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## Danfoss MCX08M2 TTL Electronic Controller



## **General features**

MCX08M2 is an electronic controller that holds all the typical functionalities of MCX controllers in the compact size of 8 DIN modules: programmability, connection to the CAN bus local network, Modbus RS485 serial communication interface.

MCX08M2 with TTL version is moreover available in the version with display and power supply 110 – 230 V AC.

## **MCX08M2 with TTL**

	<b>MCX08M2 with TTL</b>
<b>ANALOG INPUTS</b>	
NTC, 0/1 V, 0/5 V, 0/10 V, PT1000, 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	4
<b>Total number</b>	<b>8</b>
<b>DIGITAL INPUTS</b>	
Voltage free contact	8
<b>Total number</b>	<b>8</b>
<b>ANALOG OUTPUTS</b>	
0/10 V DC optoisolated	2
0/10 V DC, PWM, PPM selectable via software	2
<b>Total number</b>	<b>4</b>
<b>DIGITAL OUTPUTS</b>	
SPST relay 16 A (normally open contacts)	2
SPST relay 8 A (normally open contacts)	2
SPDT relay 8 A (changeover contacts)	4
<b>Total number</b>	<b>8</b>
<b>OTHERS</b>	
Power supply 110 V / 230 V AC	•
Connection for programming key	•
Connection for remote display and keyboard	•
Buzzer	•
CANbus	•
RTC clock	•
Modbus RS-485 serial interface	•
Serial TTL	•
Dimensions (DIN modules)	8
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:  $\geq 250$  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

### **Compliance**

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)
- Electromagnetic compatibility EMC directive 2014/30/EU:
  - 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)
- RoHS directive 2011/65/EU and 2015/863/EU:
  - 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, especially 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 to 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 mixtures of flammable gases are present, dust, strong vibrations or shock, 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 noise
- Avoid touching or nearly touching the electronic components fitted on the board to avoid electrostatic discharges

## DISCLAIMER

### Professional Use Only

This product is not subject to the UK PSTI regulation, as it is for supply to and use only by professionals with the necessary expertise and qualifications. Any misuse or improper handling may result in unintended consequences. By purchasing or using this product, you acknowledge and accept the professional-use-only nature of its application. Danfoss does not assume any liability for damages, injuries, or adverse consequences ("damage") resulting from the incorrect or improper use of the product and you agree to indemnify Danfoss for any such damage resulting from your incorrect or improper use of the product.



### Disposal instruction

Equipment containing electrical components may not be disposed of 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: 20 VA. Insulation between the power supply and the extra-low voltage: reinforced
- 20 – 60 V DC e 24 V AC  $\pm$  15% 50/60 Hz SELV. Maximum power consumption: 10 W, 17 VA. Insulation between power supply and the extra-low voltage: functional

I/O	TYPE	NUM	SPECIFICATIONS
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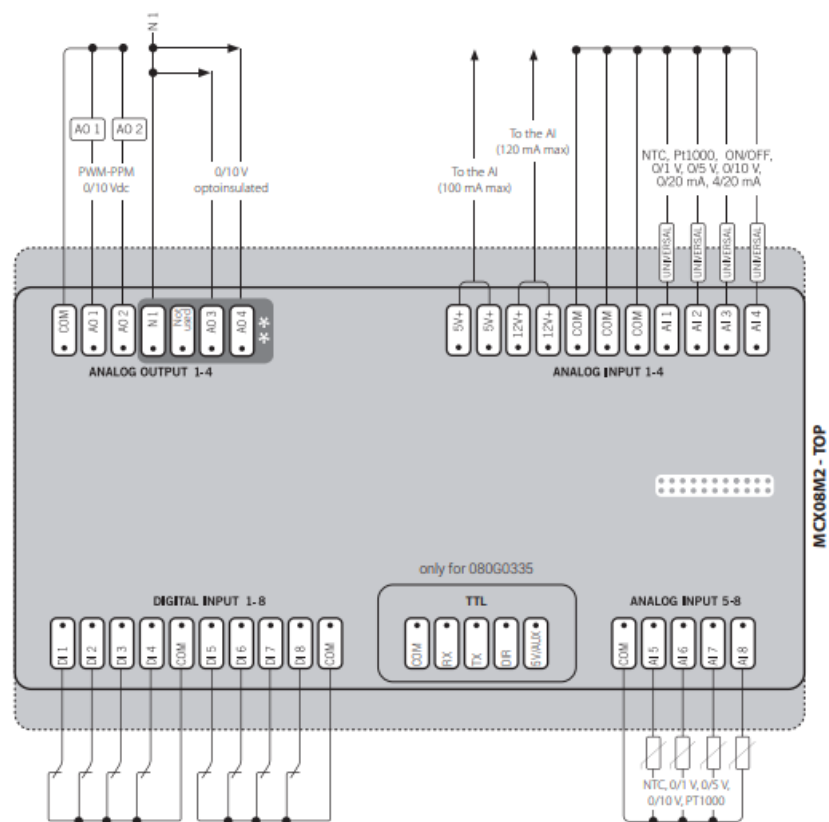
<b>Analog inputs</b>	NTC 0 / 1V 0 / 10V PT1000	4	<b>AI5, AI6, AI7, AI8</b>  Analog inputs are selectable via software between: <ul style="list-style-type: none"> <li>• 0 / 1 V, 0 / 5 V, 0 / 10 V : impedance is greater than 1M Ω</li> <li>• NTC (10 kΩ at 25 °C)</li> <li>• Pt1000</li> </ul>
	Universal	4	<b>AI1, AI2, AI3, AI4</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 : impedance is greater than 1M Ω</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, 120 mA max for 4/20 mA transmitter (total on all outputs)  5 V+ power supply 5 V DC, 100 mA max for 0/5 V transmitter (total on all outputs)
<b>Digital input</b>	Voltage-free contact	8	<b>DI1, DI2, DI3, DI4, DI5, DI6, DI7, DI8</b>  Current consumption: 10 mA
<b>Analog outputs</b>	0 / 10 V DC options	2	<b>AO3, AO4</b>  <ul style="list-style-type: none"> <li>• Analog outputs optoisolated 0/10 V DC, minimum load 1 K Ω (10 mA) for each output</li> </ul>
	PWM PPM 0 / 10 V DC	2	<b>AO1, AO2</b>  Analog outputs are selectable via software between: <ul style="list-style-type: none"> <li>• 0/10 V dc minimum load 1K Ω (10 mA) for each output</li> <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 position (PPM) with range 20 Hz to 1 KHz: open circuit voltage: 6.8 V</li> </ul>

Digital output	Relay	8	<p>Insulation between the relay: functional</p> <p>Insulation between relays and the extra-low voltage parts: reinforced. Total current load limit: 32 A</p> <p><b>C1-NO1, C2-NO2</b></p> <p>High inrush current (80 A – 20 ms) normally open contact relays 16 A Characteristics of each relay:</p> <ul style="list-style-type: none"> <li>• 10 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 <math>\cos(\phi) = 0.5</math></li> </ul> <p><b>C5-NO5, C6-NO6</b></p> <p>Normally open contact relays 8 A. Characteristics of each relay:</p> <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 <math>\cos(\phi) = 0.6</math></li> </ul> <p><b>C3-NO3-NC3, C4-NO4-NC4, C7-NO7-NC7, C8-NO8-NC8</b></p> <p>Changeover contacts relay 8 A. Characteristics of each relay:</p> <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 <math>\cos(\phi) = 0.6</math></li> </ul>
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## Connection diagram

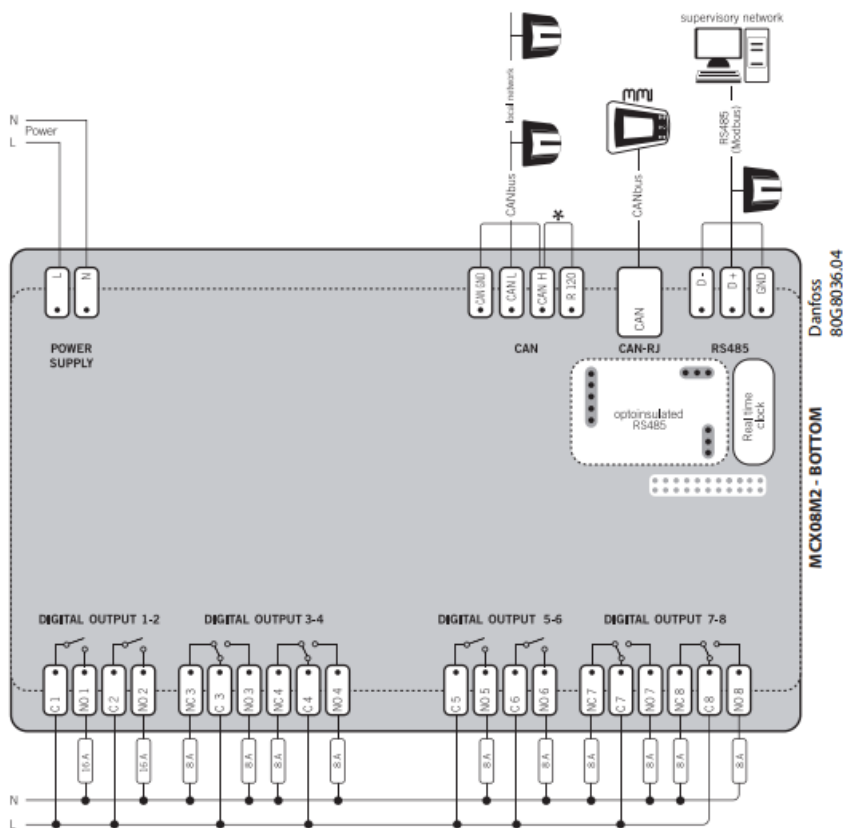
### TOP BOARD

TOP BOARD



BOTTOM BOARD

BOTTOM BOARD



Connection

Connectors	Type	Dimensions
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Top Board		
Analog output 1-4 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 1-4 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 input 1-8 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>
Analog 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>
TTL connector (only for 080G0335)	5 way spring plug-in connector type	<ul style="list-style-type: none"> <li>pitch 2.5 mm</li> <li>section cable 0.2 – 2.5 mm<sup>2</sup></li> </ul>
Bottom Board		
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>
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 RJ12 plug type	
RS485 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 1-2 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 output 3-4 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>
Digital 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>
Digital output 7-8 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>

## User interface

## LCD Display

Display mode: STN blue transmissive

Backlight: white LED backlight adjustable via software

Display format: 128 x 64 dots

Active visible area : 58 x 29 mm

Contrast: adjustable via software

## Keyboard

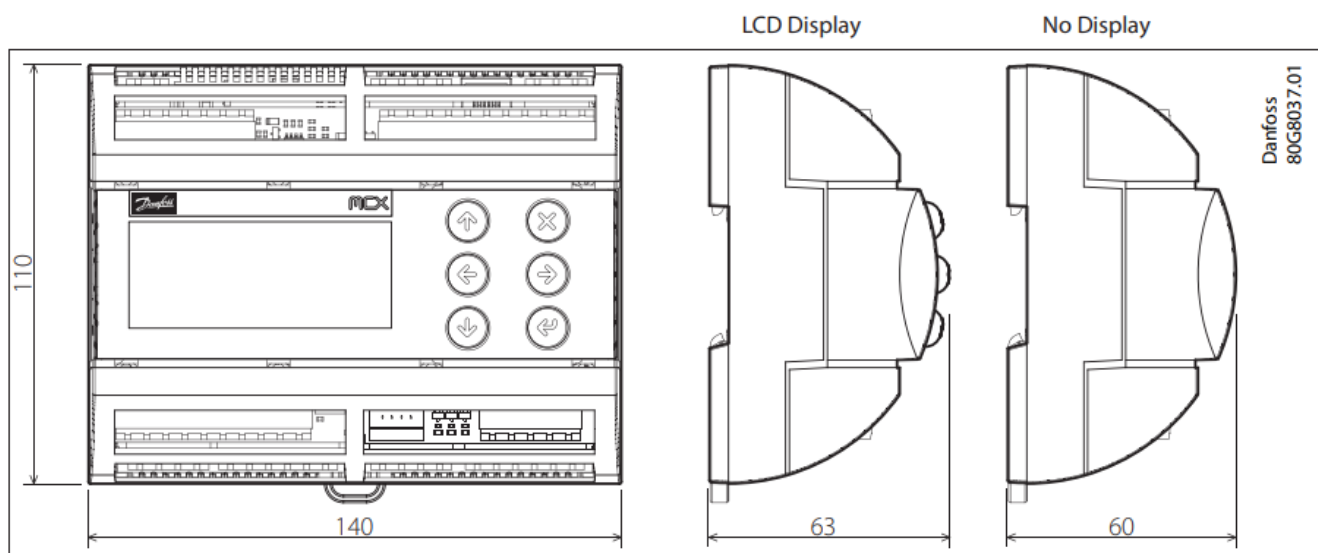
Number of keys: 6

Keys function is settled by the application software

## Display settings adjustment

Setting 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 DOWN arrow keys to adjust the contrast or the brightness of the display at the desired level.

## Dimensions



## Product part numbers

Description	Code No.
MCX08M2, 230 V, LCD, RS485, TTL, Single Pack	080G0335

## Accessories part numbers

Description	Code No.
MCX08M CONNECTORS KIT	080G0180

## CONTACT

Via San Giuseppe 38/G 31015 Conegliano

(TV) Italy

- Tel: +39 0438 336611
- Fax: +39 0438 336699

[info.mcx@danfoss.com](mailto:info.mcx@danfoss.com)  
[www.danfoss.com](http://www.danfoss.com)



## Danfoss A/S


Climate Solutions • [danfoss.com](http://danfoss.com) • +45 7488 2222

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## Documents / Resources

	<p><a href="#">Danfoss MCX08M2 TTL Electronic Controller [pdf]</a> Installation Guide  MCX08M2, MCX08M2 TTL Electronic Controller, TTL Electronic Controller, Electronic Controller, Controller</p>
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## References

- [User Manual](#)

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