

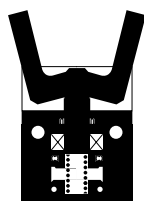
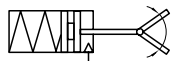
Actuators

Angular grippers

M/160300/M/11

Single acting Magnetic piston

Ø 8 to 25 mm



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

Technical data

Medium:

Compressed air, filteredlubricated 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

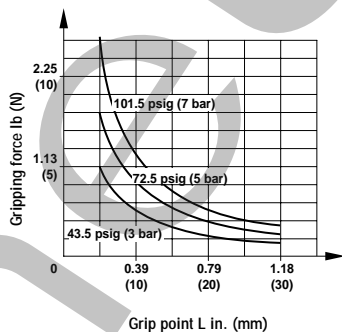
M5 x 1/8" tube ID, straight barb, part number 29217X305

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)

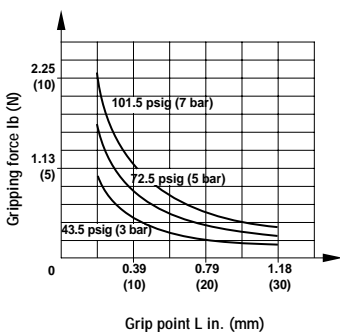
**per cycle

Theoretical closing gripping forces

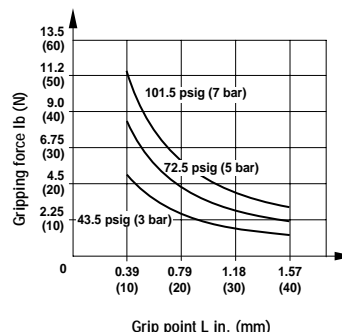
M/160305/M/11



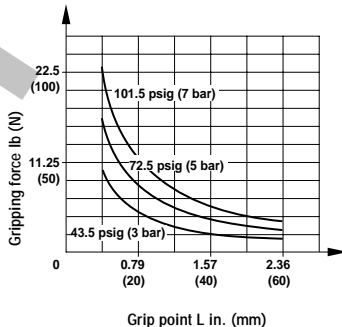
M/160306/M/11



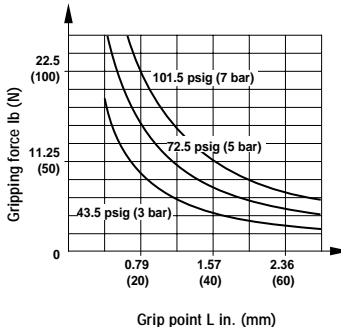
M/160307/M/11



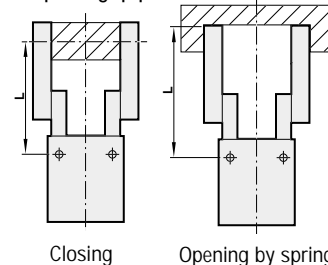
M/160308/M/11



M/160309/M/11



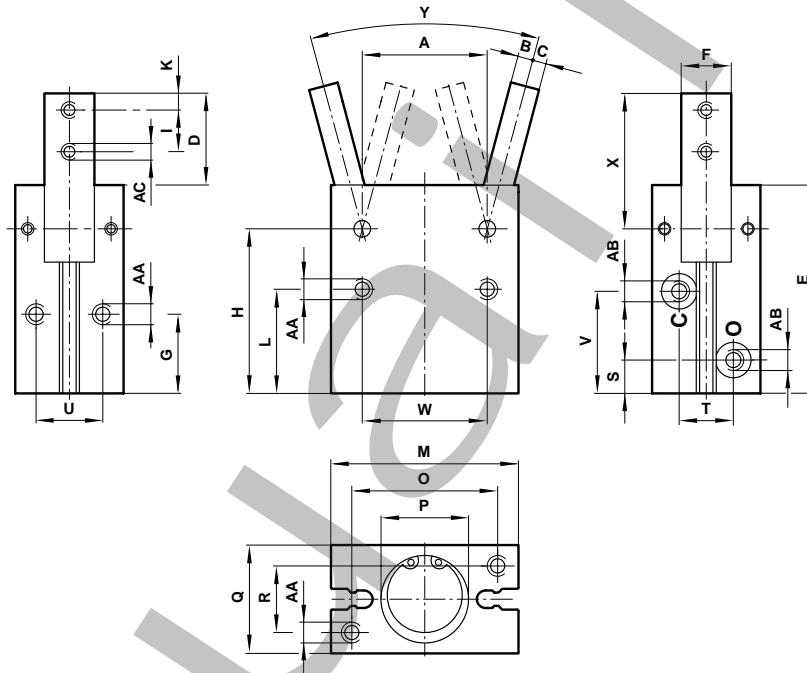
Workpiece grip point



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	Y	AA	AB	AC	kg			
M/160305/M/11	8	15	17.5	30° -10°	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	30° -10°	M3 x 0.5 deep 5	M3 x 0.5	M3 x 0.5	0.04			
M/160307/M/11	16	24	25	30° -10°	M4 x 0.7 deep 7	M5 x 0.8	M3 x 0.5	0.10			
M/160308/M/11	20	30	32.5	30° -10°	M5 x 0.8 deep 8	M5 x 0.8	M4 x 0.7	0.18			
M/160309/M/11	25	36	38.5	30° -10°	M6 x 1 deep 10	M5 x 0.8	M5 x 0.8	0.31			

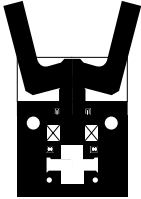
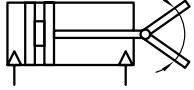
Dimensions in mm

Actuators

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

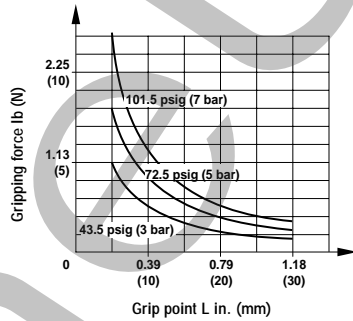
Elastomers: nitrile

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)

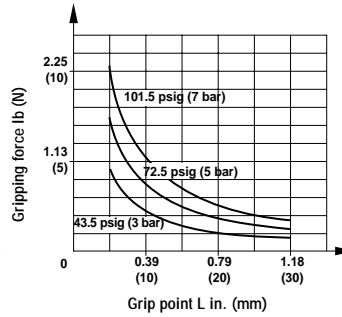
**per cycle

Theoretical closing gripping forces

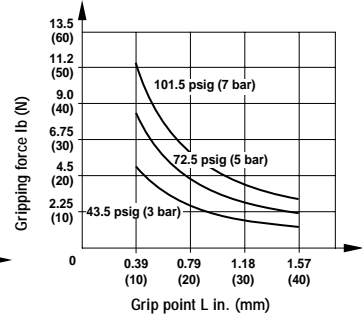
M/160305/M/12



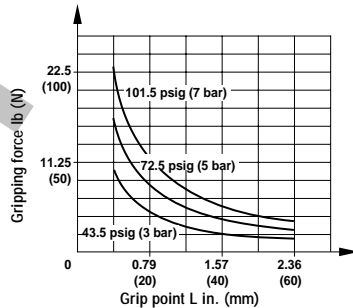
M/160306/M/12



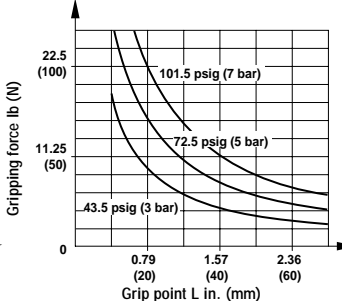
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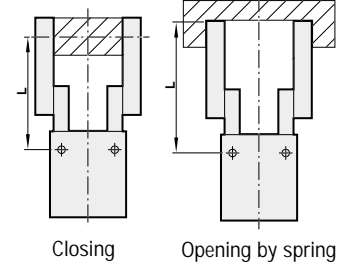
M/160308/M/12



M/160309/M/12



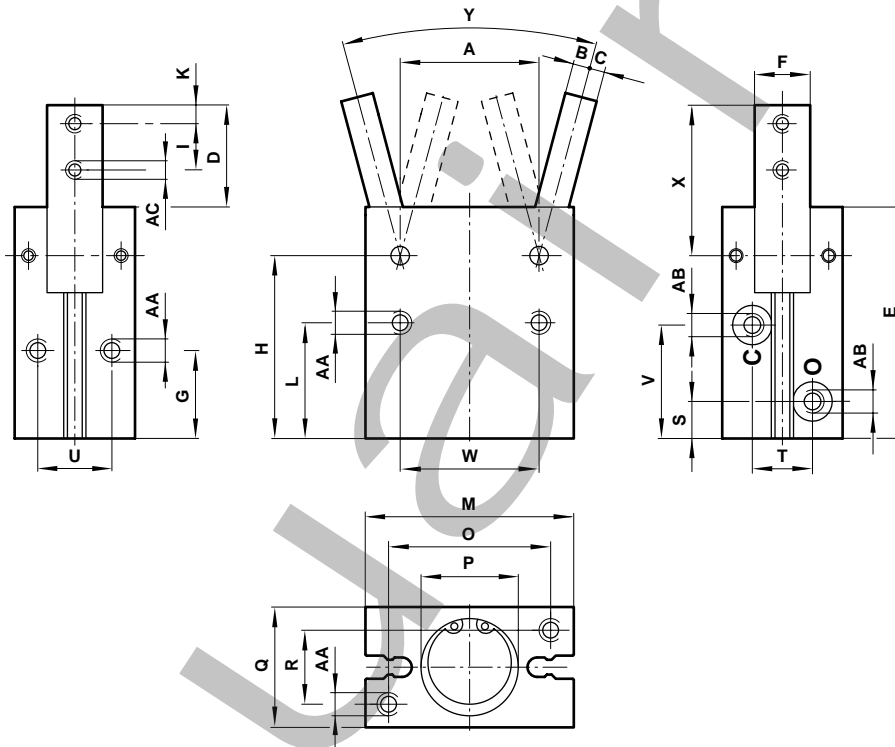
Workpiece grip point



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	Y	AA	AB	AC	kg			
M/160305/M/12	8	15	17.5	30° -10°	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	30° -10°	M3 x 0.5 deep 5	M3 x 0.5	M3 x 0.5	0.04			
M/160307/M/12	16	24	25	30° -10°	M4 x 0.7 deep 7	M5 x 0.8	M3 x 0.5	0.10			
M/160308/M/12	20	30	32.5	30° -10°	M5 x 0.8 deep 8	M5 x 0.8	M4 x 0.7	0.18			
M/160309/M/12	25	36	38.5	30° -10°	M6 x 1 deep 10	M5 x 0.8	M5 x 0.8	0.31			

Dimensions in mm

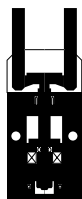
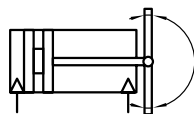


Actuators

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

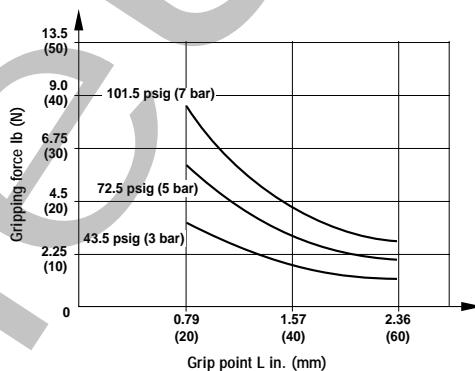
Elastomers: nitrile

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)

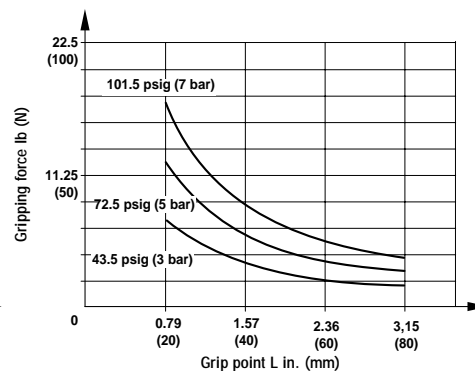
**per cycle

Theoretical closing gripping forces

M/160335/M/12

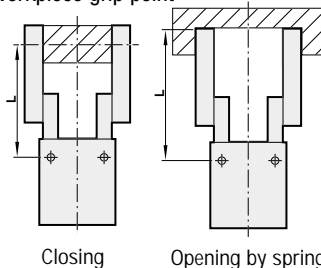


M/160336/M/12

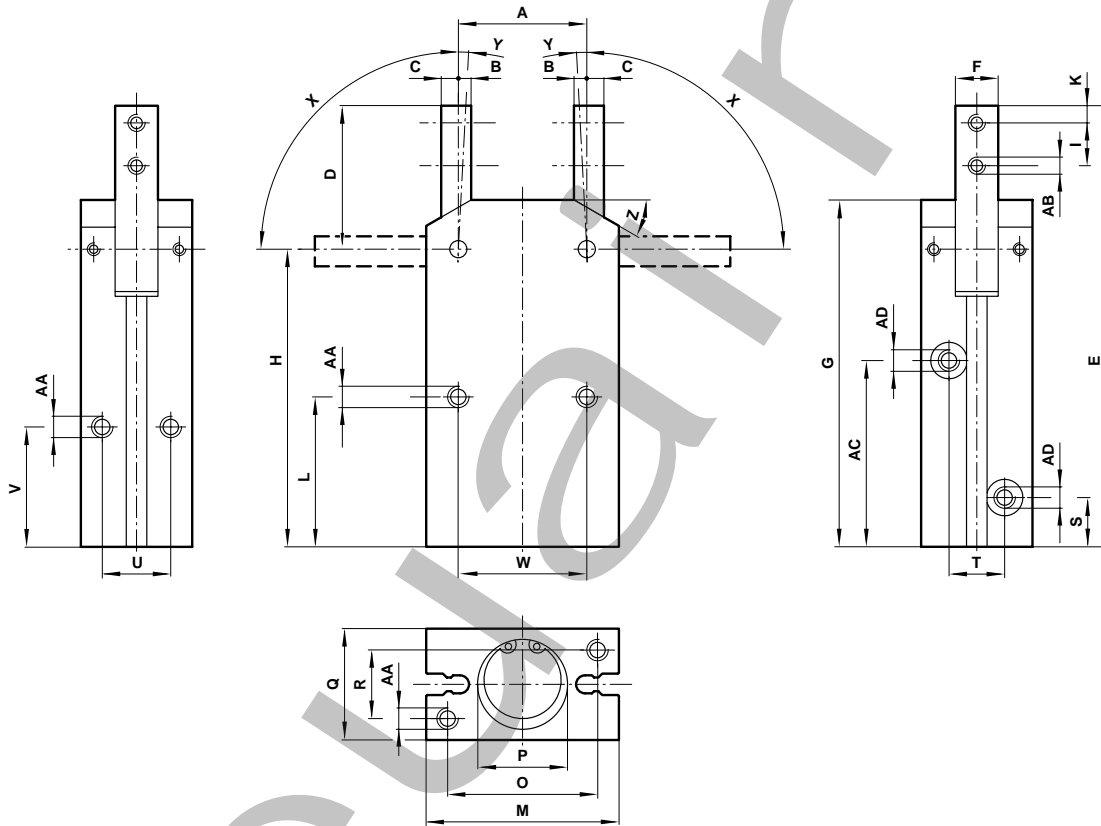


Effective closing gripping forces = Theoretical closing gripping force x 0.85

Workpiece grip point



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	

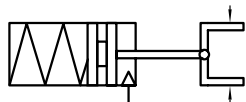
Dimensions in mm

Actuators

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

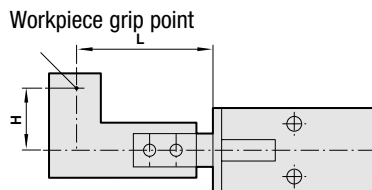
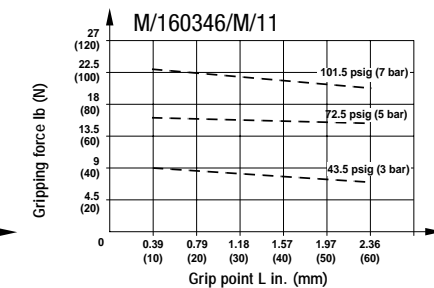
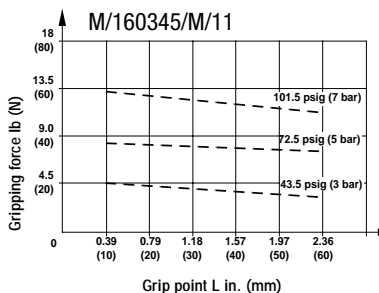
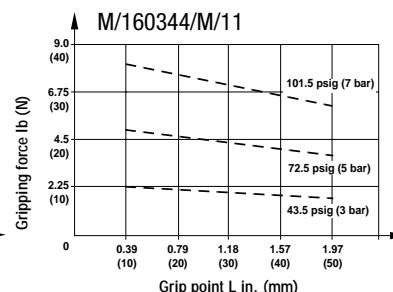
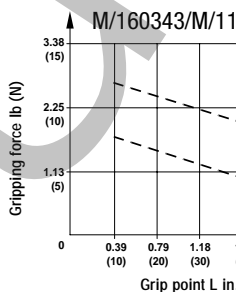
External screws: carbon steel

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.

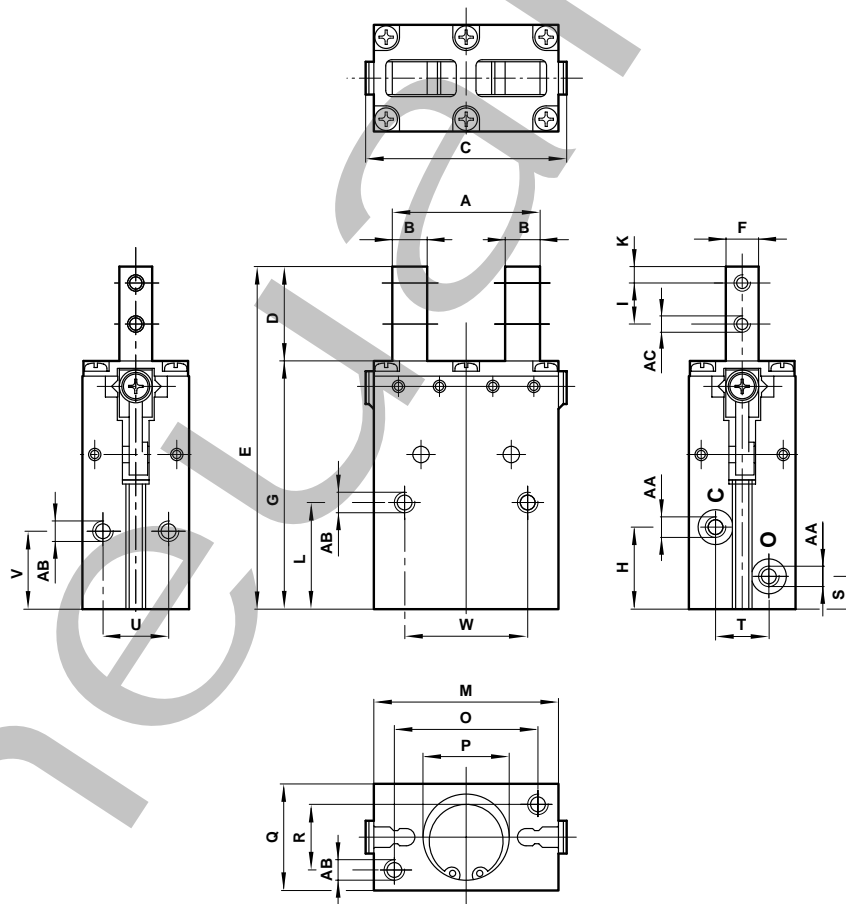
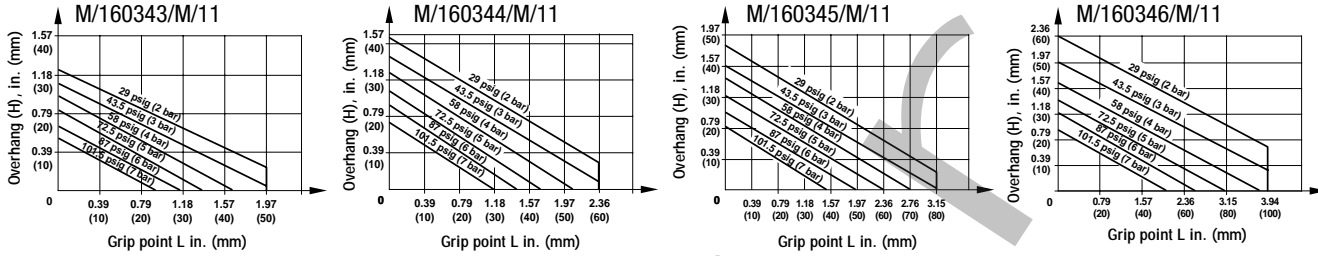
When chucking and then moving a workpiece., the workpiece may protrude or drop. Therefore workpiece weight should be less than the above mentioned value.

(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

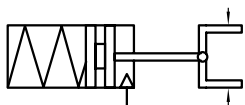
Dimensions in mm

Actuators

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

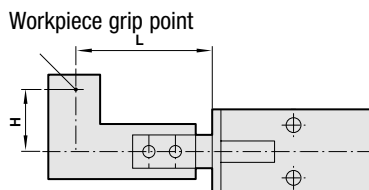
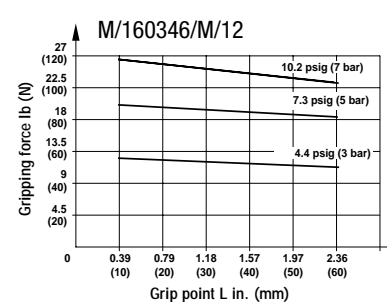
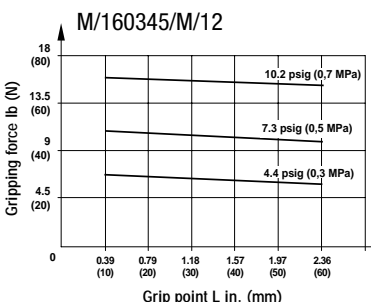
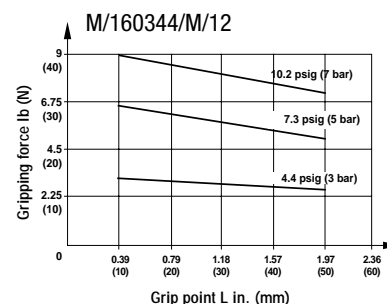
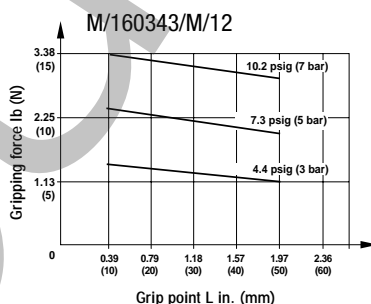
External screws: carbon steel

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.

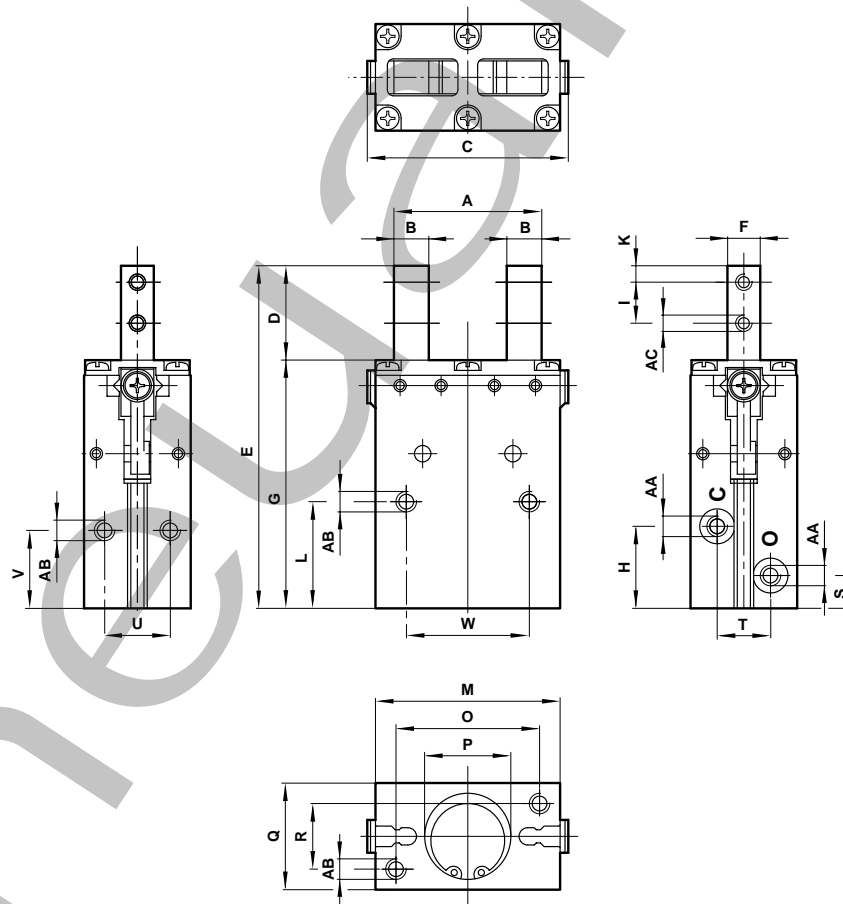
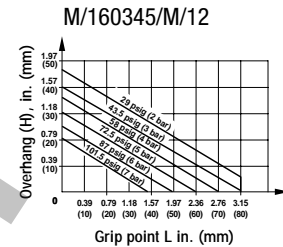
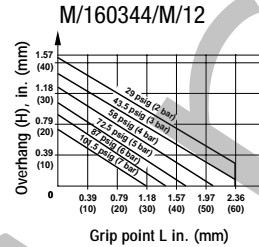
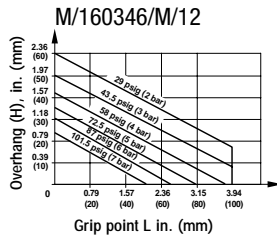
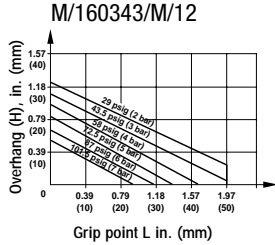
When chucking and then moving a workpiece, the workpiece may protrude or drop. Therefore, workpiece weight should be less than the above mentioned value.

(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



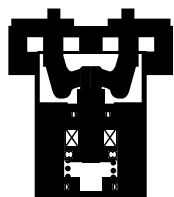
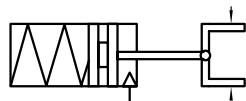
Model	Ø	A	B	C	D	E	F	G	H	I	K					
M/160343/M/11	10	17 + 1.6/-0.2 (open) 13 ± 0.4 (closed)	4.5	25 max.	16.5	59.5	5.5 - 0.03	43	15	6	3					
M/160344/M/11	16	26 + 2.3 (open) 18 + 0.6/-0.2 (closed)	6.5	37.5 max	19	71	7 - 0.03	52	17.5	8	3					
M/160345/M/11	20	36 + 1.5/-0.9 (open) 24 + 0.1/-0.9 (closed)	8.5	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

Actuators

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

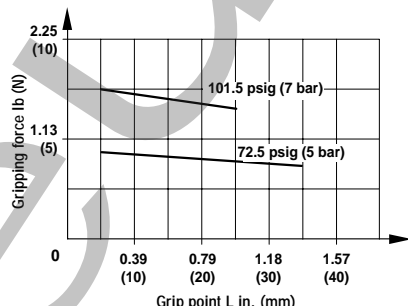
Materials
Body: aluminum alloy
Fingers: stainless steel
Guide rail: stainless steel
Elastomers: nitrile

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)

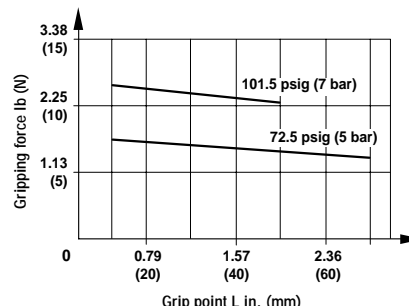
**per cycle

Theoretical closing gripping forces

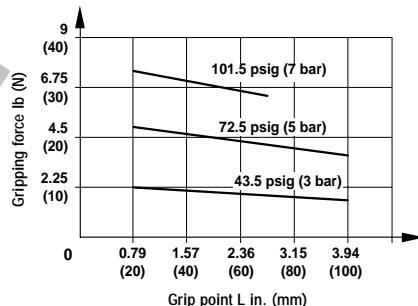
M/160354/M/11



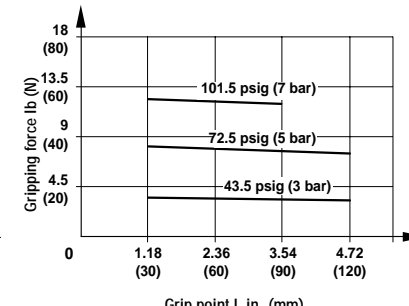
M/160355/M/11



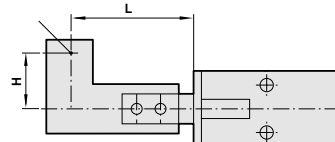
M/160356/M/11



M/160357/M/11



Workpiece grip point



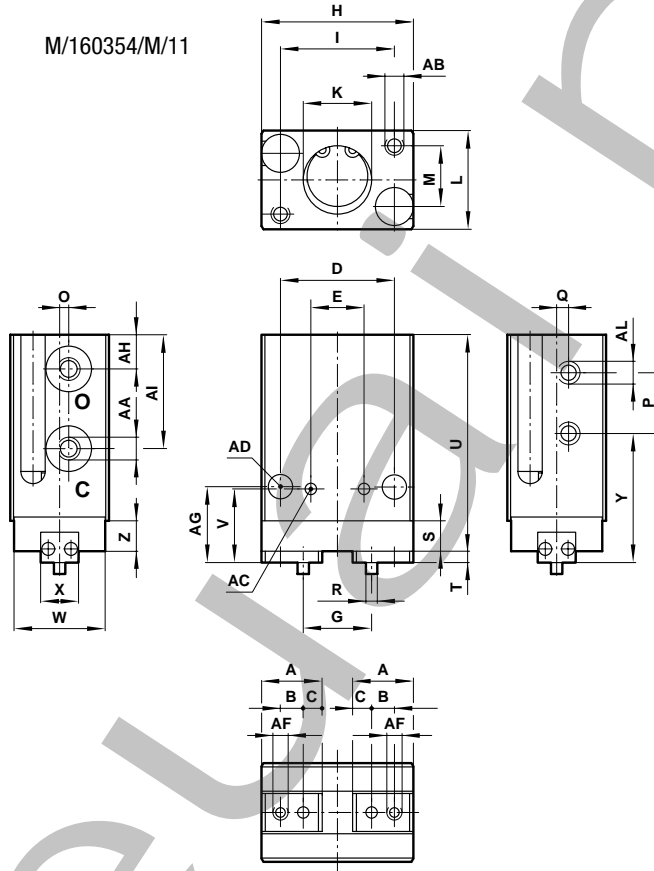
Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160350/M/11

Parallel grippers - precision, Single acting

Magnetic piston, Ø 8 ... 20 mm

M/160354/M/11



	Ø	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	Ø9 + 0.05 deep 1
	Ø	L	M	O	P	Q	R	S	T	U
M/160354/M/11	8	13 ± 0.05	9	1.2	8	1.5	Ø 1.5 -0.03	4	1.5	28.5
	Ø	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	Ø 1.5 + 0.02 deep 1	Ø 3.2
	Ø	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			

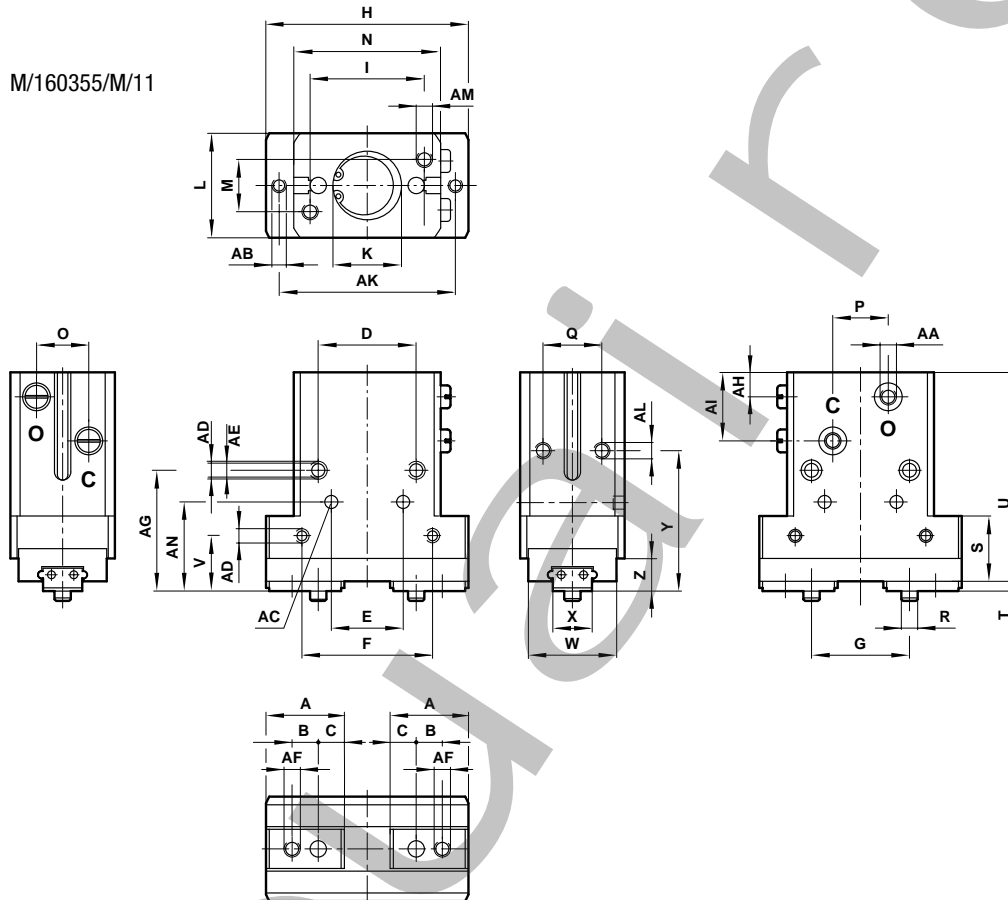
Dimensions in mm



Actuators

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

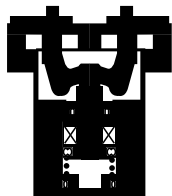
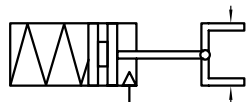
Dimensions in mm

ACT-164

Actuators

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

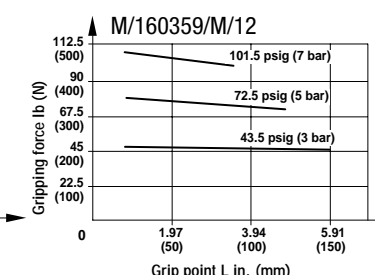
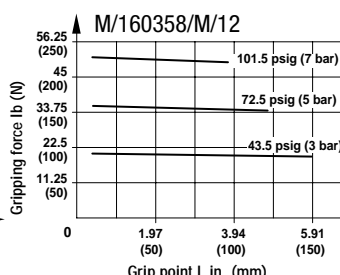
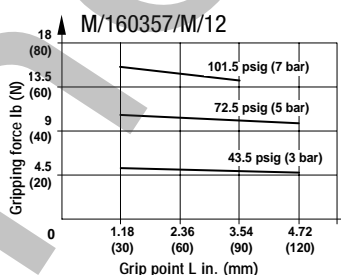
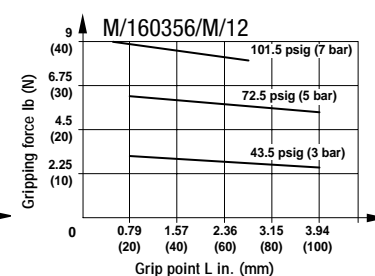
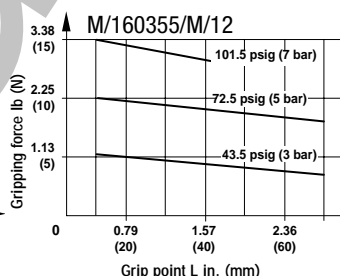
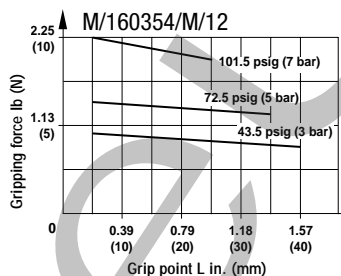
Guide rail: stainless steel

Elastomers: nitrile

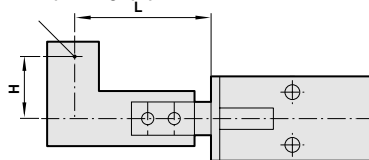
Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Minimum operating pressure in psig (bar)	Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing		
M/160354/M/12	2.23 (9.9)	1.31 (5.8)	31.9 (2.2)	0.009 (0.15)
M/160355/M/12	3.38 (15)	2.12 (9.4)	29 (2)	0.025 (0.41)
M/160356/M/12	8.78 (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



Workpiece grip point

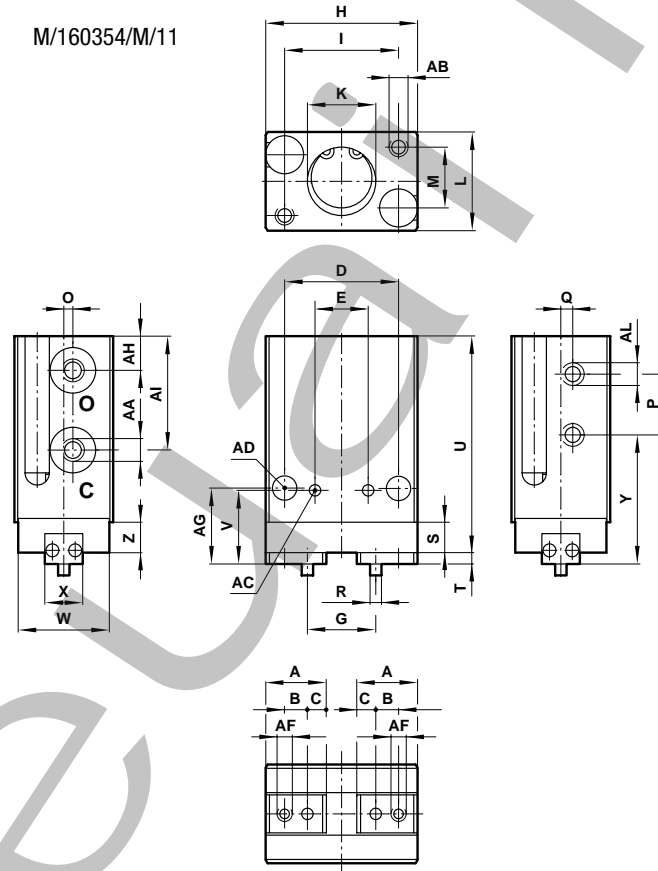


Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160350/M/12

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

M/160354/M/11



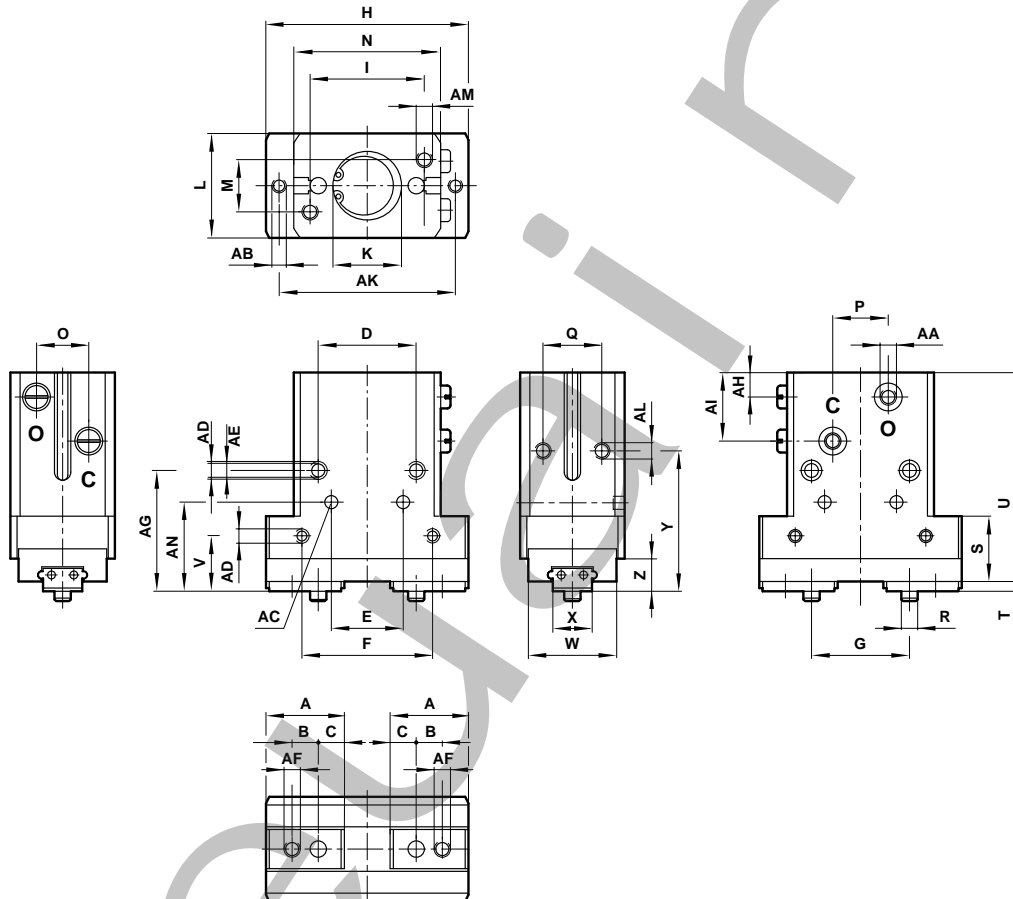
	\varnothing	A	B	C	D	E	G	H	I	K
M/160354/M/11	8	8	3	2.5	15	7 ± 0.03	$9 + 1.5$ (open) $5 + 0.5$ (closed)	20	15	$\varnothing 9 + 0.05$ deep 1
M/160354/M/11	8	13 ± 0.05	9	1.2	8	1.5	$\varnothing 1.5 - 0.03$	4	1.5	28.5
	\varnothing	V	W	X	Y	Z	AA	AB	AC	AD
M/160354/M/11	8	9.7	12	5 ± 0.025	17	4	M3 x 0.5	M2.5 x 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

Actuators

M/160350/M/12

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



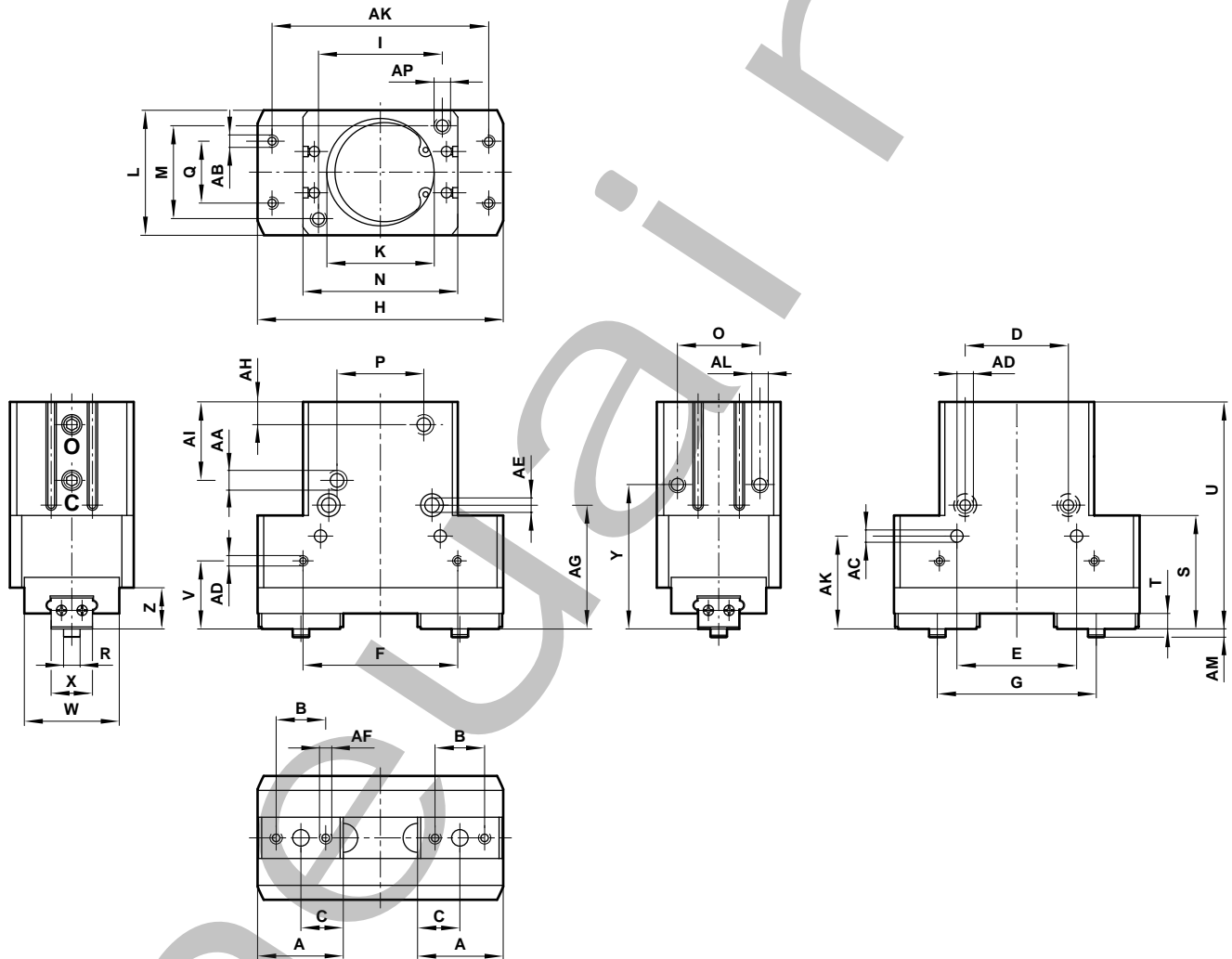
Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160355/M/11	10	14.7	5	4.5	17	12 ± 0.03	20	15.5 + 1.5 (open) 9 + 0.5 (closed)	36	17	Ø 11 + 0.05 deep 1.5
M/160356/M/11	16	20	8	6	24	16 ± 0.03	30	22 + 1.8 (open) 12 + 1.3 (closed)	50	26	Ø 17 + 0.05 deep 1.5
M/160357/M/11	20	24	8	8	30	22 ± 0.03	40	30 + 2.4/-0.5 (open) 16 + 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

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/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	Ø 52 + 0.05 deep 3
Model	Ø	L	M	N	O	P	Q	R	S	T	U		
M/160359/M/12	50	60 ± 0.05	45	75	40	42	30	Ø 8 - 002	55	7.5	110		
Model	Ø	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	Ø 6 + 003 deep 7	M8 x 1.25 deep 12	Ø 11 deep 6..5		
Model	Ø	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	

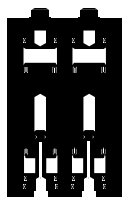
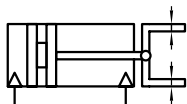
Dimensions in mm

Actuators

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

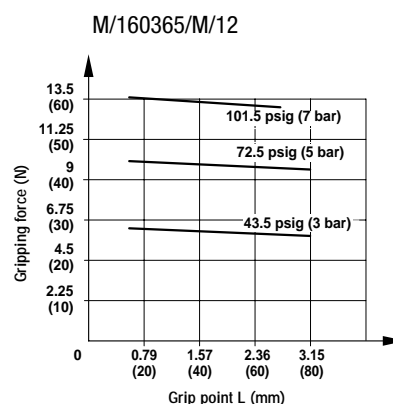
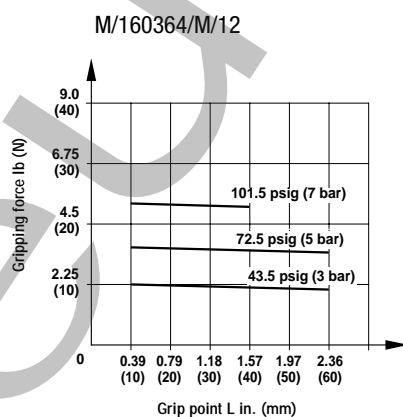
M3 x 1/8" tube ID, straight barb, part number 29217X303

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

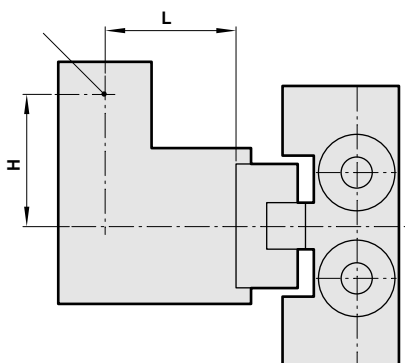
Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160364/M/12	3.76 (16.7)	3.76 (16.7)	0.084 (1.4)
M/160365/M/12	9.90 (44)	9.90 (44)	0.258 (4.3)

**per cycle

Theoretical gripping forces



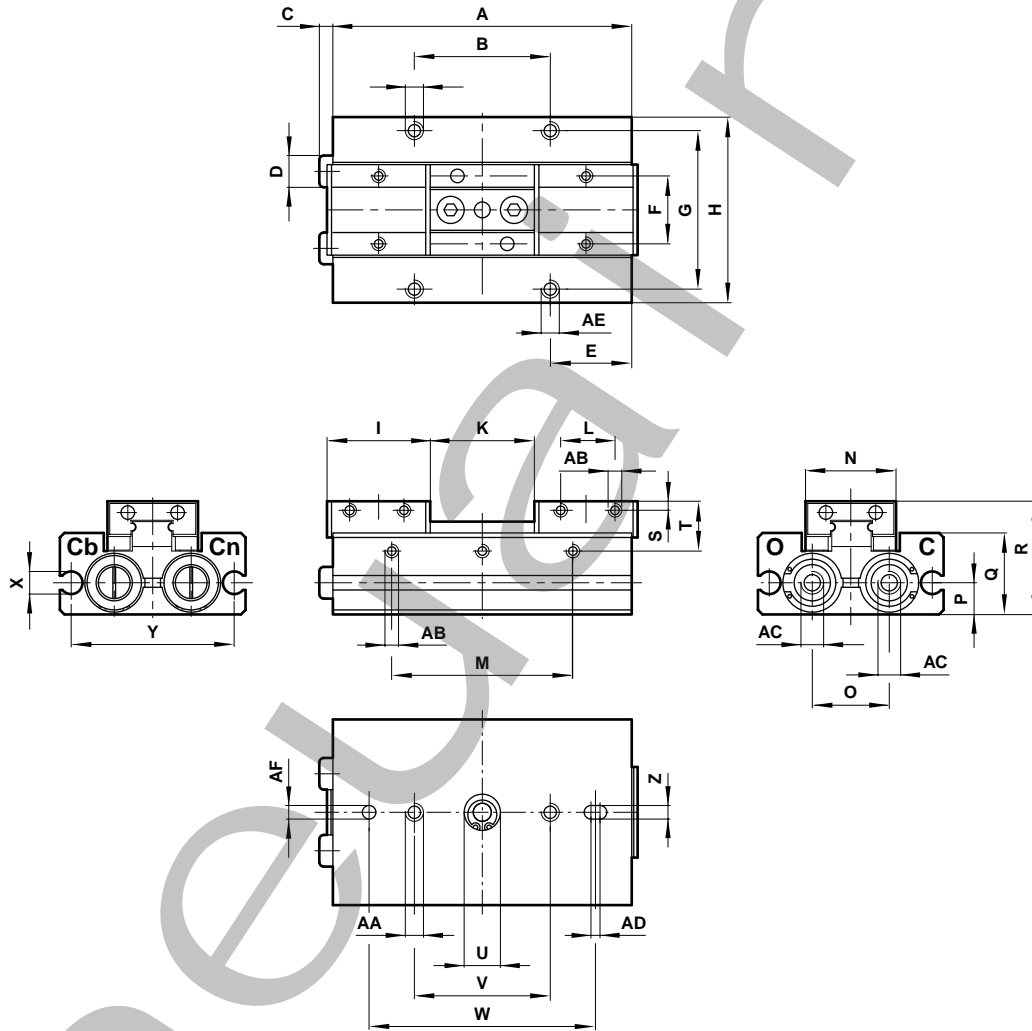
Workpiece grip point



M/160360/M/12

Parallel grippers - low profile, Double acting

Magnetic piston, Ø 8 ... 12 mm



Model	Ø	A	B	C	D	E	F	G	H	I	K
M/160364/M/12	8	52	32	2.5	Ø 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	Ø 7	11.4	15	35	41	22.8	23 +1.9/-0.5 (open) 1 +0.9/-1.0 (closed)
Model	Ø	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	Ø 8 + 0.05 deep 1
M/160365/M/12	12	12	40	20	17	7	18	25	2	11	Ø 8 + 0.05 deep 1
Model	Ø	V	W	X	Y	Z	AA	AB	AC	AD	AE
M/160364/M/12	8	24	40	Ø 5	27	2.5 + 0.03 deep 2.5	M3 x 0.5 deep 5	M2.5 x 0.45 deep 3	M3 x 0.5	2	M3 x 0.5 deep 5
M/160365/M/12	12	30	50	Ø 5	36	3 + 0.03 deep 3	M4 x 0.7 deep 8	M3 x 0.5 deep 3	M5 x 0.8	2	M4 x 0.7 deep 6
Model	Ø	AF	AG	kg							
M/160364/M/12	8	Ø 2.5 + 0.03 deep 2.5	M3 x 0.5 deep 5	0.09							
M/160365/M/12	12	Ø 3 + 0.03 deep 3	M3 x 0.5 deep 5	0.2							

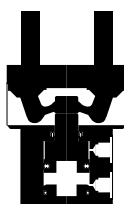
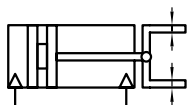
Dimensions in mm

Actuators

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

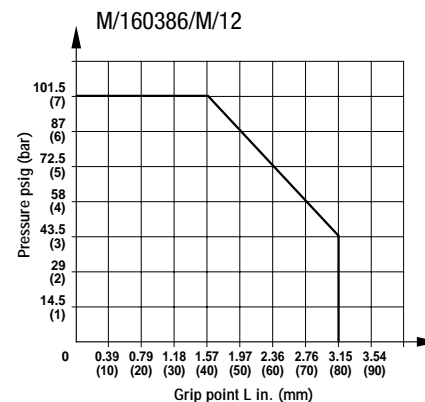
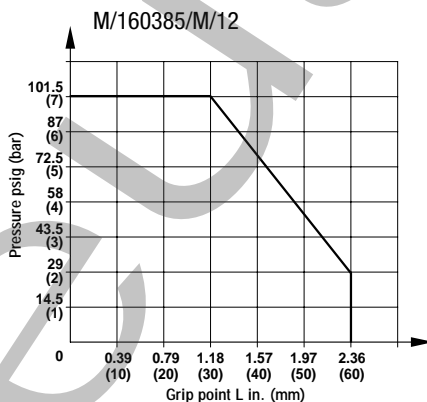
M3 x 1/8" tube ID, straight barb, part number 29217X303

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

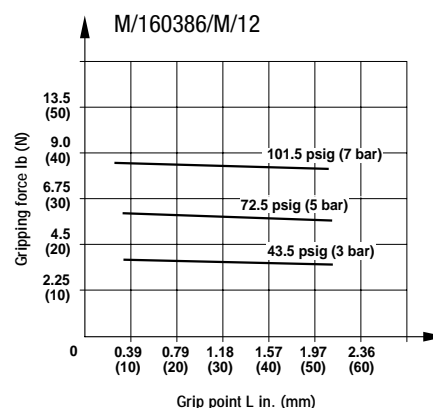
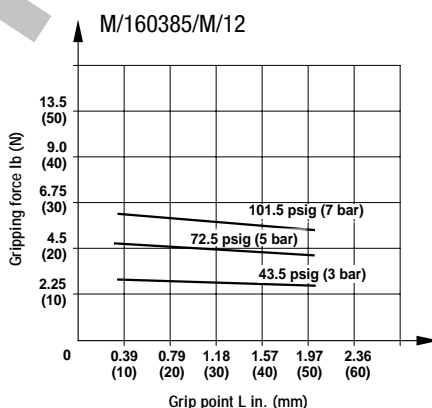
Model	Effective gripping force lb (N) at 72.5 psig (5 bar)		Air consumption in3 (cm3) at 72.5 psig (5 bar)**
	Opening	Closing	
M/160385/M/12	6.08 (27)	4.50 (20)	0.08 (1.4)
M/160386/M/12	8.10 (36)	6.08 (27)	0.20 (3.3)

**per cycle

Grip point limitation range



Theoretical closing gripping forces



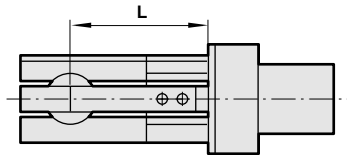
Effective closing gripping forces = Theoretical closing gripping force x 0.85

M/160380/M/12

Parallel grippers - three jaw, Double acting

Magnetic piston, Ø 16 ... 20 mm

Workpiece grip point

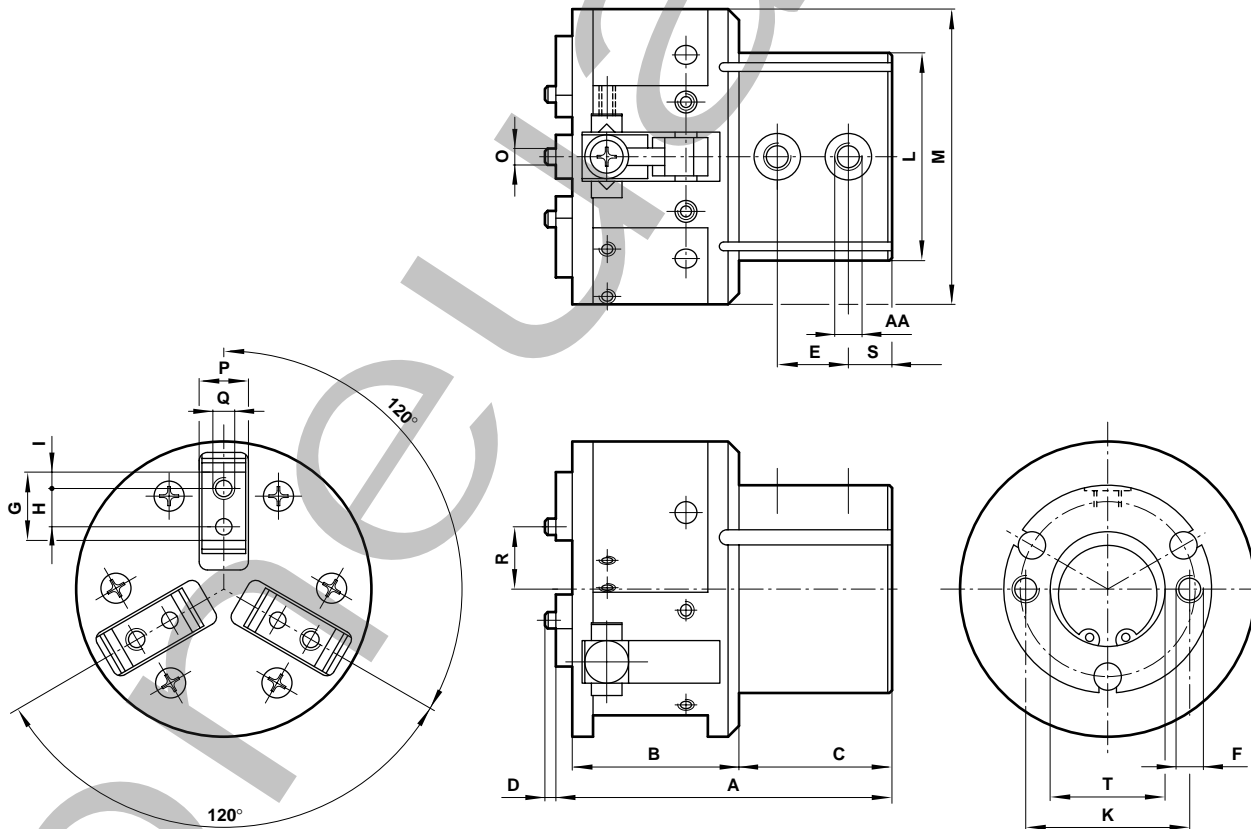


Criteria of workpiece weight

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

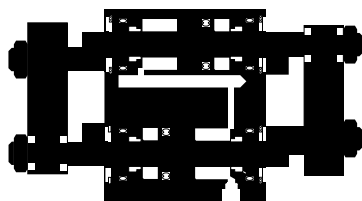
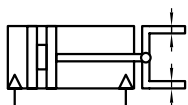
Dimensions in mm

Actuators

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

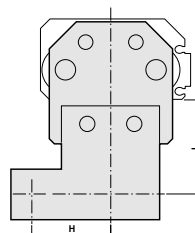
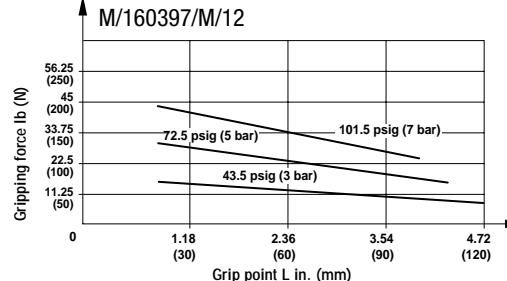
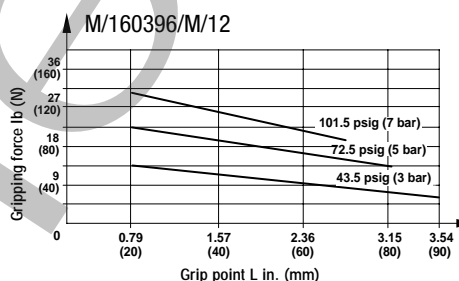
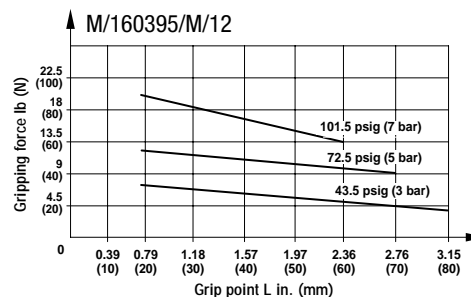
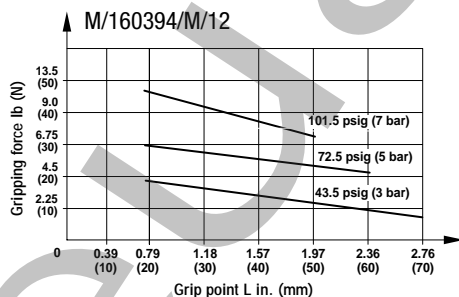
M3 x 1/8" tube ID, straight barb, part number 29217X303

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

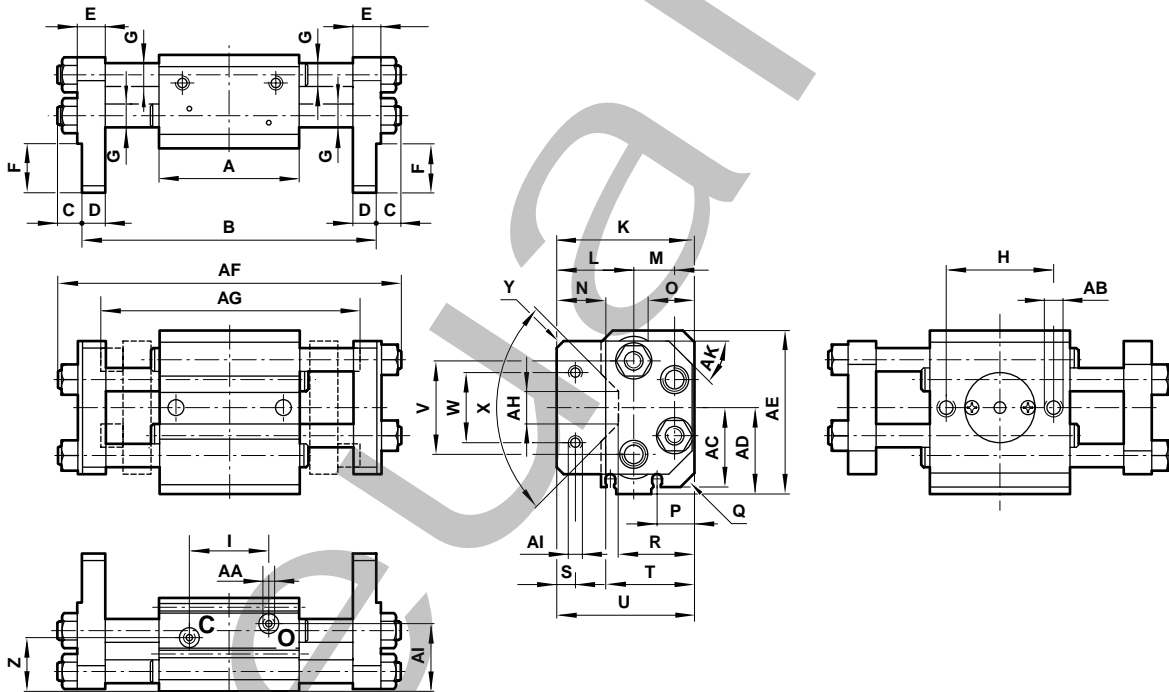
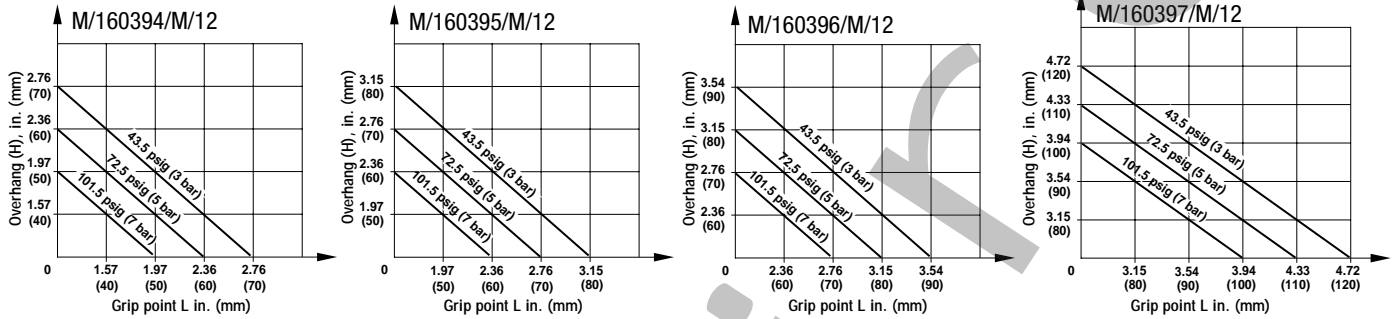
Effective gripping forces



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