



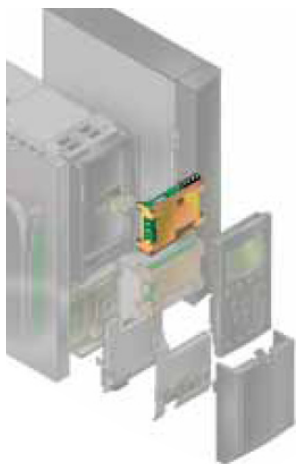
Option Overview

ADAP-KOOL® Drive - AKD 102

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Slot A

All options are built in and tested at the factory

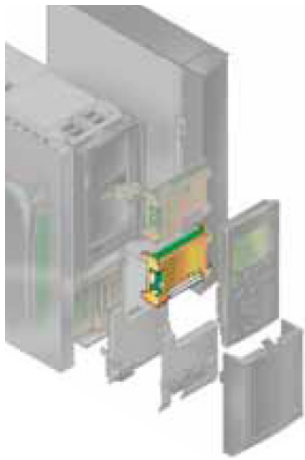


LonWorks MCA 107

Ordering number:
130B1269



Slot B All options are built in and tested at the factory



General Purpose I/O MCB 101

Ordering numbers:
Non-coated: **130B1125**
Coated: **130B1212**

I/O option offers an extended number of control inputs and outputs.

- 3 digital inputs 0-24 V: Logic '0' < 5 V; Logic '1' > 10V
- 2 analogue inputs 0-10 V: Resolution 10 bit plus sign
- 2 digital outputs NPN/PNP push pull
- 1 analogue output 0/4-20 mA
- Spring loaded connection
- Separate parameter settings



Relay Option MCB 105

Ordering numbers:
Non-coated: **130B1110**
Coated: **130B1210**

Lets you extend relay functions with 3 additional relay outputs.

- Max. terminal load:
- AC-1 Resistive load 240 V AC 2 A
 - AC-15 Inductive load @cos fi 0.4240 V AC 0.2 A
 - DC-1 Resistive load 24 V DC 1 A
 - DC-13 Inductive load @cos fi 0.424 V DC 0.1 A

- Min. terminal load:
- DC 5 V 10 mA
 - Max switch rate at rated load/min. load6 min-1/20 sec-1
 - Plug-and-play principle, fits into slot B
 - Protects control cable connection
 - Spring-loaded control wire connection
 - Selection of relay functions in normal parameter settings



Analog I/O Option MCB 109

Ordering numbers:
Non-coated: **130B1143**
Coated: **130B1243**

This Analog input/output option is easily fitted in the frequency converter for upgrading to advanced performance and control using the additional in/outputs. This option also upgrades the frequency converter with a battery back-up supply for the clock built into the frequency converter. This provides stable use of all frequency converter clock functions as timed actions etc.

- 3 analogue inputs, each configurable as both voltage and temperature input
- Connection of 0-10 V analogue signals as well as PT1000 and NI1000 temperature inputs
- 3 analogue outputs each configurable as 0-10 V outputs
- Incl. Back-up supply for the standard clock function in the frequency converter

The back-up battery typically lasts for 10 years, depending on environment.

Slot D

All options are built in and tested at the factory



24 V DC Supply Option MCB 107

Ordering numbers:
 Non-coated: **130B1108**
 Coated: **130B1208**

The option is used to connect an external DC supply to keep the control section and any installed option active by mains power down.

- Input voltage range24 V DC +/- 15% (max. 37 V in 10 sec.)
- Max. input current 2.2 A
- Max. cable length 75 m
- Input capacitance load < 10 uF
- Power-up delay< 0.6 s
- Easy to install in drives in existing machines
- Keep the control board and options active by power cut
- Keep fieldbuses active by power cuts

LCP

All options are built in and tested at the factory



LCP 102 Graphical Local Control Panel

Ordering number:
130B1107

- Multi-language display
- Status messages
- Quick menu for easy commissioning
- Parameter setting and explanation of parameter function
- Adjusting of parameters
- Full parameter backup and copy function
- Alarm logging
- Info button – explains the function of the selected item on display
- Hand-operated start/stop, or Automatic mode selection
- Reset function
- Trend graph

General Purpose I/O Option MCB101

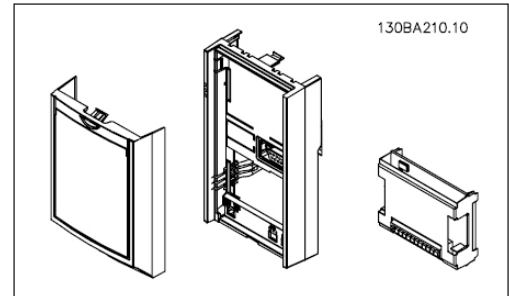
Introduction

This instruction describes the General Purpose I/O option MCB101 for use in the FC 300 series, expanding the number of input/output in the frequency converter.

SW firmware version to be installed in the drive control card must be version 3.00 or later versions. Check parameter 15-43 for firmware version.

The MCB101 option includes 3 digital inputs, 2 analog inputs, 2 digital outputs and 1 analog output.

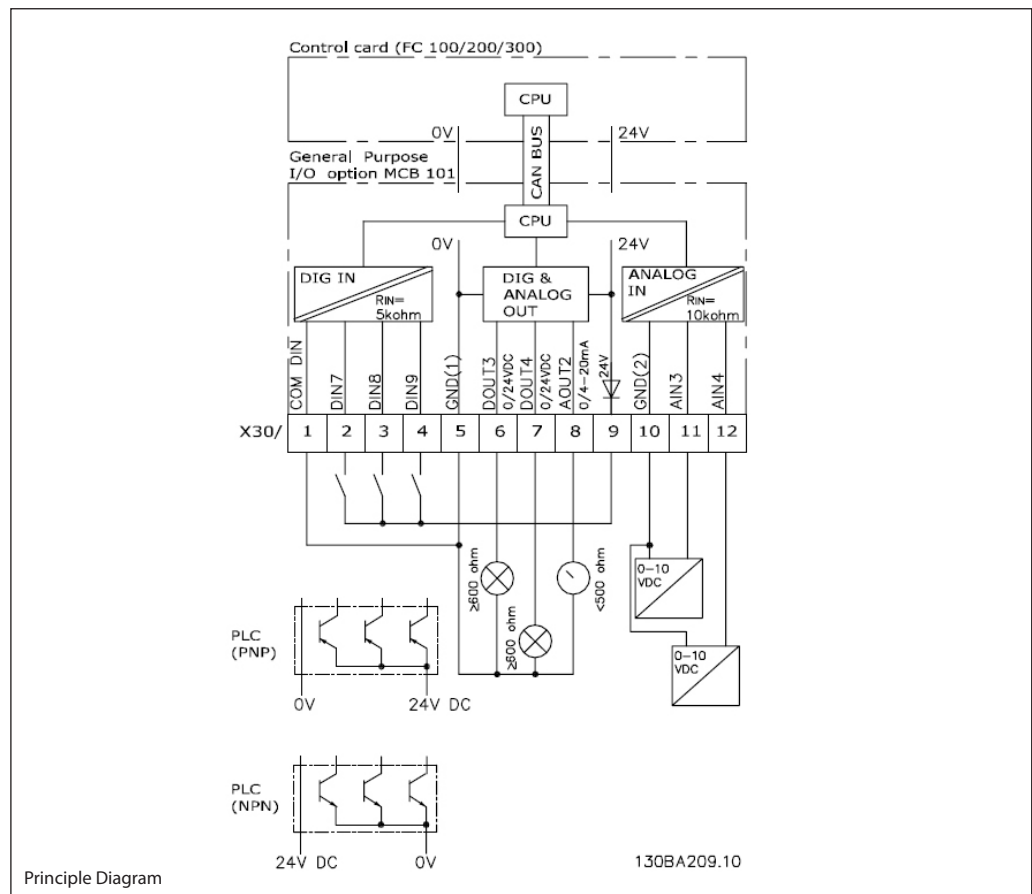
Code Numbers To Be Used At Ordering The Complete Kit For Upgrades
 Standard version code no. 130B1125.
 Coated version code no. 103B1212.



Parts for coated/non-coated code nos.

General technical data

Galvanic Isolation In The MCB101
 Digital/analog inputs are galvanically isolated from other inputs/outputs on the MCB101 and in the control card of the drive. Digital/analog outputs in the MCB101 are galvanically isolated from other inputs/outputs on the MCB101, but not from these on the control card of the drive.



Principle Diagram

130BA209.10

Option overview

ADAP-KOOL® Drive - AKD 102

General technical data (Continued)

Digital inputs - Terminal X30/1-4

Parameters for set-up: 5-16, 5-17 and 5-18

| Number of digital inputs | Voltage level | Voltage levels | Input impedance | Max. load |
|--------------------------|---------------|--|-----------------|--|
| 3 | 0-24 V DC | PNP type: Common = 0 V Logic "0": Input < 5 V DC Logic "0": Input > 10 V DC NPN type: Common = 24 V Logic "0": Input > 19 V DC Logic "0": Input < 14 V DC | Approx. 5 K ohm | ± 28 V continuous ± 37 V in minimum 10 sec. |

Analog voltage inputs - Terminal X30/10-12

Parameters for set-up: 6-3*, 6-4*, 16-75 and 16-75

| Number of analog voltage inputs | Standardised input signal | Input impedance | Resolution | Max. load |
|---------------------------------|---------------------------|-----------------|------------|---------------------|
| 2 | 0-10 V DC | Approx. 5 K ohm | 10 bits | ± 20 V continuously |

Digital outputs - Terminal X30/5-7

Parameters for set-up: 5-32 and 5-33

| Number of digital outputs | Output level | Tolerance | Max. load |
|---------------------------|--------------|-----------|-----------|
| 2 | 0 or 24 V DC | ± 4 V | ≥ 600 ohm |

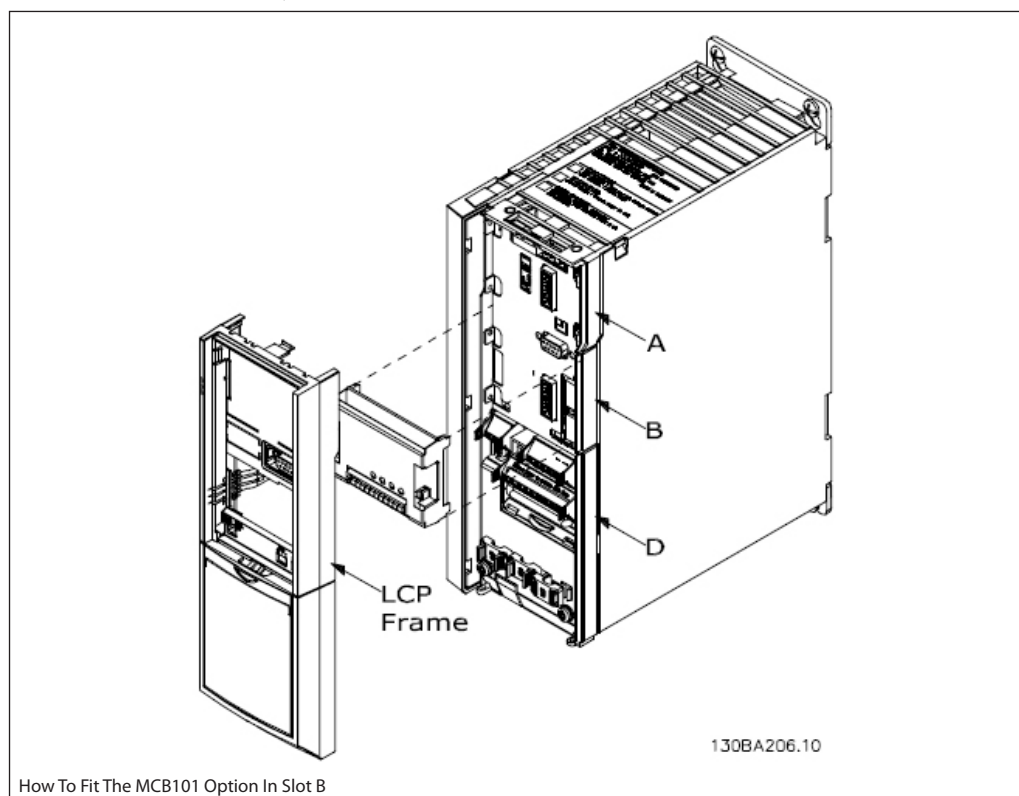
Analog outputs - Terminal X30/5+8

Parameters for set-up: 6-6* and 16-77

| Number of analog outputs | Output signal level | Tolerance | Max. load |
|--------------------------|---------------------|-----------|-----------|
| 1 | 0/4 - 20 mA | ± 0.1 mA | < 500 ohm |

Mounting Guidelines

Mounting Guidelines - Step By Step



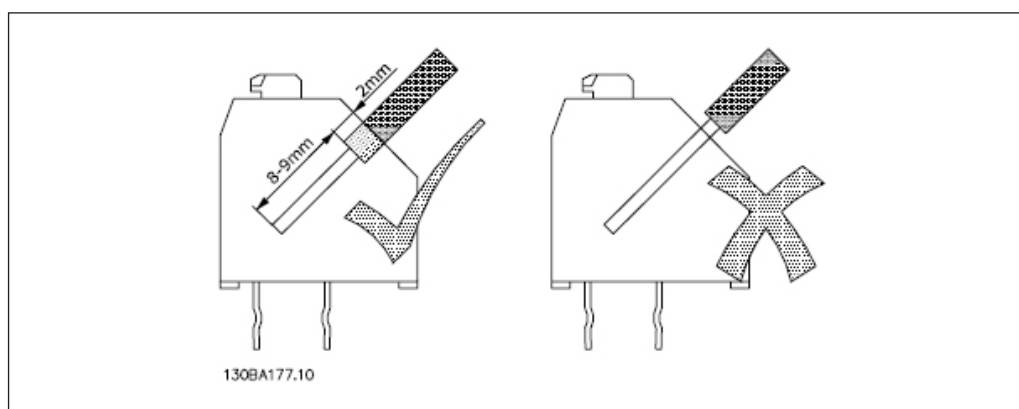
Mounting Guidelines
(Continued)

These step-by-step instructions describe how to mount the control cables:

- The power to the frequency converter must be disconnected.
- Remove the LCP (Local Control Panel), the terminal cover, and the LCP frame from the frequency converter.
- Fit the MCB101 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 LCP frame, so that the option will fit under the extended LCP frame.
- Fit the extended LCP frame and terminal cover.
- Fit the LCP or blind cover in the extended LCP frame.
- Connect power to the frequency converter.
- Set up the input/output functions in the corresponding parameters, as mentioned in the section General Technical Data.

How To Mount Cables

The graphic below illustrates how to mount the cables.



Relay Option MCB 105

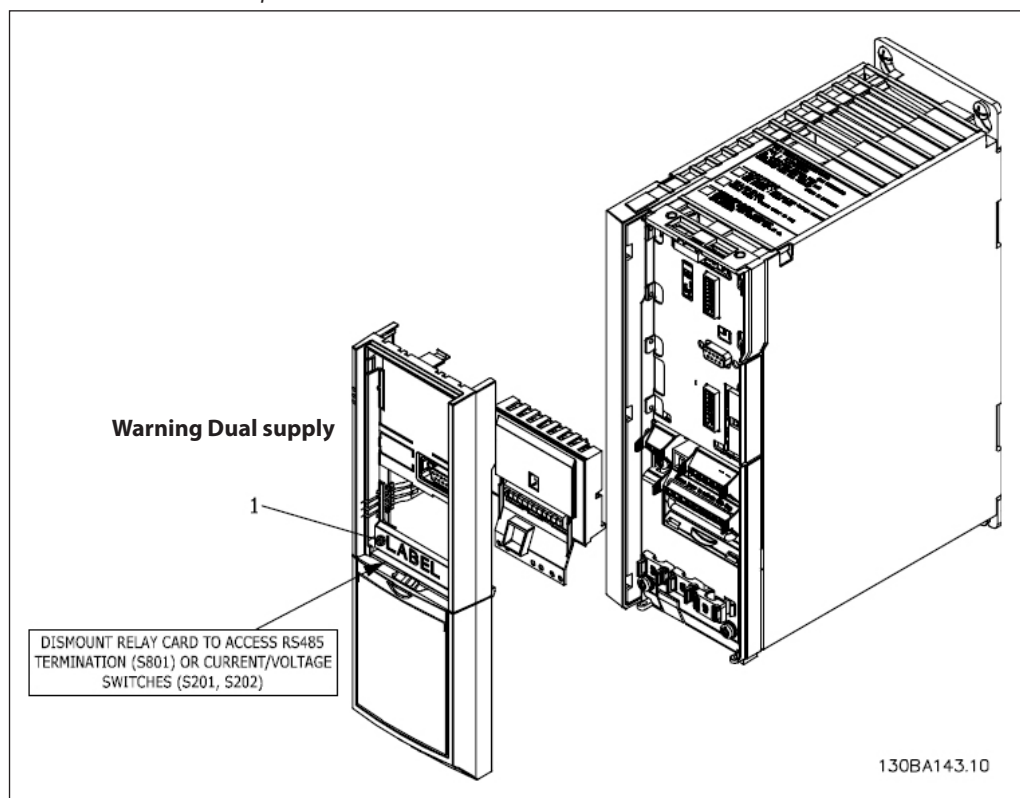
MCB 105 for option slot B

The MCB 105 option includes 3 pieces of change over contacts and can be fitted into option slot B.

Electrical Data:

| | |
|--|---|
| Max. terminal load (AC | 240 V AC 2A |
| Max. terminal load (DC | 24 V DC 1A |
| Min. terminal load (DC | 5 V 10 mA |
| Max. switching rate at rated load/min load | 6 min ⁻¹ /20 sec ⁻¹ |

How to add the MCB 105 option:



Warning Dual supply

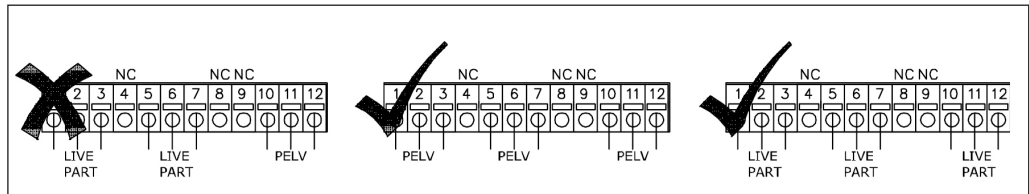
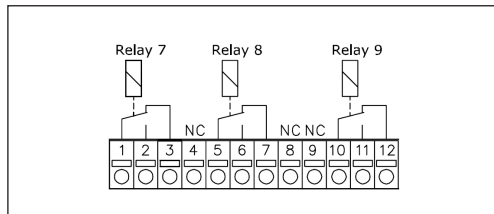
IMPORTANT

1. The label **MUST** be placed on the LCP frame as shown (UL approved).

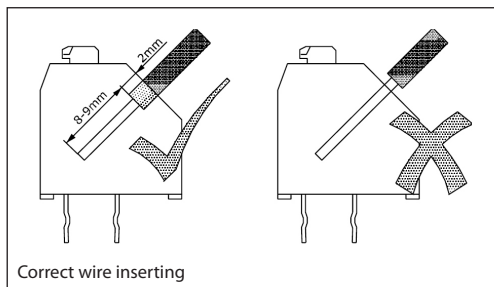
MCB 105 for option slot B
(Continued)

- The power to the frequency converter must be disconnected.
- The power to the livepart connections on relay terminals must be disconnected.
- Remove the LCP, the terminal cover and the cradle from the FC 30x.
- Fit the MCB 105 option in slot B.
- Connect the control cables and relief the cables by the enclosed cable strips.
- Various systems must not be mixed.
- Fit the extended cradle and terminal cover.
- Replace the LCP.
- Connect power to the frequency converter.
- Select the relay functions in par.5-40 [6-8], 5-41 [6-8] and 5-42 [6-8].

NB
(Array [6] is relay 7, array [7] is relay 8, and array [8] is relay 9).



Do not combine liveparts and PELV systems.



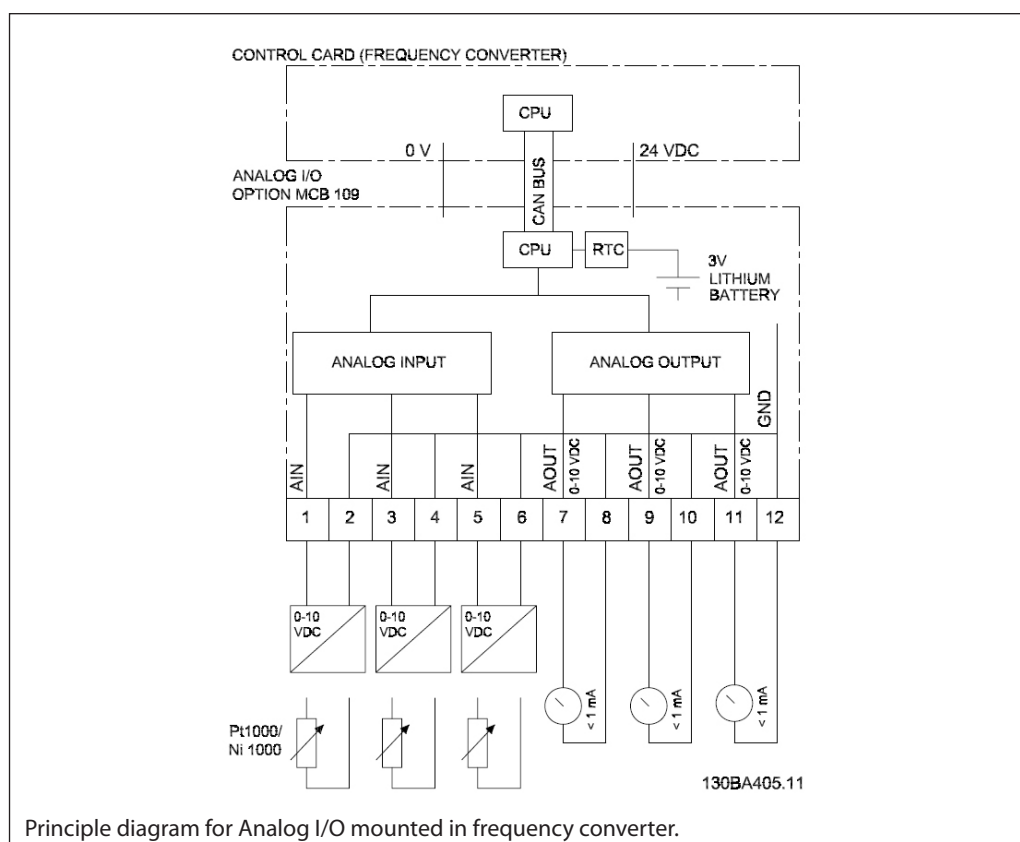
Analog I/O Option MCB109

Introduction

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.



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

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.

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.

Introduction
(Continued)
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.

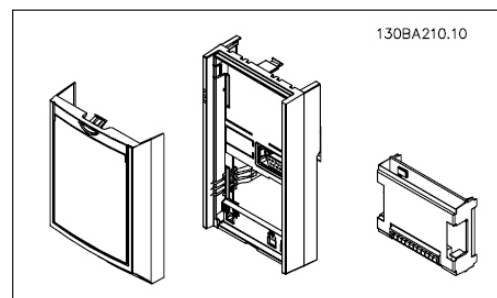
Accuracy of clock is better than ± 20 ppm at 25 °C.

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.

Ordering Code Numbers

Standard version code no: **130B1143**
 Coated version code no: **130B1243**



Mounting Guidelines

Mounting of Option Modules in Slot B

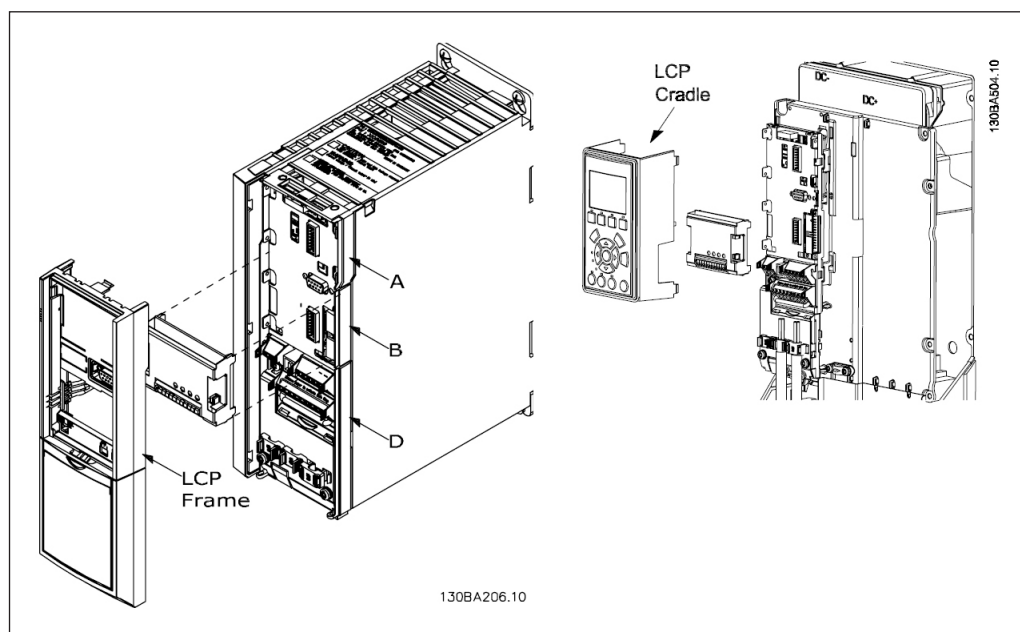
The power to the frequency converter must be disconnected.

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



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

