



Danfoss iC2-Micro Frequency Converters User Guide

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Danfoss iC2-Micro Frequency Converters



Product Information: iC2-Micro Frequency Converters

The iC2-Micro Frequency Converters are AC drives that are designed to provide necessary information to qualified personnel for installation and commissioning. These frequency converters should be used safely and professionally to avoid any risk of death, serious injury, and equipment or property damage. The iC2-Micro Frequency Converters should not be disposed of together with domestic waste that contains electrical components. Instead, they should be collected separately according to local and currently valid legislation.

Safety Instructions

It is essential to pay particular attention to the safety instructions and general warnings while using the iC2-Micro Frequency Converters. They contain high voltage when connected to AC mains input, DC supply, or load sharing. Leakage currents of the drive exceed 3.5 mA, so ensure that the minimum size of the ground conductor complies with the local safety regulations for high touch current equipment.

Installation Instructions

The following are the installation instructions for the iC2-Micro Frequency Converters:

Mechanical Dimensions

The iC2-Micro Frequency Converters come in different enclosure sizes and have specific mechanical dimensions. Refer to Table 1 for the enclosure size, height, width, depth, and maximum weight of each frequency converter.

Connecting to Mains and Motor

The iC2-Micro Frequency Converters should be connected to mains and motor as follows:

- The potentiometer on the local control panel extends 6.5 mm (0.26 in) from the drive.
- Refer to Table 1 for connecting terminals for load sharing and brake.
- Illustration 1 shows how to mount the ground cable, mains, and motor wires.
- Voltage levels of up to 850 V DC may occur between terminals +UDC/+BR and -UDC, which are not short-circuit protected.

Control Terminals

Illustration 3 provides an overview of control terminals in PNP-configuration with factory setting (speed control mode).

RJ45 Port and RS485 Termination Switch

The iC2-Micro Frequency Converters have an RJ45 port that complies with Modbus 485 protocol. Refer to the user manual for instructions on how to use the RJ45 port and RS485 termination switch.

Usage Instructions

Follow the below instructions while using the iC2-Micro Frequency Converters:

- Read and follow the instructions provided in the user manual carefully.
- Use the frequency converters safely and professionally to avoid any risk of death, serious injury, and equipment or property damage.
- Do not dispose of equipment containing electrical components together with domestic waste.
- Connect the frequency converters to mains and motor according to the instructions provided in the user manual.
- Refer to Table 1 for connecting terminals for load sharing and brake.
- Mount the ground cable, mains, and motor wires according to Illustration 1.
- Ensure that the minimum size of the ground conductor complies with the local safety regulations for high touch current equipment.
- Refer to Illustration 3 for an overview of control terminals in PNP-configuration with factory setting (speed control mode).
- Refer to the user manual for instructions on how to use the RJ45 port and RS485 termination switch.

Introduction

This operating guide provides necessary information for qualified personnel to install and commission the AC drive. Read and follow the instructions to use the drive safely and professionally.



- Do not dispose of equipment containing electrical components together with domestic waste.
- Collect it separately in accordance with local and currently valid legislation.

Safety

Pay particular attention to the safety instructions and general warnings to avoid the risk of death, serious injury, and equipment or property damage.

WARNING

• HIGH VOLTAGE

AC drives contain high voltage when connected to AC mains input, DC supply, or load sharing.

• UNINTENDED START

The motor may start from control panel, I/O inputs, eldbus, or MyDrive® Insight at any time, when the drive is connected to the AC mains, DC supply, or load sharing.

• DISCHARGE TIME

The drive contains DC-link capacitors, which can remain charged even when the drive is not powered. High voltage can be present even when the warning indicator lights are o.

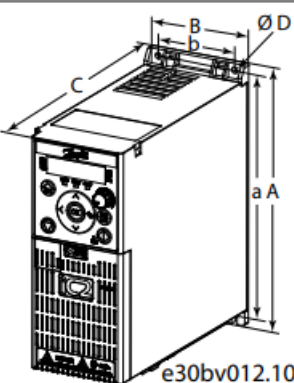
- Stop the motor, disconnect AC mains and permanent magnet type motors, and remove DC-link supplies, including battery backups, UPS, and DC-link connections to other drives.
- Wait for the capacitors to discharge fully and measure it before performing any service or repair work.
- The minimum waiting time is 4 minutes for MA01c, MA02c, MA01a, MA02a, and MA03a drives, and 15 minutes for MA04a and MA05a drives.

• LEAKAGE CURRENT

Leakage currents of the drive exceed 3.5 mA. Make sure that the minimum size of the ground conductor complies with the local safety regulations for high touch current equipment.

Installation

Mechanical Dimension

| Enclosure size | Height [mm (in)] | | | Width [mm (in)] | | Depth [mm (in)] ²⁾ | Mounting holes [mm (in)] |  |
|----------------|---|------------------|--------------|-----------------|----------|-------------------------------|--------------------------|--|
| | A | A ⁽¹⁾ | a | B | b | C | D | |
| MA01c | 150 (5.9) | 216 (8.5) | 140.4 (5.5) | 70 (2.8) | 55 (2.2) | 143 (5.6) | 4.5 (0.18) | |
| MA02c | 176 (6.9) | 232.2 (9.1) | 150.5 (5.9) | 75 (3.0) | 59 (2.3) | 157 (6.2) | 4.5 (0.18) | |
| MA01a | 150 (5.9) | 202.5 (8.0) | 140.4 (5.5) | 70 (2.8) | 55 (2.2) | 158 (6.2) | 4.5 (0.18) | |
| MA02a | 186 (7.3) | 240 (9.4) | 176.4 (6.9) | 75 (3.0) | 59 (2.3) | 175 (6.9) | 4.5 (0.18) | |
| MA03a | 238.5 (9.4) | 291 (11.5) | 226 (8.9) | 90 (3.5) | 69 (2.7) | 200 (7.9) | 5.5 (0.22) | |
| MA04a | 292 (11.5) | 365.5 (14.4) | 272.4 (10.7) | 125 (4.9) | 97 (3.8) | 244.5 (9.6) | 7.0 (0.28) | |
| MA05a | Data for MA05a will be available in next release. | | | | | | | |

| Enclosure size | Power [kW (hp)] | | Maximum weight ⁽³⁾ [kg (lb)] |
|----------------|---|--------------------|---|
| | 1x200–240 V | 3x380–480 V | |
| MA01c | 0.37–0.75 (0.5–1.0) | – | 1.0 (2.4) |
| MA02c | 1.5 (2.0) | – | 1.3 (2.9) |
| MA01a | – | 0.37–1.5 (0.5–2.0) | 1.1 (2.4) |
| MA02a | 2.2 (3.0) | 2.2–4.0 (3.0–5.5) | 1.6 (3.5) |
| MA03a | – | 5.5–7.5 (7.5–10) | 3.0 (6.6) |
| MA04a | – | 11–15 (15–20) | 6.0 (13.2) |
| MA05a | Data for MA05a will be available in next release. | | |

Note:

1. Including decoupling plate.
2. The potentiometer on the local control panel extends 6.5 mm (0.26 in) from the drive.
3. Not including decoupling plate.

Connecting to Mains and Motor

- Mount the ground wires to the PE terminal.
- Connect motor to terminals U, V, and W.
- Mount mains supply to terminals L1/L, L2, and L3/N (3-phase) or L1/L and L3/N (single-phase) and tighten.
- For required maximum screwing torque, see the back of terminal cover.

Load Sharing/Brake

Table 1: Connect Terminals

| | |
|---------------------|-------------------|
| Load sharing | -UDC and +UDC/+BR |
| Brake | -BR and +UDC/+BR |

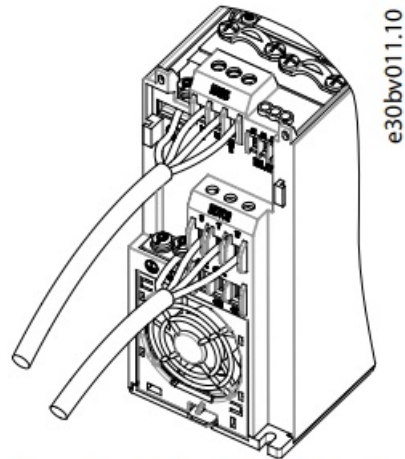


Illustration 1: Mounting of Ground Cable, Mains, and Motor Wires

- For MA01a, MA02a, and MA03a drives, wire with recommended connector (Ultra- Pod Fully Insulated FASTON Receptacles and Tabs, 521366-2, TE connectivity).
- For other enclosure sizes, mount the wires to the related terminal and tighten. For required maximum screwing torque, see the back of the terminal cover.
- For more details, contact Danfoss or refer to the drive's design guide.

NOTICE

Voltage levels of up to 850 V DC may occur between terminals +UDC/+BR and -UDC. Not short-circuit protected.

Control Terminals

- All control cable terminals are located underneath the terminal cover in front of the drive.
- See the back of the terminal cover for outlines of control terminals and switches.

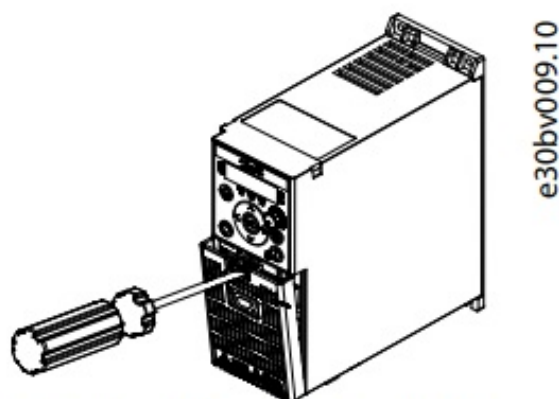


Illustration 2: Removing Terminal Cover

NOTICE

Remove the terminal cover with a screwdriver, see illustration 2.

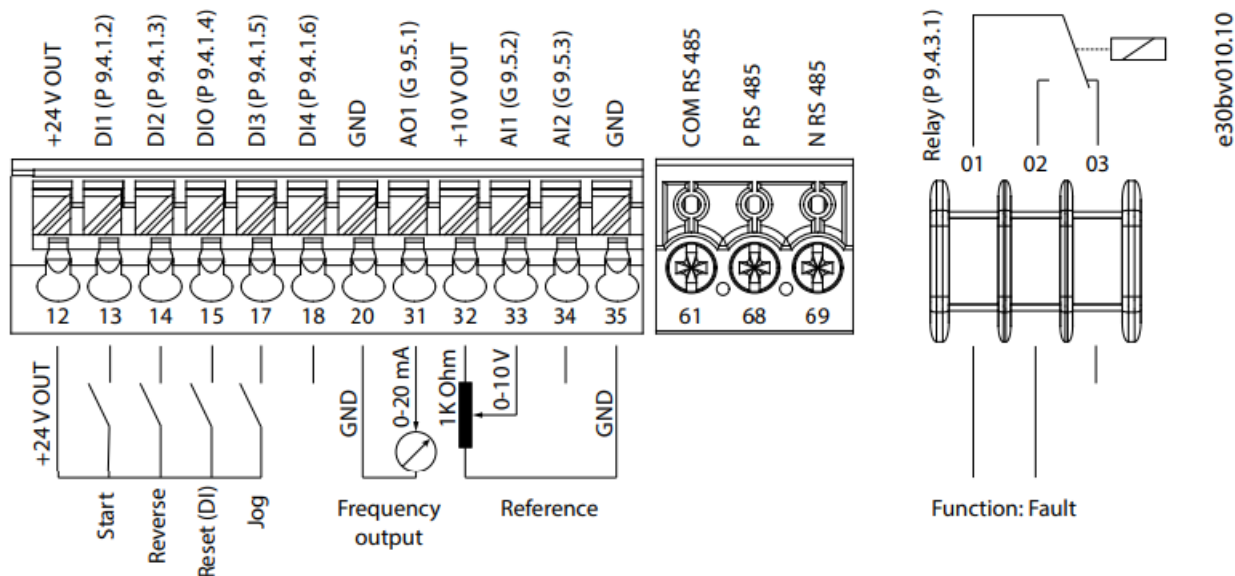


Illustration 3: Overview of Control Terminals in PNP-configuration with Factory Setting (Speed Control Mode)

RJ45 Port and RS485 Termination Switch

The drive has an RJ45 port which complies with Modbus 485 protocol.

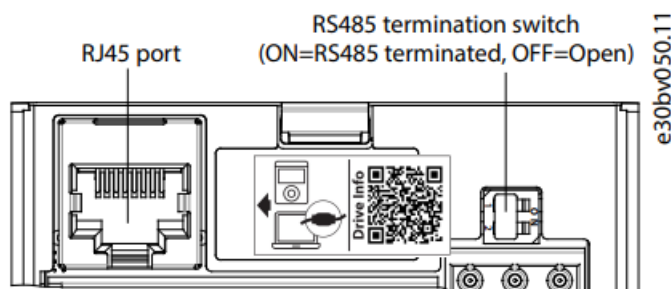


Illustration 4: RJ45 Port and RS485 Termination Switch

The RJ45 port is used for connecting:

- External control panel (Control Panel 2.0 OP2).
- PC tool (MyDrive® Insight) via an adapter option.(1)
- Offline configuration tool for parameter settings when the drive is not powered on.(1)

Note: (1) The tool is not available currently

NOTICE

- The RJ45 port supports up to 3 m (9.8 ft) of shielded CAT5e cable which is NOT used to directly connect the drive to a PC. Failure to follow this notice causes damage to the PC.
- RS485 termination switch should be set to ON if the drive is at the end of the eldbus.
- Do not operate RS485 termination switch when the drive is powered on.

Programming

Control Panel

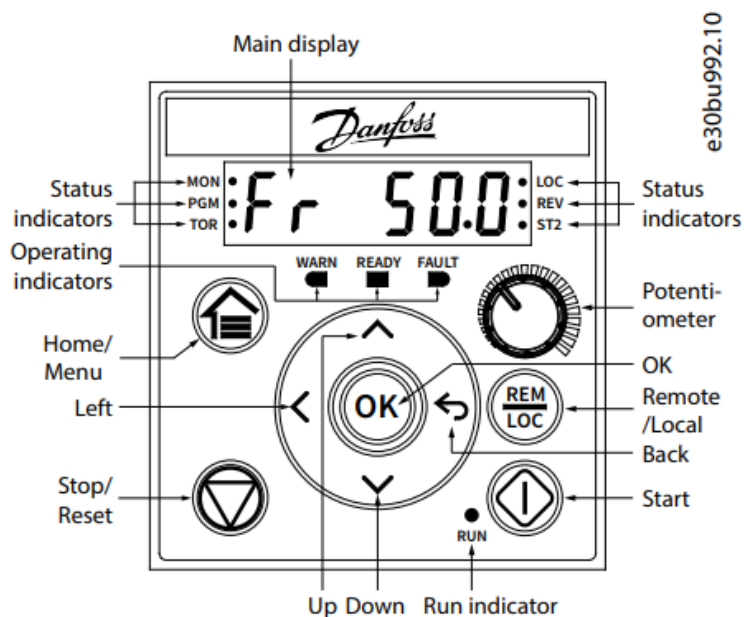


Illustration 5: Indicators and Operation Keys

Table 2: Operation Keys and Potentiometer

| Name | Function |
|---------------|--|
| Home/Menu | (1) Toggles between status display and main menu. (2) Long press to access the shortcut menu for quickly reading and editing parameters. |
| Up/Down | Switches status/parameter group/parameter numbers and tunes the parameter values. |
| Left | Moves the cursor 1 bit to the left. |
| Back | Navigates to the previous step in the menu structure or cancels the setting during tuning parameter values. |
| OK | Confirms the operation. |
| Remote/Local | Toggles between remote and local mode. |
| Start | Starts the drive in local mode. |
| Stop/Reset | Stops the drive in local mode, or resets the drive to clear a fault. |
| Potentiometer | Changes the reference value when the reference value is selected as potentiometer. |

Table 3: Status and Operating Indicator Lights

| Name | Function | Name | Function |
|------|--|-------|--|
| MON | On Shows the drive status. | REV | On The drive is in reverse direction. |
| PGM | On The drive is in programming status. | REV | Off The drive is in forward direction. |
| TOR | On The drive is in torque mode. | ST2 | Refer to Table 5 Multiple Setups Indicator Lights. |
| | Off The drive is in speed mode. | WARN | Steadily lit when a warning occurs. |
| LOC | On The drive is in local mode. | READY | Steadily lit when the drive is ready. |
| | Off The drive is in remote mode. | FAULT | Flashes when a fault occurs. |

Table 4: Run Indicator Lights

| Name | Function |
|-------|--|
| On | The drive is in normal operation. |
| Off | The drive has stopped. |
| Flash | In the motor-stopping process; or the drive received a RUN command, but no frequency output. |

Table 5: Multiple Setups Indicator Lights

| ST2 | Off | On | Flash | Flash quickly |
|----------------------------------|---------|---------|---------|---------------|
| Active setup ⁽¹⁾ | Setup 1 | Setup 2 | Setup 1 | Setup 2 |
| Programming setup ⁽²⁾ | Setup 1 | Setup 2 | Setup 2 | Setup 1 |

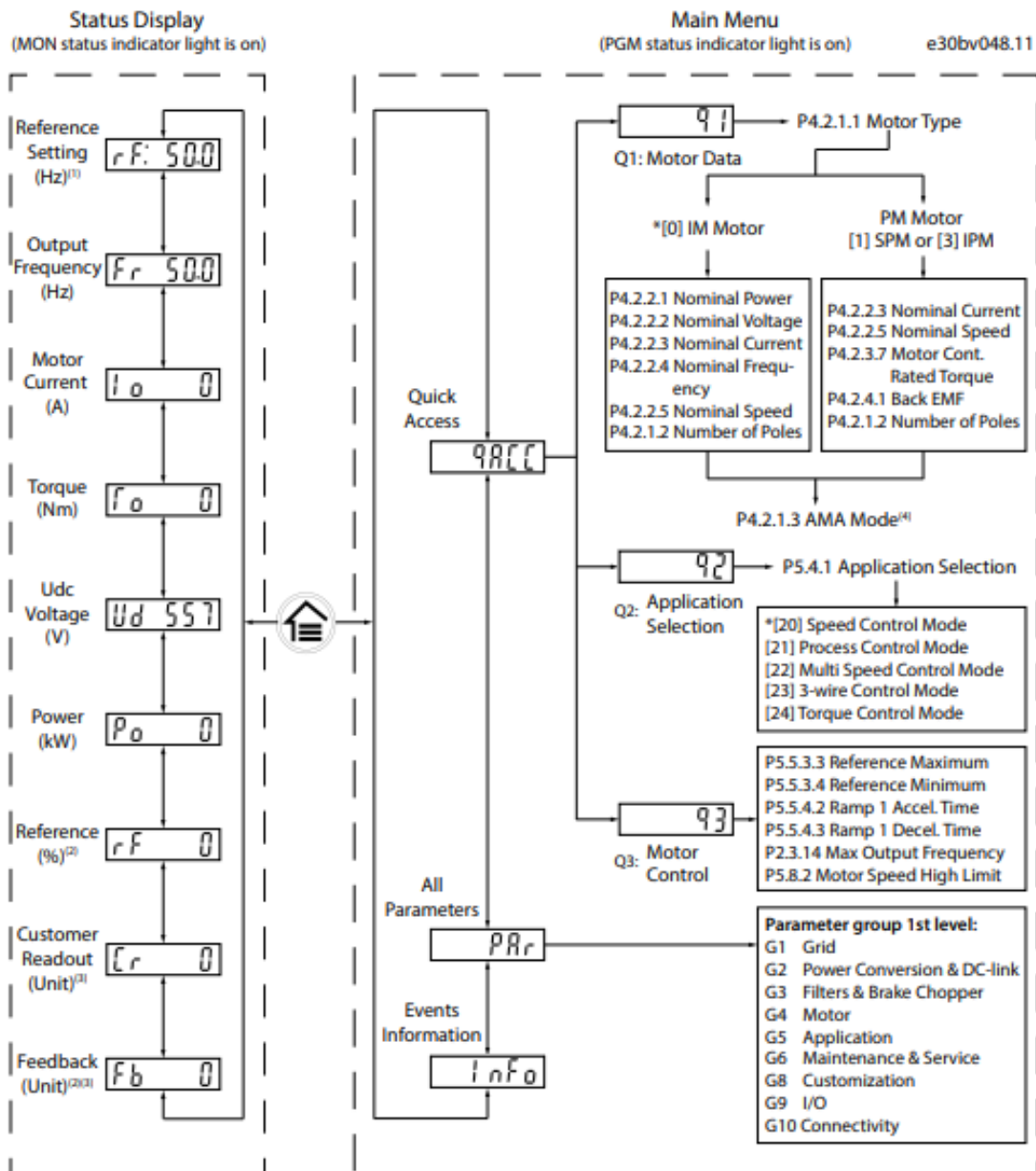
Note:

(1) Select active setup in parameter P6.6.1 Active Setup.

(2) Select programming setup in parameter P6.6.2 Programming Setup.

Operation with Control Panel

After the drive is powered up, press the Home/Menu key to toggle between status display and main menu. Use the Up/Down keys to select items, and press the OK key to confirm selection



Note:

1. Local mode only.
2. Remote mode only.
3. The status is only shown when the corresponding function is enabled.
4. For AMA execution, refer to chapter Automatic Motor Adaptation (AMA). If parameter P5.4.3 Motor Control Principle is set as [0] U/f, no need to execute AMA.

Automatic Motor Adaptation (AMA)

- Via running AMA in VVC+ mode, the drive builds a mathematical model of the motor to optimize compatibility between drive and motor, and thus enhances the motor control performance.
- Some motors may be unable to run the complete version of the test. In that case, select [2] Enable Reduced AMA in parameter P4.2.1.3 AMA Mode.
- AMA completes within 5 minutes. For best results, run the following procedure on a cold motor.

Procedure:

1. Set motor data according to the motor nameplate.
2. If needed, set motor cable length in parameter P4.2.1.4 Motor Cable Length.
3. Set [1] Enable Complete AMA or [2] Enable Reduced AMA for parameter P4.2.1.3 AMA Mode, the main display shows To start AMA, see illustration 7.
4. Press the Start key, the test runs automatically and the main display indicates when it is completed.
5. When AMA is completed, press any key to exit and return to normal operation mode.

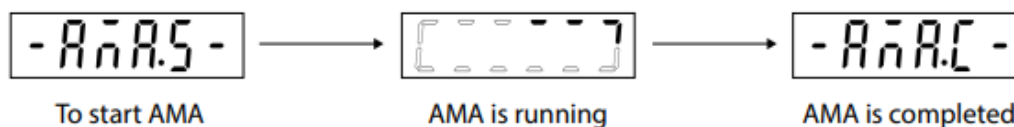


Illustration 7: AMA Status Indications

Troubleshooting

Table 6: Warning and Fault Events Summary

| Number | Description | Warning | Fault | Trip lock | Cause |
|--------|--|---------|-------|-----------|---|
| 2 | Live zero error | X | X | – | Signal on terminal 33 or 34 is less than 50% of the value set in <i>parameter P9.5.2.3 T33 Low Voltage, parameter P9.5.2.5 T33 Low Current, parameter P9.5.3.3 T34 Low Voltage, and parameter P9.5.3.5 T34 Low Current.</i> |
| 3 | No motor | X | – | – | No motor has been connected to the output of the drive. |
| 4 | Mains phase loss ⁽¹⁾ | X | X | X | Missing phase on the supply side, or the voltage imbalance is too high. Check the supply voltage. |
| 7 | DC overvoltage ⁽¹⁾ | X | X | – | DC-link voltage exceeds the limit. |
| 8 | DC undervoltage ⁽¹⁾ | X | X | – | DC-link voltage drops below the voltage warning low limit. |
| 9 | Inverter overloaded | X | X | – | More than 100% load for too long. |
| 10 | Motor ETR overtemperature | X | X | – | Motor is too hot due to more than 100% load for too long. |
| 11 | Motor thermistor overtemperature | X | X | – | Thermistor or thermistor connection is disconnected, or the motor is too hot. |
| 12 | Torque limit | X | X | – | Torque exceeds the value set in either <i>parameter P5.10.1 Motor Torque Limit</i> or <i>parameter P5.10.2 Regenerative Torque Limit.</i> |
| 13 | Overcurrent | X | X | X | Inverter peak current limit is exceeded. If this fault occurs on power-up, check whether power cables are mistakenly connected to the motor terminals. |
| 14 | Ground fault | – | X | X | Discharge from output phases to ground. |
| 16 | Short circuit | – | X | X | Short circuit in motor or on motor terminals. |
| 17 | Control word timeout | X | X | – | No communication to the drive. |
| 18 | Start failed | – | X | – | May be caused by a blocked motor. |
| 25 | Brake resistor short-circuited | – | X | X | Brake resistor is short-circuited, thus the brake function is disconnected. |
| 26 | Brake overload | X | X | – | The power transmitted to the brake resistor over the last 120 s exceeds the limit. Possible corrections: Decrease brake energy via lower speed or longer ramp time. |
| 27 | Brake IGBT/Brake chopper short-circuited | – | X | X | Brake transistor is short-circuited, thus brake function is disconnected. |
| 28 | Brake check | – | X | – | Brake resistor is not connected/working. |
| 30 | U phase loss | – | X | X | Motor phase U is missing. Check the phase. |
| 31 | V phase loss | – | X | X | Motor phase V is missing. Check the phase. |
| 32 | W phase loss | – | X | X | Motor phase W is missing. Check the phase. |

| | | | | | |
|---------|------------------------------------|---|---|---|--|
| 36 | Mains failure | X | X | – | This warning/fault is only active if the supply voltage to the drive is less than the value set in <i>parameter P2.3.7 Power Loss Controller Limit</i> , and <i>parameter P2.3.6 Power Loss Action</i> is NOT set to [0] No Function. |
| 38 | Internal fault | – | X | X | Contact the local supplier. |
| 40 | Overload T15 | X | – | – | Check the load connected to terminal 15 or remove short-circuit connection. |
| 46 | Gate drive voltage fault | – | X | – | – |
| 47 | 24 V supply low | X | X | X | 24 V DC may be overloaded. |
| 50 | AMA calibration failed | – | X | – | A calibration error has occurred. |
| 51 | AMA check U_{nom} and I_{nom} | – | X | – | Wrong setting for motor voltage and/or motor current. |
| 52 | AMA low I_{nom} | – | X | – | Motor current is too low. Check the settings. |
| 53 | AMA big motor | – | X | – | The power size of the motor is too large for the AMA to operate. |
| 54 | AMA small motor | – | X | – | The power size of the motor is too small for the AMA to operate. |
| 55 | AMA parameter range | – | X | – | The parameter values of the motor are outside of the acceptable range. AMA does not run. |
| 56 | AMA interrupt | – | X | – | The AMA is interrupted. |
| 57 | AMA timeout | – | X | – | – |
| 58 | AMA internal | – | X | – | Contact the local supplier. |
| 59 | Current limit | X | X | – | The drive is overloaded. |
| 60 | External Interlock | – | X | – | External interlock has been activated. |
| 61 | Feedback error | X | X | – | – |
| 63 | Mechanical brake low | – | X | – | Actual motor current has not exceeded release brake current within start delay time window. |
| 69 | Power card temp | X | X | X | The cutout temperature of the power card has exceeded the upper limit. |
| 80 | Drive initialized to default value | – | X | – | All parameter settings are initialized to default settings. |
| 87 | Auto DC brake | X | – | – | Occurs in IT mains when the drive coasts, and the DC voltage is higher than 830 V for 400 V units and 425 V for 200 V units. The motor consumes energy on the DC link. This function can be enabled/disabled in <i>parameter P2.3.13 Auto DC Braking</i> . |
| 95 | Lost load detected | X | X | – | – |
| 99 | Locked rotor | – | X | – | Rotor is blocked. |
| 126 | Motor rotating | – | X | – | PM motor is rotating when AMA is performed. |
| 127 | Back EMF too high | X | – | – | The back EMF of PM motor is too high before starting. |
| Err. 89 | Parameter read only | – | – | – | Parameters cannot be changed. |
| Err. 95 | Not while running | – | – | – | Parameters can only be changed when the motor is stopped. |

Note: (1) These faults may be caused by mains distortions. Installing a Danfoss line filter may rectify this problem.

Specifications

Table 7: Mains Supply 1x200–240 V AC

| Normal overload 150% for 1 minute | | | | |
|--|------------|------------|-----------|-----------|
| Drive | 02A2 | 04A2 | 06A8 | 09A6 |
| Typical shaft output [kW (hp)] | 0.37 (0.5) | 0.75 (1.0) | 1.5 (2.0) | 2.2 (3.0) |
| Enclosure protection rating IP20 | MA01c | MA01c | MA02c | MA02a |
| Output current | | | | |
| Continuous (3x200–240 V) [A] | 2.2 | 4.2 | 6.8 | 9.6 |
| Intermittent (3x200–240 V) [A] | 3.3 | 6.3 | 10.2 | 14.4 |
| Maximum cable size (Mains, motor) [mm²/AWG] | 4/10 | | | |
| Maximum input current | | | | |
| Continuous (1x200–240 V) [A] | 6.1 | 11.6 | 18.7 | 26.4 |
| Intermittent (1x200–240 V) [A] | 8.3 | 15.6 | 26.4 | 37 |

Table 8: Mains Supply 3x380–480 V AC MA01a–MA02a

| Normal overload 150% for 1 minute | | | | | | |
|--|------------|------------|-----------|-----------|-----------|-----------|
| Drive | 01A2 | 02A2 | 03A7 | 05A3 | 07A2 | 09A0 |
| Typical shaft output [kW (hp)] | 0.37 (0.5) | 0.75 (1.0) | 1.5 (2.0) | 2.2 (3.0) | 3.0 (4.0) | 4.0 (5.5) |
| Enclosure protection rating IP20 | MA01a | MA01a | MA01a | MA02a | MA02a | MA02a |
| Output current | | | | | | |
| Continuous (3x380–440 V) [A] | 1.2 | 2.2 | 3.7 | 5.3 | 7.2 | 9.0 |
| Intermittent (3x380–440 V) [A] | 1.8 | 3.3 | 5.6 | 8.0 | 10.8 | 13.7 |
| Continuous (3x440–480 V) [A] | 1.1 | 2.1 | 3.4 | 4.8 | 6.3 | 8.2 |
| Intermittent (3x440–480 V) [A] | 1.7 | 3.2 | 5.1 | 7.2 | 9.5 | 12.3 |
| Maximum cable size (Mains, motor) [mm²/AWG] | 4/10 | | | | | |
| Maximum input current | | | | | | |
| Continuous (3x380–440 V) [A] | 1.9 | 3.5 | 5.9 | 8.5 | 11.5 | 14.4 |
| Intermittent (3x380–440 V) [A] | 2.6 | 4.7 | 8.7 | 12.6 | 16.8 | 20.2 |
| Continuous (3x440–480 V) [A] | 1.7 | 3.0 | 5.1 | 7.3 | 9.9 | 12.4 |
| Intermittent (3x440–480 V) [A] | 2.3 | 4.0 | 7.5 | 10.8 | 14.4 | 17.5 |

Table 9: Mains Supply 3x380–480 V AC MA03a–MA05a

| Normal overload 150% for 1 minute | | | | | | |
|--|-----------|----------|---------|---------|-----------|---------|
| Drive | 12A0 | 15A5 | 23A0 | 31A0 | 37A0 | 43A0 |
| Typical shaft output [kW (hp)] | 5.5 (7.5) | 7.5 (10) | 11 (15) | 15 (20) | 18.5 (25) | 22 (30) |
| Enclosure protection rating IP20 | MA03a | MA03a | MA04a | MA04a | MA05a | MA05a |
| Output current | | | | | | |
| Continuous (3x380–440 V) [A] | 12 | 15.5 | 23 | 31 | 37 | 43 |
| Intermittent (3x380–440 V) [A] | 18 | 23.5 | 34.5 | 46.5 | 55.5 | 64.5 |
| Continuous (3x440–480 V) [A] | 11 | 14 | 21 | 27 | 34 | 40 |
| Intermittent (3x440–480 V) [A] | 16.5 | 21.3 | 31.5 | 40.5 | 51 | 60 |
| Maximum cable size (Mains, motor) [mm²/AWG] | 4/10 | | 16/6 | | | |
| Maximum input current | | | | | | |
| Continuous (3x380–440 V) [A] | 19.2 | 24.8 | 33 | 42 | 34.7 | 41.2 |
| Intermittent (3x380–440 V) [A] | 27.4 | 36.3 | 47.5 | 60 | 49 | 57.6 |
| Continuous (3x440–480 V) [A] | 16.6 | 21.4 | 29 | 36 | 31.5 | 37.5 |
| Intermittent (3x440–480 V) [A] | 23.6 | 30.1 | 41 | 52 | 44 | 53 |

Ambient Conditions

| | | |
|---|----------------|--|
| Protection rating | | IP20/Open Type (IP21/Type 1 conversion kit as an option). |
| Temperature during operation | | -10 °C to 50 °C (14 °F to 122 °F), up to 55 °C (131 °F) with derating. |
| Temperature during storage/transport | | -25 °C to 65/70 °C (-13 °F to 149/158 °F). |
| Relative humidity | | 5–95%, non-condensing during operation. |
| Altitude | | 0–1000 m (3280 ft) without derating. |
| | | 1000–3000 m (3280–9243 ft) with derating of 1%/100 m (328 ft). |
| Contamination level | Storage | IEC 60721-3-1, Class 1C2 (aggressive gases), Class 1S11 (dust/sand). |
| | Transportation | IEC 60721-3-2, Class 2C2 (aggressive gases), Class 2S5 (dust/sand). |
| | Operation | IEC 60721-3-3, Class C3 (aggressive gases), Class 3S6 (dust/sand). |
| Mechanical conditions | Storage | IEC 60721-3-1, Class 1M11. |
| | Transportation | IEC 60721-3-2, Class 2M4. |
| | Operation | IEC 60721-3-3, Class 3M11. |

Mounting Clearance

Table 10: Minimum Mounting Clearance

| Enclosure size | Minimum mounting clearance [maximum temperature 50 °C (122 °F)] |
|-------------------------|--|
| All enclosure sizes | Above and below: 100 mm (3.9 in). |
| MA01a–MA05a, MA02c | Sides: 0 mm (0 in). |
| MA01c (natural cooling) | Sides: 0 mm (0 in) for 40 °C (104 °F), 10 mm (0.39 in) and above for 50 °C (122 °F). |

EMC Compatibility and Motor Cable Length

Based on different EMC filter types, the drive has 2 variants:

(1) Drive with built-in EMC filter. (2) Drive with non built-in EMC filter

Table 11: EMC Compatibility Motor Cable Length

| Drive with built-in EMC filter | Maximum motor cable length (shielded), @4kHz | |
|--------------------------------|--|----------------|
| | C1 (Conducted) | C2 (Conducted) |
| 1x200–240 V | 5 m (16.4 ft) | – |
| 3x400–480 V | – | 15 m (49.2 ft) |

Table 12: Maximum Motor Cable Length

| Maximum motor cable length | Shielded | 50 m (164 ft) |
|----------------------------|------------|---------------|
| | Unshielded | 75 m (246 ft) |

- Drive with built-in EMC filter fulfills radiated emission C2 limits.
- Drive with non built-in EMC filter fulfills conducted/radiated emission C4 requirements.
- The drive is designed to operate with optimum performance within the maximum motor cable lengths defined in Table 12 Maximum Motor Cable Length.

Fuses and Circuit Breakers

| iC2-Micro | Non cabinet | | | | | Cabinet | | | | |
|-----------------------------|---|--------|---|----|---------|---------------------------------|-----------------------------------|---|----------------------------|------|
| | UL fuse | | | | CE fuse | UL circuit breaker | CE circuit breaker | Test cabinet size [Height x Width x Depth] [mm (in)] | Minimum cabinet volume [L] | |
| kW (hp) | RK1 | T | J | CC | gG | ABB MS165 Maximum trip level | Eaton PKZM4 Maximum trip level | | | |
| Standard fault current SCCR | 5 kA | 5 kA | | | 5 kA | 5 kA | 5 kA | | | |
| High fault current SCCR | – | 100 kA | | | – | 65 kA | – | | | |
| 1x200-240 V | | | | | | | | | | |
| 0.37 (0.5) | 25 A | | | | 25 A | 25 A | 25 A | 500 x 400 x 260 (19.7 x 15.7 x 10.2) | 52 | |
| 0.75 (1.0) | | | | | | | | | | |
| 1.5 (2.0) | | | | | | | | | | 35 A |
| 2.2 (3.0) | 40 A | | | | 50 A | 42 A | 50 A | | | |
| 3x380-480 V | | | | | | | | | | |
| 0.37 (0.5) | 15 A | | | | 16 A | 16 A | 16 A | 500 x 400 x 260 (19.7 x 15.7 x 10.2) | 52 | |
| 0.75 (1.0) | | | | | | | | | | |
| 1.5 (2.0) | | | | | | | | | | |
| 2.2 (3.0) | 30 A | | | | 40 A | 32 A | 32 A | | | |
| 3.0 (4.0) | | | | | | | | | | |
| 4.0 (5.5) | | | | | | | | | | |
| 5.5 (7.5) | 40 A | | | | 40 A | 42 A | 40 A | | | |
| 7.5 (10) | | | | | | | | | | |
| 11 (15) | 60 A | | | | 63 A | 65 A | 63 A | 800 x 400 x 300 (31.5 x 15.7 x 11.8) | 96 | |
| 15 (20) | | | | | | | | | | |
| 18.5 (25) | Data for MA05a will be available in next release. | | | | | | | | | |
| 22 (30) | | | | | | | | | | |

Accessories and Spare Parts

| Accessories | Code number | Accessories | Code number |
|---|-------------|---|-------------|
| IP21/Type 1 conversion kit, MA01c | 132G0188 | Decoupling plate mounting kit, MA01c | 132G0202 |
| IP21/Type 1 conversion kit, MA02c | 132G0189 | Decoupling plate mounting kit, MA02c | 132G0203 |
| IP21/Type 1 conversion kit, MA01a | 132G0190 | Decoupling plate mounting kit, MA01a | 132G0204 |
| IP21/Type 1 conversion kit, MA02a | 132G0191 | Decoupling plate mounting kit, MA02/03a | 132G0205 |
| IP21/Type 1 conversion kit, MA03a | 132G0192 | Decoupling plate mounting kit, MA04/05a | 132G0206 |
| NEMA 1 conversion kit, MA01c | 132G0195 | Connector for common DC/brake resistor | 132G0207 |
| NEMA 1 conversion kit, MA02c | 132G0196 | Control panel 2.0 OP2 | 132G0234 |
| NEMA 1 conversion kit, MA01a | 132G0197 | Surface mounting kit OA2 | 132G0235 |
| NEMA 1 conversion kit, MA02a | 132G0198 | Flush mounting kit OA2 | 132G0236 |
| NEMA 1 conversion kit, MA03a | 132G0199 | Control panel cable 1.5 m OA2 | 132G0237 |
| NEMA 1 conversion kit, MA04a | 132G0200 | Control panel cable 3 m OA2 | 132G0238 |
| NEMA 1 conversion kit, MA05a ⁽¹⁾ | 132G0201 | Note: (1) Not available currently. | |

| Spare parts | Code number |
|------------------|----------------------------|
| Cooling fans | Refer to the Design Guide. |
| Spare parts kits | |

Technical Documentation

Scan the QR code to access more technical documents for the drive. Or, after scanning the QR code, click Global English on the website to select your local region's website, search iC2 to and the documents in your own languages



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Documents / Resources

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|--|--|
| | Danfoss iC2-Micro Frequency Converters [pdf] User Guide MA01c, MA02c, MA01a, MA02a, MA03a, MA04a, MA05a, iC2-Micro Frequency Converters, iC 2-Micro, Frequency Converters, Converters |
| | Danfoss iC2-Micro Frequency Converters [pdf] User Guide MA01c, MA02c, MA01a, MA02a, MA03a, MA04a, MA05a, iC2-Micro Frequency Converters, iC 2-Micro, Frequency Converters, Converters |

References

- [Global AC drive manufacturer - Danfoss Drives | Danfoss](#)