



SYNC PWM

RETROFIT GUIDE



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 Controller Digital Controls

ID#	Pages:	PWM Board: ETPWM G3 PWM	Fan Relay Control: XFMR and Relay FCRB FRBii	Motor Type: EON 5.0 ZBOM BLDC Pika
1	11-13	 ETPWM	 XFMR and Relay	 EON 5.0 (1-motor)
2	14-16	 ETPWM (x2)	 XFMR and Relay	 EON 5.0 (1-motor)
3	17-19	 G3 PWM	 XFMR and Relay	 EON 5.0 (1-motor)
4	20-22	 G3 PWM	 FCRB	 EON 5.0 (1-motor)
5	23-25	 G3 PWM	 FRBii	 EON 5.0 (1-motor)
6	26-28	 G3 PWM	 XFMR and Relay	 ZBOM BLDC (1-motor)
7	29-31	 G3 PWM	 XFMR and Relay	 ZBOM BLDC (1-motor)
8	32-34	 G3 PWM	 FCRB	 ZBOM BLDC (1-motor)
9	35-37	 G3 PWM	 FCRB	 ZBOM BLDC (1-motor)
10	38-41	 G3 PWM	 FRBii	 Pika (1-motor)
11	42-45	 G3 PWM	 FRBii	 Pika (1-motor)

KIT BILL OF MATERIAL

This is a universal kit, designed to be able install the Sync 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.

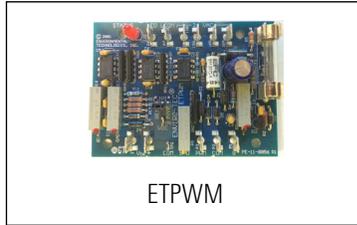
DESCRIPTION	PART NUMBER	QTY
Conversion Wire Diagram(s)	88-24010-xx (-01 thru -11)	1 of each
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
Butterfly connector	PH-06-0070	1
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (5 quick connects) for 1 EON motor	61-13369-01	1
Harness: ICM-motor (10 quick connects) for 2 EON motors	61-13369-02	1
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 Sync PWM (4-pin,1 wire, quick connect)	61-13276-02	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: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

SYNC PWM GENERAL WIRING DESCRIPTION:

- The Sync PWM uses the fan enable relay to provide 24VAC power to the board. The PWM board is on only when the fan enable is commanded.
- The 4-pin header provides the output signal to the motor(s).
- The 2-10V input is wired to the Signal and Common quick connects.

INSTRUCTIONS TO REPLACE ETPWM CONTROLLER WITH SYNC PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND AN EON MOTOR

These instructions explain how to replace the existing ETPWM Controller with the Sync 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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the ETPWM board 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 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.



Figure 1 – ETPWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-01	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
Harness: ICM-motor (5 quick connects) for 1 EON motor	61-13369-01	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1

REMOVE PWM POWER WIRES (See Figure 2)



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

- Lift BLU wires from P16A and P16B. Wire identified as #1 below comes from the unit transformer. Wire identified as #2 goes to a terminal strip or provides 24V power to the unit controls.
- Lift YEL wires from P15A and P15B. Wires identified #3 and #4 go to the transformer and terminal strip/unit controls

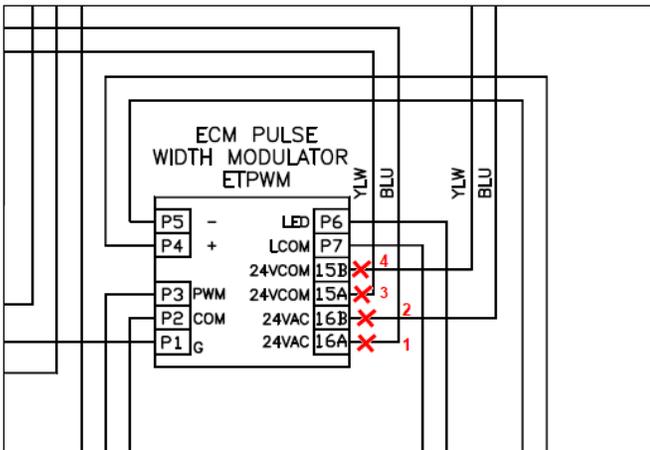


Figure 2 – Remove PWM Power

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)

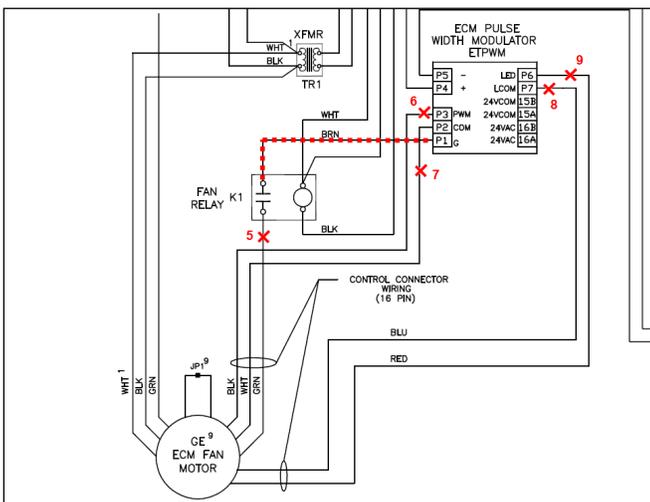


Figure 3 – Remove Motor Signal Wires

REMOVE 2-10VDC SIGNAL WIRES (See Figure 4)

- Disconnect the ORG and BRN wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

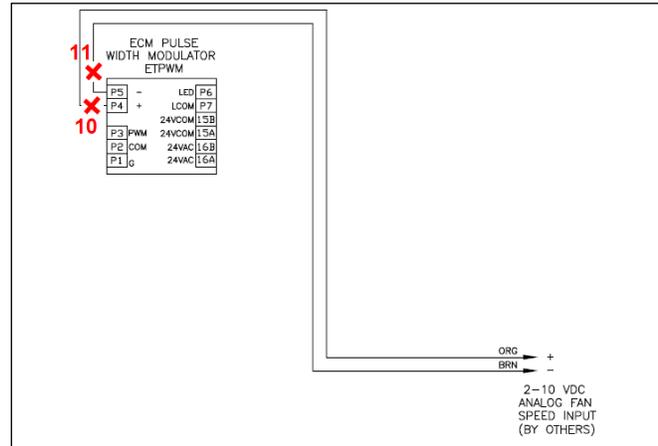


Figure 4 – Remove Motor Signal Wires

REMOVE ETPWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 5)

- Position the Sync PWM bracket in the approximate location of the ETPWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from ETPWM bracket.

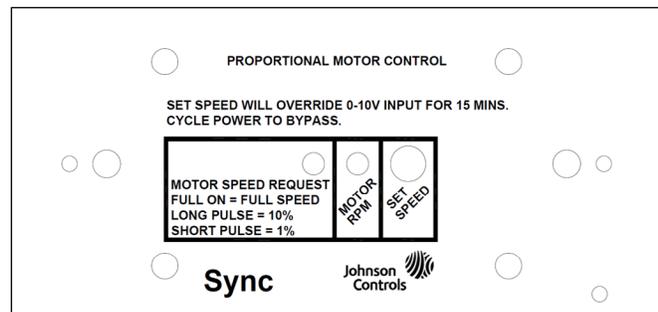


Figure 5 – Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 6)

- Install YEL wires #3 and #4 on "NEUTRAL" quick connects.
- Lift BLU wire at transformer and install butterfly/Y connector on the transformer and replace BLU wire at transformer on one of the butterfly/Y connector terminals.
- Install BLU wire #1 (originating from transformer) on the fan relay contact.
- Install BLU wire #2 (originating from 24V unit controls) on the other butterfly/Y connector terminal at the transformer.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 6)

- Connect ORG to "SIGNAL" on Sync PWM.
- Connect BRN to "COMMON" on Sync PWM.

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.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- Leave the conversion wire diagram **88-24010-01** with the original diagrams in the electrical enclosure.
- Discard the remaining unused diagrams.

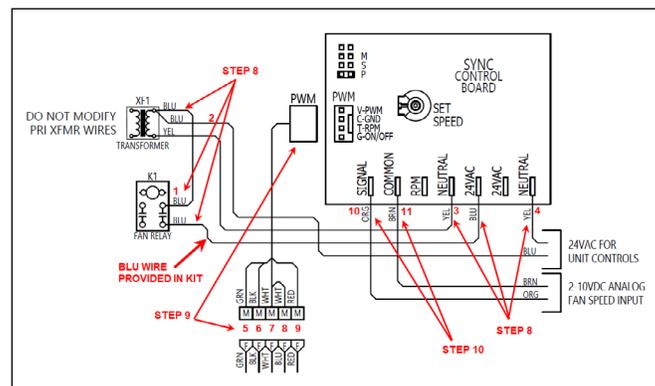
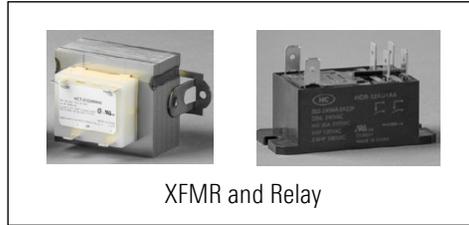
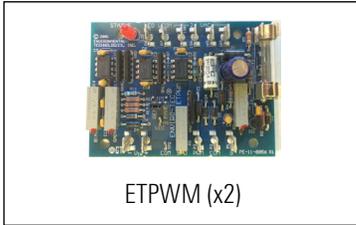


Figure 6 - Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE ETPWM2/3 CONTROLLER WITH SYNC PWM CONTROLLER WHEN INSTALLED WITH A TRANSFORMER/RELAY(S) AND 2 EON MOTORS

These instructions explain how to replace the existing ETPWM Controller with the Sync 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.

Legend	
	Lift wire
	Remove wire and discard

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 66-13092-01. 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

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-02	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
Harness: ICM-motor (10 quick connects) for 2 EON motors	61-13369-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1

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 wire from P16 that connects the two PWM boards.
- Remove and discard the YEL wire from P15 that connects the two PWM boards.
- Lift remaining BLU wires from both PWM boards at P16 (1 from each). Wire identified as #1 below comes from the unit transformer. Wire identified as #2 goes to a terminal strip or provides 24V power to the unit controls.
- Lift remaining YEL wires from both PWM boards at P15 (1 from each). Wires identified #3 and #4 go to the transformer and terminal strip/unit controls.

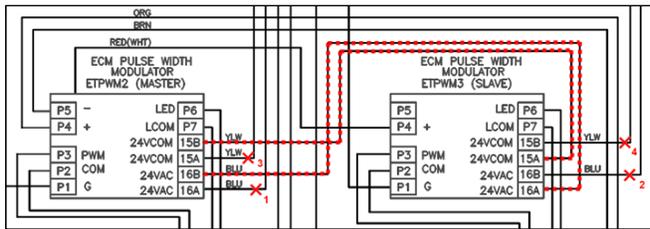


Figure 8 - Remove PWM Power

REMOVE LOW VOLTAGE 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). Only one set of fan relay contacts will be used with the G3 PWM board.
- On both PWM boards, lift wires from P2 (WHT), P3 (BLK), P6 (RED), P7 (BLU) and the motor side of the fan relay (K1) contact (GRN).

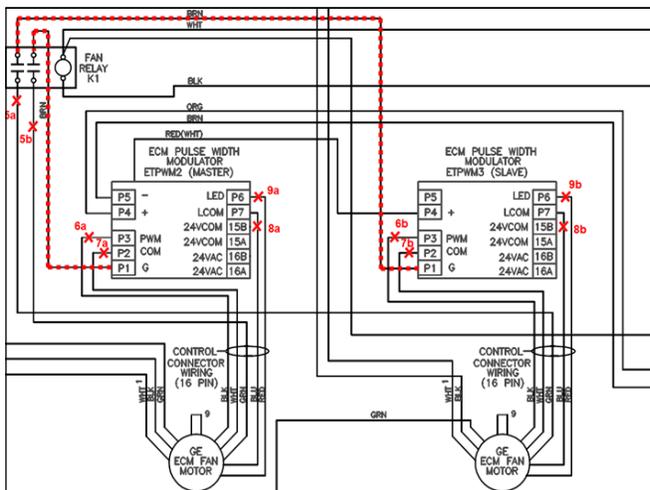


Figure 9 - Remove low voltage signal wires to motor

REMOVE 2-10VDC WIRES AND ETPWM2/ETPWM3 BOARDS FROM EACH OTHER (See Figure 10)

- Lift wires from P4 (ORG) and P5 (BRN). Leave the quick connect terminations as is.
- Lift wire between the back of ETPWM2 board and P4 of ETPWM3 (RED/WHT in Figure 10, but color may vary depending on unit).

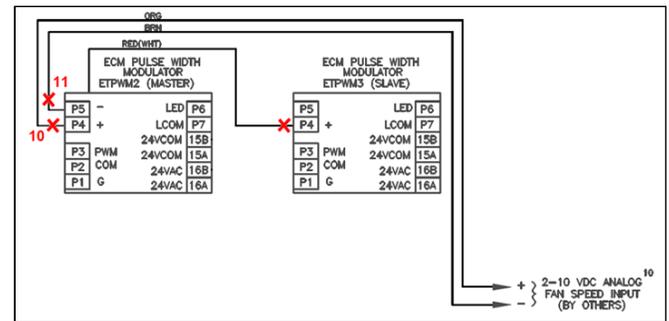


Figure 10 – Remove 2-10VDC motor control signal

REMOVE ETPWM2 AND ETPWM3 BOARDS

- Verify that all wired connections have been removed from the ETPWM2 and ETPWM3 boards.
- Remove the ETPWM2 and ETPWM3 boards and brackets.

INSTALL SYNC PWM BOARD (See Figure 11)

- Position the Sync PWM bracket in the approximate location of the ETPWM2/ETPWM3 brackets, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from one of the ETPWM brackets.

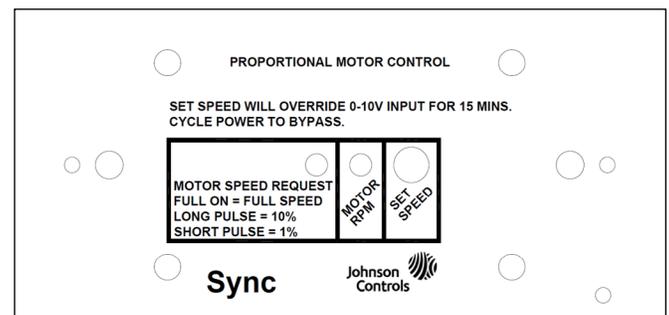


Figure 11 – Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 12)

- Install YEL wires #3 and #4 on "NEUTRAL" quick connects.
- Lift BLU wire at transformer and install butterfly/Y connector on the transformer and replace BLU wire at transformer on one of the butterfly/Y connector terminals.
- Install BLU wire #1 (originating from transformer) on the fan relay contact.
- Install BLU wire #2 (originating from 24V unit controls) on the other butterfly/Y connector terminal at the transformer.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 12)

- Connect WHT, BLU, RED, GRN, BLK wires from each motor to quick connect ends of harness provided in the kit. Note the RED wire from the 2nd motor (identified as 9b) will not be connected.
- Install the other side of the harness on the Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 12)

- Connect ORG to "SIGNAL" on Sync PWM.
- Connect BRN to "COMMON" on Sync PWM.

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.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- Leave the conversion wire diagram **88-24010-02** with the original diagrams in the electrical enclosure.
- Discard the remaining unused diagrams.

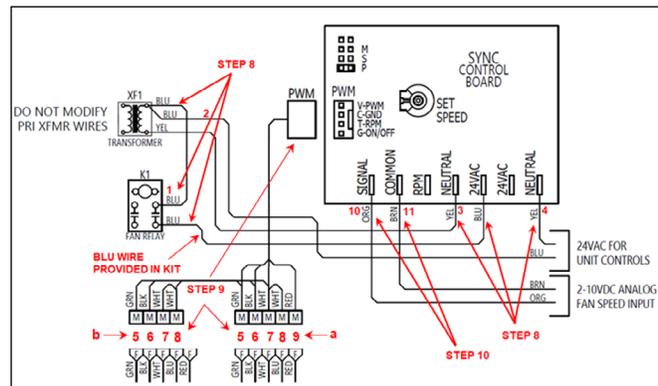


Figure 12 – Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC 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 Sync 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.

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 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

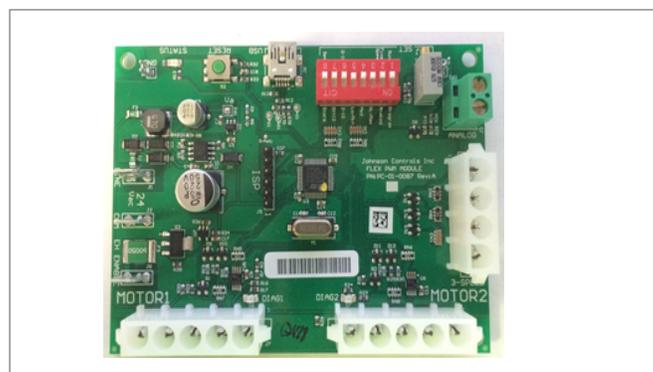


Figure 13 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-03	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
Butterfly connector	PH-06-0070	1
2-position lever nut	PH-06-0171	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: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

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).

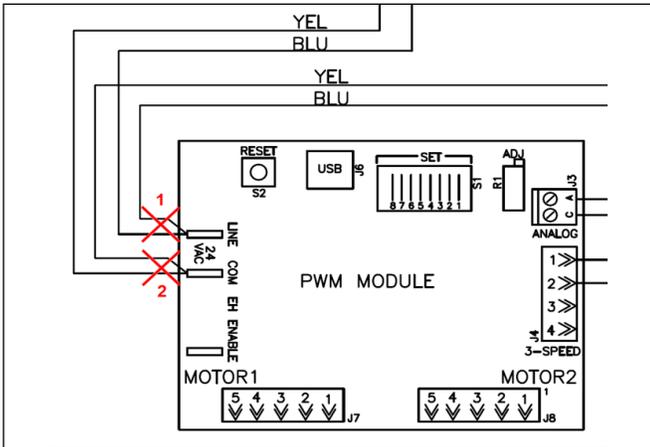


Figure 14 - Remove PWM Power

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.

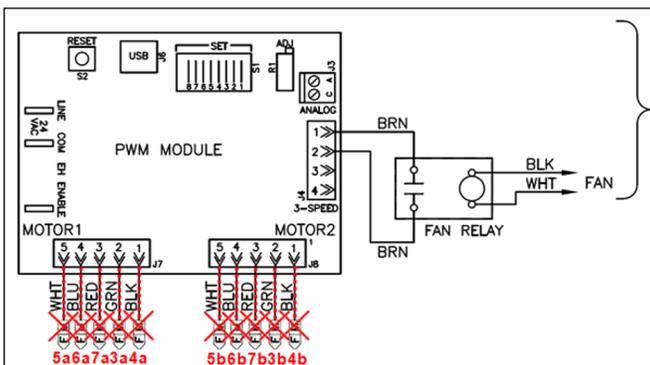


Figure 15 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 16)

- Lift both BRN wires from fan relay contacts.
- Remove the 4-pin harness (with 2 wires) on the other end from the PWM board and discard.

NOTE: Alternate wiring of the harness between the G3 PWM and Fan Relay may be 4 wires (BLU/YEL/ORG/PUR) with only 2 wires used.

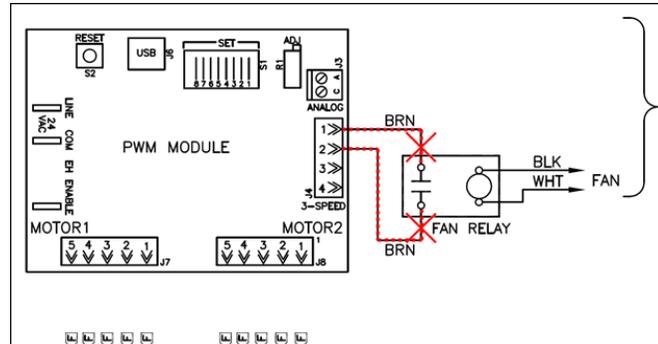


Figure 16 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 17)

- Disconnect the ORG and BRN wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

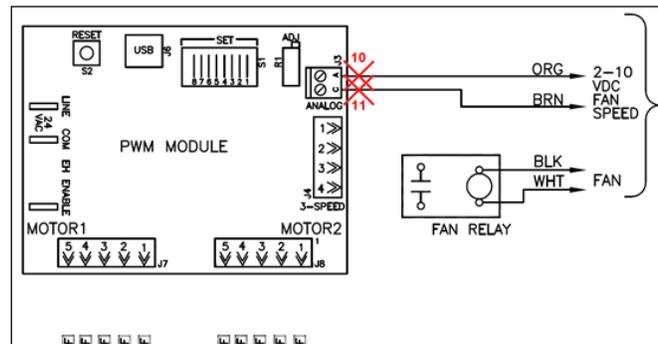


Figure 17 – Remove 2-10VDC motor control signal

REMOVE G3 PWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 18)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

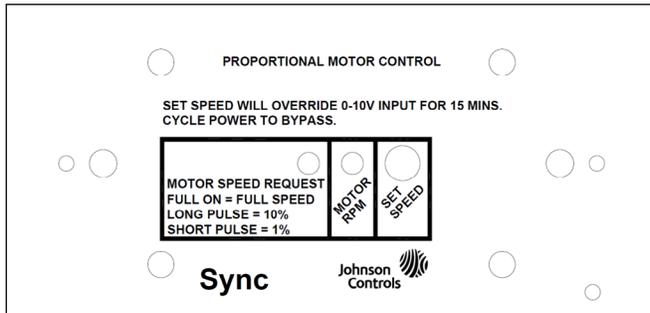


Figure 18 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 19)

- Install YEL wire(s) on "NEUTRAL" quick connect(s) on Sync PWM board.
- Install BLU wire or wires with butterfly/Y connector on the fan relay contact.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 19)

- 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 19)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of BRN wire to the "COMMON" on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.
- Connect the wire identified as "10" from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "11" from Step 6 to the 2-pole lever nut with the BRN wire.

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 14-17 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 19.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram **88-24010-03** with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 PWM) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

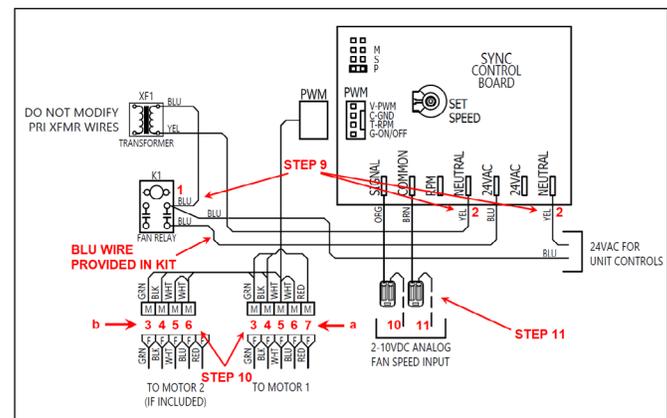
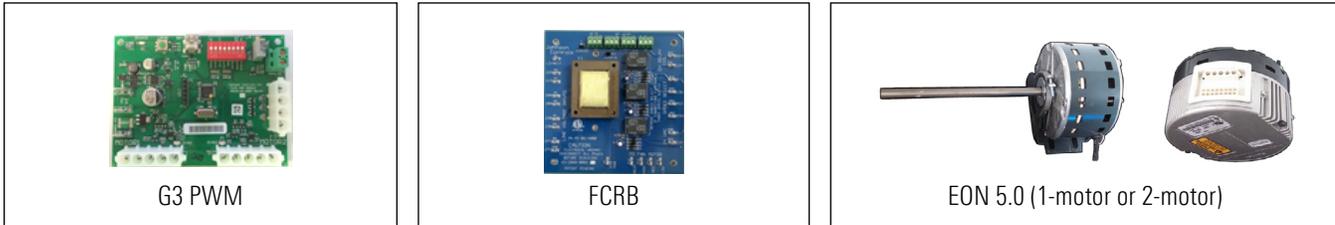


Figure 19 - Sync PWM Electrical Connections

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

These instructions explain how to replace the existing G3 PWM Controller with the Sync 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

- 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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 20).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

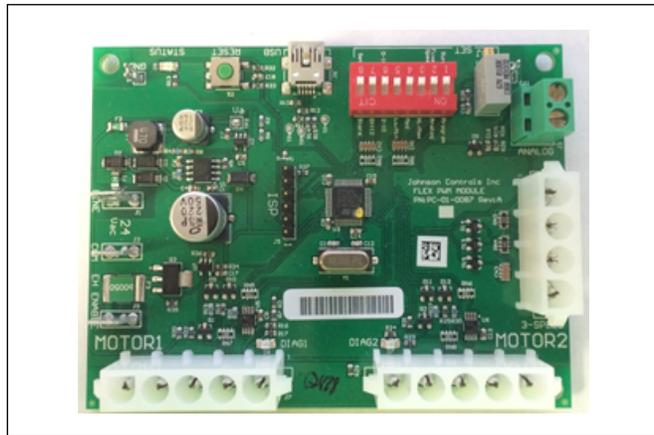


Figure 20 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-04	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
2-position lever nut	PH-06-0171	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: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 21)

- Lift BLK wire(s) from LINE (including butterfly/Y connector if installed).
- Lift WHT wire(s) from COM (remove the butterfly/Y connector if installed).

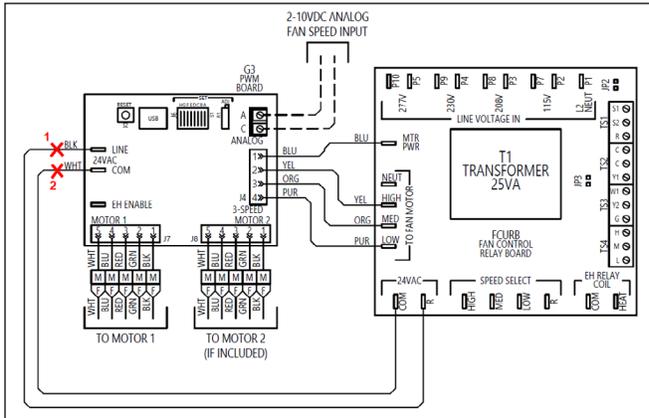


Figure 21 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 22)

- 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.

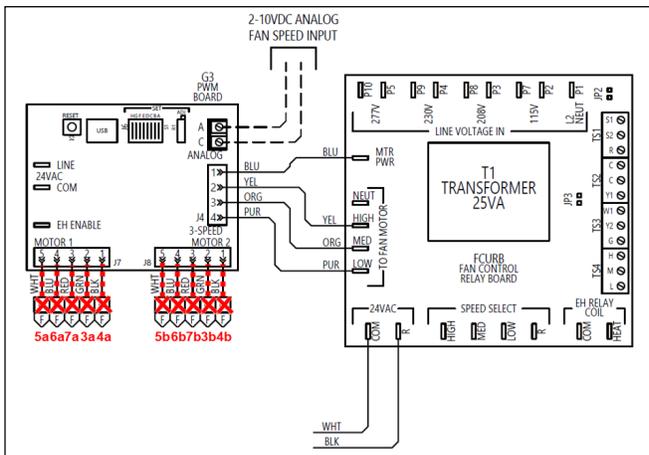


Figure 22 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 23)

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

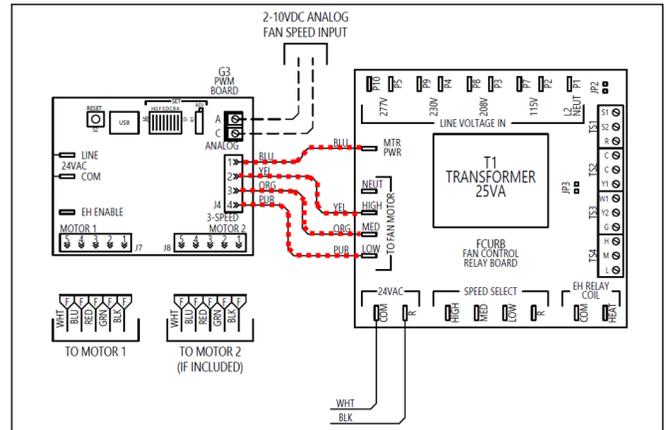


Figure 23 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 24)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

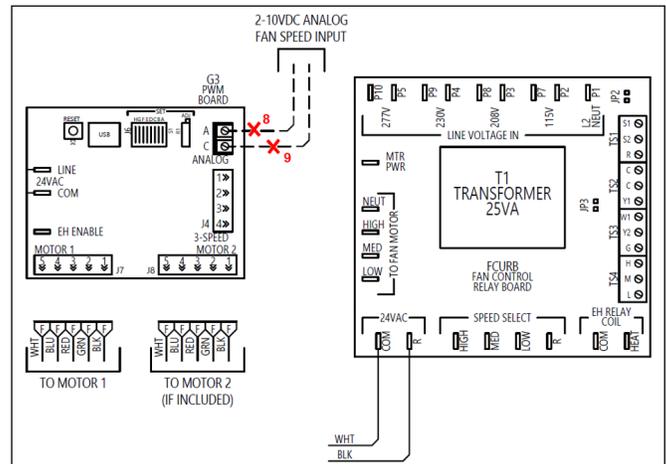


Figure 24 – Remove 2-10VDC motor control signal

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 SYNC PWM BOARD (See Figure 25)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

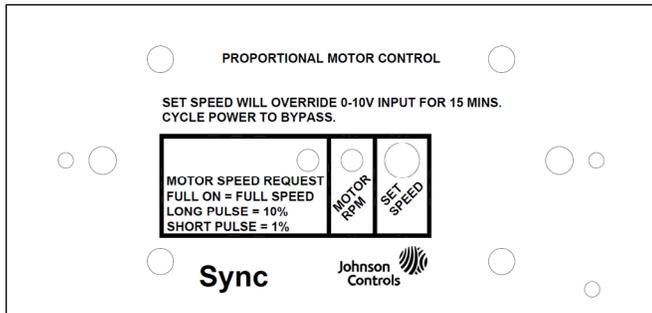


Figure 25 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 26)

- Install WHT wire(s) on “NEUTRAL” quick connect(s) on Sync PWM board.
- Install BLK wire (or wires with butterfly/Y connector) on the FCRB MTR_PWR terminal.
- Add BLU wire provided in kit with female quick connects on both sides between FCRB High terminal and the “24VAC” on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 26)

- 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 26)

- Connect female quick connect side of the ORG wire to the “SIGNAL” on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of the BRN wire to the “COMMON” on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.

- Connect the wire identified as “8” from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as “9” from Step 6 to the 2-pole lever nut with the BRN wire.

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 21-24 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 26.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the “P” position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the “M” position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram **88-24010-04** with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

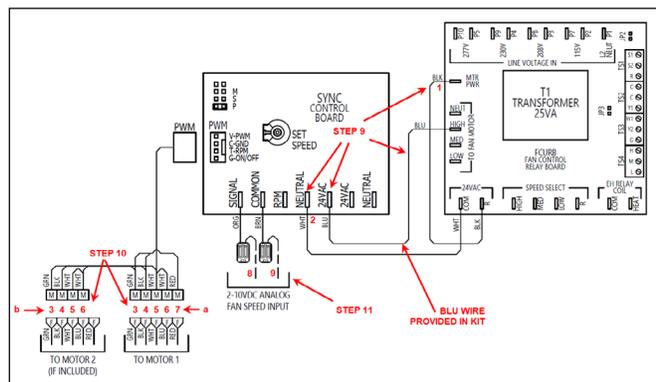


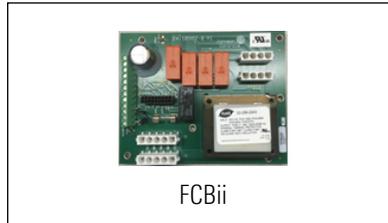
Figure 26 - Sync PWM Electrical Connections

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

These instructions explain how to replace the existing G3 PWM Controller with the Sync 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.



G3 PWM



FCBii



EON 5.0 (1-motor or 2-motor)

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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 27).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

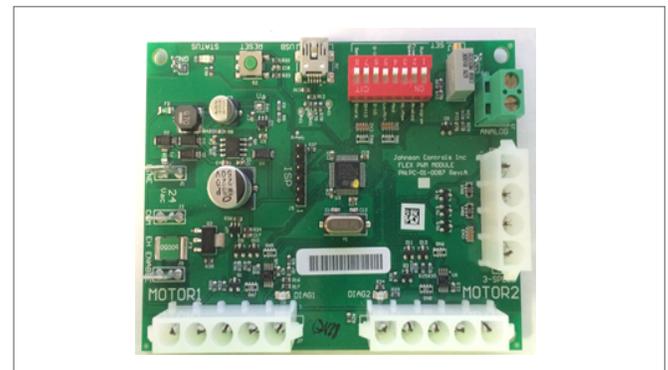


Figure 27 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-05	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
2-position lever nut	PH-06-0171	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 Sync PWM (4-pin, 1 wire, quick connect)	61-13276-02	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 28)

- Lift BLK wire(s) from LINE (including butterfly/Y connector if installed).
- Lift WHT wire(s) from COM (remove the butterfly/Y connector if installed).

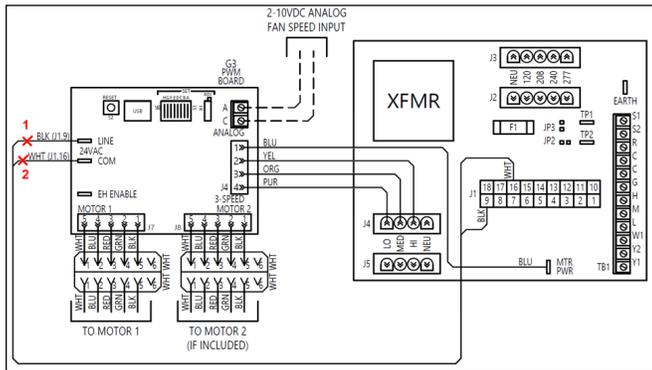


Figure 28 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 29)

- 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.

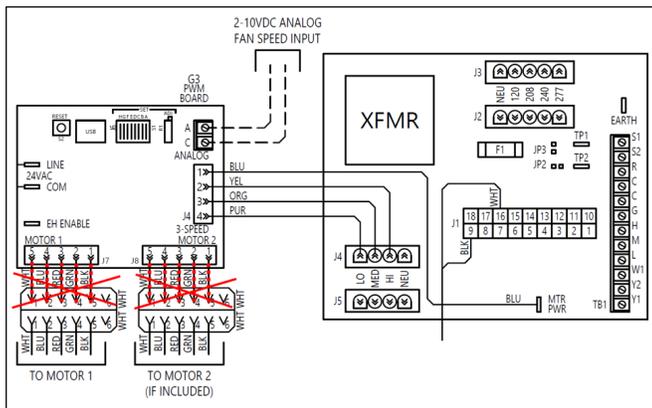


Figure 29 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 30)

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

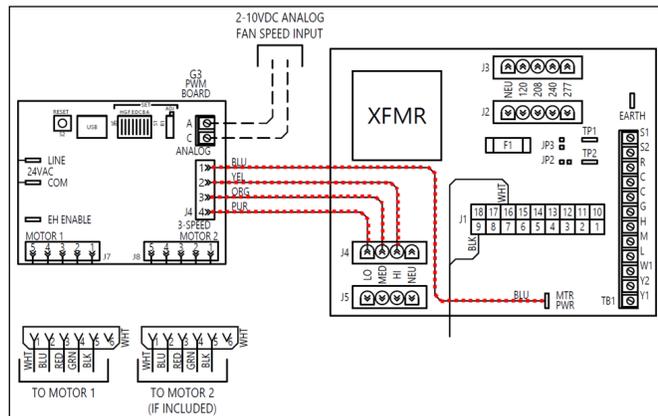


Figure 30 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 31)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

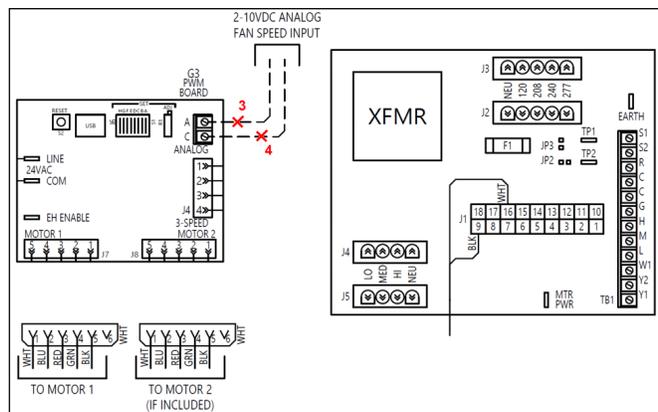


Figure 31 – Remove 2-10VDC motor control signal

REMOVE G3 PWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 32)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

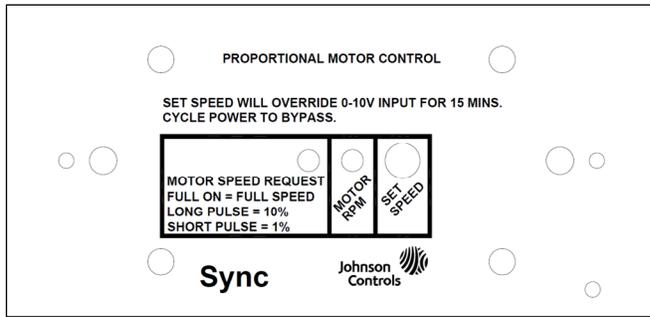


Figure 32 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 33)

- Install WHT wire(s) on "NEUTRAL" quick connect(s) on Sync PWM board.
- Install BLK wire on "MTR PWR" quick connect on FRBii board.
- Install the 4-pin (1-wire, BLK) harness provided in kit between FRBii-J4 and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 33)

- 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 33)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of the BRN wire to the "COMMON" on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.
- Connect the wire identified as "3" from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "4" from Step 6 to the 2-pole lever nut with the BRN wire.

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 28-31 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 33.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram **88-24010-05** with the original diagrams in the electrical enclosure.
- Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

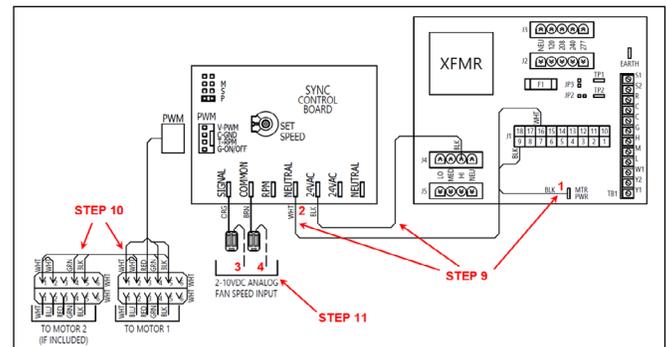
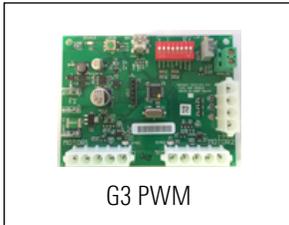


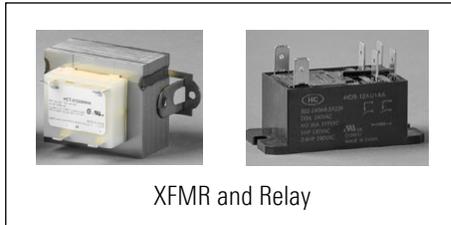
Figure 33 - Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC 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 Sync 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.



G3 PWM



XFMR and Relay



ZBOM BLDC (1-motor)

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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 34).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

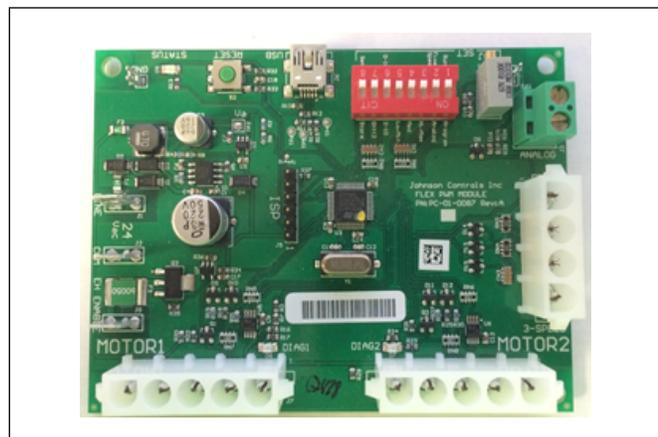


Figure 34 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-05	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
Butterfly connector	PH-06-0070	1
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (4-pin mtr side connector) for 1 ZBOM BLDC	66-13069-01	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 35)



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).

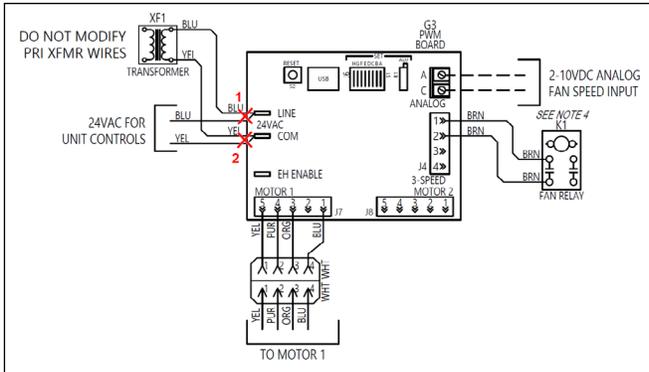


Figure 35 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 36)

- 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.

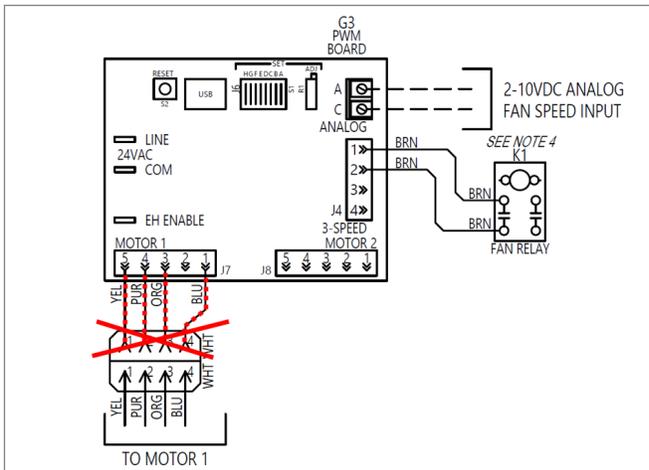


Figure 36 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 37)

- Lift both BRN wires from fan relay contacts.
- Remove the 4-pin harness (with 2 wires) on the other end from the PWM board and discard.

NOTE: Alternate wiring of the harness between the G3 PWM and Fan Relay may be 4 wires (BLU/YEL/ORG/PUR) with only 2 wires used.

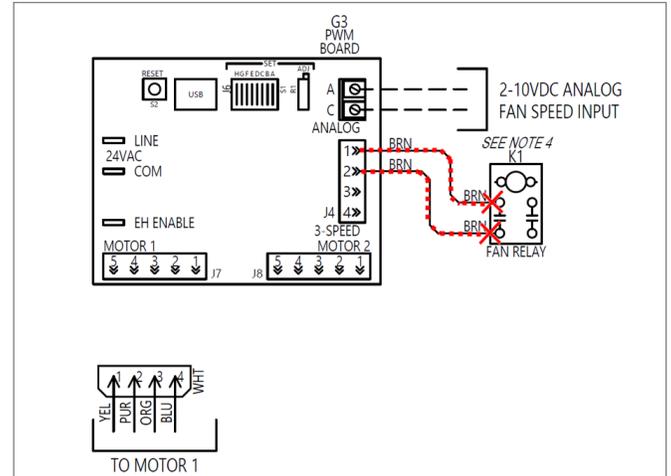


Figure 37 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 38)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

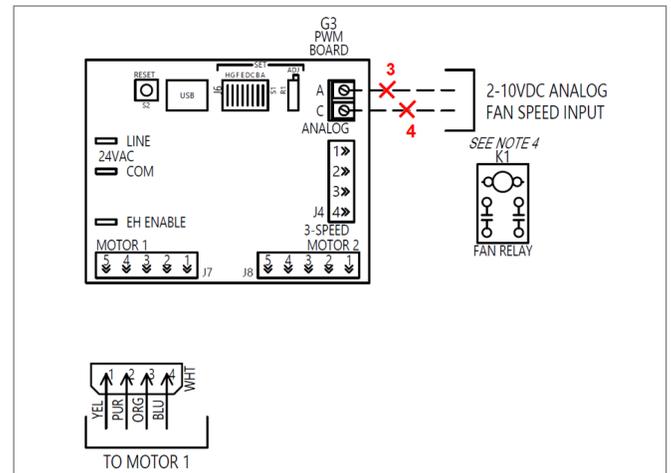


Figure 38 – Remove 2-10VDC motor control signal

REMOVE G3 PWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 39)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

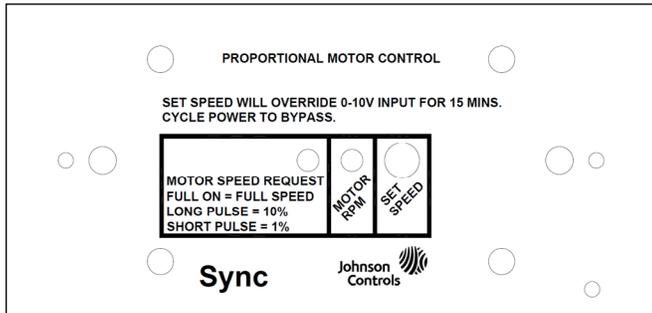


Figure 39 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 40)

- Install YEL wire(s) on "NEUTRAL" quick connect(s) on Sync PWM board.
- Install BLU wire or wires with butterfly/Y connector on the fan relay contact.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 40)

- 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

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 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 40)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of BRN wire to the "COMMON" on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.

- Connect the wire identified as "3" from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "4" from Step 6 to the 2-pole lever nut with the BRN wire.

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 35-38 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 40.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram 88-24010-06 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

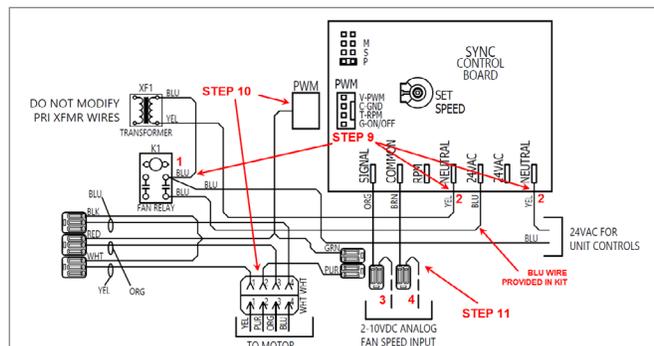


Figure 40 - Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC 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 Sync 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.



G3 PWM



XFMR and Relay



ZBOM BLDC (2-motor)

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 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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 41).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

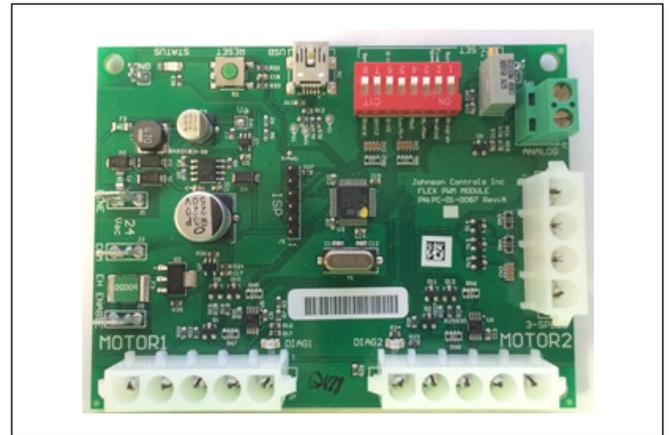


Figure 41 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-07	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
Butterfly connector	PH-06-0070	1
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (4-pin mtr-side connector) for 2 ZBOM BLDC	66-13069-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 42)



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).

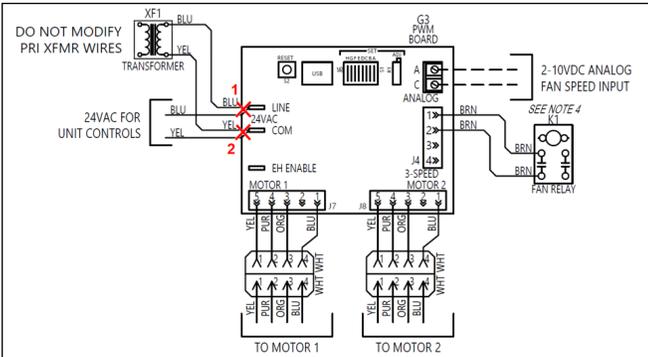


Figure 42 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 43)

- 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.

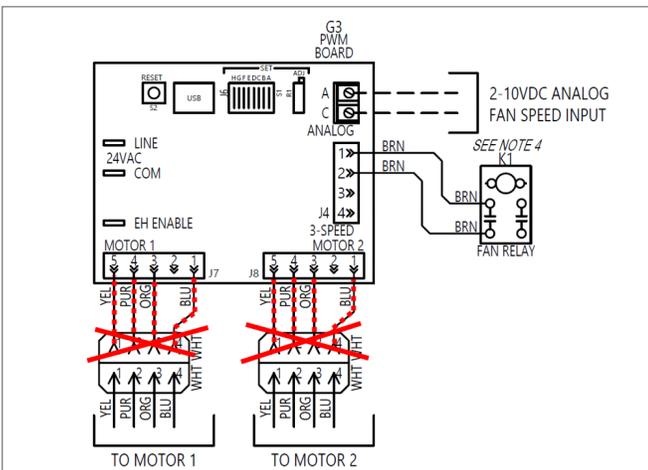


Figure 43 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 44)

- Lift both BRN wires from fan relay contacts.
- Remove the 4-pin harness (with 2 wires) on the other end from the PWM board and discard.

NOTE: Alternate wiring of the harness between the G3 PWM and Fan Relay may be 4 wires (BLU/YEL/ORG/PUR) with only 2 wires used.

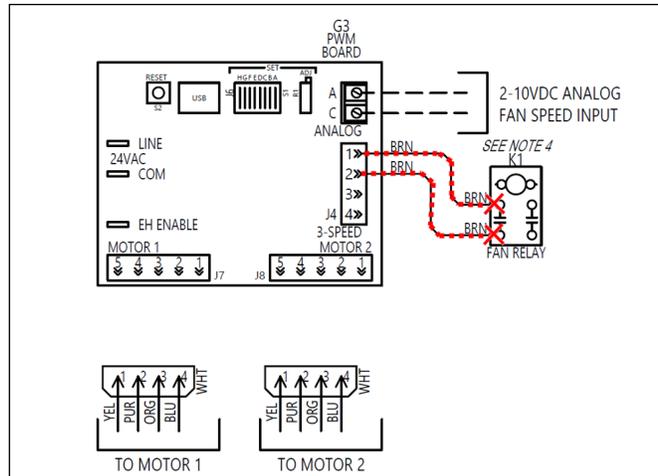


Figure 44 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 45)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

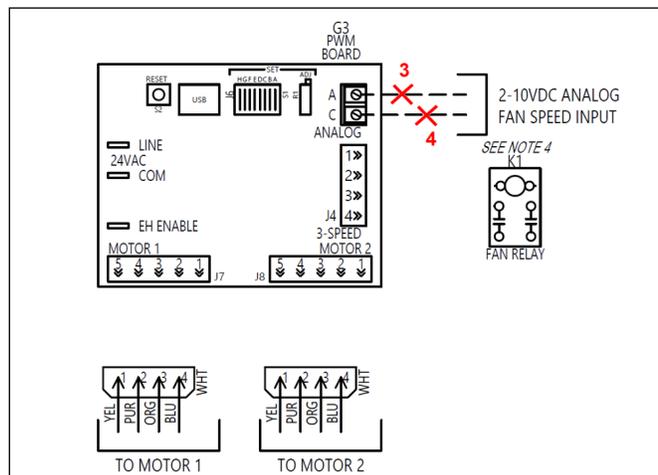


Figure 45 – Remove 2-10VDC motor control signal

REMOVE G3 PWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 46)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

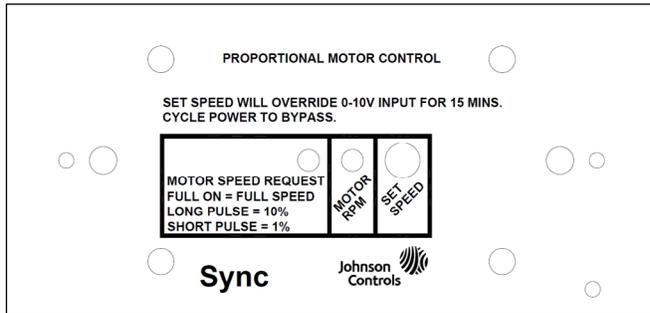


Figure 46 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 47)

- Install YEL wire(s) on "NEUTRAL" quick connect(s) on Sync PWM board.
- Install BLU wire or wires with butterfly/Y connector on the fan relay contact.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 47)

- 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

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 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 47)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of BRN wire to the "COMMON" on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.

- Connect the wire identified as "3" from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "4" from Step 6 to the 2-pole lever nut with the BRN wire.

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 42-45 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 47.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram **88-24010-07** with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

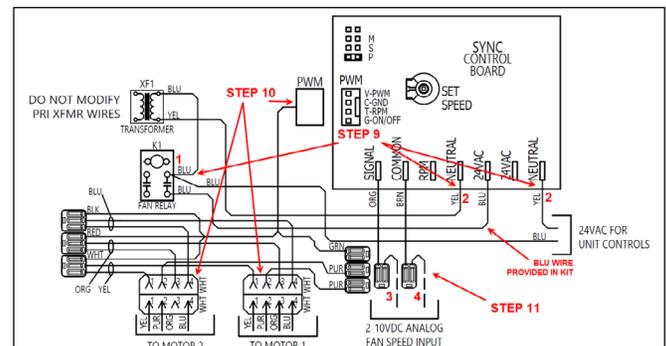


Figure 47 - Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC 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 Sync 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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 48).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

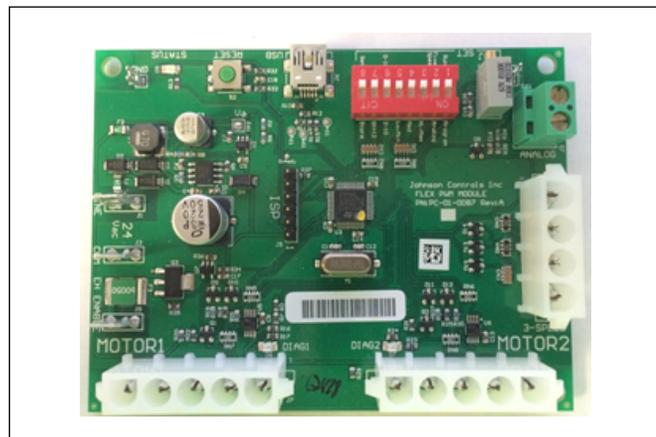


Figure 48 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-08	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (4-pin mtr-side connector) for 1 ZBOM BLDC	66-13069-01	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 49)

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

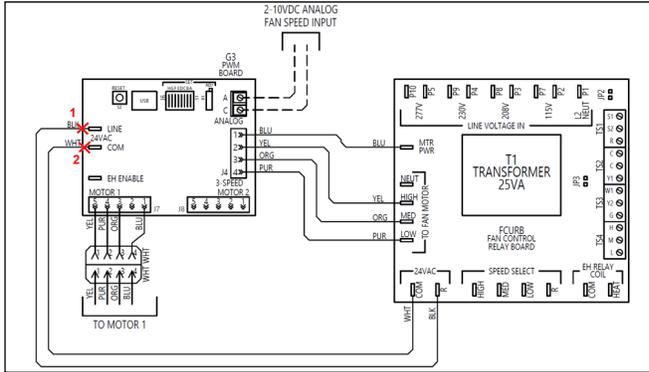


Figure 49 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 50)

- 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.

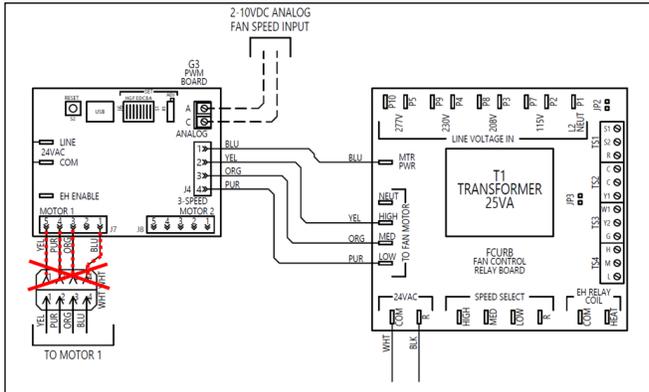


Figure 50 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 51)

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

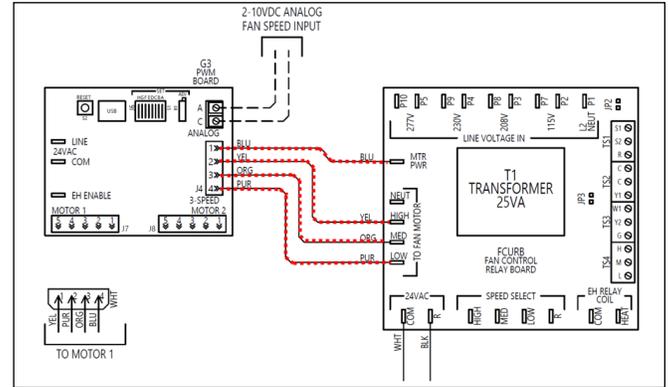


Figure 51 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 52)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

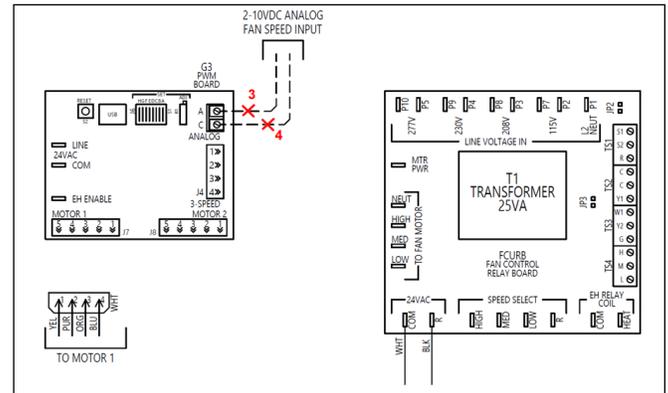


Figure 52 – Remove 2-10VDC motor control signal

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 SYNC PWM BOARD (See Figure 53)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

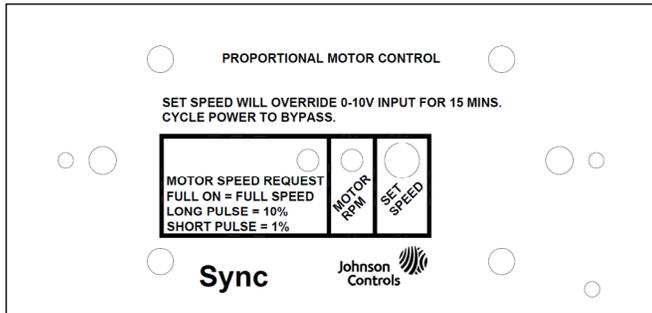


Figure 53 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 54)

- Install WHT wire(s) on "NEUTRAL" quick connect(s) on Sync PWM board.
- Install BLK wire (or wires with butterfly/Y connector) on the FCRB MTR_PWR terminal.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

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 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 54)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of BRN wire to the "COMMON" on Sync PWM.

- Connect stripped side of the BRN wire to the other 2-pole lever nut.
- Connect the wire identified as "3" from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "4" from Step 6 to the 2-pole lever nut with the BRN wire.

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 49-52 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 54.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram 88-24010-08 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

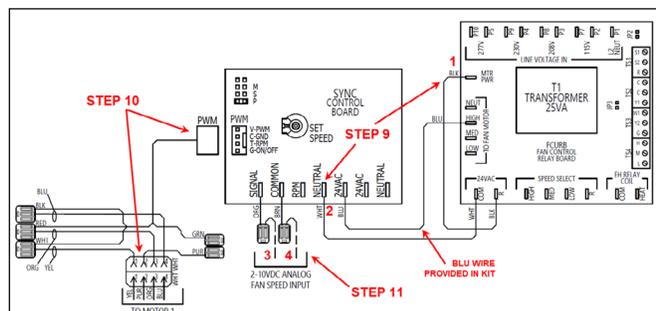


Figure 54 - Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC 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 Sync 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.

Legend

Lift wire

Remove wire and discard

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 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

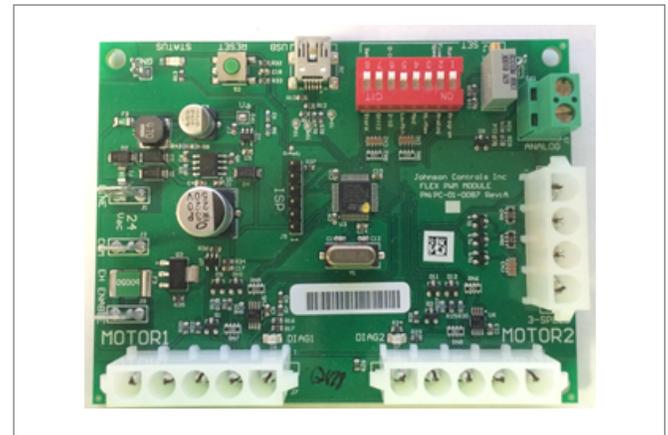


Figure 55 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram	88-24010-09	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (4-pin mtr-side connector) for 2 ZBOM BLDC	66-13069-02	1
Wire: BLU, 18-inch, 16AWG, female quick connects on both ends	61-13230-03	1
Wire: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 56)

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

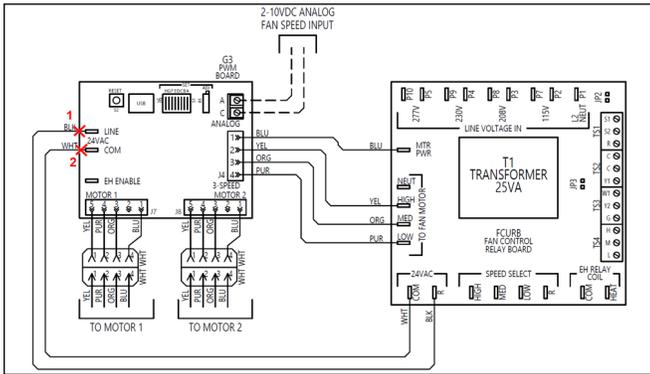


Figure 56 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 57)

- 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.

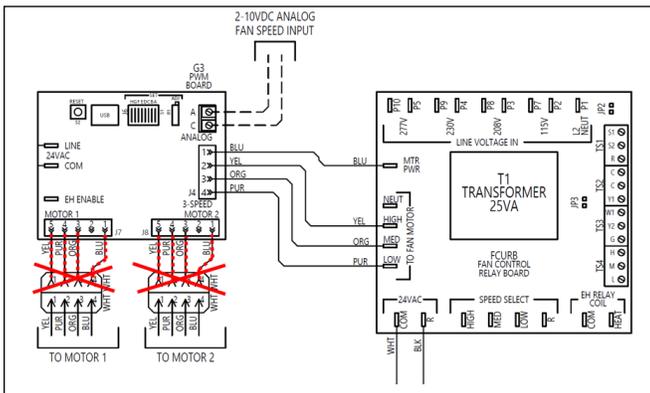


Figure 57 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 58)

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

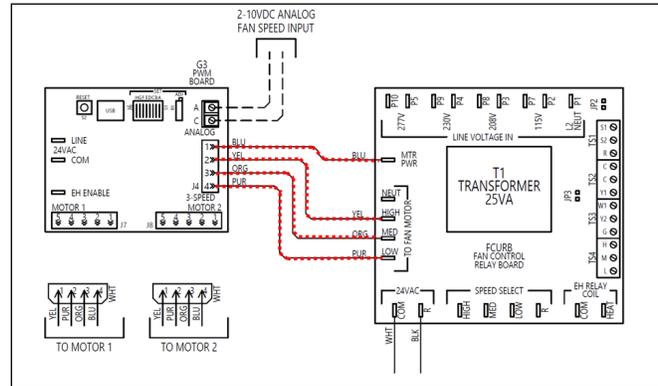


Figure 58 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 59)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

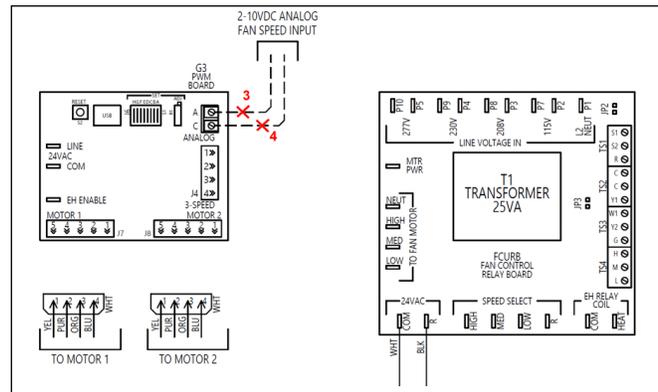


Figure 59 – Remove 2-10VDC motor control signal

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 SYNC PWM BOARD (See Figure 60)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

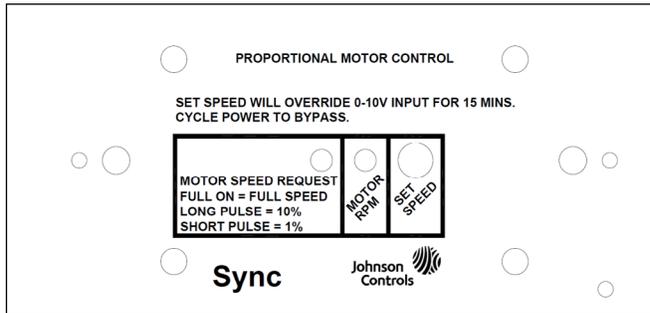


Figure 60 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 61)

- Install WHT wire(s) on "NEUTRAL" quick connect(s) on Sync PWM board.
- Install BLK wire (or wires with butterfly/Y connector) on the FCRB MTR_PWR terminal.
- Add BLU wire provided in kit with female quick connects on both sides between opposite fan relay contact and the "24VAC" on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 61)

- 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 Sync PWM board, making sure the GRN wire is closest to the quick connect terminations and BLK is closest to 8 header pins.

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 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 61)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of BRN wire to the "COMMON" on Sync PWM.

- Connect stripped side of the BRN wire to the other 2-pole lever nut.
- Connect the wire identified as "3" from Step 6 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "4" from Step 6 to the 2-pole lever nut with the BRN wire.

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.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram 88-24010-09 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

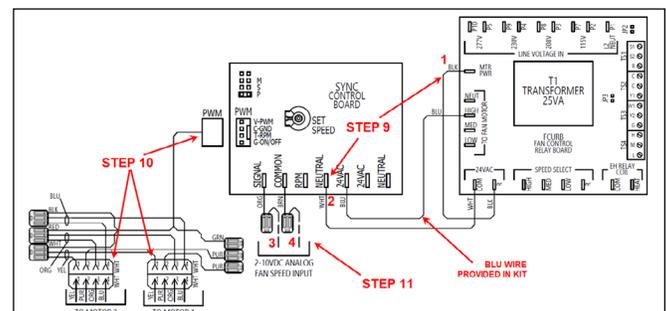
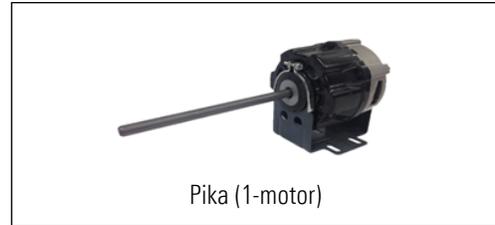


Figure 61 - Sync PWM Electrical Connections

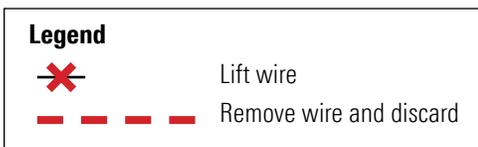
INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC PWM CONTROLLER WHEN INSTALLED WITH A FRBII AND PIKA MOTOR

These instructions explain how to replace the existing G3 PWM Controller with the Sync 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.



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 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded.

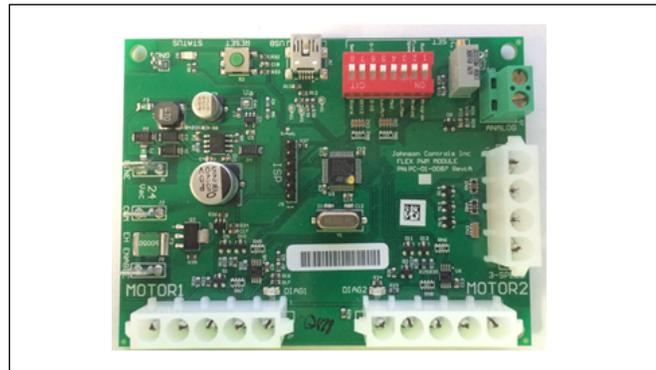


Figure 62 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram(s)	88-24010-10	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (2 quick mtr side connects) for 1 Pika motor	PE-16-0924	1
Harness: FRBii-J4 to Sync PWM (4-pin, 1 wire, quick connect)	61-13276-02	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: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 63)

- Lift BLK wire(s) from LINE (including butterfly/Y connector if installed).
- Lift WHT wire(s) from COM (remove the butterfly/Y connector if installed).

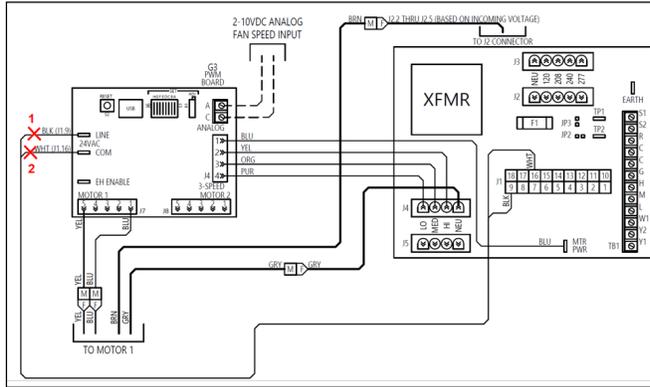


Figure 63 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 64)

- 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.

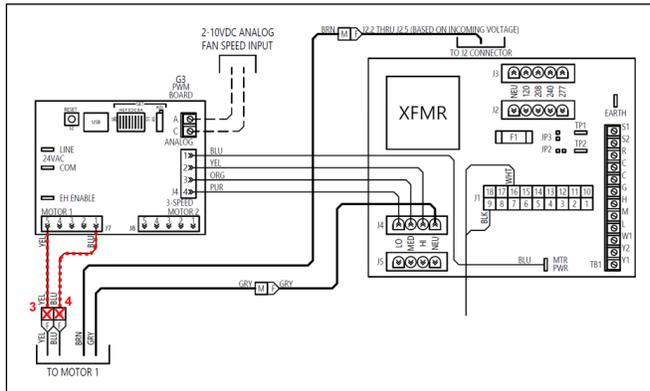


Figure 64 – Remove Motor Signal Wires

REMOVE MOTOR POWER WIRES (See Figure 65)

- 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.

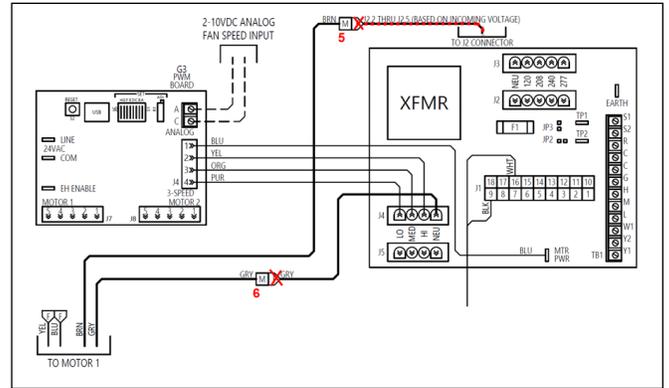


Figure 65 – Remove Motor Signal Wires

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.

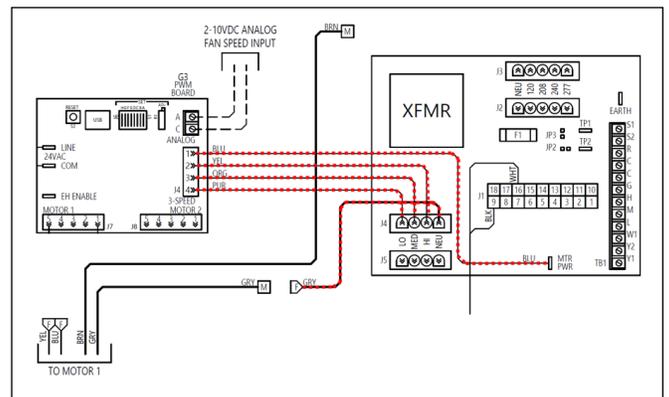


Figure 66 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 67)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

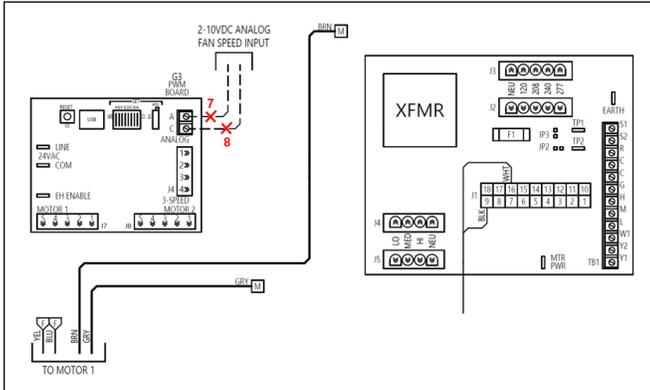


Figure 67 – Remove 2-10VDC motor control signal

REMOVE G3 PWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 68)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

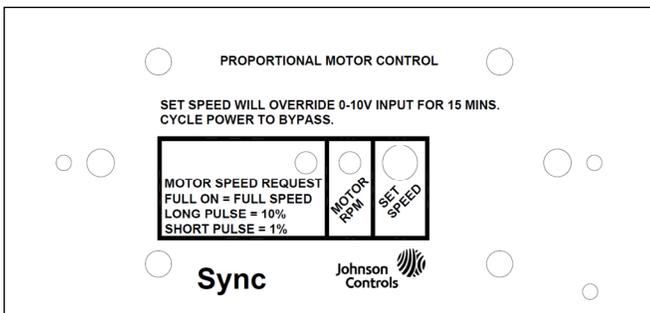


Figure 68 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 69)

- Install WHT wire(s) on “NEUTRAL” quick connect(s) on Sync PWM board.
- Install BLK wire on “MTR PWR” quick connect on FRBii board.
- Install the 4-pin (1-wire, BLK) harness provided in kit between FRBii-J4 and the “24VAC” on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 69)

- 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 Sync PWM board, making sure the YEL wire is closest to the quick connect terminations and BLU is closest to 8 header pins.

CONNECT MOTOR POWER WIRES TO FRBii (See Figure 69)

- 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 POWER AND FAN RELAY TO SYNC PWM (See Figure 69)

- Install WHT wire(s) on “NEUTRAL” quick connect(s) on Sync PWM board.
- Install BLK wire on “MTR PWR” quick connect on FRBii board.
- Install the 4-pin (1-wire, BLK) harness provided in kit between FRBii-J4 and the “24VAC” on the Sync PWM board.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 69)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of the BRN wire to the "COMMON" on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.
- Connect the wire identified as "7" from Step 7 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "8" from Step 7 to the 2-pole lever nut with the BRN wire.

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 63-67 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 69.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram **88-24010-10** with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

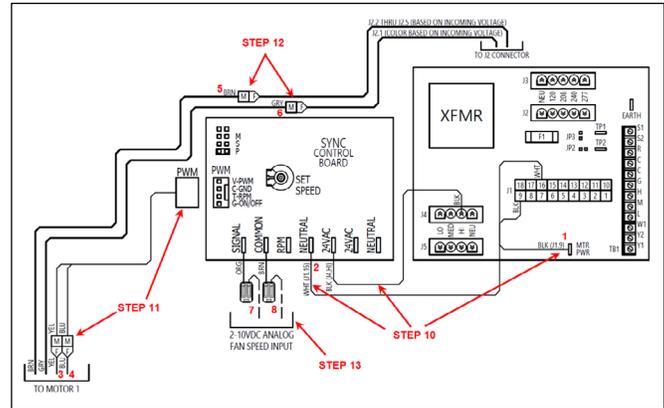
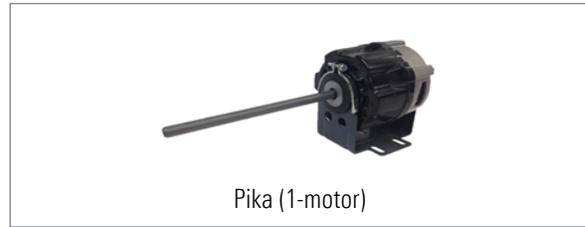


Figure 69 - Sync PWM Electrical Connections

INSTRUCTIONS TO REPLACE G3 PWM CONTROLLER WITH SYNC 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 Sync 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.

Legend	
	Lift wire
	Remove wire and discard

IDENTIFY COMPONENTS

- a. Locate the G3 PWM board within the control enclosure (See Figure 70).
- b. Confirm all parts listed in replacement kit are present. The part number of the retrofit kit will be 66-13092-01. Only the parts and wires required for this combination are shown. Unused parts/wires are not listed here and can be discarded

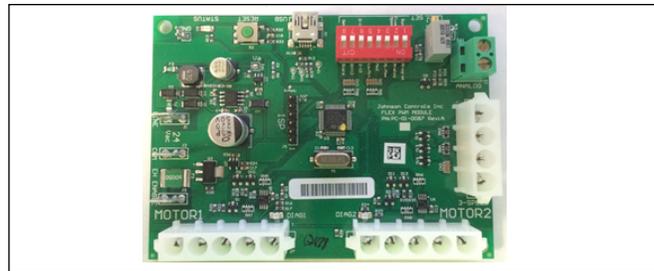


Figure 70 – G3 PWM Board

Description	Part Number	Qty
Conversion Wire Diagram(s)	88-24010-11	1
Sync PWM board	PC-01-0165	1
Bracket	00-00568-01	1
Screws	PH-00-0030	4
2-position lever nut	PH-06-0171	2
Harness: ICM-motor (4 quick mtr side connects) for 2 Pika motors	PE-16-0926	1
Harness: FRBii-J4 to Sync PWM (4-pin, 1 wire, quick connect)	61-13276-02	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: ORG, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-06	1
Wire: BRN, 6-inch, 16AWG, female quick connect on one end, stripped other end	61-13230-07	1

REMOVE PWM POWER WIRES (See Figure 71)

- Lift BLK wire(s) from LINE (including butterfly/Y connector if installed).
- Lift WHT wire(s) from COM (remove the butterfly/Y connector if installed).

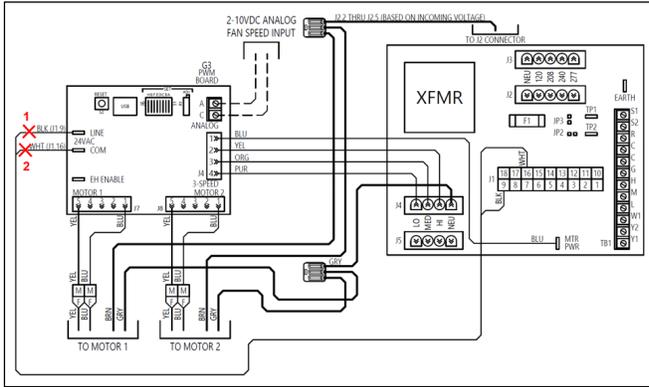


Figure 71 - Remove PWM Power

REMOVE MOTOR SIGNAL WIRES (See Figure 72)

- 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.

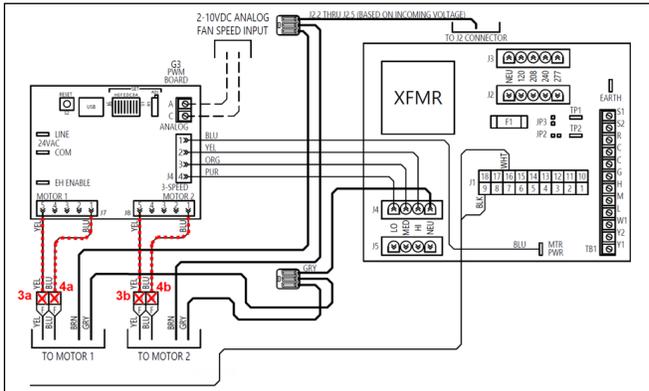


Figure 72 – Remove Motor Signal Wires

REMOVE MOTOR POWER WIRES (See Figure 73)

- 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.

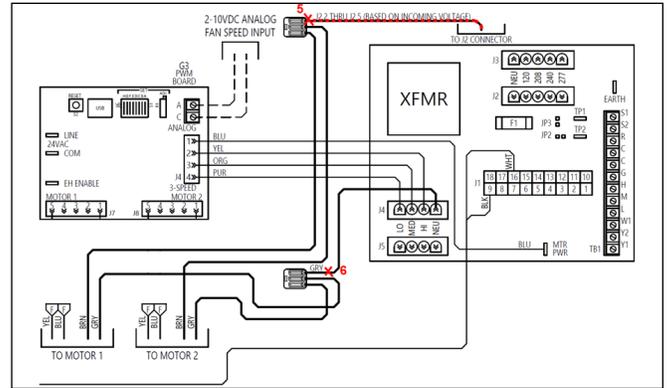


Figure 73 – Remove Motor Signal Wires

REMOVE FAN ENABLE SIGNAL WIRES (See Figure 74)

- 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.

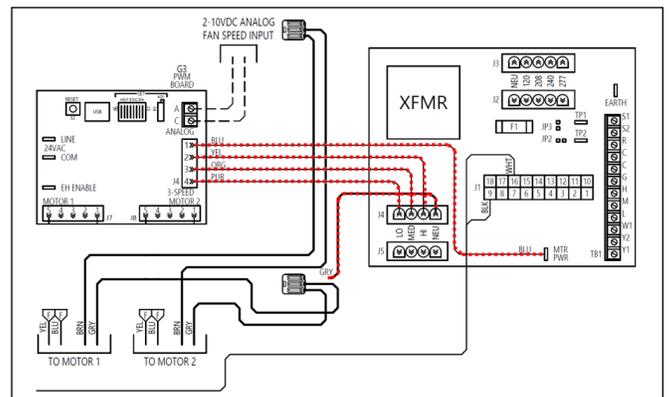


Figure 74 - Remove low voltage signal wires to motor(s)

REMOVE 2-10VDC SIGNAL WIRES (See Figure 75)

- Disconnect the wires from the 2-position screw terminal that go back to the remote controller providing the 2-10VDC signal.

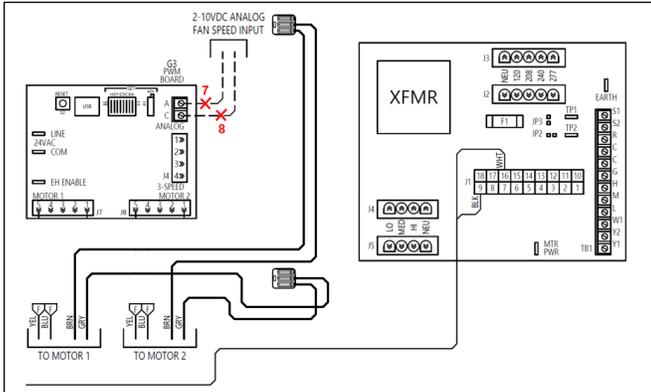


Figure 75 – Remove 2-10VDC motor control signal

REMOVE G3 PWM BOARD

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

INSTALL SYNC PWM BOARD (See Figure 76)

- Position the Sync PWM bracket in the approximate location of the G3 PWM bracket, making sure the potentiometer is accessible.
- Attach the Sync PWM assembly using screws from the G3 PWM bracket.

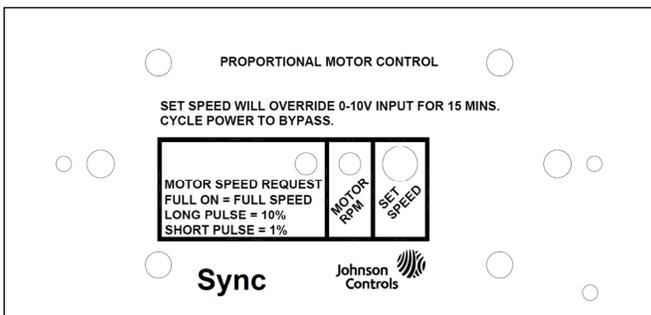


Figure 76 - Sync PWM Board

CONNECT POWER AND FAN RELAY TO SYNC PWM (See Figure 77)

- Install WHT wire(s) on “NEUTRAL” quick connect(s) on Sync PWM board.
- Install BLK wire on “MTR PWR” quick connect on FRBii board.
- Install the 4-pin (1-wire, BLK) harness provided in kit between FRBii-J4 and the “24VAC” on the Sync PWM board.

CONNECT MOTOR CONTROL SIGNAL TO SYNC PWM (See Figure 77)

- 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 Sync PWM board, making sure the YEL wire is closest to the quick connect terminations and BLU is closest to 8 header pins.

CONNECT MOTOR POWER WIRES TO FRBii (See Figure 77)

- 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

- Cut and strip the wires at the end of the appropriate J2 harness.
- Connect the wire from Pin 1 of the J2 harness to the 3-pole lever nut with GRY wires.
- Connect the wire from Pins 2-5 of the J2 harness to the 3-pole lever nut with BRN wires.
- Install the other side of the harness on the FRBii at J2.

CONNECT 2-10VDC SIGNAL WIRES TO SYNC PWM (See Figure 77)

- Connect female quick connect side of the ORG wire to the "SIGNAL" on Sync PWM.
- Connect stripped side of the ORG wire to one 2-pole lever nut.
- Connect female quick connect side of the BRN wire to the "COMMON" on Sync PWM.
- Connect stripped side of the BRN wire to the other 2-pole lever nut.
- Connect the wire identified as "7" from Step 7 to the 2-pole lever nut with the ORG wire.
- Connect the wire identified as "8" from Step 7 to the 2-pole lever nut with the BRN wire.

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 71-75 were disconnected.
 - Ensure that the new wires have been connected as specified in Figure 77.
- Verify operation of unit.
- Ensure the correct Sync PWM jumper position:
 - For motor control using 2-10VDC analog signal, install jumper on Sync in the "P" position.
 - For motor control using a manually adjustable single speed, install jumper on Sync PWM in the "M" position. The motor can then be controlled by the potentiometer from the front of the PWM board. The LED frequency will indicate the PWM percentage. Refer to IOM for details as needed.
- If desired, modify the fan calibration curve label over the existing fan calibration curve label for the new voltage levels (see below).
- Leave the conversion wire diagram 88-24010-11 with the original diagrams in the electrical enclosure.
 - Discard the remaining unused diagrams.

G3 PWM MANUAL ADJUSTMENT	SYNC PWM (2-10V CONTROL) EQUATION: $3.2 * (G3 \text{ PWM}) + 2$
0.00 VDC	2.0 VDC
0.63 VDC	4.0 VDC
1.25 VDC	6.0 VDC
1.88 VDC	8.0 VDC
2.50 VDC	10.0 VDC

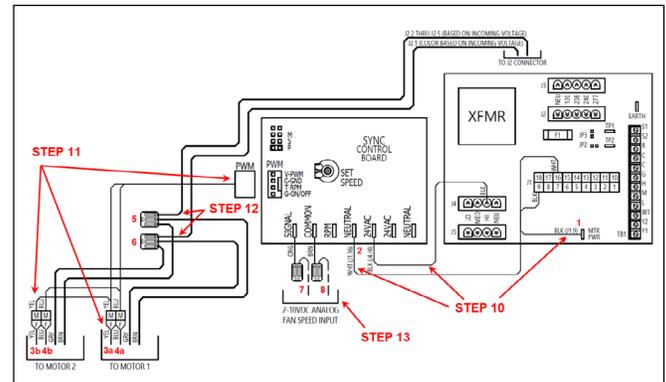


Figure 77 - Sync PWM Electrical Connections

