



YASKAWA AC Drive High Performance Vector Control A1000

200 V CLASS, 0.4 to 110 kW
400 V CLASS, 0.4 to 630 kW



The Answer

Certified for
ISO9001 and
ISO14001



JQA-0422



JQA-EM0498

The Birth of Yaskawa's Ace Drive

Offering limitless possibilities....

A top quality drive: silent, beautiful, and incredibly powerful. Perfectly designed functions open a new field with A1000. A product only possible from Yaskawa, knowing everything there is to know about the world of drive technology to create the most efficient operation possible with an inverter drive. You just have to try it to know how easy it is to use. High level, Yaskawa quality. Integrating the latest vector control technology in a general-purpose drive with the performance of a higher order demanded by the drives industry. A1000 is the answer to user needs, carrying on the Yaskawa traditions of absolute quality in this next generation product line.



The Answer is
A1000

Contents

Features	4
Features for Every Application	10
Product Lineup	14
Model Selection	15
Software Functions	16
Parameter List	18
Basic Instructions	24
Standard Specifications	26
Standard Connection Diagram	28
Dimensions	30
Fully-Enclosed Design	32
Peripheral Devices and Options	34
Application Notes	58
YASKAWA AC Drive Series	64
Global Service Network	65

The Drive for
a Greener World

Motor Drive Performance
Leading the Pack

Transforming the Application Installation
with Unparalleled Performance.



* CE and UL approval still pending for some models

A

Motor Drive Performance Leading the Pack

The Most Advanced Drive Technology

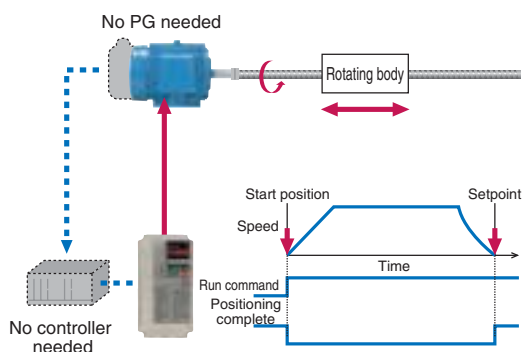
- ▲ Capable of driving any kind of motor.
A1000 runs not only induction motors, but also synchronous motors like IPM and SPM motors with high performance current vector control.
- ▲ Minimize equipment needed for your business by using the same drive to run induction and synchronous motors.
- ▲ Switch easily between motor types with a single parameter setting.

	Induction motor	Synchronous motor (SPM) EMR1 Series	Synchronous motor (IPM) Super Energy-Saving Motor
Features		<ul style="list-style-type: none"> Ultra-compact, ultra-light Energy saving, high efficiency High-performance control without a motor encoder 	<ul style="list-style-type: none"> Compact, light Energy saving, high efficiency High starting torque without an encoder. Positioning capability without an encoder.
Capacities		200 V: 0.4 to 7.5 kW	200 V: 0.4 to 75 kW 400 V: 0.4 to 300* kW

* 160 kW without PG

Rotor Positioning without Motor Encoder

- ▲ Use an IPM motor to perform position control without motor feedback.
Electrical saliency in IPM motors makes it possible to detect speed, direction, and rotor position without the use of a motor encoder.
- ▲ Precision positioning functionality without an upper controller.
Visual programming in DriveWorksEZ lets the user easily create a customized position control sequence, without the use of a motor encoder.



Cutting-Edge Torque Characteristics

- ▲ Powerful torque at 0 Hz, without a motor encoder*
Once out of reach for AC drives, Yaskawa now offers advanced control features without a motor encoder. Achieve even more powerful starting torque at zero speed with an IPM motor.
* No speed sensors or pole sensors required.



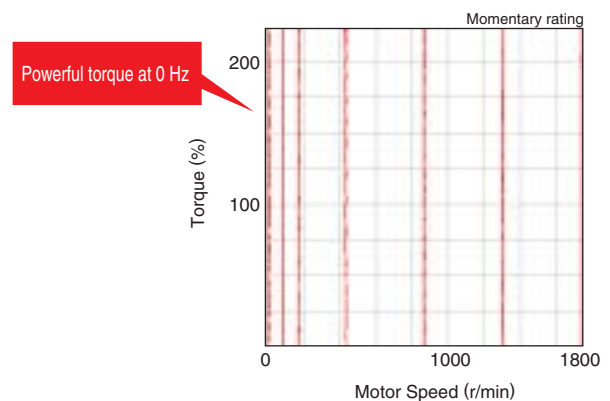
Synchronous Motor

- Advanced Open Loop Vector Control for PM
200% rated torque at 0 r/min*, speed range of 1:100
- Closed Loop Vector Control for PM
200% rated torque at 0 r/min*, speed range of 1:1500

* Achieving this torque output requires a larger capacity drive.

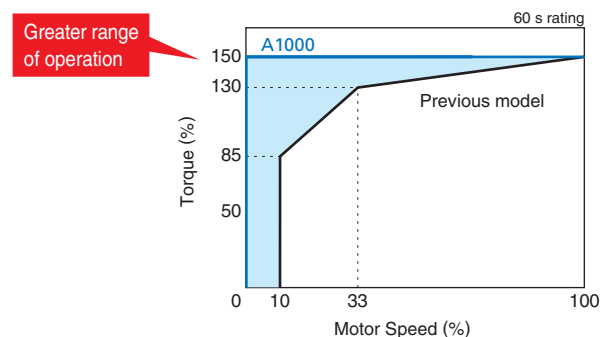
● Torque characteristics

[Advanced Open Loop Vector Control for PM with an IPM motor]



● Comparing the speed control range

[Advanced Open Loop Vector Control for PM with an IPM motor]



- ▲ High-performance current vector control achieves powerful starting torque with an induction motor.




Induction Motor


- Open Loop Vector Control
200% rated torque at 0.3 Hz*, speed range of 1:200
- Closed Loop Vector Control
200% rated torque at 0 r/min*, speed range of 1:1500

* Achieving this torque output requires a larger capacity drive.

Loaded with Auto-Tuning Features

- ▲ Auto-Tuning features optimize drive parameters for operation with induction motors as well as synchronous motors to achieve the highest performance levels possible.
- ▲ Perfects not only the drive and motor performance, but also automatically adjusts settings relative to the connected machinery.
 - A variety of ways to automatically optimize drive settings and performance

 Tuning the Motor	
Rotational Auto-Tuning	Applications requiring high starting torque, high speed, and high accuracy.
Stationary Auto-Tuning	Applications where the motor must remain connected to the load during the tuning process.
Line-to-Line Resistance Auto-Tuning	For re-tuning after the cable length between the motor and drive has changed, or when motor and drive capacity ratings differ.
Energy-Saving Auto-Tuning	For running the motor at top efficiency all the time.

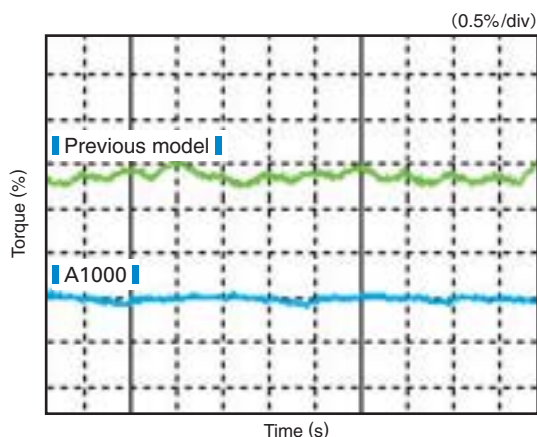
 Tuning the Load	
Inertia Tuning	Optimizes the drive's ability to decelerate the load. Useful for applications using KEB and Feed Forward functions.
ASR* Gain Auto-Tuning * Automatic Speed Regulator	Automatically adjusts ASR gain to better match the frequency reference.

Note: This type of Auto-Tuning is available only for motors less than 450 kW using an encoder.

- ▲ Brand-new Auto-Tuning methods. A1000 continuously analyzes changes in motor characteristics during run for highly precise speed control.

Smooth Operation

- ▲ Smooth low speed operation thanks to even better torque ripple suppression.
 - Comparing torque ripple at zero speed (Closed Loop Vector)



Tackling Power Loss and Recovery

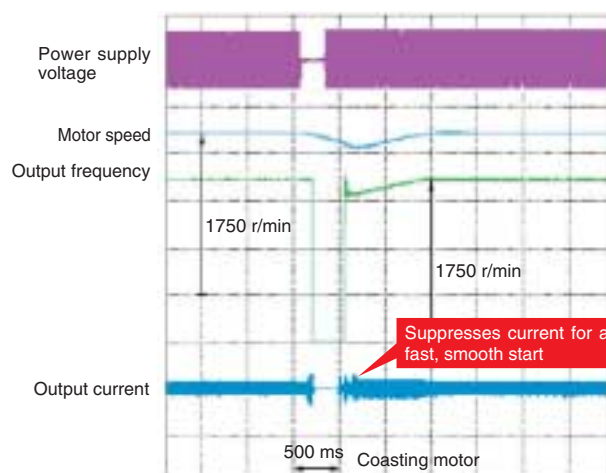
- ▲ A1000 offers two ways to handle momentary power loss.
- ▲ A1000 is capable of handling momentary power loss for induction motors as well as synchronous motors-- without the use of a motor encoder.

● Speed Search

Easily find the speed of a coasting motor for a smooth restart.

Applications

Perfect for fans, blowers, and other rotating, fluid-type applications.



● KEB

Keep the motor running without allowing it to coast.

Applications

Highly recommended for film lines and other applications requiring continuous operation.



Note: Requires a separate sensor to detect power loss. The drive may trip depending on load conditions, and the motor coast to stop.

- ▲ Ride through power loss for up to 2 seconds.*
 - Crucial for semi-conductor manufacturers
 - No need to purchase a back-up power supply
 - Detects, outputs an undervoltage signal during power loss

* The Momentary Power Loss Recovery Unit option may be required depending on the capacity of the drive.



The Drive for a Greener World

Energy Saving

Next-Generation Energy Saving

▲ Loaded with the most advanced energy-saving control technology* Energy Saving control makes highly efficient operation possible with an induction motor.

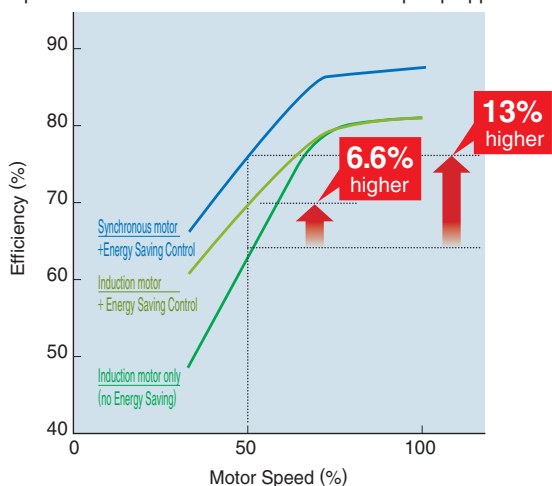
* Not available in models 450 kW and above.

▲ Amazing energy saving with a synchronous motor* Combining the high efficiency of a synchronous motor along with A1000's Energy Saving control capabilities allows for unparalleled energy saving.

* Not available in models 450 kW and above.

● Efficiency using a motor drive

Example shows a 200 V 3.7 kW drive in a fan or pump application.



● Examples of energy saving with drives

Conditions

A : Induction motor + A1000
B : IPM motor + A1000

Annual energy savings for an HVAC fan application running 100 3.7 kW motors. Electric costs of 15 cents/kWH, operating 365 days/year

Annual Energy Savings

A : Induction motor + A1000
 Power consumption: 1,903,100 kWh
 Electrical costs: **\$285,500**

B : IPM motor + A1000
 Power consumption: 1,754,600 kWh
 Electrical costs: **\$263,200**

Total Energy Savings \$22,300

Annual savings on energy costs: (A) vs. (B)
 Energy saved: 148,500 kWh
 Electrical costs: **\$22,300**

Annual reduction in CO₂
 148,500 kWh × 0.555 ÷ 1,000 = **82.4 tons!**
 Assumes 1 kWh of power consumed creates 0.555 kg/kWH of CO₂

Environmental Features

Protective Design

▲ A variety of protective designs are available to reinforce the drive against moisture, dust, oil mist, vibration, corrosive sulfur gas, conductive particles, and other harsh environments.

▲ IP54 drip-proof and dustproof options are also offered.*

* Available soon

RoHS

▲ All standard products are fully compliant with the EU's RoHS directive.

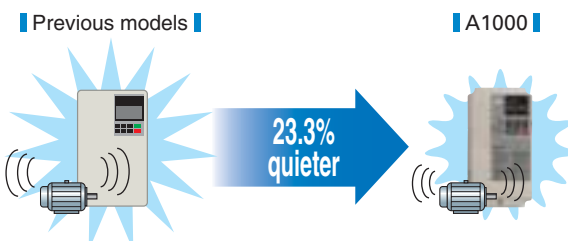


Noise Reduction

▲ A1000 uses Yaskawa's Swing PWM function* to suppress electromagnetic and audible motor noise, creating a more peaceful environment.

* Not available in models 450 kW and above.

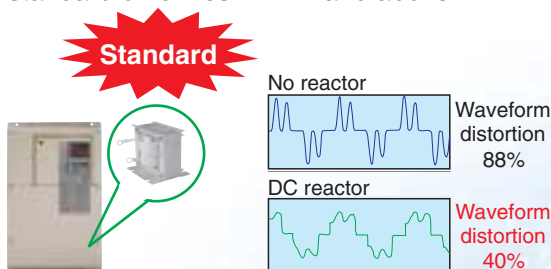
● Comparing our former product line with our new Swing PWM feature



Note: Calculated by comparing peak values during noise generation

Suppressing Power Supply Harmonics

▲ A DC reactor minimizes harmonic distortion, standard on drives 22 kW and above.



▲ Optional features available soon for compatibility with 12-pulse and 18-pulse rectifiers.*

* Requires a separate 3-winding or 4-winding transformer.

▲ Filter option available soon to suppress harmonic distortion.

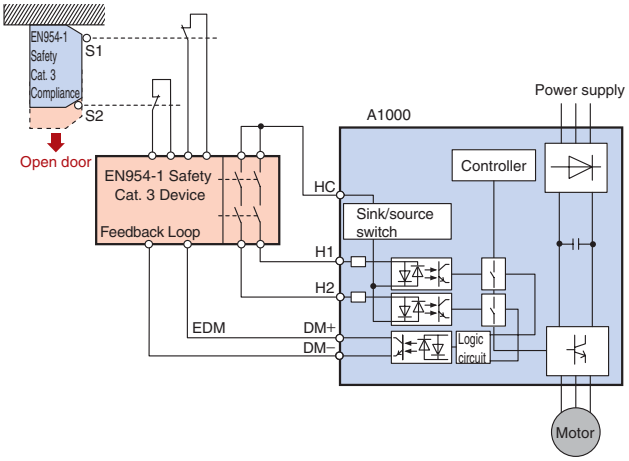
Safety

Safety Regulations

- ▲ All models have a Safe Disable function to stop the motor in accordance with EN954-1 safety category 3, IEC/EN61508 SIL2 requirements.
- ▲ An External Device Monitor (EDM) function has also been added to monitor the safety status of the drive.

● **Safe Disable example: Door switch circuit**

A1000 is equipped with 2 input terminals and a single output terminal for connecting a safe disable device.
 Input: Triggered when either terminal H1 or H2 opens.
 Output: EDM output monitors the safety status of the drive.



Controlled Stop Despite Power Loss

- ▲ Should a power outage occur, A1000 can bring the application to controlled stop quickly and safely using the KEB function.*

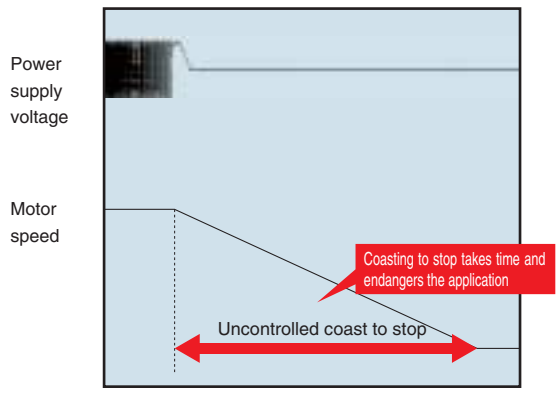
* Under development for models 450 kW and above.

● **Quickly ramp to stop with KEB function**

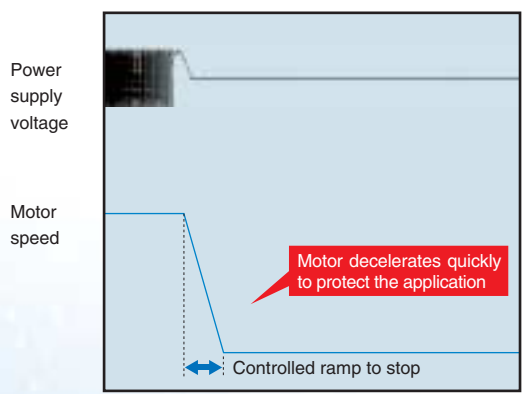
Applications

Perfect for spindle drive application and film production lines where stopping methods are crucial to the application to reduce production cost.

Previous model



A1000



The Answer is
A1000

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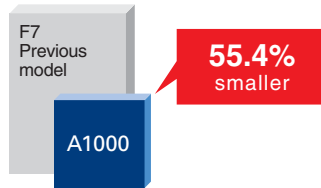
Transforming the Application Installation with Unparalleled Performance

Even More and More Compact

▲ Yaskawa continues to make applications even smaller by combining the world's smallest drive in its class with the light, efficient design of a synchronous motor.

● **Comparing drive dimensions**

Example: 400 V Class 75 kW



● **Comparing motor dimensions**

Example: 200 V 3.7 kW motor



▲ Use Side-by-Side installation* for an even more compact setup.

* For models up to 18.5 kW.

▲ Finless models* also available.

* For release soon

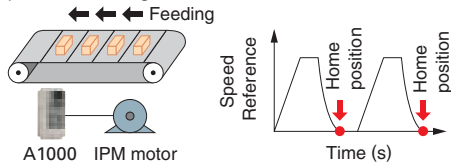
Customize Your Drive

▲ DriveWorksEZ visual programming tool with all models

Simply drag and drop icons to completely customize your drive. Create special sequences and detection functions, then load them onto the drive.

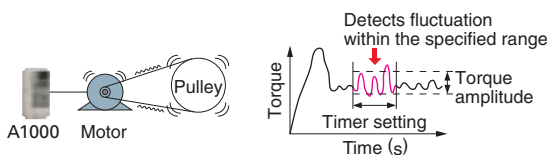
● **Program a customized sequence**

Example: Positioning control without a motor encoder



● **Create customized detection features**

Example: Machine weakening analysis using torque pulse detection



▲ USB for connecting to a PC

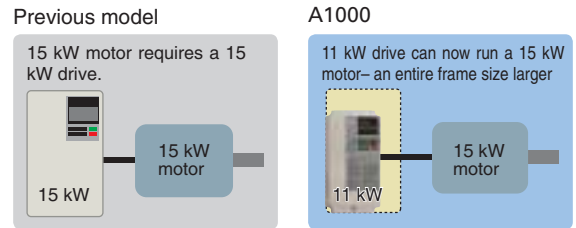
● **USB port lets the drive connect to a PC**



Note: Drives are also equipped with an RJ-45 comm. port that takes the existing WV103 cable used in Yaskawa's previous models. Simply remove the operator keypad for the RJ-45 connector.

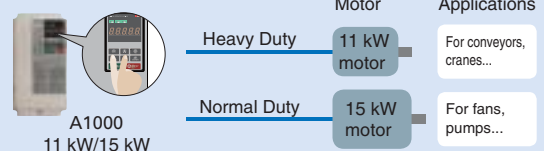
▲ Dual Rating allows for an even more compact setup
Each drive lets the user choose between Normal Duty or Heavy Duty operation. Depending on the application, A1000 can run a motor an entire frame size larger than our previous model.

● **Select the drive rating that best fits the application needs**



Dual Ratings in A1000

A single parameter lets the user set the drive for Normal Duty or Heavy Duty



Note: Always select a drive with a current rating greater than the motor rated current.

Breeze-Easy Setup

▲ Immediate setup with Application Presets

A1000 automatically sets parameters needed for most major applications. Simply selecting the appropriate application instantly optimizes the drive for top performance, saving enormous time setting up for a trial run.



● **Example using Application Presets**

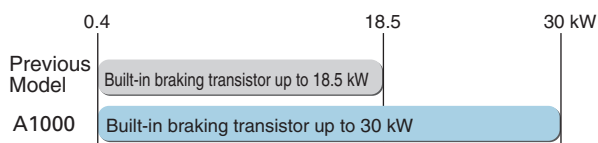
Selecting "Conveyor" optimizes five parameter settings so the drive is ready to start running your conveyor application immediately.



Setting	Application	Parameters are programmed automatically
00	General-purpose	
01	Water Supply Pump	
02	Conveyor	A1-02 Control mode selection
03	Exhaust Fan	C1-01 Accel Time 1
04	HVAC Fan	C1-02 Decel Time 1
05	Air Compressor	
06	Crane (Hoist)	C6-01 ND/HD Selection
07	Crane (Traverse)	

Variety of Braking Functions

- ▲ Overexcitation deceleration brings the motor to an immediate stop without the use of a braking resistor.
- ▲ All models up to 30 kW are equipped with a braking transistor for even more powerful braking options by just adding a braking resistor.



All Major Serial Network Protocols

- ▲ RS-422/485 (MEMOBUS/Modbus at 115.2 kbps) standard on all models.
- ▲ Option cards available for all major serial networks used across the globe: PROFIBUS-DP, DeviceNet, CC-Link, CANopen, LONWORKS*, MECHATRO-LINK-II, among others.
* Available soon
Note: Registered trademarks of those companies.
- ▲ Less wiring and space-saving features make for easy installation and maintenance.

Long Life Performance

Ten Years of Durable Performance

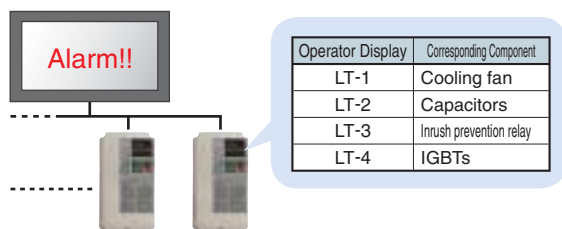
- ▲ Cooling fan, capacitors, relays, and IGBTs have been carefully selected and designed for a life expectancy up to ten years.*
* Assumes the drive is running continuously for 24 hours a day at 80% load with an ambient temperature of 40°C.

Motor Life

- ▲ Thanks to relatively low copper loss in the rotor and a cool shaft during operation, synchronous motors have a bearing life twice that of induction motors.

Performance Life Monitors

- ▲ Yaskawa's latest drive series is equipped with performance life monitors that notify the user of part wear and maintenance periods to prevent problems before they occur.
- Drive outputs a signal to the control device indicating components may need to be replaced

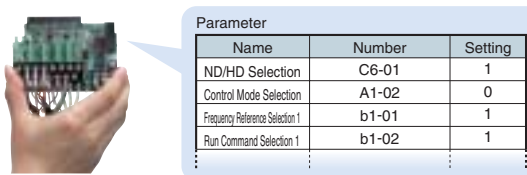


Easy Maintenance

The First Terminal Board with a Parameter Backup Function

- ▲ The terminal block's ability to save parameter setting data makes it a breeze to get the application back on-line in the event of a failure requiring drive replacement.

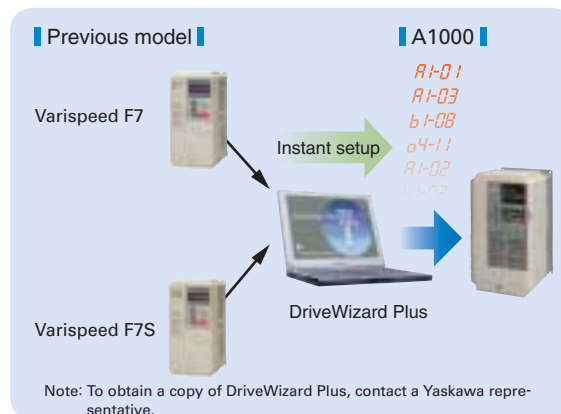
● A1000 Terminal Block



Engineering Tool DriveWizard Plus

- ▲ Manage the unique settings for all your drives right on your PC.
- ▲ An indispensable tool for drive setup and maintenance. Edit parameters, access all monitors, create customized operation sequences, and observe drive performance with the oscilloscope function.
- ▲ The Drive Replacement feature in DriveWizard Plus saves valuable time during equipment replacement and application upgrades by converting previous Yaskawa product parameter values to the new A1000 parameters automatically.

● Drive Replacement Function



Parameter Copy Function

- ▲ All standard models are equipped with a Parameter Copy function using the keypad that allows parameter settings to be easily copied from the drive or uploaded for quick setup.
- ▲ A USB Copy Unit is also available as an even faster, more convenient way to back up settings and instantly program the drive.

Features for Every Application

A1000 is loaded with functions to match the particular needs of every application.



Cranes

Advantages

1 Application Presets

Selecting “Crane” from A1000’s Application Presets automatically programs A1000 for optimal performance with a crane application. Save valuable set-up time and start running immediately.

2 Switch Between Motors

Use the same drive to control one motor for hoisting, another motor for traverse operation. Terminal inputs let the user set up a relay to switch back and forth between motors.

3 Powerful Starting Torque

Powerful torque at low speeds ensures the power needed for the application and prevents problems with slipping.

4 Safety Functions

The Safe Disable function comes standard for compliance with various safety regulations.

5 Visual Programming with DriveWorksEZ

Easily customize the drive using a PC.

6 Performance Life Diagnostic Features

A1000 notifies the user or controller when maintenance may be required for certain components such as the cooling fan or capacitors.

7 Terminal Block with Parameter Backup Function



The terminal block can be transferred to a new drive keeping all terminal wiring intact, and built-in memory backs up all parameter settings. An incredible time saver when replacing a drive.

Functions

<small>NEW</small> Application Presets	Motor 2 Switch	<small>NEW</small> IM/PM Switch
Torque Limit	<small>NEW</small> Overexcitation Braking	<small>NEW</small> Drive WorksEZ
Current Vector Control	Speed Search	Zero Servo Function
<small>NEW</small> Maintenance Monitors	Accel/Decel Time Switch	Torque Detection
KEB Function		

NEW NEW NEW Indicates a new function in A1000

Applications

	
Hoist, Crane	Shutter Door

A1000

Features for Every Application

Fans and Pumps

Advantages

1 Application Presets

Selecting "Fan" or "Pump" from A1000's Application Presets automatically programs A1000 for optimal performance specific for those applications. Save valuable setup time and start running immediately.

2 Compact Design

Yaskawa offers a compact solution for both drive and motor.

- Dual ratings
- Selecting Normal Duty makes it possible to use a smaller drive.
- Combine with a synchronous motor
- Run a synchronous motor instead of an induction motor for an even more compact installation.

3 Astounding Efficiency

Combine A1000 with a synchronous motor and save on energy costs.

Motor Capacity (kW)	ECOiPM motor (EMRT Series) (%)	IPM motor (Super Energy Saving Motor) (%)	Standard induction motor (%)
0.4	~82	~75	~75
0.75	~84	~76	~76
1.5	~85	~77	~77
2.2	~86	~78	~78
3.7	~87	~79	~79
5.5	~87.5	~80	~80
7.5	~88	~81	~81
11	~88.5	~81.5	~81.5
15	88.8	85.1	81.2

4 Output Power Pulse Monitor

Pulse output feature can send a signal to the PLC to keep track of kilowatt hours. No extra power meter needed.

Note: Cannot legally be used as proof of power consumption.

5 Speed Search

Yaskawa's unique speed search functions easily carry the motor through momentary power loss. No back-up power supply needed to keep the entire application running smoothly.

6 24 V Control Power Supply Option

Lets the user monitor drive data from a PLC even when the power goes out.

7 Terminal Block with Parameter Backup Function

The terminal block can be transferred to a new drive keeping all terminal wiring intact, and built-in memory backs up all parameter settings. An incredible time saver when replacing a drive.

8 Performance Life Diagnostic Features

A1000 notifies the user or controller when maintenance may be required for certain components such as the cooling fan or capacitors.

9 Low Harmonic Distortion




DC reactor comes standard on all model above 22 kW to minimize harmonic distortion. This built-in feature saves space and wiring.

Functions

<small>NEW</small> Application Presets	<small>NEW</small> IM/PM Switch	Momentary Power Loss Ride-Thru
<small>NEW</small> Overexcitation Braking	<small>NEW</small> Watt-Hour Pulse Monitor	Frequency Reference Loss
Accel/Decel Time Switch	Energy Saving	Fault Restart
Speed Search	<small>NEW</small> Drive WorksEZ	Overvoltage Suppression
Frequency Jump	PID Control	<small>NEW</small> Overload Fault Prevention
Frequency Reference Hold	Torque Detection	<small>NEW</small> Maintenance Monitors

NEW Functions Indicates a new function in A1000

Applications

 HVAC	 Fan	 Pump
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11

Features for Every Application

A1000 is loaded with functions to match the particular needs of every application.



Metal Working

Advantages

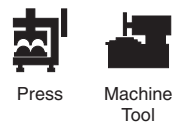
- 1 KEB Function**
 The KEB function can quickly decelerate the motor to stop in case of a power outage, rather than putting equipment at risk by simply allowing the motor to coast. Easy to program to match application needs.
- 2 Overvoltage Suppression**
 Particularly beneficial for die cushion and other press-type machinery, overvoltage suppression prevents faults and keeps the application running.
- 3 Visual Programming with DriveWorksEZ**
 Easily customize the drive using a PC.
- 4 Safety Functions**
 Safe Disable feature comes standard for compliance with various safety regulations.
- 5 Current Vector Control**
 Protect connected machinery by controlling torque directly through torque detection and torque limits offered by current vector control.
- 6 Performance Life Diagnostic Features**
 A1000 notifies the user or controller when maintenance may be required for certain components such as fan or capacitors.
- 7 Terminal Block with Parameter Backup Function**
 The terminal block can be transferred to a new drive keeping all terminal wiring intact, and built-in memory backs up all parameter settings. An incredible time saver when replacing a drive.

Functions

KEB Function	NEW Overexcitation Braking	Pulse Train Input
Fault Restart	Speed Search	Pulse Train Output
Overvoltage Suppression	Dwell Function	Torque Detection
NEW Overload Fault Prevention	Current Vector Control	Torque Limit
NEW Maintenance Monitors	NEW Drive WorksEZ	Zero Servo Function

NEW Functions Indicates a new function in A1000

Applications



Press Machine Tool



Conveyor Systems

Advantages

- 1 Application Presets**
 Selecting "Conveyor" from A1000's Application Presets presets automatically programs A1000 for optimal performance specific for those applications. Save valuable setup time and start running immediately.
- 2 Safety Functions**
 Safe Disable feature comes standard for compliance with various safety regulations.
- 3 Astounding Efficiency**
 Combine A1000 with a synchronous motor to save on energy costs. Save further but still maintain high performance by eliminating the motor encoder.
- 4 Overexcitation Braking**
 Bring the motor to an immediate stop without the use of a braking resistor (IM motors only).

DC voltage

Output frequency

Output current

Normal Deceleration
Deceleration Time 12.7 s

→

Overexcitation Deceleration
Deceleration Time 6.4 s

50% Faster!

Note: Varies in accordance with motor specifications and load.
- 5 Visual Programming with DriveWorksEZ**
 Easily customize the drive using a PC.
- 6 24 V Control Power Supply Option**
 Lets the user monitor drive data from a PLC even when the main power is removed.
- 7 Verify Menu**
 Quickly reference any settings that have been changed from their original default values.

Changed Value			
Name	Parameter	Default	Set Value
Frequency Ref. Selection1	b1-01	1	0
Acceleration Time1	C1-01	10.00 s	15.00 s
Deceleration Time1	C1-02	10.00 s	15.00 s
⋮	⋮	⋮	⋮
- 8 Performance Life Diagnostic Features**
 A1000 notifies the user or controller when maintenance may be required for certain components such as fan or capacitors.
- 9 Low Harmonic Distortion**
 DC reactor comes standard on all model above 22 kW to minimize harmonic distortion. This built-in feature saves space and wiring.

Functions

NEW Application Presets

NEW Drive WorksEZ

Current Vector Control

NEW Overexcitation Braking

PID Control

NEW Torque Limit

Droop Control

Pulse Train Input

Zero Servo Function

NEW IM/PM Switch

Pulse Train Output

Fault Restart

NEW Online Tuning

Torque Detection

NEW Maintenance Monitors

NEW Functions Indicates a new function in A1000

Applications

Conveyor

Product Lineup

Motor Capacity (kW)	Three-Phase 200 V				Three-Phase 400 V			
	Normal Duty		Heavy Duty		Normal Duty		Heavy Duty	
	Model	Rated Output	Model	Rated Output	Model	Rated Output	Model	Rated Output
0.4			CIMR-AA2A0004	3.2 A			CIMR-AA4A0002	1.8 A
0.75	CIMR-AA2A0004	3.5 A	CIMR-AA2A0006	5 A	CIMR-AA4A0002	2.1 A	CIMR-AA4A0004	3.4 A
1.1	CIMR-AA2A0006	6 A	CIMR-AA2A0008*	6.9 A				
1.5	CIMR-AA2A0008*	8 A	CIMR-AA2A0010	8 A	CIMR-AA4A0004	4.1 A	CIMR-AA4A0005	4.8 A
2.2	CIMR-AA2A0010	9.6 A	CIMR-AA2A0012	11 A	CIMR-AA4A0005	5.4 A	CIMR-AA4A0007	5.5 A
3.0	CIMR-AA2A0012	12 A	CIMR-AA2A0018*	14 A	CIMR-AA4A0007	6.9 A	CIMR-AA4A0009	7.2 A
3.7	CIMR-AA2A0018*	17.5 A	CIMR-AA2A0021	17.5 A	CIMR-AA4A0009	8.8 A	CIMR-AA4A0011	9.2 A
5.5	CIMR-AA2A0021	21 A	CIMR-AA2A0030	25 A	CIMR-AA4A0011	11.1 A	CIMR-AA4A0018	14.8 A
7.5	CIMR-AA2A0030	30 A	CIMR-AA2A0040	33 A	CIMR-AA4A0018	17.5 A	CIMR-AA4A0023	18 A
11	CIMR-AA2A0040	40 A	CIMR-AA2A0056	47 A	CIMR-AA4A0023	23 A	CIMR-AA4A0031	24 A
15	CIMR-AA2A0056	56 A	CIMR-AA2A0069	60 A	CIMR-AA4A0031	31 A	CIMR-AA4A0038	31 A
18.5	CIMR-AA2A0069	69 A	CIMR-AA2A0081	75 A	CIMR-AA4A0038	38 A	CIMR-AA4A0044	39 A
22	CIMR-AA2A0081	81 A	CIMR-AA2A0110	85 A	CIMR-AA4A0044	44 A	CIMR-AA4A0058	45 A
30	CIMR-AA2A0110	110 A	CIMR-AA2A0138	115 A	CIMR-AA4A0058	58 A	CIMR-AA4A0072	60 A
37	CIMR-AA2A0138	138 A	CIMR-AA2A0169	145 A	CIMR-AA4A0072	72 A	CIMR-AA4A0088	75 A
45	CIMR-AA2A0169	169 A	CIMR-AA2A0211	180 A	CIMR-AA4A0088	88 A	CIMR-AA4A0103	91 A
55	CIMR-AA2A0211	211 A	CIMR-AA2A0250	215 A	CIMR-AA4A0103	103 A	CIMR-AA4A0139	112 A
75	CIMR-AA2A0250	250 A	CIMR-AA2A0312	283 A	CIMR-AA4A0139	139 A	CIMR-AA4A0165	150 A
90	CIMR-AA2A0312	312 A	CIMR-AA2A0360	346 A	CIMR-AA4A0165	165 A	CIMR-AA4A0208	180 A
110	CIMR-AA2A0360	360 A	CIMR-AA2A0415	415 A	CIMR-AA4A0208	208 A	CIMR-AA4A0250	216 A
	CIMR-AA2A0415	415 A						
132					CIMR-AA4A0250	250 A	CIMR-AA4A0296	260 A
160					CIMR-AA4A0296	296 A	CIMR-AA4A0362	304 A
185					CIMR-AA4A0362	362 A	CIMR-AA4A0414	370 A
220					CIMR-AA4A0414	414 A	CIMR-AA4A0515	450 A
250					CIMR-AA4A0515	515 A		
315							CIMR-AA4A0675	605 A
355					CIMR-AA4A0675	675 A		
450							CIMR-AA4A0930	810 A
500					CIMR-AA4A0930	930 A		
560							CIMR-AA4A1200	1090A
630					CIMR-AA4A1200	1200 A		

Model Number Key

* Available in Japan only

CIMR- A A 2 A 0004 F A A

AC Drive A1000 Series

No.	Region Code	No.	Voltage Class	No.	Customized Specifications	No.	Output Current A	No.	Enclosure Type	No.	Environmental Specifications		
T	Asia	2	3-phase, 200-240 Vac	A	Standard model		Note: See chart above.	A	IP00	A	Standard	N	Oil
A	Japan	4	3-phase, 380-480 Vac					F	NEMA Type1	C	Salt resistant	P	Moisture, dust, vibration
										K	Gas	R	Gas, vibration
										M	Humidity, dust	S	Shock, vibration
												T	Oil, vibration

Note: Contact a Yaskawa representative for more on environmental specifications.

Model Selection

Optimizing Control for Each Application

A1000 offers two separate performance ratings: Normal Duty and Heavy Duty.

Heavy Duty is capable of creating more powerful torque, while Normal Duty allows the drive to operate a larger motor.

Difference between load ratings:

	Normal Duty Rating	Heavy Duty Rating
Parameter settings	C6-01=1	C6-01=0 (default)
Overload tolerance	120% for 60 s	150% for 60 s
Carrier frequency	Low carrier frequency (Swing PWM)*	Low carrier frequency

* Use Swing PWM to quiet undesirable motor noise generated when operating with a low carrier frequency.
Not available in models 450 kW and above.

Normal Duty Applications

● Applications

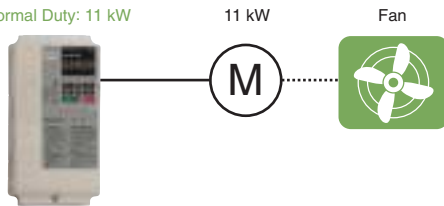


● Selecting a Drive

For a fan application using a 11 kW motor, select CIMR-AA2A0040 and set it for Normal Duty performance (C6-01 = 1).

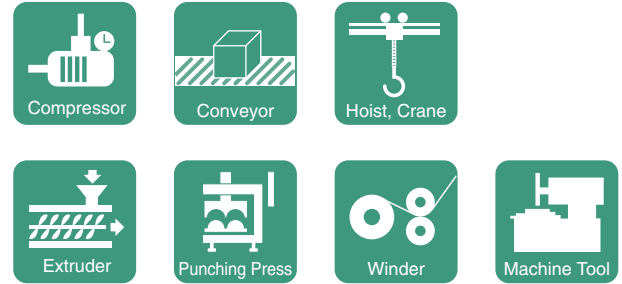
Model: CIMR-AA2A0040

Normal Duty: 11 kW



Heavy Duty Applications

● Applications

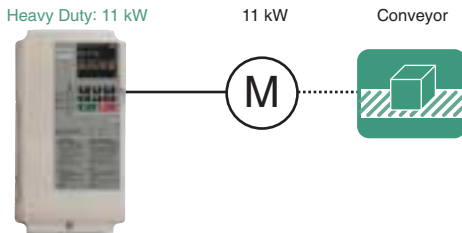


● Selecting a Drive

For a conveyor application using an 11 kW motor, select CIMR-AA2A0056 and set it for Heavy Duty performance (default).

Model: CIMR-AA2A0056

Heavy Duty: 11 kW



Use the table below to transition from Varispeed F7 and Varispeed F7S to the A1000 series.

Power Supply	200 V						400 V					
	Varispeed F7		Varispeed F7S		A1000		Varispeed F7		Varispeed F7S		A1000	
Model	CIMR-F7A2		CIMR-F7S2		CIMR-AA2A		CIMR-F7A4		CIMR-F7S4		CIMR-AA4A	
Applicable Motor	Induction Motor		Synchronous Motor		Induction Motor Synchronous Motor		Induction Motor		Synchronous Motor		Induction Motor Synchronous Motor	
Max. Applicable Motor Capacity (kW)	0.4	0P4	0P4	0P4	0004	0P4	0P4	0P4	0002			
	0.75	0P7	0P7	0P7	0006	0P7	0P7	0004				
	1.5	1P5	1P5	1P5	0010	1P5	1P5	0005				
	2.2	2P2	2P2	2P2	0012	2P2	2P2	0007				
	3.7	3P7	3P7	3P7	0021	3P7	3P7	0011				
	5.5	5P5	5P5	5P5	0030	5P5	5P5	0018				
	7.5	7P5	7P5	7P5	0040	7P5	7P5	0023				
	11	011	011	011	0056	011	011	0031				
	15	015	015	015	0069	015	015	0038				
	18.5	018	018	018	0081	018	018	0044				
	22	022	022	022	0110	022	022	0058				
	30	030	030	030	0138	030	030	0072				
	37	037	037	037	0169	037	037	0088				
	45	045	045	045	0211	045	045	0103				
	55	055	055	055	0250	055	055	0139				
	75	075	075	075	0312	075	075	0165				
	90	090	-	-	0360	090	090	0208				
	110	110	-	-	0415	110	110	0250				
	132	-	-	-	-	132	132	0296				
160	-	-	-	-	160	160	0362					
185	-	-	-	-	185	220	0414					
220	-	-	-	-	220	300	0515					
315	-	-	-	-	300	300	0675					

Software Functions

Loaded with software functions just right for your application.



New software available to upgrade from F7 to A1000, automatically matching function and sequence settings.

Note: Major functions listed below.

NEW

Application Presets

No need to struggle with difficult parameters and complex calculations. Parameters are set instantly simply by selecting the appropriate Application Preset.

Functions at Start and Stop

NEW

Optimal Deceleration

Optimal deceleration without needing to set the deceleration time. Drive slows the application smoothly controlling DC bus voltage.

NEW

Overexcitation Braking

Perfect for applications with high load inertia that rarely need to be stopped. Stop quickly: 50% faster without the use of a braking resistor.

Note: Stopping times may vary based on motor characteristics.

Speed Search

Start a coasting motor. Automatically brings a coasting motor back to the target frequency without using a motor encoder.

Dwell Function

Accelerate and decelerate smoothly with large inertia loads. Drive prevents speed loss by holding the output frequency at a constant level during acceleration and deceleration.

Accel/Decel Time Switch

Switch easily between accel/decel times. Switch acceleration and deceleration rates when running two motors from the same drive, or assign specific accel/decel rates when operating at high speed or at low speed.

Reference Functions

Frequency Reference Upper/Lower Limits

Limit motor speed. Set speed limits and eliminate the need for extra peripheral devices and extraneous hardware.

Frequency Jump

Skip over troublesome resonant frequencies. Drive can be programmed to avoid machine resonance problems by avoiding constant speed operation at certain speeds.

Frequency Reference Hold

Improved operability. Momentarily hold the operating frequency during acceleration or deceleration as the load is lowered or raised.

Droop Control

Balances the load automatically between motors. Calculates the ratio of the load torque and adjusts motor speed accordingly.

Functions for Top Performance

NEW

IM/PM Switch

Run both IM and PM motors with a single drive. The most advanced motor drive technology can run both IM and PM motors, allowing for even greater energy savings and a more compact setup.

NEW

Watt-Hour Pulse Monitor

No extra watt hour meter needed. A pulse output lets the user monitor power consumption.*

* Cannot legally be used as proof of power consumption.

Energy Saving

Automatically runs at top efficiency.* The drive supplies voltage to the motor relative to the speed and load so that the application is for operating at the most efficient level.

* Not available in models 450 kW and above.

NEW

Online Tuning

Enables high-precision operation. Automatically adjusts resistance between motor conductors during operation, thus improving speed accuracy when there are motor temperature fluctuations. This function is active only for Open Loop Vector Control.

Current Vector Control

Achieve high levels of performance. The drive comes with current vector control capabilities for high performance applications.

NEW

Drive WorksEZ

Customize the perfect drive to fit your needs. Upper controller circuitry and drive I/O terminals can be programmed so that extra hardware is no longer needed. Drag-and-drop. Visual programming makes customization a breeze.

PID Control

Automatic PID control. The internal PID controller fine-tunes the output frequency for precise control of pressure, flow, or other variables.

Motor 2 Switch

One drive runs two motors. Use a single drive to operate two different motors. Only one PM motor may be used.

Pulse Train Input

Improved operability. Use the Pulse Train Input to control not only the frequency reference, but also PID feedback and PID input.

Pulse Train Output

Improved monitor functions. Pulse output lets the user observe everything from the frequency reference and output frequency to motor speed, softstart output frequency, PID feedback, and PID input.

Torque Detection

Protects the load and helps ensure continuous operation.
An output terminal is triggered when motor torque rises above or falls below a specified level. Useful as an interlock signal for protecting equipment when blade problems arise in a machine tool application or for detecting a broken belt.

Limit

Better reliability: Keep the application running while protecting the load.
A1000 helps protect your application by restricting the amount of torque the motor can create.

Torque Control

Freely adjust torque levels with an external reference signal.
Perfect for tension control in winders and assisting torque followers.

Feed Forward Control

Optimizes speed changes when working with high-inertia loads.
Estimates the acceleration/deceleration torque required for the change in speed, and then recalculates the torque reference.

NEW Inertia Tuning

Automatically optimize ASR settings for superior responsiveness.*
Optimizes the drive's ability to decelerate the load. Useful for applications using KEB and Feed Forward functions.
* Not available in models 450 kW and above.

Speed Search

Automatically switches to line power.
Switches operation between line power and inverter drive operation without stopping the motor.

Timer Function

No need for extra hardware.
Control timing by opening and closing the output signal relative to the input signal.

Zero Servo Control

Locks the motor at zero speed.
Holds the motor solidly at 0 Hz, regardless of external influences on the load.

NEW Carrier Frequency

Set the carrier frequency to best match application needs.
Reduces noise and resonance in the both the motor as well as the mechanical system. The Swing PWM feature* can be used to minimize audible motor noise.
* Not available in models 450 kW and above.

Continuous Run during Reference Loss

Keeps the application running.
Maintains continuous operation even if the controller fails or frequency reference is lost. An indispensable feature for large HVAC applications.

Fault Restart

Keep running when a fault occurs.
A1000 has full self-diagnostic features and can restart the application in the event of a fault. Up to 10 restarts possible.

Protective Functions**Momentary Power Loss Ride-Thru**

Keep running even during a momentary loss in power.
A1000 automatically restarts the motor and keeps the application going in the event of a power loss.

Overvoltage Suppression

Avoid overvoltage trip.
Effective for punching presses and crank shafts where repetitive motion creates large amounts of regenerative energy. The drive increases or decreases the frequency in correspondence with regen levels to prevent overvoltage from occurring.

NEW Overload Fault Prevention

Prevents overload faults to keep the application running at all times.
Ensures continuous operation during sudden changes in the load that may briefly rise above overload levels and would otherwise shut the application down.

Load Speed Display

Monitor actual speed of the motor and load.
Monitors let the user keep track of motor rotations and line speed.

Copy Function

Save parameter setting to the digital operator.
Copy all parameter settings to the operator keypad, and then transfer those settings to another drive. Saves valuable setup and maintenance time.

NEW Maintenance Monitors

Notifies the user when maintenance may be required.
An output signal is triggered when certain components such as the cooling fan or capacitors are nearing their expected performance life.

KEB Function

Decelerate to stop when the power goes out.*
A1000 uses regenerative energy from the motor to bring the application to a stop, rather than simply letting it coast.
* Currently under development for models 450 kW and above.