KBRC-240D

Full-Wave 4-Quadrant Regenerative Drive

for Speed & Torque Control of PM & Shunt DC Motors

NEMA-4X / IP-65

Rated for 1/10 - 1 HP (90 Volts DC) @115 Volts AC, 50/60 Hz
and 1/5 - 2 HP (180 Volts DC) @ 208/230 Volts AC, 50/60 Hz
Washdown and Watertight for Indoor and Outdoor Use

TYPICAL APPLICATIONS

CE* • Conveyors • Feeders • Packaging Equipment
• Positioners • Textile Equipment • Indexers
c UL us Pending

Model KBRC-240D
KB Part No. 8840
(Black Case)
KB Part No. 8841
(White Case)

STANDARD FEATURES

- **Industrial Duty Die-Cast Aluminum Case:** Available in black finish (P/N 8840) and white FDA approved finish (P/N 8841).
- **Front Panel LEDs:** Power On (ON), Stop (STOP) and Overload (OL).
- **PC Board LEDs:** Power On (PWR ON), Overload (OL), Forward Enable (FWD EN) and Reverse Enable (REV EN).
- **Run Relay:** Used to signal a warning or to shut down other equipment if the control is put into "stop" or times out in TCL.
- **Start/Stop Switch:** Provides electronic start and stop functions.
- **Barrier Terminal Blocks:** Facilitates wiring of motor, AC line, Tach-generator and run relay.

PROTECTION FEATURES

- **AC Line Transient Protection:** Provides protection to power devices from AC line transients.
- **Auto-Inhibit®:** Allows rapid, safe cycling of the AC line.
- **Motor Burnout Protection (I x t):** Shuts down control if the motor is overloaded for a predetermined amount of time.
- **Regeneration Overspeed Protection:** Prevents power bridge failure in extreme overhauling conditions.

TRIMPOT ADJUSTMENTS

- **Offset** (OFFSET)
- **Reverse Accel** (RACC)
- **Forward Accel** (FACC)
- **Maximum Speed** (MAX)
- **Forward CL** (FWDCL)
- **Reverse CL** (REVCL)
- **IR Comp** (IR)
- **Response** (RESP)
- **Dead Band** (DB)
- **Timed CL** (TCL)

JUMPER SELECTABLE FEATURES

- **J1/J2 (115V, 230V):** Selects AC line input voltage.
- **J3 (A90, A180, T7, T50):** Selects motor voltage or tach feedback.
- **J4 (1.7A, 2.5A, 5A, 7.5A, 10A):** Selects motor current.
- **J5 (10V, 15V):** Selects analog input voltage.
- **J6 (SPD, TRQ):** Selects control mode.
- **J7 (S/L, NL):** Selects Linear or Non-Linear Torque Mode.
- **J8 (TCL, NTCL):** Selects current limit mode.
- **J9 (RTS, CTS):** Selects stopping mode.
- **J10 (NC, NO):** Selects run relay output contacts.
- **J11 (EN):** Enable Jumper.

OPTIONAL ACCESSORIES

- **Forward-Stop-Reverse Switch (P/N 9485):** Provides motor reversing and regenerative braking.
- **Power On/Off Switch (P/N 9486):** Disconnects the AC line.
- **Signal Isolator SIRC (P/N 8842):** Provides isolation between a non-isolated signal voltage source and the KBRC-240D.
- **Auto/Manual Switch (P/N 9487):** Selects signal input from either the SIRC Signal Isolator or the Main Speed Potentiometer.

Note: * Requires CE RFI filter KBRF-200A (KB P/N 9945) or equivalent.

DESCRIPTION

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 allows forward and reverse torque in both speed directions. This allows the control to maintain constant speed with overhauling loads and provides rapid instant reversing and controlled braking. Because of its excellent performance, the control can replace servo drives in many applications.

The KBRC-240D has a Regeneration Overspeed Protection Circuit, which prevents failure of the power bridge in extreme overhauling conditions. Motor overload protection (I x t) will shut down 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.

Due to its user-friendly design, the KBRC-240D is easy to install and operate. Tailoring to specific applications is accomplished via selectable jumpers and trimpot adjustments. However, for most applications, no adjustments are necessary.

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. They can be used to turn on or off equipment or to signal a warning if the control is put into Stop Mode or times out in TCL.

Main features of the KBRC-240D include Speed or Torque control modes. In Linear Torque mode (S/L), speed and torque vary linearly as a function of main speed potentiometer rotation or input signal. In Non-Linear Torque mode (NL), the torque is varied by the main speed potentiometer or input signal, and remains constant throughout the motor's entire speed range. In addition, Regenerate-to-Stop (RTS) or Coast-to-Stop (CTS) stoping 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 (facilitates wiring of the AC line, motor, tach-generator and run relay), adjustable trimpots (OFFSET, RACC, FACC, MAX, FWDCL, REVCL, IR, RESP, DB and TCL), selectable jumpers (AC line voltage, motor voltage or tach feedback, motor current, analog input voltage, control mode, torque mode, current limit mode, regeneration mode, run relay and enable) and LEDs (Power On, Overload, Forward Enable and Reverse Enable).

Optional accessories for the KBRC-240D include a Forward-Stop-Reverse Switch, a Power On/Off Switch, a Signal Isolator and an Auto/Manual Switch. Quick-connect terminals are provided for easy installation of all accessories.

PENTA KB POWER™

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MODEL KBRC-240D (KB Part Nos. 8840 and 8841[1]) – GENERAL PERFORMANCE SPECIFICATIONS

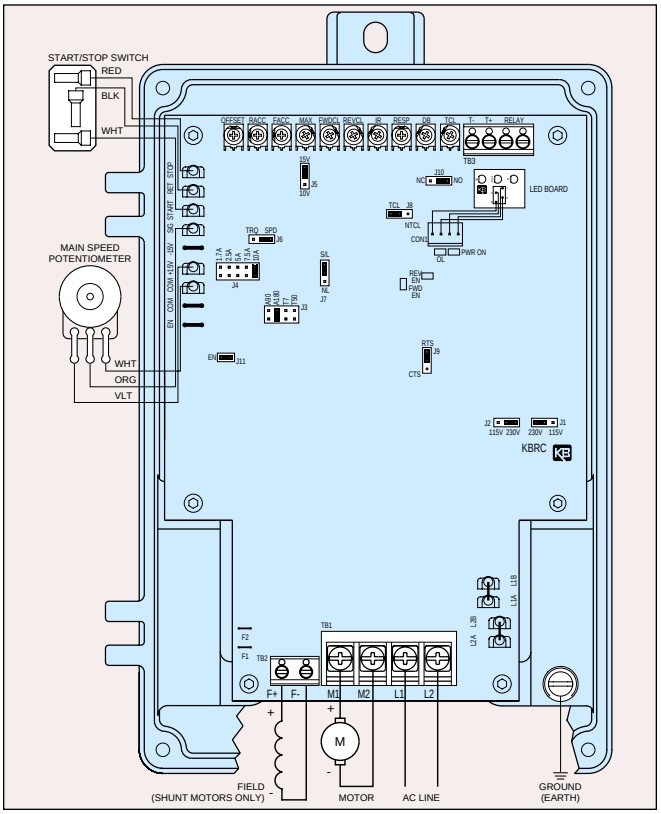
Parameter	Specification	Factory Setting
AC Line Input Voltage (Volts AC, ±10%, 50/60 Hz)	115 and 208/230	230
Armature Voltage Range at 115 Volts AC Line (Volts DC)	0 – ±90	—
Armature Voltage Range at 208/230 Volts AC Line (Volts DC)	0 – ±90[2], 0 – ±180	0 – ±180
Field Voltage at 115 Volts AC Line (Volts DC)	100/50	—
Field Voltage at 208/230 Volts AC Line (Volts DC)	200/100	—
Signal Following Input (Non-Isolated[3]) Range (Volts DC)	0 – ±10, 0 – ±15	0 – ±15
Signal Following Linearity (% Base Speed)	1	—
Line Regulation (% Base Speed)	±0.5	—
Armature Feedback Load Regulation (% Base Speed)	±1	—
Tach-Generator Feedback Load Regulation (% Set Speed)	±1	—
Maximum Load Capacity (% for 2 Minutes)	150	—
Current Ranges (Amps DC)	1.7, 2.5, 5, 7.5, 10	10
Speed Range (Ratio)	50:1	—
Operating Temperature Range (°C)	0 – 45	—
Offset Trimpot (OFFSET) Range (% Base Speed)	0 – ±10	0
Reverse Acceleration Trimpot (RACC) Range (Seconds)	0.2 – 15	1
Forward Acceleration Trimpot (FACC) Range (Seconds)	0.2 – 15	1
Maximum Speed Trimpot (MAX) Range (% Base Speed)	70 – 110	100
Forward Current Limit Trimpot (FWDCL) Range (% Range Setting)	0 – 200	150
Reverse Current Limit Trimpot (REVCL) Range (% Range Setting)	0 – 200	150
IR Compensation Trimpot (IR) Range at 90 Volts DC Output (Volts DC at Full Load)	0 – 15	—
IR Compensation Trimpot (IR) Range at 180 Volts DC Output (Volts DC at Full Load)	0 – 30	10
Deadband Trimpot (DB) Range (% Base Speed)	0 – ±3	0.5
Timed Current Limit Trimpot (TCL) Range (Seconds)	0 – 15	5

ELECTRICAL RATINGS

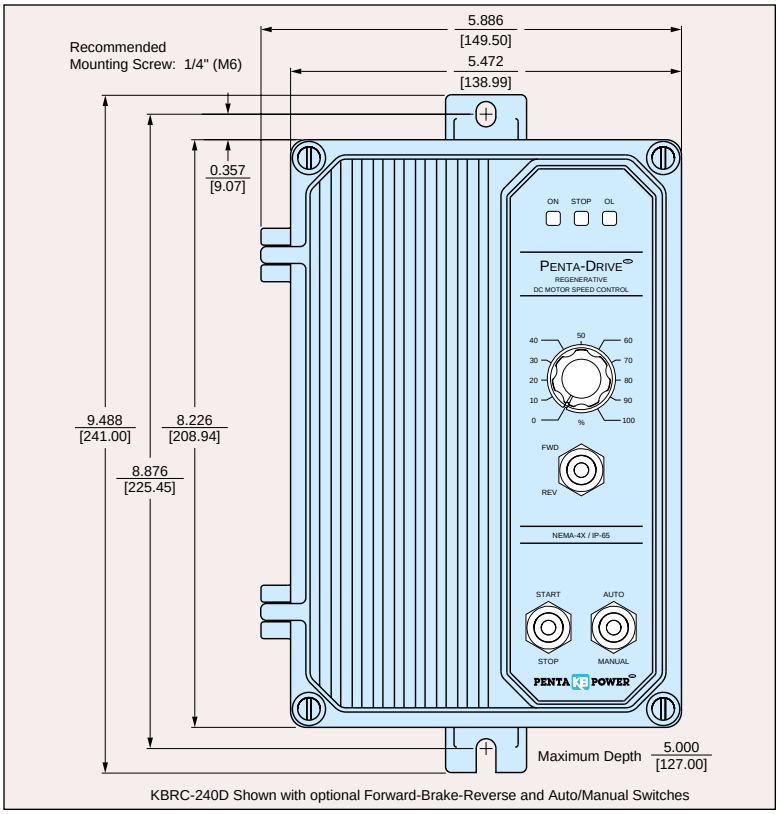
AC Line Input Voltage ±10%, 50/60 Hz (Single Phase Volts AC)	Maximum AC Line Input Current (Amps AC)	Nominal Output Voltage (Volts DC)	Maximum Output Load Current (Amps DC)	Maximum Horsepower Rating HP, (KW)
115	15	0 – ±90	11	1, (0.75)
208/230	15	0 – ±180	11	2, (1.5)
208/230	15	0 – ±90[2]	11	1, (0.75)

Notes: 1. KB Part No. 8841 is white FDA approved finish., 2. Step-down operation: Motor may have reduced brush life. Consult motor manufacturer.
3. Requires an isolated signal. If a non-isolated signal is used, install the Signal Isolator SIRC (P/N 8842).

CONTROL LAYOUT & CONNECTION DIAGRAM



MECHANICAL SPECIFICATIONS (Inches / [mm])



KBRC-240D Shown with optional Forward-Brake-Reverse and Auto/Manual Switches

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