

Data Sheet

Programmable controller, 6 relays Type **MCX061V**

Electronic controller suitable for all HVAC/R software application needs.



MCX061V is a standard MCX electronic controller with one integrated electronic expansion valve driver. It is available in the version with graphic LCD display and 110 / 230 V AC or 24 V AC power supply. It holds all the typical functionalities of MCX controllers in the compact size of 8 DIN modules:

- Programmability
- Connection to the CANbus local network
- Modbus RS485 serial communication interface

It is moreover fitted with a slot for memory card SD / MMC and Ethernet connection. The memory card assures SW download and datalogging function; the Ethernet port allows the SW download, monitoring with web pages, datalogging and the alarms warning.

Features:

- 7 analog and 8 digital inputs
- 3 analog and 6 digital outputs
- Power supply 24 V AC and 110 V / 230 V AC
- Drives bipolar and unipolar electronic expansion valves
- SD / MMC card slot for easy software upload and datalogging
- Remote access to data through CANbus connection for additional display and keyboard
- RTC clock for managing weekly time programs and data logging information
- Ethernet / WebServer option
- Modbus RS485 opto-insulated serial interface
- Available with graphic LCD display for showing the desired information
- Dimensions 8 DIN modules

Portfolio overview

Table 1: Portfolio overview

MCX family	MCX06C	MCX06D	MCX061V	MCX08M2	MCX152V	MCX15B2	MCX20B2
Product image							
Power supply	24 V	24 V	24 V or 110/230 V	24 V or 110/230 V	24 V or 110/230 V	24/110/230 V	24/110/230 V
Built-in display (optional)	LED	LCD	LCD	LCD	LCD	LCD	LCD
Analog Inputs	4	4	7	8	14	10	16
Digital Inputs	6	8	8	8	18	22	22
Analog Outputs	2	3	3	4	6	6	6
Digital Outputs	6	6	6	8	15	15	20
EXV driver embedded			1		2		
RS485	1	1	1	1	2	1	2
CANbus	•	•	•	•	•	•	•
Ethernet / Web server			optional		optional	•	•
USB/Memory Card			•		•	•	•
Dimensions (1 DIN module = 17,5 mm)	33 x 75 mm	4 DIN	8 DIN	8 DIN	16 DIN	16 DIN	16 DIN

Product specification

General features

Table 2: General features

Features	Description
Power supply	85 – 265 V AC, 50/60 Hz. Maximum power consumption: 18 W, 27 V A Insulation between power supply and the extra-low voltage: reinforced 24 V AC $\pm$ 15% 50/60 Hz SELV. Maximum power consumption: 18 W, 22 V A 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: $\geq$ 250 V according to IEC 60112
Operating conditions	CE: -20T55, 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

Input/Output

Table 3: Analog inputs

Type	Num	Specifications
		Max 15 V input voltage Do not connect voltage sources without current limitation (overall 80 mA) to analog inputs while unit is not powered Open circuit HW diagnostics available for voltage input on: AI1,2,3,4,6
0 / 1 V 0 / 5 V 0 / 10 V	7	AI1, AI2, AI3, AI4, AI5, AI6, AI7 0 / 1 V, 0 / 5 V, 0 / 10 V AI1, AI2, AI3, AI4, AI6 impedance is 33 k Ω (by software can be set greater than 1 M Ω) AI7 impedance is greater than 1 M Ω
NTC	5	AI1, AI2, AI3, AI4, AI6 NTC temperature probes, default: 10 k Ω at 25 °C
0 / 20 mA 4 / 20 mA	6	AI1, AI2, AI3, AI4, AI5, AI6 0 / 20 mA; 4 / 20 mA
Pt1000	4	AI1, AI2, AI3, AI7 Pt1000
Differential input	1	AI5(-), AI6(+) Differential input, DM Voltage 0.300 mV; CM voltage max 14 V
Auxiliary Supplies	2	15 V+ and 5 V+ 5 V+ max: 70 mA 15 V+ max: 100 mA

Table 4: Digital inputs

Type	Num	Specifications
Voltage free contacts	8	DI1 Frequency input: 200 Hz Max (pulse time about 2.5 ms) DI2, DI3, DI4, DI5, DI6, DI7, DI8 Frequency input: 5 Hz Max (pulse time about 100 ms)

Table 5: Analog outputs

Type	Num	Specifications
0 / 10 V DC	2	AO1, AO2 Minimum load 1 k Ω (10 mA)
0 / 10 V PWM PPM	1	AO3 Minimum load 1 k Ω (10 mA) 0 / 10 V - pulse output, synchronous with mains, at modulation of impulse position (PPM) or modulation of impulse width (PWM): 6.8 V open circuit - pulse output, PWM with range from 1 – 1000 Hz: 6.8 V open circuit

Table 6: Digital outputs

Type	Num	Specifications
Relay	6	C1-NO1, C2-NO2, C3-NO3, C4-NO4, C5-NO5 Functional Isolation Normally open contact relays 5 A Characteristics of each relay: • 5 A 30 V DC / 250 V AC for resistive loads - 100.000 cycles • 0.7 A 250 V AC for inductive load - 100.000 cycles with $\cos(\phi) = 0.5$ • UL: 3 A, 250 V AC, resistive, 50.000 cycles • 1 / 10 hp, 240 V AC, motor, 30.000 cycles • 1.5 FLA, 9.0 LRA, 240 V AC, 30.000 cycles • 144 VA, pilot duty, 240 V AC, 30.000 cycles C1-NO1 Optionally it can be solid state relays Characteristics of each relay: • 15-280 Vrms, 1 A • UL: 1 A resistive, 240 V AC, 30.000 cycles C6-NO6 Functional Isolation Normally open contact relays 5 A Characteristics of each relay: • 5 A 30 V DC / 250 V AC for resistive loads - 100.000 cycles • 0.7 A 250 V AC for inductive load - 100.000 cycles with $\cos(\phi) = 0.5$ • UL: 3 A, 250 V AC, resistive, 50.000 cycles • 1 / 10 hp, 240 V AC, motor, 30.000 cycles • 1.5 FLA, 9.0 LRA, 240 V AC, 30.000 cycles • 144 VA, pilot duty, 240 V AC, 30.000 cycles Reinforced isolation (with respect to DO1..DO5)

Table 7: Stepper motor

Type	Num	Specifications
Bipolar and unipolar stepper motor driver	1	ST1, ST2, ST3, ST4 Bipolar and unipolar stepper motor output: Danfoss ETS / KVS / ETSC Valves (green, red, black, white) Saginomyia UKV / SKV / VKV / PKV / ETS6 (black, red, yellow, orange) Other valves: drive mode 1/8 microstep peak phase current: 650 mA (RMS 460 mA) max drive voltage 30 V max output power 6.5 W max speed 200 steps/sec Max distance between valve and MCX: 30 m (suggested: 10 m)

Table 8: Battery backup

Type	Num	Specifications
	1	BATT 18 – 24 V DC: • leakage current max 12 μA • max battery current: 0.5 A at 18 V

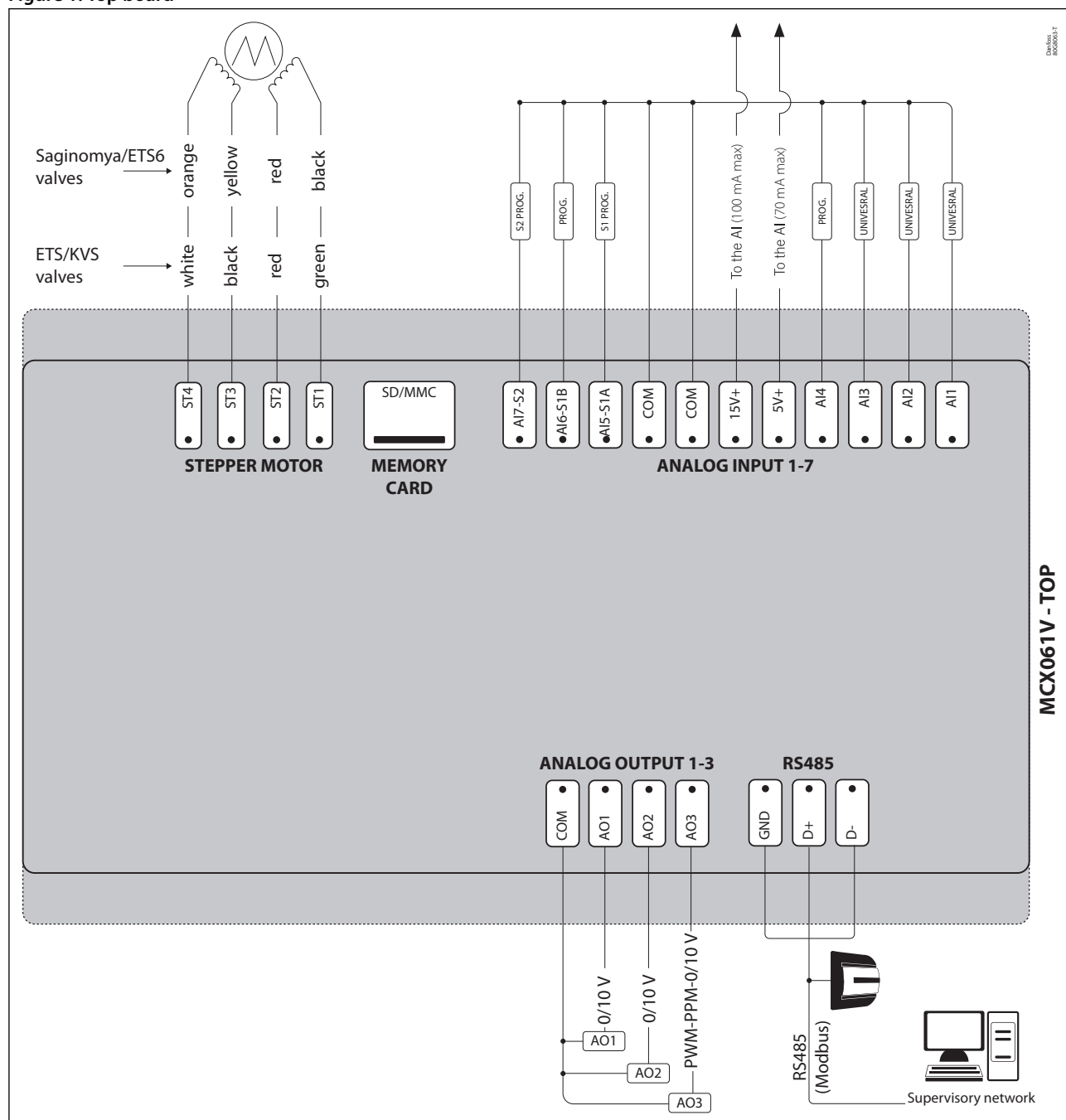
Table 9: Memory card

Type	Num	Specifications
SD/MMC	1	SD/MMC • for data logging make sure that the memory card is firm in place • avoid installations with vibrations

Connection diagram

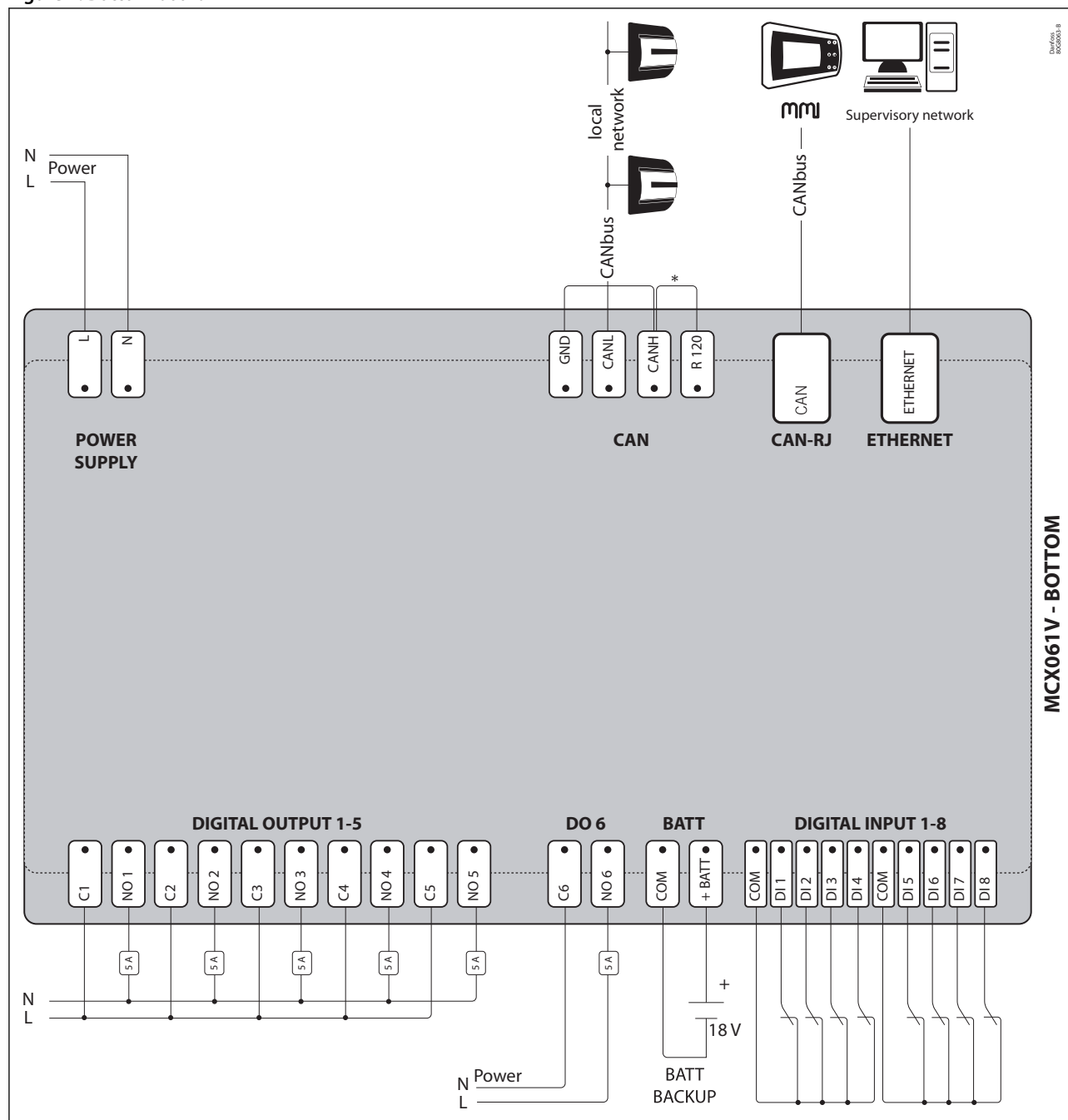
Top board

Figure 1: Top board



Bottom board

Figure 2: 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.

Connection

Table 10: Top board

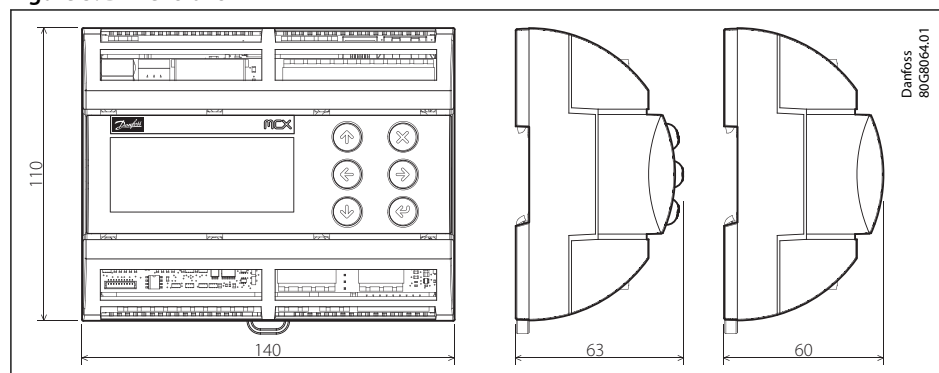
Connectors	Type	Dimensions
Stepper motor connector	4 way spring-cage plug-in connector type	- pitch 2.5 mm - section cable 0.2 – 0.5 mm²
Memory card connector	SD / MMC card slot	
Analog input 1-7 connector	11 way screw plug-in connector type	- pitch 5 mm - section cable 0.2 – 2.5 mm²
Analog output 1-3 connector	4 way screw plug-in connector type	- pitch 5 mm - section cable 0.2 – 2.5 mm²
RS485 connector	3 way screw plug-in connector type	- pitch 5 mm - section cable 0.2 – 2.5 mm²

Table 11: Bottom board

Connectors	Type	Dimensions
Power supply connector	2 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	
Ethernet connector	8/8 way RJ45 plug type	
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 connector	2 way screw plug-in connector type	- pitch 5 mm - section cable 0.2 – 2.5 mm²
Batt connector	2 way screw plug-in connector type	- pitch 5 mm - section cable 0.2 – 2.5 mm²
Digital output 1-8 connector	10 way spring-cage plug-in connector type	- pitch 2.5 mm - section cable 0.2 – 0.5 mm²

Dimensions

Figure 3: Dimensions



User interface

Table 12: User interface

Type	Features	Description
LCD display	Display	STN blue transmissive
	Backlight	White LED backlight adjustable via software
	Contrast	Adjustable via software
	Format	128 x 64 dots
	Active visible area	58 x 29 mm
Keyboard	Number of keys	4
	Keys function	Set by the application software

Ordering

Product part numbers

Table 13: Product part numbers

Description	Code No.
MCX061V, 230 V, LCD, RS485, RTC, S	080G0250
MCX061V, 24 V, LCD, RS485, RTC, S	080G0251
MCX061V, 24 V, LCD, RS485, RTC, ETH, S	080G0255

NOTE:

Single pack codes (S) include standard kit connectors.

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 14: Certificates, declarations, and approvals

File name	Document type	Document topic	Approval authority
080R2088.02	EU Declaration of conformity	EMC directive 2014/30/EU: EN61000-6-4: 2007 +A1: 2011 EN61000-6-2: 2005 LVD directive 2014/35/EU: EN60730-1: 2011 EN60730-2-9: 2010 RoHS directive 2011/65/EU and 2015/863/EU: EN 50581: 2012	Danfoss
UL E31024	Electrical - Safety Certificate	–	UL

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