



GENERAL FEATURES

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 110-230 Vac or 24 Vac.

Instruction sheet

Electronic controller
MCX20B



www.danfoss.com

MCX20B	
ANALOG INPUTS	
NTC, 0/1 V, 0/5 V, selectable via software	6
Universal NTC, Pt1000, 0/1 V, 0/5 V, 0/10 V, ON/OFF, 0/20 mA, 4/20 mA, selectable via software	10
Total number	16
DIGITAL INPUTS	
24 V optoisolated	22
230 Vac optoisolated	4
Total number	22
ANALOG OUTPUTS	
0/10 Vdc optoisolated	6
Total number	6
DIGITAL OUTPUTS	
SPST relay 16 A (normally open contacts)	2
SPDT relay 16 A (changeover contacts)	1
SPST relay 8 A (normally open contacts)	13
SPDT relay 8 A (changeover contacts)	4
Total number	20
OTHERS	
Power supply 24 Vac/20-60 Vdc	-
Power supply 110 V/230 Vac	-
Connection for programming key	-
Connection for remote display and keyboard	-
Buzzer	-
CANbus	-
RTC clock	-
Modbus RS485 serial interface	-
Dimensions (DIN module)	16
Mounting	DIN rail



GENERAL FEATURES AND WARNINGS

- PLASTIC HOUSING FEATURES**
- DIN rail mounting complying with EN 60715
 - Self-extinguishing 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 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**
- This product is designed to comply with the following EU standards:
- Low voltage guidelines: 73/23/EEC
 - Electromagnetic compatibility EMC: 89/336/EEC and with the following norms:
 - EN61000-6-1, EN61000-6-3 (immunity for residential, commercial and light-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 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 to 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
 - 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 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 noises
 - Avoid touching or nearby 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 Vac, 50-60 Hz. Maximum power consumption: 31 VA. Insulation between power supply and the extra-low voltage: reinforced
- 20-60 Vdc or 24 Vac $\pm 15\%$, 50/60 Hz. Maximum power consumption: 17 W, 25 VA. Insulation between power supply and the extra-low voltage: functional

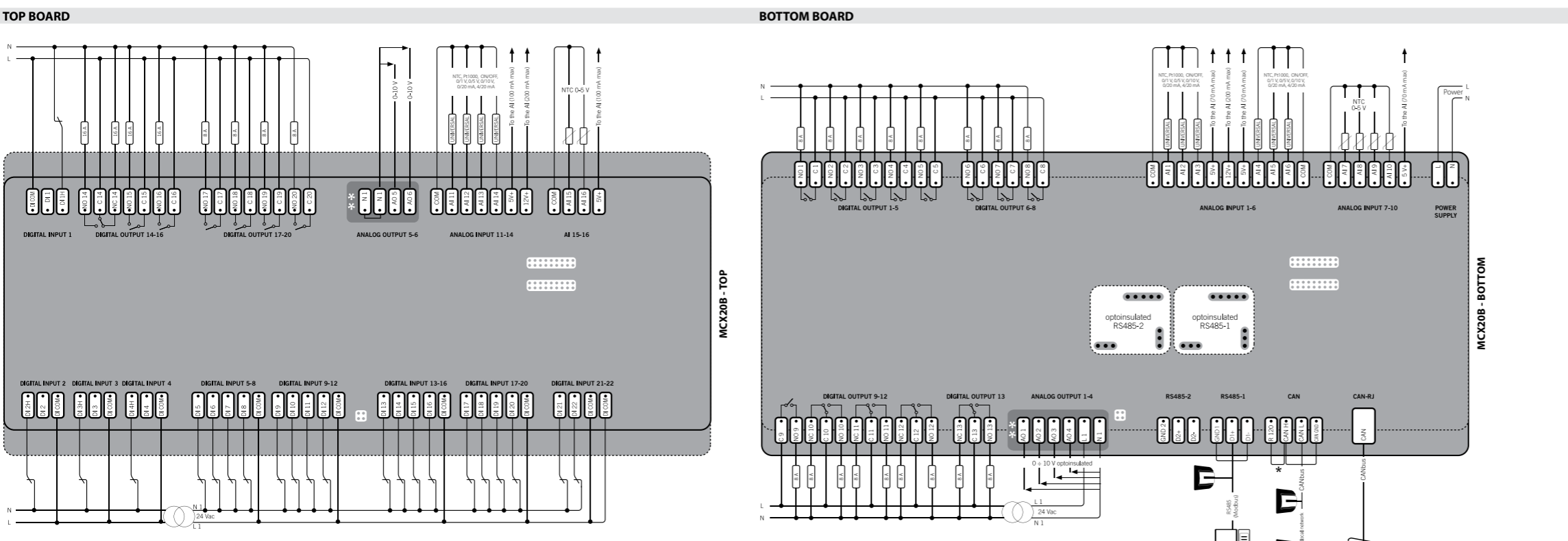
I/O	TYPE	NUMBER	SPECIFICATIONS
Digital outputs	Relay	20	Concerning the insulation distance there are three groups of relays: <ul style="list-style-type: none"> - group 1: relays 1 to 8 - group 2: relays 9 to 13 - group 3: relays 14 to 20 Insulation between relays of the same group: functional Insulation between relays of different groups: reinforced Insulation between relays and the extra-low voltage parts: reinforced Total current load limit: 123 A C1-N01 to C9-N09, C17-N017 to C20-N020 Normally open contact relays 8 A: <ul style="list-style-type: none"> - characteristics of each relay: <ul style="list-style-type: none"> 6 A 250 Vac for resistive loads - 100,000 cycles 4 A 250 Vac for inductive loads - 100,000 cycles with $\cos\phi=0.6$ UL: 240 Vac - 4 A resistive - 3.6 FLA - 21.6 LRA - 346 VA pilot duty 30,000 cycles C10-N010-NC10 to C13-NO13-NC13 Changeover contacts relay 8 A: <ul style="list-style-type: none"> - characteristics of each relay: <ul style="list-style-type: none"> 6 A 250 Vac for resistive loads - 100,000 cycles 4 A 250 Vac for inductive loads - 100,000 cycles with $\cos\phi=0.6$ UL: 240 Vac - 4 A resistive - 3.6 FLA - 21.6 LRA - 346 VA pilot duty 30,000 cycles C15-NO15 to C16-NO16 High inrush current (80 A - 20 ms) normally open contact relays 16 A: <ul style="list-style-type: none"> - characteristics of each relay: <ul style="list-style-type: none"> 7 A 250 Vac for resistive loads - 100,000 cycles 3.5 A 230 Vac for inductive loads - 230,000 cycles with $\cos\phi=0.5$ UL: 240 Vac - 6 A resistive - 4.9 FLA - 29.4 LRA - 470 VA pilot duty 30,000 cycles C14-NO14-NC14 High inrush current (80 A - 20 ms) changeover contacts relay 16 A: <ul style="list-style-type: none"> - characteristics of each relay: <ul style="list-style-type: none"> 7 A 250 Vac for resistive loads - 100,000 cycles 3.5 A 230 Vac for inductive loads - 230,000 cycles with $\cos\phi=0.5$ UL: 240 Vac - 6 A resistive - 4.9 FLA - 29.4 LRA - 470 VA pilot duty 30,000 cycles Using of device in case of Tamb = 70 °C has to be according to following requirements: <ul style="list-style-type: none"> - maximum load admitted for 8 A relay: 4 A 250 Vac - maximum load admitted for 16 A relay: 5 A 250 Vac

I/O	TYPE	NUMBER	SPECIFICATIONS
Digital Inputs	24 V optoisolated	22	DI1 to DI22 Inputs optoisolated, 24 Vac 50/60 Hz or 24 Vdc Rated current: 5 mA DI1 to DIH4 Inputs optoisolated, 230 Vac 50/60 Hz. Basic insulation Rated current: 2 mA at 230 Vac; 1 mA at 110 Vac - NOTE: when the 230 Vac 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	AO1, AO2, AO3, AO4, AO5, AO6 Analog outputs optoisolated 0/10 Vdc: 10 mA Max for each output - 40 mA Max totally on 6 outputs External power supply 24 Vac/Vdc
Analog inputs	NTC, 0/1 V, 0/5 V	6	A17 to A10, A15, A16 Inputs selectable via software between: - NTC temperature probes, default: 10 k Ω at 25 °C - pressure transducers with 0/5 V output
	Universal	10	A11 to A16, A11 to A14 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 Vdc, 400 mA max for 4/20 mA transmitter (total on all outputs) 5 V+ power supply 5 Vdc, 410 mA max for 0/5 V transmitter (total on all outputs)

Via San Giuseppe 38/G
31015 Conegliano
(TV) Italy
Tel: +39 0438 336611
Fax: +39 0438 336699
info@danfosselectronics.com
www.danfossselectronics.com

DNCR.PLR.IE.1U / 520H5317 - MCX20B Instruction sheet - PN. 3106000430 - 15-310600043-C
Produced by Danfoss Automatic Controls, 04-2011

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

CONNECTIONS

- TOP BOARD**
- Digital input 1 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital output 14-16 connector
 - 7 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital output 17-20 connector
 - 8 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Analog output 5-6 connector
 - 4 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Analog input 11-14 connector
 - 7 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Analog input 15-16 connector
 - 4 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 2 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 3 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 4 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 5-8 connector
 - 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 9-12 connector
 - 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 13-16 connector
 - 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 17-20 connector
 - 5 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital input 21-22 connector
 - 4 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
- BOTTOM BOARD**
- Digital output 1-5 connector
 - 10 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital output 6-8 connector
 - 6 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Analog input 1-6 connector
 - 11 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Analog input 7-10 connector
 - 6 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Power supply connector
 - 2 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital output 9-12 connector
 - 11 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Digital output 13 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - Analog output 1-4 connector
 - 6 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - RS485-2 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - RS485 connector
 - 3 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - CAN connector
 - 4 way screw plug-in connector type pitch 5 mm: section cable 0.2-25 mm²
 - CAN-RJ connector
 - 6/6 way telephone RJ11 plug type



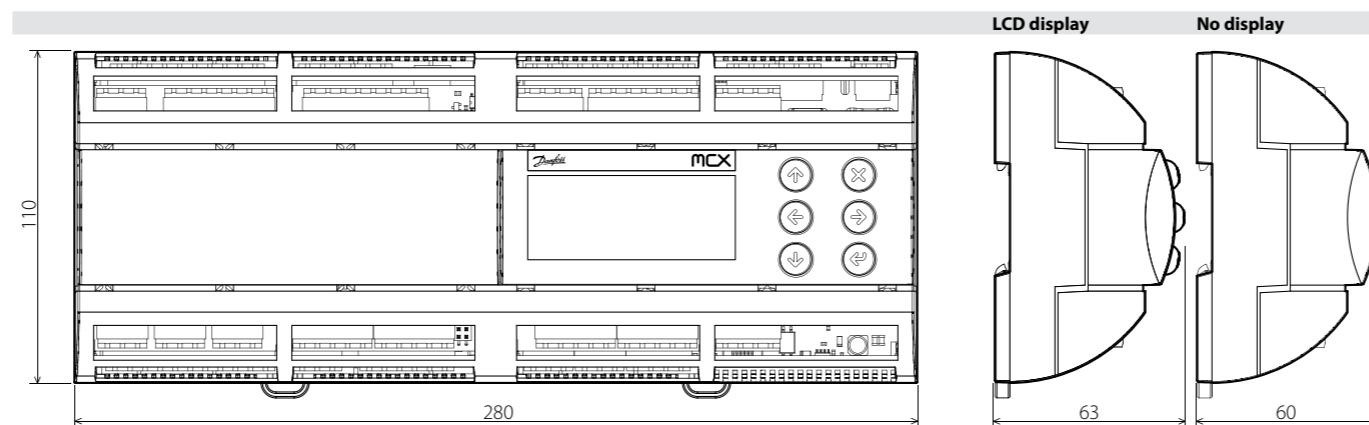
Instruction sheet

Electronic controller
MCX20B



www.danfoss.com

DIMENSIONS



USER INTERFACE

- LCD DISPLAY**
- display mode: STN blue transmissive
 - back-light: white LED back-light adjustable via software
 - display format: 128x64 dots
 - active visible area: 58x29 mm
 - 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, 2XR5485, RTC, S
080G0058	MCX20B, 230V, LCD, 2XR5485, 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, 2XR5485, RTC, S
080G0060	MCX20B, 230V, 2XR5485, RTC, S