

Dynamic Braking Kit for FlexPak 3000 and WebPak 3000 Digital DC Drives 1.5 HP to 30 HP @ 230 VAC, 3 HP to 60 HP @ 460 VAC NEMA 1 Enclosures

Model Numbers 908FKxxxx and 909FKxxxx

Instruction Manual D2-3313-3



ATTENTION: Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual in its entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: The user is responsible for conforming with all applicable local, national, and international codes. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Product Description

This instruction manual describes optional Dynamic Braking (DB) kits that can be installed on FlexPak™ 3000 and WebPak™ 3000 Digital DC drives from 1.5 through 60 HP. These kits (908FK and 909FK series models) are designed for use with drives in NEMA 1 enclosures. Hardware Only DB kits (912FK and 913FK series model numbers) used on drives without NEMA 1 enclosures are described in instruction manual D2-3374.

Dynamic braking slows down a rotating DC motor and its load. It is an "uncontrolled" process. During dynamic braking, the motor armature is disconnected from the drive. A resistor is placed across the motor's rotating armature (now acting as a generator), and the resulting current causes braking torque in the motor that decays exponentially (assuming there is no overhauling load and a fixed motor field) with the motor's counter-EMF. The motor will decelerate, even with a drive failure, as long as motor field excitation is maintained.

The drive must have the DC contactor open for dynamic braking stopping to occur. This typically occurs with a Coast/DB Stop command or a drive fault when the drive is in standby mode. Under drive fault conditions, the DC contactor opens, which applies the dynamic braking grid across the motor for a dynamic braking stop.

Verifying the Kit Model Matches the Drive

Refer to the following table for the correct kit model number for your drive.

Drive HP	Kit Model Number	
	230 VAC	460 VAC
1.5	908FK0011	
2	908FK0021	
3	908FK0031	909FK0031
5	908FK0051	909FK0051
7.5	908FK0071	909FK0071
10	908FK0101	909FK0101
15	908FK0151	909FK0151
20	908FK0201	909FK0201
25	908FK0251	909FK0201
30	908FK0301	909FK0301
40		909FK0401
50		909FK0501
60		909FK0501

Checking the Contents of the Kit

Important: The user must supply power wiring for connection purposes.

The contents of NEMA 1 enclosure DB kits are listed in table 2.

Description	Quantity	Part Number
DB Assembly	1	802273-70XX
Conduit Plate	1	707973-6A
Control Power Wire	1	802273-78T
Cable Tie	4	69306-3F

Installing the Dynamic Braking Kit for 1.5 HP to 30 HP @ 230 VAC and 3 HP to 60 HP @ 460 VAC Drives



ATTENTION: The drive is at line voltage when connected to incoming AC power. Disconnect, tag and lockout all incoming power to the drive before performing the following procedures. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: The user is responsible for conforming with all applicable local, national, and international codes. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Step 1. Remove the screened cover from the DB assembly.

Important: The removable conduit plate is located on the upper left side of the DB enclosure. An additional conduit plate is supplied for use on the drive when the NEMA 1 cover kit (M/N 904FK0101) is installed. Determine conduit requirements and punch holes in the conduit plates as required. Two conduit holes plugged with plastic caps are located on the top panel of the DB enclosure.

Step 2. **If the drive has the NEMA 1 cover kit (M/N 904FK0101) installed**, locate and drill the mounting holes for the DB enclosure to the right of the drive using the mounting hole pattern located on the back panel. See figure 1.

If the drive is mounted in some other NEMA 1 enclosure, the DB kit can be mounted above or next to the drive. Locate and drill the mounting holes for the DB enclosure using the mounting hole pattern located on the back panel. See figure 1.

Step 3. Drive the mounting screws (provided by the user) into the mounting panel leaving a minimum of 5 mm (3/16 inch) space between the head of the screw and the mounting panel.

Important: Use of 6 mm (1/4 inch) mounting hardware is recommended.

Step 4. Slide the slots of the DB assembly panel down over the heads of the mounting screws.

Step 5. Tighten the mounting screws firmly to the panel.

Step 6. Connect the motor armature leads, A1 and A2, to the power terminal block located on the inside of the DB assembly back panel. See figure 2.

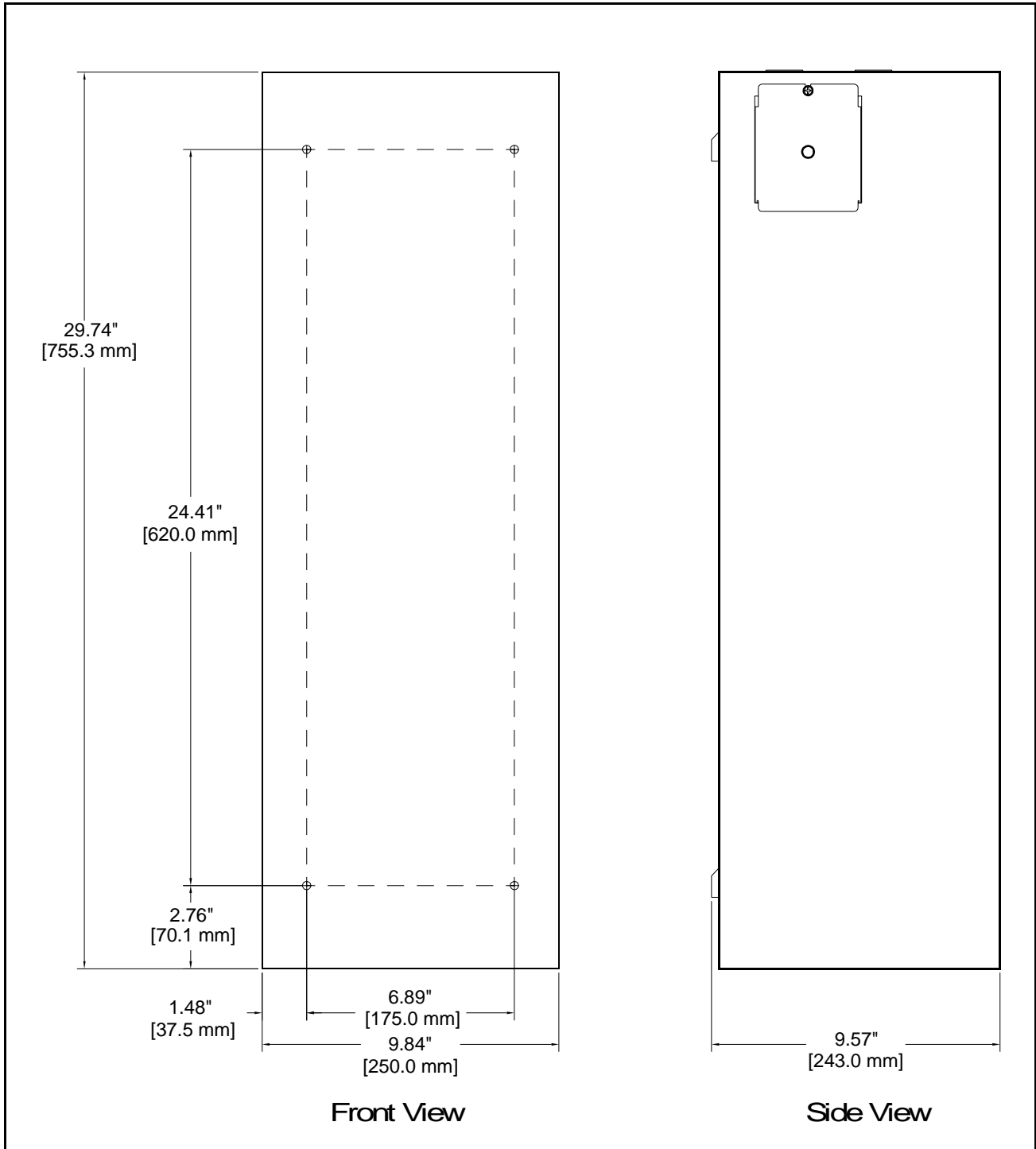


Figure 1 – DB Kit Enclosure and Mounting Dimensions

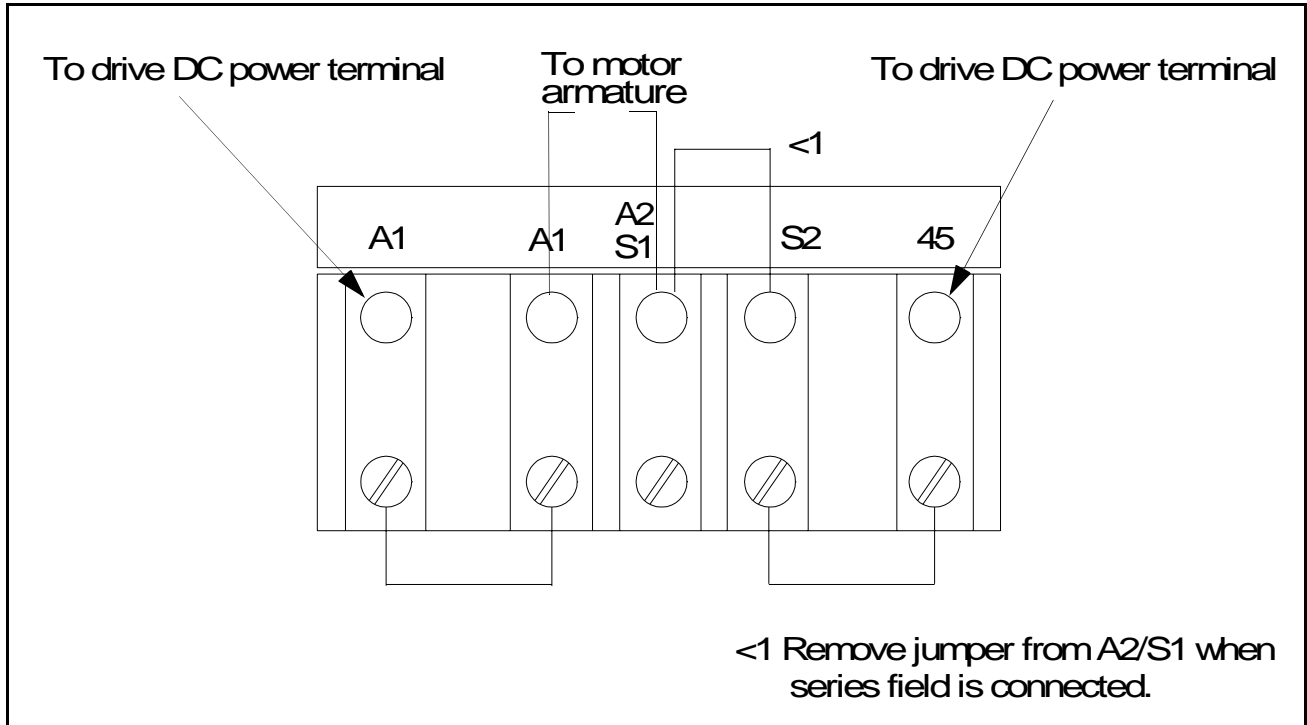
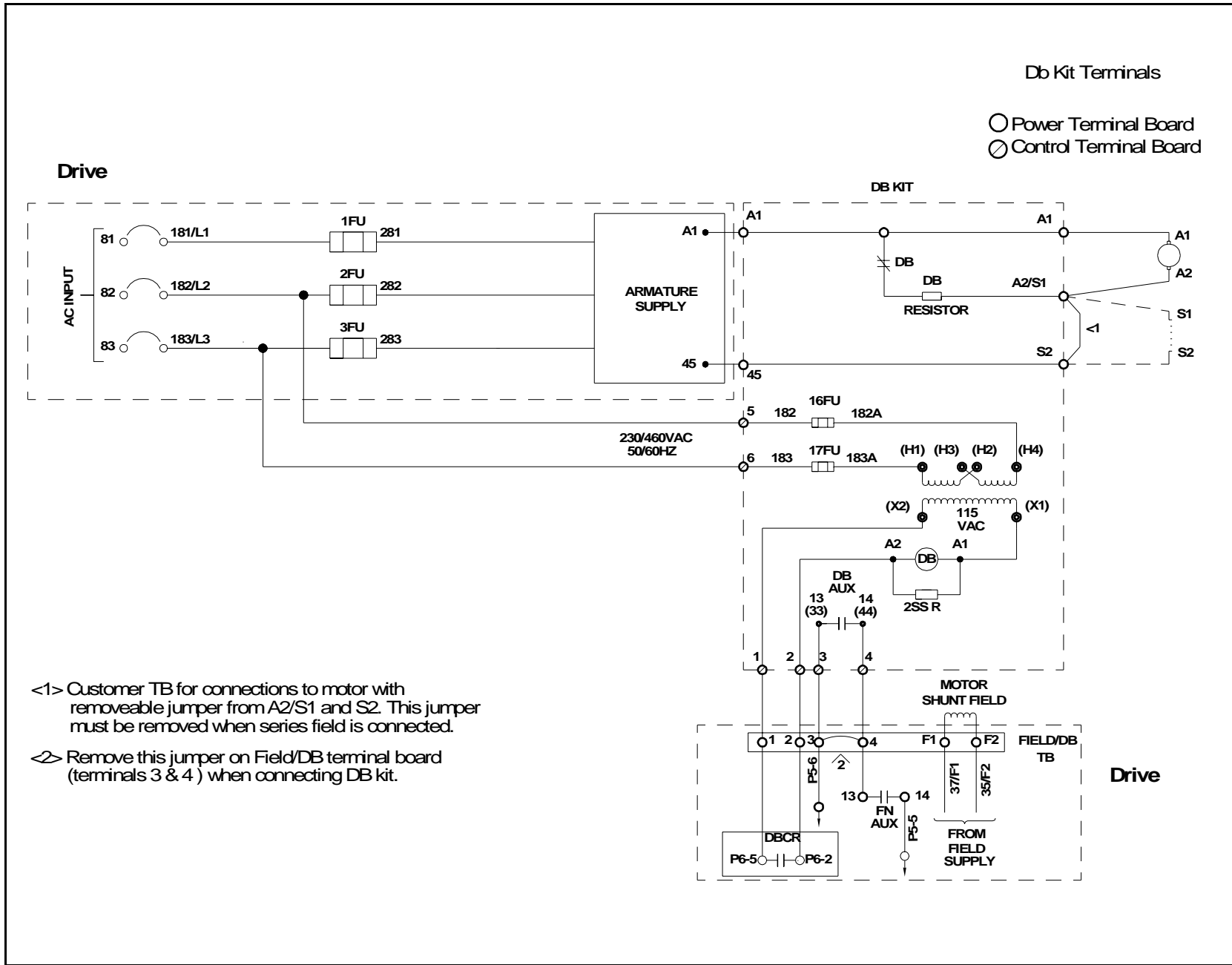


Figure 2 – DB Power Terminal Block

- Step 7. If the motor has S1 and S2 field leads, remove the S1 and S2 jumper from the power terminal block on the DB assembly back panel. Connect the motor series field leads to their respective terminals.
- Step 8. Follow the wiring diagram in figure 3 and connect the drive leads, 45 and A1, to terminals 45 and A1 of the DB assembly.

Figure 3 – DB Kit Wiring Diagram



Step 9. Remove the jumper (terminals 3 to 4) from the field/DB terminal block on the drive. See figure 4.

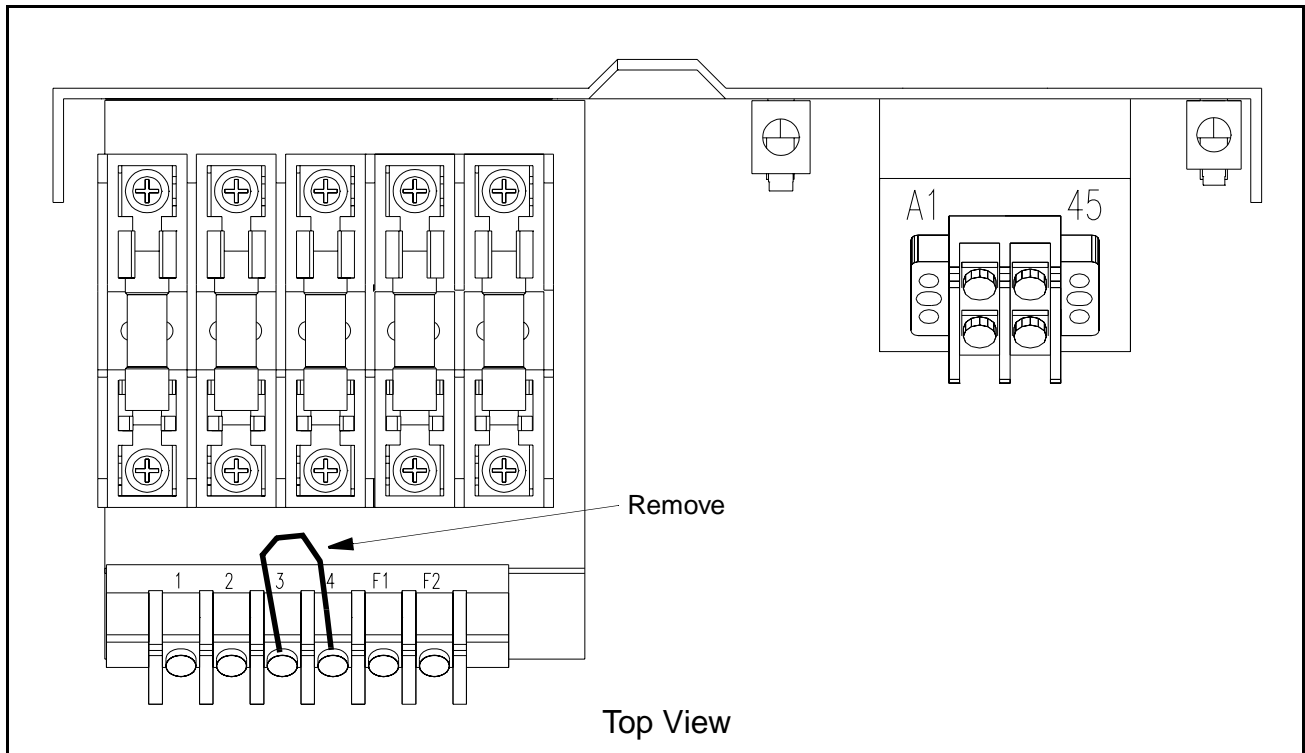


Figure 4 – Field/DB Terminal Block

Step 10. Connect the drive terminals 1, 2, 3, and 4 to their respective terminals on the DB assembly control terminal block. (The DB assembly control terminal block is located on a bracket above the DB contactor.) See figure 5.

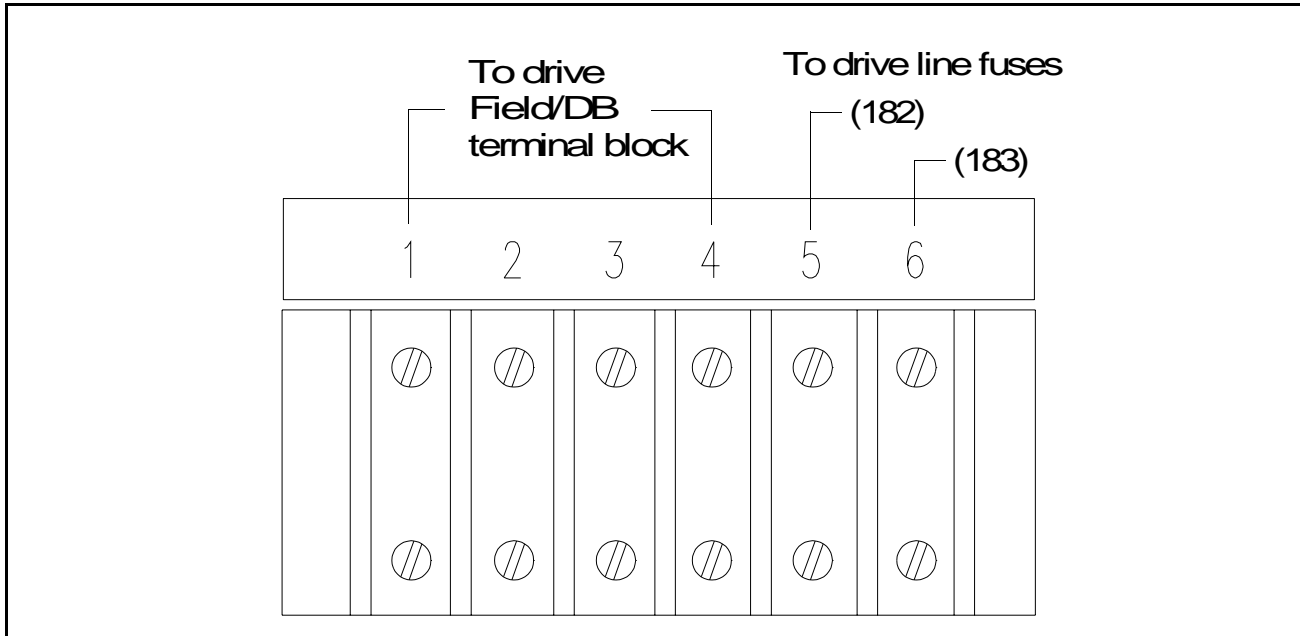


Figure 5 – DB Control Terminal Block

Step 11. Locate the control transformer at the lower left of the DB assembly back panel. Verify the jumpers on the DB assembly control transformer are connected to the proper terminals (according to line input voltage). See table 3 for jumper settings.

Line Voltage	Jumper Setting
230 VAC	H1-H3 H2-H4
460 VAC	H2-H3

Step 12. Connect the spade connectors (182 and 183) of the control power wire to the male tabs on line terminals 182 and 183 (located at the bottom of the line fuses) on the drive assembly. See figure 6.

Step 13. Route the control power wire to the DB assembly control terminal block and connect them to terminals 5 (182) and 6 (183). See figure 5.

Step 14. Be sure wires will not come in contact with hot parts or sharp metal edges. Check that all wiring has been correctly connected before energizing the drive.

Step 15. Replace the screen cover and secure it with the eight screws you removed in step 1.

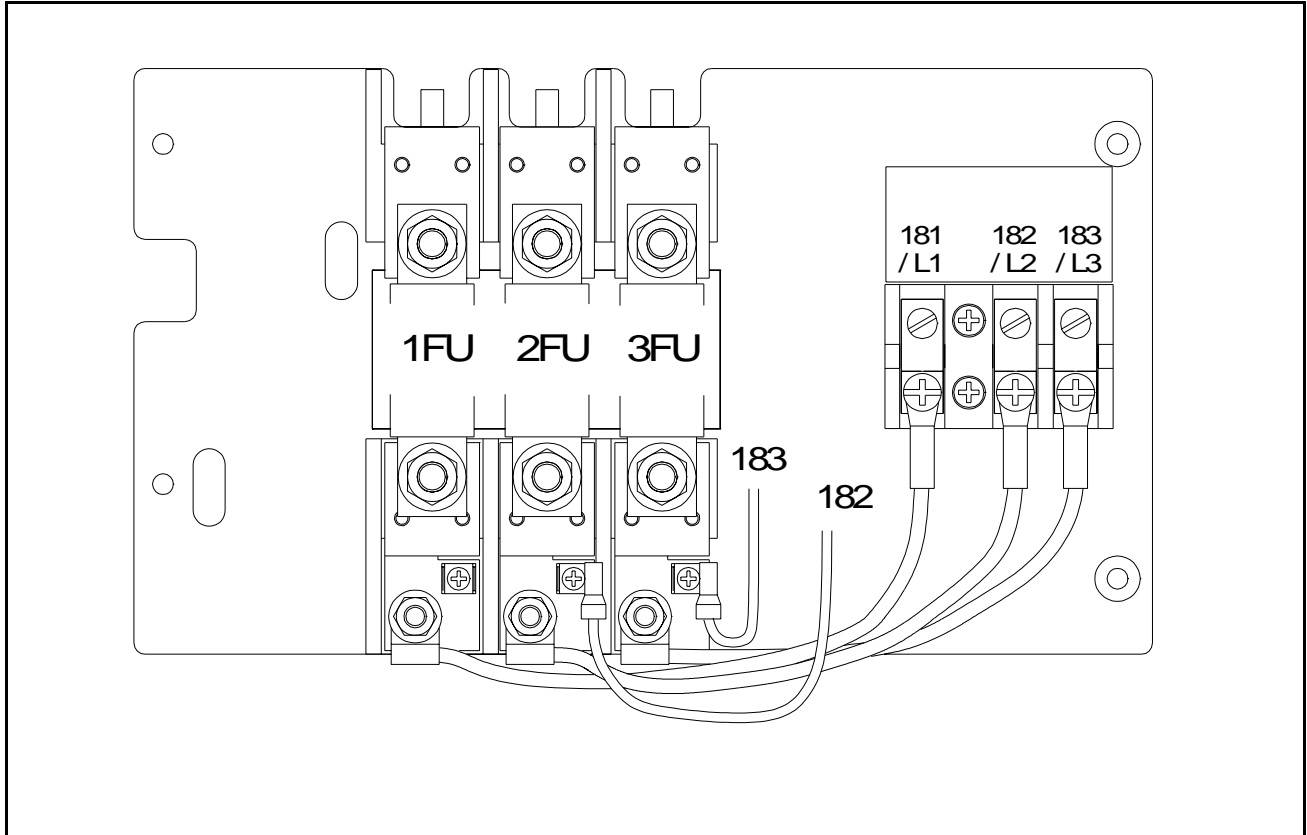


Figure 6 – DB Kit to Drive Line Voltage Connection

Replacement Parts List

Description	Qty.	Part Number
Control Transformer (150 VA)	1	417155-R
Fuse:		
230 VAC Connection (1.5A)	2	64676-64F
460 VAC Connection (.6A)	2	64676-64U
Contactors:		
1.5 to 3 / 3 to 7.5 HP @ 240 / 500 VDC Armature Volts	1	705310-100A (VA _{INRUSH} = 80, VA _{HOLD} = 10)
5 to 7.5 / 10 to 15 HP @ 240 / 500 VDC Armature Volts	1	705310-110A (VA _{INRUSH} = 100, VA _{HOLD} = 11)
10 to 30/20 to 60 HP @ 240 / 500 VDC Armature Volts	1	705310-141A (VA _{INRUSH} = 490, VA _{HOLD} = 35)
Resistor:		
20.87 ohms (1.5 HP @ 240 VDC Armature Volts)	1	48267-P
11.86 ohms (2 HP @ 240 VDC Armature Volts)	2	48267-J ⁽¹⁾
9.39 ohms (3 HP @ 240 VDC Armature Volts)	2	48267-H ⁽¹⁾
6.088 ohms (5 HP @ 240 VDC Armature Volts)	2	48267-F ⁽¹⁾
3.824 ohms (7.5 HP @ 240 VDC Armature Volts)	2	48267-D ⁽¹⁾
3.046 ohms (10 HP @ 240 VDC Armature Volts)	2	48267-C ⁽¹⁾
1.932 ohms (15 HP @ 240 VDC Armature Volts)	2	48267-A ⁽¹⁾
1.523 ohms (20 HP @ 240 VDC Armature Volts)	4	48267-C ⁽²⁾
1.212 ohms (25 HP @ 240 VDC Armature Volts)	4	48267-B ⁽²⁾
0.966 ohms (30 HP @ 240 VDC Armature Volts)	4	48267-A ⁽²⁾
49.35 ohms (3 HP @ 500 VDC Armature Volts)	3	48267-N ⁽¹⁾
22.34 ohms (5 HP @ 500 VDC Armature Volts)	3	48267-K ⁽¹⁾
17.79 ohms (7.5 HP @ 500 VDC Armature Volts)	3	48267-J ⁽¹⁾
14.09 ohms (10 HP @ 500 VDC Armature Volts)	3	48267-H ⁽¹⁾
9.132 ohms (15 HP @ 500 VDC Armature Volts)	3	48267-F ⁽¹⁾
6.09 ohms (20 to 25 HP @ 500 VDC Armature Volts)	4	48267-C ⁽¹⁾
4.85 ohms (30 HP @ 500 VDC Armature Volts)	4	48267-B ⁽¹⁾
3.864 ohms (40 HP @ 500 VDC Armature Volts)	4	48267-A ⁽¹⁾
3.00 ohms (50 to 60 HP @ 500 VDC Armature Volts)	3	402422-3D ⁽¹⁾

1. Series Connection
2. Series/parallel connection

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