KBVF SERIES

CHASSIS/IP-20 INVERTERS

Models KBVF-21D, 22D, 13, 23, 23D, 14, 24, 24D, 26D, 27, 29, 45, 48
Variable Speed/Soft-Start AC Motor Drives
with Electronic Motor Overload Protection[1]
Rated for 208-230 and 400/460 Volt 50 & 60 Hz
3-Phase & PSC AC Induction Motors from Subfractional thru 5 HP
Operates from 115, 208/230, and 400/460 Volt 50/60 Hz AC Line

TYPICAL APPLICATIONS

• Conveyors • Feeders • Packaging Equipment
• Pumps • Blowers • Printing Presses • Indexers
• Fans • Treadmills • Door & Gate Openers
• Portable Equipment used with GFCIs[2]

CE* c UL us**

STANDARD FEATURES

- **Simple to Operate** – Does not require programming. Uses trimpots and jumpers, which are factory set for most applications.
- **Diagnostic LEDs** – Power on (PWR) and drive status (ST).
- **Signal Isolation** – Provides an isolated interface between non-isolated signal sources and the drive. (Standard on Models KBVF-45, 48. See Note 3.)
- **Run/Fault Relay Output Contacts** – Can be used to turn on or off equipment or to signal a warning if the drive is put into the Stop Mode or a fault has occurred. (Standard on Models KBVF-45, 48. See Note 3.)
- **Jumper Selection of Drive Output Frequency** – Increases the motor speed up to two times the rated RPM.
- **Compatible with GFCIs (with optional software).**
- **Industry Standard Mounting.**
- **Finger-Safe Cover** – Meets IP-20 standard.

PERFORMANCE FEATURES

- **Power Start™** – Provides more than 200% starting torque which ensures startup of high frictional loads.
- **Slip Compensation with Static Auto-Tune and Boost** – Provides excellent load regulation over a wide speed range.
- **Speed Range** – 60:1

PROTECTION FEATURES

- **Motor Overload (I^2t) with RMS Current Limit** – Provides motor overload protection which prevents motor burnout and eliminates nuisance trips.[1]
- **Electronic Inrush Current Limit (EICL™)** – Eliminates harmful inrush AC line current during startup.[4]
- **Short Circuit** – Prevents drive failure if a short circuit occurs at the motor (phase-to-phase).
- **Motor Filter** – Reduces harmful voltage spikes to the motor.[5]
- **Regeneration** – Eliminates tripping due to bus overvoltage caused by rapid deceleration of high inertial loads.
- **Undervoltage and Overvoltage** – Shuts down the drive if the AC line input voltage goes above or below the operating range.
- **MOV Input Transient Suppression.**
- **Microcontroller Self Monitoring and Auto-Reboot.**

DESCRIPTION

The KBVF Adjustable Frequency Drives provide variable speed control for standard 208-230 and 400/460 Volt 50 & 60 Hz 3-phase & PSC AC induction motors from subfractional thru 5 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. Adjustable linear acceleration and deceleration are provided, making the drive suitable for soft-start applications.

Due to its user-friendly design, the KBVF is easy to install and operate. Tailoring to specific applications is accomplished with selectable jumpers and trimpots, which eliminate the computer-like programming required on other drives. However, for most applications no adjustments are necessary. For more advanced programming, PC based Drive-Link™ software is available.

Main features include adjustable RMS Current Limit and I^2t Motor Overload Protection.[1] In addition, Adjustable Slip 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. Electronic Inrush Current Limit (EICL™) eliminates harmful AC line inrush current.[4] The drive is suitable for machine or variable torque (HVAC) applications. With optional software, the drive can be programmed for DC Injection Braking.

For AC line and motor wiring, Models KBVF-21D, 22D, 13, 23, 23D, 14, 24, 24D, 26D contain quick-connect terminals. Models KBVF-27, 29, 45, 48 contain a Barrier Terminal Block. Other features include: adjustable trimpots (CL, MAX, MIN, DEC/B[6] ACC, COMP), customer selectable jumpers (Line Voltage (dual voltage models only), Automatic-Manual Start/Reset, Motor Frequency, Frequency Multiplier, Forward/Reverse). Diagnostic LEDs are provided for power (PWR) and drive status (ST).

A Signal Isolator and Run/Fault Relay Output Contacts are provided on Models KBVF-45, 48 and are optional on all other models. Other optional accessories include: Class "A" and "B" AC Line Filters, Dynamic Brake Module, Multi-Speed Board, Programming Kit, and Modbus Communication Module. A connector is provided for easy installation of accessories. A 5 kΩ Main Speed Potentiometer is also included.

TRIMPOT ADJUSTMENTS

- **Minimum Speed** (MIN)
- **Maximum Speed** (MAX)
- **Acceleration** (ACC)
- **Deceleration/Boost** (DEC/B)[6]
- **Slip Compensation** (COMP)
- **Current Limit** (CL)

**Requires CE approved KBRF-250 Class A RFI Filter (Part No. 9509) or KBRF-350 Class B RFI Filter (Part No. 9511). **Models KBVF-22D, 13, 23, 23D, 14, 24, 24D, 26D are UL Listed for USA and Canada. Other models pending.*
***Notes:* 1.** *UL approved as an electronic overload protector for motors.* **2.** *Requires optional software.* **3.** *Signal Isolator and Run/Fault Relay is standard on Models KBVF-45, 48 and optional on all other models.* **4.** *Models KBVF-21D, 22D contain ICL in lieu of EICL™.* **5.** *Only Models KBVF-21D, 22D, 13, 23, 23D, 14, 24, 24D, 26D contain Motor Filter.* **6.** *In 50 Hz Mode, the DEC/B Trimpot automatically becomes Adjustable Boost.*

PENTA KB POWER™
A Complete Line of Motor Drives

TABLE 1 – GENERAL PERFORMANCE SPECIFICATIONS

Description	Specification	Factory Setting
115 Volt AC Line Input Voltage Operating Range (Volts AC)	115 (±15%)	—
208/230 Volt AC Line Input Voltage Operating Range (Volts AC)	208 (–15%) / 230 (+15%)	—
400/460 Volt AC Line Input Voltage Operating Range (Volts AC)	380 (–15%) - 460 (+15%)	—
Maximum Load (% Current Overload for 2 Minutes)	150	—
Carrier, Switching Frequency (kHz)	16, 8	—
Signal Following Input Voltage Range[1] (Volts DC)	0 - 5	—
Output Frequency Resolution (Bits, Hz)	10, .06	—
Minimum Speed Trimpot (MIN) Range (% Frequency Setting)	0 - 40	0
Maximum Speed Trimpot (MAX) Range (% Frequency Setting)	70 - 110	100
Acceleration Trimpot (ACC) and Deceleration Trimpot (DEC/B) Range (Seconds)	.3 - 20	1.5
Boost Trimpot (DEC/B) Range (50 Hz Only) (Volts/Hz)	0 - 30	5
Slip Compensation Trimpot (COMP) Range at Drive Rating (Volts/Hz)	0 - 3	1.5
Current Limit Trimpot (CL) Range (Amps AC): KBVF-21D	.65 - 1.8	1.6
KBVF-22D	1.0 - 2.8	2.4
KBVF-13, 23, 23D	1.5 - 4.5	3.8
KBVF-14, 24, 24D	2.5 - 7.5	6.4
KBVF-26D	3.5 - 10.5	8.8
KBVF-27	4.0 - 12.5	10.7
KBVF-29	5.5 - 17.0	14.4
KBVF-45	3.0 - 8.5	7.4
KBVF-48	5.0 - 15.5	13.3
Motor Frequency Setting (Hz) (Jumper J1)	50, 60	60
Output Frequency Multiplier (X1, X2) (Jumper J2)[2]	1, 2	1
Minimum Operating Frequency at Motor (Hz)	1	—
Speed Range (Ratio)	60:1	—
Speed Regulation (30:1 Speed Range, 0 - Full Load) (% Base Speed)[3]	2.5	—
Overload Protector Trip Time for Stalled Motor (Seconds)	6	—
AC Line Input Undervoltage/Overvoltage Trip Points for 115 Volt AC Line (±5%) (Volts AC)[4]	76 - 141	—
AC Line Input Undervoltage/Overvoltage Trip Points for 208/230 Volt AC Line (±5%) (Volts AC)[4]	151 - 282	—
AC Line Input Undervoltage/Overvoltage Trip Points for 400/460 Volt AC Line (±5%) (Volts AC)[4]	302 - 567	—
Run/Fault Relay Output Contact Rating[5] (Amps at 30 Volts DC, 125 Volts AC, 250 Volts AC)	1, 0.5, 0.25	—
Operating Temperature Range (°C)	0 - 45	—

Notes: 1. *Models KBVF-45, 48 contain built-in signal isolation. For other models, if a non-isolated signal is used, install the SIVFR - Signal Isolator (Part No. 9597).* ***2.*** *Allows the motor to operate up to two times the rated RPM. Constant horsepower will result when operating the drive in the "X2" mode.* ***3.*** *Dependent on motor performance.* ***4.*** *Do not operate the drive outside the specified AC line input voltage operating range.* ***5.*** *Models KBVF-45, 48 only.*

TABLE 2 – ELECTRICAL RATINGS & FEATURES

Model	Part No.	AC Line Input			Output			Features by Model[4]			Net Wt.	
		Volts AC (50/60 Hz)	Phase (ϕ)	Maximum Current (Amps AC)	Volt Range (Nominal) (Volts AC)	Maximum Continuous Load Current (RMS Amps/Phase)	Maximum Horsepower (HP (kW))	Motor Filter (See Figure 2)	Signal Isolator and Run/Fault Relay (See Figure 18)	AC Line and Motor Wiring (See Figure 17)	lbs	kg
KBVF-21D	9581	115	1	4.0	0 - 230	1.0	1/10 (.07)	S	0	QD	0.7	0.3
		208/230	1	2.5								
KBVF-22D	9572	115	1	6.0	0 - 230	1.5	1/4 (.18)	S	0	QD	1.3	0.6
		208/230	1	3.8								
KBVF-13	9957	115	1	11.0	0 - 230	2.4	1/2 (.37)	S	0	QD	1.3	0.6
KBVF-23	9958	208/230	1	7.0	0 - 230	2.4	1/2 (.37)	S	0	QD	1.3	0.6
KBVF-23D	9959	115	1	11.0	0 - 230	2.4	1/2 (.37)	S	0	QD	1.3	0.6
		208/230	1	7.0								
KBVF-14	9977	115	1	16.0	0 - 230	4.0	1 (.75)	S	0	QD	2.2	1.0
KBVF-24	9978	208/230	1	10.0	0 - 230	4.0	1 (.75)	S	0	QD	2.2	1.0
KBVF-24D	9979	115	1	16.0	0 - 230	4.0	1 (.75)	S	0	QD	2.2	1.0
		208/230	1	10.0								
KBVF-26D[1]	9496	115	1	22.0	0 - 230	5.5	1½ (1.13)	S	0	QD	2.9	1.3
		208/230	1	14.0								
KBVF-27	9591	208/230	1, 3	15.0	0 - 230	6.7	2 (1.5)	N	0	TB	4.1	1.9
KBVF-29[2]	9593	208/230	3	10.8	0 - 230	9.0	3 (2.25)	N	0	TB	4.6	2.1
KBVF-45[3]	9590	400/460	3	5.3	0 - 400/460	4.6	3 (2.25)	N	S	TB	4.1	1.9
KBVF-48[2,3]	9592	400/460	3	9.6	0 - 400/460	8.3	5 (3.75)	N	S	TB	4.6	2.1

Notes: 1. *Model KBVF-26D is rated 2 HP (1.5 kW) for most premium efficiency motors.* ***2.*** *Models KBVF-29, 48 contain a built-in cooling fan.* ***3.*** *Models KBVF-45, 48 are rated 0 - 400 Volts AC for 50 Hz motor operation and 0 - 460 Volts AC for 60 Hz motor operation.* ***4.*** *S = Standard Feature, N = Not Available, O = Optional Feature, QD = Quick-Connect Terminals for AC line and motor wiring, TB = Terminal Block for AC line and motor wiring.*

TABLE 3 – JUMPER SELECTABLE FEATURES

Description (bold indicates factory setting)	Location	Designation	KBVF-21D, 22D, 23D, 24D, 26D	KBVF-13, 23, 14, 24, 27, 29, 45, 48
AC Line Input Voltage (115, **230**)	Upper PC Board	J1	✓	—
Automatic-Manual Start/Reset (**A**, M)	Lower PC Board	CON1	✓	✓
Forward or Reverse Direction (**F**, R)	Lower PC Board	CON2	✓	✓
Motor Frequency (50Hz, **60Hz**)	Lower PC Board	J1	✓	✓
Frequency Multiplier (**X1**, X2)	Lower PC Board	J2	✓	✓

OPTIONAL ACCESSORIES & FEATURES

- **SIVFR Signal Isolator and Run/Fault Relay (Part No. 9597) —** Provides isolation between a non-isolated signal voltage source and the drive. Run/Fault Relay Output Contacts are also provided, which can be used to turn on or off equipment or to signal a warning if the drive is put into the Stop Mode or a fault has occurred. Mounts on the side of the KBVF heat sink.
  Note: *Models KBVF-45, 48 contain built-in Signal Isolator and Run/Fault Relay Output Contacts.*
- **DBVF - Dynamic Brake Module (Part No. 9598) —** Provides up to 25% continuous braking and 200% instantaneous braking torque (maximum 1 HP (.75 kW)).
- **Multi-Speed Board (Part No. 9503) —** Provides multi-speed operation using external contacts or a PLC. Mounts on the side of the KBVF heat sink.
- **Programming Kit (Part No. 9582) —** Includes DownLoad Module™ (DLM) handheld programming device which uploads and downloads drive programs, PC to DLM serial communication cable, DLM to inverter communication cable, and PC Windows® based Drive-Link™ communication software.
- **Modbus Communication Module (Part No. 9568) —** Allows direct communication between drive and Modbus* protocol. If a USB communication cable is required, purchase Part No. 19008.
  **Other protocols available, contact the Sales Department.*
- **RFI Filters and Chokes —** Provide RFI and EMI Suppression. They comply with CE Council Directive 39/336/EEC relating to the Class A Industrial Standard and Class B Residential Standard. These filters are available for Models KBVF-21D, 22D, 13, 23, 23D, 14, 24, 24D, 26D, 27 only. See RFI Filters and Chokes Selection Guide Publication No. D-321.
- **Custom Software —** All models can be factory programmed for applications that require special switching, timing, and PLC functions. Contact our Sales Department

YOU GET MORE WITH KBVF INVERTERS

Eliminate Motor Failure Due to Overload

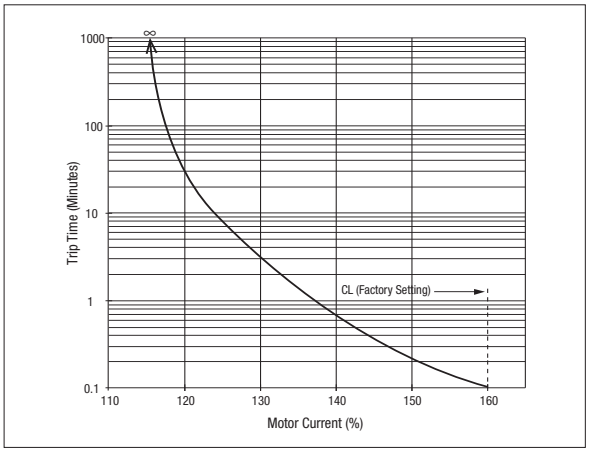
The KBVF contains modified I^2t Overload Protection.* Part of this function consists of a Current Limit (CL) circuit, which limits the drive current to a factory preset level of 160% of the rated motor current. The CL Trimpot can be used to recalibrate the drive current from 60% thru 200%. The circuit provides an overshoot function that allows most motors to develop more than 200% of starting and breakdown torque. Figure 1 illustrates the time versus motor current relationship.

Standard I^2t is undesirable because it causes nuisance tripping. It allows a very high motor current to develop and will turn the drive off after a short period of time. KB's RMS Current Limit Circuit avoids this nuisance tripping while providing maximum motor protection.

If the motor is overloaded to 120% of full load (or 75% of the CL setting), the I^2t timer starts. If the motor continues to be overloaded at the 120% level, the timer will shut down the drive after 30 minutes. If the motor is overloaded to 160% of full load, the drive will trip in 6 seconds.

**UL approved as an electronic overload protector for motors.*

Figure 1 – Modified I^2t Time vs. Motor Current



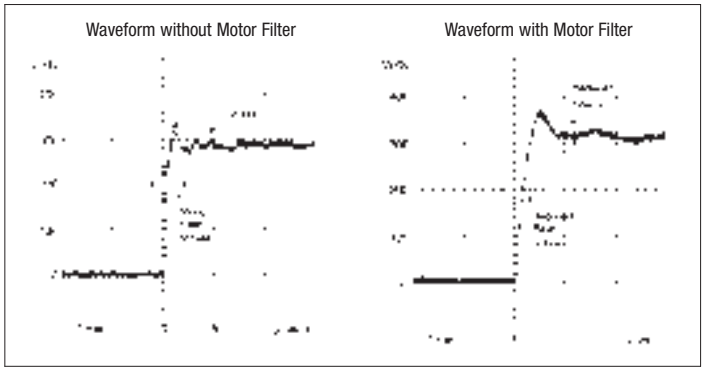
AC Motors Last Longer

AC drives produce very fast rising voltages that can be harmful to motor windings. Some motor manufacturers are now using spike resistant magnet wire that reduces the chance of insulation breakdown. Unfortunately, many motors do not contain the spike resistant wire, especially motors below 1HP.

To substantially reduce the chance of motor winding damage, all KBVF inverters from 1/10 thru 1.5 HP contain built-in Motor Filters.* Figure 2 compares a typical inverter waveform with and without the motor filter.It can be observed that the waveform with the Motor Filter has a reduced rate of voltage rise and reduced voltage spikes.

**Models KBVF-21D, 22D, 13, 23, 23D, 14, 24, 24D, 26D contain the Motor Filter.*

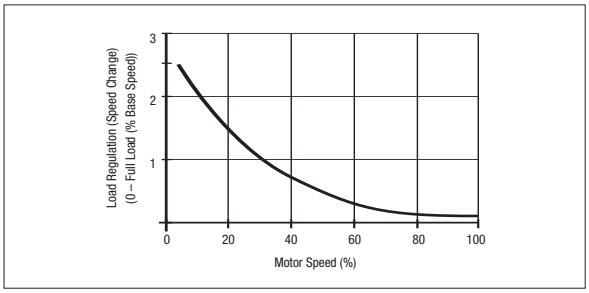
Figure 2 – Typical 3-Phase Inverter PWM Waveforms (230 Volt AC Line)



Maintain Constant Motor Speed Under Varying Loads

The KBVF's unique microcontroller programming, with Static Auto-Tune and an active motor current algorithm with Boost, is used to stabilize motor speed. This feature activates each time the AC line is applied. Base speed load regulation is up to 2.5% over a 30:1 speed range. The KBVF contains a Slip Compensation Trimpot (COMP), which is factory calibrated for most motors. See Figure 3.

Figure 3 – Load Regulation vs. Motor Speed



Eliminate Harmful Inrush Current

Most KBVF drives contain an Electronic Inrush Current Limit (EICL™) circuit.* The EICL™ prevents high AC inrush current each time power is applied to the drive. The EICL™ feature also allows the drive to be rapidly switched “on” and “off” with the AC line.

Some competitive drives only use a thermistor type of inrush current limiter (ICL). The thermistor operates favorably when the drive is initially connected to the AC line. The problem with the thermistor occurs when the drive is disconnected from the AC line for a short period of time (1/2 - 2 minutes). During this time, the main bus capacitors discharge. However, the thermistor takes more than 3 minutes to cool down to the point where its resistance increases enough to limit inrush current. If the drive is reconnected to the AC line before the thermistor has cooled, very high inrush current results, which can damage the drive’s power bridge or can weld the contacts of the AC line switch. In many cases, the main circuit breaker or fuse will trip.

It could be suggested to leave the drive on continuously to avoid the restart problem. This philosophy does not work, since the drive could shut down due to momentary power outages or an operator inadvertently turning it off and then on.

Figure 4 shows the current surge of a drive using a thermistor ICL when started for the first time. The current surge is normal.

Figure 5 shows the current surge of a drive using a thermistor ICL after the drive is restarted after a 1 minute shutdown. The current surge is abnormally high and can damage the drive’s power bridge and trip the main circuit breaker.

Figure 6 shows the current surge of the KBVF drive using EICL™. The current surge is normal whether the drive is started for the first time or restarted anytime.

** Because Models KBVF-21D, 22D operate with low levels of AC line current, they contain an ICL in lieu of EICL™.*

Figure 4 – Drive with ICL started for the first time

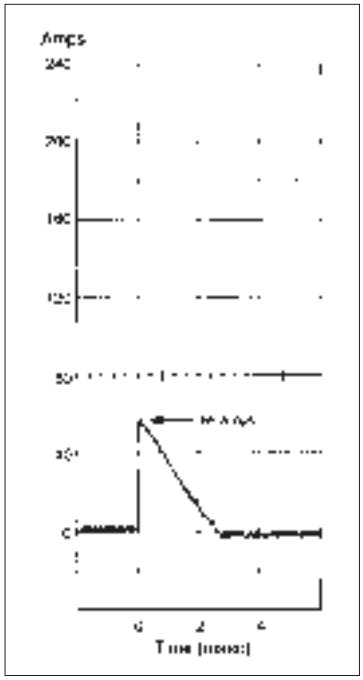


Figure 5 – Drive with ICL restarted after 1 minute

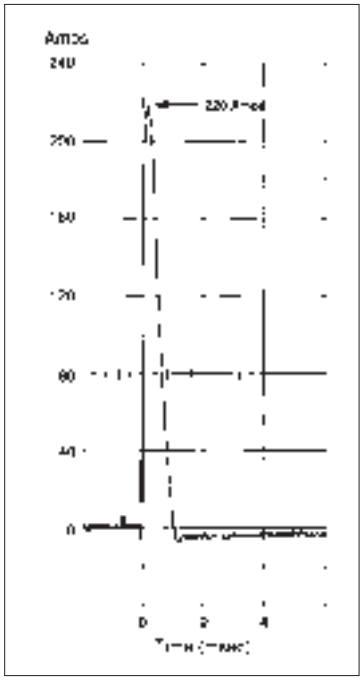
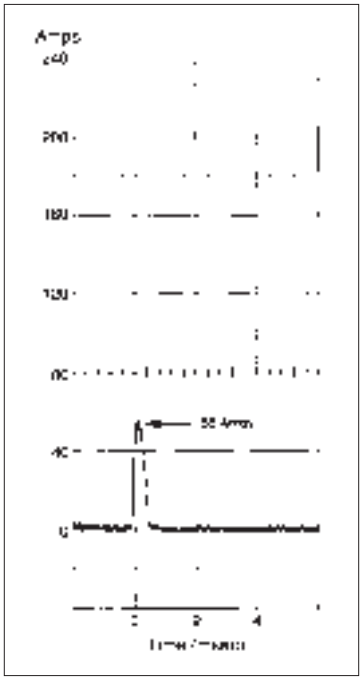


Figure 6 – KBVF Drive with EICL™ started for the first time or restarted anytime



Status Indicators Save Installation Time

The drive contains two diagnostic LEDs. The “ST” LED is a tricolor LED which provides indication of a fault or abnormal condition. The information provided can be used to diagnose an installation problem such as incorrect input voltage, overload condition, and drive output miswiring. It also provides a signal which informs the user that all drive and microprocessor operating parameters are normal. When the AC line is applied to the drive, the “PWR” LED provides an indication of the presence of bus voltage and the proper operation of the logic power supply. See Table 4.

TABLE 4 – LED STATUS INDICATORS

LED	Function	State[1]	LED Color	LED Color After Recovered Fault (Manual Start)
ST (Status)	Normal Operation	Slow Flash	Green	—
ST (Status)	CL (Current Limit)	Steady	Red	Green[2]
ST (Status)	I^2t	Quick Flash	Red	Green[2]
ST (Status)	Short Circuit	Slow Flash	Red	—
ST (Status)	Undervoltage	Quick Flash	Red/Yellow	Red/Yellow/Green
ST (Status)	Overvoltage	Slow Flash	Red/Yellow	Red/Yellow/Green
ST (Status)	Stop	Steady	Yellow	Green[2]
PWR (Power)	Bus and Logic Power Supply	Steady	Green	—

Notes: 1. *Slow Flash = 1 second on and 1 second off. Quick Flash = 0.25 second on and 0.25 second off.* ***2.*** *Slow flashing green.*

FIGURE 7 – MODELS KBVF-21D, 22D, 13, 23, 23D MECHANICAL SPECIFICATIONS & CONTROL LAYOUT (Inches/mm)
(Model KBVF-22D shown)

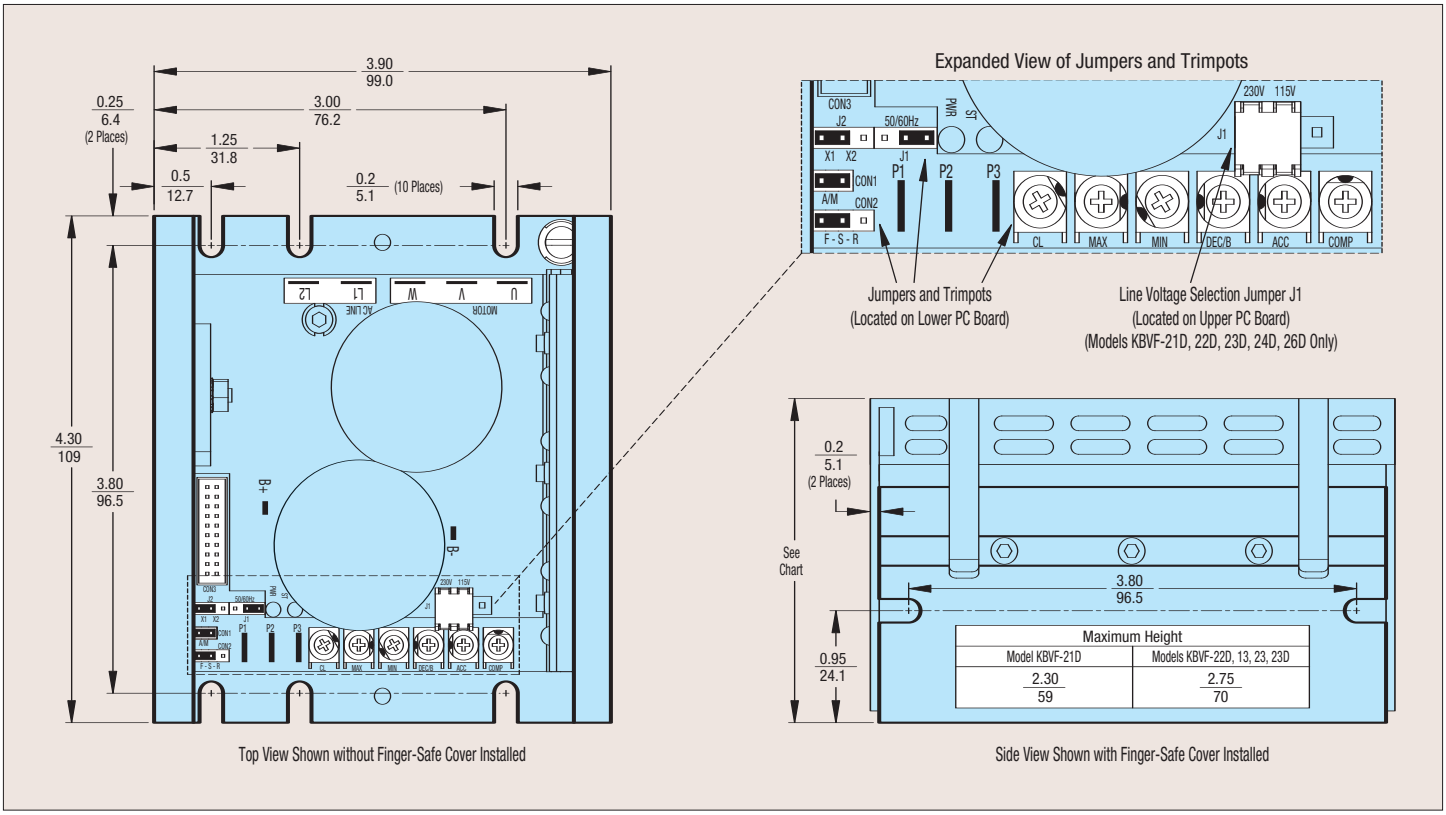


FIGURE 8 – MODELS KBVF-14, 24, 24D, 26D MECHANICAL SPECIFICATIONS & CONTROL LAYOUT (Inches/mm)
(Model KBVF-26D shown with Finger-Safe Cover installed) (See Figure 7 for expanded view of jumpers and trimpots)

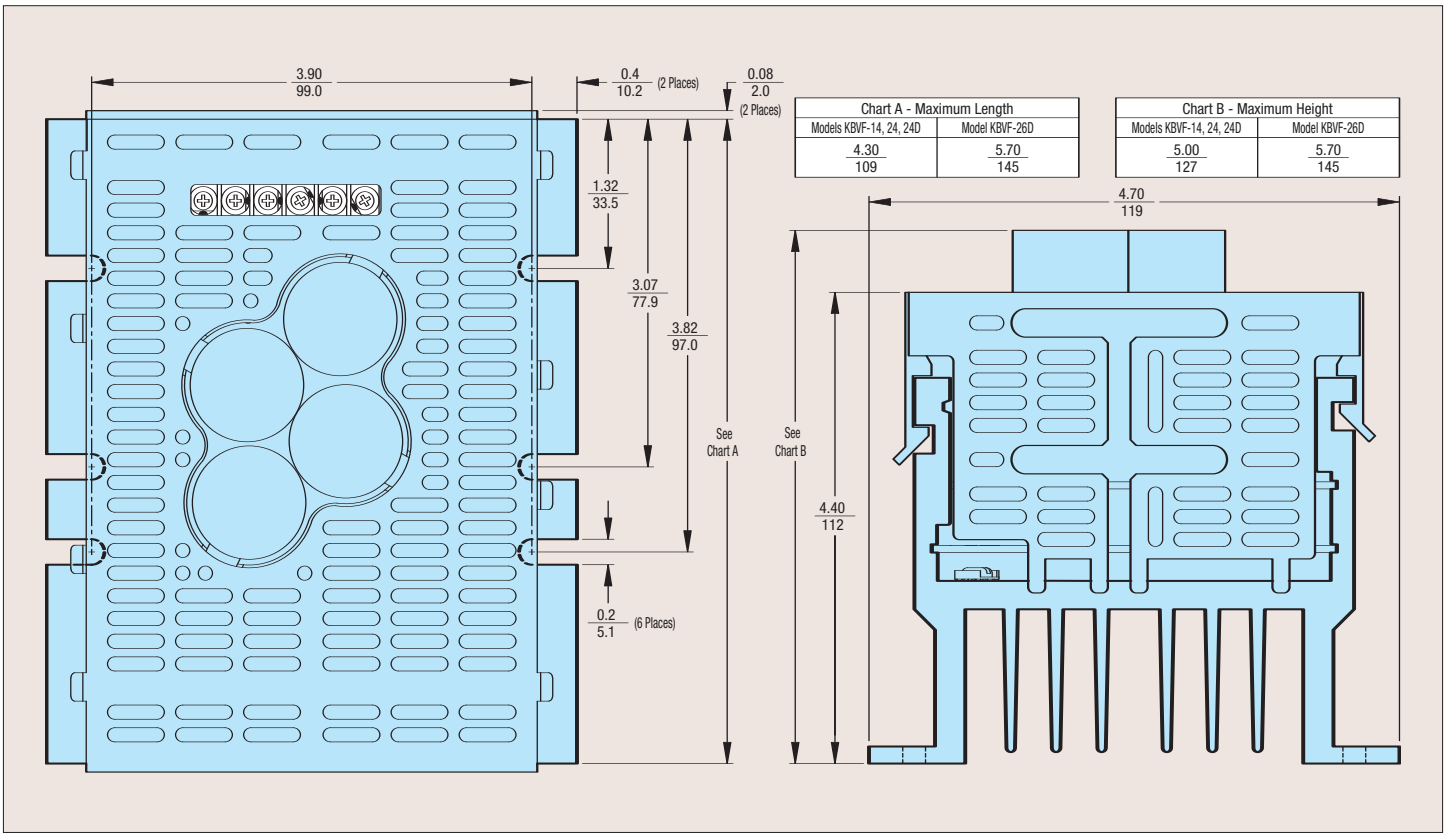


FIGURE 9 – MODELS KBVF-27, 29, 45, 48 MECHANICAL SPECIFICATIONS & CONTROL LAYOUT (Inches/mm)

(Shown without Finger-Safe Cover installed) (See Figure 7 for expanded view of jumpers and trimpots)

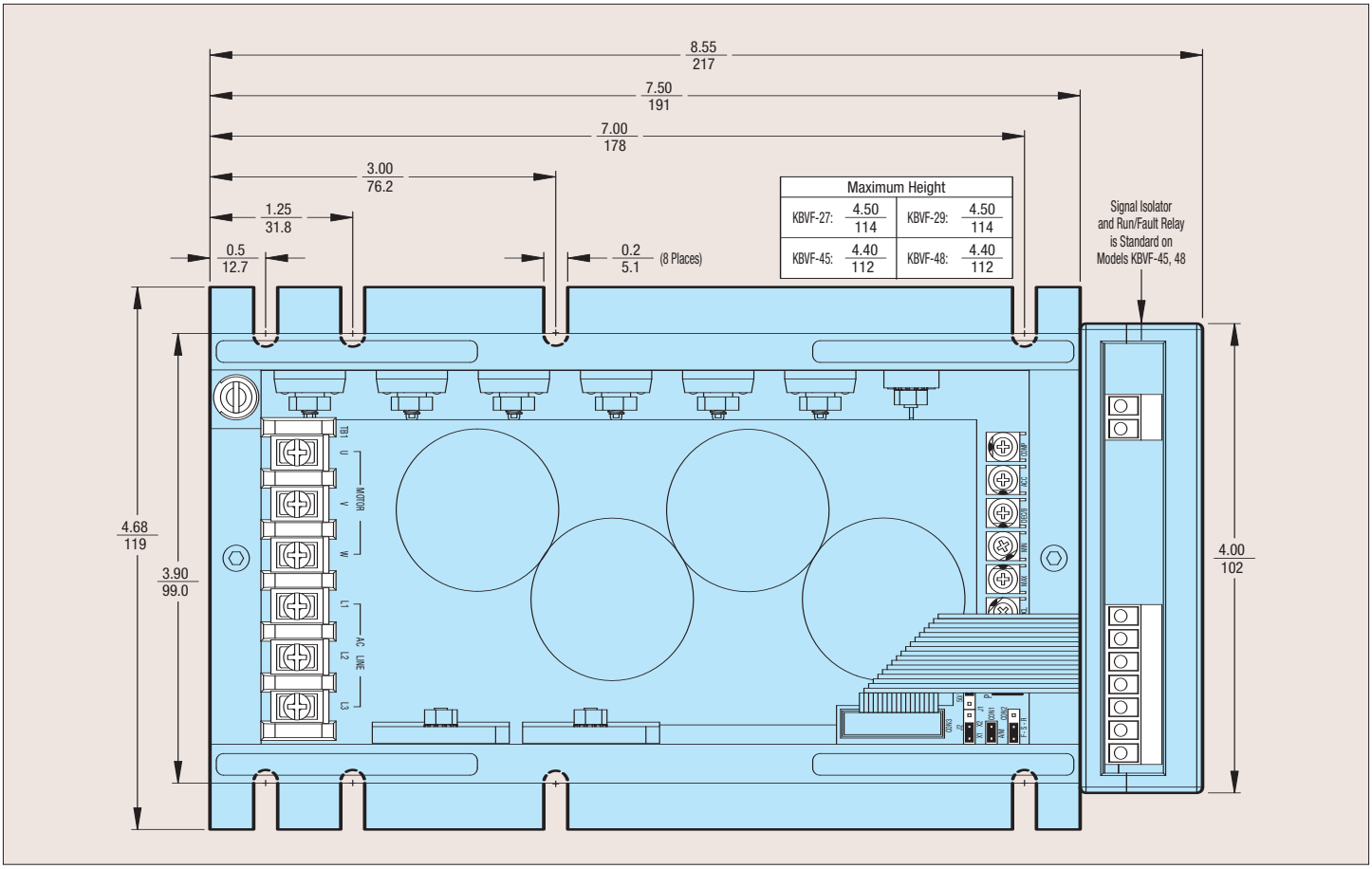


FIGURE 10 - AC LINE INPUT VOLTAGE SELECTION (DUAL VOLTAGE MODELS ONLY)

(J1 is located on the Upper PC Board)

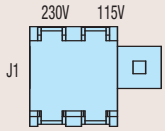
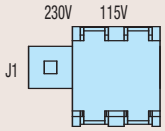
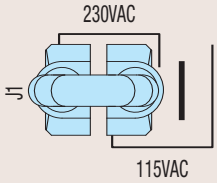
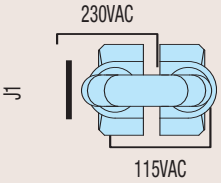
Models KBVF-21D, 22D, 23D, 24D		Model KBVF-26D Only	
230 Volt AC Line Input (Factory Setting) (J1 Installed in "230V" Position)	**115 Volt AC Line Input** (J1 Installed in "115V" Position)	**230 Volt AC Line Input** (Factory Setting) (J1 Installed in "230VAC" Position)	**115 Volt AC Line Input** (J1 Installed in "115VAC" Position)
			

FIGURE 11 - MOTOR & DRIVE OUTPUT FREQUENCY SELECTION

(J1 and J2 are located on the Lower PC Board)

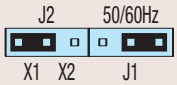
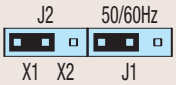
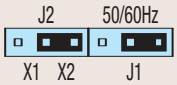
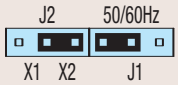
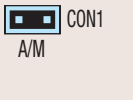
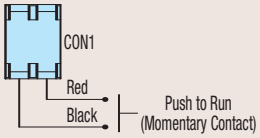
60 Hz Motor Operation (Factory Setting) (J1 Installed in "60Hz" Position) (J2 Installed in "X1" Position)	50 Hz Motor Operation (J1 Installed in "50Hz" Position) (J2 Installed in "X1" Position)	120 Hz Output with 60 Hz Motor (J1 Installed in "60Hz" Position) (J2 Installed in "X2" Position)	100 Hz Output with 50 Hz Motor (J1 Installed in "50Hz" Position) (J2 Installed in "X2" Position)
			

FIGURE 12 – AUTOMATIC-MANUAL START/RESET
(CONN1 is located on the Lower PC Board)

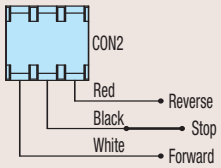
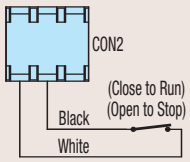
Automatic Start Operation (Factory Setting) (Jumper Installed)	Manual Start - Reset Operation* (Connector Installed)
	

The drive can be factory programmed for Run/Stop operation with momentary contacts.* ***Notes: 1.* *In Automatic Mode, the drive will automatically start when power is applied and a run command is given. The drive will automatically restart after a recovered fault, except for an I^2t trip.* ***2.*** *The Manual Start Mode is used to start the drive or restart the drive (reset) if a fault has occurred.*

FIGURE 13 – FORWARD/REVERSE SPEED SELECTION
(CON2 is located on the Lower PC Board)

Forward Speed Operation (Factory Setting) (Jumper Installed in "F" Position)	Reverse Speed Operation (Jumper Installed in "R" Position)

FIGURE 14 – FORWARD-STOP-REVERSE & ENABLE SWITCH CONNECTIONS*
(CON2 is located on the Lower PC Board)

Forward-Stop-Reverse Operation (Connector Installed)	Forward Enable Operation (Connector Installed)
	

**The drive can be programmed for momentary contact operation.*

FIGURE 15 – MAIN SPEED POTENTIOMETER CONNECTION
(Terminals P1, P2 & P3 are located on the Lower PC Board)

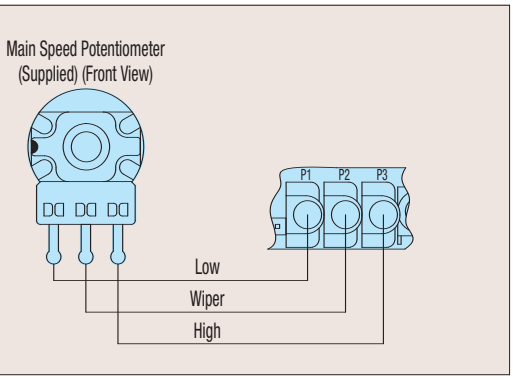
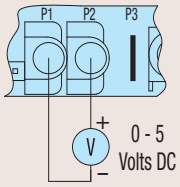
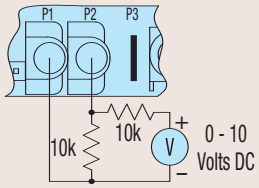
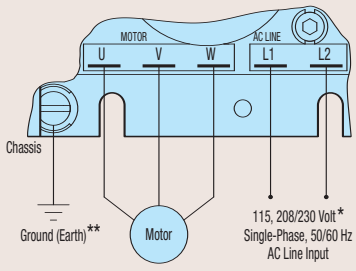
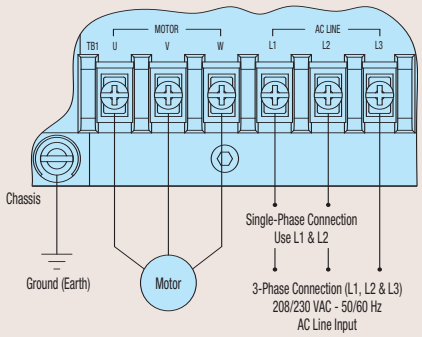
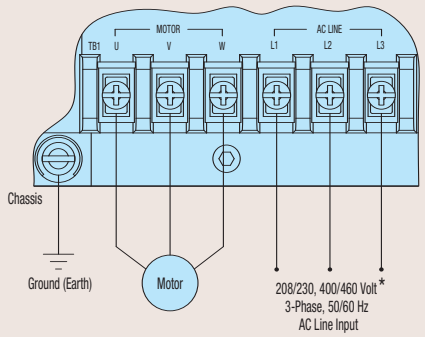


FIGURE 16 – VOLTAGE FOLLOWING CONNECTIONS*
(Terminals P1 & P2 are located on the Lower PC Board)

0 - 5 Volts DC (Isolated)	0 - 10 Volts DC (Isolated)
	

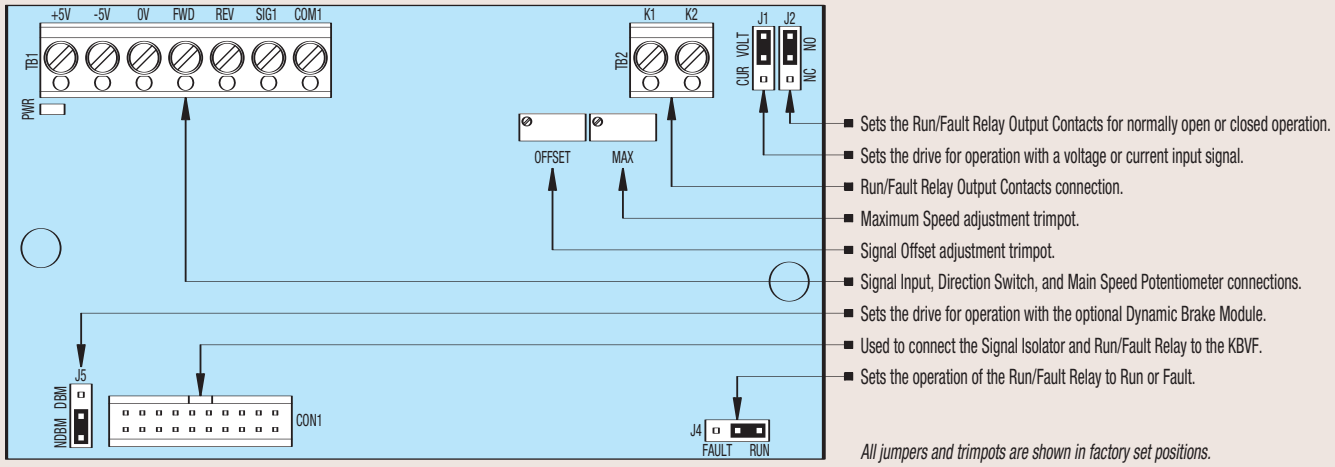
**If a non-isolated signal is used, install the SIVFR - Signal Isolator (Part No. 9597). (Do not Earth ground signal wiring.)*
Note: *Models KBVF-45, 48 contain built-in SIVFR - Signal Isolator.*

FIGURE 17 - MOTOR & AC LINE INPUT CONNECTIONS
(Motor and AC Line Terminals are located on the Upper PC Board)

Models KBVF-21D, 22D, 13, 23, 23D, 14, 24, 24D, 26D (Single Phase AC Line Input)	Model KBVF-27 (Single-Phase and 3-Phase AC Line Input)	Models KBVF-29, 45, 48 (3-Phase AC Line Input)
		

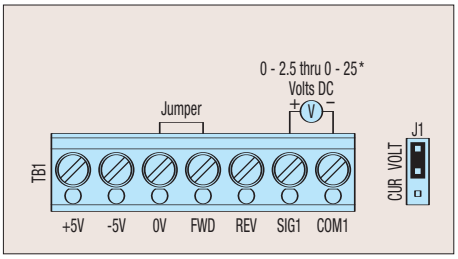
Models KBVF-13, 14: *115 Volt AC line input only.* ***Models KBVF-23, 24, 27, 29:*** *208/230 Volt AC line input only.* ***Models KBVF-21D, 22D, 23D, 24D, 26D:*** *115 Volt AC Line Input (with Jumper J1 set to "115V" position) and 208/230 Volt AC line input (with Jumper J1 set to "230V" position).* ***Models KBVF-45, 48:*** *400/460 Volt AC line input only.* ******** *Model KBVF-21D, due to its plastic case design, does not contain a ground screw.*

FIGURE 18 - SIGNAL ISOLATOR & RUN/FAULT RELAY CONTROL LAYOUT
(Standard on Models KBVF-45, 48 and optional on other models)



CONNECTION DIAGRAMS FOR SIVFR – SIGNAL ISOLATOR & RUN/FAULT RELAY

FIGURE 19 – VOLTAGE FOLLOWING SIGNAL INPUT CONNECTION (J1 Set to "VOLT" Position)



*Factory calibrated for 0-5 Volts DC signal input.

FIGURE 20 – CURRENT FOLLOWING SIGNAL INPUT CONNECTION (J1 Set to "CUR" Position)

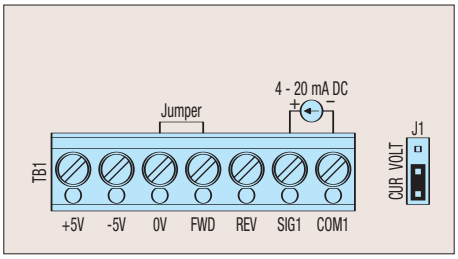


FIGURE 21 – MAIN SPEED POTENTIOMETER & FORWARD-STOP-REVERSE SWITCH CONNECTIONS (J1 Set to "VOLT" Position)

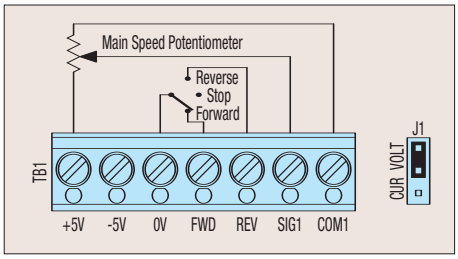


FIGURE 22 – BIDIRECTIONAL (WIGWAG) MAIN SPEED POTENTIOMETER CONNECTION (J1 Set to "VOLT" Position)

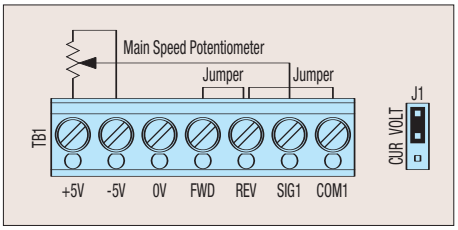


FIGURE 23 – FORM "C" CONTACT OR RELAY FORWARD-STOP-REVERSE CONNECTION

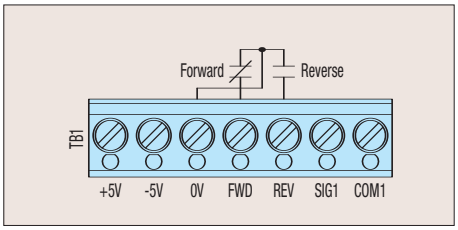


FIGURE 24 – OPEN COLLECTOR FORWARD-STOP-REVERSE CONNECTION

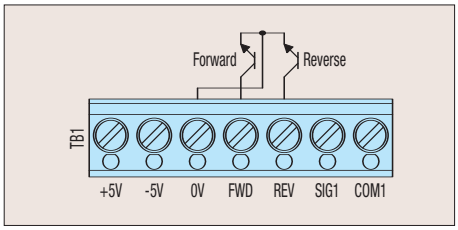


FIGURE 25 – RUN/FAULT RELAY CONNECTION (TB1)

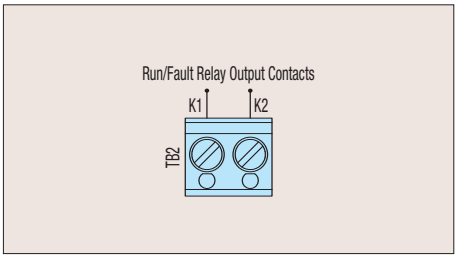


FIGURE 26 – RUN/FAULT RELAY OUTPUT CONTACT SELECTION (J2)

Run/Fault Relay Set for Normally Open Contacts (Factory Setting) (Jumper Installed in "NO" Position)	Run/Fault Relay Set for Normally Closed Contacts (Jumper Installed in "NC" Position)

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 • info@kbelectronics.com
www.kbelectronics.com

(A42092) – Rev. C – 3/2005
Print Code