KBMM™

Variable Speed DC Motor Controls For Shunt Wound and PM Motors

1/100 – 1½ HP[1] @ 115 VAC – 50/60 Hz

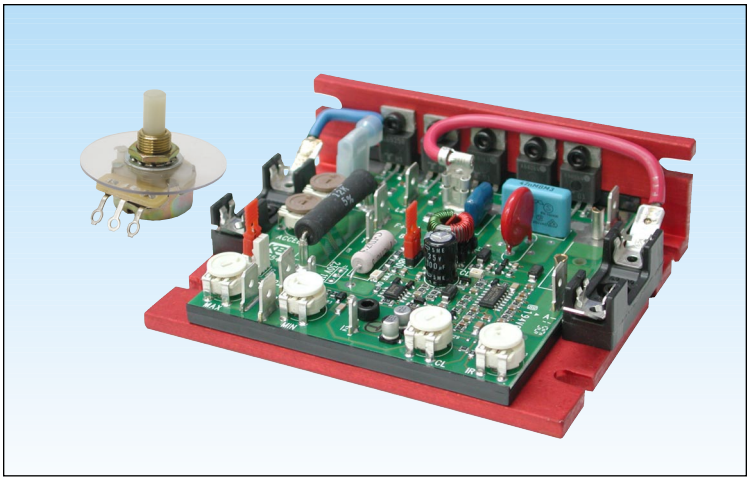
1/50 – 3 HP[1] @ 230 VAC – 50/60 Hz

Short Circuit Proof[2] – 5 Year Warranty[3]

Patented

TYPICAL APPLICATIONS

• Conveyors • Packaging Machines
• Exercise Equipment • Pumps • Feeders
• Screening and Printing Equipment



STANDARD FEATURES

- Plug-in Horsepower Resistor®[5] – Eliminates the need to calibrate control for IR Comp and Current Limit when used on various horsepower motors.
- Auto Inhibit® – Allows the control to be rapidly switched "on" and "off" using the AC line.
- Inhibit and Enable – Allows the control to be turned "on" and "off" using electronic switching.
- Trimpots: MIN & MAX Speed, IR Comp, Current Limit, ACCEL & DECEL
- Model KBMM-225D can operate on 115 or 230 VAC input with 90 or 180 VDC motors. – Jumper selectable.
- Model KBMM-225 operates on 230 VAC input with 90 or 180 VDC motors.
- Armature or Tach-Generator Feedback
- MOV Transient Protection • SMT Construction
- Power On and Current Limit LED Indicators
- Built-in Armature and AC Line Fusing[5]
- Main Speed Potentiometer (5 kΩ)

OPTIONAL ACCESSORIES

- **Auxiliary Heat Sink (Part No. 9861) –** Doubles the horsepower rating of the control.
- **Barrier Terminal Board (Part No. 9897) –** Converts the quick-connect terminals of the KBMM™ to a barrier terminal block. Contains PC board mounted line and armature fuse holders. Plugs onto the quick-connect terminals of the KBMM.
- **SI-6 Signal Isolator (Part No. 9444) –** Provides isolation between noniso-lated signal sources and the KBMM™. Plugs onto the quick-connect ter-minals of the KBMM™. Contains barrier terminal block.
- **Run/Brake Module (Part No. 9952) –** Used for applications that require rapid stopping of the motor. Contains barrier terminal block.
- **Barrier Terminal Accessory Kit (Part No. 9883) –** When used with the Auxiliary Heat Sink, it converts the quick-connect terminals of the KBMM™ to a barrier terminal block and provides built-in fusing.
- **Dial Plate and Knob Kit (Part No. 9832) –** Provides indication of the Main Speed Potentiometer position (incremented form 0 – 100%).
- **Finger-Safe Cover (Part No. 9564)[6] –** Converts the control from open chassis to the IP-20 standard.
- **DIN Rail Mounting Kit (Part No. 9995)**
- **RFI Filters –** A variety of filters are available in both undermount and remote designs. The filters comply with CE Directive 89/336/EEC relating to the EMC Class A Industrial, Class B Residential and FCC A and B. See RFI Filters and Chokes Selection Guide D-321.

Notes:
1. Rating indicated is with Auxiliary Heat Sink. For maximum rating without Auxiliary Heat Sink see Electrical Ratings Chart. **2.** Short circuit protected at motor only. **3.** KB Limited Warranty applies. **4.** CE compliance requires KBRF-200A RFI Filter and proper wiring practices. **5.** Fuses and Plug-in Horsepower Resistor® supplied separately. **6.** Fuse holders must be removed when installing the Finger-Safe Cover.

DESCRIPTION

The KBMM™ full-wave variable speed DC motor controls, *now with SMT construction*, offer the user the ultimate in reliability and performance at an affordable price. The controls contain a unique, super fast, Direct-Fed™ current limit circuit that helps to protect the SCR power bridge against direct shorts[2]. The reliability of the KBMM™ is further enhanced with the use of high-surge, 25A SCRs and AC line and armature fusing[5]. The KBMM™ is fitted with KB's exclusive Plug-in Horsepower Resistor®[5]. It eliminates the need for recalibrating IR Comp and Current Limit when the control is used on various horsepower motors. In addition, the rating of the control can be extended to 1½ HP at 115V and 3 HP at 230V by the use of KB's auxiliary heat sink. Models KBMM-225 and KBMM-225D also allow operation of 90 VDC motors when used on 230 VAC line input.

The versatility of the KBMM™ is confirmed by its extensive list of standard features, such as: selectable armature or tach feedback and adjustment trim-pots for Min speed, Max speed, IR comp, CL and linear Accel and Decel. The KBMM™ includes Auto Inhibit®, which eliminates surging during rapid AC line switching; pulse transformer triggering, which provides cogless operation at low speed; and superior noise rejection circuitry, which eliminates false starts and blown SCRs. Enable (N/C) and Inhibit (N/O) functions provide electronic switch-ing of control output.

The output voltage of the control is a linear function of potentiometer rota-tion. In addition, the control can be used in a voltage following mode by sup-plying an *isolated* analog input signal to terminal P2(+) and F-. The KBMM™ is compact in size (only 4.3" x 3.64" x 1.25") and easily replaces all competitive speed controls. The control is supplied with a 5 kΩ remote potentiometer and QD terminals.

SPECIFICATIONS

Speed Range (Ratio)	50:1
Load Regulation – Armature Feedback (0 – Full Load, 50:1 Speed Range) (% Base Speed)	1*
Load Regulation – Tachometer Feedback (0 – Full Load, 50:1 Speed Range) (% Set Speed)	1*
Line Voltage Regulation (at Full Load, ± 10% Line Variation) (% Speed)	1/2*
Control Linearity (% Speed vs. Dial Rotation)	2
CL/Torque Range (% Full Load)	0 – 200
ACCEL-DECEL Time Range (0 – Full Speed) (Secs.)	0.2 – 10
MIN Speed Trimpot Range (% Full Speed)	.0 – 30*
MAX Speed Trimpot Range (% Full Speed)	50 – 120*
IR Compensation Trimpot Range (at Specified Full Load) (Volts)	0 – 24
Maximum Allowable Ambient Temperature (at Full Rating) (°C/°F)	45/113
Tach Feedback Input Volts (Per 1000 RPM) (VDC)	7/50

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

PENTA KB POWER™

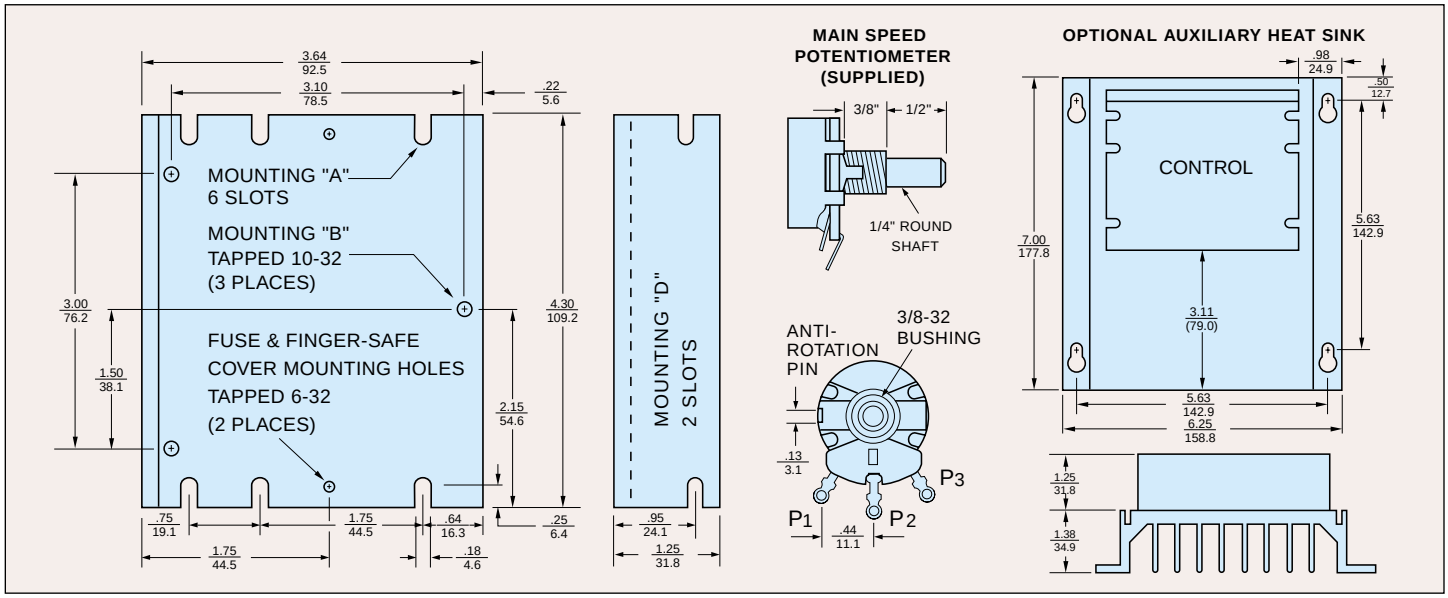
A Complete Line of Motor Drives

ELECTRICAL RATINGS

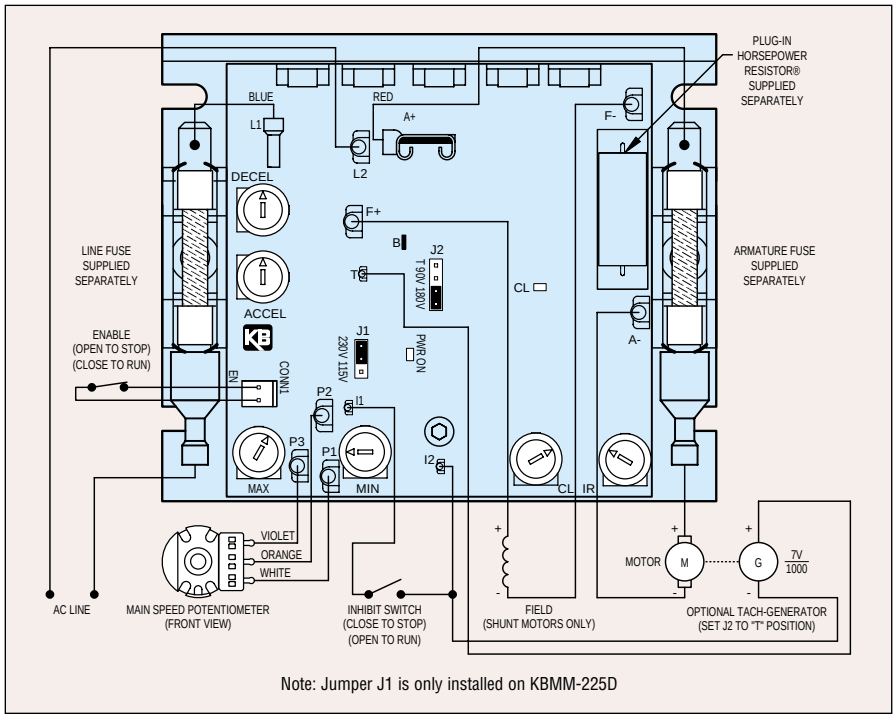
Model Number	Part Number	AC Line Voltage (VAC) ±15% 50/60 Hz	Motor Voltage (VDC)	Rating Without Auxiliary Heat Sink			Rating With Auxiliary Heat Sink			Field Voltage (Shunt Wound Motors Only) (VDC)
				Max AC Load Current (RMS Amps)	Max DC Load Current (Avg. Amps)	Maximum Horsepower HP, (kW)	Max AC Load Current (RMS Amps)	Max DC Load Current (Avg. Amps)	Maximum Horsepower HP, (kW)	
KBMM-125	9449	115	0 – 90	12.0	8.0	.75, (.6)	24.0	16.0	1.5, (1.1)	50, 100
KBMM-225	9450	230	0 – 180	12.0	8.0	1.5, (1.1)	24.0	16.0	3, (2.3)	100, 200
			0 – 90*	12.0	8.0	.75, (.6)	24.0	16.0	1.5, (1.1)	100
KBMM-225D	9451	115	0 – 90	12.0	8.0	.75, (.6)	24.0	16.0	1.5, (1.1)	50, 100
		230	0 – 180	12.0	8.0	1.5, (1.1)	24.0	16.0	3, (2.3)	100, 200
			0 – 90*	12.0	8.0	.75, (.6)	24.0	16.0	1.5, (1.1)	100

Step-Down Operation.

MECHANICAL SPECIFICATIONS (Inches / mm)



CONNECTION DIAGRAM (Model KBMM-225D Shown)



Note: Jumper J1 is only installed on KBMM-225D

PLUG-IN HORSEPOWER RESISTOR® & FUSE SELECTION CHART *

Motor Horsepower Range**		Plug-in Horsepower Resistor® Value (Ohms)	Recommended Fuse Size (Amps)	
Armature Voltage 90 – 130 VDC	Armature Voltage 180 VDC		Line	Armature
1/100 – 1/50	1/50 – 1/25	1.0	12	1/3
1/50 – 1/30	1/25 – 1/15	.51	12	1/2
1/30 – 1/20	1/15 – 1/10	.35	12	3/4
1/20 – 1/12	1/10 – 1/6	.25	12	1¼
1/12 – 1/8	1/6 – 1/4	.18	12	2
1/8 – 1/5	1/4 – 1/3	.1	12	2½
1/4	1/2	.05	12	4
1/3	3/4	.035	12	5
1/2	1	.025	12	8
3/4	1½	.015	12	12
1***	2***	.01	25	15
1½***	3***	.006	25	25

* Fuses and Plug-in Horsepower Resistor® supplied separately.
** For overlapping motor horsepower range use lower value Plug-in Horsepower Resistor®.
*** Use with Auxiliary Heat Sink (P/N 9861) – see Electrical Ratings.

KB ELECTRONICS, INC.
12095 NW 39th Street, Coral Springs, FL 33065-2516 • (954) 346-4900 • Fax (954) 346-3377
Outside Florida Call **Toll Free** (800) 221-6570 • **E-mail** – info@kbelectronics.com
www.kbelectronics.com