

Installation Instructions

VLT[®] Sensor Input MCB 114

VLT[®] HVAC Drive FC 102, VLT[®] AQUA Drive FC 202, VLT[®] Automation Drive FC 301/302

The VLT[®] Sensor Input MCB 114 can be used in the following cases:

- Sensor input for temperature transmitters PT100 and PT1000 for monitoring bearing temperatures.
- As general extension of analog inputs with 1 extra input (0/4–20 mA) for multi-zone control or differential pressure measurements.
- Support extended PID controllers with I/Os for setpoint, transmitter/sensor inputs.

| FC series | Software version |
|---|------------------|
| VLT [®] HVAC Drive FC 102 | 1.00 and later |
| VLT [®] AQUA Drive FC 202 | 1.41 and later |
| VLT [®] Automation Drive FC 301/FC 302 | 6.02 and later |

Table 1.1 Software Versions Supporting the VLT[®] Sensor Input MCB 114

Items Supplied

Items supplied depend on ordered code number and enclosure type of the frequency converter.

| Code number | Items supplied |
|-------------|------------------|
| 130B1172 | Uncoated version |
| 130B1272 | Coated version |

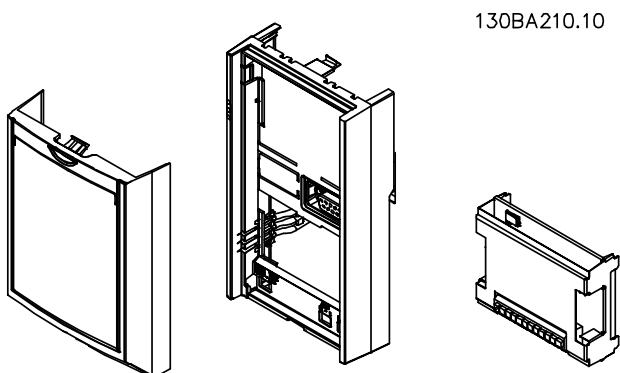


Illustration 1.1 Parts for Coated/Non-coated Code Numbers

Safety Information

⚠ WARNING

DISCHARGE TIME

The frequency converter contains DC-link capacitors, which can remain charged even when the frequency converter is not powered. High voltage can be present even when the warning LED indicator lights are off. Failure to wait the specified time after power has been removed before performing service or repair work can result in death or serious injury.

- Stop the motor.
- Disconnect AC mains and remote DC-link power supplies, including battery back-ups, UPS, and DC-link connections to other frequency converters.
- Disconnect or lock PM motor.
- Wait for the capacitors to discharge fully. The minimum duration of waiting time is specified in *Table 1.2* to *Table 1.4*.
- Before performing any service or repair work, use an appropriate voltage measuring device to make sure that the capacitors are fully discharged.

| Voltage [V] | Minimum waiting time (minutes) | | | | | |
|-------------|--------------------------------|----------------------------|--------------------------|----------------------------|--|------------------------------|
| | 4 | 7 | 15 | 20 | 30 | 40 |
| 200–240 | 1.1–3.7 kW (1.50–5 hp) | – | 5.5–45 kW (7.5–60 hp) | – | – | – |
| 380–480 | 1.1–7.5 kW (1.50–10 hp) | – | 11–90 kW (15–121 hp) | – | – | 315–1000 kW (450–1350 hp) |
| 400 | – | – | – | 90–315 kW (121–450 hp) | – | – |
| 500 | – | – | – | 110–355 kW (150–500 hp) | – | – |
| 525 | – | – | – | 75–315 kW (100–450 hp) | – | – |
| 525–600 | 1.1–7.5 kW (1.50–10 hp) | – | 11–90 kW (15–121 hp) | – | – | – |
| 690 | – | – | – | 90–315 kW (100–350 hp) | – | – |
| 525–690 | – | 1.1–7.5 kW (1.50–10 hp) | 11–90 kW (15–121 hp) | – | 400–1400 kW (500–1550 hp) 450–1400 kW (600–1550 hp) | – |

Table 1.2 Discharge Time, VLT® HVAC Drive FC 102

| Voltage [V] | Minimum waiting time (minutes) | | | | | |
|-------------|--------------------------------|---------------------------|--------------------------|----------------------------|------------------------------|--|
| | 4 | 7 | 15 | 20 | 30 | 40 |
| 200–240 | 0.25–3.7 kW (0.34–5 hp) | – | 5.5–45 kW (7.5–60 hp) | – | – | – |
| 380–480 | 0.37–7.5 kW (0.5–10 hp) | – | 11–90 kW (15–121 hp) | 110–315 kW (150–450 hp) | – | 315–1000 kW (450–1350 hp) 355–560 kW (500–750 hp) |
| 525–600 | 0.75–7.5 kW (1–10 hp) | – | 11–90 kW (15–121 hp) | – | 400–1400 kW (400–1550 hp) | – |
| 525–690 | – | 1.1–7.5 kW (1.5–10 hp) | 11–90 kW (10–100 hp) | 75–400 kW (75–400 hp) | – | 450–800 kW (450–950 hp) |

Table 1.3 Discharge Time, VLT® AQUA Drive FC 202

| Voltage [V] | Minimum waiting time (minutes) | | | | | |
|-------------|--------------------------------|-------------------------|--------------------------|----------------------------|------------------------------|--|
| | 4 | 7 | 15 | 20 | 30 | 40 |
| 200–240 | 0.25–3.7 kW (0.34–5 hp) | – | 5.5–37 kW (7.5–50 hp) | | | |
| 380–500 | 0.25–7.5 kW (0.34–10 hp) | – | 11–75 kW (15–100 hp) | 90–200 kW (150–350 hp) | 250–500 kW (450–750 hp) | 250–800 kW (450–1350 hp) 315–500 (500–750 hp) |
| 400 | – | – | – | 90–315 kW (125–450 hp) | – | – |
| 500 | – | – | – | 110–355 kW (150–450 hp) | – | – |
| 525 | – | – | – | 55–315 kW (75–400 hp) | – | – |
| 525–600 | 0.75–7.5 kW (1–10 hp) | – | 11–75 kW (15–100 hp) | – | – | – |
| 525–690 | – | 1.5–7.5 kW (2–10 hp) | 11–75 kW (15–100 hp) | 37–315 kW (50–450 hp) | 355–1200 kW (450–1550 hp) | 355–2000 kW (450–2050 hp) 355–710 kW (400–950 hp) |
| 690 | – | – | – | 55–315 kW (75–400 hp) | – | – |

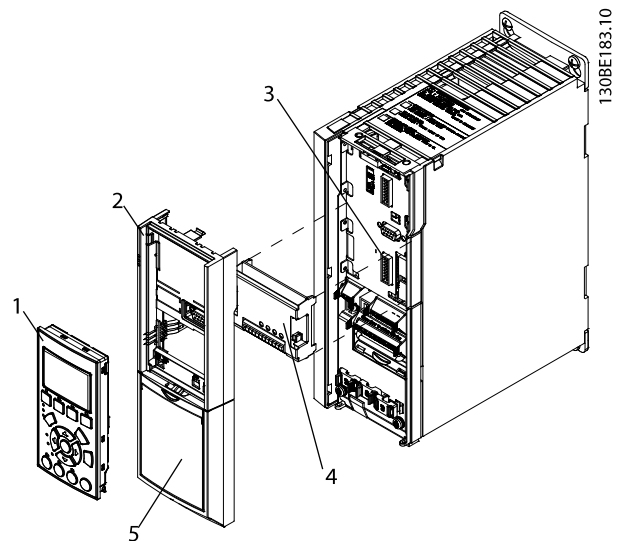
Table 1.4 Discharge Time, VLT® Automation Drive FC 301/FC 302

Mounting

The installation procedure depends on the enclosure size of the frequency converter.

Enclosure sizes A2, A3, and B3

1. Remove the LCP (local control panel), the terminal cover, and the LCP frame from the frequency converter.
2. Fit the option into slot B.
3. Connect the control cables and relieve the cable. See *Illustration 1.4* and *Illustration 1.5* for details about wiring.
4. Remove the knockout in the extended LCP frame (supplied).
5. Fit the extended LCP frame and terminal cover on the frequency converter.
6. Fit the LCP or blind cover in the extended LCP frame.
7. Connect power to the frequency converter.
8. Set up the input/output functions in the corresponding parameters.

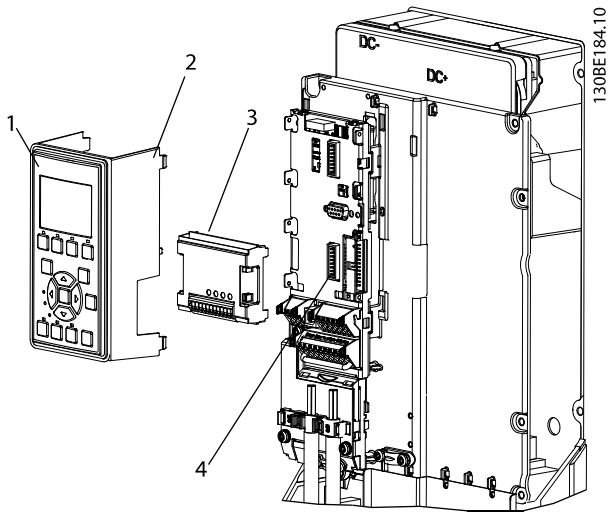


| | |
|---|----------------|
| 1 | LCP |
| 2 | Terminal cover |
| 3 | Slot B |
| 4 | Option |
| 5 | LCP frame |

Illustration 1.2 Installation in Enclosure Sizes A2, A3, and B3

Enclosure sizes A5, B1, B2, B4, C1, C2, C3, C4, D, E, and F

1. Remove the LCP (local control panel) and the LCP cradle.
2. Fit the option card into slot B.
3. Connect the control cables and relieve the cable. See *Illustration 1.4* and *Illustration 1.5* for details about wiring.
4. Fit the cradle on the frequency converter.
5. Fit the LCP in the cradle.



| | |
|---|------------|
| 1 | LCP |
| 2 | LCP cradle |
| 3 | Option |
| 4 | Slot B |

Illustration 1.3 Installation in Other Enclosures Sizes (Example)

Galvanic Insulation

Galvanically isolate the sensors from the mains voltage level.
 Safety demands: IEC 61800-5-1 and UL 508C.

Wiring

Wiring of VLT® Sensor Input MCB 114.

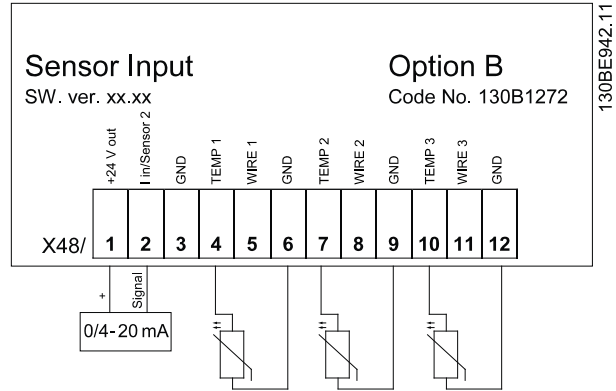


Illustration 1.4 2-Wire Sensors

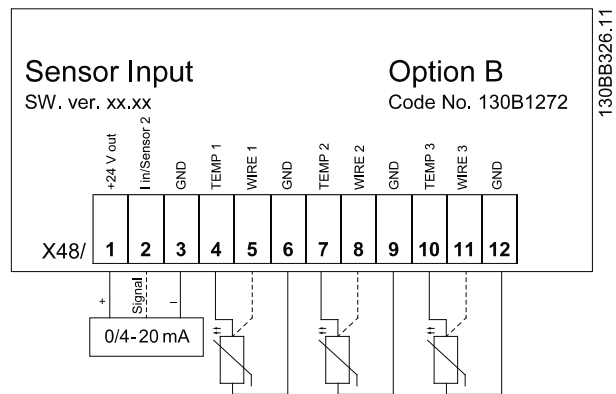


Illustration 1.5 3-Wire Sensors

| Terminal | Name | Function |
|----------|--------------|---|
| 1 | VDD | 24 V DC to supply 0/4–20 mA sensor |
| 2 | I in | 0/4–20 mA input |
| 3 | GND | Analog input GND |
| 4, 7, 10 | Temp 1, 2, 3 | Temperature input |
| 5, 8, 11 | Wire 1, 2, 3 | 3 rd wire input if 3 wire sensors are used |
| 6, 9, 12 | GND | Temperature input GND |

Table 1.5 Legend table for *Illustration 1.4* and *Illustration 1.5*

Cabling

Maximum signal cable length is 500 m (1640 ft).

Electrical and Mechanical Specifications

The option is able to supply the analog sensor with 24 V DC (terminal 1).

| | |
|------------------------------|--------------------|
| Number of analog inputs | 1 |
| Format | 0–20 mA or 4–20 mA |
| Wires | 2 wires |
| Input Impedance | <200 Ω |
| Sample rate | 1 kHz |
| 3 rd order filter | 100 Hz at 3 dB |

Table 1.6 Analog Input

| | |
|---|---|
| Number of analog inputs supporting PT100/1000 | 3 |
| Signal type | PT100/PT1000 |
| Connection | PT100 2 or 3 wire PT1000 2 or 3 wire |
| Frequency PT100 and PT1000 input | 1 Hz for each channel |
| Resolution | 10 bit |
| Temperature range | -50 to +204 °C -58 to +399 °F |

Table 1.7 Temperature Sensor Input

Configuration

- The 3 sensor inputs support 2 and 3 wire sensors and an auto detection of sensor type, PT100 or PT1000 takes places at power-up.
- The analog input is capable of handling 0/4–20 mA.

For programming of the parameters, see the product-specific *programming guide*, *parameter group 35-** Sensor Input Option* and *parameter group 18-3* Analog Readouts* with data readouts in *parameter 18-36 Analog Input X48/2 [mA]* to *parameter 18-39 Temp. Input X48/10*.

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