

Specifications

200 V Class (Three-phase/Single-phase)

Value inside parenthesis is for a single-phase drive.

| Model | | | 0001 | 0002 | 0004 | 0006 | 0008 | 0010 | 0012 | 0018 | 0020 | 0030 | 0040 | 0056 | 0070 |
|--------------------------------------|---------------------------------|---|--|-------|----------|-------|-------|-------|------------|------------|------------|------|------|------|------|
| Three-Phase CIMR-VA2A□□□□ | | | 0001 | 0002 | 0004 | 0006 | 0008 | 0010 | 0012 | 0018 | 0020 | 0030 | 0040 | 0056 | 0070 |
| Single-Phase *2 CIMR-VABA□□□□ | | | 0001 | 0002 | 0003 | 0006 | - | 0010 | 0012 | - | 0018* 1 | - | - | - | - |
| Max. Applicable Motor Capacity *3 kW | Normal Duty | | 0.2 | 0.4 | 0.75 | 1.1 | 1.5 | 2.2 | 3.0 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18 |
| | Heavy Duty | | 0.1 | 0.2 | 0.4 | 0.75 | 1.1 | 1.5 | 2.2 | 3.0 | 3.7 | 5.5 | 7.5 | 11 | 15 |
| Input | Rated Input Current *4 A | Three-phase Normal Duty | 1.1 | 1.9 | 3.9 | 7.3 | 8.8 | 10.8 | 13.9 | 18.5 | 24.0 | 34.7 | 50.9 | 69.4 | 85 |
| | | Three-phase Heavy Duty | 0.7 | 1.5 | 2.9 | 5.8 | 7.0 | 7.5 | 11.0 | 15.6 | 18.9 | 26.0 | 35.4 | 51.9 | 70 |
| | Single-phase | Normal Duty | 2.0 | 3.6 | 7.3 | 13.8 | - | 20.2 | 24.0 | - | - | - | - | - | - |
| | | Heavy Duty | 1.4 | 2.8 | 5.5 | 11.0 | - | 14.1 | 20.6 | - | 35.0 | - | - | - | - |
| Rated Output Capacity *5 kVA | Normal Duty | | 0.5 | 0.7 | 1.3 | 2.3 | 3.0 | 3.7 | 4.6 | 6.7 | 7.5 | 11.4 | 15.2 | 21.3 | 26 |
| | Heavy Duty | | 0.3 | 0.6 | 1.1 | 1.9 | 2.6 | 3.0 | 4.2 | 5.3 | 6.7 | 9.5 | 12.6 | 17.9 | 22 |
| Rated Output Current A | Normal Duty *6 | | 1.2 | 1.9 | 3.5(3.3) | 6.0 | 8.0 | 9.6 | 12.0 | 17.5 | 19.6 | 30 | 40 | 56 | 69 |
| | Heavy Duty | | 0.8*7 | 1.6*7 | 3.0*7 | 5.0*7 | 6.9*8 | 8.0*8 | 11.0* 8 | 14.0* 8 | 17.5*8 | 25*8 | 33*8 | 47*8 | 60 |
| Output | Overload Tolerance | | Normal Duty Rating: 120% of rated output current for 60 s. Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads) | | | | | | | | | | | | |
| | Carrier Frequency | | 2 kHz (user-set, up to 15 kHz possible) | | | | | | | | | | | | |
| Max. Output Voltage | | Three-Phase Power Supply: Three-Phase 200 to 240 V (relative to input voltage) Single-Phase Power Supply: Three-Phase 200 to 240 V (relative to input voltage) | | | | | | | | | | | | | |
| Max. Output Frequency | | 400 Hz (user-set) | | | | | | | | | | | | | |
| Power | Rated Voltage/Rated Frequency | | Three-Phase Power Supply: Three-Phase 200 to 240 V 50/60 Hz Single-Phase Power Supply: Single-Phase 200 to 240 V 50/60 Hz | | | | | | | | | | | | |
| | Allowable Voltage Fluctuation | | -15 to 10% | | | | | | | | | | | | |
| | Allowable Frequency Fluctuation | | ±5% | | | | | | | | | | | | |
| Power Supply | Three-phase | Normal Duty | 0.5 | 0.9 | 1.8 | 3.3 | 4.0 | 4.9 | 6.4 | 8.5 | 11 | 17 | 24 | 33 | 37 |

| | | | | | | | | | | | | | | | | |
|-----|--------------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|---|
| kVA | Single-phase | Heavy Duty | 0.3 | 0.7 | 1.3 | 2.7 | 3.2 | 3.4 | 5.0 | 7.1 | 8.6 | 11 | 17 | 24 | 30 | |
| | | Normal Duty | 0.5 | 1.0 | 1.9 | 3.6 | - | 5.3 | 6.3 | - | - | - | - | - | - | - |
| | | Heavy Duty | 0.4 | 0.7 | 1.5 | 2.9 | - | 3.7 | 5.4 | - | 9.2 | - | - | - | - | - |

*1: Heavy Duty (3.7 kW) only.

*2: Drives with a single-phase power supply input have Three-phase output. Single-phase motors cannot be used.

*3: Based on motor data of Yaskawa 4-pole, 60 Hz standard motors. Motor rated current should not exceed drive rated output current.

*4: Value shown is for when operating at the rated output current. This value may fluctuate based on the power supply side impedance, as well as the input current, power supply transformer, input side reactor, and wiring conditions.

*5: Rated output capacity is calculated with a rated output voltage of 220 V.

*6: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.

*7: This value assumes a carrier frequency of 10 kHz. Increasing the carrier frequency requires a reduction in current.

*8: This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.

400 V Class (Three-phase)

| Model | CIMR-VA4A□□□□ | 0001 | 0002 | 0004 | 0005 | 0007 | 0009 | 0011 | 0018 | 0023 | 0031 | 0038 | |
|--|-------------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|
| Max. Applicable Motor Capacity ^{*1} | Normal Duty | 0.4 | 0.75 | 1.5 | 2.2 | 3.0 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 | |
| | Heavy Duty | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | 3.0 | 3.7 | 5.5 | 7.5 | 11 | 15 | |
| Input | Rated Input Current ^{*2} | Normal Duty | 1.2 | 2.1 | 4.3 | 5.9 | 8.1 | 9.4 | 14.0 | 20 | 24 | 38 | 44 |
| | | Heavy Duty | 1.2 | 1.8 | 3.2 | 4.4 | 6.0 | 8.2 | 10.4 | 15 | 20 | 29 | 39 |
| Output | Rated Output Capacity ^{*3} | Normal Duty ^{*4} | 0.9 | 1.6 | 3.1 | 4.1 | 5.3 | 6.7 | 8.5 | 13.3 | 17.5 | 23.6 | 29 |
| | | Heavy Duty ^{*5} | 0.9 | 1.4 | 2.6 | 3.7 | 4.2 | 5.5 | 7.0 | 11.3 | 13.7 | 18.3 | 23.6 |
| | Rated Output Current A | Normal Duty ^{*4} | 1.2 | 2.1 | 4.1 | 5.4 | 6.9 | 8.8 | 11.1 | 17.5 | 23 | 31 | 38 |
| | | Heavy Duty ^{*5} | 1.2 | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 9.2 | 14.8 | 18 | 24 | 31 |
| Overload Tolerance | | Normal Duty Rating: 120% of rated output current for 60 s. Heavy Duty Rating: 150% of rated output current for 60 s. (Derating may be required for repetitive loads) | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|-------|------------------------------------|--|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|
| | Carrier Frequency | 2 kHz (user-set, up to 15 kHz possible) | | | | | | | | | | | |
| | Max. Output Voltage | Three-phase 380 to 480 V (relative to input voltage) | | | | | | | | | | | |
| | Max. Output Frequency | 400 Hz (user-set) | | | | | | | | | | | |
| | Rated Voltage/ Rated Frequency | Three-phase 380 to 480 V 50/60 Hz | | | | | | | | | | | |
| | Allowable Voltage Fluctuation | -15 to 10% | | | | | | | | | | | |
| Power | Allowable Frequency Fluctuation | ±5% | | | | | | | | | | | |
| | Power Supply kVA | Normal Duty | 1.1 | 1.9 | 3.9 | 5.4 | 7.4 | 8.6 | 13 | 18 | 22 | 35 | 40 |
| | | Heavy Duty | 1.1 | 1.6 | 2.9 | 4.0 | 5.5 | 7.5 | 9.5 | 14 | 18 | 27 | 36 |

*1: Based on motor data of Yaskawa 4-pole, 60 Hz standard motors. Motor rated current should not exceed the drive rated output current.

*2: Value shown is for when operating at the rated output current. This value may fluctuate based on the power supply side impedance, as well as the input current, power supply transformer, input side reactor, and wiring conditions.

*3: Value displayed is for when operating at the rated output current. Rated output capacity is calculated with a rated output voltage of 440 V.

*4: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.

*5: This value assumes a carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.

Common Specifications

Rotational Auto-Tuning must be performed to achieve the performance described with Open Loop Vector Control.

| | | |
|-------------------------|--|---|
| Control Characteristics | Control Method | Open Loop Vector Control (Current Vector), V/f Control, PM Open Loop Vector Control (for SPM and IPM motors) |
| | Frequency Control Range | 0.01 to 400 Hz |
| | Frequency Accuracy (Temperature Fluctuation) | Digital Input : within ±0.01% of the max. output frequency (-10 to +50°C) Analog Input: within ±0.1% of the max. output frequency (25°C ±10°C) |
| | Frequency Setting Resolution | Digital Input : 0.01 Hz Analog Input: 1/1000 of max. frequency |
| | Output Frequency | 1/2 ²⁰ of maximum output frequency (parameter E1-04 setting) |

| | | |
|------------------------|----------------------------------|---|
| Resolution | | |
| Frequency Setting | | Main frequency Reference : 0 to +10 Vdc (20 k Ω), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) |
| Resolution | | Main speed reference : Pulse Train Input max. 32 kHz |
| Starting Torque | | 200% / 0.5 Hz (assumes Heavy Duty rating IM of 3.7 kW or less using Open Loop Vector Control), 50% / 6 Hz (assumes Open Loop Vector Control for PM motors) |
| Speed Control Range | | 1:100 (Open Loop Vector Control), 1:20 to 40 (V/f Control), 1:10 (PM Open Loop Vector Control) |
| Speed Control Accuracy | | $\pm 0.2\%$ in Open Loop Vector Control (25°C $\pm 10^\circ\text{C}$) *1 |
| Speed Response | | 5 Hz in Open Loop Vector (25°C $\pm 10^\circ\text{C}$) |
| Torque Limit | | Open Loop Vector Control allows separate settings in four quadrants |
| Accel/Decel Time | | 0.0 to 6000.0 sec (4 selectable combinations of independent acceleration and deceleration settings) |
| Braking Torque | | 1. Short-time decel torque *2: over 150% for 0.1/0.2 kW motors, over 100% for 0.4/ 0.75 kW motors, over 50% for 1.5 kW motors, and over 20% for 2.2 kW and above motors (overexcitation braking/High-Slip Braking: approx. 40%). 2. Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option *3: 10% ED, 10 s, internal braking transistor) |
| V/f Characteristics | | User-selected programs, V/f preset patterns possible |
| Main Control Functions | | Momentary Power Loss Ride-Thru, Speed Search, Overtorque Detection, Torque Limit, 17-Step Speed (max), Accel/Decel Time Switch, S-Curve Accel/Decel, 3-Wire Sequence, Auto-Tuning (Rotational, Stationary Tuning for Resistance between Lines), Dwell, cooling fan on/off switch, Slip Compensation, Torque Compensation, Frequency Jump, upper/lower limits for frequency reference, DC Injection braking at start and stop, High Slip Braking, PID Control (with sleep function), Energy Saving Control, Memobus Comm. (RS-485/422 max, 115.2 kbps), Fault Restart, Application Presets, DriveWorksEZ (customized function), removable terminal block with Parameter Backup Function... |
| Protection Function | Motor Protection | Motor overheat protection based on output current |
| | Momentary Overcurrent Protection | Drive stops when output current exceeds 200% of Heavy Duty Rating |
| | Overload Protection | Drive stops after 60 s at 150% of rated output current (Heavy Duty Rating) *4 |
| | Overvoltage Protection | 200 V class: Stops when DC bus exceeds Approx. 410 V 400 V class: Stops when DC bus exceeds Approx. 820 V |
| | Undervoltage | Stops when DC bus voltage falls below the following levels: |

| | | |
|-----------------------------------|--|---|
| | Protection | Three-phase 200 V class: Approx. 190 V, Single-phase 200 V class: Approx. 160 V, Three-phase 400 V class: Approx. 380 V, Three-phase 380 V class: Approx. 350 V |
| | Momentary Power Loss Ride-Thru | Stops after Approx. 15 ms (default). Parameter settings allow the drive to continue running if power loss lasts for up to Approx. 2 s *5 |
| | Heatsink Overheat Protection | Protection by thermistor |
| | Braking Resistance Overheat Protection | Overheat sensor for braking resistor (optional ERF-type, 3% ED) |
| | Stall Prevention | Separate settings allowed during acceleration, and during run. Enable/disable only during deceleration. |
| | Ground Fault Protection | Protection by electronic circuit *6 |
| | Charge LED | Charge LED remains lit until DC bus has fallen below Approx. 50 V |
| | Area of Use | Indoors |
| | Ambient Temperature | -10 to +50°C (open chassis), -10 to +40°C (NEMA 1 Type 1) |
| Operating Environment | Humidity | 95 RH% or less (no condensation) |
| | Storage Temperature | -20 to +60°C (short-term temperature during transportation) |
| | Altitude | Up to 1000 meters |
| Safety Standard Protection Design | Shock | 10 to less than 20 Hz (9.8 m/s ²) max., 20 to 50 Hz (5.9 m/s ²) max |
| | | UL508C, EN954-1 Cat. 3, IEC/EN61508 SIL2 |
| | | IP20 open-chassis, NEMA 1 enclosure |

*1: Speed control accuracy may vary slightly depending on installation conditions or motor used.

*2: Momentary average deceleration torque refers to the deceleration torque from 60Hz down to 0 Hz. This may vary depending on the motor.

*3: Parameter L3-04 should be disabled when a braking resistor or Dynamic Braking Resistor Unit is connected.

*4: Overload protection may be triggered at lower levels if output frequency is below 6 Hz.

*5: Varies by drive capacity. Drives smaller than 7.5 kW (CIMR-VA2A0004/CIMR-VA4A0023) require a separate Momentary Power Loss Ride-Thru device to continue operating during a momentary power loss of two seconds.

*6: Protection may not be provided under the following conditions as the motor windings are grounded internally during run:

- Low resistance to ground from the motor cable or terminal block.
- Drive already has a short-circuit when the power is turned on.

