

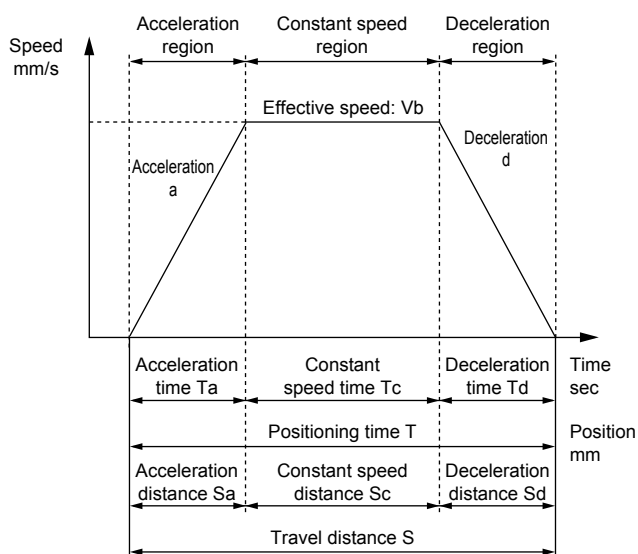
STEP 1 Confirming load capacity

Load capacity varies with mounting orientation, screw lead, transport speed, acceleration/deceleration and power supply voltage. Refer to the Series Variation (page 32), 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 available.

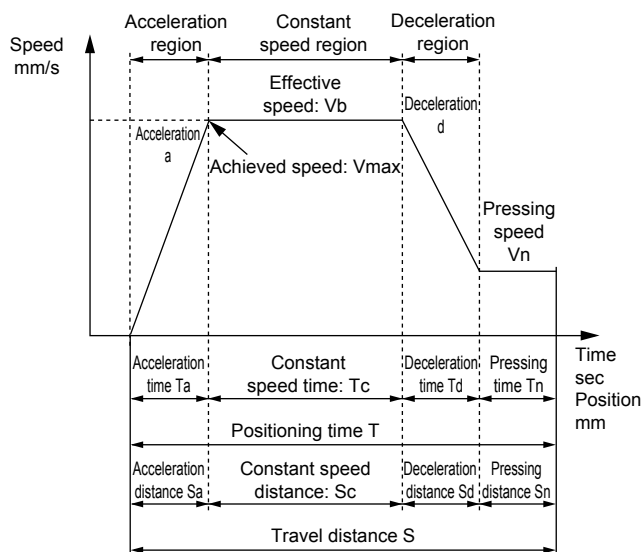
Positioning time for general transport operation



	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.
- * Acceleration/deceleration varies depending on the product and the working conditions. Refer to page 58 for details.
- * While settling time depends on working conditions, it may take 0.2 seconds or so.
- * $1 G \approx 9.8 \text{ m/s}^2$.

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	
	Pressing distance	Sn	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.
- * Acceleration/deceleration varies depending on the product and the working conditions. Refer to page 58 for details.
- * While settling time depends on working conditions, it may take 0.2 seconds or so.
- * $1 G \approx 9.8 \text{ m/s}^2$.

STEP 3 **Confirming allowable load weight (Rod with built-in guide EBR Series)**

Confirm that the load weight during operation is within the allowable range (pages 54 to 55).
If the allowable load weight is exceeded, increase the size or use an external guide in conjunction.

EBS
(With motor)

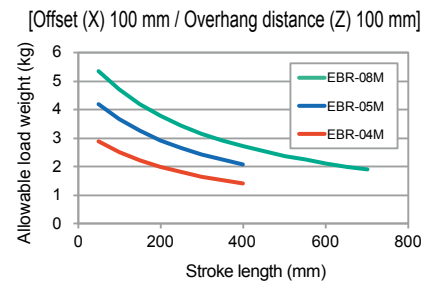
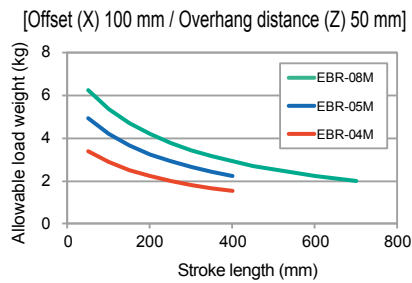
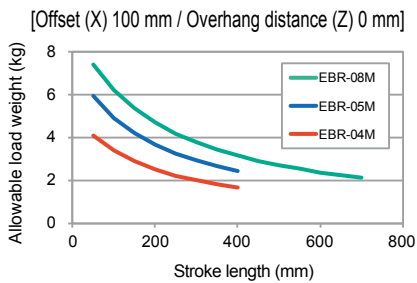
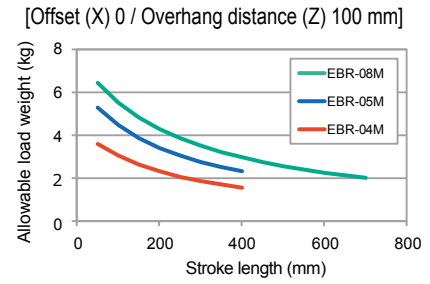
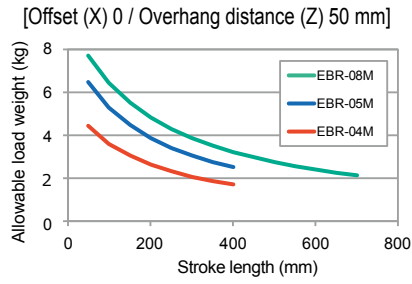
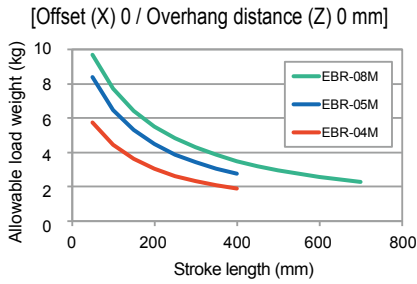
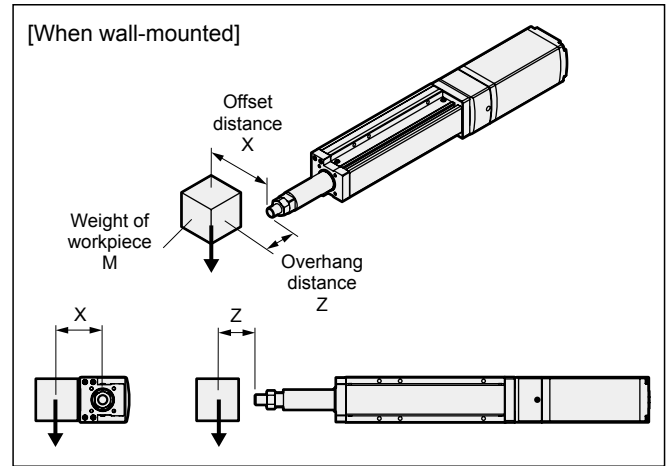
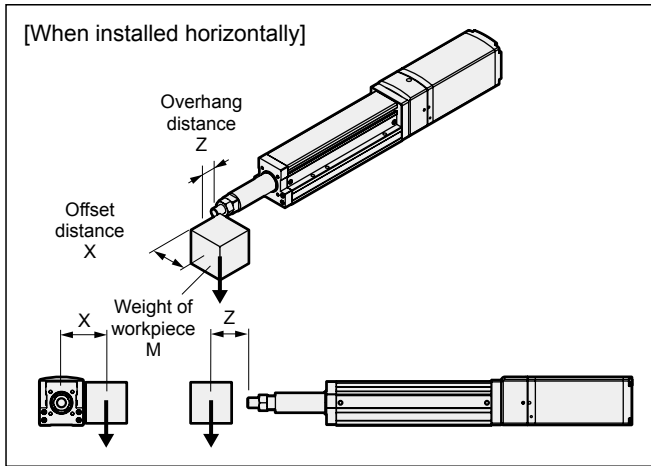
EBR
(With motor)

ECR
(Controller)

Safety
precautions

Allowable load weight

[When installed horizontally or wall-mounted]



*Values with actuator operating life restricted to 5,000 km. (Acceleration/deceleration 0.5 G, speed 300 mm/s)

EBR
(With motor)

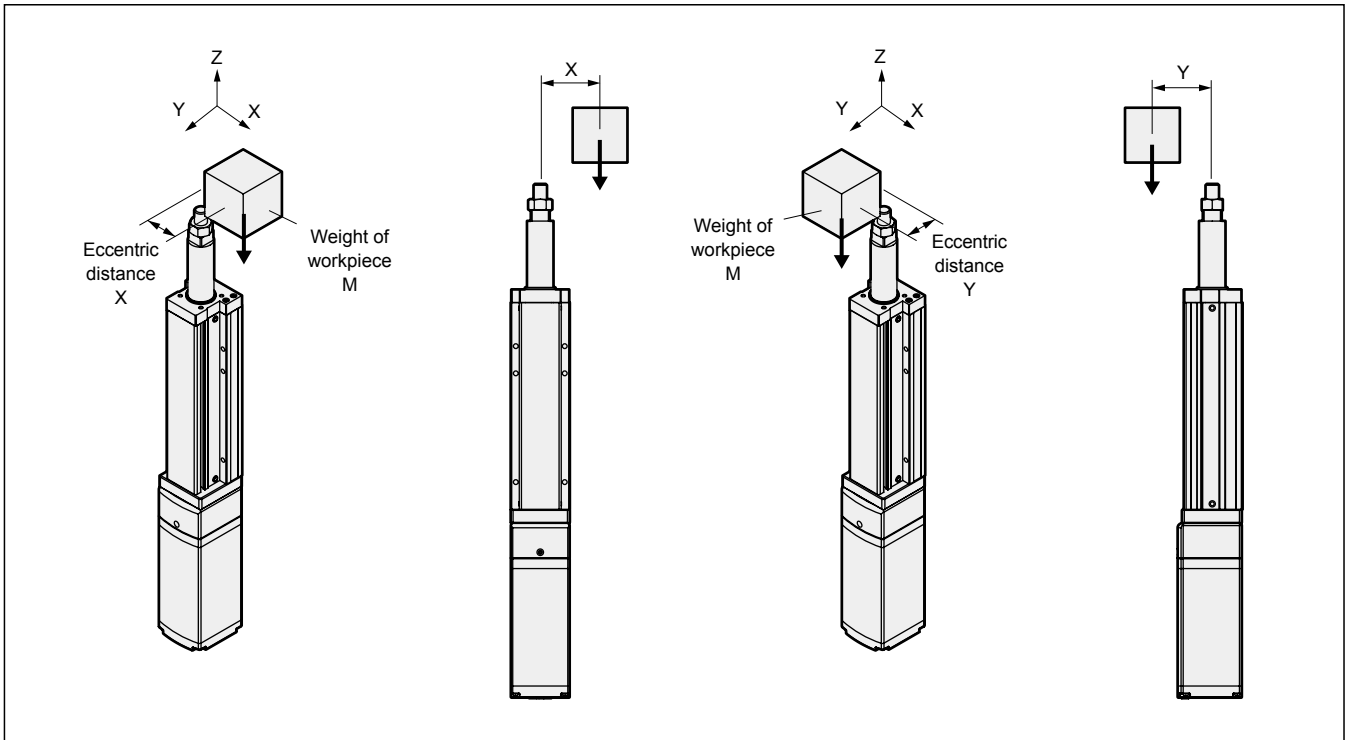
EBR
(With motor)

ECR
(Controller)

Safety
precautions

Allowable load weight

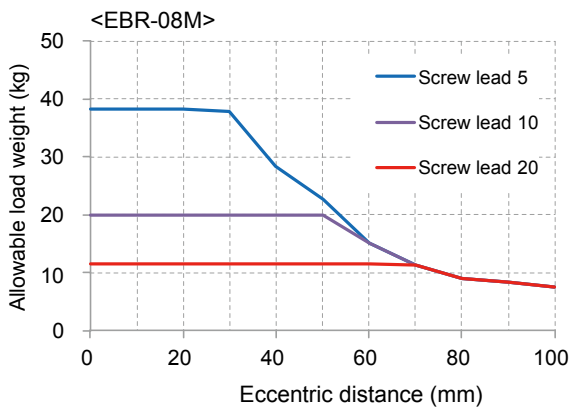
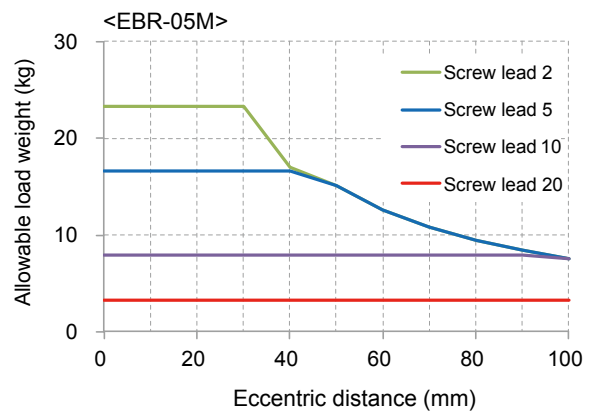
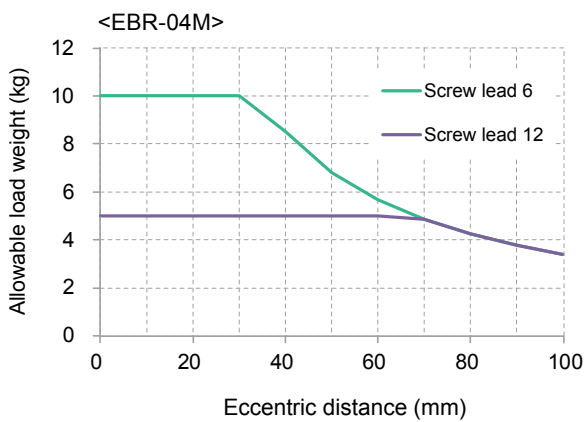
[When installed vertically]



EBS
(With motor)

EBR
(With motor)

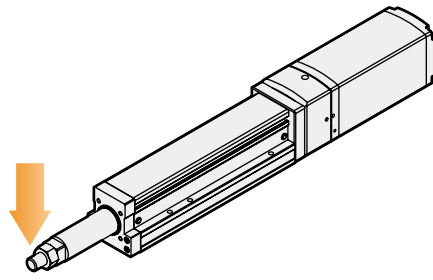
ECR
(Controller)



*Acceleration/deceleration 0.5 G

Safety
precautions

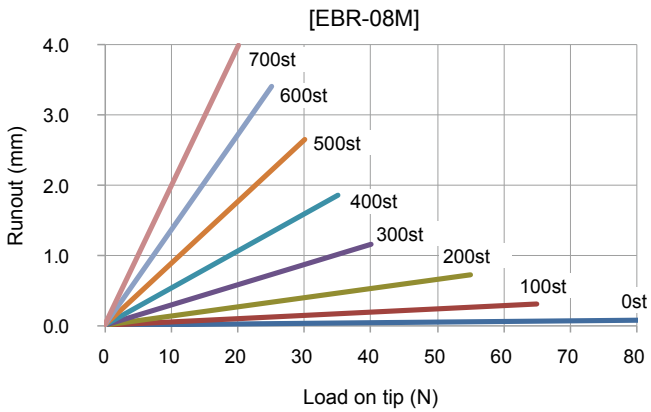
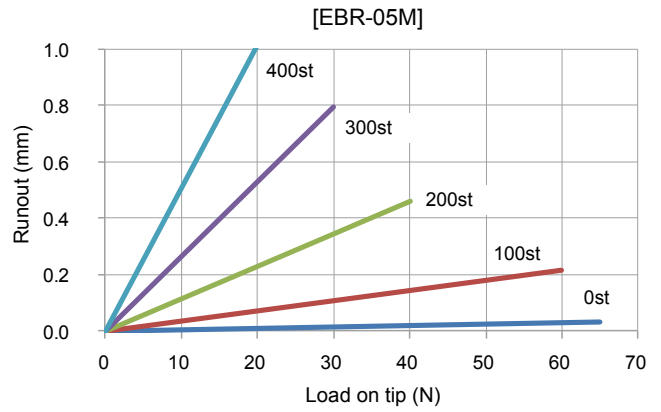
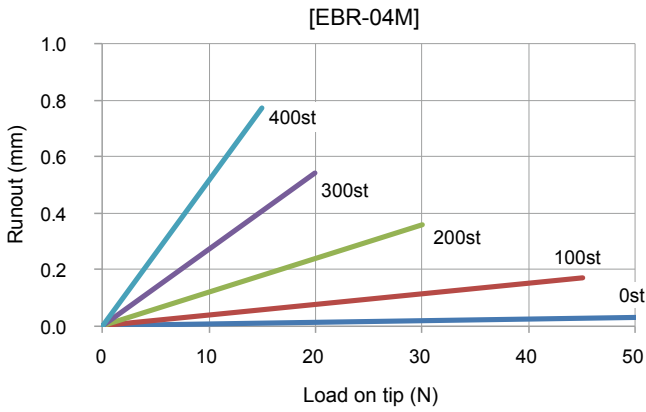
Rod end runout *Reference value



EBS
(With motor)

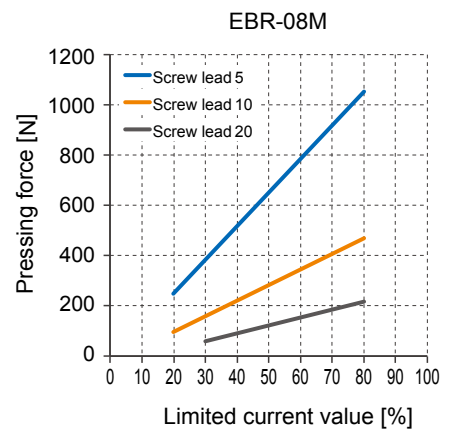
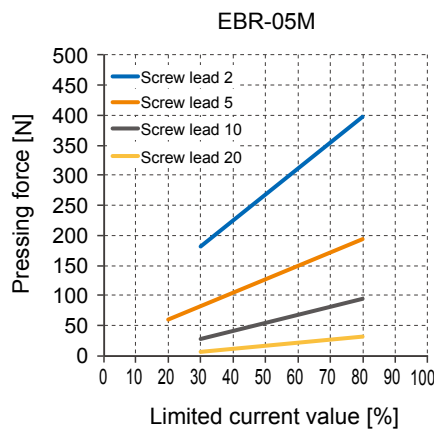
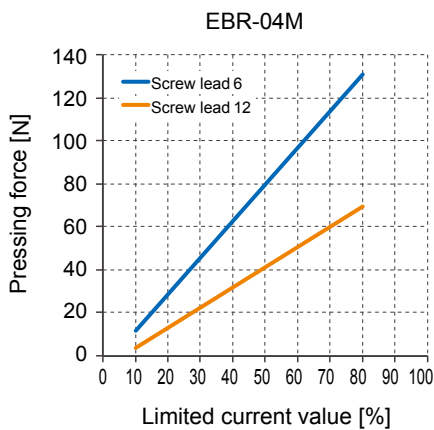
EBR
(With motor)

ECR
(Controller)



Safety
precautions

Pressing force



*The above pressing force is a reference value. Variation may occur according to conditions such as pressing speed.

Notes

EBS
(With motor)

EBR
(With motor)

ECR
(Controller)

Safety
precautions

Table of Load Capacity by Speed and Acceleration/Deceleration

48 VDC

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.

[When installed horizontally]

■EBR-04M

Screw lead 6 (kg)

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	33.3	33.3	33.3	28.3
100	33.3	28.3	33.3	28.3
150	33.3	16.6	33.3	15.0
200	28.3	6.6	28.3	6.6
250	20.0	6.6	20.0	6.6
300	10.0		10.0	
350	3.3		3.3	

Screw lead 12

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	18.3	10.0	18.3	10.0
100	18.3	10.0	18.3	10.0
200	18.3	8.3	18.3	8.3
300	16.6	8.3	16.6	6.6
400	16.6	6.6	16.6	5.0
500	8.3	5.0	8.3	3.3
600	3.3	3.3	3.3	

■EBR-05M

Screw lead 2

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	80.0	80.0	80.0	80.0
30	80.0	80.0	80.0	80.0
50	68.3	68.3	68.3	68.3
70	68.3	60.0	68.3	60.0
90	48.3	23.3	48.3	23.3
100	48.3	13.3	48.3	21.6
110	36.6		36.6	
120	31.6		30.0	
130	28.3			

Screw lead 5

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	60.0	60.0	60.0	60.0
50	60.0	60.0	60.0	60.0
100	60.0	55.0	60.0	43.3
150	60.0	38.3	60.0	23.3
200	60.0	21.6	60.0	13.3
225	60.0	10.0	43.3	3.3
250	55.0	10.0	40.0	3.3
275	50.0	1.6	36.6	
300	36.6	1.6	26.6	
330	16.6		1.6	

Screw lead 10

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	50.0	35.0	36.6	26.6
50	50.0	35.0	36.6	26.6
75	50.0	23.3	35.0	23.3
100	50.0	21.6	35.0	21.6
200	50.0	20.0	35.0	15.0
300	35.0	18.3	35.0	10.0
400	20.0	11.6	20.0	5.0
500	10.0	5.0	10.0	1.6
600	1.6	1.6		

Screw lead 20

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	20.0	15.0	18.3	8.3
100	20.0	15.0	18.3	8.3
200	20.0	13.3	16.6	8.3
300	20.0	11.6	16.6	8.3
400	20.0	10.0	16.6	8.3
500	20.0	8.3	16.6	5.8
600	19.1	5.8	16.6	1.6
700	15.0	3.3	15.0	1.6
800	11.6	1.6	11.6	0.8

■EBR-08M

Screw lead 5

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	80.0	80.0	80.0	80.0
50	80.0	80.0	80.0	80.0
75	80.0	51.6	80.0	51.6
100	80.0	20.0	80.0	20.0
125	50.0	20.0	50.0	6.6
150	20.0	3.3	20.0	
175	18.3		18.3	
200	18.3		18.3	
225	18.3		1.6	

Screw lead 10

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	70.0	68.3	70.0	60.0
100	70.0	68.3	70.0	60.0
150	70.0	50.0	70.0	46.6
200	70.0	23.3	70.0	23.3
250	68.3	10.0	68.3	10.0
300	50.0	10.0	43.3	
350	35.0	1.6	33.3	
400	35.0		23.3	
450	25.0		10.0	

Screw lead 20

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	1.0	0.3	1.0
0	35.0	26.6	35.0	23.3
200	35.0	26.6	35.0	23.3
300	35.0	16.6	35.0	16.6
400	35.0	11.6	35.0	11.6
500	16.6	5.0	16.6	5
600	16.6	3.3	16.6	1.6
700	16.6	3.3	16.6	0.8
800	16.6	1.6		
900	8.3			

[When installed vertically]

■EBR-04M

Screw lead 6

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	10.0	8.3	9.1	8.3
50	10.0	8.3	9.1	8.3
100	8.3	8.3	9.1	8.3
150	8.3	6.6	8.3	5.8
200	6.6	5.0	6.6	4.1
250	5.0	3.3	3.7	2.0
300	3.3	1.6	2.0	0.8
350	1.6			

Screw lead 12

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	5.0	4.1	5.0	4.1
100	5.0	4.1	5.0	4.1
200	5.0	4.1	5.0	4.1
300	4.1	3.3	4.1	3.3
400	3.3	3.3	3.3	3.3
500	1.6	2.5	1.6	1.6
600	1.6	0.8	0.8	0.4

■EBR-05M

Screw lead 2

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	24.0	23.3	24.0	23.3
25	24.0	23.3	24.0	23.3
50	13.3	23.3	13.3	23.3
60	13.3	18.3	13.3	18.3
70	13.3	15.0	13.3	15
75	13.3	8.3	13.3	8.3
80	13.3	8.3	11.6	8.3
90	13.3	0.8	11.6	0.8
100	13.3		11.6	
110	13.3		11.6	
120	13.3		5.0	

Screw lead 5

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	16.6	16.6	16.6	16.6
50	16.6	16.6	16.6	16.6
100	15.0	13.3	13.3	13.3
150	11.6	11.6	11.6	11.6
200	11.6	8.3	11.6	8.3
250	10.0	6.6	10.0	5.0
275	8.3	3.3	6.6	0.8
300	5.0	3.3	0.8	0.8

Screw lead 10

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	10.0	7.9	8.3	7.9
100	10.0	7.9	8.3	7.9
200	10.0	7.5	6.6	7.5
300	7.5	5.4	5.8	5.4
350	5.8	3.7	5.0	3.7
400	5.0	3.7	5.0	3.7
500	4.1	2.5	4.1	2.5
600	0.8	0.4		

Screw lead 20

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	4.1	3.3	4.1	3.3
100	4.1	3.3	4.1	3.3
200	4.1	3.3	4.1	3.3
300	4.1	2.5	4.1	2.5
400	3.7	2.5	3.7	2.5
500	3.3	1.6	3.3	1.6
600	2.5	1.6	2.5	1.6
700	2.0	1.6	2.0	1.6
800	1.6	0.8		

■EBR-08M

Screw lead 5

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	38.3	38.3	38.3	38.3
50	38.3	38.3	38.3	38.3
75	35.0	35.0	35.0	35.0
100	26.6	26.6	26.6	26.6
125	23.3	26.6	20.0	20.0
150	18.3	21.6	11.6	11.6
165	15.0	16.6	6.6	5.0
175	15.0	16.6	5.0	5
200	15.0	16.6	3.3	3.3
225	15.0	11.6		

Screw lead 10

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	18.3	20.0	18.3	18.3
100	18.3	20.0	18.3	18.3
150	15.0	15.0	15.0	15.0
200	11.6	11.6	11.6	11.6
250	11.6	11.6	10.0	8.3
300	11.6	11.6	6.6	5.0
350	10.0	10.0	5.0	3.3
400	5.0	5.0	3.3	1.6
450	3.3	3.3	0.8	0.8

Screw lead 20

Speed (mm/s)	Straight		Side/Bottom	
	Acceleration/deceleration (G)			
	0.3	0.5	0.3	0.5
0	11.6	11.6	8.3	8.3
100	11.6	11.6	8.3	8.3
200	11.6	10.0	8.3	8.3
300	10.0	8.3	8.3	8.3
400	3.3	2.5	3.3	2.5
500	1.6	1.6	1.6	1.6
600	1.6	1.6	1.6	1.6
700	1.6	1.6	1.6	1.6
800	1.6	1.6		
900	0.8	0.8		

Table of Load Capacity by Speed and Acceleration/Deceleration

24 VDC

[When installed horizontally]

* At 24 VDC, operation is possible up to 0.7 G when horizontally installed and 0.3 G when vertically installed.
Contact CKD for details.

EBR-04M

Screw lead 6 (kg)

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	33.3	33.3
100	33.3	33.3
150	14.1	13.3
200	1.6	1.6
250	1.6	

Screw lead 12

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
100	18.3	18.3
200	15.4	15.8
300	4.5	5.0
400	4.5	0.8
500	1.6	

EBR-05M

Screw lead 2

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
25	80.0	80.0
50	73.3	41.6
60	73.3	20.0
70	43.3	20.0
80	20.0	20.0

Screw lead 5

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	60.0	60.0
100	60.0	53.3
150	43.3	41.6
200	20.8	15.0
225	15.0	8.3
250	10.0	1.6
275	8.3	

Screw lead 10

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	50.0	36.6
100	50.0	36.6
200	35.0	35.0
300	11.6	11.6
400	7.5	7.5
500	1.6	

Screw lead 20

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	20.0	18.3
100	20.0	18.3
200	20.0	18.3
300	20.0	18.3
400	13.3	13.3
500	7.5	6.6
600	3.3	3.3
700	0.4	0.4

EBR-08M

Screw lead 5

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
25	80.0	80.0
50	80.0	80.0
75	66.6	66.6
100	36.6	36.6
125	3.3	
150	3.3	

Screw lead 10

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	70.0	70.0
100	70.0	58.3
150	35.0	33.3
200	25.0	11.6
250	10.8	1.6
300	1.6	1.6

Screw lead 20

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
100	23.3	23.3
200	18.3	18.3
300	18.3	15.0
400	10.0	10.0
500	1.6	1.6

[When installed vertically]

EBR-04M

Screw lead 6

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	9.1	9.1
100	7.5	7.5
150	2.9	2.9
200	0.4	0.4

Screw lead 12

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
100	4.5	4.5
200	2.0	2.0
300	0.4	0.8

EBR-05M

Screw lead 2

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
25	24.0	24.0
50	24.0	24.0
60	15.0	3.3
	3.3	

Screw lead 5

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	15.0	15.0
100	11.0	15.0
150	8.3	3.3
200	3.3	1.6
250	1.6	

Screw lead 10

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
100	6.6	6.6
200	5.8	5.8
300	2.5	2.5
400	0.8	0.8

Screw lead 20

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	4.1	4.1
100	4.1	4.1
200	2.5	3.3
300	2.5	3.3
400	1.6	0.8
450	0.8	0.8
500	0.8	

EBR-08M

Screw lead 5

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
25	35.0	35.0
50	35.0	35.0
75	20.0	10.0
100	8.3	0.8
125	0.8	

Screw lead 10

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
50	15.0	15.0
100	15.0	15.0
150	6.6	5.0
200	4.1	1.6
250	1.6	
300	0.8	

Screw lead 20

Speed (mm/s)	Straight	Side/Bottom
	Acceleration/deceleration (G)	
0	0.3	0.3
100	10.0	8.3
200	10.0	8.3
250	6.6	6.6
300	3.3	3.3
350	1.6	1.6
400	0.8	0.8
450	0.4	0.8
500	0.4	0.8