

A1000



240V Class: ½ to 175 HP
480V Class: ½ to 1000 HP
600V Class: ½ to 250 HP



 **YASKAWA**™

A single drive for all your needs, with outstanding performance and flexibility!

The A1000 is a full-featured drive, providing outstanding quality, performance, flexibility, and environmental friendliness through 1000HP. From simple fans and pumps to complex machine control, A1000 can be the single drive platform for an entire facility. Network communications, expandable I/O, and feedback are among the many choices. For new installations or retrofits, the A1000 provides a single robust solution, regardless of your application.



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Features and Benefits

Exceptional Quality

Enjoy peace of mind by knowing that you are considering a product from Yaskawa, the factory automation controls company with the highest reputation for quality and reliability. Historically, Yaskawa drives have demonstrated extremely high reliability with an average MTBF (mean time between failure) of 28 years or more. The new 1000 series products take reliability to the next level with a calculated design life that is twice as long as previous generations.



Highly Integrated Design results in fewer parts and interconnections, reducing the number of failure points.

Component Derating extends the life of any single part by selecting higher specifications (e.g. voltage, current) than what a circuit requires for normal operation.

Latest Generation IGBT Power Modules, capable of four times more thermal cycles than previous designs.

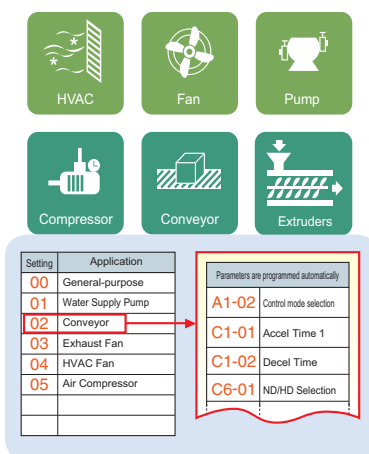
Enhanced Short Circuit Detection and Self Diagnostics provide additional protection against severe catastrophic conditions.

In addition, the A1000 is designed for use around the world, and carries agency certifications for all major geographical regions



Easy to Apply and Maintain

Whether your applications are simple or complex, the A1000 is supported by user-friendly configuration tools. For local field access, the keypad interface features a multi-language LCD display, parameter storage, and application presets to make programming a simple task. It also has built-in memory for backup purposes. In addition, a USB Copy Unit can be loaded with a drive's program for convenient portable transfer of configuration between an office environment and the factory floor.



DriveWizard® computer software delivers configuration, monitoring, and trending functions enhanced by direct connectivity through the A1000's standard USB port.

- Online and Offline Editing
- Application Wizard
- Monitoring and Diagnostic Panels
- Trend Recorder and Playback
- Network Configurator
- Multidrive Support
- Drive Flash Support
- Project Converter
- Report and Export Generation
- Search Engine



Features and Benefits

Easy to Apply and Maintain

Preventative Maintenance Monitors

Maximize production and intelligently schedule your maintenance by making use of the A1000's special monitors that provide alarm information when a drive requires attention. Use this information to trigger discrete outputs or send the status across a network for upper level decision making.

- Cooling Fan Remaining Life
- IGBT (Power Module) Remaining Life
- Bus Capacitor Remaining Life
- Precharge Relay
- Drive (Heatsink) Temperature



Highly Reliable and Easily Replaceable Cooling Fans

- Improved location for convenient access
- No tools required
- 24Vdc powered (including large ratings) eliminates need to make proper connection at time of installation



Removeable I/O Terminal Board with Drive Backup Memory

- All parameter changes automatically saved to both main control board and I/O board
- Leave I/O connected when replacing a drive
- Configuration is downloaded to replacement drive
- Reduces MTTR (Mean Time To Repair)



Maximum Flexibility

Have it your way with the A1000's impressive flexibility. Take advantage of a significant quantity of control points as standard. For applications requiring more I/O, feedback, or network choices, the A1000 offers three expansion ports that support a wide variety of interface modules.



Standard I/O and Communications

- Digital Inputs (8)
- Analog Inputs (3)
- Pulse Inputs (1)
- Digital Outputs (4)
- Analog Outputs (2)
- Pulse Outputs (1)
- RS485 Modbus RTU Communication



Expansion Capability

I/O Modules

- Digital Inputs (16)
- Analog Inputs (3)
- Digital Outputs (8)
- Analog Outputs (2)



Feedback Modules

- Incremental Encoder
- Resolver
- Absolute Encoder (Stegmann, Heidenhain)



Communication Modules

- DeviceNet
- EtherNet/IP
- Modbus TCP/IP
- PROFIBUS-DP
- PROFINET
- MECHATROLINK-II

Features and Benefits

Maximum Flexibility

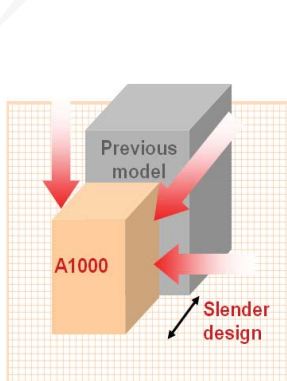
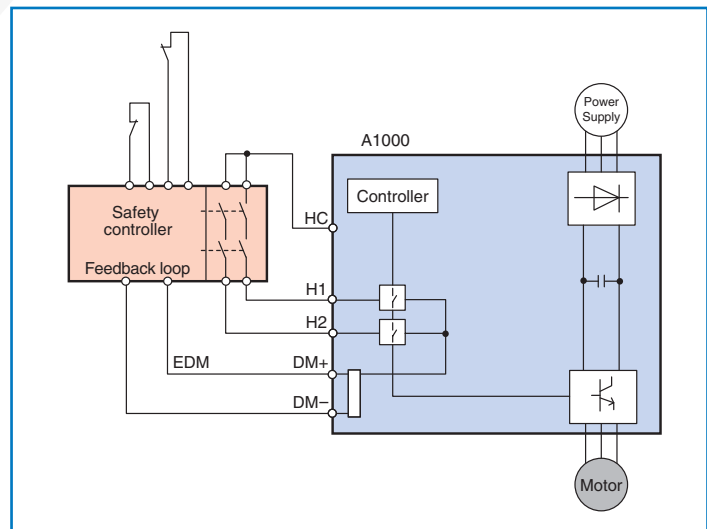
Auxiliary Control Power Input

Keep your drives communicating over the network, even while main power is removed. The Auxiliary Control Power Input uses facility supplied 24Vdc to keep the drive's control and communication intact. Service your drive cabinets with the benefit of live control and communications without the need for main power and associated Arc Flash protection.

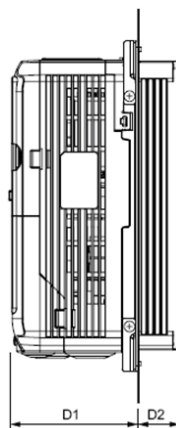


Embedded Functional Safety

Minimize downtime for applications requiring occasional or frequent mechanical intervention. Safe Torque Off provides safe removal of torque without removal of power to the drive. The A1000 provides this functionality as standard in a safety category 3 architecture, and is certified by TUV to PLd and SIL CL2 according to ISO/EN 13849-1 and IEC/EN 62061 respectively, meeting the requirements of IEC/EN 61508.



Physical Size Reduction



External Heatsink Solution
(Side View)

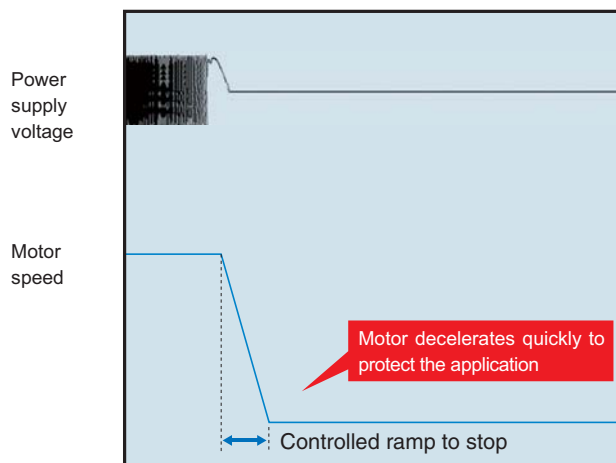


Zero Side Clearance
(40°C max ambient)

Maximum Flexibility

A variety of braking solutions optimized for your application.

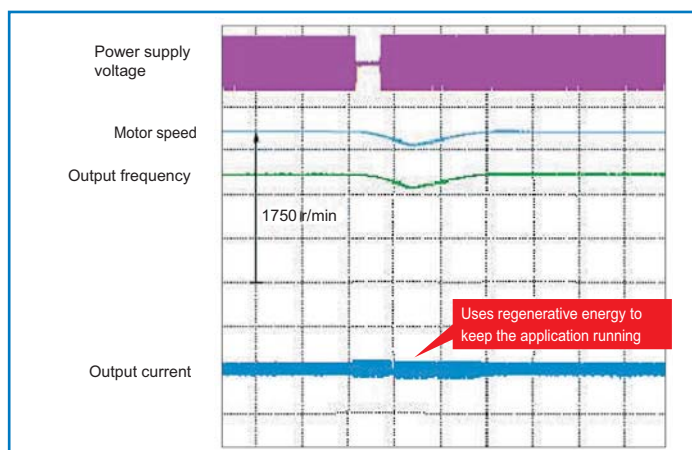
- For high demand braking conditions, the A1000 provides powerful Dynamic Braking with integrated brake transistors through 50HP normal duty (40HP heavy duty). For drives rated through 7.5HP normal duty (5HP heavy duty), drive mounted low duty cycle resistors are available
- For applications that can dissipate losses in the motor, Over-Excitation Braking and High Slip Braking are good performing, money saving alternatives to dynamic braking



- In the event of a power loss, Kinetic Energy Braking uses energy stored in the rotating load to keep the drive powered and bring the process to a controlled stop

Keep your applications running with features designed to avoid interruptions that are typical with demanding load conditions.

- Optimal Decel automatically extends the programmed deceleration time based on the load condition and drive capability
- Overvoltage Suppression limits the DC bus voltage by modulating output frequency to keep the drive out of the regenerative region
- Overload Fault Prevention responds to heavy load conditions by adjusting output frequency and voltage to keep the drive's current within operating limits
- Momentary Power Loss Ride-Thru puts the drive in standby mode during transient power losses and then automatically restarts, avoiding potentially costly power related shut down conditions

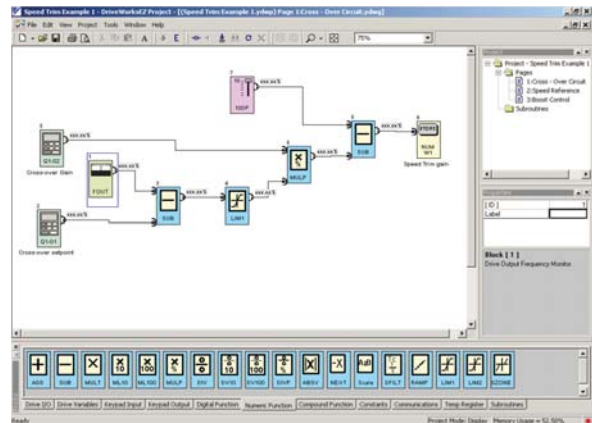


- Speed Search allows the drive to start into a rotating load by quickly matching its speed before delivering full power

Features and Benefits

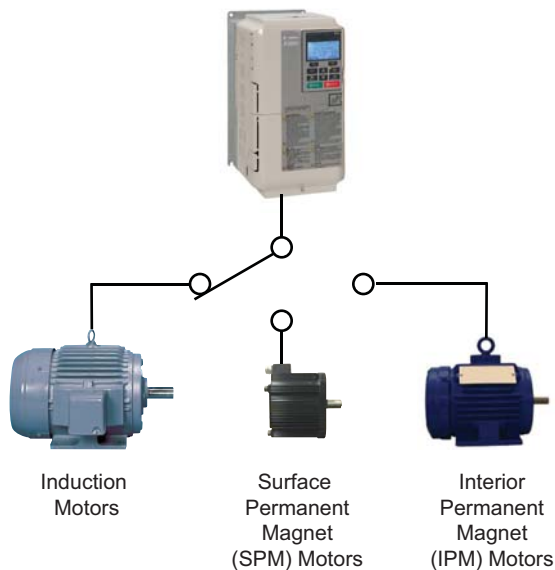
Maximum Flexibility

- Embedded Application Functions provide system level control without the use of a stand-alone controller.
- PID (Proportional Integral Derivative) Control regulates your process variable (flow, pressure, etc.).
- Droop Control automatically adjusts motor slip to perform load sharing in a multi-drive system.
- Function Block Programming supported by DriveWorksEZ® offers internal logic functions to build the application of your choice.
 - Drag and Drop Graphical Environment
 - Interface with I/O, Drive Data, Network Data
 - Logic Functions
 - Math Functions
 - Timers
 - Counters
 - Subroutine Creation
 - Up to 289 Function Blocks
 - Up to 100 Connections
 - 1 millisecond execution



A single drive to control traditional and emerging motor technologies:

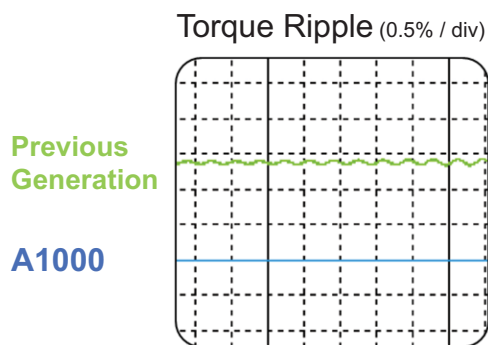
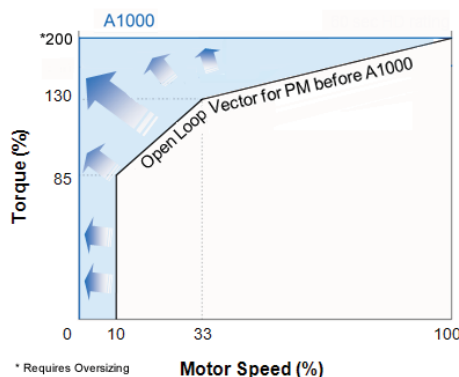
- **Induction Motors**
 - Low cost
 - Widely available
 - Efficient
- **Interior Permanent Magnet (IPM) Motors**
 - Very Compact
 - Highly Efficient
 - Sensorless High Precision Control
- **Surface Permanent Magnet (SPM) Motors**
 - Ultra Compact
 - Highly Efficient



Outstanding Performance

The A1000 delivers incredible performance, producing up to 200% torque with or without feedback.

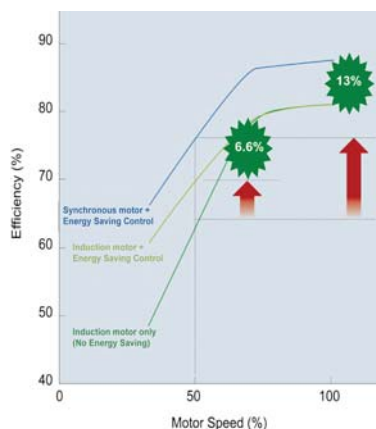
- Continuous Autotuning automatically compensates for changes in motor temperature
- Inertia Autotuning automatically sets gains for speed and torque loops
- Dead-Time Compensation drastically reduces torque ripple at low speeds
- High Frequency Injection (for IPM motors) enables high precision control without feedback, including positioning to within ± 5 degrees !



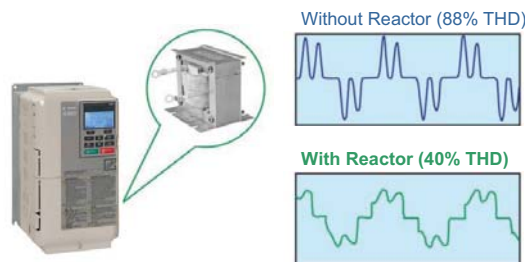
| | |
|---------------------|---|
| Speed Control Range | 1500:1 Closed Loop Vector (Induction and PM Motors) |
| | 200:1 Open Loop Vector (Induction Motors) |
| | 100:1 Open Loop Vector (IPM Motors) |
| Speed Accuracy | 0.02% - Closed Loop Vector (Induction Motors) |
| | 0.2% - Open Loop Vector (Induction Motors) |
| | 0.00% - Closed Loop Vector (IPM & SPM Motors) |
| | 0.00% - Open Loop Vector (IPM Motors) |
| Speed Response | 60 Hz - Closed Loop Vector |
| | 10 Hz - Open Loop Vector |
| Torque Response | 300 Hz - Closed Loop Vector |

Environmentally Friendly

Reduce your energy bill and contribute towards a cleaner environment with sustainable features designed into the A1000.



Applying variable speed often results in large energy savings. Combining this with more efficient motors magnifies the result.



The A1000 is offered with DC Link Reactors that reduce harmonic demand from the power system, keeping the power source cleaner and more efficient.



All materials used in the A1000 comply with the directive for Restriction of Hazardous Substances (RoHS)

Specifications

240V Class

| Model | | | CIMR-AU2A | | 0004 | 0006 | 0008 | 0010 | 0012 | 0018 | 0021 | 0030 | 0040 | 0056 |
|--|-------------------------------------|--|-----------|---|-------------------|-------------------|-------------------|-----------------|-------------------|-------------------|--------------------|-------------------|--------------------|--------------------|
| Max. Applicable Motor Capacity ^{*1} | | | HP | Normal Duty | 0.75 | 1.5 | 2 | 3 | 3 | 5 | 7.5 | 10 | 15 | 20 |
| | | | | Heavy Duty | 0.75 | 1 | 2 | 2 | 3 | 3 | 5 | 7.5 | 10 | 15 |
| Input | Rated Input Current ^{*2} | | A | Normal Duty | 3.9 | 7.3 | 8.8 | 10.8 | 13.9 | 18.5 | 24 | 37 | 52 | 68 |
| | | | | Heavy Duty | 2.9 | 5.8 | 7 | 7.5 | 11 | 15.6 | 18.9 | 28 | 37 | 52 |
| Output | Rated Output Capacity ^{*4} | | kVA | Normal Duty ^{*5} | 1.3 | 2.3 | 3 | 3.7 | 4.6 | 6.7 | 8 | 11.4 | 15.2 | 21 |
| | | | | Heavy Duty | 1.2 ^{*6} | 1.9 ^{*6} | 2.6 ^{*6} | 3 ^{*6} | 4.2 ^{*6} | 5.3 ^{*6} | 6.7 ^{*6} | 9.5 ^{*5} | 12.6 ^{*5} | 17.9 ^{*5} |
| | Rated Output Current | | A | Normal Duty ^{*5} | 3.5 | 6 | 8 | 9.6 | 12 | 17.5 | 21 | 30 | 40 | 56 |
| | | | | Heavy Duty | 3.2 ^{*6} | 5 ^{*6} | 6.9 ^{*6} | 8 ^{*6} | 11 ^{*6} | 14 ^{*6} | 17.5 ^{*6} | 25 ^{*5} | 33 ^{*5} | 47 ^{*5} |
| | Overload Tolerance | | | Normal Duty Rating: 120% of rated output current for 60 sec. Heavy Duty Rating: 150% of rated output current for 60 sec. (Derating may be required for applications that start and stop frequently) | | | | | | | | | | |
| | Carrier Frequency (User Adjustable) | | | 2 to 15 kHz | | | | | | | | | | |
| | Max. Output Voltage | | | Three-phase 200 to 240 V (relative to input voltage) | | | | | | | | | | |
| | Max. Output Frequency | | | 400 Hz | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Power | Rated Voltage/Rated Frequency | | | Three-phase 200 to 240 Vac 50/60 Hz 270 to 340 Vdc ^{*3} | | | | | | | | | | |
| | Allowable Voltage Fluctuation | | | -15% to +10% | | | | | | | | | | |
| | Allowable Frequency Fluctuation | | | ±5% | | | | | | | | | | |
| | Braking Transistor | | | Included | | | | | | | | | | |
| | Fan | | | No fan | | | | | | With fan | | | | |
| | DC Link Choke | | | External Option | | | | | | | | | | |
| | Power Supply | | kVA | Normal Duty | 2.2 | 3.1 | 4.1 | 5.8 | 7.8 | 9.5 | 14 | 18 | 27 | 36 |
| | | | | Heavy Duty | 1.3 | 2.2 | 3.1 | 4.1 | 5.8 | 7.8 | 9.5 | 14 | 18 | 27 |

| Model | | | CIMR-AU2A | | | 0069 | 0081 | 0110 | 0138 | 0169 | 0211 | 0250 | 0312 | 0360 | 0415 |
|--|-------------------------------------|--|-----------|---|------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| Max. Applicable Motor Capacity ^{*1} | | | HP | Normal Duty | 25 | 30 | 40 | 50 | 60 | 75 | 100 | 125 | 150 | 175 | |
| | | | | Heavy Duty | 20 | 25 | 30 | 40 | 50 | 60 | 75 | 100 | 125 | 150 | |
| Input | Rated Input Current ^{*2} | | A | Normal Duty | 80 | 96 | 111 | 136 | 164 | 200 | 271 | 324 | 394 | 471 | |
| | | | | Heavy Duty | 68 | 80 | 82 | 111 | 136 | 164 | 200 | 271 | 324 | 394 | |
| Output | Rated Output Capacity ^{*4} | | kVA | Normal Duty ^{*5} | 26 | 31 | 42 | 53 | 64 | 80 | 95 | 119 | 137 | 158 | |
| | | | | Heavy Duty | 23 ^{*6} | 29 ^{*6} | 32 ^{*6} | 44 ^{*6} | 55 ^{*6} | 69 ^{*7} | 82 ^{*7} | 108 ^{*7} | 132 ^{*7} | 158 ^{*5} | |
| | Rated Output Current | | A | Normal Duty ^{*5} | 69 | 81 | 110 | 138 | 169 | 211 | 250 | 312 | 360 | 415 | |
| | | | | Heavy Duty | 60 ^{*6} | 75 ^{*6} | 85 ^{*5} | 115 ^{*6} | 145 ^{*6} | 180 ^{*7} | 215 ^{*7} | 283 ^{*7} | 346 ^{*7} | 415 ^{*5} | |
| | Overload Tolerance | | | Normal Duty Rating: 120% of rated output current for 60 sec. Heavy Duty Rating: 150% of rated output current for 60 sec. (Derating may be required for applications that start and stop frequently) | | | | | | | | | | | |
| | Carrier Frequency (User Adjustable) | | | 2 to 15 kHz | | | | | | 2 to 10 kHz | | | | | |
| | Max. Output Voltage | | | Three-phase 200 to 240 V (relative to input voltage) | | | | | | | | | | | |
| | Max. Output Frequency | | | 400 Hz (user-set) | | | | | | | | | | | |
| | Rated Voltage/Rated Frequency | | | Three-phase 200 to 240 Vac 50/60 Hz 270 to 340 Vdc ^{*3} | | | | | | | | | | | |
| Power | Allowable Voltage Fluctuation | | | -15% to +10% | | | | | | | | | | | |
| | Allowable Frequency Fluctuation | | | ±5% | | | | | | | | | | | |
| | Braking Transistor | | | Included | | | | | | External Option | | | | | |
| | Fan | | | With fan | | | | | | | | | | | |
| | DC Link Choke | | | External Option | | | Included | | | | | | | | |
| | Power Supply | | kVA | Normal Duty | 44 | 52 | 51 | 62 | 75 | 91 | 124 | 148 | 180 | 215 | |
| | | | | Heavy Duty | 36 | 44 | 37 | 51 | 62 | 75 | 91 | 124 | 148 | 180 | |

*1. The motor capacity (HP) refers to a NEC rated 4-pole motor. The rated output current of the drive output amps should be equal to or greater than the motor current. Select the appropriate capacity drive if operating the motor continuously above motor nameplate current.

*2. Assumes operation at the rated output current. Input current rating varies depending on the power supply transformer, input reactor, wiring connections, and power supply impedance.

*3. DC is not available for UL/CE standards.

*4. Rated motor capacity is calculated with a rated output voltage of 230V.

*5. Carrier frequency is set to 2 kHz. Current derating is required in order to raise the carrier frequency.

*6. Carrier frequency can be increased to 8 kHz while keeping this current derating. Higher carrier frequency settings require derating.

*7. Carrier frequency can be increased to 5 kHz while keeping this current derating. Higher carrier frequency settings require derating.

480V Class

| Model | CIMR-AU4A | | 0002 | 0004 | 0005 | 0007 | 0009 | 0011 | 0018 | 0023 | 0031 | 0038 | 0044 | 0058 | 0072 |
|--|-------------------------------------|-------------|--|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|------------------|------------------|------------------|------------------|
| Max. Applicable Motor Capacity ^{*1} | HP | Normal Duty | 1 | 2 | 3 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 |
| | | Heavy Duty | 0.75 | 2 | 3 | 3 | 5 | 5 | 10 | 10 | 15 | 20 | 30 | 30 | 40 |
| Input | Rated Input Current ^{*2} | A | 2.1 | 4.3 | 5.9 | 8.1 | 9.4 | 14 | 20 | 24 | 38 | 51 | 60 | 58 | 71 |
| | | Heavy Duty | 1.8 | 3.2 | 4.4 | 6 | 8.2 | 10.4 | 15 | 20 | 29 | 41 | 51 | 43 | 58 |
| Output | Rated Output Capacity ^{*4} | kVA | 1.6 | 3.1 | 4.1 | 5.3 | 6.7 | 8.5 | 13.3 | 17.5 | 24 | 29 | 34 | 44 | 55 |
| | | Heavy Duty | 1.4 ^{*6} | 2.6 ^{*6} | 3.7 ^{*6} | 4.2 ^{*6} | 5.5 ^{*6} | 7 ^{*6} | 11.3 ^{*6} | 13.7 ^{*6} | 18.3 ^{*6} | 24 ^{*6} | 30 ^{*6} | 34 ^{*6} | 48 ^{*6} |
| | Rated Output Current | A | 2.1 | 4.1 | 5.4 | 6.9 | 8.8 | 11.1 | 17.5 | 23 | 31 | 38 | 44 | 58 | 72 |
| | | Heavy Duty | 1.8 ^{*6} | 3.4 ^{*6} | 4.8 ^{*6} | 5.5 ^{*6} | 7.2 ^{*6} | 9.2 ^{*6} | 14.8 ^{*6} | 18 ^{*6} | 24 ^{*6} | 31 ^{*6} | 39 ^{*6} | 45 ^{*6} | 60 ^{*6} |
| | Overload Tolerance | | Normal Duty Rating: 120% of rated output current for 60 sec. Heavy Duty Rating: 150% of rated output current for 60 sec. (Derating may be required for repetitive loads) | | | | | | | | | | | | |
| | Carrier Frequency (User Adjustable) | | 2 to 15 kHz | | | | | | | | | | | | |
| | Max. Output Voltage | | Three-phase 380 to 480 V (relative to input voltage) | | | | | | | | | | | | |
| | Max. Output Frequency | | 400 Hz | | | | | | | | | | | | |
| | Rated Voltage/Rated Frequency | | Three-phase 380 to 480 Vac 50/60 Hz 510 to 680 Vdc ^{*3} | | | | | | | | | | | | |
| | Allowable Voltage Fluctuation | | -15% to +10% | | | | | | | | | | | | |
| Power | Allowable Frequency Fluctuation | | ±5% | | | | | | | | | | | | |
| | Braking Transistor | | Included | | | | | | | | | | | | |
| | Fan | | No fan | | | | With fan | | | | | | | | |
| | DC Link Choke | | External Option | | | | | | | | | | | | Included |
| | Power Supply | kVA | 2.3 | 4.3 | 6.1 | 8.1 | 10 | 14.5 | 19.4 | 28.4 | 37.5 | 46.6 | 54.9 | 53 | 64.9 |
| | | Heavy Duty | 1.4 | 2.3 | 4.3 | 6.1 | 8.1 | 10 | 14.6 | 19.2 | 28.4 | 37.5 | 46.6 | 39.3 | 53 |

| Model | | | CIMR-AU4A ^{①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺} | | | 0088 | 0103 | 0139 | 0165 | 0208 | 0250 | 0296 | 0362 | 0414 | 0515 | 0675 | 0930 | 1200 |
|--|-------------------------------------|-------------------------------|--|--|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|------|------|
| Max. Applicable Motor Capacity ^{*1} | | | HP | Normal Duty | 60 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 450 | 600 | 800 | 1000 | |
| Motor Capacity ^{*1} | | | HP | Heavy Duty | 60 | 60 | 75 | 100 | 150 | 150 | 200 | 250 | 300 | 350 | 500 | 700 | 900 | |
| Input | Rated Input | | Normal Duty | 86 | 105 | 142 | 170 | 207 | 248 | 300 | 346 | 410 | 465 | 657 | 922 | 1158 | | |
| | Current ^{*2} | A | Heavy Duty | 71 | 86 | 105 | 142 | 170 | 207 | 248 | 300 | 346 | 410 | 584 | 830 | 1031 | | |
| Output | Rated Output | | Normal Duty ^{*5} | 67 | 78 | 106 | 126 | 159 | 191 | 226 | 276 | 316 | 392 | 514 | 709 | 915 | | |
| | Capacity ^{*4} | kVA | Heavy Duty | 57 ^{*6} | 69 ^{*6} | 85 ^{*6} | 114 ^{*7} | 137 ^{*7} | 165 ^{*7} | 198 ^{*7} | 232 ^{*7} | 282 ^{*5} | 343 ^{*5} | 461 ^{*5} | 617 ^{*5} | 831 ^{*5} | | |
| | Rated Output | | Normal Duty ^{*5} | 88 | 103 | 139 | 165 | 208 | 250 | 296 | 362 | 414 | 515 | 675 | 930 | 1200 | | |
| | Current | A | Heavy Duty | 75 ^{*6} | 91 ^{*6} | 112 ^{*6} | 150 ^{*7} | 180 ^{*7} | 216 ^{*7} | 260 ^{*7} | 304 ^{*7} | 370 ^{*5} | 450 ^{*5} | 605 ^{*5} | 810 ^{*5} | 1090 ^{*5} | | |
| | Overload Tolerance | | Normal Duty Rating: 120% of rated output current for 60 sec. Heavy Duty Rating: 150% of rated output current for 60 sec. (Derating may be required for repetitive loads) | | | | | | | | | | | | | | | |
| | Carrier Frequency (User Adjustable) | | 2 to 15 kHz | | 2 to 10 kHz | | | | | | | 2 to 5 kHz | | | | | | |
| | Max. Output Voltage | | Three-phase 380 to 480 V (relative to input voltage) | | | | | | | | | | | | | | | |
| | Max. Output Frequency | | 400 Hz (user-set) | | | | | | | | | | | | | | | |
| | Power | Rated Voltage/Rated Frequency | | Three-phase 380 to 480 Vac 50/60 Hz 510 to 680 Vdc ^{*3} | | | | | | | | | | | | | | |
| | | Allowable Voltage Fluctuation | | -15% to +10% | | | | | | | | | | | | | | |
| Allowable Frequency Fluctuation | | ±5% | | | | | | | | | | | | | | | | |
| Braking Transistor | | External Option | | | | | | | | | | | | | | | | |
| Fan | | With fan | | | | | | | | | | | | | | | | |
| DC Link Choke | | Included | | | | | | | | | | | | | | | | |
| Power Supply | | kVA | Normal Duty | 78.6 | 96 | 130 | 156 | 189 | 227 | 274 | 316 | 375 | 425 | 601 | 843 | 601 | | |
| | | | Heavy Duty | 64.9 | 78.6 | 96 | 130 | 155 | 189 | 227 | 274 | 316 | 375 | 534 | 759 | 508 | | |

*1. The motor capacity (HP) refers to a NEC rated 4-pole motor. The rated output current of the drive output amps should be equal to or greater than the motor current. Select the appropriate capacity drive if operating the motor continuously above motor nameplate current.

*2. Assumes operation at the rated output current. Input current rating varies depending on the power supply transformer, input reactor, wiring connections, and power supply impedance.

*3. DC is not available for UL/CE standards.

*4. Rated motor capacity is calculated with a rated output voltage of 460V.

*5. Carrier frequency is set to 2 kHz. Current derating is required in order to raise the carrier frequency.

*6. Carrier frequency can be increased to 8 kHz while keeping this current derating. Higher carrier frequency settings require derating.

*7. Carrier frequency can be increased to 5 kHz while keeping this current derating. Higher carrier frequency settings require derating.

Specifications

600V Class

| Model CIMR-AU5A | | | 0003 | 0004 | 0006 | 0009 | 0011 | 0017 | 0022 | 0027 | 0032 | | |
|--|-------------------------------------|-------------------------------|-------------------|---|-------------------------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|
| Max. Applicable Motor Capacity ^{*1} | | HP | Normal Duty | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | |
| | | | Heavy Duty | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | |
| Input | Rated Input Current ^{*2} | | A | Normal Duty | 3.6 | 5.1 | 8.3 | 12 | 16 | 23 | 31 | 38 | 45 |
| | | | | Heavy Duty | 1.9 | 3.6 | 5.1 | 8.3 | 12 | 16 | 23 | 31 | 38 |
| Output | Rated Output Capacity ^{*3} | | kVA | Normal Duty ^{*4} | 2.7 | 3.9 | 6.1 | 9 | 11 | 17 | 22 | 27 | 32 |
| | | | | Heavy Duty | 1.7 ^{*5} | 3.5 ^{*5} | 4.1 ^{*5} | 6.3 ^{*5} | 9.8 ^{*5} | 12 ^{*5} | 17 ^{*5} | 22 ^{*5} | 27 ^{*5} |
| | Rated Output Current | | A | Normal Duty ^{*4} | 2.7 | 3.9 | 6.1 | 9 | 11 | 17 | 22 | 27 | 32 |
| | | | | Heavy Duty | 1.7 ^{*5} | 3.5 ^{*5} | 4.1 ^{*5} | 6.3 ^{*5} | 9.8 ^{*5} | 12 ^{*5} | 17 ^{*5} | 22 ^{*5} | 27 ^{*5} |
| | Overload Tolerance | | | Normal Duty Rating: 120% of rated output current for 60 sec. Heavy Duty Rating: 150% of rated output current for 60 sec. (Derating may be required for applications that start and stop frequently) | | | | | | | | | |
| | Carrier Frequency | | | 2 to 15 kHz | | | | | | | | | |
| | Max. Output Voltage | | | Three-phase: 500 to 600 V (proportional to input voltage) | | | | | | | | | |
| | Max. Output Frequency | | | 400 Hz | | | | | | | | | |
| | Power | Rated Voltage/Rated Frequency | | | Three-phase 500 to 600 Vac 50/60 Hz | | | | | | | | |
| Allowable Voltage Fluctuation | | | -10 (-15) to +10% | | | | | | | | | | |
| Allowable Frequency Fluctuation | | | ±5% | | | | | | | | | | |
| Braking Transistor | | | Included | | | | | | | | | | |
| Fan | | | No fan | | With fan | | | | | | | | |
| DC Link Choke | | | Included | | | | | | | | | | |
| Power Supply | | kVA | Normal Duty | 4.1 | 5.8 | 9.5 | 14 | 18 | 26 | 35 | 43 | 51 | |
| | | | Heavy Duty | 2.2 | 4.1 | 5.8 | 9.5 | 14 | 18 | 26 | 35 | 43 | |

| Model CIMR-AU5A | | | 0041 | 0052 | 0062 | 0077 | 0099 | 0125 | 0145 | 0192 | 0242 |
|--|-------------------------------------|-------------|---|------------------|------------------|------------------|------------------|------|------|------|------|
| Max. Applicable Motor Capacity ^{*1} | HP | Normal Duty | 40 | 50 | 60 | 75 | 100 | 125 | 150 | 200 | 250 |
| | | Heavy Duty | 30 | 40 | 50 | 60 | 75 | 100 | 125 | 150 | 200 |
| Input | Rated Input Current ^{*2} | A | 41 | 52 | 62 | 77 | 99 | 125 | 145 | 192 | 242 |
| | | Heavy Duty | 32 | 41 | 52 | 62 | 77 | 100 | 130 | 172 | 200 |
| Output | Rated Output Capacity ^{*3} | kVA | 41 | 52 | 62 | 77 | 99 | | | | |
| | | Heavy Duty | 32 ^{*5} | 41 ^{*5} | 52 ^{*5} | 62 ^{*5} | 77 ^{*5} | | | | |
| | Rated Output Current | A | 41 | 52 | 62 | 77 | 99 | | | | |
| | | Heavy Duty | 32 ^{*5} | 41 ^{*5} | 52 ^{*5} | 62 ^{*5} | 77 ^{*5} | | | | |
| | Overload Tolerance | | Normal Duty Rating: 120% of rated output current for 60 sec. Heavy Duty Rating: 150% of rated output current for 60 sec. (Derating may be required for applications that start and stop frequently) | | | | | | | | |
| | Carrier Frequency | | 2 to 15 kHz | | | | | | | | |
| Power | Max. Output Voltage | | Three-phase: 500 to 600 V (proportional to input voltage) | | | | | | | | |
| | Max. Output Frequency | | 400 Hz (user-set) | | | | | | | | |
| | Rated Voltage/Rated Frequency | | Three-phase 500 to 600 Vac 50/60 Hz | | | | | | | | |
| | Allowable Voltage Fluctuation | | -10 (-15) to +10% | | | | | | | | |
| | Allowable Frequency Fluctuation | | ±5% | | | | | | | | |
| | Braking Transistor | | Data not available | | | | | | | | |
| | Fan | | Data not available | | | | | | | | |
| | DC Link Choke | | Data not available | | | | | | | | |
| | Power Supply | kVA | 50 | 62 | 75 | 91 | 123 | | | | |
| | | Heavy Duty | 38 | 50 | 62 | 75 | 91 | | | | |

*1. The motor capacity (HP) refers to a NEC rated 4-pole motor. The rated output current of the drive output amps should be equal to or greater than the motor current. Select the appropriate capacity drive if operating the motor continuously above motor nameplate current.

*2. Assumes operation at the rated output current. Input current rating varies depending on the power supply transformer, input reactor, wiring connections, and power supply impedance.

*3. Rated motor capacity is calculated with a rated output voltage of 575V.

*4. Carrier frequency is set to 2 kHz. Current derating is required to raise the carrier frequency.

*5. Carrier frequency can be increased to 8 kHz while keeping this current derating. Higher carrier frequency settings require derating.

*6. Carrier frequency can be increased to 5 kHz while keeping this current derating. Higher carrier frequency settings require derating.

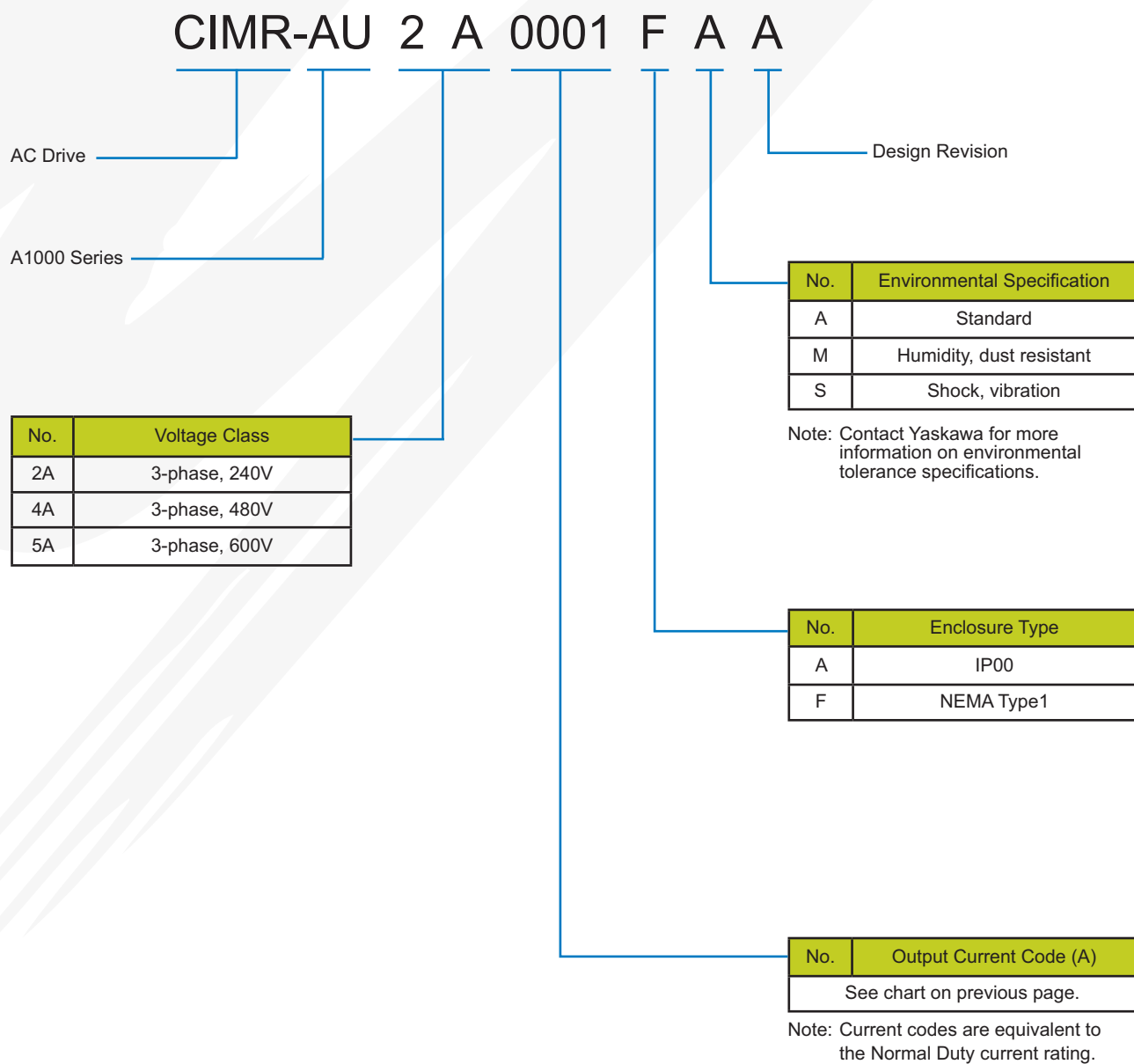
Common Specifications

| Item | | Specifications |
|------------------------------|--|--|
| Control Characteristics | Control Methods | •V/f Control (V/f) •V/f Control with PG (V/f w/PG) •Open Loop Vector Control (OLV) •Closed Loop Vector Control (CLV) •Open Loop Vector Control for PM (OLV/PM) •Advanced Open Loop Vector Control for PM (AOLV/PM) •Closed Loop Vector Control for PM (CLV/PM) Note: PM motor control modes are not available on 600V class drives, CIMR-A□5A□□□□□□. |
| | Frequency Control Range | 0.01 to 400 Hz (up to 1000 Hz is available with optional software) |
| | Frequency Accuracy (Temperature Fluctuation) | Digital input: within ±0.01% of the max output frequency (-10 to +40 °C) Analog input: within ±0.1% of the max output frequency (25 °C ±10 °C) |
| | Frequency Setting Resolution | Digital inputs: 0.01 Hz Analog inputs: 1/2048 of the maximum output frequency setting (11 bit plus sign) |
| | Output Frequency Resolution | 0.001 Hz |
| | Frequency Setting Methods | -10 to +10 V, 0 to +10 V, 4 to 20 mA, Pulse Train Input |
| | Starting Torque ^{<1>} | V/f, V/f w/PG: 150% at 3 Hz CLV, AOLV/PM, CLV/PM: 200% at 0 r/min OLV: 200% at 0.3 Hz OLV/PM: 100% at 5% speed |
| | Speed Control Range ^{<1>} | V/f, V/f w/PG: 1:40 OLV/PM: 1:20 OLV: 1:200 AOLV/PM: 1:100 CLV, CLV/PM: 1:1500 |
| | Speed Control Accuracy ^{<1>} | OLV: ±0.2% (25 °C ±10 °C) CLV: ±0.01% (25 °C ±10 °C) |
| | Speed Response ^{<1>} | OLV, OLV/PM, AOLV/PM: 10 Hz CLV, CLV/PM: 50 Hz |
| | Torque Limit | Separate limits in four quadrants (available in OLV, CLV, AOLV/PM, CLV/PM) |
| | Accel/Decel Time | 0.0 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings) |
| | Braking Torque | Approx. 20% (approx. 125% when using braking resistor) ^{<2>} • Short-time decel torque ^{<3>} : 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 ^{<4>} (overexcitation braking/High Slip Braking: approx. 40%). • Continuous regenerative torque: approx. 20% ^{<5>} (approx. 125% with dynamic braking resistor option ^{<6>} : 10% ED, 10s). |
| | Braking Transistor | Models 2A0004 to 2A0138, 4A0002 to 4A0072, and 5A0003 to 5A0032 have a built-in braking transistor. |
| Protection Function | V/f Characteristics | User-selected programs and V/f preset patterns possible |
| | Main Control Functions | Torque Control, Droop Control, Speed/torque Control Switching, Feed Forward Control, Zero Servo Function, Momentary Power Loss Ride-Thru, Speed Search, Overtorque/Undertorque Detection, Torque Limit, 17 Step Speed (max), Accel/decel Switch, S-curve Accel/decel, 3-wire Sequence, Auto-tuning (rotational, stationary tuning), 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, Overexcitation Braking, High Slip Braking, PID Control (with sleep function), Energy Saving Control, Modbus Comm. (RS-422/485 max, 115.2 kbps), Fault Restart, Application Presets, DriveWorksEZ (customized function), Removable Terminal Block with Parameter Backup Function, Online Tuning, KEB, Overexcitation Deceleration, Inertia (ASR) Tuning, Overvoltage Suppression, High Frequency Injection. |
| | Motor Protection | Electronic thermal overload relay |
| | 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 Heavy Duty output current ^{<5>} |
| | Overvoltage Protection | 240V class: Faults when DC bus voltage exceeds approx. 410 V; 480V class: Faults when DC bus voltage exceeds approx. 820 V; 600V class: Faults when DC bus voltage exceeds approx. 1040 V. |
| | Undervoltage Protection | 240V class: Faults when DC bus voltage falls below approx. 190 V; 480V class: Faults when DC bus voltage falls below approx. 380 V; 600V class: Faults when DC bus voltage falls below approx. 475 V. |
| | Momentary Power Loss Ride-Thru | Stops modulating after 15 ms or longer power loss ^{<6>} . Resumes operation if power loss is less than 2 s (standard) ^{<7>} |
| | Heatsink Overheat Protection | Thermistor |
| | Braking Resistance Overheat Protection | Overheat input signal for braking resistor (Optional ERF-type, 3% ED) |
| | Stall Prevention | Stall Prevention is available during acceleration, deceleration, and during run. |
| | Ground Fault Protection | Electronic circuit protection ^{<8>} |
| | Charge LED | Remains lit until DC bus voltage falls below 50 V |
| Operating Environment | Area of Use | Indoors |
| | Ambient Temperature | -10 to +50°C (Chassis Installation) -10 to +40°C (Chassis with zero side clearance, or Type 1) |
| | Humidity | 95% RH or less (no condensation) |
| | Storage Temperature | -20 to +60°C (short-term temperature during transportation) |
| | Altitude | Up to 1000 meters without derating, up to 3000 m with output current and voltage derating |
| | Shock | 10 to 20 Hz: 9.8 m/s ² 20 to 55 Hz: 5.9 m/s ² (2A0004 to 2A0211, 4A0002 to 4A0165, and 5A0003 to 5A0032) 2.0 m/s ² (2A0250 to 2A0415 and 4A0208 to 4A0675) |
| Standards and Certifications | | UL 508C, CSA C22.2, IEC/EN 61508, EN 61800-5-1 ^{<9>} |
| Protection Design | | IP00 enclosure, IP20/NEMA Type 1 enclosure ^{<10>} |

- <1> The accuracy of these values depends on motor characteristics, ambient conditions, and drive settings. Specifications may vary with different motors and with changing motor temperature. Contact Yaskawa for consultation.
- <2> Disable Stall Prevention during deceleration (L3-O4 = 0) when using a regenerative converter, a regenerative unit, a braking resistor or the Braking Resistor Unit. The default setting for the Stall Prevention function will interfere with the braking resistor.
- <3> Instantaneous average deceleration torque refers to the torque required to decelerate the motor (uncoupled from the load) from the rated motor speed down to zero in the shortest time.
- <4> Actual specifications may vary depending on motor characteristics.
- <5> Overload protection may be triggered when operating with 150% of the rated output current if the output frequency is less than 6 Hz.
- <6> May be shorter due to load conditions and motor speed.
- <7> A separate Momentary Power Loss Ride-Thru Unit is required for models 2A0004 to 2A0056, 4A0002 to 4A0031, and 5A0003 to 5A0032 if the application needs to continue running for up to 2 seconds during a momentary power loss.
- <8> Ground protection cannot be provided when the impedance of the ground fault path is too low, or when the drive is powered up while a ground fault is present at the output.
- <9> Terminals H1, H2, DM+, and DM- on 600 V class models are designed to the functionality, but are not certified to Insulation coordination: class1.
- <10> Removing the top protective cover or bottom conduit bracket from an IP20/NEMA Type 1 enclosure drive voids NEMA Type 1 protection while maintaining IP20 conformity. This is applicable to models 2A0004 to 2A0211, 4A0002 to 4A0165, and 5A0003 to 5A0032.

Drive Selection

Model Number Key



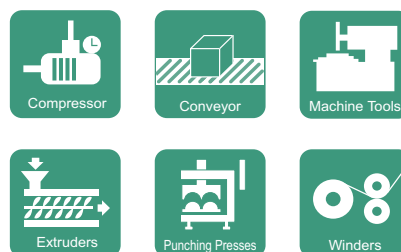
The A1000 drive can be sized to maximize its capability based on the application type. For applications with little or no overload requirements, size the drive as “Normal Duty.” For applications requiring more than 120% for 60 seconds, size the drive as “Heavy Duty.” See the chart on the next page to select a specific model.

| Duty Rating | Normal Duty | Heavy Duty |
|-------------------|------------------|------------------|
| Overload capacity | 120% for 60 sec. | 150% for 60 sec. |

Normal Duty Applications



Heavy Duty Applications



Selecting a Drive

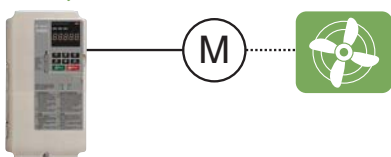
For a fan application using a 15 HP motor, select CIMR-AU4A0023 and set it for Normal Duty (C6-01 = 1).

Model: CIMR-AU4A0023

Normal Duty: 15 HP

15 HP

Fan



Selecting a Drive

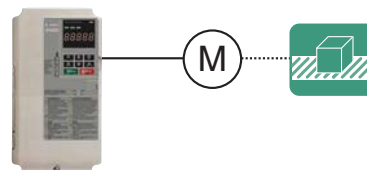
For an extruder application using a 15 HP motor, select CIMR-AU4A0031 and set it for Heavy Duty (default).

Model: CIMR-AU4A0031

Heavy Duty: 15 HP

15 HP

Conveyor



Drive Selection

| HP | Three-Phase 240V | | | | Three-Phase 480V | | | | Three-Phase 600V | | | | | |
|------|------------------|--------------|-------------|--------------|------------------|--------------|----------------------|----------------|------------------|--------------|-------------|--------------|----------|-------|
| | Normal Duty | | Heavy Duty | | Normal Duty | | Heavy Duty | | Normal Duty | | Heavy Duty | | | |
| | Model CIMR- | Rated Output | Model CIMR- | Rated Output | Model CIMR- | Rated Output | Model CIMR- | Rated Output | Model CIMR- | Rated Output | Model CIMR- | Rated Output | | |
| 0.75 | AU2A0004 | 3.5 A | AU2A0004 | 3.2 A | AU4A0002 | 2.1 A | AU4A0002 | 1.8 A | AU5A0003 | 2.7 A | AU5A0003 | 1.7 A | | |
| 1 | AU2A0006 | 6 A | AU2A0006 | 5 A | | | AU4A0004 | 3.4 A | | | AU5A0004 | 3.5 A | | |
| 1.5 | | | AU2A0008 | 6.9 A | AU4A0004 | 4.1 A | | | | | | | | |
| 2 | AU2A0008 | 8 A | AU2A0010 | 8 A | AU4A0005 | 5.4 A | AU4A0005 | 4.8 A | AU5A0004 | 3.9 A | AU5A0006 | 4.1 A | | |
| 3 | AU2A0010 | 9.6 A | | | | | | | | | | | AU2A0012 | 11 A |
| | AU2A0012 | 12 A | AU2A0018 | 14 A | | | | | | | | | AU4A0007 | 5.5 A |
| 5 | AU2A0018 | 17.5 A | AU2A0021 | 17.5 A | AU4A0009 | 8.8 A | AU4A0009 | 7.2 A | AU5A0006 | 6.1 A | AU5A0009 | 6.3 A | | |
| | | | | | | | AU4A0011 | 9.2 A | | | | | | |
| 7.5 | AU2A0021 | 21 A | AU2A0030 | 25 A | AU4A0011 | 11.1 A | AU4A0018 AU4A0023 | 14.8 A 18 A | AU5A0009 | 9 A | AU5A0011 | 9.8 A | | |
| 10 | AU2A0030 | 30 A | AU2A0040 | 33 A | AU4A0018 | 17.5 A | | | AU5A0011 | 11 A | AU5A0017 | 12.5 A | | |
| 15 | AU2A0040 | 40 A | AU2A0056 | 47 A | AU4A0023 | 23 A | AU4A0031 | 24 A | AU5A0017 | 17 A | AU5A0022 | 17 A | | |
| 20 | AU2A0056 | 56 A | AU2A0069 | 60 A | AU4A0031 | 31 A | AU4A0038 | 31 A | AU5A0022 | 22 A | AU5A0027 | 22 A | | |
| 25 | AU2A0069 | 69 A | AU2A0081 | 75 A | AU4A0038 | 38 A | AU4A0044 | 39 A | AU5A0027 | 27 A | AU5A0032 | 27 A | | |
| 30 | AU2A0081 | 81 A | AU2A0110 | 85 A | AU4A0044 | 44 A | AU4A0058 | 45 A | AU5A0032 | 32 A | AU5A0041 | 32 A | | |
| 40 | AU2A0110 | 110 A | AU2A0138 | 115 A | AU4A0058 | 58 A | AU4A0072 | 60 A | AU5A0041 | 41 A | AU5A0052 | 41 A | | |
| 50 | AU2A0138 | 138 A | AU2A0169 | 145 A | AU4A0072 | 72 A | AU4A0088 | 75 A | AU5A0052 | 52 A | AU5A0062 | 52 A | | |
| 60 | AU2A0169 | 169 A | AU2A0211 | 180 A | AU4A0088 | 88 A | AU4A0103 | 91 A | AU5A0062 | 62 A | AU5A0077 | 62 A | | |
| 75 | AU2A0211 | 211 A | AU2A0250 | 215 A | AU4A0103 | 103 A | AU4A0139 | 112 A | AU5A0077 | 77 A | AU5A0099 | 77 A | | |
| 100 | AU2A0250 | 250 A | AU2A0312 | 283 A | AU4A0139 | 139 A | AU4A0165 | 150 A | AU5A0099 | 99 A | AU5A0125 | 100 A | | |
| 125 | AU2A0312 | 312 A | AU2A0360 | 346 A | AU4A0165 | 165 A | AU4A0208 | 180 A | AU5A0125 | 125 A | AU5A0145 | 130 A | | |
| 150 | AU2A0360 | 360 A | AU2A0415 | 415 A | AU4A0208 | 208 A | AU4A0250 | 216 A | AU5A0145 | 145 A | AU5A0192 | 172 A | | |
| 175 | AU2A0415 | 415 A | | | AU4A0250 | 250 A | AU4A0296 | 260 A | AU5A0192 | 192 A | | | | |
| 200 | | | | | | | | | | | AU5A0242 | 200 A | | |
| 250 | | | | | AU4A0296 | 296 A | AU4A0362 | 304 A | AU5A0242 | 242 A | | | | |
| 300 | | | | | AU4A0362 | 362 A | AU4A0414 | 370 A | | | | | | |
| 350 | | | | | AU4A0414 | 414 A | AU4A0515 | 450 A | | | | | | |
| 400 | | | | | AU4A0515 | 515 A | AU4A0675 | 605 A | | | | | | |
| 450 | | | | | | | | | | | | | | |
| 500 | | | | | AU4A0675 | 675 A | AU4A0930 | 810 A | | | | | | |
| 550 | | | | | | | | | | | | | | |
| 600 | | | | | AU4A0930 | 930 A | AU4A1200 | 1090 A | | | | | | |
| 700 | | | | | | | | | | | | | | |
| 750 | | | | | AU4A0930 | 930 A | AU4A1200 | 1090 A | | | | | | |
| 800 | | | | | | | | | | | | | | |
| 900 | | | | | AU4A1200 | 1200 A | | | | | | | | |
| 1000 | | | | | | | | | | | | | | |