



EU DECLARATION OF CONFORMITY

➤ Manufacturer

KB Electronics
12095 NW 39th St.
Coral Springs, FL 33065

➤ This declaration of conformity is issued under the sole responsibility of the manufacturer. The KB motor speed control products and accessories listed in the attached Annex D:

▪ comply with the CE Directives

- 2014/30/EU EMC Directive
- 2014/35/EU Low Voltage Directive
- 2011/65/EU Restriction of Hazardous Substances Directive

▪ when installed to the applicable standards

- EN61800-3 Adjustable speed electrical power drive systems – Part 3 EMC requirements and specific test methods
- EN50178 Electronic Equipment for use in power installations

▪ when installed to the manufacturer's instructions including the product documentation, the EMC Directive Installation Guidelines Annex A, and Low Voltage Directive Installation Guidelines Annex B and Annex C

➤ Year of CE Marking: 2001

➤ Manufacturer

A handwritten signature in black ink, appearing to read 'Linley Rawlins', written over a horizontal line.

Linley Rawlins
Director of Engineering
2019 April 11

Annex A

Installation Guidelines for CE Electromagnetic Compatibility EMC to EU Directive 2014/30/EC

- **CE Compliance Overview:** KB motor speed controllers and accessories are components that are intended to be installed in a system or machine. Compliance of the system as a whole is the responsibility of the system integrator for the EMC directive 2014/30/EU and 2014/35/EU Low Voltage Directive. Grounding, filtering, and shielding are required to meet these requirements as described below.
- These guidelines are presented as an aid to the system integrator and do not guarantee that the installation will meet the requirements of 2014/30/EU
- The applied EU standard “EN61800-3 – Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods” defines the minimum electromagnetic compatibility EMC requirements for a power drive system PDS
- A KB motor speed controller is defined by EN61800-3 to be a basic drive module (BDM) or component that includes a converter, control, and self-protection functions. This basic drive module becomes a complete drive module (CDM) with the addition of auxiliary power input and out components (filters) as well as the enclosure and ventilation system. The complete drive module (CDM) plus the motor constitutes the power drive system (PDS). Again, EN61800-3 defines the EMC requirements of the power drive system (PDS).
- **EMC Overview:** Electromagnetic compatibility EMC results from containing and attenuating high frequency electromagnetic interference EMI. A motor speed controller’s switching circuits can produce EMI in varying degrees. To contain radiated EMI requires earth grounded, conductive shields and enclosures. To attenuate conducted EMI requires earth grounded filters.
- **EMC Installation Guidelines:** To ensure electromagnetic compatibility (EMC), the following guidelines should be adhered to
 - **Earth Grounding**
 - Overview: The objective is to conduct all EMI, generated by the speed controller, to earth ground within the enclosure of the complete drive module.
 - All system elements must be electrically connected to a common earth ground point. This includes the speed controller, motor, filters, cable shields, and enclosures. Ideally, all of these are mounted to a single conductive metal plate.
 - **Filtering**
 - Overview: The objective is to attenuate the EMI from all cables before these cables exit the complete drive module.
 - AC input power lines require filtering for radio frequency interference RFI. Examples of these filters include the KB filters: RF-200, RF-300, RF-250, RF-350.
 - AC input power lines require filtering for line frequency harmonics when line currents are 16arms or lower. A 20mH inductor would be an example.
 - Motor output power wiring may require ferrite filtering. A 2643626502 FairRite ferrite core is an example.
 - **Shielding**
 - Overview: The objective is to completely contain radiated EMI within the complete drive module and wiring.
 - Power wiring should be shielded and twisted. The shield should be grounded.
 - Installation of the speed controller and filters in a grounded, conductive enclosure may be required.
 - Power wiring must be separated from signal wiring. Any crossing of the power and signal should be at 90 degrees.
 - All seams and gaps in the enclosure and cable shields must be filled with grounded screen to prevent the egress of EMI

Annex B

Installation Guidelines for CE Protection against Electric Shock to Low Voltage Directive 2014/35/EU

- **CE Compliance Overview:** KB motor speed controllers and accessories are components that are intended to be installed in a system or machine. Compliance of the system as a whole is the responsibility of the system integrator for the Low Voltage Directive. Grounding, isolation, insulation, barriers, RCD, and instructions are required to meet these requirements as described below.
- These guidelines are presented as an aid to the system integrator and do not guarantee that the installation will meet the requirements of 2014/35/EU
- The applied EU standard “EN50178 – Electronic Equipment for use in Power Installations” defines the minimum requirements for design and manufacture of electrical equipment for protection against electric shock, for testing and its integration into systems for power installations.
- A KB motor speed controller is a sub-assembly as related to the requirements of EN50178. As such, a complete CE compliant installed system or machine typically requires the addition of an enclosure, EMC filters, overload fusing, electrical isolation, RCD, and instructions
- **Overview for Protection against Electric Shock:** Shock protection results from keeping the user away from high voltages. A motor speed controller’s circuits typically contain high voltages. To protect against electric shock requires grounding, enclosure, electrical isolation, RCD, and instructions
- **Shock Protection Installation Guidelines:** To ensure protection against electric shock, the following guidelines should be adhered to
 - **Earth Grounding**
 - Overview: The objective is to prevent shocks by conducting all leakage or fault currents, generated by the speed controller, to earth ground.
 - All system elements must be electrically connected to a common earth ground point. This includes the speed controller, motor, filters, cable shields, and enclosures. Ideally, all these are mounted to a single conductive metal plate.
 - **Enclosure / Barriers / Insulation**
 - Overview: The objective is to prevent shocks by installed barriers to prevent contact of a person to the high voltage
 - All controllers, that have exposed power connections i.e. controllers with an IP designation less than IP-20, must be mounted in a grounded enclosure
 - **Electrical Isolation**
 - Overview: The objective is to prevent shocks by keeping high voltage out of the user interface circuits
 - All controller inputs and outputs except the ac line and the motor connections must be electrically isolated through an isolating circuit or relay. Examples of isolation devices include the KB potentiometer, signal isolators circuits KBSI, SIVF, IODA, relays
 - **Discharge of capacitors**
 - Overview: The objective is to prevent shocks by warning of live circuits after power has been removed
 - All installations must have instructions and warnings to wait 60 seconds after power loss before opening an enclosure and check voltages before touching circuits
 - **RCD residual-current-operated-protective-device**
 - Overview: The objective is to prevent shocks by monitoring the leakage of the power circuits
 - All installations should have an RCD installed. The RCD should be rated for use with power switching circuits
 - **Instructions**
 - Overview: The objective is to prevent shocks by instructing the installer and the user on the shock prevention details of the system
 - All installations must have instructions and warnings including product instruction manuals, EMC guidelines, and application guidelines.
 - The instructions, cautions, and warnings in Annex C must be provided by the OEM machine builder to the installer and by the installer to the end user

Annex C

CE Installation and Use requirements of Instructions, Cautions, and Warnings for the installed application to meet CE EN 50178 'Electronic equipment for use in power installations' *

"The installer is responsible for ensuring that the installation meets the requirements of the instruction manual, local codes, and the CE EN50178 standard ' Electronic equipment for use in power installations'. The user is responsible for using the control only for the intended purpose"

"The installer/user is responsible for any additional means to meet sufficient safety requirements in the end product, installation, and application"

"The installer/user is responsible for the installation meeting the EMC requirements of the application"

"The installer/user is responsible for implementing EMC emissions reduction measures such as: grounding the enclosure; installing an EMC filter on the ac mains; installation to the KB EMC cessation measures in this EU document "

"The installer/user is responsible for the installation to minimize coupling EMC into the controller by using good wiring practice such as: separating line, output, and control wiring, suppressing relay contacts"

"The installer/user is responsible for installing the control within the limits of the IP designation. The enclosure must not be modified in any way"

"The installer/user is responsible for installation with the recommended wire sizes"

"The installer/user is responsible for installation of the recommended fusing and overload protection"

"Grounding of the control enclosure is required for EMC and safety"

"The installer/user is responsible for grounding the enclosure with a fixed connection "

"The protective conductor ground is designated by the 5019 symbol"

"The neutral conductor must be grounded in the power installation"

"Fusing of the protective (grounding) conductor is not allowed"

"If an RCD (Residual Current Device) is used, it must be intended for the use with the applicable speed controller"

"The installer/user is responsible for maintaining the input voltage and frequency to within the specified range"

"The installer/user is responsible for maintaining the ambient temperature to the specified range"

"The installer/user is responsible for maintaining the ambient humidity and air pressure to the specified range"

"The control is intended to mount on a stationary wall connected to the earth. The installer/user is responsible for minimizing vibration to the control which could cause damage"

"The installer/user is responsible for the set up and installation to EN50178 section 8"

"The installer/user is responsible for setting up the control as specified and using it as intended"

"The control is not protected from short circuit of the output to ground. Connection of an output to earth will damage the speed controller"

"The enclosure must be closed before power is applied and during operation "

"The control must be operated and stored with the enclosure closed to prevent ingress of pollution"

"The enclosure may be uncomfortably warm to the touch"

"Do not operate if the control is damaged. Do not operate if the LEDs are not on or indicate a fault"

"Any external connection that is not electrically isolated must have a warning for shock hazard"

Add label: "Warning: Circuits, internal points, and connections are at high voltage line potential including input and output connections typically labeled: L1, L2, L3, U, V, W, M1, M2, F+, F-, P3, P2, P1, SIG, EN, INH, F, S, R. Extreme caution must be exercised to avoid shock hazard."

Add label: "Warning: all controller connections are at high voltage line potential. For remote operation, a Signal Isolator (SIVF, SIMG, KBSI) must be used for the controller signals typically labeled Signal, Enable, Inhibit, Forward, and Reverse as applicable."

Add label: "Warning: High voltage may be present after power is removed. Wait for 60 seconds after the LEDs are off before opening the enclosure. Check for voltage before touching the circuits or connections"

Add label: "Warning: In the case of a fault shutdown, the speed controller still has high voltages present"

* These instructions, cautions, and warnings in Annex C must be provided by the OEM machine builder to the installer and by the installer to the end user

Annex D

SCR Controls

KBPB-125, 225
KBPC-225 (Black), 225, (White), 225D (Black), 225D (White), 240D (Black), 240D (White)
KBPI-120 (NR), 240D (R)
KBCC-125, 125R, 225, 225R, 240D, 255
KBMD-240D
KBMM-29, 125, 218, 225, 225D
KBIC-11, 14, 19, 21, 24, 29, 118, 120, 125, 218, 225, 240, 240D, 240DS
KBLC-120, 125, 225, 240, 240D, 240DS
KBDM-11, 14, 16, 21, 24, 26
KBDT-14, 24
KBTM-118, 218
KBTC-125, 225
KBRG-212D, 213D, 225D, 225DE, 240D, 255
KBMG-21D, 212D
KBRC-240D (Black), 240D (White)
KBWM-120, 240
Load Cell PID

PWM Controls

KBWT-16, 26, 26R, 110, 112, 210
KBWD-13, 15, 16
KBWS-12, 15, 22D, 25D
KBPW-240D (Black), 240D (White)
KBBC-14, 24, 34, 44
KBSL-47

AC Inverters

KBVF-1P2, 1P6, 2P2, 2P6, 2P2D, 2P6D, 13, 14, 23, 23D, 23P, 24, 24D, 24P, 26D, 27, 29, 29 (1P), 42, 45, 48
KBLF-1P2, 1P6, 2P2, 2P6, 2P2D, 2P6D, 13, 14, 23, 23D, 23P, 24, 24D, 24P, 26D, 27, 29, 29 (1P), 42, 45, 48
KBBL-1P2, 1P6, 2P2, 2P6, 2P2D, 2P6D, 13, 14, 23, 23D, 23P, 24, 24D, 24P, 26D, 27, 29, 29 (1P), 42, 45, 48
KBWA-2P3D, 2P6D, 21D, 22D, 23D
KBWK-23D
KBDF-12, 13, 14, 16, 22, 22D, 23, 23D, 24, 24D, 26, 26D, 27, 27D, 29, 45, 48
KBDL-12, 13, 14, 16, 22, 22D, 23, 23D, 24, 24D, 26, 26D, 27, 27D, 29, 45, 48
KBAC-24D, 27D, 29, 29 (1P), 45, 48, 217, 217S, 217F, 217SF, 416, 416S, 416F, 416SF
KBDA-24D, 24P, 27D, 29, 29 (1P), 42, 45, 48, 217, 217S, 217F, 217SF, 416, 416S, 416F, 416SF
KBMA-24D
KBMK-24D
KBHD-27D

RF Line Filters

KBRF-200A, 250, 300, 350
RFAC-24, 27, 4X

Triac Controls

SIMC-11, 21
KBWC-25, 25K

Accessories

SI-4X, SI-5, SI-6, KBSI-240D, KBET-240D, KBAP-240D, KBPS-240D, KBEP-240D, 4-Quadrant Accel/Decel, PID, MSB, SIVF, SIAC, SIAC-PS, SIMG, SIRC, IODA, IODF, DIVF, DIDF, KBCB, KBRM