

Data sheet

# MCX15B

## Programmable controller



MCX15B is fitted with or without graphic LCD display. It is an electronic controller that stands on the top of the MCX range, thanks to the large number of its inputs and outputs.

It holds all the typical functionalities of MCX controllers:

- programmability
- connection to the CANbus local network
- up to two Modbus RS485 opto-insulated serial
- interface

Furthermore it is available in two models, powered at 110 / 230 V AC or 24 V AC

### Features MCX15B

- 10 analog and 18 digital inputs
- 6 analog and 15 digital outputs
- Power supply 24 V AC / 20/60 V DC and 110 V / 230 V AC
- Remote access to data through CANbus connection for additional display (LCD available) and keyboard
- RTC clock for managing weekly time programs and data logging information
- Up to two Modbus RS485 opto-insulated serial interface
- Available with graphic LCD display for showing the desired information and without display
- Dimensions 16 DIN modules

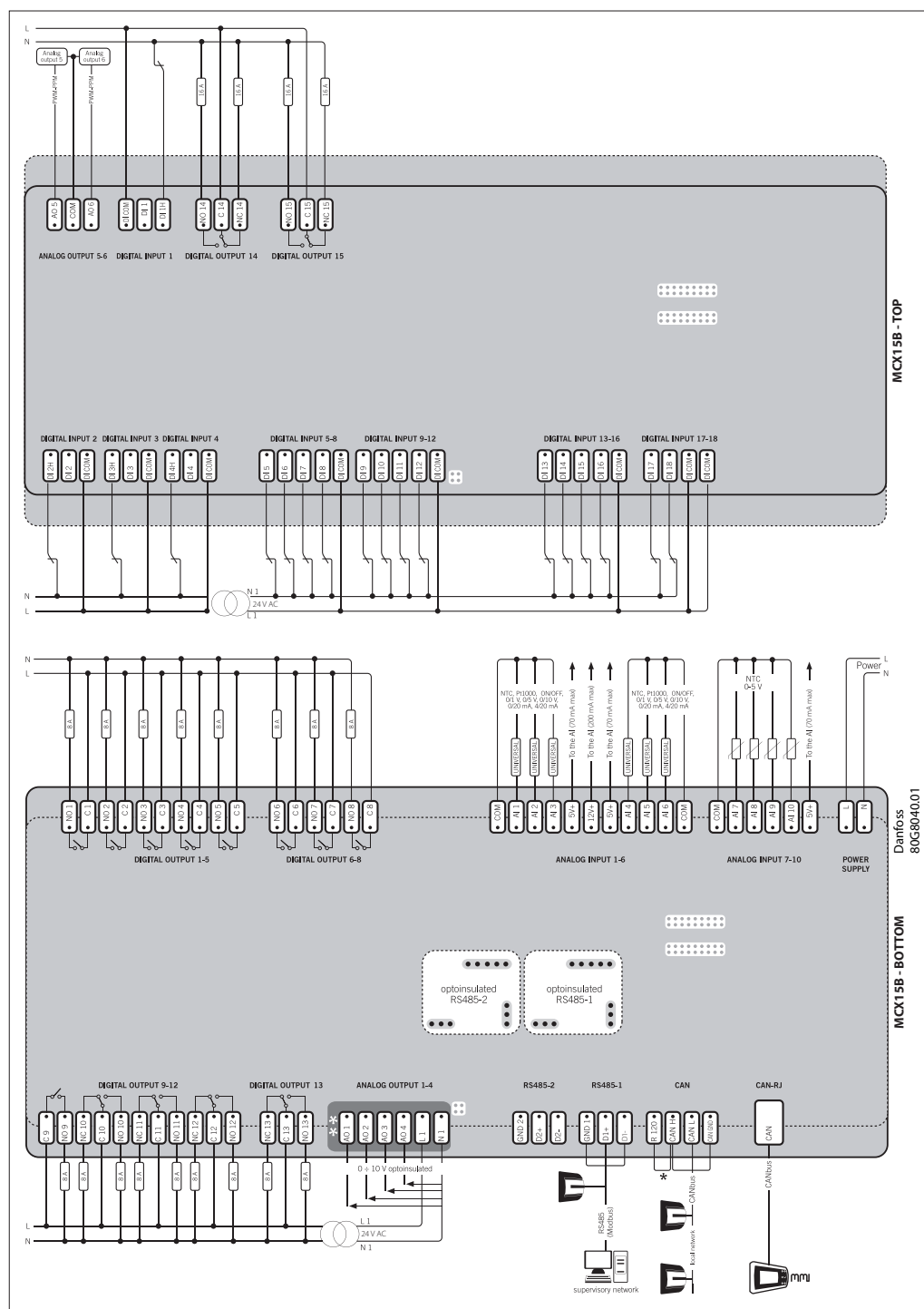
## General features

| FEATURES  | DESCRIPTION   |
|---|---|
| Power supply                                      | 85 – 265 V AC, 50/60 Hz<br>Maximum power consumption: 26 V A<br>Insulation between power supply and the extra-low voltage: reinforced   |
|   | 20 – 60 V DC and 24 V AC $\pm$ 15% 50/60 Hz<br>Maximum power consumption: 12 W, 20 V A<br>Insulation between power supply and the extra-low voltage: functional   |
| Plastic housing                                   | DIN rail mounting complying with EN 60715   |
|   | Self extinguishing V0 according to IEC 60695-11-10 and glowing/hot wire test at 960 °C according to IEC 60695-2-12  |
| Ball test   | 125 °C according to IEC 60730-1<br>Leakage current: $\geq$ 250 V according to IEC 60112   |
| Operating conditions                              | CE: -20T60 / UL: 0T55, 90% RH non-condensing  |
| Storage conditions                                | -30T80, 90% RH non-condensing   |
| Integration                                       | In Class I and / or II appliances   |
| Index of protection                               | IP40 only on the front cover  |
| Period of electric stress across insulating parts | Long  |
| Resistance to heat and fire                       | Category D  |
| Immunity against voltage surges                   | Category II   |
| Software class and structure                      | Class A   |
| Approvals   | CE mark<br>This product is designed to comply with the following EU standards: <ul style="list-style-type: none"> <li>Low voltage directive LVD 2014/35/EU: <ul style="list-style-type: none"> <li>EN60730-1: 2011 (Automatic electrical control for household and similar use. General requirements)</li> <li>EN60730-2-9: 2010 (Particular requirements for temperature sensing controls)</li> </ul> </li> <li>Electromagnetic compatibility EMC directive 2014/30/EU: <ul style="list-style-type: none"> <li>EN 61000-6-3: 2007 +A1: 2011 (Emission standard for residential, commercial and light-industrial environments)</li> <li>EN 61000-6-2: 2005 (Immunity for industrial environments)</li> </ul> </li> <li>RoHS directive 2011/65/EU: <ul style="list-style-type: none"> <li>EN50581: 2012</li> </ul> </li> </ul> |
|   | UL approval: <ul style="list-style-type: none"> <li>UL file E31024</li> </ul>   |

## Input/output

| I/O            | TYPE                  | NUM | SPECIFICATIONS   |
|----------------|-----------------------|-----|--|
| Analog inputs  | NTC, 0 / 1 V, 0 / 5 V | 4   | <b>AI7, AI8, AI9, AI10</b><br>Analog inputs selectable via software between: <ul style="list-style-type: none"> <li>• NTC temperature probes, default: 10 kΩ at 25 °C</li> <li>• pressure transducers with 0 / 5 V output</li> </ul>   |
|                | Universal             | 6   | <b>AI1, AI2, AI3, AI4, AI5, AI6</b><br>Universal analog inputs selectable via software between: <ul style="list-style-type: none"> <li>• ON/OFF (current: 20 mA)</li> <li>• 0 / 1 V, 0 / 5 V, 0 / 10 V</li> <li>• 0 / 20 mA, 4 / 20 mA</li> <li>• NTC (10 kΩ at 25 °C)</li> <li>• Pt1000</li> </ul> 12 V+ power supply 12 V DC, 200 mA max for 4 / 20 mA transmitter (total on all outputs)<br>5 V+ power supply 5 V DC, 210 mA max for 0 / 5 V transmitter (total on all outputs)   |
| Digital inputs | 24 V AC optoins.      | 18  | <b>DI1, DI2, DI3, DI4, DI5, DI6, DI7, DI8, DI9, DI10, DI11, DI12, DI13, DI14, DI15, DI16, DI17, DI18</b><br>Digital Inputs optoinsulated 24 V AC 50/60 Hz o 24 V DC  |
|                | 230 V AC optoins.     | 4   | <b>DIH1, DIH2, DIH3, DIH4</b><br>Inputs optoinsulated, 230 V AC 50/60 Hz<br>Basic insulation<br>Rated current: 2 mA at 230 V AC; 1 mA at 110 V AC<br>NOTE: when the 230 V AC DIH1 input is used, the corresponding 24 V DI1 input is not available anymore; the same for the couple of inputs DIH2 and DI2, DIH3 and DI3, DIH4 and DI4   |
| Analog outputs | 0 / 10 V              | 4   | <b>AO1, AO2, AO3, AO4</b><br>Analog outputs optoinsulated 0 / 10 V DC 10 mA max for each output<br>External power supply 24 V AC / V DC  |
|                | PWM, PPM              | 2   | <b>AO5, AO6</b><br>Analog outputs selectable via software between: <ul style="list-style-type: none"> <li>• pulsing output, synchronous with the line, at modulation of impulse position (PPM) or modulation of impulse width (PWM)</li> <li>• pulsing output, at modulation of impulse width (PWM) with range 20 Hz to 1 KHz: <ul style="list-style-type: none"> <li>– open circuit voltage: 6.8 V</li> <li>– minimum load: 1 kΩ</li> </ul> </li> </ul>   |
| Digital output | Relay                 | 15  | Concerning the insulation distance there are three groups of relays: <ul style="list-style-type: none"> <li>• group 1: relays 1 to 8</li> <li>• group 2: relays 9 to 13</li> <li>• group 3: relays 14 to 15</li> </ul> Insulation between relays of the same group: functional<br>Insulation between relays of different groups: reinforced<br>Insulation between relays and the extra-low voltage parts: reinforced<br>Total current load limit: 92 A<br><b>C1-NO1, C2-NO2, C3-NO3, C4-NO4, C5-NO5, C6-NO6, C7-NO7, C8-NO8 C9-NO9</b><br>Normally open contact relays 8 A <ul style="list-style-type: none"> <li>• characteristics of each relay: <ul style="list-style-type: none"> <li>– 6 A 250 V AC for resistive loads - 100.000 cycles</li> <li>– 4 A 250 V AC for inductive loads - 100.000 cycles with cos(phi) = 0.6</li> <li>– UL: 240 V AC - 4 A resistive - 3.6 FLA - 21.6 LRA - 346 V A pilot duty 30.000 cycles</li> </ul> </li> </ul> <b>C10-NO10-NC10, C11-NO11-NC11, C12-NO12-NC12, C13-NO13-NC13</b><br>Changeover contacts relay 8 A <ul style="list-style-type: none"> <li>• characteristics of each relay: <ul style="list-style-type: none"> <li>– 6 A 250 V AC for resistive loads - 100.000 cycles</li> <li>– 4 A 250 V AC for inductive loads - 100.000 cycles with cos(phi) = 0.6</li> <li>– UL: 240 V AC - 4 A resistive - 3.6 FLA - 21.6 LRA - 346 V A pilot duty 30.000 cycles</li> </ul> </li> </ul> <b>C14-NO14-NC14, C15-NO15-NC15</b><br>High inrush current (80 A - 20 ms) changeover contacts relay 16 A <ul style="list-style-type: none"> <li>• characteristics of each relay: <ul style="list-style-type: none"> <li>– 7 A 250 V AC for resistive loads - 100.000 cycles</li> <li>– 3.5 A 230 V AC for inductive loads - 230.000 cycles with cos(phi) = 0.4</li> <li>– UL: 240 V AC - 6 A resistive - 4.9 FLA - 29.4 LRA - 470 V A pilot duty 30.000 cycles</li> </ul> </li> </ul> Using of device in case of Tamb = 70 °C has to be according to following requirements: <ul style="list-style-type: none"> <li>– maximum load admitted for 8 A relay: 4 A 250 V AC</li> <li>– maximum load admitted for 16 A relay: 5 A 250 V AC</li> </ul> |

# Connection diagram



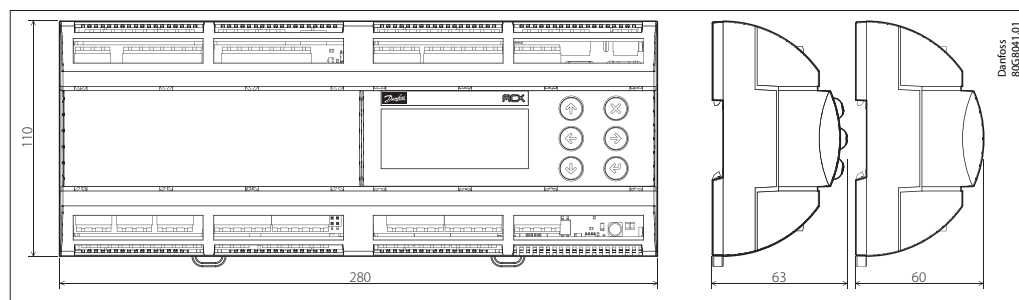
\*NOTE: connection has to be made on the first and last local network units, make the connection as close as possible to the connector

\*\*NOTE: optoisolated analog outputs voltages are referenced to contact N1

## Connection

| CONNECTORS                    | TYPE                                | DIMENSIONS   |
|-------------------------------|-------------------------------------|--|
| <b>TOP BOARD</b>              |                                     |  |
| Analog output 5-6 connector   | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 1 connector     | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital output 14 connector   | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital output 15 connector   | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 2 connector     | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 3 connector     | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 4 connector     | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 5-8 connector   | 5 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 9-12 connector  | 5 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 13-16 connector | 5 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital input 17-18 connector | 4 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| <b>BOTTOM BOARD</b>           |                                     |  |
| Analog output 5-6 connector   | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital output 1-5 connector  | 10 way screw plug-in connector type | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital output 6-8 connector  | 6 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Analog input 1-6 connector    | 11 way screw plug-in connector type | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Analog input 7-10 connector   | 6 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Power supply connector        | 2 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital output 9-12 connector | 11 way screw plug-in connector type | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Digital output 13 connector   | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| Analog output 1-4 connector   | 6 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| RS485-2 connector             | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| RS485-1 connector             | 3 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| CAN connector                 | 4 way screw plug-in connector type  | <ul style="list-style-type: none"> <li>pitch 5 mm</li> <li>section cable 0.2-2.5 mm<sup>2</sup></li> </ul> |
| CAN-RJ connector              | 6/6 way telephone RJ11 plug type    |  |

## Dimensions



## User interface

| TYPE        | TYPE FEATURES       | DESCRIPTION                                 |
|-------------|---------------------|---|
| LCD display | Display             | STN blue transmissive                       |
|             | Backlight           | White LED backlight adjustable via software |
|             | Contrast            | Adjustable via software                     |
|             | Format              | 128x64 dots                                 |
|             | Active visible area | 58x29 mm                                    |
| Keyboard    | Number of keys      | 6   |
|             | Keys function       | Set by the application software             |

## Product part numbers

| DESCRIPTION                      | CODE NO. |
|----------------------------------|----------|
| MCX15B, 24V, LCD, RS485, RTC, S  | 080G0036 |
| MCX15B, 230V, LCD, RS485, RTC, S | 080G0037 |
| MCX15B, 24V, RS485, RTC, S       | 080G0042 |
| MCX15B, 230V, LCD, RS485, RTC, I | 080G0127 |
| MCX15B, 24V, RTC, I              | 080G0130 |
| MCX15B, 24V, RS485, RTC, I       | 080G0132 |

*Note: single pack codes (S) include standard kit connectors,  
industrial pack codes (I) don't include standard kit connectors*

## Accessories part numbers

| DESCRIPTION           | CODE NO. |
|-----------------------|----------|
| MCX15B CONNECTORS KIT | 080G0181 |