deep 1.5
M/160357/M/11	20	24	8	8	30	22 ± 0.03	40	30 + 2.4/-0.5 (open) 16 + 1.4 (closed)	62	35	Ø 21 + 0.05 deep 1.5
Model	Ø	L	M	N	O	P	Q	R	S	T	U
M/160355/M/11	10	20 ± 0.05	10	23	9	7	12	Ø 3 - 0.03	12.5	1.5	47.5
M/160356/M/11	16	25 ± 0.05	14	34	12	15	15	Ø 4 - 0.03	15	2	54
M/160357/M/11	20	32 ± 0.05	16	45	16	17	18	Ø 5 - 0.03	20	3	64
Model	Ø	V	W	X	Y	Z	AA	AB	AC	AD	AE
M/160355/M/11	10	11	17	7 ± 0.025	29	6	M3 x 0.5	M3 x 0.5 deep 4.5	Ø2.5 + 0.02 deep 2.5	M4 x 0.7 deep 6	Ø 3.4
M/160356/M/11	16	14	20	9 ± 0.025	36	8	M5 x 0.8	M4 x 0.7 deep 5	Ø3 + 0.02 deep 3	M4 x 0.7 deep 6	Ø 3.4
M/160357/M/11	20	17	27	12 ± 0.025	43	8	M5 x 0.8	M4 x 0.7 deep 7	Ø4 + 0.02 deep 3.5	M5 x 0.8 deep 8	Ø 4.2
Model	Ø	AF	AG	AH	AI	AK	AL	AM	AN	AO	kg
M/160355/M/11	10	M3 x 0.5 deep 4	24	7.5	17	30	M3 x 0.5 deep 5	M3 x 0.5 deep 6	16	M3 x 0.5 deep 5	0.08
M/160356/M/11	16	M4 x 0.7 deep 5	31	7.5	19	42	M4 x 0.7 deep 6	M4 x 0.7 deep 7	21	M3 x 0.5 deep 5	0.16
M/160357/M/11	20	M5 x 0.8 deep 7	37	7.5	21	54	M5 x 0.8 deep 8	M5 x 0.8 deep 9	27.3	M4 x 0.7 deep 6	0.33

Dimensions in mm



Norgren in the medical industry


Adding value through integrated design solutions for fluid and motion control

Norgren proven solutions for the medical industry are widely accepted by leading manufacturers worldwide – and are consistently delivering the performance and results they need.

The winning combination of Norgren and KIP expertise and technology brings you all the benefits of 20 years specialized experience and understanding of a wide range of medical applications from respiration, dialysis and dental to high volume laboratory automation.


At the heart of this is the capability to design and engineer added-value, integrated solutions to answer the most demanding application challenges.

- Integrated solutions
- Technical expertise
- Specialised engineering
- International manufacturing
- Quality assurance
- Flexible deliveries
- Global service network




Clinical chemistry

Norgren valve systems can help end users and manufacturers in areas such as biochemistry, haematology, speciality testing and high volume laboratory testing to eliminate contamination carry over, reduce space, accuracy, speed and modularised solutions.



Laboratory automation

Norgren offers a wide range of automation solutions to enhance speed and provide optimum flexibility to help with the increasing and demanding test requirements.



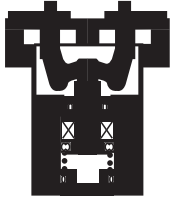
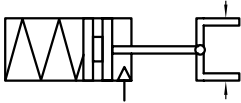
Respiration

Norgren has a proven ability to manage compressed air as well as gases such as O₂, CO₂ and N₂O

www.norgren.com/medical

M/160350/M/12

Parallel grippers - precision, Double acting
Magnetic piston, Ø 8 ... 20 mm



- Ideal for applications demanding accuracy and precise repeatability**
- Smooth, accurate movement**
- Long, uninterrupted service life**
- Low weight**
- Compact size**
- Integral magnets for positional feedback**

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Single acting, parallel, magnetic piston

Operating pressure:

101.5 psig (7 bar) maximum -
See website for minimum operating pressures

Operating temperature:
32°F to 140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 2°C

Mounting:

Mounting holes on three faces

Gripping repeatability:

+/- 0.0004 inches (+/- 0.01 mm)

Accuracy to center:

+/- 0.003 inches (+/- 0.07 mm)

Mechanical life:

~ 5 million cycles before maintenance may be necessary

Operating frequency:

120 cycles per minute maximum

Materials

Body: aluminum alloy

Fingers: stainless steel

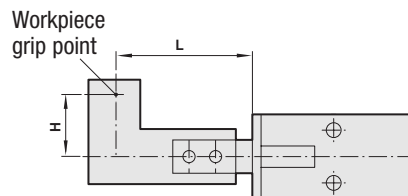
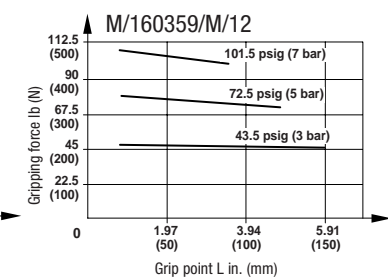
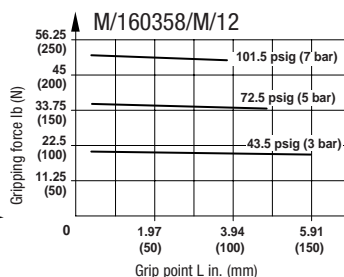
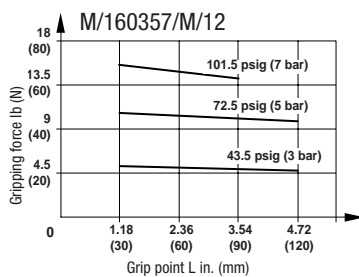
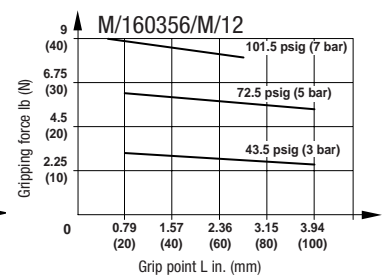
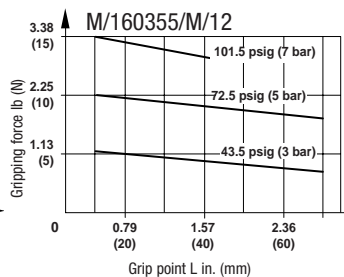
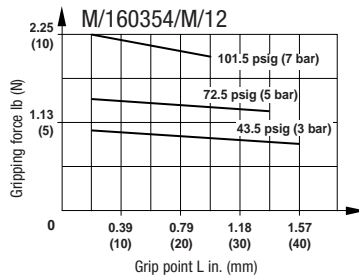
Guide rail: stainless steel

Elastomers: nitrile

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Minimum operating pressure in psig (bar)	Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing		
M/160354/M/12	2.23 (9.9)	1.31 (5.8)	31.9 (2.2)	0.009 (0.15)
M/160355/M/12	3.38 (15)	2.12 (9.4)	29 (2)	0.025 (0.41)
M/160356/M/12	8.78 (39)	5.85 (26)	17.4 (1.2)	0.096 (1.6)
M/160357/M/12	13.50 (60)	10.13 (45)	14.5 (1)	0.222 (3.7)
M/160358/M/12	39.60 (176)	35.33 (157)	14.5 (1)	0.984 (16.4)
M/160359/M/12	93.15 (414)	78.08 (347)	14.5 (1)	3.660 (61.0)

**per cycle

Theoretical closing gripping forces



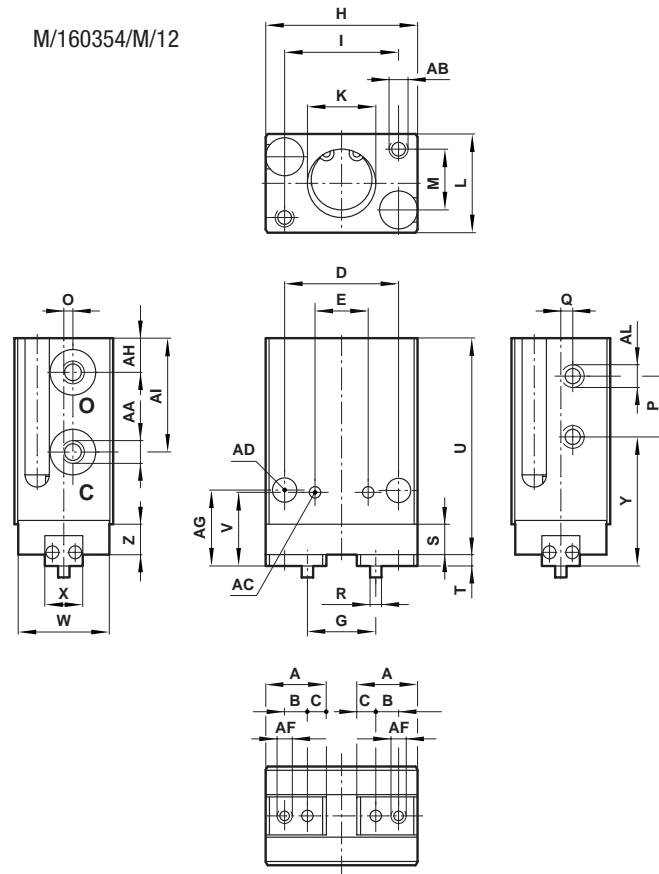
Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160350/M/12

Parallel grippers - precision, Double acting

Magnetic piston, $\varnothing 8 \dots 20$ mm

M/160354/M/12

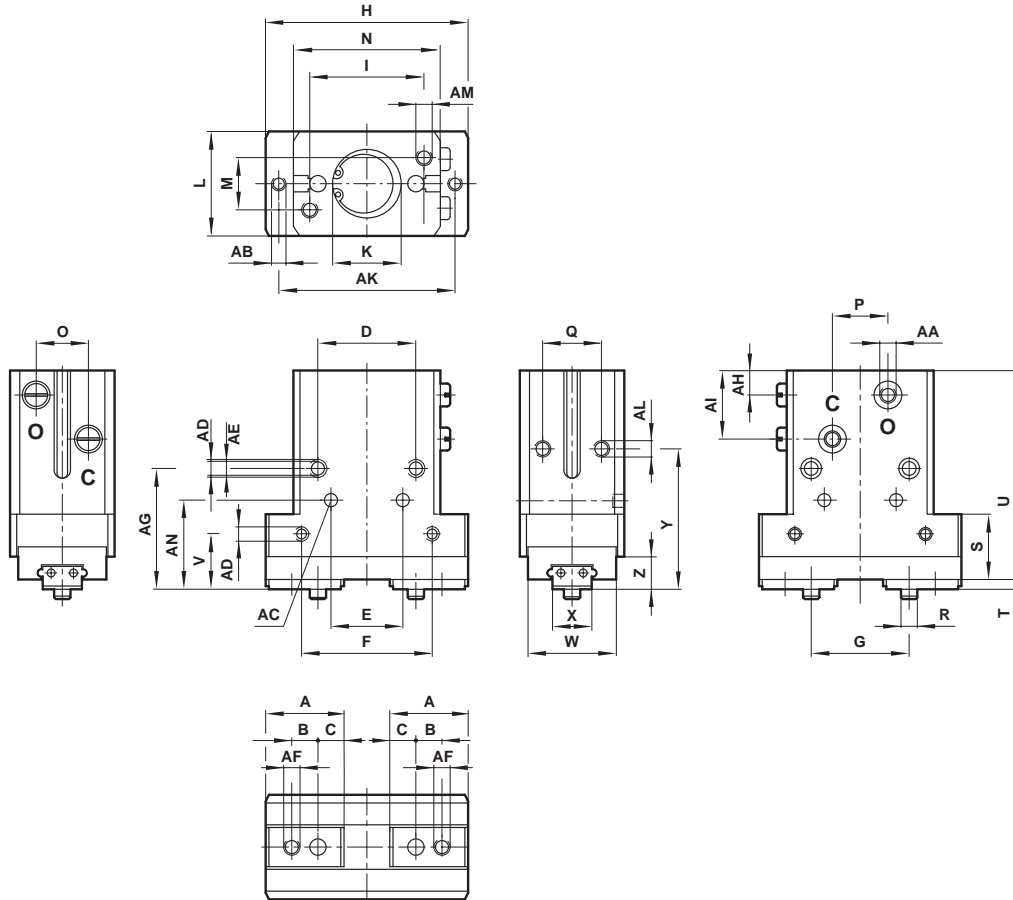


	\varnothing	A	B	C	D	E	G	H	I	K	
M/160354/M/12	8	8	3	2.5	15	7 ± 0.03	$9 + 1.5$ (open)	$5 + 0.5$ (closed)	20	15	$\varnothing 9 + 0.05$ deep 1
	\varnothing	L	M	O	P	Q	R	S	T	U	
M/160354/M/12	8	13 ± 0.05	9	1.2	8	1.5	$\varnothing 1.5 - 0.03$	4	1.5	28.5	
	\varnothing	V	W	X	Y	Z	AA	AB	AC		AD
M/160354/M/12	8	9.7	12	5 ± 0.025	17	4	M3 x 0.5	M2.5 x 0.45 deep 4	$\varnothing 1.5 + 0.02$ deep 1	$\varnothing 3.2$	
	\varnothing	AF		AG	AH	AI	AL	kg			
M/160354/M/12	8	M2 x 0.4 deep 3.5		10	4.5	15	M3 x 0.5 deep 3	0.02			

Dimensions in mm

M/160350/M/12

Parallel grippers - precision, Double acting
Magnetic piston, Ø 8 ... 20 mm



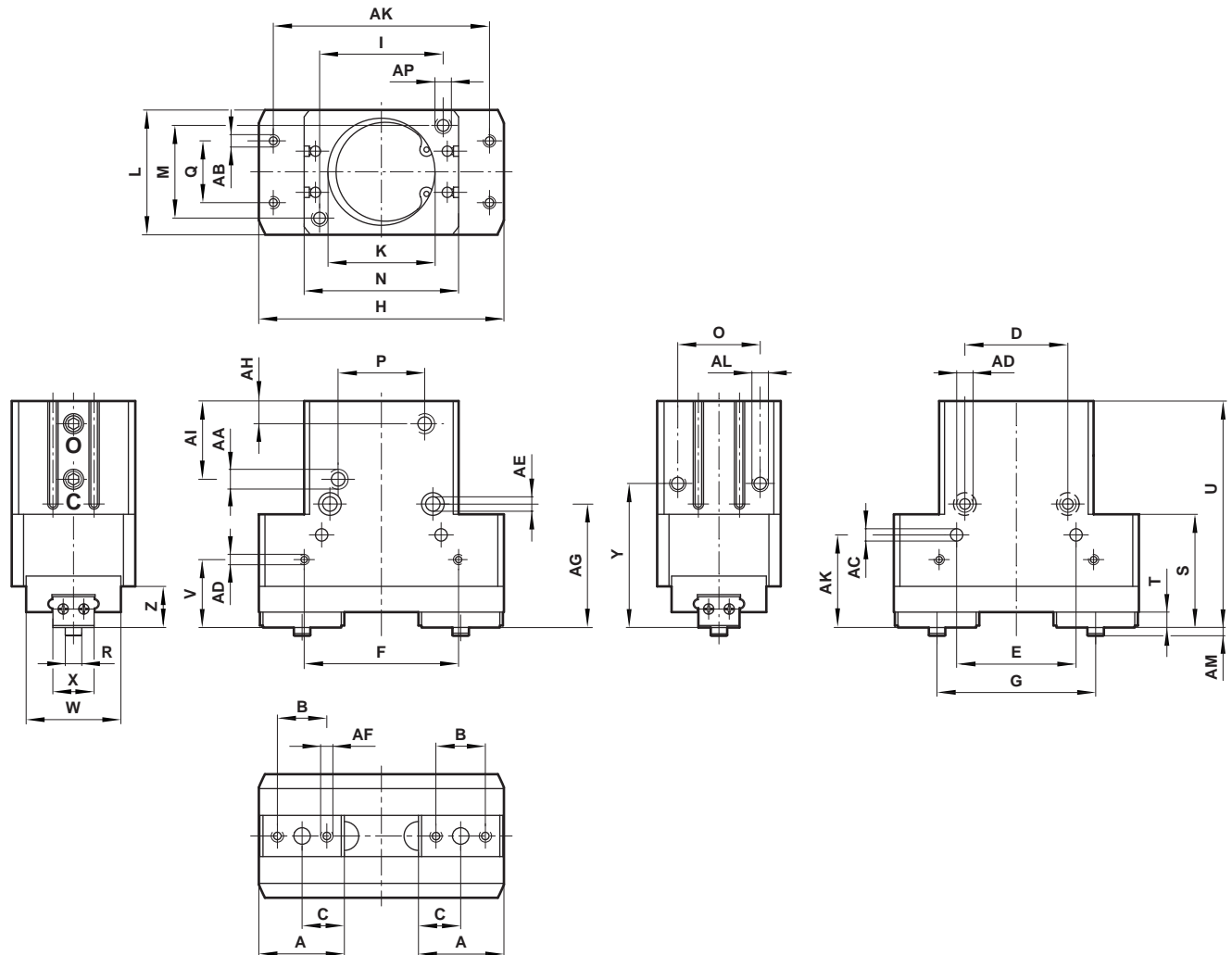
Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160355/M/12	10	14.7	5	4.5	17	12 ± 0.03	20	15.5 + 1.5 (open) 9 + 0.5 (closed)	36	17	Ø 11 + 0.05 deep 1.5
M/160356/M/12	16	20	8	6	24	16 ± 0.03	30	22 + 1.8 (open) 12 + 1.3 (closed)	50	26	Ø 17 + 0.05 deep 1.5
M/160357/M/12	20	24	8	8	30	22 ± 0.03	40	30 + 2.4/-0.5 (open) 16 + 1.4 (closed)	62	35	Ø 21 + 0.05 deep 1.5
M/160358/M/12	32	31	14	9.5	30	30 ± 0.03	50	41 + 1.8 (open) 19 + 1.30 (closed)	85	40	Ø 34 + 0.05 deep 2.0
Model	Ø	L	M	N	O	P	Q	R	S	T	U
M/160355/M/12	10	20 ± 0.05	10	23	9	7	12	Ø 3 - 0.03	12.5	1.5	47.5
M/160356/M/12	16	25 ± 0.05	14	34	12	15	15	Ø 4 - 0.03	15	2	54
M/160357/M/12	20	32 ± 0.05	16	45	16	17	18	Ø 5 - 0.03	20	3	64
M/160358/M/12	32	40 ± 0.05	30	45	20	20	20	Ø 6 - 0.03	31	4	79
Model	Ø	V	W	X	Y	Z	AA	AB	AC	AD	AE
M/160355/M/12	10	11	17	7 ± 0.025	29	6	M3 x 0.5	M3 x 0.5 deep 4.5	Ø2.5 + 0.02 deep 2.5	M4 x 0.7 deep 6	Ø 3.4
M/160356/M/12	16	14	20	9 ± 0.025	36	8	M5 x 0.8	M4 x 0.7 deep 5	Ø3 + 0.02 deep 3	M4 x 0.7 deep 6	Ø 3.4
M/160357/M/12	20	17	27	12 ± 0.025	43	8	M5 x 0.8	M4 x 0.7 deep 7	Ø4 + 0.02 deep 3.5	M5 x 0.8 deep 8	Ø 4.2
M/160358/M/12	32	20	32	15 ± 0.025	53	13	M5 x 0.8	M8 x 1 deep 9	Ø5 + 0.03 deep 4	M6 x 1 deep 9	Ø 5.2
Model	Ø	AF	AG	AH	AI	AK	AL	AM	AN	AO	kg
M/160355/M/12	10	M3 x 0.5 deep 4	24	7.5	17	30	M3 x 0.5 deep 5	M3 x 0.5 deep 6	16	M3 x 0.5 deep 5	0.08
M/160356/M/12	16	M4 x 0.7 deep 5	31	7.5	19	42	M4 x 0.7 deep 6	M4 x 0.7 deep 7	21	M3 x 0.5 deep 5	0.16
M/160357/M/12	20	M5 x 0.8 deep 7	37	7.5	21	54	M5 x 0.8 deep 8	M5 x 0.8 deep 9	27.3	M4 x 0.7 deep 6	0.33
M/160358/M/12	32	M6 x 1 deep 9	46	9	28.5	70	M6 x 1 deep 9	M6 x 1 deep 9	31	M5 x 0.8 deep 8	0.66

Dimensions in mm

M/160350/M/12

Parallel grippers - precision, Double acting

Magnetic piston, \varnothing 8 ... 20 mm



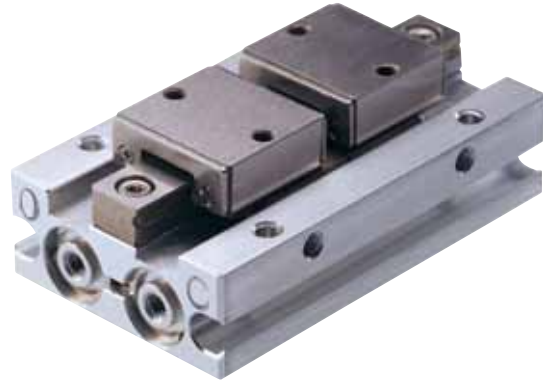
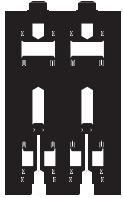
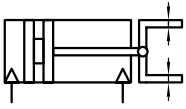
Model	\varnothing	A	B	C	D	E	F	G	H	I	K	
M/160359/M/12	50	41	24	20.5	50	58 ± 0.03	75	77 + 1.8/-0.2 (open)	41 + 0.4 (closed)	119	60	\varnothing 52 + 0.05 deep 3
Model	\varnothing	L	M	N	O	P	Q	R	S	T	U	
M/160359/M/12	50	60 ± 0.05	45	75	40	42	30	\varnothing 8 - 002	55	7.5	110	
Model	\varnothing	V	W	X	Y	Z	AA	AB	AC	AD	AE	
M/160359/M/12	50	33	46	20 -0.025	70	20	Rc1/8	M6 x 1 deep 12	\varnothing 6 + 003 deep 7	M8 x 1.25 deep 12	\varnothing 11 deep 6.5	
Model	\varnothing	AF	AG	AH	AI	AK	AL	AM	AN	AO	AP	kg
M/160359/M/12	50	M6 x 1 deep 12	60	11	38	105	M8 x 1.25 deep 12	4	45	M5 x 0.8 deep 8	M8 x 1.25 deep 15	1.85

Dimensions in mm

M/160360/M/12

Parallel grippers - low profile, Double acting

Magnetic piston, Ø 8 ... 12 mm



- Ideal for applications where operating space is restricted
- Smooth, accurate movement
- Long, uninterrupted service life
- Low weight, compact size
- Integral magnets for positional feedback

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operating pressure:
M/160364/M/12: 29 to 101.5 psig (2 to 7 bar)

M/160365/M/12: 21.75 to 101.5 psig (1.5 to 7 bar)

Operating temperature:
32°F to 140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on three faces

Gripping repeatability:
+/- 0.003 inches (+/- 0.07mm)

Accuracy to center:
+/- 0.004 inches (+/- 0.1mm)

Materials

Body: aluminum alloy

Fingers: carbon steel

Bearings: stainless steel

Elastomers: nitrile

Barb fittings connections

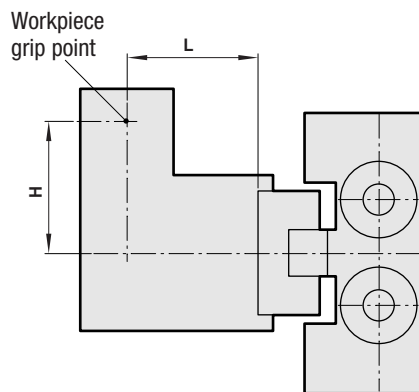
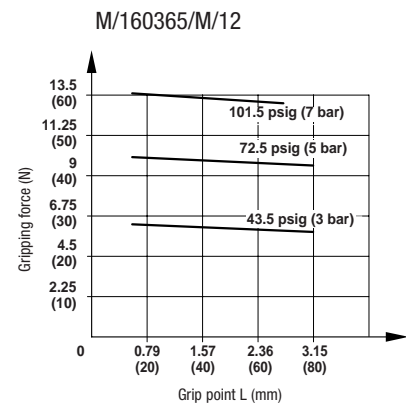
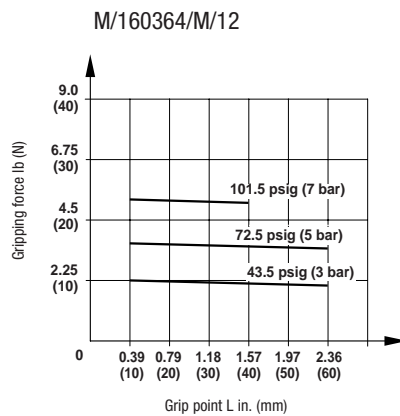
M3 x 1/8" tube ID, straight barb, part number 29217X303

M5 x 1/8" tube ID, straight barb, part number 29217X305

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160364/M/12	3.76 (16.7)	3.76 (16.7)	0.084 (1.4)
M/160365/M/12	9.90 (44)	9.90 (44)	0.258 (4.3)

**per cycle

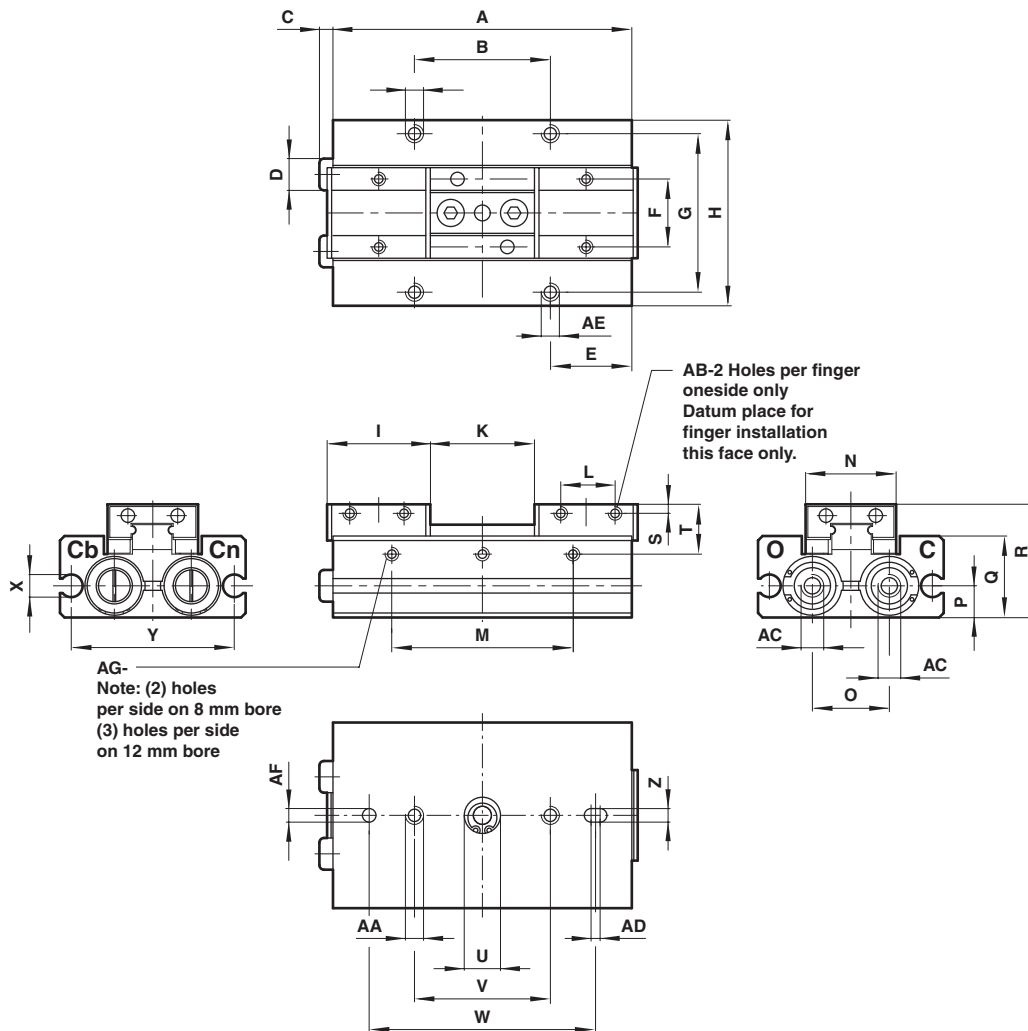
Theoretical gripping forces



M/160360/M/12

Parallel grippers - low profile, Double acting

Magnetic piston, $\varnothing 8 \dots 12$ mm



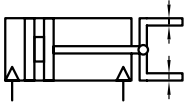
Model	\varnothing	A	B	C	D	E	F	G	H	I	K
M/160364/M/12	8	52	32	2.5	$\varnothing 5$	8.1	13	26	32	16.2	17 +1.7/-0.5 (open) 1 +0.7/-1.0 (closed)
M/160365/M/12	12	66	30	3	$\varnothing 7$	11.4	15	35	41	22.8	23 +1.9/-0.5 (open) 1 +0.9/-1.0 (closed)
Model	\varnothing	L	M	N	O	P	Q	R	S	T	U
M/160364/M/12	8	10	24	17	12	5	13	19	2	8.5	$\varnothing 8 + 0.05$ deep 1
M/160365/M/12	12	12	40	20	17	7	18	25	2	11	$\varnothing 8 + 0.05$ deep 1
Model	\varnothing	V	W	X	Y	Z	AA	AB	AC	AD	AE
M/160364/M/12	8	24	40	$\varnothing 5$	27	2.5 + 0.03 2.5mm deep	M3 x 0.5 5mm deep	M2.5 x 0.45 3mm deep	M3 x 0.5	2	M3 x 0.5 5mm deep
M/160365/M/12	12	30	50	$\varnothing 5$	36	3 + 0.03 3mm deep	M4 x 0.7 8mm deep	M3 x 0.5 3mm deep	M5 x 0.8	2	M4 x 0.7 6mm deep
Model	\varnothing	AF	AG	kg							
M/160364/M/12	8	$\varnothing 2.5 + 0.03$ 2.5mm deep	M3 x 0.5 5mm deep	0.09							
M/160365/M/12	12	$\varnothing 3.0 + 0.03$ 3.0mm deep	M3 x 0.5 5mm deep	0.2							

Dimensions in mm

M/160380/M/12

Parallel grippers - three jaw, Double acting

Magnetic piston, Ø 16 ... 20 mm



Ideal for gripping spheres or components with circular faces

Smooth, accurate movement

Long, uninterrupted service life

Low weight, compact size

Integral magnets for positional feedback

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operation:

Double acting, three jaw parallel, magnetic piston

Operating pressure:

29 to 101.5 psig (2 to 7 bar)

21.75 to 101.5 psig (1.5 to 7 bar)

M/160386/M/12

Operating temperature:

32°F to 140°F (+0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C)

Mounting:

Mounting holes on base

Gripping repeatability:

+/- 0.004 inches (+/- 0.01 mm)

Mechanical life:

~ 5 million cycles before maintenance may be necessary

Operating frequency:

200 cycles per minute maximum

Materials

Body: aluminum alloy

Top plate: carbon steel

Fingers: carbon steel

External screws: carbon steel

Elastomers: nitrile

Barb fittings connections

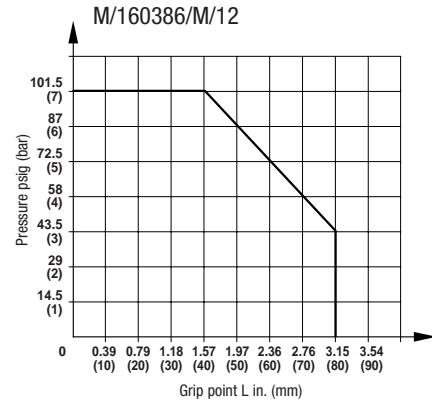
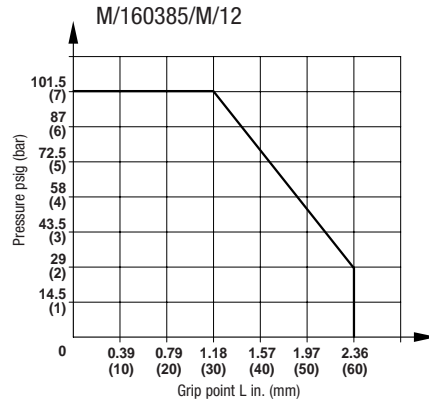
M3 x 1/8" tube ID, straight barb, part number 29217X303

M5 x 1/8" tube ID, straight barb, part number 29217X305

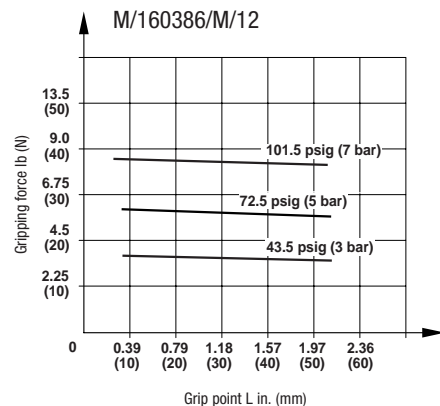
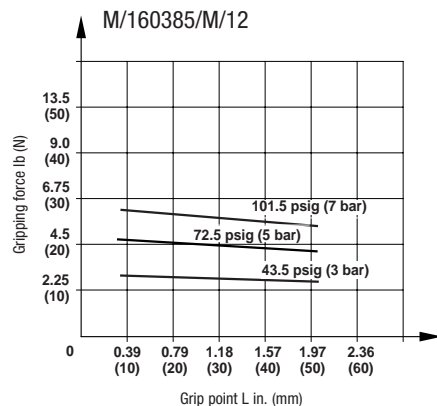
Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160385/M/12	6.08 (27)	4.50 (20)	0.08 (1.4)
M/160386/M/12	8.10 (36)	6.08 (27)	0.20 (3.3)

**per cycle

Grip point limitation range



Theoretical closing gripping forces



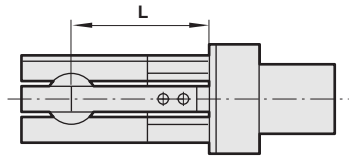
Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160380/M/12

Parallel grippers - three jaw, Double acting

Magnetic piston, Ø 16 ... 20 mm

Workpiece grip point

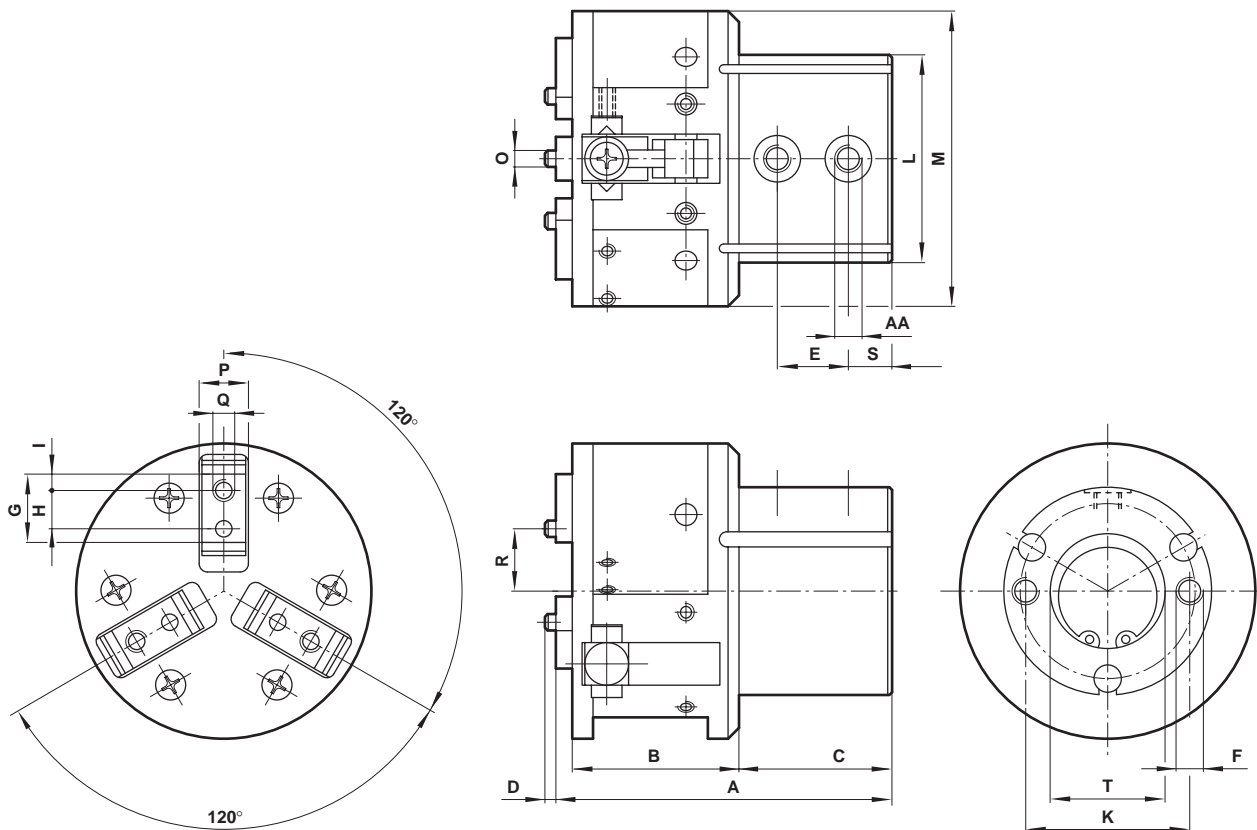


Criteria of workpiece weight

When chucking a workpiece, weight should be within the range between 1/10 and 1/20 of the above gripping force.

When chucking and then moving a workpiece, the workpiece may protrude or drop. Therefore, workpiece weight should be less than the above mentioned value. (Reference value is 1/30-1/50)

Weight depends on the operational condition, such as material and shape of workpiece or claw, speed and direction of moving workpiece (straight advance, rotation or swing, etc.)



Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160385/M/12	16	53	23	27	2	12.5	M4 x 0.7 deep 7	10	5	2.5	24
M/160386/M/12	20	61.5	30.5	28	2	13	M5 x 0.8 deep 8	12.5	7	3.0	30

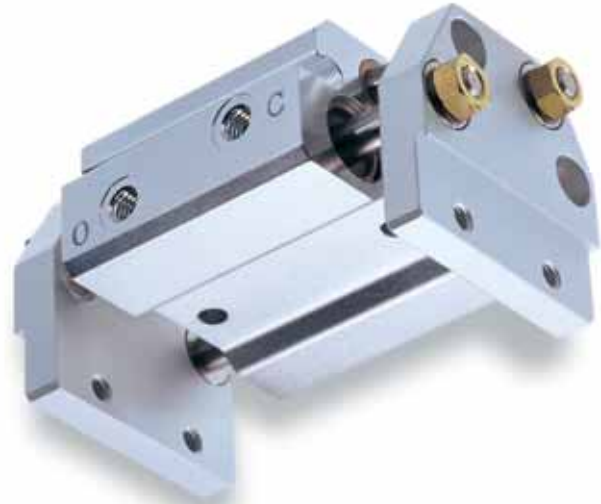
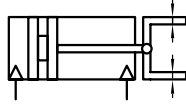
Model	Ø	L	M	O	P	Q	R	S	T	AA	kg
M/160385/M/12	16	Ø 32	Ø 42	Ø 3 - 0.005	7 - 0.03	M3 x 0.5	9.5 + 0.9/-0.4 (open) 5.5 + 0.9/-0.4 (closed)	7.5	Ø 17 + 0.05 deep 1.5	M5 x 0.8	0.16
M/160386/M/12	20	Ø 38	Ø 54	Ø 3 - 0.005	8 - 0.04	M4 x 0.7	13 + 1.6/-0.4 (open) 7 + 1.2/-0.4 (closed)	8	Ø 21 + 0.05 deep 1.5	M5 x 0.8	0.28

Dimensions in mm

M/160390/M/12

Parallel grippers - long stroke, Double acting

Magnetic piston, Ø 12 ... 25 mm



- Ideal for handling wide components**
- Smooth, accurate movement**
- Long, uninterrupted service life**
- Low weight**
- Compact size**

Technical data

Medium:

Compressed air, filtered, lubricated or non-lubricated

Operating pressure: 29 to 101.5 psig (2 to 7 bar)

Operating temperature: 32°F to 140°F (0°C to 60°C)

* Air supply must be dry enough to avoid ice formation at temperatures below 35°F (+2°C)

Mounting:

Mounting holes on two faces

Materials

- Body: aluminum alloy
- Piston rods: stainless steel
- External nuts: carbon steel
- Elastomers: nitrile

Barb fittings connections

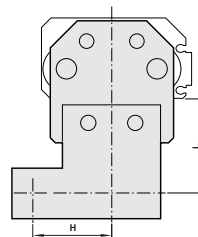
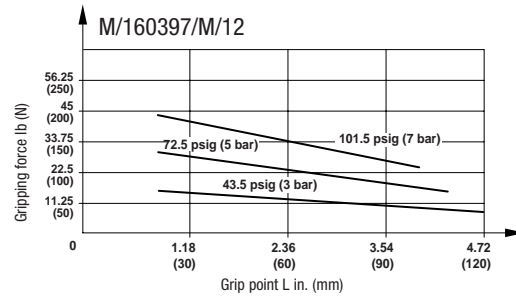
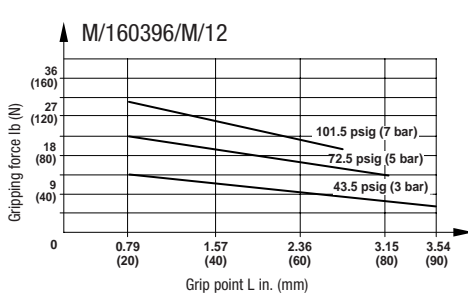
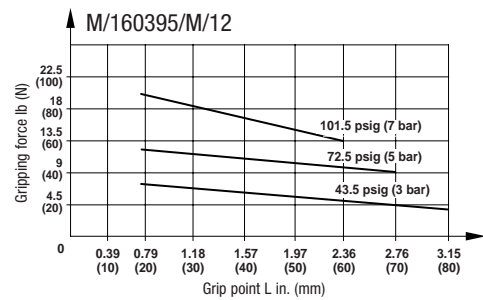
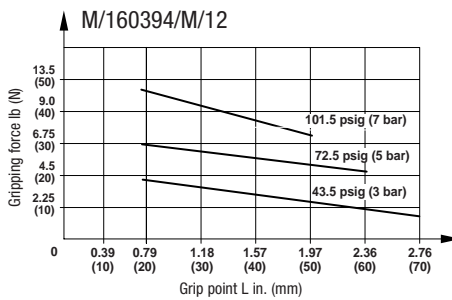
M3 x 1/8" tube ID, straight barb, part number 29217X303

M5 x 1/8" tube ID, straight barb, part number 29217X305

Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160394/M/12	6.08 (27)	6.08 (27)	0.24 (4)
M/160395/M/12	12.36 (55)	12.36 (55)	0.57 (9.5)
M/160396/M/12	19.13 (85)	19.13 (85)	1.13 (18.8)
M/160397/M/12	30.38 (135)	30.38 (135)	2.28 (38)

**per cycle

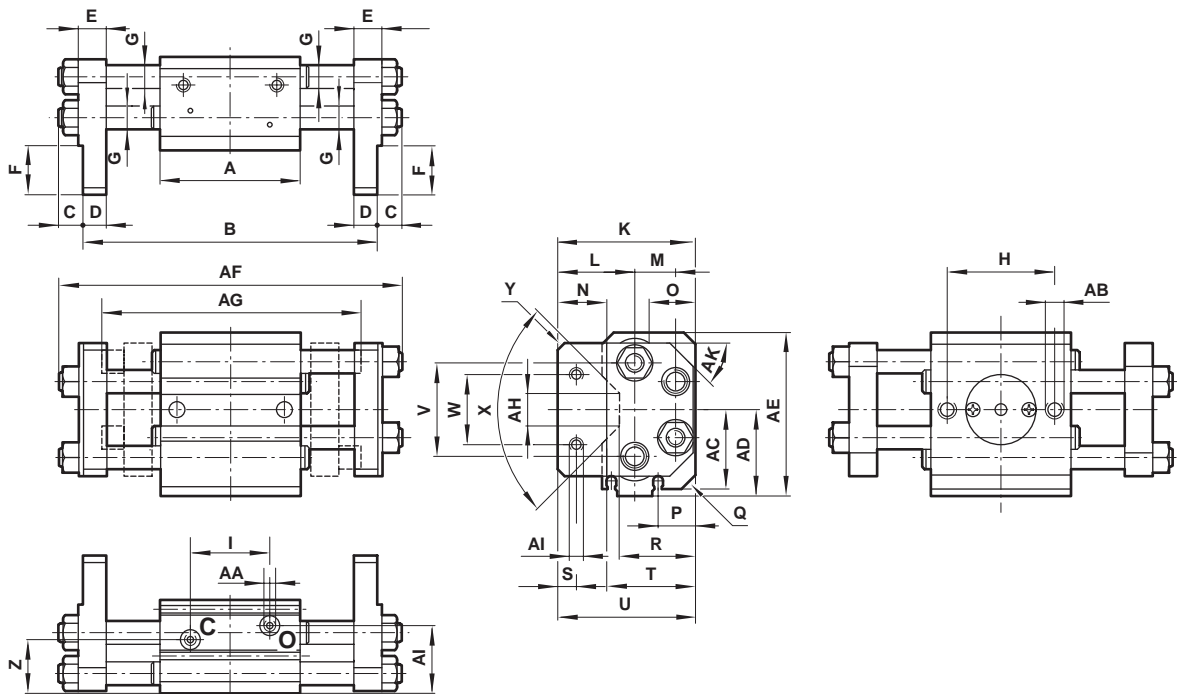
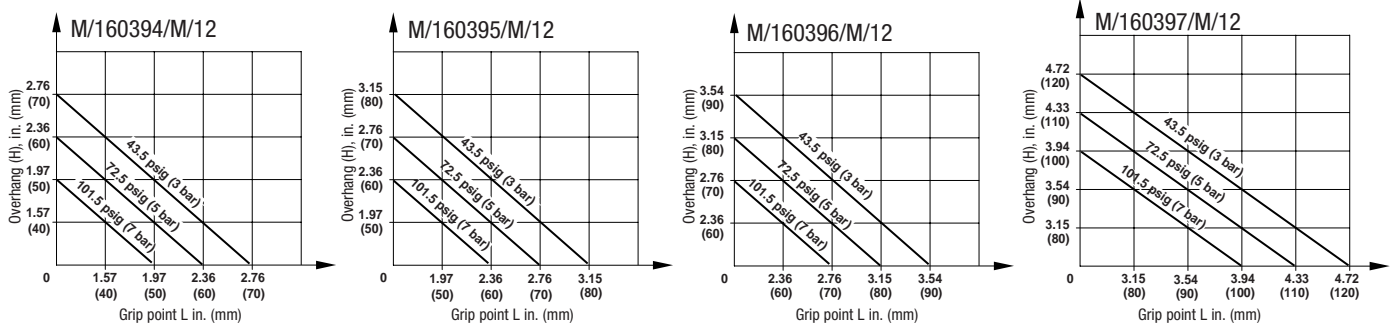
Effective gripping forces



M/160390/M/12

Parallel grippers - long stroke, Double acting
Magnetic piston, Ø 12 ... 25 mm

Grip point limitation range



Model	Ø	A	B	C	D	E	F	G	H	I	K		
M/160394/M/12	12	44	84.4 + 1.4/-1.0 (open) 60 + 1.0/-0.9 (closed)	6.5	6	8	12	Ø 6	34	21	38.5		
M/160395/M/12	16	50	102.4 + 1.4/-1.0 (open) 70 + 1.0/-1.8 (closed)	8	8	10	13.5	Ø 8	38	28	43.5		
M/160396/M/12	20	60	124.4 + 1.5/-1.1 (open) 84 + 1.1/-1.9 (closed)	10.5	10	12	21	Ø 10	46	34	58		
M/160397/M/12	25	66	145 + 1.5/-1.1 (open) 94.6 + 1.1/-1.9 (closed)	11	12	14	26	Ø 10 & Ø 12	52	39	67.5		
Model	Ø	L	M	O	P	Q	R	S	T	U	V		
M/160394/M/12	12	21	11.5	15	9.5	3.5	24	4	27	39	29		
M/160395/M/12	16	23.5	14	15	11	3.5	27	5	32	45	34		
M/160396/M/12	20	33	17.5	-	16	5	32.5	8	40	59	40		
M/160397/M/12	25	41	18.5	-	16.5	10	35.5	10	44	69	49		
Model	Ø	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
M/160394/M/12	12	20	90°	1	16	M5 x 0.8	M5 x 0.8	22.7	27	50	99	76	16
M/160395/M/12	16	20	90°	1	19.5	M5 x 0.8	M6 x 1	27.5	32.5	60	123	93	9.5
M/160396/M/12	20	30	90°	3	23	M5 x 0.8	M8 x 1.25	34	37	70	147	112	14
M/160397/M/12	25	30	90°	3	25	M5 x 0.8	M10 x 1.5	40.5	44	84	169	124	14
Model	Ø	AI	AJ	AK	kg								
M/160394/M/12	12	M4 x 0.7	20	30°	0.23								
M/160395/M/12	16	M5 x 0.8	23.5	30°	0.40								
M/160396/M/12	20	M6 x 1	29	45°	0.76								
M/160397/M/12	25	M8 x 1.25	31	45°	1.10								

Dimensions in mm