

# Definite Purpose Contactors & Starters

**35**

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*Definite Purpose Contactors & Starters*

## Application Description

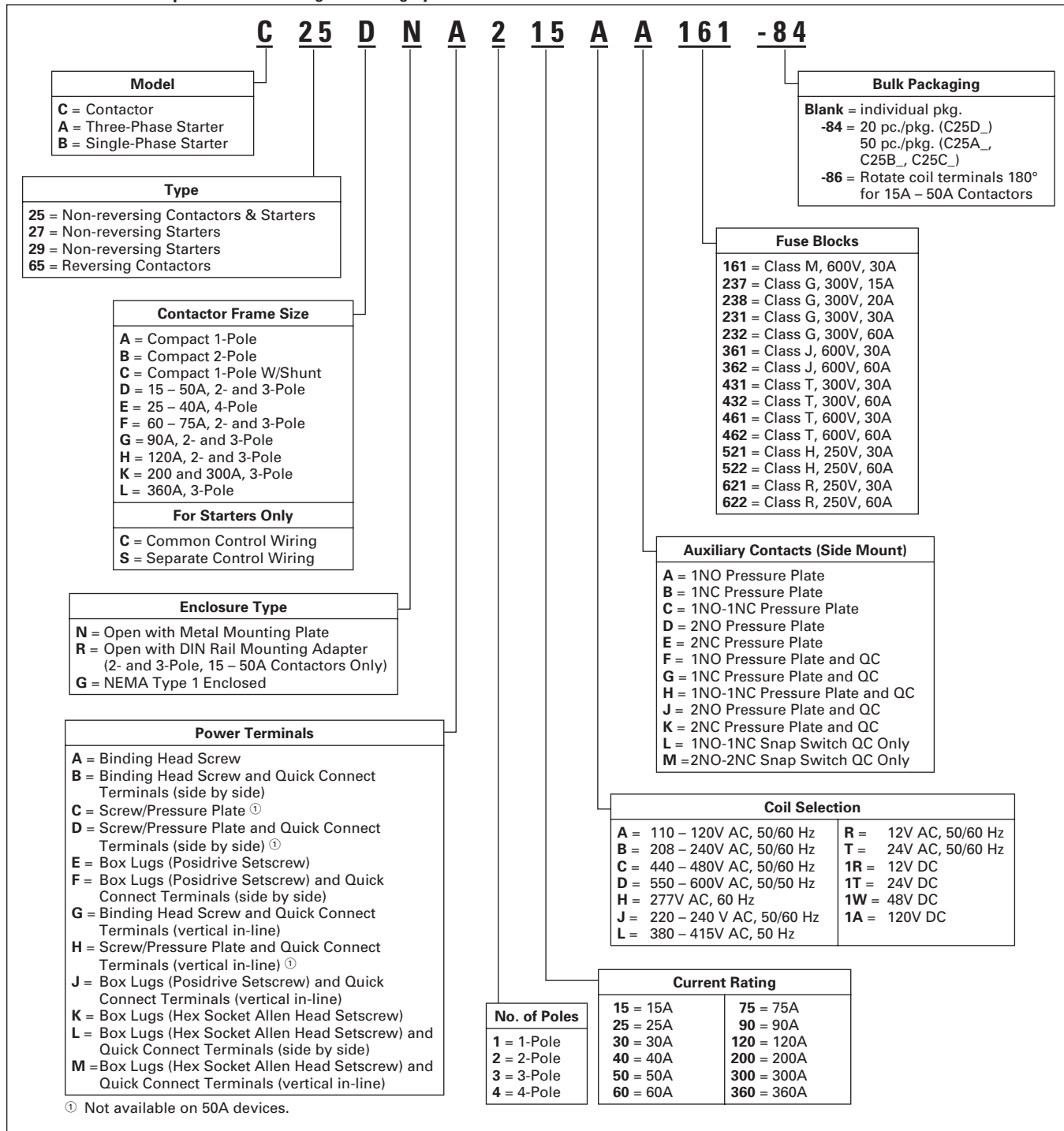
These Cutler-Hammer® ampere and horsepower rated devices from Eaton's electrical business are designed for service in applications such as Refrigeration, Air Conditioning and Resistance Heating and are manufactured to traditional Cutler-Hammer standards for quality and reliability. They are subjected to stringent quality assurance inspections and

testing procedures. The life expectancy, both electrical and mechanical, will meet or exceed industry performance requirements for Definite Purpose devices.

If more detailed technical information is required — specifications, ratings, etc. — contact your local Eaton distributor or sales office.

## Catalog Number Selection

Table 35-1. Definite Purpose Control Catalog Numbering System



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<i>Description</i>	<i>Page</i>
<b>Compact 1- and 2-Pole Contactors 20 – 40A</b>	
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*Compact 2-Pole*

**Product Description**

Cutler-Hammer® 20 – 40A, single- and double-pole, Type C25 contactors from Eaton’s electrical business feature a compact, efficient design with a low VA coil and straight-through wiring. New contactor housing design effectively limits dust and other contaminants from magnet structure — reduces or eliminates noise. These economically priced, UL recognized/ CSA certified, ampere rated devices are well suited for use in heating/air conditioning, refrigeration, data processing and food service applications.

**Standards and Certifications**

- UL Recognized Components: UL File Number E1491, Guides NLDX2 and NLDX8
- CSA Certified Components: CSA C22.2 No. 14-05, File Number 238083 Class 3211 84
- IEC 60947-4-1
- EN 60947-4-1
- ARI 780/790 Standard
- RoHS Compliance



**Technical Data — Specifications**

- Insulation Voltage: 690V
- Current Rated and hp/kW Rated
- Contacts: Double Break
- Magnet Coil: Class F, 155°C
- Contact Arc Covers are standard on all Contactors
- Standard Power Terminals —
  - 5/16" Hex Washer Head Screws
  - Quad (4) Quick Connect Terminals on all Line and Load Terminals
  - Box Lugs available as option
- Contactors are marked with Line and Load Terminal Designations
- Operating Temperature Range: -13 to 158°F (-25 to 70°C)
- Terminal Wire Range —
  - Hex Washer Head Screws: 16 – 10 AWG, 30 lb-in torque rating
  - Box Lugs: 16 – 10 AWG, 35 lb-in torque rating; 8 AWG, 40 lb-in torque rating; 6 – 4 AWG, 45 lb-in torque rating
- Mounting Position: Vertical, Horizontal or Tabletop

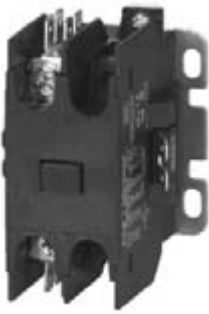
**Table 35-2. Coil Characteristics**

AC Coil Voltage 50/60 Hz	Max. Inrush VA	Max. Sealed VA	Max. Sealed Watts
<b>One-Pole</b>			
24	33	6	2
120	33	6	2
208/240	33	6	2
277	33	6	2
<b>Two-Pole</b>			
24	41	6.5	3
120	41	6.5	3
208/240	41	6.5	3
277	41	6.5	3
480	41	6.5	3

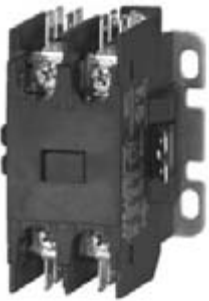
**Options**

**Table 35-3. Compact Options — Factory Installed**

Description	Adder U.S. \$
<b>Box lugs with quick connects for 20 – 40A contactors:</b>	
1-Pole	
1-Pole with shunt	
2-Pole	
To order replace letter in the 6th position of Catalog Number with letter F. EXAMPLE: C25BNF240A	



Compact 1-Pole



Compact 1-Pole with Shunt



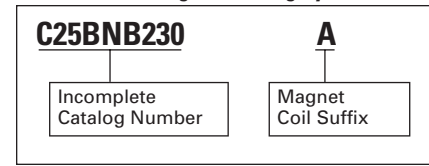
Compact 2-Pole

**Product Selection**

**When Ordering Specify**

- Catalog Number plus Magnet Coil Suffix
- Modify Catalog Number for any options required — see factory installed Options **Page 35-3**

**Table 35-4. Catalog Numbering System**



**Table 35-5. Compact Contactors Product Selection— Open Type**

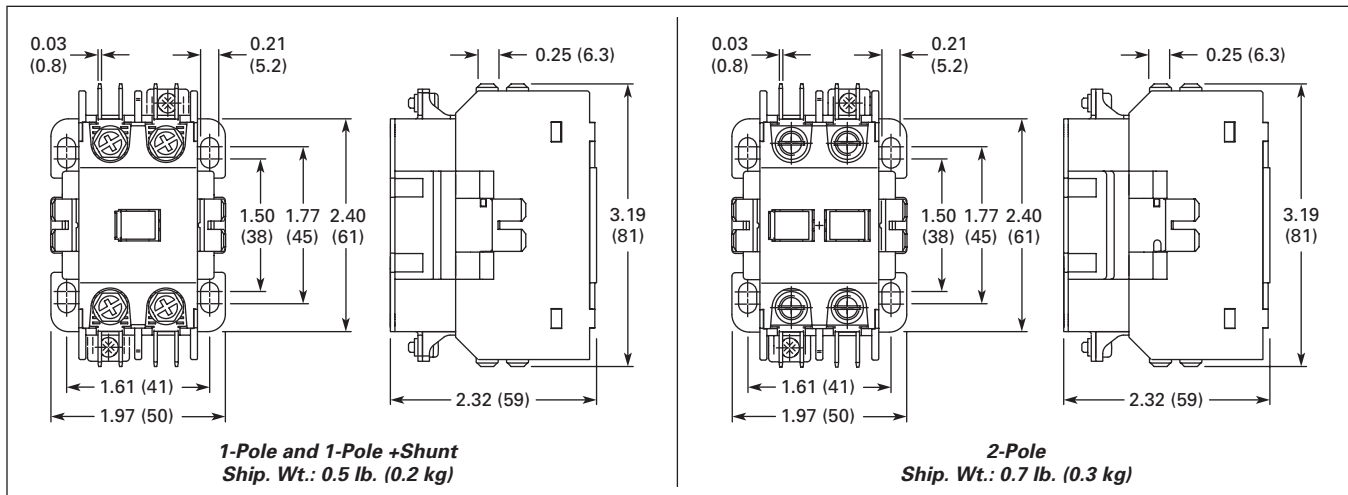
Ampere Ratings ①					Max. Motor Horsepower	Max. Motor Kilowatts	Catalog Number ②③	Price U.S. \$	
Inductive Full Load	Resistive	Locked Rotor							
		240 – 277V	480V	600V	115V	230V	115V	230V	
<b>Single-Pole</b>									
25	30	150	50	40	2	3	1.5	2.2	C25ANB125_
30	40	150	75	50	2	5	1.5	3.7	C25ANB130_
40	50	240	200	160	3	7-1/2	2.2	5.5	C25ANB140_
<b>Single-Pole with Shunt</b>									
25	30	150	50	40	2	3	1.5	2.2	C25CNB125_
30	40	150	75	50	2	5	1.5	3.7	C25CNB130_
40	50	240	200	160	3	7-1/2	2.2	5.5	C25CNB140_
<b>Double-Pole</b>									
20	30	120	100	80	1-1/2	3	1.1	2.2	C25BNB220_
25	35	150	125	100	2	3	1.5	2.2	C25BNB225_
30	40	150	125	100	2	5	1.5	3.7	C25BNB230_
40	50	240	200	160	3	7-1/2	2.2	5.5	C25BNB240_

- ① Rating per pole.
- ② Incomplete Catalog Number. Replace underscore ( \_ ) in Catalog Number with Coil Suffix letter from **Table 35-6**.
- ③ Bulk pack quantities are available in quantities of 50, contact local sales office.

**Table 35-6. Magnet Coil Selection**

AC Coil Voltage 50/60 Hz	Coil Suffix
24	T
110 – 120	A
208 – 240	B
277	H
380 – 415 (50 Hz); 440 – 480 (60 Hz)	C

**Dimensions**



**Figure 35-1. Compact Approximate Dimensions in Inches (mm) and Shipping Weights**

Technical Data ..... **Page 35-3**  
 Options..... **Page 35-3**  
 Discount Symbol ..... **1CD-5C**



**50 mm DP Contactor**

**Product Description**

Cutler-Hammer® Type C25 Definite Purpose Contactors 15A through 360A, from Eaton's electrical business incorporate most competitive contactor mounting dimensions into a single baseplate. Contactors are dual-rated with inductive and resistive ratings as well as horsepower and kilowatt ratings. C25 contactors are furnished with pressure plates and quick connect terminals as standard on 15, 25 and 30A devices and with box lugs and quick-connect terminals on 40, 50, 60 and 75A. Other terminal configurations are available, see **Table 35-14**. Contactors will accept add-on auxiliary contacts — order factory assembled or as kits for field installation.

The separately available snap-on mechanical interlock permits interlocking two contactors for reversing or two-speed applications.

Contactors rated 15 – 50A only are available with DIN rail mount as a factory installed option.

**Standards and Certifications**

- UL Recognized Components  
UL File #E-1491, Guide NLDX2
- CSA Certified Components  
File #LR353, Class 3211 04, 481301 & 122201
- IEC 60947-4-1
- EN 60947-4-1



- RoHS Compliance (15A to 50A Only)



**Technical Data and Specifications**

- Magnet coil:
  - Class B (C25E, F, G, H and K), 130°C
  - Class F (C25D and L), 155°C
  - Class H (C25D), 180°C (Available as factory installed option)

- Contacts: Double break
- Coil terminals: 10 – 14 AWG
- Ambient temperature: 150°F (65°C) maximum
- UL recognized, CSA certified and conform to ARI 780
- CE mark
- Terminal wire range:
  - #8–32 binding head screw: 14 – 12 AWG (one conductor-solid)
  - #8–32 screw/pressure plate:
    - 14 – 8 AWG (one conductor)
    - 14 – 8 AWG (two conductors)
  - Box lugs — 15 – 50A:
    - # 2 posidrive screw or 5/32 hex socket screw
    - Upper Level: 14 – 4 AWG (one conductor)
    - Lower Level: 14 – 6 AWG (one conductor)

- Box lugs — 60 – 75A
  - Upper Level: 14 – 2 AWG
  - Lower Level: 14 – 6 AWG
- Note:** The box lugs on the 15 – 75A device can accept two conductors per pole.
- Box lugs — 90A: 1/0 – 14 AWG
- Box lugs — 120A: 3/0 – 8 AWG
- Box lugs — 200 – 300A: 350 MCM – 6 AWG
- Box lugs — 360A: 750 MCM – 2 AWG

**Table 35-7. Lighting Duty Ratings (25A to 50A Only)**

C25D_ Inductive Rating	Tungsten & Ballast (480V)
25A	30A
30A	40A
40A	50A
50A	60A

**Table 35-8. IEC/CE Ratings (IEC 60947-4-1, EN 60947-4-1) for 15A through 50A C25D\_ Contactors**

C25D_ Inductive Rating	AC-1 (Ic)		AC-3 (Ie)		AC-4 (Ie)		AC-8a	
	480V	600V	480V	600V	480V	600V	480V	600V
15A	20A	20A	15A	15A	15A	—	15A	15A
25A	30A	30A	25A	25A	25A	—	25A	25A
30A	40A	40A	30A	30A	30A	—	30A	30A
40A	50A	—	40A	—	40A	—	40A	—
50A	65A	65A	50A	50A	50A	—	50A	50A

**Table 35-9. DC Ratings (15A to 50A Only)**

Voltage	2-Pole, 15 – 30A Inductive			2-Pole, 40A Inductive			3-Pole, 15 – 30A Inductive			3-Pole, 40A Inductive		
	UL/CSA		DC-3/DC-5	UL/CSA		DC-3/DC-5	UL/CSA		DC-3/DC-5	UL/CSA		DC-3/DC-5
	FLA	hp	I <sub>e</sub>	FLA	hp	I <sub>e</sub>	FLA	hp	I <sub>e</sub>	FLA	hp	I <sub>e</sub>
240V DC 3 Poles in Series	—	—	—	—	—	—	4	3/4	4	5	1	5
120V DC 3 Poles in Series	—	—	—	—	—	—	8	3/4	8	10	1	10
120V DC 2 Poles in Series	5.5	1/2	5.5	8	3/4	8	5.5	1/2	5.5	8	3/4	8
120V DC per Pole	2	1/10	2	3.5	1/4	3.5	2	1/10	2	3.5	1/4	3.5
24V DC per Pole	15	—	15	20	—	20	15	—	15	20	—	20

**Table 35-10. Contactor Torque Ratings**

Contactor Size	Terminal	Wire Range	Tightening Torque
15 – 50A ①	8–32 Binding Head Screw	12 – 14 AWG	22 lb-in
	Screw/Pressure Plate	8 – 14 AWG	15 lb-in
	Box Lug	12 – 14 AWG 10 AWG 8 AWG 4 – 6 AWG	15 lb-in 25 lb-in 40 lb-in 45 lb-in
60 – 75A ②	Box Lug	10 – 14 AWG 8 AWG 3 – 6 AWG	40 lb-in 45 lb-in 50 lb-in
90A	Box Lug	1/0 – 14 AWG	60 lb-in
120A	Box Lug	8 AWG 4 – 6 AWG 3 – 1/0 AWG	40 lb-in 45 lb-in 50 lb-in
200 – 300A	Box Lug	6 – 350 MCM	200 lb-in
360A	Box Lug	2 – 750 MCM	550 lb-in

① The box lugs on the 15 – 50A device can accept 2 conductors per pole, the upper section will accept 4 – 14 AWG and the lower section will accept 6 – 14 AWG.  
 ② The box lugs on the 60 – 75A device can accept 2 conductors per pole, the upper section will accept 3 – 14 AWG and the lower section will accept 6 – 14 AWG.

15 – 360A, 2-, 3- and 4-Pole — C25

## Product Selection

### When Ordering Specify

- Catalog Number plus Magnet Coil Suffix, below

- Modify Catalog Number for any options required — see Options, **Page 35-7**

- Catalog Numbers of accessory kits required, **Page 35-7**

Table 35-11. Catalog Numbering System

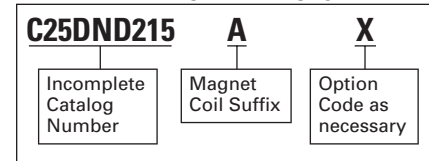


Table 35-12. C25 Contactors Product Selection— Open Type

Rating, Amperes				Maximum Motor Horsepower		Maximum Motor Kilowatts		Number of Poles	Open Type with Metal Mounting Plate		Open Type with DIN Rail Adapter	
Inductive Full Load	Resistive per Pole	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase		Catalog Number ①②	Price U.S. \$	Catalog Number ①②	Price U.S. \$
15	20	115	90	3/4	—	0.40	—	2	C25DND215_	C25DRD215_		
		230	90	2	3	1.5	2.2					
		460	75	—	5	—	3.7	3	C25DND315_	C25DRD315_		
		575	60	—	5	—	3.7					
25	35	115	150	2	—	1.5	—	2	C25DND225_	C25DRD225_		
		230	150	3	7-1/2	2.2	5.5					
		460	125	—	10	—	7.5	3	C25DND325_	C25DRD325_		
		575	100	—	10	—	7.5					
30	40	115	180	2	—	1.5	—	2	C25DND230_	C25DRD230_		
		230	180	5	10	3.7	7.5					
		460	150	—	15	—	11	3	C25DND330_	C25DRD330_		
		575	120	—	15	—	11					
40	50	115	240	3	—	2.2	—	2	C25DNF240_	C25DRF240_		
		230	240	7-1/2	10	5.5	7.5					
		460	200	—	20	—	15	3	C25DNF340_	C25DRF340_		
		575	160	—	20	—	15					
50	65	115	300	3	—	2.2	—	2	C25DNJ250_	C25DRJ250_		
		230	300	10	15	7.5	11					
		460	250	—	30	—	22	3	C25DNJ350_	C25DRJ350_		
		575	200	—	30	—	22					
60	75	115	360	5	—	3.7	—	2	C25FNF260_	NA		
		230	360	10	20	7.5	15					
		460	300	—	40	—	30	3	C25FNF360_	NA		
		575	240	—	40	—	30					
75	90	115	450	5	—	3.7	—	2	C25FNF275_	NA		
		230	450	15	20	11	18.5					
		460	375	—	50	—	37	3	C25FNF375_	NA		
		575	300	—	50	—	37					
90	120	115	540	7-1/2	—	5.7	—	2	C25GNF290_	NA		
		230	540	20	30	15.1	22					
		460	450	—	50	—	37	3	C25GNF390_	NA		
		575	360	—	50	—	37					
120	140	230	720	—	—	—	—	3	C25HNE3120_	NA		
		460	720	—	—	—	—					
		575	570	—	—	—	—					
200	200	240	1200	—	—	—	—	3	C25KNE3200_	NA		
		480	1200	—	—	—	—					
		600	1000	—	—	—	—					
300	300	240	1800	—	—	—	—	3	C25KNE3300_	NA		
		480	1800	—	—	—	—					
		600	1500	—	—	—	—					
360	360	240	2320	—	—	—	—	3	C25LNE3360_	NA		
		480	2320	—	—	—	—					
		600	1900	—	—	—	—					

- ① Incomplete Catalog Number. Replace underscore ( \_ ) in Catalog Number with Magnet Coil Suffix from table below.
- ② Carton quantities including 20 individually packaged units are available for 2- and 3-pole units through 60A inductive.
- ③ Contactors with DC coils (only available up to 75A) include an early break NC auxiliary contact, C320KGD1. See **Page 35-34** for more details.
- ④ Available only for 15A through 75A contactors and 4-pole contactors.
- ⑤ Available through 75A.
- ⑥ Available through 120A.
- ⑦ Available 120 – 360A.
- ⑧ Available 15 – 90A, others 240V.
- ⑨ Available through 50A.

Table 35-13. Magnet Coil Selection

Voltage		Coil Suffix	
60 Hertz	50 Hertz		
<b>AC</b> ⑩			
12 ⑤	12	R T A E B J H L C D	
24 ⑥	24		
110 – 120 ⑦	110 – 120 ⑦		
208 ⑦	—		
208 – 240 ⑧	208 – 240		
240 ⑨	220		
277	—		
—	380 – 415		
440 – 480	440 – 480		
550 – 600	550 – 600		
<b>DC</b> ⑪			
12	1R		
24	1T		
48	1W		
120	1A ④		

- ⑩ 104 – 120V 50/60 Hz for 60A, 75A and all 4-Pole Contactors (25A – 40A).
- ⑪ Class H AC Coils available as option for 15A – 50A Contactor. Add 2 before AC Coil Suffix letter.

Technical Data ..... **Pages 35-5, 35-35**  
 Options ..... **Page 35-7**  
 Accessories ..... **Page 35-7**  
 Dimensions ..... **Page 35-31**  
 Discount Symbol ..... **1CD-5C**

**Options — Factory Installed**

To order C25, C65, A25 and B25 Contactors and Starters with the factory installed options listed below, change the basic Catalog Number listed in the Product Selection Table as noted.

**Table 35-14. Factory Installed Options**

Description	Code Letter	Number of Poles	Adder U.S. \$
<b>Terminals — 15A through 50A</b>			
<b>Binding Head Screws</b>			
Without Quick Connect Terminals	<b>A</b>	2-, 3-, 4-Pole	
With Quick Connect Terminals (Side-by-Side)	<b>B</b>	2-, 3-, 4-Pole	
With Quick Connect Terminals (Vertical In-Line)	<b>G</b>	2-, 3-Pole	
<b>Screw/Pressure Plate</b> ②			
Without Quick Connect Terminals	<b>C</b>	2-, 3-, 4-Pole	
With Quick Connect Terminals (Side-by-Side)	<b>D</b>	2-, 3-, 4-Pole	
With Quick Connect Terminals (Vertical In-Line)	<b>H</b>	2-, 3-Pole	
<b>Box Lugs</b>			
<b>(#2 Posidrive/Slotted Screw)</b>			
Without Quick Connect Terminals	<b>E</b>	2-, 3-, 4-Pole ①	
With Quick Connect Terminals (Side-by-Side)	<b>F</b>	2-, 3-, 4-Pole ①	
With Quick Connect Terminals (Vertical In-Line)	<b>J</b>	2-, 3-Pole	
<b>Box Lugs (Hex Socket Allen Head Screw)</b>			
Without Quick Connect Terminals	<b>K</b>	2-, 3-Pole	
With Quick Connect Terminals (Side-by-Side)	<b>L</b>	2-, 3-Pole	
With Quick Connect Terminals (Vertical In-Line)	<b>M</b>	2-, 3-Pole	
<b>Terminals — 60A through 75A</b>			
Replace letter in the 6th position of Catalog Number with Code Letter listed below. EXAMPLE: Change C25FNF250 to C25FNE250.			
<b>Box Lugs (Slotted Screw)</b>			
Without Quick Connect Terminals	<b>E</b>	2-, 3-Pole	
With Quick Connect Terminals	<b>F</b>	2-, 3-Pole	

① 4-Pole contactors have box lugs with slotted screws.  
② Screw/Pressure Plate terminals are not available on 50A Contactors.

**Auxiliary Contacts (Side Mount)**

**Table 35-15. Auxiliary Contacts — Factory Installed**

Add Code Letter listed below to complete Catalog Number. EXAMPLE: Change C25DND215A to C25DND215AA.

Description	With Standard Pressure Plate Terminals		With Quick Connect Terminals		Snap Switch Design with Quick Connect Terminals	
	Code Letter	Adder U.S. \$	Code Letter	Adder U.S. \$	Code Letter	Adder U.S. \$
<b>For 15 through 90A</b> ③						
1NO	<b>A</b>		<b>F</b>		—	
1NC	<b>B</b>		<b>G</b>		—	
1NO-1NC	<b>C</b>		<b>H</b>		—	
2NO	<b>D</b>		<b>J</b>		—	
2NC	<b>E</b>		<b>K</b>		—	
<b>For 15 through 75A</b>						
1NO-1NC	—		—		<b>L</b>	
2NO-2NC	—		—		<b>M</b>	
<b>For 120 through 360A</b>						
1NO	<b>A</b>		—		—	
1NO-1NC	<b>C</b>		—		—	
2NO	<b>D</b>		—		—	
2NC	<b>E</b>		—		—	

**Special Marking**

Special contactor marking, consult local sales office.

③ 90A available only with binding head screw and quick connect terminals.

**Accessories**

**Auxiliary Contact Kits (Side Mounted)**



*Side Mounted Auxiliary Contact*

**Table 35-16. Heavy-Duty Pilot Rated for 10A at 600V AC**

Circuit	With Standard Pressure Plate Terminals		With Pressure Plate and Quick Connect Terminals	
	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$
<b>For 15 through 75A</b>				
1NO	<b>C320KG1</b>		<b>C320KG11</b>	
1NC	<b>C320KG2</b>		<b>C320KG12</b>	
1NO-1NC	<b>C320KG3</b>		<b>C320KG13</b>	
2NO	<b>C320KG4</b>		<b>C320KG14</b>	
2NC	<b>C320KG5</b>		<b>C320KG15</b>	
<b>For 90A</b>				
1NO	—		<b>C320DPG10</b>	
1NC	—		<b>C320DPG01</b>	
1NO-1NC	—		<b>C320DPG11</b>	
2NO	—		<b>C320DPG20</b>	
<b>For 120 through 360A</b>				
1NO	<b>C320KGS20</b>		—	
1NC	<b>C320KGS21</b>		—	
1NO-1NC	<b>C320KGS22</b>		—	



*Side Mounted Snap Switch*

**Table 35-17. Snap Switch Design Side Mounted Auxiliary Contacts**

Circuit	Snap Switch Design with Quick Connect Terminals	
	Catalog Number	Price U.S. \$
1NO-1NC	<b>C320SNP11</b>	
2NO-2NC	<b>C320SNP22</b>	

15 – 360A, Options and Accessories

**Magnet Coil Quick Connect Terminal**

**Table 35-18. Magnet Coil Quick Connect Terminal**

Description	Adder U.S. \$
Extra Dual Quick Connect Terminals (U-shaped) for Magnet Coil Terminals ①	

① To order, add Suffix Number 9 to the complete Catalog Number. Example: C25DND215A9.

**35**

**Auxiliary Contact Kits (Top Mounted)**



*Top Mounted  
Auxiliary Contact*

**Table 35-19. Heavy-Duty Pilot Rated for 10A at 600V AC**

Circuit	With Standard Pressure Plate Terminals	
	Catalog Number	Price U.S. \$
1NO 1NC	C320KGT1 C320KGT2	
1NO-1NC 2NO 2NC	C320KGT3 C320KGT4 C320KGT5	
3NO 2NO-1NC 1NO-2NC 3NC 4NO	C320KGT9 C320KGT10 C320KGT11 C320KGT12 C320KGT13	
3NO-1NC 2NO-2NC 1NO-3NC 4NC	C320KGT14 C320KGT15 C320KGT16 C320KGT17	

For 15 through 75A ②

② Not available for 4-pole contactors (15 – 40 Amp).

**Mechanical Interlock Kit**



*Mechanical  
Interlock*

**Table 35-20. Mechanical Interlock Kit for 15 through 75A**

Catalog Number	Price U.S. \$
C321KM60B	

**Solid-State ON DELAY Timer**



*Solid-State  
ON DELAY Timer*

**Side Mounted on C25D, C25E and C25F Frame**

This timer is designed to be **wired in series with the load** (typically a coil). When the START button is pushed (power applied to timer), the ON DELAY timing function starts. At the completion of the set timing period, timer and series wired load will both be energized.

**Table 35-21. Solid-State ON DELAY Timer**

Timing Range	Catalog Number ③④⑤	Price U.S. \$
.1 – 1.0 Seconds	C320TDN1_	
1 – 30 Seconds	C320TDN30_	
30 – 300 Seconds	C320TDN300_	
5 – 30 Minutes	C320TDN3000_	

③ Add operating voltage Suffix to Catalog Number. **A** = 120V, **B** = 240V, **E** = 208V

④ Rated .5 ampere pilot duty — not to be used on larger contactors.

⑤ Terminal connections are quick connects only. Two per side.

**Separate Enclosures**



*NEMA 1 Enclosure —  
Cat. No. C799B19*

**Table 35-22. Separate Enclosures — NEMA 1**

Application	Catalog Number	Price U.S. \$
15 through 50A, 2- and 3-Pole	C799B18	
60A, 2- and 3-Pole or 25 through 40A, 4-Pole	C799B19	



**Optional 3-Pole Fuse Block**

**Available only on 3-Pole, 15 – 50A Contactors**

Designed to save space and reduce installation costs, these 3-pole Fuse Blocks will accommodate a variety of fuse classes and fuse holders to satisfy a wide range of electrical/electronic applications such as commercial space and water heaters, dishwashers, food coolers and sterilizing equipment. They are supplied either factory assembled, mounted and wired to the contactor or in kit form.

To order factory assembled, add Suffix Number from table below to Catalog Number of contactor listed on **Page 35-6** and make necessary price addition. EXAMPLE: C25DND325A**361**.

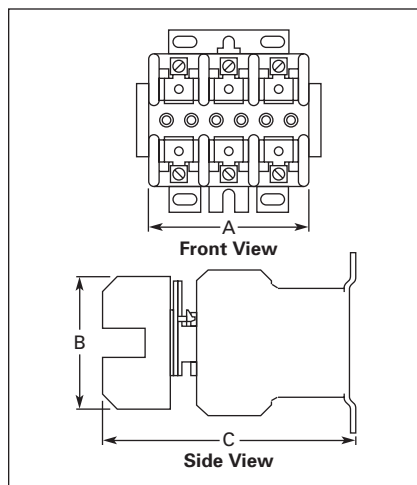


*3-Pole Fuse Block*

**Table 35-23. 3-Pole Fuse Block**

Fuse Holder		Fuse Dimensions in Inches (mm)		Terminal Type and Maximum Wire Size	Factory Installed Ordering Suffix	Field Installation Kit Catalog Number	Price/Addr U.S. \$
Volts	Amperes	Diameter	Length				
<b>Class M</b>							
600	30	0.41 (10.4)	1.50 (38.1)	Pressure Plate	10 AWG Cu	<b>161</b>	<b>C350KM61</b>
<b>Class G</b>							
600	15	0.41 (10.4)	1.31 (33.3)	Pressure Plate	10 AWG Cu	<b>237</b>	<b>C350KG37</b>
	20		1.41 (35.8)	Pressure Plate	10 AWG Cu	<b>238</b>	<b>C350KG38</b>
480	30	0.41 (10.4)	1.63 (41.4)	Pressure Plate	10 AWG Cu	<b>231</b>	<b>C350KG31</b>
	60		2.25 (57.2)	Box Lug	2 AWG Cu/Al	<b>232</b>	<b>C350KG32</b>
<b>Class J</b>							
600	30	0.81 (20.6)	2.25 (57.2)	Pressure Plate	10 AWG Cu	<b>361</b>	<b>C350KJ61</b>
	60	1.06 (26.9)	2.38 (60.5)	Box Lug	2 AWG Cu/Al	<b>362</b>	<b>C350KJ62</b>
<b>Class T</b>							
300	30	0.41 (10.4)	0.88 (22.4)	Box Lug	6 AWG Cu	<b>431</b>	<b>C350KT31</b>
	60	0.56 (14.2)	0.88 (22.4)	Box Lug	2 AWG Cu/Al	<b>432</b>	<b>C350KT32</b>
600	30	0.56 (14.2)	1.50 (38.1)	Box Lug	6 AWG Cu	<b>461</b>	<b>C350KT61</b>
	60	0.81 (20.6)	1.56 (39.6)	Box Lug	2 AWG Cu/Al	<b>462</b>	<b>C350KT62</b>
<b>Class H</b>							
250	30	0.56 (14.2)	2.00 (50.8)	Pressure Plate	10 AWG Cu	<b>521</b>	<b>C350KH21</b>
	60	0.81 (20.6)	3.00 (76.2)	Box Lug	2 AWG Cu/Al	<b>522</b>	<b>C350KH22</b>
<b>Class R</b>							
250	30	0.56 (14.2)	2.00 (50.8)	Pressure Plate	10 AWG Cu	<b>621</b>	<b>C350KR21</b>
	60	0.81 (20.6)	3.00 (76.2)	Box Lug	2 AWG Cu/Al	<b>622</b>	<b>C350KR22</b>

**Dimensions**



**Figure 35-2. 3-Pole Fuse Block and Contactor Dimensions**

**Table 35-24. Approximate Dimensions for 3-Pole Fuse Block and Contactor**

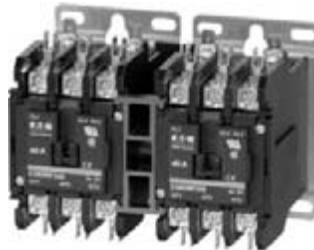
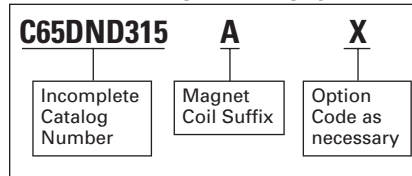
Fuse Size			Dimensions in Inches (mm)		
Class	Amps	Volts	Wide A	High B	Deep C
<b>For Dimensions Not Shown, See Next Page.</b>					
G	15	600	2.41 (61)	2.81 (71)	5.14 (131)
	20		2.41 (61)	2.81 (71)	5.14 (131)
	30	480	2.41 (61)	2.81 (71)	5.14 (131)
	60		2.62 (67)	4.25 (108)	5.18 (132)
H	30	250	3.00 (76)	3.03 (77)	5.33 (135)
	60		4.22 (107)	4.75 (121)	5.86 (149)
J	30	600	4.81 (122)	4.12 (105)	5.92 (150)
	60		4.81 (122)	4.12 (105)	5.92 (150)
M	30	600	2.41 (61)	2.81 (71)	5.14 (131)
R	30	250	3.00 (76)	3.03 (77)	5.33 (135)
	60		4.22 (107)	4.75 (121)	5.86 (149)
T	30	300	3.44 (87)	2.75 (70)	5.43 (138)
	60	300	3.44 (87)	2.75 (70)	5.43 (138)
	30	600	3.75 (95)	3.19 (81)	5.36 (136)
	60	600	4.87 (124)	2.94 (75)	5.68 (144)

**Product Description**

Cutler-Hammer® C65 Reversing Contactors from Eaton's electrical business are furnished with pressure plates and quick connect terminals as standard on 15, 25 and 30A devices and with box lugs and quick connect terminals on 40, 50, 60 and 75A.

Other terminal configurations are available — see Factory Installed Options Table on **Page 35-7**. Reversing contactors will accept add-on Auxiliary Contacts on either side — order factory assembled or as kits for field installation. See **Page 35-7**.

**Table 35-25. Catalog Numbering System**



*C65 Reversing Contactor*

**Standards and Certifications**

- UL Recognized Components  
UL File #E-1491, Guide NLDX2
- CSA Certified Components  
File #LR353, Guide 380w-1.14 Class 3211 04



**35**

**Product Selection**

**Table 35-26. Reversing and 2-Speed Contactors Product Selection — Open Type — Unwired, Mechanically Interlocked Only**

Rating, Amperes				Maximum Motor Horsepower		Maximum Motor Kilowatts		Number of Poles	Open Type with Metal Mounting Plate		Open Type with DIN Rail Adapter	
Inductive Full Load	Resistive per Pole	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase		Catalog Number ①	Price U.S. \$	Catalog Number ①	Price U.S. \$
15	20	115	90	3/4	—	0.40	—	2 3	C65DND215_ C65DND315_		C65DRD215_ C65DRD315_	
		230	90	2	3	1.5	2.2					
		460	75	—	5	—	3.7					
		575	60	—	5	—	3.7					
25	35	115	150	2	—	1.5	—	2 3	C65DND225_ C65DND325_		C65DRD225_ C65DRD325_	
		230	150	3	7-1/2	2.2	5.5					
		460	125	—	10	—	7.5					
		575	100	—	10	—	7.5					
30	40	115	180	2	—	1.5	—	2 3	C65DND230_ C65DND330_		C65DRD230_ C65DRD330_	
		230	180	5	10	3.7	7.5					
		460	150	—	15	—	11					
		575	120	—	15	—	11					
40	50	115	240	3	—	2.2	—	2 3	C65DNF240_ C65DNF340_		C65DRF240_ C65DRF340_	
		230	240	7-1/2	10	5.5	7.5					
		460	200	—	20	—	15					
		575	160	—	20	—	15					
50	65	115	300	3	—	2.2	—	2 3	C65DNJ250_ C65DNJ350_		C65DRJ250_ C65DRJ350_	
		230	300	10	15	7.5	11					
		460	250	—	30	—	22					
		575	200	—	30	—	22					
60	75	115	360	5	—	3.7	—	2 3	C65FNF260_ C65FNF360_		NA	
		230	360	10	20	7.5	15					
		460	300	—	40	—	30					
		575	240	—	40	—	30					
75	90	115	450	5	—	3.7	—	2 3	C65FNF275_ C65FNF375_		NA	
		230	450	15	20	11	18.5					
		460	375	—	50	—	37					
		575	300	—	50	—	37					

- ① Incomplete Catalog Number. Replace underscore (\_) with Magnet Coil Suffix from **Table 35-27**.
- ② Available through 50A.
- ③ 104 – 120V 50/60 Hz for 60A, 75A.
- ④ Class H AC Coils available as option for 15A – 50A Contactor. Add 2 before AC Coil Suffix letter.

**Table 35-27. Magnet Coil Selection**

Volts		Coil Suffix ④
60 Hz	50 Hz	
12	12	R
24	24	T
110 – 120 ③	110 – 120 ③	A
208 – 240	208 – 240	B
240 ②	220	J
277	—	H
—	380 – 415	L
440 – 480	440 – 480	C
550 – 600	550 – 600	D

**Table 35-28. Magnet Coil Options**

Description	Adder U.S. \$
Extra dual quick connect terminals ("U" shaped) for magnet coil terminals. To order, add Suffix Number 9 to the complete Catalog Number. EXAMPLE: C65DND315A9.	

- Torque Ratings ..... **Page 35-5**
- Options ..... **Page 35-7**
- Dimensions ..... **Page 35-31**
- Discount Symbol ..... **1CD-5C**

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Heater Packs . . . . .	35-14
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**Product Description**

Cutler-Hammer® A25 and B25 Definite Purpose Starters from Eaton’s electrical business combine the features and flexibility of the C25 Definite Purpose Contactors and Freedom Series Bi-metallic Ambient Compensated Overload Relays mounted on a common mounting plate.



**A25 Starter**

**Features**

**Overload Relay**

- Selectable Manual or Automatic Reset operation
- Interchangeable Heater Packs adjustable ±24% to match motor FLA and calibrated for use with 1.0 and 1.15 service factor motors
- Class 10 or 20 heater packs
- Bimetallic, ambient compensated operated. Trip free mechanism.
- Electrically isolated NO-NC contacts (pull RESET button to test)
- Overload trip indication
- Shrouded or fingerproof terminals to reduce possibility of electrical shock
- Single-phase sensitivity

**Standards and Certifications**

- UL Recognized Components  
UL File #E-1491, Guide NLDX2
- CSA Certified Components  
File #LR353, Guide 380W-1.14  
Class 3211 04



**Technical Data and Specifications**

**Table 35-29. Terminal Wire Sizes**

Line Side (Contactor) ①		
Terminal Type	Wire Range — Solid or Stranded	
	Power Terminals	Coil Terminals
Screw/Pressure Plate	8 – 14 AWG	12 – 16 AWG
Box Lug — 25 – 50A	4 – 14 AWG	12 – 16 AWG
Box Lug — 60A	3 – 14 AWG	12 – 16 AWG

① Line side (contactor) torque ratings can be found on Page 35-5.

**Table 35-30. Power Terminals — Load — Cu Only (Stranded or Solid)**

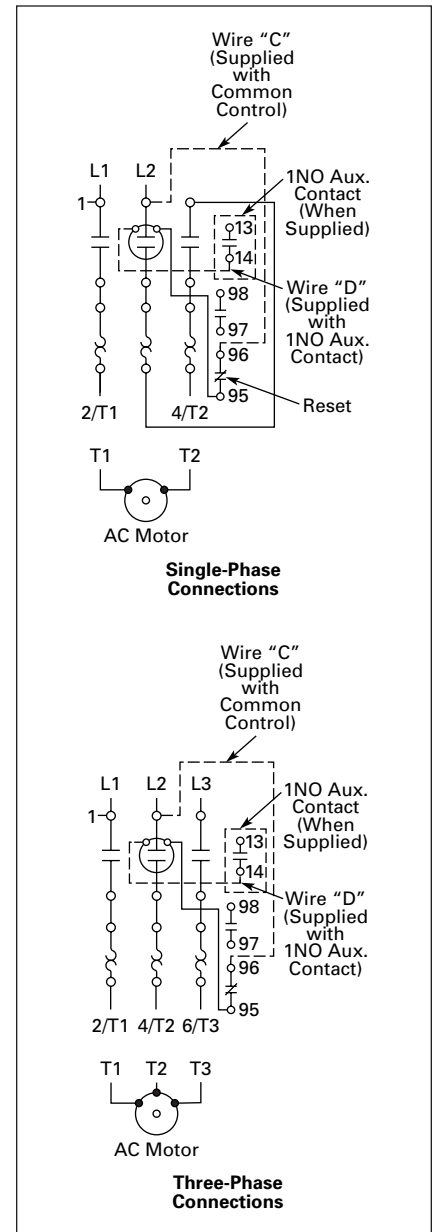
Terminal	Range	Torque Rating
25 and 30 Ampere	14 – 6 AWG	20 lb-in (14 – 10 AWG)
40, 50 and 60 Ampere	14 – 2 AWG	35 lb-in (14 – 10 AWG) 40 lb-in (8 AWG) 45 lb-in (6 – 4 AWG) 50 lb-in (3 – 2 AWG)

**Control Terminals — Cu Only**

12 – 16 AWG stranded, 12 – 14 AWG solid
---

**Table 35-31. Overload Relay UL/CSA Contact Ratings Control Circuit**

AC Volts	120V	240V	480V	600V
<b>NC Contact B600</b>				
Make and Break	30A	15A	7.5A	6A
Break	3A	1.5A	0.75A	0.6A
Continuous	5A	5A	5A	5A
<b>NO Contact C600</b>				
Make and Break	15A	7.5A	3.375A	3A
Break	1.5A	0.75A	0.375A	0.3A
Continuous	2.5A	2.5A	2.5A	2.5A



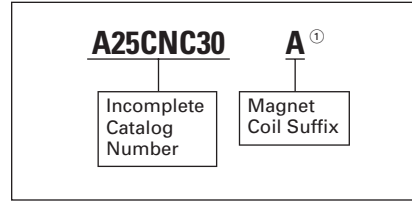
**Figure 35-3. Starter Wiring Diagrams**

**Product Selection**

**When Ordering Specify**

- Catalog Number plus Magnet Coil Suffix
- Heater Packs for specific FLA of motor, see **Page 35-14**

**Table 35-32. Catalog Numbering System**



① Order Catalog Number **A25CNC30A**.

**Note:** Modify Catalog Number for any options required.

**Table 35-33. Single- and Three-Phase Starters Product Selection— Open Type**

Ampere Rating			Max. Motor hp		Max. Motor kW		Single-Phase ③④			Three-Phase ③		
Inductive Full Load	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase	Common Control	Separate Control	Price U.S. \$	Common Control	Separate Control	Price U.S. \$
							Catalog Number ②	Catalog Number ②		Catalog Number ②	Catalog Number ②	
25	115	150	2	—	1.5	—	B25CNC25_	B25SNC25_		A25CNC25_	A25SNC25_	
	230	150	3	7-1/2	2.2	5.5						
	460	125	—	10	—	7.5						
	575	100	—	10	—	7.5						
30	115	180	2	—	1.5	—	B25CNC30_	B25SNC30_		A25CNC30_	A25SNC30_	
	230	180	5	10	3.7	7.5						
	460	150	—	15	—	11						
	575	120	—	15	—	11						
40	115	240	3	—	2.2	—	B25CNE40_	B25SNE40_		A25CNE40_	A25SNE40_	
	230	240	7-1/2	10	5.5	7.5						
	460	200	—	20	—	15						
	575	160	—	20	—	15						
50	115	300	—	—	—	—	—	—		A25CNE50_	A25SNE50_	
	230	300	—	15	—	11						
	460	250	—	30	—	22						
	575	200	—	30	—	22						
60	115	360	—	—	—	—	—	—		A25CNE60_	A25SNE60_	
	230	360	—	20	—	15						
	460	300	—	40	—	30						
	575	240	—	40	—	30						

② Incomplete Catalog Number. Replace underscore ( \_ ) with Magnet Coil Suffix from **Table 35-34**.

③ Starters do not include heater packs. Select heater pack from tables, **Page 35-14**.

④ Set of 3 heater packs required for single-phase applications.

**Table 35-34. Magnet Coil Selection**

AC ⑧		Coil Suffix	DC ⑨	
60 Hertz	50 Hertz		Voltage	Coil Suffix
12	12	R T A B J H L C D	12	1R
24	24		24	1T
110 – 120 ⑦	110 – 120 ⑦		48	1W
208 – 240	208 – 240		120	1A
240 ⑥	220			
277	—			
—	380 – 415			
440 – 480	440 – 480			
550 – 600	550 – 600			

⑤ Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 35-34** for more detail.

⑥ Available through 50A.

⑦ 104 – 120V 50/60 Hz for 60A Contactor.

⑧ Class H AC Coils available as option for 15A – 50A Contactor. Add 2 before AC Coil Suffix letter.

Technical Data ..... **Pages 35-11, 35-35**  
 Accessories ..... **Page 35-7**  
 Dimensions ..... **Page 35-29**  
 Discount Symbol ..... **1CD-5C**

**Overload Relay**

**General**

Overload relays are provided to protect motors, motor control apparatus and motor-branch circuit conductors against excessive heating due to motor overloads and failure to start. This definition does not include: 1) motor circuits over 600 volts, 2) short circuits, 3) ground faults and 4) fire pump control. (NEC Art. 430-31)

**Time Current Characteristics**

The time-current characteristics of an overload relay is an expression of performance which defines its operating time at various multiples of its current setting. Tests are run at Underwriters Laboratory (UL) in accordance with NEMA Standards and the NEC.

**UL requires**

- When tested at 100 percent of its current rating, the overload relay shall trip ultimately.
- When tested at 200 percent of its current rating, the overload relay shall trip in not more than 8 minutes.
- When tested at 600 percent of its current rating, the overload relay shall trip in not more than 10 or 20 seconds, depending on the Class of the relay or heater packs.

“Current Rating” is defined as the minimum current at which the relay will trip. Per NEC, an overload must ultimately trip at 125% of FLA current (heater) setting for a 1.15 service factor motor and 115% FLA for a 1.0 service factor motor.

“Current Setting” is defined as the FLA (Full Load Amperes) of the motor and thus the overload heater pack setting.

Example: 600% of current rating is defined as 750% (600 x 1.25) of FLA current (heater) setting for a 1.15 service factor motor. A 10 ampere heater setting must trip in 20 seconds or less at 75 amperes motor current for a Class 20 relay.

**Overload Relay Setting**

**FLA Dial Adjustment**

For motors having a 1.15 service factor, rotate the FLA adjustment dial to correspond to the motor’s FLA rating. Estimate the dial position when the motor FLA falls between two letter values as shown in the example.

For motors having a 1.0 service factor, rotate the FLA dial one-half position counterclockwise (CCW).

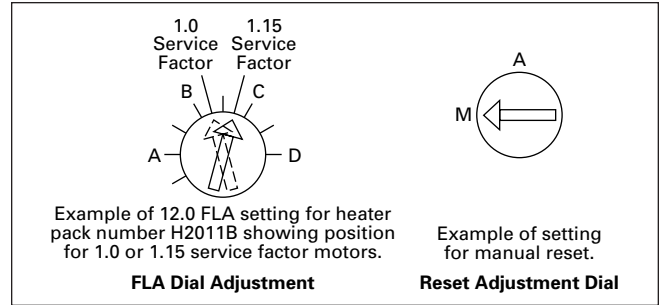
**Manual/Automatic Reset**

The overload relay is factory set at M for manual reset operation. For automatic reset operation, turn the reset adjustment dial to the A position as shown in the illustration.

Automatic reset is not intended for two-wire control devices.

**Test for Trip Indication**

To test overload relay for trip indication when in manual reset, pull out the blue RESET button. An orange flag will appear indicating that the device has tripped. Push RESET button in to reset.



**Figure 35-4. FLA Dial Adjustment**

**Table 35-35. Replacement Overload with Connectors**

Starter Size	Overload Part Number	Price U.S. \$
25 and 30A 40A and 50A 60A	10-7125 10-7132 10-7131	

**Accessories**

**Contactors Accessories**

See **Pages 35-7** and **35-8**.

**Locking Cover for Overload Relay**

Snap-on transparent or opaque plastic panel for covering access port to the overload relay trip setting dial — helps prevent accidental or unauthorized changes to trip and reset setting.



**Table 35-36. Locking Cover for Overload Relay**

Description	Min. Order Quantity (Std. Pkg.)	Catalog Number	Price U.S. \$
Clear cover, no accessibility	50	C320PC3	
Gray cover, no accessibility, with Auto only nib	50	C320PC4	
Gray cover, no accessibility, with Manual only nib	50	C320PC5	
Gray cover with FLA dial accessibility, A, B, C, D positions and Auto only nib	50	C320PC6	
Gray cover with FLA dial accessibility, A, B, C, D positions and Manual only nib	50	C320PC7	

**Separate Enclosures**

**Table 35-37. Separate Enclosures — NEMA 1**

Application	Catalog Number	Price U.S. \$
25 and 30A 40, 50 and 60A	C799B11 C799B13	

Heater Packs — Class 10 and Class 20

Heater Packs

Fast Trip — Class 10 Heater Packs

Manual or Automatic Reset

Note: Heater packs are shipped 3 to a carton. Catalog Numbers listed below are for 3 heater packs.

Table 35-38. Fast Trip Ratings

Motor Full Load Ampere Rating <sup>①</sup>				Catalog Number <sup>②</sup> (Includes 3 Heater Packs)	Price U.S. \$
Dial Position					
A	B	C	D		
0.260	0.313	0.367	0.420	H2101B-3	
0.384	0.464	0.543	0.623	H2102B-3	
0.570	0.688	0.806	0.924	H2103B-3	
0.846	1.02	1.20	1.37	H2104B-3	
1.28	1.55	1.83	2.10	H2105B-3	
1.92	2.33	2.74	3.15	H2106B-3	
2.30	2.79	3.28	3.77	H2107B-3	
3.38	4.10	4.82	5.54	H2108B-3	
4.96	6.03	7.09	8.16	H2109B-3	
7.07	8.58	10.1	11.6	H2110B-3	
9.60	11.2	12.8	14.4	H2111B-3	
14.4	17.5	20.7	23.8	H2112B-3	
18.7	21.8	25.0	28.1	H2113B-3	
23.5	27.3	31.0	34.8	H2114B-3	
28.3	32.6	37.0	41.3	H2115B-3	
36.6	42.3	48.1	53.8	H2116B-3	
53.8	60.8	67.9	74.9	H2117B-3	

① For motor full load amperes between listed values, adjust dial clockwise for higher or counterclockwise for lower motor currents. The currents listed are for 1.5 service factor motors. A position adjustment is provided for 1.0 service factor motors.

② Set of three heater packs are required for both single- and three-phase applications.

Standard Trip — Class 20 Heater Packs

Manual or Automatic Reset

Note: Heater packs are shipped 3 to a carton. Catalog Numbers and prices listed below are for 3 heater packs.

Table 35-39. Standard Trip Ratings

Motor Full Load Ampere Rating <sup>③</sup>				Catalog Number <sup>④</sup> (Includes 3 Heater Packs)	Price U.S. \$
Dial Position					
A	B	C	D		
0.254	0.306	0.359	0.411	H2001B-3	
0.375	0.452	0.530	0.607	H2002B-3	
0.560	0.676	0.791	0.907	H2003B-3	
0.814	0.983	1.15	1.32	H2004B-3	
1.20	1.45	1.71	1.96	H2005B-3	
1.79	2.16	2.53	2.90	H2006B-3	
2.15	2.60	3.04	3.49	H2007B-3	
3.23	3.90	4.56	5.23	H2008B-3	
4.55	5.50	6.45	7.40	H2009B-3	
6.75	8.17	9.58	11.0	H2010B-3	
9.14	10.8	12.4	14.0	H2011B-3	
14.0	16.9	19.9	22.8	H2012B-3	
18.7	22.7	26.7	30.7	H2013B-3	
23.5	28.5	33.5	38.5	H2014B-3	
29.0	34.0	39.1	44.1	H2015B-3	
39.6	45.5	51.5	57.4	H2016B-3	
53.9	60.9	67.9	74.9	H2017B-3	

③ For motor full load amperes between listed values, adjust dial clockwise for higher or counterclockwise for lower motor currents. The currents listed are for 1.5 service factor motors. A position adjustment is provided for 1.0 service factor motors.

④ Set of three heater packs are required for both single- and three-phase applications.

Trip Curves — Bimetallic Ambient Compensated Overload Relay — 25°C Open Rating

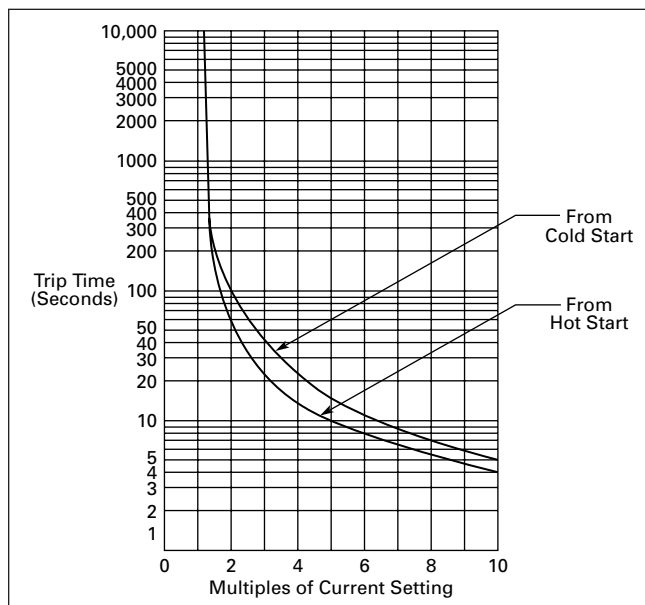


Figure 35-5. Class 10 Overload Relay 25°C Open Rating

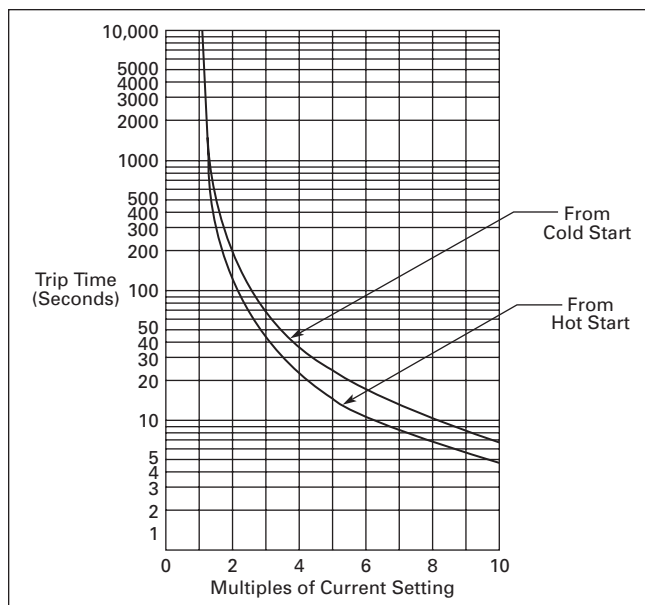


Figure 35-6. Class 20 Overload Relay 25°C Open Rating

Discount Symbol ..... 1CD-1C

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**Product Description**

Cutler-Hammer® A27 and B27 Definite Purpose Starters from Eaton’s electrical business combine the features and flexibility of the C25 Definite Purpose Contactors and **XT** Series Bi-metallic Ambient Compensated Overload Relays.



**A27 Starter**

**Features**

- Selectable Manual or Automatic Reset operation
- Class 10 Trip Class
- Bimetallic, ambient compensated operated. Trip free mechanism.
- Electrically isolated NO-NC contacts (pull TEST button to test)
- Shrouded or fingerproof terminals to reduce possibility of electrical shock
- Single-phase sensitivity

**Standards and Certifications**

- UL Recognized Components  
UL File #E-1491, Guide NLDX2
- CSA Certified Components  
File #LR353, Guide 380W-1.14  
Class 3211 04



**Technical Data and Specifications**

**Table 35-40. Terminal Wire Sizes**

Line Side (Contactor) ①		
Terminal Type	Wire Range — Solid or Stranded	
	Power Terminals	Coil Terminals
Screw/ Pressure Plate	8 – 14 AWG	12 – 16 AWG
Box Lug — 15 – 45A	4 – 14 AWG	12 – 16 AWG

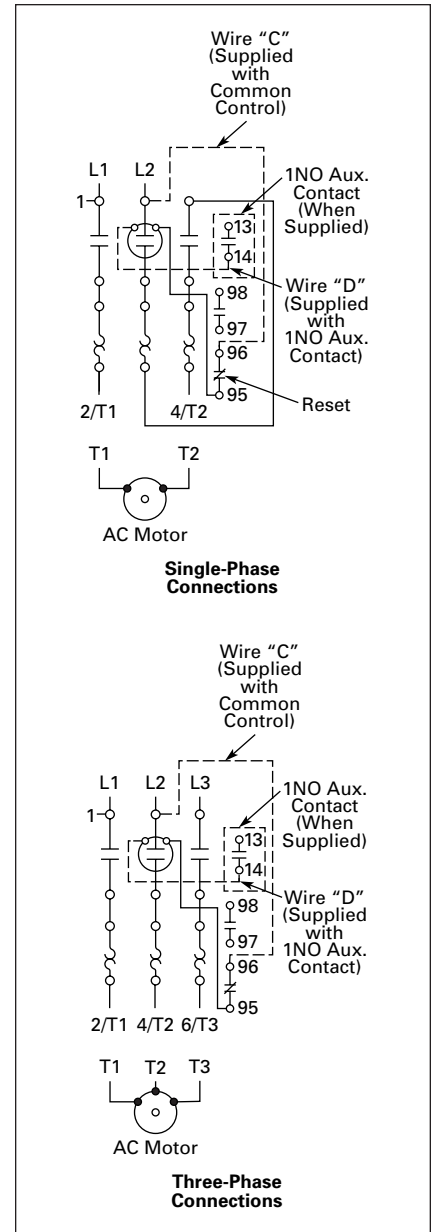
① Line side (contactor) torque ratings can be found on **Page 35-5**.

**Table 35-41. Power Terminals — Load — Cu Only (Stranded or Solid)**

Terminal	Range	Torque Rating
15 and 25 Ampere	14 – 8 AWG	16 lb-in (14 – 8 AWG)
30, 40 and 45 Ampere	14 – 2 AWG	31 lb-in (14 – 2 AWG)

**Control Terminals — Cu Only**

12 – 16 AWG stranded, 12 – 14 AWG solid
---



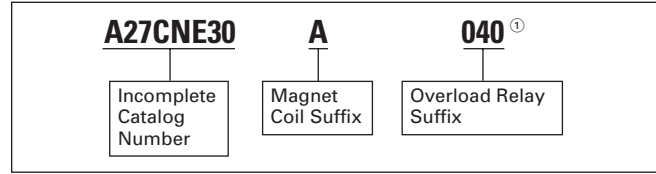
**Figure 35-7. Starter Wiring Diagrams**

**Product Selection**

**When Ordering Specify**

- Catalog Number plus Magnet Coil Suffix plus Overload Relay Suffix (see example at right)

**Table 35-42. Catalog Numbering System**



① Order Catalog Number **A27CNE30A040**.

**Note:** Modify Catalog Number for any options required.

**Table 35-43. Three-Phase Starter Product Selection — Open Type**

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		Price U.S. \$	
Inductive Full Load	Line Voltage	Locked Rotor			Metal Mounting Plate	DIN Rail Adapter	Metal Mounting Plate	DIN Rail Adapter		
					Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②		
15	115	90	—	—	A27CNC15_	A27CRC15_	A27SNC15_	A27SRC15_		
	230	90	3	2.2						
	460	75	5	3.7						
	575	60	5	3.7						
25	115	150	—	—	A27CNC25_	A27CRC25_	A27SNC25_	A27SRC25_		
	230	150	7-1/2	5.5						
	460	125	10	7.5						
	575	100	10	7.5						
30	115	180	—	—	A27CNE30_	A27CRE30_	A27SNE30_	A27SRE30_		
	230	180	10	7.5						
	460	150	15	11						
	575	120	15	11						
40	115	240	—	—	A27CNE40_	A27CRE40_	A27SNE40_	A27SRE40_		
	230	240	10	7.5						
	460	200	20	15						
	575	160	20	15						
45	115	270	—	—	A27CNE45_	A27CRE45_	A27SNE45_	A27SRE45_		
	230	270	15	11						
	460	225	30	22						
	575	180	30	22						

② Incomplete Catalog Number. Replace underscore ( \_ ) with Magnet Coil Suffix from **Table 35-44** and Overload Relay Suffix from **Table 35-45**.

**Table 35-44. Magnet Coil Selection**

AC ⑤		Coil Suffix	DC ③	
Voltage			Voltage	Coil Suffix
60 Hertz	50 Hertz			
12	12		R	12
24	24	T	24	1T
110 – 120	110 – 120	A	48	1W
208 – 240	208 – 240	B	120	1A
240 ④	220	J		
277	—	H		
—	380 – 415	L		
440 – 480	440 – 480	C		
550 – 600	550 – 600	D		

③ Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 35-34** for more detail.

④ Available through 45A.

⑤ Class H AC Coils available as option. Add 2 before AC Coil Suffix letter.

**Table 35-45. Overload Relay Suffix**

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range
<b>Frame C</b>		
0.1 – 0.16	P16	15 – 25A
0.16 – 0.24	P24	15 – 25A
0.24 – 0.4	P40	15 – 25A
0.4 – 0.6	P60	15 – 25A
0.6 – 1	001	15 – 25A
1 – 1.6	1P6	15 – 25A
1.6 – 2.4	2P4	15 – 25A
2.4 – 4	004	15 – 25A
4 – 6	006	15 – 25A
6 – 10	010	15 – 25A
10 – 16	016	15 – 25A
16 – 24	024	15 – 25A
24 – 32	032	15 – 25A
<b>Frame D</b>		
6 – 10	010	30 – 45A
10 – 16	016	30 – 45A
16 – 24	024	30 – 45A
24 – 40	040	30 – 45A
40 – 57	057	30 – 45A



**Table 35-46. Single-Phase Starter Product Selection — Open Type**

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		Price U.S. \$
Inductive Full Load	Line Voltage	Locked Rotor			Metal Mounting Plate	DIN Rail Adapter	Metal Mounting Plate	DIN Rail Adapter	
					Catalog Number ①	Catalog Number ①	Catalog Number ①	Catalog Number ①	
15	115	90	3/4	0.4	B27CNC15_	B27CRC15_	B27SNC15_	B27SRC15_	
	230	90	2	1.5					
	460	75	—	—					
	575	60	—	—					
25	115	150	2	1.5	B27CNC25_	B27CRC25_	B27SNC25_	B27SRC25_	
	230	150	3	2.2					
	460	125	—	—					
	575	100	—	—					
30	115	180	2	1.5	B27CNE30_	B27CRE30_	B27SNE30_	B27SRE30_	
	230	180	5	3.7					
	460	150	—	—					
	575	120	—	—					
40	115	240	3	2.2	B27CNE40_	B27CRE40_	B27SNE40_	B27SRE40_	
	230	240	7-1/2	5.5					
	460	200	—	—					
	575	160	—	—					
45	115	270	3	2.2	B27CNE45_	B27CRE45_	B27SNE45_	B27SRE45_	
	230	270	7-1/2	7.5					
	460	225	—	—					
	575	180	—	—					

① Incomplete Catalog Number. Replace underscore (\_) with Magnet Coil Suffix from **Table 35-47** and Overload Relay Suffix from **Table 35-48**.

**Table 35-47. Magnet Coil Selection**

AC ④		Coil Suffix	DC ②	
Voltage			Voltage	Coil Suffix
60 Hertz	50 Hertz			
12	12	R	12	1R
24	24	T	24	1T
110 – 120	110 – 120	A	48	1W
208 – 240	208 – 240	B	120	1A
240 ③	220	J		
277	—	H		
—	380 – 415	L		
440 – 480	440 – 480	C		
550 – 600	550 – 600	D		

② Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 35-34** for more detail.

③ Available through 45A.

④ Class H AC Coils available as option. Add 2 before AC Coil Suffix letter.

**Table 35-48. Overload Relay Suffix**

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range
<b>Frame C</b>		
0.1 – 0.16	P16	15 – 25A
0.16 – 0.24	P24	15 – 25A
0.24 – 0.4	P40	15 – 25A
0.4 – 0.6	P60	15 – 25A
0.6 – 1	001	15 – 25A
1 – 1.6	1P6	15 – 25A
1.6 – 2.4	2P4	15 – 25A
2.4 – 4	004	15 – 25A
4 – 6	006	15 – 25A
6 – 10	010	15 – 25A
10 – 16	016	15 – 25A
16 – 24	024	15 – 25A
24 – 32	032	15 – 25A
<b>Frame D</b>		
6 – 10	010	30 – 45A
10 – 16	016	30 – 45A
16 – 24	024	30 – 45A
24 – 40	040	30 – 45A
40 – 57	057	30 – 45A

### Overload Relay Specifications

#### Overload Relays

These tripping characteristics are the mean values of the spread at 20°C ambient temperature in a cold state.

Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approximately 25% of the read off value. Specific characteristics for each individual setting range can be found in MN03402001E.

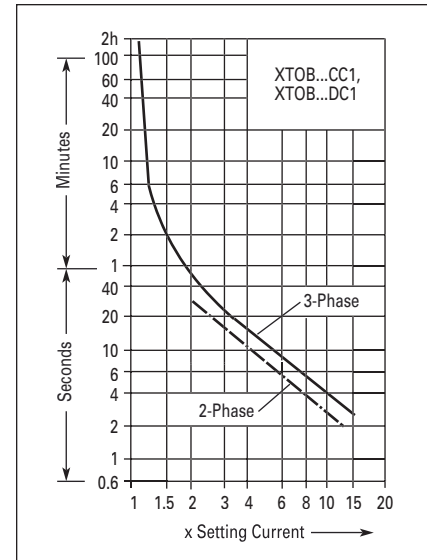


Figure 35-8. Tripping Characteristics

Table 35-49. Overload Relay — Technical Data and Specifications

Description	XTOB...CC1	XTOB...DC1
<b>General</b>		
Standards	IEC/EN 60947, VDE 0660, UL, CSA	IEC/EN 60947, VDE 0660, UL, CSA
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30
Ambient Temperature ①	-25 to 50°C [-13 to 122°F]	-25 to 50°C [-13 to 122°F]
Temperature Compensation	Continuous	Continuous
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal Shock 10 mS	10g	10g
Degree of Protection	IP20	IP20
Protection against Direct Contact when Actuated from Front (IEC 536)	Finger and back of hand proof	Finger and back of hand proof
Insulation Voltage (U <sub>i</sub> ) VAC	690	690
Overvoltage Category /Pollution Degree	III/3	III/3
Impulse Withstand Voltage (U <sub>imp</sub> ) VAC	6000	6000
Operational Voltage (U <sub>e</sub> ) VAC	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between auxiliary contacts and main contacts (VAC) Between main contacts (VAC)	440 440	440 440
Overload Relay Setting Range	0.1 – 32A	6 – 75A
Temperature Compensation Residual Error >20°C (%/K)	≤ 0.25	≤ 0.25
Current Heat Loss (3 Conductors) Lower value of setting range, W Upper value of setting range, W	2.5 6	3 7.5
Terminal Capacity Solid, mm <sup>2</sup> Flexible with ferrule, mm <sup>2</sup>	2 x (1 – 6) 2 x (1 – 4) 2 x (1 – 6) ②	2 x (1 – 16) 1 x 25 2 x (1 – 10) ③
Solid or Stranded, AWG	14-8	14-2
Terminal Screw Tightening Torque Nm Lb-in	M4 1.8 16	M6 3.5 31
Tools Poizidrive screwdriver Standard screwdriver	Size 2 1 x 6	Size 2 1 x 6

① Ambient temperature operating range to IEC/EN 60947, PTB: -5°C to +50°C.

② 6 mm<sup>2</sup> flexible with ferrules to DIN 46228.

③ Main contact terminal capacity, solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section.

**Overload Relay Specifications**

**Table 35-49. Overload Relay — Technical Data and Specifications (Continued)**

Description	XTOB...CC1	XTOB...DC1
<b>Auxiliary and Control Circuit Connections</b>		
Impulse Withstand Voltage (U <sub>imp</sub> ) VAC	6000	6000
Overvoltage Category/Pollution Degree	III/3	III/3
Terminal Capacity Solid, mm <sup>2</sup> Flexible with ferrule, mm <sup>2</sup> Solid or stranded, AWG	2 × (0.75 – 4) 2 × (0.75 – 2.5) 2 × (18 – 12)	2 × (0.75 – 4) 2 × (0.75 – 2.5) 2 × (18 – 12)
Terminal Screw Tightening Torque Nm Lb-in	M3.5 0.8 – 1.3 7 – 11.5	M3.5 0.8 – 1.3 7 – 11.5
Tools Pozidrive screwdriver Standard screwdriver	Size 2 1 × 6	Size 2 1 × 6
Auxiliary Circuit Rated Insulation Voltage (U <sub>i</sub> ) VAC	500	500
Rated Operational Voltage (U <sub>e</sub> ) VAC	500	500
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between the auxiliary contacts (VAC)	240	240
Conventional Thermal Current, I <sub>th</sub>	6	6
Rated Operational Current — AC-15 NO Contact 120V 240V 415V 500V	1.5 1.5 0.5 0.5	1.5 1.5 0.5 0.5
NC Contact 120V 240V 415V 500V	1.5 1.5 0.9 0.8	1.5 1.5 0.9 0.8
Rated Operational Current — DC-13 L/R ≤15 mS ① 24V 60V 110V 220V	0.9 0.75 0.4 0.2	0.9 0.75 0.4 0.2
Short Circuit Rating without Welding Maximum fuse, A gG/gL	6	6

① Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

**Table 35-50. Overload Relay Replacement Catalog Numbers**

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range	Overload Relay Catalog Number	Price U.S. \$
<b>Frame C</b>				
0.1 – 0.16	<b>P16</b>	15 – 25A	XTOBP16CC1DP	
0.16 – 0.24	<b>P24</b>	15 – 25A	XTOBP24CC1DP	
0.24 – 0.4	<b>P40</b>	15 – 25A	XTOBP40CC1DP	
0.4 – 0.6	<b>P60</b>	15 – 25A	XTOBP60CC1DP	
0.6 – 1	<b>001</b>	15 – 25A	XTOB001CC1DP	
1 – 1.6	<b>1P6</b>	15 – 25A	XTOB1P6CC1DP	
1.6 – 2.4	<b>2P4</b>	15 – 25A	XTOB2P4CC1DP	
2.4 – 4	<b>004</b>	15 – 25A	XTOB004CC1DP	
4 – 6	<b>006</b>	15 – 25A	XTOB006CC1DP	
6 – 10	<b>010</b>	15 – 25A	XTOB010CC1DP	
10 – 16	<b>016</b>	15 – 25A	XTOB016CC1DP	
16 – 24	<b>024</b>	15 – 25A	XTOB024CC1DP	
24 – 32	<b>032</b>	15 – 25A	XTOB032CC1DP	
<b>Frame D</b>				
6 – 10	<b>010</b>	30 – 45A	XTOB010DC1DP	
10 – 16	<b>016</b>	30 – 45A	XTOB016DC1DP	
16 – 24	<b>024</b>	30 – 45A	XTOB024DC1DP	
24 – 40	<b>040</b>	30 – 45A	XTOB040DC1DP	
40 – 57	<b>057</b>	30 – 45A	XTOB057DC1DP	

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A29 Starter

**Product Description**

Cutler-Hammer® A29 and B29 Definite Purpose Starters from Eaton’s electrical business combine the features and flexibility of the C25 Definite Purpose Contactors and C396 Electronic Overload Relays.

**Features**

- Standard Version: Selectable Trip Class (5, 10, 20, 30) with Selectable Manual or Auto Reset (45 and 65 mm Frames)
- Current Adjustment Range: 5:1
- Self-Powered Design — will accept AC voltages from 12 to 690V 50/60 Hz
- Ambient Temperature Compensation
- Low Heat Generation
- Phase Loss Protection
- Phase Unbalance Protection
- Electrically isolated 1NO-1NC Contacts (Push-to-Test)
- Trip Status Indicator

**Standards and Certifications**

- UL Listed Components
- CSA Certified Components
- IEC EN 60947-4-1, EN 60947-5-1
- CE Certified Components
- CCC Certified Components
- RoHS Certified Components

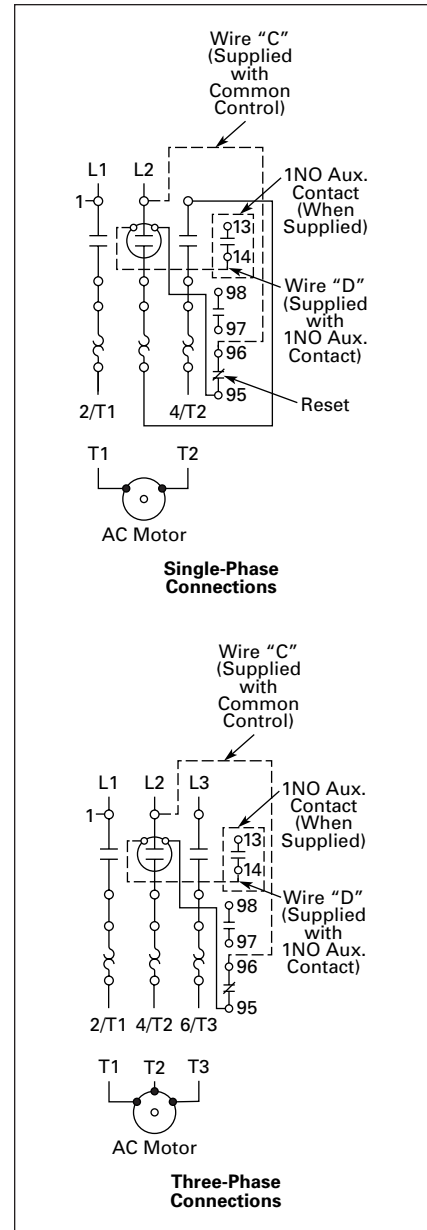
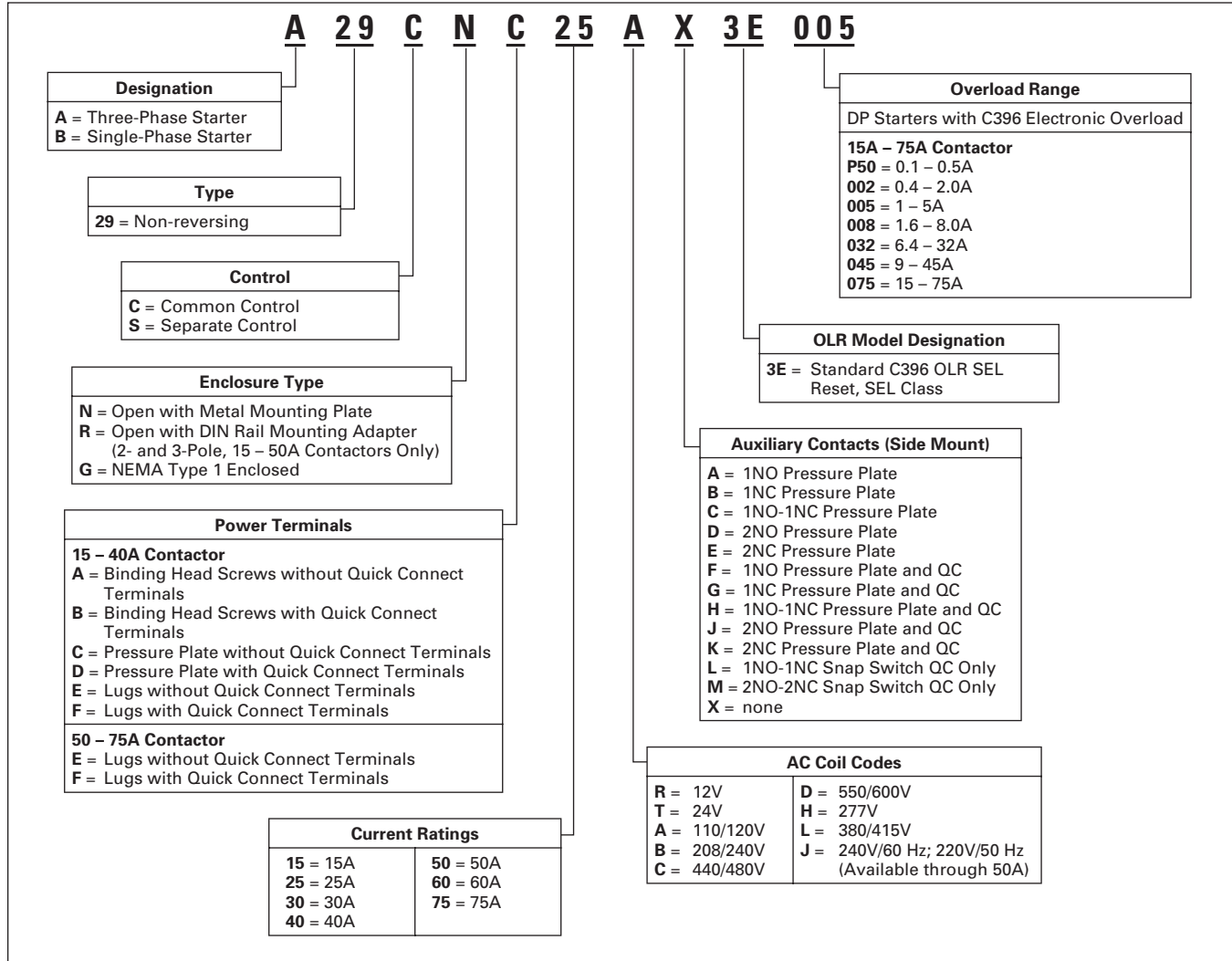


Figure 35-9. Starter Wiring Diagrams

**Catalog Number Selection**

Table 35-51. A29 and B29 DP Catalog Numbering System



**Product Selection**

**When Ordering Specify**

- Catalog Number plus AC Coil Code, Auxiliary Contact Code, OLR Model Designation and Overload Range Code (see Table 35-52)

Table 35-52. Catalog Numbering System

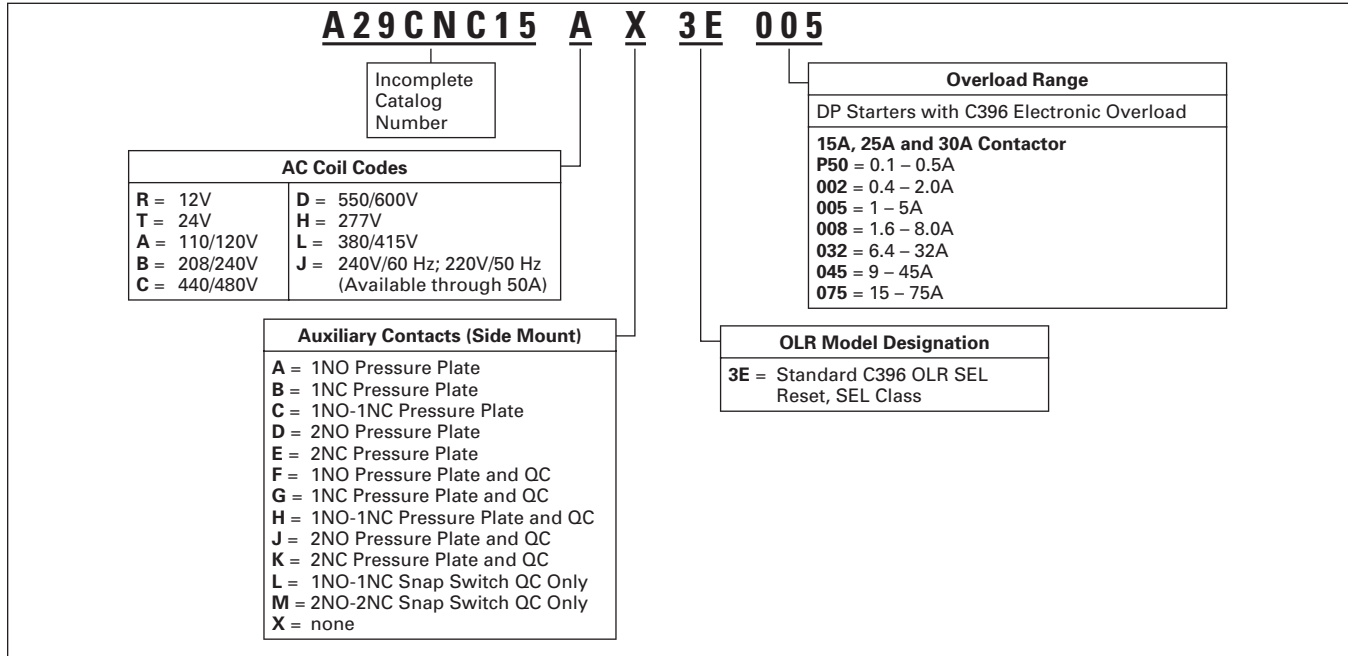


Table 35-53. Three-Phase Starter Product Selection — Open Type

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		Price U.S. \$
Inductive Full Load	Line Voltage	Locked Rotor			Metal Mounting Plate	DIN Rail Adapter	Metal Mounting Plate	DIN Rail Adapter	
					Catalog Number ①	Catalog Number ①	Catalog Number ①	Catalog Number ①	
15	115 230 460 575	90 90 75 60	— 3 5 5	— 2.2 3.7 3.7	A29CNC15_	A29CRC15_	A29SNC15_	A29SRC15_	
25	115 230 460 575	150 150 125 100	— 7-1/2 10 10	— 5.5 7.5 7.5	A29CNC25_	A29CRC25_	A29SNC25_	A29SRC25_	
30	115 230 460 575	180 180 150 120	— 10 15 15	— 7.5 11 11	A29CNE30_	A29CRE30_	A29SNE30_	A29SRE30_	
40	115 230 460 575	240 240 200 160	— 10 20 20	— 7.5 15 15	A29CNE40_	A29CRE40_	A29SNE40_	A29SRE40_	
50	115 230 460 575	300 300 250 200	— 15 30 30	— 11 22 22	A29CNE45_	A29CRE45_	A29SNE45_	A29SRE45_	
60	115 230 460 575	360 360 300 240	— 20 40 40	— 15 30 30	A29CNE60_	—	A29SNE60_	—	
75	115 230 460 575	450 450 375 300	— 20 50 50	— 18.5 37 37	A29CNE75_	—	A29SNE75_	—	

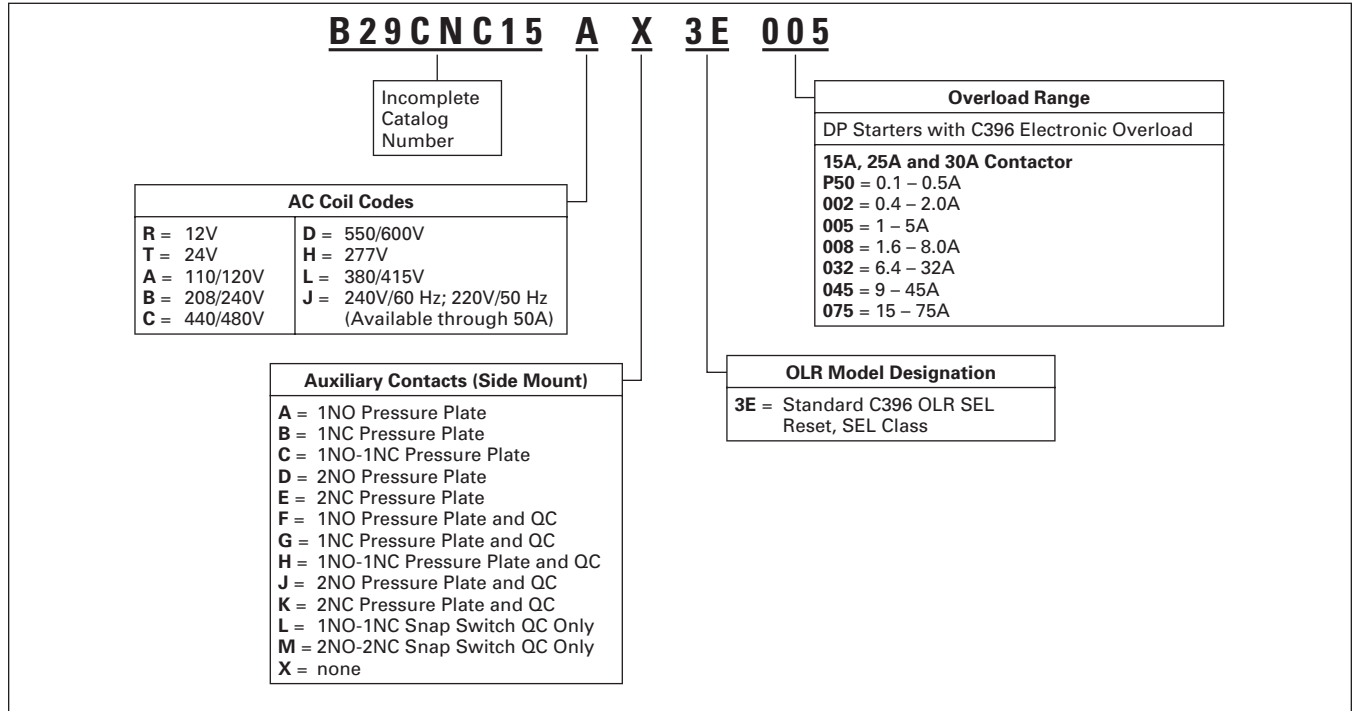
① Incomplete Catalog Number. Replace underscore ( \_ ) with Suffix (see Table 35-52).

**Product Selection**

**When Ordering Specify**

- Catalog Number plus AC Coil Code, Auxiliary Contact Code, OLR Model Designation and Overload Range Code (see **Table 35-54**)

**Table 35-54. Catalog Numbering System**



**Table 35-55. Single-Phase Starter Product Selection — Open Type**

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		Price U.S. \$	
Inductive Full Load	Line Voltage	Locked Rotor			Metal Mounting Plate	DIN Rail Adapter	Metal Mounting Plate	DIN Rail Adapter		
					Catalog Number ①	Catalog Number ①	Catalog Number ①	Catalog Number ①		
15	115 230 460 575	90 90 75 60	3/4 2 — —	0.4 1.5 — —	B29CNC15_	B29CRC15_	B29SNC15_	B29SRC15_		
25	115 230 460 575	150 150 125 100	2 3 — —	1.5 2.2 — —	B29CNC25_	B29CRC25_	B29SNC25_	B29SRC25_		
30	115 230 460 575	180 180 150 120	2 5 — —	1.5 3.7 — —	B29CNE30_	B29CRE30_	B29SNE30_	B29SRE30_		
40	115 230 460 575	240 240 200 160	3 7-1/2 — —	2.2 5.5 — —	B29CNE40_	B29CRE40_	B29SNE40_	B29SRE40_		
50	115 230 460 575	300 300 250 200	3 10 — —	2.2 7.5 — —	B29CNE45_	B29CRE45_	B29SNE45_	B29SRE45_		

① Incomplete Catalog Number. Replace underscore (\_) with Suffix (see **Table 35-54**).

## Overload Relay Specifications

## Technical Data and Specifications

Table 35-56. Overload Relay Specifications

<b>General Description</b>	<b>C396_2_</b> <b>Standard</b>
<b>Protection</b>	
Thermal	1.05 x FLA: Does not trip 1.25 x FLA: Overload trip
Phase Loss	1 Phase = 0, Trip time = 3s (Hot Status)
Phase Imbalance	Max - Min / Max > 40%, Trip time = 3s (Hot Status)
Inrush Current	> 8 x Max FLA, Trip time is 0.3s (Cold Status)
<b>Trip Class</b>	
Class 5, 10, 20, 30	Selectable
<b>Reset</b>	
M / M-O A / A-O	Manual / Manual + Stop Auto / Auto + Stop Auto Reset Time = 165s
<b>Indications</b>	
Test Indicator	Yellow
Trip Indicator	Yellow
<b>PCBA</b>	
Power Sensing	3 phase
Instant Reset by Power ON	CPU reset by Power ON after 2 – 3s
Thermal memory	< 3 min.
Cold and Hot Trip Curves	Power ON > 20 min. is Hot Status
Power Consumption	< 300 mW
<b>Options</b>	
Safety Cover	Covers FLA dial, DIP switches
Remote Reset	24V DC, 24V AC, 120V AC, 240V AC

Table 35-56. Overload Relay Specifications (Continued)

<b>General Description</b>	<b>C396_2_</b> <b>Standard</b>
<b>Climate Considerations</b>	
Ambient Temperature (Operating)	-25° to 65°C (-13° to 149°F) inside enclosure
Ambient Temperature (Storage / Transportation)	-40° to 80°C (-40° to 176°F)
Humidity	UL991 (H3): 20 – 95% non-condensing
Altitude (Operating)	NEMA ICS1: 2000 meters max above sea level
Pollution (Operating — External)	Pollution degree 3
Mechanical Shock Resistance (IEC/EN 68-2-17)	15g
Vibration (Lloyd's Register of Shipping, Vibration Test 2)	6g
Temperature Compensation	Continuous
<b>Voltages</b>	
Control Voltage	12 – 690V AC, 50/60 Hz
Insulation Voltage (Ui) — Main Circuit	1000V AC
Insulation Voltage (Ui) — Control Circuit	690V AC
Impulse Withstand Voltage (Uimp) VAC	6000
<b>FLA Range</b>	
45 mm Frame: C396A_	0.1 – 45A
65 mm Frame: C396B_	15 – 110A
110 mm Frame: C396C_	30 – 150A
<b>Safety</b>	
Degree of Protection	IP20 (Stand-Alone Version Only)
<b>Capacity</b>	
Control Terminal Capacity	18 – 14 AWG
Control Terminal Tightening Torque in Nm (lb-in)	0.79 (7)
<b>Load Terminal Capacity</b>	
45 mm Frame: C396A_	14 – 6 AWG
65 mm Frame: C396B_	10 – 1 AWG
110 mm Frame: C396C_	6 AWG – 250 mcm
<b>Load Terminal Tightening Torque in Nm (lb-in)</b>	
45 mm Frame: C396A_	3.2 (28)
65 mm Frame: C396B_	9.0 (80)
110 mm Frame: C396C_	22.6 (200)



**Stand-Alone Overload Relay**



**Cat. No.**  
**C396A2A045SELDF**

**Table 35-57. C396 Overload Relay for Integrated Use with DP Contactors by Feature Set ①**

FLA Range (Amps)	DP Contactor Rating	Catalog Number	Price U.S. \$
<b>45 mm Overload Frame Size</b>			
0.1 – 0.5	15, 25, 30	C396A2AP05SELDC	
0.4 – 2.0	15, 25, 30	C396A2A002SELDC	
1 – 5	15, 25, 30	C396A2A005SELDC	
1.6 – 8	15, 25, 30, 40	C396A2A008SELDE	
6.4 – 32	15, 25, 30, 40, 50	C396A2A032SELDF	
9 – 45	40, 50	C396A2A045SELDF	
<b>65 mm Overload Frame Size</b>			
15 – 75	60, 75	C396B2A075SELDG	

① Discount Symbol **1CD-5C**.

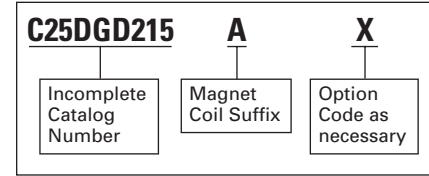


**Product Selection**

**When Ordering Specify**

- Catalog Number plus Magnet Coil Suffix, below
- Modify Catalog Number for any options required — see Options, Page 35-7

**Table 35-58. Catalog Numbering System**



**NEMA 1 Enclosed DP Contactor**

**Table 35-59. 2-, 3- and 4-Pole NEMA Type 1 Enclosed Contactors Product Selection**

Rating, Amperes				Maximum Motor Horsepower		Maximum Motor Kilowatts		Number of Poles	NEMA Type 1	
Inductive Full Load	Resistive per Pole	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase		Catalog Number ①	Price U.S. \$
15	20	115	90	3/4	—	0.40	—	2	C25DGD215_	
		230	90	2	3	1.5	2.2			
		460	75	—	5	—	3.7			
		575	60	—	5	—	3.7			
25	35	115	150	2	—	1.5	—	2	C25DGD225_	
		230	150	3	7-1/2	2.2	5.5			
		460	125	—	10	—	7.5			
		575	100	—	10	—	7.5			
30	40	115	180	2	—	1.5	—	2	C25DGD230_	
		230	180	5	10	3.7	7.5			
		460	150	—	15	—	11			
		575	120	—	15	—	11			
40	50	115	240	3	—	2.2	—	2	C25DGF240_	
		230	240	7-1/2	10	5.5	7.5			
		460	200	—	20	—	15			
		575	160	—	20	—	15			
50	65	115	300	3	—	2.2	—	2	C25DGJ250_	
		230	300	10	15	7.5	11			
		460	250	—	30	—	22			
		575	200	—	30	—	22			
60	75	115	360	5	—	3.7	—	2	C25FGF260_	
		230	360	10	20	7.5	15			
		460	300	—	40	—	30			
		575	240	—	40	—	30			

① Incomplete Catalog Number. Replace underscore ( \_ ) in Catalog Number with Magnet Coil Suffix from table below.

**Table 35-60. Magnet Coil Selection**

Voltage		Coil Suffix
60 Hertz	50 Hertz	
<b>AC</b> ⑤		
12	12	R
24	24	T
110 – 120 ④	110 – 120 ④	A
208 – 240	208 – 240	B
240 ③	220	J
277	—	H
—	380 – 415	L
440 – 480	440 – 480	C
550 – 600	550 – 600	D
<b>DC</b> ②		
12	—	1R
24	—	1T
48	—	1W
120	—	1A

② Contactors with DC coils include an early break NC auxiliary contact, C320KGD1. See Page 35-34 for more details.

③ Available through 50A.

④ 104 – 120A 50/60 Hz for 60A Contactor.

⑤ Class H AC Coils available as option. Add 2 before Coil Suffix letter.

Technical Data ..... Pages 35-5, 35-35  
 Options ..... Page 35-7  
 Accessories ..... Page 35-7  
 Dimensions ..... Page 35-31  
 Discount Symbol ..... 1CD-5C



*NEMA 1 Enclosed DP Starter*

**Product Description**

Cutler-Hammer® A25 and B25 Definite Purpose Starters from Eaton’s electrical business combine the features and flexibility of the C25 Definite Purpose Contactors and Freedom Series Bi-metallic Ambient Compensated Over-load Relays mounted on a common mounting plate.

**Standards and Certifications**

- UL Recognized Components UL File #E-1491, Guide NLDX2
- CSA Certified Components File #LR353, Guide 380W-1.14 Class 3211 04

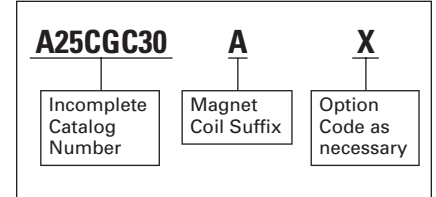


**Product Selection**

**When Ordering Specify**

- Catalog Number plus Magnet Coil Suffix
- Heater Packs for specific FLA of motor, see **Page 35-14**

**Table 35-61. Catalog Numbering System**



**Table 35-62. Single- and Three-Phase NEMA Type 1 Enclosed Starters Product Selection**

Ampere Rating			Max. Motor hp		Max. Motor kW		Single-Phase <sup>(2)(3)</sup>			Three-Phase <sup>(3)</sup>		
Inductive Full Load	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase	Common Control	Separate Control	Price U.S. \$	Common Control	Separate Control	Price U.S. \$
							Catalog Number <sup>(1)</sup>	Catalog Number <sup>(1)</sup>		Catalog Number <sup>(1)</sup>	Catalog Number <sup>(1)</sup>	
25	115	150	2	—	1.5	—	B25CGC25_	B25SGC25_		A25CGC25_	A25SGC25_	
	230	150	3	7-1/2	2.2	5.5						
	460	125	—	10	—	7.5						
	575	100	—	10	—	7.5						
30	115	180	2	—	1.5	—	B25CGC30_	B25SGC30_		A25CGC30_	A25SGC30_	
	230	180	5	10	3.7	7.5						
	460	150	—	15	—	11						
	575	120	—	15	—	11						
40	115	240	3	—	2.2	—	B25CGE40_	B25SGE40_		A25CGE40_	A25SGE40_	
	230	240	7-1/2	10	5.5	7.5						
	460	200	—	20	—	15						
	575	160	—	20	—	15						
50	115	300	—	—	—	—	—	—		A25CGE50_	A25SGE50_	
	230	300	—	15	—	11						
	460	250	—	30	—	22						
	575	200	—	30	—	22						
60	115	360	—	—	—	—	—	—		A25CGE60_	A25SGE60_	
	230	360	—	20	—	15						
	460	300	—	40	—	30						
	575	240	—	40	—	30						

- <sup>(1)</sup> Incomplete Catalog Number. Replace underscore ( \_ ) with Magnet Coil Suffix from **Table 35-63**.
- <sup>(2)</sup> Starters do not include heater packs. Select heater pack from tables, **Page 35-14**.
- <sup>(3)</sup> Set of 3 heater packs required for single-phase applications.
- <sup>(4)</sup> Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 35-34** for more detail.
- <sup>(5)</sup> Available through 50A.
- <sup>(6)</sup> 104 – 120A 50/60 Hz for 60A Contactor.
- <sup>(7)</sup> Class H AC Coils available as option. Add 2 before Coil Suffix letter.

**Table 35-63. Magnet Coil Selection**

Voltage		Coil Suffix
60 Hertz	50 Hertz	
<b>AC <sup>(7)</sup></b>		
12	12	R
24	24	T
110 – 120 <sup>(6)</sup>	110 – 120 <sup>(6)</sup>	A
208 – 240	208 – 240	B
240 <sup>(4)</sup>	220	J
277	—	H
—	380 – 415	L
440 – 480	440 – 480	C
550 – 600	550 – 600	D
<b>DC <sup>(5)</sup></b>		
12	—	1R
24	—	1T
48	—	1W
120	—	1A

Technical Data . . . . . **Pages 35-11, 35-35**  
 Accessories . . . . . **Page 35-7**  
 Dimensions . . . . . **Page 35-29**  
 Discount Symbol . . . . . **1CD-5C**



NEMA 1 Enclosed DP Starter

**Product Description**

Cutler-Hammer® A27 and B27 Definite Purpose Starters from Eaton's electrical business combine the features and flexibility of the C25 Definite Purpose Contactors and XT Series Bi-metallic Ambient Compensated Overload Relays.

**Standards and Certifications**

- UL Recognized Components UL File #E-1491, Guide NLDX2
- CSA Certified Components File #LR353, Guide 380W-1.14 Class 3211 04

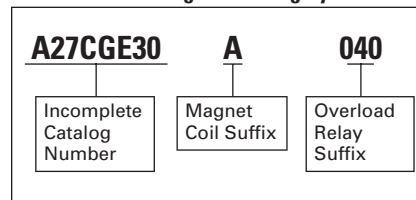


**Product Selection**

**When Ordering Specify**

- Catalog Number plus Magnet Coil Suffix plus Overload Relay Suffix

Table 35-64. Catalog Numbering System



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Table 35-65. Single- and Three-Phase NEMA Type 1 Enclosed Starters Product Selection

Ampere Rating			Max. Motor hp		Max. Motor kW		Single-Phase			Three-Phase		
Inductive Full Load	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase	Common Control	Separate Control	Price U.S. \$	Common Control	Separate Control	Price U.S. \$
							Catalog Number ①	Catalog Number ①		Catalog Number ①	Catalog Number ①	
15	115	90	3/4	—	0.4	—	B27CGC15_	B27SGC15_		A27CGC15_	A27SGC15_	
	230	90	2	3	1.5	2.2						
	460	75	—	5	—	3.7						
	575	60	—	5	—	3.7						
25	115	150	2	—	1.5	—	B27CGC25_	B27SGC25_		A27CGC25_	A27SGC25_	
	230	150	3	7-1/2	2.2	5.5						
	460	125	—	10	—	7.5						
	575	100	—	10	—	7.5						
30	115	180	2	—	1.5	—	B27CGE30_	B27SGE30_		A27CGE30_	A27SGE30_	
	230	180	5	10	3.7	7.5						
	460	150	—	15	—	11						
	575	120	—	15	—	11						
40	115	240	3	—	2.2	—	B27CGE40_	B27SGE40_		A27CGE40_	A27SGE40_	
	230	240	7-1/2	10	5.5	7.5						
	460	200	—	20	—	15						
	575	160	—	20	—	15						
45	115	270	3	—	2.2	—	B27CGE45_	B27SGE45_		A27CGE45_	A27SGE45_	
	230	270	7-1/2	15	7.5	11						
	460	225	—	30	—	22						
	575	180	—	30	—	22						

① Incomplete Catalog Number. Replace underscore (\_) with Magnet Coil Suffix from Table 35-66 and Overload Relay Suffix from Table 35-67.

Table 35-66. Magnet Coil Selection

Voltage		Coil Suffix
60 Hertz	50 Hertz	
<b>AC</b> ④		
12	12	R
24	24	T
110 – 120	110 – 120	A
208 – 240	208 – 240	B
240 ②	220	J
277	—	H
—	380 – 415	L
440 – 480	440 – 480	C
550 – 600	550 – 600	D
<b>DC</b> ③		
12		1R
24		1T
48		1W
120		1A

- ② Available through 45A.
- ③ Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See Page 35-34 for more detail.
- ④ Class H AC Coils available as option. Add 2 before Coil Suffix letter.

Table 35-67. Overload Relay Suffix

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range
<b>Frame C</b>		
0.1 – 0.16	P16	15 – 25A
0.16 – 0.24	P24	15 – 25A
0.24 – 0.4	P40	15 – 25A
0.4 – 0.6	P60	15 – 25A
0.6 – 1	001	15 – 25A
1 – 1.6	1P6	15 – 25A
1.6 – 2.4	2P4	15 – 25A
2.4 – 4	004	15 – 25A
4 – 6	006	15 – 25A
6 – 10	010	15 – 25A
10 – 16	016	15 – 25A
16 – 24	024	15 – 25A
24 – 32	032	15 – 25A
<b>Frame D</b>		
6 – 10	010	30 – 45A
10 – 16	016	30 – 45A
16 – 24	024	30 – 45A
24 – 40	040	30 – 45A
40 – 57	057	30 – 45A

Technical Data ..... Pages 35-15, 35-35  
 Accessories ..... Page 35-7  
 Dimensions ..... Page 35-30  
 Discount Symbol ..... 1CD-5C

October 2008

**A25 and B25 Starters**

**Table 35-68. Approximate Dimensions and Shipping Weights**

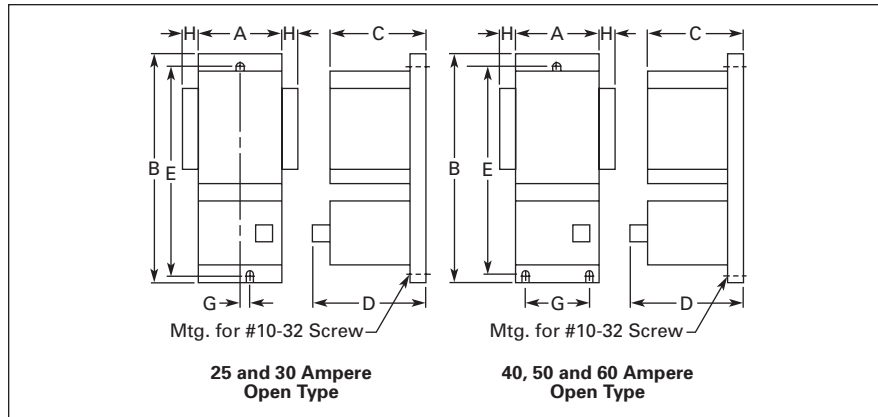
Ampere Size	Dimensions in Inches (mm)						Ship. Wt. Lbs. (kg)	
	Wide A	High B	Deep		Mounting			Auxiliary Contact Adder H
			C	D	E	G		

**Open Type**

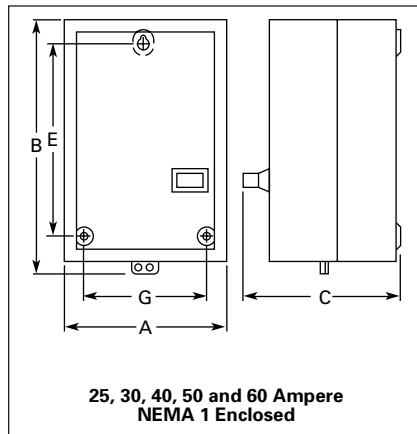
25 and 30	2.50 (64.0)	7.14 (181.0)	3.56 (90.4)	3.69 (93.7)	6.55 (166.0)	.20 (5.1)	.54 (13.7)	1.8 (.8)
40	2.56 (65.0)	8.08 (205.0)	3.50 (89.0)	3.66 (93.0)	7.50 (190.5)	2.00 (51.0)	.54 (13.7)	1.8 (.8)
50 and 60	2.56 (65.0)	8.08 (205.0)	4.15 (105.0)	3.66 (93.0)	7.50 (190.5)	2.00 (51.0)	.54 (13.7)	3.6 (1.6)

**NEMA 1 Enclosed**

25 and 30	5.63 (143.0)	10.17 (258.0)	5.81 (148.0)	—	8.00 (203.0)	4.50 (114.0)	—	4.8 (2.2)
40, 50 and 60	7.64 (194.0)	13.27 (337.0)	6.67 (169.0)	—	10.75 (273.0)	6.00 (152.0)	—	10.6 (4.8)



**Figure 35-10. Approximate Dimensions — Open Type**



**Figure 35-11. NEMA 1 Enclosed Dimensions**

**A27 and B27 Starters**

**Table 35-69. Approximate Dimensions and Shipping Weights**

Ampere Size	Dimensions in Inches (mm)						Ship. Wt. Lbs. (kg)	
	Wide A	High B	Deep		Mounting			Auxiliary Contact Adder
			C	D	E	G		

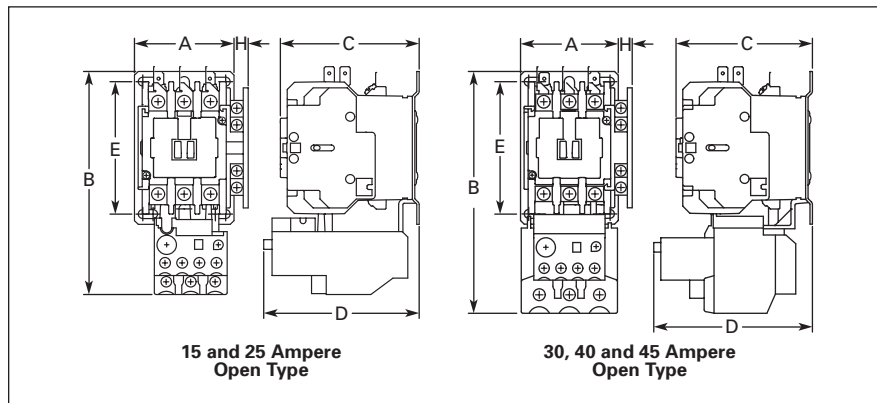
**Open Type**

15 and 25 (Metal Plate)	2.40 (61.0)	5.50 (139.0)	3.35 (85.0)	3.70 (94.0)	3.13 (82.6)	—	.54 (13.7)	1.6 (.7)
15 and 25 (DIN Rail Mount)	2.23 (56.5)	5.20 (133.0)	3.35 (85.0)	3.70 (94.0)	—	—	.54 (13.7)	1.6 (.7)
30, 40 and 45 (Metal Plate)	2.40 (61.0)	6.00 (152.0)	3.35 (85.0)	3.90 (98.0)	3.13 (82.6)	—	.54 (13.7)	1.11 (.9)
30, 40 and 45 (DIN Rail Mount)	2.23 (56.5)	5.70 (145.0)	3.35 (85.0)	3.90 (98.0)	—	—	.54 (13.7)	1.11 (.9)

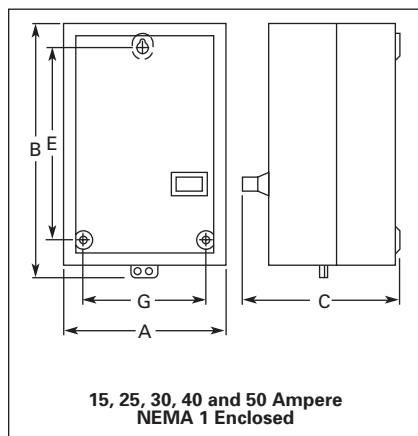
**NEMA 1 Enclosed**

15, 25 and 30	5.63 (143.0)	10.17 (258.0)	5.81 (148.0)	—	8.00 (203.0)	4.50 (114.0)	—	4.8 (2.2)
40 and 45	7.64 (194.0)	13.27 (337.0)	6.67 (169.0)	—	10.75 (273.0)	6.00 (152.0)	—	10.6 (4.8)

35



**Figure 35-12. Approximate Dimensions — Open Type**



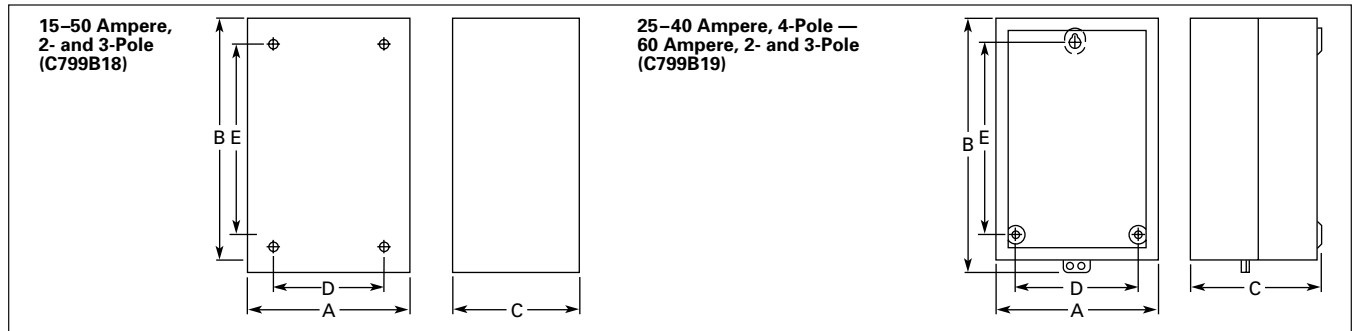
**Figure 35-13. NEMA 1 Enclosed Dimensions**

**C25 Contactors**

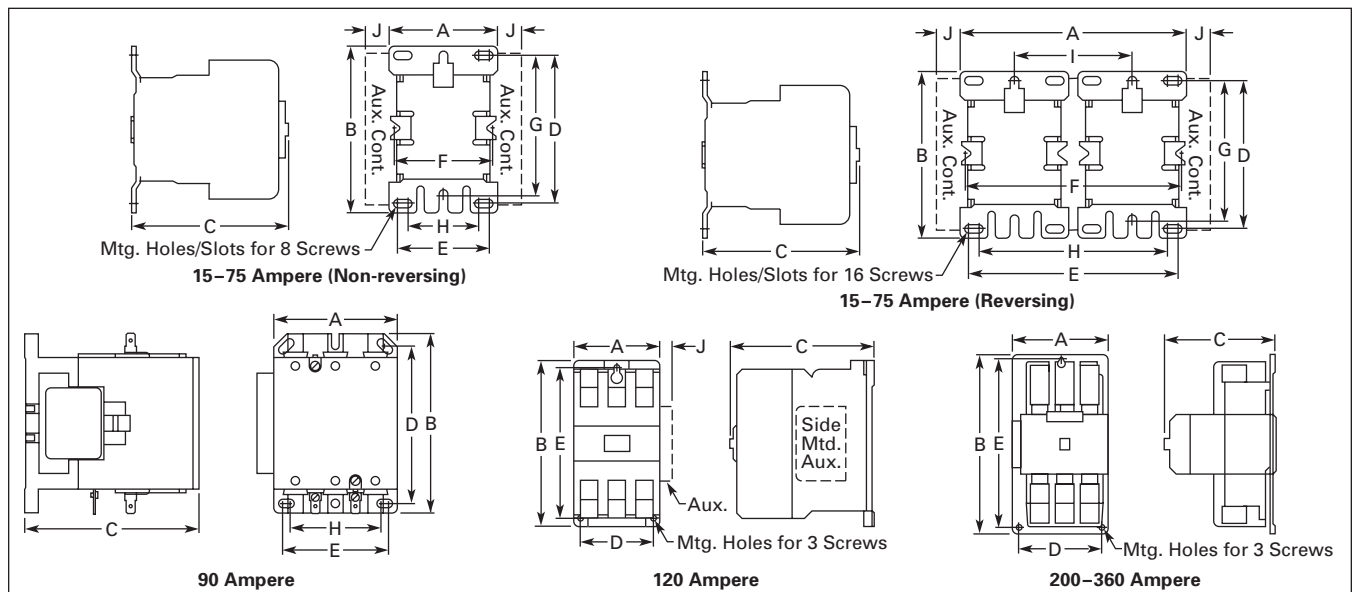
**Table 35-70. Approximate Dimensions and Shipping Weights**

Ampere Size	Number of Poles	Dimensions in Inches (mm)					Mounting	Side Auxiliary Contact Adder	Ship. Wt. Lbs. (kg)		
		Wide A	High B	Deep C	D	E				F	G
<b>Open Type</b>											
15 – 50	2 and 3	2.40 (61.0) ①	3.75 (95.0)	3.35 (85.0)	3.25 (83.0)	2.00 (51.0)	—	3.13 (79.0)	1.50 (38.0)	0.34 (8.6)	1.3 (.6)
25 – 40	4	2.68 (68.0) ①	3.75 (95.0)	3.38 (86.0)	3.25 (83.0)	2.00 (51.0)	1.5 (38.0)	3.13 (79.0)	1.50 (38.0)	0.50 (12.5)	2.3 (1.0)
60 – 75	2 and 3	2.63 (67.0) ①	3.75 (95.0)	3.97 (101.0)	3.25 (83.0)	2.00 (51.0)	1.5 (38.0)	3.13 (79.0)	1.50 (38.0)	0.37 (9.5)	2.8 (1.3)
90	2 and 3	3.39 (86.0)	5.12 (130.0)	4.76 (121.0)	4.44 (113.0)	2.87 (73.0)	—	—	2.50 (63.5)	0.54 (13.7)	4.0 (1.8)
120	2 and 3	4.08 (104.0)	7.17 (182.0)	5.94 (151.0)	3.00 (76.0)	6.63 (168.0)	—	—	—	0.54 (13.7)	8.5 (3.9)
200 and 300	2 and 3	7.05 (179.0)	9.11 (232.0)	7.25 (184.0)	6.00 (152.0)	8.50 (216.0)	—	—	—	—	20.0 (9.1)
360	2 and 3	7.05 (179.0)	13.12 (333.0)	7.78 (198.0)	6.00 (152.0)	12.50 (318.0)	—	—	—	—	23.0 (10.4)
<b>Open Type — Reversing</b>											
15 – 50	2 and 3	5.0 (127)	3.75 (95)	3.35 (85)	3.25 (83)	4.53 (118)	—	3.13 (79)	4.13 (105)	0.34 (8.6)	2.6 (1.2)
60 – 75	2 and 3	5.77 (147)	3.75 (95)	3.97 (101)	3.25 (83)	5.15 (131)	3.15 (80)	3.13 (79)	4.65 (118)	0.37 (9.5)	5.6 (2.5)
<b>NEMA 1 Enclosed</b>											
15 – 50	2 and 3	4.10 (104.0)	6.75 (171.0)	3.50 (89.0)	2.75 (70.0)	4.88 (124.0)	—	—	—	—	3.4 (1.5)
25 – 40	4	5.62 (142.0)	9.51 (241.0)	4.81 (122.0)	4.50 (114.0)	8.00 (203.0)	—	—	—	—	5.8 (2.6)
60	2 and 3										6.3 (2.9)

① Add 0.30 inch (8 mm) to width for C25 contactors with DC coils.



**Figure 35-14. Enclosures**



**Figure 35-15. 15 – 360A, 2-, 3- and 4-Pole**

**Renewal Parts**

**Renewal Contact Kits for C25 Definite Purpose Contactors**

- Replace complete contactor for:
  - C25A...
  - C25B...
  - C25C...
  - C25D...

**Table 35-71. Renewal Contact Kits for C25 Definite Purpose Contactors**

Catalog Number	1-Pole Kit Part No.	Price U.S. \$	2-Pole Kit Part No.	Price U.S. \$	3-Pole Kit Part No.	Price U.S. \$
C25FNF250	—		6-65-5		—	
C25FNF350	—		—		6-65-6	
C25FNF260	—		6-65-7		—	
C25FNF360	—		—		6-65-8	
C25FNF275	—		6-65-20		—	
C25FNF375	—		—		6-65-19	
C25GNF290	6-647-1 ①		—		—	
C25GNF390	6-647-1 ①		—		—	
C25HNE3120	—		—		6-43-6	
C25KNE3200	—		—		6-288	
C25KNE3300	—		—		6-286	
C25LNE3360	—		—		6-45-2	

① Order one kit per pole, 2 for 2-pole and 3 for 3-pole devices.

**AC Coils**

**Table 35-72. AC Coil Selection**

AC Coil Voltage	Frequency	Inrush (Maximum)		Sealed (Maximum)		Coil Suffix	Coil Part Number		Price U.S. \$
		VA	Watts	VA	Watts		Class	Standard	
<b>15, 25, 30 and 40A — 2- and 3-Pole (Series D1)</b>									
12	60	74.85	46.1	5.53	1.68	R T A B	Class F, 155°C	9-3185-5	
24		81.35	49.7	5.83	1.74			9-3185-6	
110/120		74.69	51.6	5.79	1.81			9-3185-1	
208/240		82.64	59.1	6.96	2.38			9-3185-2	
220/240		74.03	51.8	5.85	1.99			J C D H	Class F, 155°C
440/480	73.39	52.1	6.09	2.58	9-3185-3				
550/600	79.47	51.7	6.56	3.05	9-3185-4				
277	72.88	52.4	6.09	2.58	9-3185-7				
380/415	64.50	50.6	6.08	2.43	L	Class F, 155°C	9-3185-8		
<b>15, 25, 30 and 40A — 2- and 3-Pole (Series C1)</b>									
12	60	65.00	30.0	11.00	2.50	R T A	Class F, 155°C	9-3125-5	
24		65.00	30.0	11.00	2.50			9-3125-6	
104/120		65.00	30.0	11.00	2.50			9-3125-1	
208/240	50	75.00	35.0	17.00	3.50	B C D	Class F, 155°C	9-3125-2	
440/480		75.00	35.0	17.00	3.50			9-3125-3	
550/600		75.00	35.0	17.00	3.50			9-3125-4	
277	60	65.00	30.0	11.00	2.50	H	Class F, 155°C	9-3125-8	
380/415	50	75.00	35.0	17.00	3.50	L	Class F, 155°C	9-3125-8	
<b>15, 25, 30 and 40A — 2- and 3-Pole (Series D1)</b>									
12	60	74.85	46.1	5.53	1.68	R T A B	Class H, 180°C	9-3252-5	
24		81.35	49.7	5.83	1.74			9-3252-6	
110/120		74.69	51.6	5.79	1.81			9-3252-1	
208/240		82.64	59.1	6.96	2.38			9-3252-2	
220/240		74.03	51.8	5.85	1.99			J C D H	Class H, 180°C
440/480	73.39	52.1	6.09	2.58	9-3252-3				
550/600	79.47	51.7	6.56	3.05	9-3252-4				
277	72.88	52.4	6.09	2.58	9-3252-7				
380/415	64.50	50.6	6.08	2.43	L	Class H, 180°C	9-3252-8		
<b>50A — 2- and 3-Pole (Series D1)</b>									
12	60	115.8	73.6	7.71	2.80	R T A B	Class F, 155°C	9-3186-5	
24		118.1	70.7	7.58	2.79			9-3186-6	
110/120		110.7	73.3	7.67	2.89			9-3186-1	
208/240		124.9	90.3	10.04	3.74			9-3186-2	
220/240		112.9	76.2	7.60	3.02			J C D H	Class F, 155°C
440/480	114.7	75.6	8.01	3.68	9-3186-3				
550/600	109.0	78.6	8.21	4.11	9-3186-4				
277	115.4	73.1	7.73	3.12	9-3186-7				
380/415	50	110.3	77.0	8.66	3.31	L	Class F, 155°C		

Discount Symbol ..... **1CD-1C**



**Table 35-72. AC Coil Selection — Continued**

AC Coil Voltage	Frequency	Inrush (Maximum)		Sealed (Maximum)		Coil Suffix	Coil Part Number		Price U.S. \$
		VA	Watts	VA	Watts		Class	Standard	
<b>50A — 2- and 3-Pole (Series D1)</b>									
12 24 110/120 208/240	60	115.8 118.1 110.7 124.9	73.6 70.7 73.3 90.3	7.71 7.58 7.67 10.04	2.80 2.79 2.89 3.74	R T A B	Class H, 180°C	9-3253-5 9-3253-6 9-3253-1 9-3253-2	
220/240 440/480 550/600 277	60	112.9 114.7 109.0 115.4	76.2 75.6 78.6 73.1	7.60 8.01 8.21 7.73	3.02 3.68 4.11 3.12	J C D H	Class H, 180°C	9-3253-10 9-3253-3 9-3253-4 9-3253-7	
380/415	50	110.3	77.0	8.66	3.31	L	Class H, 180°C	9-3253-8	
<b>60 and 75A — 2- and 3-Pole; 25, 30 and 40A — 4-Pole</b>									
12 24 104/120	60	204.0	84.0	36.5	8.00	R T A	Class B, 130°C	9-3256-5 9-3256-6 9-3256-1	
208/240 440/480 550/600	50	240.0	100.8	50.4	10.80	B C D	Class B, 130°C	9-3256-2 9-3256-3 9-3256-4	
277	60	204.0	84.0	36.5	8.00	H	Class B, 130°C	9-3256-7	
380/415	50	199.0	88.8	37.8	8.80	L	Class B, 130°C	9-3256-8	
<b>90A — 2- and 3-Pole</b>									
24 110/120 208/240	60	214.0	—	19.0	6.80	T A B	Class B, 130°C	9-3079-1 9-3079-2 9-3079-3	
440/480 550/600	50	247.0	—	19.0	6.80	C D	Class B, 130°C	9-3079-5 9-3079-6	
277	60	214.0	—	19.0	6.80	H	Class B, 130°C	9-3079-4	
<b>120A — 3-Pole</b>									
24 110/120 220/240 440/480 550/600	50/60	390.0	112.0	49.8	13.00	T A B C D	Class B, 130°C	9-2756-16 9-2756-1 9-2756-2 9-2756-3 9-2756-4	
208 277	60	390.0	112.0	49.8	13.00	E H	Class B, 130°C	9-2756-5 9-2756-9	
<b>200, 300 and 360A — 3-Pole</b>									
110/120 220/240 440/480 550/600	50/60	1040.0	216.0	116.0	17.00	A B C D	Class F, 155°C	9-1891-1 9-1891-2 9-1891-3 9-1891-4	
208 277	60	1040.0	216.0	116.0	17.00	E H	Class F, 155°C	9-1891-13 9-1891-26	

**DC Coils**

**Table 35-73. DC Coil Selection** ①

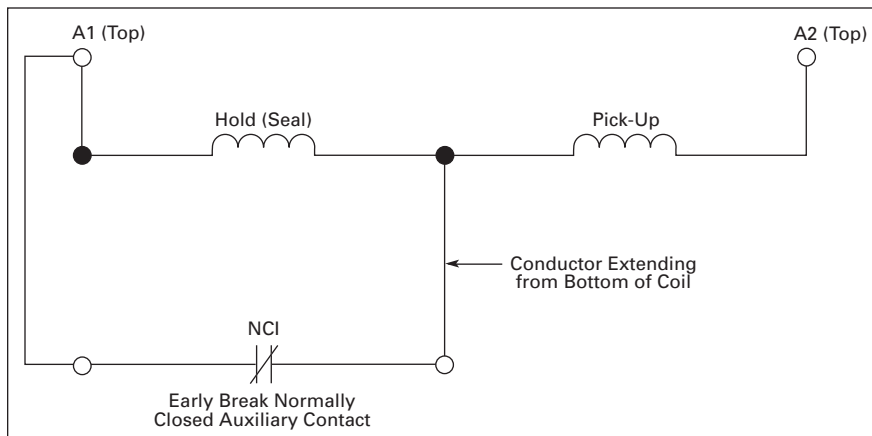
DC Coil Voltage	Max. Inrush Amperes	Max. Inrush Watts	Max. Sealed Amperes	Max. Sealed Watts	Coil Suffix	Class	Part Number	Price U.S. \$
<b>15, 25, 30 and 40A — 2- and 3-Pole (Series D1)</b>								
12	5.8	69	.272	3.27	1R	Class F, 155°C	9-3254-2	
24	2.9	69	.130	3.12	1T		9-3254-3	
48	1.5	72	.070	3.37	1W		9-3254-4	
120	.61	73	.030	3.68	1A		9-3254-5	
<b>50A — 2- and 3-Pole (Series D1)</b>								
12	5.8	69	.272	3.27	1R	Class F, 155°C	9-3255-2	
24	2.9	69	.130	3.12	1T		9-3255-3	
48	1.5	72	.070	3.37	1W		9-3255-4	
120	.61	73	.030	3.68	1A		9-3255-5	
<b>15, 25, 30 and 40A — 2- and 3-Pole (Series C1)</b>								
12	4.7	51	232 mA	1.80	1R	Class F, 155°C	9-3126-1	
24	2.7	64	110 mA	2.40	1T		9-3126-2	
48	1.4	65	55 mA	2.50	1W		9-3126-3	
<b>60 and 75A — 2- and 3-Pole; 25, 30 and 40A — 4-Pole (Series C1)</b>								
12	15.4	126	.434	5.26	1R	Class F, 155°C	9-3257-1	
24	6.2	88.4	.211	5.12	1T		9-3257-2	
48	2.9	76.2	.102	4.92	1W		9-3257-3	
120	1.1	67.3	.044	5.32	1A		9-3257-4	

① DC coils require an early break NC auxiliary contact C320KGD1 (1NCI) or C320KGD2 (1NO-1NCI). Order separately, not included with replacement coil.

**DC Operation**

These DC coils have separate pick-up and seal windings. The pick-up winding must be connected to an early break normally closed auxiliary contact block and provides the magnetic force required to close the magnet. As the magnet approaches the closed position, the early break normally closed contact is opened and the holding coil is inserted in series with the pick-up winding.

The early break contact block (C320KGD1) has to be attached to the side of the contactor, taking up one of the positions available for add-on auxiliary contact blocks.



**Figure 35-16. DC Coil Elementary Diagram — Contactors and Starters**

**Ampere Rating of AC Motors**

Ampere ratings of motors vary somewhat, depending upon the type of motor. The values given below are for drip-proof, Class B insulated (T Frame) where available, 1.15 service factor, NEMA Design B motors. These values represent an average full load motor current which was calculated from the motor performance data published by several motor manufacturers. In the case of high torque squirrel cage motors, the ampere ratings will be at least 10% greater than the values given below.

**Caution — These average ratings could be high or low for a specific motor and therefore heater coil selection on this basis always involves risk. For fully reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.**

**Table 35-74. Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor**

hp ①	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ②	460V	575V	2200V
1/4	1800	1.09	.95	.55	.48	.38	—
	1200	1.61	1.40	.81	.70	.56	—
	900	1.84	1.60	.93	.80	.64	—
1/3	1800	1.37	1.19	.69	.60	.48	—
	1200	1.83	1.59	.92	.80	.64	—
	900	2.07	1.80	1.04	.90	.72	—
1/2	1800	1.98	1.72	.99	.86	.69	—
	1200	2.47	2.15	1.24	1.08	.86	—
	900	2.74	2.38	1.38	1.19	.95	—
3/4	1800	2.83	2.46	1.42	1.23	.98	—
	1200	3.36	2.92	1.69	1.46	1.17	—
	900	3.75	3.26	1.88	1.63	1.30	—
1	3600	3.22	2.80	1.70	1.40	1.12	—
	1800	4.09	3.56	2.06	1.78	1.42	—
	1200	4.32	3.76	2.28	1.88	1.50	—
	900	4.95	4.30	2.60	2.15	1.72	—
1-1/2	3600	5.01	4.36	2.64	2.18	1.74	—
	1800	5.59	4.86	2.94	2.43	1.94	—
	1200	6.07	5.28	3.20	2.64	2.11	—
	900	6.44	5.60	3.39	2.80	2.24	—
2	3600	6.44	5.60	3.39	2.80	2.24	—
	1800	7.36	6.40	3.87	3.20	2.56	—
	1200	7.87	6.84	4.14	3.42	2.74	—
	900	9.09	7.90	4.77	3.95	3.16	—
3	3600	9.59	8.34	5.02	4.17	3.34	—
	1800	10.8	9.40	5.70	4.70	3.76	—
	1200	11.7	10.2	6.20	5.12	4.10	—
	900	13.1	11.4	6.90	5.70	4.55	—
5	3600	15.5	13.5	8.20	6.76	5.41	—
	1800	16.6	14.4	8.74	7.21	5.78	—
	1200	18.2	15.8	9.59	7.91	6.32	—
	900	18.3	15.9	9.60	7.92	6.33	—
7-1/2	3600	22.4	19.5	11.8	9.79	7.81	—
	1800	24.7	21.5	13.0	10.7	8.55	—
	1200	25.1	21.8	13.2	10.9	8.70	—
	900	26.5	23.0	13.9	11.5	9.19	—
10	3600	29.2	25.4	15.4	12.7	10.1	—
	1800	30.8	26.8	16.3	13.4	10.7	—
	1200	32.2	28.0	16.9	14.0	11.2	—
	900	35.1	30.5	18.5	15.2	12.2	—
15	3600	41.9	36.4	22.0	18.2	14.5	—
	1800	45.1	39.2	23.7	19.6	15.7	—
	1200	47.6	41.4	25.0	20.7	16.5	—
	900	51.2	44.5	26.9	22.2	17.8	—
20	3600	58.0	50.4	30.5	25.2	20.1	—
	1800	58.9	51.2	31.0	25.6	20.5	—
	1200	60.7	52.8	31.9	26.4	21.1	—
	900	63.1	54.9	33.2	27.4	21.9	—

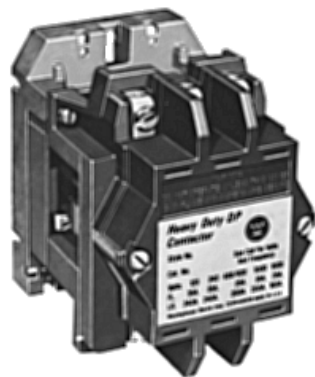
hp ①	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ②	460V	575V	2200V
25	3600	69.9	60.8	36.8	30.4	24.3	—
	1800	74.5	64.8	39.2	32.4	25.9	—
	1200	75.4	65.6	39.6	32.8	26.2	—
	900	77.4	67.3	40.7	33.7	27.0	—
30	3600	84.8	73.7	44.4	36.8	29.4	—
	1800	86.9	75.6	45.7	37.8	30.2	—
	1200	90.6	78.8	47.6	39.4	31.5	—
	900	94.1	81.8	49.5	40.9	32.7	—
40	3600	111	96.4	58.2	48.2	38.5	—
	1800	116	101	61.0	50.4	40.3	—
	1200	117	102	61.2	50.6	40.4	—
	900	121	105	63.2	52.2	41.7	—
50	3600	138	120	72.9	60.1	48.2	—
	1800	143	124	75.2	62.2	49.7	—
	1200	145	126	76.2	63.0	50.4	—
	900	150	130	78.5	65.0	52.0	—
60	3600	164	143	86.8	71.7	57.3	—
	1800	171	140	90.0	74.5	59.4	—
	1200	173	150	91.0	75.0	60.0	—
	900	177	154	93.1	77.0	61.5	—
75	3600	206	179	108	89.6	71.7	—
	1800	210	183	111	91.6	73.2	—
	1200	212	184	112	92.0	73.5	—
	900	222	193	117	96.5	77.5	—
100	3600	266	231	140	115	92.2	—
	1800	271	236	144	118	94.8	23.6
	1200	275	239	145	120	95.6	24.2
	900	290	252	153	126	101	24.8
125	3600	—	292	176	146	116	—
	1800	—	293	177	147	117	29.2
	1200	—	298	180	149	119	29.9
	900	—	305	186	153	122	30.9
150	3600	—	343	208	171	137	—
	1800	—	348	210	174	139	34.8
	1200	—	350	210	174	139	35.5
	900	—	365	211	183	146	37.0
200	3600	—	452	257	226	181	—
	1800	—	458	265	229	184	46.7
	1200	—	460	266	230	184	47.0
	900	—	482	279	241	193	49.4
250	3600	—	559	338	279	223	—
	1800	—	568	343	284	227	57.5
	1200	—	573	345	287	229	58.5
	900	—	600	347	300	240	60.5
300	1800	—	678	392	339	271	69.0
	1200	—	684	395	342	274	70.0
400	1800	—	896	518	448	358	91.8
500	1800	—	1110	642	555	444	116

① To convert horsepower to kW, multiply horsepower by .7457.  
② 380V 50 Hz.

**DPCK**

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*35A 600/1000V Contactor*

**Product Description**

The DPCK Contactors are designed to provide peak performance and reliability on special switching applications. These heavy-duty special purpose contactors are rated for applications up to 1500V AC.

**Application Description**

- Typical applications include mining equipment, welding equipment, heating and air conditioning applications and other loads that require a compact heavy-duty contactor rated up to 1500V AC.
- The DPCK Contactors are supplied with bolts and washers on each terminal for use with customer supplied lugs.

**Features**

- A double wound epoxy coil allows for lower temperature rise and longer life
- The U-shaped magnet provides fast, reliable action, long life and lower power requirements
- Stainless steel kick-out springs
- Rugged one-piece mounting plate
- Allows up to four double circuit auxiliary contacts per contactor

**Benefits**

- All contacts are silver alloy, providing long life and resistance to welding
- Straight-through wiring and up front terminals allow for fast, easy installation
- Loosening two captive screws allows for easy visual inspection of contacts

**Technical Data and Specifications**

**Table 35-75. Magnet Coil VA — 60 Hz**

Catalog Number	Open VA	Closed VA	Closed Watts
DPCK3035	625	50	18
DPCK3100, DPCK3250	1200	130	40
DPCK3250 — Model B Only	1000	40	5

**Table 35-76. Contactor Ratings**

Volts	Full Load Current (Amperes)	Locked Rotor Current (Amperes)	Resistive Load (Amperes)	Lighting Load (Amperes)
-------	-----------------------------	--------------------------------	--------------------------	-------------------------

**Catalog Number DPCK3035**

120	35	240	35	35
240	35	240	35	35
480	35	200	35	35
600	35	200	35	35
1000	35	200	—	—
1500	20	160	—	—

**Catalog Number DPCK3100**

120	100	600	100	100
240	100	600	100	100
480	100	600	100	100
600	100	600	100	100
1000	100	450	—	—
1500	75	300	—	—

**Catalog Number DPCK3250**

120	250	1500	250	250
240	250	1250	250	250
480	250	1000	250	250
600	250	1000	250	250
1000	220	1000	—	—
1500	150	900	—	—

**Accessories**

**Table 35-77. Accessory Kits**

Description	Catalog Number	Price U.S. \$
Auxiliary Contacts, 1NO-1NC	J11	
<b>Horizontal Mechanical Interlock:</b>		
35A	180C113G09	
100A	1264C37G01	
250A	179C984G01	
Line, Load Terminal Kit	TK250A ①	
Surge Suppressor	SS56	

① Includes two terminals and hardware for #4 to 1 600 kcmil Cu conductors. Contactors supplied with terminals for ring type connectors only.

Discount Symbol . . . . . **1CD-1**

**Renewal Parts**

**Table 35-78. DPCK Contactor Renewal Parts**

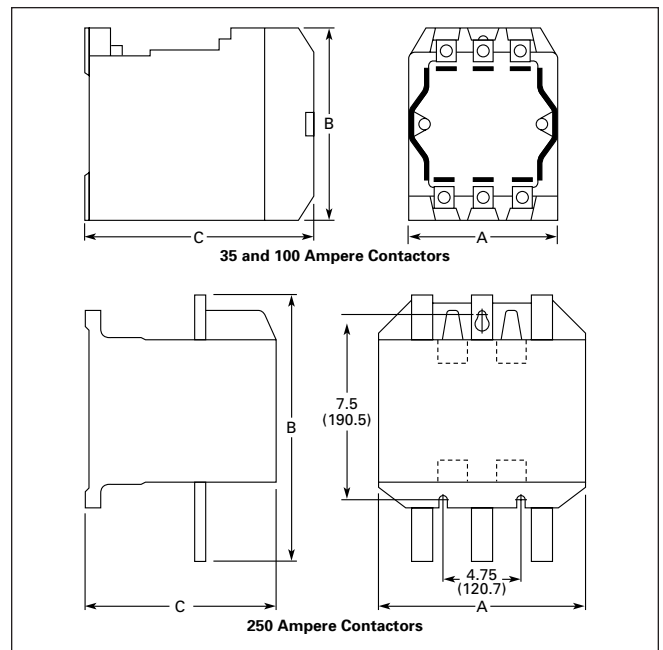
Description	Hz	Coil Suffix Code	35A				100A		Model A ① — 250A		Model B ① — 250A	
			2-, 3-Pole	Price U.S. \$	4-, 5-Pole	Price U.S. \$	2-, 3-Pole	Price U.S. \$	2-, 3-Pole	Price U.S. \$	2-, 3-Pole	Price U.S. \$
			Part Number		Part Number		Part Number		Part Number		Part Number	
Contact Kit 2-Pole 3-Pole ARC Box	—	—	180C180G01 180C180G02 673B439G01		② ③ 673B439G02		180C180G05 180C180G06 673B440G01		672B839G21 672B839G22 N/A		672B839G21 672B839G22 672B839G29	
Upper Base Lower Base Crossbar	—	—	673B439G03 673B439G05 673B439G07		673B439G04 673B439G06 673B439G08		673B440G02 673B440G03 673B440G04		N/A N/A N/A		672B839G32 672B839G25 672B839G24	
Magnet Coil 120/110 110 208/220 220/240 240/220	60/50 60 60 60 60/50	A V B — W	1266C28G01 1266C28G08 1266C28G02 N/A 1266C28G09		1266C29G01 1266C29G06 1266C29G02 N/A 1266C29G07		1254C70G01 1254C70G08 1254C70G02 N/A 1254C70G03		179C749G01 179C749G08 179C749G02 N/A 179C749G03		N/A 5249C90G01 N/A 5249C90G02 N/A	
480/440 440/480 600/550 550	60/50 60 60/50 60	X — E —	1266C28G10 N/A 1266C28G05 N/A		1266C29G08 N/A 1266C29G04 N/A		1254C70G05 N/A 1254C70G07 N/A		179C749G05 N/A 179C749G07 179C749G06		N/A 5249C90G03 N/A 5249C90G05	
380 380/110	50 60	H —	1266C28G06 N/A		1266C29G09 N/A		N/A 1254C70G12		N/A 179C749G11		N/A N/A	

- ① Model B replaces Model A — renewal parts are different. Only use parts for proper model.
- ② For a 4-pole device, use (2) of the 180C180G01 Contact Kits.
- ③ For a 5-pole device, use (1) of the 180C180G01 and (1) of the 180C180G02 Contact Kits.

**Dimensions**

**Table 35-79. Approximate Dimensions and Shipping Weights**

Poles	Dimensions in Inches (mm)			Ship. Wt. Lbs. (kg)
	Wide A	High B	Deep C	
<b>35A Contactors</b>				
2 and 3	4.06 (103.1)	5.44 (138.2)	5.63 (143.0)	16.0 (7.3)
4 and 5	6.06 (153.9)	5.44 (138.2)	5.63 (143.0)	19.0 (8.6)
<b>100A Contactors</b>				
2 and 3	5.38 (136.7)	7.81 (198.4)	6.75 (171.5)	28.0 (12.7)
<b>250A Contactors</b>				
2 and 3	8.25 (209.6)	10.81 (274.6)	7.69 (195.3)	50.0 (22.7)



**Figure 35-17. Contactor Dimensions**

**DPCK**

**Product Selection**

**When Ordering Specify**

- Catalog Number with any required Accessories from **Page 35-36**



**35A 600/1000V Contactor**



**250A 600V Contactor**

**Table 35-80. Catalog Number DPCK Air Break Contactors — 2- and 3-Pole ①**

Open Ampere Rating			Coil Voltage 60 Hz ②	Open Type — Number of Poles			
600V	1000V	1500V		2-Pole Catalog Number ③	Price U.S. \$	3-Pole Catalog Number ③	Price U.S. \$
35	35	20	240 480 600	DPCK2035WW DPCK2035XW DPCK2035EW		DPCK3035WW DPCK3035XW DPCK3035EW	
100	100	75	240 480 600	DPCK2100WW DPCK2100XW DPCK2100EW		DPCK3100WW DPCK3100XW DPCK3100EW	
250	220	150	110 220/240 440/480 550/600	DPCK2250V DPCK2250W DPCK2250X DPCK2250E		DPCK3250V DPCK3250W DPCK3250X DPCK3250E	

- ① Holding circuit auxiliary contact not included. If required, order from Accessories on **Page 35-36**.
- ② For other coil voltages, refer to replacement coils on **Page 35-37** and insert proper letter in place of 9th digit of listed Catalog Number.  
Example: DPCK3035WW with 380/50 coil DPCK3035HW.
- ③ If short load terminals are desired, add the letter **S** in the 10th position of the listed Catalog Number. Example: DPCK3250WS.

**Table 35-81. Catalog Number DPCK Air Break Contactors — 4- and 5-Pole ④**

Open Ampere Rating			Coil Voltage 60 Hz ⑤	Open Type — Number of Poles			
600V	1000V	1500V		4-Pole Catalog Number ⑥	Price U.S. \$	5-Pole Catalog Number ⑥	Price U.S. \$
35	35	20	240 480 600	DPCK4035WW DPCK4035XW DPCK4035EW		DPCK5035WW DPCK5035XW DPCK5035EW	

- ④ Holding circuit auxiliary contact not included. If required, order from Accessories on **Page 35-36**.
- ⑤ For other coil voltages, refer to replacement coils on **Page 35-37** and insert proper letter in place of 9th digit of listed Catalog Number.  
Example: DPCK3035WW with 380/50 coil DPCK3035HW.
- ⑥ If short load terminals are desired, add the letter **S** in the 10th position of the listed Catalog Number. Example: DPCK3250WS.

Accessory Kits ..... **Page 35-36**  
 Dimensions ..... **Page 35-37**  
 Discount Symbol ..... **1CD-1**

### Mill Type Contactors

#### Contents

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#### Mill Type Contactors



*Cat. No. C80DG12  
Size 2 — 2-Pole Contactor*

#### Product Description

These DC mill type contactors are designed for heavy industry service and are suitable for use on moving machinery. The contactors listed here are for surface mounting on steel panels and front-of-panel wiring. The power stud assembly is mounted on the side of the contactor, rather than as part of a separate mounting kit.

#### Application Description

- Applications include Mining, Milling, Cranes and Transportation
- These contactors utilize DC coils

**Note:** Be sure to utilize a rectifier module if the only control voltage source available is 120V AC.

#### Features

- Forged steel armature levers and magnet frames for superior physical strength
- Self-lubricating bearings
- Long contact life

#### Standards and Certifications

- CMAA 5.6.6-2
- NEMA ICS3-441, 442, 443
- NEMA ICS2-331.23
- NEMA ICS2-110.05.02
- NEMA ICS2-125.21.02

#### Technical Data and Specifications

- Current Range: 5 – 1800 Amperes
- Voltage: 115, 230 and 550V DC
- Mechanical Life: 20M Operations
- Electrical Life: 500K Operations

#### Accessories

**Table 35-82. Auxiliary Contacts with Mounting Kit**

Mounting Location	Contact Arrangement	Contact Size	Catalog Number	Price U.S. \$
Side	1NO, 1NC	2	C81BAC1	
Bottom	1NO, 1NC	2 3, 4, 5, 6, 6A	C81BBC1 C81BBC2	

**Table 35-83. Rectifier Module**

Description	Contactor Size	Catalog Number	Price U.S. \$
120V AC Input, 100V DC Output	All	C81EB	

#### Options

**Table 35-84. Auxiliary Contact Mounting Material Options**

Contactor Size	Location	Suffix	Adder U.S. \$
2	Side	A	
	Bottom, with left hand and right hand option	B	
	Bottom, with left hand or right hand option	C	
3 – 8	Bottom, with left hand and right hand option	B	
2 – 8	None	N	

**Table 35-85. Auxiliary Contact Options per Side**

Configuration	Suffix	Adder U.S. \$
1NO	1	
2NO	2	
1NO-1NC	3	
1NC	4	
2NC	5	
None	0	

Discount Symbol . . . . . **18CD-4**



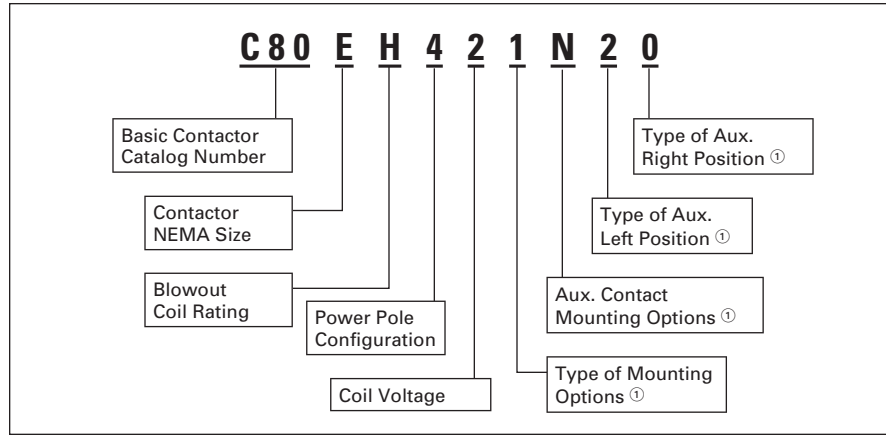
**Cat. No. C80EH121**  
**Size 3 — 1-Pole NO**



**Cat. No. C80EH121**  
**Size 3 — 1-Pole NO**

**Catalog Number Selection**

**Table 35-86. DC Mill Type Contactor Catalog Numbering System**



① See Tables 35-84 and 35-85 on Page 35-39 for Options.

**Product Selection**

**When Ordering Specify**

- The Catalog Number with any required Accessories

**Table 35-87. DC Mill Type Contactors Product Selection**

NEMA Size	Open Type Contactors				Price U.S. \$	Mechanical Interlock	
	Number of Poles	Blowout Coil Ampere Rating	230V Coil Catalog Number	100V Coil Catalog Number		Catalog Number	Price U.S. \$
2	1NO	None 5 25 50	C80DX12 C80DC12 C80DF12 C80DG12	C80DX14 C80DC14 C80DF14 C80DG14		C81DDA11	
	2NO	None 5 25 50	C80DX22 C80DC22 C80DF22 C80DG22	C80DX24 C80DC24 C80DF24 C80DG24		C81DDA12	
3	1NO	100	C80EH121 C80EH421	C80EH141 C80EH441		C81DEA11	
	1NC	100				—	
4	1NO	150	C80FJ121 C80FJ421	C80FJ141 C80FJ441		C81DEA11	
	1NC	150				—	
5	1NO	300	C80GK121 C80GK421	C80GK141 C80GK441		C81DGA11	
	1NC	300				—	
6	1NO	600	C80JL121 C80JL421	C80JL141 C80JL441		C81DJA11	
	1NC	600				—	
6A ②	1NO	810	C80KM121	C80KM141		C81DJA11	
8	1NO	1350	C80WN121	C80WN141		C81DLA11	

② Not a NEMA size.

**Table 35-88. Magnet Coil Selection**

DC Coil Voltage	Coil Suffix
115V	1
230V	2
100V	4
No Coil	5
Special ③	9

③ Consult factory.

**Table 35-89. Mounting Kit Options ④**

Description	Suffix
Surface — Front of Panel Wiring	1
Elevated — Front of Panel Wiring	3 ⑤

④ Solderless lugs available, consult factory.

⑤ Not available with Size 2.



**600V Contactors**

**600V Contactors**



*Single Pole, Cat. No. MD510 with L-64 Auxiliary Contact*

**Product Description**

These DC Contactors are designed to handle rugged DC applications. They provide durable service and easy installation and maintenance.

**Application Description**

- Applications including Mining, Milling, Cranes and Transportation.
- These contactors utilize DC coils.

**Note:** Be sure to utilize a rectifier module if the only control voltage source available is 120V AC.

**Features**

- Sturdy glass polyester base on MD and ME
- Knife edge bearings that guarantee precise operation and minimal wear
- High contact pressure
- Vacuum impregnated magnetic coil

**Benefits**

- Able to mount on steel or panels of any material for maximum flexibility
- Front or rear mounting available for convenient installation and maintenance
- Rapid arc quenching to ensure long life
- Easily accessible contact tips to remove and replace

**Accessories**

**Table 35-90. Auxiliary Contacts (Electrical Interlocks) — For Field Installation Only ①**

Auxiliary Contact Type	Application	Contact Arrangement ②	Number of Auxiliary Contacts	Auxiliary Contacts Factory Installed ①		Auxiliary Contacts Unmounted Replacement Only		Mounting and Operating Hardware for New Applications	
				Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$
L46	ME01 Only	NO – FC NC – FC	1	11A8713G10 11A8713G09		11A8713G10 11A8713G09		None Required	
	ME10 Only	NC – FC – OB	1	487B878G01		487B878G01		None Required	
	ME10, ME11, ME20, ME30, ME31, ME40 and ME41	NO – FC NC – FC	1	11A8713G09 11A8713G10		11A8713G09 11A8713G10		None Required	
L66	ME10, ME11, ME20, ME30, ME31, ME40 and ME41	DB – FC – L DB – FC – R	1	659C301G04 659C301G05		659C301G04 659C301G05		None Required	
	ME10 Only	DB – FC – L – OB DB – FC – R – OB	1	487B878G06 487B878G07		487B878G06 487B878G07		None Required	
L64	MD/MR501, MD/MR601 and MD/MR701	NO-NC 2NO 2NC	1	843D943G04 843D943G05 843D943G06		843D943G04 843D943G05 843D943G06		2087A63G02 2087A63G03 2087A63G03	
	MD/MR510, MD/MR610 – 710, MD/MR810, MD/MR910	NO-NC 2NO 2NC		843D943G04 843D943G05 843D943G06		843D943G04 843D943G05 843D943G06		2087A63G04 2087A63G17 2087A63G05 2087A63G06	
Added to Existing L64 Interlocks	MD810	4NO to 4NC 6NO to 6NC	2 3	Order (2) L64 Order (3) L64		Order (2) L64 Order (3) L64		2087A63G07 2087A63G07	
		MD910	4NO to 4NC 6NO to 6NC	2 3	Order (2) L64 Order (3) L64		Order (2) L64 Order (3) L64		2087A63G08 2087A63G08
	MD810 – 910	2NO to 2NC 4NO to 4NC 2NO to 2NC	1 ③ 2 ③ 1 ④	Order (1) L64 Order (2) L64 Order (1) L64		Order (1) L64 Order (2) L64 Order (1) L64		2087A63G08 2087A63G09 2087A63G10	

① For factory installed electrical interlocks, consult factory.

② NO = Normally Open, NC = Normally Closed, DB = Delayed Break, FC = Front Connected, L = Left Hand, R = Right Hand, OB = Outboard (for 1-pole, Size 2 frame).

③ With one interlock mounted.

④ With two interlocks mounted.

**Table 35-91. Standard Magnet Coil Selection**

Voltage	Suffix Code
65V DC (ME Size 0 – 4 only)	A
115V DC	B
125V DC	C
230V DC	D
250V DC	E
550V DC	F
Other	G

Discount Symbol ..... **1CD-1**

600V Contactors — Dimensions

**Table 35-92. Rear Connector Kit for ME Contactors** ①

Catalog Number	Price U.S. \$
2184A10G08	

① Field installation only.

**Table 35-93. Options**

Description	Adder U.S. \$
Rectifier for AC Operation Order by description	

**Table 35-94. Mechanical Interlocks, Unmounted**

Type	Contactor			Catalog Number	Price U.S. \$
	Type	Size	Contacts		
M-25	ME	All	1NO, 1NO + 1NC	878D400G01	
M-25	ME	All	2NO, 2NO + 1NC	878D401G01	
M-27	MD	5	1NO	25A1669G01	
M-27	MD	6-7	1NO	25A1670G01	
M-27	MD	8-9	1NO	25A1671G01	

**Dimensions**

**Table 35-95. Approximate Dimensions and Shipping Weights**

Contactor Size	Contact Arrangement	Width in Inches (mm)	Height in Inches (mm)	Depth in Inches (mm)	Ship. Wt. Lbs. (kg)
<b>Front Connected</b>					
0-2	1NO	3.18 (80.8)	7.56 (192.0)	6.81 (173.0)	8.0 (3.6)
	2NO	5.53 (140.5)	6.75 (171.5)		10.0 (4.5)
	1NO, 1NC	3.67 (93.2)	12.44 (316.0)		12.0 (5.4)
	1NC	3.67 (93.2)	9.57 (243.1)		10.0 (4.5)
3-4	1NO	3.18 (80.8)	7.78 (197.6)	6.81 (173.0)	8.0 (3.6)
	2NO	5.53 (140.5)	7.44 (189.0)		10.0 (4.5)
	1NO, 1NC	3.67 (93.2)	12.88 (327.2)		12.0 (5.4)
	1NC	3.67 (93.2)	9.69 (246.1)		10.0 (4.5)
5	1NO	5.50 (139.7)	13.00 (330.2)	12.00 (304.8)	34.0 (15.4)
	1NC	5.88 (149.4)	16.19 (411.2)	12.00 (304.8)	45.0 (20.4)
6	1NO	6.63 (168.4)	16.81 (427.0)	14.38 (365.3)	71.0 (32.2)
	1NC	9.95 (252.7)	20.38 (517.7)	14.75 (374.7)	103.0 (46.8)
7	1NO	6.63 (168.4)	16.81 (427.0)	14.38 (365.3)	76.0 (34.5)
	1NC	9.95 (252.7)	20.38 (517.7)	14.75 (374.7)	110.0 (49.9)
8	1NO	11.00 (279.4)	21.00 (533.4)	17.00 (431.8)	151.0 (68.6)
9	1NO	11.00 (279.4)	21.00 (533.4)	19.00 (482.6)	188.0 (85.4)
<b>Rear Connected</b>					
5	1NO	7.00 (177.8)	17.00 (431.8)	12.50 (317.5)	34.0 (15.4)
	1NC	7.00 (177.8)	20.00 (508.0)	10.50 (266.7)	45.0 (20.4)
6	1NO	6.75 (171.5)	21.00 (533.4)	13.00 (330.2)	71.0 (32.2)
	1NC	9.50 (241.3)	24.00 (609.6)	13.00 (330.2)	103.0 (46.8)
7	1NO	6.75 (171.5)	21.00 (533.4)	13.00 (330.2)	76.0 (34.5)
	1NC	9.50 (241.3)	24.00 (609.6)	13.00 (330.2)	110.0 (49.9)
8	1NO	9.50 (241.3)	24.00 (609.6)	15.00 (381.0)	151.0 (68.6)
9	1NO	9.50 (241.3)	24.00 (609.6)	17.00 (431.8)	220.0 (99.9)

Discount Symbol ..... 1CD-1

**Renewal Parts**

**Sizes 5 – 9 M & MD Series**



*MD 510 Coil  
Part No. 45A5515G11*

**Table 35-96. Coils**

Voltage	M & MD 501			M & MD 510			M & MD 610/710		
	Part Number	Price U.S. \$	Sym Wiring	Part Number	Price U.S. \$	Sym Wiring	Part Number	Price U.S. \$	Sym Wiring
65V	N/A		—	45A5515G11		—	—		—
90/92V	N/A		—	45A5515G23		—	30B4377G17		—
115V	30B4375G04		—	45A5515G01		—	30B4377G04		—
125V	30B4375G24		—	45A5515G07		—	30B4377G10		—
230V	30B4375G05		—	45A5515G04		—	30B4377G05		—
250V	30B4375G12		—	45A5515G12		—	30B4377G07		—
550V	30B4375G06		—	45A5515G05		—	30B4377G08		—

Voltage	M & MD 601/701			M & MD 810			M & MD 910		
	Part Number	Price U.S. \$	Sym Wiring	Part Number	Price U.S. \$	Sym Wiring	Part Number	Price U.S. \$	Sym Wiring
92V	—		—	435A928G01		①	435A930G01		—
115V	30B4377G23		①	435A929G01		①	L483507G01		①
115V	30B4377G01		②	L482211G01		②	L483507G01		②
125V	30B4377G24		①	435A966G01		①	435A967G01		①
125V	30B4377G13		②	—		—	—		—
230V	30B4377G01		①	L482211G01		①	L483507G01		②
230V	30B4377G02		②	—		—	—		—
250V	30B4377G13		①	334P064G01		①	L549720G01		②
250V	30B4377G08		②	—		—	—		—
550V	30B4377G25		①	L482213G01		②	L483508G01		—
550V	30B4377G03		②	—		—	—		—
600V	—		—	N/A		—	L548879G01		—

Voltage	M & MD 810R								
	Coil	Price U.S. \$	Sym Wiring	Resistor	Price U.S. \$	Sym Wiring	Resistor Mounting	Price U.S. \$	Sym Wiring
115V	N/A		—	N/A		—	N/A		—
230V	L482211G01		①	57D1336G10		③	57D1340G02		—
550V	N/A		①	57D1336G12		④	57D1340G02		—

① 2 coils connected in series.

③ 2 resistors connected in parallel.

② 2 coils connected in parallel.

④ Resistors connected in series.

600V Contactors — Renewal Parts

## ME Series

Table 35-97. Kits

Description	1 NO Pole			2 NO Poles			1 NC Pole			1 NO/NC Pole		
	Qty.	Part Number	Price U.S. \$	Qty.	Part Number	Price U.S. \$	Qty.	Part Number	Price U.S. \$	Qty.	Part Number	Price U.S. \$
Contact Kit	1	2184A10G14		2	2184A10G14		1	2184A10G14		2	2184A10G14	
Arc Box 10/25/50A	1	2184A10G09		2	2184A10G09		1	2184A10G09		2	2184A10G09	
Arc Box 100/150A	1	2184A10G10		2	2184A10G10		1	2184A10G10		2	2184A10G10	
Shunt Kit	1	2184A10G21		1	2184A20G16		1	2084A01G07		1	2184A11G07	
Armature Kit	1	2184A10G19		1	2184A20G15		1	2084A01G06		1	2184A11G06	
Blowout Assembly 10A	1	2184A10G15		1	2184A20G11		1	2184A10G15		2	2184A10G15	
25A	1	2184A10G16		1	2184A20G12		1	2184A10G16		2	2184A10G16	
50A	1	2184A10G17		1	2184A20G13		1	2184A10G17		2	2184A10G17	
110/150A	1	2184A10G18		1	2184A20G14		1	2184A10G18		2	2184A10G18	
Rear Conn. Kit	1	2184A10G08		1	2184A10G08		1	2184A10G08		1	2184A10G08	

Table 35-98. Coils

Voltage	Operating Coils		Holding Coils (Lower) ① — 1NO-1NC Contactors Only			
	10/25/50/100/150 Ampere Sizes		10/25/50 Ampere Sizes		100/150 Ampere Sizes	
	Part Number	Price U.S. \$	Part Number	Price U.S. \$	Part Number	Price U.S. \$
65V	30B4376G06		44A6366G10		30B4376G27	
90/92V	30B4376G25		44A6366G12		427C048G16	
115V	30B4376G07		44A6366G13		30B4376G01	
125V	30B4376G08		44A6366G19		30B4376G26	
230/240V	30B4376G09		44A6366G15		30B4376G02	
250V	30B4376G10		44A6366G23		30B4376G17	
500V	30B4376G14		N/A		N/A	
550V	30B4376G11		44A6366G18		30B4376G03	

① If lower coils are required, order separately.



**Contact Kit**  
Part No. 26D2610G15



**Shunt**  
Part No. 25A1650G02



**Arc Box**  
Part No. 25A1646G01



**Armature Kit**  
Part No. 25A1640G05



**Blowout Coil Kit**  
Part No. 25A1644G05

## Sizes 5 – 9 MR & MD Series ②

Table 35-99. Kits — Contact, Shunt and Arc Box

Type MR & MD	Current Part Number	Price U.S. \$	Obsolete Part Number
<b>Contact Kit</b>			
501/501R	26D2610G22		(1745058)
510	26D2610G15		(1745051)
601/701	26D2610G24		(1745060)
610/710	26D2610G16		(1745052)
810	26D2610G18		(1745054)
910	26D2610G20		(1745056)
<b>Shunt</b>			
501/501R	25A1650G02		(1486952)
510	25A1641G02		N/A
601	25A1666G03		(1486925)
610	25A1654G03		(1486811)
701	25A1666G04		(1486920)
710	25A1654G04		(1486872)
810/810R	25A1693G02		(1490271)
910	45A1425G02		(1747587)
<b>Arc Box</b>			
501/510	25A1646G01		(1486651)
601/610, 701/710	25A1662G01		(1486654)
810/910	25A1677G05		N/A

② MR = rear connected; MD = front connected.

Table 35-100. Armature Kit

Type MR & MD	Current Part Number	Price U.S. \$
<b>Armature Kit</b>		
501/501R	25A1649G05	
510	25A1640G05	
601/701	25A1667G03	
610/710	25A1655G04	
810/810R	25A1694G05	
910	38A2269G02	

Table 35-101. Blowout Coil Assembly Kit

Type MR	Current Part Number	Price U.S. \$	Type MD	Current Part Number	Price U.S. \$
M501/501R	25A1644G05		MD501/501R	857D505G05	
M601/610	25A1659G05		MD601/610	857D506G08	
M701/710	25A1660G03		MD701/710	857D516G05	
M810/810R	25A1698G03		MD810/810R	857D508G07	
M910	38A2273G02		MD910	857D509G04	

Discount Symbol ..... 1CD1

## Product Selection

### When Ordering Specify

- Catalog Number with appropriate Coils Suffix
- Any Required Accessories

**Table 35-102. 600V DC Contactors**

Size	Open 8 Hour Ampere Rating	Contact Arrangement	Provisions for Interlocks		Magnet Coil Voltage	Catalog Number	Price U.S. \$
			Mechanical	Electrical			
<b>Front Connected</b>							
0	10	1NO 2NO 1NO, 1NC 1NC	Yes	4 2 4 2	125V DC ①	ME010C ME020C ME011C ME001C	
1	25	1NO 2NO 1NO, 1NC 1NC	Yes	4 2 4 2	125V DC ①	ME110C ME120C ME111C ME101C	
2	50	1NO 2NO 1NO, 1NC 1NC	Yes	4 2 4 2	125V DC ①	ME210C ME220C ME211C ME201C	
3	100	1NO 2NO 1NO, 1NC 1NC	Yes	4 2 4 2	125V DC ①	ME310C ME320C ME311C ME301C	
4	150	1NO 2NO 1NO, 1NC 1NC	Yes	4 2 4 2	125V DC ①	ME410C ME420C ME411C ME401C	
5	300	1NO 1NC	Yes No	2 2	125V DC ①	MD510C MD501C	
6	600	1NO 1NC	Yes No	2 2	125V DC ①	MD610C MD601C	
7	900	1NO 1NC	Yes No	2 2	125V DC ①	MD710C MD701C	
8	1350	1NO	Yes	3	125V DC ①	MD810C	
9	2500	1NO	Yes	3	125V DC ①	MD910C	
<b>Rear Connected</b>							
0 – 4	10 – 150	—	—	—	—	ME ②	
5	300	1NO 1NC	Yes No	2 2	125V DC ④	MR510C MR501C	
6	600	1NO 1NC	Yes No	2 2	125V DC ④	MR610C MR601C	
7	900	1NO 1NC	Yes No	2 2	125V DC ④	MR710C MR701C	
8	1350	1NO	Yes	2 ③	125V DC ④	MR810C	
9	2500	1NO	Yes	2 ③	125V DC ④	MR910C	

① Other coil voltages available, see **Table 35-91** on **Page 35-41**. Substitute Suffix Code of desired voltage for last digit in listed Catalog Number. Example: ME010B.

② For 10 – 150A rear connected contactors, order front connected ME contactor above and rear connection kit, Catalog Number 2184A10G08, (field installed only). See **Table 35-92** on **Page 35-42**.

③ Requires panel drilling.

④ Other coil voltages available, see **Table 35-91** on **Page 35-41**. Substitute Suffix Code of desired voltage for last digit in listed Catalog Number. Example: MR510B.

DPM 1000V Contactor

**DPM 1000V Contactor**



Cat. No. 2120A07G02 DC Contactor

**Product Description**

The DPM 1000V DC Definite Purpose Contactor has been designed to meet severe environmental and vibration conditions found in your worst applications. The contactor is of unit construction, assembled on a molded insulated base, providing maximum performance in minimum space.

**Application Description**

This rugged device was designed for applications such as railway equipment, offshore drilling, mining, off-road vehicles, marine, etc.

**Features**

- Power circuit insulating barriers are molded from glass-polyester materials having high arc and track resisting qualities.
- The DPM is designed to mount directly on a channel or angle frame, but may be adapted for mounting on a flat metal or insulated panel.
- Available with or without an over-current latching mechanism to prevent opening under heavy overload currents. When the line current returns to normal, the overcurrent latch disengages.

**Benefits**

- Saves panel space by locating the arc chute vents on the front of the unit. This eliminates the need for arcing clearance above the contactor.
- All vital parts are removable from the front without having to disconnect line or load connections, allowing for easy maintenance.
- Safety is a must. The mechanical interlock prevents the contactor from closing when the arc box has been removed or when it is not installed properly.

**Technical Data and Specifications**

- Line Voltage: 1000V DC
- Continuous Current Rating:
  - Carrying and Interrupting Capacity: 1250A
- Operating Coil:
  - Duty Rating: Continuous

- Operation: Will operate at 80 – 110% of rated voltage
- Insulation between power circuit and operating coil: Rated 1000V DC
- Arcing and Creepage Distances: Meet or exceed NEMA standards for 1000V equipment
- Blowout Coil: Rated for continuous duty

**Accessories**

**Table 35-103. Extra L-67 Auxiliary Contacts — Order Separately**

Contact Combination Provided by One Auxiliary Contact Assembly		Factory Installed		Field Installed Kit	
Normally Open	Normally Closed	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$
0	4	2087A40G01		2087A40G11	
1	3	2087A40G02		2087A40G12	
2	2	2087A40G03		2087A40G13	
3	1	2087A40G04		2087A40G14	
4	0	2087A40G05		2087A40G15	
Interlock Mounting		—		6479D96G01	

**Table 35-104. Mechanical Interlock Kit**

Description	Catalog Number	Price U.S. \$
<b>Mechanical Horizontal Interlock Kit</b> Includes mounting instructions and mounting hardware ①	1954D13G01	

① When interlock kit is installed, only one L-67 auxiliary contact can be mounted on each DPM contactor.

**Renewal Parts**

**Table 35-105. DPM Contactor**

Description	Catalog Number ②	Price U.S. \$
Contact Kit	2131A94G10	
Arc Box	2131A94G03	
Shunt	3534C86G01	

**Coils**

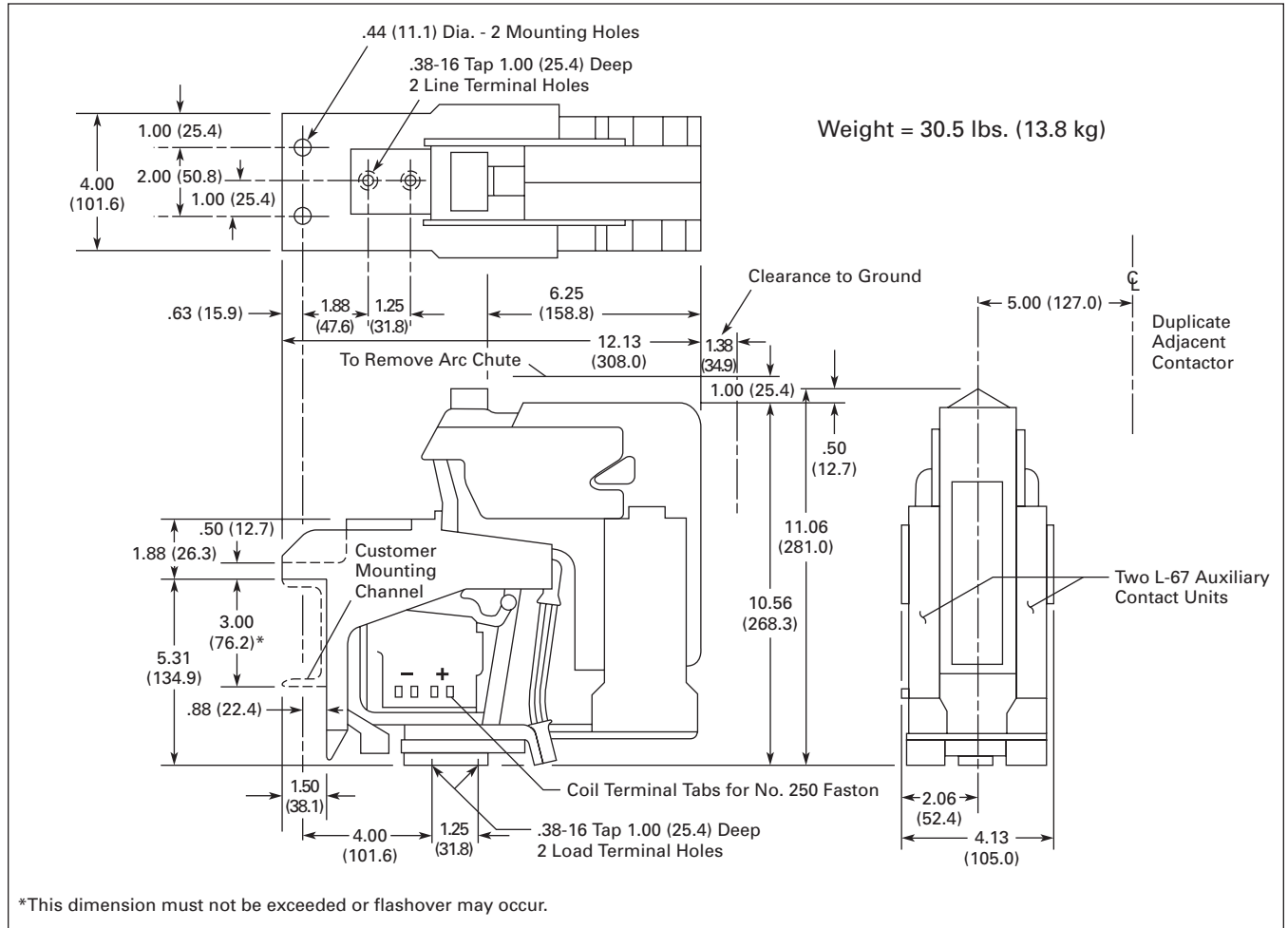
28V DC	2114A92G04	
36V DC	2114A92G05	
55V DC	2114A92G06	
74V DC	2114A92G09	
110/115V DC	2114A92G14	
125V DC	2114A92G15	
275V DC	2114A92G16	
600V DC	2114A92G20	

② Discount symbol **1CD-1C**.

Discount Symbol ..... **1CD-1**

**DPM 1000V Contactor**

**Dimensions**



**Figure 35-18. Dimension Drawing — Approximate Dimensions in Inches (mm)**

**Table 35-106. Approximate Dimensions and Shipping Weights**

Dimensions in Inches (mm)			Ship. Wt. Lbs. (kg)
Width	Height	Depth	
4.13 (105)	11.06 (280.9)	12.12 (307.8)	30.5 (13.8)

**Product Selection**

**When Ordering Specify**

- Catalog Number of contactor and any required Accessories

**Table 35-107. 1000V DC Contactors**

Coil Operating Voltage	Over-current Latch	Catalog Number	Price U.S. \$
28V DC	Without	2120A07G01	
	With	2120A07G02	
36V DC	Without	2120A07G03	
	With	2120A07G04	
55V DC	Without	2120A07G05	
	With	2120A07G06	
74V DC	Without	2120A07G09	
	With	2120A07G10	
110V DC	Without	2120A07G13	
	With	2120A07G14	
600V DC	Without	2120A07G31	
	With	2120A07G32	

Discount Symbol ..... **1CD-1**

### AVD-Contactor

## AVD-Contactor



2000V Contactor

## Product Description

The AVD-Contactor is a single-pole normally open, load break, bi-directional definite purpose DC contactor. The device is rated at 1400 amps continuous and is capable of switching up to 2000V DC loads.

## Application Description

The AVD-Contactor was designed for the demanding environmental requirements of Locomotive, Rapid Transit and Off Highway Vehicle applications. This device is also applied in high horsepower DC drive applications including Process Lines and Off Shore Oil Drilling Rigs.

## Features

- Bi-directional interrupting capability
- 2000V DC switching in a compact design due to patented arc chute
- Any combination of up to four isolated NO or NC auxiliary contacts
- Panel mount design
- Continuous duty operating coil
- Continuous duty blow out coil

## Technical Data

- 1400A continuous current carrying capability at 55°C
- Electrical creepage and clearance distances up to 2000V DC applications
- Mechanical life of 2 million operations
- Operating Coil Voltages (DC): 28, 37, 74, 100, 230 (others available)

Table 35-108. Operating Coil Characteristics

Coil Voltage	Current Draw at Nominal Voltage ( $\pm 5\%$ @ 20°C)	Catalog Number
28	1.87	9-3004-2
37	1.58	9-3004-3
74	.79	9-3004-1
100	.62	9-3004-5
230	.25	9-3004-4

## Accessories

Table 35-109. Auxiliary Contacts

Contact Configuration	Terminal Configuration	Catalog Number	Price U.S. \$
1NO/1NC	Fast-On	10-3519-5	
2NO	Fast-On	10-3519-6	
2NC	Fast-On	10-3519-7	
1NO/1NC	Screw Type	10-6817	
2NO	Screw Type	10-6817-2	
2NC	Screw Type	10-6817-3	

## Renewal Parts

Table 35-110. Contacts

Description	Quantity Required per Contactor	Catalog Number	Price U.S. \$
Stationary Contact	1	23-7253	
Movable Contact	2	23-7255	

## Product Specification

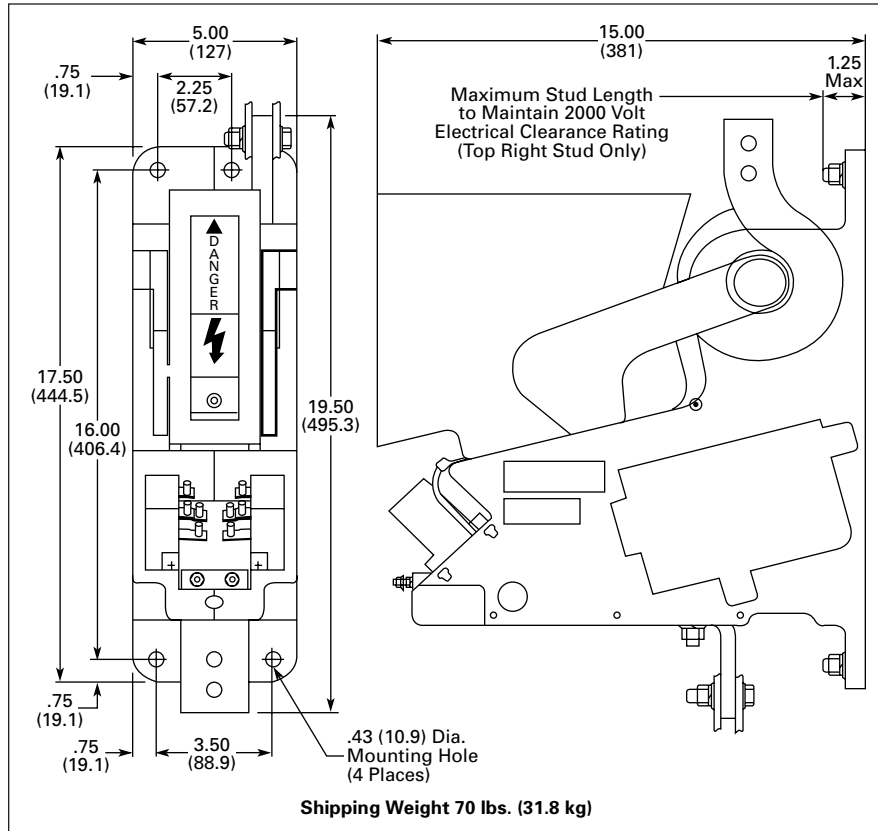
The AVD-Contactor is a definite purpose DC contactor. Please contact our Technical Resource Center for assistance in applying this device.

Discount Symbol ..... 15CD3



**AVD-Contactor**

**Dimensions**



**Figure 35-19. AVD Approximate Dimensions in Inches (mm) and Shipping Weights**

**Table 35-111. Arc Clearances in Inches (mm)**

2000V DC		
Front	Top	Sides
2 (51)	2 (51)	1 (25)

**Table 35-112. Approximate Dimensions and Shipping Weights**

Dimensions in Inches (mm)			Ship. Wt. Lbs. (kg)
Width	Height	Depth	
15 (381)	19.5 (495.3)	5 (127)	70 (31.8)

**Product Selection**

**Table 35-113. AVD-Contactor**

Device Type	Auxiliary Contact Configuration	Coil Voltage	Catalog Number	Price U.S. \$
1400A Contactor	3NO/1NC	28	6702ED667-4	
		37	6702ED667-5	
		74	6702ED667-6	
		100	6702ED667-3	
		230	6702ED667-7	

**Note:** Please consult our Technical Resource Center for Catalog Numbers of other device configurations and application assistance.

### D-Contactor

## D-Contactor



750V Contactor

## Product Description

The D-Contactor is a single-pole normally open, load break, bi-directional definite purpose DC contactor. Two devices are available rated at 1800A and 3000A at 750V DC.

## Application Description

The D-Contactor was designed for the demanding environmental requirements of Locomotive, Rapid Transit and Off Highway Vehicle applications. This device is also widely applied in high horsepower DC drive applications including Process Lines and Off Shore Oil Drilling Rigs.

## Features

- Bi-directional interrupting capability
- Compact design due to intermittent duty blowout coil and arc interruption circuit (not suitable for extremely high duty cycle or jogging applications)
- Any combination of up to eight isolated NO or NC auxiliary contacts
- Channel/angle frame mounting standard, optional panel mount kit available
- Continuous duty operating coil
- Screw type or fast-on control terminals

## Technical Data

- 1800A and 3000A continuous current carrying capability at 55°C
- 5000A 750V DC resistive interrupt rating
- Electrical creepage and clearance distances up to 1500V DC applications
- Mechanical life of 2 million operations
- Operating Coil Voltages (DC): 12, 24, 32, 48, 74, 100, 115, 230 (others available)

Table 35-114. Operating Coil Characteristics

Coil Voltage	Current Draw at Nominal Voltage ( $\pm 7.5\%$ @ 20°C)	Catalog Number
12	3.96	9-1688-15
24	2.00	9-1688-7
32	1.44	9-1688-9
48	1.00	9-1688-12
74	.97	9-2064-3
100	.45	9-1688-8
115	.37	9-1688-2
230	.20	9-1688-1

## Accessories

Table 35-115. Auxiliary Contacts

Contact Configuration	Terminal Configuration	Catalog Number	Price U.S. \$
1NO/1NC	Fast-On	10-3519-5	
2NO	Fast-On	10-3519-6	
2NC	Fast-On	10-3519-7	
1NO/1NC	Screw Type	10-6817	
2NO	Screw Type	10-6817-2	
2NC	Screw Type	10-6817-3	

Table 35-116. Panel Mounting Kit

Description	Catalog Number	Price U.S. \$
Panel Mounting Kit	99-3842	

## Renewal Parts

Table 35-117. Contact Kits

Device Rating	Main Contact Configuration	Contacts	Catalog Number	Price U.S. \$
1800A	2-Main	Main Contacts	6-497	
1800A	2-Main	Arcing Contacts	23-5449	
3000A	4-Main	Main Contacts	6-496	
3000A	4-Main	Arcing Contacts	23-5448	

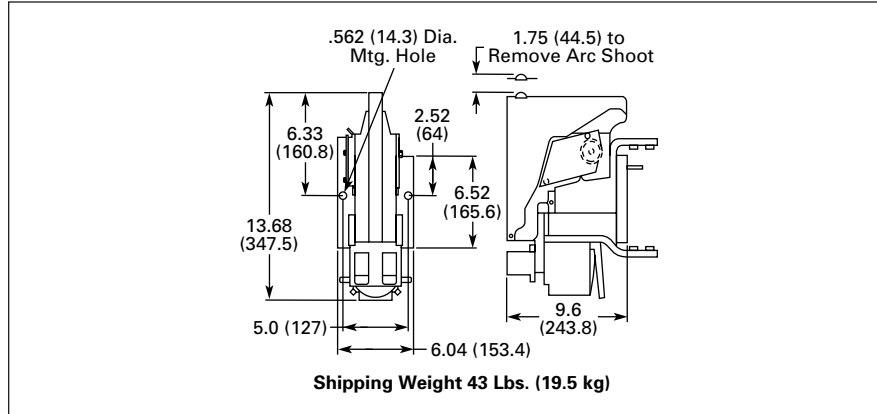
Discount Symbol ..... 15CD3

**D-Contactor**

**Product Specification**

The D-Contactor is a definite purpose DC contactor. Please contact our Technical Response Center for assistance in applying this device.

**Dimensions**



**Figure 35-20. D-Contactor Approximate Dimensions in Inches (mm) and Shipping Weights**

**Table 35-118. Arc Clearances in Inches (mm)**

Type of Load	750V DC		
	Front	Top	Sides
Resistive	4 (102)	2 (51)	3 (76)
Inductive	7 (178)	4 (102)	3 (76)

**Table 35-119. Approximate Dimensions and Shipping Weights**

Dimensions in Inches (mm)			Shipping Weight Lbs. (kg)
Width	Height	Depth	
9.6 (243.8)	13.68 (347.5)	6.04 (153.4)	43 (19.5)

**Product Selection**

**Table 35-120. D-Contactor**

Device Type	Auxiliary Contact Configuration	Coil Voltage	Catalog Number	Price U.S. \$
1800A Contactor	3NO/1NC	74V DC	6702ED584	
	3NO/1NC	100 V DC	6702ED663	
	2NO/2NC	115V DC	6702ED584-2	
	3NO/1NC	74V DC	6702ED587-2	
	2NO/2NC	100V DC	6702ED668	
	3NO/1NC	115V DC	6702ED587-4	

**Note:** Please consult our Technical Resource Center for Catalog Numbers of other device configurations and application assistance.

Reversing/Assignment Contactor

**Reversing/Assignment Contactor**



1000V Contactor

35

**Product Description**

The Reversing/Assignment Contactor is a double-pole, double-throw non-load break definite purpose DC contactor. A three-position center-off and a two-position magnetically-latched configuration is available. The device is rated for 1100A, 1000V DC. The Reversing Contactor includes cross over bus bars for DC motor reversing applications; the Assignment Contactor omits the cross over bus bars for motor assignment applications. (See Figure 35-21).

**Application Description**

The Reversing/Assignment Contactor was designed for the demanding environmental requirements of Off Highway Vehicle applications. This device is also widely utilized with high horsepower DC drives for DC motor reversing and drive assignment applications.

**Features**

- Bi-directional current carrying capability (non-load break)
- Can replace four single-pole contactors in DC motor reversing applications
- Can replace two or four single-pole contactors in DC motor assignment applications
- Any combination of up to eight isolated NO or NC auxiliary contacts
- Panel mount design
- Continuous duty operating coil
- Screw type or fast-on control terminals

**Technical Data**

- 1100A continuous current carrying capability at 55°C
- Electrical creepage and clearance distances for 1000V DC applications
- Mechanical life of 1 million operations
- Operating Coil Voltages (DC): 24, 28, 36, 74, 110, 125, 250 (others available)

Table 35-121. Operating Coil Characteristics

Coil Voltage	Current Draw at Nominal Voltage ( $\pm 7.5\%$ @ 20°C)	Catalog Number
24	1.60	9-1903-9
28	1.30	9-1903-1
36	1.06	9-1903-3
74	.49	9-1903-7
110	.33	9-1903-6
125	.33	9-1903-4
250	.17	9-1903-8

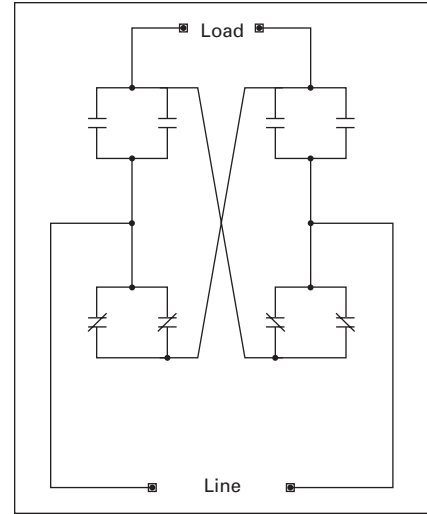


Figure 35-21. Reversing Contactor Schematic Diagram

The Reversing Contactor includes the cross over bus bars for DC motor reversing applications. The Assignment Contactor omits the cross over bus bars for motor assignment applications.

**Accessories**

Table 35-122. Auxiliary Contacts

Contact Configuration	Terminal Configuration	Catalog Number	Price U.S. \$
1NO/1NC	Fast-On	10-3519-5	
2NO	Fast-On	10-3519-6	
2NC	Fast-On	10-3519-7	
1NO/1NC	Screw Type	10-6817	
2NO	Screw Type	10-6817-2	
2NC	Screw Type	10-6817-3	

**Renewal Parts**

**Table 35-123. Contact Kits**

Device	Configuration	Catalog Number	Price ② U.S. \$
Reversing/Assignment	3-Position	6-602	
Reversing/Assignment Upgrade Kit ①	3-Position	6-602-3	
Magnetic Latched Reversing/Assignment	2-Position	6-602-5	

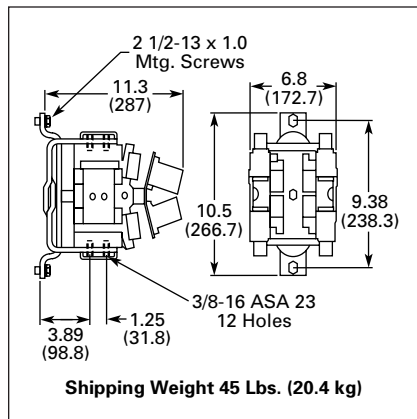
① The 6-602-3 contact kit will upgrade the 3-position, reversing/assignment device from the original design that incorporated a leaf spring contact structure to the present design that incorporates a coil spring contact structure. The 6-602 contact kit can then be used after the device has been upgraded for subsequent contact replacement.

② Discount Symbol **15CD3**.

**Product Specification**

The Reversing/Assignment Contactor is a definite purpose DC contactor. Please contact our Technical Response Center for assistance in applying this device.

**Dimensions**



**Table 35-124. Approximate Dimensions and Shipping Weights**

Dimensions in Inches (mm)			Ship. Wt. Lbs. (kg)
Width	Height	Depth	
11.3 (287)	10.5 (266.7)	6.8 (172.7)	45 (20.4)

**Figure 35-22. Reversing Contactor Approximate Dimensions in Inches (mm) and Shipping Weight**

**Product Selection**

**Table 35-125. Reversing/Assignment Contactors (3-Position, Center OFF)**

Device Type	Auxiliary Contact Configuration	Coil Voltage	Catalog Number	Price U.S. \$
Reverser	8NO	74	6702ED615	
	4NO/4NC	125	6702ED621-2	
		250	6702ED622	
Assignment	4NO/4NC	74	6702ED664-2	
		125	6702ED621	
		250	6702ED664-6	

**Note:** Please consult our Technical Resource Center for Catalog Numbers of other device configurations and application assistance.



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