# MX2


## Born to drive machines

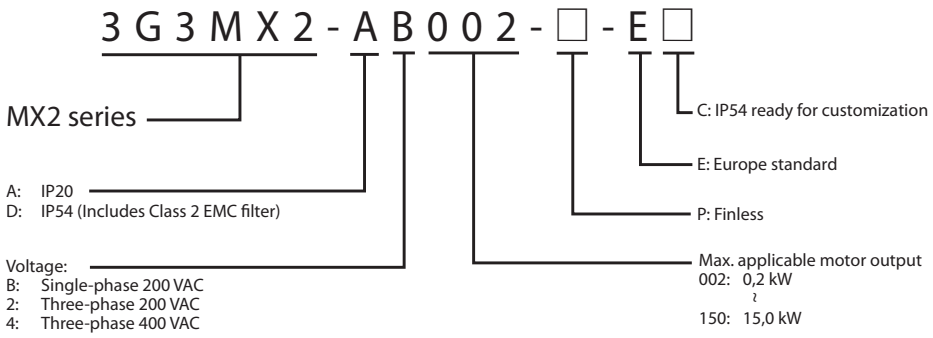
- Current vector control
- High starting torque: 200% at 0.5 Hz
- Double rating VT 120%/1 min and CT 150%/1 min
- IM & PM motor control
- Torque control in open loop vector
- Positioning functionality
- Built-in application functionality (i.e. Brake control)
- Built-in logic programing
- Safety embedded compliant with ISO13849-1 (double input circuit and external device monitor EDM)
- USB port for PC programming
- 24 VDC backup supply for control board
- Fieldbus communications: Modbus, DeviceNet, Profibus, CompoNet, EtherCAT, ML-II and EtherNet/IP
- PC configuration tool: CX-Drive
- RoHS, CE, cULus

## Ratings

- 200 V Class single-phase 0.1 to 2.2 kW
- 200 V Class three-phase 0.1 to 15.0 kW
- 400 V Class three-phase 0.4 to 15.0 kW

## Specifications

### Type designation




### 200 V class

| Single-phase: 3G3MX2-□ | | | B001 | B002 | B004 | B007[1] | B015 | B022 | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Three-phase: 3G3MX2-□ | | | 2001 | 2002 | 2004 | 2007 | 2015 | 2022 | 2037 | 2055 | 2075 | 2110 | 2150 |
| Motor kW[2] | For VT setting | | 0.2 | 0.4 | 0.55 | 1.1 | 2.2 | 3.0 | 5.5 | 7.5 | 11 | 15 | 18.5 |
| | For CT setting | | 0.1 | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 |
| Output characteristics | Inverter capacity kVA | 200 VT | 0.4 | 0.6 | 1.2 | 2.0 | 3.3 | 4.1 | 6.7 | 10.3 | 13.8 | 19.3 | 23.9 |
| | | 200 CT | 0.2 | 0.5 | 1.0 | 1.7 | 2.7 | 3.8 | 6.0 | 8.6 | 11.4 | 16.2 | 20.7 |
| | | 240 VT | 0.4 | 0.7 | 1.4 | 2.4 | 3.9 | 4.9 | 8.1 | 12.4 | 16.6 | 23.2 | 28.6 |
| | | 240 CT | 0.3 | 0.6 | 1.2 | 2.0 | 3.3 | 4.5 | 7.2 | 10.3 | 13.7 | 19.5 | 24.9 |
| | Rated output current (A) at VT | | 1.2 | 1.9 | 3.5 | 6.0 | 9.6 | 12.0 | 19.6 | 30.0 | 40.0 | 56.0 | 69.0 |
| | Rated output current (A) at CT | | 1.0 | 1.6 | 3.0 | 5.0 | 8.0 | 11.0 | 17.5 | 25.0 | 33.0 | 47.0 | 60.0 |
| | Max. output voltage | | Proportional to input voltage: 0..240 V | | | | | | | | | | |
| | Max. output frequency | | 400 Hz | | | | | | | | | | |
| Power supply | Rated input voltage and frequency | | Single-phase 200..240 V 50/60 Hz<br>3-phase 200..240 V 50/60 Hz | | | | | | | | | | |
| | Allowable voltage fluctuation | | -15%..+10% | | | | | | | | | | |
| | Allowable frequency fluctuation | | 5% | | | | | | | | | | |
| Braking torque | | At short-time deceleration At capacitor feedback | 100%: <50Hz<br>50%: <60Hz | | | | 70%: <50Hz<br>50%: <60Hz | Approx 20% | - | | | | |
| Cooling method | | | Self cooling[3] | | | | Forced-air-cooling | | | | | | |

1. Three phase model use forced-air-cooling but single phase model is self cooling.
2. Based on a standard 3-Phase standard motor.
3. Forced air cooling for IP54 models.

### 400 V class

| Three-phase: 3G3MX2-□ | | | 4004 | 4007 | 4015 | 4022 | 4030 | 4040 | 4055 | 4075 | 4110 | 4150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor kW[1] | For VT setting | | 0.75 | 1.5 | 2.2 | 3.0 | 4.0 | 5.5 | 7.5 | 11 | 15 | 18.5 |
| | For CT setting | | 0.4 | 0.75 | 1.5 | 2.2 | 3.0 | 4.0 | 5.5 | 7.5 | 11 | 15 |
| Output characteristics | Inverter capacity kVA | 380 VT | 1.3 | 2.6 | 3.5 | 4.5 | 5.7 | 7.3 | 11.5 | 15.1 | 20.4 | 25.0 |
| | | 380 CT | 1.1 | 2.2 | 3.1 | 3.6 | 4.7 | 6.0 | 9.7 | 11.8 | 15.7 | 20.4 |
| | | 480 VT | 1.7 | 3.4 | 4.4 | 5.7 | 7.3 | 9.2 | 14.5 | 19.1 | 25.7 | 31.5 |
| | | 480 CT | 1.4 | 2.8 | 3.9 | 4.5 | 5.9 | 7.6 | 12.3 | 14.9 | 19.9 | 25.7 |
| | Rated output current (A) at VT | | 2.1 | 4.1 | 5.4 | 6.9 | 8.8 | 11.1 | 17.5 | 23.0 | 31.0 | 38.0 |
| | Rated output current (A) at CT | | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 9.2 | 14.8 | 18.0 | 24.0 | 31.0 |
| | Max. output voltage | | Proportional to input voltage: 0..480 V | | | | | | | | | |
| | Max. output frequency | | 400 Hz | | | | | | | | | |
| Power supply | Rated input voltage and frequency | | 3-phase 380..480 V 50/60 Hz | | | | | | | | | |
| | Allowable voltage fluctuation | | -15%..+10% | | | | | | | | | |
| | Allowable frequency fluctuation | | 5% | | | | | | | | | |
| Braking torque | | At short-time deceleration At capacitor feedback | 100%: <50Hz<br>50%: <60Hz | | | | 70%: <50Hz<br>50%: <60Hz | - | | | | |
| Cooling method | | | Self cooling[2] | | Forced-air-cooling | | | | | | | |

1. Based on a standard 3-Phase standard motor.
2. Forced air cooling for IP54 models.

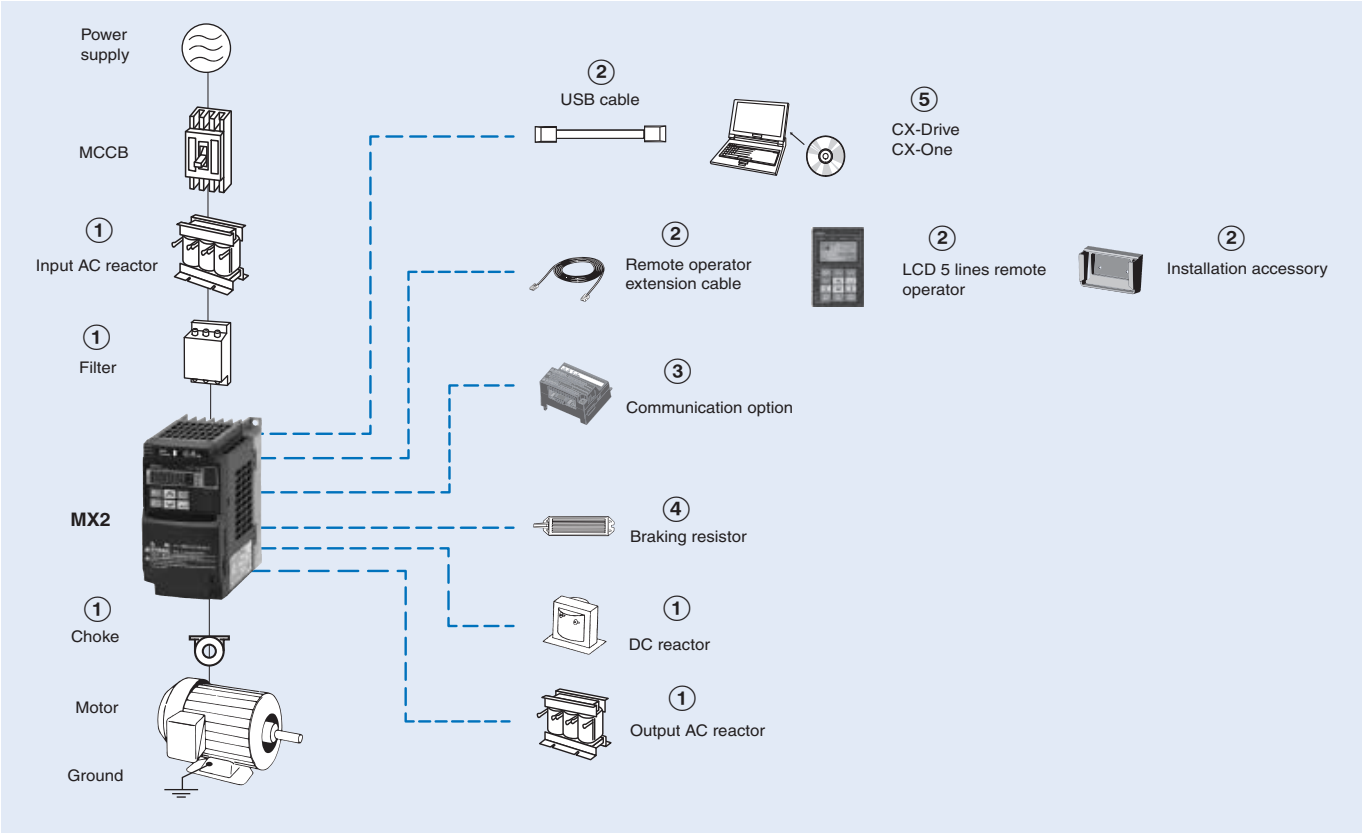
# Specifications

## Common specifications

| Model number 3G3MX2 | | Specifications |
|---|---|---|
| Control functions | Control methods | Phase-to-phase sinusoidal pulse with modulation PWM (Sensorless vector control, V/F) |
| | Output frequency range | 0.10..400.00 Hz |
| | Frequency precision | Digital set value: ±0.01% of the max. frequency |
| | | Analogue set value: ±0.2% of the max. frequency (25 ±10ºC) |
| | Resolution of frequency set value | Digital set value: 0.01 Hz |
| | | Analogue set value: 1/1000 of maximum frequency |
| | Resolution of output frequency | 0.01Hz |
| | Starting torque | 200% / 0.5 Hz |
| | Overload capability | Dual rating:<br>Heavy duty (CT): 150% for 1 minute<br>Normal Duty (VT): 120% for 1 minute |
| | Frequency set value | 0 to 10 VDC (10 KΩ), 4 to 20 mA (100 Ω), RS485 Modbus, Network options |
| | V/f Characteristics | Constant/ reduced torque, free V/f |
| Functionality | Inputs signals | FW (forward run command), RV (reverse run command), CF1~CF4 (multi-stage speed setting), JG (jog command), DB (external braking), SET (set second motor), 2CH (2-stage accel./decel. command), FRS (free run stop command), EXT (external trip), USP (startup function), CS (commercial power switchover), SFT (soft lock), AT (analog input selection), RS (reset), PTC (thermistor thermal protection), STA (start), STP (stop), F/R (forward/reverse), PID (PID disable), PIDC (PID reset), UP (remote control up function), DWN (remote control down function), UDC (remote control data clear), OPE (operator control), SF1~SF7 (multi-stage speed setting; bit operation), OLR (overload restriction), TL (torque limit enable), TRQ1 (torque limit changeover1), TRQ2 (torque limit changeover2), BOK (Braking confirmation), LAC (LAD cancellation), PCLR (position deviation clear), ADD (add frequency enable), F-TM (force terminal mode), ATR (permission of torque command input), KHC (Cumulative power clear), MI1~MI7 (general purpose inputs for Drive Programming), AHD (analog command hold), CP1~CP3 (multistage-position switches), ORL (limit signal of zero-return), ORC (trigger signal of zero-return), SPD (speed/position changeover), GS1~GS2 (STO inputs, safety related signals), 485 (Starting communication signal), PRG (executing Drive Programming), HLD (retain output frequency), ROK (permission of run command), EB (rotation direction detection of B-phase), DISP (display limitation), OP (option control signal), NO (no function), PSET (preset position) |
| | Output signals | RUN (run signal), FA1~FA5 (frequency arrival signal), OL,OL2 (overload advance notice signal), OD (PID deviation error signal), AL (alarm signal), OTQ (over/under torque threshold), UV (under-voltage), TRQ (torque limit signal), RNT (run time expired), ONT (power ON time expired), THM (thermal warning), BRK (brake release), BER (brake error), ZS (0Hz detection), DSE (speed deviation excessive), POK (positioning completion), ODc (analog voltage input disconnection), OIDc (analog current input disconnection), FBV (PID second stage output), NDc (network disconnect detection), LOG1~LOG3 (Logic output signals), WAC (capacitor life warning), WAF (cooling fan warning), FR (starting contact), OHF (heat sink overheat warning), LOC (Low load), MO1~MO3 (general outputs for Drive Programming), IRDY (inverter ready), FWR (forward operation), RVR (reverse operation), MJA (major failure), WCO (window comparator O), WCOI (window comparator OI), FREF (frequency command source), REF (run command source), SETM (second motor in operation), EDM (STO (safe torque off) performance monitor), OP (option control signal), NO (no function) |
| | Standard functions | Free-V/f, manual/automatic torque boost, output voltage gain adjustment, AVR function, reduced voltage start, motor data selection, auto-tuning, motor stabilization control, reverse running protection, simple position control, simple torque control, torque limiting, automatic carrier frequency reduction, energy saving operation, PID function, non-stop operation at instantaneous power failure, brake control, DC injection braking, dynamic braking (BRD), frequency upper and lower limiters, jump frequencies, curve accel and decel (S, U, inversed U,EL-S), 16-stage speed profile, fine adjustment of start frequency, accel and decel stop, process jogging, frequency calculation, frequency addition, 2-stage accel/decel, stop mode selection, start/end freq., analog input filter, window comparators, input terminal response time, output signal delay/hold function, rotation direction restriction, stop key selection, software lock, safe stop function, scaling function, display restriction, password function, user parameter, initialization, initial display selection, cooling fan control, warning, trip retry, frequency pull-in restart, frequency matching, overload restriction, over current restriction, DC bus voltage AVR |
| | Analogue inputs | 2 analogue inputs 0 to 10 V (10 KΩ), 4 to 20 mA (100 Ω) |
| | Pulse train input terminal | 0 to 24 V, up to 32 kHz |
| | Accel/Decel times | 0.01 to 3600.0 s (line/curve selection), 2nd accel/decel setting available |
| | Display | Status indicator LED's Run, Program, Alarm, Power, Hz, Amps |
| | | Digital operator: Available to monitor 32 items: frequency reference, output current, output frequency... |
| Protection functions | Motor overload protection | Electronic Thermal overload relay and PTC thermistor input |
| | Instantaneous overcurrent | 200% of rated current |
| | Overload | Dual rating:<br>Heavy duty (CT): 150% for 1 minute<br>Normal Duty (VT): 120% for 1 minute |
| | Overvoltage | 800 V for 400 V type and 400 V for 200 V type |
| | Undervoltage | 345 V for 400 V type and 172.5 V for 200 V type |
| | Momentary power loss | Following items are selectable: Alarm, decelerates to stop, decelerates to stop with DC bus controlled, restart |
| | Cooling fin overheat | Temperature monitor and error detection |
| | Stall prevention level | Stall prevention during acceleration/deceleration and constant speed |
| | Ground fault | Detection at power-on |
| | Power charge indication | On when power is supplied to the control part |
| Ambient conditions | Degree of protection | IP20, Varnish coating on PCB & IP54 (For 3G3MX2-D□ type) |
| | Ambient humidity | 90% RH or less (without condensation) |
| | Storage temperature | -20ºC..+65ºC (short-term temperature during transportation) |
| | Ambient temperature[1] | –10°C to 50ºC (Both the carrier frequency and output current need to be reduced over 40ºC) |
| | Installation | Indoor (no corrosive gas, dust, etc.) |
| | Installation height | Max. 1000 m |
| | Vibration | 5.9 $m/s^2$ (0.6G), 10 to 55 Hz |

1. Some types of 3G3MX2-D requires special derating depending on installation conditions and carrier frequency selected. Check the manual for details.

## Ordering information




### 3G3MX2

| Specifications | | | | | Model | | |
|---|---|---|---|---|---|---|---|
| Voltage class | Constant torque | | Variable torque | | Standard (IP20) | Finless | IP54 |
| | Max motor kW | Rated current A | Max motor kW | Rated current A | | | |
| Single-phase 200 V | 0.1 | 1.0 | 0.2 | 1.2 | 3G3MX2-AB001-E | 3G3MX2-AB001-P-E | 3G3MX2-DB001-E/EC |
| | 0.2 | 1.6 | 0.4 | 1.9 | 3G3MX2-AB002-E | 3G3MX2-AB002-P-E | 3G3MX2-DB002-E/EC |
| | 0.4 | 3.0 | 0.55 | 3.5 | 3G3MX2-AB004-E | 3G3MX2-AB004-P-E | 3G3MX2-DB004-E/EC |
| | 0.75 | 5.0 | 1.1 | 6.0 | 3G3MX2-AB007-E | 3G3MX2-AB007-P-E | 3G3MX2-DB007-EC |
| | 1.5 | 8.0 | 2.2 | 9.6 | 3G3MX2-AB015-E | 3G3MX2-AB015-P-E | 3G3MX2-DB015-EC |
| | 2.2 | 11.0 | 3.0 | 12.0 | 3G3MX2-AB022-E | 3G3MX2-AB022-P-E | 3G3MX2-DB022-EC |
| Three-phase 200 V | 0.1 | 1.0 | 0.2 | 1.2 | 3G3MX2-A2001-E | 3G3MX2-A2001-P-E | 3G3MX2-D2001-E/EC |
| | 0.2 | 1.6 | 0.4 | 1.9 | 3G3MX2-A2002-E | 3G3MX2-A2002-P-E | 3G3MX2-D2002-E/EC |
| | 0.4 | 3.0 | 0.55 | 3.5 | 3G3MX2-A2004-E | 3G3MX2-A2004-P-E | 3G3MX2-D2004-E/EC |
| | 0.75 | 5.0 | 1.1 | 6.0 | 3G3MX2-A2007-E | 3G3MX2-A2007-P-E | 3G3MX2-D2007-E/EC |
| | 1.5 | 8.0 | 2.2 | 9.6 | 3G3MX2-A2015-E | 3G3MX2-A2015-P-E | 3G3MX2-D2015-EC |
| | 2.2 | 11.0 | 3.0 | 12.0 | 3G3MX2-A2022-E | 3G3MX2-A2022-P-E | 3G3MX2-D2022-EC |
| | 3.7 | 17.5 | 5.5 | 19.6 | 3G3MX2-A2037-E | 3G3MX2-A2037-P-E | 3G3MX2-D2037-EC |
| | 5.5 | 25.0 | 7.5 | 30.0 | 3G3MX2-A2055-E | - | 3G3MX2-D2055-EC |
| | 7.5 | 33.0 | 11 | 40.0 | 3G3MX2-A2075-E | - | 3G3MX2-D2075-EC |
| | 11 | 47.0 | 15 | 56.0 | 3G3MX2-A2110-E | - | 3G3MX2-D2110-EC |
| | 15 | 60.0 | 18.5 | 69.0 | 3G3MX2-A2150-E | - | 3G3MX2-D2150-EC |
| Three-phase 400 V | 0.4 | 1.8 | 0.75 | 2.1 | 3G3MX2-A4004-E | 3G3MX2-A4004-P-E | 3G3MX2-D4004-EC |
| | 0.75 | 3.4 | 1.5 | 4.1 | 3G3MX2-A4007-E | 3G3MX2-A4007-P-E | 3G3MX2-D4007-EC |
| | 1.5 | 4.8 | 2.2 | 5.4 | 3G3MX2-A4015-E | 3G3MX2-A4015-P-E | 3G3MX2-D4015-EC |
| | 2.2 | 5.5 | 3.0 | 6.9 | 3G3MX2-A4022-E | 3G3MX2-A4022-P-E | 3G3MX2-D4022-EC |
| | 3.0 | 7.2 | 4.0 | 8.8 | 3G3MX2-A4030-E | 3G3MX2-A4030-P-E | 3G3MX2-D4030-EC |
| | 4.0 | 9.2 | 5.5 | 11.1 | 3G3MX2-A4040-E | 3G3MX2-A4040-P-E | 3G3MX2-D4040-EC |
| | 5.5 | 14.8 | 7.5 | 17.5 | 3G3MX2-A4055-E | - | 3G3MX2-D4055-EC |
| | 7.5 | 18.0 | 11 | 23.0 | 3G3MX2-A4075-E | - | 3G3MX2-D4075-EC |
| | 11 | 24.0 | 15 | 31.0 | 3G3MX2-A4110-E | - | 3G3MX2-D4110-EC |
| | 15 | 31.0 | 18.5 | 38.0 | 3G3MX2-A4150-E | - | 3G3MX2-D4150-EC |