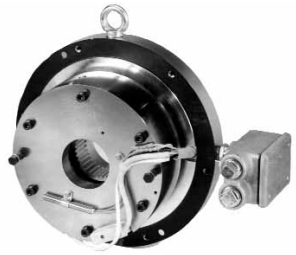
Series 350 Armature Actuated Brakes

Brake with IP56 Aluminum Cover



Brake showing space heater and release indicator location

Reverse view showing adapter mounting plate orientation

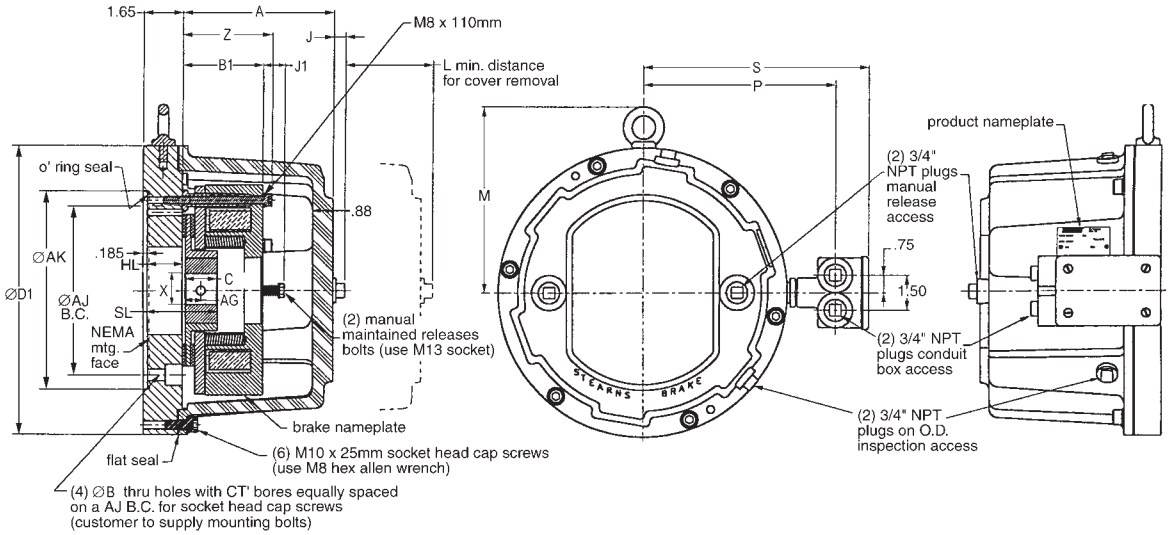
Features

- *Torque rating 102 - 400 Nm, 75 - 300 lb-ft*
- *Universal mounting*
- *Class H insulation*
- *Maintained manual release*
- *Corrosion resistance (stainless steel external hardware)*
- *IP56 enclosure protection (available in ductile cast iron or aluminum cover)*
- *ABS, CSA and CE certification*
- *Simple wear adjustment with access hole for air gap inspection*
- *Metric and US Customary bore sizes*
- *C-Face mounting - various adapter plates available for 182TC through 405TSC frame mounting*
- *Splined hub for quiet dependable operation*
- *Installation Instructions/Parts List: P/N 8-078-895-00*

Standard Options

- *AC rectifier (see pages 86-89)*
- *Tach/encoder mounting*
- *Space Heater 115, 230 or 460 Vac*
- *Thru-shaft*
- *IEC D and C Flange*
- *Conduit Box- specify F1 or F2 location (F1 location shown)*

F1 Conduit Box location shown.
F2 location on left side facing brake housing.



Size		NEMA frame	ØB	Torque		AJ	AK	Mount Bolt	X				D1	B1	Z	L	M	S	P	J1	A	J	C Hub length	HL Hub Location	AG set screw location
									Min. Bore		Max. Bore														
				lb-ft	Nm				in	*mm*	in	*mm*													
7	196	182TC-256TSC	.53	75	*102*	7.250	8.500	1/2"-13	1.375	*20*	1.625	*48**	12.38	3.57	3.97	4.6	8.00	9.68	8.25	.93	6.47	.50	1.378	1.63	.689 *17.50*
7	196	182TC-256TSC	.53	110	*150*	7.250	8.500	1/2"-13	1.375	*20*	1.625	*48**	12.38	3.57	3.97	4.6	8.00	9.68	8.25	.93	6.47	.50	1.378	1.63	.689 *17.50*
7	196	284TC-286TSC	.53	110	*150*	9.000	10.500	1/2"-13	1.375	*20*	1.625	*48**	12.38	3.57	3.97	4.6	8.00	9.68	8.25	.93	6.47	.50	1.378	1.63	.689 *17.50*
7	196	324TC-405TSC	.66	110	*150*	11.000	12.500	5/8"-18	1.375	*20*	1.625	*48**	15.75	3.57	3.97	4.6	9.63	11.38	9.94	.93	6.81	.50	1.378	1.63	.689 *17.50*
8	230	284TC-286TSC	.53	180	*240*	9.000	10.500	1/2"-13	1.625	*25*	1.875	*50**	15.75	4.00	4.46	5.0	9.63	11.38	9.94	.93	6.71	.25	1.575	1.63	.790 *20.07*
8	230	324TC-405TSC	.66	180	*240*	11.000	12.500	5/8"-18	1.625	*25*	1.875	*50**	15.75	4.00	4.46	5.0	9.63	11.38	9.94	.93	6.71	.25	1.575	1.63	.790 *20.07*
9	278	324TC-405TSC	.66	300	*400*	11.000	12.500	5/8"-18	1.875	*25*	2.125	*70*	15.75	4.00	5.08	5.0	9.63	11.38	9.94	.97	6.71	.25	1.969	1.63	.985 *25.02*

*Key to DIN 6885/3p9-Standard Metric Keyway DIN 6885/1p9

Component Materials:
- Adapter plate - steel (zinc plate)
- Splined hub - steel (zinc plate)
- Splined carrier - aluminum
- Armature - steel (zinc plate)
- Magnet body - steel (zinc plate) Hardware - steel (corrosion resistant plating or stainless)
- Cover: Size 196 - 182T thru 286TS NEMA - Aluminum (anodized) (additional paint optional) Size 196 - 324T thru 405TS NEMA - Cast Iron (primed) (additional paint optional)
- Size 230 - 284T thru 405TS NEMA - Cast Iron (primed) (additional paint optional)
- Size 278 - 324T thru 405TS NEMA - Cast Iron (primed) (additional paint optional)

Series 350 Continued

BACK TO PAGE 1

UnitSpecifications/Pricing (Discount Symbol R5)

Size	NEMA Frame	Nominal Static Torque		Part Number		Weight/lbs		Max RPM	Thermal Capacity Hp-Sec/Min	List Price	Options				
		lb-ft	*Nm*	Ductile Cast Iron	Aluminum Cover	Ductile Iron	Aluminum				Electronic Brake Release Indicator*	Space Heater	Terminal Strip	IP56 Conduit Box	IP67 Conduit Box
196	182TC-256TSC	75	*102*	351-734HX-XX-XX	355-734HX-XX-XX	–	103	1800	22	$4,266.00	$330.00	$208.00	$120.00	$205.00	$360.00
196	182TC-256TSC	110	*150*	351-744HX-XX-XX	355-744HX-XX-XX	–	103	1800	22	4,466.00	330.00	208.00	120.00	205.00	360.00
196	284TC-286TSC	110	*150*	351-744JX-XX-XX	355-744JX-XX-XX	–	103	1800	22	4,665.00	330.00	208.00	120.00	205.00	360.00
196	324TC-405TSC	110	*150*	351-744KX-XX-XX	355-744KX-XX-XX	134	128	1800	22	4,866.00	330.00	208.00	120.00	205.00	360.00
230	284TC-286TSC	180	*240*	351-844JX-XX-XX	355-844JX-XX-XX	208	178	1800	28	4,909.00	330.00	208.00	120.00	205.00	360.00
230	324TC-405TSC	180	*240*	351-844KX-XX-XX	355-844KX-XX-XX	208	178	1800	28	5,209.00	330.00	208.00	120.00	205.00	360.00
278	324TC-405TSC	300	*400*	351-944KX-XX-XX	355-944KX-XX-XX	219	189	1800	30	6,605.00	330.00	208.00	120.00	205.00	360.00

*Remote mount device

Ordering Information

Part number example: 355-744JCOMEA

Group "3" Armature Acting Brake (Direct acting with a DC Coil)

Options **Table 3**

Voltages - **Table 2**

Hub bore and keyset - **Table 1**

Mounting Design	
Numeral	Design
5	Pressure Plate Mount

Numeral	Brake Cover Type
1	Ductile Iron
5	Aluminum

Numeral/ Alpha	Magnet Body Size	Torque lb-ft
7	196	110
8	230	180
9	278	300

	Torque/Modification
3	Reduced Torque
4	Standard Torque

Additional Options	
Standard Brake	0
Space Heater 115	1
Space Heater 230	2
Space Heater 460	3
Brake release indicator NO/NC	4
Brake release indicator NO/NC Space Heater 115	5
Brake release indicator NO/NC Space Heater 230	6
Brake release indicator NO/NC Space Heater 460	7

Numeral	Enclosure
4	IP 56 (standard)
E	IP 56 conduit box with terminal strip*
G	IP56 conduit box*
H	IP67 conduit box* with terminal strip
M	IP67 conduit box*

*Specify F1 or F2 location for conduit box modification

Mounting	
NEMA 180/210/250 C-face	H
NEMA 280 C-face	J
NEMA 320/400 C-face	K
NEMA 440 C-face Mt*	L
NEMA 500 C-face Mt*	M
IEC 132 C-face Mt*	S
IEC 160 C-face Mt*	T
IEC 132 D-face Mt*	U
IEC 160 D-face Mt*	V
IEC 180 D-face Mt*	W
IEC 200 D-face Mt*	X
IEC 225 D-face Mt*	Y

*Contact factory for pricing on these mounting options

Table 1 - Hub Bores

NOTE: See page 97 for recommended minimum bore sizes by torque

Character to insert	Bore	Keyway Size*		Bores Available		
		Width (in.)	Depth (in.)	Unit Size		
				196	230	278
0G	1.375	5/16	5/32	X		
0M	1.500	3/8	3/16	X		
0H	1.625	3/8	3/16	X	X	
0I	1.750	3/8	3/16		X	
0J	1.875	1/2	1/4		X	X
0L	2.000	1/2	1/4			X
0N	2.125	1/2	1/4			X
Metric	*Bore*	*Width*	*Depth*	***196***	***230***	**278**
20	*20*	—	—	X		
30	*30*	*8*	*3.3*	X		X
35	*35*	*10*	*3.3*	X	X	
38	*38*	*10*	*3.3*	X	X	
40	*40*	*12*	*3.3*	X	X	X
42	*42*	*12*	*3.3*	X	X	
45	*45*	*14*	*3.8*	X	X	X
48	*48*	*14*	*3.8*	X		
50	*50***	*14*	*3.8***		X	
50	*50*	*14*	*3.8*			X
55	*55*	*16*	*4.3*			X
60	*60*	*18*	*4.4*			X
70	*70*	*20*	*4.9*			X

*Standard U.S. keyseats made to ANSI B17.1 standard. Standard metric keyseat DIN 6885/1 p9.
**Keyseat to DIN 6885/3 p9.

Table 2 - Coil Voltage

Character to Insert	Coil Voltage	Current Rating		
		7	8	9
		196	230	278
E	24 Vdc	3.30	4.27	3.85
J	90 Vdc	.82	1.05	1.19
K	103 Vdc	.75	.96	1.08
L	180 Vdc	.42	.54	.61
M	205 Vdc	.38	.49	.56
B	414/432 Vdc	.24	.26	.28

Other voltages available - consult factory
For AC rectifiers see pages 86-89

Table 3 - Additional Options

No manual release	A
Maintained release (standard)	R

NOTE: *Final part number may change due to specifications or options selected or other product design considerations. A number such as a 2, 3, 4 etc., in the 12th position is used to designate a unique brake (custom) and can only be assigned by Stearns Design Engineering Department.*

Modifications are available - see AAB Modification Section.

Armature Actuated Brakes (AAB) Torque Selection

BACK TO PRODUCT PAGE

Select the proper torque rating based on horsepower and rpm (speed at the clutch or brake) using the *Torque Selection Chart* below. Based on 1.4 service factor.

For other service factors and speeds, use the formulas shown below.

Formula for TABLE 1

$$T = \frac{63{,}025 \times P}{N} \times SF$$

T = Static torque, lb-in.

P = Horsepower, hp

N = Shaft speed at brake, rpm

SF = Service Factor

63,025 = Constant

Formula for TABLE 2

$$T = \frac{5{,}252 \times P}{N} \times SF$$

T = Static torque, lb-ft.

P = Horsepower, hp

N = Shaft speed at brake, rpm

SF = Service Factor

5,252 = Constant

Caution: Do not use Table 1 to select brakes for overhauling or high inertial loads, or where a stop in specified time or distance is required. For these applications the total inertia of the load and power transmission system must be determined to make a brake selection. Refer to sections on torque and thermal ratings and determination.

NOTE: Series 310 and 311 for holding applications only.

TABLE 1

Series 320, 321, 322 Static Torque in lb-in. *(Nm)*

Motor hp	rpm									
	600	800	1000	1200	1500	1800	2000	2400	3000	3600
	Static Torque lb-in *(Nm)*									
1/20	18 *(2.03)*	7 *(.79)*	7 *(.79)*	7 *(.79)*	3 *(.34)*	3 *(.34)*	3 *(.34)*	3 *(.34)*	3 *(.34)*	3 *(.34)*
1/12	18 *(2.03)*	18 *(2.03)*	7 *(.79)*	7 *(.79)*	7 *(.79)*	7 *(.79)*	7 *(.79)*	3 *(.34)*	3 *(.34)*	3 *(.34)*
1/8	35 *(3.95)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	7 *(.79)*	7 *(.79)*	7 *(.79)*	7 *(.79)*	3 *(.34)*
1/6	35 *(3.95)*	35 *(3.95)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	7 *(.79)*	7 *(.79)*	7 *(.79)*
1/4	—	35 *(3.95)*	35 *(3.95)*	35 *(3.95)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	7 *(.79)*
1/3	—	—	35 *(3.95)*	35 *(3.95)*	35 *(3.95)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*	18 *(2.03)*
1/2	—	—	—	—	35 *(3.95)*	35 *(3.95)*	35 *(3.95)*	35 *(3.95)*	18 *(2.03)*	18 *(2.03)*
3/4	—	—	—	—	—	—	35 *(3.95)*	35 *(3.95)*	35 *(3.95)*	35 *(3.95)*
1	—	—	—	—	—	—	—	—	—	35 *(3.95)*

TABLE 2

Series 333/350/360 Static Torque in lb-ft. *(Nm)*

Motor hp *(kw)*	rpm									
	600	800	1000	1200	1500	1800	2000	2400	3000	3600
	Static Torque lb-ft *(Nm)*									
1/3 *(.25)*	6 *(8)*	6 *(8)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*
1/2 *(.37)*	12 *(16)*	6 *(8)*	6 *(8)*	6 *(8)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*
3/4 *(.55)*	12 *(16)*	12 *(16)*	6 *(8)*	6 *(8)*	6 *(8)*	6 *(8)*	3 *(4)*	3 *(4)*	3 *(4)*	3 *(4)*
1 *(.75)*	25 *(34)*	12 *(16)*	12 *(16)*	12 *(16)*	6 *(8)*	6 *(8)*	6 *(8)*	6 *(8)*	6 *(8)*	3 *(4)*
1-1/2 *(1.1)*	25 *(34)*	25 *(34)*	12 *(16)*	12 *(16)*	12 *(16)*	12 *(16)*	6 *(8)*	6 *(8)*	6 *(8)*	6 *(8)*
2 *(1.5)*	25 *(34)*	25 *(34)*	25 *(34)*	25 *(34)*	12 *(16)*	12 *(16)*	12 *(16)*	6 *(8)*	6 *(8)*	6 *(8)*
3 *(2.2)*	45 *(60)*	45 *(60)*	25 *(34)*	25 *(34)*	25 *(34)*	25 *(34)*	12 *(16)*	12 *(16)*	12 *(16)*	12 *(16)*
5 *(3.7)*	60 *(80)*	60 *(80)*	45 *(60)*	45 *(60)*	25 *(34)*	25 *(34)*	25 *(34)*	25 *(34)*	25 *(34)*	12 *(16)*
7-1/2 *(5.6)*	110 *(150)*	110 *(150)*	60 *(80)*	60 *(60)*	45 *(60)*	45 *(60)*	45 *(60)*	25 *(34)*	25 *(34)*	25 *(34)*
10 *(7.5)*	180 *(240)*	110 *(150)*	110 *(150)*	110 *(150)*	60 *(80)*	45 *(60)*	45 *(60)*	45 *(60)*	25 *(34)*	25 *(34)*
15 *(11.2)*	300 *(400)*	180 *(240)*	110 *(150)*	110 *(150)*	110 *(150)*	60 *(80)*	60 *(80)*	60 *(80)*	45 *(60)*	45 *(60)*
20 *(14.9)*	300 *(400)*	180 *(240)*	180 *(240)*	180 *(240)*	110 *(150)*	110 *(150)*	110 *(150)*	60 *(80)*	60 *(80)*	60 *(80)*
25 *(18.6)*	—	300 *(400)*	180 *(240)*	180 *(240)*	180 *(240)*	110 *(150)*	*	*	*	*
30 *(22.4)*	—	300 *(400)*	300 *(400)*	300 *(400)*	180 *(240)*	180 *(240)*	*	*	*	*
40 *(29.8)*	—	—	300 *(400)*	300 *(400)*	300 *(400)*	180 *(240)*	*	*	*	*
50 *(37.3)*	—	—	—	—	300 *(400)*	300 *(400)*	*	*	*	*
60 *(44.7)*	—	—	—	—	300 *(400)*	300 *(400)*	*	*	*	*

* Exceeds maximum speed rating.

P/N 8-078-895-00
effective 8/5/04

Stearns® *Armature Actuated Brakes*

Installation, Service and Parts List for 35X Series Armature Actuated Brakes

Important

Please read these instructions carefully before installing, operating, or servicing your Stearns brake. Failure to comply with these instructions could cause injury to personnel and/or damage to property if the brake is installed or operated incorrectly. For definition of limited warranty/liability, contact Rexnord Industries, Inc., Stearns Division, 5150 S. International Dr., Cudahy, Wisconsin 53110, (414) 272-1100.

OEM's and subsystem suppliers, please forward these instructions with your components to the final user.

Caution

1. Servicing shall be in compliance with applicable local safety codes including Occupational Safety and Health Act (OSHA). All wiring and electrical connections must comply with the National Electric Code (NEC) and local electric codes in effect.
2. To prevent an electrical hazard, disconnect power source before working on the brake. If power disconnect point is out of sight, lock disconnect in the *off* position and tag to prevent accidental application of power to system.
3. To avoid damage to internal power supply, hipot testing should not exceed 1500 volts for one second. Brake coil leads must be connected together.
4. Heat developed during normal operation (135°C) of the brake may be hot enough to be painful or cause injury. Be careful when touching exterior surfaces. Allow sufficient time for the brake to cool before servicing.
5. After usage, the brake will contain burnt and degraded friction material dust. This dust should be removed before servicing or adjusting the brake.

   DO NOT blow off dust using an air hose. It is important to avoid dispersing dust into the air or inhaling it, as this may be dangerous to your health.

   a) Wear a filtered mask or a respirator while removing dust.

   b) Use a vacuum cleaner or a soft brush to remove dust from the brake. When brushing, avoid causing the dust to become airborne. Collect the dust in a container, such as a bag, which can be sealed off.
6. Maximum operating ambient temperature for these brakes should not exceed 40°C (104° F).

I. Installation

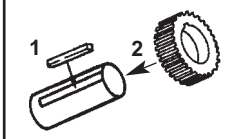
Note 1: Position of hub should allow full engagement of friction disc without interfering with the movement of the armature. **Motor shaft end float should not exceed .020". Shaft runout should be within .002" TIR. Motor mounting surface should be flat and perpendicular to within .004" of motor shaft.**

Note 2: Keep grease and oil from contacting friction surfaces.

Note 3: Hub should be a tight sliding fit. **For shrink fit hub, consult factory.**

I. Installation

Step 1



1. Place key in motor shaft.
2. Position hub per Table A.
3. Tighten set screws per Table B.

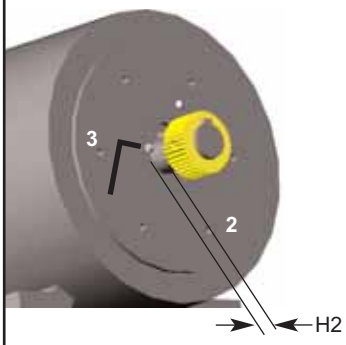


Table A (H2)

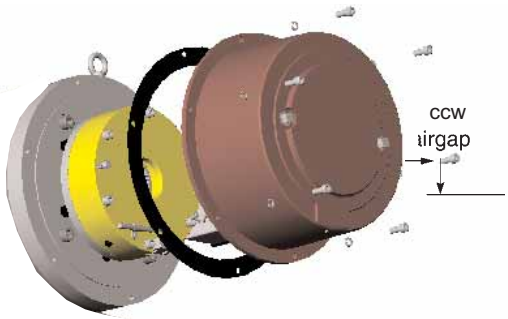
Brake Model	Bolt Circle	Metric	English
35X-7	7.25 9.00 11.00	*38 mm* *39.5 mm*	1.50" 1.55"
35X-8	9.00 11.00	*40.5 mm*	1.60"
35X-9	11.00	*40.5 mm*	1.60"

Table B

Brake Model	Bolt Circle	Metric	English	Hex Wrench
35X-7	7.25 9.00 11.00	*32.5 Nm*	24 lb-ft	3/16"
35X-8	9.00 11.00	*32.5 Nm*	24 lb-ft	3/16"
35X-9	11.00	*70.5 Nm*	52 lb-ft	1/4"

Step 2

Remove 6 housing bolts (8mm hex wrench) lift housing and gasket from brake assembly/mounting plate.

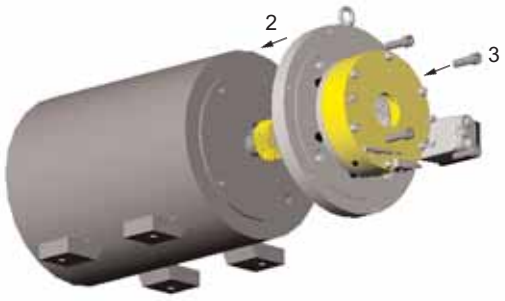


Step 3 Mounting Instructions: 35X-7 and 35X-8 with 11.00" BC mounting.

Note 1: It may be necessary to manually release the brake to align the mounting register if the pressure plate has shifted in shipment.

1. Insert O-ring in groove of register mounting face.
2. Position brake assembly over hub using care to align spline teeth, and slide the assembly up against the motor register face.
3. Insert four (4) mounting bolts (5/8 - 11 x 1.25") tighten to manufacturers specifications using 1/2" hex wrench.

Note 2: Release air gap is factory set per Table D. Verify air gap after mounting brake to motor.



Installation procedure continued on reverse side.

Installation continued

Step 4 Mounting Instructions: 35X-7 with 7.25” and 9.00” BC Mounting, 35X-8 with 9.00” BC mounting and 35X-9 with 11.00” BC mounting

1. Remove the six mag body to adapter plate mounting bolts to separate the adapter plate from the mag body.
2. Insert O-ring in groove of register mounting face.
3. Bolt adapter plate to motor register with four mounting bolts. (1/2-13 x 1.25” for 7.25” and 9.00” BC and 5/8-11 x 1.25” for 11.00” BC.) Tighten to manufacturers specification using 3/8” hex wrench for 7.25” and 9.00” BC mounting. Use 1/2” hex wrench for 11.00” BC mounting.
4. Align carrier disc onto mounted hub and slide it into place against the mounting plate.
5. Position brake assembly over hub/carrier disc and slide up against the pressure plate. Tighten mounting bolts per Table C.

Note: Release air gap is factory set per Table D. Verify air gap after mounting brake to motor.

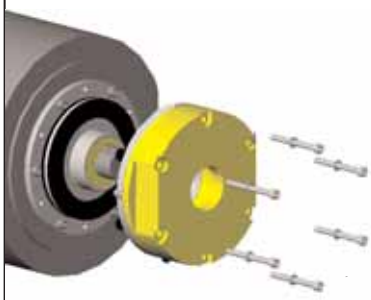
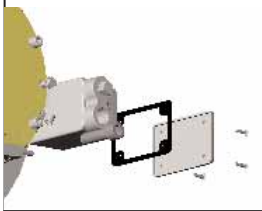


Table C

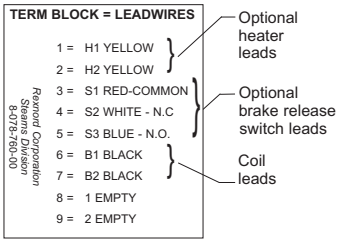
Brake Model	Bolt Circle	Mounting Bolt Torque		Hex Wrench
		Metric	English	
35X-7	196	*19 Nm*	14 lb-ft	*6 mm*
35X-8	230	*38 Nm*	28 lb-ft	*8 mm*
35X-9	278	*38 Nm*	28 lb-ft	*8 mm*

Step 5 Leadwire Connection Optional Conduit Box

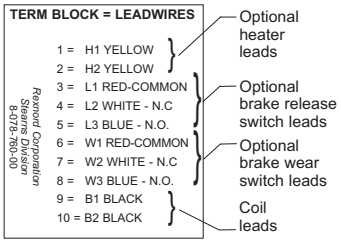
1. Loosen NPT plug and four (4) cover plate screws from junction box and remove.
2. Route leadwires into junction box and connect conduit to box.
3. Connect wiring as shown below for either the 9 terminal IP 56 or IP 65 conduit box assembly.
4. Replace junction box cover and tighten screws to seal.



5-08-0050-00 IP 56 Assembly

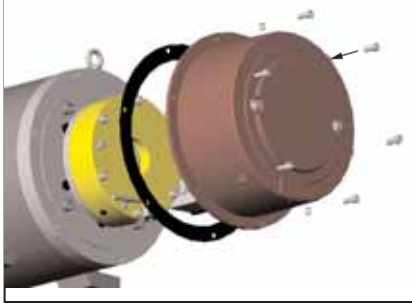


5-08-0051-00 IP 65 Assembly



Step 6

1. Replace gasket; align holes for housing bolts.
2. Place housing over brake making sure the manual release access holes align with the release bolts.
3. Insert six (6) housing bolts and tighten to 11.2 Nm (100 in-lb).

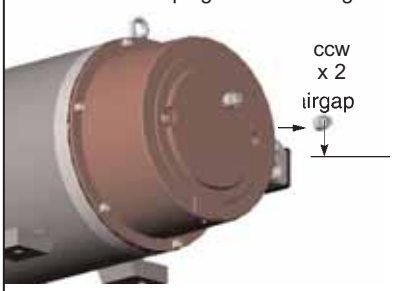


CAUTION: Be sure all internal wiring is clear of housing flange before replacing housing.

II. Manual Release Engagement

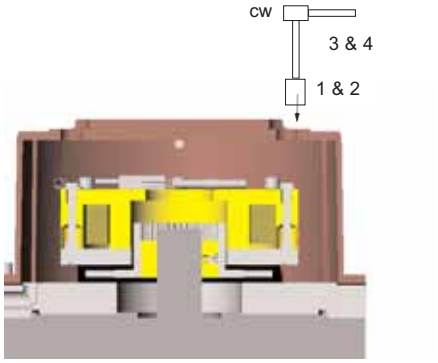
Step 1

Remove access plugs from housing.



Step 2

1. Insert a 13mm socket through the access hole and engage the release bolt.
2. Push down on the bolt while rotating the socket to engage the first threads of the bolt.
3. Tighten the release bolts until snug against the brake frame.
4. Tighten the bolts (cw) to 19-23 Nm (14-17 ft-lb) by alternately rotating each bolt 1/2 turn at a time.

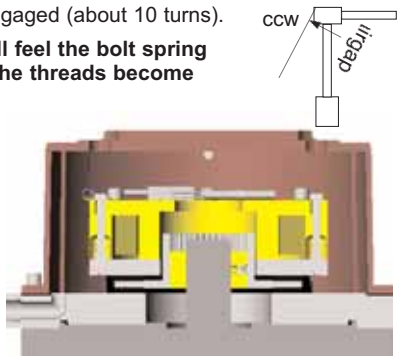


III Manual Release Disengagement

Step 1

Loosen (ccw) release bolts until threads are fully disengaged (about 10 turns).

Note: You will feel the bolt spring loose when the threads become disengaged.



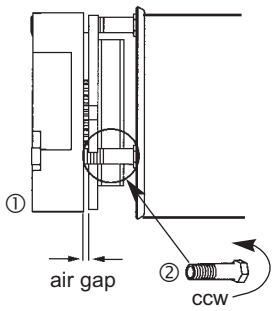
Step 2

Replace access plugs.

Note: Ensure that gasket is securely located on the face of the plug. Add a drop of Loctite 242, or equivalent, to the thread of the plug and tighten to 28 lb-ft.

IV. Air Gap Setting and Wear Adjust

Figure 1



Air gap is factory set per Table D. Set air gap is measured at the adjusting bolts, between the armature and magbody.

Table D - Minimum Air Gap

Brake Model	Bolt Circle	Air Gap
35X-7	196	*.508-.610 mm*
		.020-.024"
35X-8	230	*.508-.610 mm*
		.020-.024"
35X-9	278	*.508-.610 mm*
		.020-.024"

Normal friction disc wear will cause air gap to increase from original setting (Table D). Air gap should be readjusted when gap reaches dimension shown in Table E.

Table E - Maximum Air Gap

Brake Model	Hex Wrench	Max Gap	
		Metric	English
35X-7	3/4"	*.89 mm*	.035"
35X-8	3/4"	*1.09 mm*	.043"
35X-9	3/4"	*1.40 mm*	.055"

Table F - Disc Maximum Wear

Brake Model	Min Thickness	
	Metric	English
35X-7	*9.27mm*	0.365"
35X-8	*11.68 mm*	0.460"
35X-9	*12.57 mm*	0.495"

Wear Adjustment

1. Loosen six mounting bolts 1/2 turn.
2. Rotate three alternate adjusting screws 1-1/2 turns counter- clockwise (as viewed from back side of brake).
3. Rotate three remaining adjusting screws similarly ccw to achieve original gap (Table D).
4. Retighten mounting bolts.
5. Recheck gap. Repeat above procedures as necessary.
6. Rotate three alternate adjust screws clockwise until snug with pressure plate.

Note 1: 90° ccw rotation is approximately 0.38mm (0.015") air gap increase.

Note 2: Brake discs should be replaced when they reach the thickness shown in Table F. Normally this will occur after 4-5 adjustments.

V. Coil Wiring

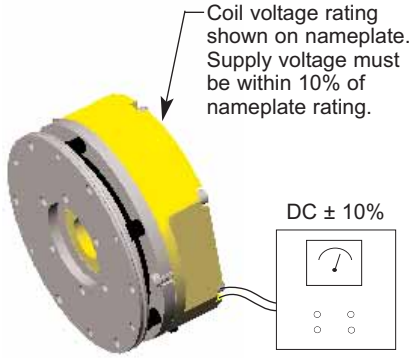
Caution: Brake wiring should only be carried out by qualified personnel.

Stearns brake coils are wound for DC voltage input at ± 10% of nameplate rating. Coil resistances shown below are for references purposes. For applications where AC voltage is being rectified refer to AC control switching shown on next page.

Table G

Bolt Circle	196	230	278
Brake Model	35X-7	35X-8	35X-9
Voltage Rating↓	Ohm (nominal value)*		
24	7.28	5.62	5.11
90	110.3	85.4	77.9
103	138.2	107.	97.7
180	426.8	330.7	302.6
205	534.6	414.3	379.3
258	669	650	605
414/432	1726	1649	1484

* Resistance values at 20°C



Electrical Considerations

Caution: Electrical work should only be performed by qualified personnel.

Note 1: All 35X series brakes have DC wound coils designed to accept DC line voltage at ± 10% of nameplate rating.

Note 2: When using a rectifier for AC line input, use table H to determine the proper DC coil rating requirement.

Table H

Line Voltage (AC)	Rectifier Type	Recommended Coil Voltage Rating	Stearns Rectifier Part Number*	Rectifier Output Voltage
100	full	90	412-0292-01K	90
110	full	103	412-0292-01K	99
115	full	103	412-0292-01K	103
127	full	103	412-0292-01K	115
208	full	180	412-0291-01K	187
220	full	205	412-0291-01K	198
230	full	205	412-0291-01K	207
240	full	205	412-0291-01K	216
220	half	103	412-0591-01K	99
230	half	103	412-0591-01K	103
240	half	103	412-0591-01K	108
380/400	half	180	412-0591-01K	171/180
415	half	180	412-0591-01K	187
460	half	205	412-0591-01K	207
575	half	260	412-0591-01K	259

Note: Fullwave rectifier output is 90% of AC line. Halfwave rectifier output is 45% of AC line input.

* -0291- indicates 0.8 amp rating
* -0292- indicates 1.6 amp rating

AC Switching with Standard Rectifier

Switching on the AC line is the most common method of control when the rectifier is wired through the motor windings or motor contacts. However, brake engagement can take up to 5 times longer than DC switching. Switching on the AC line is not suitable for hoist and crane applications.

Crane and Hoist Applications

For descending loads such as cranes and hoists or high inertia loads, the motor windings can develop regenerative voltage during deceleration which can delay the engagement of the brake when switching on the AC supply.

For these type of applications it is important to switch on the DC side of the rectifier or use a Quick Set device. Stearns rectifiers have a built in suppression circuit to protect the rectifier. However, it may still be necessary to protect the switching contacts with a separate suppression device. (see Figure 1 and Figure 2).

Figure 1

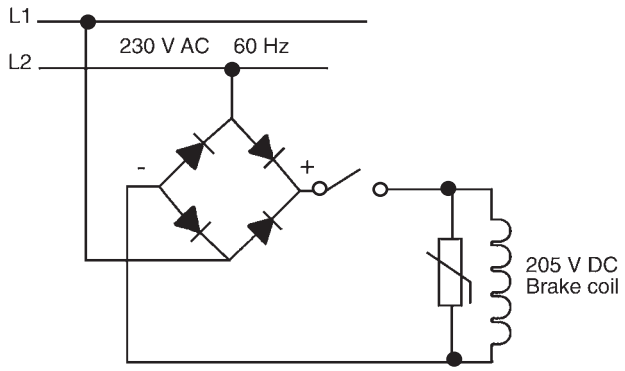
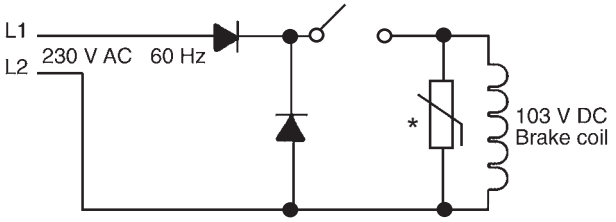
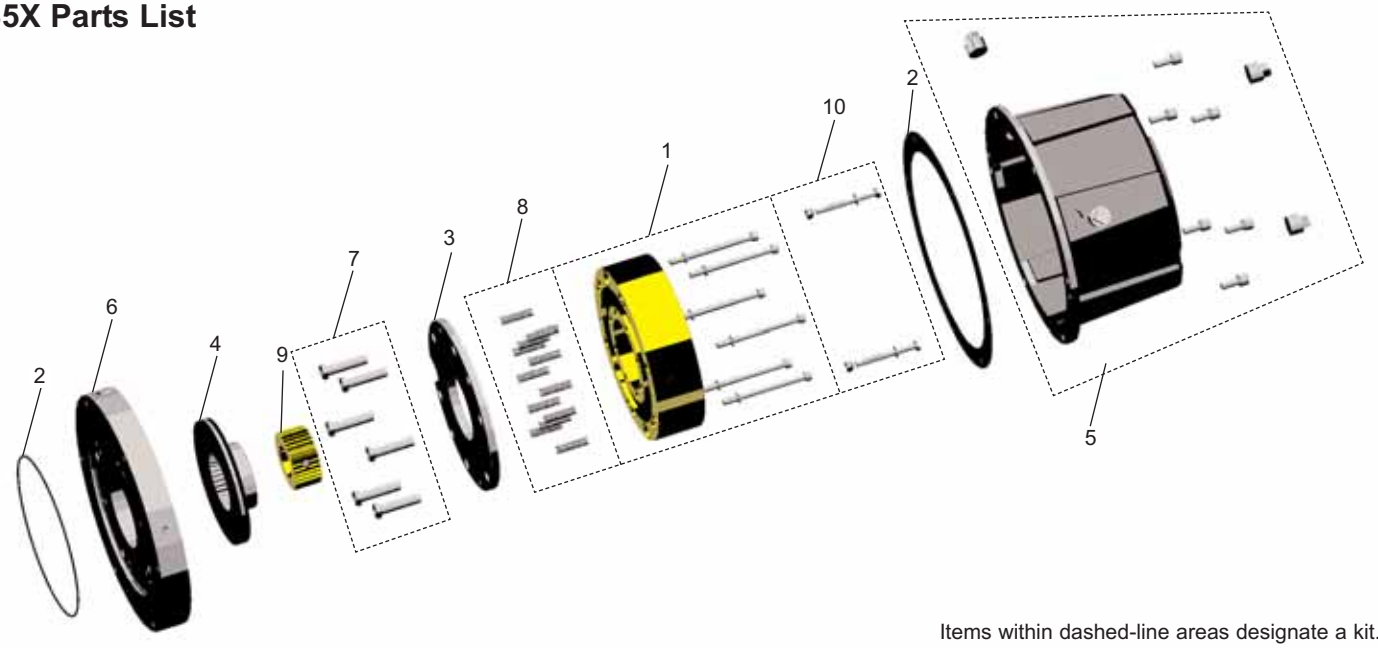


Figure 2



* A suppression device **is** required when switching on the DC side of the line and using the half wave rectifier (412-0591-01K).

35X Parts List



Items within dashed-line areas designate a kit.

Table I

Item	Torque Rating Description		35X-7	35X-8	35X-9
1	Mag body & coil assembly (see table J for voltage)		5-04-0986-00-0[ ]K	5-04-0991-00-0[ ]K	5-04-0996-00-0[ ]K
2	Gasket kit		5-77-0987-00	5-77-0992-00	5-77-0992-00
3	Armature kit		8-405-986-OK	8-405-991-OK	8-405-996-OK
4	Carrier disc kit		5-14-0985-OK	5-14-0990-OK	5-14-0995-OK
5 5a	Housing kit (aluminum) Housing kit (cast iron)		8-007-116-OK –	8-007-117-OK 8-007-115-OK	8-007-117-OK 8-007-115-OK
6a	Adapter plate kit 7.25" B.C.		8-001-903-OK	–	–
6b	Adapter plate kit 9.00" B.C.		8-001-904-OK	–	–
6c	Adapter plate kit 11.00" B.C.		8-001-905-OK	8-001-905-OK	8-001-905-OK
7	Adjust bolt kit		8-434-985-OK	8-434-990-OK	8-434-990-OK
8	Spring kit		9-70-0985-OK	9-70-0990-OK	9-70-0995-OK
9	Hub (see table K)	English bore	5-16-0981-01-01[ ]	5-16-0991-01-01[ ]	5-16-0995-01-01[ ]
		Metric bore	8-016-980-00-M[ ]	8-016-990-00-M[ ]	8-106-995-00M[ ]
10	Maintained release kit		9-17-9884-OK	9-17-9884-OK	9-17-9886-OK

Kit Contents

Item	Description
1	Mag body & coil assembly Mounting bolts (6) & lock washers (6)
2	O-ring Flat gasket
5	Housing Mounting bolts (6) & lock washers (6) Hole plugs
8	Outer & inner pole springs
10	Maintained release bolts, washers, springs & locknuts

Table J Coil Voltage & Current Ratings

Magbody & Coil Assembly Voltage Identifier -0[ ]K		Current Rating		
Voltage	Insert	196	230	278
24 V DC	0 [E]K	3.30	4.27	3.85
90 V DC	0 [J]K	.82	1.05	1.19
103 V DC	0 [K]K	.75	.96	1.08
180 V DC	0 [L]K	.42	.54	.61
205 V DC	0 [M]K	.38	.49	.56
258 V DC	0 [S]K	.38	.40	.44
414/432 V DC	0 [B]K	.25	.26	.29

Table K

Bore Diameters			
English Bore	Insert [ ]	*Metric Bore*	Insert [ ]
1 3/8	G	*30 mm*	30
1 1/2	M	*35 mm*	35
1 5/8	H	*38 mm*	38
1 3/4	I	*40 mm*	40
1 7/8	J	*42 mm*	42
2	W	*45 mm*	45
2 1/8	N	*48 mm*	48
		50 mm	50
		55 mm	55
		60 mm	60
		70 mm	70

Rexnord Industries, Inc.
Stearns Division
5150 S. International Dr.
Cudahy, Wisconsin 53110
(414) 272-1100 Fax: (414) 277-4364 www.rexnord.com

Copyright© 2001-2003 by Rexnord Industries, Inc.

P/N 8-078-877-00
effective 09/21/06

Stearns® *Armature Actuated Brakes*

Installation and Service Instructions for Stearns AAB Rectifier

Important

Please read these instructions carefully before installing, operating, or servicing your Stearns brake and rectifier. Failure to comply with these instructions could cause injury to personnel and/or damage to property if the brake is installed or operated incorrectly. For definition of limited warranty/liability, contact Rexnord Industries, Inc., Stearns Division, 5150 S. International Dr., Cudahy, Wisconsin 53110,(414) 272-1100.

OEM's and subsystem suppliers, please forward these instructions with your components to the final user.

Caution

1. Servicing shall be in compliance with applicable local safety codes including Occupational Safety and Health Act (OSHA). All wiring and electrical connections must comply with the National Electric Code (NEC) and local electric codes in effect.
2. To prevent an electrical hazard, disconnect power source before working on the brake. If power disconnect point is out of sight, lock disconnect in the *off* position and tag to prevent accidental application of power to system.
3. Maximum operating ambient temperature for these rectifiers should not exceed 65°C (150° F).
4. Refer to specific brake Installation and Service Instructions for proper mounting of brake.

Wiring

1. Connect coil leadwires to rectifier as shown in diagrams. (Polarity does **not** matter.)
2. Connect rectifier leadwires to AC power source.

Note 1: For each nominal AC line voltage, use table to determine the proper DC coil rating requirement.

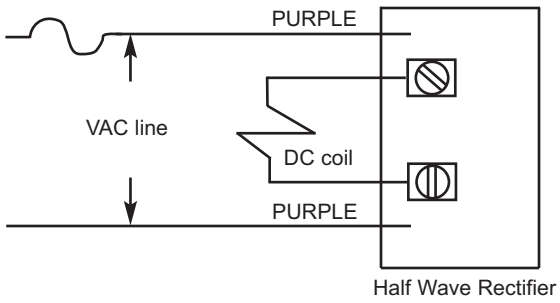
Note 2: Rectifiers must be fused with a 1 amp; fast acting fuse, with a rating at, or above the line voltage input to the rectifier. The exception to fusing are kits #412-0292-01 and 412-0292-03, which have built in fuses.

Table

Line Voltage (AC)	Rectifier Type	Recommended Coil Voltage Rating	Stearns Rectifier Part Number	Rectifier Output Voltage
100	full	90	412-029*-01K	90
110	full	103	412-029*-01K	99
115	full	103	412-029*-01K	103
127	full	103	412-029*-01K	115
208	full	180	412-029*-01K	187
220	full	205	412-029*-01K	198
230	full	205	412-029*-01K	207
240	full	205	412-029*-01K	216
230	full	205	412-0292-03K	207
220	half	103	412-0591-01K	99
230	half	103	412-0591-0*K	103
240	half	103	412-0591-0*K	108
380/400	half	180	412-0591-0*K	171/180
415	half	180	412-0591-0*K	187
460	half	205	412-0591-0*K	207
460	half	205	412-0493-0*K	207
575	half	260	412-0591-0*K	259
480	half	205	412-0591-0*K	216

Note: *Insert numeral from existing rectifier in this position. Full Wave rectifier output is 90% of AC line input. Half wave rectifier output is 45% of AC line input.

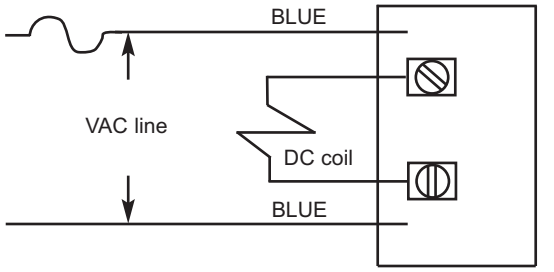
Kit Number 412-0591-01K**



Half Wave Rectifier

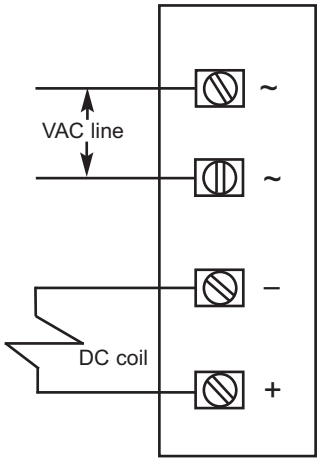
** A suppression device is required when switching on the DC side of the line and using the half wave rectifier (412-0591-01K).

Kit Number 412-0291-01K



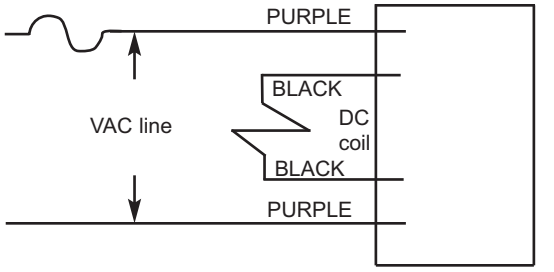
Full Wave Rectifier

Kit Number 412-0292-01K



Full Wave Rectifier

Kit Number 412-0591-03K**



Half Wave Rectifier

BACK TO PRODUCT PAGE

Installation and Service Instructions for Stearns Quick-Set & Over-Excitation Rectifiers

Important

Please read these instructions carefully before installing, operating, or servicing your Stearns brake and rectifier. Failure to comply with these instructions could cause injury to personnel and/or damage to property if the brake is installed or operated incorrectly. For definition of limited warranty/liability, contact Rexnord Industries, Inc., Stearns Division, 5150 S. International Dr., Cudahy, Wisconsin 53110,(414) 272-1100.

OEM's and subsystem suppliers, please forward these instructions with your components to the final user.

Caution

1. Servicing shall be in compliance with applicable local safety codes including Occupational Safety and Health Act (OSHA). All wiring and electrical connections must comply with the National Electric Code (NEC) and local electric codes in effect.
2. To prevent an electrical hazard, disconnect power source before working on the brake. If power disconnect point is out of sight, lock disconnect in the *off* position and tag to prevent accidental application of power to system.
3. Maximum operating ambient temperature for these rectifiers should not exceed 65°C (150° F).
4. Refer to specific brake Installation and Service Instructions for proper mounting of brake.
5. When use of these rectifiers is in conjunction with a motor operated by a variably frequency drive, the input wiring to the rectifier should be run in a wireway that does not contain the motor wires. Shielded cable should be used in applications where the rectifier and motor wires must be run together.

Wiring

1. Connect coil leadwires to rectifier as shown in diagrams. (Polarity does **not** matter.)
2. Connect rectifier leadwires to AC power source.

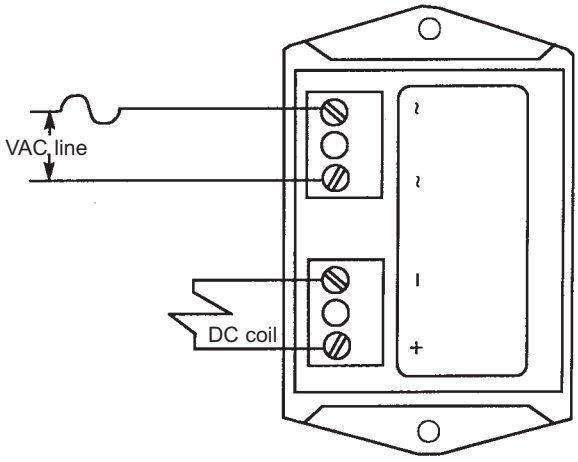
Note: For each nominal AC line voltage, use table to determine the proper DC coil rating requirement.

Table A

Line Voltage (AC)	Rectifier Type	Recommended Coil Voltage Rating	Stearns Rectifier Part Number	Rectifier Output Voltage
230	full	205	412-0296-01K	207
460	full	415	412-0498-01K	414
230	half	103	412-0293-01K	207/103*
460	half	205	412-0496-01K	414/207*
575	half	260	412-0598-11K	259
460	half	205	412-0498-11K	207

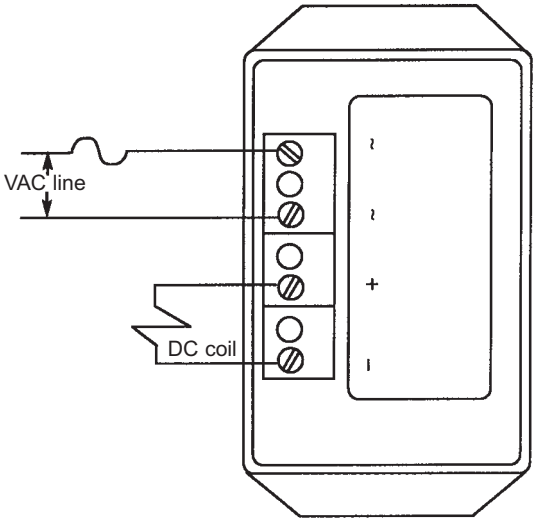
*The over-excitation rectifier produces a momentary fullwave output before switching to a halfwave output.

412-0296-01K
412-0498-01K
412-0498-11K
412-0598-11K



Quick-Set Rectifier/Tor-ac
Fuse is: 1A 250V for 230 VAC line
1A 600V for 460 VAC line
1A 600V for 575 VAC line

412-0293-01K
412-0496-01K



Over-Excitation Rectifier
Fuse is: 3A 250V for 230 VAC line
3A 600V for 460 VAC line

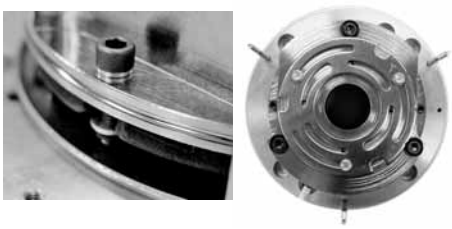
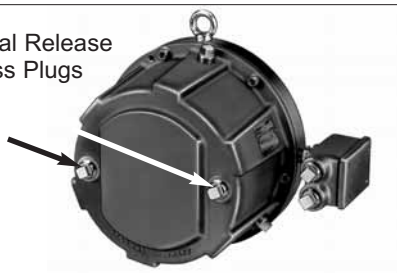
Rexnord Industries, LLC
Stearns Division
5150 S. International Drive
Cudahy, Wisconsin 53110
(414) 272-1100 Fax: (414) 277-4364 ***www.rexnord.com***

Copyright© 2002-2006 by Rexnord Industries, LLC

Armature Actuated Brake Modifications

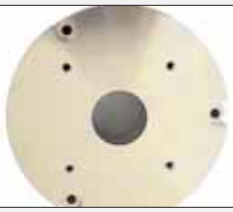
BACK TO PRODUCT PAGE

Series 333/350/360

Modification	Series	Brake Size	List Price Adder
Maintained Manual Release			
	333	ALL	size 72 $43.00 size 90 $50.00 size 112 $55.00 size 132 $63.00 size 145 $70.00 size 170 $80.00 size 196 $150.00 size 230 $184.00 size 278 $275.00
Manual Release Access Plugs 	350/360	ALL	Standard feature
Non-Maintained Manual Release			
333  360	333	ALL	size 72 $43.00 size 90 $50.00 size 112 $55.00 size 132 $63.00 size 145 $70.00 size 170 $80.00 size 196 $150.00 size 230 $184.00 size 278 $275.00
	360	ALL	size 170 $250.00 size 196-278 $300.00
Electronic Brake Release Indicator Switch			
	333/350/360	ALL	$330.00
Electronic Wear Indicator Switch	333/350/360	ALL	$330.00
AC Rectifiers, In-Line	333	size 72-90 115 Vac size 72-112 230 Vac	$46.00 standard in-line $70.00 in-line quickset
AC Rectifiers, Separate	333/350/360	ALL	see rectifier pages
Conduit Box			
	333/350/360	ALL	$205.00
	350/360 with IP67 conduit box	ALL	$360.00

Series 333/350/360 Modifications

BACK TO PRODUCT PAGE

Modification	Series	Brake Size	List Price
Band Seal (Boot)			
	333	ALL	size 72 $11.00 size 90 $12.00 size 112 $14.00 size 132 $20.00 size 145 $34.00 size 170 $50.00 size 196 $63.00 size 230 $75.00 size 278 $90.00
End Cap Plug			
	333	ALL	size 72 $10.00 size 90 $15.00 size 112 $20.00 size 132 $25.00 size 145 $45.00 size 170 $45.00 size 196 $50.00 size 230 $60.00 size 278 $75.00
Space Heater			
	333/350/360	ALL	Sizes 72-112 $116.00 Sizes 132-278 $208.00
Tach Machining			
	333 tapped holes in magnet body for tether mount	ALL	$25.00
	350/360 Machining on brake housing	ALL	Size 170 $814.00 Sizes 196-278 $1,020.00
Through-Shaft			
	333 through-shaft seal in magnet body	ALL	Sizes 72-170 $176.00 Sizes 196-278 $376.00
	350/360 through-shaft hole in housing with shaft seal	ALL	$376.00

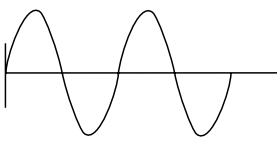
AC Rectifiers for use with Armature Actuated Brakes

Product Overview

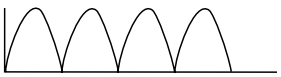
NOTE: For brake response times with and without AC rectifiers see page 94.

Full Wave

Input



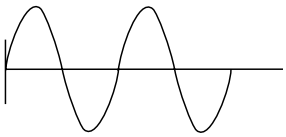
Output



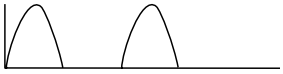
A rectifier in which both positive and negative half-cycles of the incoming (AC) signal are rectified to produce a unidirectional (DC) current through the load. The DC output voltage of a full wave rectifier is $V_{DC=}$ .90V_{AC}.
Maximum operating voltage is +10% of nominal, frequency 50/60 Hz, maximum ambient temperature range of -40˚C to 65˚C

Half Wave

Input



Output



A rectifier in which only alternate half-cycles of the incoming (AC) signal are rectified to produce a unidirectional (DC) current through the load. The DC output voltage of a half wave rectifier is $V_{DC=}$ .45V_{AC}.
Maximum operating voltage is +10% of nominal, frequency 50/60 Hz, maximum ambient temperature range of -40°C to 65°C

Combination Full and Half Wave

Provides option of utilizing either full or half wave rectification
Maximum operating voltage is +10% of nominal, frequency 50/60 Hz.
Maximum ambient temperature range is -40°C to 65°C

TOR-AC Full and Half Wave

Provides coil turn off nearly as fast as DC side switching. Includes line filter for AC drive applications or whenever electrical filtering is required to protect the rectifier from high-frequency electrical line pulses. Must be switched on/off by a switch in an AC lead of the TOR-AC. Maximum operating voltage +10% of nominal, frequency 50/60 Hz.
Maximum ambient temperature range is -40°C to 65°C

QuickSet

A rectifier that provides a quick brake response time even when the rectifier is permanently wired across the windings of an AC motor. The QuickSet Rectifier detects the decaying, motor generated voltage that occurs when power is removed from the motor circuit, and interrupts brake coil current in response. QuickSet Rectifiers can be specified full wave or half wave.
Operating voltage is ±10% of nominal, frequency 50/60 Hz.
Maximum ambient temperature range is -40°C to 65°C

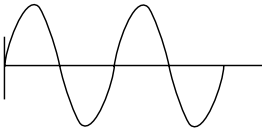
QuickSet/QuickRelease

A rectifier that provides a timed, full wave rectified "over-excitation" brake release function, followed by continuous, half wave rectified brake released "holding" function, when used in conjunction with an appropriate brake coil voltage rating.

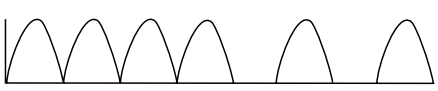
USED AS WATTSAVER: Provides a timed, full wave rectified brake release function, followed by continuous, half wave rectified brake released "wattsaver" function, when used in conjunction with an appropriate brake coil voltage rating. The Wattsaver serves to reduce the electrical power consumption and dissipation of the brake in the released state.

Operating voltage is ±10% of nominal, frequency 50/60 Hz.
Maximum ambient temperature varies by part number - see information by part number on following pages.

Input

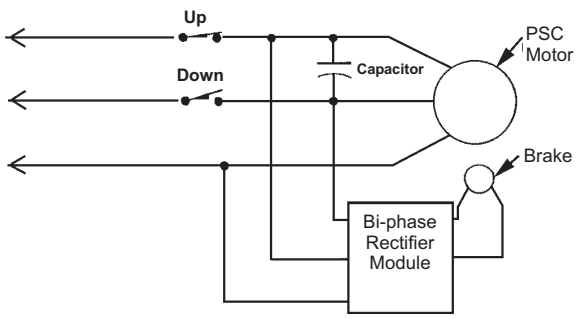


Output



Bi-Phase Rectifiers

A rectifier that is typically used in single phase, reversing, permanent split capacitor (PSC) motor applications. A single phase, reversing, PSC motor typically has two windings of equivalent resistance. The winding which serves as the main winding is connected directly across the power line, the winding which serves as the auxiliary winding is connected in series with a run capacitor across the power line. The direction of rotation is reversed by interchanging the function of the two windings. The Bi-Phase Rectifier provides the same voltage to the brake coil regardless of the direction of rotation of the motor. The Bi-Phase Rectifier has five leads and comes in standard response and QuickSet versions. Bi-Phase Rectifiers are application specific. Please contact factory for more information.



AC Rectifiers Continued
Selection & Pricing

BACK TO PAGE 1

Discount Symbol R3

115 Vac Input Voltage

Full Wave

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/Letter Designation	Switching	Connection	Max Current (amps)	List Price
72-196	412029101K	115	103	K or J	ac or dc side or connect across motor terminals	ac leads dc terminal block	.8	$46.00
ALL	412029201K	115	103	K or J	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	1.6	$70.00
ALL	412029203K	115	103	K or J	ac or dc side or connect across motor terminals	ac leads dc leads	1.6	$70.00

Combination Full and Half Wave

Brake Sizes	Part Number	AC Input	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
*	412049101K	115/230 460/575	50/103 207/259 414/517	50 Vdc = G 103 Vdc = K* 207 Vdc = M 259 Vdc = S 414 Vdc = B 517 Vdc = A	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	.8	$90.00

*At 50 Vdc coil voltage, this rectifier can be used on brake sizes 72-112. At 103 Vdc coil voltage, this rectifier can be used on brake sizes 72-196. At all other listed coil voltages, this rectifier can be used on any brake size.

230 Vac Input Voltage

Full Wave

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412029101K	230	207	M	ac or dc side or connect across motor terminals	ac leads dc terminal block	.8	$46.00
ALL	412029201K	230	207	M	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	1.6	$70.00
ALL	412029203K	230	207	M	ac or dc side or connect across motor terminals	ac leads dc leads	1.6	$70.00

Combination Full and Half Wave

Brake Sizes	Part Number	AC Input	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
*	412049101K	115/230 460/575	50/103 207/259 414/517	50 Vdc = G 103 Vdc = K 207 Vdc = M 259 Vdc = S 414 Vdc = B 517 Vdc = A	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	.8	$90.00

TOR-AC Rectifier with Line Filter, Full Wave

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412029401K 412029402K	230	207	M	ac side only	Terminals Leadwires	.6	$115.00

QuickSet

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412029601K	230	207	M	NONE-connect across motor terminals	ac terminal block dc terminal block	.6	$120.00

QuickSet/QuickRelease or 205 Vdc Wattsaver

Brake Sizes	Part Number	Max Ambient Temp	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
72-230	412029301K	65°C	230	207 Vdc over-excitation	K or J	ac side only or connect across motor terminals	ac terminal block dc terminal block	2.0	$480.00
				103 Vdc sustaining				1.0	

AC Rectifiers Selection/Pricing Continued

BACK TO PAGE 1

Discount Symbol R3

460 Vac Input Voltage

**At 50 Vdc coil voltage, this rectifier can be used on brake sizes 72-112.
At 103 Vdc coil voltage, this rectifier can be used on brake sizes 72-196. At all other listed coil voltages, this rectifier can be used on any brakes size.

Half Wave

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412049301K	400	180	L	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	.8	$46.00
		460	207	M				

Combination Full and Half Wave

Brake Sizes	Part Number	AC Input	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
**	412049101K	115/230 460/575	50/103 207/259 414/517	50 Vdc = G 103 Vdc = K* 207 Vdc = M 259 Vdc = S 414 Vdc = B 517 Vdc = A	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	.8	$90.00

TOR-AC with Line Filter

Brake Sizes	Part Number	AC Input	DC Output	Brake Coil Voltage/Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412049404K	460	414	B / Full	ac side only	Terminals	0.3	$102.00
ALL	412049405K	460	414	B / Full	ac side only	Leadwires	0.3	$102.00
ALL	412049411K	460	207	M / Half	ac side only	Terminals	0.3	$102.00
ALL	412049412K	460	207	M / Half	ac side only	Leadwires	0.3	$102.00
ALL	412049413K	460	207	M / Half	ac side only	Terminals	0.6	$187.00
ALL	412049414K	460	207	M / Half	ac side only	Leadwires	0.6	$187.00

QuickSet

Brake Sizes	Part Number	AC Input	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412049801K	460	414	B Fullwave	NONE-connect across motor terminals	ac terminal block dc terminal block	.3	$120.00
ALL	412049811K	460	207	M Halfwave	NONE-connect across motor terminals	ac terminal block dc terminal block	.6	$120.00

QuickSet/QuickRelease or 414 Vdc Wattsaver

Brake Sizes	Part Number	Max Ambient Temp	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
72-230	412049601K	45°C	460	414 Vdc over-excitation	M	ac side only or connect across motor terminals	ac terminal block dc terminal block	1.0	$480.00
				207 Vdc sustaining				0.5	

575 Vac Input Voltage

Half Wave

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412059101K UL E71115	400	180	L	ac side only or connect across motor terminals	ac leads dc terminal block	.8	$46.00
		575	259	S				
ALL	412059103K	400	180	L	ac side only or connect across motor terminals	ac leads dc leads	.8	$46.00
		575	259	S				

Combination Full and Half Wave

Brake Sizes	Part Number	AC Input	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
**	412049101K	115/230 460/575	50/103 207/259 414/517	50 Vdc = G 103 Vdc = K 207 Vdc = M 259 Vdc = S 414 Vdc = B 517 Vdc = A	ac or dc side or connect across motor terminals	ac terminal block dc terminal block	.8	$90.00

QuickSet

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412059811K	575	258	S	NONE-connect across motor terminals	ac terminal block dc terminal block	.6	$120.00

TOR-AC with Line Filter - Half Wave

Brake Sizes	Part Number	AC Input 50/60 Hz	DC Output	Brake Coil Voltage/ Letter Designation	Switching	Connection	Max Current (amps)	List Price
ALL	412059411K	575	259	S	ac side only	terminals	.6	$102.00
	412059412K					leadwires		

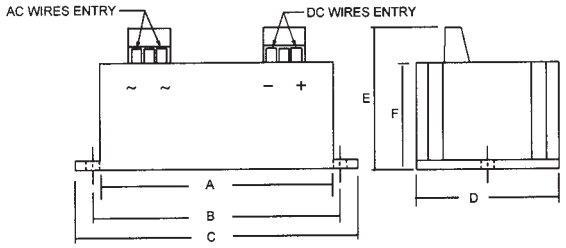
BACK TO PAGE 1

AC Rectifiers Continued

Rectifier Dimensions

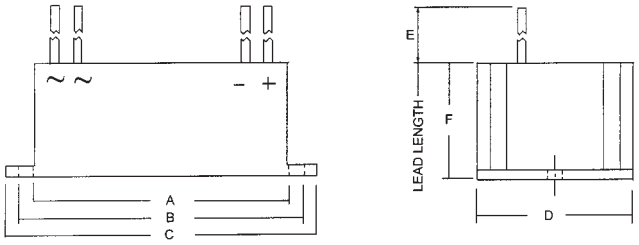
Tape Mount

Part Number	Length	Width	Ht	Connection	
				AC	DC
4-1-20291-01K	1.4	0.6	1.0	Leadwire, 7” long	Terminal
4-1-20292-01K	1.38	1.06	0.94	Terminal	Terminal
4-1-20292-03K	1.38	1.06	0.9	Leadwire, 2.5” long	Leadwire, 2.5” long
4-1-20491-01K	2.25	1.25	1.0	Terminal	Terminal
4-1-20591-03K	1.4	0.75	0.9	Leadwire, 7” long	Leadwire, 7” long
4-1-20591-01K	1.4	0.75	1.0	Leadwire, 7” long	Terminal



Terminal location or connection may differ from sketch
Flange or Tape Mount

Part Number	A	B	C	D	E	F
4-1-20293-01K	4.6	5	5.5	3.3	2.03	1.25
4-1-20294-01K	3	3.5	4	2	2	1.5
4-1-20296-01K	3	3.5	4	3	2	1.5
4-1-20493-01K	2	2.5	3	1.5	1.6	1
4-1-20494-04K	3	3.5	4	2	2	1.5
4-1-20494-11K	3	3.5	4	2	2	1.5
4-1-20494-13K	3	3.5	4	2	2	1.5
4-1-20496-01K	4.6	5	5.5	3.3	2	1.25
4-1-20498-01K	3	3.5	4	3	2	1.5
4-1-20498-11K	2	2.38	2.6	2	2.1	1.3
4-1-20594-11K	3	3.5	4	2	2	1.5
4-1-20598-11K	2	2.38	2.6	2	2.1	1.3

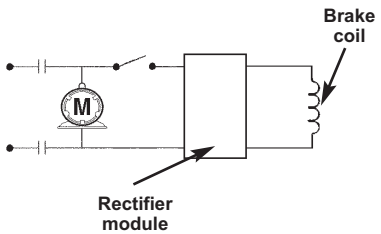


Part Number	A	B	C	D	E	F	Mount
4-1-20494-01K	2.3			1.32	6	0.86	Tape
4-1-20294-02K	3	3.5	4	2	6	1.5	Flange
4-1-20494-05K	3	3.5	4	2	6	1.5	Flange
4-1-20494-12K	3	3.5	4	2	6	1.5	Flange
4-1-20494-14K	3	3.5	4	2	6	1.5	Flange
4-1-20594-12K	3	3.5	4	2	6	1.5	Flange

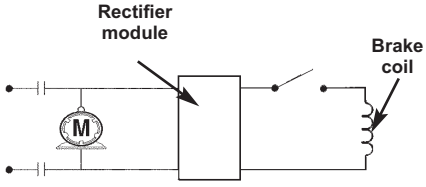
Wiring Diagrams/Switching

NOTE: For brake response times with and without AC rectifiers see page 94

AC Side Switching

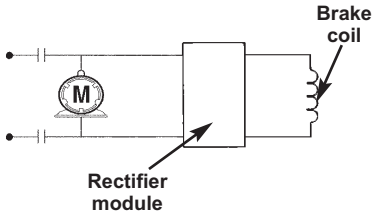


DC Side Switching



Use DC side switching with the following Rectifiers ONLY: 4-1-20291-01K, 4-1-20292-01K, 4-1-20292-03K, 4-1-20493-01K, 4-1-20491-01K

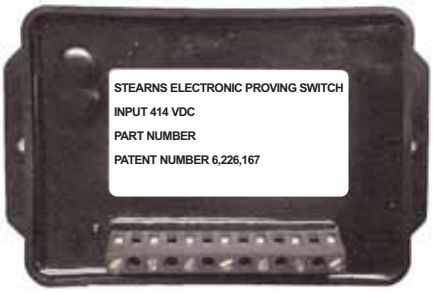
Connected Across Motor Terminals (No switching)



Electronic Brake Release Indicator (Proving Switch)
Armature-Actuated Brake Series

BACK TO PAGE 1

Indicates when the brake is released by sensing the change in the brake coil current waveform.
For use with the Series 333/350/360 brakes



Features

- *Mount in remote location (control cabinet)*
- *Operating temperature -40°C through 65°C*
- *Not susceptible to common problems of mechanical switches, such as mechanical fatigue, tolerances, and vibration.*
- *Relay contacts are silver-cadmium oxide*
- *Utilize either normally-open contacts (UL rated 2-20A, inductive or resistive, at 12-240 VAC and CSA rated 10A, inductive or resistive at 240 VAC) or normally-closed contacts (UL rated 2-10A, inductive or resistive, at 12-240 VAC and CSA rated 10A, inductive or resistive, at 240 VAC)*

Wiring Instructions: See sheet P/N 8-178-000-03

Brake Operation

When electrical power is applied to the armature-actuated brake coil, the armature is attracted by the electromagnetic force generated by the magnet body, which overcomes spring action. This allows the friction disc to rotate freely. When electrical power is interrupted, the electromagnetic force is removed and the pressure spring mechanically forces the armature plate to clamp the friction disc between itself and the pressure plate. This develops torque to stop or hold the load.

Switch Operation

When the brake armature is pulled in to the magnet body to release the brake, a change in the brake coil current waveform occurs. By tracking this change in the brake coil current, the electronic switch indicates when the brake is released.

Ordering Information

List Price	Discount Symbol
$330.00	R3

Part Number Example: 4 - 4 - 0 7 0 9 0 - X X

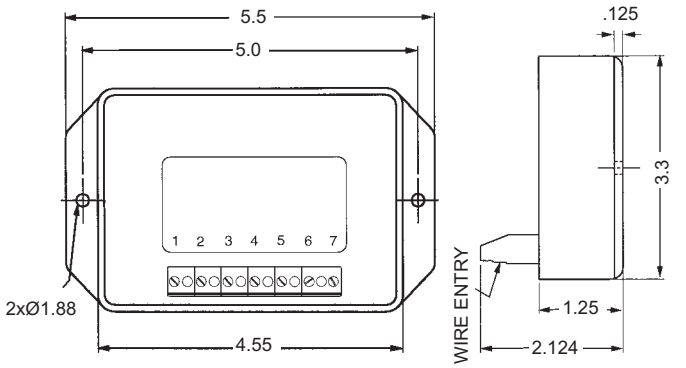
DC Voltage*	Characters To Insert
24	024
90	090
103	103
180	180
205	205
258	258
414	414

*Standard voltages listed. For other voltages, contact factory.

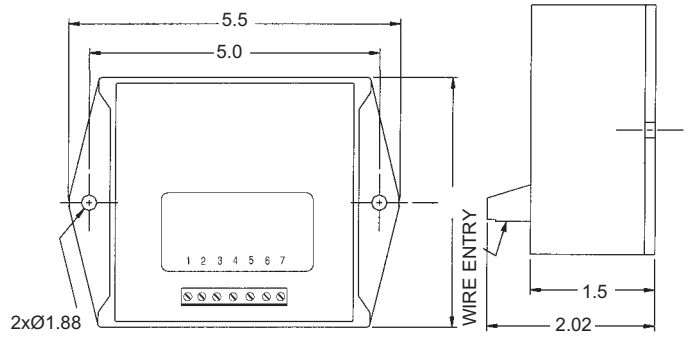
Specify brake model number. The last 2 digits of the switch part number will depend upon the brake size

Dimensions

414V Unit



24V thru 240V Units



*Standard voltages listed. For other voltages, contact factory.

NOTE: Cannot be used with half-wave rectifier. Use with full-wave or TOR-AC full-wave rectifier only.

Stearns® Brakes, Clutches and Electronic Components

P/N 8-178-000-03
effective 6/27/03

Electronic Brake Release Indicator (Proving Switch)
Armature-Actuated Brake Series

Indicates when the brake is released by sensing the change in the brake coil current waveform.
For use with the Series 333/350/360 brakes

Features

- *Mount in remote location (control cabinet)*
- *Operating temperature -40°C through 65°C*
- *Not susceptible to common problems of mechanical switches, such as mechanical fatigue, tolerances, and vibration.*
- *Relay contacts are silver-cadmium oxide*
- *Utilize either normally-open contacts (UL rated 2-20A, inductive or resistive, at 12-240 VAC and CSA rated 10A, inductive or resistive at 240 VAC) or normally-closed contacts (UL rated 2-10A, inductive or resistive, at 12-240 VAC and CSA rated 10A, inductive or resistive, at 240 VAC)*

Brake Operation

When electrical power is applied to the armature-actuated brake coil, the armature is attracted by the electromagnetic force generated by the magnet body, which overcomes spring action. This allows the friction disc to rotate freely. When electrical power is interrupted, the electromagnetic force is removed and the pressure spring mechanically forces the armature plate to clamp the friction disc between itself and the pressure plate. This develops torque to stop or hold the load.

Switch Operation

When the brake armature is pulled in to the magnet body to release the brake, a change in the brake coil current waveform occurs. By tracking this change in the brake coil current, the electronic switch indicates when the brake is released.

Ordering Information

List Price	Discount Symbol
$330.00	R3

Part Number Example: 4 - 4 - 0 7 0 9 0 - X X

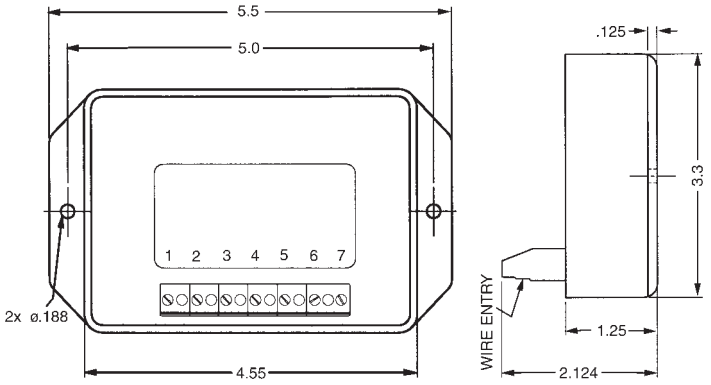
DC Voltage*	Characters To Insert
24	024
48	048
90	090
103	103
180	180
205	205
240	240
414	414

*Standard voltages listed. For other voltages, contact factory.

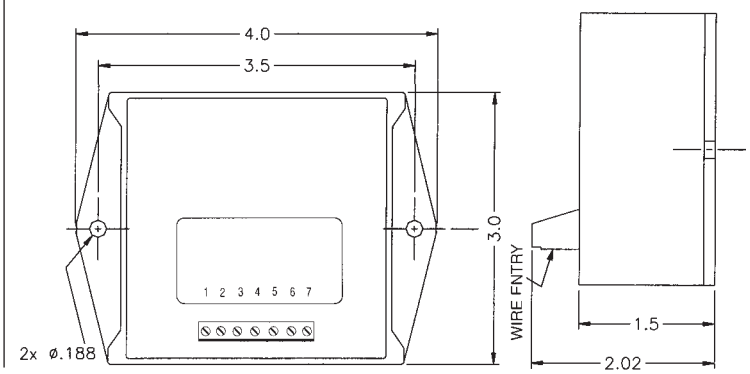
Specify brake model number. The last 2 digits of the switch part number will depend upon the brake size

Dimensions

414V Unit



24V thru 240V Units



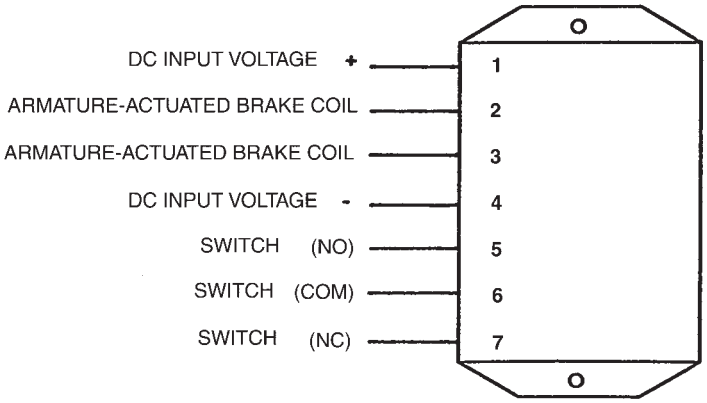
NOTE: Cannot be used with half-wave rectifier. Use with full-wave or TOR-AC full-wave rectifier only.

Wiring Instructions

IMPORTANT: Please read these instructions carefully before installing, operating or servicing your Stearns switch. Failure to comply with these instructions could cause injury to personnel and/or damage to property if the switch is installed or operated incorrectly. For definition of limited warranty/liability, contact Rexnord Insustries, Inc., Stearns Division, 5150 S International Drive, Cudahy, Wisconsin 53110, (414) 272-1100.

CAUTION!

1. Installation and servicing must be made in compliance with all local safety codes including Occupational Safety and Health Act (OSHA). All wiring and electrical connections must comply with the National Electrical Code (NEC) and local electrical codes in effect.
2. To prevent an electrical hazard, disconnect power source before working on equipment. If the power disconnect is out of sight, lock the disconnect in the *off* position and tag it to prevent accidental application of power.
3. Make sure voltage rating of the switch corresponds to the voltage rating shown on the nameplate of the brake.
4. Installation and servicing should be performed only by qualified personnel familiar with the construction and operation of this equipment.



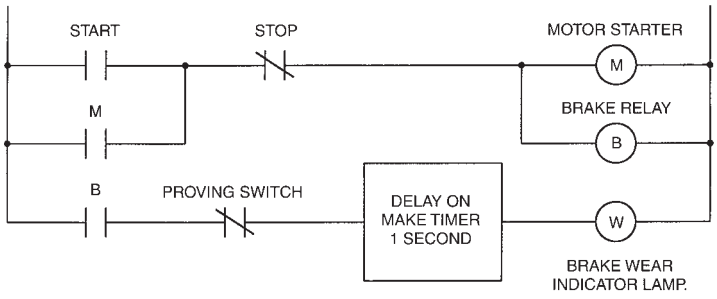
WARNING!

This switch is designed for use with a full wave rectifier only, *DO NOT USE THIS SWITCH WITH A HALF WAVE RECTIFIER.*

Applications

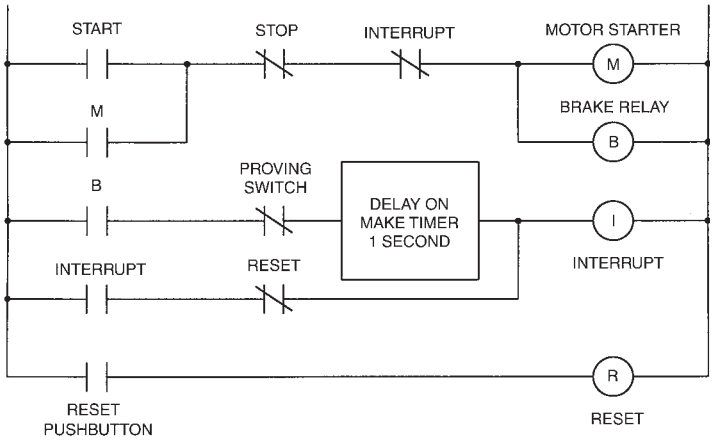
The Stearns electronic proving switch has been designed to detect and analyze the brake or clutch coil current waveform "signature" and thereby determine the operational status of the power transmission device. This operational status signal is delivered via a single pole, double throw relay contact. The status signal can be utilized in a wide variety of control and warning functions, as described in diagrams A and B.

A. SIMPLE BRAKE WEAR INDICATOR



LOGIC: If, within one second after application of power to the motor and brake, the proving switch N.C. contact does not open, the brake has not released, or has not released in an appropriate manner. The brake wear indicator lamp will illuminate, alerting the user that brake wear is excessive and service is required.

B. BRAKE RELEASE DETECTOR WITH SYSTEM SHUTDOWN



LOGIC: If, within one second after application of power to the motor and brake, the proving switch N.C. contact does not open, the brake has not released, or has not released in an appropriate manner. Interrupt relay "I" is energized and latched, disabling motor starter "M" and brake relay "B". An indicator lamp may be wired in parallel with the interrupt relay coil, indicating "Brake not Released". Adjust/repair brake, depress "Reset" push-button, depress "Start" button, system resumes operation. Control voltage may simply be interrupted to eliminate "Reset" function, if desired. Proving switch contact must be utilized to interrupt *both motor starter and brake relay !!!* If only motor starter is interrupted, load may be free to fall !!!

REXNORD

Rexnord Industries, LLC
Stearns Division
5150 S. International Dr.
Cudahy, Wisconsin 53110
(414) 272-1100 Fax: (414) 277-4364 www.stearns.rexnord.com

Copyright© 2001-2003 by Rexnord Industries, LLC

Technical Data

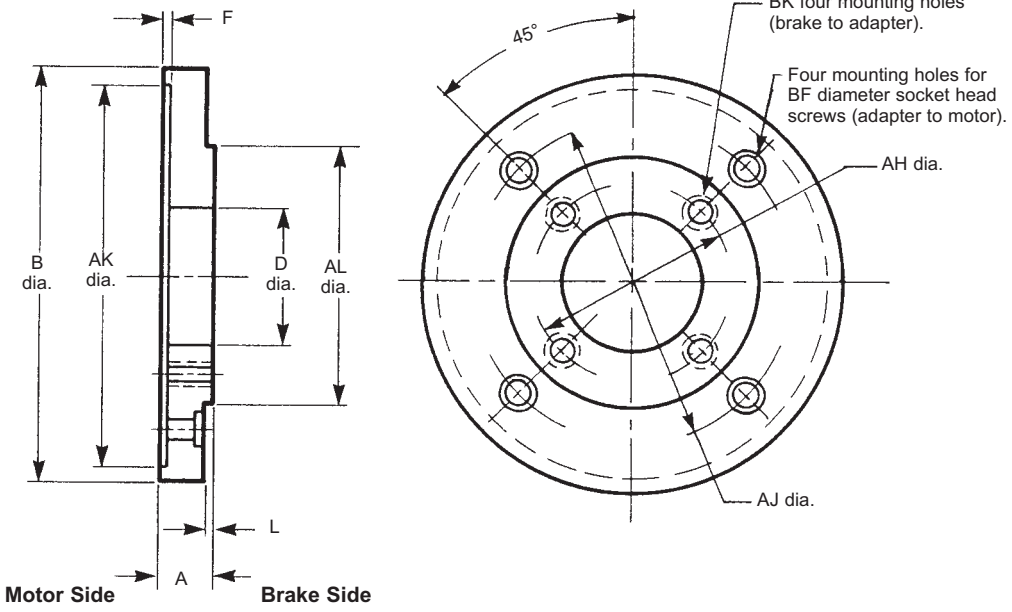
SAB Motor Frame Adapter Dimensions

Selection

To select an adapter for a specific brake, refer to the *Motor Frame Adapter* Tables as shown in the brake series sections of this Catalog. After selecting the adapter stock number, refer to the Tables below for dimensions.

All adapters are constructed with an opening for internal lead wire connection, corresponding to the NEMA standard location for the motor frame size.

Screws for mounting adapter to motor must be provided by customer. Socket head cap screws are supplied for mounting brake to adapter.



Dimensions for estimating only. For installation purposes, request certified prints.

Brake Series	Torque (lb-ft)	Adapter Stock Number	Dimensions in Inches (Dimensions in Millimeters)											Add'l Shaft Length Req'd	List Price	Discount Symbol
			A	AH	AJ	AK	AL	B	BF	BK Hole	D	F	L			
56,000	1.5 - 6	5-55-5041-00	1.25 (31.75)	5.88 (149.22)	7.25 (184.15)	8.500 8.502 (215.900) (215.951)	4.497 4.500 (114.325) (114.275)	9.00 (228.60)	.50 (12.70)	3/8 - 16 x 1/2 deep	4.00 (101.60)	.19 (4.76)	.12 (3.18)	.94 (23.88)	$700	B4
65,300*		5-55-5046-00														
56,000 and 56,800*	10 - 25	5-55-5043-00													$700	B4
87,000 and 87,800*	6 - 105	5-55-7046-00	1.06 (26.99)	7.25 (184.15)	11.00 (279.40)	12.501 12.504 (317.525) (317.602)	8.499 8.497 (215.875) (215.849)	13.00 (330.20)	.62 (15.88)	1/2 - 13 through	4.12 (104.78)	.19 (4.76)	.38 (9.52)	.87 (22.10)	$875	B2
87,300		5-55-7054-00														
87,000 and 87,800*	6 - 105	5-55-7055-00	1.00 (25.40)		9.00 (228.60)	10.500 10.502 (266.700) (266.751)	8.499 8.497 (215.875) (215.849)	11.00 (279.40)	**		6.25 (158.75)		.25 (6.35)	.81 (20.57)	$450	B2
87,300*		5-55-7045-00														
87,000, 87,800* and 87,300*	6 - 105	5-55-7043-00	.75 (19.05)	7.25 (184.15)	5.88 (149.35)	4.502 4.507 (114.35) (114.48)	8.499 8.497 (215.875) (215.849)	8.75 (222.25)	.62 (15.75)	1/2 - 13 through	4.00 (101.60)	.19 (4.76)	.25 (6.35)	.56 (14.23)	$1,300	B2
81,000	125 - 130	5-55-2045-00	1.06 (26.99)	11.00 (279.40)	14.00 (355.60)	16.002 16.005 (406.451) (406.527)	12.499 12.496 (317.475) (317.398)	16.50 (419.10)	.62 (15.88)	5/8 - 11 through	9.75 (247.65)	.19 (4.76)	.25 (6.35)	.87 (22.10)	$1,875	C1
81,000	125 - 230	5-55-2041-00	1.12 (28.58)	11.00 (279.40)	7.25 (184.15)	8.500 8.502 (215.900) (215.951)	12.499 12.496 (317.475) (317.398)	12.499 12.496 (317.475) (317.398)	.50 (12.70)	5/8 -11 through	6.00 (152.40)	.19 (4.76)	---	.93 (23.62)	$1,325	C1
81,000		5-55-2043-00			9.00 (228.60)	10.500 10.502 (266.700) (266.751)					7.75 (196.85)			.93 (23.62)		C1
82,000 and 82,300*	125 - 550	5-55-2046-00	1.94 (49.21)	11.00 (279.40)	14.00 (355.60)	16.002 16.005 (406.451) (406.527)	12.499 12.496 (317.475) (317.398)	16.50 (419.10)	.62 (15.88)	5/8 - 11 x 1 deep	9.50 (241.30)	.19 (4.76)	.25 (6.35)	1.75 (44.45)	$1,875	C1
82,000 and 82,300*		5-55-2042-00	1.38 (34.92)		7.25 (184.15)	8.500 8.502 (215.900) (215.951)		13.25 (336.55)	.50 (12.70)	5/8 -11 through	6.00 (152.40)			1.19 (30.23)	$1,325	C1
82,000 and 82,300*		5-55-2044	1.38 (34.92)		9.00 (228.60)	10.500 10.502 (266.700) (266.751)		13.25 (336.55)			7.75 (196.85)			1.19 (30.23)	$2,075	C1
86,000	500 - 1000	5-55-6041-00	1.56 (38.69)	14.00 (355.60)	11.00 (379.40)	12.500 12.504 (317.500) (317.602)	16.000 15.995 (406.400) (406.273)	16.19 (441.16)	.62 (15.88)	5/8 - 11 x 3/4 deep	8.62 (219.08)	.19 (4.76)	.25 (6.35)	1.37 (34.80)	$2,800	C1

* 1/2-13 flat head screws are supplied with adapter.

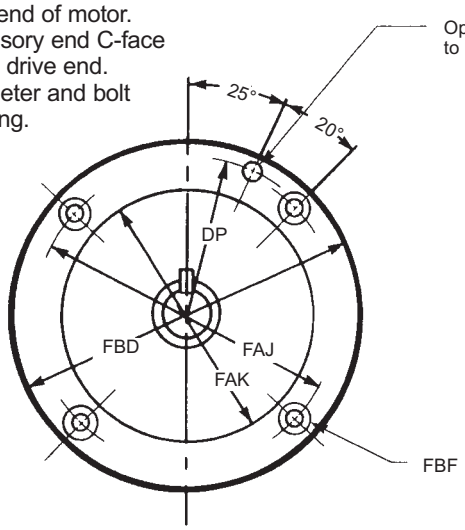
** When adding an adapter to a hazardous location brake, refer to the "mounting requirements" on the product page for the recommended brake series for accommodating adapters.

Dimensions for C-Face AC Brake Motor System (cont.)

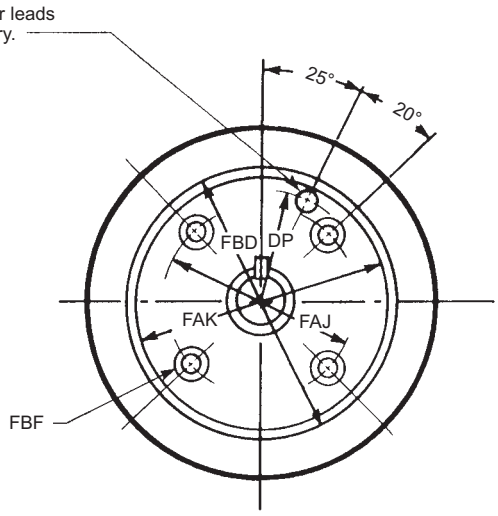
BACK TO PRODUCT PAGE

Accessory End

FC face mounting for accessories, including brakes, on the end opposite the drive end of motor. Some motor accessory end C-face may differ from the drive end. Confirm shaft diameter and bolt circle before ordering.



143TFC to 184TFC Frames, Inclusive



213TFC to 326TFC Frames, Inclusive

Dimensions (Inches)

Frame Designation	FAJ	FAK	FBD Max.	FBF Hole			Hole for Accessory Leads	
				Number	Tap Size	Bolt Penetration Allowance	DP	Diameter
143TFC and 145TFC	5.875	4.500	6.50	4	3/8-16	0.56	2.81	0.41
182TFC and 184TFC	5.875	4.500	6.50	4	3/8-16	0.56	2.81	0.41
213TFC and 215TFC	7.250	8.500	9.00	4	1/2-13	0.75	3.81	0.62
254TFC and 256TFC	7.250	8.500	10.00	4	1/2-13	0.75	3.81	0.62
284TFC and 286TFC	9.000	10.500	11.25	4	1/2-13	0.75	4.50	0.62
324TFC and 326TFC	11.000	12.500	14.00	4	5/8-11	0.94	5.25	0.62

NOTE: Standards have not been developed for the shaft extenison diameter and length, and keyseat dimensions.

Tolerances* (Inches)

FAK Dimension, Face Runout, Permissible Eccentricity of Mounting Rabbet

FAK Dimension	Tolerance on FAK Dimension		Maximum Face Runout	Maximum Permissible Eccentricity of Mounting Rabbet
	Plus	Minus		
Less than 12	0.000	0.003	0.004	0.004
12 and Larger	0.000	0.005	0.007	0.007

* Tolerance requirement on 56,X00 and 87,000 Series Brake kits is .015 T.I.R. (total indicated runout shaft to motor register face).

Shaft Runout

Shaft Diameter	Maximum Permissible Shaft Runout
0.3750 to 1.625, inclusive	0.002
Over 1.625 to 6.500, inclusive	0.003

SOURCE: ANSI/NEMA Standards Publication No. MG 1-1987; Part 4 and Part 11.

Stearns Recommended Minimum Shaft Diameter by Torque

Minimum recommended shaft size considers a keyed C1045 steel shaft under *dynamic* use in a typical spring set brake application.

Torque ft-lb	Minimum Shaft (inches)
0.50	0.250
0.75	0.250
1.5	0.375
3	0.500
6	0.500
10	0.625
15	0.750
25	0.875
35	1.000
50	1.125

Torque ft-lb	Minimum Shaft (inches)
75	1.250
105	1.375
125	1.375
175	1.625
230	1.750
330	2.000
440	2.125
500	2.375
750	2.500
1000	2.750

Torque Nm	Minimum Shaft (mm)
4 Nm	ø10 mm
8 Nm	ø13 mm
16 Nm	ø16 mm
32 Nm	ø20 mm
60 Nm	ø25 mm
80 Nm	ø28 mm
150 Nm	ø34 mm
240 Nm	ø39 mm
400 Nm	ø47 mm