



# MCX20B electronic 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 and up to two Modbus RS485 serial communication interfaces. Furthermore it is available in two models, powered at 110-230Vac or 24Vac

REERIGERATION & AIR CONDITIONING DIVISION



## **GENERAL FEATURES**

	MCX20B
ANALOG INPUTS	
NTC, 0/1V, 0/5V	6
Universal (NTC, Pt1000, 0/1V, 0/5V, 0/10V, ON/OFF, 0/20mA, 4/20mA) selectable via software	10
Total number	16
DIGITAL INPUTS	
24V optoinsulated	22
230Vac optoinsulated	4
Total number	22
ANALOG OUTPUTS	
0/10Vdc optoinsulated	6
Total number	6
DIGITAL OUTPUTS	
SPST relay 16A (normally open contacts)	2
SPDT relay 16A (changeover contacts)	1
SPST relay 8A (normally open contacts)	13
SPDT relay 8A (changeover contacts)	4
Total number	20
OTHERS	
Power supply 24V AC/20-60V DC	
Power supply 110V/230V 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 bar



Viale Venezia, 59

## **TECHNICAL SPECIFICATIONS**

POWER SUPPLY Danfoss Electronics spa

## - 85-265Vac, 50-60Hz. Maximum power consumption: 31VA. Insulation between power supply and the extra-low voltage: reinforced

- 20-60Vdc or 24Vac ± 15%, 50/60Hz. Maximum power consumption: 17W, 25VA. Insulation between power supply and the extra-low voltage: functional

- maximum load admitted for 16A relay: 5A 250Vac

31020 San Vendemiano (TV) Italy	1/0	TYPE	NUMBER	SPECIFICATIONS	1/0	ТҮРЕ	NUMBER	SPECIFICA
Digital el: +39 0438 336611 outputs	Digital Relay outputs	Relay 20 Concerning the insulation distance there are three groups of relays: - group 1: relays 1 to 8	Concerning the insulation distance there are three groups of relays: - group 1: relays 1 to 8	Digital	24V optoinsulated	22	DI1 to DI22 Inputs opto	
Fax: +39 0438 336699				- group 2: relays 9 to 13 - group 3: relays 14 to 20		230Vac optoinsulated	4	DIH1 to DIH
info@danfosselectronics.com www.danfosselectronics.com material. Danfoss reserves the right h alternations can be made without terial are property of the respective				Insulation between relays of the same group: functional Insulation between relays of different groups: reinforced				- NOTE: wh
		Insulation between relays and the extra-low voltage parts: reinforced Total current load limit: 123A C1-NO1 to C9-N09, C17-NO17 to C20-NO20 Normally open contact relays 8A: - characteristics of each relay: 6A 250Vac for reisitive loads - 100.000 cycles 4A 250Vac for reisitive loads - 100.000 cycles 4A 250Vac for reisitive loads - 100.000 cycles C10-NO10-NC10 to C13-NO13-NC13 Changeover contacts relay 8A: - characteristics of each relay: 6A 250Vac for inductive loads - 100.000 cycles 4A 250Vac for inductive loads - 100.000 cycles C15-NO15 to C16-NO16 High inrush current (80A - 20ms) normally open contact relays 16A: - characteristics of each relay: 7A 250Vac for reisitive loads - 100.000 cycles 3.5A 230Vac for inductive loads - 200.000 cycles C14-NO14-NC14	Insulation between relays and the extra-low Total current load limit: 123A C1-NO1 to C9-NO9, C17-NO17 to C20-NO2	nsulation between relays and the extra-low voltage parts: reinforced Total current load limit: 123A	Analog outputs Analog inputs	0/10V NTC, 0/1V, 0/5V	6	AO1, AO2, A
				C1-NO1 to C9-NO9, C17-NO17 to C20-NO20				External pov
				Normally open contact relays 8A: - characteristics of each relay: 6A 250Vac for resistive loads - 100.000 cycles 4A 250Vac for inductive loads - 100.000 cycles with cos(phi) = 0.6				AI7 to AI10, Inputs selec - NTC tem - pressure
				Universal	10	Al1 to Al6, A Universal an - ON/OFF - 0/1V, 0/5' - 0/20mA, - NTC (10k - Pt1000		
						12V+ power 5V+ powers		
				C14-N014-NC14				
				High inrush current (80A - 20ms) changeover contacts relay 16A: - characteristics of each relay: 7A 250Vac for resistive loads - 100.000 cycles 3.5A 230Vac for inductive loads - 230.000 cycles with cos(phi) = 0.5 UL: 240Vac - 6A resistive - 4.9FLA - 29.4LRA - 470VA pilot duty 30.000 cycles				
				Using of device in case of Tamb = $70^{\circ}$ C has to be according to following requirements:				

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## **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: ≥ 250V 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 using in a normal pollution environment Category of resistance to heat and fire: D Immunity against voltage surges: category II
- Software class and structure: class A

### CE COMPLIANCE

- CE COMPLIANCE This product is designed to comply with the following EU standards: Low voltage guideline: 73/23/EEC Electromagnetic compatibility EMC: 89/336/EEC and with the follwing norms: EN61000-6-1, EN61000-6-3 (immunity for residential, commercial and ligth-industrial environments) EN61000-6-2, EN61000-6-4 (immunity and emission standard for industrial environments) EN60730 (Automatic electrical controls for household and similar use)

## 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 - 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 reccomended: vertical
- The installation must be executed according the local standards and legislations 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
- 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

## TIONS

pinsulated, 24Vac 50/60Hz or 24Vdc

#### -14

oinsulated, 230Vac 50/60Hz. Basic insulation

hen the 230Vac DH1 input is used, the corresponding 24V DI1 input is not available anymore; the same for the of inputs DIH2 and DI2, DIH3 and DI3, DIH4 and DI4

## AO3, AO4, AO5, AO6

puts optoinsulated 0/10Vdc 10mA Max for each output: – 40mA Max totally on 6 outputs , wer supply 24Vac/Vdc

### , AI15, AI16

ctable via software between

perature probes, default: 10kΩ at 25°C transducers with 0/5V output

## Al11 to Al14

nalog inputs selectable via software between:

(current: 20mA)

5V, 0/10V , 4/20mA

<Ω at 25°C)

r supply 12Vdc, 400mA max for 4/20mA transmitter (total on all outputs) supply 5Vdc, 410mA max for 0/5V transmitter (total on all outputs)



\*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

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MCX20B electronic controller





No display

LCD display



## CONNECTIONS

#### TOP BOARD

- Digital input 1 connector
- Jumpter Point Connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Digital output 14-16 connector
- 7 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Digital output 17-20 connector
- Analog output 1-2 connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Analog output 5-6 connector
- Analog uuput 3-b connector
  4 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Analog input 11-14 connector
  7 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Analog input 15-16 connector
  4 way screw plug-in connector
  5 way screw plug-in connector
  6 way screw plug-in connector
  7 way sc

- A way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
  Digital input 2 connector
  3 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
  Digital input 3 connector
- 3 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Digital input 4 connector
- grant reper Pointector
   3 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Digital input 5-8 connector
- Sway screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Digital input 9-12 connector
- 5 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Digital input 13-16 connector
- Sway screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Digital input 17-20 connector
- S way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>
   Digital input 21-22 connector
- 4 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup>

### BOTTOM BOARD

#### - Digital output 1-5 connector 10 way screw plug-in connector type pitch 5mm; section cable 0.2-2.5mm<sup>2</sup>

- Digital output 6-8 connector Analog input 1-6 connector
- Analog input 0 connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Analog input 7-10 connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Double product of the section cable 0.2-2.5mm<sup>2</sup>
- Power supply connector 2 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Digital output 9-12 connector
- Digital output =/ 2 connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Digital output 13 connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> Analog output 1-4 connector
- 6 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> RS485 -2 connector
- 3 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> -CAN connector
- 4 way screw plug-in connector type pitch 5mm: section cable 0.2-2.5mm<sup>2</sup> CAN-RJ connector 6/6 way telephone RJ11 plug type

## USER INTERFACE

### LCD DISPLAY

- display mode: STN blue transmissive
- display from the LD backlight adjustable via software display format: 128x64dots active visible area : 58x29mm
- contrast: adjustable via software

## KEYBOARD

number of keys: 6
 keys function is settled by the application software

## PRODUCT PART NUMBERS

CODE	DESCRIPTION
080G0092	MCX20B, 24V, LCD, RTC, S
080G0093	MCX20B, 230V, LCD, RTC, S
080G0044	MCX20B, 24V, LCD, RS485, RTC, S
080G0045	MCX20B, 230V, LCD, RS485, RTC, S
080G0057	MCX20B, 24V, LCD, 2XRS485, RTC, S
080G0058	MCX20B, 230V, LCD, 2XRS485, RTC, S
080G0094	MCX20B, 24V, RTC, S
080G0095	MCX20B, 230V, RTC, S
080G0050	MCX20B, 24V, RS485, RTC, S
080G0051	MCX20B, 230V, RS485, RTC, S
080G0059	MCX20B, 24V, 2XRS485, RTC, S
080G0060	MCX20B, 230V, 2XRS485, RTC, S