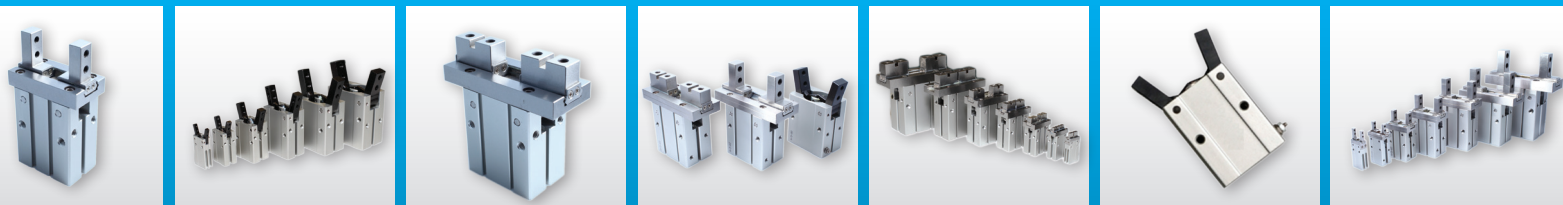


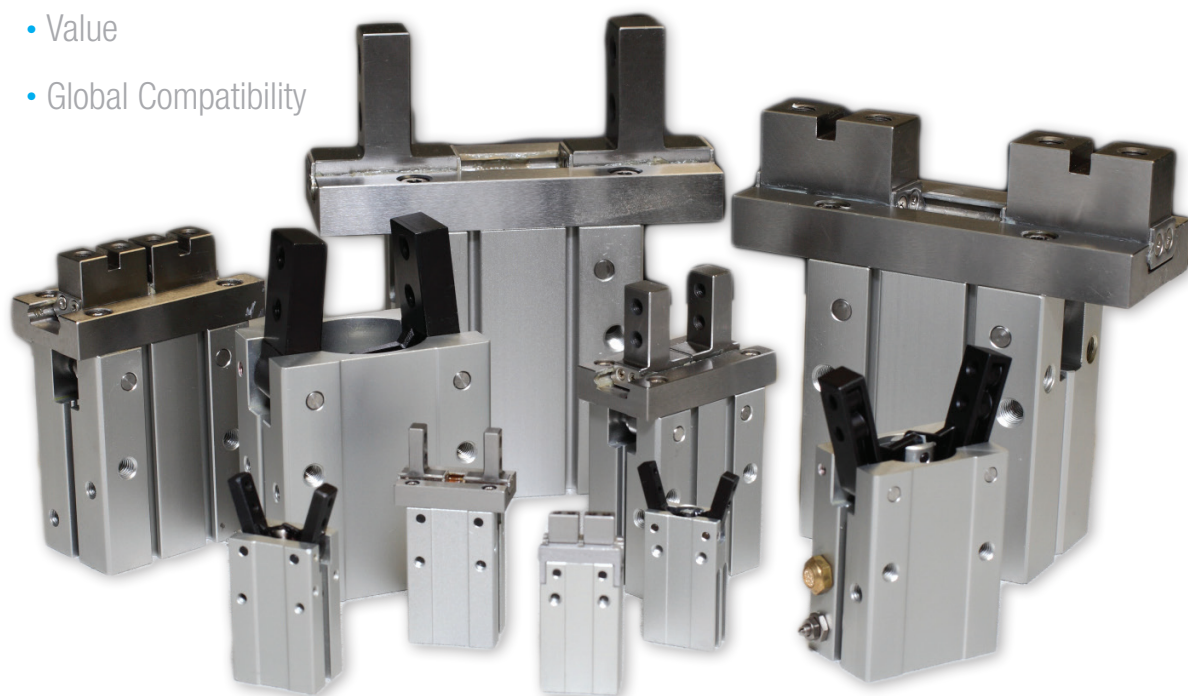


Parallel and Angular Grippers



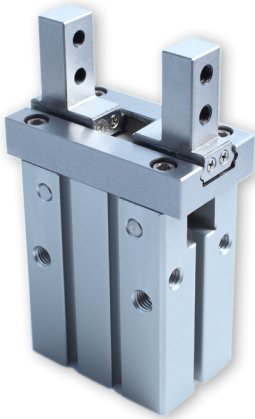
Setting a new standard for:

- Quality
- Reliability
- Value
- Global Compatibility



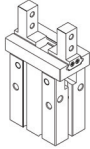
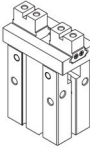
Parallel Grippers

How to Order MHFZ20 - F



MODEL
MHFZ - Double Acting
MHFSZ - Single Acting, Normally Closed
MHFTZ - Single Acting, Normally Open

BORE SIZE
06 - 6mm
10 - 10mm
16 - 16mm
20 - 20mm
25 - 25mm
32 - 32mm
40 - 40mm

FINGER STYLE
Blank - Standard

F - Bottom


Engineering Specifications

Bore Size (mm)			6	10	16	20	25	32	40
Fluid			Air (Clean/Dry)						
Pressure Range	Double Acting	6mm, 10mm	0.2 to 0.7 MPa (28 to 100 PSI)						
		16mm to 40mm	0.1 to 0.7 MPa (15 to 100 PSI)						
	Single Acting	6mm, 10mm	0.35 to 0.7 MPa (50 to 100 PSI)						
		16mm to 40mm	0.25 to 0.7 MPa (36 to 100 PSI)						
Temperature Range			-4 to 160° F (-20 to 70° C)						
Lubrication			Not Required						
Repeatability			±0.01mm					±0.02mm	
Maximum Frequency			180 Cycles/Min					60 Cycles/Min	
Port Size			M3x0.5		M5x0.8				
Sensor Switches			MCS1-H	MCS1-G	MCS1-G, MCS1-H, MDS1-G, MDS1-H				
			MDS1-H	MDS1-G					

Gripping Force and Stroke

Model		Double Acting (MHFZ)						
Bore Size (mm)		6	10	16	20	25	32	40
Gripping Force ¹ , F _g (N)	Closing ²	3.3	11	34	45	69	160	255
	Opening ²	6.1	17	45	68	102	195	320
Closing/Opening Stroke (mm)		4	4	6	10	14	22	30
Weight (g)	Standard	25	56	124	236	428	729	1268
	Bottom	24	56	124	236	418	750	1340

Model		Single Acting Normally Open (MHFTZ)						
Bore Size (mm)		6	10	16	20	25	32	40
Gripping Force ¹ , F _g (N)	Closing ²	1.9	7	27	35	55	133	220
	Opening ²	--	--	--	--	--	--	--
Closing/Opening Stroke (mm)		4	4	6	10	14	22	30
Weight (g)	Standard	26	57	125	238	430	778	1365
	Bottom	25	57	125	238	420	799	1437

Model		Single Acting Normally Closed (MHFSZ)						
Bore Size (mm)		6	10	16	20	25	32	40
Gripping Force ¹ , F _g (N)	Closing ²	--	--	--	--	--	--	--
	Opening ²	3.7	13	38	59	87	163	270
Closing/Opening Stroke (mm)		4	4	6	10	14	22	30
Weight (g)	Standard	26	57	125	238	430	778	1365
	Bottom	25	57	125	238	420	799	1437

¹ Gripping force, F, measured with an operating pressure of 0.5MPa (72.5 PSI) at a gripping point of 20mm. See figure 1 on page 7. Contact MFD for more information.

² See figure 2 on page 7.

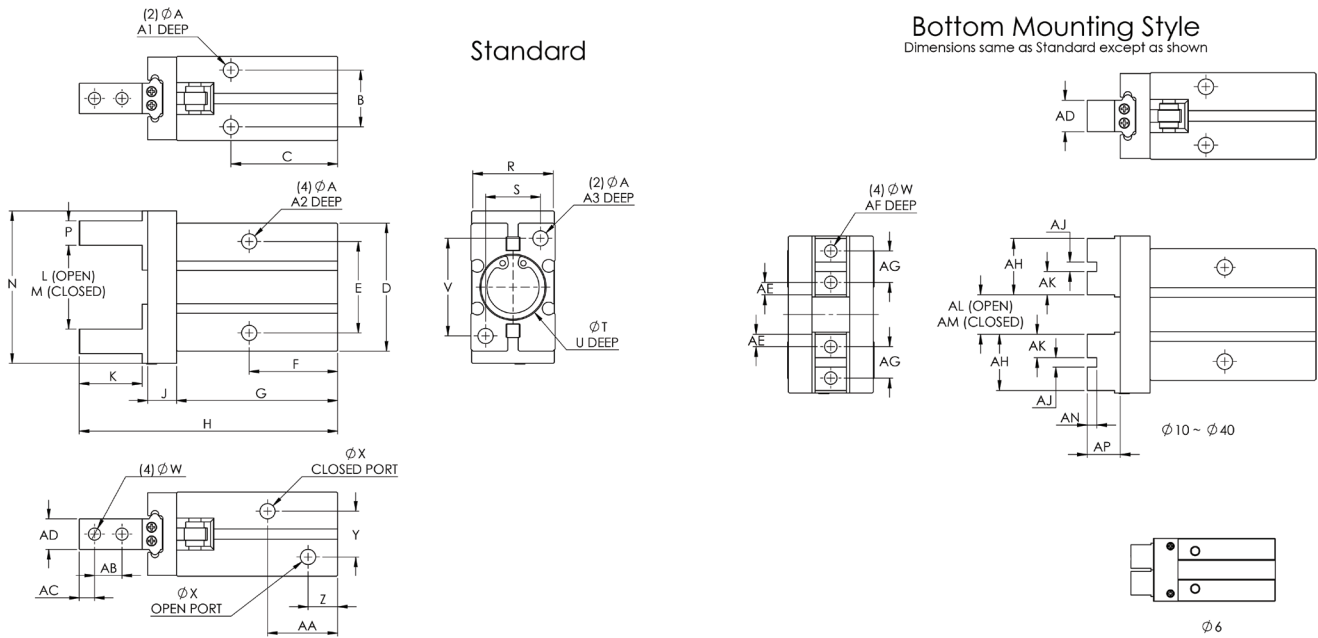
1 MPa = 145.04 PSI

1 N = 0.225 lbf

1 lb = 453.6 g

Parallel Grippers

Dimensions (mm)



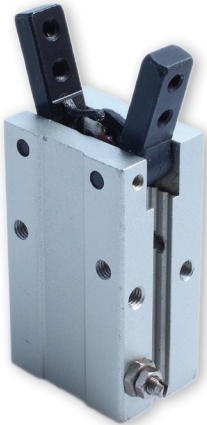
BORE SIZE (mm)	A	A1	A2	A3	B	C	D	E	F	G	H	J	K	L
6	M3 X 0.5	--	--	--	--	--	20	12	25.5	31	53	7.9	11	12 +/-1
10	M3 X 0.5	6	5.5	6	11.4	27	23	16	23	37.6	57	6	12	15.2 +2/-0
16	M4 X 0.7	4.5	8	8	16	30	30.6	24	24.5	42.5	67.3	7.5	15	20.9 +2/-0
20	M5 X 0.8	8	10	10	18.6	35	42	30	29	52.8	84.7	9.5	20	26.3 +2/-0
25	M6 X 1.0	10	12	12	22	36.5	52	36	30	63.6	102.7	11	25	33.3 +2.5/-0
32	M6 X 1.0	13	10	13	26	48 (DA*) 57 (SA**)	60	46	40 (DA*) 49 (SA**)	67 (DA*) 76 (SA**)	113 (DA*) 122 (SA**)	12	29	48 +2.5/-0
40	M8 X 1.25	13	16	17	32	58 (DA*) 71 (SA**)	72	56	49 (DA*) 62 (SA**)	83 (DA*) 96 (SA**)	139 (DA*) 152 (SA**)	15	36	60 +2.5/-0

BORE SIZE (mm)	M	N	P	R	S	T	U	V	W	X	Y	Z	AA
6	8 +0/-0.4	20	4 +0/-0.05	10 +/-0.05	--	7 +0.05/-0	1.5	--	M2 X 0.4	M3 X 0.5	1.6	5.5	19
10	11.2 +0/-0.7	29	4 +0/-0.05	16.4	12	11 +0.05/-0	2	18	M2.5 X 0.45	M3 X 0.5	10	7.5	19
16	14.9 +0/-0.7	38	5 +0/-0.05	23.6	15	17 +0.05/-0	2	22	M3 X 0.5	M5 X 0.8	13	7.5	19
20	16.3 +0/-0.7	50	8 +0/-0.05	27.6	18	21 +0.05/-0	3	32	M4 X 0.7	M5 X 0.8	15	9.7	23
25	19.3 +0/-0.8	63	10 +0/-0.05	33.6	22	26 +0.05/-0	3.5	40	M5 X 0.8	M5 X 0.8	20	10	23.8
32	26 +0/-0.5	97	12 +0/-0.05	40	26	34 +0.05/-0	4	46	M6 X 1.0	M5 X 0.8	24	11	31 (DA*) 40 (SA**)
40	30 +0/-0.5	119	14 +0/-0.05	48	32	42 +0.05/-0	4	56	M8 X 1.25	M5 X 0.8	28	12	38 (DA*) 50 (SA**)

BORE SIZE (mm)	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN	AP
6	5	2.5	4 +0/-0.05	2	3	3.5	7.5	--	--	5 +1.2/-0.8	1 +0.2/-0	--	7.2
10	5.7	3	5 +0/-0.05	2.45	4	6	10.9	2 +0.025/-0	4.45	5.4 +2.2/-0	1.4 +0/-0.2	2	5.2
16	7	4	8 +0/-0.05	3.05	6	8	14.1	2.5 +0.025/-0	5.8	7.4 +2.2/-0	1.4 +0/-0.2	2.5	8.3
20	9	5	10 +0/-0.05	3.95	8	10	17.9	3 +0.025/-0	7.45	11.6 +2.3/-0	1.4 +0/-0.2	3	10.5
25	12	6	12 +0/-0.05	4.9	10	12	21.8	4 +0.030/-0	8.9	16 +2.5/-0	1.8 +0/-0.2	4	13.1
32	14	7	15 +0/-0.05	7.3	12	20	34.6	5 +0.030/-0	14.8	25 +2.7/-0	3 +0/-0.2	5	18
40	17	9	18 +0/-0.05	8.7	16	24	41.4	6 +0.030/-0	17.7	33 +2.9/-0	3 +0/-0.2	6	22

*Double Acting **Single Acting

Angular Grippers



How to Order

MH FY20

MODEL	BORE SIZE
MH FY - Double Acting	06 - 6mm
MH FY - Single Acting, Normally Open	10 - 10mm
	16 - 16mm
	20 - 20mm
	25 - 25mm
	32 - 32mm

Engineering Specifications

Bore Size (mm)			6	10	16	20	25	32
Fluid			Air (Clean/Dry)					
Pressure Range	Double Acting	6mm	0.15 to 0.7 MPa (22 to 100 PSI)					
		10mm to 32mm	0.1 to 0.7 MPa (15 to 100 PSI)					
	Single Acting	6mm	0.3 to 0.7 MPa (45 to 100 PSI)					
		10mm to 32mm	0.25 to 0.7 MPa (36 to 100 PSI)					
Temperature Range			-4 to 160° F (-20 to 70° C)					
Lubrication			Not Required					
Cushion Type			Bumper					
Integrated Flow Control			Not Available	Standard - Flow Control in Closing Direction				
Maximum Frequency			180 cycles per minute					
Port Size			M3x0.5		M5x0.8			
Sensor Switches			MCS1-H	MCS1-G, MDS1-G				
			MDS1-H					

Gripping Force and Stroke

Model		Double Acting (MHFY)					
Bore Size (mm)		6	10	16	20	25	32
Gripping Moment ¹ , M _g (N-cm)	Closing ²	7.4 x P	17.6 x P	90 x P	152 x P	304 x P	637 x P
	Opening ²	10.6 x P	29.4 x P	129 x P	252 x P	473 x P	904 x P
Maximum Recommended Length to Gripping Point ³ (mm)		30	30	40	60	70	85
Opening Angle ²		30° +3/-0					
Closing Angle ²		10° +0/-3					

Model		Single Acting Normally Open (MHFY)					
Bore Size (mm)		6	10	16	20	25	32
Gripping Moment ¹ , M _g (N-cm)	Closing ²	5.7 x P	11.8 x P	71.2 x P	122.4 x P	252 x P	589 x P
	Opening ²	--	--	--	--	--	--
Maximum Recommended Length to Gripping Point ³ (mm)		30	30	40	60	70	85
Opening Angle ²		30° +3/-0					
Closing Angle ²		10° +0/-3					

Note: P = Operating Pressure (MPa)

¹ See figure 3 on page 7.

² See figure 4 on page 7.

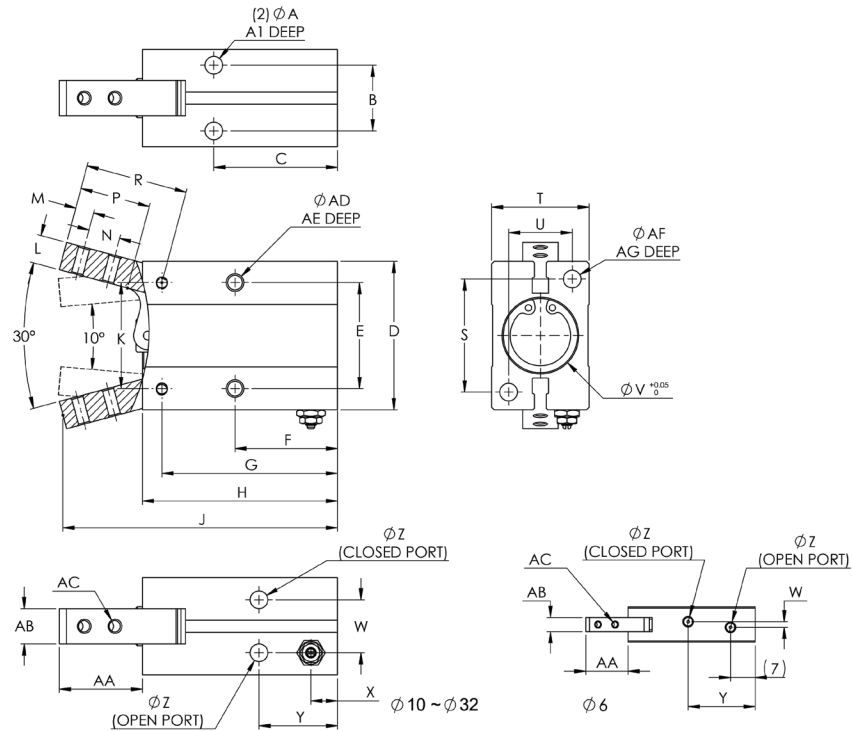
³ See figure 5 on page 7.

1 MPa = 145.04 PSI

1 N-cm = 0.089 lb-in

Angular Grippers

Dimensions (mm)



BORE SIZE (mm)	A	A1	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
6	--	--	--	--	20	12	26	32	36	47.5	14	4	2.5	5	11	16	--
10	M3 X 0.5	6	11.4	27	23	16	23	35.8	38.6	52.4	14	4	3	5.7	12	17.2	18
16	M4 X 0.7	8	16	30	30.6	24	24.5	39.7	44.6	62.6	24	7	4	7	16	23.6	22
20	M5 X 0.8	10	18.6	35	42	30	29	49.7	55.2	77.7	30	8	5.2	9	20	29	32
25	M6 X 1.0	10	22	36.5	52	36	30	54.8	60.4	92	36	10	8	12	27	38.5	40
32	M6 X 1.0	10	26	30	60	44	37.5	58	68	96.5	42	10	6	14	27	40	46

BORE SIZE (mm)	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
6	10	--	7	1.6	7	19	M3 X 0.5	11.9	4	M2 X 0.4	M3 X 0.5	--	--	--
10	16.4	12	11	10.2	6.5	18.8	M3 X 0.5	14.3	6.4	M2.5 X 0.45	M3 X 0.5	5	M3 X 0.5	6
16	23.6	15	17	13	7	18.3	M5 X 0.8	18.8	8	M3 X 0.5	M4 X 0.7	8	M4 X 0.7	8
20	27.6	18	21	15	7.5	22.2	M5 X 0.8	23.5	10	M4 X 0.7	M5 X 0.8	10	M5 X 0.8	10
25	33.6	22	26	20	7.7	23.5	M5 X 0.8	32.8	12	M5 X 0.8	M6 X 1.0	12	M6 X 1.0	12
32	40	26	34	24	9.2	31	M5 X 0.8	29.7	18	M6 X 1.0	M6 X 1.0	16	M6 X 1.0	12

Accessories

Track-Mounted Switch

How to Order

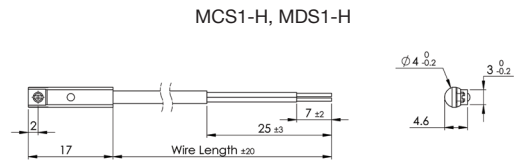
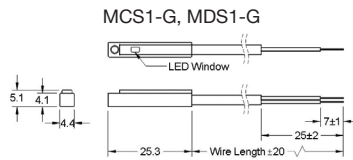
Two-Wire Reed Switches	
Model Number	Description
MCS1-G-050	2-wire reed switch; 5 meter leads
MCS1-G-C08	2-wire reed switch; M8 male quick-connect; 150mm wire length
MCS1-G-C12	2-wire reed switch; M12 male quick-connect; 150mm wire length
MCS1-H-010	2-wire reed switch; 1 meter leads

Three-Wire Solid State Switches	
Model Number	Description
MDS1-HN-050	3-wire solid state switch; 5 meter leads; NPN (sinking)
MDS1-HP-050	3-wire solid state switch; 5 meter leads; PNP (sourcing)
MDS1-GN-050	3-wire solid state switch; 5 meter leads; NPN (sinking)
MDS1-GN-C08	3-wire solid state switch; M8 male quick-connect; 150mm wire length; NPN (sinking)
MDS1-GN-C12	3-wire solid state switch; M12 male quick-connect; 150mm wire length; NPN (sinking)
MDS1-GP-050	3-wire solid state switch; 5 meter leads; PNP (sourcing)
MDS1-GP-C08	3-wire solid state switch; M8 male quick-connect; 150mm wire length; PNP (sourcing)
MDS1-GP-C12	3-wire solid state switch; M12 male quick-connect; 150mm wire length; PNP (sourcing)

Specifications

Item/Type	MCS1-G	MCS1-H	MDS1-GN	MDS1-GP	MDS1-HN	MDS1-HP
Switch Logic	SPST Normally Open		Transistor without contact, Normally Open Type			
Sensor Type	Reed Switch with Contact		NPN Type	PNP Type	NPN Type	PNP Type
Operating Voltage (V)	5-240V AC/DC	5-120V AC/DC	5-30V DC			
Max. Switching Current (mA)	100	50	200			
Switching Rating (W)	10 Max.	6 Max.	6 Max.			
Current Consumption	-	-	15mA Max. @ 24V			
Voltage Drop	2.5V Max @ 100mA DC	3.0V Max	0.5V Max. @ 200mA DC			
Cable	Ø2.8, 2C, Gray Oil Resistant PVC (Flame Retardant)	Ø2.8, Polyurethane	Ø3.3, 3C, Black Oil Resistant PVC			
Indicator	Red LED					
Leakage Current	-	-	0.01mA Max.			
Sensitivity (Gauss)	60-75	40	60-75			
Max. Frequency (Hz)	200		1000			
Shock (m/s²)	300		500			
Vibration (m/s²)	90					
Temperature Range (°C)	-10 to 70					
Enclosure Classification	IP67 (NEMA6)					
Protection Circuit	None		Power Reverse Polarity, Surge Suppression			

Dimensions (mm)



Wiring Diagrams

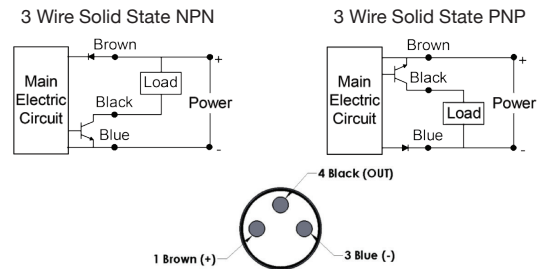
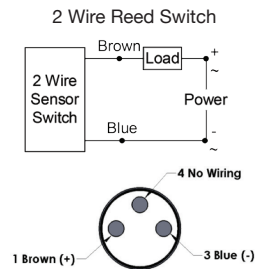


Figure 1

Parallel Grippers
Gripping Force and Point

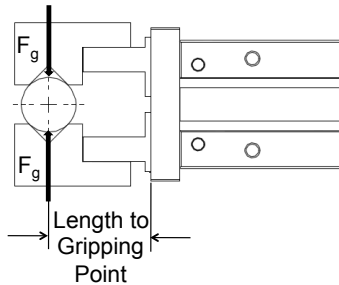


Figure 2

Parallel Grippers
Gripping Direction

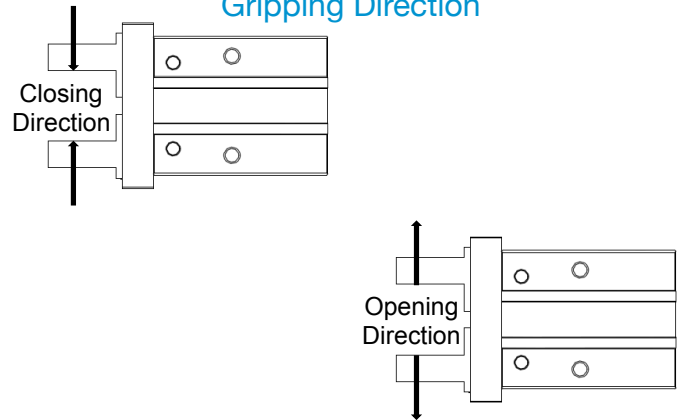


Figure 3

Angular Grippers
Gripping Moment

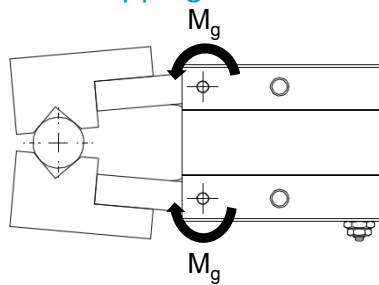


Figure 4

Angular Grippers
Opening and Closing Angles

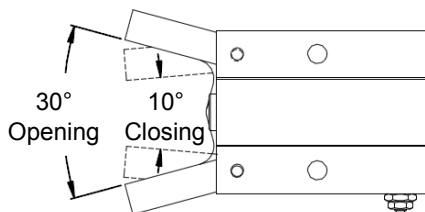
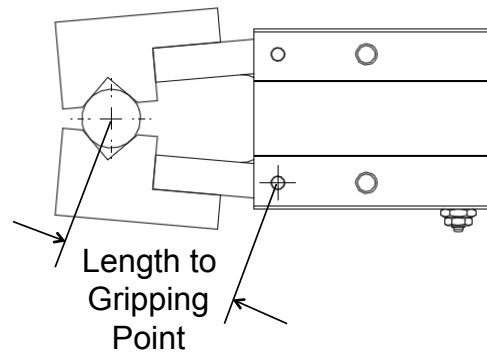


Figure 5

Angular Grippers
Gripping Point



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