

ANTI-PLUG REVERSING MODULE (APRM[®]-PC) WITH DYNAMIC BRAKING

KB PART NO. 9378

FOR USE WITH KBPC-240D SPEED CONTROL

INSTALLATION AND OPERATING INSTRUCTIONS

 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.



*See Page 1



A COMPLETE LINE OF MOTOR DRIVES



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PATENTED

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i. SAFETY WARNING! — PLEASE READ CAREFULLY

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 overcurrent protection and grounding, can reduce the chance of electric shocks, fires or explosions 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 information is required on this product, contact our factory. It is the responsibility of the equipment manufacturer and individual installer to supply this safety warning to the ultimate user of this product. (SW effective 11/92)

This control contains Start/Stop and Inhibit circuits that can be used to start and stop the control. However, these circuits are never to be used as safety disconnects since they are not fail-safe. Use only the AC line for this purpose.

The input circuits of this control (potentiometer, Start/Stop, Inhibit) are not isolated from AC line. **Be sure to follow all instructions carefully. Fire and/or electrocution can result due to improper use of this product.**



This product complies with all CE directives pertinent at the time of manufacture. Contact factory for detailed installation instructions and Declaration of Conformity.

I. OPERATION.

The APRM[®]-PC provides anti-plug instant reverse and solid state dynamic braking. It has been specifically designed for installation into the KBPC-240D speed control. The patented circuitry senses armature voltage and permits armature switching to take place only when current levels are near zero. This eliminates contact arcing normally associated with relay reversing circuits.

Braking is achieved via an electronic circuit utilizing an SCR and brake resistor. An LED indicates when the APRM[®] is in the brake mode. Operation is made via a SPDT switch with center off.

The unit installs easily into the inside cover of the KBPC control. Wiring is made via quick-connect terminals.

II. SET UP.

Be sure the Jumpers J1 and J2 on the APRM[®] are both set to the proper AC line input voltage, 115 or 230VAC. Note: This should be the same setting as the Jumpers J2A and J2B are set for on the KBPC main board which should correspond to the correct AC line input voltage. Refer to the KBPC-240D Installation and Operating Instruction Manual for complete information.

TABLE 1 – APRM[®] OPERATION

Switch Position	Switch Connection	Output Polarity	
		A1	A2
Forward (FWD)	S1, S2	+	-
Brake (BRK)	None (Center off)*	0	0
Reverse (REV)	S2, S3	-	+

***Note:** If no connection is made to S1, S2 and S3, the APRM[®] is in the brake mode which will rapidly stop the motor.

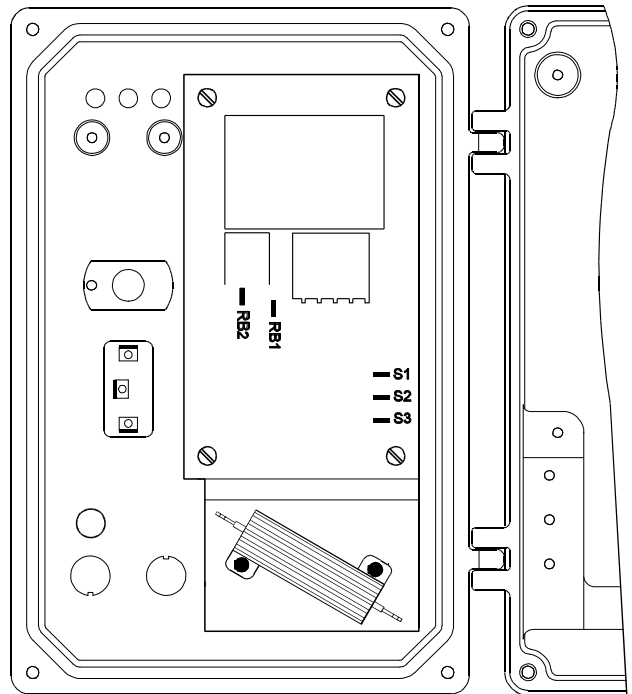
TABLE 2 – GENERAL PERFORMANCE SPECIFICATIONS

Input AC line voltage – 50/60 Hz	115/230
Maximum number of run/brake or forward/reverse operations per minute*	4
Ambient temperature range (°C)	0 – 50
*Based on a one (1) minute braking time.	

III. MOUNTING.

1. Mount the APRM[®]-PC on the 4 bosses located on the inside cover of the KBPC-240D using the four (4) # 6-32 screws provided. Position the APRM so that the brake resistor is toward the bottom of the cover. Be sure not to trap any wires under the APRM mounting bracket. (See fig. 1.)
2. To mount the FWD-BRK-REV switch in the KBPC first remove the rubber plug in the FWD-BRK-REV position by unscrewing the retainer nut on the inside cover. (See fig. 3 p. 5.)
3. Install the FWD-BRK-REV switch assembly into the front cover making sure the key in the hole lines up with the keyway in the switch bushing. Be sure the hex nut supplied is installed at the base of the switch bushing before inserting switch into the KBPC cover.
4. Install the rubber switch boot with integral hex nut over switch lever. Switch should be in the stop position to facilitate installation. Also, the switch bushing threads should protrude no more than .25" (6.4mm) or no less than .10" (2.6mm) through the front cover for proper installation. Tighten the switch boot so that the bottom seals against the cover label. Do not overtighten.

FIG. 1 – APRM[®] MOUNTED IN THE KBPC-240D



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5. FWD-BRK-REV switch remote mounted. It is possible to operate the control with a remote FWD-BRK-REV switch or with a remote relay. Carefully remove the three switch wires: S1, S2, S3 from the APRM[®]. Wires may be extended for remote operation, but it is suggested that a shielded cable be used. (See table 1 APRM[®] Operation, p. 2.)

FIG. 2 – KBPC-240D JUMPER REMOVAL

IV. WIRING. Do not wire control with AC line connected.

1. Carefully remove from the KBPC main PC board the 2 jumpers, J8A (connects A1A and A1B) and J8B (connects A2A and A2B). **Note: Use long nose pliers and rock terminal back and forth to facilitate removal. (See fig. 2.)**
2. Install the wires from the APRM onto the following terminals on the KBPC main board. Refer to the internal wiring diagram provided. (See fig. 5, p. 6.)

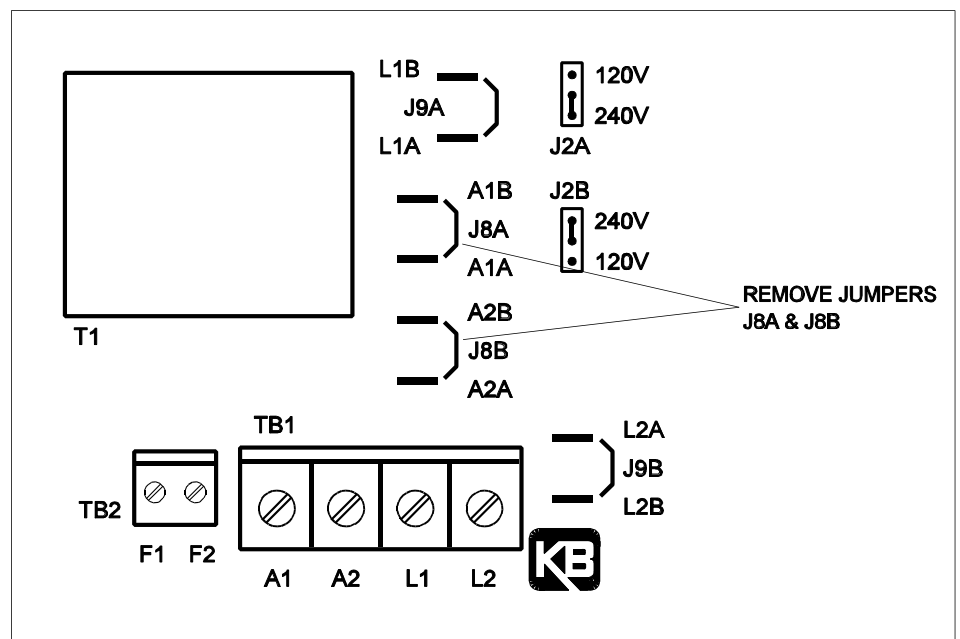


FIG. 3 – SWITCH MOUNTING

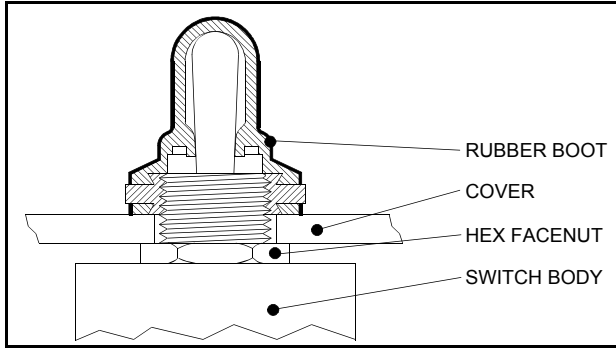


FIG. 4 – REMOTE RELAY CONTACTS

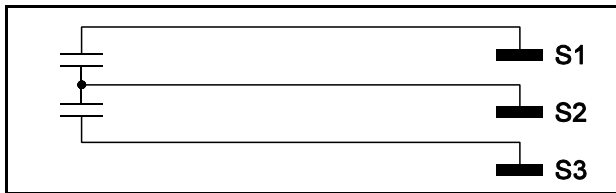


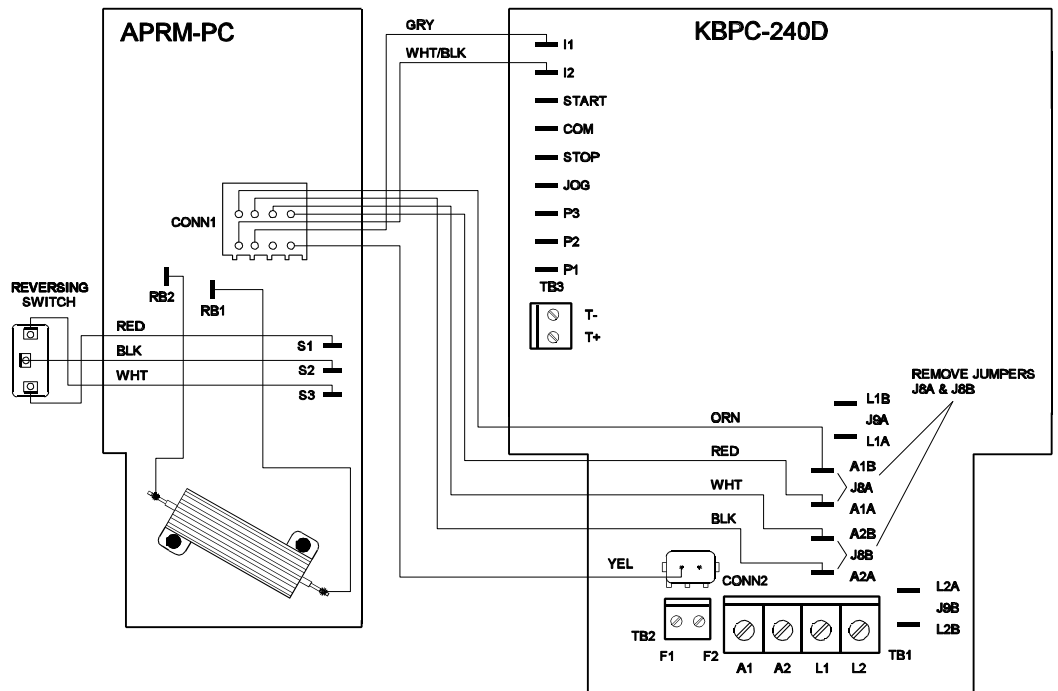
TABLE 3 – APRM® TO PC CONNECTIONS

APRM® Wire Color	Terminal Position on KBPC PC Board
Red	A1A
Orange	A1B
Black	A2A
White	A2B
Gray	I1
White / Black	I2
Yellow	F1*

***Note:**

Newer models contain a connector on the yellow APRM® lead. Observe correct polarity and insert the plug onto the mating connector just behind terminal block TB2. (See fig. 5, p. 6)

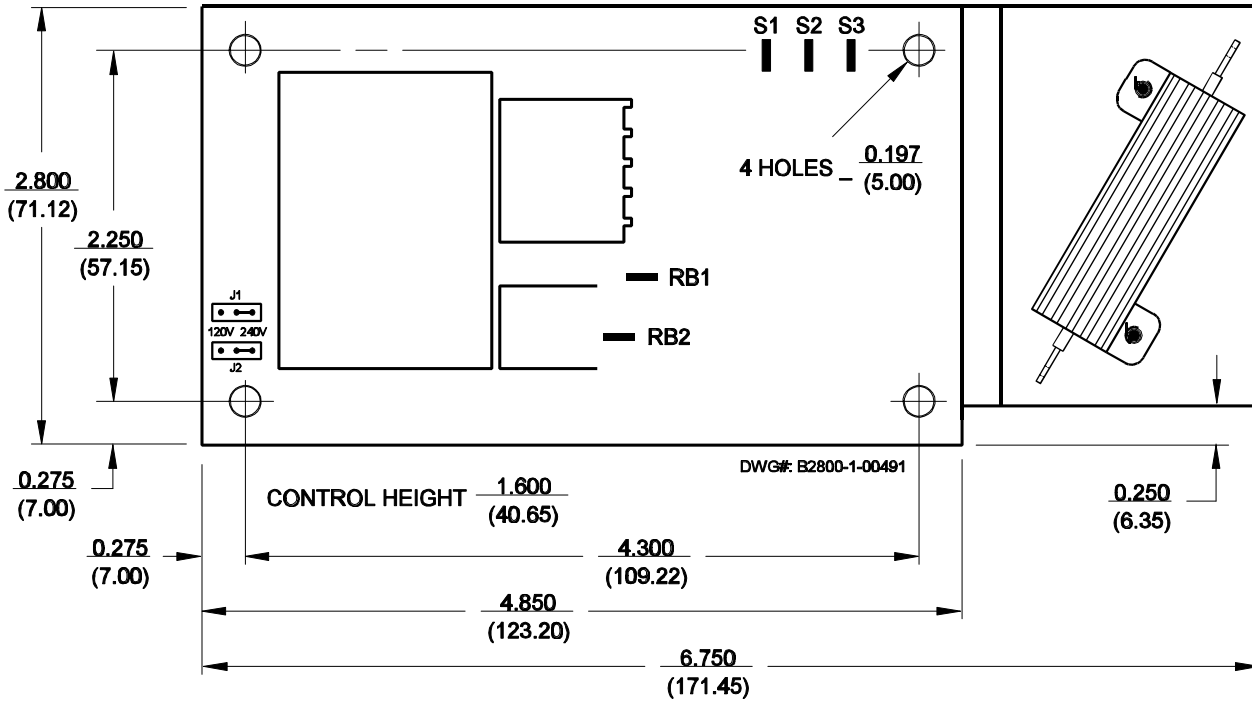
FIG. 5 – INTERNAL WIRING DIAGRAM



To avoid erratic operation do not bundle AC line and motor wires with reversing, potentiometer, voltage following, enable, inhibit or other signal wiring. Use shielded cables on all signal wiring over 12" (30 cm) – Do not ground shield.

Note:
Reversing switch can be remotely mounted.

FIG. 7 – MECHANICAL SPECIFICATIONS $\frac{\text{INCHES}}{[\text{mm}]}$



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V – LIMITED WARRANTY

For a period of 18 months from date of original purchase, KB 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, and we are 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 so that they may not apply to you. In any event, KB's total liability, under all circumstances, shall not exceed the full purchase price of this unit. (rev 4/88)



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