

Standards and Certifications

- Standard: designed to meet or exceed UL, NEMA, IEC, CSA, VDE and BS
- UL listed: UL File #E1491, Guide #NLDX—Open and NEMA 1, 4, 12 Enclosed
- CSA Certified: CSA File #LR353, Class #321104 Open and NEMA 1 Enclosed



ISO 9000 Certification

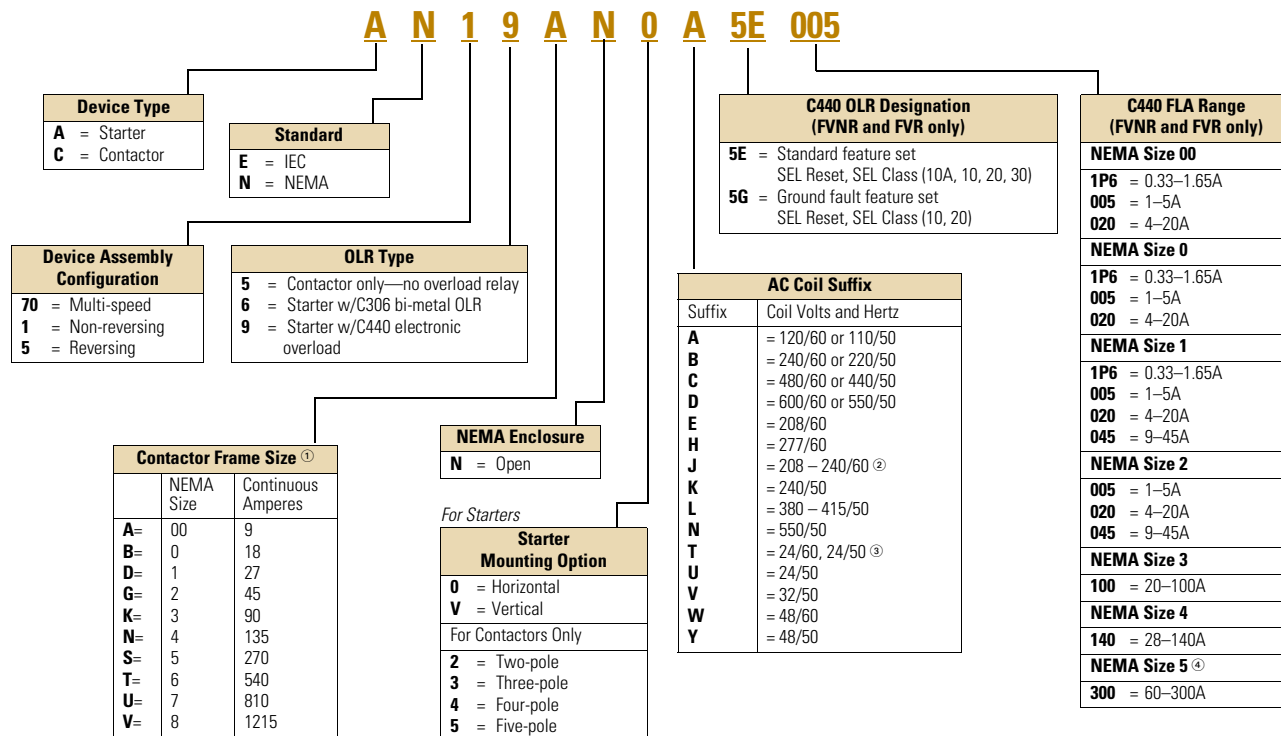
When you turn to Eaton's products, you turn to quality. The International Standards Organization (ISO) has established a series of standards acknowledged by 91 industrialized nations to bring harmony to the international quest for quality. The ISO certification process covers 20 quality system elements in design, production and installation that must conform to achieve registration. This commitment to quality will result in increased product reliability and total customer satisfaction.

Short Circuit Protection

Fuses and Inverse-Time Circuit Breakers may be selected per Article 430, Part D of the National Electrical Code to protect motor branch circuits from fault conditions. If higher ratings or settings are required to start the motor, **do not** exceed the maximum as listed in Exception No. 2, Article 430-52.

Catalogue Number Selection

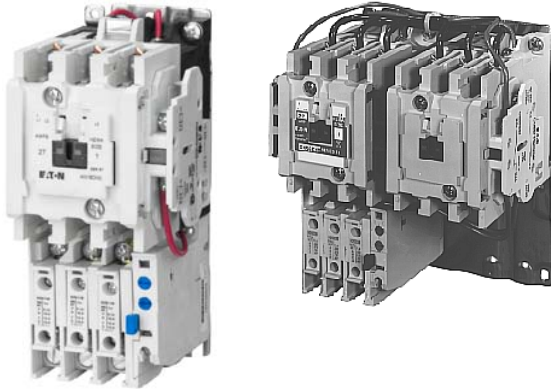
Freedom Series



Notes

- ① For contactor only orders, add **B** to end of Catalogue number if NEMA Size 00–2, 6.
- ② NEMA Sizes 00 and 0 only.
- ③ NEMA Sizes 00 and 0 only. Sizes 1–8 are 24/60 only.
- ④ NEMA Size 5 requires the use of CTs with 1-5A OL relay.

Three-Phase Non-Reversing and Reversing, Full Voltage Starters



Contents

Description	Page
Contactors—Non-Reversing and Reversing	V5-T2-4
Starters—Three-Phase Non-Reversing and Reversing, Full Voltage	
Product Selection	V5-T2-11
Kits and Accessories	V5-T2-13
Renewal Parts Publication Numbers	V5-T2-13
Technical Data and Specifications	V5-T2-13
Wiring Diagrams	V5-T2-14
Starters—Single-Phase Non-Reversing, Full Voltage, Bi-Metallic Overload	V5-T2-15
Accessories	V5-T2-21
Renewal Parts	V5-T2-30
Technical Data and Specifications	V5-T2-34
Relays—Thermal Overload	V5-T2-38
C440/ <i>XT</i> Electronic Overload Relay	V5-T2-48

Starters—Three-Phase Non-Reversing and Reversing, Full Voltage

Product Description

Non-Reversing

Three-phase, full voltage magnetic starters are most commonly used to switch AC motor loads. Starters consist of a magnetically actuated switch (contactor) and an overload relay assembled together.

Reversing

Three-phase, full voltage magnetic starters are used primarily for reversing of three-phase squirrel cage motors. They consist of two contactors and a single overload relay assembled together. The contactors are mechanically and electrically interlocked to prevent line shorts and energization of both contactors simultaneously.

Features, Benefits and Functions

- Bimetallic ambient compensated overload relays—available in three basic sizes covering applications up to 900 hp—reducing number of different contactor/overload relay combinations that have to be stocked
These overload relays feature:
 - Selectable manual or automatic reset operation
 - Interchangeable heater packs adjustable $\pm 24\%$ to match motor FLA and calibrated for 1.0 and 1.15 service factors. Heater packs for smaller overload relay will mount in larger overload relay—useful in derating applications such as jogging
 - Load lugs built into relay base
 - Single-phase protection, Class 20 or Class 10 trip time
 - Overload trip indication
 - Electrically isolated NO-NC contacts (pull RESET button to test)
- The C440 is a self-powered, robust electronic overload designed for integrated use with Freedom NEMA contactors
 - Tiered feature set to provide coverage specific to your application
 - Broad 5: 1 FLA range for maximum flexibility
 - Coverage from 0.05–1500A to meet all your needs
- Long life twin break, silver cadmium oxide contacts—provide excellent conductivity and superior resistance to welding and arc erosion. Generously sized for low resistance and cool operation
- Designed to 3,000,000 electrical operations at maximum hp ratings up through 25 hp at 600V
- Steel mounting plate standard on all open type starters
- Wired for separate or common control

Non-Reversing

- Holding circuit contact(s) supplied as standard:
 - Sizes 00–3 have a NO auxiliary contact block mounted on right-hand side (on Size 00, contact occupies 4th power pole position—no increase in width)
 - Sizes 4–5 have a NO contact block mounted on left side
 - Sizes 6–7 have a 2NO/2NC contact block on top left
 - Size 8 has a NO/NC contact block on top left back and a NO on top right back

Reversing

- Each contactor (Size 00–8) supplied with one NO-NC side mounted contact block as standard. NC contacts are wired as electrical interlocks

Product Selection

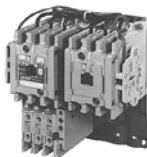
When Ordering Supply

- Catalogue number
- Heater pack number (see selection table, **Pages V5-T2-40 to V5-T2-42**) or full load current

Size 0 Non-Reversing Starter



Size 1 Reversing Starter



Type AN16/AN56 NEMA—Manual or Automatic Reset Overload Relay—Non-Reversing and Reversing ^①

NEMA Size	Continuous Ampere Rating	Service-Limit Current Rating (Amperes) ^②	Maximum UL Horsepower ^②						Three-Pole Non-Reversing ^③ Catalogue Number	Three-Pole Reversing ^③ Catalogue Number	Vertical Reversing ^③ Catalogue Number
			Single-Phase		Three-Phase		115V	230V			
00	9	11	1/3	1	1-1/2	1-1/2	2	2	AN16AN0_C	AN56AN0_C	—
0	18	21	1	2	3	3	5	5	AN16BN0_C	AN56BN0_C	AN56BNV0_
1	27	32	2	3	7-1/2	7-1/2	10	10	AN16DN0_B	AN56DN0_B	AN56DNV0_
2	45	52	3	7-1/2	10	15	25	25	AN16GN0_B	AN56GN0_B	AN56GNV0_
3	90	104	—	—	25	30	50	50	AN16KN0_	AN56KN0_	AN56KNV0_
4	135	156	—	—	40	50	100	100	AN16NN0_	AN56NN0_	AN56NNV0_
5	270	311	—	—	75	100	200	200	AN16SN0_B	AN56SN0_B	—
6	540	621	—	—	150	200	400	400	AN16TN0_C	AN56TN0_C	—
7	810	932	—	—	200	300	600	600	AN16UN0_B	AN56UN0_B	—
8 ^⑤	1215	1400	—	—	400	450	900	900	AN16VN0_B	AN56VN0_B	—

Magnet Coils—AC or DC

Starter coils listed in this section also have a 50 Hz rating as shown in the adjacent table. Select required starter by Catalogue number and replace the magnet coil alpha designation in the Catalogue number (_)

with the proper code suffix from the table.

For Sizes 00–2 and 5–8, the magnet coil alpha designation will be the next to last digit of the listed Catalogue number. EXAMPLE: For a

380V, 50 Hz coil, change AN16BN0_C to AN16BN0LC. For all other sizes, the magnet coil alpha designation will be the last digit of the listed Catalogue number.

For **DC Magnet Coils**, see Accessories, **Pages V5-T2-28 and V5-T2-29**.

AC Suffix

Coil Volts and Hertz	Code Suffix
120/60 or 110/50	A
240/60 or 220/50	B
480/60 or 440/50	C
600/60 or 550/50	D
208/60	E
277/60	H
208–240/60 ^⑥	J
240/50	K

Coil Volts and Hertz	Code Suffix
380–415/50	L
550/50	N
24/60, 24/50 ^⑦	T
24/50	U
32/50	V
48/60	W
48/50	Y
48/50	Y

Notes

^① Starter Catalogue numbers do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Pages V5-T2-40 to V5-T2-42**.

^② Maximum horsepower rating of starters for 380V 50 Hz applications:

NEMA Size	00	0	1	2	3	4	5	6	7	8
Horsepower	1-1/2	5	10	25	50	75	150	300	600	900

^③ Underscore (_) indicates coil suffix required, see AC Suffix table.

^④ The service-limit current ratings represent the maximum rms current, in amperes, which the controller shall be permitted to carry for protracted periods in normal service. At service-limit current ratings, temperature rises shall be permitted to exceed those obtained by testing the controller at its continuous current rating. The current rating of overload relays or trip current of other motor protective devices used shall not exceed the service-limit current rating of the controller.

^⑤ Common control. For separate 120V control, insert letter **D** in 7th position of listed Catalogue number. Example: AN56VND0CB.

^⑥ NEMA Sizes 00 and 0 only.

^⑦ NEMA Sizes 00 and 0 only. Sizes 1–8 are 24/60 only.