

Контроллер торможения электродвигателя серии MBC2K



MBC2K Motor brake controller

The **MBC2K** is a device controlled by a microprocessor, that can automatically insert a power resistor into the DC BUS for braking a motor fed by the same DC Bus through a motor drive. The function of the MBC2K is to dissipate the energy delivered by the motor in an external resistor thus damping the resulting overvoltage on the DC Bus.

On top of that the MBC2K provides several protections to ensure reliable operation. MBC2K can be connected to any DC Bus within 24Vdc and 100Vdc. The simplified application diagram is shown in Figure 1, while the unit front view with all its controls is shown in Figure 2. Up to 4 MBC2K units can be connected in parallel to increase the braking power up to 8kW max. The MBC2K is provided with a 2.5 digits 7 segments LED display, used to display the DC Bus voltage (with +/- 1V accuracy), to help the user during the setup phase and/or to show error messages.

MBC2K Setup

The MBC2K unit needs to be set up before operating. The setup phase consists of 3 menu pages. The user can navigate through the menu pages by pressing the MENU button and the values on each menu page can be changed by pressing SET / RESET button.

- The three menu pages are the following:
- Brake intervention threshold (VTH) setup
 - Hysteresis around the brake intervention threshold voltage
 - Master / Slave mode, used for parallel connection up to four modules.

MBC2K protection and error codes

The MBC2K unit integrates several active protections to guarantee reliable operations in normal conditions. As soon as a faulty event is detected the MBC2K power stage is switched off so that no uncontrolled current flow through the brake resistor is possible. A fault condition is indicated by the continuous blinking of the Alarm LED. Remote sensing of the status of the MBC2K unit is possible thanks to the Alarm relay dry contact. To help the user to understand which faulty event occurred, an error code is displayed on the 7 segments LED display. Every protection is latched, so that to put back the MBC2K unit in "operation mode".

Parallel connection up to 4 MBC2K units

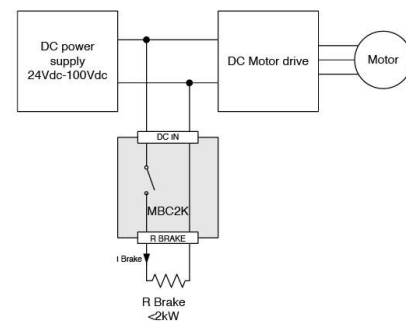
The MBC2K brake controller provides a feature allowing connecting up to 4 identical MBC2K units to **increase the peak braking power up to 8kW**. In any case every MBC2K unit can handle only 2kW of peak braking power therefore every MBC2K unit need its own 2kW brake resistor.

To realize this feature the MBC2K is equipped with a Synchronization Bus used to synchronize the operation of all the units connected to the synchronization bus. The principle of operation relies on one MBC2K unit configured as the **master** and others MBC2K units (up to 3) configured as **slave**.

The master measures the DC Bus voltage and decides when to insert its brake resistor in the circuit; on top of that it sends a command on the synchronization bus. The slaves connected on the synchronization bus are waiting for the command sent by the master; when they receive the command they insert their brake resistors in the circuit too. Please note that even when the MBC2K is configured in slave mode, all its circuits protections are functional.



Figure 1: Simplified application diagram



- SET/RESET button:** used to reset the protections and to change setup values in setup mode.
- MENU button:** used to enter into setup mode and to navigate through menu pages.
- Synchronization bus connector:** used to parallel up to 4 units.
- Resistor temperature sensor connector:** used to connect an optional brake resistor temperature sensor.
- Alarm dry contact connector:** an SPDT contact provide remote failure signal.
- Brake resistor connector:** used to connect the brake resistor wires 2.5mm²
- DC Bus connector:** used to connect the MBC2K unit to the power supply Bus (24...100Vdc).
- Protective earth (PE) connection:** to connect the module to the protective earth.
- LED display 100's indicator:** used to display numbers >99 on 2 digits; when this indicator is lit and the display shows "03" this means 103V.
- Brake indicator LED:** used to display braking activity; when lit it means that there is a current flow through the brake resistor.
- 2.5 digits 7-segment display:** in operating mode it shows the voltage measured on the DC Bus (accuracy +/- 1V); it's used also to show menu items and error codes.
- Alarm LED:** used to indicate a fault condition of the unit.

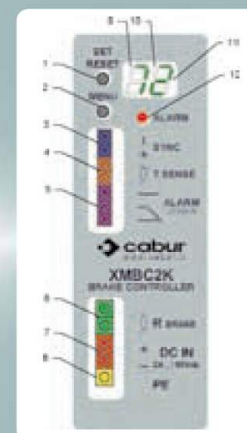


Figure 2: MBC2K Front View



Motor brake controller

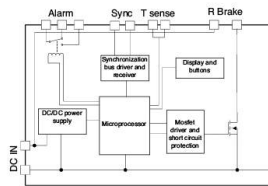
- 20 threshold levels with automatic activation
- Each module can drive 2kW braking power
- It is possible to connect up to four modules master/slave to get 8kW total braking power
- Symple functions programming and set up
- Control of the temperature of the braking resistor



NOTES

The depth dimension includes the terminal blocks and the DIN clamp.

BLOCK DIAGRAM



VERSIONS

Cod. XMBC2K

MBC2K

APPLICATIONS

The MBC2K is a device controlled by a microprocessor, that can automatically insert a power resistor into the DC BUS for braking a motor fed by the same DC Bus through a motor drive. The function of the MBC2K is to dissipate the energy delivered by the motor in an external resistor thus damping the resulting overvoltage on the DC Bus. On top of that the MBC2K provides several protections to ensure reliable operation. MBC2K can be connected to any DC Bus within 24Vdc and 100Vdc. The simplified application diagram is shown in Figure 1, while the unit front view with all its controls is shown in Figure 2. Up to 4 MBC2K units can be connected in parallel to increase the braking power up to 8kW max. The MBC2K is provided with a 2.5 digits 7 segments LED display, used to display the DC Bus voltage (with +/- 1V accuracy), to help the user during the setup phase and/or to show error messages.

INPUT TECHNICAL DATA

Nominal DC BUS voltage range
Maximum braking current
Brake activation voltage
Brake voltage hysteresis
User interface

24...100 Vdc

50 A for 1 s
27...106 V, threshold adjustable in 20 steps
3 V o 6 V selectable
2 setup push buttons (SET/RESET and MENU)
2 x 7 segment LED displays
1 LED for general alarm indication
1 SPDT dry contact for general alarm remote warning
Undervoltage on DC BUS < 22 Vdc
Overvoltage on DC BUS > 110 Vdc
Brake resistor overtemperature (if the temperature sensor is present)
Module Internal overtemperature > 90°C (194°F)
Module Internal overtemperature > 90°C (194°F)
Brake resistor interrupted or not connected
Short circuit : braking current > 80 A
Overload : braking time > 1 s

Protections

Parallel connection

Up to 4 units can be connected in parallel through synchronization bus for a total braking power of 8kW (4 x 2kW braking resistors are needed)

GENERAL TECHNICAL DATA

Dissipated power
Operating temperature range
Input/output isolation
Input/ground isolation
Output/ground isolation
Standard/approvals
EMC Standards
Overvoltage category/Pollution degree
Protection degree
Connection terminal
Housing material
Approx. weight
Mounting information
Approx. weight
Mounting information

20 W
0...+70°C
—
500 Vac / 60s
—
IEC950, EN60950 for SELV use up to 60Vdc; using the MBC2K at voltages greater than 60Vdc is not classifiable as SELV
EN55011 Class B
I / 2
IP 20 IEC 529, EN60529
1.5 and 2.5 mm ² pluggable screw type
aluminium
200 g
vertical on rail, allow 10 mm spacing between adjacent components
120 g
vertical on rail, adjacent

MOUNTING ACCESSORIES

Mounting rail type according to IEC60715/TH35-7.5
Mounting rail type according to IEC60715/G32

PR/3/AC, PR/3/AC/ZB, PR/3/AS, PR/3/AS/ZB
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