

Data sheet

# MCX20B

## Programmable controller



MCX20B 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 MCX20B

- 16 analog and 22 digital inputs
- 6 analog and 20 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 and without display for showing the desired information
- Dimensions 16 DIN modules

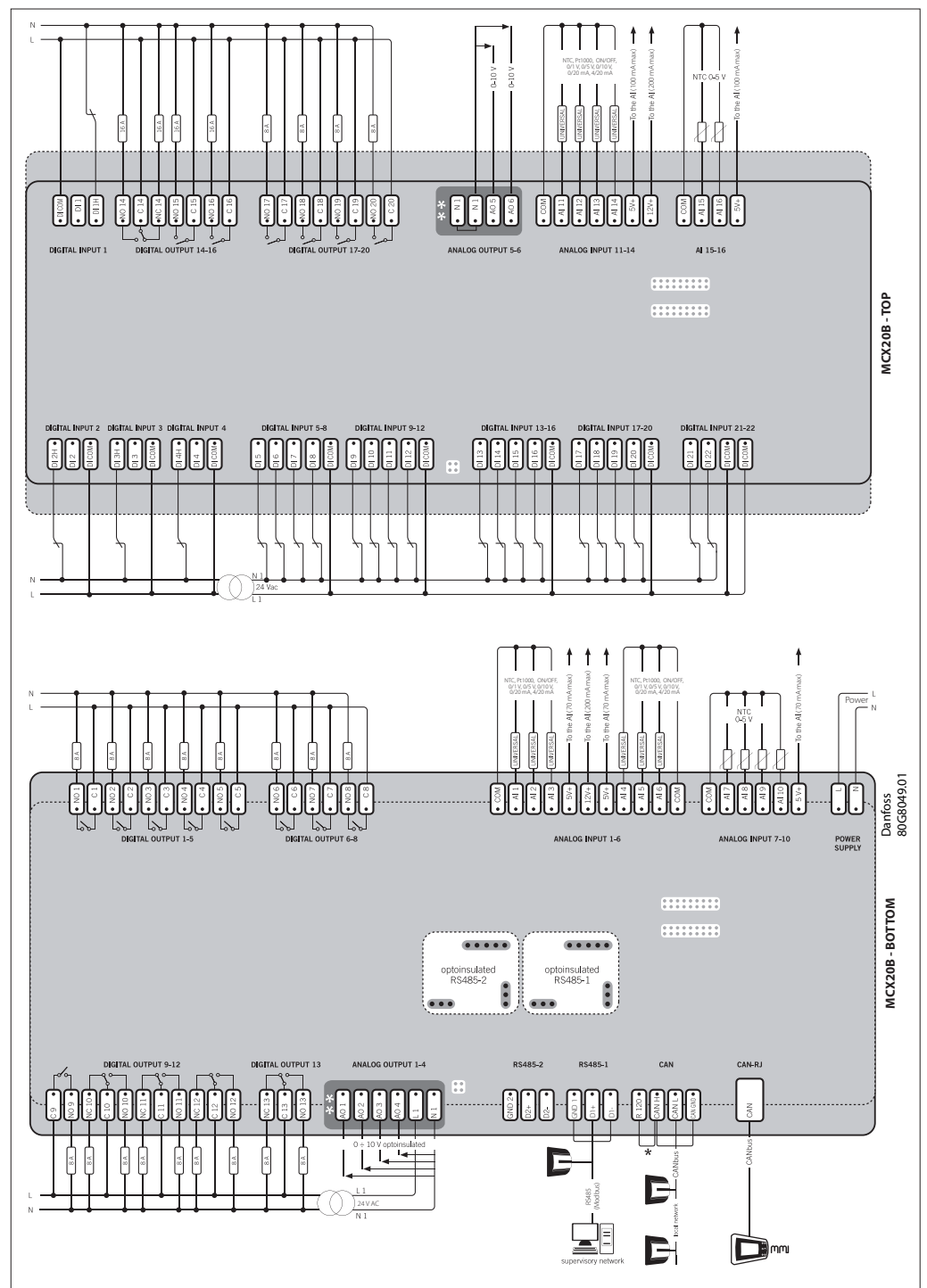
General features

FEATURES	DESCRIPTION
Power supply	85 – 265 V AC, 50/60 Hz Maximum power consumption: 31 V A Insulation between power supply and the extra-low voltage: reinforced
	20 – 60 V DC or 24 V AC ± 15%, 50/60 Hz Maximum power consumption: 17 W, 25 V A Insulation between power supply and the extra-low voltage: functional
	Note: <i>check the product number to determine the power supply type</i>
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 Leakage current: ≥ 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 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	6	<b>AI7, AI8, AI9, AI10, AI15, AI16</b> 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	10	<b>AI1, AI2, AI3, AI4, AI5, AI6, AI11, AI12, AI13, AI14</b> 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, 400 mA max for 4 / 20 mA transmitter (total on all outputs) 5 V+ power supply 5 V DC, 410 mA max for 0 / 5 V transmitter (total on all outputs)
Digital inputs	24 V AC optoins.	22	<b>DI1, DI2, DI3, DI4, DI5, DI6, DI7, DI8, DI9, DI10, DI11, DI12, DI13, DI14, DI15, DI16, DI17, DI18, DI19, DI20, DI21, DI22</b> Inputs optoinsulated, 24 V AC / 50/60 Hz or 24 V DC Rated current: 5 mA
	230 V AC optoins.	4	<b>DIH1, DIH2, DIH3, DIH4</b> Inputs optoinsulated, 230 V AC / 50/60 Hz Basic insulation Rated current: 2 mA at 230 V AC; 1 mA at 110 V AC 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	6	<b>AO1, AO2, AO3, AO4, AO5, AO6</b> Analog outputs optoinsulated 0 / 10 V DC 10 mA max for each output: <ul style="list-style-type: none"> <li>• 40 mA max totally on 6 outputs</li> </ul> External power supply 24 V AC / V DC
Digital output	Relay	20	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 20</li> </ul> Insulation between relays of the same group: functional Insulation between relays of different groups: reinforced Insulation between relays and the extra-low voltage parts: reinforced Total current load limit: 123 A <b>C1-NO1, C2-NO2, C3-NO3, C4-NO4, C5-NO5, C6-NO6, C7-NO7, C8-NO8, C9-NO9, C17-NO17, C18-NO18, C19-NO19, C20-NO20</b> 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> 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>C15-NO15, C16-NO16</b> High inrush current (80 A - 20 ms) normally open contact relays 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) = 0.5</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> <b>C14-NO14-NC14</b> 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) = 0.5</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

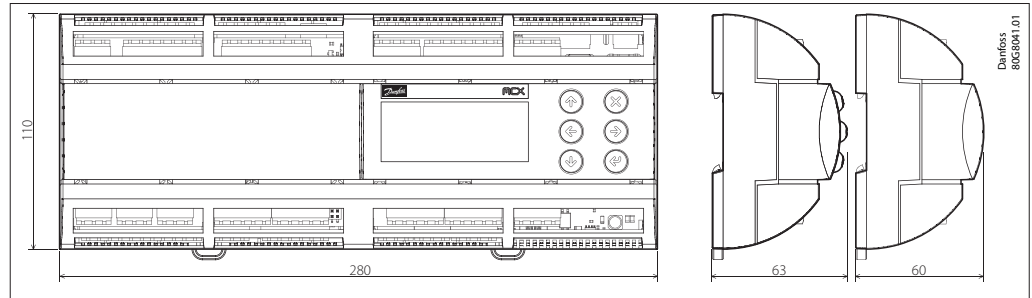


\*NOTE: connection has to be made on the first and last local network units, make the connection as close as possible to the connector  
 \*\*NOTE: optoinsulated analog outputs voltages are referenced to contact N1

**Connection**

CONNECTORS	TYPE	DIMENSIONS
<b>TOP BOARD</b>		
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 14-16 connector	7 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 17-20 connector	8 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 5-6 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>
Analog input 11-14 connector	7 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 15-16 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>
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 17-20 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 21-22 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>		
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	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.
MCX20B, 230V, LCD, RS485, RTC, S	080G0045
MCX20B, 24V, LCD, 2XRS485, RTC, S	080G0057
MCX20B, 24V, 2XRS485, RTC, S	080G0059
MCX20B, 230V, LCD, RS485, RTC, I	080G0139
MCX20B, 24V, RTC, I	080G0142
MCX20B, 230V, RS485, RTC, I	080G0145
MCX20B, 24V, 2XRS485, RTC, I	080G0146

*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.
MCX20B CONNECTORS KIT	080G0182