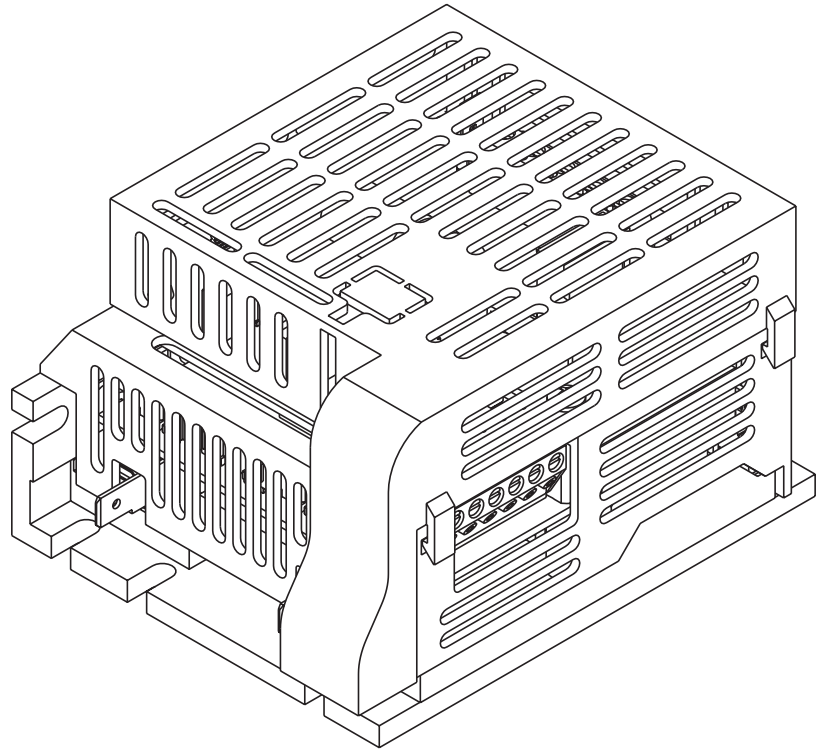
INSTALLATION AND OPERATION MANUAL

KBMG MULTI-SPEED BOARD

KB Part No. 8833 — Multi-Speed Board for KBMG Series Regenerative Drive



See Safety Warning on Page 1

The information contained in this manual is intended to be accurate. However, the manufacturer retains the right to make changes in design which may not be included herein.

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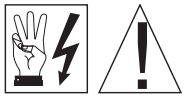
i. SAFETY WARNING

Definition of Safety Warning Symbols

Electrical Hazard Warning Symbol – Failure to observe this warning could result in electrical shock or electrocution.

Operational Hazard Warning Symbol – Failure to observe this warning could result in serious injury or death.



This product should be installed and serviced by a qualified technician, electrician, or electrical maintenance person familiar with its operation and the hazards involved. Proper installation, which includes wiring, mounting in proper enclosure, fusing or other over current protection, and grounding can reduce the chance of electrical shocks, fires, or explosion in this product or products used with this product, such as electric motors, switches, coils, solenoids, and/or relays. Eye protection must be worn and insulated adjustment tools must be used when working with control under power. This product is constructed of materials (plastics, metals, carbon, silicon, etc.) which may be a potential hazard. Proper shielding, grounding, and filtering of this product can reduce the emission of radio frequency interference (RFI) which may adversely affect sensitive electronic equipment. If further information is required on this product, contact the Sales Department. It is the responsibility of the equipment manufacturer and individual installer to supply this Safety Warning to the ultimate end user of this product. (SW effective 11/1992).

CE

This product complies with all CE directives pertinent at the time of manufacture.
Contact the Sales Department for Declaration of Conformity.

INSTALLATION AND OPERATION INSTRUCTIONS

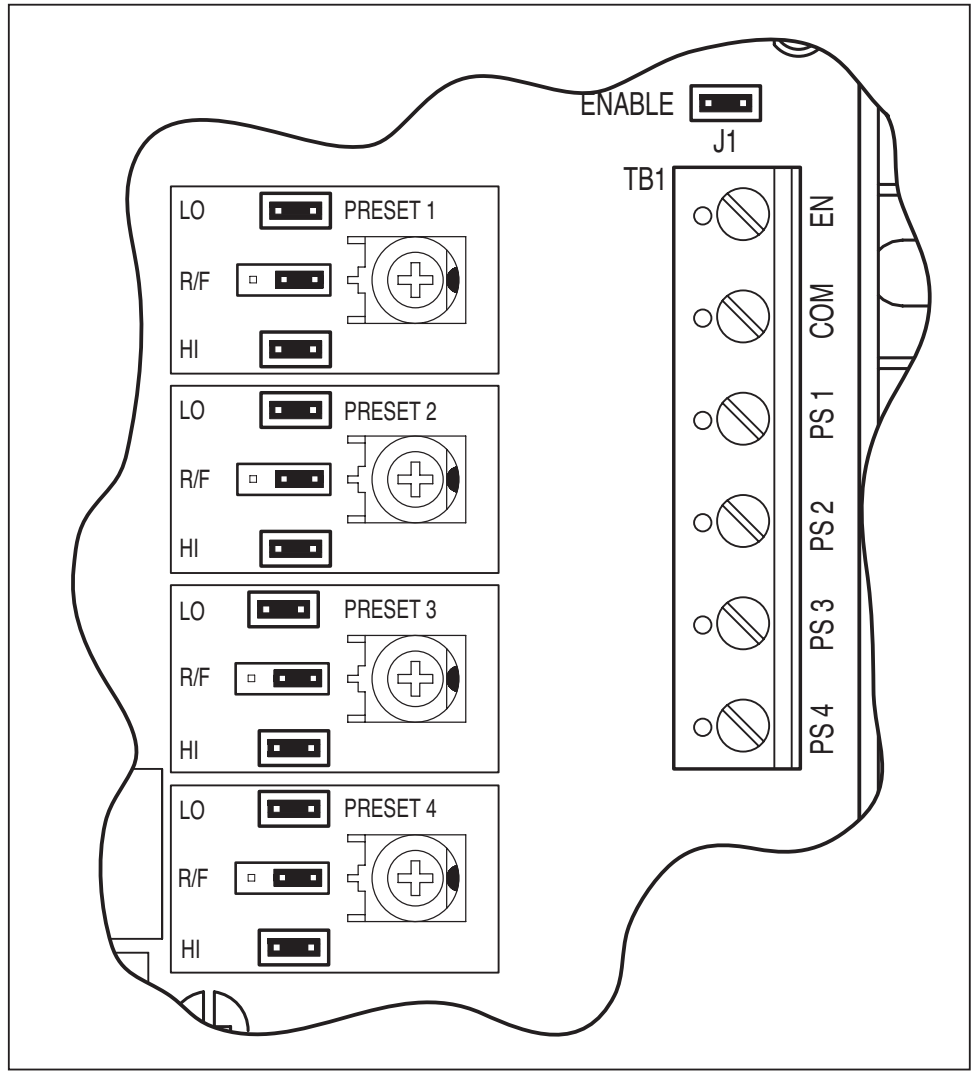
IMPORTANT – You must read these installation and operation instructions before attempting to operate this control.

I. INTRODUCTION

Thank you for purchasing the KBMG Multi-Speed Board (Part No. 8833). KB Electronics, Inc. is committed to providing total customer satisfaction by producing quality products that are easy to install and operate. The KBMG Multi-Speed Board is manufactured with surface mount components incorporating advanced circuitry and technology.

The KBMG Multi-Speed Board provides four (4) user adjustable preset speeds to control a motor connected to the KBMG Series Regenerative Drive. A preset (Preset 1, Preset 2, Preset 3, Preset 4) is selected with a contact closure or open collector. Motor direction is set by the position of Jumper R/F (reverse/forward) which is provided for each preset.

FIGURE 1 – CONTROL LAYOUT



Speed range selection jumpers (HI, LO) and Enable jumper (ENABLE) are also provided. Other features include a barrier terminal block (TB1) to facilitate wiring and a connector (CON2) to connect a tach-generator (TACH) for the KBMG.

STANDARD FEATURES

- **Multi-Speed Operation –** Four (4) user Preset Speeds.
- **Forward and Reverse –** Each preset provides a selection of forward and reverse direction.
- **Speed Range Settings –** Each preset provides expanded trimpot adjustments for motor speed range (0-100, 50-100, 0-50, 33-66 % base speed).
- **Enable –** Provides electronic Run/Stop function.

TABLE 1 – GENERAL SPECIFICATIONS

PARAMETER	SPECIFICATION
Preset or Enable Switch Types	Dry Contact* or Open Collector
Maximum Operating Current per Preset (milliamps DC)	1.5
Operating Temperature Range (°C)	0 – 50

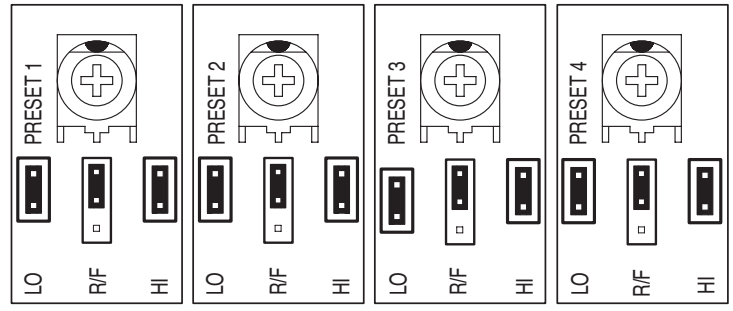
Note:* ***Note:* *Contacts must be isolated from the AC line.*

II. SETTING SELECTABLE JUMPERS (each preset)

The KBMG Multi-Speed Board has customer selectable jumpers which can be set for a specific application. See Figure 2.

Note: *Disconnect the AC line before changing position of jumpers.*

FIGURE 2 – PRESETS 1 THRU 4



A. Direction Selection (R/F) – All R/F Jumpers are factory set to the "F" position for forward operation. For reverse operation, set the desired preset speed Jumper to the "R" position. See Figure 3.

B. Speed Range Selection (HI, LO) – All HI and LO Jumpers are factory installed for full motor speed range. For more precise adjustment over a narrower speed range (high, medium, or low) set the HI and LO jumpers as shown in Figure 4.

FIGURE 3 – DIRECTION SELECTION (R/F)

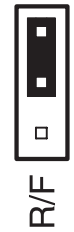
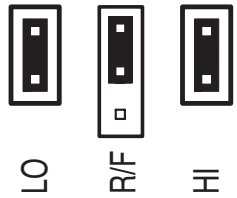
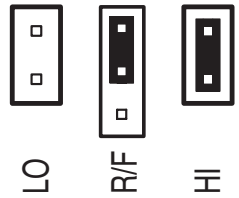
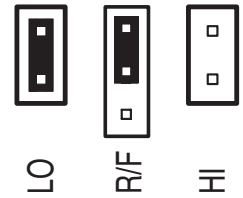
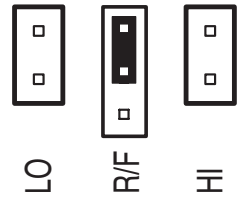
R/F Set for Forward Direction (Factory Setting)	R/F Set for Reverse Direction
 R/F	 R/F

FIGURE 4 SPEED RANGE SELECTION (HI/LO)

	HI/LO Set for Full Speed Range (Factory Setting)	HI/LO Set for High Speed Setting	HI/LO Set for Low Speed Setting	HI/LO Set for Med. Speed Setting
	 LO R/F HI	 LO R/F HI	 LO R/F HI	 LO R/F HI
% Base Speed	0 - 100	50 - 100	0 - 50	33 - 66

C. Enable Selection (J1) – Jumper J1 is factory installed to enable the control. To connect an Enable Switch to Terminal Block TB1, remove Jumper J1. See Figure 5 and Figure 12, on page 10.

FIGURE 5 – ENABLE SELECTION (J1)

J1 Set for Enabling of Control (Factory Setting)	J1 Removed for Enable Switch
	

FIGURE 6 – MECHANICAL SPECIFICATIONS (Inches/[mm])

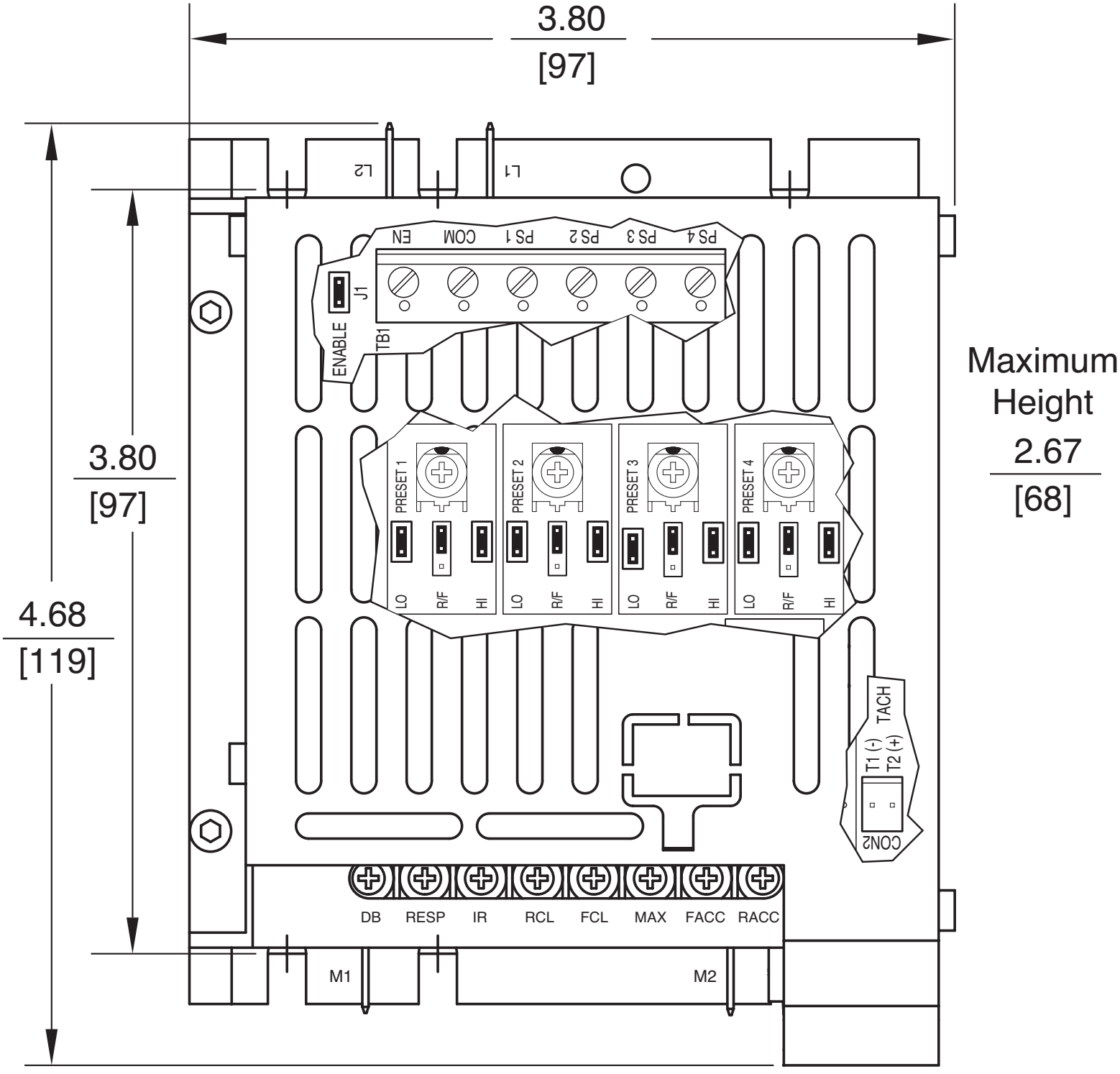
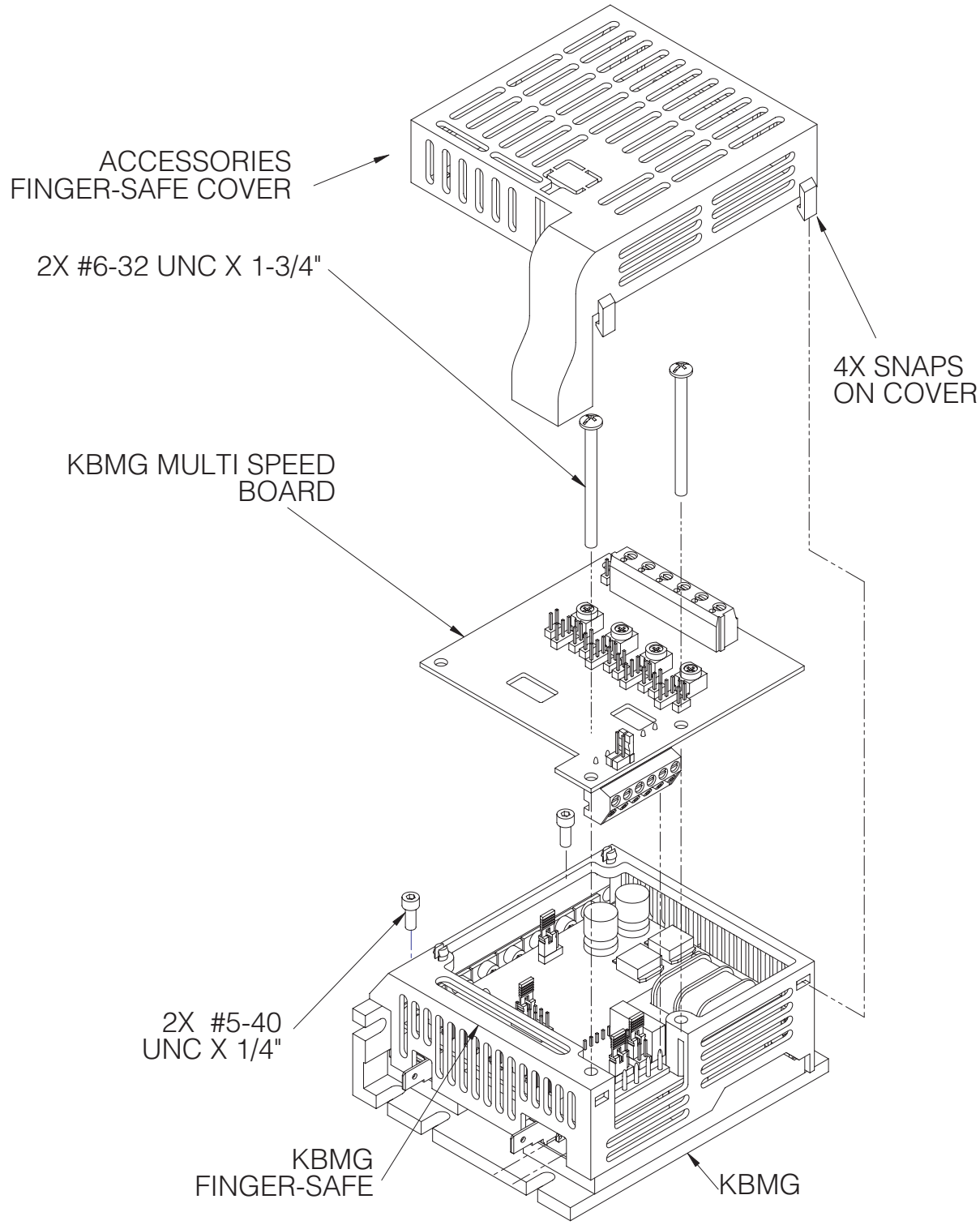


FIGURE 7 – KBMG MULTI-SPEED BOARD & KBMG ASSEMBLY DIAGRAM



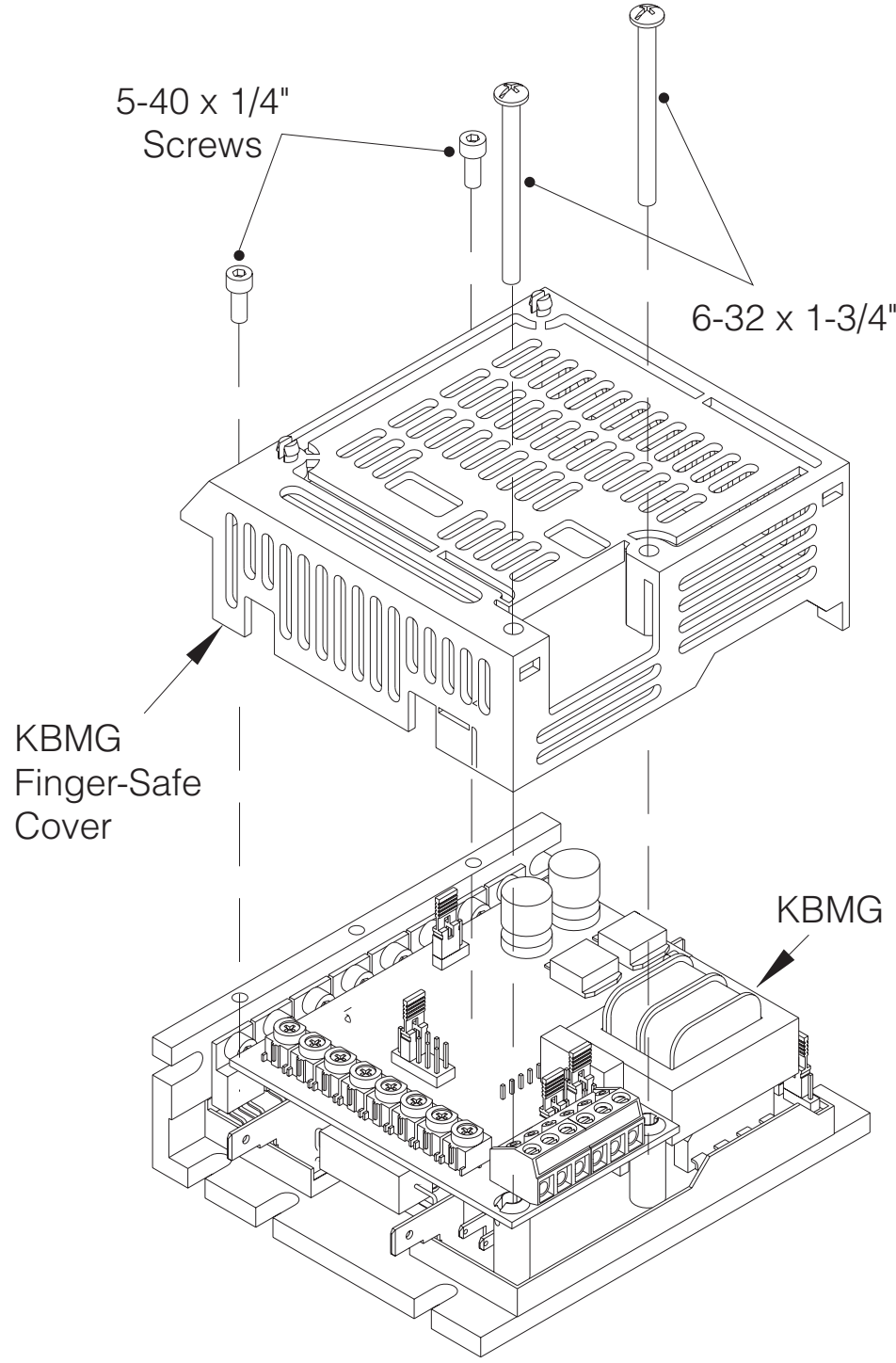
III. MOUNTING INSTRUCTIONS

See Figure 7 on page 6. Note: Figure 7 is also supplied as a separate drawing.

WARNING! Make sure all power is disconnected from the KBMG before proceeding.

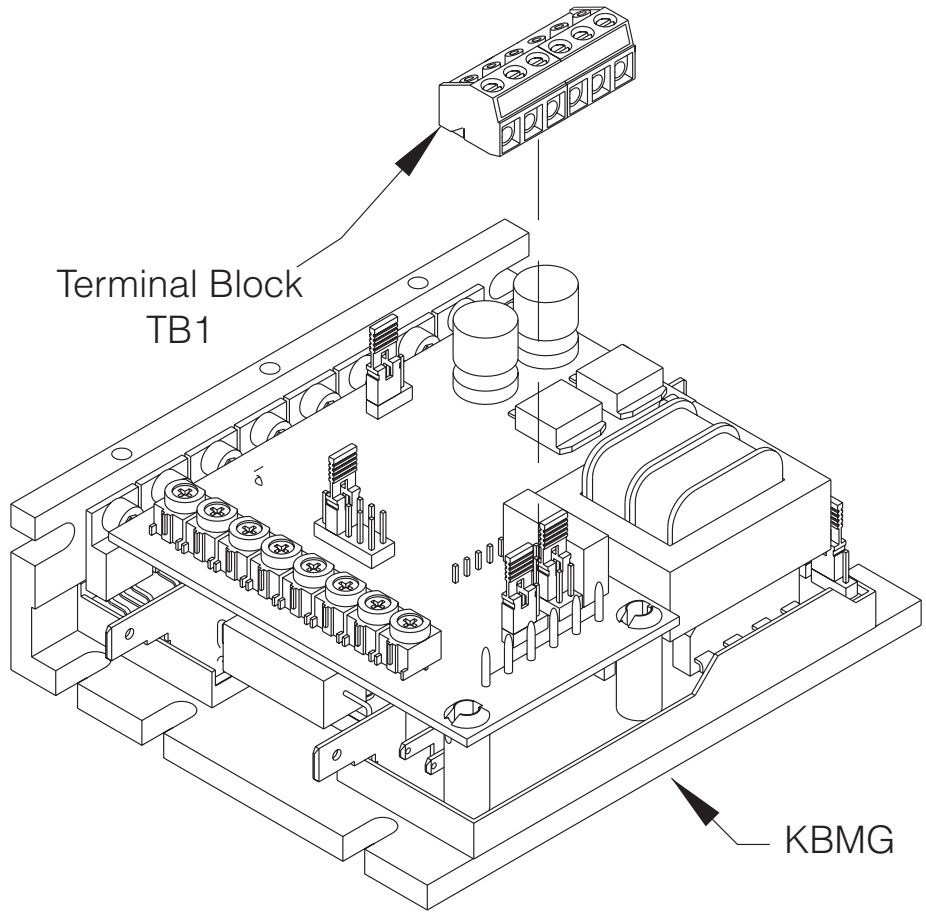
A. Removing the KBMG Finger-Safe Cover – If a finger-safe cover is not installed on the KBMG, proceed to Section III B. If a finger-safe cover is installed on the KBMG, remove the two (2) socket head 5-40 X 1/4” screws located at the rear of the KBMG using the supplied 3/32” hex key. Also, remove the two (2) 6-32 X 1¾” screws located on either side of Terminal Block TB1 of the KBMG. See Figure 8.

FIGURE 8 – REMOVING THE KBMG FINGER-SAFE COVER



B. Removing Terminal Block TB1 from the KBMG – Remove Terminal Block TB1 from the KBMG by rocking it back and forth or using a flat blade screwdriver to gently pry it off. The removed terminal block will not be used and may be discarded. See Figure 9.

FIGURE 9 – REMOVING TERMINAL BLOCK TB1 FROM THE KBMG

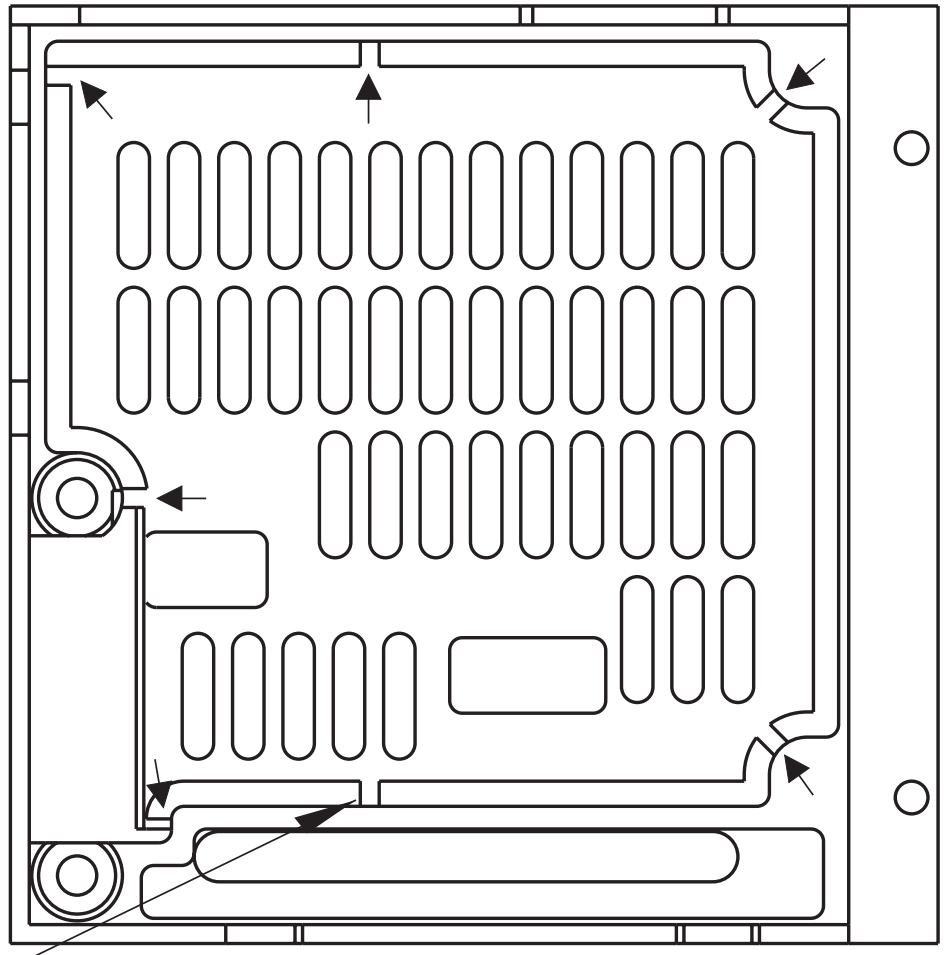


C. Modifying the KBMG Finger-Safe Cover – Once the KBMG finger-safe cover is removed, it has to be modified to accommodate the KBMG Multi-Speed Board. Cut out the finger-safe cover panel at seven (7) places as shown in Figure 10, on page 9. Note: Some finger-safe covers may already have the cover removed.

D. Installing the KBMG Finger-Safe Cover – Once the KBMG finger-safe cover has been modified, it can be installed onto the KBMG. Initially, use only the two (2) 5-40 X 1/4" socket head screws, using the supplied 3/32" hex key. Do not over tighten these screws or damage may result to the KBMG finger-safe cover. See Figure 6 on page 6.

Note: *All jumpers on the KBMG must be set before installing the KBMG finger-safe cover.*

FIGURE 10 – REMOVING KBMG FINGER-SAFE COVER PANEL



KBMG Finger-Safe Cover. Remove Panel (cut 7 places) to Install KBMG Multi-Speed Board.

E. Installing the KBMG Multi-speed Board onto the KBMG – The terminal block located on the bottom of the KBMG Multi-Speed Board plugs onto the six (6) header pins where TB1 was removed from the KBMG. The two (2) holes on the back of the KBMG Multi-Speed Board snap onto the finger-safe cover. Use the two (2) 6-32 X 1¾" screws, that were previously removed, to secure the KBMG Multi-Speed Board to the KBMG. Do not over tighten these screws or damage may result to the KBMG Multi-Speed Board and the KBMG. See Figure 7, on page 6.

Installation is now complete.

TABLE 2 – TERMINAL BLOCK TB1 WIRING INFORMATION

Connection Designation	Supply Wire Size (AWG – Cu)		Recommended Tightening Torque (in-lbs)
	Minimum	Maximum	
Logic Connections	24	14	3.5

IV. WIRING INSTRUCTIONS

WARNING! Read Safety Warning, on page 1, before using this control. Make sure all power is disconnected from the KBMG before proceeding.

Safety Warning! Do not use the PRESET or ENABLE contacts as a safety disconnect since they are not fail-safe. Use only the AC line for this purpose.

FIGURE 12 – ENABLE CONTACT CONNECTION

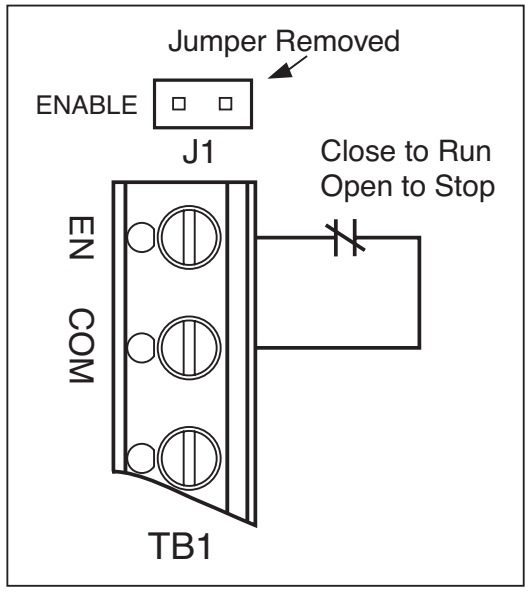
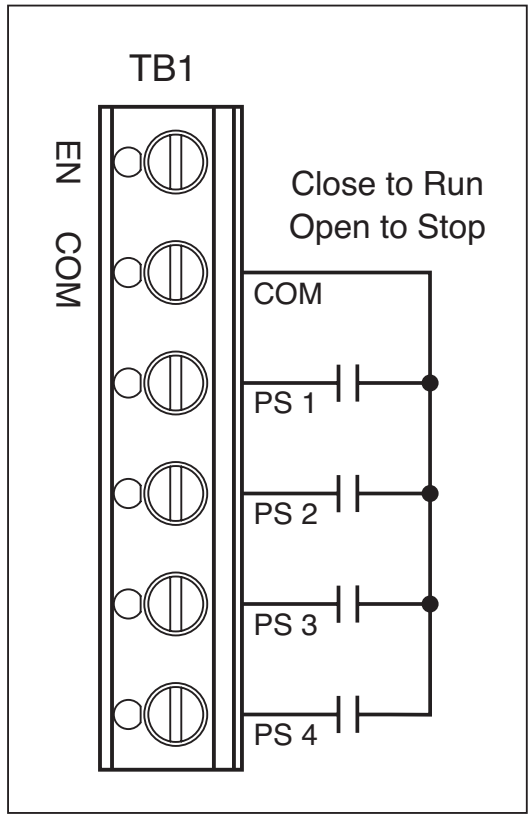


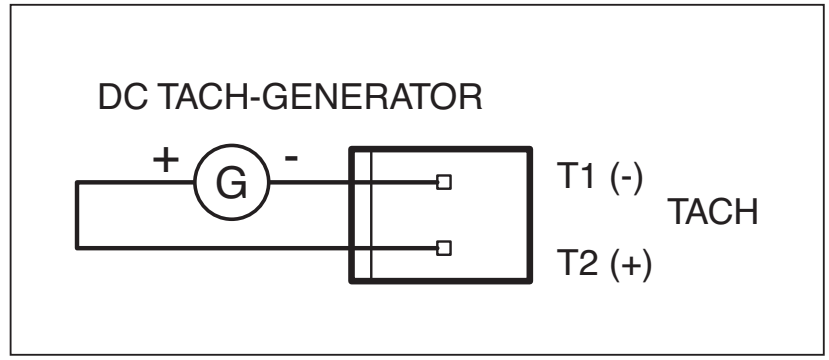
FIGURE 11 – PRESET SPEED CONNECTION



A. Preset Speed Connection – Preset speed range, direction, and speed are selected by making a contact closure between Terminals COM and either PS 1, PS 2, PS 3, or PS 4 of Terminal Block TB1. See Figure 11.

B. Enable Switch Connection – If a Run/Stop function is required, remove the KBMG Multi-Speed Board Jumper J1 and wire a switch to Terminals EN and COM of Terminal Block TB1. When the switch is closed, the control will operate. When the switch is opened, the control will stop. Note: KBMG Multi-Speed Board Jumper J1 must be installed or a connection must be made between Terminals EN and COM of Terminal Block TB1 in order for the KBMG Multi-Speed Board to operate. See Figure 12, on page 10.

FIGURE 13 – TACH-GENERATOR CONNECTION



C. Tach-Generator Connection – If a tach-generator is to be used, wire a 7 Volt (or 50 Volt) DC per 1000 RPM tach-generator to the KBMG Multi- Speed Board, connect the positive (+) side of the tach-generator to Terminal T2 of CON2 and the negative (-) side of the tach-generator to Terminal T1 of CON2. Note: If the positive (+) and negative (-) tach-generator connections are not as described above, the motor will run at full speed only. See Figure 13. (Note: Refer to the KBMG instruction manual for tach-generator feedback operation.)

V. OPERATION

After the KBMG Multi-Speed Board has been properly setup (jumpers and trimpots set to desired positions and wiring completed), the startup procedure can begin. If AC power has been properly brought to the control, the power on (PWR) LED, on the KBMG, will illuminate. Select a preset, as described in Section IV A, on page 10. The motor will begin to run at the preset speed selected.

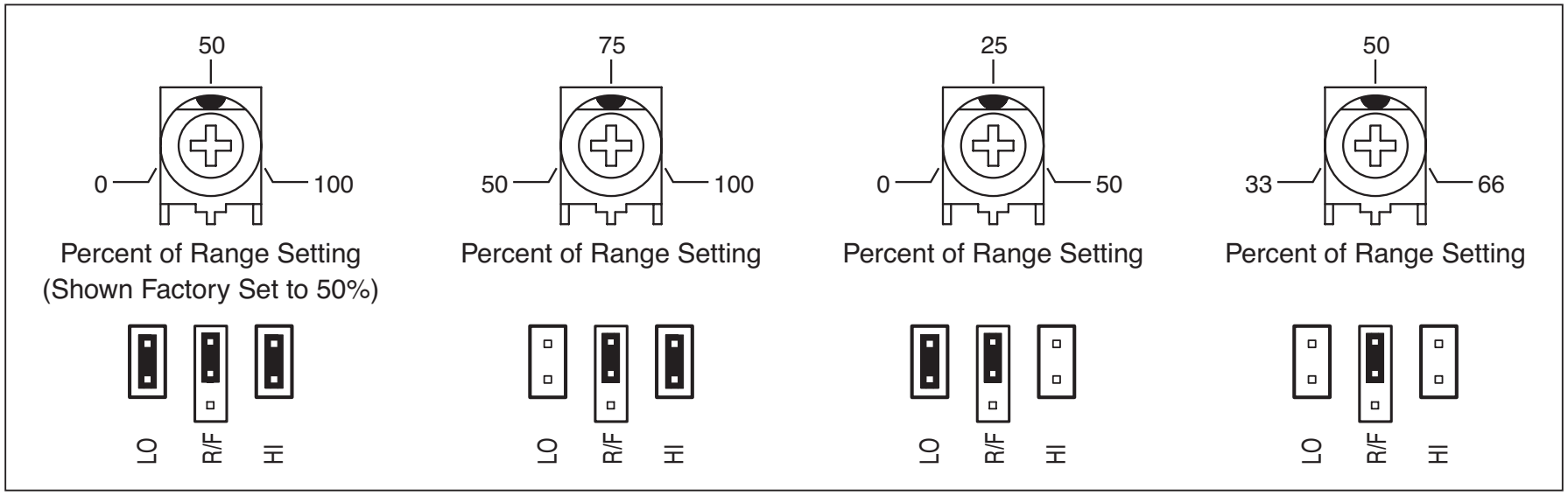
VI. TRIMPOT ADJUSTMENTS (Each Preset)

The KBMG Multi-Speed Board contains trimpots which are factory set for approx. 50% of base motor speed. Readjustment of the trimpots will be required in order to tailor the control for a specific application. If the HI and LO jumpers have been changed in accordance with Figure 4, on page 4, the trimpot ranges will also change. Readjust trimpots as shown in Figure 14.

WARNING! If adjustments are made with main power applied, an insulated adjustment tool must be used and safety glasses must be worn. High voltage exists in this control. Fire and/or electrocution can result if caution is not exercised. Safety Warning, on page 1, must be read before proceeding.

Preset 1, Preset 2, Preset 3, Preset 4 – Sets the speed of the motor (within the speed range selected with **both** Jumpers HI and LO, as described in Section II B, on page 4). For a higher speed setting, rotate the selected preset trimpot clockwise. For a lower speed setting, rotate the selected preset trimpot counterclockwise. See Figure 14.

FIGURE 14 – PRESET TRIMPOT vs HI/LO JUMPER SETTING (EACH PRESET)



– NOTES –

VII. LIMITED WARRANTY

For a period of 18 months from the date of original purchase, KB Electronics, Inc. will repair or replace, without charge, devices which our examination proves to be defective in material or workmanship. This warranty is valid if the unit has not been tampered with by unauthorized persons, misused, abused, or improperly installed and has been used in accordance with the instructions and/or ratings supplied. The foregoing is in lieu of any other warranty or guarantee, expressed or implied. KB Electronics, Inc. is not responsible for any expense, including installation and removal, inconvenience, or consequential damage, including injury to any person, caused by items of our manufacture or sale. Some states do not allow certain exclusions or limitations found in this warranty and therefore they may not apply to you. In any event, the total liability of KB Electronics, Inc., under any circumstance, shall not exceed the full purchase price of this product.

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