

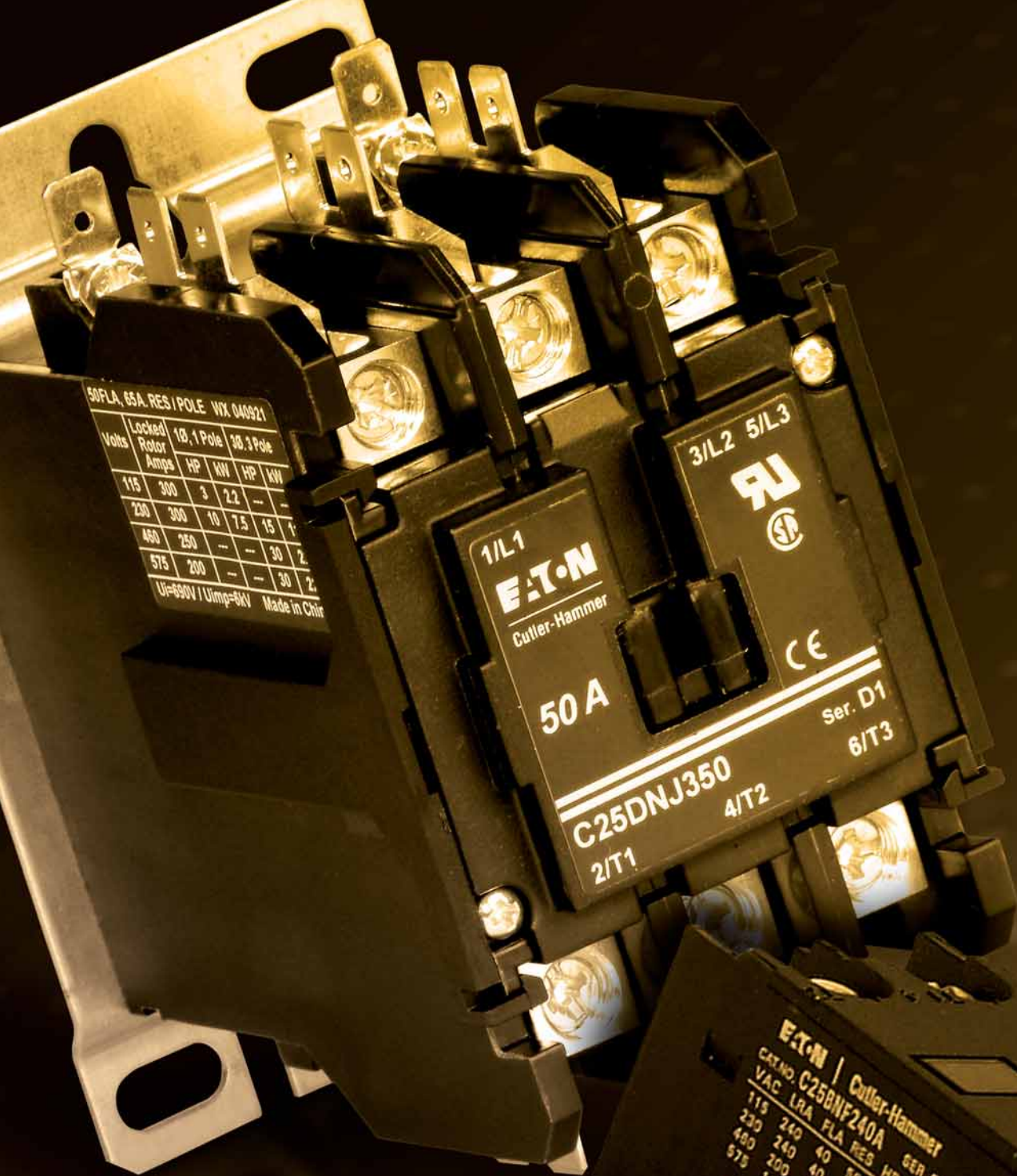
EAT•N

Cutler-Hammer

Definite Purpose Control

Product Focus

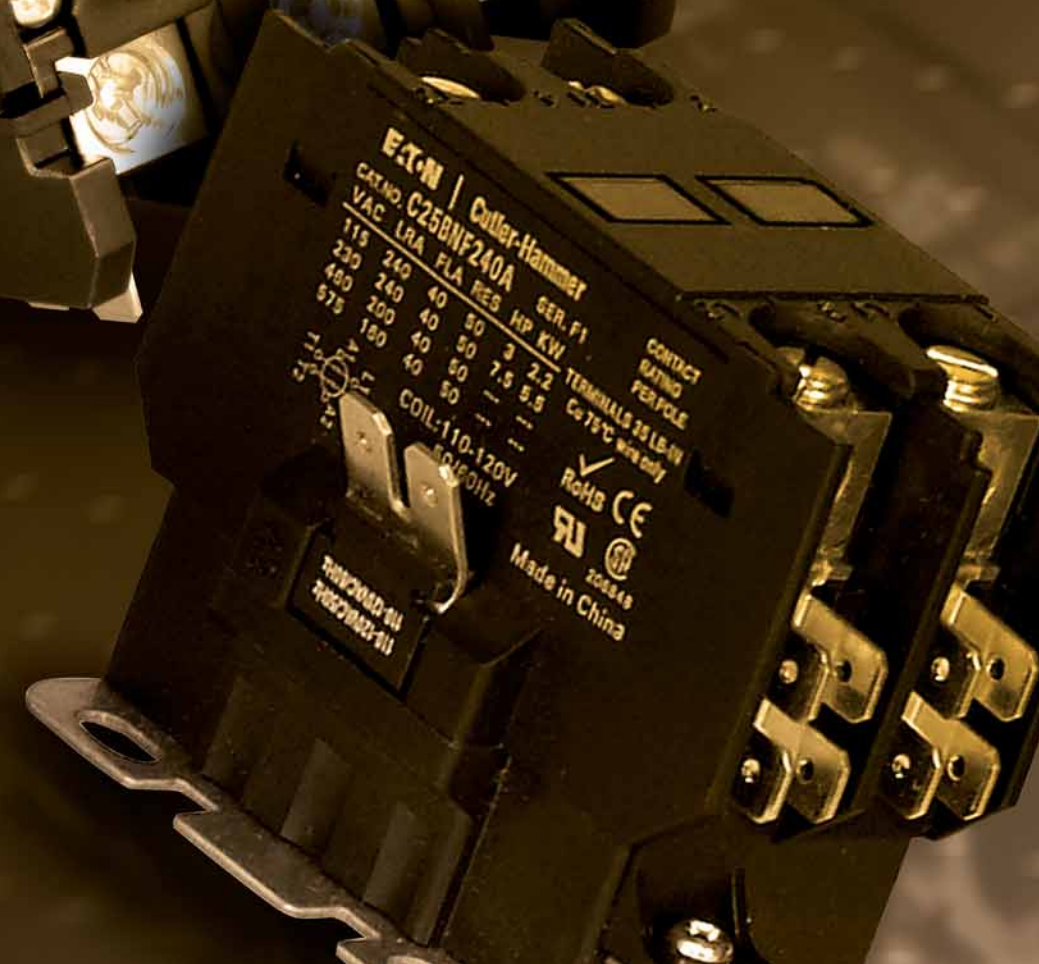




50FLA, 65A RES / POLE WX 040921

Volts	Locked Rotor Amps	1Ø, 1 Pole HP	1Ø, 1 Pole kW	3Ø, 3 Pole HP	3Ø, 3 Pole kW
115	300	3	2.2	—	—
230	300	10	7.5	15	11
460	250	—	—	30	22
575	200	—	—	30	22

U_i=690V / U_{imp}=8kV Made in China



EATON / Cutler-Hammer

CAT. NO.	VAC	LRA	FLA	RES	HP	KW	SER. F1	CONTACT RATING PER POLE	TERMINALS 25 LB-IN Co 75°C wire only
115	240	40	50	3	2.2	—	—	—	—
230	240	40	50	3	2.2	—	—	—	—
460	200	40	50	7.5	5.5	—	—	—	—
575	180	40	50	—	—	—	—	—	—

COIL: 110-120V 50/60Hz

RoHS CE

Made in China

Innovation in Definite Purpose Control

Eaton's Cutler-Hammer® Definite Purpose (DP) Contactors are designed to improve control of refrigeration, air conditioning, ventilation and resistance heating applications. The complete line offers everything from compact DP's to the smallest 50 ampere DP Contactor in the world — an average of 20% smaller than the competition.

Always looking for new ways to improve the customer experience, Eaton launched the 50mm DP Contactor with an innovative sealed housing design to keep out contaminants and lower noise. Building on that success, the new series of Compact DP's are now available in a sleek new sealed design.

Continuing to innovate and upgrade products, Eaton offers the perfect definite purpose solution for your HVACR applications.

New Series of Compact Definite Purpose Contactors

The new 20 – 40 ampere, single- and double-pole, Type C25 compact DP contactors feature a compact, efficient design with a low VA coil and straight-through wiring. These devices are economically priced, UL® recognized/CSA® certified, are current rated and hp/kW rated with magnet coils rated Class F, 155°C (most are Class B, 130°C) and designed with low VA current ratings for less energy consumption.

With the ability to be mounted vertically, horizontally or tabletop, the new series of compact DP's will meet all your definite purpose application needs.

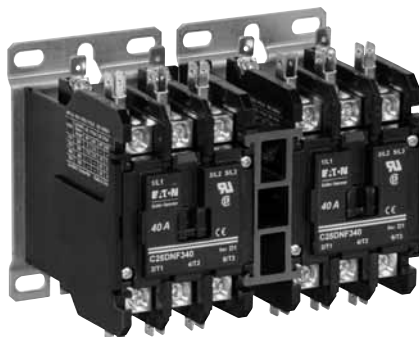


1

2



3



1. Compact DP Contactor
2. 50mm DP Contactor with Quick Connect Terminals
3. 50mm Reversing DP Contactor with Quick Connect Terminals

<i>Description</i>	<i>Page</i>
Product Family Overview	
Application Description	1
Catalog Number Selection	1
Contactors	
20 – 40A, Compact 1- and 2-Pole — C25	2
15 – 360A, 2-, 3- and 4-Pole — C25	4
15 – 360A, Options and Accessories	6
15 – 40A, 3-Pole Fuse Block	8
15 – 75A, Reversing and 2-Speed — C65	9
Starters	
25 – 60A, Single and Three-Phase — A25, B25	10
Overload Relay and Accessories	12
Heater Packs — Class 10 and Class 20	13
15 – 45A, Single and Three-Phase — A27, B27	14
Overload Relay Specifications	17
15 – 75A, Single and Three-Phase — A29, B29	19
NEMA Type 1 Enclosed Control	
15 – 60A Contactors — C25	25
25 – 60A Starters — A25, B25	26
15 – 45A Starters — A27, B27	27
Dimensions	28
Renewal Parts	31
Technical Data and Specifications	34

Dimensions, Weights and Ratings

Dimensions, weights and ratings given in this Product Guide are approximate and should not be used for construction purposes. Drawings giving exact dimensions are available upon request. All listed product specifications and ratings are subject to change without notice. Photographs are representative of production units.

Terms and Conditions

All orders accepted by Eaton are subject to the general terms and conditions as set forth in Sellers Policy 25-000.

Other Cutler-Hammer® Products

Eaton's electrical business is a leader in the development and manufacturing of power distribution equipment, electrical control products and advanced industrial automation solutions.

For more information on Cutler-Hammer products and services, visit our Web site at www.eaton.com.

WARNING

The installation and use of Cutler-Hammer products should be in accordance with the provisions of the U.S. National Electrical Code and/or other local codes or industry standards that are pertinent to the particular end use. Installation or use not in accordance with these codes and standards could be hazardous to personnel and/or equipment.

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 1. Definite Purpose Control Catalog Numbering System

C 25 D N A 2 15 A A 161 - 84									
Model C = Contactor A = Three-Phase Starter B = Single-Phase Starter								Bulk Packaging Blank = individual pkg. -84 = 20 pc./pkg. (C25D_) 50 pc./pkg. (C25A_, C25B_, C25C_) -86 = Rotate coil terminals 180° for 15A – 50A Contactors	
Type 25 = Non-reversing Contactors & Starters 27 = Non-reversing Starters 29 = Non-reversing Starters 65 = Reversing Contactors									
Contactor Frame Size A = Compact 1-Pole B = Compact 2-Pole C = Compact 1-Pole W/Shunt D = 15 – 50A, 2- and 3-Pole E = 25 – 40A, 4-Pole F = 60 – 75A, 2- and 3-Pole G = 90A, 2- and 3-Pole H = 120A, 2- and 3-Pole K = 200 and 300A, 3-Pole L = 360A, 3-Pole For Starters Only C = Common Control Wiring S = Separate Control Wiring									
Enclosure Type N = Open with Metal Mounting Plate R = Open with DIN Rail Mounting Adapter (2- and 3-Pole, 15 – 50A Contactors Only) G = NEMA Type 1 Enclosed									
Power Terminals A = Binding Head Screw B = Binding Head Screw and Quick Connect Terminals (side by side) C = Screw/Pressure Plate ① D = Screw/Pressure Plate and Quick Connect Terminals (side by side) ① E = Box Lugs (Posidrive Setscrew) F = Box Lugs (Posidrive Setscrew) and Quick Connect Terminals (side by side) G = Binding Head Screw and Quick Connect Terminals (vertical in-line) H = Screw/Pressure Plate and Quick Connect Terminals (vertical in-line) ① J = Box Lugs (Posidrive Setscrew) and Quick Connect Terminals (vertical in-line) K = Box Lugs (Hex Socket Allen Head Setscrew) L = Box Lugs (Hex Socket Allen Head Setscrew) and Quick Connect Terminals (side by side) M = Box Lugs (Hex Socket Allen Head Setscrew) and Quick Connect Terminals (vertical in-line)									
								Fuse Blocks 161 = Class M, 600V, 30A 237 = Class G, 300V, 15A 238 = Class G, 300V, 20A 231 = Class G, 300V, 30A 232 = Class G, 300V, 60A 361 = Class J, 600V, 30A 362 = Class J, 600V, 60A 431 = Class T, 300V, 30A 432 = Class T, 300V, 60A 461 = Class T, 600V, 30A 462 = Class T, 600V, 60A 521 = Class H, 250V, 30A 522 = Class H, 250V, 60A 621 = Class R, 250V, 30A 622 = Class R, 250V, 60A	
								Auxiliary Contacts (Side Mount) A = 1NO Pressure Plate B = 1NC Pressure Plate C = 1NO-1NC Pressure Plate D = 2NO Pressure Plate E = 2NC Pressure Plate F = 1NO Pressure Plate and QC G = 1NC Pressure Plate and QC H = 1NO-1NC Pressure Plate and QC J = 2NO Pressure Plate and QC K = 2NC Pressure Plate and QC L = 1NO-1NC Snap Switch QC Only M = 2NO-2NC Snap Switch QC Only	
								Coil Selection A = 110 – 120V AC, 50/60 Hz B = 208 – 240V AC, 50/60 Hz C = 440 – 480V AC, 50/60 Hz D = 550 – 600V AC, 50/50 Hz H = 277V AC, 60 Hz J = 220 – 240 V AC, 50/60 Hz L = 380 – 415V AC, 50 Hz R = 12V AC, 50/60 Hz T = 24V AC, 50/60 Hz 1R = 12V DC 1T = 24V DC 1W = 48V DC 1A = 120V DC	
								Current Rating 15 = 15A 25 = 25A 30 = 30A 40 = 40A 50 = 50A 60 = 60A 75 = 75A 90 = 90A 120 = 120A 200 = 200A 300 = 300A 360 = 360A	
		No. of Poles 1 = 1-Pole 2 = 2-Pole 3 = 3-Pole 4 = 4-Pole							
① Not available on 50A devices.									

① Not available on 50A devices.

Contents

Description	Page
Compact 1- and 2-Pole Contactors 20 – 40A	
Product Description	2
Standards and Certifications	2
Technical Data — Specifications	2
Options	2
Dimensions	3
Product Selection	3



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 2. Coil Characteristics

AC Coil Voltage 50/60 Hz	Max. Inrush VA	Max. Sealed VA	Max. Sealed Watts
One-Pole			
24	33	6	2
120	33	6	2
208/240	33	6	2
277	33	6	2
Two-Pole			
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

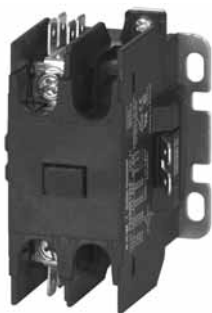
Options

Table 3. Compact Options — Factory Installed

Description	*
Box lugs with quick connects for 20 – 40A contactors: 1-Pole 1-Pole with shunt 2-Pole To order replace letter in the 6th position of Catalog Number with letter F. EXAMPLE: C25BNF240A	

Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing



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 2**.

Table 4. Catalog Numbering System

C25BNB230	A
Incomplete Catalog Number	Magnet Coil Suffix

Table 5. Compact Contactors Product Selection— Open Type

Ampere Ratings ①					Max. Motor Horsepower		Max. Motor Kilowatts		Catalog Number ②③	*
Inductive Full Load	Resistive	Locked Rotor			115V	230V	115V	230V		
		240 – 277V	480V	600V						
Single-Pole										
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_	
Single-Pole with Shunt										
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_	
Double-Pole										
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 6**.

③ Bulk pack quantities are available in quantities of 50, contact local sales office.

Table 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

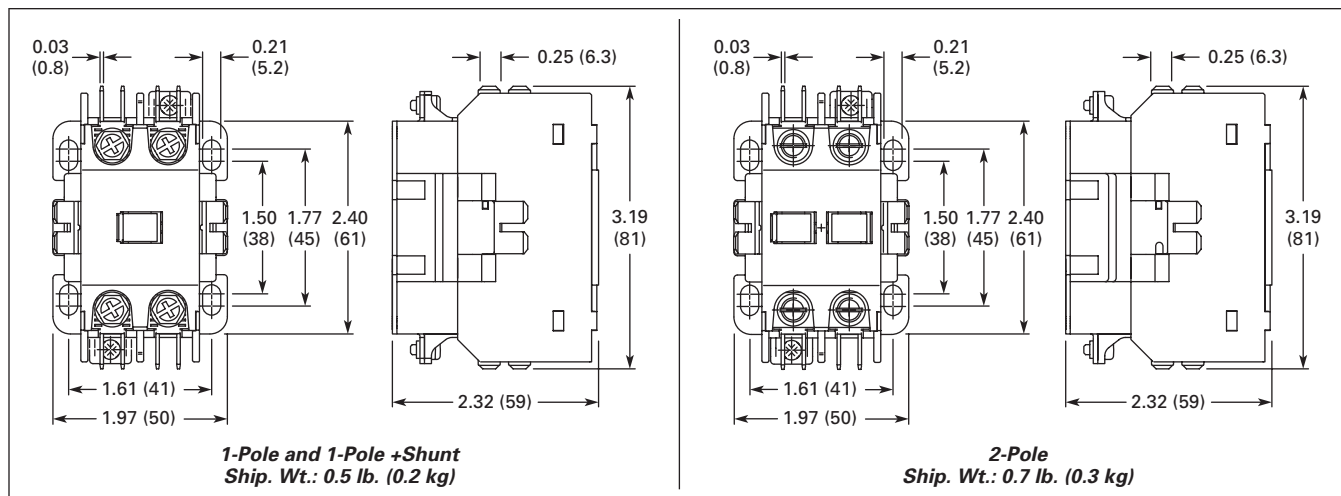


Figure 1. Compact Approximate Dimensions in Inches (mm) and Shipping Weights

Technical Data..... **Page 2**
Options **Page 2**
Discount Symbol..... **1CD-5C**

* Consult Sales Office for Pricing



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 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 7. Lighting Duty Ratings (25A to 50A Only)

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

Table 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 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 _e	FLA	hp	I _e	FLA	hp	I _e	FLA	hp	I _e
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 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.

Product Selection

When Ordering Specify

- Catalog Number plus Magnet Coil Suffix, below.

- Modify Catalog Number for any options required — see Options, **Page 6**.
- Catalog Numbers of accessory kits required, **Page 6**.

Table 11. Catalog Numbering System

C25DND215	A	X
Incomplete Catalog Number	Magnet Coil Suffix	Option Code as necessary

Table 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	*	Catalog Number ①②	*
15	20	115 230 460 575	90 90 75 60	3/4 2 — —	— 3 5 5	0.40 1.5 — —	— 2.2 3.7 3.7	2 3	C25DND215 C25DND315		C25DRD215 C25DRD315	
25	35	115 230 460 575	150 150 125 100	2 3 — —	— 7-1/2 10 10	1.5 2.2 — —	— 5.5 7.5 7.5	2 3 4	C25DND225 C25DND325 C25END425		C25DRD225 C25DRD325	
30	40	115 230 460 575	180 180 150 120	2 5 — —	— 10 15 15	1.5 3.7 — —	— 7.5 11 11	2 3 4	C25DND230 C25DND330 C25END430		C25DRD230 C25DRD330	
40	50	115 230 460 575	240 240 200 160	3 7-1/2 — —	— 10 20 20	2.2 5.5 — —	— 7.5 15 15	2 3 4	C25DNF240 C25DNF340 C25ENF440		C25DRF240 C25DRF340	
50	65	115 230 460 575	300 300 250 200	3 10 — —	— 15 30 30	2.2 7.5 — —	— 11 22 22	2 3	C25DNJ250 C25DNJ350		C25DRJ250 C25DRJ350	
60	75	115 230 460 575	360 360 300 240	5 10 — —	— 20 40 40	3.7 7.5 — —	— 15 30 30	2 3	C25FNF260 C25FNF360		NA	
75	90	115 230 460 575	450 450 375 300	5 15 — —	— 20 50 50	3.7 11 — —	— 18.5 37 37	2 3	C25FNF275 C25FNF375		NA	
90	120	115 230 460 575	540 540 450 360	7-1/2 20 — —	— 30 50 50	5.7 15.1 — —	— 22 37 37	2 3	C25GNF290 C25GNF390		NA	
120	140	230 460 575	720 720 570	— — —	— — —	— — —	— — —	3	C25HNE3120		NA	
200	200	240 480 600	1200 1200 1000	— — —	— — —	— — —	— — —	3	C25KNE3200		NA	
300	300	240 480 600	1800 1800 1500	— — —	— — —	— — —	— — —	3	C25KNE3300		NA	
360	360	240 480 600	2320 2320 1900	— — —	— — —	— — —	— — —	3	C25LNE3360		NA	

- 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 33** 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 13. Magnet Coil Selection

Voltage		Coil Suffix
60 Hertz	50 Hertz	
AC ①		
12 ⑤	12	R
24 ⑥	24	T
110 – 120 ⑩	110 – 120 ⑩	A
208 ⑦	—	E
208 – 240 ⑧	208 – 240	B
240 ⑨	220	J
277	—	H
—	380 – 415	L
440 – 480	440 – 480	C
550 – 600	550 – 600	D
DC ③		
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 4, 34**
Options **Page 6**
Accessories..... **Page 6**
Dimensions..... **Page 30**
Discount Symbol..... **1CD-5C**

* Consult Sales Office for Pricing

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 14. Factory Installed Options

Description	Code Letter	Number of Poles	*
Terminals — 15A through 50A			
Binding Head Screws			
Without Quick Connect Terminals	A	2-, 3-, 4-Pole	
With Quick Connect Terminals (Side-by-Side)	B	2-, 3-, 4-Pole	
With Quick Connect Terminals (Vertical In-Line)	G	2-, 3-Pole	
Screw/Pressure Plate ②			
Without Quick Connect Terminals	C	2-, 3-, 4-Pole	
With Quick Connect Terminals (Side-by-Side)	D	2-, 3-, 4-Pole	
With Quick Connect Terminals (Vertical In-Line)	H	2-, 3-Pole	
Box Lugs			
(#2 Posidrive/Slotted Screw)			
Without Quick Connect Terminals	E	2-, 3-, 4-Pole ①	
With Quick Connect Terminals (Side-by-Side)	F	2-, 3-, 4-Pole ①	
With Quick Connect Terminals (Vertical In-Line)	J	2-, 3-Pole	
Box Lugs			
(Hex Socket Allen Head Screw)			
Without Quick Connect Terminals	K	2-, 3-Pole	
With Quick Connect Terminals (Side-by-Side)	L	2-, 3-Pole	
With Quick Connect Terminals (Vertical In-Line)	M	2-, 3-Pole	
Terminals — 60A through 75A			
Replace letter in the 6th position of Catalog Number with Code Letter listed below. EXAMPLE: Change C25FNF250 to C25FNE250.			
Box Lugs (Slotted Screw)			
Without Quick Connect Terminals	E	2-, 3-Pole	
With Quick Connect Terminals	F	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 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	*	Code Letter	*	Code Letter *
For 15 through 90A ③					
1NO	A		F		—
1NC	B		G		—
1NO-1NC	C		H		—
2NO	D		J		—
2NC	E		K		—
For 15 through 75A					
1NO-1NC	—		—		L
2NO-2NC	—		—		M
For 120 through 360A					
1NO	A		—		—
1NO-1NC	C		—		—
2NO	D		—		—
2NC	E		—		—

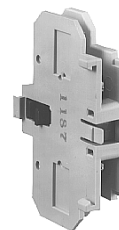
Special Marking

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 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	*	Catalog Number	*
For 15 through 75A				
1NO	C320KG1		C320KG11	
1NC	C320KG2		C320KG12	
1NO-1NC	C320KG3		C320KG13	
2NO	C320KG4		C320KG14	
2NC	C320KG5		C320KG15	
For 90A				
1NO	—		C320DPG10	
1NC	—		C320DPG01	
1NO-1NC	—		C320DPG11	
2NO	—		C320DPG20	
For 120 through 360A				
1NO	C320KGS20		—	
1NC	C320KGS21		—	
1NO-1NC	C320KGS22		—	



Side Mounted Snap Switch

Table 17. Snap Switch Design Side Mounted Auxiliary Contacts

Circuit	Snap Switch Design with Quick Connect Terminals	
	Catalog Number	*
1NO-1NC	C320SNP11	
2NO-2NC	C320SNP22	

Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing

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

Description	*
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.

Auxiliary Contact Kits (Top Mounted)*Top Mounted
Auxiliary Contact***Table 19. Heavy-Duty Pilot Rated for 10A at 600V AC**

Circuit	With Standard Pressure Plate Terminals	
	Catalog Number	*
For 15 through 75A ②		
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	

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

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

Catalog Number	*
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 21. Solid-State ON DELAY Timer

Timing Range	Catalog Number ③④⑤	*
.1 – 1.0 Seconds 1 – 30 Seconds 30 – 300 Seconds 5 – 30 Minutes	C320TDN1_ C320TDN30_ C320TDN300_ 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 22. Separate Enclosures — NEMA 1**

Application	Catalog Number	*
15 through 50A, 2- and 3-Pole	C799B18	
60A, 2- and 3-Pole or 25 through 40A, 4-Pole	C799B19	

Discount Symbol 1CD-5C

* Consult Sales Office for Pricing

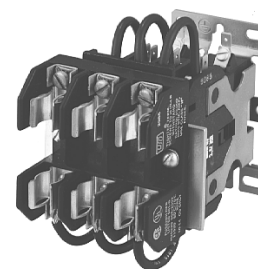
15 – 40A, 3-Pole Fuse Block

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 5** and make necessary price addition. EXAMPLE: C25DND325A**361**.



3-Pole Fuse Block

Table 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	*
Volts	Amperes	Diameter	Length					
Class M								
600	30	0.41 (10.4)	1.50 (38.1)	Pressure Plate	10 AWG Cu	161	C350KM61	
Class G								
600	15	0.41 (10.4)	1.31 (33.3)	Pressure Plate	10 AWG Cu	237	C350KG37	
	20		1.41 (35.8)	Pressure Plate	10 AWG Cu	238	C350KG38	
480	30	0.41 (10.4)	1.63 (41.4)	Pressure Plate	10 AWG Cu	231	C350KG31	
	60		2.25 (57.2)	Box Lug	2 AWG Cu/Al	232	C350KG32	
Class J								
600	30	0.81 (20.6)	2.25 (57.2)	Pressure Plate	10 AWG Cu	361	C350KJ61	
	60	1.06 (26.9)	2.38 (60.5)	Box Lug	2 AWG Cu/Al	362	C350KJ62	
Class T								
300	30	0.41 (10.4)	0.88 (22.4)	Box Lug	6 AWG Cu	431	C350KT31	
	60	0.56 (14.2)	0.88 (22.4)	Box Lug	2 AWG Cu/Al	432	C350KT32	
600	30	0.56 (14.2)	1.50 (38.1)	Box Lug	6 AWG Cu	461	C350KT61	
	60	0.81 (20.6)	1.56 (39.6)	Box Lug	2 AWG Cu/Al	462	C350KT62	
Class H								
250	30	0.56 (14.2)	2.00 (50.8)	Pressure Plate	10 AWG Cu	521	C350KH21	
	60	0.81 (20.6)	3.00 (76.2)	Box Lug	2 AWG Cu/Al	522	C350KH22	
Class R								
250	30	0.56 (14.2)	2.00 (50.8)	Pressure Plate	10 AWG Cu	621	C350KR21	
	60	0.81 (20.6)	3.00 (76.2)	Box Lug	2 AWG Cu/Al	622	C350KR22	

Dimensions

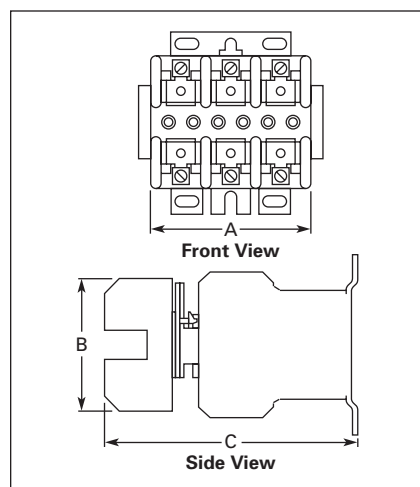


Figure 2. 3-Pole Fuse Block and Contactor Dimensions

Table 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
For Dimensions Not Shown, See Next Page.					
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)

Discount Symbol **1CD-5C**

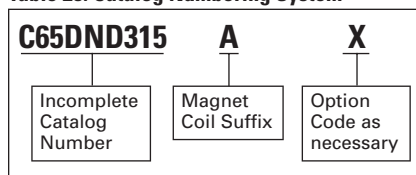
* Consult Sales Office for Pricing

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 6**. Reversing contactors will accept add-on Auxiliary Contacts on either side — order factory assembled or as kits for field installation. See **Page 6**.

Table 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



Product Selection

Table 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	*	Catalog Number ①	*
15	20	115 230 460 575	90 90 75 60	3/4 2 —	— 3 5 5	0.40 1.5 —	— 2.2 3.7 3.7	2 3	C65DND215_ C65DND315_		C65DRD215_ C65DRD315_	
25	35	115 230 460 575	150 150 125 100	2 3 —	— 7-1/2 10 10	1.5 2.2 —	— 5.5 7.5 7.5	2 3	C65DND225_ C65DND325_		C65DRD225_ C65DRD325_	
30	40	115 230 460 575	180 180 150 120	2 5 —	— 10 15 15	1.5 3.7 —	— 7.5 11 11	2 3	C65DND230_ C65DND330_		C65DRD230_ C65DRD330_	
40	50	115 230 460 575	240 240 200 160	3 7-1/2 —	— 10 20 20	2.2 5.5 —	— 7.5 15 15	2 3	C65DNF240_ C65DNF340_		C65DRF240_ C65DRF340_	
50	65	115 230 460 575	300 300 250 200	3 10 —	— 15 30 30	2.2 7.5 —	— 11 22 22	2 3	C65DNJ250_ C65DNJ350_		C65DRJ250_ C65DRJ350_	
60	75	115 230 460 575	360 360 300 240	5 10 —	— 20 40 40	3.7 7.5 —	— 15 30 30	2 3	C65FNF260_ C65FNF360_		NA	
75	90	115 230 460 575	450 450 375 300	5 15 —	— 20 50 50	3.7 11 —	— 18.5 37 37	2 3	C65FNF275_ C65FNF375_		NA	

① Incomplete Catalog Number. Replace underscore (_) with Magnet Coil Suffix from **Table 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 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 28. Magnet Coil Options

Description	*
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 4**
Options..... **Page 6**
Dimensions..... **Page 30**
Discount Symbol..... **1CD-5C**

* Consult Sales Office for Pricing

Contents

Description	Page
Starters 25 – 60A	
Product Description . . .	10
Features	10
Standards and Certifications	10
Technical Data and Specifications . . .	10, 34
Product Selection . . .	11
Overload Relay	12
Accessories	12
Heater Packs	13
Dimensions	28
Renewal Parts	31

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 $\pm 24\%$ 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 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 4.

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

AC Volts	120V	240V	480V	600V
NC Contact B600				
Make and Break	30A	15A	7.5A	6A
Break	3A	1.5A	0.75A	0.6A
Continuous	5A	5A	5A	5A
NO Contact C600				
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

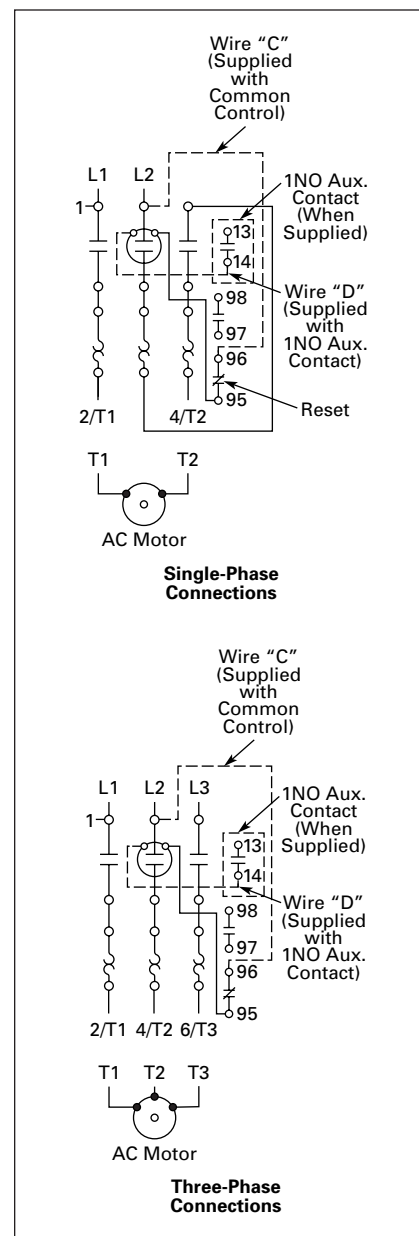


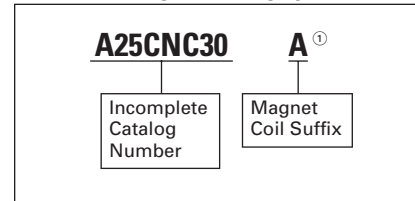
Figure 3. Starter Wiring Diagrams

Product Selection

When Ordering Specify

- Catalog Number plus Magnet Coil Suffix
- Heater Packs for specific FLA of motor, see **Page 13**

Table 32. Catalog Numbering System



① Order Catalog Number **A25CNC30A**.

Note: Modify Catalog Number for any options required.

Table 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	*	Common Control	Separate Control	*
							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	—	2.2	—						
	460	125	—	7-1/2	—	5.5						
	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 34**.

③ Starters do not include heater packs. Select heater pack from tables, **Page 13**.

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

Table 34. Magnet Coil Selection

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

⑤ Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 33** 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 10, 34**
 Accessories **Page 6**
 Dimensions **Page 28**
 Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing

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.

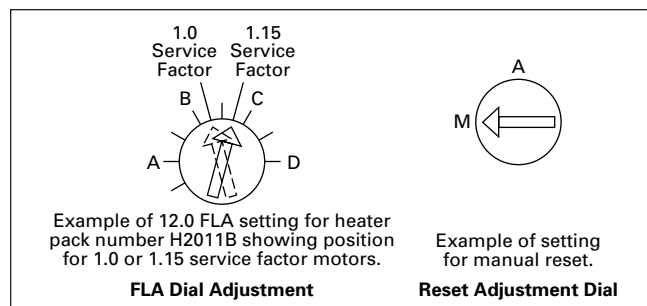


Figure 4. FLA Dial Adjustment

Table 35. Replacement Overload with Connectors

Starter Size	Overload Part Number	*
25 and 30A	10-7125	
40A and 50A	10-7132	
60A	10-7131	

Accessories

Contactors Accessories

See Pages 6 and 7.

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 36. Locking Cover for Overload Relay

Description	Min. Order Quantity (Std. Pkg.)	Catalog Number	*
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 37. Separate Enclosures — NEMA 1

Application	Catalog Number	*
25 and 30A	C799B11	
40, 50 and 60A	C799B13	

Discount Symbol 1CD-1C

* Consult Sales Office for Pricing

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 38. Fast Trip Ratings

Motor Full Load Ampere Rating ①				Catalog Number ② (Includes 3 Heater Packs)	*
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.

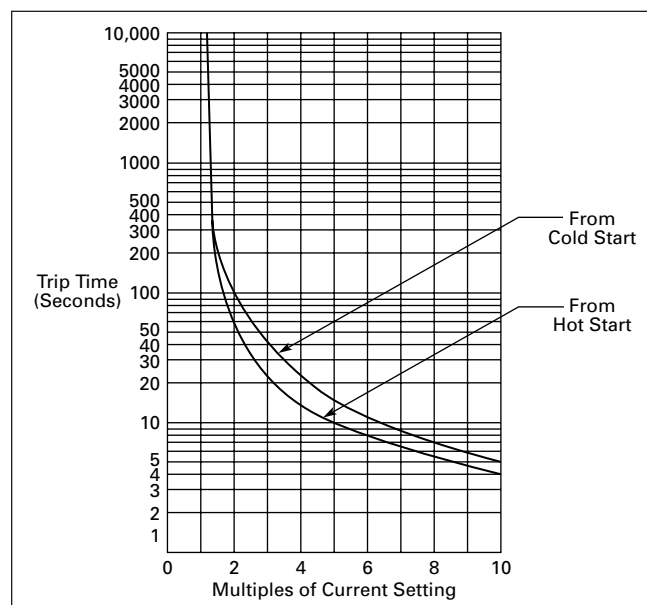
Table 39. Standard Trip Ratings

Motor Full Load Ampere Rating ③				Catalog Number ④ (Includes 3 Heater Packs)	*
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	

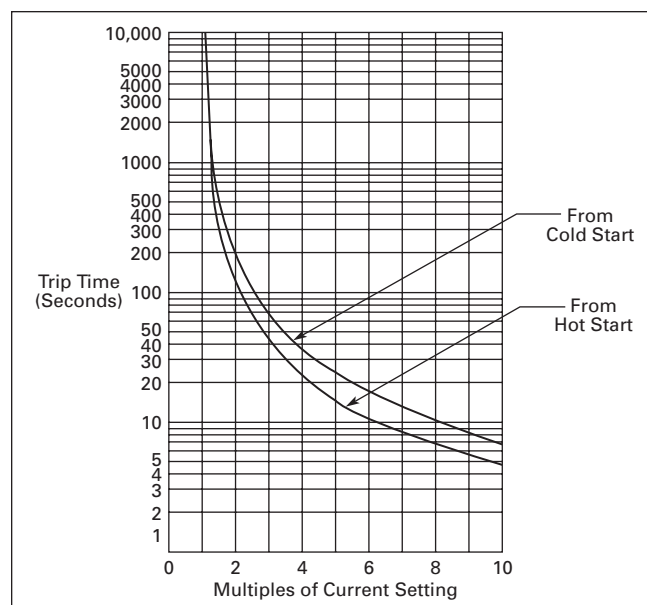
③ For motor full load amperes between listed values, adjust dial clockwise for higher or counterclockwise for lower motor currents. The currents listed are for 1.5 service factor motors. A position adjustment is provided for 1.0 service factor motors.

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 5. Class 10 Overload Relay
25°C Open Rating**



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

Discount Symbol **1CD-1C**

* Consult Sales Office for Pricing

Contents

Description	Page
Starters 15 – 45A	
Product Description	14
Features	14
Standards and Certifications	14
Technical Data and Specifications	14
Product Selection	15
Overload Relay Specifications	17
Dimensions	29
Renewal Parts	31

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 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 4.

Table 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

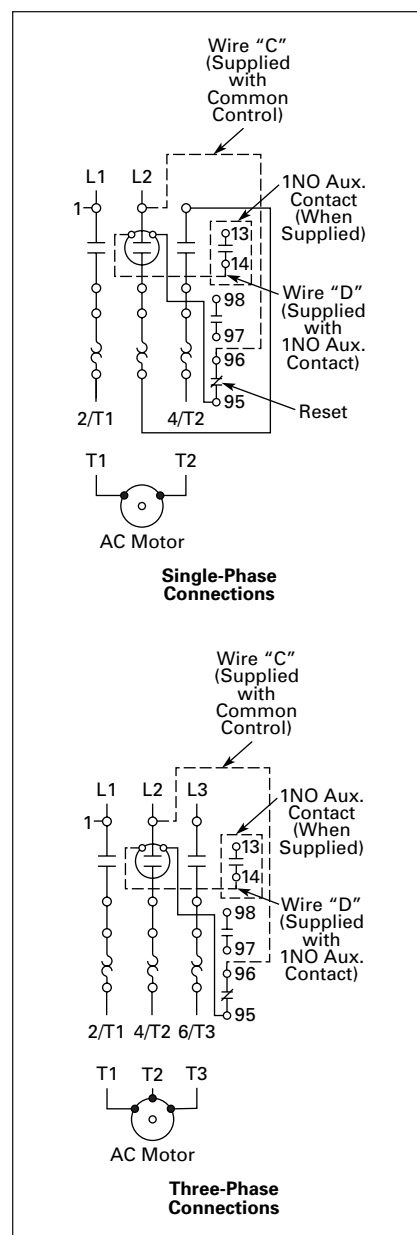


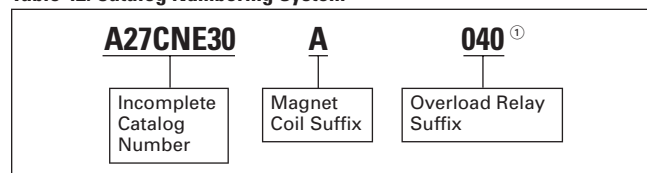
Figure 7. Starter Wiring Diagrams

Product Selection

When Ordering Specify

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

Table 42. Catalog Numbering System



① Order Catalog Number A27CNE30A040.

Note: Modify Catalog Number for any options required.

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

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		*
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	115 230 460 575	90 90 75 60	— 3 5 5	— 2.2 3.7 3.7	A27CNC15_	A27CRC15_	A27SNC15_	A27SRC15_	
25	115 230 460 575	150 150 125 100	— 7-1/2 10 10	— 5.5 7.5 7.5	A27CNC25_	A27CRC25_	A27SNC25_	A27SRC25_	
30	115 230 460 575	180 180 150 120	— 10 15 15	— 7.5 11 11	A27CNE30_	A27CRE30_	A27SNE30_	A27SRE30_	
40	115 230 460 575	240 240 200 160	— 10 20 20	— 7.5 15 15	A27CNE40_	A27CRE40_	A27SNE40_	A27SRE40_	
45	115 230 460 575	270 270 225 180	— 15 30 30	— 11 22 22	A27CNE45_	A27CRE45_	A27SNE45_	A27SRE45_	

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

Table 44. Magnet Coil Selection

AC ⑤		Coil Suffix	DC ③	
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 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 33 for more detail.

④ Available through 45A.

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

Table 45. Overload Relay Suffix

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range
Frame C		
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
Frame D		
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

Discount Symbol 1CD-5C

* Consult Sales Office for Pricing

15 – 45A, Single and Three-Phase — A27, B27

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

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		*
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 — —	B27CNC15_	B27CRC15_	B27SNC15_	B27SRC15_	
25	115 230 460 575	150 150 125 100	2 3 — —	1.5 2.2 — —	B27CNC25_	B27CRC25_	B27SNC25_	B27SRC25_	
30	115 230 460 575	180 180 150 120	2 5 — —	1.5 3.7 — —	B27CNE30_	B27CRE30_	B27SNE30_	B27SRE30_	
40	115 230 460 575	240 240 200 160	3 7-1/2 — —	2.2 5.5 — —	B27CNE40_	B27CRE40_	B27SNE40_	B27SRE40_	
45	115 230 460 575	270 270 225 180	3 7-1/2 — —	2.2 7.5 — —	B27CNE45_	B27CRE45_	B27SNE45_	B27SRE45_	

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

Table 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		24	
110 – 120	110 – 120		48	
208 – 240	208 – 240		120	
240 ③	220	A		1T
277	—			
—	380 – 415			
440 – 480	440 – 480			
550 – 600	550 – 600	B		1W
		J		1A
		H		
		L		
		C		
		D		

② Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 33** for more detail.

③ Available through 45A.

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

Table 48. Overload Relay Suffix

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range
Frame C		
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
Frame D		
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

Discount Symbol 1CD-5C

* Consult Sales Office for Pricing

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.

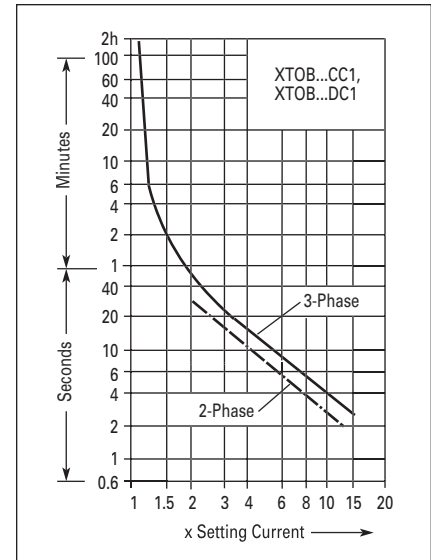


Figure 8. Tripping Characteristics

Table 49. Overload Relay — Technical Data and Specifications

Description	XTOB...CC1	XTOB...DC1
General		
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 (Ui) VAC	690	690
Overvoltage Category /Pollution Degree	III/3	III/3
Impulse Withstand Voltage (Uimp) VAC	6000	6000
Operational Voltage (Ue) 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 ² Flexible with ferrule, mm ²	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 Pozidrive 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 mm² 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 49. Overload Relay — Technical Data and Specifications (Continued)

Description	XTOB...CC1	XTOB...DC1
Auxiliary and Control Circuit Connections		
Impulse Withstand Voltage (U _{imp}) VAC	6000	6000
Overvoltage Category/Pollution Degree	III/3	III/3
Terminal Capacity Solid, mm ² Flexible with ferrule, mm ² 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 _i) VAC	500	500
Rated Operational Voltage (U _e) 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 _{th}	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 50. Overload Relay Replacement Catalog Numbers

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

Discount Symbol **1CD-1C**

* Consult Sales Office for Pricing



Contents

Description	Page
Starters 15 – 75A	
Product Description	19
Features	19
Standards and Certifications	19
Catalog Number Selection	20
Product Selection	21
Overload Relay Specifications	23



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

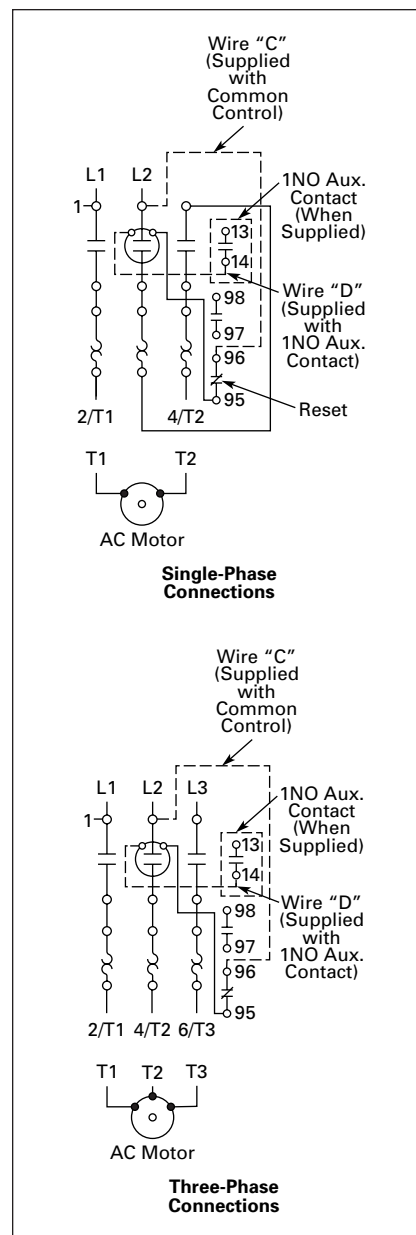


Figure 9. Starter Wiring Diagrams



Catalog Number Selection

Table 51. A29 and B29 DP Catalog Numbering System

A 29 C N C 25 A X 3E 005									
Designation A = Three-Phase Starter B = Single-Phase Starter					Overload Range DP Starters with C396 Electronic Overload 15A – 75A Contactor P50 = 0.1 – 0.5A 002 = 0.4 – 2.0A 005 = 1 – 5A 008 = 1.6 – 8.0A 032 = 6.4 – 32A 045 = 9 – 45A 075 = 15 – 75A				
Type 29 = Non-reversing 69 = Reversing					OLR Model Designation 3E = Standard C396 OLR SEL Reset, SEL Class				
Control C = Common Control S = Separate Control					Auxiliary Contacts (Side Mount) A = 1NO Pressure Plate B = 1NC Pressure Plate C = 1NO-1NC Pressure Plate D = 2NO Pressure Plate E = 2NC Pressure Plate F = 1NO Pressure Plate and QC G = 1NC Pressure Plate and QC H = 1NO-1NC Pressure Plate and QC J = 2NO Pressure Plate and QC K = 2NC Pressure Plate and QC L = 1NO-1NC Snap Switch QC Only M = 2NO-2NC Snap Switch QC Only X = none				
Enclosure Type N = Open with Metal Mounting Plate R = Open with DIN Rail Mounting Adapter (2- and 3-Pole, 15 – 50A Contactors Only) G = NEMA Type 1 Enclosed					AC Coil Codes R = 12V T = 24V A = 110/120V B = 208/240V C = 440/480V D = 550/600V H = 277V L = 380/415V J = 240V/60 Hz; 220V/50 Hz (Available through 50A)				
Power Terminals 15 – 40A Contactor A = Binding Head Screws without Quick Connect Terminals B = Binding Head Screws with Quick Connect Terminals C = Pressure Plate without Quick Connect Terminals D = Pressure Plate with Quick Connect Terminals E = Lugs without Quick Connect Terminals F = Lugs with Quick Connect Terminals 50 – 75A Contactor E = Lugs without Quick Connect Terminals F = Lugs with Quick Connect Terminals					Current Ratings 15 = 15A 25 = 25A 30 = 30A 40 = 40A 50 = 50A 60 = 60A 75 = 75A				

Product Selection

When Ordering Specify

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



Table 52. Catalog Numbering System

A 29 C N C 15 A X 3 E 0 0 5			
AC Coil Codes R = 12V T = 24V A = 110/120V B = 208/240V C = 440/480V D = 550/600V H = 277V L = 380/415V J = 240V/60 Hz; 220V/50 Hz (Available through 50A)		Overload Range DP Starters with C396 Electronic Overload 15A, 25A and 30A Contactor P50 = 0.1 – 0.5A 002 = 0.4 – 2.0A 005 = 1 – 5A 008 = 1.6 – 8.0A 032 = 6.4 – 32A 045 = 9 – 45A 075 = 15 – 75A	
Auxiliary Contacts (Side Mount) A = 1NO Pressure Plate B = 1NC Pressure Plate C = 1NO-1NC Pressure Plate D = 2NO Pressure Plate E = 2NC Pressure Plate F = 1NO Pressure Plate and QC G = 1NC Pressure Plate and QC H = 1NO-1NC Pressure Plate and QC J = 2NO Pressure Plate and QC K = 2NC Pressure Plate and QC L = 1NO-1NC Snap Switch QC Only M = 2NO-2NC Snap Switch QC Only X = none		OLR Model Designation 3E = Standard C396 OLR SEL Reset, SEL Class	

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

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		*
Inductive Full Load	Line Voltage	Locked Rotor			Metal Mounting Plate Catalog Number ①	DIN Rail Adapter Catalog Number ①	Metal Mounting Plate Catalog Number ①	DIN Rail Adapter 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	A29CNE50_	A29CRE50_	A29SNE50_	A29SRE50_	
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 52**).

Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing

Product Selection

When Ordering Specify

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

**Available
June 2007**

Table 54. Catalog Numbering System

B 29 C N C 15 A X 3 E 005				
Incomplete Catalog Number				
AC Coil Codes R = 12V D = 550/600V T = 24V H = 277V A = 110/120V L = 380/415V B = 208/240V J = 240V/60 Hz; 220V/50 Hz C = 440/480V (Available through 50A)				
Auxiliary Contacts (Side Mount) A = 1NO Pressure Plate B = 1NC Pressure Plate C = 1NO-1NC Pressure Plate D = 2NO Pressure Plate E = 2NC Pressure Plate F = 1NO Pressure Plate and QC G = 1NC Pressure Plate and QC H = 1NO-1NC Pressure Plate and QC J = 2NO Pressure Plate and QC K = 2NC Pressure Plate and QC L = 1NO-1NC Snap Switch QC Only M = 2NO-2NC Snap Switch QC Only X = none				
		Overload Range DP Starters with C396 Electronic Overload 15A, 25A and 30A Contactor P50 = 0.1 – 0.5A 002 = 0.4 – 2.0A 005 = 1 – 5A 008 = 1.6 – 8.0A 032 = 6.4 – 32A 045 = 9 – 45A 075 = 15 – 75A		
		OLR Model Designation 3E = Standard C396 OLR SEL Reset, SEL Class		

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

Ampere Rating			Max. Motor hp	Max. Motor kW	Common Control		Separate Control		*
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 54**).

Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing

Overload Relay Specifications



Technical Data and Specifications

Table 56. Overload Relay Specifications

General Description	C396_2_ Standard
Protection	
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)
Trip Class	
Class 5, 10, 20, 30	Selectable
Reset	
M / M-O A / A-O	Manual / Manual + Stop Auto / Auto + Stop Auto Reset Time = 165s
Indications	
Test Indicator	Yellow
Trip Indicator	Yellow
PCBA	
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
Options	
Safety Cover	Covers FLA dial, DIP switches
Remote Reset	24V DC, 24V AC, 120V AC, 240V AC

Table 56. Overload Relay Specifications (Continued)

General Description	C396_2_ Standard
Climate Considerations	
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
Voltages	
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
FLA Range	
45 mm Frame: C396A_	0.1 – 45A
65 mm Frame: C396B_	15 – 110A
110 mm Frame: C396C_	30 – 150A
Safety	
Degree of Protection	IP20 (Stand-Alone Version Only)
Capacity	
Control Terminal Capacity	18 – 14 AWG
Control Terminal Tightening Torque in Nm (lb-in)	0.79 (7)
Load Terminal Capacity	
45 mm Frame: C396A_	14 – 6 AWG
65 mm Frame: C396B_	10 – 1 AWG
110 mm Frame: C396C_	6 AWG – 250 mcm
Load Terminal Tightening Torque in Nm (lb-in)	
45 mm Frame: C396A_	3.2 (28)
65 mm Frame: C396B_	9.0 (80)
110 mm Frame: C396C_	22.6 (200)

Overload Relay Specifications



Table 57. C396 Replacement Overloads for Integrated Use with DP Contactors

FLA Range (Amps)	DP Contactor Rating	Standard Class 5/10/20/30	
		Catalog Number	*

45 mm Overload Frame Size

0.1 – 0.5	15, 25, 30	C396A2AP05SELDG	
0.4 – 2.0	15, 25, 30	C396A2A002SELDG	
1 – 5	15, 25, 30	C396A2A005SELDG	
1.6 – 8	15, 25, 30, 40	C396A2A008SELDE	
6.4 – 32	15, 25, 30, 40, 50	C396A2A032SELDG	
9 – 45	40, 50	C396A2A045SELDG	

65 mm Overload Frame Size

15 – 75	60, 75	C396B2B075SELDG	
---------	--------	-----------------	--

Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing



NEMA 1 Enclosed DP Contactor

Product Selection

When Ordering Specify

- Catalog Number plus Magnet Coil Suffix, below.
- Modify Catalog Number for any options required — see Options, Page 6.

Table 58. Catalog Numbering System

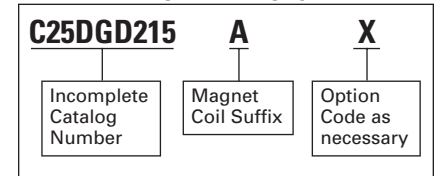


Table 59. 2-, 3- and 4-Pole NEMA Type 1 Enclosed Contactors Product Selection

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	*
15	20	115	90	3/4	—	0.40	—	2	C25DGD215_	
		230	90	2	3	1.5	2.2	3	C25DGD315_	
		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	3	C25DGD325_	
		460	125	—	10	—	7.5	4	C25EGD425_	
		575	100	—	10	—	7.5			
30	40	115	180	2	—	1.5	—	2	C25DGD230_	
		230	180	5	10	3.7	7.5	3	C25DGD330_	
		460	150	—	15	—	11	4	C25EGD430_	
		575	120	—	15	—	11			
40	50	115	240	3	—	2.2	—	2	C25DGF240_	
		230	240	7-1/2	10	5.5	7.5	3	C25DGF340_	
		460	200	—	20	—	15	4	C25EGF440_	
		575	160	—	20	—	15			
50	65	115	300	3	—	2.2	—	2	C25DGJ250_	
		230	300	10	15	7.5	11	3	C25DGJ350_	
		460	250	—	30	—	22			
		575	200	—	30	—	22			
60	75	115	360	5	—	3.7	—	2	C25FGF260_	
		230	360	10	20	7.5	15	3	C25FGF360_	
		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 60. Magnet Coil Selection

Voltage		Coil Suffix
60 Hertz	50 Hertz	

AC ⑤

12	12	R T A B J H L C D
24	24	
110 – 120 ④	110 – 120 ④	
208 – 240	208 – 240	
240 ③	220	
277	—	
—	380 – 415	
440 – 480	440 – 480	
550 – 600	550 – 600	

DC ②

12	1R 1T 1W 1A
24	
48	
120	

② Contactors with DC coils include an early break NC auxiliary contact, C320KGD1. See Page 33 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 4, 34
Options	Page 6
Accessories	Page 6
Dimensions	Page 30
Discount Symbol	1CD-5C

* Consult Sales Office for Pricing



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 Overload 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 13**.

Table 61. Catalog Numbering System

A25CGC30	A	X
Incomplete Catalog Number	Magnet Coil Suffix	Option Code as necessary

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

Ampere Rating			Max. Motor hp		Max. Motor kW		Single-Phase ②③			Three-Phase ③		
Inductive Full Load	Line Voltage	Locked Rotor	1-Phase	3-Phase	1-Phase	3-Phase	Common Control	Separate Control	*	Common Control	Separate Control	*
							Catalog Number ①	Catalog Number ①		Catalog Number ①	Catalog Number ①	
25	115 230 460 575	150 150 125 100	2 3 — —	— 7-1/2 10 10	1.5 2.2 — —	— 5.5 7.5 7.5	B25CGC25_	B25SGC25_		A25CGC25_	A25SGC25_	
30	115 230 460 575	180 180 150 120	2 5 — —	— 10 15 15	1.5 3.7 — —	— 7.5 11 11	B25CGC30_	B25SGC30_		A25CGC30_	A25SGC30_	
40	115 230 460 575	240 240 200 160	3 — 7-1/2 —	— 10 20 20	2.2 5.5 — —	— 7.5 15 15	B25CGE40_	B25SGE40_		A25CGE40_	A25SGE40_	
50	115 230 460 575	300 300 250 200	— — — —	— 15 30 30	— — — —	— 11 22 22	—	—		A25CGE50_	A25SGE50_	
60	115 230 460 575	360 360 300 240	— — — —	— 20 40 40	— — — —	— 15 30 30	—	—		A25CGE60_	A25SGE60_	

① Incomplete Catalog Number. Replace underscore (_) with Magnet Coil Suffix from **Table 63**.

② Starters do not include heater packs. Select heater pack from tables, **Page 13**.

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

④ Starters with DC coils include an early breaking auxiliary contact, C320KGD1. See **Page 33** for more detail.

⑤ Available through 50A.

⑥ 104 – 120A 50/60 Hz for 60A Contactor.

⑦ Class H AC Coils available as option. Add 2 before Coil Suffix letter.

Table 63. Magnet Coil Selection

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

Technical Data **Pages 10, 34**
 Accessories **Page 6**
 Dimensions **Page 28**
 Discount Symbol **1CD-5C**

* Consult Sales Office for Pricing



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 64. Catalog Numbering System

A27CGE30	A	040
Incomplete Catalog Number	Magnet Coil Suffix	Overload Relay Suffix

Table 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	*	Common Control	Separate Control	*
							Catalog Number ①	Catalog Number ①		Catalog Number ①	Catalog Number ①	
15	115 230 460 575	90 90 75 60	3/4 2 — —	— 3 5 5	0.4 1.5 — —	— 2.2 3.7 3.7	B27CGC15_	B27SGC15_		A27CGC15_	A27SGC15_	
25	115 230 460 575	150 150 125 100	2 3 — —	— 7-1/2 10 10	1.5 2.2 — —	— 5.5 7.5 7.5	B27CGC25_	B27SGC25_		A27CGC25_	A27SGC25_	
30	115 230 460 575	180 180 150 120	2 5 — —	— 10 15 15	1.5 3.7 — —	— 7.5 11 11	B27CGE30_	B27SGE30_		A27CGE30_	A27SGE30_	
40	115 230 460 575	240 240 200 160	3 7-1/2 — —	— 10 20 20	2.2 5.5 — —	— 7.5 15 15	B27CGE40_	B27SGE40_		A27CGE40_	A27SGE40_	
45	115 230 460 575	270 270 225 180	3 7-1/2 — —	— 15 30 30	2.2 7.5 — —	— 11 22 22	B27CGE45_	B27SGE45_		A27CGE45_	A27SGE45_	

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

Table 66. Magnet Coil Selection

Voltage	Coil Suffix
60 Hertz	50 Hertz
AC ④	
12	12
24	24
110 – 120	110 – 120
208 – 240	208 – 240
240 ②	220
277	—
—	380 – 415
440 – 480	440 – 480
550 – 600	550 – 600
DC 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 33 for more detail.

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

Table 67. Overload Relay Suffix

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range
Frame C		
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
Frame D		
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 14, 34
Accessories..... Page 6
Dimensions..... Page 29
Discount Symbol..... 1CD-5C

* Consult Sales Office for Pricing

A25 and B25 Starters

Table 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	
			C	D	E	G	H	

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)

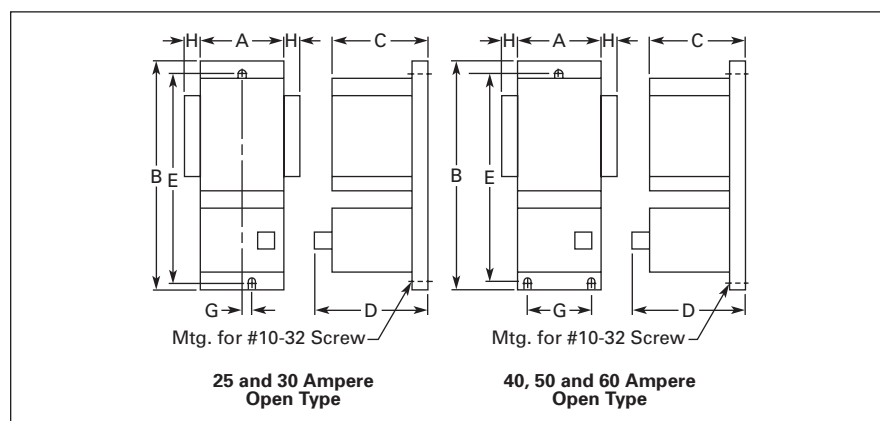


Figure 10. Approximate Dimensions — Open Type

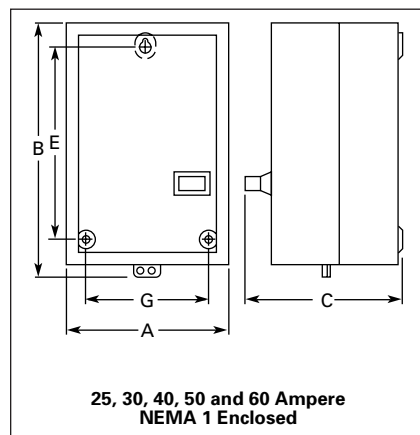


Figure 11. NEMA 1 Enclosed Dimensions

A27 and B27 Starters

Table 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	H	
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)

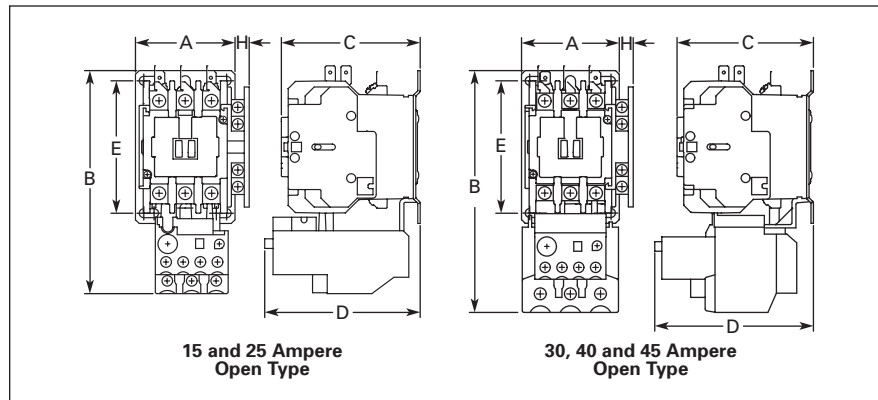


Figure 12. Approximate Dimensions — Open Type

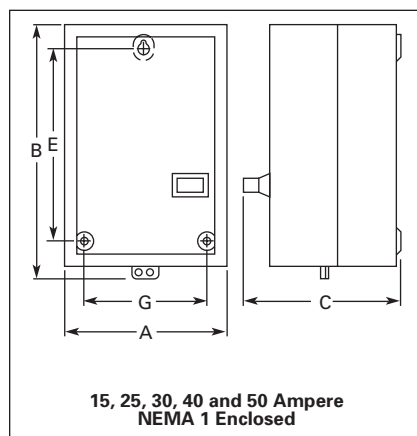


Figure 13. NEMA 1 Enclosed Dimensions

C25 Contactors

Table 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	H	J		
Open Type												
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)	
Open Type — Reversing												
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)	
NEMA 1 Enclosed												
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.

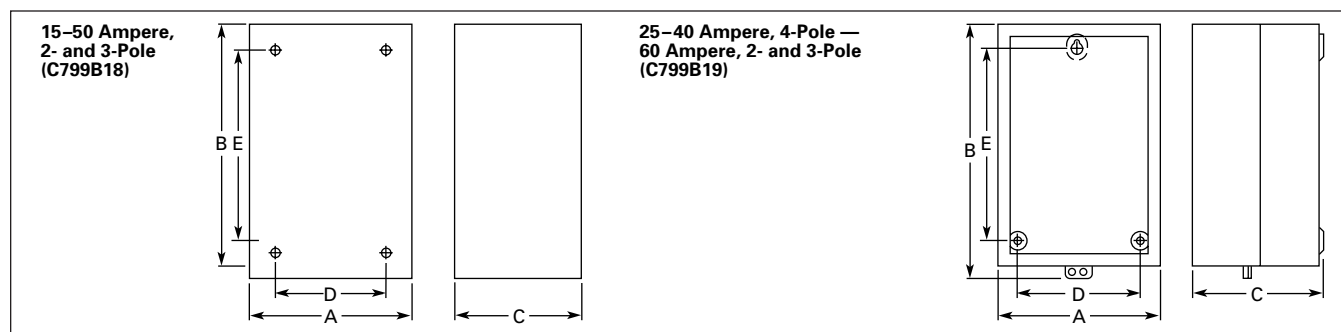


Figure 14. Enclosures

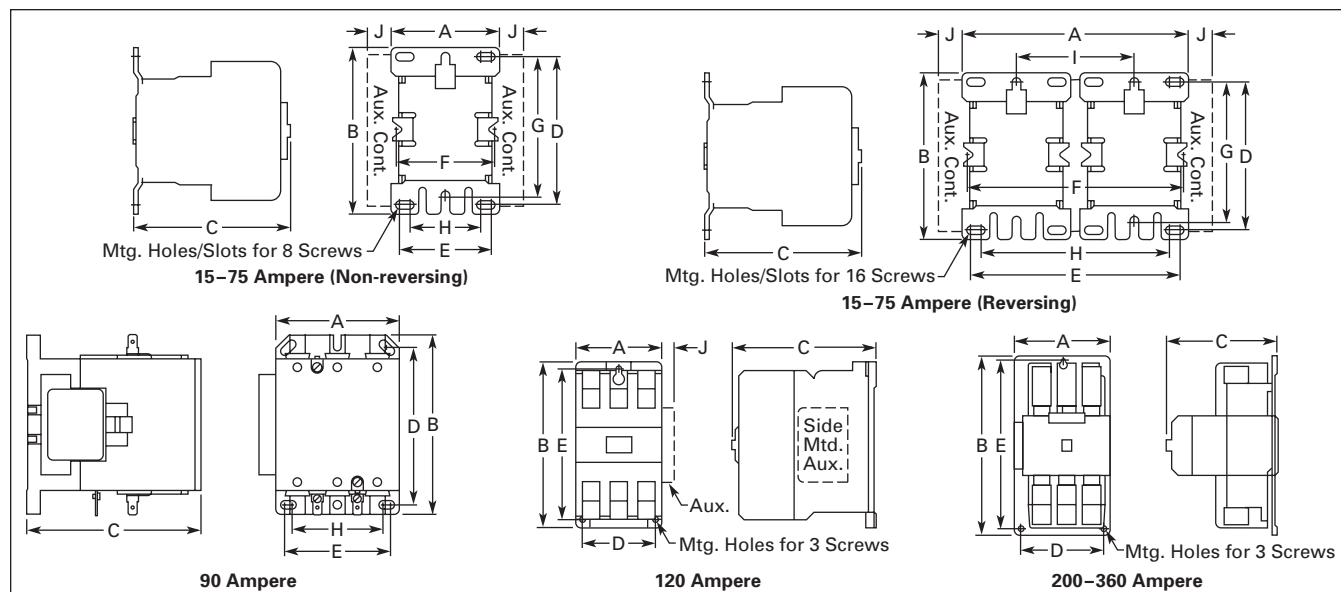


Figure 15. 15 – 360A, 2-, 3- and 4-Pole

Renewal Parts

Renewal Contact Kits for C25 Definite Purpose Contactors

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

Table 72. Renewal Contact Kits for C25 Definite Purpose Contactors

Catalog Number	1-Pole Kit Part No.	*	2-Pole Kit Part No.	*	3-Pole Kit Part No.	*
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 71. AC Coil Selection

AC Coil Voltage	Frequency	Inrush (Maximum)		Sealed (Maximum)		Coil Suffix	Coil Part Number		*		
		VA	Watts	VA	Watts		Class	Standard			
15, 25, 30 and 40A — 2- and 3-Pole (Series D1)											
12 24 110/120 208/240	60	74.85 81.35 74.69 82.64	46.1 49.7 51.6 59.1	5.53 5.83 5.79 6.96	1.68 1.74 1.81 2.38	R T A B	Class F, 155°C	9-3185-5 9-3185-6 9-3185-1 9-3185-2			
220/240 440/480 550/600 277	60	74.03 73.39 79.47 72.88	51.8 52.1 51.7 52.4	5.85 6.09 6.56 6.09	1.99 2.58 3.05 2.58	J C D H		Class F, 155°C	9-3185-10 9-3185-3 9-3185-4 9-3185-7		
380/415	50	64.50	50.6	6.08	2.43	L			Class F, 155°C	9-3185-8	
15, 25, 30 and 40A — 2- and 3-Pole (Series C1)											
12 24 104/120	60	65.00 65.00 65.00	30.0 30.0 30.0	11.00 11.00 11.00	2.50 2.50 2.50	R T A	Class F, 155°C		9-3125-5 9-3125-6 9-3125-1		
208/240 440/480 550/600	50	75.00 75.00 75.00	35.0 35.0 35.0	17.00 17.00 17.00	3.50 3.50 3.50	B C D		Class F, 155°C	9-3125-2 9-3125-3 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	
15, 25, 30 and 40A — 2- and 3-Pole (Series D1)											
12 24 110/120 208/240	60	74.85 81.35 74.69 82.64	46.1 49.7 51.6 59.1	5.53 5.83 5.79 6.96	1.68 1.74 1.81 2.38	R T A B	Class H, 180°C	9-3252-5 9-3252-6 9-3252-1 9-3252-2			
220/240 440/480 550/600 277	60	74.03 73.39 79.47 72.88	51.8 52.1 51.7 52.4	5.85 6.09 6.56 6.09	1.99 2.58 3.05 2.58	J C D H		Class H, 180°C	9-3252-10 9-3252-3 9-3252-4 9-3252-7		
380/415	50	64.50	50.6	6.08	2.43	L			Class H, 180°C	9-3252-8	
50A — 2- and 3-Pole (Series D1)											
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 F, 155°C		9-3186-5 9-3186-6 9-3186-1 9-3186-2		
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 F, 155°C	9-3186-10 9-3186-3 9-3186-4 9-3186-7		
380/415	50	110.3	77.0	8.66	3.31	L			Class F, 155°C	9-3186-8	

Discount Symbol **1CD-1C**

* Consult Sales Office for Pricing

Table 71. AC Coil Selection — Continued

AC Coil Voltage	Frequency	Inrush (Maximum)		Sealed (Maximum)		Coil Suffix	Coil Part Number		*
		VA	Watts	VA	Watts		Class	Standard	
50A — 2- and 3-Pole (Series D1)									
12 24 110/120 208/240	60	115.8	73.6	7.71	2.80	R T A B	Class H, 180°C	9-3253-5	
		118.1	70.7	7.58	2.79			9-3253-6	
		110.7	73.3	7.67	2.89			9-3253-1	
		124.9	90.3	10.04	3.74			9-3253-2	
220/240 440/480 550/600 277	60	112.9	76.2	7.60	3.02	J C D H	Class H, 180°C	9-3253-10	
		114.7	75.6	8.01	3.68			9-3253-3	
		109.0	78.6	8.21	4.11			9-3253-4	
		115.4	73.1	7.73	3.12			9-3253-7	
380/415	50	110.3	77.0	8.66	3.31	L	Class H, 180°C	9-3253-8	
60 and 75A — 2- and 3-Pole; 25, 30 and 40A — 4-Pole									
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	
90A — 2- and 3-Pole									
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	
120A — 3-Pole									
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	
200, 300 and 360A — 3-Pole									
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	

Discount Symbol **1CD-1C**

* Consult Sales Office for Pricing

DC Coils

Table 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	*
15, 25, 30 and 40A — 2- and 3-Pole (Series D1)								
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	
50A — 2- and 3-Pole (Series D1)								
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	
15, 25, 30 and 40A — 2- and 3-Pole (Series C1)								
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	
60 and 75A — 2- and 3-Pole; 25, 30 and 40A — 4-Pole (Series C1)								
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.

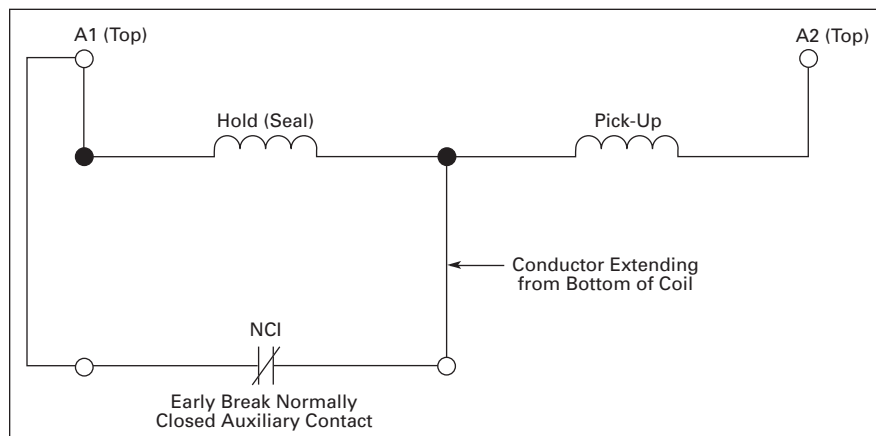


Figure 16. DC Coil Elementary Diagram — Contactors and Starters

Discount Symbol **1CD-1C**

* Consult Sales Office for Pricing

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.

Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor

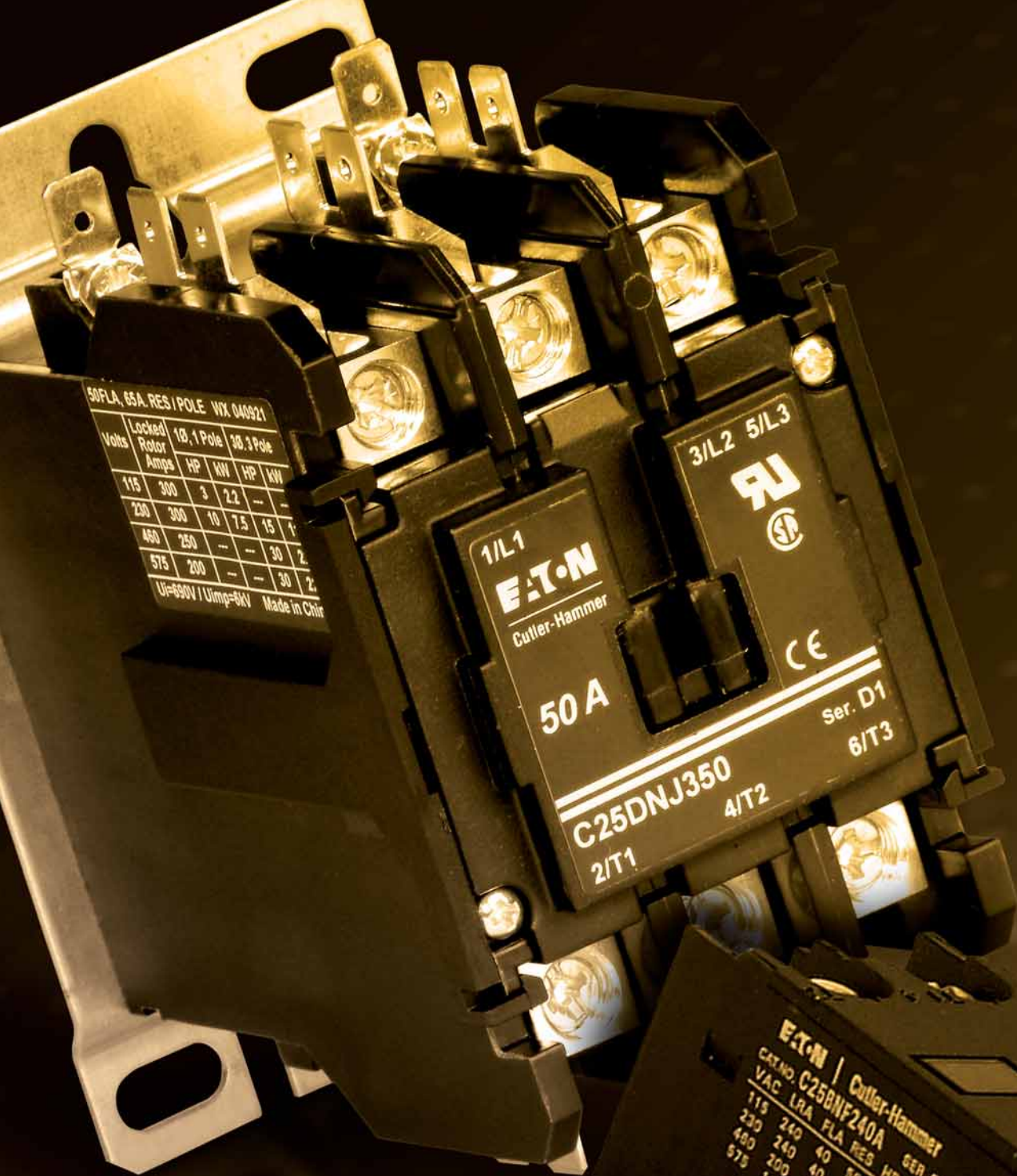
hp ①	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ②	460V	575V	2200V
1/4	1800	1.09	.95	.55	.48	.38	—
	1200	1.61	1.40	.81	.70	.56	—
	900	1.84	1.60	.93	.80	.64	—
1/3	1800	1.37	1.19	.69	.60	.48	—
	1200	1.83	1.59	.92	.80	.64	—
	900	2.07	1.80	1.04	.90	.72	—
1/2	1800	1.98	1.72	.99	.86	.69	—
	1200	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	—

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.

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.



50FLA, 65A RES / POLE WX 040921

Volts	Locked Rotor Amps	1Ø, 1 Pole HP	1Ø, 1 Pole kW	3Ø, 3 Pole HP	3Ø, 3 Pole kW
115	300	3	2.2	—	—
230	300	10	7.5	15	11
460	250	—	—	30	22
575	200	—	—	30	22

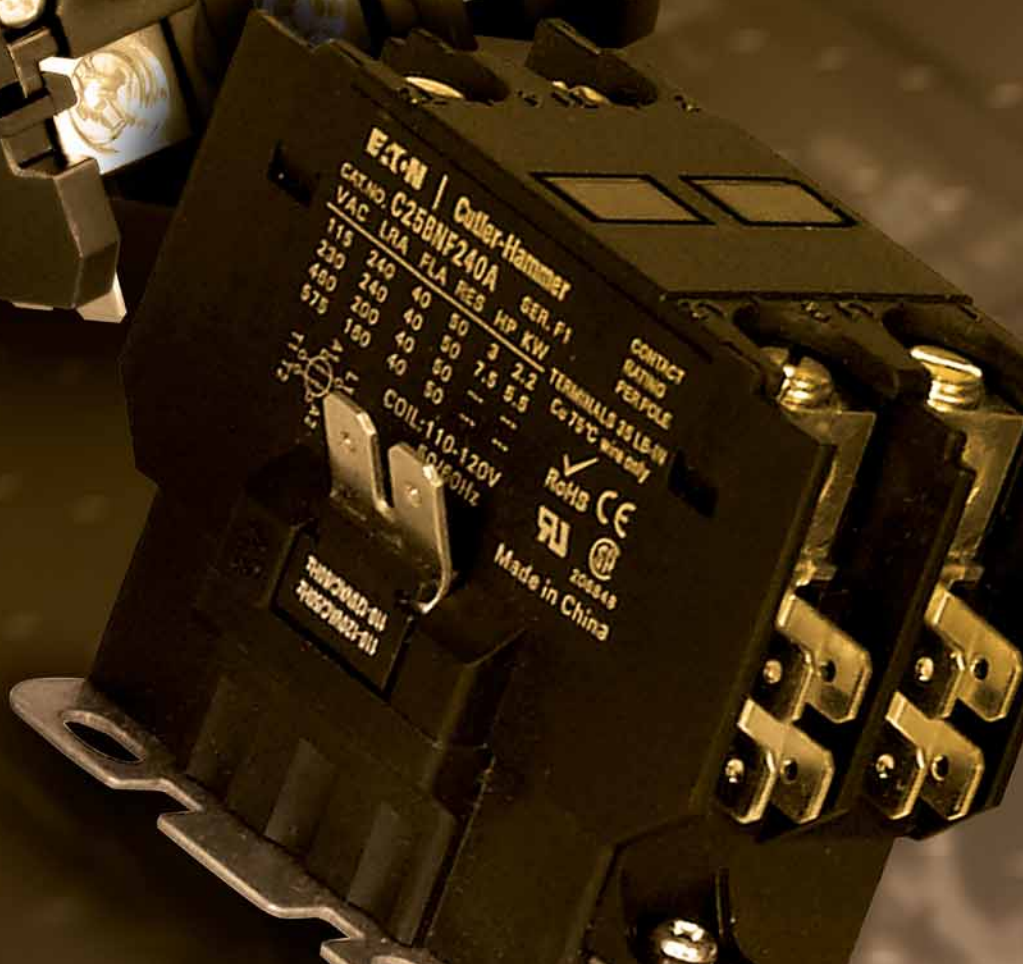
U_i=690V / U_{imp}=8kV Made in China

1/L1
EATON
Cutler-Hammer
50 A
C25DNJ350
2/T1 4/T2

3/L2 5/L3



Ser. D1
6/T3



EATON | Cutler-Hammer
CAT. NO. C25BNF240A
VAC LRA FLA RES HP KW SER. F1
115 240 40 50 3 2.2
230 240 40 50 3 2.2
460 200 40 50 7.5 5.5
575 180 40 50 7.5 5.5
COIL: 110-120V 50/60Hz
CONTACT RATING PER POLE
TERMINALS 25 LB-IN
Co 75°C wire only
RoHS CE
200849
Made in China

Eaton's electrical business is a global leader in electrical control, power distribution, uninterruptible power supply and industrial automation products and services. Eaton's global electrical brands, including Cutler-Hammer®, Powerware®, Holec® and MEM®, provide customer-driven PowerChain Management™ solutions to serve the power system needs of the industrial, institutional, government, utility, commercial, residential, IT, mission critical and OEM markets worldwide.

Eaton Corporation is a diversified industrial manufacturer with 2006 sales of \$12.4 billion. Eaton is a global leader in electrical systems and components for power quality, distribution and control; fluid power systems and services for industrial, mobile and aircraft equipment; intelligent truck drivetrain systems for safety and fuel economy; and automotive engine air management systems, powertrain solutions and specialty controls for performance, fuel economy and safety. Eaton has 61,000 employees and sells products to customers in more than 125 countries. For more information, visit www.eaton.com.

Eaton Corporation
Electrical Group
1000 Cherrington Parkway
Moon Township, PA 15108
United States
877-ETN CARE (877-386-2273)
Eaton.com

CSA is a registered trademark of the Canadian Standards Association. Cutler-Hammer is a federally registered trademark of Eaton Corporation. National Electrical Code and NEC are registered trademarks of the National Fire Protection Association, Quincy, Mass. NEMA is the registered trademark and service mark of the National Electrical Manufacturers Association. UL is a registered trademark of Underwriters Laboratories Inc.

EAT•N

Cutler-Hammer

© 2007 Eaton Corporation
All Rights Reserved
Printed in USA
Publication No. PG03502001E / Z5681
May 2007