

Model selection

STEP 1 Confirming load capacity

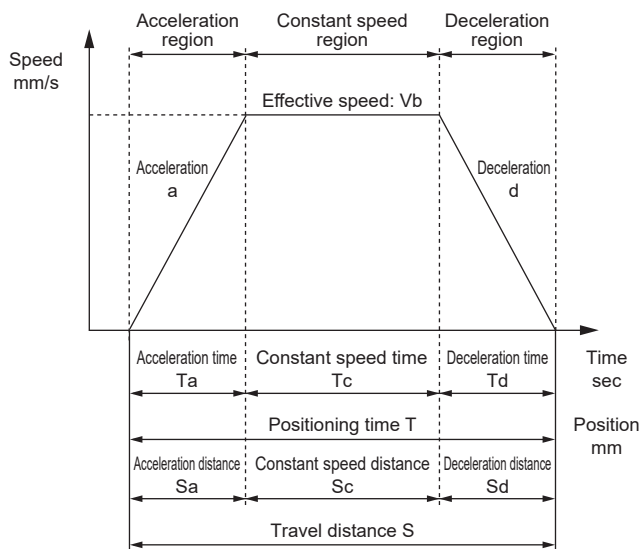
Load capacity varies with mounting orientation, screw lead, transport speed, acceleration/deceleration and power supply voltage.

Refer to the Series Variation (page 13), the specification table for each model and the Table of Load Capacity by Speed and Acceleration/Deceleration to select the size and screw lead.

STEP 2 Confirming positioning time

Calculate the positioning time with the selected product according to the following example and confirm that the required tact is attainable.

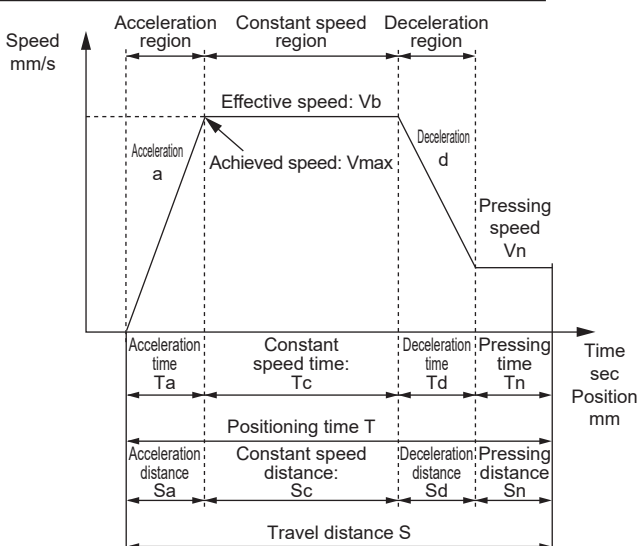
Positioning time for general transport operation



	Content	Code	Unit	Remarks
Set value	Set speed	V	mm/s	
	Set acceleration	a	mm/s ²	
	Set deceleration	d	mm/s ²	
	Travel distance	S	mm	
Calculated value	Achieved speed	Vmax	mm/s	$= \{2 \times a \times d \times S / (a + d)\}^{1/2}$
	Effective speed	Vb	mm/s	Smaller of V and Vmax
	Acceleration time	Ta	s	$= Vb/a$
	Deceleration time	Td	s	$= Vb/d$
	Constant speed time	Tc	s	$= Sc/Vb$
	Acceleration distance	Sa	mm	$= (a \times Ta^2)/2$
	Deceleration distance	Sd	mm	$= (d \times Td^2)/2$
	Constant speed distance	Sc	mm	$= S - (Sa + Sd)$
Positioning time	T	s	$= Ta + Tc + Td$	

- * Do not use at speeds that exceed the specifications.
- * Depending on acceleration/deceleration and stroke length, the trapezoid speed waveform may not be formed (the set speed may not be achieved). In this case, select the effective speed (Vb) from the set speed (V) and the achieved speed (Vmax), whichever is smaller.
- * Use at the acceleration and deceleration of 0.3 G or less. Refer to page 27 for details.
- * While settling time depends on working conditions, it may take 0.2 seconds or so.
- * 1 G \approx 9.8 m/s².

Positioning time for pressing operation



	Content	Code	Unit	Remarks
Set value	Set speed	V	mm/s	
	Set acceleration	a	mm/s ²	
	Set deceleration	d	mm/s ²	
	Travel distance	S	mm	
Calculated value	Achieved speed	Vmax	mm/s	$= \{2 \times a \times d \times (S - Sn + Vn^2/2d) / (a + d)\}^{1/2}$
	Effective speed	Vb	mm/s	The lesser value of V and Vmax
	Acceleration time	Ta	s	$= Vb/a$
	Deceleration time	Td	s	$= (Vb - Vn)/d$
	Constant speed time	Tc	s	$= Sc/Vb$
	Pressing time	Tn	s	$= Sn/Vn$
	Acceleration distance	Sa	mm	$= (a \times Ta^2)/2$
	Deceleration distance	Sd	mm	$= ((Vb + Vn) \times Td)/2$
Constant speed distance	Sc	mm	$= S - (Sa + Sd + Sn)$	
Positioning time	T	s	$= Ta + Tc + Td + Tn$	

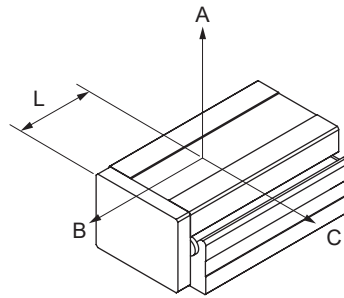
- * Do not use at speeds that exceed the specifications.
- * Pressing speed differs depending on the product.
- * Depending on acceleration/deceleration and stroke length, the trapezoid speed waveform may not be formed (the set speed may not be achieved). In this case, select the effective speed (Vb) from the set speed (V) and the achieved speed (Vmax), whichever is smaller.
- * Use at the acceleration and deceleration of 0.3 G or less. Refer to page 27 for details.
- * While settling time depends on working conditions, it may take 0.2 seconds or so.
- * 1 G \approx 9.8 m/s².

STEP 3 Checking allowable overhang length

Make sure that the load overhang length during operation is within the allowable range (pages 21 to 23).

Allowable overhang length

[When installed horizontally]



[Allowable overhang length]

■ FLCR-16

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm		
				A	B	C
50	0.1	2	1	630	155	195
			2	630	75	95
			4	630	35	45
		8	1	630	135	155
			2	630	65	75
			4	340	30	35
	0.3	2	1	630	160	195
			2	630	80	95
			4	340	35	45
		8	1	475	120	120
			2	225	60	55
			3	145	40	35
75/100	0.1	2	1	630	380	195
			2	630	185	95
			4	630	85	45
		8	1	630	325	165
			2	630	155	80
			4	630	75	35
	0.3	2	1	630	385	200
			2	630	185	95
			4	630	90	45
		8	1	630	295	145
			2	630	140	70
			3	460	90	45

■ FLCR-20

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm		
				A	B	C
50	0.1	2	1	645	285	380
			3	645	90	125
			5.5	645	50	65
		8	1	645	225	265
			3	645	75	85
			5.5	350	35	45
	0.3	2	1	645	285	380
			3	645	90	120
			5.5	405	50	65
		8	1	645	220	235
			3	270	70	75
			5	155	40	40
75/100	0.1	2	1	645	580	385
			3	645	185	125
			5.5	645	95	65
		8	1	645	460	295
			3	645	145	95
			5.5	645	75	45
	0.3	2	1	645	580	385
			3	645	185	125
			5.5	645	95	65
		8	1	645	450	280
			3	645	145	90
			5	410	80	50

■ FLCR-25

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm		
				A	B	C
50	0.1	2	3	940	210	410
			5	940	125	245
			11	940	55	105
		6	3	940	165	245
			5	780	95	145
			11	330	40	60
	0.3	2	3	940	210	405
			5	940	125	240
			11	450	55	105
		6	3	630	165	225
			5	365	95	130
			11	150	40	55
75/100	0.1	2	3	940	465	420
			5	940	275	245
			11	940	115	105
		6	3	940	360	300
			5	940	210	175
			11	920	90	75
	0.3	2	3	940	465	420
			5	940	275	245
			11	940	115	105
		6	3	940	360	295
			5	940	210	175
			11	445	90	70

* Values restricted to actuator operation of 5 million cycles or operating life of 1,000 km, whichever is lower.

* The overhang direction is for a single-direction load.

* Dimensions A, B, and C are measured from the slide table top.

* Values are at maximum speed and maximum load capacity.

* Values may vary according to power supply voltage. Contact CKD for details.

* For acceleration/deceleration and load capacity, refer to the Table of Acceleration/Deceleration and Load Capacity (page 27).

L value (guide block center distance) [mm]

Size	Stroke		
	50	75	100
FLCR-16	91	124	149
FLCR-20	101	127	152
FLCR-25	104	143	168

FLSH

FLCR

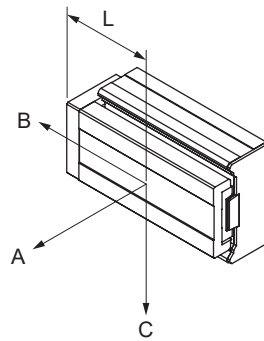
FGRC

ECR
(Controller)

Safety
precautions

Allowable overhang length

[When wall-mounted]



[Allowable overhang length]

■ FLCR-16

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm		
				A	B	C
50	0.1	2	1	180	145	630
			2	80	65	630
			4	30	25	540
		8	1	140	125	630
			2	60	55	600
			4	20	20	230
	0.3	2	1	185	150	630
			2	85	65	630
			4	30	25	300
		8	1	110	110	440
			2	45	45	190
			3	25	25	110
75/100	0.1	2	1	180	350	630
			2	80	160	630
			4	30	60	630
		8	1	150	295	630
			2	65	130	630
			4	20	45	630
	0.3	2	1	185	360	630
			2	80	160	630
			4	30	60	630
		8	1	130	265	630
			2	55	115	620
			3	30	65	370

■ FLCR-20

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm				
				A	B	C		
50	0.1	2	1	365	275	645		
			3	110	80	645		
			5.5	50	35	645		
		8	1	255	215	645		
			3	70	60	565		
			5.5	30	25	245		
		0.3	2	1	365	275	645	
				3	110	80	645	
				5.5	50	35	365	
	8		1	225	210	645		
			3	60	55	235		
			5	30	25	115		
	75/100		0.1	2	1	370	560	645
					3	110	165	645
					5.5	50	75	645
		8		1	280	440	645	
				3	80	125	645	
				5.5	30	50	645	
0.3		2	1	370	560	645		
			3	110	165	645		
			5.5	50	75	645		
		8	1	270	430	645		
			3	75	120	640		
			5	35	60	335		

■ FLCR-25

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm				
				A	B	C		
50	0.1	2	3	390	200	940		
			5	225	115	940		
			11	85	45	850		
		6	3	230	150	940		
			5	130	85	680		
			11	45	30	230		
		0.3	2	3	385	200	940	
				5	220	115	940	
				11	85	45	415	
	6		3	215	150	600		
			5	120	85	335		
			11	40	25	115		
	75/100		0.1	2	3	400	445	940
					5	225	250	940
					11	85	95	940
		6		3	285	335	940	
				5	155	190	940	
				11	55	65	700	
0.3		2	3	400	445	940		
			5	225	250	940		
			11	85	95	940		
		6	3	280	335	940		
			5	155	190	940		
			11	55	65	370		

* Values restricted to actuator operation of 5 million cycles or operating life of 1,000 km, whichever is lower.

* The overhang direction is for a single-direction load.

* Dimensions A, B, and C are measured from the slide table top.

* Values are at maximum speed and maximum load capacity.

* Values may vary according to power supply voltage. Contact CKD for details.

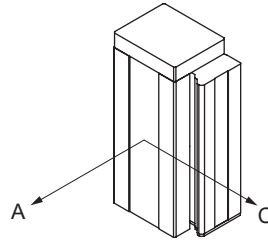
* For acceleration/deceleration and load capacity, refer to the Table of Acceleration/Deceleration and Load Capacity (page 27).

L value (guide block center distance) [mm]

Size	Stroke		
	50	75	100
FLCR-16	91	124	149
FLCR-20	101	127	152
FLCR-25	104	143	168

Allowable overhang length

[When installed vertically]



[Allowable overhang length]

■ FLCR-16

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm	
				A	C
50	0.1	2	1	160	160
			2	70	70
			4	30	30
		8	0.3	570	570
			0.4	425	420
			0.5	335	335
	0.3	2	1	160	160
			2	70	70
			4	30	30
		8	0.3	570	570
			0.4	425	420
			0.5	335	335
75/100	0.1	2	1	410	405
			2	195	195
			4	90	90
		8	0.3	630	630
			0.4	630	630
			0.5	630	630
	0.3	2	1	410	405
			2	195	195
			4	90	90
		8	0.3	630	630
			0.4	630	630
			0.5	630	630

■ FLCR-20

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm	
				A	C
50	0.1	2	1	300	295
			2	140	140
			4	60	60
		8	0.3	645	645
			0.5	615	610
			0.8	375	375
	0.3	2	1	295	295
			2	140	140
			4	60	60
		8	0.3	645	645
			0.5	610	610
			0.8	375	375
75/100	0.1	2	1	625	625
			2	305	305
			4	145	145
		8	0.3	645	645
			0.4	645	645
			0.5	645	645
	0.3	2	1	625	625
			2	305	305
			4	145	145
		8	0.3	645	645
			0.4	645	645
			0.5	645	645

■ FLCR-25

Stroke mm	Acceleration/deceleration G	Screw lead	Weight kg	Overhang mm	
				A	C
50	0.1	2	2	325	320
			4	150	150
			8.5	60	60
		6	1	680	680
			2	330	330
			3	210	210
	0.3	2	2	325	320
			4	150	150
			8.5	60	60
		6	1	680	680
			2	330	330
			3	210	210
75/100	0.1	2	2	745	745
			4	360	360
			8.5	160	160
		6	1	940	940
			2	760	760
			3	500	500
	0.3	2	2	745	745
			4	360	360
			8.5	160	160
		6	1	940	940
			2	760	760
			3	500	500

* Values restricted to actuator operation of 5 million cycles or operating life of 1,000 km, whichever is lower.

* The overhang direction is for a single-direction load.

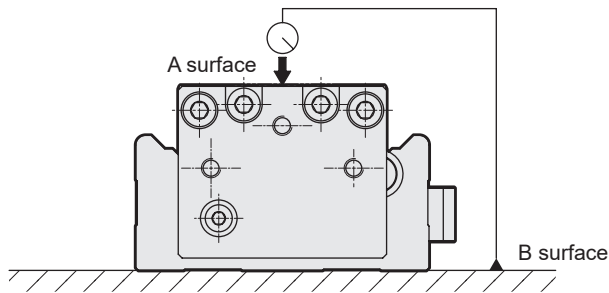
* Dimensions A, B, and C are measured from the slide table top.

* Values are at maximum speed and maximum load capacity.

* Values may vary according to power supply voltage. Contact CKD for details.

* For acceleration/deceleration and load capacity, refer to the Table of Acceleration/Deceleration and Load Capacity (page 27).

Slider parallelism *Reference value

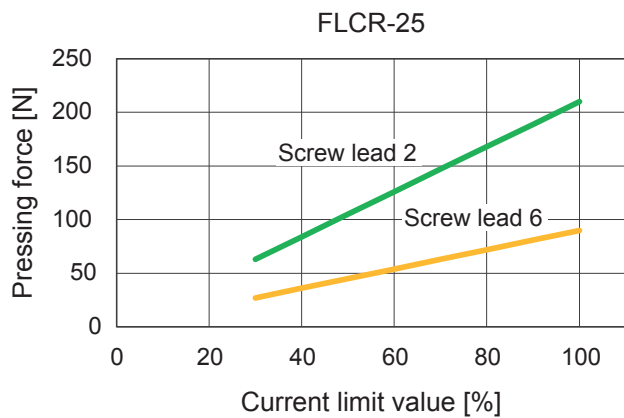
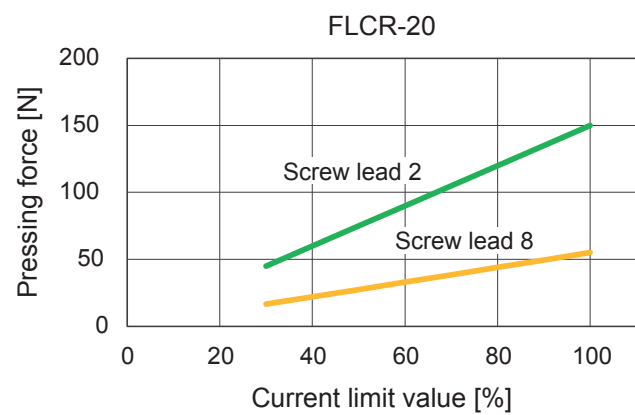
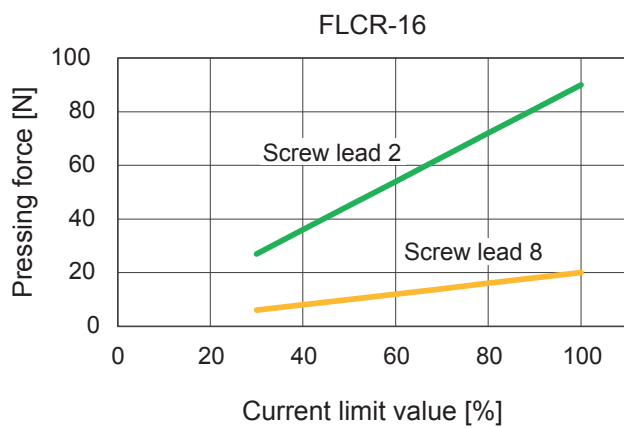


(mm)

	Parallelism		
	A surface against B surface		
	Stroke		
	50st	75st	100st
FLCR-16	0.070	0.105	0.135
FLCR-20	0.075	0.115	0.140
FLCR-25	0.080	0.110	0.140

*Parallelism with the product fixed to a surface plate.

Pressing force and current limit value correlation diagram

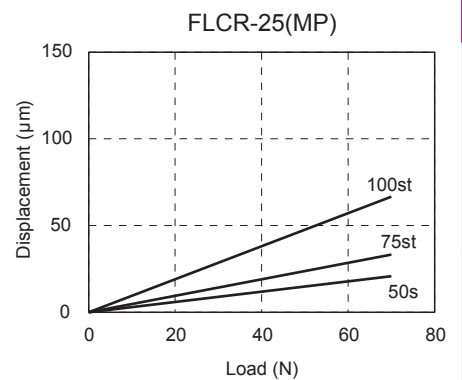
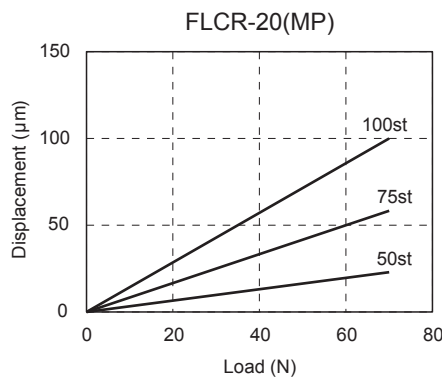
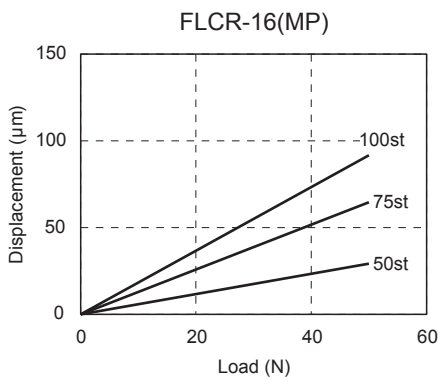
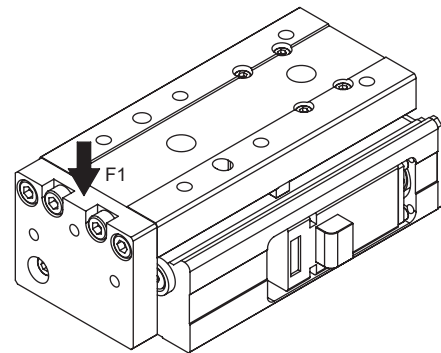


*1 The pressing force/current limit value correlation diagram is merely a guideline. Individual motor differences and variations in mechanical efficiency may result in differing actual values, even at the same current value.

Table deflection *Reference value

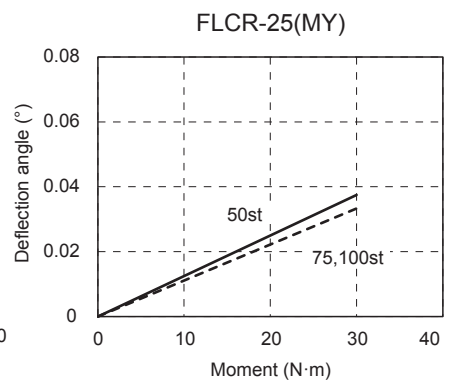
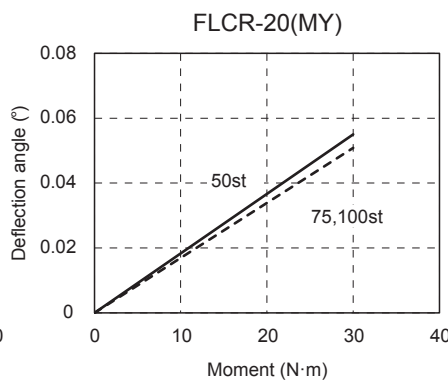
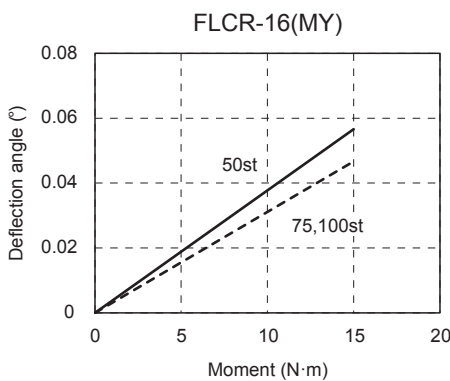
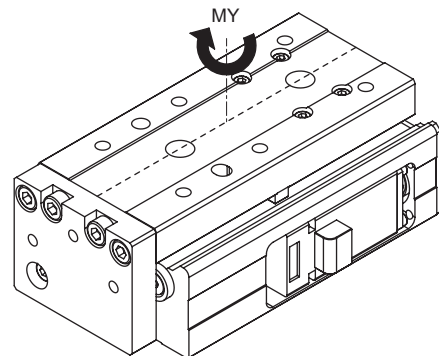
[Table deflection due to pitching moment MP]

Displacement at the table end when load (F1) is applied to the table end



[Table displacement angle due to yawing moment MY]

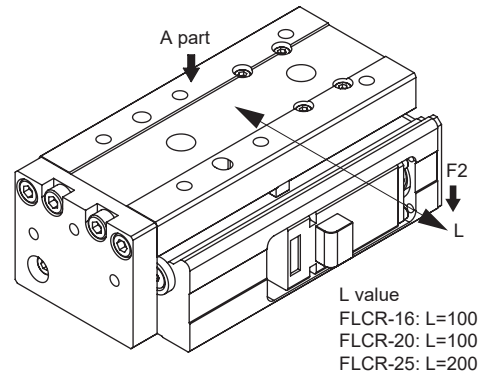
Displacement angle of the table when rotation moment (MY) is applied to the table



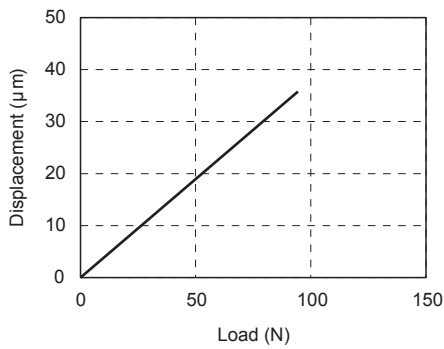
FLSH
FLCR
 FGRC
 ECR (Controller)
 Safety precautions

[Table deflection due to rolling moment MR]

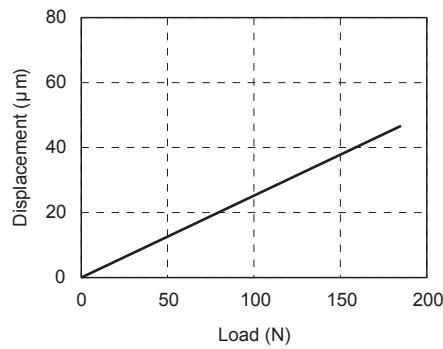
Displacement at the table end (part A) when load (F2) is applied to a position L mm away from the center of the actuator



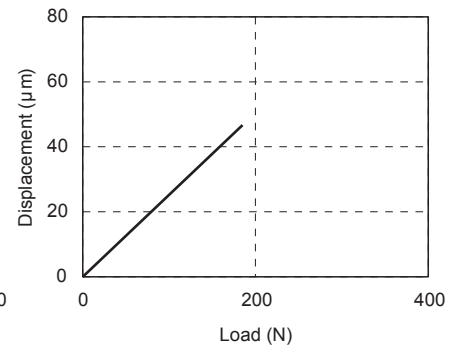
FLCR-16(MR)



FLCR-20(MR)



FLCR-25(MR)



FLSH

FLCR

FGRC

ECR
(Controller)

Safety
precautions

Table of Load Capacity by Speed and Acceleration/Deceleration

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The table below lists the maximum load capacity during acceleration/deceleration and the maximum speed at which operation is possible. Refer to the model that satisfies the required operation conditions.

● FLCR-16

■ Screw lead 2 (kg)

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
2	4	4	4	4
10	4	4	4	4
20	4	4	4	4
30	4	4	4	4
40	4	4	4	4
50	4	4	4	4
60	4	4	2.5	2.5
70	4	4	2	1.5
80	4	4	1.5	1.5
90	4	4	1	0.5
100	4	3.5	0.4	

■ Screw lead 8

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
10	4	3	0.5	0.5
50	4	3	0.5	0.5
100	4	3	0.3	0.3
150	4	3	0.3	0.3
200	4	3	0.3	0.3
250	3	3	0.3	0.3
300	3	3		

● FLCR-20

■ Screw lead 2

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
2	5.5	5.5	6	6
15	5.5	5.5	6	6
30	5.5	5.5	6	6
45	5.5	5.5	6	6
60	5.5	5.5	6	6
75	5.5	5.5	6	6
90	5.5	5.5	6	6
100	5.5	5.5	5.5	5.5

■ Screw lead 8

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
10	5.5	5	0.8	0.8
50	5.5	5	0.8	0.8
100	5.5	5	0.4	0.4
150	5.5	5	0.4	0.4
200	5.5	5	0.4	0.4
250	5.5	5	0.4	0.4
300	5	5	0.4	0.4

● FLCR-25

■ Screw lead 2

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
2	11	11	8.5	8.5
15	11	11	8.5	8.5
30	11	11	8.5	8.5
45	11	11	8.5	8.5
60	11	11	8.5	8.5
75	11	11	7.5	7
90	11	11	7.5	6
100	11	11	7.5	4.5

■ Screw lead 6

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
10	11	11	3	3
50	11	11	3	3
100	11	11	2.5	2.5
150	11	11	2	2
200	11	11	1	1
250	11	11	1	1
300	11	11	1	1

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● FLCR-16

■ Screw lead 2 (kg)

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
2	4	4	4	4
10	4	4	4	4
20	4	4	4	4
30	4	4	4	3
40	4	4	4	3
50	4	4	3	2.5
60	4	4	0.5	0.4
70	4	4	0.5	0.4
80	4	2	0.4	
90	2.5	1		
100	2.5	0.5		

■ Screw lead 8

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
10	4	3	0.5	0.5
50	4	3	0.5	0.5
100	4	3	0.3	0.3
150	4	3		
200	4	3		
250	1	1		

● FLCR-20

■ Screw lead 2

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
2	5.5	5.5	6	6
15	5.5	5.5	6	6
30	5.5	5.5	6	6
45	5.5	5.5	6	6
60	5.5	5.5	6	6
75	5.5	5.5	4	3
90	5.5	5	2	2
100	5.5	2.5	1.5	1.5

■ Screw lead 8

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
10	5.5	5	0.8	0.8
50	5.5	5	0.8	0.8
100	5.5	5	0.4	0.4
150	5.5	5	0.4	0.4
200	5.5	4.5	0.4	0.4
250	5.5	4.5		
300	3	3		

● FLCR-25

■ Screw lead 2

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
2	11	11	8.5	8.5
15	11	11	8.5	8.5
30	11	11	8.5	8.5
45	11	11	4	4
60	11	11	3.5	3.5
75	11	11	3.5	3.5

■ Screw lead 6

Speed (mm/s)	Horizontal		Vertical	
	Acceleration/deceleration (G)			
	0.1	0.3	0.1	0.3
10	11	11	3	3
50	11	11	3	3
100	11	11	2.5	2.5
150	11	11	2	2
200	11	11	1	1