

KB Electronics, Inc.

“Stock” Variable Speed
AC & DC Motor Controls & Accessories
Selection Guide GS-118A



Automation and Control

STOCKED WORLDWIDE



PENTA **KB** POWER

A Complete Line of Motor Drives

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Our New Line of
Fully Customizable Compact
Digital Frequency Inverters

KBDF SERIES

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AC MOTOR SPEED CONTROLS (Inverters)

KBVF	AC Chassis (IP-20) Inverters	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBVF Adjustable Frequency Drive is designed to provide variable speed control of standard three-phase AC induction motors. Adjustable linear acceleration and deceleration are provided, making the drive suitable for soft-start applications. Main features of the KBVF include Adjustable Current Limit and I²t Motor Overload Protection. Adjustable Slip Compensation with “auto-tune” provides excellent load regulation over a wide speed range. Power Start™ delivers over 200% motor torque to ensure startup of high frictional loads. Other standard features include Electronic Inrush Current Limit (EICL™) which eliminates harmful AC line inrush current and a built-in motor filter¹, which reduces harmful voltage spikes to the motor. Also provided are two diagnostic LEDs. The drive is housed in a versatile U-frame chassis with a mounting footprint consistent with industry standards. Optional accessories include a Signal Isolator², Multi-Speed Board and RFI Filters. A finger-safe cover provides protection against accidental contact with electrical components. The drive can be manually readjusted with trim pots and jumpers or digitally programmed with optional Drive-Link™ or DownLoad Module™ (DLM). See KBVF optional accessories on page 9.</p> <p>Notes: 1. Most models. 2. 460 VAC models contain built-in signal isolation. 3. Model KBVF-26D is rated 2 HP when used with premium efficiency motors.</p>	115 VAC 1φ Input • 230 VAC 3φ Output				
	KBVF-13	9957	1/2, (0.37)	2.4	
	KBVF-14	9977	1, (0.75)	4.0	
	230 VAC 1φ Input • 230 VAC 3φ Output				
	KBVF-23	9958	1/2, (0.37)	2.4	
	KBVF-24	9978	1, (0.75)	4.0	
	115/230 VAC 1φ Input • 230 VAC 3φ Output				
	KBVF-21D	9581	1/10, (0.07)	1.0	
	KBVF-22D	9572	1/4, (0.18)	1.5	
	KBVF-23D	9959	1/2, (0.37)	2.4	
	KBVF-24D	9979	1, (0.75)	4.0	
	KBVF-26D ³	9496	1½, (1.13)	5.5	
	230 VAC 3φ Input • 230 VAC 3φ Output				
	KBVF-23P	9676	1/2, (0.37)	2.4	
	KBVF-24P	9677	1, (0.75)	4.0	
	KBVF-27	9591	2, (1.5)	6.7	
	KBVF-29	9593	3, (2.25)	9.0	
	460 VAC 3φ Input • 460 VAC 3φ Output				
	KBVF-42	9645	1, (0.75)	2.0	
	KBVF-45	9590	3, (2.25)	4.6	
KBVF-48	9592	5, (3.75)	8.3		

KBMA	AC NEMA-1 (IP-40) Inverters	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBMA Series Adjustable Frequency Drives are variable speed controls housed in a NEMA-1/IP-40 enclosure. They are designed to operate 208–230 Volt 50 & 60 Hz 3-phase AC induction motors from 1/8 HP thru 1 HP. The sine wave coded Pulse Width Modulated (PWM) output operates at a carrier frequency of 16 kHz, which provides high motor efficiency and low noise. The Motor Horsepower Selection Jumper allows the drive to be used on a wide range of motor horsepower without recalibration or programming. Model KBMA-24DF contains a built-in AC line Class A RFI (EMI) filter which meets CE requirements.</p> <p>Setting the drive to specific applications is accomplished with selectable jumpers and trim pots, which eliminates the computer-like programming required on other drives. For more advanced programming, PC based Drive-Link™ software is available. An optional Forward-Stop-Reverse switch KB P/N 9519 is also available.</p>	115/230 VAC 1φ Input • 230 VAC 3φ Output				
	KBMA-24D	9533	1, (0.75)	3.6	
	KBMA-24DF	9534	1, (0.75)	3.6	

KBMK	AC NEMA-1 (IP-40) Digital Inverters	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBMK Series Adjustable Frequency Drives are variable speed controls housed in a NEMA-1/IP-40 enclosure. They are designed to operate 208–230 Volt 50 & 60 Hz 3-phase AC induction motors from 1/8 HP thru 1 HP. The sine wave coded Pulse Width Modulated (PWM) output operates at a carrier frequency of 16 kHz, which provides high motor efficiency and low noise. Model KBMK-24DF contains a built-in AC line Class A RFI (EMI) filter which meets CE requirements.</p> <p>Setting the drive to specific applications is accomplished using the Multi-Function Keypad. To facilitate programming, all similar functions are presented in common groups. For more advanced programming, PC based Drive-Link™ software is available. An optional On/Off switch KB P/N 9683 is also available.</p>	115/230 VAC 1φ Input • 230 VAC 3φ Output				
	KBMK-24D	9680	1, (0.75)	3.6	
	KBMK-24DF	9681	1, (0.75)	3.6	

AC MOTOR SPEED CONTROLS (Inverters)

KBAC	AC NEMA-4X (IP-65) Inverters	Model	Part No. Gray / White	Ratings*	
				HP, (kW)	AMPS
 <p>The KBAC Adjustable Frequency Drive is a variable speed control housed in a rugged die cast NEMA-4X / IP-65 washdown and watertight enclosure. They are designed to operate 208-230 and 460 Volt 3-phase AC induction motors through 5 HP. The main features of the KBAC include adjustable Current Limit and I²t Motor Overload Protection. In addition, Adjustable Slip Compensation with “auto-tune” provides excellent load regulation over a wide speed range. Power Start™ delivers over 200% motor torque to ensure startup of high frictional loads. Electronic Inrush Current Limit (EICL™) eliminates harmful AC line inrush current and Adjustable Linear Acceleration and Deceleration make the drive suitable for soft-start applications. Also provided is a Horsepower Selection Jumper which enables the KBAC to be used on motors below its maximum rating without recalibrating Current Limit and Slip Comp. Standard front panel features of the KBAC include diagnostic LEDs, a Start/Stop Switch, and Main Speed Potentiometer. Run / Fault Relay output contacts are also provided. Optional accessories for the KBAC include a Power On/Off Switch, Forward-Brake-Reverse Switch, Signal Isolator, Multi-Speed Board and RFI Filters. The control is available in dark gray or white FDA approved finish. The drive can be manually readjusted with trim pots and jumpers or digitally programmed with optional Drive-Link™ or DownLoad Module™ (DLM). See KBAC optional accessories on pages 9 and 10.</p>	115/230 VAC 1φ Input • 230 VAC 3φ Output				
	KBAC-24D	9987 / 9988	1, (0.75)	3.6	
	KBAC-27D	9520 / 9521	2, (1.5)	6.7	
	230 VAC 1φ Input • 230 VAC 3φ Output				
	KBAC-29 (1P)	10001 / 10002	3, (2.25)	9.0	
	230 VAC 3φ Input • 230 VAC 3φ Output				
	KBAC-29	9528 / 9529	3, (2.25)	9.0	
	460 VAC 3φ Input • 460 VAC 3φ Output				
	KBAC-45	9530 / 9531	3, (2.25)	4.6	
	KBAC-48	9540 / 9541	5, (3.75)	8.3	

*All models [except Model KBAC-29 (1P)] are rated at 40 °C, maximum ambient temperature, at the Rated Load Current. Model KBAC-29 (1P) is rated 9.0 Amps at 35 °C and derated to 8.3 Amps at 40 °C. For ambient temperatures above 40 °C, all drives are derated 2.5% per °C.

KBDA	AC NEMA-4X (IP-65) Digital Inverters	Model	Part No. Gray / White	Ratings*	
				HP, (kW)	AMPS
 <p>The KBDA Adjustable Frequency Drives are variable speed controls housed in a rugged NEMA-4X / IP-65 washdown and watertight die-cast aluminum enclosure. They are designed to operate 208 – 230 and 400/460 Volt 50 & 60 Hz 3-phase AC induction motors from subfractional thru 5 HP. The sine wave coded Pulse Width Modulated (PWM) output provides high motor efficiency and low noise.</p> <p>Setting the drive to specific applications is accomplished using the Multi-Function Keypad. To facilitate programming, all similar functions are presented in common groups. For more advanced programming, PC based Drive-Link™ software is available.</p> <p>The 4-Digit LED Display provides readout of drive operating parameters and programming functions and displays Output Frequency, Motor RPM, Output Current, Output Voltage, Bus Voltage, Function Codes and Values, Fault Codes, and Custom Units. The LEDs provide indication of the drive's status and operating mode (Hz, PGM, LCL/REM, STOP, FWD, REV, OL, JOG/REM).</p> <p>Main features include: adjustable RMS Current Limit and I²t Motor Overload Protection Flux Vector Compensation with Static Auto-Tune and Boost provides high torque and excellent load regulation over a wide speed range. Power Start™ delivers over 200% motor torque to ensure startup of high frictional loads. Programmable Injection Braking provides rapid motor stop. Electronic Inrush Current Limit (EICL™) eliminates harmful AC line inrush current, which allows the drive to be line switched. A Multi-Function Output Relay is provided, which can be used to turn on or off equipment or to signal a warning if the drive is put into various modes of operation. The drive is suitable for machine or variable torque (HVAC) applications. The control is available in dark gray or white FDA approved finish. See KBDA optional accessories on pages 10. An optional IODA KB P/N 9668 is also available, see page 10.</p>	115/230 VAC 1φ Input • 230 VAC 3φ Output				
	KBDA-24D	9536 / 9537	1, (0.75)	3.6	
	KBDA-27D	9543 / 9544	2, (1.5)	6.7	
	230 VAC 1φ Input • 230 VAC 3φ Output				
	KBDA-29 (1P)	10003 / 10004	3, (2.25)	9.0	
	230 VAC 3φ Input • 230 VAC 3φ Output				
	KBDA-24P	9766 / 9767	1, (0.75)	3.6	
	KBDA-29	9545 / 9546	3, (2.25)	9.0	
	460 VAC 3φ Input • 460 VAC 3φ Output				
	KBDA-42	9763 / 9764	1, (0.75)	2.0	
KBDA-45	9659 / 9660	3, (2.25)	4.6		
KBDA-48	9661 / 9662	5, (3.75)	8.3		

*All models [except Model KBDA-29 (1P)] are rated at 40 °C, maximum ambient temperature, at the Rated Load Current. Model KBDA-29 (1P) is rated 9.0 Amps at 35 °C and derated to 8.3 Amps at 40 °C. For ambient temperatures above 40 °C, all drives are derated 2.5% per °C.

DC MOTOR SPEED CONTROLS

KBIC	SCR DC Chassis Controls	Model	Part No.	Ratings without Auxiliary Heat Sink		Ratings with Auxiliary Heat Sink	
				HP, (kW)	AMPS DC	HP, (kW)	AMPS DC
 <p>The KBIC® controls PM, Shunt and AC/DC motors over a range of 1/100– 3 HP with only a few models. All models can be used on a wide range of motor horsepower by inserting KB's exclusive Plug-In Horsepower Resistor®. Speed range is 50:1 with load regulation of 1%. Features include Auto Inhibit®, Voltage Following, MOV transient protection, 5k ohm speed potentiometer and trimpot adjustments for MIN, MAX, ACCEL, IR and CL. Options include Auxiliary Heat Sink, AC Line and Armature Fuse Kit, Barrier Terminal Options and SI-5 Signal Isolator. See KBIC optional accessories on page 10.</p>	115 VAC Input • 90 VDC Output						
	KBIC-120	9429	1/2, (0.37)	6.0	1, (0.75)	12.0	
	KBIC-125	9433	3/4, (0.56)	8.0	1½, (1.13)	16.0	
	230 VAC Input • 180 VDC Output						
	KBIC-240	9428	1, (0.75)	6.0	2, (1.5)	12.0	
	KBIC-225	9432	1½, (1.13)	8.0	3, (2.25)	16.0	
	115/230 VAC Input • 90/180 VDC Output						
	KBIC-240D	9464	1/2, (0.37)	6.0	1, (0.75)	12.0	
			1, (0.75)		2, (1.5)		
	KBIC-240DS	9423	1/2, (0.37)	6.0	1, (0.75)	12.0	

KBMM	SCR DC Chassis Controls	Model	Part No.	Ratings without Auxiliary Heat Sink		Ratings with Auxiliary Heat Sink	
				HP, (kW)	AMPS DC	HP, (kW)	AMPS DC
 <p>The KBMM™ full-wave DC motor control is the ultimate in reliability and performance. Contains Direct-Fed™ current limit that helps protect the SCR power bridge against direct shorts and prevents demagnetization of PM motors. 25A SCR's and AC line and armature fusing further enhance reliability. KB's exclusive Plug-in Horsepower Resistor® eliminates the need for recalibration when used over a wide range of motor horsepower. Standard features include trimpots for MIN, MAX, IR, CL and Linear ACCEL and DECEL, armature or tach feedback. Auto Inhibit, MOV transient protection, 5k ohm potentiometer and Noise Rejection Circuitry. Options: Auxiliary Heat Sink, Barrier Terminal Options, Finger Safe Cover, and SI-6 Signal Isolator. See KBMM optional accessories on page 10.</p>	115 VAC Input • 90 VDC Output						
	KBMM-125	9449	3/4, (0.56)	8.0	1½, (1.13)	16.0	
	230 VAC Input • 180 VDC Output						
	KBMM-225	9450	1½, (1.13)	8.0	3, (2.25)	16.0	
	115/230 VAC Input • 90/180 VDC Output						
	KBMM-225D	9451	3/4, (0.56)	8.0	1½, (1.13)	16.0	
1½, (1.13)			3, (2.25)				

KBCC	SCR DC Chassis Controls	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBCC™ chassis controls utilize the KBMM™ speed control to provide a low-cost, reliable SCR drive. They include all the features of the KBMM™ plus the Auxiliary Heat Sink and Barrier Terminal Block with AC line and armature fuses. The controls are ruggedly constructed and contain a 5k ohm speed potentiometer.</p>	115 VAC Input • 90 VDC Output				
	KBCC-125	9936	1½, (1.13)	16.0	
	230 VAC Input • 180 VDC Output				
	KBCC-225	9938	3, (2.25)	16.0	

KBCC-240D	SCR DC Chassis Controls	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>This updated chassis control utilizes state-of-the-art circuitry. It utilizes I x t timed current limit which provides motor burnout protection and Direct-Fed™ CL which provides short circuit protection. A jumper selection used to preset motor current eliminates the need to calibrate IR Comp and CL. Other features include armature fusing, electronic start/stop, LED array for power on and stop, anti-demagnetization and current limit. Jumpers are also used to select AC line input, DC motor output, speed or torque mode, and armature or tach feedback.</p>	115/230 VAC Input • 90/180 VDC Output				
	KBCC-240D	9947	1, (0.75)	10.2	
			2, (1.5)		

DC MOTOR SPEED CONTROLS

KBCC-255	SCR DC Chassis Controls	Model	Part No	Ratings	
				HP, (kW)	AMPS
 <p>The KBCC-255 is designed for 5 HP DC Shunt and PM motors. It is built on a rugged aluminum chassis and uses the KBMM™ speed control, which contains Direct-Fed™ CL circuitry, for excellent performance and reliability. The unit contains a 42 Amp power bridge and armature and control fusing, which enhance reliability. An exclusive feature, found only in KB drives, is Auto Inhibit®, which provides a smooth, safe start during rapid switching of the AC line. Standard features include: armature or tach feedback, and trimpots for MIN, MAX, IR Comp, CL and Linear ACCEL and DECEL. A 5k ohm speed potentiometer is included.</p>	230 VAC Input • 180 VDC Output				
	KBCC-255	9940	5, (3.75)	26.0	

KBCC "R"	SCR Chassis Relay Reversing Controls	Model	Part No	Ratings	
				HP, (kW)	AMPS
 <p>The KBCC™ "R"-suffix chassis control is designed to provide anti-plug "instant" reversing, solid state dynamic braking and rapid cycling. It combines all of the features of the KBCC™ control with the features of the KB APRM®. The APRM® eliminates contact arcing by allowing armature switching to take place only when current levels are near zero. Specific functions that can be performed by the KBCC™-R are Run-Brake, Forward-Brake-Reverse, Run-Stop and Forward-Reverse (instant reverse).</p>	115 VAC Input • 90 VDC Output				
	KBCC-125R	9937	1½, (1.13)	16.0	
	230 VAC Input • 180 VDC Output				
	KBCC-225R	9924	3, (2.25)	16.0	

KBPB	SCR Chassis Relay Reversing Controls	Model	Part No.	Ratings without Auxiliary Heat Sink		Ratings with Auxiliary Heat Sink	
				HP, (kW)	AMPS DC	HP, (kW)	AMPS DC
 <p>The KBPB™ is a compact version of the KBCC™ "R"-suffix control. The APRM® is mounted directly to the rear of the KBMM™ speed control. A built-in Barrier Terminal Block and its small size make the control ideal for installation where space is at a premium. The KBPB™ is equipped with a built-in dynamic brake resistor, Accel/Decel trimpots and provision for AC line and armature fusing. This control provides functions identical to that of the KBCC™-R. A 5k ohm speed potentiometer is included.</p>	115 VAC Input • 90 VDC Output						
	KBPB-125	8900	3/4, (0.56)	8.0	1½, (1.13)	16.0	
	230 VAC Input • 180 VDC Output						
	KBPB-225	8901	1½, (1.13)	8.0	3, (2.25)	16.0	

KBMG	SCR Chassis Regen Reversing Controls	Model	Part No.	Ratings without Auxiliary Heat Sink		Ratings with Auxiliary Heat Sink	
				HP, (kW)	AMPS DC	HP, (kW)	AMPS DC
 <p>The KBMG is an ultracompact, full-wave regenerative drive capable of operating DC PM or Shunt motors in a bidirectional mode. Its 4-quadrant operation provides forward and reverse torque in both speed directions. With a jumper selection, the motor can be controlled to rapidly "regenerate-to-stop" or to "coast-to-stop." KB's exclusive Auto Inhibit® circuit provides safe, smooth starting even during rapid cycling of the AC line. The Overspeed Protect Circuit prevents failure of the power bridge in extreme overhauling conditions. Reliability of the KBMG is further enhanced with the use of a high speed current limit circuit and MOV transient protection. LED's, which can be used for diagnostics, are provided for power on ("PWR ON") and motor overload ("OL"). Power connections to the KBMG are made via quick connect terminals and signal input connections are made via a removable barrier terminal block. The finger-safe cover provides protection against accidental contact with electrical components. See KBMG optional accessories on pages 10 and 11.</p>	115/230 VAC Input • 90/180 VDC Output						
	KBMG-21D	8830	1/10, (0.08)	1.2	—	—	
			1/5, (0.15)				
	KBMG-212D	8831	3/4, (0.56)	8.0	1, (0.75)	11.0	
			1½, (1.13)		2, (1.5)		

DC MOTOR SPEED CONTROLS

KBRG	SCR Chassis Regen Reversing Controls	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBRG™ is a full-wave regenerative control, capable of operating a DC motor (Permanent Magnet or Shunt) in a bidirectional mode. It provides 4-quadrant operation which allows forward and reverse torque in both speed directions. The KBRG™ contains many standard features, such as: armature and tach feedback, built-in horsepower selection, trim pots for FWD CL, REV CL, IR COMP, RESP, MAX SPD, OFFSET, DEADBAND, FWD ACCEL, REV ACCEL and Timed Current Limit. LED indicators for: Power On, Current Limit, FWD Enable and REV Enable. A 5k ohm speed potentiometer is included. An SI-4X Signal Isolator KB P/N 8801 is also available.</p> <p>The KBRG-255 is designed specifically for 5 HP shunt wound and PM DC motors. It is similar to the KBRG-225D (3 HP); however, the SCR ratings and heat sink size have been enhanced. All of the features of the KBRG-225D have been retained in the KBRG-255 except that the current jumper selection and built-in armature fusing have been eliminated. A new power PC board incorporates 35 Amp SCR's and a rugged 45 Amp barrier terminal block.</p>	115/230 VAC Input • 90/180 VDC Output				
	KBRG-240D	8802	1, (0.75)	11.0	
			2, (1.5)		
	KBRG-225D	8800	1½, (1.13)	16.0	
			3, (2.25)		
	230 VAC Input • 180 VDC Output				
KBRG-255	8821	5, (3.75)	26.0		

KBWD	PWM DC Chassis Controls	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBWD-13,16 models provide a low cost alternative for pulse-width modulated (PWM) control applications. Their compact size allows for direct replacement of other types. Standard features include instantaneous short circuit protection, under voltage protection and KB's Plug-in Horsepower Resistor®, which eliminates the need to calibrate IR Comp and CL. A 5k ohm potentiometer, isolated analog signal (0-5VDC) or PWM microprocessor output can be used as an input signal.</p>	115 VAC Input • 130 VDC Output				
	KBWD-13	8609	1/3, (0.25)	3.0	
	KBWD-16	8607	1/2, (0.37)	6.0	

KBWS	PWM DC Chassis Controls	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBWS Pulse-Width Modulated (PWM) controls are designed to operate PWM and SCR rated Permanent Magnet motors ranging from 1/50 HP to 11/2 HP. They operate at a switching frequency greater than 16 kHz to provide high motor efficiency and quiet operation. Permanent magnet motor demagnetization is completely eliminated because current peaks are reduced to safe levels. The controls contain an AC line inrush current limiter (ICL) which reduces the AC line surge current during startup. The KBWS contains built-in isolation for all inputs. This includes signal voltage, Main Speed Potentiometer, Inhibit Circuit and +5VDC Power Supply. The dual voltage models contain a jumper to select motor voltage and special circuitry which automatically accepts AC line input voltages of 115 or 208/230 Volts AC without having to make a jumper selection.</p> <p>Note: Horsepower ratings are given for PWM rated motors.</p>	115/230 VAC Input • 90 to 130/180 to 220 VDC Output				
	KBWS-22D	9492	1/3, (0.25)	2.5	
			3/4, (0.56)		
	KBWS-25D	9493	3/4, (0.56)	5.0	
			1½, (1.13)		

KBWT	PWM DC Chassis Controls	Model	Part No.	Ratings	
				HP, (kW)	AMPS
 <p>The KBWT series Pulse-Width Modulated (PWM) controls, rated through 12 amps DC, are designed for high current applications. Several models are offered, which provide the user a choice of input voltage and output current. An important feature of this control is its active bridge circuitry, which limits inrush current during AC line startup and prevents control runaway due to a shorted output transistor. The KBWT also contains (l x t) motor overload protection and instantaneous short circuit protection. Note: Horsepower ratings are for PWM rated motors. For SCR rated motors, the maximum horsepower rating is reduced by 20%.</p>	115 VAC Input • 90 to 130 VDC Output				
	KBWT-16	8614	3/4, (0.56)	6.0	
	KBWT-110	8603	1.2, (0.9)	10.0	
	KBWT-112	8612	1½, (1.13)	12.0	
	230 VAC Input • 180 to 260 VDC Output				
	KBWT-26	8615	1½, (1.13)	6.0	
	KBWT-210	8610	2.2, (1.65)	10.0	

DC MOTOR SPEED CONTROLS

KBWM	SCR NEMA 1 Non-Reversing	Model	Part No	Ratings	
				HP, (kW)	AMPS
 <p>The KBWM control is a compact version of the Multi Drive™ (KBMD). The control is packaged in an all-metal NEMA-1 enclosure. This unidirectional SCR drive utilizes the KBMM speed control module, which prevents motor failure due to demagnetization, and contains AC line and armature fusing and a barrier terminal connection block. The KB Plug-In Horsepower Resistor® automatically calibrates IR Comp and CL.</p>		115 VAC Input • 90 VDC Output			
		KBWM-120	9380	1/3, (0.25)	3.5
		230 VAC Input • 180 VDC Output			
		KBWM-240	9381	3/4, (0.56)	3.5

KBMD	SCR NEMA 1 Non-Reversing	Model	Part No.	Ratings without Auxiliary Heat Sink		Ratings with Auxiliary Heat Sink	
				HP, (kW)	AMPS DC	HP, (kW)	AMPS DC
 <p>The Model KBMD-240D, also called Multi-Drive™, is a packaged SCR drive in a NEMA-1 enclosure. It utilizes the KBMM™ speed control for its electronics. The Multi-Drive™ is rugged and compact in size. It handles both 115 and 208/230 Volts AC line inputs by setting the built-in Dual Voltage Switch. In addition, the single model can be used on a wide range of motor horsepower by inserting the appropriate Plug-In Horsepower Resistor®. The Auxiliary Heat Sink P/N 9861 (optional) increases the rating of the basic unit to 1 HP at 90 VDC and 2 HP at 180 VDC. An optional Forward-Brake-Reverse Switch Kit (P/N 9860) is also available.</p>		115/230 VAC Input • 90/180 VDC Output					
		KBMD-240D	9370	3/4, (0.56)	8.0	1, (0.75)	11.0
				1½, (1.13)		2, (1.5)	

KBPC	SCR NEMA 4X DC Drives	Model	Part No. Black/White	Ratings	
				HP, (kW)	AMPS
 <p>The KBPC Series NEMA-4X (IP-65) SCR DC Motor Speed and Torque Control is designed for applications requiring washdown and watertight integrity. Its housing is ruggedly constructed of die cast aluminum which is protected with an acrylic coating. Exclusive Short Circuit and Timed Current Limit (TCL) circuitry prevents motor burnout and demagnetization of PM motors. Features such as Selectable Current Range eliminate unnecessary calibration of IR and current limit trimpots. Other selectable features are: Input voltage (115, 208/230 Volts AC), Output Voltage (90, 180 Volts DC), Current Range (2.5, 5, 7.5, 10) amps, Input Signal (0-5, 0-20) Volts DC, Armature or tach feedback, Tach voltages (7, 20, 30, 50 Volts/1000 RPM). Trimpot Adjustments include: MIN, MAX, ACCEL, DECEL, IR, CL and TCL. Standard features include: Armature Fusing, Electronic Start-Stop and diagnostic LED Indicator Array for "Power On," "Stop" and "Overload." The KBPC-225 contains all of the features of the KBPC-240D except Armature Fusing. In addition, it is designed specifically for 3HP - 180 VDC PM or shunt motors operating from a 230VAC line. Accessories include: KBSI-240D Signal Isolator, Electronic Fwd-Brk-Rev containing APRM-PC, hesitation type Fwd-Brk-Rev switch kit and switches for AC Line ON/OFF, Run-Stop-Jog and Auto/Manual. See KBPC optional accessories on page 11.</p>		115/230 VAC Input • 90/180 VDC Output			
		KBPC-240D	9338 / 9342	1, (0.75)	10.2
				2, (1.5)	
		230 VAC Input • 180 VDC Output			
KBPC-225	9391 / 9392	3, (2.25)	15.0		

DC MOTOR SPEED CONTROLS

KBPW	PWM NEMA 4X DC Drives	Model	Part No. Black/White	Ratings	
				HP, (kW)	AMPS
 <p>The KBPW-240D is a Pulse-Width Modulated (PWM) control in a NEMA-4X / IP-65 washdown and watertight enclosure designed to operate Permanent Magnet and Shunt Wound motors through 7.5 Amps DC. This provides high motor efficiency, whisper quiet operation along with less motor heating. This allows for a smaller, less costly motor to be used in most applications. A unique feature of the KBPW-240D is its active bridge, which substantially reduces the AC line surge current during cycling of the AC line. This allows the control to be turned on and off rapidly without damage to critical components. The active bridge is coupled with a failsafe circuit that will shut down the control if the main power transistor shorts, preventing a dangerous high-speed runaway condition. Motor burnout is prevented with the Timed Current Limit circuit (TCL). Standard front panel features include diagnostic LEDs for "Power On," "Stop" and "Overload," Start/Stop Switch, and a Main Speed Potentiometer. Optional accessories for the KBPW-240D include FWD-BRK-REV Switch, On/Off AC Line Switch, Run-Stop-Jog Switch, Signal Isolator, and an Anti-Plug Reversing Module™. The control is available in black finish or white FDA approved finish. See KBPW optional accessories on page 11.</p>	115/230 VAC Input • 130/180 to 220 VDC Output				
	KBPW-240D	8401 / 8402	1, (0.75)	7.5	
			2, (1.5)		

KBRC	SCR NEMA 4X Regen Reversing Drives	Model	Part No. Black/White	Ratings	
				HP, (kW)	AMPS
 <p>The KBRC-240D is a Full-Wave Regenerative Drive in a NEMA-4X / IP-65 washdown and watertight enclosure. It is designed to operate 90 and 180 Volt Permanent Magnet and Shunt Wound DC motors in a bidirectional mode. It provides 4-quadrant operation, which provides forward and reverse torque in both speed directions. Motor overload protection (I x t) will shut down the control if the motor is overloaded for a predetermined amount of time. The exclusive Auto-Inhibit® circuit allows safe, smooth starting during rapid cycling of the AC line. The KBRC-240D can be operated from a two or three wire start/stop circuit or can be started from the AC line. A set of dedicated normally open or normally closed relay contacts are provided, which are activated via the start/stop circuit. Main features of the KBRC-240D include Speed or Torque control modes. In addition, Regenerate-to-Stop (RTS) or Coast-to-Stop (CTS) stopping modes are also provided. Standard front panel features of the KBRC-240D include diagnostic LEDs (for Power On, Stop and Overload), a Start/Stop Switch and a Main Speed Potentiometer. Other features include Barrier Terminal Blocks, adjustable trimpots, selectable jumpers and LEDs. The KBRC-240D is available in black finish or white FDA approved finish. Accessories include: SIRC Signal Isolator (KB P/N 8842), switches for AC Line ON/OFF, Fwd-Stop-Rev and Auto/Manual.</p>	115/230 VAC Input • 90/180 VDC Output				
	KBRC-240D	8840 / 8841	1, (0.75)	11.0	
			2, (1.5)		

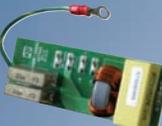
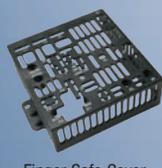
BATTERY POWERED DC MOTOR SPEED CONTROLS

KBBC	DC – DC Chassis Controls	Model	Part No. Black/White	Ratings	
				HP, (kW)	AMPS
 <p>The KBBC series of battery powered variable speed controls are designed for 12, 24, 36, and 48 Volt PM and Series Wound DC motors. Microcontroller design provides superior performance and ease of tailoring to specific applications. Operating in a regenerative mode, precise and efficient control is obtained using state-of-the-art MOSFET technology. The KBBC contains many standard features such as current limit, short circuit protection, speed potentiometer fault detector, overtemperature sensing, reverse polarity protection and undervoltage/overvoltage protection. The KBBC can be controlled in several ways, such as single-ended or wigwag speed potentiometer and 0 - 5 Volts DC signal following. The controls contain a built-in heat sink that also serves as a mounting base.</p>	12/24 VDC Input				
	KBBC-24M	9500	2, (1.5)	40.0	
	12 thru 48 VDC Input				
KBBC-44M	9501	4, (3.0)	40.0		

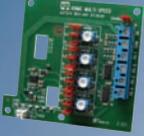
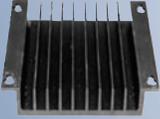
SPEED CONTROL ACCESSORIES

		DESCRIPTION	Model	Part No.	Models Where Used
Signal Isolator	 KBSI-240D	The Model KBSI-240D Signal Isolator provides an isolated interface between non-isolated signals and KB motor speed controls. The maximum output voltage of the KBSI is 10 Volts DC, which is a linear function of the input. The unit is versatile, since a single model accepts a wide range of voltage (0-25, 0-120 and 0-550 Volts DC) and current (1-5, 4-20 and 10-50mA) signals, multi-turn trim pots are provided for MIN and MAX. The KBSI can be operated from either 115V or 208/230 Volts AC, 50/60Hz.	KBSI-240D	9431	All Controls
KBVF Inverter Accessories	 SIVFR	The SIVFR is used to isolate, amplify, and condition DC voltage and current signals from any source (power supplies, motors, tachometer generators, transducers, and potentiometers). It also provides isolated inputs to control motor direction and an isolated power supply for transducer or potentiometer operation. All input connections are isolated from the AC line and motor wiring. The SIVFR installs easily onto the side of the drive with the mounting base and two screws (provided). An adapter bracket is provided for use with 1/2 HP model drives. The SIVFR is supplied with a finger-safe panel, which may be used with the enclosure cover to close the unused exposed area of the SIVFR between Terminal Blocks TB1 and TB2.	SIVFR Signal Isolator and Run/Fault Relay	9597	KBVF
	 KBVF-MSB	The KBVF Multi-Speed Board (MSB) provides (4) - user selectable preset speeds to control a motor connected to the KBVF Adjustable Frequency Drive. The motor speed for each preset is adjustable via trim pot settings which can be fine tuned by using the HI-LO range jumpers. Motor direction is set by the position of Jumper R/F (forward/reverse) which is provided for each preset. Connections to the Multi-Speed Board are made with a barrier terminal block. The MSB mounts onto the side of the KBVF.	Multi-Speed Board	9503	KBVF, KBAC
	 DBVF	The DBVF is a transistor controlled dynamic brake. It increases the standard braking torque of the KBVF from 25% to over 100%. It is designed for all 230 VAC output models.	Dynamic Brake Module	9598	KBVF
KBAC Inverter Accessories	 F-S-R Switch	The Forward-Stop-Reverse Switch Kit is designed for installation on the front cover of the KBAC inverters. It is used to provide electronic reversing for the KBAC.	Forward-Stop-Reverse Switch Kit	9480	KBAC
	 Auto/Manual Switch	The Auto/Manual Switch Kit is designed for installation on the front cover of the KBAC inverters. It is suggested that the SIAC Signal Isolator (KB P/N 9600) be used with the Auto/Manual Switch Kit to provide signal isolation between the signal source and the KBAC.	Auto/Manual Switch Kit	9481	KBAC
	 On/Off Switch	The Power On/Off Switch Kit is designed to provide a positive AC line power disconnect. It can be installed in lieu of, or in addition to, the factory installed Start/Stop Switch assembly.	Power On/Off Switch Kit	9482	KBAC-24D
		For Models KBAC-24D, 27D, the switch is double pole, which is used to disconnect both AC line wires. If only one AC line is to be disconnected, a single pole can be used. Refer to local electrical codes that apply.		9523	KBAC-27D
For Models KBAC-29, 45, 48, the switch is triple pole, which is used to disconnect all three AC line wires.		9532		KBAC-29, 45, 48	
 SIAC	The SIAC is used with the KBAC series inverters to isolate, amplify and condition DC voltage and current signals from any source (tach-generators, transducers, PLCs and potentiometers). It also provides an isolated input to control motor direction and an isolated power supply for transducer or potentiometer operation. All input connections are isolated from the AC line and motor wiring.	SIAC Signal Isolator	9600	KBAC	

SPEED CONTROL ACCESSORIES

		DESCRIPTION	Model	Part No.	Models Where Used
KBAC, KBDA AC Line Filters	 RFAC	The RFAC Line Filters are used to suppress electrical interference to within acceptable levels as determined by the CE Council Directive 89/336/EEC relating to the Class A Industrial Standard. The RFAC-24 is rated 10 Amps at 230 Volts AC, the RFAC-27D is rated 22 Amps at 230 Volts AC and the RFAC-4X is rated 10 Amps at 460 VAC. Notes: 1. Suffix "NS" indicates line filter must be used without the Power On/Off Switch Kit.	RFAC-24 CE Approved Built-In AC Line Filter	9507	KBAC-24D KBDA-24D
			RFAC-27D CE Approved Built-In AC Line Filter	9512	KBAC-27D KBDA-27D
			RFAC-4X CE Approved Built-In AC Line Filter	9479	KBAC-29, 45, 48 KBDA-29, 45, 48
			RFAC-4X NS CE Approved Built-In AC Line Filter	9515	
KBDA Accessory	 IODA	The IODA Input/Output Multi-Function Board provides a variety of functions which include preset frequency, up/down frequency control, signal isolation, isolated output voltage for controlling auxiliary devices, output relay contacts, and open collector outputs. The IODA mounts on the drive's PC board with 2 snap-ins (located on the bottom of the mounting base) and 2 screws (provided). All of the IODA inputs and outputs are isolated from the AC line	IODA	9668	KBDA
					KBMK
KBIC, KBMM Accessories	 Barrier Terminal	The Barrier Terminal Accessory Kit converts a standard KBIC® from 1/4" Q-D terminals to barrier terminals. It installs easily with its preformed wiring harness and is compatible with KB's 7" Auxiliary Heat Sink. The Kit contains AC line and armature fuse holders (fuses supplied separately).	Barrier Terminal Kit	9863	KBIC
				9883	KBMM
	 Barrier Terminal Board	The Barrier Terminal Boards easily convert a standard control with quick-connect terminals to barrier terminals with AC line and armature fuse holders. (Fuses supplied separately.) 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.	Barrier Terminal Board	9884	KBIC
				9897	KBMM
KBIC, KBMM Accessories	 SI-5, SI-6	The Signal Isolators convert a standard control to an isolated input. By using external resistors, the input signal can be changed to 0-100VDC, 0-200VDC and 4-20mA. The output voltage is 0-10VDC which can be rescaled with the built-in MIN and MAX trim pots. Selectable AC line jumpers allow the SI-5 to be used either with 115 or 208/230 Volts AC controls. Installation is made by simply mating the unit to the speed control with the built-in quick-connect terminals.	Signal Isolator (SI-5)	9443	KBIC
			Signal Isolator (SI-6)	9444	KBMM
KBMM Finger Safe Cover	 Finger Safe Cover	The Finger Safe Cover converts the KBMM from an "open chassis" to the IP-20 standard. Constructed of high temperature ABS, it installs easily with the two screws provided. Note: the AC line and armature fuse holders must be removed before installing the Finger Safe Cover.	Finger Safe Cover	9564	KBMM
KBMG Accessory	 SIMG	The SIMG is used to isolate, amplify, and condition DC voltage signals from any source (power supplies, motors, tach-generators, transducers, and potentiometers) to control the KBMG Series of Regenerative Drive. Input connections (+15V, -15V, SIG, COM, and EN) are made with a barrier terminal block and are isolated from AC line and motor wiring. The SIMG is factory calibrated to accept a signal input voltage of -10V to +10V DC. OFFSET and MAX trim pots are provided in order to recalibrate the SIMG for a specific application.	SIMG Bi-Polar Signal Isolator	8832	KBMG

SPEED CONTROL ACCESSORIES

		DESCRIPTION	Model	Part No.	Models Where Used
KBMG Accessory	 <p>KBMG-MSB</p>	<p>The KBMG Multi-Speed Board provides 4-user selectable preset speeds to control a motor connected to the KBMG Series Regenerative Drive. A preset (PS 1, PS 2, PS 3, PS 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. Connections to the Multi-Speed Board are made with a barrier terminal block. A connector is available for a tach-generator, if required.</p>	KBMG Multi Speed Board (MSB)	8833	KBMG-21D, 212D
KBPC-240D, KBPW-240D Accessories	 <p>F-B-R Switch</p>	<p>The Forward-Brake-Reverse Switch Kit is designed to mount in the cover of the KBPC and KBPW speed controls. The switch reconnects the motor armature wires to reverse the motor, and includes a "hesitation" feature which is designed to prevent "plug reversing" the DC motor. A dynamic brake resistor is included, providing for up to 3 cycles per minute.</p>	KBPC Forward-Brake-Reverse Switch Kit	9339	KBPC-240D, KBPW-240D
	 <p>APRM-PC</p>	<p>The APRM-PC is designed to provide anti-plug "instant" reversing and solid state dynamic braking for the KBPC and KBPW controls. The APRM-PC mounts inside the front cover of the control. It connects using the wiring harness (provided) with QD terminals and includes a three position Forward-Brake-Reverse switch which also mounts on the cover.</p>	KBPC Anti Plug Reversing Module	9378	KBPC-240D, KBPW-240D
	 <p>On/Off Switch</p>	<p>The On/Off AC Line Switch Kit provides a positive disconnect of the AC line to the control. When used to replace the standard Start/Stop switch, the control is converted from a 3-wire control to a 2-wire control, providing automatic restart after a power outage. The switch connects to the control using the wiring harness with QD terminals (provided). A separate ON-OFF label is provided.</p>	KBPC, On/Off AC Line Switch Kit	9341	KBPC-240D, KBPW-240D
	 <p>Auto/Manual Switch</p>	<p>The Auto/Manual Switch Kit provides the ability to select the control's speed reference from either the Main Speed Potentiometer or a remote signal when used with the optional Signal Isolator (Part No. 9431). The switch mounts in the Brake switch position, and a separate AUTO-MANUAL label is included.</p>	KBPC, KBPW Auto/Manual Switch Kit	9377	KBPC-240D, KBPW-240D
Accessories for All Controls	 <p>Auxiliary Heat Sink</p>	<p>The Auxiliary Heat Sink is used to increase the rating of several KB control models. It is constructed of black anodized aluminum and has keyhole slots to facilitate mounting. When used with the KBIC® and KBMM™ models, the Auxiliary Heat Sink has provision for mounting the Barrier Terminal Accessory Kit.</p>	Auxiliary Heat Sink (7")	9861	KBIC, KBMM, KBMG, KBPB, KBMD, etc...
	 <p>DIN Rail</p>	<p>The DIN Rail mounting kit consists of a mounting plate and two mounting clips. This accessory makes it possible to mount any "L" bracket control onto a DIN rail. The kit can be attached on the short side or long side of the "L" bracket. When used on the long side, it allows for either horizontal or vertical mounting of the control. For short side mounting, only one clip is used.</p>	Din Rail Mounting Kit	9995	KBIC, KBMM, KBVF, KBPB, KBMG, etc...
	 <p>Potentiometer Kit</p>	<p>The Potentiometer Kit consists of a 5k ohm linear potentiometer with mounting hardware and front panel insulator. Two types are offered. The wire wound type is rated 5 watts with excellent linearity and zero end resistance. The conductive plastic type is rated 1/3 watt and is fitted with a nylon shaft and isolated brass mounting bushing.</p>	<p>Potentiometer Kit (No Switch)</p> <p>Potentiometer Kit (w/On-Off Switch)</p> <p>Wire-Wound Potentiometer Kit (No Switch)</p>	<p>9111</p> <p>9114</p> <p>9831</p>	<p>All Controls</p> <p>All Controls</p> <p>All Controls</p>

SPEED CONTROL ACCESSORIES

	DESCRIPTION	Model	Part No.	Models Where Used
Accessory for All Controls	 <p>Knob and Dial</p> <p>Two Knob/Dial Kits are available. Both contain black knobs with silver inserts. Dial Plates are .040" aluminum with 3/8" mounting hole. Dimensions (L x W approx.): large dial plate: 2.25" x 2.06", small dial plate: 1.62" x 1.50".</p>	Knob and Dial Kit (Large Dial Plate)	9832	All Controls
		Knob and Dial Kit (Small Dial Plate)	9815	All Controls
RFI / EMI Filters	 <p>KBRF-200A</p> <p>The KBRF-200A is an RFI filter used to suppress electronic interference caused by motor speed controls to within acceptable levels as determined by the CE Council Directive 89/336/EEC relating to EMC. Rated 24 Amps AC Maximum – 115/230 VAC, 50/60 Hz.</p>	KBRF-200A CE Approved AC Line Filter (Class A)	9945	All Controls
	 <p>KBRF-250</p> <p>The KBRF-250 is an RFI filter used to suppress electronic interference caused by motor speed controls. The KBRF-250 is primarily designed as an integral mounting base for speed controls with industry standard mounting requirements such as the KBVF Series Inverter, PWM DC Speed Controls, and SCR Speed Controls. Installation is easily accomplished with quick-connect terminals. It is housed in a plated steel case which is to be grounded with the external ground screw or mounting tab. Rated 10 Amps at 230 Volts Ac. CE approved meets (Class A) industrial.</p>	KBRF-250 CE Approved AC Line Filter (Class A)	9509	KBVF, KBIC, KBMM, KBWD, KBWS, KBMG
	 <p>KBRF-300</p> <p>The KBRF-300 is an RFI filter used to suppress electronic interference caused by motor speed controls to within acceptable levels as determined by the CE Council Directive 89/336/EEC relating to EMC. Rated 16 Amps at 115 or 208/230 Volts AC – 115/230 VAC, 50/60 Hz.</p>	KBRF-300 CE Approved AC Line Filter (Class B)	9484	All Controls
	 <p>KBRF-350</p> <p>The KBRF-350 is an RFI filter used to suppress electronic interference caused by motor speed controls. The KBRF-350 is primarily designed as an integral mounting base for speed controls with industry standard mounting requirements such as the KBVF Series Inverter, PWM DC Speed Controls, and SCR Speed Controls. Installation is easily accomplished with quick-connect terminals. It is housed in a plated steel case which is to be grounded with the external ground screw or mounting tab. Rated 10 Amps at 230 Volts AC. CE approved meets (Class B) residential.</p>	KBRF-350 CE Approved AC Line Filter (Class B)	9511	KBVF, KBIC, KBMM, KBWD, KBWS, KBMG

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