CHOICE®

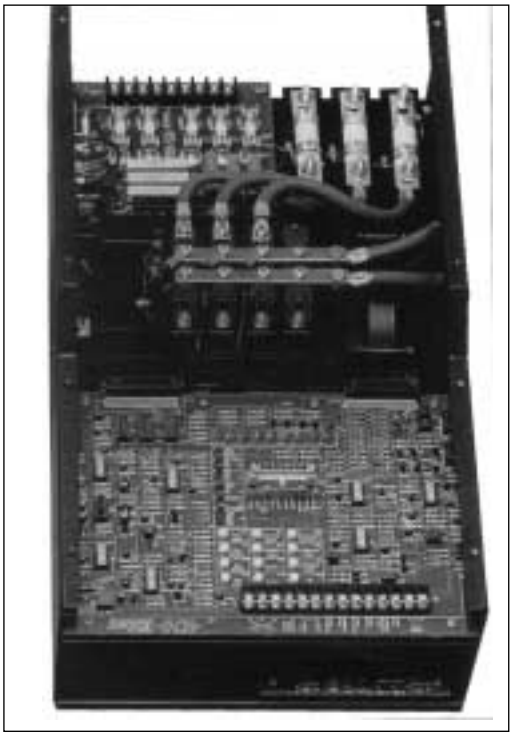
CDC300 SERIES 5 - 150 HP DC Motor Controls

General Description

The CHOICE CDC300 Series of non-regenerative D.C. motor controls provides a full range of speed or torque control for 5-150 HP D.C. motors rated for NEMA type “D” power.

Five standard models are offered in a compact panel mount assembly. Each model is customer connectable for operation at 230 VAC or 460 VAC three phase input. When operated with 230 VAC input, each unit supplies variable armature voltage up to 240 VDC and a fixed field supply of 150 VDC. For operation with 460 VAC input, each model supplies up to 500 VDC for armature voltage and a fixed field supply of 300 VDC.

Each CHOICE model is designed for maximum flexibility and ease of installation. Fuses are supplied for A.C. line protection, auxiliary line fuses for optional equipment, fuse protection for the 115 VAC control voltage input, and fusing for the field circuit. Standard relay logic interfaces separately supplied operators for Emergency Stop, Ramp Stop.



Covers Removed

Model CDC340-000

Run Forward, Run Reverse, Jog Forward, anad Jog Reverse when the unit is operated with a separately supplied Forward armature contactor and a separately supplied Reverse armature contactor. A complete line of options are available.

An accessory drive circuit monitor, Model DCM 100-000, is available to assist in set-up and troubleshooting by plugging into the control board to easily access 20 separate signals. See Section K for further details. Loaded with standard features, the Carotron CHOICE D.C. motor controls offer an innovative, economical solution to your variable speed or variable torque control requirements.

Standard Features

- Reconnectable for 230 or 460 VAC 3 phase line input
- Hall effect sensor to isolate armature current feedback
- 10 megohm impedance isolation for armature voltage feedback
- Independently adjustable 1 to 60 second Linear Accel/Decel
- Electrically isolated power modules rated 1400 Volts PIV and 1000 Volts/microsecond DV/DT
- Semiconductor fuses for power circuit protection
- R-C networks for A.C. line transient suppression
- 10 Amp internal field supply with provisions for interfacing an optional external field supply to the field loss circuit
- Latching fault logic for safety shutdown with LED indicators for Phase Loss, Field Loss, Heatsink Overtemp, and Over Current
- Foldback current limit to allow a 1 minute overload and then foldback to 112% of the current range selected
- Over Current trip when 112% of the current range selected is sustained for 5 minutes
- Speed feedback is jumper selectable for Armature Voltage, D.C. Tachometer Voltage (7, 50, or 100 V/1000 RPM), or Digital Encoder (300 PPR)
- Tachometer feedback circuit is insensitive to input polarity
- A +12 VDC, 50 mA available for encoder power supply
- Summing input for auxiliary speed signals with on board trim pot for scaling and jumper selection for polarity
- Terminal strip access to Accel/Decel output, Velocity Loop output and Current Loop input for versatile control functions. Inner current loop for responsive and precise control of motor torque and speed.
- Insensitive to phase rotation of A.C. line input
- Status LED's for Run, Zero Speed, Jog, and Foldback
- 115 VAC logic for pushbutton operator interface
- Zero Speed logic for ramp to stop and anti-plug ging protection
- Jog Delay circuit to allow rapid jogging without de-energizing the armature contactor to give longer contactor life
- 5 armature current ranges are jumper selectable for each model to match motor armature current
- High frequency multi-pulse trigger circuit for reliable SCR gating
- Ribbon cable connector interface for Drive Circuit Monitor DCM100-000 for easier setup and troubleshooting.

Specifications

A.C. INPUT
230 VAC ± 10%, 3 phase, 50/60 Hz ± 2 Hz
460 VAC ± 10%, 3 phase, 50/60 Hz ± 2 Hz

ARMATURE OUTPUT
0- 240 VDC for 230 VAC input
0-500 VDC for 460 VAC input

FIELD OUTPUT
150 VDC @ 230 VAC input, 10 Amps max.
300 VDC @460 VAC input, 10 Amps max.

HORSEPOWER RANGE
- Model CDC320-000: 10 HP @ 240 VDC, 36 Amps
  20 HP @ 500 VDC, 36 Amps
- Model CDC340-000: 20 HP @ 240 VDC, 71 Amps
  40 HP @ 500 VDC, 71 Amps
- Model CDC360-000: 30 HP @ 240 VDC, 107 Amps
  60 HP @ 500 VDC, 107 Amps
- Model CDC375-000: 40 HP @ 240 VDC, 140 Amps
  75 HP @ 500 VDC, 140 Amps
- Model CDC3150-000: 75 HP @ 240VDC, 256 Amps
  150 HP @ 500VDC, 256 Amps

SPEED REGULATION
- Armature Feedback: ± 1.0% of base speed
- Tachometer or Encoder Feedback: ± 0.5% of base speed

TORQUE REGULATION
- ±2% of range selected

ADJUSTMENTS
- Minimum Speed: 0 to 30% of Base Speed
- Maximum Speed: 0 to 110% of Base Speed
- Jog Speed: 0 to 25% of Base Speed
- Sum Trim: 0 to 100% of Summing Input
- Acceleration: 1 to 60 seconds
- Deceleration: 1 to 60 seconds
- Voltage Gain: Application dependent
- Current Gain: Application dependent
- IR Compensation: Range set by Current
- Range Jumper
- Current Limit: 0 to 150% of Current Range
- Current Calibration: Factory adjustment
- Current Offset: Factory adjustment
- Bal 1: Factory adjustment
- Bal 2: Factory adjustment

SPEED RANGE

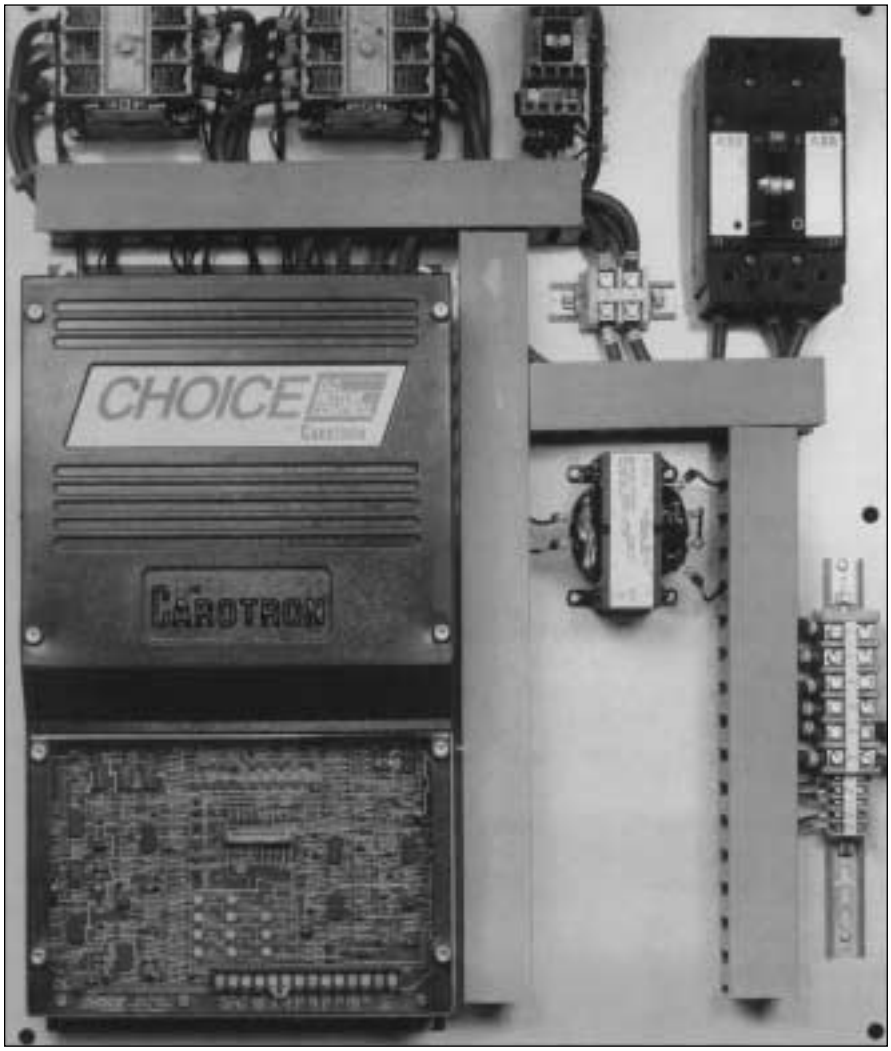
- Dependent upon motor cooling
  20:1 with Armature Feedback
  50:1 with Tach or Encoder Feedback

TEMPERATURE

Chassis - 0 to 55˚C
Enclosed - 0 to 40˚C

Standard Models and Descriptions

230 VAC input	460 VAC input	Model number	Description	Approx. Shpg. Wt.	Dim.	Conn.
5 - 10 HP	10 - 20 HP	CDC320-000	Chassis Only, basic model	35 lbs.	Fig. G.1	Fig. G.12
15 - 20 HP	25 - 40 HP	CDC340-000	Chassis Only, basic model	35 lbs.	Fig. G.1	Fig. G.12
25 - 30 HP	50 - 60 HP	CDC360-000	Chassis Only, basic model	35 lbs.	Fig. G.1	Fig. G.12
40 HP	75 HP	CDC375-000	Chassis Only, basic model	35 lbs.	Fig. G.1	Fig. G.12
50 - 75 HP	100 - 150 HP	CDC3150-000	Chassis Only, basic model	90 lbs.	Fig. G.1	Fig. G.12



Additional comdels are also offered with options such as armature contactors, brake resistors, disconnect switches, blower starters, and enclosures.

Field econimy and supply units are also available for use with the CHOICE® Series. These units can be found in secitons I and J.

Standard Models and Descriptions

Run/Stop Chassis Models

230 VAC input	460 VAC input	Model number	Description	Approx. Shpg. Wt.	Dim.	Conn.
5 - 7.5 HP	10 - 15 HP	CDC320-C15	Run/Stop Chassis Model with Arm. contactor & Control XFMR	100 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
10 HP	20 HP	CDC320-C20	Run/Stop Chassis Model with Arm. contactor & Control XFMR	100 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
15 HP	25 -30 HP	CDC340-C30	Run/Stop Chassis Model with Arm. contactor & Control XFMR	100 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
20 HP	40 HP	CDC340-C40	Run/Stop Chassis Model with Arm. contactor & Control XFMR	100 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
25 - 30 HP	50 - 60 HP	CDC360-C60	Run/Stop Chassis Model with Arm. contactor & Control XFMR	105 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
40 HP	75 HP	CDC375-C75	Run/Stop Chassis Model with Arm. contactor & Control XFMR	140 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
50 HP	100 HP	CDC3150-C100	Run/Stop Chassis Model with Arm. contactor & Control XFMR	235 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
60 HP	125 HP	CDC3150-C125	Run/Stop Chassis Model with Arm. contactor & Control XFMR	235 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13
75 HP	150 HP	CDC3150-C150	Run/Stop Chassis Model with Arm. contactor & Control XFMR	235 lbs.	Fig. G.3	Fig. G.12 & Fig. G.13

Contactor Reversing Models

230 VAC input	460 VAC input	Model number	Description	Approx. Shpg. Wt.	Dim.	Conn.
5 - 7.5 HP	10 - 15 HP	CDC320-R15	Reversing Chassis Model with Arm. contactor & Control XFMR	110 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
10 HP	20 HP	CDC320-R20	Reversing Chassis Model with Arm. contactor & Control XFMR	110 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
15 HP	25 -30 HP	CDC340-R30	Reversing Chassis Model with Arm. contactor & Control XFMR	110 lbs.	Fig. G.3	Fig. G.12 & Fig. G.4
20 HP	40 HP	CDC340-R40	Reversing Chassis Model with Arm. contactor & Control XFMR	110 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
25 - 30 HP	50 - 60 HP	CDC360-R60	Reversing Chassis Model with Arm. contactor & Control XFMR	115 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
40 HP	75 HP	CDC375-R75	Reversing Chassis Model with Arm. contactor & Control XFMR	160 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
50 HP	100 HP	CDC3150-R100	Reversing Chassis Model with Arm. contactor & Control XFMR	260 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
60 HP	125 HP	CDC3150-R125	Reversing Chassis Model with Arm. contactor & Control XFMR	260 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14
75 HP	150 HP	CDC3150-R150	Reversing Chassis Model with Arm. contactor & Control XFMR	260 lbs.	Fig. G.3	Fig. G.12 & Fig. G.14

Blower Starter Options

Option Number	Description	Compatible with these Blower Options	Approx. Shpg. Wt.	Dim.	Conn.
CDC3BS-001	0.6 to 1.0 AMP Overload Range for Single Phase	MTP-FVB3180, 230 VAC, 1PH.	1 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14
CDC3BS-002	0.4 to 0.6 AMP Overload Range for Single Phase	MTP-FVB3210, 460 VAC, 3PH. MTP-FVB3250, 460 VAC, 3PH.	1 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14
CDC3BS-003	0.6 to 1.0 AMP Overload Range for Single Phase	MTP-FVB3210, 230 VAC, 3PH. MTP-FVB3250, 230 VAC, 3PH. MTP-FVB4280, 460 VAC, 3PH.	1 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14
CDC3BS-004	1.4 to 1.8 AMP Overload Range for Single Phase	MTP-FVB4280, 230 VAC, 3PH. MTP-FVB6320, 460 VAC, 3PH. MTP-FVB6400, 460 VAC, 3PH.	1 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14
CDC3BS-005	2.8 to 4.0 AMP Overload Range for Single Phase	MTP-FVB6230, 230 VAC, 3PH. MTP-FVB6400, 230 VAC, 3PH.	1 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14

Disconnect Switch Options

Option Number	Description	Compatible with these Blower Options	Approx. Shpg. Wt.	Dim.	Conn.
CDC3DS-150	150 AMP, 600 VAC Molded Case Disconnect Switch	CDC320-C15, CDC320-C20 CDC340-C30, CDC340-C40 CDC360-C60, CDC375-C75 CDC320-R15, CDC320-R20 CDC340-R30, CDC340-R40 CDC360-R60, CDC375-R75	5 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14
CDC3DS-225	225 AMP, 600 VAC Molded Case Disconnect Switch	CDC315-C100 CDC315-C125 CDC3150-R100 CDC3150-R125	7 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14
CDC3DS-400	400 AMP, 600 VAC Molded Case	CDC3150-C150 CDC3150-R150	15 lbs.	Mounts to Run/Stop & Reversing Models	Fig. G.13 & Fig. G.14

Standard Models and Descriptions

Enclosure Options

Option Number	Description	Compatible with these Models	Approx. Shpg. Wt.	Dimensions
CDC3EN-001	NEMA 12 Enclosure	CDC320-C15, CDC320-C20 CDC340-C30, CDC340-C40 CDC360-C60 CDC320-R15, CDC320-R20 CDC340-R30, CDC340-R40 CDC360-R60	95 lbs.	Fig. G.4
CDC3EN-002	NEMA 12 Enclosure	CDC75-C75 CDC375-R75	155 lbs.	Fig. G.4
CDC3EN-003	NEMA 12 Enclosure	CDC150-C100 CDC3150-C125 CDC315-C150 CDC3150-R100 CDC315-R125 CDC3150-R150	395 lbs.	Fig. G.5
CDC3EN-H01	NEMA 12 Enclosure with door mounted disconnect handle mechanism	CDC3DS-150 Option with the following drives: CDC320-C15, CDC320-C20 CDC340-C30, CDC340-C40 CDC360-C60 CDC320-R15, CDC320-R20 CDC340-R30, CDC340-R40 CDC360-R60	100 lbs.	Fig. G.4
CDC3EN-H02	NEMA 12 Enclosure with door mounted disconnect handle mechanism	CDC3DS-150 Option with the following drives: CDC375-C75 CDC375-R75	160 lbs.	Fig. G.4
CDC3EN-H03	NEMA 12 Enclosure with door mounted disconnect handle mechanism	CDC3DS-225 Option with the following drives: CDC3150-C100 CDC3150-C125 CDC3150-R100 CDC3150-R125	400 lbs.	Fig. G.5
CDC3EN-H04	NEMA 12 Enclosure with door mounted disconnect handle mechanism	CDC3DS-400 Option with the following drives: CDC3150-C150 CDC3150-R150 CDC3150-R100	400 lbs.	Fig. G.5

240 VDC Dynamic Braking Options

Option Number	Description	Compatible with these MotorRatings	Approx. Shpg. Wt.	Dim.	Conn.
CDC3BR-205	NEMA 12 Enclosed Brake Resistor	5 HP, 240 VDC. Arm.	10 lbs.	Fig. G.6	Fig. G.7
CDC3BR-207	NEMA 12 Enclosed Brake Resistor	7.5 HP, 240 VDC. Arm.	11 lbs.	Fig. G.6	Fig. G.8
CDC3BR-210	NEMA 12 Enclosed Brake Resistor	10 HP, 240 VDC. Arm.	19 lbs.	Fig. G.6	Fig. G.7
CDC3BR-215	NEMA 12 Enclosed Brake Resistor	15 HP, 240 VDC. Arm.	20 lbs.	Fig. G.6	Fig. G.7
CDC3BR-220	NEMA 12 Enclosed Brake Resistor	20 HP, 240 VDC. Arm.	30 lbs.	Fig. G.6	Fig. G.8
CDC3BR-225	NEMA 12 Enclosed Brake Resistor	25 HP, 240 VDC. Arm.	27 lbs.	Fig. G.6	Fig. G.7
CDC3BR-230	NEMA 12 Enclosed Brake Resistor	30 HP, 240 VDC. Arm.	27 lbs.	Fig. G.6	Fig. G.7
CDC3BR-240	Extended Metal Enclosed Brake Resistor	40 HP, 240 VDC. Arm.	13 lbs.	Fig. G.6	Fig. G.10
CDC3BR-275	Extended Metal Enclosed Brake Resistor	50 HP, 240 VDC. Arm. 60 HP, 240 VDC. Arm.	15 lbs.	Fig. G.6	Fig. G.10

500 VDC Dynamic Braking Options

Option Number	Description	Compatible with these MotorRatings	Approx. Shpg. Wt.	Dim.	Conn.
CDC3BR-405	NEMA 12 Enclosed Brake Resistor	5 HP, 500 VDC. Arm.	10 lbs.	Fig. G.6	Fig. G.7
CDC3BR-407	NEMA 12 Enclosed Brake Resistor	7.5 HP, 500 VDC. Arm.	11 bs.	Fig. G.6	Fig. G.8
CDC3BR-410	NEMA 12 Enclosed Brake Resistor	10 HP, 500 VDC. Arm.	11 lbs.	Fig. G.6	Fig. G.8
CDC3BR-415	NEMA 12 Enclosed Brake Resistor	15 HP,500 VDC. Arm.	20 lbs.	Fig. G.6	Fig. G.7
CDC3BR-420	NEMA 12 Enclosed Brake Resistor	20 HP, 500 VDC. Arm.	22 lbs.	Fig. G.6	Fig. G.7
CDC3BR-425	NEMA 12 Enclosed Brake Resistor	25 HP, 500 VDC. Arm.	32 lbs.	Fig. G.6	Fig. G.8
CDC3BR-430	NEMA 12 Enclosed Brake Resistor	30 HP, 500 VDC. Arm.	32 lbs.	Fig. G.6	Fig. G.9
CDC3BR-440	NEMA 12 Enclosed Brake Resistor	40 HP, 500 VDC. Arm.	61 lbs.	Fig. G.6	Fig. G.8
CDC3BR-450	NEMA 12 Enclosed Brake Resistor	50 HP, 500 VDC. Arm.	72 lbs.	Fig. G.6	Fig. G.9
CDC3BR-460	NEMA 12 Enclosed Brake Resistor	60 HP, 500 VDC. Arm.	72 lbs.	Fig. G.6	Fig. G.9
CDC3BR-475	Expanded Metal Enclosed Brake Resistor	75 HP, 500 VDC. Arm.	20 lbs.	Fig. G.6	Fig. G.11
CDC3BR-4150	Expanded Metal Enclosed Brake Resistor	100 HP, 500 VDC. Arm. 125 HP, 500 VDC. Arm. 150 HP, 500 VDC. Arm.	24 lbs.	Fig. G.6	Fig. G.11

Dimensions

5 - 75 HP

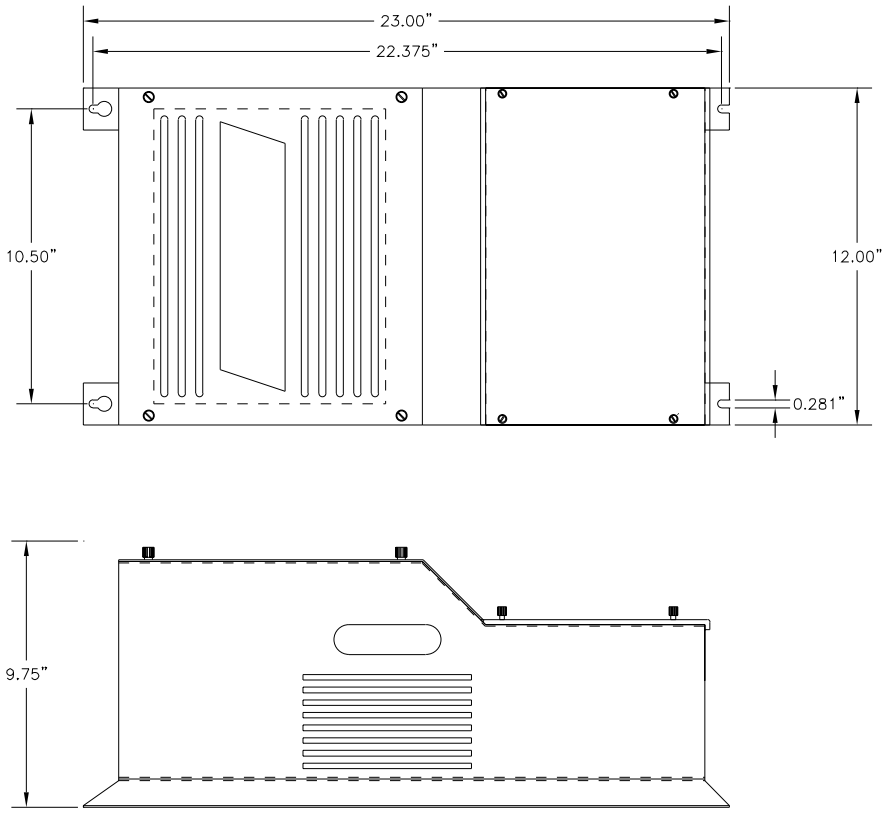


Fig. G.1

100 - 150 HP

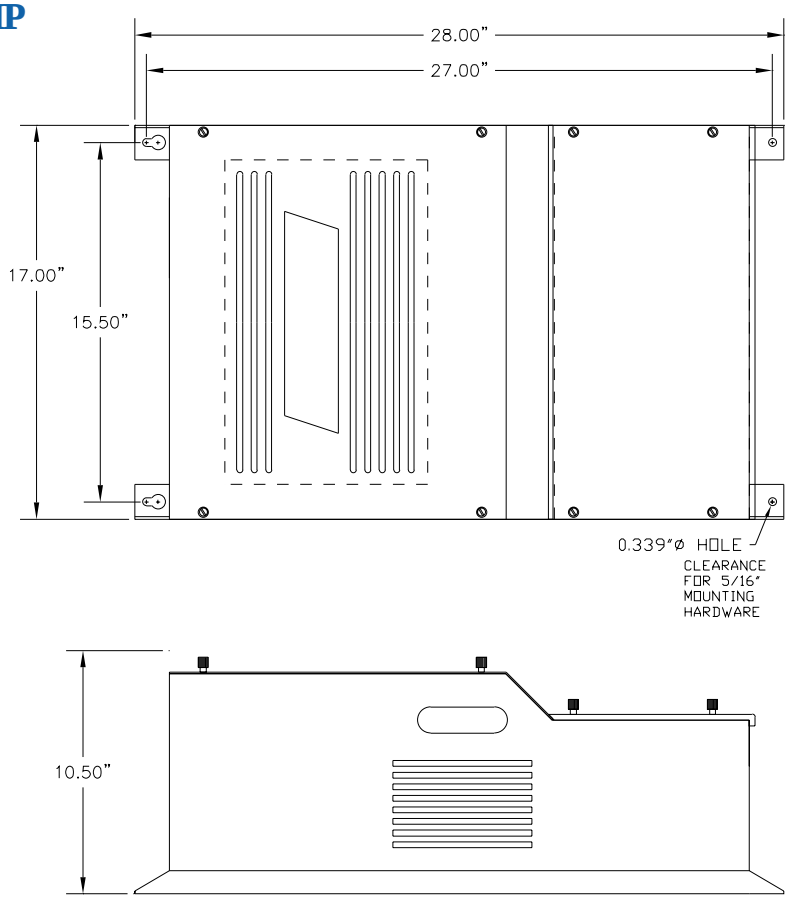
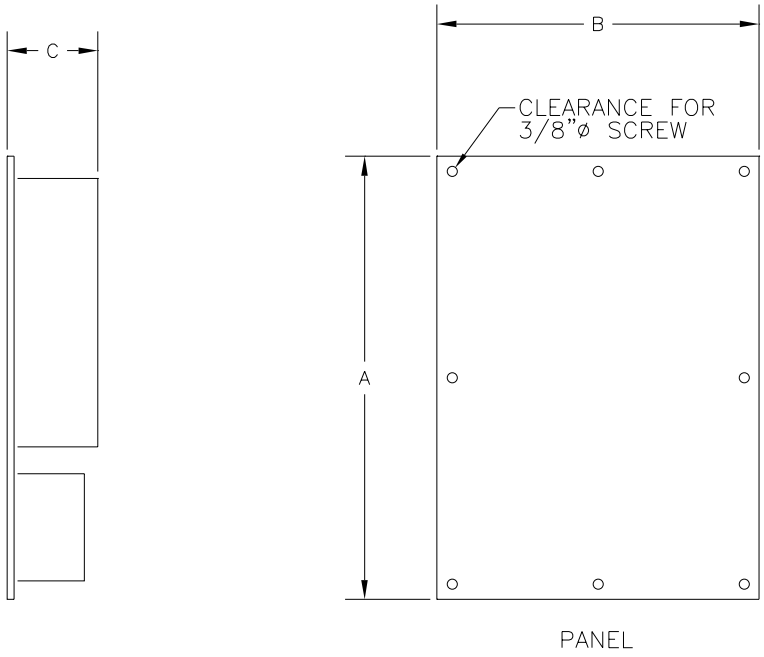


Fig. G.2

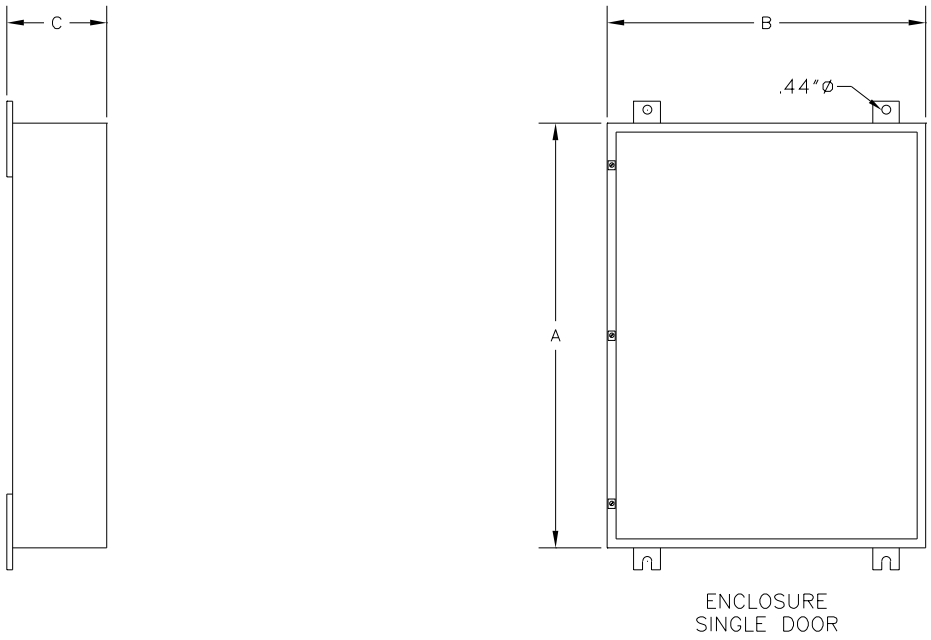
Option Chassis



OPTIONAL CHASSIS DASH NO.	A	B	C
C15-C60	33	27	11
C75	45	33	13
C100-C150	56	44	13

Fig. G.3

5 - 75 HP Enclosed Options

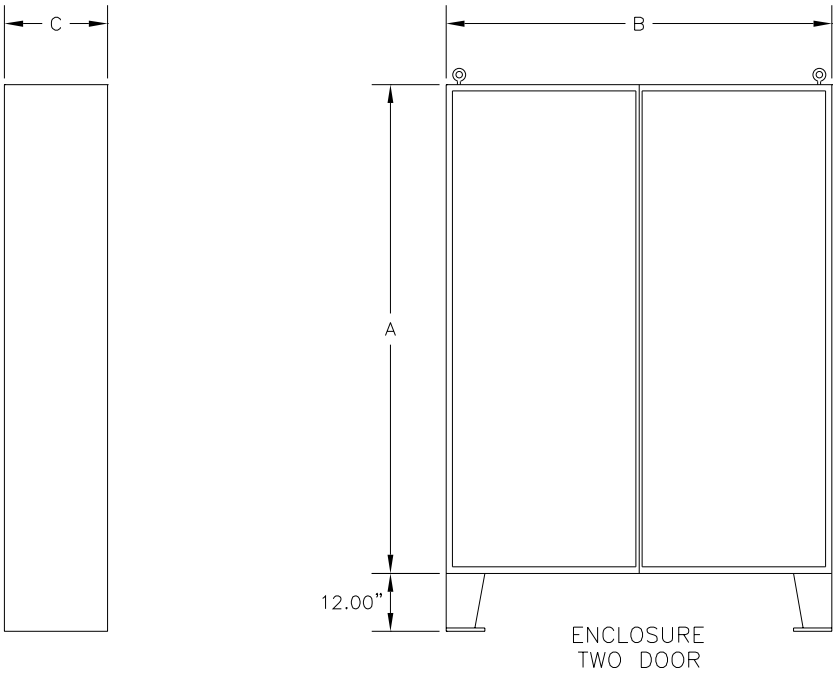


NEMA 12 ENCLOSURE DIMENSIONS		
OPTIONAL DASH NO.	A x B x C	NOTES
001 & H01	36 x 30 x12	SINGLE DOOR WALL MOUNT
002 & H02	48 x 36 x16	SINGLE DOOR WALL MOUNT

Fig. G.4

Dimensions

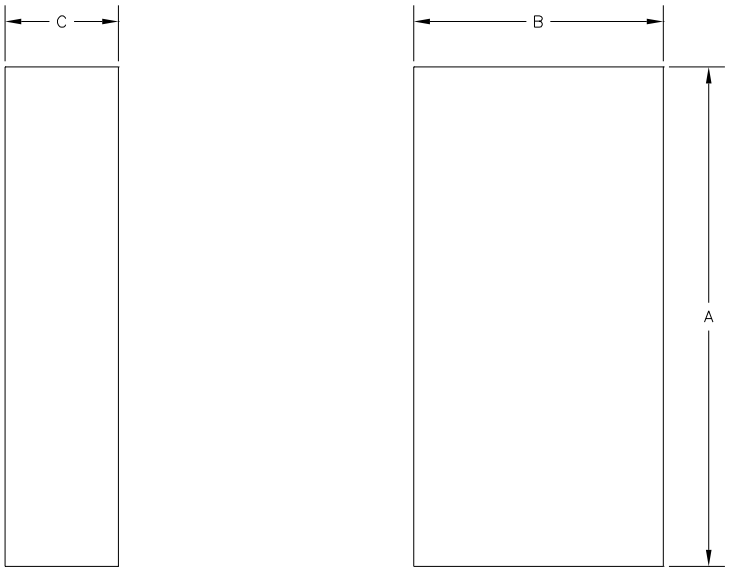
150 HP Enclosed Options



OPTIONAL DASH NO.	A	B	C
003,H03,H04	60	48	16

Fig. G.5

Dynamic Braking Options

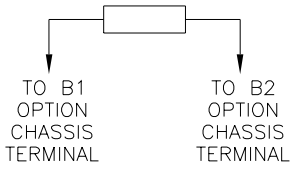


OPTIONAL DASH NO.	A	B	C	ENCLOSURE TYPE
205,207,405,407,410	18.25	5.50	4.26	NEMA 12
210,215,225,230,415,420	24.25	7.50	6.25	NEMA 12
220,425,430	24.25	9.50	8.25	NEMA 12
240,275	18.50	7.00	5.00	NEMA 12
2100	22.00	13.00	5.00	EXPANDED METAL
2125,2150	22.00	10.00	10.00	EXPANDED METAL
440,450,460	36.25	13.50	12.27	NEMA 12
475,4150	18.50	13.00	5.00	EXPANDED METAL

Fig. G.6

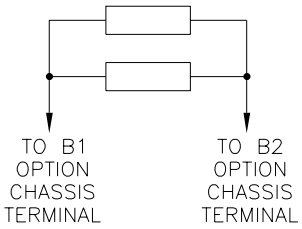
Connections

Dynamic Braking Options



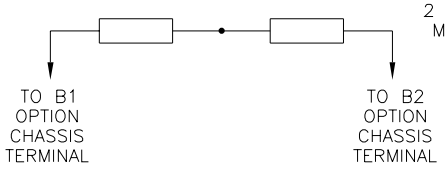
SINGLE RESISTOR
MODELS CDC3BR–205
CDC3BR–210
CDC3BR–215
CDC3BR–225
CDC3BR–230
CDC3BR–405
CDC3BR–415
CDC3BR–420

Fig. G.7



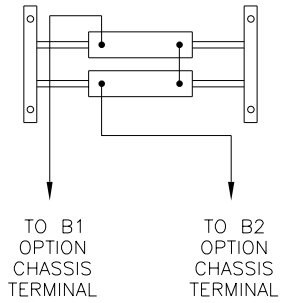
2 RESISTORS IN PARALLEL
MODELS CDC3BR–207
CDC3BR–220
CDC3BR–407
CDC3BR–410
CDC3BR–425
CDC3BR–440

Fig. G.8



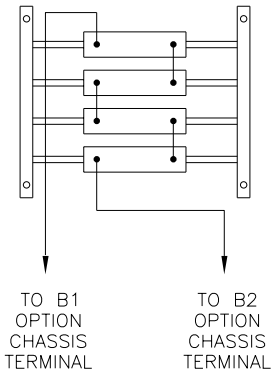
2 RESISTORS IN SERIES
MODELS CDC3BR–430
CDC3BR–450
CDC3BR–460

Fig. G.9



MODELS CDC3BR–240
CDC3BR–275

Fig. G.10



MODELS CDC3BR–475
CDC3BR–4150

Fig. G.11

Connections

Chassis Only Models

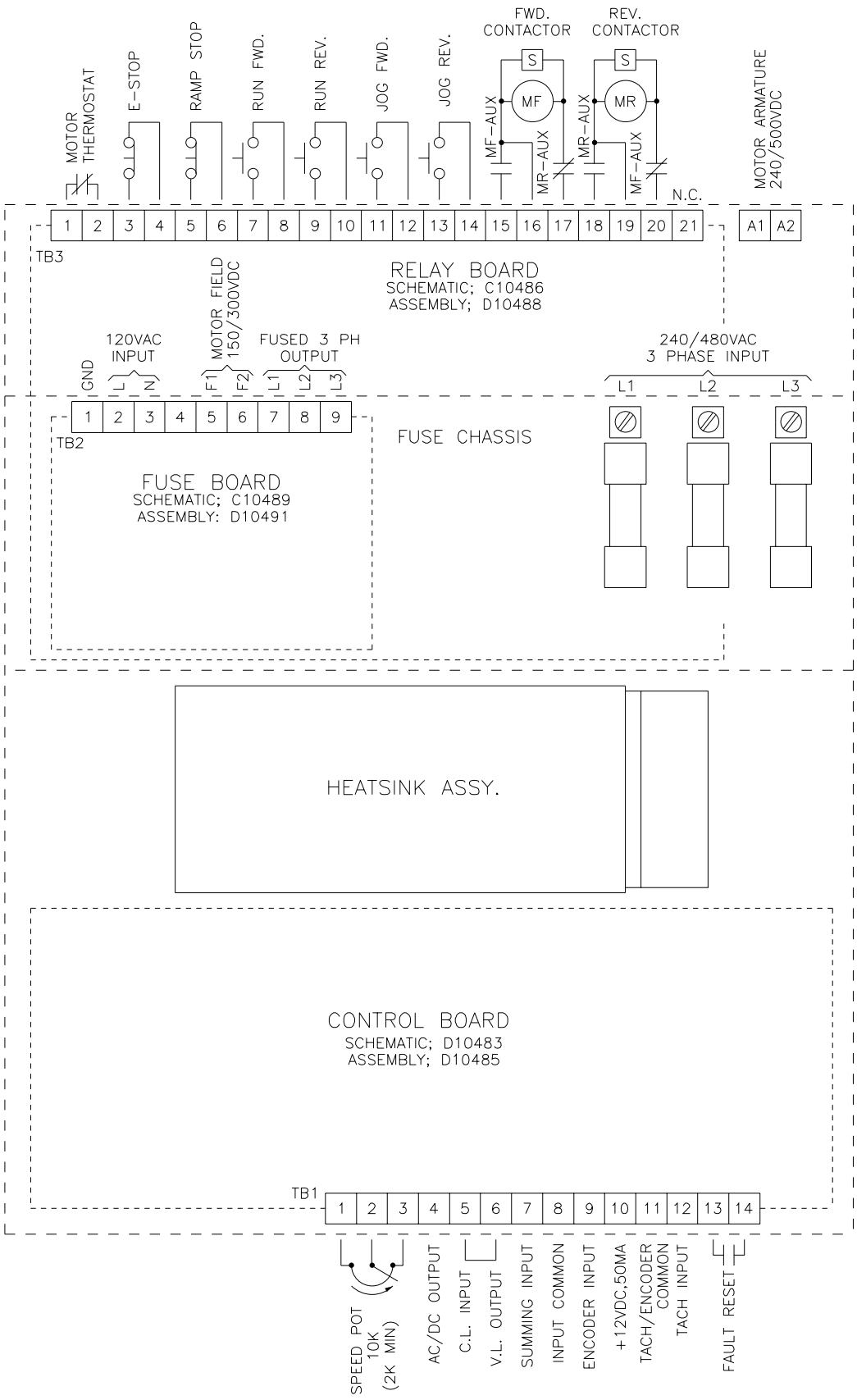


Fig. G.12

Run/Stop Contactor Models

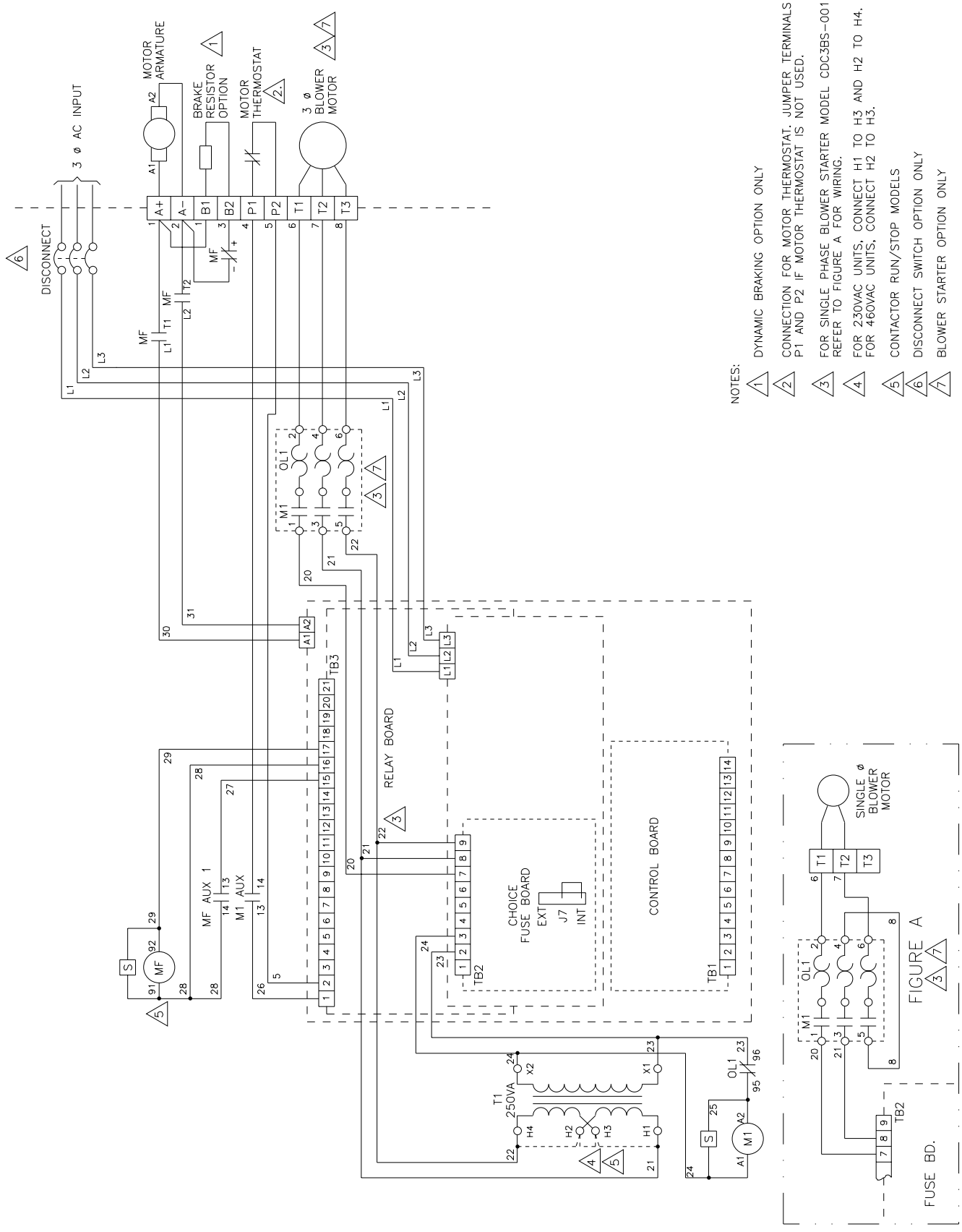


Fig. G.13

Connections

Contactor Reversing Models

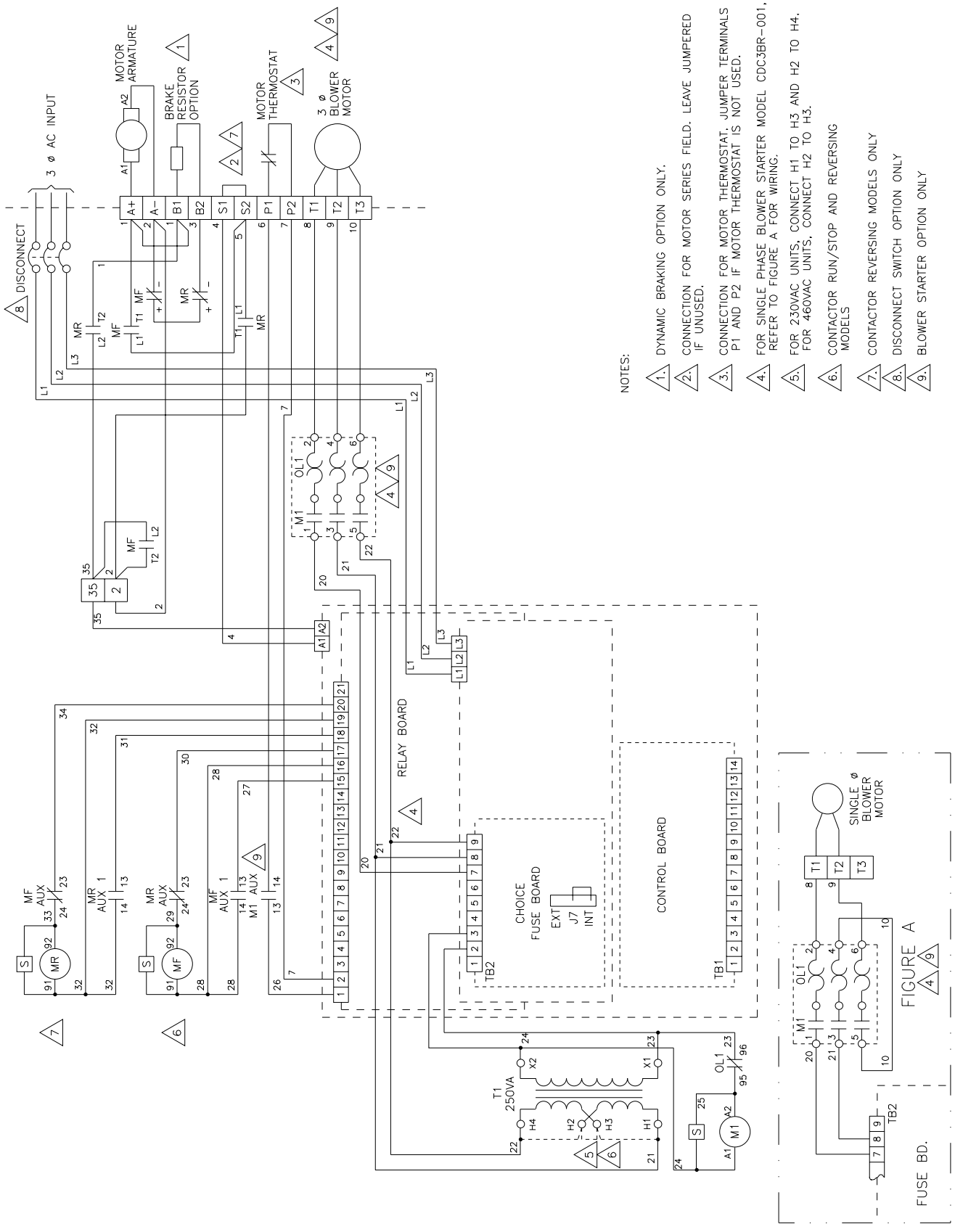


Fig. G.14