Danfoss

Technical brochure

Programmable controller MCX15B

Danfoss' range of universal MCX programmable controllers offers the functionality and reliability you need to get the best out of your heating, ventilation, air-conditioning and refrigeration (HVAC/R) equipment. With the MCX range, Danfoss is widening the concept of programmability and applying it to as many environments as possible

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 opto-insulated serial interface.
Furthermore it is available in two models, powered at 110-230 Vac or 24 Vac

Features MCX15B

- 10 analog and 18 digital inputs
- 6 analog and 15 digital outputs
- Power supply 24 Vac/20-60 Vdc and 110 V/230 Vac
- 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

Programmable	Protection degree	CAN bus	Graphic display	Multilanguage	MYK connection	Modbus RS485
PRG	IP40	CAN				485

## www.danfoss.com/mcx

General features

FEATURES	DESCRIPTION
Power supply	85 Vac at 265 Vac, 50-60 Hz. Maximum power consumption: 26 VA Insulation between power supply and the extra-low voltage: reinforced
	20 Vdc at 60 Vdc and 24 Vac ± 15% 50/60 Hz. Maximum power consumption:12 W, 20 VA. Insulation between power supply and the extra-low voltage: functional
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 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 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

Inputs/outputs

I/O	TYPE	NUM	SPECIFICATIONS
Analog inputs	NTC, 0/1 V, 0/5 V	4	AI7, AI8, AI9, AI10 Analog inputs selectable via software between: - NTC temperature probes, default: 10 kΩ at 25 °C - pressure transducers with 0/5 V output
	Universal	6	AI1, AI2, AI3, AI4, AI5, 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 kΩ at 25 °C) - Pt1000 12 V+ power supply 12 Vdc, 200 mA max for 4/20 mA transmitter (total on all outputs) 5 V+ power supply 5 Vdc, 210 mA max for 0/5 V transmitter (total on all outputs)
Digital inputs	24 V optoins.	18	DI1, DI2, DI3, DI4, DI5, DI6, DI7, DI8, DI9, DI10, DI11, DI12, DI13, DI14, DI15, DI16, DI17, DI18 Digital Inputs optoinsulated 24 Vac 50/60 Hz o 24 Vdc
	230 Vac optoins.	4	DIH1, DIH2, DIH3, DIH4 Inputs optoinsulated, 230 Vac 50/60 Hz. Basic insulation Rated current: 2 mA at 230 Vac; 1 mA at 110 Vac - NOTE: when the 230 Vac DH1 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, AO2, AO3, AO4 Analog outputs optoinsulated 0/10 Vdc 10 mA max for each output External power supply 24 Vac/Vdc

	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 position (PPM) with range 20 Hz to 1 KHz:
			  • open circuit voltage: 6.8 V
			  • minimum load: 1 kΩ

Digital output	Relay	15	Concerning the insulation distance there are three groups of relays:
			- group 1: relays 1 to 8
			- group 2: relays 9 to 13
			- group 3: relays14 to 15
			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: 92 A
			C1-NO1, C2-NO2, C3-NO3, C4-NO4, C5-NO5, C6-NO6, C7-NO7, C8-NO8 C9-NO9
			Normally open contact relays 8 A
			- characteristics of each relay:
			  • 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-NO10-NC10, C11-NO11-NC11, C12-NO12-NC12, C13-NO13-NC13
			Changeover contacts relay 8 A
			- characteristics of each relay:
			  • 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
			C14-NO14-NC14, C15-NO15-NC15
			High inrush current (80 A - 20 ms) changeover contacts relay 16 A
			- characteristics of each relay:
			  • 7 A 250 Vac for resistive loads - 100.000 cycles
			  • 3.5 A 230 Vac for inductive loads - 230.000 cycles with cos(phi) = 0.4
			  • 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:
			- maximum load admitted for 8 A relay: 4 A 250 Vac
			- maximum load admitted for 16 A relay: 5 A 250 Vac

**Connection diagram:
top and bottom board**
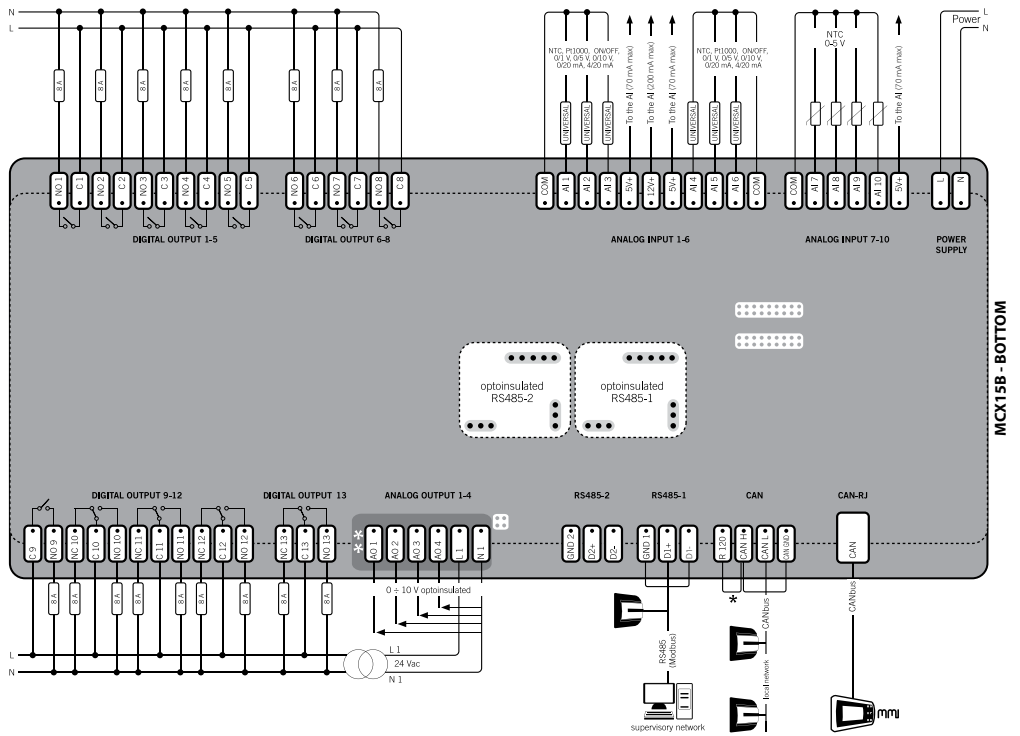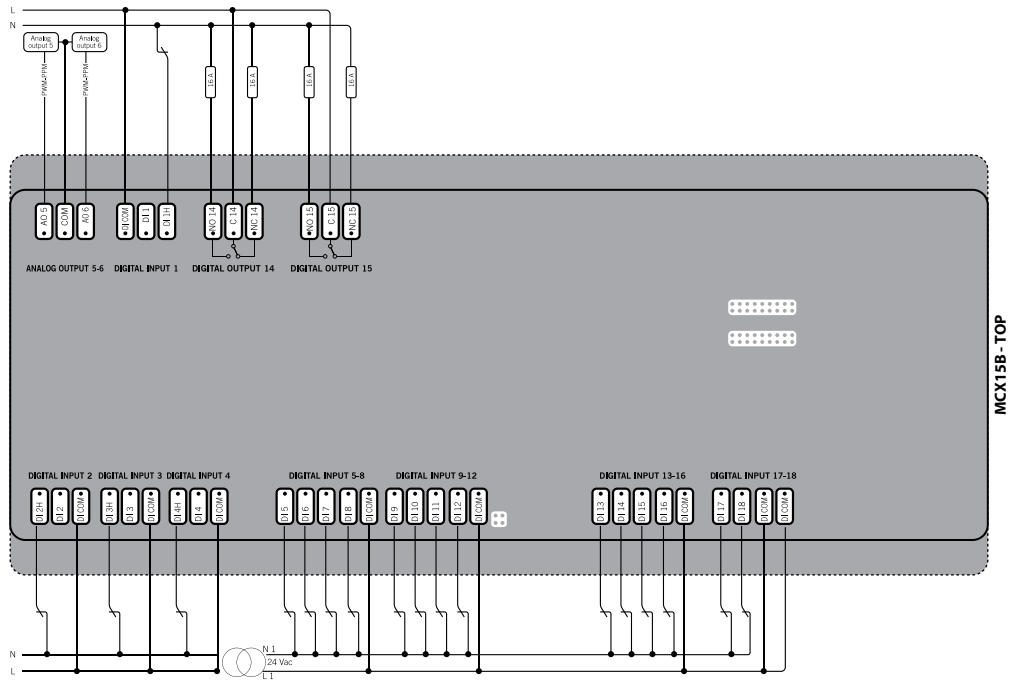

*NOTE: connection has to be made on the first and last local network units, make the connection as close as possible to the connector
**NOTE: optoinsulated analog outputs voltages are referenced to contact N1

Connection

CONNECTORS	TYPE	DIMENSIONS
TOP BOARD		
Analog output 5-6 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 1 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital output 14 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital output 15 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 2 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 3 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 4 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 5-8 connector	5 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 9-12 connector	5 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 13-16 connector	5 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital input 17-18 connector	4 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
BOTTOM BOARD		
Analog output 5-6 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital output 1-5 connector	10 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital output 6-8 connector	6 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Analog input 1-6 connector	11 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Analog input 7-10 connector	6 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Power supply connector	2 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital output 9-12 connector	11 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Digital output 13 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
Analog output 1-4 connector	6 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
RS485-2 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
-RS485 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
CAN connector	4 way screw plug-in connector type	- pitch 5 mm - section cable 0.2-2.5 mm^2
CAN-RJ connector	6/6 way telephone RJ11 plug type	

Dimensions

LCD display   No display

110

280

63   60
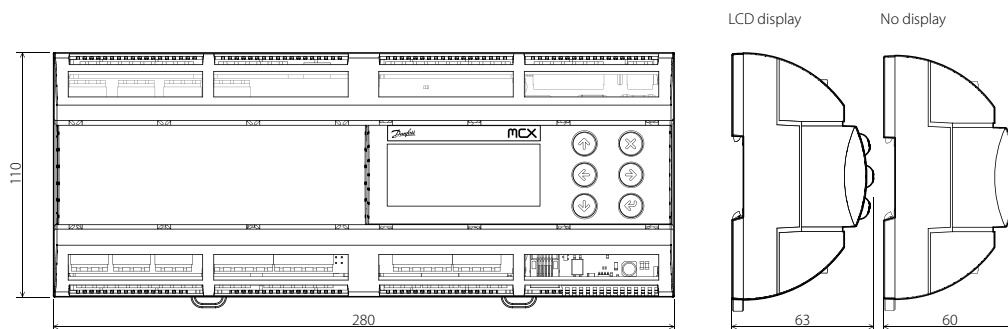
User interface

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	Settled by the application software

Ordering

DESCRIPTION	CODE NR.
MCX15B, 24V, LCD, RTC, S	080G0088
MCX15B, 230V, LCD, RTC, S	080G0089
MCX15B, 24V, LCD, RS485, RTC, S	080G0036
MCX15B, 230V, LCD, RS485, RTC, S	080G0037
MCX15B, 24V, LCD, 2×RS485, RTC, S	080G0053
MCX15B, 230V, LCD, 2×RS485, RTC, S	080G0054

DESCRIPTION	CODE NR.
MCX15B, 24V, RTC, S	080G0090
MCX15B, 230V, RTC, S	080G0091
MCX15B, 24V, RS485, RTC, S	080G0042
MCX15B, 230V, RS485, RTC, S	080G0043
MCX15B, 24V, 2×RS485, RTC, S	080G0055
MCX15B, 230V, 2×RS485, RTC, S	080G0056

(S): Single Pack
Note: Single pack include standard kit connectors
Industrial pack codes are avaliable on request (these do not include standard kit connectors)

Accessory

DESCRIPTION	CODE NR.
MCX15B CONNECTORS KIT	080G0181