

弹簧加压电磁制动器工作原理

How spring applied electromagnetic brake works

瑞迪弹簧加压电磁安全制动器是单片式制动器，有两个摩擦表面，轴过通平键与花键套联接，花键套通过花键与摩擦盘组件联接。

当定子断电时，弹簧所产生的力作用在衔铁上，将轴带动旋转的摩擦盘组件紧紧夹在衔铁与盖板之间，从而产生制动力矩。此时，在衔铁与定子之间会产生一个间隙Z。

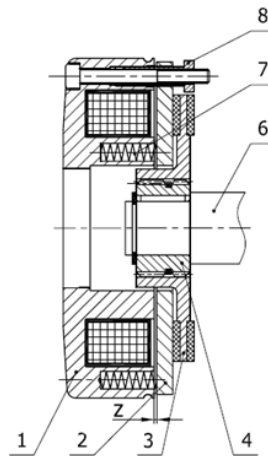
当需要放松制动时，定子接通直流电，所产生的磁场吸引衔铁向定子移动，衔铁移动时压缩弹簧，此时摩擦盘组件被松开，制动解除。在A型制动器中，制动力矩的大小可通过调整环进行调整。

REACH spring-applied electromagnetic brake is a single-disk brake with two friction surfaces. The motor shaft is connected with the spline hub via flat key, and the spline hub is connected with friction disk components through spline.

When stator is powered off, the spring generates forces upon armature, then the friction disk components will be clamped between armature and flange to generate braking torque. At that time, a gap Z is created between armature and stator.

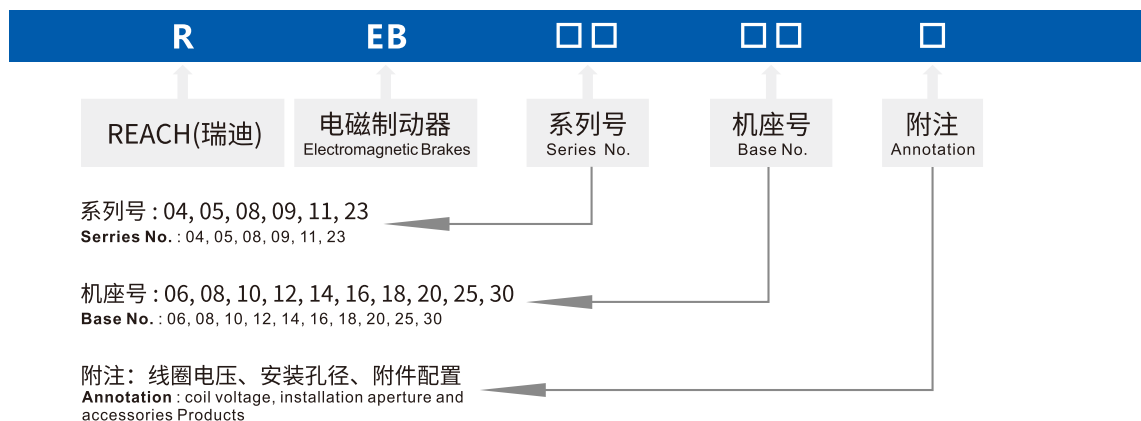
When brakes need to be released, the stator should be connected DC power, then the armature will move to the stator by electromagnetic force. At that time, the armature presses the spring while moving and the friction disk components are released to disengage the brake. The braking torque can be adjusted by adjusting ring in A-Type brake.

1 定子	1 Stator
2 衔铁	2 Armature
3 摩擦盘组件	3 Friction Disk Components
4 花键套	4 Splined Hub
5 盖板	5 Flange
6 轴	6 Shaft
7 弹簧	7 Spring
8 空心螺钉	8 Hollow Screws
9 调整环	9 Adjusting Ring
Z 间隙	Z Air Gap



型号说明

Product Model



制动电机制动器

Brake Motor Brake

1 REB04系列 弹簧加压电磁制动器 REB04 Series Spring-applied Electromagnetic Brakes

产品特点

- ⊙ REB04系列是一种弹簧加压的干式摩擦电磁制动器,具有可靠的制动力和保持力,广泛应用于各种需要减速制动和保持制动的场合。
- ⊙ REB04系列是瑞迪最早研发量产的制动器,有A型可调节力矩和B型不可调节力矩两种结构
- ⊙ 制动器额定电压(VDC):24V、45V、96V、103V、170V、180V、190V、205V
- ⊙ 电网电压范围(VAC):42~460V
- ⊙ 制动器扭矩范围:3~1350N.m
- ⊙ 获得国家起重运输机械质量监督检验中心型式实验合格证
- ⊙ 根据不同附件模块选择,防护等级最高可达IP65

应用范围

- ⊙ 塔机起升
- ⊙ 制动电机
- ⊙ 起重设备
- ⊙ 仓储设备
- ⊙ 减速电机
- ⊙ 自动立体车库
- ⊙ 建筑机械
- ⊙ 包装机械
- ⊙ 木工机械
- ⊙ 自动卷闸门
- ⊙ 制动力矩控制设备
- ⊙ 电动车
- ⊙ 代步车

Product Features

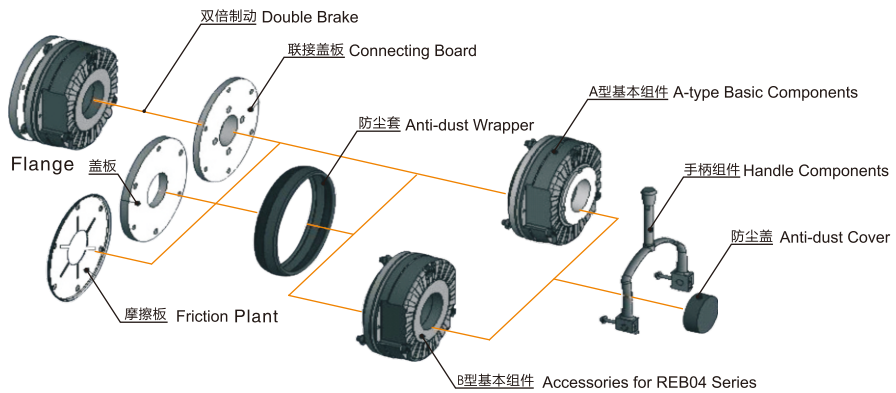
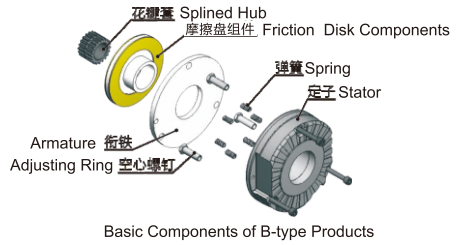
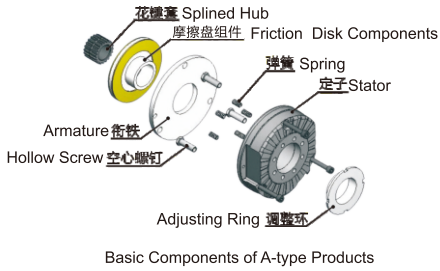
- ⊙ REB04 series product are spring-applied and dry-friction electromagnetic brakes (releasing when energized and braking when cut off). The brakes are used wherever masses in motion have to be decelerated or held in a defined position
- ⊙ REB04 series is the first generation brake product which is divided into two types : A-type (adjustable braking torque) and B type (non-adjustable braking torque)
- ⊙ Rated voltage of Brake (VDC): 24V,45V,96V,103V,170, 180V,190V,205V
- ⊙ Adaptable to various network Voltage(VAC):42~460V
- ⊙ Braking torque scope: 3~1350N.m
- ⊙ Certificated by national hoisting and conveying machinery quality supervision and inspection center type test
- ⊙ By selecting different modules, the highest protection level can reach to Ip65

Application

- ⊙ Tower crane hosting mechanism
- ⊙ Braking Motor
- ⊙ Hoisting Equipment
- ⊙ Storage Facilities
- ⊙ Gear Motor
- ⊙ Automatic Tridimensional Garage
- ⊙ Construction Machinery
- ⊙ Packaging Machinery
- ⊙ Carpenter Machinery
- ⊙ Automatic Rolling Gate
- ⊙ Braking Toque Control equipment
- ⊙ Electric Vehicle
- ⊙ Electric Scooter

模块化的产品设计

A型制动器与B型制动器通过不同的附件搭配组合 满足客户不同的需求。



制动器扭矩选择表

Torque Selection List for Brakes

机座号 BASE NO.	06	08	10	12	14	16	18	20	25	30
电机机座号 Motor NO.	56,63,71	80	90	100	112	132	160	180	200	225
额定力矩 (转速100r/min) Rated Torque (Rotation Speed 100r/min)	3	6	11	23	45	60	115	200	300	600
	3.5	7	14	27	55	70	130	230	350	
	4	8	16	32	60	80	150	260	400	1000
	5	10	20	40	65	90	185	290	445	
	6	12	23	46	75	100	200	345	530	1350
					80	125	235	400	600	

(单位：N.m)

保持制动 Holding Brake

减速制动 Decelerating Brake

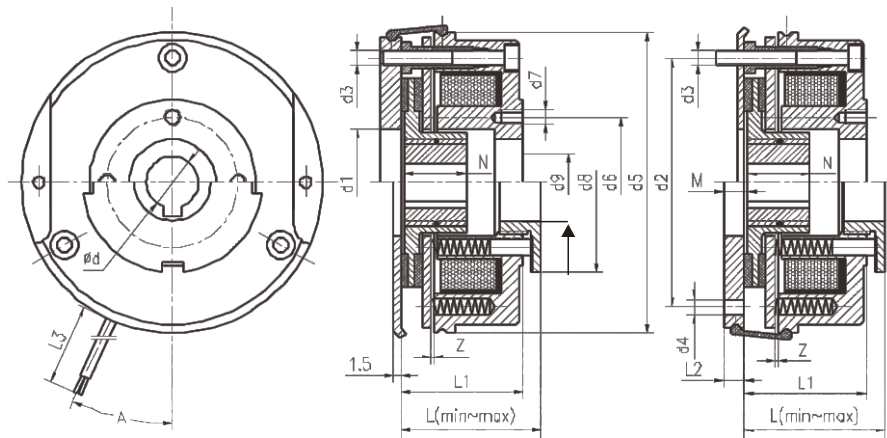
额定制动力矩 Rated Braking Torque

技术参数

Technical Data

A/B型制动器基本组件+盖板/摩擦板

Basic Components of A/B-type Brakes+Flange/Friction Plate



单位为毫米 (mm)

机座号 Size NO.	d	d1	d2	d3	d4	Lmin	Lmax	d5	d6	d7	d8	M	N	Z	A	L3	L2	L1	d9
06	11	31	72	3×M4	3×Φ4.5	39.5	43.5	87	37.7	4×M4	52	7	18	0.2	25°	400	6	37.3	25
08	15	41	90	3×M5	3×Φ5.5	47.7	51.7	105	49	4×M5	60	8.5	20	0.2	25°	400	7	44	32
10	15	45	112	3×M6	3×Φ6.5	52.5	56.5	130	54	4×M5	68	11	20	0.2	25°	400	9	48.4	42
12	20	52	132	3×M6	3×Φ6.5	59.9	64.9	150	64	4×M5	82	11	25	0.3	25°	400	9	54.9	50
14	25	55	145	3×M8	3×Φ9	72.5	78.5	165	75	4×M6	92	13	30	0.3	25°	1000	11	67.8	60
16	30	70	170	3×M8	3×Φ9	79.3	87.3	190	85	4×M6	102	13.25	30	0.3	25°	1000	11	74.5	68
18	40	77	196	6×M8	4×Φ9	91	99	217	95	4×M8	116	13.75	35	0.4	25°	1000	11	85.1	75
20	40	90	230	6×M10	4×Φ11	108.1	118.1	254	110	4×M10	135	14.5	40	0.4	25°	1000	11	99.6	85
25	50	120	278	6×M10	6×Φ11	117.2	129.2	302	140	4×M10	165	17	50	0.5	25°	1000	13	109	115
30	70	145	325	6×M10	6×Φ11	144	156	363	180	4×M10	200	25	75	0.6	25°	1000	20	134.5	140

⊙ 此安装尺寸可按客户需求定制

⊙ The mounting size can be ordered by the customers.

⊙ L3为产品的标准导线长度，可以根据客户的不同要求定制。

⊙ L3 represents standard lead length of the product and could also be ordered to satisfy customers' requirements.

B型制动器+联接盖板+ B型制动器+盖板

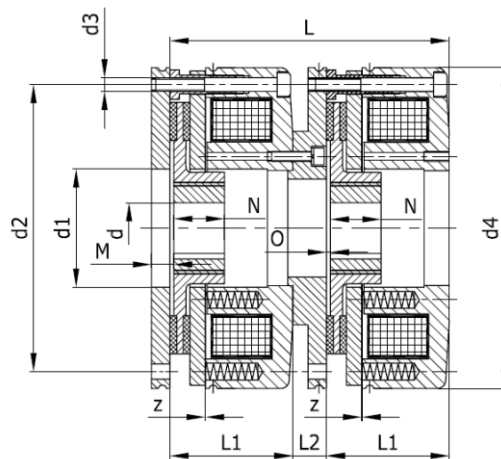
B-type Brakes+Connecting Flange+B-type Brakes+Flange

REBO4系列的双倍制动器特别适用于自动立体车库、轻型电梯等涉及人且对安全要求非常高的领域。

两个制动器可以独立控制，以确保各种机械可靠的保持或制动，具有很高的安全性。

REB-04 Series Double-Brakes are highly qualified in terms of safety. The products are particularly applied to the areas involving person and strict safety circumstances, such as automatic spatial carport and light elevator.

The two brakes are controlled independently to ensure reliable holding or braking for the machinery.



► 单位为毫米 (mm) Unit:mm

机座号 Size NO.	d1	d2	d3	d4	M	N	O	L	L1	L2	z	L3
06	31	72	3×M4	87	7	18	1	84.6	36.3	12	0.2	400
08	41	90	3×M5	105	8.5	20	1.5	97.6	42.8	12	0.2	400
10	45	112	3×M6	130	11	20	2	109.8	48.4	13	0.2	400
12	52	132	3×M6	150	11	25	2	125.8	54.9	16	0.3	400
14	55	145	3×M8	165	13	30	2	148	65.5	17	0.3	1000
16	70	170	3×M8	190	13.25	30	2.25	165	72.5	20	0.3	1000
18	77	196	6×M8	217	13.75	35	2.75	186.2	83.1	20	0.4	1000
20	90	230	6×M10	254	14.5	40	3.5	215.2	97.6	20	0.4	1000
25	120	278	6×M10	302	17	50	4.5	236.4	105.7	25	0.5	1000
30	145	325	6×M10	363	25	75	5	304	134.5	35	0.6	1000

⊙ 表中L3为导线长度，特殊要求可以定制

⊙ 可根据需要选配手动释放手柄

⊙ L3 represents standard lead length of the product and could be ordered to satisfy customers' requirements.

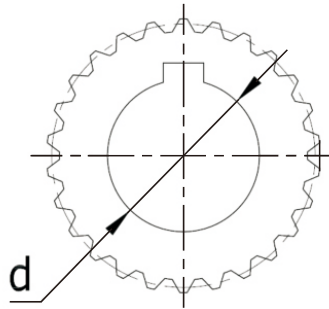
⊙ Customers are able to select manual release handle

花键套内孔可选安装尺寸

Optional Mounting Sizes for the Inner Bore of the Splined Hub

安装孔公差为H7，键槽尺寸符合DIN6885/1(GB/T1095-79)JS9，其中加粗的孔径为基本尺寸。

The mounting hole tolerance is H7. The dimension of keyway satisfies DIN6885/1(GB/T1095-79)JS9. The apertures presented in bold letters are basic dimensions.

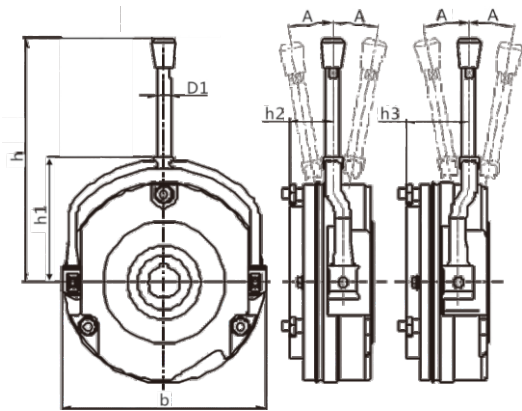


机座号 Size NO.	d
06	10/ 11 /12/14/15
08	11/12/14/ 15 /20
10	11/12/14/ 15 /20
12	15/17/ 20 /25/27
14	20/ 25 /30/31
16	25/ 30 /35/38
18	30/35/ 40 /45
20	35 / 40 /45/50
25	50 /55/60/65/70
30	65/70/75/80

手动释放手柄安装尺寸

Mounting Size for Manual Release Handle

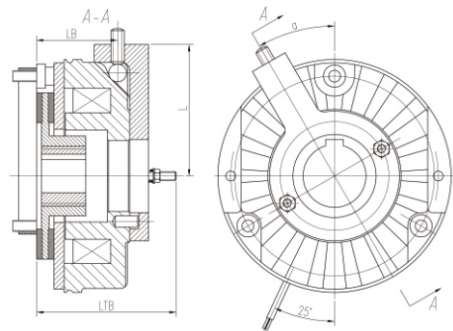
机座号 Size NO.	h	b	h1	h2	h3	D1	A
06	107	88	56.3	15	32	8	12
08	116	107	65.0	16	41	8	10
10	133	132	77.8	27	42	10	9
12	162	152	88.5	29.1	47.1	10	10
14	197	169	101.5	32	49	12	12
16	242	195	115.0	36.4	55.6	12	12
18	282	222	128.5	41.5	59.5	14	11
20	321	258	149.5	48	69	14	10
25	444	302	182	60	91	16	15
30	832	362	226	67.4	124.6	20	14



螺钉释放安装尺寸(自锁功能)

Mounting Dimensions for Releasing Screws(Self-Locking)

机座号 Size No.	LTB	LB	L	a
06	50.5	22.1	50.25	30°
08	63	28.6	59.25	30°
10	65	34.2	72.25	30°
12	72.6	40.7	83	30°
14	89.5	50	92.75	30°
16	102.5	56.2	105	30°
18	111	65.7	119.5	30°
20	131	75.7	140	30°
25	143	85.2	166	30°
30	177	110.9	202	30°



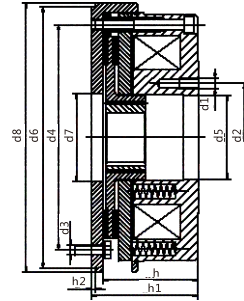
B型制动器+定心盖板

B-type Brake+Centering Flange

适用于安装速度或位置传感器，安装孔位置还可以根据客户要求定制。

The parts are applicable for speed or position sensors. Customers are also able to order the position of the installation bore.

机座号 Size No.	h	h1	h2	d1	d2	d3	d4	d5	d6	d7	d8
06	36.3	42.3	2	4×M4	37.7	3×M4	72	25	95	40	98
08	42.8	49.8	2	4×M5	49	3×M5	90	32	115	50	116
10	48.4	57.4	2	4×M5	54	3×M6	112	42	140	60	141
12	54.9	63.9	2	4×M5	64	3×M6	132	50	162	60	165
14	65.5	76.5	2	4×M6	75	3×M8	145	60	177	80	181
16	72.5	83.5	2	4×M6	85	3×M8	170	68	204	85	206
18	83.1	94.1	2	4×M8	95	4×M8	196	75	233	90	237
20	97.6	108.6	2	4×M10	110	4×M10	230	85	271	90	274
25	105.7	118.2	2	4×M10	140	6×M10	278	115	321	120	324



制动扭矩与转速的关系及最高工作转速

Relation between the braking torque and rotation speed;maximum working speed

产品规格 Product Size	额定扭矩[%](转速100r/min) Rated Torque[%](Rotation Speed 100r/min)	制动力矩与转速的关系[%] Relationship between braking torque and rotation speed[%]			最高工作转速 (r/min) Maximum Rotation Speed in Working(r/min)
		1500	3000	max	
REB0406	100%	86%	79%	74%	6000
REB0408	100%	84%	77%	73%	5000
REB0410	100%	82%	76%	73%	4000
REB0412	100%	80%	74%	73%	3600
REB0414	100%	79%	72%	70%	3600
REB0416	100%	78%	71%	67%	3600
REB0418	100%	76%	69%	67%	3600
REB0420	100%	74%	67%	67%	3600
REB0425	100%	72%	67%	67%	3000
REB 0430	100%	70%	67%	67%	3000

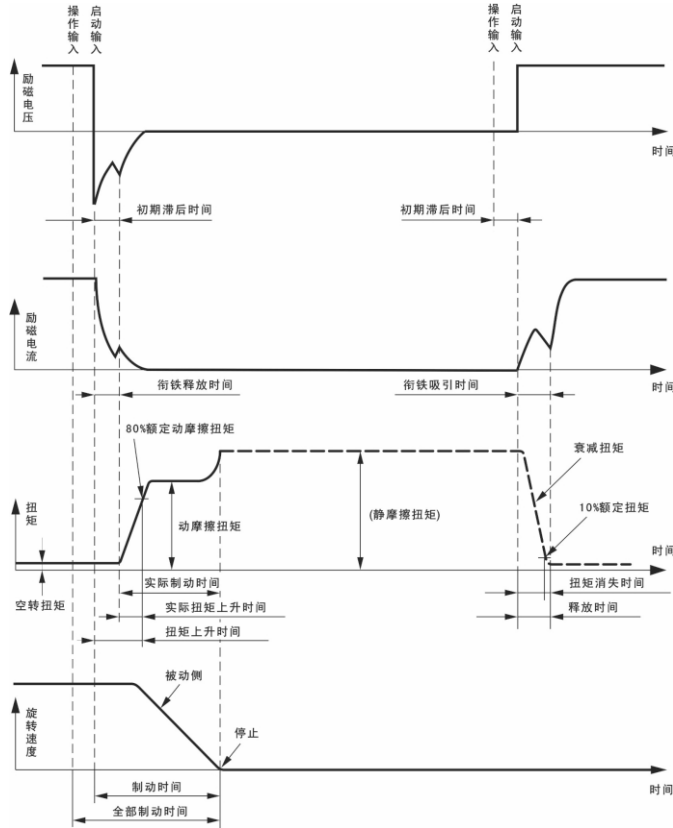
制动器使用额定参数

Relation between the braking torque and rotation speed;maximum working speed

机座号 Size NO.	额定间隙z(+0.1/-0.05) (mm)	Zmax 保持制动 (mm)	Zmax 减速制动 (mm)	摩擦盘组件 厚度(mm)		额定功率 20°C (W)	安 装 位置圆 (mm)	安 装 螺 钉 规 格
				min	Max			
06	0.2	0.3	0.5	4.5	6	20	72	3×M4
08	0.2	0.3	0.5	5.5	7	25	90	3×M5
10	0.2	0.3	0.5	7.5	9	30	112	3×M6
12	0.3	0.45	0.75	8	10	40	132	3×M6
14	0.3	0.45	0.75	7.5	10	50	145	3×M8
16	0.3	0.45	0.75	8.5	11.5	55	170	3×M8
18	0.4	0.6	1	10	13	85	196	6×M8
20	0.4	0.6	1	12	16	100	230	6×M10
25	0.5	0.75	1.25	15.5	20	110	278	6×M10
30	0.6	1	1.2	18.5	23	200	325	6×M10

动作时间

Operation time



产品规格	额定扭矩T(Nm) (转速100r/min)	制动时间 t_1 (ms)			释放时间 t_2 (ms)
		t_{11}	t_{12}	t_1	
REB0406	4	15	15	30	40
REB0408	8	15	17	32	50
REB0410	16	25	20	45	69
REB0412	32	26	30	56	108
REB0414	60	27	30	57	190
REB0416	80	30	30	60	200
REB0418	150	35	43	78	260
REB0420	260	65	100	165	340
REB0425	400	110	120	230	390
REB0430	1000	200	180	380	420

- ⊙ T11 衔铁释放时间
- ⊙ T12 扭矩上升时间
- ⊙ T1 制动时间
- ⊙ T2 释放时间 (衔铁吸合时间)
- ⊙ 以上所有时间参数均为直流侧控制所得参数
- ⊙ T11 Armature release time
- ⊙ T12 Rising Time of Braking Torque
- ⊙ T1 Braking Time
- ⊙ T2 Releasing Time (Armature Attracting Time)
- ⊙ All the above time-parameters are obtained through control at the DC side