OMRON

Multi-function Compact Inverter

# M1 Series

CSM_M1_DS_E_4_1

## Advanced position control and EtherCAT® connectivity maximize potential of your motion system

- Nine types of motor control methods
- High starting torque: 200% at 0 Hz (vector control with speed sensor)
- Maximum output frequency: 590 Hz
- Dual rating: Heavy load mode (1 min at 150%, 0.5 s at 200%) and light load mode (1 min at 120%)
- Supports induction and PM motors (up to 128 poles)
- Position control (built-in ABZ phase encoder input)
- Torque control (in vector control)
- Safety functionality: STO (Cat. 3/PLe according to ISO 13849-1)
- Two safety inputs + EDM output as standard
- Configuration using integrated development environment Sysmac Studio
- Built-in EtherCAT communications (3G3M1-□□□□□-ECT)

# M1 Series

# Standard Specifications

## Inverter 3G3M1

### Three-phase 200-V Class

HHD: Heavy load, HND: Light load

| Item | | | Three-phase 200 V | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model (3G3M1-A2□□□(-ECT)) | | | 001 | 002 | 004 | 007 | 015 | 022 | 037 | 055 | 075 | 110 | 150 | 185 |
| Maximum applicable motor capacity ✻1 | kW | HHD | 0.1 | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 |
| | | HND | 0.2 | 0.4 | 0.75 | 1.1 | 2.2 | 3 ✻7 | 5.5 ✻7 | 7.5 | 11 | 15 | 18.5 | 22 |
| | HP | HHD | 1/8 | 1/4 | 1/2 | 1 | 2 | 3 | 5 | 7 1/2 | 10 | 15 | 20 | 25 |
| | | HND | 1/4 | 1/2 | 1 | 1 1/2 | 3 | 4 | 7 1/2 | 10 | 15 | 20 | 25 | 30 |
| Rated output capacity [kVA] ✻2 | 200 V | HHD | 0.3 | 0.6 | 1 | 1.7 | 2.8 | 3.8 | 6.1 | 8.7 | 11 | 16 | 21 | 26 |
| | | HND | 0.5 | 0.7 | 1.2 | 2.1 | 3.3 | 4.2 | 6.8 | 10 | 14 | 19 | 24 | 30 |
| | 240 V | HHD | 0.4 | 0.7 | 1.2 | 2.1 | 3.3 | 4.6 | 7.3 | 10 | 14 | 20 | 25 | 32 |
| | | HND | 0.5 | 0.8 | 1.5 | 2.5 | 4.0 | 5.0 | 8.1 | 12 | 17 | 23 | 29 | 37 |
| Rated input voltage ✻3 | | | Three-phase 200 to 240 V, 50/60 Hz | | | | | | | | | | | |
| Rated input current [A] ✻4 | | HHD | 1.1 | 1.8 | 3.1 | 5.3 | 9.5 | 13.2 | 22.2 | 31.5 | 42.7 | 60.7 | 80 | 97 |
| | | HND | 1.8 | 2.6 | 4.9 | 6.7 | 12.8 | 17.9 | 28.5 | 42.7 | 60.7 | 80 | 97 | 112 |
| Rated output voltage | | | Three-phase 200 to 240 V (with AVR) | | | | | | | | | | | |
| Rated output current [A] ✻5 | | HHD | 1 | 1.6 | 3 | 5 | 8 | 11 | 17.5 | 25 | 33 | 47 | 60 | 76 |
| | | HND | 1.3 | 2 | 3.5 | 6 | 9.6 | 12 ✻7 | 19.6 ✻7 | 30 | 40 | 56 | 69 | 88 |
| Braking torque [%] ✻6 | | HHD | 150 | | 100 | | 70 | 40 | | 20 | | | | |
| | | HND | 75 | | 53 | 68 | 48 | 29 ✻7 | 27 ✻7 | 15 | | | | |
| Braking resistor circuit | Regenerative braking | | Built-in braking resistor circuit (discharge resistor separately mounted) | | | | | | | | | | | |
| | Minimum connection resistance [Ω] | | 100 to 120 | | | | 40 to 120 | | 33 to 120 | 20 min. | 15 min. | 10 min. | 8.6 min. | 4 min. |
| Short circuit current rating [kA] | | | 100 | | | | | | | | | | | |
| Weight [kg] | | | Approx. 0.5 | Approx. 0.5 | Approx. 0.7 | Approx. 0.9 | Approx. 1.4 | Approx. 1.4 | Approx. 1.7 | Approx. 3.8 | Approx. 4 | Approx. 5.3 | Approx. 5.4 | Approx. 11 |
| Dimensions (Width × Height) [mm] | | | 68 × 127 | | | | 110 × 130 | | 140 × 130 | 180 × 220 | | 220 × 260 | | 250 × 400 |
| Dimensions (Depth) [mm] | | | 98 | | 113 | 145 | 156 | | | 171 | | 203 | | STD: 203 ECT: 208 |

✻1. The maximum applicable motor capacity is given for a standard four-phase motor. When selecting an inverter, select not just by kW but also ensure that the inverter rated output current is greater than the motor rated current.
✻2. In calculating the rated capacity, the rated output voltage is assumed to be 200 V or 240 V.
✻3. A voltage higher than the power supply voltage cannot be output.
✻4. When Carrier Frequency (F26) is set to the following or below, derating is required.
HHD mode...A2001 to A2037: 8 kHz, A2055 to A2185: 10 kHz
HND mode...A2001 to A2037: 4 kHz, A2055 to A2150: 10 kHz, A2185: 4 kHz
Refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat. No. I669) or *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat. No. I670) for details.
✻5. The following shows the calculated value when the power supply capacity is 500 kVA (10x the inverter capacity when the inverter capacity exceeds 50 kVA) and when a %X = 5% power supply is connected.
✻6. The numeric value is the average braking torque per individual motor. (Varies according to motor efficiency)
✻7. Allowable ambient temperature of 40°C or below of A2022 to A2037 in the HND mode. The rated output current in the HND mode decreases by 1% for every temperature increase of 1°C when the ambient temperature is 40°C or more.

## Three-phase 400-V Class

HHD/HD: Heavy load, HND/ND: Light load

| Item | | | Three-phase 400 V | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model (3G3M1-A4□□□(-ECT)) | | | 004 | 007 | 015 | 022 | 030 | 040 | 055 | 075 | 110 | 150 | 185 | 220 |
| Maximum applicable motor capacity ✻1 | kW | HD | 0.75 | 1.1 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 |
| | | ND | 0.75 | 1.5 | 2.2 | 3 | 4 | 5.5 | 11 | 15 | 18.5 | 22 | 30 | 37 |
| | | HHD | 0.4 | 0.75 | 1.5 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 |
| | | HND | 0.75 | 1.1 | 2.2 | 3 ✻7 | 4 | 5.5 ✻7 | 7.5 | 11 | 15 | 18.5 | 22 | 30 |
| | HP | HD | 1 | 1 1/2 | 3 | 4 | 5 | 7 1/2 | 10 | 15 | 20 | 25 | 30 | 40 |
| | | ND | 1 | 1 1/2 | 3 | 4 | 5 | 7 1/2 | 15 | 20 | 25 | 30 | 40 | 50 |
| | | HHD | 1/2 | 1 | 1 1/2 | 3 | 4 | 5 | 7 1/2 | 10 | 15 | 20 | 25 | 30 |
| | | HND | 1 | 1 1/2 | 3 | 4 | 5 | 7 1/2 | 10 | 15 | 20 | 25 | 30 | 40 |
| Rated output capacity [kVA] ✻2 | 380 V | HD | 1.2 | 2.2 | 3.3 | 4.1 | 5.8 | 7.3 | 12 | 15 | 20 | 25 | 30 | 39 |
| | | ND | 1.4 | 2.7 | 3.6 | 4.5 | 6.1 | 7.9 | 14 | 19 | 24 | 29 | 39 | 47 |
| | | HHD | 1.2 | 2.2 | 3.2 | 3.6 | 4.7 | 6.1 | 9.7 | 12 | 16 | 20 | 26 | 30 |
| | | HND | 1.4 | 2.7 | 3.6 | 4.5 | 5.8 | 7.3 | 12 | 15 | 20 | 25 | 30 | 39 |
| | 480 V | HD | 1.5 | 2.8 | 4.2 | 5.2 | 7.3 | 9.2 | 15 | 19 | 26 | 32 | 37 | 50 |
| | | ND | 1.7 | 3.4 | 4.6 | 5.7 | 7.6 | 10 | 18 | 24 | 31 | 37 | 49 | 60 |
| | | HHD | 1.5 | 2.8 | 4 | 4.6 | 6 | 7.6 | 12.3 | 15 | 20 | 26 | 32 | 37 |
| | | HND | 1.7 | 3.4 | 4.6 | 5.7 | 7.3 | 9.2 | 15 | 19 | 26 | 32 | 37 | 50 |
| Rated input voltage ✻3 | | | Three-phase 380 to 480 V, 50/60 Hz | | | | | | | | | | | |
| Rated input current [A] ✻4 | | HD | 2.7 | 3.9 | 7.3 | 11.3 | 14.2 | 16.8 | 23.2 | 33 | 43.8 | 52.3 | 60.6 | 77.9 |
| | | ND | 2.7 | 4.8 | 7.3 | 11.3 | 14.2 | 16.8 | 33 | 43.8 | 52.3 | 60.6 | 77.9 | 94.3 |
| | | HHD | 1.7 | 3.1 | 5.9 | 8.2 | 11.3 | 14.2 | 17.3 | 23.2 | 33 | 43.8 | 52.3 | 60.6 |
| | | HND | 2.7 | 3.9 | 7.3 | 11.3 | 14.2 | 16.8 | 23.2 | 33 | 43.8 | 52.3 | 60.6 | 77.9 |
| Rated output voltage | | | Three-phase 380 to 480 V (with AVR) | | | | | | | | | | | |
| Rated output current [A] ✻5 | | HD | 1.8 | 3.4 | 5 | 6.3 | 8.8 | 11.1 | 17.5 | 23 | 31 | 38 | 45 | 60 |
| | | ND | 2.1 | 4.1 | 5.5 | 6.9 | 9.2 | 12 | 21.5 | 28.5 | 37 | 44 | 59 | 72 |
| | | HHD | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 9.2 | 14.8 | 18 | 24 | 31 | 39 | 45 |
| | | HND | 2.1 | 4.1 | 5.5 | 6.9 ✻7 | 8.8 | 11.1 ✻7 | 17.5 | 23 | 31 | 38 | 45 | 60 |
| Braking torque [%] ✻6 | | HD | 53.3 | 68.2 | 47.7 | 29.3 | 29.3 | 26.9 | 15 | | | | | |
| | | ND | 53.3 | 50.0 | 47.7 | 29.3 | 29.3 | 26.9 | 12 | | | | | |
| | | HHD | 100 | | 70 | 40 | 40 | 40 | 20 | | | | | |
| | | HND | 53 | 68 | 48 | 29 ✻7 | 29 | 27 ✻7 | 15 | | | | | |
| Braking resistor circuit | Regenerative braking | | Built-in braking resistor circuit (discharge resistor separately mounted) | | | | | | | | | | | |
| | Minimum connection resistance [Ω] | | 200 | | 160 to 200 | | 130 to 200 | | 80 min. | 60 min. | 40 min. | 34.4 min. | 16 min. | |
| Short circuit current rating [kA] | | | 100 | | | | | | | | | | | |
| Weight [kg] | | | Approx. 1.2 | Approx. 1.4 | Approx. 1.5 | Approx. 1.4 | Approx. 1.8 | Approx. 1.8 | Approx. 3.8 | Approx. 3.8 | Approx. 5.3 | Approx. 5.4 | Approx. 11 | Approx. 11 |
| Dimensions (Width × Height) [mm] | | | 110 × 130 | | | | 140 × 130 | | 180 × 220 | | 220 × 260 | | 250 × 400 | |
| Dimensions (Depth) [mm] | | | 132 | 156 | | | | | 171 | | 203 | | STD: 203 ECT: 208 | |

✻1. The maximum applicable motor capacity is given for a standard four-phase motor. When selecting an inverter, select not just by kW but also ensure that the inverter rated output current is greater than the motor rated current.
✻2. In calculating the rated capacity, the rated output voltage is assumed to be 380 V or 480 V.
✻3. A voltage higher than the power supply voltage cannot be output.
✻4. When Carrier Frequency (F26) is set to the following or below, derating is required.
HHD mode...A4004 to A4040: 8 kHz, A4055 to A4220: 10 kHz
HND mode...A4004 to A4040: 8 kHz, A4055 to A4185: 10 kHz, A4220: 6 kHz
HD and ND...modes All models: 4 kHz
Refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat. No. I669) or *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat. No. I670) for details.
✻5. The following shows the calculated value when the power supply capacity is 500 kVA (10x the inverter capacity when the inverter capacity exceeds 50 kVA) and when a %X = 5% power supply is connected.
✻6. The numeric value is the average braking torque per individual motor. (Varies according to motor efficiency)
✻7. Allowable ambient temperature of 40°C or below of A4022 to A4040 in the HND mode. The rated output current of A4022 and A4040 in the HND mode decreases by 1% for every temperature increase of 1°C when the ambient temperature is 40°C or more.

## Single-phase 200-V Class

HHD: Heavy load, HND: Light load

| Item | | | Single-phase 200 V | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model (3G3M1-AB□□□(-ECT)) | | | 001 | 002 | 004 | 007 | 015 | 022 | 037 |
| Maximum applicable motor capacity ✻1 | kW | HHD | 0.1 | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | 3.7 |
| | | HND | 0.2 | 0.4 | 0.55 | 1.1 | 2 ✻8 | 2.7 ✻9 | --- |
| | HP | HHD | 1/8 | 1/4 | 1/2 | 1 | 2 | 3 | 5 |
| | | HND | 1/4 | 1/2 | 3/4 | 1 1/2 | 3 | 4 | --- |
| Rated output capacity [kVA] ✻2 | 200 V | HHD | 0.3 | 0.6 | 1 | 1.7 | 2.8 | 3.8 | 6.1 |
| | | HND | 0.4 | 0.7 | 1.2 | 2.1 | 3.3 | 4.2 | --- |
| | 240 V | HHD | 0.4 | 0.7 | 1.2 | 2.1 | 3.3 | 4.6 | 7.3 |
| | | HND | 0.5 | 0.8 | 1.5 | 2.5 | 4 | 5 | --- |
| Rated input voltage ✻3 | | | Three-phase 200 to 240 V, 50/60 Hz | | | | | | |
| Rated input current [A] ✻4 | | HHD | 1.8 | 3.3 | 5.4 | 9.7 | 16.4 | 22 | 45.4 |
| | | HND | 3.3 | 4.9 | 7.3 | 13.8 | 20.2 | 26 | --- |
| Rated output voltage | | | Three-phase 200 to 240 V (with AVR) | | | | | | |
| Rated output current [A] ✻5 | | HHD | 1 | 1.6 | 3 | 5 | 8 | 11 | 17.5 |
| | | HND | 1.2 | 1.9 | 3.5 ✻7 | 6.0 ✻7 | 9.6 ✻7 | 12 ✻7 | --- |
| Braking torque [%] ✻6 | | HHD | 150 | | 100 | | 70 | 40 | 40 |
| | | HND | 75 | | 73 | 68 | 48 | 29 | --- |
| Braking resistor circuit | Regenerative braking | | Built-in braking resistor circuit (discharge resistor separately mounted) | | | | | | |
| | Minimum connection resistance [Ω] | | 100 to 120 | | | | 40 to 120 | | |
| Short circuit current rating [kA] | | | 100 | | | | | | |
| Weight [kg] | | | Approx. 0.5 | Approx. 0.5 | Approx. 0.7 | Approx. 0.9 | Approx. 1.5 | Approx. 1.7 | Approx. 3.8 |
| Dimensions (Width × Height) [mm] | | | 68 × 127 | | | | 110 × 130 | 140 × 130 | 180 × 220 |
| Dimensions (Depth) [mm] | | | 98 | | 120 | 165 | 166 | 156 | 171 |

✻1. The maximum applicable motor capacity is given for a standard four-phase motor. When selecting an inverter, select not just by kW but also ensure that the inverter rated output current is greater than the motor rated current.
✻2. In calculating the rated capacity, the rated output voltage is assumed to be 200 V or 240 V.
✻3. A voltage higher than the power supply voltage cannot be output.
✻4. When Carrier Frequency (F26) is set to the following or below, derating is required.
HHD mode...AB001 to A2037: 8 kHz
HND mode...AB001 to A2022: 4 kHz
Refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat. No. I669) or *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat. No. I670) for details.
✻5. The following shows the calculated value when the power supply capacity is 500 kVA (10x the inverter capacity when the inverter capacity exceeds 50 kVA) and when a %X = 5% power supply is connected.
✻6. The numeric value is the average braking torque per individual motor. (Varies according to motor efficiency)
✻7. Allowable ambient temperature of 40°C or below of AB004, AB007, AB015 and AB022. The rated output current in the HND mode decreases by 2% for every temperature increase of 1°C when the ambient temperature is 40°C or more.
✻8. The maximum applicable motor capacity is 2.2 kW when the input voltage is 220 to 240 V.
✻9. The maximum applicable motor capacity is 3.0 kW when the input voltage is 220 to 240 V.

# Common Specifications

## Inverter 3G3M1

| Item | | Specifications |
|---|---|---|
| **Enclosure rating ✻1** | | Open type (IP20) |
| **Control** | **Control method** | Phase-to-phase sinusoidal modulation PWM |
| | **Output frequency range ✻2** | 0.00 to 590 Hz |
| | **Frequency precision** | Digital command: ±0.01% of the maximum frequency,<br>Analog command: ±0.2% of the maximum frequency (25±10°C) |
| | **Frequency setting resolution** | Digital setting: 0.01 Hz,<br>Analog setting: Maximum frequency × 5/10,000 |
| | **Overload current rating of inverter** | Heavy load rating (HHD): 150%/60 s or 200%/0.5 s<br>Heavy load rating (HD): 150%/60 s<br>Light load rating (HND/ND): 120%/60 s |
| | **Instantaneous overcurrent protection** | • Digital setting: 0.01 Hz (99.99 Hz max.), 0.1 Hz (100.0 to 590.0 Hz)<br>• Analog setting: Maximum frequency × 5/10,000<br>• Communication setting: 0.005% of the maximum output frequency or 0.01 Hz (fixed) |
| | **Acceleration/Deceleration time** | 0.00 to 6000 s (line/curve arbitrary setting), 2nd acceleration/deceleration setting provided |
| | **Carrier frequency change range** | Three-phase 400-V class<br>• 3G3M1-A4004 to A4185<br>0.75 to 16 kHz (HHD/HND/HD)<br>0.75 to 10 kHz (ND)<br>• 3G3M1-A4220<br>0.75 to 16 kHz (HHD)<br>0.75 to 10 kHz (HND/HD)<br>0.75 to 6 kHz (ND)<br>Three-phase 200-V class<br>• 3G3M1-A2001 to A2015, A2055 to A2185<br>0.75 to 16 kHz (HHD/HND)<br>• 3G3M1-A2022/A2037<br>0.75 to 16 kHz (HHD)<br>0.75 to 10 kHz (HND)<br>Single-phase 200-V class<br>• 3G3M1-AB001 to AB022<br>0.75 to 16 kHz (HHD)<br>0.75 to 10 kHz (HND)<br>• 3G3M1-AB037<br>0.75 to 16 kHz (HHD)<br>The carrier frequency automatically drops according to the ambient temperature and output current. (This function can be disabled.) |
| | **Starting torque** | • 150% min. / Rated speed of 10%<br>V/f control (IM motor)<br>V/f control (slip compensation)<br>V/f control with speed sensor (IM motor)<br>• 200% min./0.5 Hz<br>Vector control without speed sensor (dynamic vector control) (IM motor)<br>V/f control with speed feedback (Automatic torque boost)<br>Sensorless vector control<br>• 200% min./0.0 Hz (0 Hz torque control)<br>Vector control with speed sensor (IM motor)<br>Vector control with speed and pole position sensor (PM motor)<br>To obtain 200% starting torque at low speed, consider raising the capacity of the inverter to the next higher capacity.<br>• 200% min. / Rated speed of 10%<br>Vector control without speed and pole position sensor (PM motor)<br>To obtain these starting torques at low speed, the capacity of the inverter and motor must be taken into consideration.<br>The maximum torque that can be used is limited when the current capacity matched to the mode is exceeded.<br>Current capacity of 200% in HHD mode, 150% in HD mode, and 120% in HND and ND modes |

| Item | | Specifications |
|---|---|---|
| **Protective function** | | Overcurrent, Overvoltage, Undervoltage, Electronic thermal, Temperature error, Ground-fault current at power-on, Inrush current prevention circuit, Overload limit, Incoming overvoltage, External trip, Memory error, CPU error, USP error, Communication error, Overvoltage suppression during deceleration, Power interruption protection, Emergency Forced Stop, etc. |
| **Input signal** | **Frequency settings** | • Standard Type 3G3M1-□□□□□:<br>Operator<br>External analog input signal (variable resistor/0 to 10 VDC/-10 to 10 VDC/4 to 20 mA), Modbus communication<br>• Built-in EtherCAT Communications Type 3G3M1-□□□□-ECT:<br>External analog input signal (variable resistor/0 to 10 VDC) |
| | **RUN/STOP command** | • Standard Type 3G3M1-□□□□□:<br>Operator<br>External digital input signal (3-wire input available), Modbus communication<br>• Built-in EtherCAT Communications Type 3G3M1-□□□□□-ECT:<br>External digital input signal (3-wire input available) |
| | **Multi-function Input ✻3** | Seven points (DI1 to DI7, Functions can be selected from among 101) |
| | **Analog input ✻4** | • Standard Type 3G3M1-□□□□□:<br>Two points (voltage AI1 terminal: 10 bits/-10 to 10 VDC, voltage AI2 (AIV) terminal: 10 bits/0 to 10 V, current AI2 (AII) terminal: 10 bits/4 to 20 mA or 0 to 20 mA)<br>• Built-in EtherCAT Communications Type 3G3M1-□□□□□-ECT:<br>One point (voltage AI1 terminal: 10 bits/-10 to 10 VDC) |
| | **Pulse input** | One point (A, B, Z phases can be input, max. 32 kHz, 5 to 24 VDC) |
| **Output signal** | **Multi-function output ✻3** | • Standard Type 3G3M1-□□□□□:<br>Two points (DO1 and DO2, Functions can be selected from among 92)<br>• Built-in EtherCAT Communications Type 3G3M1-□□□□□-ECT:<br>One point (DO1, Functions can be selected from among 92) |
| | **Relay output ✻3** | One point (SPDT contact (ROA, ROB, ROC), Functions can be selected from among 92) |
| | **Analog output ✻5** | • Standard Type 3G3M1-□□□□□ only:<br>One point (AO (AOV) terminal: Voltage 10 bits/0 to 10 V, AO (AOI) terminal: Current 10 bits/4 to 20 mA or 0 to 20 mA, AO (PO) terminal: Max. 32 kHz, 0 to 11 V) |
| | **Pulse output** | |
| **Communications** | **RS-485** | • Standard Type 3G3M1-□□□□□ only:<br>RJ45 connector (for Digital Operator) |
| | **RS-485** | • Standard Type 3G3M1-□□□□□ only:<br>Control circuit terminal block, Modbus communication |
| | **USB** | USB 2.0, Micro-B connector |
| **Other functions** | | AVR function, V/f characteristics switching, Upper/Lower limit, Multi-step speed (16 steps), Starting frequency adjustment, Jogging operation, Carrier frequency adjustment, PID control, Frequency jump, Analog gain/bias adjustment, S-shape acceleration/deceleration, Electronic thermal characteristics/level adjustment, Restart function, Torque boost function, Fault monitor, Soft lock function, Frequency conversion display, USP function, 2nd control function, UP/DOWN, Overcurrent suppression function, etc. |
| **General specifications** | **Operating ambient temperature ✻6** | -10 to 50°C (Derating required) |
| | **Storage ambient temperature** | -25 to 70°C (Short-time temperature during shipment) |
| | **Operating ambient humidity** | 5% to 95% (with no condensation) |
| | **Vibration resistance** | **Vibration Frequency** / **Specification**<br>2 to less than 9 Hz / 3 mm (0.12 inch) (Max. amplitude)<br>9 to less than 20 Hz / 1 G<br>20 to less than 55 Hz / 0.2 G<br>55 to less than 200 Hz / 0.1 G |
| | **Location** | At a maximum altitude of 1,000 m, indoors (without corrosive gases or dust) |

**✻1.** The enclosure rating complies with JISC0920.
**✻2.** If you must use the motor at higher than 50/60 Hz, check the allowable maximum motor speed and other information with the motor manufacturer.
**✻3.** In the HND/ND (light load) mode or PM motor mode compared with the HHD/HD (heavy load) mode, for some parameters, the default data and setting range also differ. Refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat.No.I669) or *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat.No.I670) for details.
**✻4.** By default, the maximum frequency is adjusted to 10 V for a voltage input of 0 to 10 VDC and to 20 mA for a current input of 4 to 20 mA, respectively. If necessary, adjust the default parameter settings. Refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat.No.I669) or *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat.No.I670) for details.
**✻5.** The analog output shows values that can only be used as a guide for analog meter connection. The maximum output value may differ from 10 V or 20 mA due to the variability of the analog output circuit. If necessary, adjust the default parameter settings.
**✻6.** Derating of the rated output current of the inverter may be required depending on the heavy/light load mode selection, operating ambient temperature, side-by-side installation, and carrier frequency settings. Refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat.No.I669) or *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat.No.I670) for details.

## Regulations and Standards

To export (or provide to nonresident aliens) any part of this product that falls under the category of goods (or technologies) for which an export certificate or license is mandatory according to the Foreign Exchange and Foreign Trade Control Law of Japan, an export certificate or license (or service transaction approval) according to this law is required.

| Standard | | Applicable standard |
|---|---|---|
| CE<br>UKCA | EMC | EN 61800-3:2004/A1:2012 |
| | Functional safety | EN 61800-5-2:2017 STO SIL3<br>EN ISO 13849-1:2015, Cat.3 / PLe |
| | Electrical safety | EN 61800-5-1:2017 |
| UL | US | UL61800-5-1, Edition 1, 2012 |
| | CA | CSA-C22.2 No.274, 2017 |
| KC | | KS-C9800-3 (Standard Type 3G3M1-□□□□□ only) |
| RCM | | EN 61800-3:2004+A1:2012 |

The customer must check the conditions that must be met for compliance with the environmental standards and regulations of their respective country.

**1.** Checking use of regulated chemical substances
This product complies with regulated substances used in electrical parts based on the RoHS Directive.
For details on the Certificate of Conformance and other regulations, contact the place of purchase.

**2.** Motor efficiency regulations
This product is subject to energy efficiency regulations when it is used in motor systems that are driven by an inverter. For details on inverter efficiency with respect to motor output in accordance with EU efficiency regulations, refer to the following website.
https://industrial.omron.eu/en/company-info/environmental/ecodesign-directive

# M1 Series

# EtherCAT Communications Specifications

### Inverter 3G3M1 (3G3M1-A□□□□-ECT only)

| Item | Specifications |
|---|---|
| **Physical layer** | 100BASE-TX (IEEE802.3) |
| **Connectors** | RJ45 × 2 (shielded)<br>ECAT IN: EtherCAT input<br>ECAT OUT: EtherCAT output |
| **Communications media** | Category 5 or higher (cable with double, aluminum tape and braided shielding) is recommended. |
| **Communications distance** | Distance between nodes: 100 m max. |
| **Process data** | Fixed PDO mapping<br>User PDO mapping |
| **Mailbox (CoE)** | Emergency messages, SDO requests, and SDO responses |
| **Synchronization mode** | Free Run Mode ✻1 |
| **Indicators** | L/A IN (Link/Activity IN) × 1<br>L/A OUT (Link/Activity OUT) × 1<br>RUN × 1<br>ERR × 1 |
| **CiA 402 Drive Profile** | Velocity mode |

**✻1.** In Free Run Mode, slaves perform I/O processing (refresh I/O data) asynchronously with the communications cycle of the master. The communications cycle is determined by the cycle time of the master. For the communications response time of the EtherCAT communication unit, refer to *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat. No. I670).
Note that Free Run Mode in the synchronization mode has a different meaning from free-run stop of an Inverter.

# Safety Function

The safety function is designed so that the safety stop function of category 0 (uncontrolled stop) specified in IEC 60204-1 is used to meet the safety standards of PL-e under ISO 13849-1.
M1 Inverters have two type STO functions. Use either or both functions in the table below according to the model you are using.

| Type | STO function by safety input signals | STO function via EtherCAT communications |
|---|---|---|
| Standard Type<br>3G3M1-□□□□□ | Yes | No |
| Built-in EtherCAT Communications Type<br>3G3M1-□□□□□-ECT | Yes | Yes |

## Safety Functions

| Function | Standard |
|---|---|
| STO (Safe Torque Off) | EN IEC 61800-5-2 |
| Stop Category 0 | EN IEC 60204-1 |

## Response Time

| Response time | | Remarks |
|---|---|---|
| STO response time | 50 ms or less | Time from when the SF1/SF2 signal state changes to STO up to when power to the motor is cut off |
| EDM response time | 50 ms | Time from when the SF1/SF2 signal state changes to STO up to when the EDM signal state changes to ON |
| STO function via Ether-CAT communication response time | 80 ms max. | Time from when the FSoE state changes to STO up to when power to the motor is cut off |

## Safety Related Parameters

| Parameter | Value | Standard |
|---|---|---|
| PL | e | EN ISO 13849-1<br>EN IEC 60204-1 |
| Cat | 3 | |
| MTTFd | >62 years | |
| DCavg | Medium | |

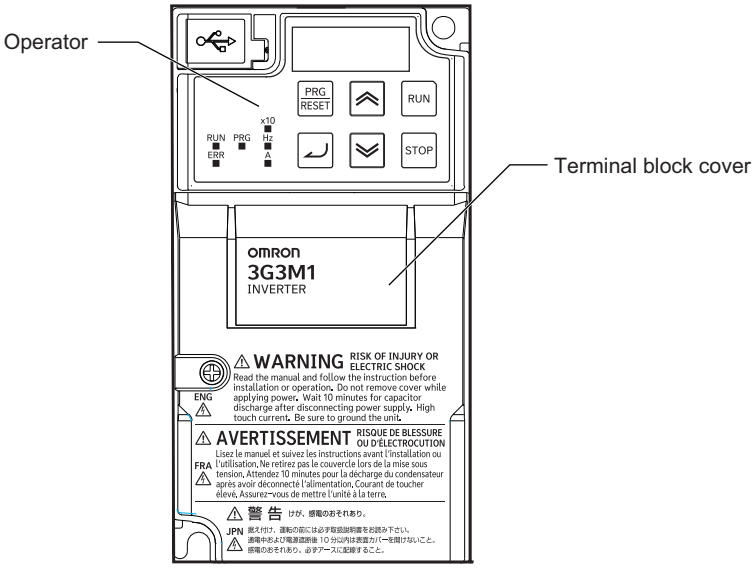
| Parameter | | Value | Standard |
|---|---|---|---|
| SIL | | 3 | EN IEC 61508-1 to -7<br>EN IEC 61800-5-2<br>EN IEC 62061 |
| HFT | | 1 | |
| SFF | | >90 % | |
| STO Function by Safety Input Signal | PFH | $3.00 \times 10^{-9}$ | |
| | PFD | $4.00 \times 10^{-5}$ | |
| | Mission time | 20 years | |
| STO Function via EtherCAT Communications | PFH | $1.10 \times 10^{-8}$ | |
| | PFD | $1.10 \times 10^{-4}$ | |
| | Mission time | 10 years | |

# Appearance and Part Names

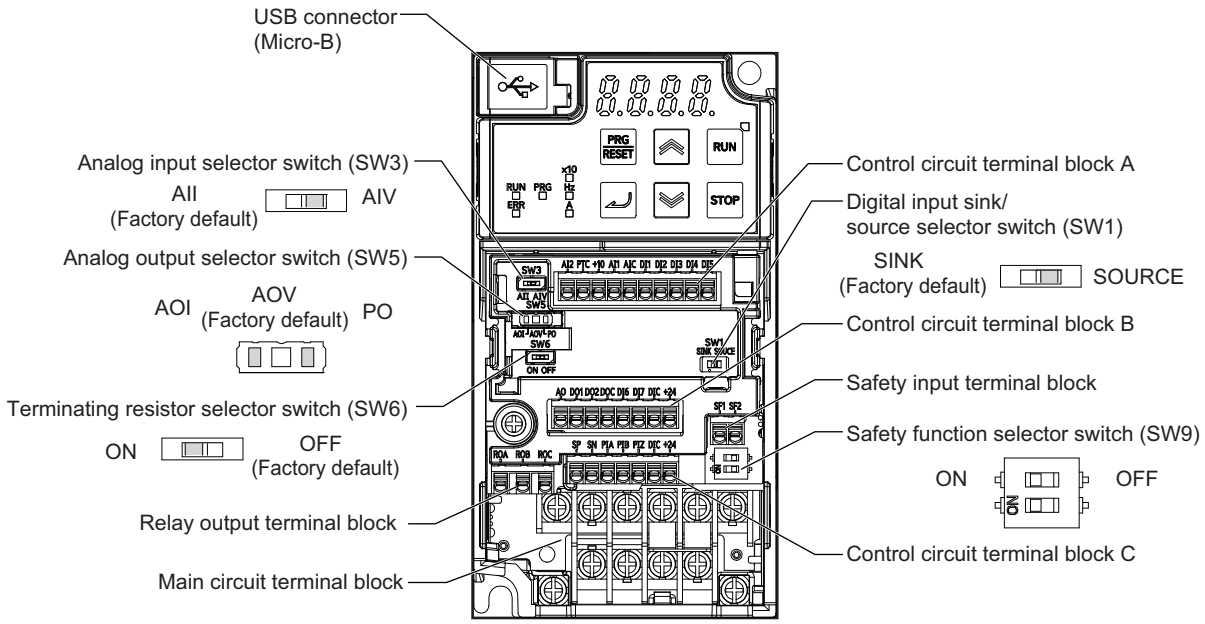
## Inverter 3G3M1

### 3G3M1-A□□□□

The following shows the front view when the product is unpacked.
(An example of 3G3M1-AB001/AB002/AB004/AB007/A2001/A2002/A2004/A2007)

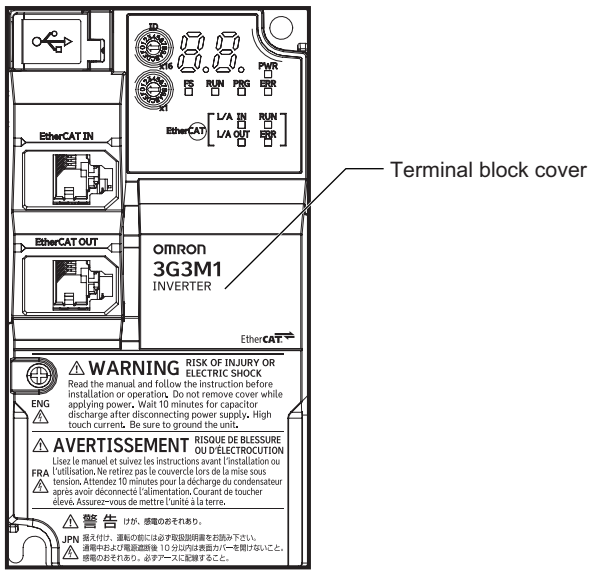



Open the terminal block cover to wire the main circuit terminal block and the control circuit terminal block.

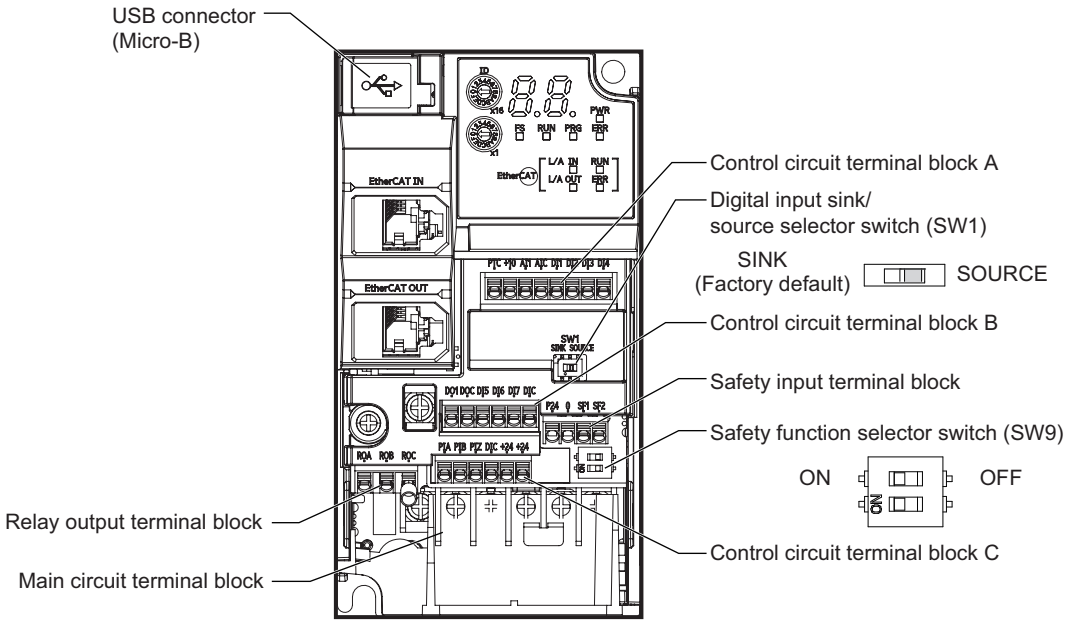


## 3G3M1-A□□□□-ECT

The following shows the front view when the product is unpacked.
(An example of 3G3M1-AB001-ECT/AB002-ECT/AB004-ECT/AB007-ECT/A2001-ECT/A2002-ECT/A2004-ECT/A2007-ECT)




Open the terminal block cover to wire the main circuit terminal block and the control circuit terminal block.

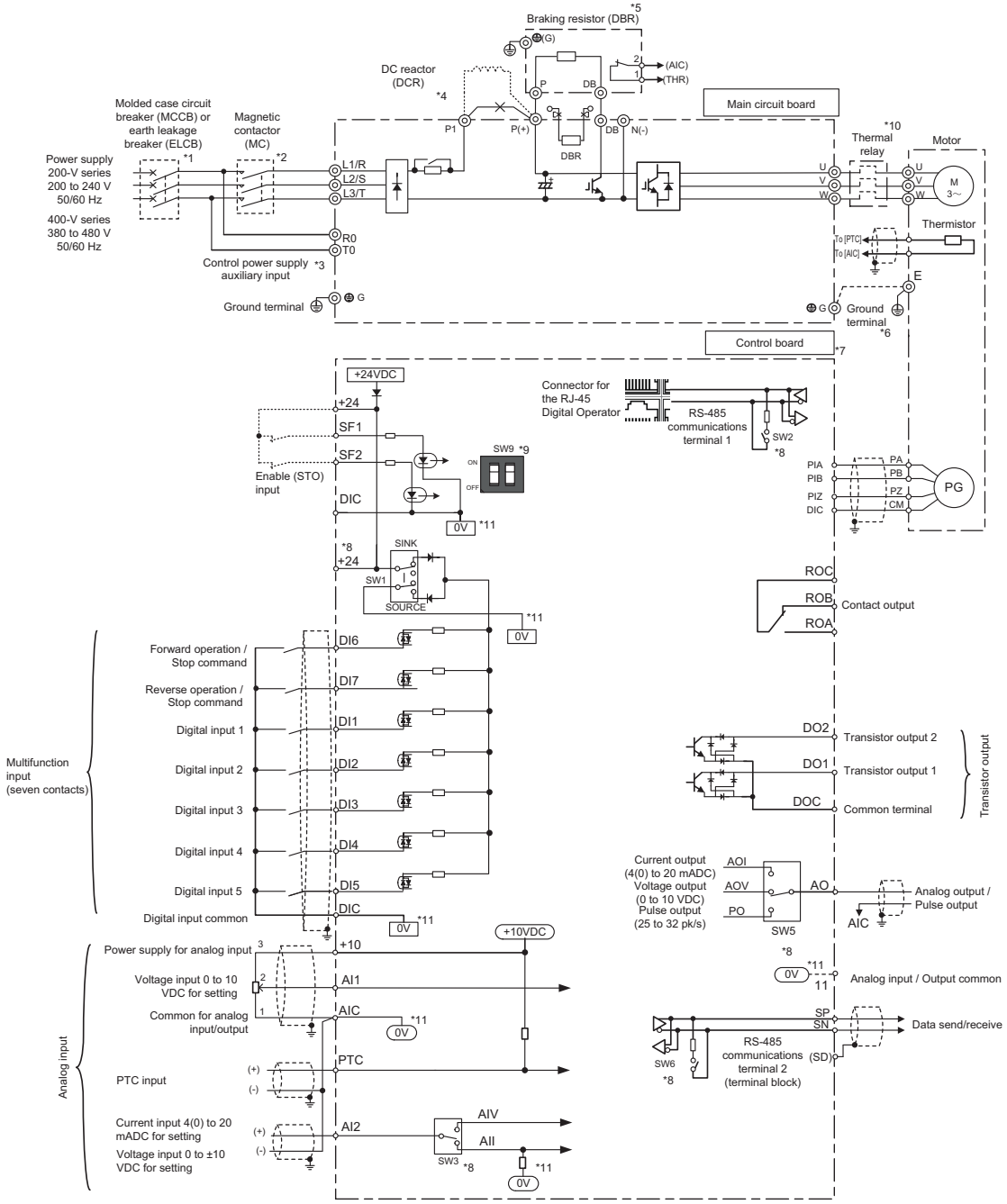


# M1 Series

# Standard Connection Diagram

## Inverter 3G3M1

### 3G3M1-A□□□□




**✻1.** To protect the wiring, install a molded case circuit breaker (MCCB) or earth leakage circuit breaker (ELCB) (with overcurrent protection function) recommended for each inverter on the inverter input side (primary side). Do not use circuit breakers whose rated current exceeds recommended values.

**✻2.** The molded case circuit breaker and earth leakage circuit breaker are also used for insulation from the inverter's power supply. For this reason, install a magnetic contactor (MC) recommended for each inverter as required. When installing a magnetic contactor and solenoid or other coil near an inverter, connect surge absorbers in parallel.

**✻3.** To enable a batch alarm signal when the protection function is activated even if the main power supply of the inverter is cut off or to display the Digital Operator at all times, connect these terminals to the power supply. (3G3M1-A2185 or later or 3G3M1-A4185 or later products) The inverter operates even when these terminals are not connected to the power supply.

**✻4.** When connecting the optional DC reactor (DCR), remove the short-circuit bar between the main circuit terminals P1 and P(+) of the inverter before connecting. When the capacity of the power transformer is 500 kVA or more and 10 times or more than the rated capacity of the inverter, or when a thyristor load is connected, use a DC reactor (DCR).

**✻5.** As a transistor for braking is built into the inverter, the braking resistor can be directly connected between P(+) and DB.

**✻6.** The terminal for grounding the motor. Connect this terminal, as required.

**✻7.** Use twisted wire or shield wire for the control signal wire.
Generally, shield wire is grounded. However, when inductive noise from an external source is large, the influence of noise can sometimes be suppressed by connecting the shield wire to a DIC. Separate control signal wire as far as possible (at least 10 cm is recommended) from the wiring of the main circuit, and do not pass control signal wire through the same wiring duct. When wires cross, be sure to cross them so that they are almost vertical to the wiring of the main circuit.

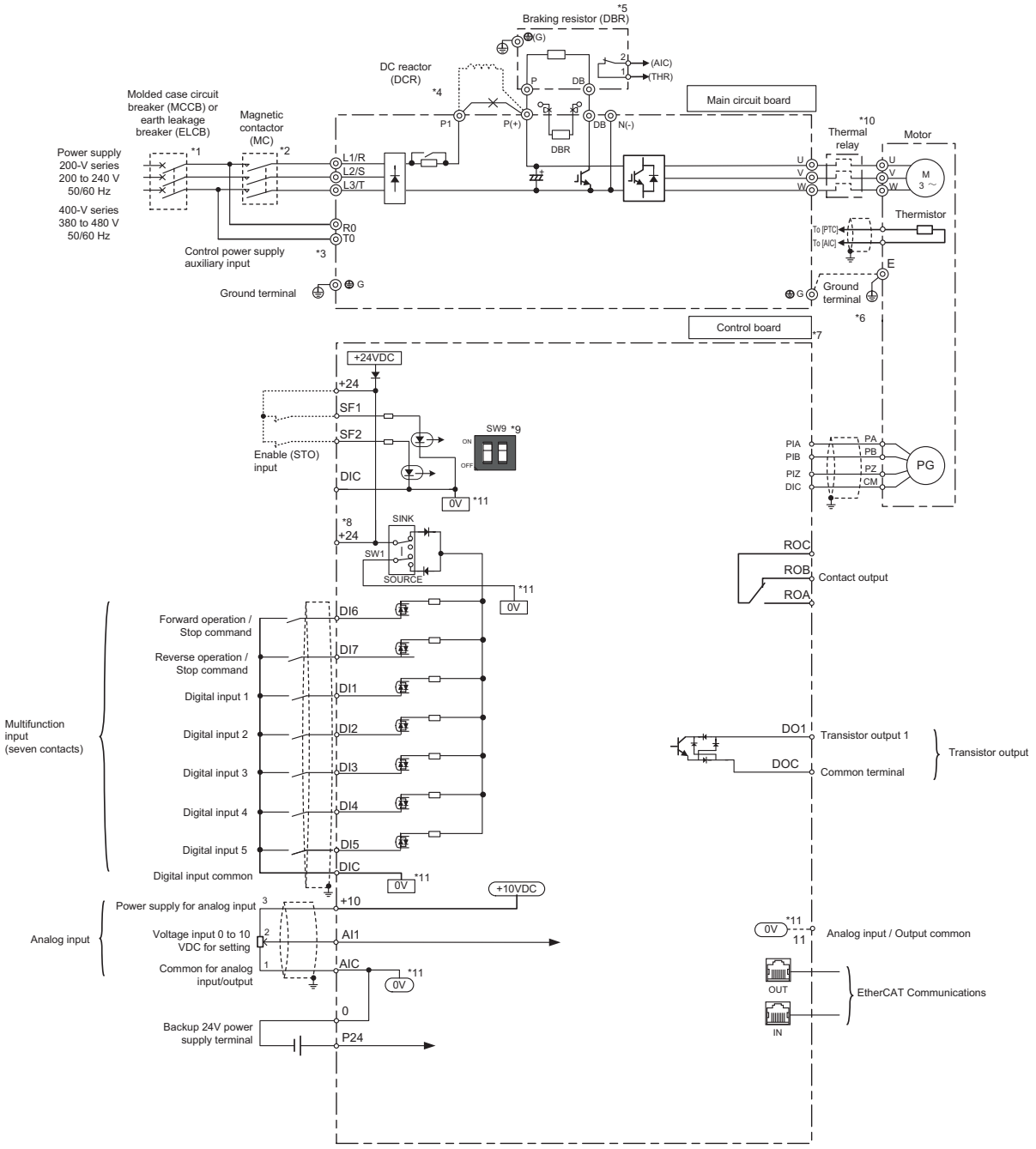
**✻8.** This switch on the printed circuit board is for specifying the operation setting of the inverter. For details, refer to *the Multi-function Compact Inverter M1 Series Standard Type User's Manual* (Cat.No.I669).

**✻9.** Safety function terminals SF1 and SF2 are disabled at SW9 (double-pole switch) on the printed circuit board before shipment from the factory. When using the SF1 and SF2 terminal functions, be sure to turn each SW9 switch OFF before connecting to these terminals.

**✻10.** Cut off the molded case circuit breaker (MCCB) or magnetic contactor (MC) at the auxiliary contact (manual reset) of the thermal relay.

**✻11.** 0V and (0V) are separated and insulated.

## 3G3M1-A□□□□-ECT




**∗1.** To protect the wiring, install a molded case circuit breaker (MCCB) or earth leakage circuit breaker (ELCB) (with overcurrent protection function) recommended for each inverter on the inverter input side (primary side). Do not use circuit breakers whose rated current exceeds recommended values.

**∗2.** The molded case circuit breaker and earth leakage circuit breaker are also used for insulation from the inverter's power supply. For this reason, install a magnetic contactor (MC) recommended for each inverter as required. When installing a magnetic contactor and solenoid or other coil near an inverter, connect surge absorbers in parallel.

**∗3.** To enable a batch alarm signal when the protection function is activated even if the main power supply of the inverter is cut off or to display the Digital Operator at all times, connect these terminals to the power supply. (3G3M1-A2185 or later or 3G3M1-A4185 or later products) The inverter operates even when these terminals are not connected to the power supply.

**∗4.** When connecting the optional DC reactor (DCR), remove the short-circuit bar between the main circuit terminals P1 and P(+) of the inverter before connecting. When the capacity of the power transformer is 500 kVA or more and 10 times or more than the rated capacity of the inverter, or when a thyristor load is connected, use a DC reactor (DCR).

**∗5.** As a transistor for braking is built into the inverter, the braking resistor can be directly connected between P(+) and DB.

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**∗7.** Use twisted wire or shield wire for the control signal wire. Generally, shield wire is grounded. However, when inductive noise from an external source is large, the influence of noise can sometimes be suppressed by connecting the shield wire to a DIC. Separate control signal wire as far as possible (at least 10 cm is recommended) from the wiring of the main circuit, and do not pass control signal wire through the same wiring duct. When wires cross, be sure to cross them so that they are almost vertical to the wiring of the main circuit.

**∗8.** This switch on the printed circuit board is for specifying the operation setting of the inverter. For details, refer to *the Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual* (Cat.No.I670).

**∗9.** Safety function terminals SF1 and SF2 are disabled at SW9 (double-pole switch) on the printed circuit board before shipment from the factory. When using the SF1 and SF2 terminal functions, be sure to turn each SW9 switch OFF before connecting to these terminals.

**∗10.** Cut off the molded case circuit breaker (MCCB) or magnetic contactor (MC) at the auxiliary contact (manual reset) of the thermal relay.

**∗11.** 0V and (0V) are separated and insulated.

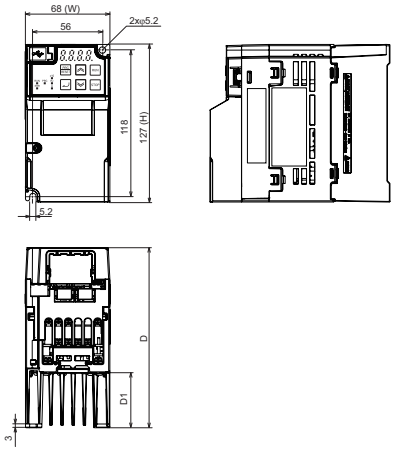
# Dimensions

(unit: mm)

## Inverter 3G3M1

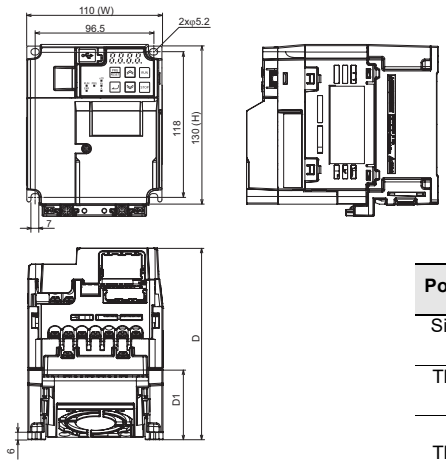
### 3G3M1-A□□□□

**3G3M1-AB001**
**3G3M1-AB002**
**3G3M1-AB004**
**3G3M1-AB007**
**3G3M1-A2001**
**3G3M1-A2002**
**3G3M1-A2004**
**3G3M1-A2007**



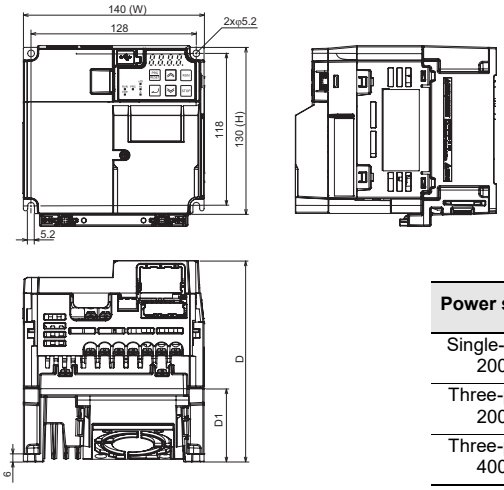

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB001<br>3G3M1-AB002 | 68 | 127 | 98 | 8 |
| | 3G3M1-AB004 | | | 120 | 23 |
| | 3G3M1-AB007 | | | 165 | 48 |
| Three-phase 200 V | 3G3M1-A2001<br>3G3M1-A2002 | | | 98 | 8 |
| | 3G3M1-A2004 | | | 113 | 23 |
| | 3G3M1-A2007 | | | 145 | 48 |

**3G3M1-AB015**
**3G3M1-A2015**
**3G3M1-A2022**
**3G3M1-A4004**
**3G3M1-A4007**
**3G3M1-A4015**
**3G3M1-A4022**



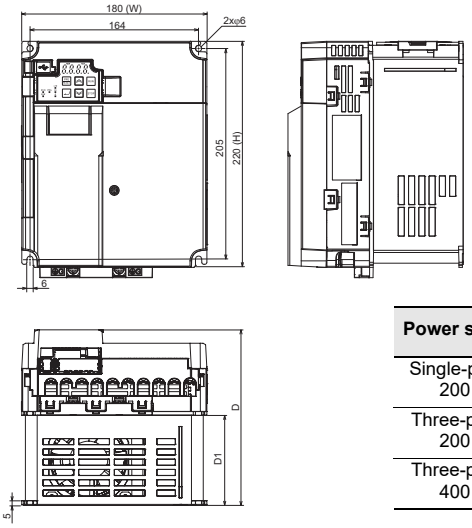

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB015 | 110 | 130 | 166 | 58 |
| Three-phase 200 V | 3G3M1-A2015<br>3G3M1-A2022 | | | 156 | |
| Three-phase 400 V | 3G3M1-A4004 | | | 132 | 38 |
| | 3G3M1-A4007<br>3G3M1-A4015<br>3G3M1-A4022 | | | 156 | 58 |

**3G3M1-AB022**
**3G3M1-A2037**
**3G3M1-A4030**
**3G3M1-A4040**



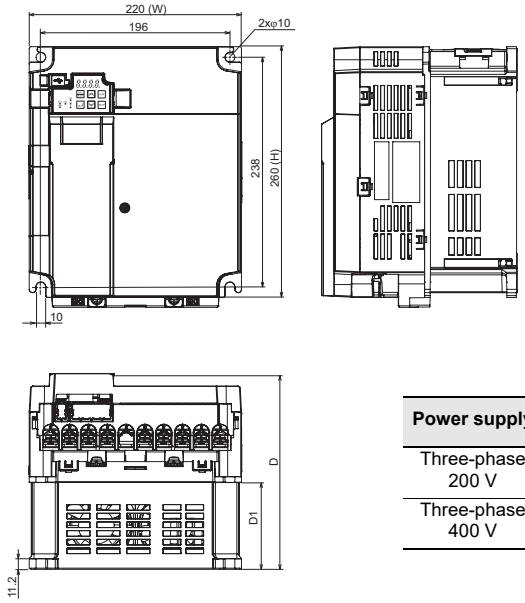

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB022 | 140 | 130 | 156 | 58 |
| Three-phase 200 V | 3G3M1-A2037 | | | | |
| Three-phase 400 V | 3G3M1-A4030<br>3G3M1-A4040 | | | | |

**3G3M1-AB037**
**3G3M1-A2055**
**3G3M1-A2075**
**3G3M1-A4055**
**3G3M1-A4075**



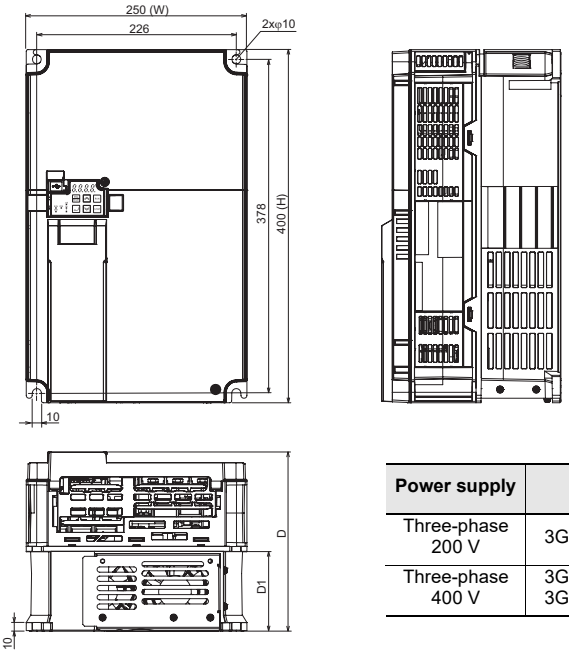

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB037 | 180 | 220 | 171 | 87.7 |
| Three-phase 200 V | 3G3M1-A2055<br>3G3M1-A2075 | | | | |
| Three-phase 400 V | 3G3M1-A4055<br>3G3M1-A4075 | | | | |

**3G3M1-A2110**
**3G3M1-A2150**
**3G3M1-A4110**
**3G3M1-A4150**




| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Three-phase 200 V | 3G3M1-A2110<br>3G3M1-A2150 | 220 | 260 | 203 | 90 |
| Three-phase 400 V | 3G3M1-A4110<br>3G3M1-A4150 | | | | |

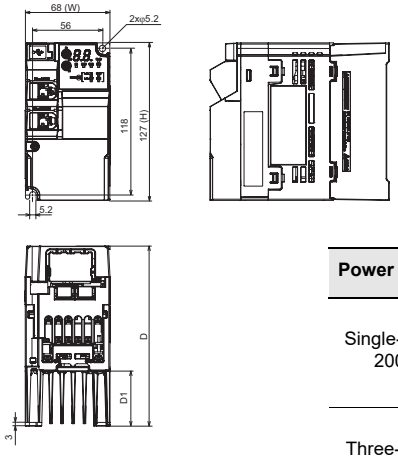
**3G3M1-A2185**
**3G3M1-A4185**
**3G3M1-A4220**




| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Three-phase 200 V | 3G3M1-A2185 | 250 | 400 | 203 | 90 |
| Three-phase 400 V | 3G3M1-A4185<br>3G3M1-A4220 | | | | |

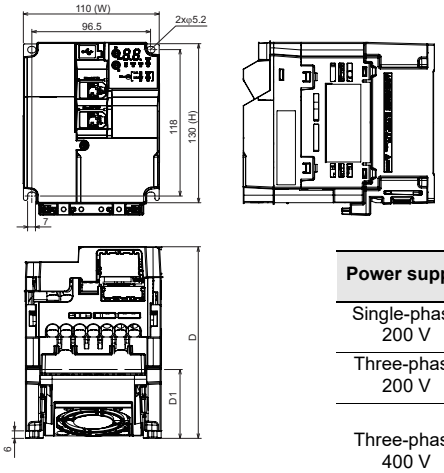
## 3G3M1-A□□□□-ECT

**3G3M1-AB001-ECT**
**3G3M1-AB002-ECT**
**3G3M1-AB004-ECT**
**3G3M1-AB007-ECT**
**3G3M1-A2001-ECT**
**3G3M1-A2002-ECT**
**3G3M1-A2004-ECT**
**3G3M1-A2007-ECT**



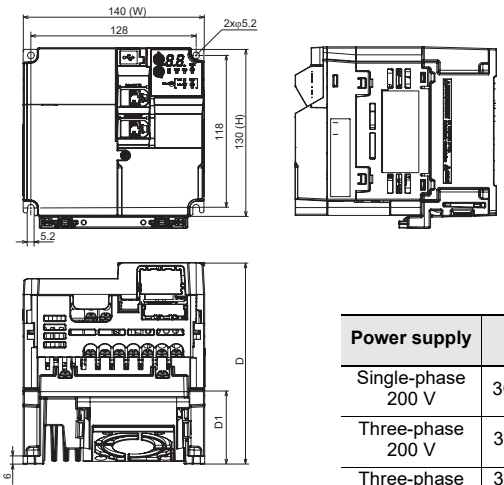

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB001-ECT<br>3G3M1-AB002-ECT | 68 | 127 | 98 | 8 |
| | 3G3M1-AB004-ECT | | | 120 | 23 |
| | 3G3M1-AB007-ECT | | | 165 | 48 |
| Three-phase 200 V | 3G3M1-A2001-ECT<br>3G3M1-A2002-ECT | | | 98 | 8 |
| | 3G3M1-A2004-ECT | | | 113 | 23 |
| | 3G3M1-A2007-ECT | | | 145 | 48 |

**3G3M1-AB015-ECT**
**3G3M1-A2015-ECT**
**3G3M1-A2022-ECT**
**3G3M1-A4004-ECT**
**3G3M1-A4007-ECT**
**3G3M1-A4015-ECT**
**3G3M1-A4022-ECT**



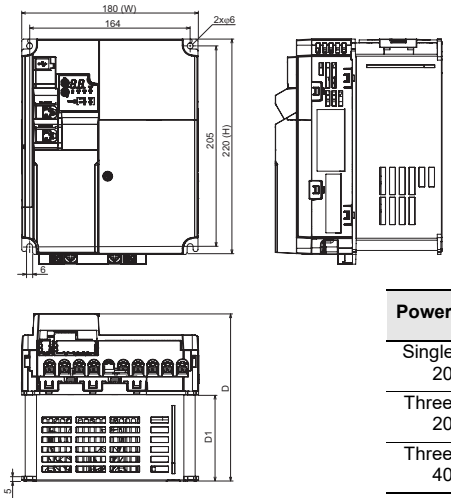

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB015-ECT | 110 | 130 | 166 | 58 |
| Three-phase 200 V | 3G3M1-A2015-ECT<br>3G3M1-A2022-ECT | | | 156 | |
| Three-phase 400 V | 3G3M1-A4004-ECT | | | 132 | 38 |
| | 3G3M1-A4007-ECT<br>3G3M1-A4015-ECT<br>3G3M1-A4022-ECT | | | 156 | 58 |

**3G3M1-AB022-ECT**
**3G3M1-A2037-ECT**
**3G3M1-A4030-ECT**
**3G3M1-A4040-ECT**



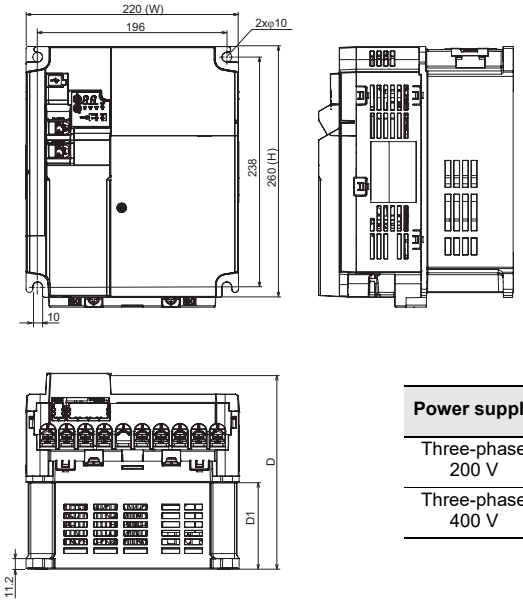

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB022-ECT | 140 | 130 | 156 | 58 |
| Three-phase 200 V | 3G3M1-A2037-ECT | | | | |
| Three-phase 400 V | 3G3M1-A4030-ECT<br>3G3M1-A4040-ECT | | | | |

**3G3M1-AB037-ECT**
**3G3M1-A2055-ECT**
**3G3M1-A2075-ECT**
**3G3M1-A4055-ECT**
**3G3M1-A4075-ECT**



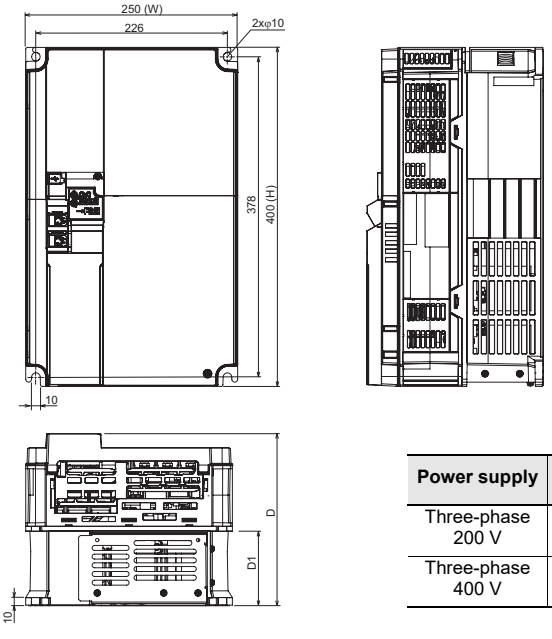

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Single-phase 200 V | 3G3M1-AB037-ECT | 180 | 220 | 171 | 87.7 |
| Three-phase 200 V | 3G3M1-A2055-ECT<br>3G3M1-A2075-ECT | | | | |
| Three-phase 400 V | 3G3M1-A4055-ECT<br>3G3M1-A4075-ECT | | | | |

**3G3M1-A2110-ECT**
**3G3M1-A2150-ECT**
**3G3M1-A4110-ECT**
**3G3M1-A4150-ECT**




| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Three-phase 200 V | 3G3M1-A2110-ECT<br>3G3M1-A2150-ECT | 220 | 260 | 203 | 90 |
| Three-phase 400 V | 3G3M1-A4110-ECT<br>3G3M1-A4150-ECT | | | | |

**3G3M1-A2185-ECT**
**3G3M1-A4185-ECT**
**3G3M1-A4220-ECT**



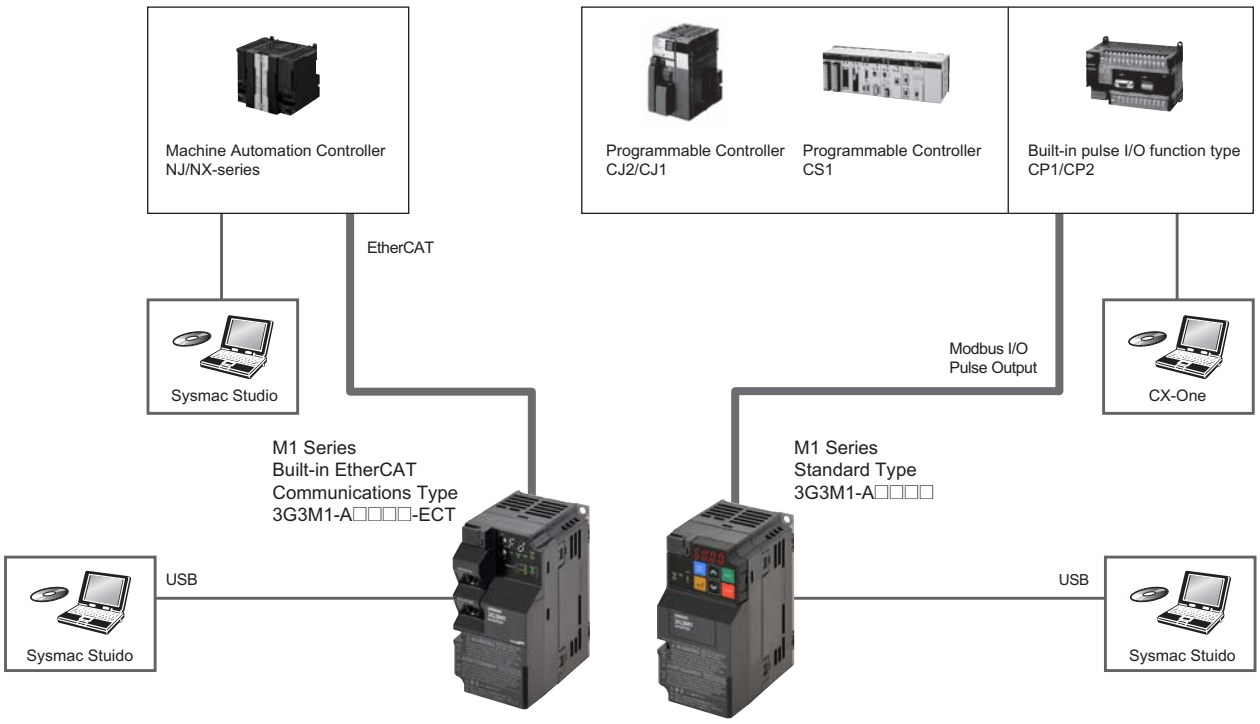

| Power supply | Model | W (mm) | H (mm) | D (mm) | D1 (mm) |
|---|---|---|---|---|---|
| Three-phase 200 V | 3G3M1-A2185-ECT | 250 | 400 | 208 | 90 |
| Three-phase 400 V | 3G3M1-A4185-ECT<br>3G3M1-A4220-ECT | | | | |

MEMO

# Ordering Information

# M1 Series

## System Configuration



# Interpreting Model Numbers

**3G3M1-A□□□□**

3 G 3 M 1 - A 2 0 0 1

Maximum applicable motor capacity (HHD rating)

| | |
|---|---|
| 001 | 0.1 kW |
| 002 | 0.2 kW |
| 004 | 0.4 kW |
| 007 | 0.75 kW |
| 015 | 1.5 kW |
| 022 | 2.2 kW |
| 030 | 3.0 kW |
| 037 | 3.7 kW |
| 040 | 4.0 kW |
| 055 | 5.5 kW |
| 075 | 7.5 kW |
| 110 | 11 kW |
| 150 | 15 kW |
| 185 | 18.5 kW |
| 220 | 22 kW |

Voltage class

| | |
|---|---|
| B | Single-phase 200 VAC (200-V class) |
| 2 | 3-phase 200 VAC (200-V class) |
| 4 | 3-phase 400 VAC (400-V class) |

Enclosure rating

| | |
|---|---|
| A | Panel-mounting or closed wall-mounting models |

**3G3M1-A□□□□-ECT**

3 G 3 M 1 - A 2 0 0 1 - E C T

Maximum applicable motor capacity (HHD rating)

| | |
|---|---|
| 001 | 0.1 kW |
| 002 | 0.2 kW |
| 004 | 0.4 kW |
| 007 | 0.75 kW |
| 015 | 1.5 kW |
| 022 | 2.2 kW |
| 030 | 3.0 kW |
| 037 | 3.7 kW |
| 040 | 4.0 kW |
| 055 | 5.5 kW |
| 075 | 7.5 kW |
| 110 | 11 kW |
| 150 | 15 kW |
| 185 | 18.5 kW |
| 220 | 22 kW |

Voltage class

| | |
|---|---|
| B | Single-phase 200 VAC (200-V class) |
| 2 | 3-phase 200 VAC (200-V class) |
| 4 | 3-phase 400 VAC (400-V class) |

Enclosure rating

| | |
|---|---|
| A | Panel-mounting or closed wall-mounting models |

# Ordering Information

## M1 series Inverter Models

### Standard Type

| Rated voltage | Enclosure ratings | Max. applicable motor capacity | | Model |
|---|---|---|---|---|
| | | HHD: Heavy load | HND: Light load | |
| 3-phase 200 VAC | IP20 | 0.1 kW | 0.2 kW | **3G3M1-A2001** |
| | | 0.2 kW | 0.4 kW | **3G3M1-A2002** |
| | | 0.4 kW | 0.75 kW | **3G3M1-A2004** |
| | | 0.75 kW | 1.1 kW | **3G3M1-A2007** |
| | | 1.5 kW | 2.2 kW | **3G3M1-A2015** |
| | | 2.2 kW | 3.0 kW | **3G3M1-A2022** |
| | | 3.7 kW | 5.5 kW | **3G3M1-A2037** |
| | | 5.5 kW | 7.5 kW | **3G3M1-A2055** |
| | | 7.5 kW | 11 kW | **3G3M1-A2075** |
| | | 11 kW | 15 kW | **3G3M1-A2110** |
| | | 15 kW | 18.5 kW | **3G3M1-A2150** |
| | | 18.5 kW | 22 kW | **3G3M1-A2185** |
| 3-phase 400 VAC | IP20 | 0.4 kW | 0.75 kW | **3G3M1-A4004** |
| | | 0.75 kW | 1.1 kW | **3G3M1-A4007** |
| | | 1.5 kW | 2.2 kW | **3G3M1-A4015** |
| | | 2.2 kW | 3.0 kW | **3G3M1-A4022** |
| | | 3.0 kW | 4.0 kW | **3G3M1-A4030** |
| | | 4.0 kW | 5.5 kW | **3G3M1-A4040** |
| | | 5.5 kW | 7.5 kW | **3G3M1-A4055** |
| | | 7.5 kW | 11 kW | **3G3M1-A4075** |
| | | 11 kW | 15 kW | **3G3M1-A4110** |
| | | 15 kW | 18.5 kW | **3G3M1-A4150** |
| | | 18.5 kW | 22 kW | **3G3M1-A4185** |
| | | 22 kW | 30 kW | **3G3M1-A4220** |
| 1-phase 200 VAC | IP20 | 0.1 kW | 0.2 kW | **3G3M1-AB001** |
| | | 0.2 kW | 0.4 kW | **3G3M1-AB002** |
| | | 0.4 kW | 0.55 kW | **3G3M1-AB004** |
| | | 0.75 kW | 1.1 kW | **3G3M1-AB007** |
| | | 1.5 kW | 2.0 kW | **3G3M1-AB015** |
| | | 2.2 kW | 2.7 kW | **3G3M1-AB022** |
| | | 3.7 kW | --- | **3G3M1-AB037** |

## Built-in EtherCAT Communications Type

| Rated voltage | Enclosure ratings | Max. applicable motor capacity | | Model |
|---|---|---|---|---|
| | | HHD: Heavy load | HND: Light load | |
| 3-phase 200 VAC | IP20 | 0.1 kW | 0.2 kW | **3G3M1-A2001-ECT** |
| | | 0.2 kW | 0.4 kW | **3G3M1-A2002-ECT** |
| | | 0.4 kW | 0.75 kW | **3G3M1-A2004-ECT** |
| | | 0.75 kW | 1.1 kW | **3G3M1-A2007-ECT** |
| | | 1.5 kW | 2.2 kW | **3G3M1-A2015-ECT** |
| | | 2.2 kW | 3.0 kW | **3G3M1-A2022-ECT** |
| | | 3.7 kW | 5.5 kW | **3G3M1-A2037-ECT** |
| | | 5.5 kW | 7.5 kW | **3G3M1-A2055-ECT** |
| | | 7.5 kW | 11 kW | **3G3M1-A2075-ECT** |
| | | 11 kW | 15 kW | **3G3M1-A2110-ECT** |
| | | 15 kW | 18.5 kW | **3G3M1-A2150-ECT** |
| | | 18.5 kW | 22 kW | **3G3M1-A2185-ECT** |
| 3-phase 400 VAC | IP20 | 0.4 kW | 0.75 kW | **3G3M1-A4004-ECT** |
| | | 0.75 kW | 1.1 kW | **3G3M1-A4007-ECT** |
| | | 1.5 kW | 2.2 kW | **3G3M1-A4015-ECT** |
| | | 2.2 kW | 3.0 kW | **3G3M1-A4022-ECT** |
| | | 3.0 kW | 4.0 kW | **3G3M1-A4030-ECT** |
| | | 4.0 kW | 5.5 kW | **3G3M1-A4040-ECT** |
| | | 5.5 kW | 7.5 kW | **3G3M1-A4055-ECT** |
| | | 7.5 kW | 11 kW | **3G3M1-A4075-ECT** |
| | | 11 kW | 15 kW | **3G3M1-A4110-ECT** |
| | | 15 kW | 18.5 kW | **3G3M1-A4150-ECT** |
| | | 18.5 kW | 22 kW | **3G3M1-A4185-ECT** |
| | | 22 kW | 30 kW | **3G3M1-A4220-ECT** |
| 1-phase 200 VAC | IP20 | 0.1 kW | 0.2 kW | **3G3M1-AB001-ECT** |
| | | 0.2 kW | 0.4 kW | **3G3M1-AB002-ECT** |
| | | 0.4 kW | 0.55 kW | **3G3M1-AB004-ECT** |
| | | 0.75 kW | 1.1 kW | **3G3M1-AB007-ECT** |
| | | 1.5 kW | 2.0 kW | **3G3M1-AB015-ECT** |
| | | 2.2 kW | 2.7 kW | **3G3M1-AB022-ECT** |
| | | 3.7 kW | --- | **3G3M1-AB037-ECT** |

## Recommended EtherCAT Communications Cables

Use a straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (aluminum tape and braiding) for EtherCAT.

### Cable with Connectors

| Item | | Recommended manufacturer | Cable length (m) | Model |
|---|---|---|---|---|
| Wire gauge and number of pairs: AWG26, 4-pair cable<br>Cable sheath material: PUR | Cable with Connectors on Both Ends (RJ45/RJ45)<br>Standard RJ45 plugs ✻1<br>Cable color: Yellow ✻2<br>  | OMRON | 0.3 | **XS6W-6PUR8SS30CM-YF** |
| | | | 0.5 | **XS6W-6PUR8SS50CM-YF** |
| | | | 1 | **XS6W-6PUR8SS100CM-YF** |
| | | | 2 | **XS6W-6PUR8SS200CM-YF** |
| | | | 3 | **XS6W-6PUR8SS300CM-YF** |
| | | | 5 | **XS6W-6PUR8SS500CM-YF** |
| Wire gauge and number of pairs: AWG22, 2-pair cable | Cable with Connectors on Both Ends (RJ45/RJ45)<br>Rugged RJ45 plugs ✻1<br>Cable color: Light blue<br>  | OMRON | 0.3 | **XS5W-T421-AMD-K** |
| | | | 0.5 | **XS5W-T421-BMD-K** |
| | | | 1 | **XS5W-T421-CMD-K** |
| | | | 2 | **XS5W-T421-DMD-K** |
| | | | 5 | **XS5W-T421-GMD-K** |
| | | | 10 | **XS5W-T421-JMD-K** |
| | Cable with Connectors on Both Ends (M12 Straight/RJ45)<br>Shield strengthening connector cable ✻3<br>M12/Smartclick connector and rugged RJ45 plug<br>Cable color: Black<br>  | OMRON | 0.5 | **XS5W-T421-BMC-SS** |
| | | | 1 | **XS5W-T421-CMC-SS** |
| | | | 2 | **XS5W-T421-DMC-SS** |
| | | | 3 | **XS5W-T421-EMC-SS** |
| | | | 5 | **XS5W-T421-GMC-SS** |
| | | | 10 | **XS5W-T421-JMC-SS** |

**✻1.** Cables with standard RJ45 plugs are available in the following lengths: 0.2 m, 0.3 m, 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m, 7.5 m, 10 m, 15 m, 20 m. Cables with rugged RJ45 plugs are available in the following lengths: 0.3 m, 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m, 15 m. For details, refer to *the Industrial Ethernet Connectors Catalog* (Cat. No. G019).
**✻2.** Cable colors are available in yellow, green, and blue.
**✻3.** For details, contact your OMRON representative.

### Cables/Connectors

| Item | | Recommended manufacturer | Model |
|---|---|---|---|
| Wire gauge and number of pairs: AWG24, 4-pair cable | Cable | Kuramo Electric Co. | **KETH-SB ✻1** |
| | RJ45 Connector | Panduit Corporation | **MPS588-C ✻1** |
| Wire gauge and number of pairs: AWG22, 2-pair cable | Cable | Kuramo Electric Co. | **KETH-PSB-OMR ✻2** |
| | | JMACS Japan Co., Ltd. | **PNET/B ✻2** |
| | RJ45 Assembly Connector<br>  | OMRON | **XS6G-T421-1 ✻2** |

**✻1.** We recommend you to use the above Cable and RJ45 Connector together.
**✻2.** We recommend you to use the above Cable and RJ45 Assembly Connector together.

## Software

### Automation Software Sysmac Studio

The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX-series CPU Units, NY-series Industrial PC, EtherCAT Slave, and the HMI.

For details, refer to your local OMRON website and Sysmac Studio Catalog (Cat. No. P138).
**Note:** The M1 Series is supported by Sysmac Studio version 1.52 or higher.

## Related Manuals

| Man. No. | Model | Manual |
|---|---|---|
| I669 | 3G3M1-A□□□□□ | Multi-function Compact Inverter M1 Series Standard Type User's Manual |
| I670 | 3G3M1-A□□□□□-ECT | Multi-function Compact Inverter M1 Series Built-in EtherCAT® Communications Type User's Manual |
| W504 | SYSMAC-SE2□□□ | Sysmac Studio Version 1 Operation Manual |
| I589 | SYSMAC-SE2□□□ | Sysmac Studio Drive Function Operation Manual |

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