

Danfoss

**MCX15B
Electronic
Controller**



Danfoss MCX15B Electronic Controller Instructions

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Specifications

- **Input:** Analog NTC, 0/1 V, 0/5 V (software configurable), Universal NTC, Pt1000, 0/1 V, 0/5 V, 0/10 V, ON/OFF,

0/20 mA, 4/20 mA

- **Digital Inputs:** 24 V optoisolated, 230 V AC optoisolated
- **Analog Outputs:** 0/10 V DC optoisolated PWM, PPM (software configurable)
- **Power Supply:** 24 V AC / 20-60 V DC, 110 V / 230 V AC
- **Other:** Programming key connection, remote keyboard terminal connection, Buzzer, CANbus, RTC Clock, Modbus RS485 Serial

Product Usage Instructions

Installation and Setup

1. Ensure the power supply matches the product requirements.
2. Connect the necessary analog and digital inputs based on your configuration needs.
3. Configure the analog input types using the provided software.
4. Set up the analog outputs according to your application requirements.

Programming and Configuration

Use the software provided to configure input types, set up digital inputs and outputs, and adjust output parameters as needed for your specific application.

Operation

1. Power on the device and ensure all connections are secure.
2. Monitor the input signals and adjust settings if necessary.
3. Observe the output responses and make any adjustments required for optimal performance.

Maintenance

Regularly check connections, clean the device if needed, and ensure proper ventilation for optimal performance and longevity.

Controllo elettronico MCX15B



AN15468641839001-000701



3106000420

GENERAL FEATURES

- 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 and up to two Modbus RS485 serial communication interfaces.
- Furthermore it is available in two models, powered at 110-230 V AC or 24 V AC

	MCX15B
ANALOG INPUTS	
NTC, 0/1 V, 0/5 V, selectable via software	4
Universal NTC, Pt1000, 0/1 V, 0/5 V, 0/10 V, ON/OFF, 0/20 mA, 4/20 mA, selectable via software	6
Total number	10
DIGITAL INPUTS	
24 V optoinsulated	18
230 Vac optoinsulated	4
Total number	18
ANALOG OUTPUTS	
0/10 V DC optoinsulated	4
PWM, PPM selectable via software	2
Total number	6
DIGITAL OUTPUTS	
SPDT relay 16 A (changeover contacts)	2
SPST relay 8 A (normally open contacts)	9
SPDT relay 8 A (changeover contacts)	4
Total number	15
OTHERS	
Power supply 24 V AC / 20/60 V DC	•
Power supply 110 V / 230 V AC	•
Connection for programming key	•
Connection for remote display and keyboard	•
Buzzer	•
CANbus	•
RTC clock	•
Modbus RS485 serial interface	•
Dimensions (DIN modules)	16
Mounting	DIN rail

GENERAL FEATURES AND WARNINGS

PLASTIC HOUSING FEATURES

- 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

OTHER FEATURES

- Operating conditions CE: -20T60 / UL: 0T55, 90% RH non-condensing – Storage conditions: -30T80, 90% RH non-condensing
- To be integrated in Class I and/or II appliances
- Index of protection: IP40 only on the front cover
- Period of electric stress across insulating parts: long
- Suitable for use in environments with degree of pollution 2
- Category of resistance to heat and fire: D
- Immunity against voltage surges: category II
- Software class and structure: class A

CE MARK

This product is designed to comply with the following EU standards:

- Low voltage directive LVD 2014/35/EU:
- EN60730-1: 2011 (Automatic electrical control for household and similar use. General requirements)
- EN60730-2-9: 2010 (Particular Requirements for Temperature Sensing Controls)
- EN 61000-6-3: 2007 +A1: 2011 (Emission standard for residential, commercial and light-industrial environments)
- EN 61000-6-2: 2005 (Immunity for industrial environments)
- EN50581: 2012

UL APPROVAL

- UL file: E31024

GENERAL WARNINGS

- Every use that is not described in this manual is considered incorrect and is not authorised by the manufacturer
- Verify that the installation and operating conditions of the device respect the ones specified in the manual, specially concerning the supply voltage and environmental conditions
- This device contains live electrical components therefore all the service and maintenance operations must be performed by qualified personnel
- The device can't be used as a safety device
- Liability for injury or damage caused by the incorrect use of the device lies solely with the user

INSTALLATION WARNINGS

- Mounting position recommended: vertical
- The installation must be executed according the local standards and legislation of the country
- Always operate on the electrical connections with the device disconnected from the main power supply
- Before carrying out any maintenance operations on the device, disconnect all the electrical connections
- For safety reasons the appliance must be fitted inside an electrical panel with no live parts accessible
- Don't expose the device to continuous water sprays or to relative humidity greater than 90%.
- Avoid exposure to corrosive or pollutant gases, natural elements, environments where explosives or mixes of flammable gases are present, dust, strong vibrations or chock, large and rapid fluctuations in ambient temperature that in combination with high humidity can condensate, strong magnetic and/or radio interference (e.g. transmitting antennae)
- When connecting loads beware of the maximum current for each relay and connector
- Use cable ends suitable for the corresponding connectors. After tightening the screws of connectors, slightly tug the cables to check their tightness
- Use appropriate data communication cables. Refer to the Fieldbus Installation Guide for the kind of cable to be used and setup recommendations
- Reduce the path of the probe and digital inputs cables as much as possible, and avoid spiral paths enclosing power devices. Separate from inductive loads and power cables to avoid possible electromagnetic noises
- Avoid touching or nearly touching the electronic components fitted on the board to avoid electrostatic discharges

DISPOSAL INSTRUCTION

- Equipment containing electrical components may not be disposed together with domestic waste. It must be separately collected with electrical and electronic waste according to local and valid legislation.

TECHNICAL SPECIFICATIONS

POWER SUPPLY

- 85 – 265 V AC, 50/60 Hz. Maximum power consumption: 26 VA. Insulation between power supply and the extra-low voltage: reinforced
- 20 – 60 V DC and 24 V AC ± 15% 50/60 Hz SELV. Maximum power consumption: 12 W, 20 VA. Insulation between power supply and the extra-low voltage: functional

I/O	TYPE	NUMBER	SPECIFICATIONS
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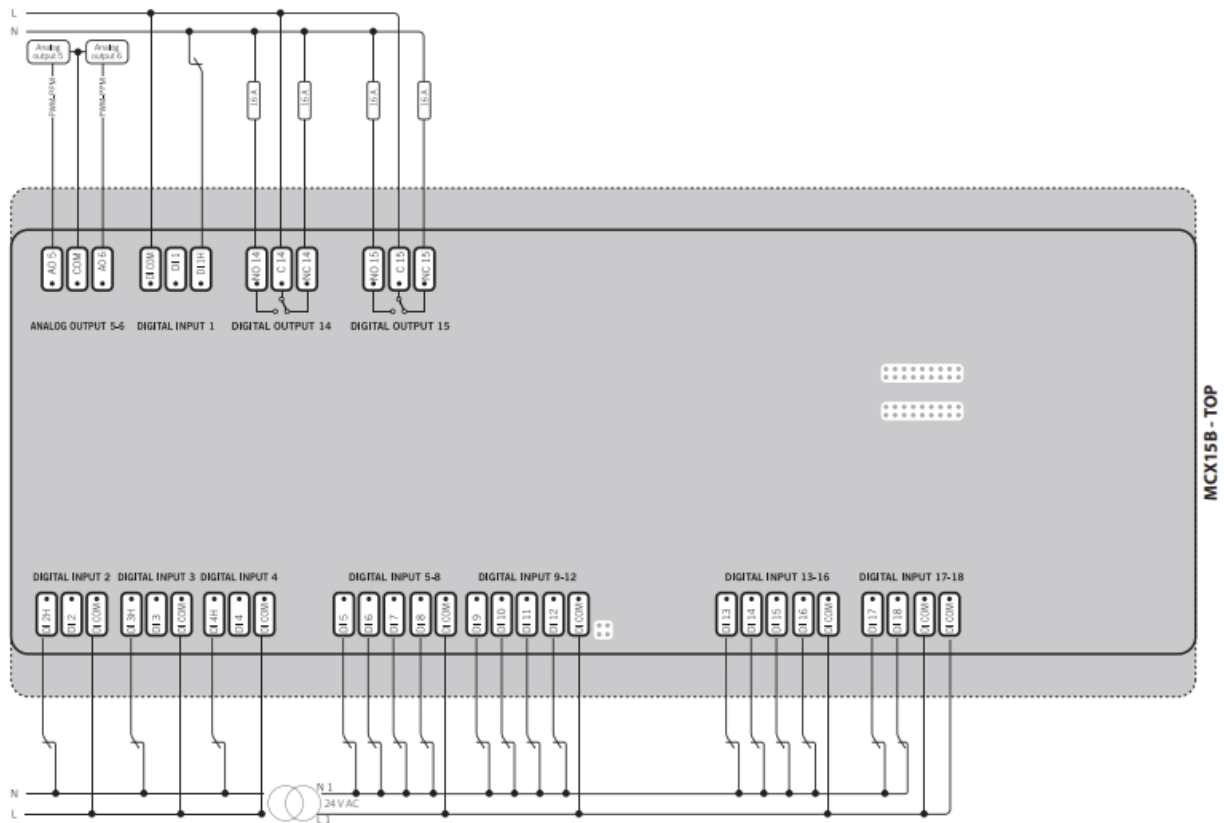
Digital outputs	Relay	15	<p>Concerning the insulation distance there are three groups of relays:</p> <ul style="list-style-type: none"> – group 1: relays 1 to 8 – group 2: relays 9 to 13 – group 3: relays 14 to 15 <p>Insulation between relays of the same group: functional Insulation between relays of different groups: reinforced</p> <p>Insulation between relays and the extra-low voltage parts: reinforced Total current load limit: 92 A</p> <p>C1-NO1 to C9-NO9</p> <p>Normally open contact relays 8 A:</p> <ul style="list-style-type: none"> – characteristics of each relay: <p><i>6 A 250 V AC for resistive loads – 100.000 cycles</i></p> <p><i>4 A 250 V AC for inductive loads – 100.000 cycles with $\cos(\phi) = 0.6$</i></p> <p><i>UL: 240 V AC – 4 A resistive – 3.6 FLA – 21.6 LRA – 346 VA pilot duty 30.000 cycles</i></p> <p>C10-NO10-NC10 to C13-NO13-NC13</p> <p>Changeover contacts relay 8 A:</p> <ul style="list-style-type: none"> – characteristics of each relay: <p><i>6 A 250 V AC for resistive loads – 100.000 cycles</i></p> <p><i>4 A 250 V AC for inductive loads – 100.000 cycles with $\cos(\phi) = 0.6$</i></p> <p><i>UL: 240 V AC – 4 A resistive – 3.6 FLA – 21.6 LRA – 346 VA pilot duty 30.000 cycles</i></p> <p>C14-NO14-NC14, C15-NO15-NC15</p> <p>High inrush current (80 A – 20 ms) changeover contacts relay 16 A:</p> <ul style="list-style-type: none"> – characteristics of each relay: <p><i>7 A 250 V AC for resistive loads – 100.000 cycles</i></p> <p><i>3.5 A 230 V AC for inductive loads – 230.000 cycles with $\cos(\phi) = 0.4$</i></p> <p><i>UL: 240 V AC – 6 A resistive – 4.9 FLA – 29.4 LRA – 470 VA pilot duty 30.000 cycles</i></p> <p>Using of device in case of $T_{amb} = 70\text{ }^{\circ}\text{C}$ has to be according to following requirements:</p> <ul style="list-style-type: none"> – maximum load admitted for 8 A relay: 4 A 250 V AC – maximum load admitted for 16 A relay: 5 A 250 V AC
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I/O	TYPE	NUMBER	SPECIFICATIONS
Digital inputs	24 V optoinsulated	18	DI1 to DI18 Digital Inputs optoinsulated 24 V AC 50-60 Hz or 24 V DC Rated current: 5 mA
	230 V AC optoinsulated	4	DIH1 to DIH4 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	4	AO1 to AO4 Analog outputs optoinsulated 0/10 V DC minimum load 1 k Ω (10 mA) for each output External power supply 24 V AC / V DC
	PWM, PPM	2	AO5, AO6 Analog outputs selectable via software between: - pulsing output, synchronous with the line, at modulation of impulse position (PPM) or modulation of impulse width (PWM) - pulsing output, at modulation of impulse width (PWM) with range 20 Hz to 1 KHz: <i>open circuit voltage: 6.8 V</i> <i>minimum load 1 kΩ (10 mA)</i>
Analog inputs	NTC, 0/1 V, 0/5 V	4	AI7 to AI10 Analog inputs selectable via software between: - NTC temperature probes, default: 10 k Ω at 25 °C - pressure transducers with 0/5 V output - 0/5V type: impedance is 18 k Ω
	Universal	6	AI1 to AI6 Universal analog inputs selectable via software between: - ON/OFF (current: 20 mA) - 0/1 V, 0/5 V, 0/10 V - 0/20 mA, 4/20 mA - NTC (10 k Ω at 25 °C) - Pt1000 12 V+ power supply 12 V DC, 200 mA max for 4/20 mA transmitter (total on all outputs) 5 V+ power supply 5 V DC, 210 mA max for 0/5 V transmitter (total on all outputs) 0/5V type: impedance is 18 k Ω 0/10V type: impedance is 2 k Ω

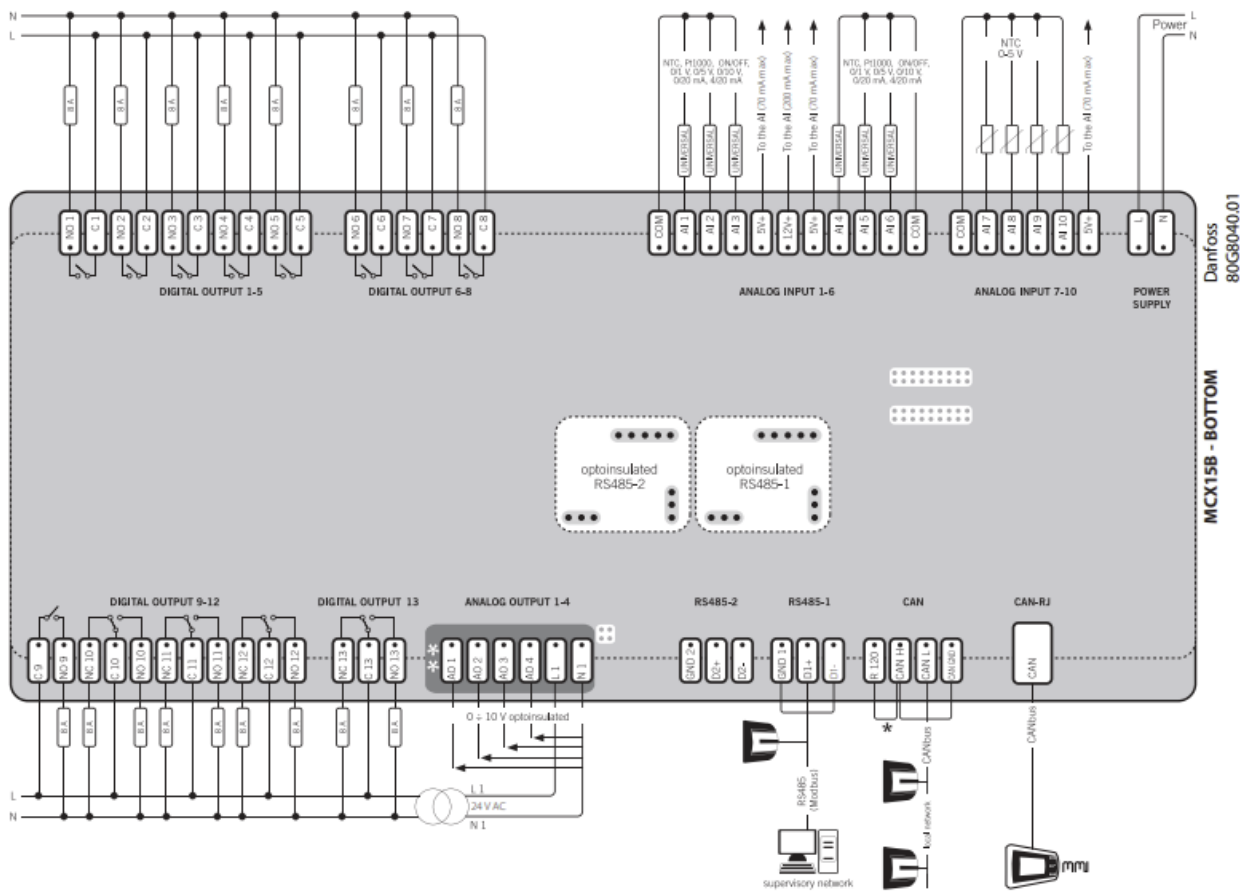
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CONNECTION DIAGRAM

TOP BOARD



BOTTOM BOARD



CONNECTIONS

TOP BOARD

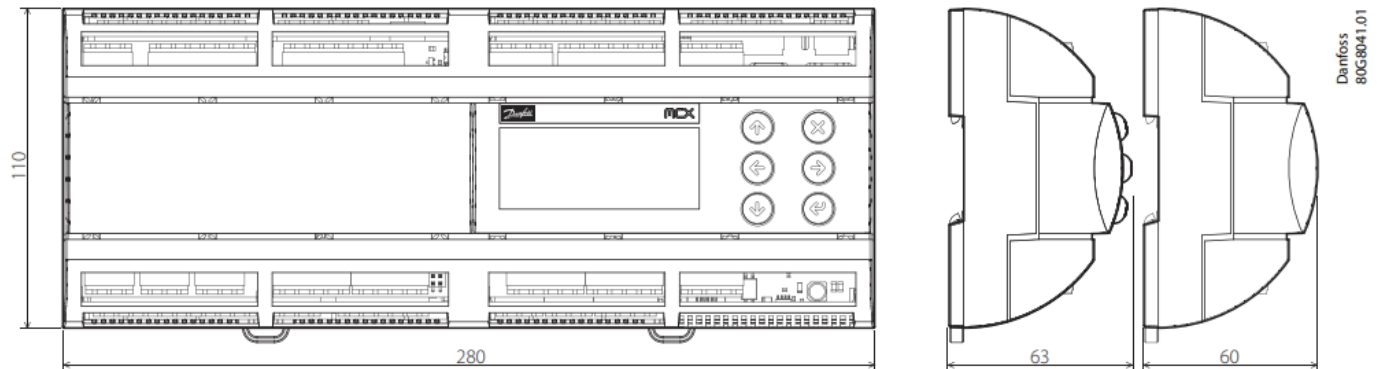
- Analog output 5-6 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 1 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital output 14 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital output 15 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 2 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 3 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 4 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 5-8 connector
- 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 9-12 connector
- 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 13-16 connector
- 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital input 17-18 connector
- 4 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²

BOTTOM BOARD

- Analog output 5-6 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital output 1-5 connector
- 10 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital output 6-8 connector
- 6 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Analog input 1-6 connector
- 11 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Analog input 7-10 connector
- 6 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Power supply connector
- 2 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital output 9-12 connector
- 11 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Digital output 13 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- Analog output 1-4 connector
- 6 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- RS485-2 connector

- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- RS485-1 connector
- 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- CAN connector
- 4 way screw plug-in connector type pitch 5 mm: section cable 0.2-2.5 mm²
- CAN-RJ connector
- 6/6 way telephone RJ12 plug type

DIMENSIONS



USER INTERFACE

DISPLAY LCD

- display mode: STN blue transmissive
- backlight: white LED backlight adjustable via software
- display format: 128×64 dots
- active visible area : 58×29 mm
- number of keys: 6
- Settings of the LCD display like contrast and brightness, might need to be adjusted due to external ambient factors. Press and release simultaneously the Enter and X key after power ON to access the BIOS menu and select the DISPLAY menu. Use UP and
- Use the down arrow keys to adjust the contrast or the brightness of the display at the desired level.

PRODUCT PART NUMBERS

CODE 080G0036

DESCRIPTION

- MCX15B, 24V, LCD, RS485, RTC, Single Pack

FAQS

Q: What is the maximum total load capacity for the digital outputs?

A: The maximum total load capacity for the digital outputs is 92 A.

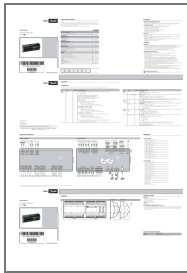
Q: How do I configure the analog outputs for specific voltage ranges?

A: Use the provided software to configure the analog outputs between 0-10 V DC and adjust the settings based on your requirements.

Q: Can I use both 24 V AC and 230 V AC inputs simultaneously?


A: Yes, you can use both 24 V AC and 230 V AC inputs simultaneously for different purposes as needed.

Documents / Resources



[Danfoss MCX15B Electronic Controller](#) [pdf] Instructions
MCX15B, MCX15B Electronic Controller, Electronic Controller, Controller

References

-  [MCX controllers](#) | [MCX programmable controls](#) | [Danfoss](#)
- [User Manual](#)

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