

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

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**** READ ME FIRST ****

Determine the components installed in the existing equipment. Photos of each possible combination are shown on the pages 2-3.

If the motor/driver pictured below (manufactured by Big Best) is currently installed, **STOP AND CONTACT YOUR SALES REP.** This kit is not compatible with Big Best motors.




































Big Best Motor



Big Best Driver

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

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ID#	Pages:	PWM Board: ETPWM & CFM SETTER G3 PWM	Fan Relay Control: XFMR and Relay FCRB FRBii	Motor Type: EON 5.0 ZBOM BLDC Pika
1	8-10	 ETPWM & CFM Setter	 XFMR and Relay	 EON 5.0 (1-motor)
2	11-13	 ETPWM & CFM Setter (2x)	 XFMR and Relay	 EON 5.0 (2-motor)
3	14-16	 G3 PWM	 XFMR and Relay	 EON 5.0 (1-motor or 2-motor)
4	17-19	 G3 PWM	 FCRB	 EON 5.0 (1-motor or 2-motor)
5	20-22	 G3 PWM	 FRBii	 EON 5.0 (1-motor or 2-motor)
6	23-25	 G3 PWM	 XFMR and Relay	 ZBOM BLDC (1-motor)
7	26-28	 G3 PWM	 XFMR and Relay	 ZBOM BLDC (2-motor)
8	29-31	 G3 PWM	 FCRB	 ZBOM BLDC (1-motor)
9	32-34	 G3 PWM	 FCRB	 ZBOM BLDC (2-motor)
10	35-37	 G3 PWM	 FCRB	 ZBOM BLDC (1-motor)
11	38-40	 G3 PWM	 FRBii	 Pika (2-motor)

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KIT BILL OF MATERIAL

This is a universal kit, designed to be able install the Select PWM in place of the earlier PWM board for all the different combinations listed on the previous pages. Each specific instructions list the specific parts needed for that kit. Discard the remaining wires/parts upon successful conversion. The full bill of material for the kit is listed below.

DESCRIPTION	PART NUMBER	QTY
Conversion Wire Diagram(s)	88-24010-xx (-01 thru -11)	1 of each
Select PWM	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	3
Harness: ICM-motor (5 quick connects) for 1 EON motor	61-13369-01	1
Harness: ICM-motor (10 quick connects) for 2 EON motors	61-13369-02	1
Harness: ICM-motor (4-pin mtr side connector) for 1 ZBOM BLDC	66-13069-01	1
Harness: ICM-motor (4-pin mtr-side connector) for 2 ZBOM BLDC	66-13069-02	1
Harness: ICM-motor (6-pin mtr side connector) for 1 EON motor	PE-16-0593	1
Harness: ICM-motor (6-pin mtr side connector) for 2 EON motors	PE-16-0594	1
Harness: ICM-motor (2 quick mtr side connects) for 1 Pika motor	PE-16-0924	1
Harness: ICM-motor (4 quick mtr side connects) for 2 Pika motors	PE-16-0926	1
Harness: FRBii-J4 to Select PWM (4-pin,3 wire, quick connects)	61-13276-01	1
Harness: FRBii-J2 power 115V (5-pin, 2 wires, quick connects)	PE-16-0500	1
Harness: FRBii-J2 power 208V (5-pin, 2 wires, quick connects)	PE-16-0418	1
Harness: FRBii-J2 power 230V (5-pin, 2 wires, quick connects)	PE-16-0420	1
Harness: FRBii-J2 power 277V (5-pin, 2 wires, quick connects)	PE-16-0502	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

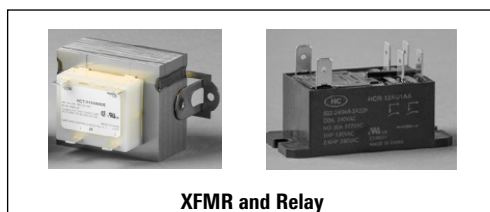
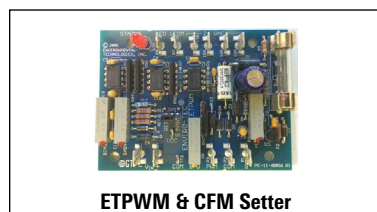
SELECT PWM GENERAL WIRING DESCRIPTION

1. The Select PWM uses 3 fan enable relays to provide 24VAC power to the board. The PWM board is always on and the fan speed (High/Med/Low) is chosen by applying 24VAC to the SPD "x" input from the fan relays.
2. The Select PWM speeds are adjustable by changing the potentiometer positions (refer to IOM for more details).
3. The 4-pin header provides the output signal to the motor(s).

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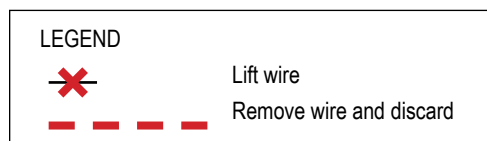
INSTRUCTIONS TO REPLACE ETPWM AND 3-SPEED CFM SETTER CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND AN EON MOTOR

These instructions explain how to replace the existing ETPWM and 3-speed CFM setter controller with the Select PWM controller when installed with a transformer/relay(s) and an EON motor. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.



IDENTIFY COMPONENTS

- a. Locate the ETPWM and 3-speed CFM Setter boards within the control enclosure (See Figure 1).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

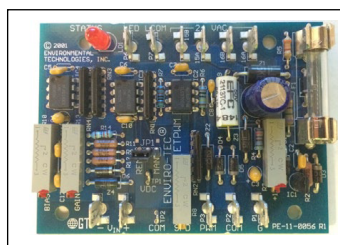


Figure 1a – ETPWM Board

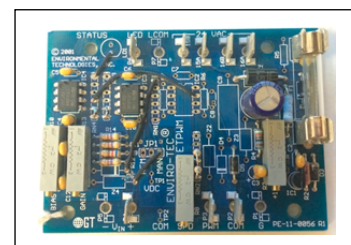


Figure 1b – 3-speed CFM Setter Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-01	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (5 quick connects) for 1 EON motor	61-13369-01	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1

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Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 2)



WHT and BLK wires on primary side of transformer are line voltage and are not changed.

- Remove and discard the BLU and YEL wires between the ETPWM, ECM 3-SPD CFM Setter and transformer. The BLU and YEL wires at the PWM boards are on P15A/B and P16A/B.
- Lift BLU and YEL wires from fan relay.

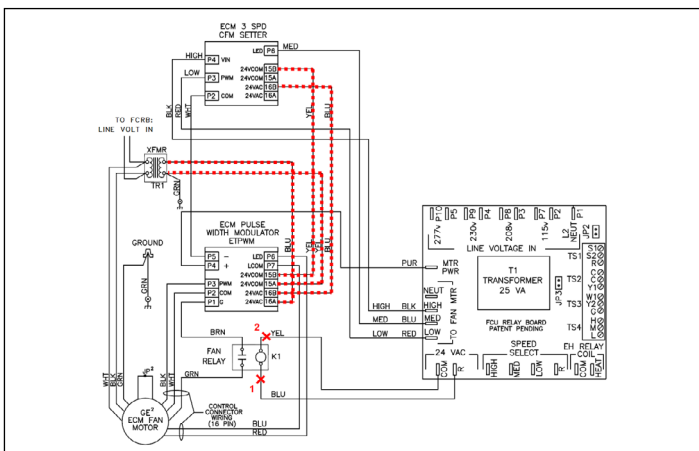


Figure 2 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 3)

- Remove wire between P1 and fan relay (K1) contact and discard (BRN in Figure 3, but color may vary depending on unit).
- Lift wires from P2 (WHT), P3 (BLK), P6 (RED), P7 (BLU) and the motor side of the fan relay (K1) contact (GRN).

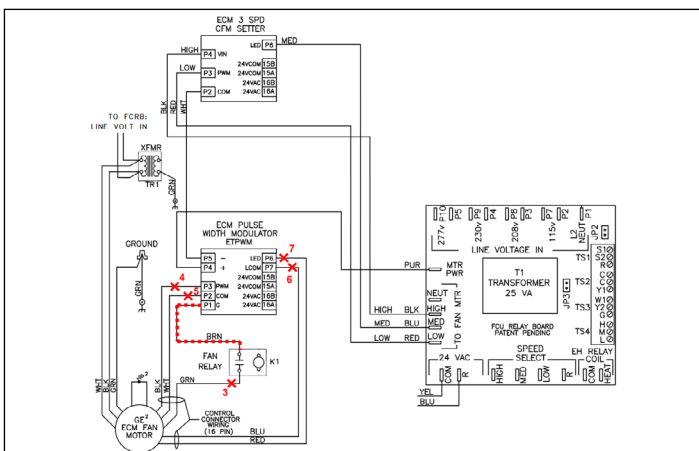


Figure 3 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 4)

- Remove and discard the WHT wire between ETPWM-P5 and 3-speed CFM Setter-P2.
- Remove and discard the PUR wire between ETPWM-P4 and FCRB-MTR PWR.
- Lift the BLK, BLU and RED wires from the 3-speed CFM Setter.

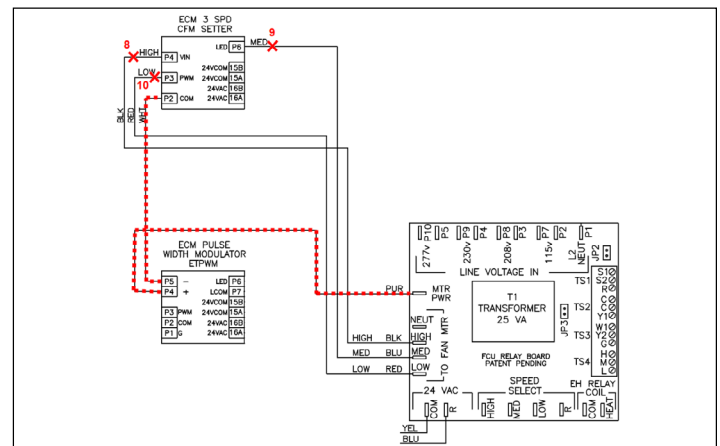


Figure 4 – Remove Fan Control Signal Wires

REMOVE ETPWM BOARD

- Verify that all wired connections have been removed from the ETPWM board and 3-speed CFM Setter.
- Remove the ETPWM and 3-speed CFM Setter and brackets.

INSTALL SELECT PWM BOARD (SEE FIGURE 5)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

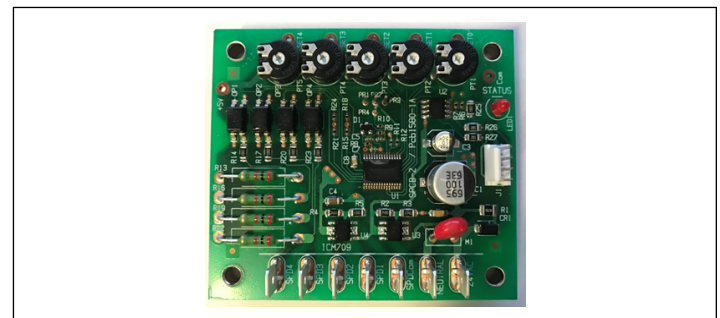


Figure 5 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 6)

- Install butterfly/Y connector on the FCRB-MTR PWR terminal and on the Select-NEUTRAL terminal.
- Install BLU wire #1 on one terminal of the butterfly/Y connector at FCRB-MTR PWR.
- Install BLU wire provided in kit between the other terminal of the butterfly/Y connector at FCRB-MTR PWR and Select-24VAC.
- Install YEL wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.

CONNECT MOTOR SIGNAL TO SELECT PWM (SEE FIGURE 6)

- Connect WHT, BLU, RED, GRN, BLK wires from motor to quick connect ends of harness provided in the kit.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 6)

- Connect BLK from FCRB-High to Select-SPD3.
- Connect BLU from FCRB-High to Select-SPD2.
- Connect RED from FCRB-High to Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 2-4 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 6.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-01 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

ETPWM Manual Adjustment	Select PWM (3-Speed Control) Equation: ETPWM - 5
5.00 VDC	0.00 VDC
6.25 VDC	1.25 VDC
7.50 VDC	2.50 VDC
8.75 VDC	3.75 VDC
10.0 VDC	5.00 VDC

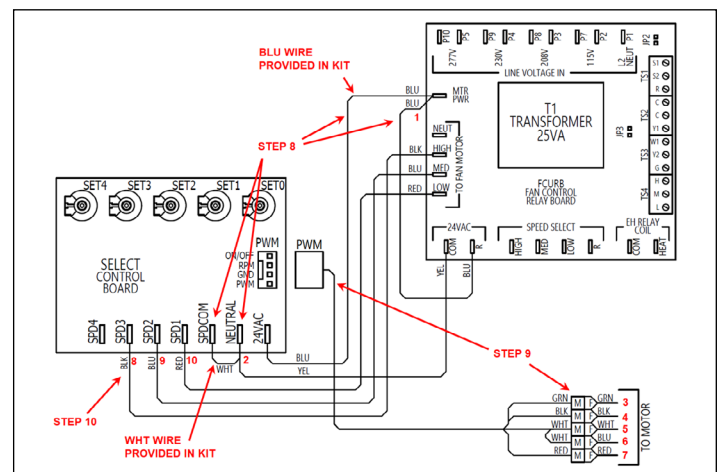
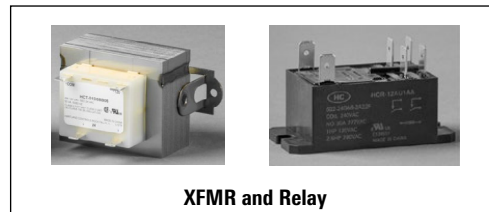
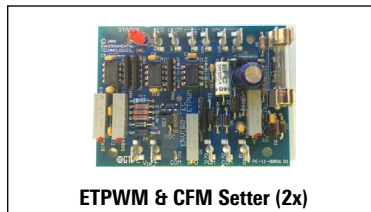


Figure 6 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

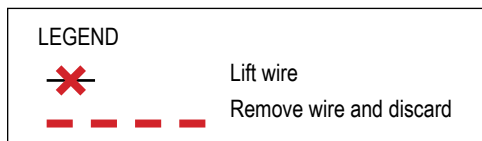
INSTRUCTIONS TO REPLACE ETPWM2/ETPWM3 AND 3-SPEED CFM SETTER CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND 2 EON MOTORS

These instructions explain how to replace the existing ETPWM2/ETPWM3 Controller with the Select PWM controller when installed with a transformer/relay(s) and 2 EON motors. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.



IDENTIFY COMPONENTS

- a. Locate the ETPWM boards within the control enclosure (See Figure 7).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

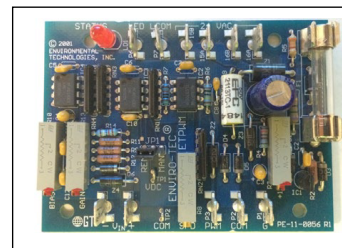


Figure 7a – ETPWM2 Board

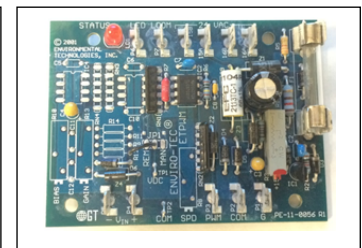


Figure 7b – ETPWM3 Board

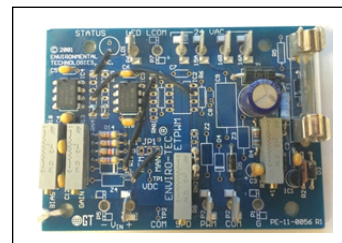


Figure 7c – 3-speed CFM Setter Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-02	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (10 quick connects) for 2 EON motors	61-13369-02	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1

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REMOVE PWM POWER WIRES (SEE FIGURE 8)



WHT and BLK wires on primary side of transformer are line voltage and are not changed.

- Remove and discard the BLU and YEL wires between the ETPWM2, ETPWM3, ECM 3-SPD CFM Setter and transformer. The BLU and YEL wires at the PWM boards are on P15A/B and P16A/B.
- Lift BLU and YEL wires from fan relay.

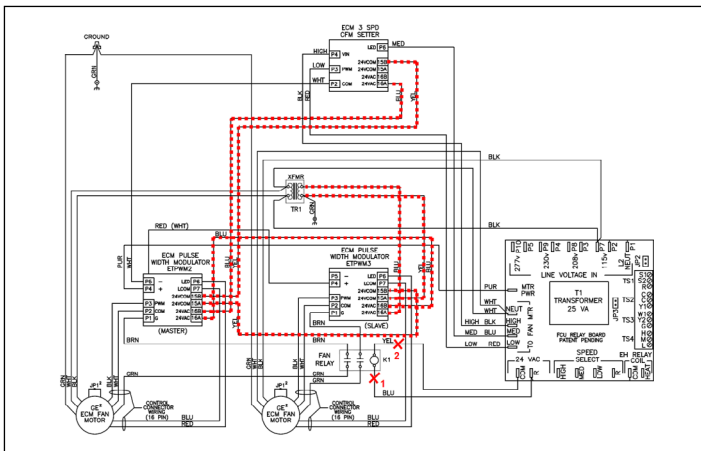


Figure 8 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 9)

- Remove wires between P1 on both PWM boards and fan relay (K1) contact and discard (BRN in Figure 3, but color may vary depending on unit). The fan relay contacts will not be used with the Select PWM board.
- On both ETPWM2 and ETPWM3 boards, lift wires from P2 (WHT), P3 (BLK), P6 (RED), P7 (BLU) and the motor side of the fan relay (K1) contact (GRN).

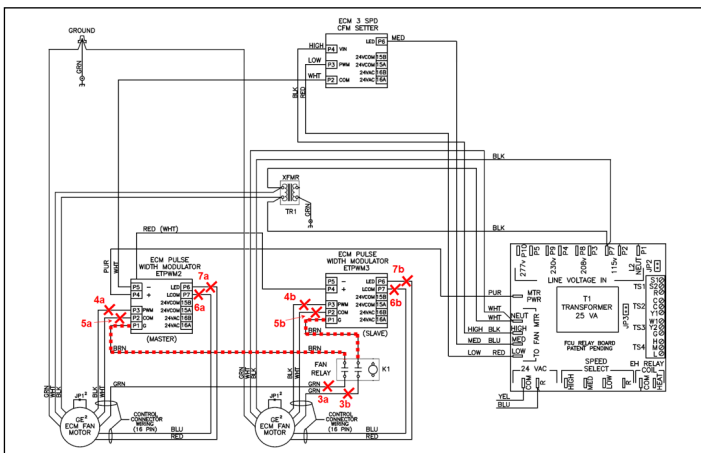


Figure 9 – Remove low voltage signal wires to motor

REMOVE FAN CONTROL WIRES AND ETPWM2/ETPWM3 BOARDS FROM EACH OTHER (SEE FIGURE 10)

- Remove and discard the WHT wire between ETPWM2-P5 and 3-speed CFM Setter-P2.
- Remove and discard the PUR wire between ETPWM2-P4 and FCRB-MTR PWR.
- Lift the BLK, BLU and RED wires from the 3-speed CFM Setter.
- Lift wire between the back of ETPWM2 board and P4 of ETPWM3 (RED/WHT in Figure 10, but color may vary depending on unit).

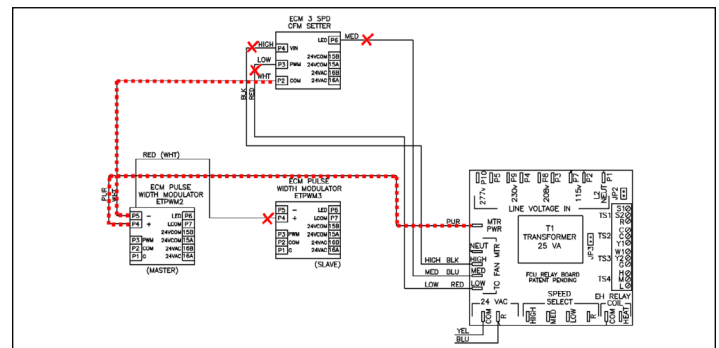


Figure 10 – Remove 2-10VDC motor control signal

REMOVE ETPWM2 AND ETPWM3 BOARDS

- Verify that all wired connections have been removed from the ETPWM2, ETPWM3 and 3-speed CFM Setter boards.
- Remove the ETPWM2, ETPWM3 and 3-speed CFM Setter boards and brackets.

INSTALL SELECT PWM BOARD (SEE FIGURE 11)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

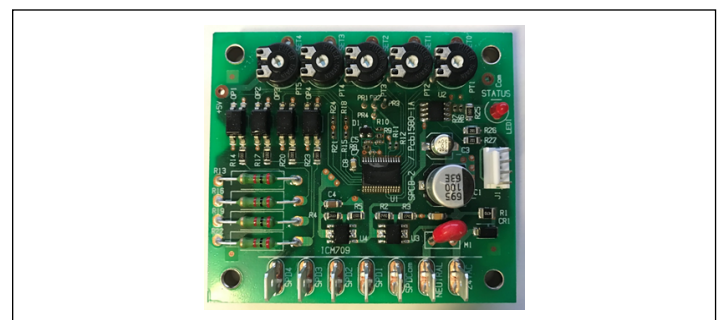


Figure 11 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 12)

- Install butterfly/Y connector on the FCRB-MTR PWR terminal and on the Select-NEUTRAL terminal.
- Install BLU wire #1 on one terminal of the butterfly/Y connector at FCRB-MTR PWR.
- Install BLU wire provided in kit between the other terminal of the butterfly/Y connector at FCRB-MTR PWR and Select-24VAC.
- Install YEL wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.

CONNECT MOTOR SIGNAL TO SELECT PWM (SEE FIGURE 12)

- Connect WHT, BLU, RED, GRN, BLK wires from motor to quick connect ends of harness provided in the kit. Note the RED wire from the 2nd motor (identified as 7b) will not be connected.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 12)

- Connect BLK from FCRB-High to Select-SPD3.
- Connect BLU from FCRB-High to Select-SPD2.
- Connect RED from FCRB-High to Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 8-10 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 12.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-02 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

ETPWM Manual Adjustment	Select PWM (3-Speed Control) Equation: ETPWM - 5
5.00 VDC	0.00 VDC
6.25 VDC	1.25 VDC
7.50 VDC	2.50 VDC
8.75 VDC	3.75 VDC
10.0 VDC	5.00 VDC

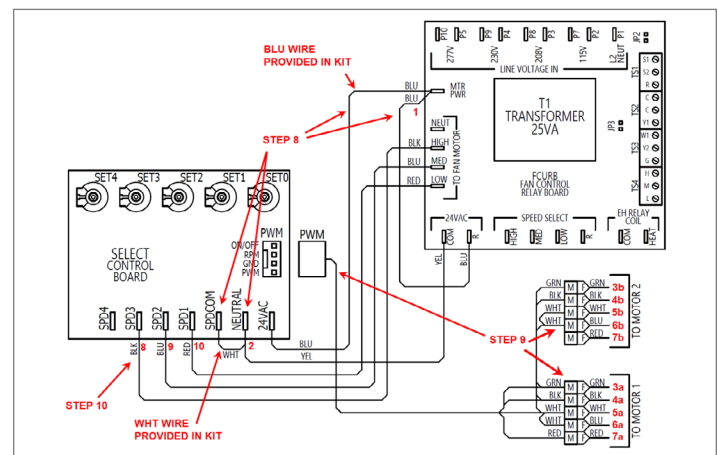
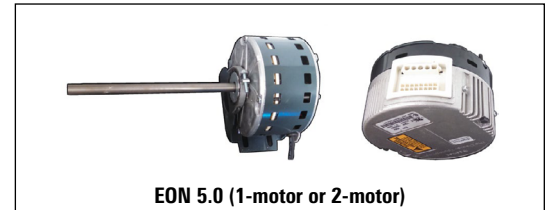
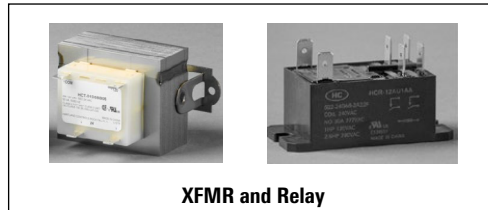
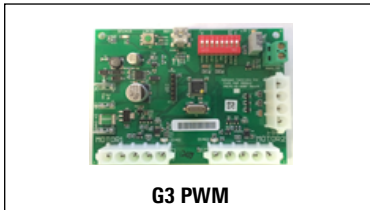


Figure 12 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND EON MOTOR(S)

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with a transformer/relay(s) and EON motor(s). This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

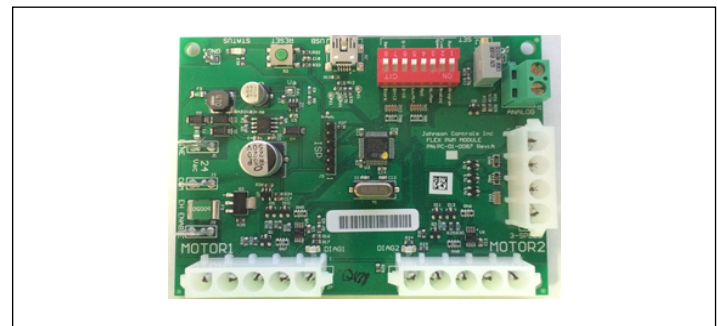


Figure 13 – G3 PWM Board

LEGEND

Lift wire

Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 13).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-03	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	3
Harness: ICM-motor (5 quick connects) for 1 EON motor	61-13369-01	1
Harness: ICM-motor (10 quick connects) for 2 EON motors	61-13369-02	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 14)



WHT and BLK wires on primary side of transformer are line voltage and are not changed.

- Lift BLU wires from LINE (including butterfly/Y connector if installed).
- Lift YEL wires from COM (remove the butterfly/Y connector if installed).

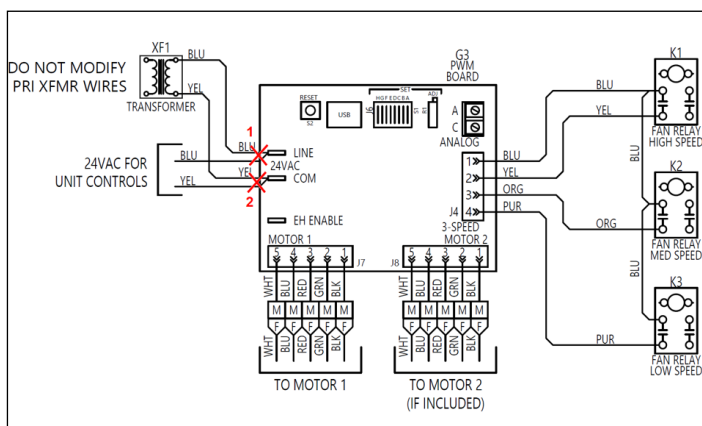


Figure 14 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 15)

- Disconnect the 5 quick connects (WHT, BLU, RED, GRN, BLK) from the motor(s), retaining the female side of the quick connects (that go to the motor(s)).
- Remove the 5-pin harness(es) on the other end from the PWM board and discard.

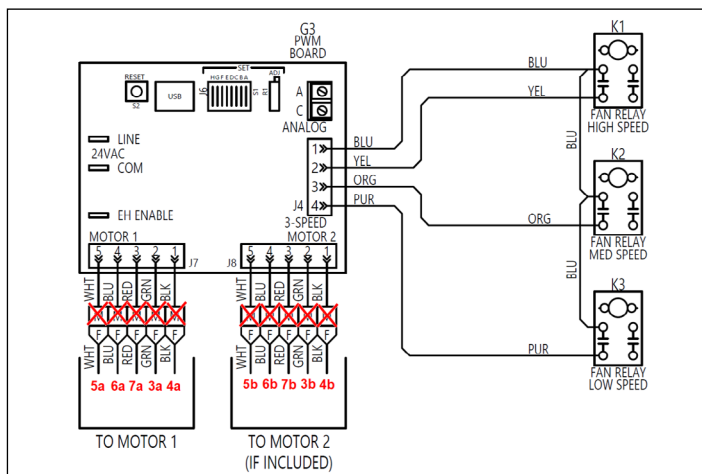


Figure 15 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 16)

- Disconnect the 4 wires from the fan relays as shown. Do not remove the butterfly/Y connectors if previously installed.
- Remove the 4-pin harness on the other end from the PWM board and discard.

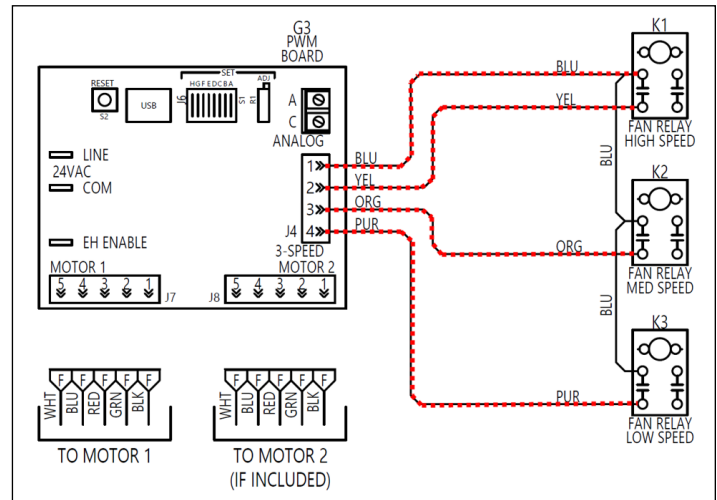


Figure 16 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 17)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

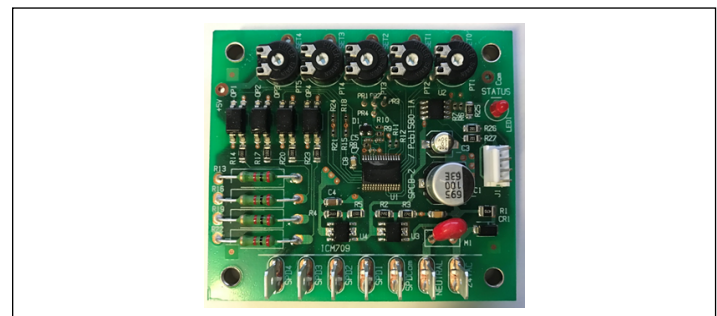


Figure 17 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 18)

- Install butterfly/Y connectors on Select-NEUTRAL and Select-SPDCom.
- Install YEL wire(s) #2 on Select-NEUTRAL and/or Select-SPDCom.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connectors at Select-NEUTRAL and Select-SPDCOM.
- Lift the BLU wire on the 24V side of the transformer and install a butterfly/Y connector and re-install the BLU wire on one terminal of the butterfly/Y connector.
- Install BLU wire #1 (or wires with butterfly/Y connector) on Select-24VAC.
- Install BLU wire provided in kit with female quick connects on both sides between open butterfly/Y connector terminal on the transformer and the open butterfly/Y connector terminal on the fan relay contact.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 18)

- Connect WHT, BLU, RED, GRN, BLK wires from motor to quick connect ends of harness provided in the kit. Note the RED wire from the 2nd motor (identified as 7b) will not be connected.
 - There are harnesses in the kit to support 1-motor and 2-motor units. Only the one that applies to the unit being replaced will be used.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 18)

- Install BLK wire provided in kit between High Fan relay and Select-SPD3.
- Install BLU wire provided in kit between Medium Fan relay and Select-SPD2.
- Install RED wire provided in kit between Low Fan relay and Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 14-16 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 18.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-03 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2^*(G3 PWM)$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

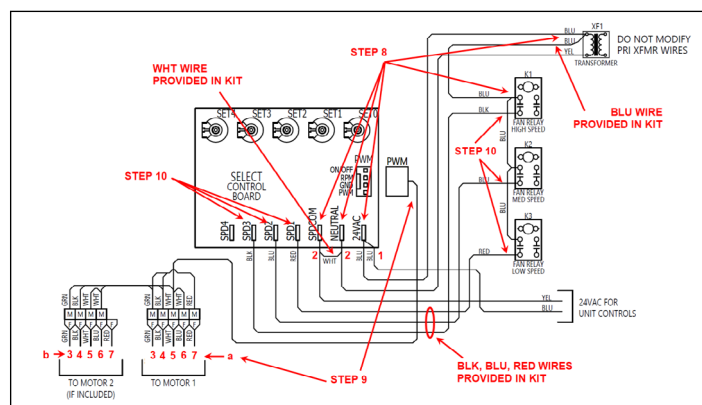
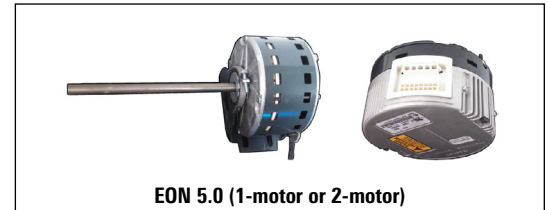
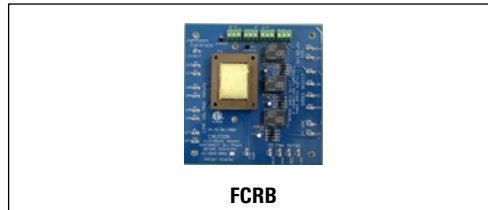
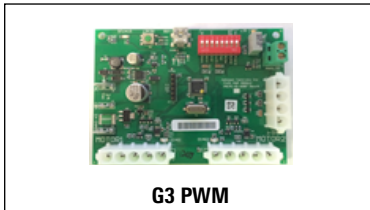


Figure 18 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH AN FCRB AND EON MOTOR(S)

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with an FCRB and EON motor(s). This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- Remove power to the unit in accordance with LOTO procedures.
- Tool(s) Required
 - 1/8" flat bladed screwdriver
 - Wire strippers (capable of stripping 16AWG)
 - 1/4" Nut driver
 - Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

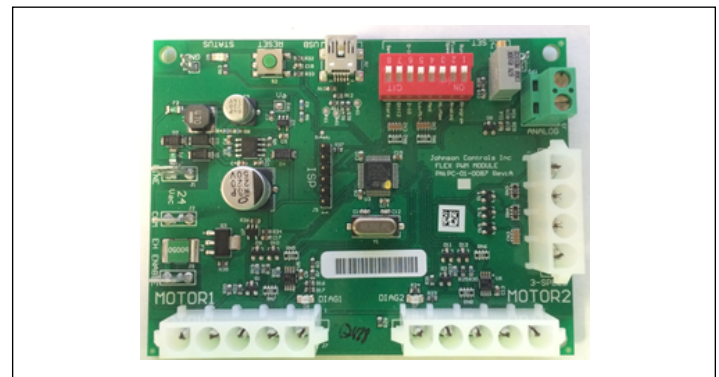
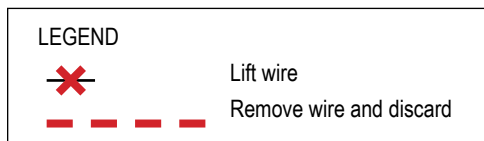


Figure 19 – G3 PWM Board



IDENTIFY COMPONENTS

- Locate the G3 PWM board within the control enclosure (See Figure 19).
- Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-04	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (5 quick connects) for 1 EON motor	61-13369-01	1
Harness: ICM-motor (10 quick connects) for 2 EON motors	61-13369-02	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 20)

- Lift BLK wire from LINE.
- Lift WHT wire from COM.

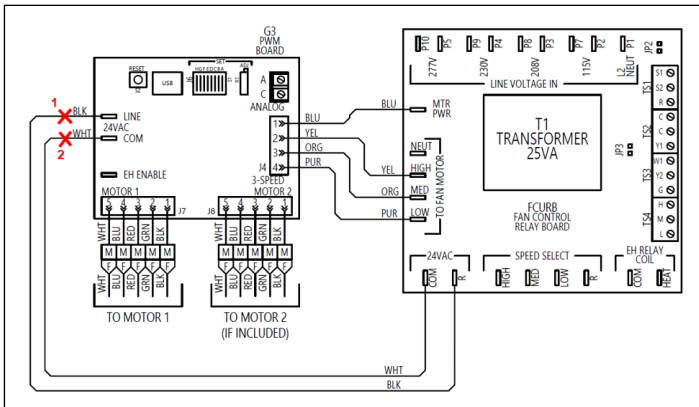


Figure 20 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 21)

- Disconnect the 5 quick connects (WHT, BLU, RED, GRN, BLK) from the motor(s), retaining the female side of the quick connects (that go to the motor(s)).
- Remove the 5-pin harness(es) on the other end from the PWM board and discard.

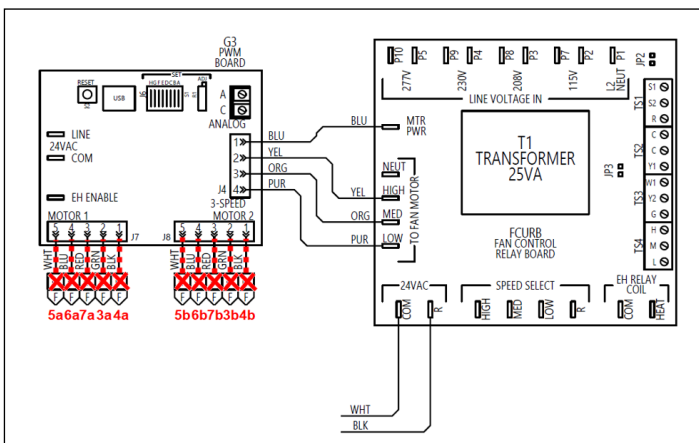


Figure 21 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 22)

- Disconnect and remove the 4-pin harness between the G3 PWM and FCURB.

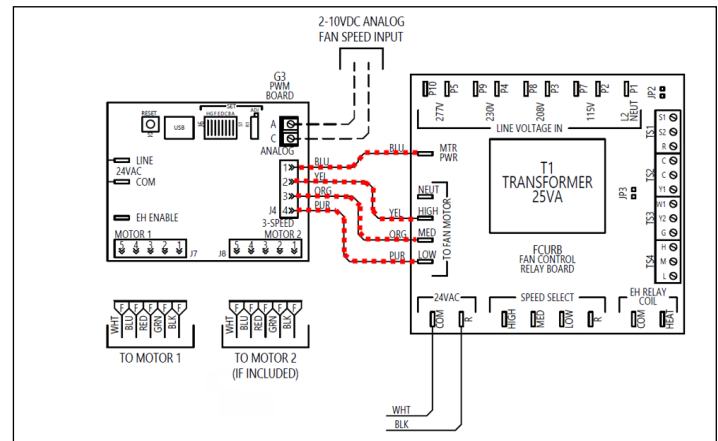


Figure 22 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
 - If there is a wire connected to the EH ENABLE terminal on the G3, lift this wire and terminate on a COM (or C) terminal on the fan relay board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 23)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

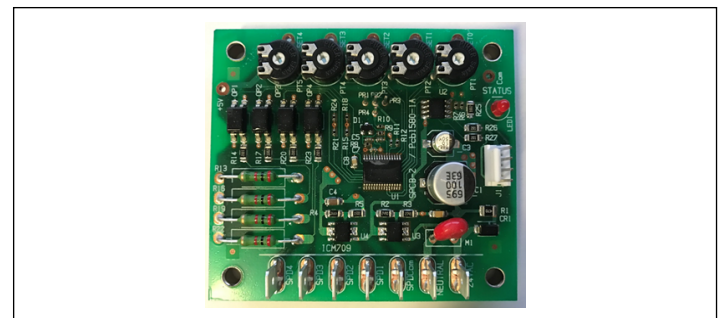


Figure 23 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 24)

- Install butterfly/Y connector on the FCRB-MTR PWR terminal and on the Select-NEUTRAL terminal.
- Install BLK wire #1 on one terminal of the butterfly/Y connector at FCRB-MTR PWR.
- Install BLU wire provided in kit between the other terminal of the butterfly/Y connector at FCRB-MTR PWR and Select-24VAC.
- Install WHT wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 24)

- Connect WHT, BLU, RED, GRN, BLK wires from each motor to quick connect ends of harness provided in the kit. When 2 motors are installed, note the RED wire from the 2nd motor (identified as 7b) will not be connected.
 - There are harnesses in the kit to support 1-motor and 2-motor units. Only the one that applies to the unit being replaced will be used.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 24)

- Install BLK wire provided in kit between High Fan relay and Select-SPD3.
- Install BLU wire provided in kit between Medium Fan relay and Select-SPD2.
- Install RED wire provided in kit between Low Fan relay and Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 20-22 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 24.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-04 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2 \times (\text{G3 PWM})$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

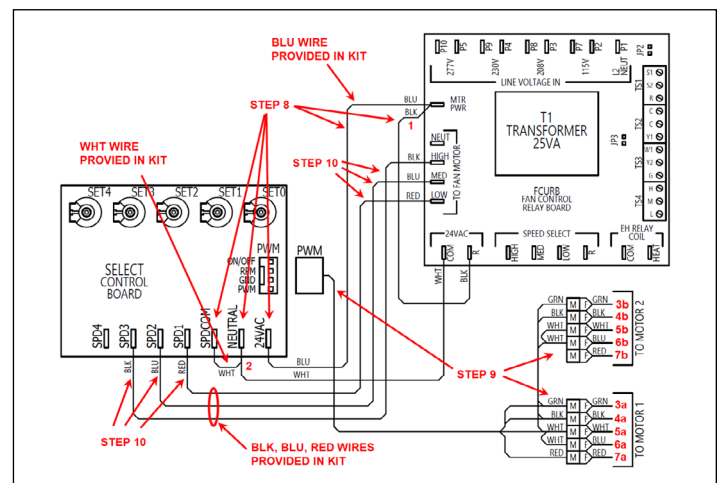


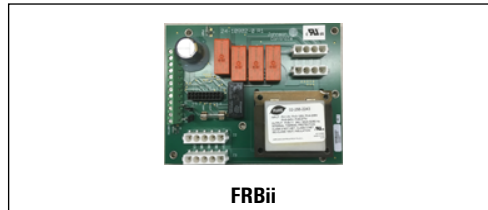
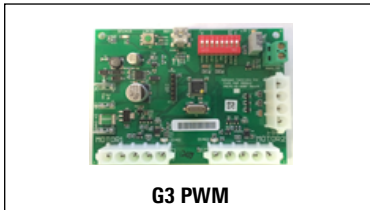
Figure 24 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A FRBii AND EON MOTOR(S)

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with a FRBii and EON motor(s). This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- Remove power to the unit in accordance with LOTO procedures.
- Tool(s) Required
 - 1/8" flat bladed screwdriver
 - Wire strippers (capable of stripping 16AWG)
 - 1/4" Nut driver
 - Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

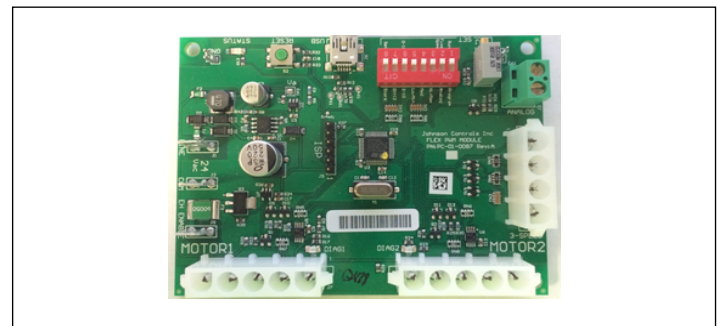


Figure 25 – G3 PWM Board

LEGEND	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- Locate the G3 PWM board within the control enclosure (See Figure 25).
- Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-05	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (6-pin mtr side connector) for 1 EON motor	PE-16-0593	1
Harness: ICM-motor (6-pin mtr side connector) for 2 EON motors	PE-16-0594	1
Harness: FRBii-J4 to Select PWM (4-pin,3 wire, quick connects)	61-13276-01	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 26)

- Lift BLK wire from LINE.
- Lift WHT wire from COM.

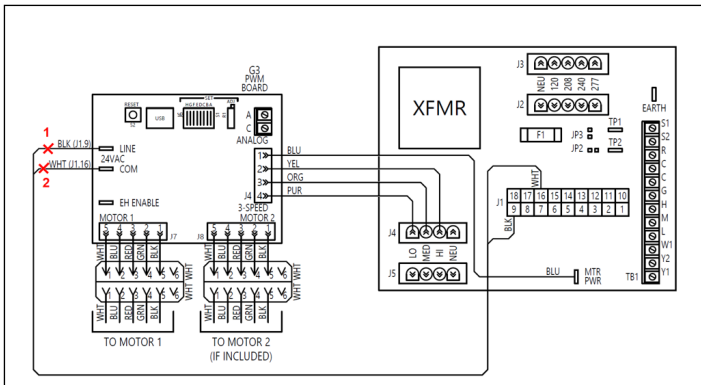


Figure 26 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 27)

- Disconnect the 6-pin (5-wire) harness connection(s) (WHT, BLU, RED, GRN, BLK) from the motor(s), retaining the mating harness(es) that go to the motor(s).
- Remove the 5-pin harness(es) on the other end from the PWM board and discard.

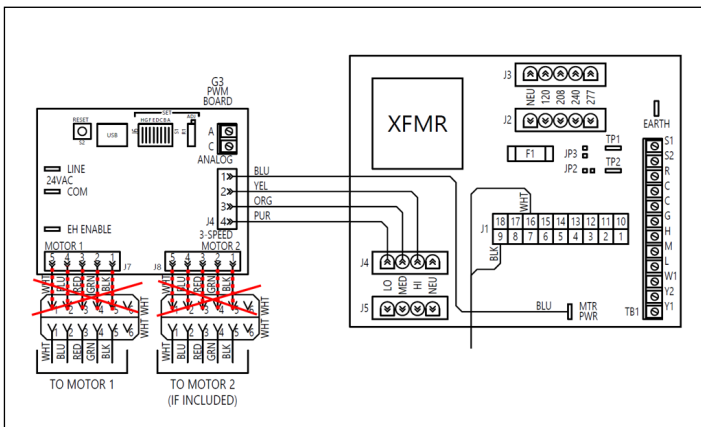


Figure 27 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 28)

- Disconnect and remove the 4-pin harness between the G3 PWM and FRBii.

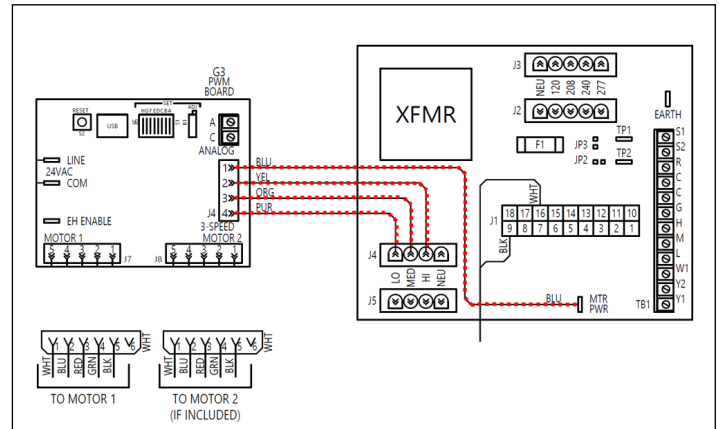


Figure 28 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 29)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

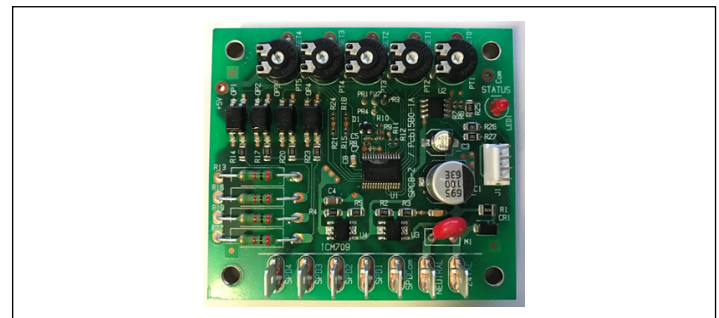


Figure 29 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 30)

- Install butterfly/Y connectors on the Select-24VAC and Select-NEUTRAL terminals.
- Install BLK wire #1 on one terminal of the butterfly/Y connector at Select-24VAC.
- Install WHT wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.
- Install BLK wire provided in kit between the other terminal of the butterfly/Y connector at Select-24VAC and FRBii-MTR PWR.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 30)

- Connect 6-pin harness provided in kit to the mating harness(es) that go to the motor(s).
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 30)

- Install 4-pin (3-wire) harness at FRBii J4.
- Install BLK wire of 4-pin (3-wire) harness on Select-SPD3.
- Install BLU wire of 4-pin (3-wire) harness on Select-SPD2.
- Install RED wire of 4-pin (3-wire) harness on Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 26-28 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 30.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-05 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2 \times (\text{G3 PWM})$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

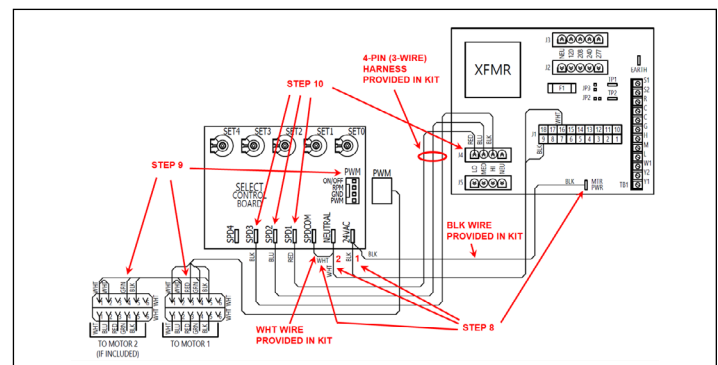
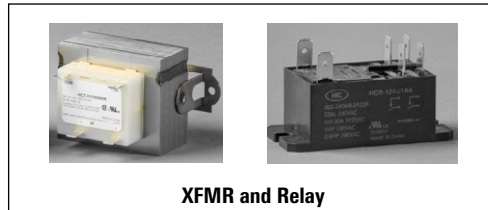
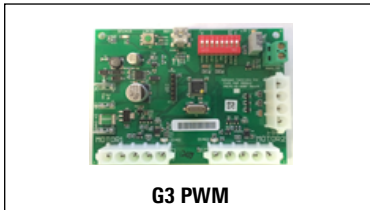


Figure 30 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND ZBOM BLDC MOTOR

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with a transformer/relay(s) and ZBOM BLDC motor. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

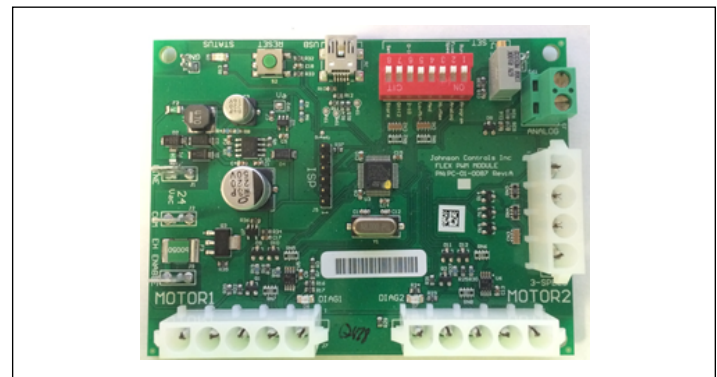
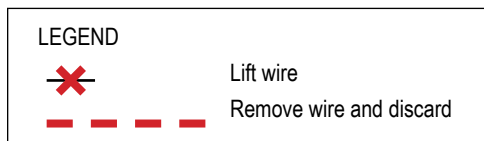


Figure 31 – G3 PWM Board



IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 31).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-06	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	3
Harness: ICM-motor (4-pin mtr side connector) for 1 ZBOM BLDC	66-13069-01	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 32)



WHT and BLK wires on primary side of transformer are line voltage and are not changed.

- Lift BLU wires from LINE (including butterfly/Y connector if installed).
- Lift YEL wires from COM (remove the butterfly/Y connector if installed).

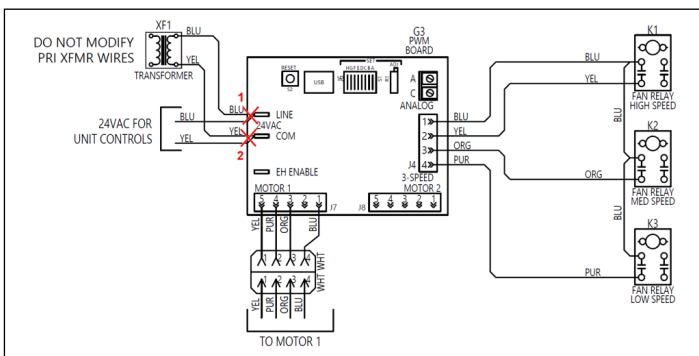


Figure 32 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 33)

- Disconnect the 4-pin harness connection (YEL, PUR, ORG, BLU) from the motor, retaining the mating harness that goes to the motor.
- Remove the 5-pin harness (4-wire) on the other end from the PWM board and discard.

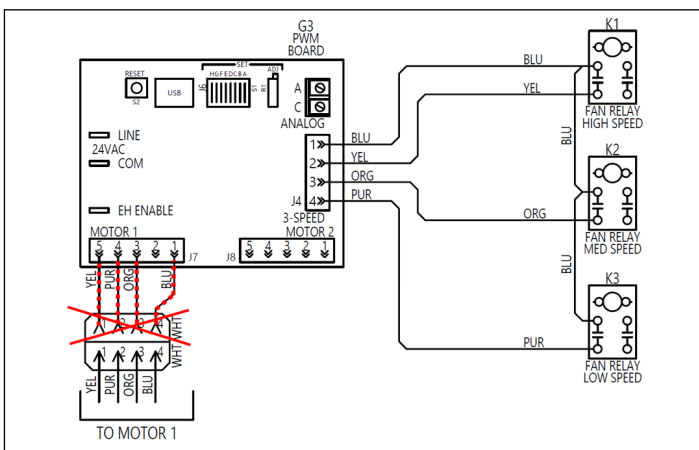


Figure 33 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 34)

- Disconnect the 4 wires from the fan relays as shown. Do not remove the butterfly/Y connectors if previously installed.
- Remove the 4-pin harness on the other end from the PWM board and discard.

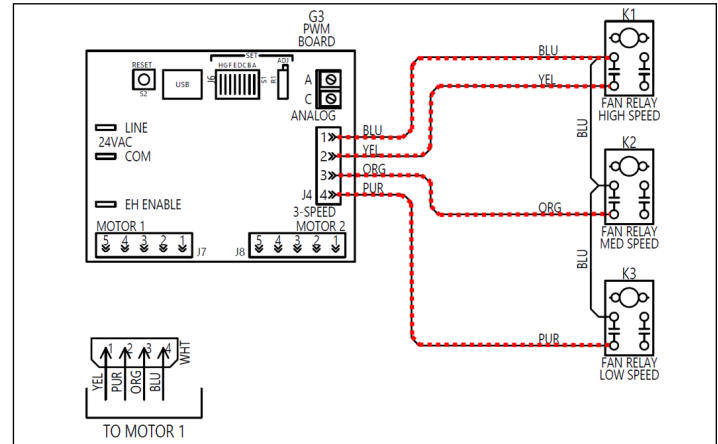


Figure 34 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 35)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

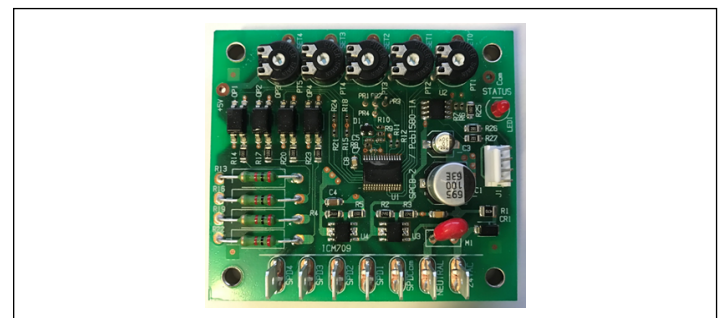


Figure 35 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 36)

- Install butterfly/Y connectors on Select-NEUTRAL and Select-SPDCom.
- Install YEL wire(s) #2 on Select-NEUTRAL and/or Select-SPDCom.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connectors at Select-NEUTRAL and Select-SPDCOM.
- Lift the BLU wire on the 24V side of the transformer and install a butterfly/Y connector and re-install the BLU wire on one terminal of the butterfly/Y connector.
- Install BLU wire #1 (or wires with butterfly/Y connector) on Select-24VAC.
- Install BLU wire provided in kit with female quick connects on both sides between open butterfly/Y connector terminal on the transformer and the open butterfly/Y connector terminal on the fan relay contact.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 36)

- Connect 4-pin harness provided in kit to the mating harness that goes to the motor.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

NOTE: This harness has lever nuts connecting the wires. These are pre-assembled and the only step required by the installer is to install the 4-pin plug to the mating harness at the motor and at the PWM board. The conversion diagram shows the lever nuts for future servicing.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 36)

- Install BLK wire provided in kit between High Fan relay and Select-SPD3.
- Install BLU wire provided in kit between Medium Fan relay and Select-SPD2.
- Install RED wire provided in kit between Low Fan relay and Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 32-34 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 36.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-06 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2^*(G3 \text{ PWM})$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

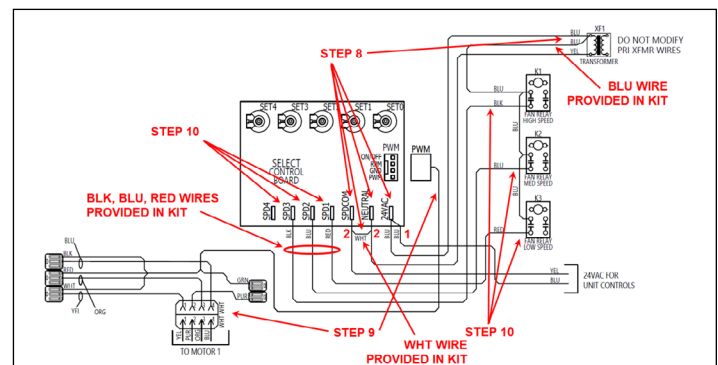
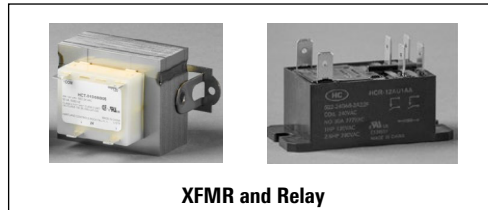
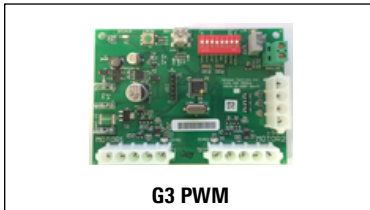


Figure 36 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND TWO (2) ZBOM BLDC MOTORS

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with a transformer/relay(s) and two (2) ZBOM BLDC motors. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

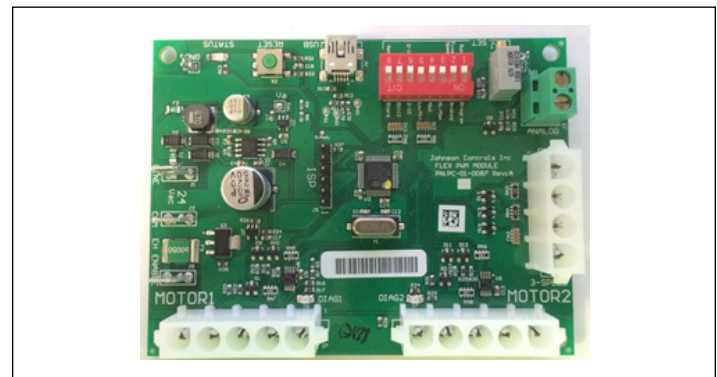


Figure 37 – G3 PWM Board

LEGEND

Lift wire

Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 37).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-06	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	3
Harness: ICM-motor (4-pin mtr side connector) for 2 ZBOM BLDC	66-13069-02	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 38)



WHT and BLK wires on primary side of transformer are line voltage and are not changed.

- Lift BLU wires from LINE (including butterfly/Y connector if installed).
- Lift YEL wires from COM (remove the butterfly/Y connector if installed).

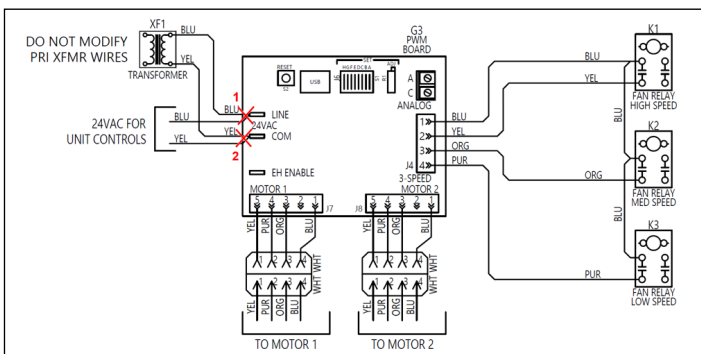


Figure 38 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 39)

- Disconnect the 4-pin harness connections (YEL, PUR, ORG, BLU) from the motors, retaining the mating harnesses that go to the motors.
- Remove the 5-pin harnesses (4-wire) on the other end from the PWM board and discard.

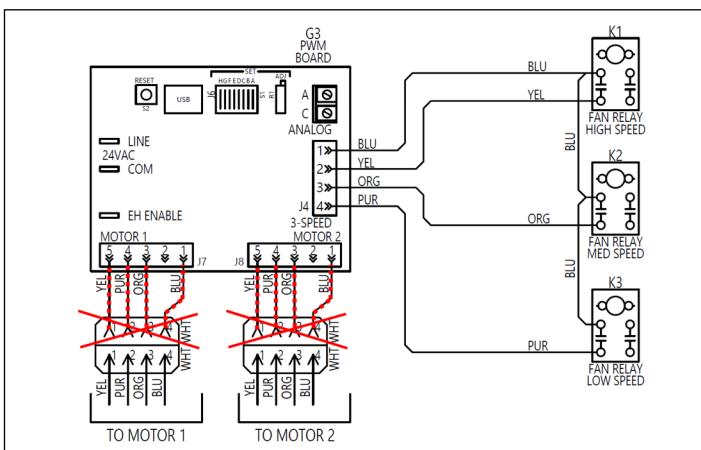


Figure 39 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 40)

- Disconnect the 4 wires from the fan relays as shown. Do not remove the butterfly/Y connectors if previously installed.
- Remove the 4-pin harness on the other end from the PWM board and discard.

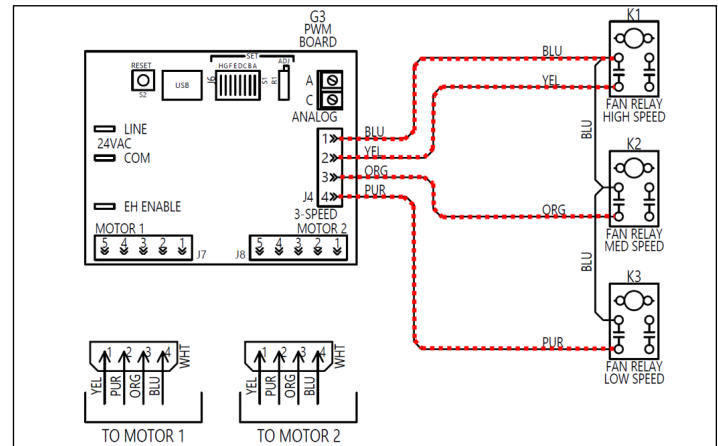


Figure 40 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 41)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

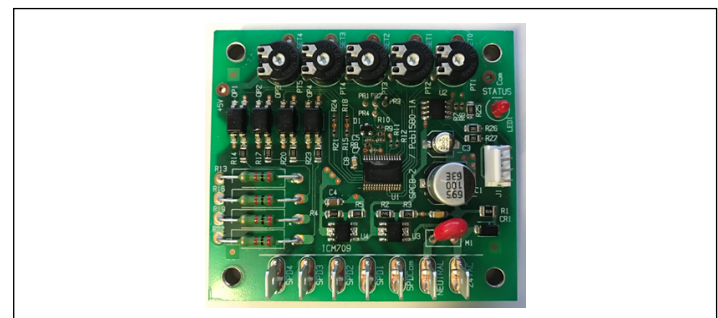


Figure 41 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 42)

- Install butterfly/Y connectors on Select-NEUTRAL and Select-SPDCom.
- Install YEL wire(s) #2 on Select-NEUTRAL and/or Select-SPDCom.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connectors at Select-NEUTRAL and Select-SPDCOM.
- Lift the BLU wire on the 24V side of the transformer and install a butterfly/Y connector and re-install the BLU wire on one terminal of the butterfly/Y connector.
- Install BLU wire #1 (or wires with butterfly/Y connector) on Select-24VAC.
- Install BLU wire provided in kit with female quick connects on both sides between open butterfly/Y connector terminal on the transformer and the open butterfly/Y connector terminal on the fan relay contact.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 42)

- Connect 4-pin harness provided in kit to the mating harness that goes to the motor.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

NOTE: This harness has lever nuts connecting the wires. These are pre-assembled and the only step required by the installer is to install the 4-pin plug to the mating harness at the motor and at the PWM board. The conversion diagram shows the lever nuts for future servicing.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 42)

- Install BLK wire provided in kit between High Fan relay and Select-SPD3.
- Install BLU wire provided in kit between Medium Fan relay and Select-SPD2.
- Install RED wire provided in kit between Low Fan relay and Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 38-40 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 42.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-07 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2 \times (\text{G3 PWM})$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

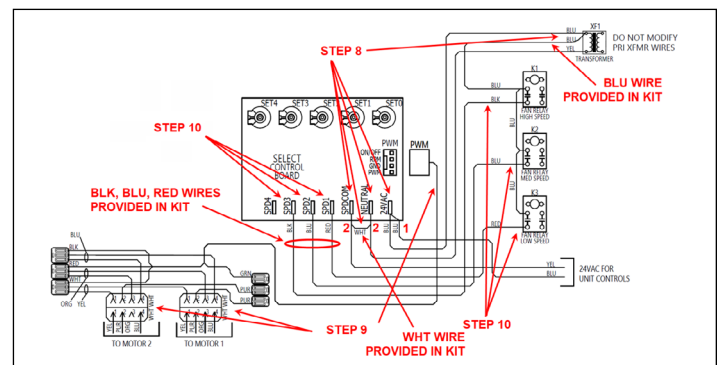
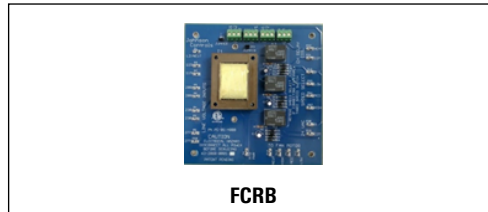
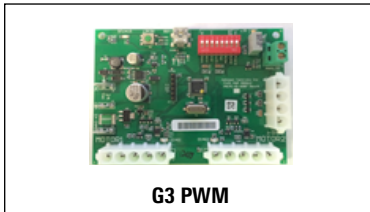


Figure 42 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH AN FCRB AND A ZBOM BLDC MOTOR

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with an FCRB and a ZBOM BLDC motor. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

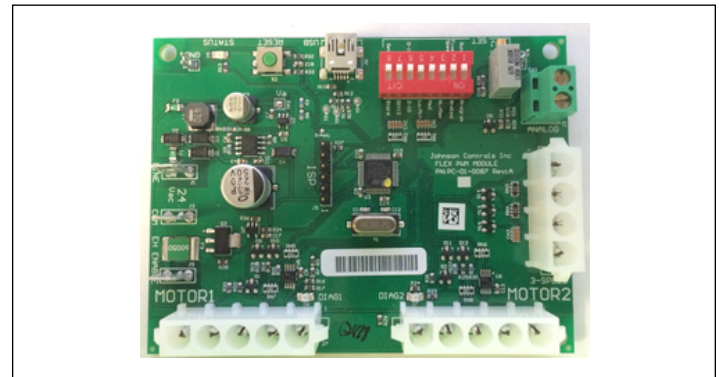


Figure 43 – G3 PWM Board

LEGEND	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 43).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-08	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (4-pin mtr side connector) for 1 ZBOM BLDC	66-13069-01	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 44)

- Lift BLK wire from LINE.
- Lift WHT wire from COM.

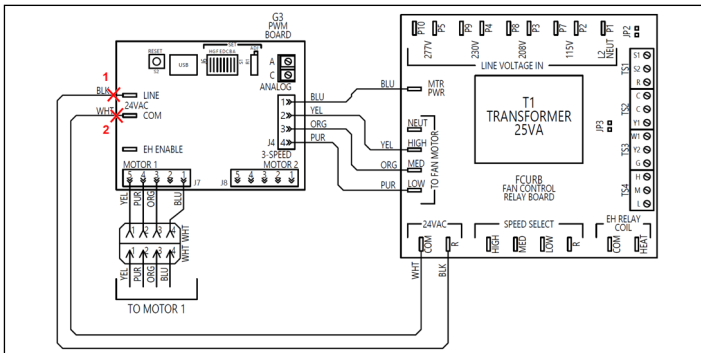


Figure 44 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 45)

- Disconnect the 4-pin harness connection (YEL, PUR, ORG, BLU) from the motor, retaining the mating harness that goes to the motor.
- Remove the 5-pin harness (4-wire) on the other end from the PWM board and discard.

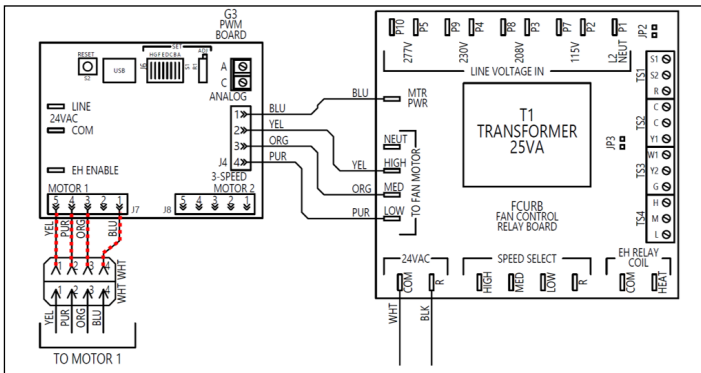


Figure 45 – Remove Motor Signal Wires

REMOVE FAN CONTROL WIRES (SEE FIGURE 46)

- Disconnect and remove the 4-pin harness between the G3 PWM and FCRB.

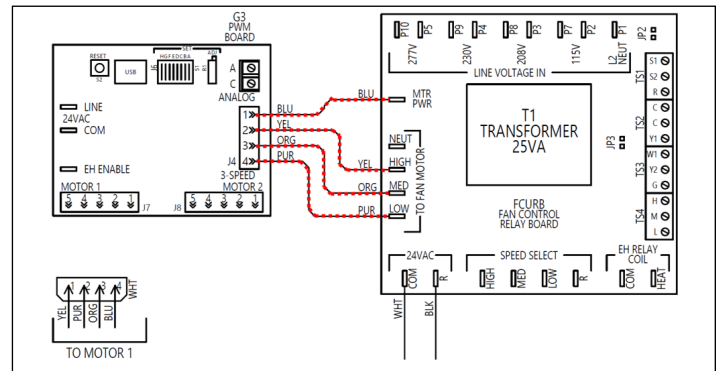


Figure 46 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
 - If there is a wire connected to the EH ENABLE terminal on the G3, lift this wire and terminate on a COM (or C) terminal on the fan relay board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 47)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

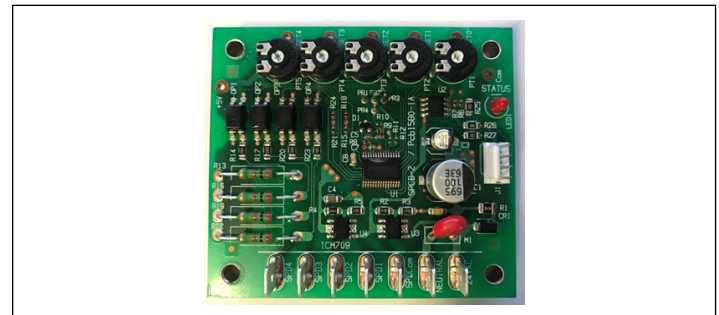


Figure 47 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 48)

- Install butterfly/Y connector on the FCRB-MTR PWR terminal and on the Select-NEUTRAL terminal.
- Install BLK wire #1 on one terminal of the butterfly/Y connector at FCRB-MTR PWR.
- Install BLU wire provided in kit between the other terminal of the butterfly/Y connector at FCRB-MTR PWR and Select-24VAC.
- Install WHT wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 48)

- Connect 4-pin harness provided in kit to the mating harness that goes to the motor.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

NOTE: This harness has lever nuts connecting the wires. These are pre-assembled and the only step required by the installer is to install the 4-pin plug to the mating harness at the motor and at the PWM board. The conversion diagram shows the lever nuts for future servicing.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 48)

- Install BLK wire provided in kit between High Fan relay and Select-SPD3.
- Install BLU wire provided in kit between Medium Fan relay and Select-SPD2.
- Install RED wire provided in kit between Low Fan relay and Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 44-46 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 48.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-08 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2 * (G3 \text{ PWM})$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

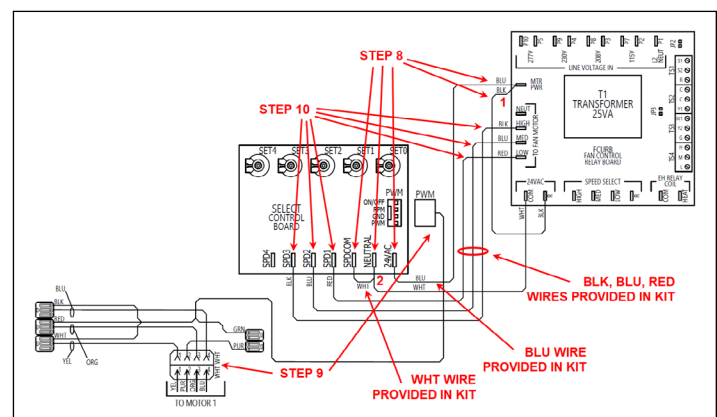
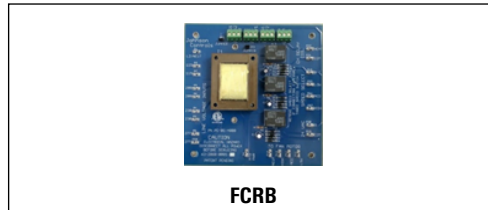
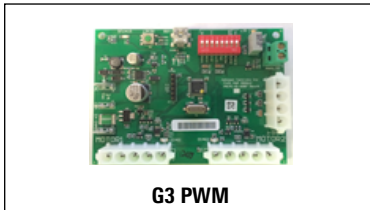


Figure 48 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH AN FCRB AND TWO (2) ZBOM BLDC MOTORS

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with an FCRB and two (2) ZBOM BLDC motors. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

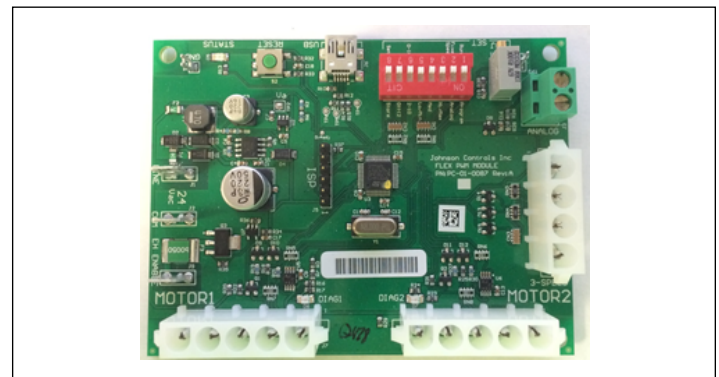
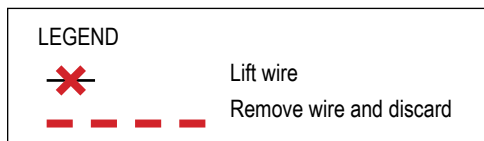


Figure 49 – G3 PWM Board



IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 49).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram	88-24011-09	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (4-pin mtr side connector) for 2 ZBOM BLDC	66-13069-02	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	2
Wire: RED, 18-inch, 16AWG, female quick connects on both ends	61-13230-25	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 50)

- Lift BLK wire from LINE.
- Lift WHT wire from COM.

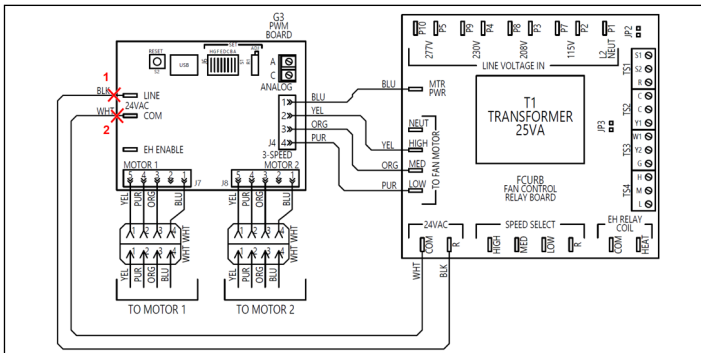


Figure 50 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 51)

- Disconnect the 4-pin harness connections (YEL, PUR, ORG, BLU) from the motors, retaining the mating harnesses that go to the motors.
- Remove the 5-pin harnesses (4-wire) on the other end from the PWM board and discard.

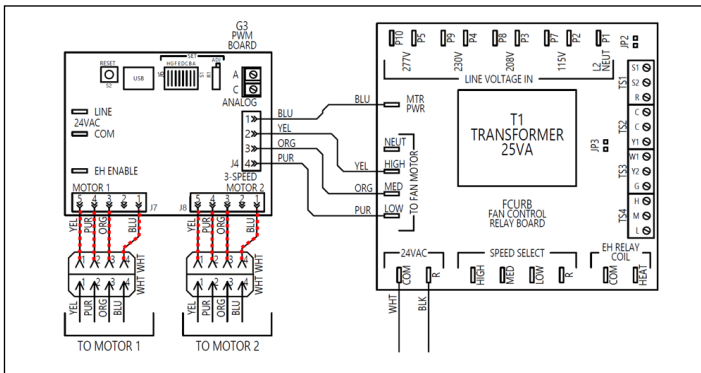


Figure 51 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (SEE FIGURE 52)

- Disconnect and remove the 4-pin harness between the G3 PWM and FCRB.

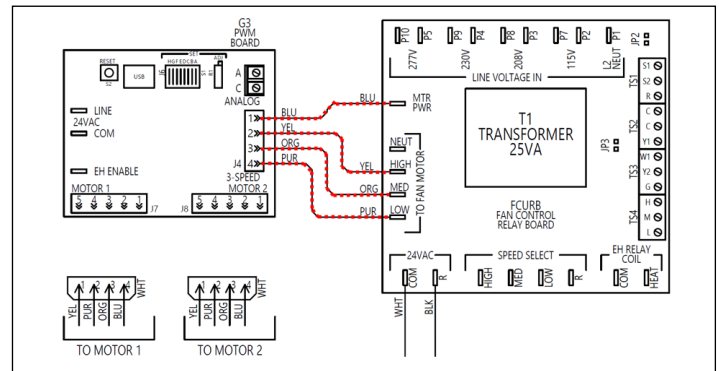


Figure 52 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
 - If there is a wire connected to the EH ENABLE terminal on the G3, lift this wire and terminate on a COM (or C) terminal on the fan relay board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 53)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

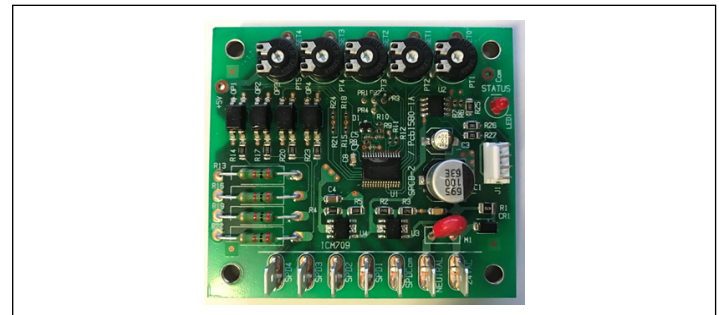


Figure 53 – Select PWM Board

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

CONNECT POWER TO SELECT PWM (SEE FIGURE 54)

- Install butterfly/Y connector on the FCRB-MTR PWR terminal and on the Select-NEUTRAL terminal.
- Install BLK wire #1 on one terminal of the butterfly/Y connector at FCRB-MTR PWR.
- Install BLU wire provided in kit between the other terminal of the butterfly/Y connector at FCRB-MTR PWR and Select-24VAC.
- Install WHT wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 54)

- Connect 4-pin harness provided in kit to the mating harness that goes to the motor.
- Install the other side of the harness on the Select PWM Board, making sure the GRN wire is closest to the potentiometers and BLK is closest to the quick connects.

NOTE: This harness has lever nuts connecting the wires. These are pre-assembled and the only step required by the installer is to install the 4-pin plug to the mating harness at the motor and at the PWM board. The conversion diagram shows the lever nuts for future servicing.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 54)

- Install BLK wire provided in kit between High Fan relay and Select-SPD3.
- Install BLU wire provided in kit between Medium Fan relay and Select-SPD2.
- Install RED wire provided in kit between Low Fan relay and Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 50-52 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 54.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-09 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2 * (G3 \text{ PWM})$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

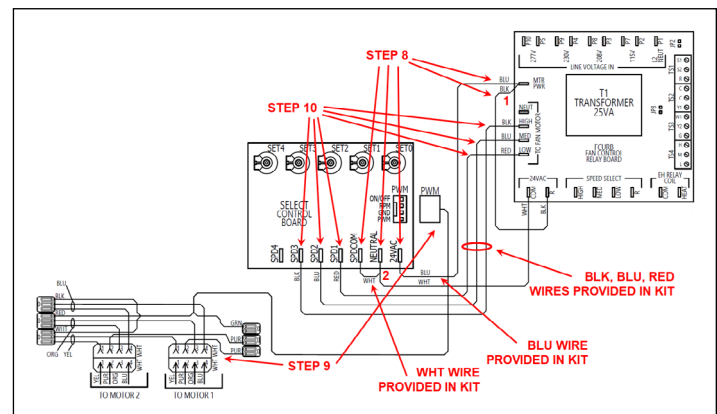
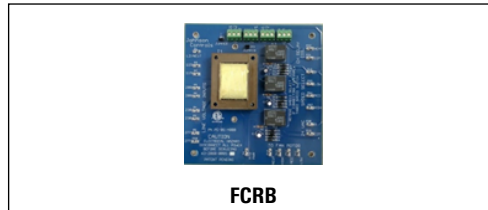
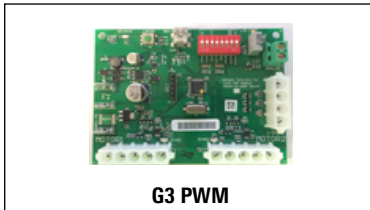


Figure 54 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A FRBii AND PIKA MOTOR

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with a FRBii and Pika motor. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

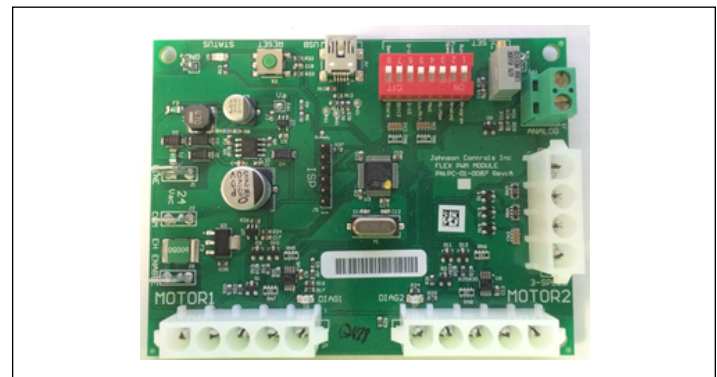
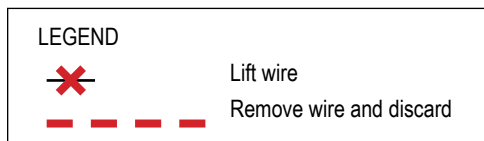


Figure 55 – G3 PWM Board



IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 55).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram(s)	88-24011-10	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (2 quick mtr side connects) for 1 Pika motor	PE-16-0924	1
Harness: FRBii-J4 to Select PWM (4-pin,3 wire, quick connects)	61-13276-01	1
Harness: FRBii-J2 power 115V (5-pin, 2 wires, quick connects)	PE-16-0500	1
Harness: FRBii-J2 power 208V (5-pin, 2 wires, quick connects)	PE-16-0418	1
Harness: FRBii-J2 power 230V (5-pin, 2 wires, quick connects)	PE-16-0420	1
Harness: FRBii-J2 power 277V (5-pin, 2 wires, quick connects)	PE-16-0502	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM

Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 56)

- Lift BLK wire from LINE.
- Lift WHT wire from COM.

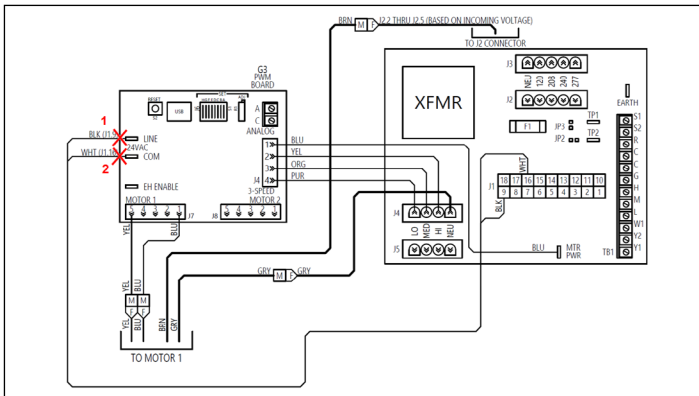


Figure 56 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 57)

- Disconnect the 2 quick connects (YEL, BLU) from the motor, retaining the female side of the quick connects (that go to the motor).
- Remove the 5-pin harness on the other end from the PWM board and discard.

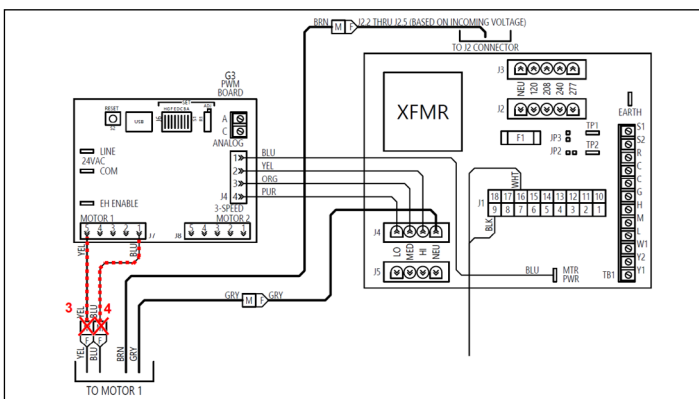


Figure 57 – Remove Motor Signal Wires

REMOVE MOTOR POWER WIRES (SEE FIGURE 58)

- Disconnect the 2 quick connects (BRN, GRY) from the motor, retaining the male side of the quick connects (that go to the motor).
- Remove the 5-pin harness on the other end from the FRBii board at J2 and discard.
- The 4-pin harness at J4 will be removed in the next step.

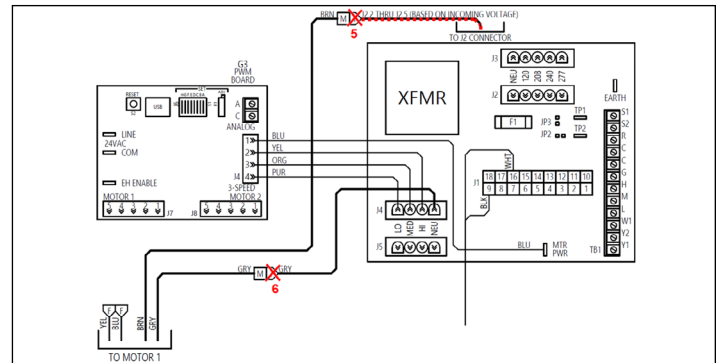


Figure 58 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (SEE FIGURE 59)

- Disconnect and remove the 4-pin harness between the G3 PWM and FRBii.
 - This includes the GRY wire that was disconnected in the previous step.
 - This includes the BLU wire that connects to the FRBii at the MTR_PWR terminal.

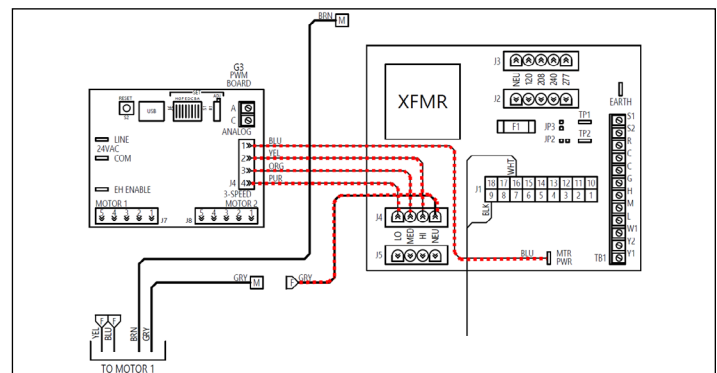


Figure 59 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 60)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

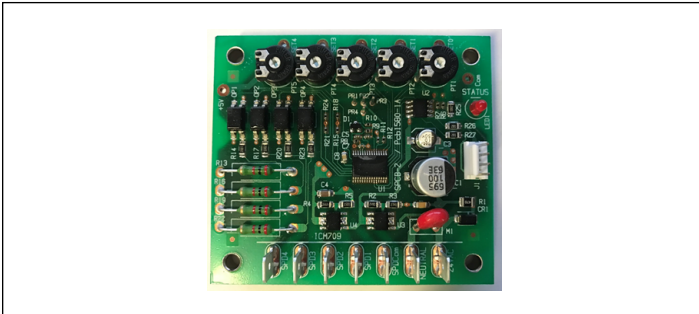


Figure 60 – Select PWM Board

CONNECT POWER TO SELECT PWM (SEE FIGURE 61)

- Install butterfly/Y connectors on the Select-24VAC and Select-NEUTRAL terminals.
- Install BLK wire #1 on one terminal of the butterfly/Y connector at Select-24VAC.
- Install WHT wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.
- Install BLK wire provided in kit between the other terminal of the butterfly/Y connector at Select-24VAC and FRBii-MTR PWR.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 61)

- Connect YEL and BLU wires from the motor to quick connect ends of harness provided in the kit.
- Install the other side of the harness on the Select PWM Board, making sure the YEL wire is closest to the potentiometers and BLU is closest to the quick connects.

CONNECT MOTOR POWER WIRES TO FRBii (SEE FIGURE 61)

- Identify the appropriate 5-pin harness to replace the existing motor power harness at J2 on the FRBii.
 - The harness is selected based on voltage and the table below can help to select the right one:

Part Number	Voltage	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
PE-16-0500	115V	WHT	BLK	-	-	-
PE-16-0418	208V	BLK	-	RED	-	-
PE-16-0420	230V	BLK	-	-	PUR	-
PE-16-0502	277V	WHT	-	-	-	ORG

- Connect GRY wire from the motor to the wire from Pin 1 of the J2 harness.

- Connect BRN wire from the motor to the wire from Pins 2-5 of the J2 harness.
- Install the other side of the harness on the FRBii at J2.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 61)

- Install 4-pin (3-wire) harness at FRBii J4.
- Install BLK wire of 4-pin (3-wire) harness on Select-SPD3.
- Install BLU wire of 4-pin (3-wire) harness on Select-SPD2.
- Install RED wire of 4-pin (3-wire) harness on Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 56-59 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 61.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-10 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2*(G3\ PWM)$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

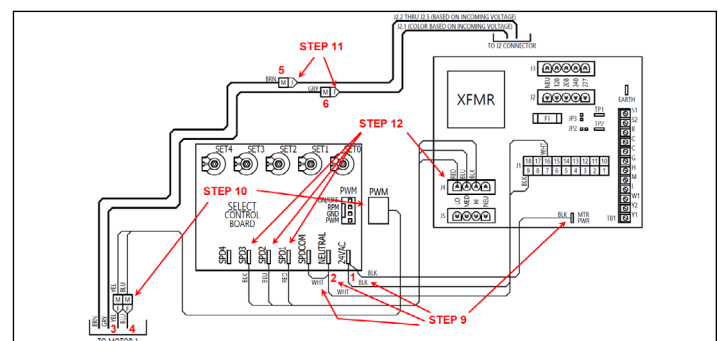
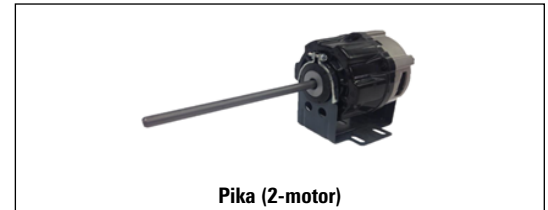
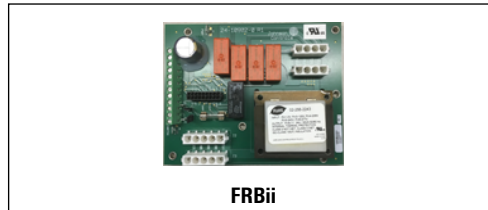
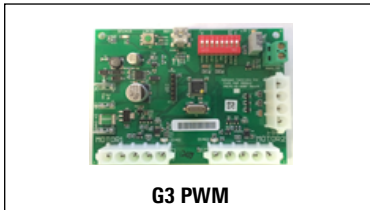


Figure 61 – Select PWM Electrical Connections

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SELECT PWM CONTROLLER WHEN INSTALLED WITH A FRBii AND TWO (2) PIKA MOTORS

These instructions explain how to replace the existing G3 PWM Controller with the Select PWM controller when installed with a FRBii and two (2) Pika motors. This procedure does not require ETL/UL oversight because all circuit changes are 24VAC or less.



SETUP

- a. Remove power to the unit in accordance with LOTO procedures.
- b. Tool(s) Required
 - i. 1/8" flat bladed screwdriver
 - ii. Wire strippers (capable of stripping 16AWG)
 - iii. 1/4" Nut driver
 - iv. Pliers (optional, but helpful if need to remove quick connect from Butterfly/Y connector)
 - v. Wire marking labels (optional, but helpful to mark the lifted wires for termination for the new equipment. Could be as simple as masking tape and a pen)
- c. The wire numbers shown in the figures throughout these instructions identify the location of the lifted wires from the existing equipment and the terminated wires on the new equipment. It is recommended to label these wires as they are lifted to facilitate their termination on the new equipment.
- d. The following legend applies for the visual sections of these instructions shown in the figures throughout this document.

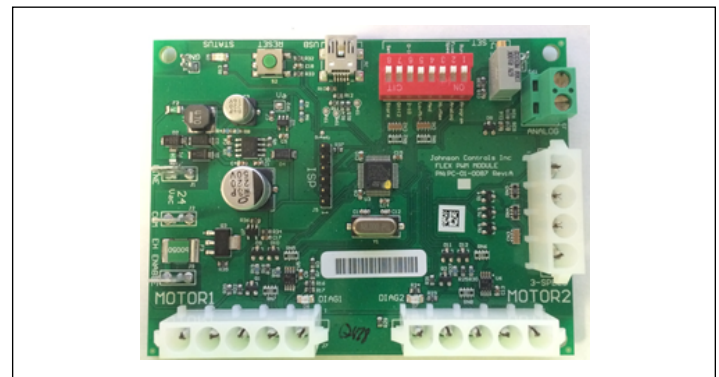


Figure 62 – G3 PWM Board

LEGEND

Lift wire

Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 62).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13093-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

Description	Part Number	Qty
Conversion Wire Diagram(s)	88-24011-11	1
Select PWM Board	PC-01-0203	1
Bracket	00-00568-02	1
Screws	PH-00-0030	2
PCB Standoffs	PE-19-0009	4
Butterfly connector	PH-06-0070	2
Harness: ICM-motor (2 quick mtr side connects) for 2 Pika motors	PE-16-0926	1
Harness: FRBii-J4 to Select PWM (4-pin,3 wire, quick connects)	61-13276-01	1
Harness: FRBii-J2 power 115V (5-pin, 2 wires, quick connects)	PE-16-0500	1
Harness: FRBii-J2 power 208V (5-pin, 2 wires, quick connects)	PE-16-0418	1
Harness: FRBii-J2 power 230V (5-pin, 2 wires, quick connects)	PE-16-0420	1
Harness: FRBii-J2 power 277V (5-pin, 2 wires, quick connects)	PE-16-0502	1
Wire: WHT, 6-inch, 16AWG, female quick connects on both ends	61-13230-02	1
Wire: BLK, 18-inch, 16AWG, female quick connects on both ends	61-13230-27	1

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

REMOVE PWM POWER WIRES (SEE FIGURE 63)

- Lift BLK wire from LINE.
- Lift WHT wire from COM.

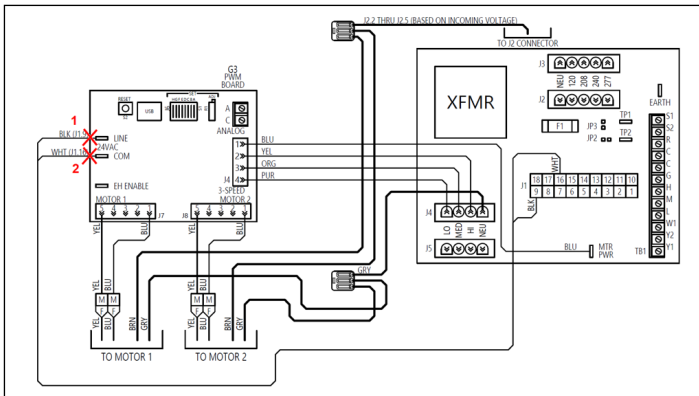


Figure 63 – Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (SEE FIGURE 64)

- Disconnect the 2 quick connects (YEL, BLU) from the motors, retaining the female side of the quick connects (that go to the motors).
- Remove the 5-pin harness on the other end from the PWM board and discard.

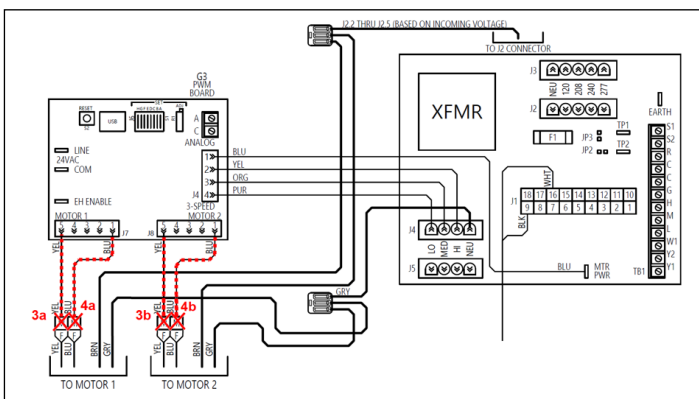


Figure 64 – Remove Motor Signal Wires

REMOVE MOTOR POWER WIRES (SEE FIGURE 65)

- Disconnect the 2 quick connects (BRN, GRY) from the motors, retaining the male side of the quick connects (that go to the motor).
- Remove the 5-pin harness on the other end from the FRBii board at J2 and discard.
- The 4-pin harness at J4 will be removed in the next step.

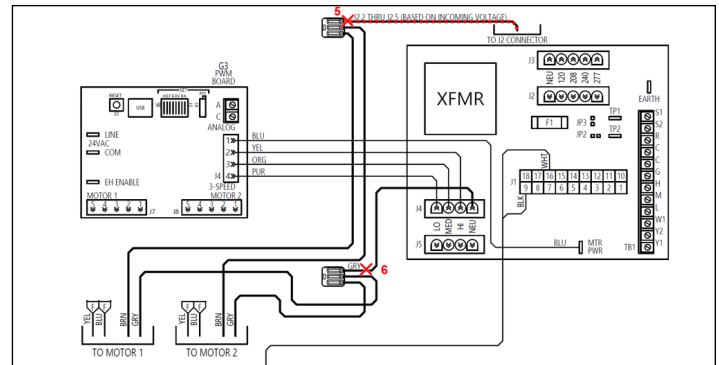


Figure 65 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (SEE FIGURE 66)

- Disconnect and remove the 4-pin harness between the G3 PWM and FRBii.
 - This includes the GRY wire that was disconnected in the previous step.
 - This includes the BLU wire that connects to the FRBii at the MTR_PWR terminal.

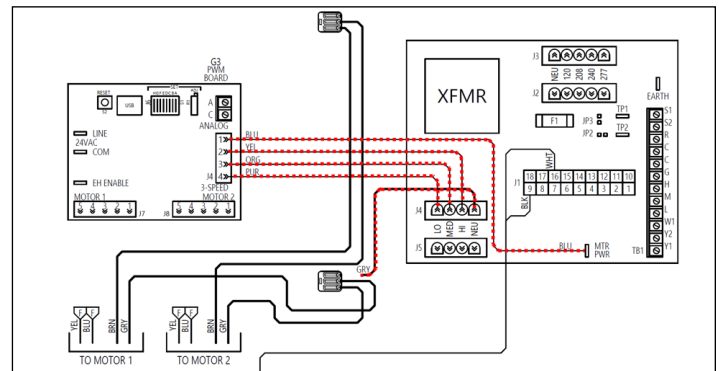


Figure 66 – Remove low voltage signal wires to motor(s)

REMOVE G3 PWM BOARD

- Verify that all wired connections have been removed from the G3 PWM board.
- Remove the G3 PWM and bracket.

INSTALL SELECT PWM BOARD (SEE FIGURE 67)

- Install the Select PWM bracket in the approximate location of the ETPWM bracket.
- Attach the Select PWM to the bracket using standoffs provided in the kit, making sure the potentiometers are accessible.

G3 PWM REPLACEMENT PWM BOARD TO SELECT PWM Installation, Operation, and Maintenance

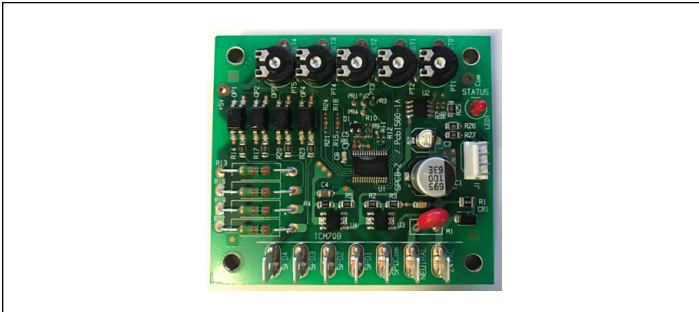


Figure 67 – Select PWM Board

CONNECT POWER TO SELECT PWM (SEE FIGURE 68)

- Install butterfly/Y connectors on the Select-24VAC and Select-NEUTRAL terminals.
- Install BLK wire #1 on one terminal of the butterfly/Y connector at Select-24VAC.
- Install WHT wire #2 on one terminal of the butterfly/Y connector at Select-NEUTRAL.
- Install WHT wire provided in kit between the other terminal of the butterfly/Y connector at Select-NEUTRAL and Select-SPDCOM.

- Install BLK wire provided in kit between the other terminal of the butterfly/Y connector at Select-24VAC and FRBii-MTR PWR.

CONNECT MOTOR CONTROL SIGNAL TO SELECT PWM (SEE FIGURE 68)

- Connect YEL and BLU wires from the motor to quick connect ends of harness provided in the kit.
- Install the other side of the harness on the Select PWM Board, making sure the YEL wire is closest to the potentiometers and BLU is closest to the quick connects.

CONNECT MOTOR POWER WIRES TO FRBii (SEE FIGURE 68)

- Identify the appropriate 5-pin harness to replace the existing motor power harness at J2 on the FRBii.
 - The harness is selected based on voltage and the table below can help to select the right one:

Part Number	Voltage	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
PE-16-0500	115V	WHT	BLK	-	-	-
PE-16-0418	208V	BLK	-	RED	-	-
PE-16-0420	230V	BLK	-	-	PUR	-
PE-16-0502	277V	WHT	-	-	-	ORG

- Connect GRY wire from the motor to the wire from Pin 1 of the J2 harness.

- Connect BRN wire from the motor to the wire from Pins 2-5 of the J2 harness.
- Install the other side of the harness on the FRBii at J2.

CONNECT FAN CONTROL WIRES TO SELECT PWM (SEE FIGURE 68)

- Install 4-pin (3-wire) harness at FRBii J4.
- Install BLK wire of 4-pin (3-wire) harness on Select-SPD3.
- Install BLU wire of 4-pin (3-wire) harness on Select-SPD2.
- Install RED wire of 4-pin (3-wire) harness on Select-SPD1.

VERIFICATION

- Verify all wiring connections per the wiring diagram stored in the unit and the figures in this instruction.
 - Ensure that no wires other than the ones specified in Figures 63-66 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 68.
- Verify operation of unit.
- Modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Adjust the SET1, SET2 and SET3 potentiometers on Select PWM for desired fan airflow. Refer to IOM for details as needed.
- Leave the conversion wire diagram 88-24011-11 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM Manual Adjustment	Select PWM (3-Speed Control) Equation: $2*(G3\ PWM)$
0.00 VDC	0.00 VDC
0.63 VDC	1.25 VDC
1.25 VDC	2.50 VDC
1.88 VDC	3.75 VDC
2.50 VDC	5.00 VDC

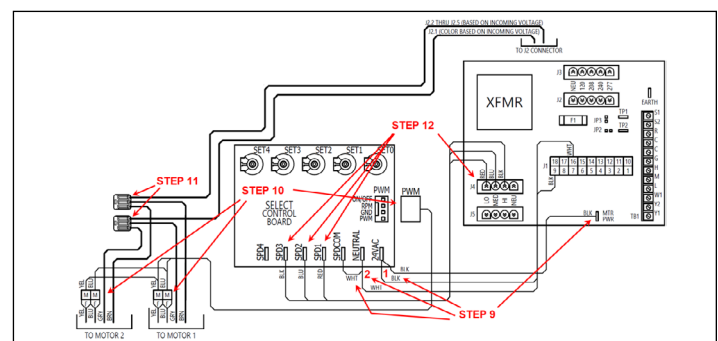


Figure 68 – Select PWM Electrical Connections