

KBIC®

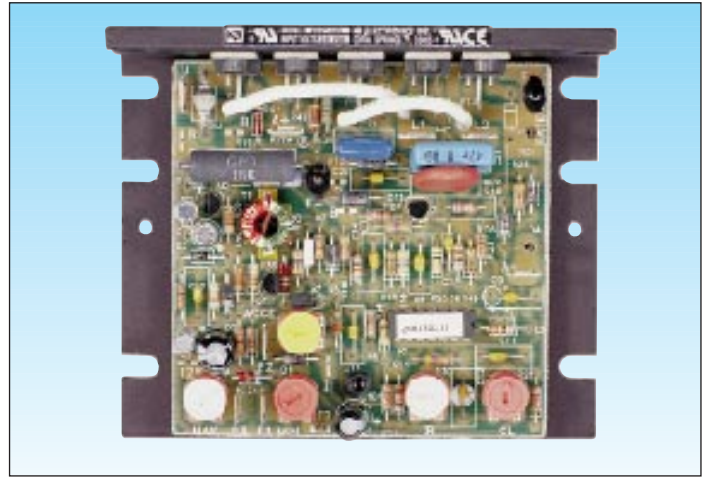
Variable Speed DC Motor Controls For Shunt Wound, PM and AC/DC Motors

1/100 – 1½ Hp @ 115 VAC – 50/60 Hz[▲]

1/50 – 3 Hp @ 230 VAC – 50/60 Hz[▲]

TYPICAL APPLICATIONS

- Conveyors • Packaging Machines • Feeders
- Welding Positioners • Pumps
- Machine Tools • Exercise Equipment
- Screening and Printing Equipment



STANDARD FEATURES

- Plug-in Horsepower Resistor® (see chart) allows a single model to be used on a wide range of motors
- MOV Transient Protection
- Trimpots: MIN, MAX, ACCEL, IR & CL
- Voltage Following
- Inhibit™ and Auto Inhibit®
- Dual Voltage Capable on 230V “D” and “DS” Models

OPTIONAL FEATURES

- Auxiliary Heatsink (P/N 9861) extends rating of basic control
- Barrier Terminal Accessory Kit (P/N 9863)
- AC Line & Armature Fuse Kit (P/N 9849)
- Dial Plate & Knob Kit (P/N 9832)

SPECIFICATIONS

Speed Range (Ratio)	50:1
Load Regulation (% Base Speed)	
(0 – Full Load, 50:1 Speed Range)	1*
Line Voltage Regulation (% Base Speed)	
(At Full Load, ± 15% Line Variation)	1/2*
Control Linearity (% Speed vs. Dial Rotation)	2
CL/Torque Range (% Full Load)	0 – 300
Accel Time Range (Secs.)5 – 4.0
Min. Speed Trimpot Range	
(% Full Speed)	0 – 30*
Max. Speed Trimpot Range (% Full Speed)	50 – 140*
Max. Allow. Amb. Temp.	
(At Full Rating, °C/°F)	45/113

[▲] Maximum rating indicated is with Auxiliary Heatsink. For maximum rating without Auxiliary Heatsink see Electrical Rating Chart.

** Performance is for 90V PM motors on 115 VAC and 180V PM motors on 230 VAC.

DESCRIPTION

The KBIC® full-wave DC motor speed controls are designed for applications demanding excellent performance, high reliability and low cost. Although compact in size (only 4.30" x 3.64" x 1.25"), these controls offer better than 2% regulation over a 50:1 speed range. The controls are fabricated with components which have proven reliability, including MOV transient protection, which is used to protect the power bridge. Integrated circuitry is used to provide a non-complicated design with superior load and line voltage regulation. Electronic current limiting (CL) protects the motor and control against overloads by limiting the maximum level of output current. Acceleration start (adjustable from .5 to 4 seconds) provides a smooth start each time the AC power is applied.

A unique feature of the KBIC® controls is the Plug-in Horsepower Resistor®. It eliminates the need for recalibrating IR Comp and Current Limit when the control is used on various horsepower motors. Additional versatility is achieved by using the Auxiliary Heatsink (optional) which is used to double the horsepower rating of each model. The output of the control is a linear function of potentiometer rotation. The KBIC® can also be operated in a voltage following mode by supplying an *isolated* analog signal (0 – 9VDC) to the input terminals P2 (+) and F-. The controls are terminated as standard with Q-D terminals. A Barrier Terminal Accessory Kit is available which incorporates both line and armature fuses.

The Inhibit™ circuit (terminals I1 and I2) is provided to electronically disconnect the armature output voltage. Another standard feature is Auto Inhibit®. This circuit prevents false starts and high surge currents when cycling the KBIC® control with the AC line.

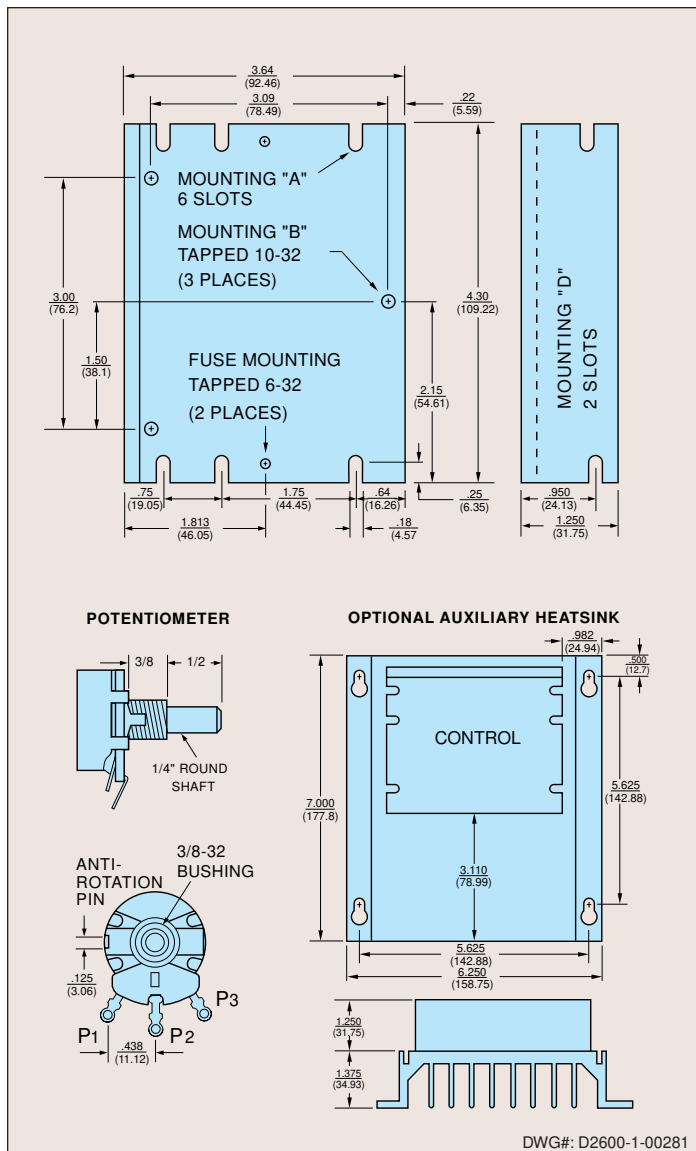
A variety of models are provided with choices of voltage and current ratings. Model KBIC-240D operates on both 115 and 230 VAC to provide 0 – 90 and 180 VDC output. Model KBIC-240DS operates on both 115 and 230 VAC to provide 0 – 90 VDC output. Included with the controls are a 5K remote potentiometer, mounting hardware and operating instructions.

* CE Compliance Requires KBRF-200A RFI Filter

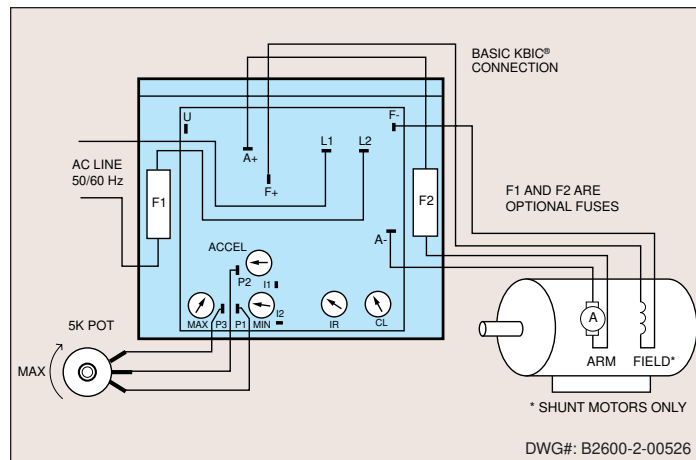
ELECTRICAL RATINGS

Model Number	KB Part Number	AC Line Voltage (VAC) ±15% 50/60 Hz	Motor Voltage (VDC)	Rating Without Auxiliary Heatsink			Rating With Auxiliary Heatsink			Field Voltage (Shunt Wound Motor Only) (VDC)
				Max AC Load Current (RMS Amps)	Max DC Load Current (Avg. Amps)	Maximum Horsepower [Hp, (KW)]	Max AC Load Current (RMS Amps)	Max DC Load Current (Avg. Amps)	Maximum Horsepower [Hp, (KW)]	
KBIC-120	9429	115	0 - 90	9.0	6.0	0.5, (0.4)	18.0	12.0	1, (.75)	50, 100
KBIC-125	9433	115	0 - 90	12.0	8.0	0.75, (0.6)	24.0	16.0	1.5, (1.1)	50, 100
KBIC-240	9428	230	0 - 180	9.0	6.0	1, (.75)	18.0	12.0	2, (1.5)	100, 200
KBIC-225	9432	230	0 - 180	12.0	8.0	1.5, (1.1)	24.0	16.0	3, (2.3)	100, 200
KBIC-240D	9464	115	0 - 90	9.0	6.0	0.5, (0.4)	18.0	12.0	1, (.75)	50, 100
		230	0 - 180			1, (.75)			2, (1.5)	
KBIC-240DS	9423	115 / 230	0 - 90	9.0	6.0	0.5, (0.4)	18.0	12.0	1, (.75)	100

MECHANICAL SPECIFICATIONS INCHES [mm]



CONNECTION DIAGRAM



PLUG-IN HORSEPOWER RESISTOR® CHART

Motor Horsepower Range**		Plug-in-Horsepower Resistor® Resistance Value (ohms)
Armature Voltage 90 - 130 VDC	Armature Voltage 180 VDC	
1/100 - 1/50	1/50 - 1/25	1.0
1/50 - 1/30	1/25 - 1/15	.51
1/30 - 1/20	1/15 - 1/10	.35
1/20 - 1/12	1/10 - 1/6	.25
1/12 - 1/8	1/6 - 1/4	.18
1/8 - 1/5	1/4 - 1/3	.1
1/4	1/2	.05
1/3	3/4	.035
1/2	1	.025
3/4*	1½*	.015
1*	2*	.01
1½*	3*	.006

* Use with Auxiliary Heatsink - see Electrical Ratings.
 ** For overlapping motor horsepower range use lower value Plug-in Horsepower Resistor®.

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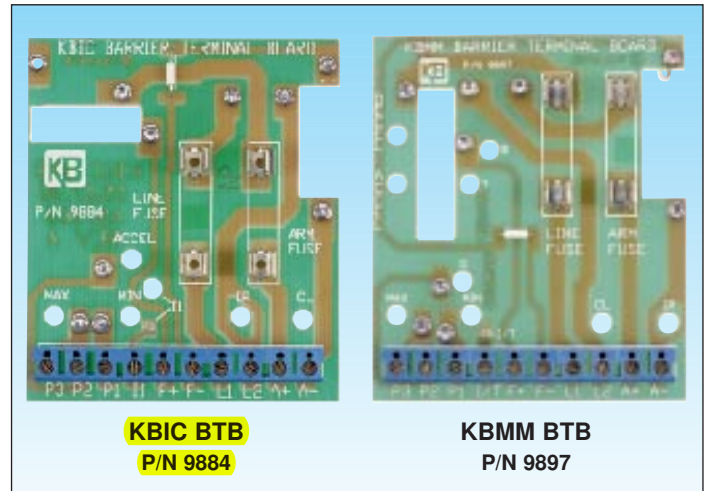
KBIC[®], KBMM[™]

BARRIER TERMINAL BOARDS

KBIC BTB (P/N 9884)
KBMM BTB (P/N 9897)

Converts KBIC[®] and KBMM[™] Controls
from Quick-Connect Terminals to
Barrier Terminals

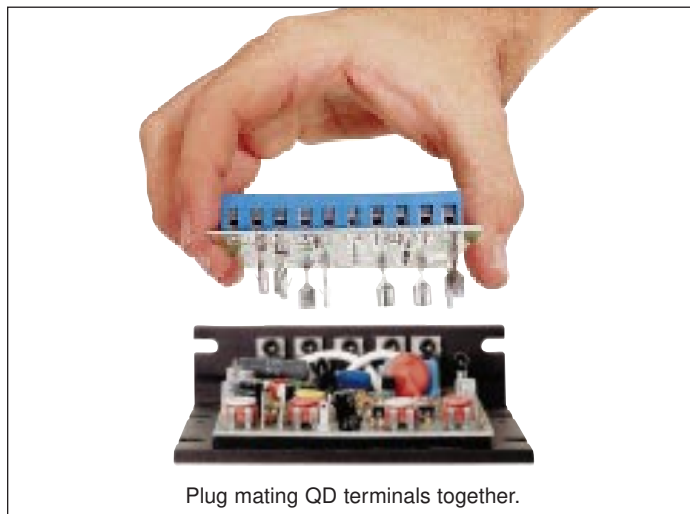
Contains Provision for AC Line
and Armature Fusing[▲]



FUSE SELECTION CHART

Motor Horsepower		Approx. Motor Current (DC Amps)	Fuse Rating (AC Amps)	Reorder Kit Part No. 100Pcs/Box
Armature Voltage 90 VDC	Armature Voltage 180 VDC			
1/30	1/15	0.33	1/2	9871
1/20	1/10	0.5	3/4	9872
1/15	1/8	0.65	1	9873
1/12	1/6	0.85	1 1/4	9874
1/8	1/4	1.3	2	9875
1/6	1/3	1.7	2 1/2	9876
1/4	1/2	2.5	4	9877
1/3	3/4	3.3	5	9878
1/2	1	5.0	8*	9879
3/4	1 1/2	7.5	12*	9880
1	2	10.0	15*	9881
1 1/2	3	15.0	25*	9882

▲Also used as AC Line Fuse



Plug mating QD terminals together.

FUSING

Provision is made for a built-in AC line fuse and armature fuse. The AC line fuse protects the control against catastrophic failure. The armature fuse provides overload protection for the motor and control. Choose the proper size armature fuse by multiplying the maximum DC motor amps by 1.7. Separate branch circuit protection for each ungrounded AC input line must be provided. All fuses should be properly rated for the intended application and all appropriate electrical codes should be followed when wiring this unit.

- The AC Line Fuse can be chosen according to the maximum rating of the control:
8 Amp fuse for all motors to 1/2 Hp-90V and 1 Hp-180VDC.
12 Amp fuse for all motors up to 3/4 Hp-90V and 1 1/2 Hp-180VDC.
15 Amp fuse for all motors up to 1 Hp-90V and 2 Hp-180VDC.
25 Amp fuse for all motors up to 1 1/2 Hp-90V and 3 Hp-180VDC.
(Use Buss ABC, Litt. 326 ceramic fuses or equivalent.)

Note: If the fuse blows, the control is miswired, the motor is shorted or grounded, or the control is defective.

- Armature Fuse can be chosen in accordance with the fuse chart. Note: The armature fuse is calculated based on the approximate full load DC current of the motor times a form factor of 1.5. If the motor has characteristics not consistent with these approximations, a different fuse value may have to be used. Fuses are available from your distributor. Also available is a Fuse Kit (KB P/N 9870) containing 700 assorted fuses.

DESCRIPTION

The KBIC[®] and KBMM[™] Barrier Terminal Boards easily convert a standard control with quick-connect terminals to barrier terminals. Provision is made for AC line and armature fusing. The Barrier Terminal Board installs directly over the control by mating the Q-D terminals. A separate .110" jumper wire can be used to connect to the I1 inhibit terminal or, on the KBMM[™], to the T or B terminals which are used for tach feedback. (Refer to KBMM Instruction Manual.)
Fuses supplied separately.

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