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1 Analog I/O Option MCB109

1.1 Introduction

1.1.1 Analog I/O option MCB 109

The Analog I/O card is supposed to be used in e.g. the following cases:

- Providing battery back-up of clock function on control card

- As general extension of analog I/O selection available on control card, e.g. for multi-zone control with three pressure transmitters

- Turning frequency converter into de-central I/O block supporting Building Management System with inputs for sensors and outputs for operating dampers and valve actuators

- Support Extended PID controllers with I/Os for set point inputs, transmitter/sensor inputs and outputs for actuators.
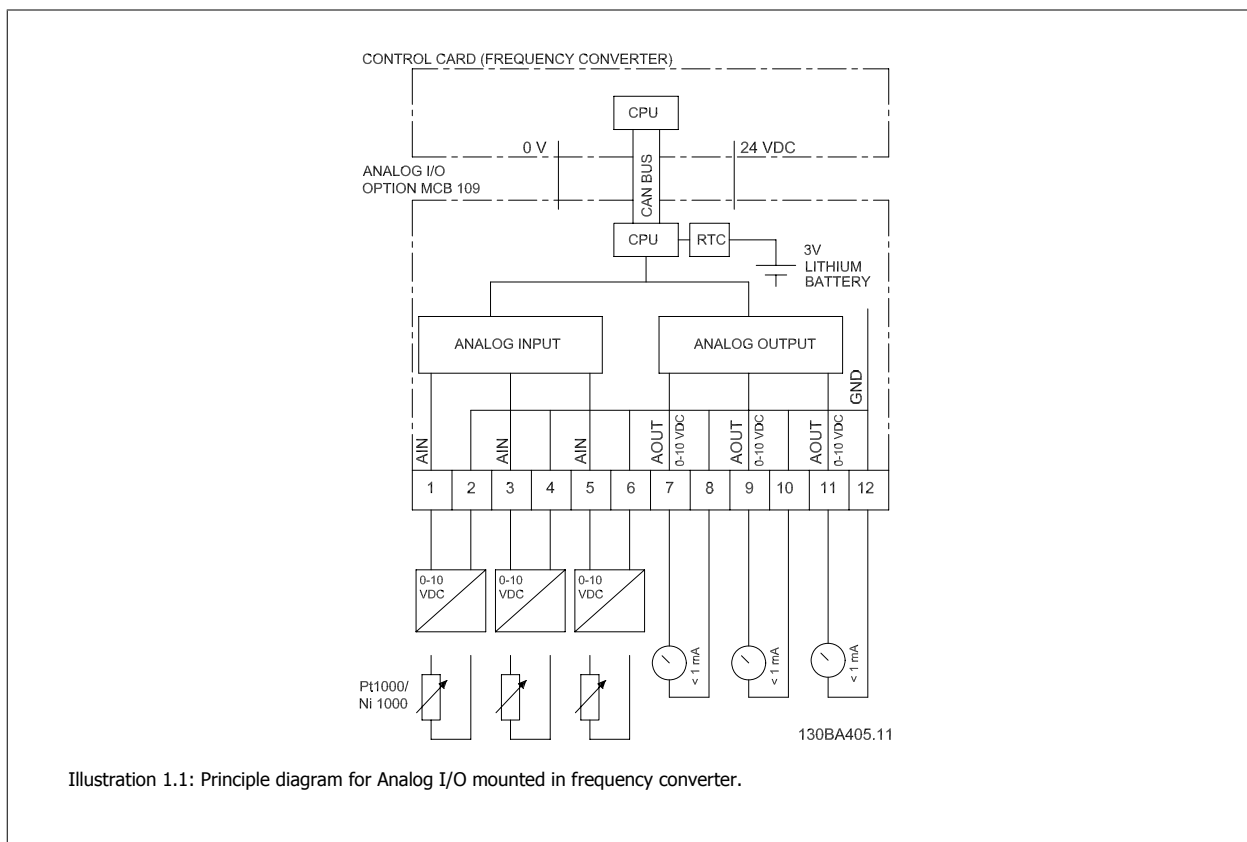

Illustration 1.1: Principle diagram for Analog I/O mounted in frequency converter.

Analog I/O configuration

3 x Analog Inputs, capable of handling following:

- 0 - 10 VDC

OR

- 0-20 mA (voltage input 0-10V) by mounting a 510Ω resistor across terminals (see NB!)

- 4-20 mA (voltage input 2-10V) by mounting a 510Ω resistor across terminals (see NB)

- Ni1000 temperature sensor of 1000 Ω at 0° C. Specifications according to DIN43760

- Pt1000 temperature sensor of 1000 Ω at 0° C. Specifications according to IEC 60751

3 x Analog Outputs supplying 0-10 VDC.

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> **NB!**
> Please note the values available within the different standard groups of resistors:
> E12: Closest standard value is 470Ω, creating an input of 449.9Ω and 8.997V.
> E24: Closest standard value is 510Ω, creating an input of 486.4Ω and 9.728V.
> E48: Closest standard value is 511Ω, creating an input of 487.3Ω and 9.746V.
> E96: Closest standard value is 523Ω, creating an input of 498.2Ω and 9.964V.

Analog inputs - terminal X42/1-6

Parameter group for read out: 18-3*. See also *Programming Guide.*

Parameter groups for set-up: 26-0*, 26-1*, 26-2* and 26-3*. See also *Programming Guide.*

3 x Analog inputs	Operating range	Resolution	Accuracy	Sampling	Max load	Impedance
Used as temperature sensor input	-50 to +150 °C	11 bits	-50 °C ±1 Kelvin +150 °C ±2 Kelvin	3 Hz	-	-
Used as voltage input	0 - 10 VDC	10 bits	0.2% of full scale at cal. temperature	2.4 Hz	+/- 20 V continuously	Approximately 5 kΩ

When used for voltage, analog inputs are scalable by parameters for each input.

When used for temperature sensor, analog inputs scaling is preset to necessary signal level for specified temperature span.

When analog inputs are used for temperature sensors, it is possible to read out feedback value in both °C and °F.

When operating with temperature sensors, maximum cable length to connect sensors is 80 m non-screened / non-twisted wires.

Analog outputs - terminal X42/7-12

Parameter group for read out and write: 18-3*. See also *Programming Guide*
Parameter groups for set-up: 26-4*, 26-5* and 26-6*. See also *Programming Guide*

3 x Analog outputs	Output signal level	Resolution	Linearity	Max load
Volt	0-10 VDC	11 bits	1% of full scale	1 mA

Analog outputs are scalable by parameters for each output.

The function assigned is selectable via a parameter and have same options as for analog outputs on control card.

For a more detailed description of parameters, please refer to the *Programming Guide*.

Real-time clock (RTC) with back-up

The data format of RTC includes year, month, date, hour, minutes and weekday.

Accuracy of clock is better than ± 20 ppm at 25 °C.

The built-in lithium back-up battery lasts on average for minimum 10 years, when frequency converter is operating at 40 °C ambient temperature. If battery pack back-up fails, analog I/O option must be exchanged.

1.1.2 Ordering Code Numbers

Standard version code no: 130B1143

Coated version code no: 130B1243

130BA210.10
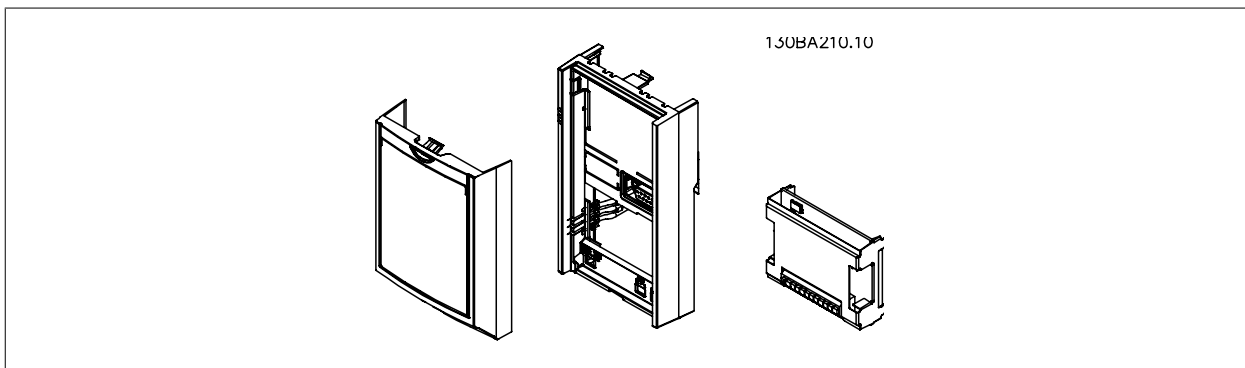
1.2 Mounting Guidelines

1.2.1 Mounting of Option Modules in Slot B

The power to the frequency converter must be disconnected.

For A2, A3 and B3 enclosures:

- Remove the (Local Control Panel), the terminal cover, and the frame from the frequency converter.
- Fit the MCB10x option card into slot B.
- Connect the control cables and relieve the cable by the enclosed cable strips.
  Remove the knock out in the extended frame delivered in the option set, so that the option will fit under the extended frame.
- Fit the extended frame and terminal cover.
- Fit the or blind cover in the extended frame.
- Connect power to the frequency converter.
- Set up the input/output functions in the corresponding parameters, as mentioned in this document.

For A5, B1, B2, B4, C1, C2, C3, C4, D, E and F enclosures:

- Remove the and the cradle
- Fit the MCB10x option card into slot B
- Connect the control cables and relieve the cable by the enclosed cable strips
- Fit the cradle
- Fit the

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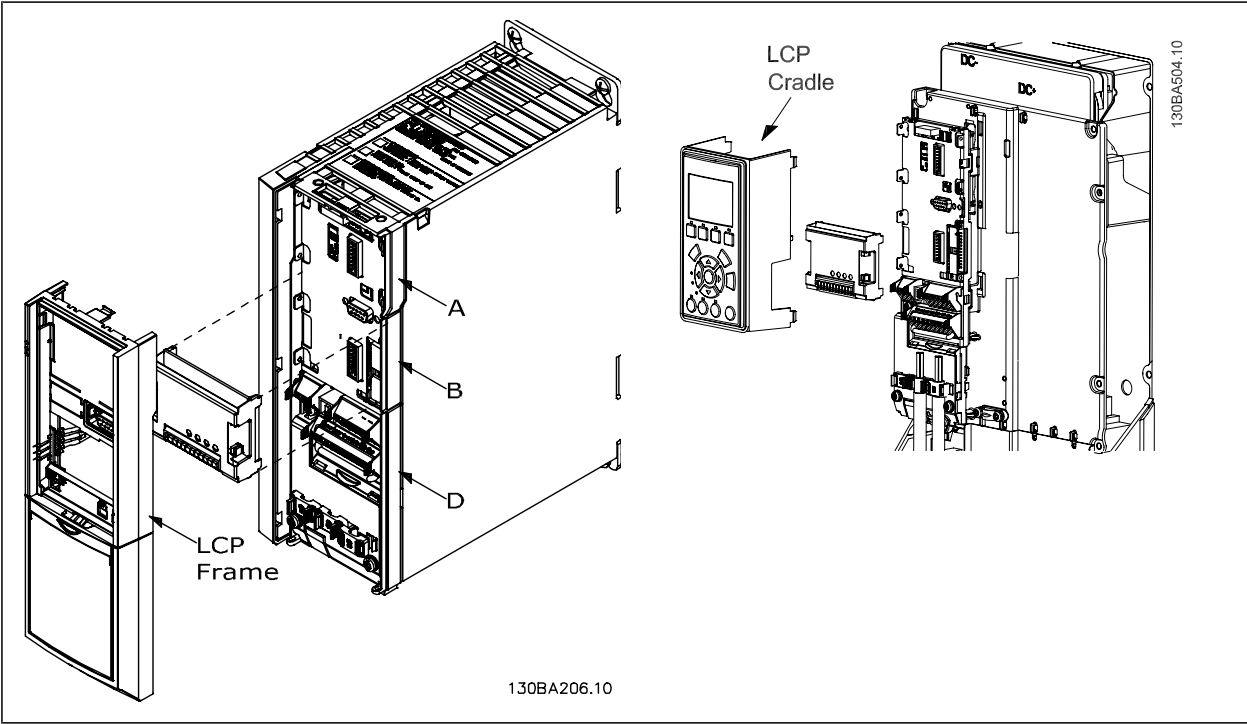
A2, A3 and B3 enclosures	A5, B1, B2, B4, C1, C2, C3, C4, D, E and F enclosures

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