Inverting Fault Circuit Breaker Kit for FlexPak 3000 and WebPak 3000 Digital DC Drives 1.5 - 30 HP @ 230 VAC and 3-60 HP @ 460 VAC

Model Numbers: 906FK0101, 906FK0201, 906FK0301, 906FK0401, and 906FK0501

Instruction Manual D2-3300-2

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 how to install the optional Inverting Fault Circuit Breaker kit on regenerative FlexPak™ 3000 and WebPak™ 3000 drives (1.5-30 HP @ 230 VAC and 3-60 HP @ 460 VAC.) Use of this kit is recommended when applying regenerative drives to high inertia loads. High inertia loads are those in which the reflected load to the motor is equal to or greater than the motor's load, or in which the drive is frequently regenerating power to the AC line, such as in unwind and pay-off application.

An inverting fault typically occurs as a result of a loss of the AC line. If this happens, the AC input transformer becomes a short circuit across the motor. Since the SCRs in the bridge no longer turn off, the motor's stored mechanical energy is regenerated into the short circuit. The inverting fault circuit breaker interrupts the generator action, protecting the SCR bridge and the motor.

In addition to the parts included in the kit, you must supply an appropriate mounting panel for the inverting fault circuit breaker and provide circuit breaker wiring.

Important: If any other interlocks are required for your application, they must be connected in series to the Customer Interlock Input along with the circuit breaker.

Table 1 – Verifying That the Inverting Fault Circuit Breaker Matches the Drive

Drive Horsepower/Voltage Rating	Kit Model Number
1.5 - 2 HP @ 230 VAC 3 - 5 HP @ 460 VAC	906FK0101
3 - 5 HP @ 230 VAC 7.5 - 10 HP @ 460 VAC	906FK0201
7.5 - 10 HP @ 230 VAC 15 - 20 HP @ 460 VAC	906FK0301
15 - 20 HP @ 230 VAC 25 - 40 HP @ 460 VAC	906FK0401
25 - 30 HP @ 230 VAC 50 - 60 HP @ 460 VAC	906FK0501

Rockwell Automation

Table 2 Contents of the Inverting Fault Circuit Breaker Option

Description	Quantity	Part Number
Inverting Fault Circuit Breaker Assembly	1	802273-85x
M5 x 10 Self-Tapping Screw	4	419062-100PHS
Jumper	1	810273-80RN
Bus Bar	1	810273-101A
Bus Bar	1	810273-102A
Ring Lug	1	58321-19D
Wire Harness	1	810273-68S
Wire Harness	1	810273-68R

Installing the Inverting Fault Circuit Breaker

ATTENTION: The drive is at line voltage when disconnected to incoming AC power. Disconnect, tag, and lock out 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.

Installing the Inverting Fault Circuit Breaker Kit involves the following processes:

- Mounting the Inverting Fault Circuit Breaker Kit
- Wiring the Inverting Fault Circuit Breaker
- Removing and Replacing Fuse 11FU
- Connecting the Wire Assembly
- Checking the Circuit Breaker Settings

Mounting the Inverting Fault Circuit Breaker Kit

Step 1. Disconnect, tag, and lock out power to the drive.

Step 2. Drill the mounting holes (4.6 mm diameter) for the circuit breaker mounting plate using the mounting hole pattern shown in Figure 1.

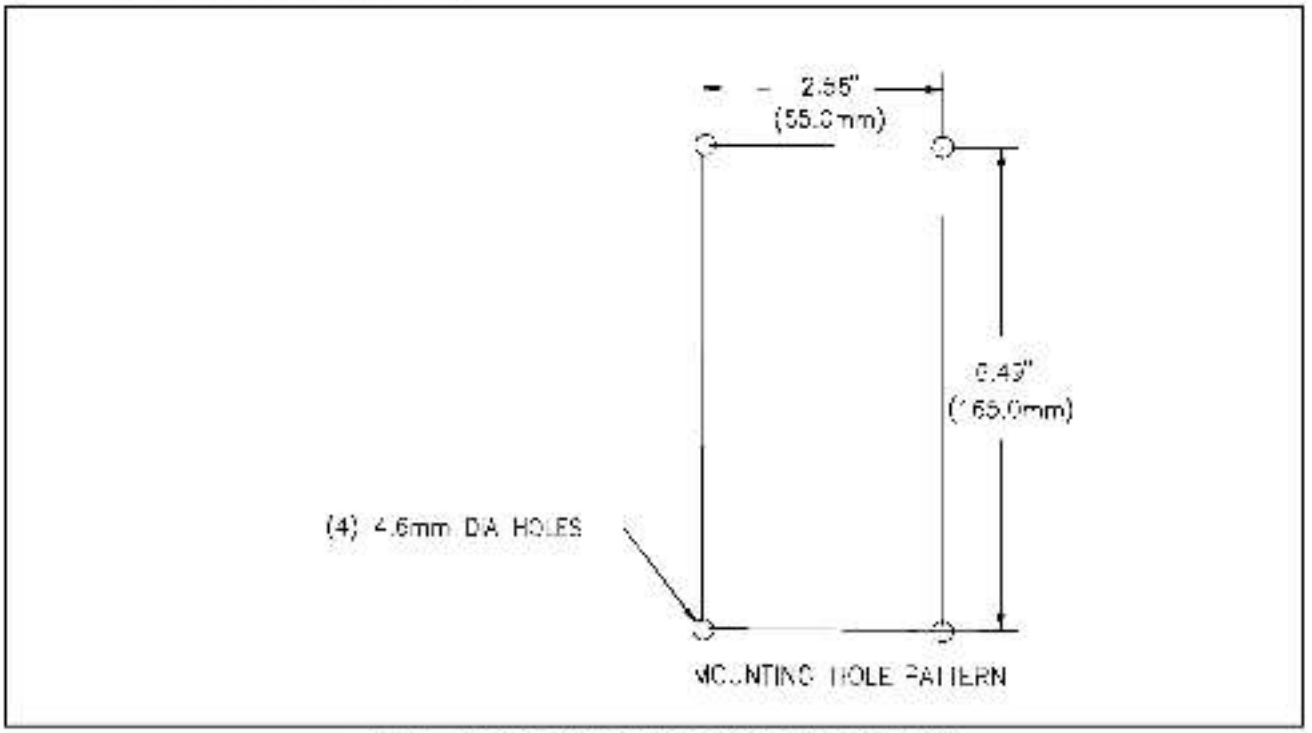

Figure 1 — Inverting Fault Circuit Breaker Mounting Hole Pattern

Step 3. Mount the circuit breaker and the plate assembly with the four M5 self tapping screws provided with the kit.

Wiring the Inverting Fault Circuit Breaker

Step 1. Connect the motor armature lead marked A1 to the Inverting Fault Circuit Breaker terminal A1. See Figure 2 for the location of terminal A1 on the circuit breaker.

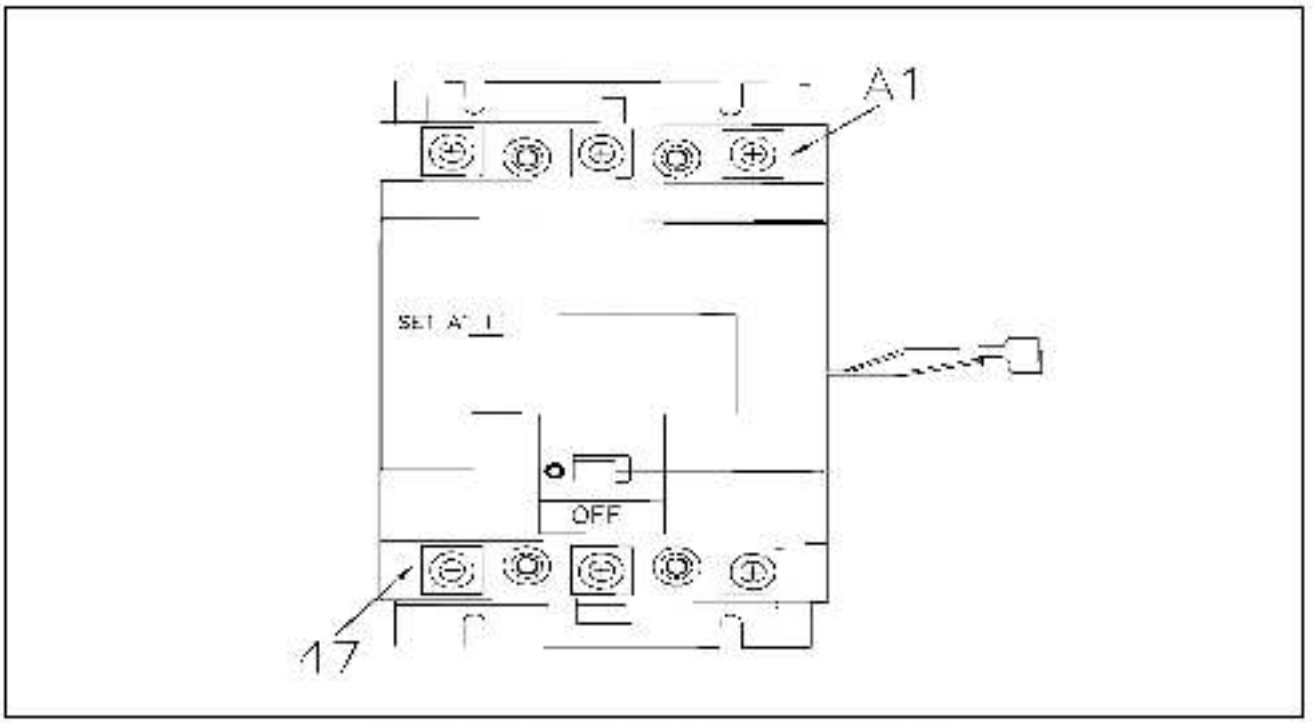

Figure 2 – Inverting Fault Circuit Breaker Terminal Locations

Step 2. Connect the wire from the inverting fault circuit breaker terminal marked 17 (see Figure 2 for location) to the drive motor terminal marked A1 (see Figure 3 for location).

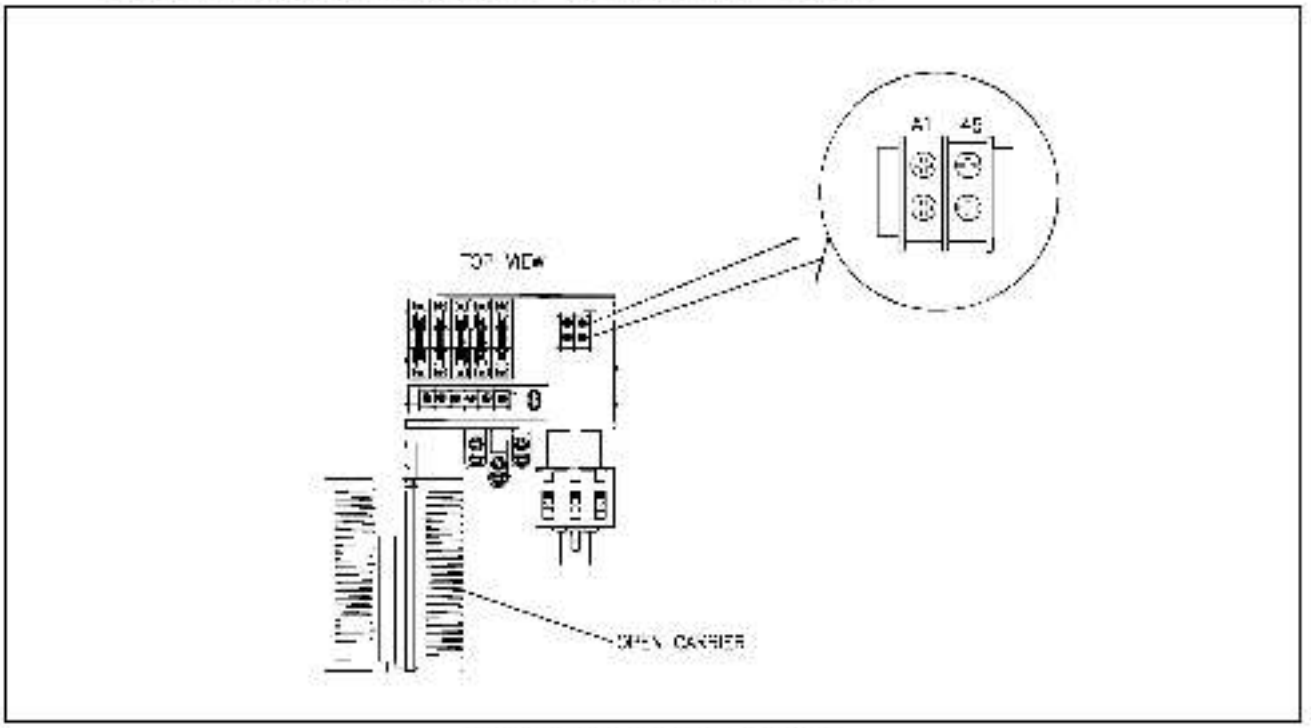

Figure 3 – Drive Motor Terminal Block

Step 3. Connect the motor armature lead marked A2 to the drive motor terminal block (see Figure 3 for location). If the motor has a series field, connect motor lead A2 to motor lead S1, and connect the motor lead S2 to the drive motor terminal block marked 45.

Removing and Replacing Fuse 11FU

Step 1. Remove the drive's front cover, then open the regulator carrier and remove the armature fuse plastic cover over the armature fuse (11FU). Refer the drawing on the back of the carrier for the location of 11FU.

Step 2. Remove the hardware used to attach 11FU to the drive.

Step 3. Replace 11FU with the jumper/bar (part number 610273-30RN, 610273-101A, or 610273-102A) provided with the kit. Use the hardware removed from 11FU to install the jumper/bar in place of 11FU.

Connecting the Wire Assembly

Step 1. Locate and remove the jumper wire from the 11FU terminal marked A1 and the terminal marked A1 on the Power Interface board. See Figure 4 for the location of the Power Interface board and terminal A1 on the Power Interface board.

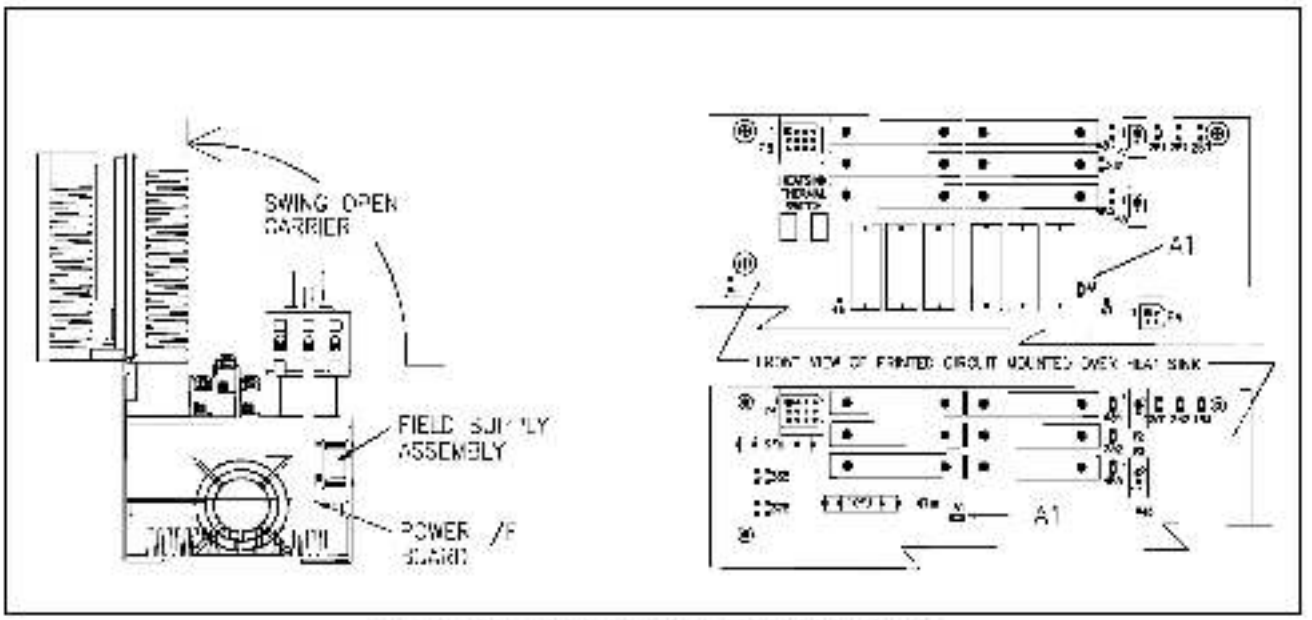

Figure 4 Power Interface board and terminal A1 locations

Step 2. Attach the spade connector on wire harness part number 610273-68D to the A1 terminal on the Power Interface board. Route the other end of this wire to the inverting fault circuit breaker terminal marked A1. Cut the wire to length as required and then terminate the end with the ring lug (part number 68321-187). Connect the ring lug to the A1 terminal on the inverting fault circuit breaker.

Step 3. Connect the spade connectors of the twisted pair harness (part number 610273-68S) to the male connectors coming out of the side of the inverting fault circuit breaker. Route this harness down to the bottom of the drive and connect it to terminals 9 and 11 on the regulator control terminal strip. See Figure 5.

Important: If any other interlocks are required for your application, they must be connected in series to the Customer Interlock Input (terminals 9 and 11) along with the circuit breaker.

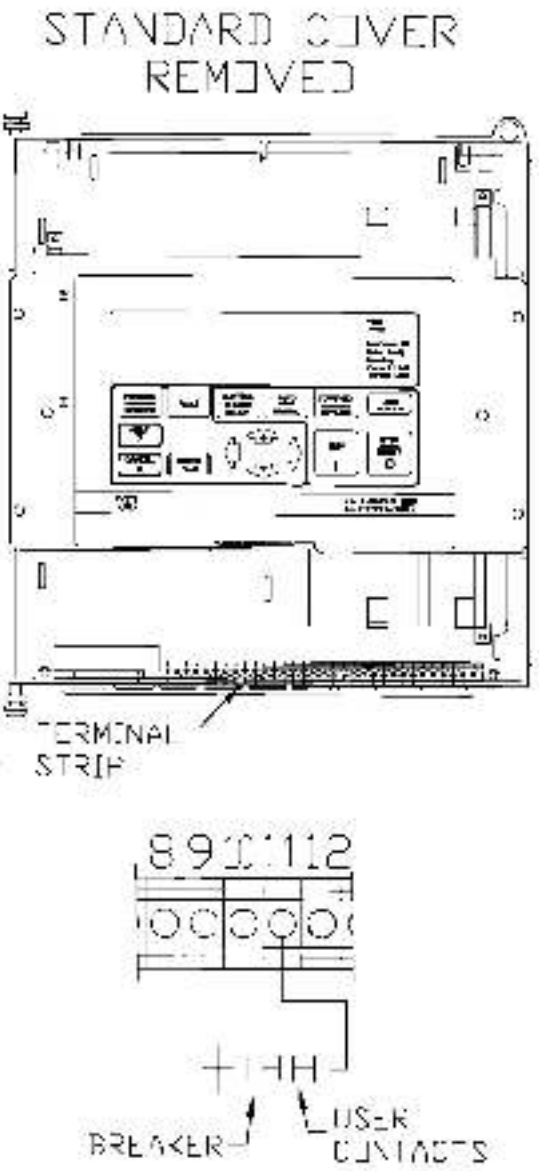

Figure 5 – Drive Control Terminal Strip

Checking the Circuit Breaker Settings

Step 1. Visually check the setting of the circuit breaker setpoint. Set the circuit breaker settings as required. See Table 3 for circuit breaker settings.

Table 3 – Inverting Fault Circuit Breaker Settings

Kit Model Number	Drive Horsepower/Volts	Required Setting
906FK0101	1.5 - 2 HP @ 230 VAC 3 - 5 HP @ 460 VAC	Set at A (40 A)
906FK0201	3 - 5 HP @ 230 VAC 7.5 - 10 HP @ 460 VAC	Set at L (50 A)
906FK0301	7.5 - 10 HP @ 230 VAC 15 - 20 HP @ 460 VAC	Set at P (90 A)
906FK0401	15 - 20 HP @ 230 VAC 25 - 40 HP @ 460 VAC	Set at L (150 A)
906FK0501	25 - 30 HP @ 230 VAC 50 - 60 HP @ 460 VAC	Set at L (450 A)

Step 2. Check and verify all wiring per Figure 6 before applying power to the drive. Ensure that wires are not in contact with hot components or sharp metal edges.

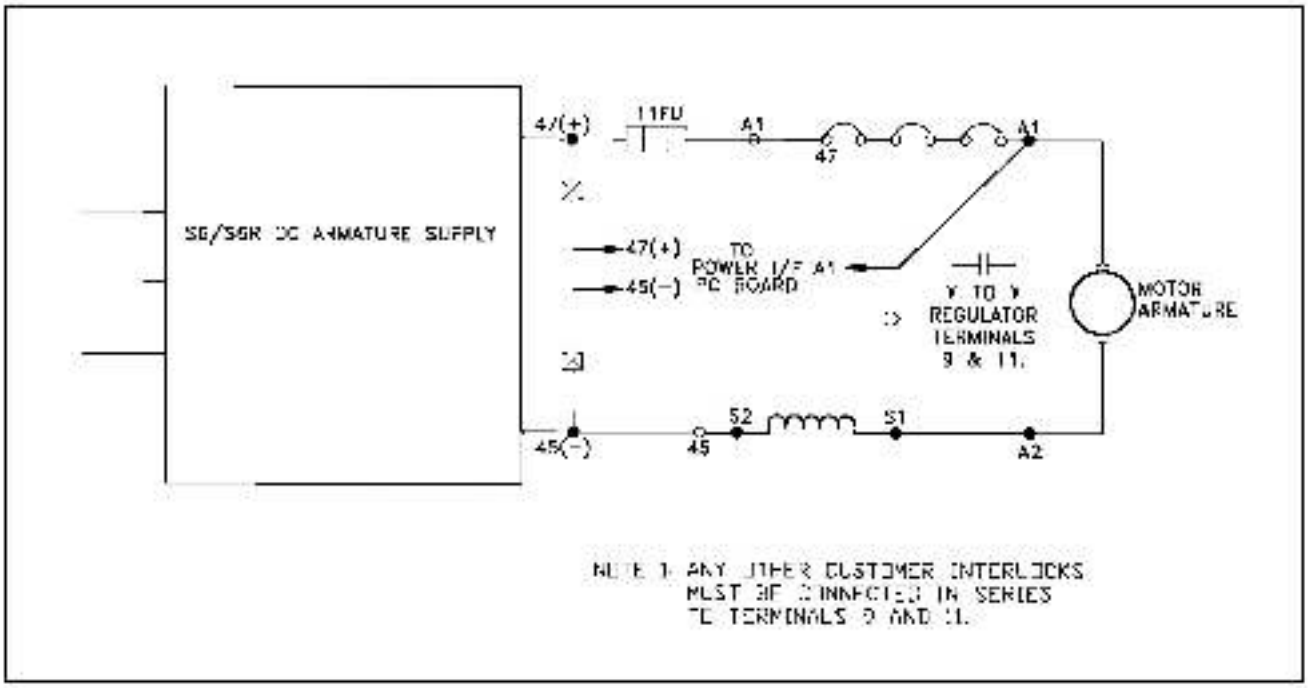

Figure 6 – Inverting Fault Circuit Breaker Connection Diagram

Step 3. Set the Inverting Fault Circuit Breaker to the ON position.

Step 4. Remove the lockout and tag and reconnect power to the drive.

Step 5. Turn on power to the drive.

Kit installation is now complete.

Technical Specifications

Table 4 - Replacement Circuit Breaker Part Numbers

Kit Model Number	Drive HorsePower/Voltage Rating	Replacement Circuit Breaker Model Number
906FK0101	1.5 - 2 HP @ 230 VAC 3 - 5 HP @ 460 VAC	77601-180XA
906FK0201	3 - 5 HP @ 230 VAC 7.5 - 10 HP @ 460 VAC	419035-100DSA
906FK0301	7.5 - 10 HP @ 230 VAC 15 - 20 HP @ 460 VAC	419035-100HSA
906FK0401	15 - 20 HP @ 230 VAC 25 - 40 HP @ 460 VAC	419035-100NSA
906FK0501	25 - 30 HP @ 230 VAC 50 - 60 HP @ 460 VAC	419035-100SSA

Table 5 - Inverting Fault Circuit Breaker Specifications

Kit Model Number	Drive Horsepower/ Voltage Rating	Circuit Breaker Dimensions HxWxD	Circuit Breaker Weight	Current Rating @ 40º C	Trip Amps	Max AC Volts 50/60 Hz.	Max DC Volts
906FK0101	1.5 - 2 HP @ 230 VAC 3 - 5 HP @ 460 VAC	6 x 4.125 x 4.13 (in) 153.4 x 105 x105 (mm)	4 lb 1.8 kg	25 A	40 A	600	600
906FK0201	3 - 5 HP @ 230 VAC 7.5 - 10 HP @ 460 VAC	6 x 4.25 x 4.16 (in) 153 x 115 x 106 (mm)	4.23 lb 1.9 kg	30 A	50-180 A	600	600
906FK0301	7.5 - 10 HP @ 230 VAC 15 - 20 HP @ 460 VAC	6 x 4.25 x 4.16 (in) 153 x 115 x 106 (mm)	4.23 lb 1.9 kg	50 A	75-260 A	600	600
906FK0401	15 - 20 HP @ 230 VAC 25 - 40 HP @ 460 VAC	6 x 4.25 x 4.16 (in) 153 x 115 x 106 (mm)	4.23 lb 1.9 kg	100 A	150-580 A	600	600
906FK0501	25 - 30 HP @ 230 VAC 50 - 60 HP @ 460 VAC	6 x 4.25 x 4.16 (in) 153 x 115 x 106 (mm)	4.23 lb 1.9 kg	150 A	450-1100 A	600	600

Publication 22-3300-2 - February 2001