

# Inverter Selection Guide

KB Electronics



- Chassis / IP20 models include Motor Filters to eliminate winding and bearing failures.
- Hybrid Drives are digital drives with an analog interface.
- Digital models feature LED displays with easy to use CSP™ (Common Sense Programming).
- All models can be customized for OEM's, Ready to Use, "Out-of-the-Box."
- A wide variety of factory installed options add to the drive versatility while maintaining low cost.



## KBAC Hybrid Drive™ – NEMA 4X / IP65



The KBAC Series of Adjustable Frequency Drives are inverter models rated for 1/8 to 10 horsepower motors. These drives are housed in heavy duty NEMA 4X / IP65 die-cast aluminum washdown/watertight enclosures for indoor or outdoor use. Hybrid drives are a digital drive with an analog interface.

**Options:** On/Off AC Line Switch (P/N's 9482, 9523, 9532, factory installed on Models KBAC-217S, 217SF, 416S, 416SF); Forward-Stop-Reverse Switch (P/N's 8888, 9480); Run-Stop-Jog Switch (P/N's 8889, 9340); Auto/Manual Switch Kit (P/N's 8891, 9481); Signal Isolator with Power Supply (P/N's 8890, 9600); Signal Isolator with Power Supply and an Auto/Manual Switch Kit (P/N's 8893, 9605); Class A (CE) RFI Filter (P/N's 9468, 9479, 9507, 9512, 9515, 9516, factory installed on Models KBAC-217F, 217SF, 416F, 416SF); and Liquidtight Fittings (P/N's 8892, 9526).

Maximum HP		AC Line Voltage (50/60 Hz)	Phase	Model Number	Part No.		Max. AC Line Current (Amps AC)	Voltage Range (Volts AC)	Max. Load Current (Amps/Phase)	Net Weight		Dim. Ref. Code
HP	kW				Gray	White*				Lbs.	kg	
1	0.75	115	1	KBAC-24D	9987	9988	14.4	0 – 208/230	3.6	5.9	2.7	A
		208/230					8.1					
1½	1.13	115	1	KBAC-27D	9520	9521	22	0 – 208/230	5.5	10.3	4.7	B
2	1.5	208/230					16.7		6.7			
3	2.25	208/230	1	KBAC-29 (1P)	10001	10002	20.5	0 – 208/230	9	10.3	4.7	B
2	1.5	208/230	1	KBAC-29	9528	9529	16.7	0 – 208/230	6.7	10.3	4.7	B
3	2.25		3				11.7		9			
3	2.25	400/460	3	KBAC-45	9530	9531	7.2	0 – 400/460	5.5	10.3	4.7	B
5	3.75	400/460	3	KBAC-48	9540	9541	11	0 – 400/460	8.3	10.3	4.7	B
5	3.75	208/230	3	KBAC-217	8868	8879	22.1	0 – 208/230	17	22	10	0
				KBAC-217S	8863	8855						
				KBAC-217F	8861	8853						
				KBAC-217SF	8869	8880						
10	7.5	400/460	3	KBAC-416	8870	8881	20.8	0 – 400/460	16	22	10	0
				KBAC-416S	8864	8856						
				KBAC-416F	8874	8883						
				KBAC-416SF	8871	8882						

\*FDA approved (white cases only).

## KBDA Digital Drive – NEMA 4X / IP65



The KBDA Series of Digital Adjustable Frequency Drives are inverter models rated for 1/8 to 10 horsepower motors. These drives are housed in heavy duty NEMA 4X / IP65 die-cast aluminum washdown/watertight enclosures for indoor or outdoor use.

**Options:** IODA Input/Output Multi-Function Module (P/N's 8873, 9668); On/Off AC Line Switch (P/N's 9482, 9523, 9532, factory installed on Models KBDA-217S, 217SF, 416S, 416SF); Class A (CE) RFI Filter (P/N's 9468, 9470, 9507, 9512, 9515, 9516, factory installed on Models KBDA-217F, 217SF, 416F 416SF); and Liquidtight Fittings (P/N's 8892, 9526).

Maximum HP		AC Line Voltage (50/60 Hz)	Phase	Model Number	Part No.		Max. AC Line Current (Amps AC)	Voltage Range (Volts AC)	Max. Load Current (Amps/Phase)	Net Weight		Dim. Ref. Code
HP	kW				Gray	White*				Lbs.	kg	
1	0.75	115	1	KBDA-24D	9536	9537	14.4	0 – 208/230	3.6	5.9	2.7	A
		208/230					8.1					
1½	1.13	115	1	KBDA-27D	9543	9544	22	0 – 208/230	5.5	10.3	4.7	B
2	1.5	208/230					16.7		6.7			
3	2.25	208/230	1	KBDA-29 (1P)	10003	10004	20.5	0 – 208/230	9	10.3	4.7	B
1	0.75	208/230	3	KBDA-24P	9766	9767	4.8	0 – 208/230	3.6	5.9	2.7	A
2	1.5		1	KBDA-29	9545	9546	16.7	0 – 208/230	6.7	10.3	4.7	B
3	2.25	3	11.7				9					
1	0.75	400/460	3	KBDA-42	9763	9764	2.1	0 – 400/460	2	5.9	2.7	A
3	2.25	400/460	3	KBDA-45	9659	9660	7.2	0 – 400/460	5.5	10.3	4.7	B
5	3.75	400/460	3	KBDA-48	9661	9662	11	0 – 400/460	8.3	10.3	4.7	B
5	3.75	208/230	3	KBDA-217	8862	8854	22.1	0 – 208/230	17	22	10	0
				KBDA-217S	8865	8857						
				KBDA-217F	8875	8884						
				KBDA-217SF	8876	8885						
10	7.5	400/460	3	KBDA-416	8866	9958	20.8	0 – 400/460	16	22	10	0
				KBDA-416S	8867	8859						
				KBDA-416F	8877	8886						
				KBDA-416SF	8878	8887						

\*FDA approved (white cases only).



### KBMA Hybrid Drive™ – NEMA 1 / IP50

The KBMA Series of Adjustable Frequency Drives are inverter models rated for 1/8 to 1 horsepower motors. These drives are housed in NEMA 1 / IP50 aluminum enclosures. The KBMA-24DF contains a built-in CE approved AC Line Class A Industrial Standard RFI (EMI) Filter. Hybrid drives are a digital drive with an analog interface.

**Option:** Forward-Stop-Reverse Switch (P/N 9519).

Maximum HP		AC Line Voltage (50/60 Hz)	Phase	Model Number	Part No.	Max. AC Line Current (Amps AC)	Voltage Range (Volts AC)	Max. Load Current (Amps/Phase)	Net Weight		Dim. Ref. Code
HP	kW								Lbs.	kg	
1	0.75	115	1	KBMA-24D	9533	14.4	0 – 208/230	3.6	2.42	1.09	C
		208/230				9.5					
1	0.75	115	1	KBMA-24DF	9534	9.5	0 – 208/230	3.6	2.48	1.12	C
		208/230									



### KBVF Hybrid Drive™ – Chassis / IP20

The KBVF Series of Adjustable Frequency Drives are inverter models rated for 1/10 to 5 horsepower motors. These chassis / IP20 drives are ideal for OEM applications where digital programming and displays are not required. Hybrid drives are a digital drive with an analog interface.

**Options:** Drive-Link™ Programming Kit, SIVFR Signal Isolator and Run Fault Relay (Standard on 460 VAC models) (P/N 9597), DIVF Modbus Serial Communication Module (P/N 9568), Class A or B (CE) RFI Filter, DBVF Dynamic Brake Module (P/N 9598), Multi-Speed Board, KBRK Remote Digital Keypad (OEM applications only), and IOVF Input/Output Multi-Function Module.

Maximum HP		AC Line Voltage (50/60 Hz)	Phase	Model Number	Part No.	Max. AC Line Current (Amps AC)	Voltage Range (Volts AC)	Max. Load Current (Amps/Phase)	Net Weight		Dim. Ref. Code
HP	kW								Lbs.	kg	
1/2	0.37	115	1	KBVF-13	9957	9.6	0 – 208/230	2.4	1.3	0.6	D
1	0.75	115	1	KBVF-14	9977	14	0 – 208/230	4	2.2	1.0	E
1/2	0.37	208/230	1	KBVF-23	9958	6	0 – 208/230	2.4	1.3	0.6	D
1	0.75	208/230	1	KBVF-24	9978	10	0 – 208/230	4	2.2	1	E
1/10	0.07	115	1	KBVF-21D*	9581	4	0 – 208/230	1	0.7	0.3	F
		208/230				2.5					
1/4	0.18	115	1	KBVF-22D*	9572	6	0 – 208/230	1.5	1.3	0.6	D
		208/230				3.8					
1/2	0.37	115	1	KBVF-23D*	9959	9.7	0 – 208/230	2.4	1.3	0.6	D
		208/230				6					
1	0.75	115	1	KBVF-24D*	9979	14	0 – 208/230	4	2.2	1	E
		208/230				10					
1½	1.13	115	1	KBVF-26D*	9496	22	0 – 208/230	5.5	2.9	1.3	G
		208/230				14					
3	2.25	208/230	1	KBVF-29 (1P)	9910	22.5	0 – 208/230	9	4.6	2.1	H
1/2	0.37	208/230	3	KBVF-23P	9676	3.1	0 – 208/230	2.4	1.1	0.5	D
1	0.75	208/230	3	KBVF-24P	9677	5.2	0 – 208/230	4	2.2	1	E
2	1.5	208/230	1	KBVF-27	9591	17	0 – 208/230	6.7	4.1	1.9	H
			3			8.7					
2	1.5	208/230	1	KBVF-29	9593	16.7	0 – 208/230	6.7	4.6	2.1	H
			3			11.7		9			
1	0.75	400/460	3	KBVF-42**	9645	2.6	0 – 400/460	2	2.8	1.3	I
3	2.25	400/460	3	KBVF-45**	9590	5.3	0 – 400/460	4.6	4.1	1.9	J
5	3.75	400/460	3	KBVF-48**	9592	11	0 – 400/460	8.3	4.6	2.1	J

\*Models KBVF-21D, 22D, 23D, 24D and 26D are available in single voltage AC line input (115 or 208/230 VAC) and also contain a built-in Motor Filter to eliminate winding and bearing failures.  
 \*\*Contains SIVFR signal input isolation with Run/Fault output relay.



## KBWA Hybrid Drive™ – NEMA 1 Enclosures\*

The KBWA Series of Adjustable Frequency Drives are inverter models rated for 1/8 to 1/2 horsepower\*\* motors. These drives are housed in NEMA 1 enclosures\*. Both models contain an On/Off AC Line Switch and a Main Speed Potentiometer. Hybrid drives are a digital drive with an analog interface.

**Option:** Forward-Stop-Reverse Switch (included).

Maximum HP		AC Line Voltage (50/60 Hz)	Phase	Model Number	Part No.	Max. AC Line Current (Amps AC)	Voltage Range (Volts AC)	Max. Load Current (Amps/Phase)	Net Weight		Dim. Ref. Code
HP	kW								Lbs.	kg	
1/4	0.19	115	1	KBWA-22D	9926	5.2	0 – 208/230	1.3	1.58	0.72	K
		208/230				3.8		1.5			
1/2	0.37	115	1	KBWA-23D	9946	8.8	0 – 208/230	2.2	1.58	0.72	
		208/230				6		2.4			

\* Model KBWA-22D (IP50), model KBWA-23D (IP20). \*\*Lower horsepower models available (KBWA-21D, 2P3D, 2P6D).



## KBDF Digital Drive – IP20

The KBDF Series of Adjustable Frequency Drives are inverter models rated for 1/8 to 5 horsepower motors. These drives are housed in IP20 enclosures. They are ideal for OEM applications where digital programming and displays are required. All models are available with a built-in CE approved AC Line Class A Industrial Standard RFI (EMI) Filter<sup>1</sup>.

**Options:** Memory Module (P/N 9634), IODF Input/Output Multi-Function Expansion Module (P/N 9646), Drive-Link™ Programming Kit and Modbus Serial Communication Module.

Maximum HP		AC Line Voltage (50/60 Hz)	Phase	Model Number	Part No.	Max. AC Line Current (Amps AC)	Voltage Range (Volts AC)	Max. Load Current (Amps/Phase)	Net Weight		Dim. Ref. Code
HP	kW								Lbs.	kg	
1/2	0.37	115	1	KBDF-13	9623	9.6	0 – 208/230	2.4	2.8	1.27	M
1	0.75	115	1	KBDF-14	9624	16	0 – 208/230	4	2.8	1.27	
1½	1.13	115	1	KBDF-16	9625	22	0 – 208/230	5.5	2.8	1.27	
1/2	0.37	208/230	1	KBDF-23 <sup>1</sup>	9688	6	0 – 208/230	2.4	2.8	1.27	
1	0.75	208/230	1	KBDF-24 <sup>1</sup>	9689	10	0 – 208/230	4	2.8	1.27	
2	1.5	208/230	1	KBDF-27 <sup>1</sup>	9690	17	0 – 208/230	6.7	2.8	1.27	
3	2.25	208/230	1	KBDF-29 (1P)	9700	22	0 – 208/230	9	4.2	1.93	N
1/2	0.37	115	1	KBDF-23D	9673	9.6	0 – 208/230	2.4	2.8	1.27	M
		208/230				6					
1	0.75	115	1	KBDF-24D	9674	16	0 – 208/230	4	2.8	1.27	
		208/230				10					
1½	1.13	115	1	KBDF-27D	9675	22	0 – 208/230	5.5	2.8	1.27	
2	1.5	208/230				17		6.7			
2	1.5	208/230	1	KBDF-29 <sup>1</sup>	9641	16.7	0 – 208/230	6.7	4.2	1.93	
3	2.25					11.7		9			
1	0.75	400/460	3	KBDF-42 <sup>1</sup>	9642	2.6	0 – 400/460	2	4.2	1.93	N
3	2.25	400/460	3	KBDF-45 <sup>1</sup>	9643	7.2	0 – 400/460	5.5	4.2	1.93	
5	3.75	400/460	3	KBDF-48 <sup>1</sup>	9644	10.8	0 – 400/460	8.3	4.2	1.93	

1. Add "F" Suffix to Model Number for Built-In Class A (CE) RFI (EMI) AC Line Filter. Ex. KBDF-24F.

# Inverter Accessories

## SIVFR Signal Isolator and Run/Fault Relay Part No. 9597



The SIVFR is used to isolate, amplify, and condition DC voltage and current signals from any source (power supplies, motors, tach-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.

**Model where used:** KBVF

## Dynamic Brake Module Part No. 9598



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.

**Model where used:** KBVF

## Multi-Speed Board Part No. 9503



The KBVF Multi-Speed Board (MSB) provides four user selectable preset speeds to control a motor connected to the KBVF Adjustable Frequency Drive. The motor speed for each preset is adjustable via trimpot settings which can be fine tuned by using the Hi-Lo range jumpers. 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. The MSB mounts onto the side of the KBVF.

**Models where used:** KBVF

## SIAC-PS Signal Isolator with Power Supply and A/M Switch Kit Part Nos. 8893, 9605



The SIAC-PS Signal Isolator with Power Supply provides an isolated interface between non-isolated signal sources and the drive. It is used to isolate, amplify and condition DC voltage and current signals from any source; such as tach-generators, transducers, PLC's and potentiometers. It provides an isolated input to control motor direction and an isolated 5 Volt DC power supply for potentiometer operation. In addition, it contains an isolated 50 ma 24 Volt DC power supply for transducers or auxiliary equipment. All input connections and power supplies are isolated from the AC line and motor wiring.

The Auto/Manual Switch is designed for installation on the front cover of the drive. It is used with the SIAC-PS to select a signal input from either the SIAC-PS or the Main Speed Potentiometer of the drive.

**Model where used:** KBAC Series

## AC Line Filters Part Nos. 9479, 9507, 9512, 9515, 9516, factory installed on Models KBAC-217F, 217SF, 416F, 416SF, and KBDA-217F, 217SF, 416F, 416SF



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.

Note: Suffix "NS" indicates line filter must be used without the Power On/Off Switch Kit.

**Models where used:** KBAC or KBDA-24D (P/N 9507), KBAC or KBDA-27D (P/N 9512), KBAC or KBDA-29, 45, 48 (P/N 9479), KBAC or KBDA-29NS, 45NS, 48NS (P/N 9515), KBAC or KBDA-217, 217S, 416, 416S (P/N 9516).

## IODA Part Nos. 8873, 9668



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 two snap-ins (located on the bottom of the mounting base) and two screws (provided). All of the IODA inputs and outputs are isolated from the AC line.

**Models where used:** KBDA (P/N's 8873, 9668), KBMK (P/N 9668)



### IODF Input/Output Module Part No. 9646

The IODF is used on the KBDF Series Drives to provide additional input/output lines and increase the functionality of the standard inputs/outputs of the drive. An additional Multi-Function Relay is also provided.

**Model where used:** KBDF



### MMDF-Memory Module Part No. 9634

The Memory Module can store up to four programs and easily mounts onto the drive's PC board header. A program stored on the drive can be uploaded to the Memory Module and a program stored on the Memory Module can be downloaded to the drive.

**Model where used:** KBDF



### Liquid Tight Fittings Part Nos. 8892, 9526

The fittings are designed to provide a liquid tight seal when using cables to wire the drive.

**Models where used:** KBAC, KBDA



### Forward-Stop-Reverse Switch Kit Part No. 9519

The Forward-Stop-Reverse Switch assembly is designed for installation on the front cover of the drive and is used to provide electronic reversing.

**Model where used:** KBMA



### On/Off AC Line Switch Kit Part No. 9683

The Power On/Off Switch assembly 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.

**Model where used:** KBMK



### Run-Stop-Jog Switch Kit Part Nos. 8889, 9340

The Run-Stop-Jog Switch provides selection between the Main Speed Potentiometer setting or a momentary jog speed, which can be used to index a machine into position.

**Model where used:** KBAC



### Forward-Stop-Reverse Switch Kit Part Nos. 8888, 9480

The Forward-Stop-Reverse Switch Kit is designed for installation on the front cover of the inverters and provide electronic reversing.

**Model where used:** KBAC



### Power On/Off Switch Kit Part Nos. 9482, 9523, 9532, factory installed on Models KBAC-217S, 217SF, 416S, 416SF and KBDA-217S, 217SF, 416S, 416SF

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. For Models KBAC or KBDA -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. For Models KBAC or KBDA-29, 45, 48, the switch is triple pole, which is used to disconnect all three AC line wires.

**Models where used:** KBAC or KBDA-24D (P/N 9482); KBAC or KBDA-27D, 29 (1P) (P/N 9523); KBDA-42, KBAC or KBDA-29, 45, 48 (P/N 9532)



### Potentiometer Kits Part Nos. 9111, 9114, and 9831

The Potentiometer Kits consist of a 5k ohm linear potentiometer with mounting hardware and front panel insulator. Part No. 9111 contains a conductive plastic element and is fitted with a nylon shaft and isolated brass mounting bushing. Part No. 9114 is the same as Part No. 9111 except that it contains an On/Off Switch. Part No. 9831 contains a 5 watt rated wire wound potentiometer with excellent linearity.

**Models where used:** KBVF Series



### Knob and Dial Kits Part Nos. 9832 (Large) and 9815 (Small)

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".

**Models where used:** KBVF Series



### KBRF-250 CE Approved AC Line Filter (Class A) Part No. 9509

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.

**Models where used:** KBVF thru 2 HP, single phase input only.



### KBRF-300 CE Approved AC Line Filter (Class B) Part No. 9484

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. CE approved meets (Class B) residential.

**Models where used:** All Controls



### KBRF-350 CE Approved AC Line Filter (Class B) Part No. 9511

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.

**Models where used:** KBVF thru 2 HP, single phase input only.

————— Dimensions (W x L x D) —————

Ref. Code	Inches	Millimeters
A	5.51 x 9.53 x 5.86	140 x 242 x 149
B	7.55 x 9.80 x 7.25	192 x 249 x 184
C	4.95 x 7 x 4.15	126 x 178 x 105
D	3.9 x 4.3 x 2.75	99 x 109 x 70
E	4.7 x 4.3 x 5	119 x 109 x 127

Ref. Code	Inches	Millimeters
F	3.9 x 4.3 x 2	99 x 109 x 51
G	4.7 x 5.7 x 4.5	119 x 145 x 114
H	4.7 x 7.5 x 4.45	119 x 191 x 113
I	4.1 x 9.31 x 2.75	103 x 236 x 70
J	4.7 x 8.75 x 4.45	119 x 222 x 113

Ref. Code	Inches	Millimeters
K	3.92 x 6.06 x 3.65	99.6 x 154 x 92.7
L	3.92 x 6.06 x 4.40	99.6 x 154 x 112
M	3.4 x 7.25 x 5.1	86.4 x 184 x 130
N	4.4 x 7.8 x 6.1	112 x 199 x 155
O	14 x 10.5 x 9	356 x 267 x 227



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