

# ERD—Electrically Released Brakes

P-229  
819-0453

Installation Instructions



**W**arner Electric's ERD series spring set, electrically released brakes are designed to hold a load when the power to the brake is off. ERD brakes are offered in eight different sizes and the characteristics of each are described under "Specifications". Brake options include a manual release handle, dust cover, and thin or thick friction flanges. A friction flange is to be mounted to the back of the brake on applications where the mounting surface is not suitable for use as a friction surface for repeated stopping and holding. The manual release handle offers the operator the ability for controlled load release without energizing the electrical coil.

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**⚠ WARNING** Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

## Specifications

	Options	Units	ERD 5	ERD 10	ERD 20	ERD 35	ERD 60	ERD 100	ERD 170	ERD 300
Holding Torque		in.lb.	45	85	175	310	530	890	1500	2650
Maximum Speed		RPM	3600	3600	3600	3600	3600	3600	3600	3600
Nominal Airgap		Inch	.008	.008	.008	.012	.012	.012	.012	.012
Maximum Airgap		Inch	.020	.025	.020	.030	.030	.035	.035	.040
Current Draw		Amps								
	24 VDC		0.83	1.03	1.22	1.61	1.94	2.35	2.73	4.11
90/96/103.5	96 VDC		0.21	0.26	0.31	0.41	0.49	0.569	0.69	1.122
190/207/215	190 VDC		0.11	0.13	0.16	0.21	0.27	0.38	0.38	0.61
Resistance at Ambient Temp.	24 VDC	Ohms	28.9	23.4	19.6	14.9	12.4	10.22	8.78	5.83
90/96/103.5	96 VDC		454	372	310	233	166.2	168.6	139.2	85.63
190/207/215	190 VDC		1775	1450	1209	912	648.1	628.5	507.2	315.6
Weight		lbs	2	4	7	10	14	22	34	57

## Installation

ERD brakes are supplied in kit form. The magnet assembly is supplied with airgap factory adjusted. Brakes are designed for dry operation and can be mounted horizontally or vertically. Maximum ambient temperature is 104° F.

### Customer Shall Maintain:

1. Squareness of flange mounting face with shaft within 0.006 in. (0.15mm) T.I.R. measured at the mounting shaft.
2. Concentricity of flange mounting with mounting shaft within 0.006 in. (0.15mm) T.I.R.
3. The mounting surface should be made of steel or cast iron, square to the shaft with a surface finish of 125 microinches or a fine turned finish over the contact area.

#### Step 1

If a friction flange is provided, mount it first. Mounting dimensions are provided on Page 7. Thick flanges are typical.

#### Step 2

Install key into shaft. Slide hub onto shaft and provide a suitable axial stop. Stop collars are typical.

#### Step 3

Slide friction disc on to hub.

#### Step 4

Fit magnet assembly to friction plate or prepared surface. If a hand release is to be used, this should be installed at this time. Remove the wedge pieces. Torque bolts to the following specifications.

ERD Size	5	10	20	35	60	100	170	300
Torque, lb.in.	20	40	70	70	210	210	210	425

Secure bolts using a LOCTITE 270 type thermo-plastic liquid.

If a rubber dust cover is to be used, install it before installing the magnet.

#### Step 5

Apply power to magnet and cycle brake on several times to confirm friction disc rotates freely. Verify correct airgap.

## Electrical Connection

Warner Electric ERD brakes are offered in 24, 96, 190, and 215 VDC versions. Energizing the brake magnet with the proper voltage will cause the magnetic field generated to overcome the brake spring force and release the brake. Any DC power source with adequate amperage will operate the brake. Warner Electric offers 24 VDC controls to operate standard 24 VDC brakes and full and half wave rectifiers to supply 96 or 190 VDC current for models with those voltage ratings. Switches are customer supplied. The magnets are not polarity sensitive, so any magnet lead can be connected to any power source lead.

Recommended Warner Electric 24 VDC controls:

Model	Part Number
CBC-400-24	6006-448-002
CBC-450-24	6006-448-005
CBC-500-24	6024-448-002
CBC-550-24	6024-448-005

Warner Electric Rectifiers:

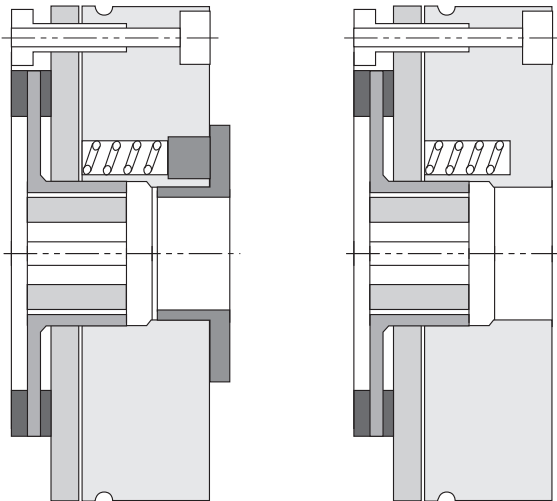
AC Input	DC Output	Rectifier	Part No.
240/220 V	96 V	Half Wave	CG 830 A1P1
415/380 V	190 V	Half Wave	CG 830 A1P1
240/220 V	190 V	Full Wave	CG 830 A1P2
110 V	96 V	Full Wave	CG 830 A1P2

## Torque Adjustment

Each brake is factory set to its nominal torque rating as listed under 'Specifications'. VAR 02 brakes are factory set at 50% of listed torque.

The torque of Variation 2 can be reduced by loosening the central nut to the extent listed in Figure 2.

ERD Size	Variation 2 - lb.in. Reduction per detent	Variation 2 Number of detents per complete revolution
5	4.5	4
10	11	4
20	11	4
35	21	4
60	16	6
100	22	6
170	27	8
300	38	8



### VAR 2

Single torque adjustment nut

- Torque reduction up to 50% by loosening nut
- Available in all sizes

### VAR 0

No torque adjustment possible

- Available in all sizes

Figure 2 - Torque Adjustment)

## Maintenance

Wear in the friction material causes an increase in the airgap. Before reaching the maximum airgap, it should be readjusted (see specifications).

- The brake must remain free from oil, grease, and abrasive dust at all times.
- Check the airgap periodically and reset as required per instructions found in Step 5 on page 3. Inspection interval(s) depend on the frequency of brake application.
- Check friction material thickness periodically per dimension M and replace when below the minimum shown below.

The theoretical reduction in airgap for 0.5 turn of the spacer screw will be as follows:

Brake	Thread	Reduction	Inches
ERD5	M6 X 0.5	0.25	0.010
ERD10	M8 X 0.75	0.375	0.015
ERD20	M10 X 0.75	0.375	0.015
ERD35	M10 X 0.75	0.375	0.015
ERD60	M12 X 1	0.5	0.020
ERD100	M12 X 1	0.5	0.020
ERD170	M12 X 1	0.5	0.020
ERD300	M16 X 1	0.5	0.020

Table 2: Airgap Adjustment Specifications

ERD Size	Minimum Thickness Millimeters	Minimum Thickness Inches
5	0.22	0.009
10	0.21	0.008
20	0.31	0.012
35	0.22	0.009
60	0.24	0.009
100	0.24	0.009
170	0.31	0.012
300	0.32	0.013

Table 3: Minimum Acceptable Friction Carrier Thickness in Inches

**Options**

- Manual Release - This option is recommended in applications where the brake needs to be released by hand. This is ideal for gradually and safely lowering suspended loads in the event of a power failure. Note: This option requires magnet VAR 2.
- Dust Cover - This option is recommended for use in environments which cannot be contaminated with brake friction dust and in harsh dust, dirt, and humidity environments where the brake is in danger from the contaminants.
- Friction Disc Carrier - Sizes 5 and 10 are available with an optional synthetic material carrier. Metallic disc carriers are standard for all sizes.
- Friction Flanges - A friction flange is to be mounted to the machine or motor frame if its surface does not meet these specifications:
  1. Cast iron or steel material
  2. Hardness 150 HB
  3. Smooth to 125 microinch
  4. Flat to .002 inches

A friction flange is required if all of the specifications are not met. The correct flange is:

**Thin friction flange**

Used where surface is machined but unsuitable for friction (eg. aluminum). Used in conjunction with "Long screw kit". Only available through size ERD 35 due to potential distortion with frictional heat input.

**Thick friction flange**

Used in the absence of a suitable machined mounting surface.

**Mounting Screw Kits:**

1. Short Screw Kit - supplied with the thick flange for mounting on the external diameter threaded holes.
2. Long Screw Kit - supplied with the thin flange for mounting through the flange on the external diameter holes. Can also be ordered separately for direct mounting without a flange.

**ERD Brake Components**

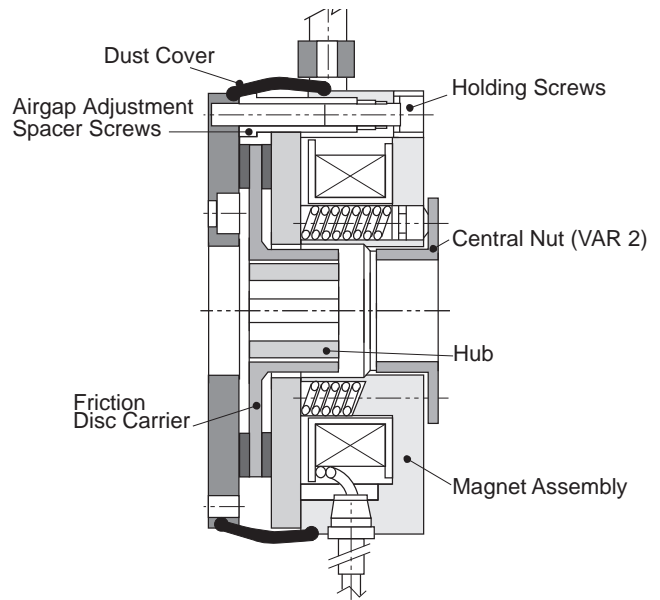


Figure 1

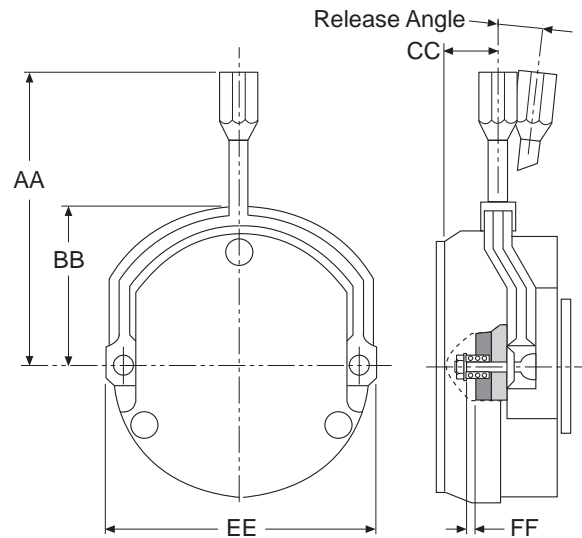
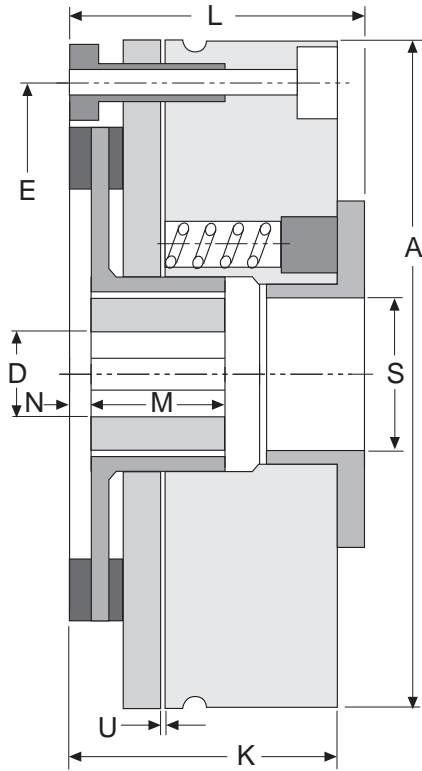


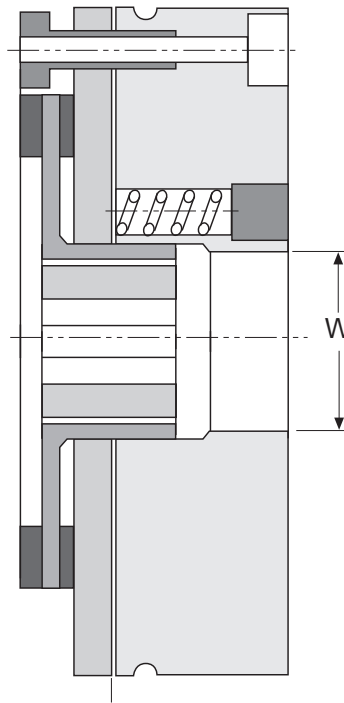
Figure 4 - Hand Release Lever Mounting

ERD Size	AA	BB	CC	EE	FF	Release Angle
5	3.86	2.09	0.67	3.46	.040	10
10	4.21	2.44	0.71	4.17	.040	9
20	5.08	2.99	0.98	5.20	.040	8
35	5.47	3.39	0.87	5.98	.050	8
60	7.44	4.09	1.57	6.54	.050	15
100	8.07	4.72	1.73	7.36	.050	15
170	9.57	5.51	2.09	8.78	.050	15
300	12.32	6.38	2.40	10.33	.050	20

**Dimensions**

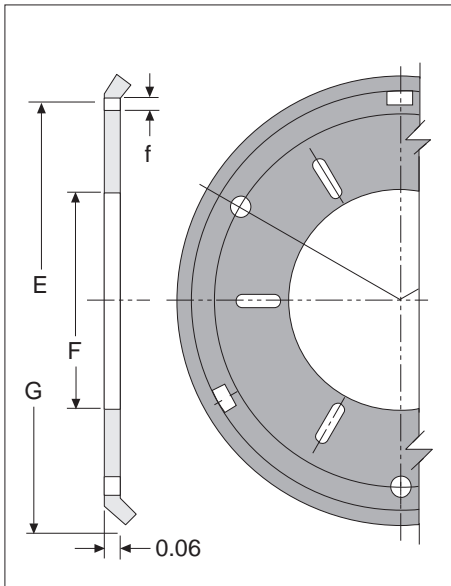


Brake Unit (typical)

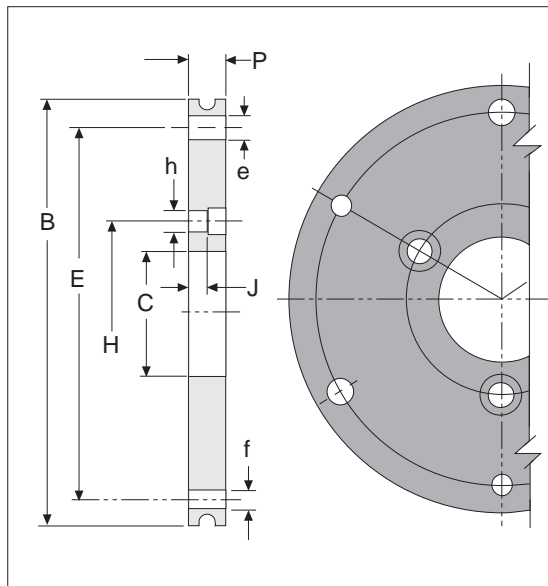


Brake Unit (VAR 0)

**Thin Friction Plate**



**Thick Friction Plate**



**Dust Cover**

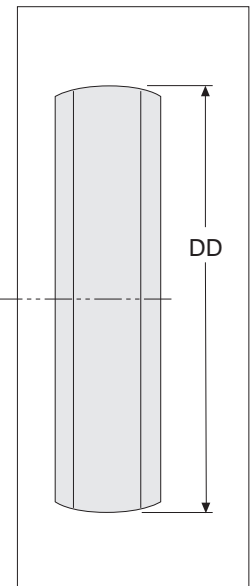


Figure 3

## Dimensions

ERD Size	A	B	C	D Max.	E	e Bolt Pattern	f Bolt Clearance Holes	F	G	H	h Bolt Clearance Holes	J
5	3.307	3.268	0.787	0.5	2.835	3xM4	3x0.177	1.654	3.425	1.181	3x0.315	0.079
10	4.016	3.937	1.181	0.625	3.543	3xM5	3x0.217	2.126	4.213	1.772	3x0.394	0.079
20	5.000	4.921	1.575	1	4.409	3xM6	3x0.256	2.362	5.217	2.205	3x0.433	0.118
35	5.787	5.709	1.772	1.125	5.197	3xM6	3x0.256	2.953	6.004	2.441	3x0.433	0.118
60	6.378	6.299	2.165	1.25	5.709	3xM8	3x0.335			2.913	3x0.551	0.118
100	7.402	7.283	2.559	1.500	6.693	3xM8	3x0.335			3.307	3x0.551	0.118
170	8.465	8.346	2.953	1.95	7.717	6xM8	6x0.335			3.937	6x0.551	0.118
300	9.921	9.843	3.543	2.125	9.055	6xM10	6x0.413			4.724	6x0.670	0.118

ERD Size	K	L Max.	M +0.000/-0.008	N	P	S	U +/-0.002	W	DD
5	1.378	1.575	0.709	0.079	0.236	0.748	0.008	0.925	3.46
10	1.614	1.831	0.787	0.118	0.276	0.945	0.008	1.122	4.17
20	1.870	2.185	0.787	0.157	0.354	1.378	0.008	1.594	5.20
35	2.146	2.559	0.984	0.118	0.354	1.575	0.012	1.909	5.98
60	2.520	2.933	1.181	0.118	0.433	1.890	0.012	2.303	6.53
100	2.795	3.209	1.181	0.118	0.433	2.047	0.012	2.500	7.56
170	3.268	3.780	1.378	0.177	0.433	2.362	0.012	2.894	8.62
300	3.819	4.528	1.575	0.197	0.433	2.874	0.012	3.484	10.8

## Warranty

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This warranty extends only to the original purchaser and is not transferable or assignable without Warner Electric LLC's prior consent.

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A purchase receipt or other proof of original purchase will be required before warranty service is rendered. If found defective under the terms of this warranty, repair or replacement will be made, without charge, together with a refund for transportation costs. If found not to be defective, you will be notified and, with your consent, the item will be repaired or replaced and returned to you at your expense.

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