



YASKAWA

YASKAWA AC Drive Compact Vector Control Drive V1000

200 V CLASS, THREE-PHASE INPUT: 0.1 to 18.5 kW
200 V CLASS, SINGLE-PHASE INPUT: 0.1 to 3.7 kW
400 V CLASS, THREE-PHASE INPUT: 0.2 to 18.5 kW



So advanced !

So easy !

So small !

Certified for
ISO9001 and
ISO14001



JQA-0422

JQA-EM0498



Bringing you the world's smallest* variable speed drive to stand at the top of its class: V1000

Yaskawa has built a reputation for high performance, functionality, quality, and reliability. To make it even easier to optimize your applications, we present the new V1000.

A single drive with so many uses, benefiting your application the more you use it.

So advanced!

*: Results from market research on vector drives performed by Yaskawa.

Quick and easy installation, ready to run your application in no time. You'll be amazed how simple it is to use.

So easy!



Smallest in the world!

Top performance for its class. Loaded with functions and features in an unbelievably small package!



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PUMP



FAN



HVAC

FLUID MACHINE ▶ See page 8.

APPLICATIONS

COMPACT CONVEYOR ▶ See page 9.



AUTO SHUTTER



PACKAGING



CONVEYOR

Even more eye-opening versatility.

V1000

Features

Yaskawa offers solutions customized for your application in an incredibly compact, technologically advanced, environmentally responsible package capable of driving a synchronous motor.

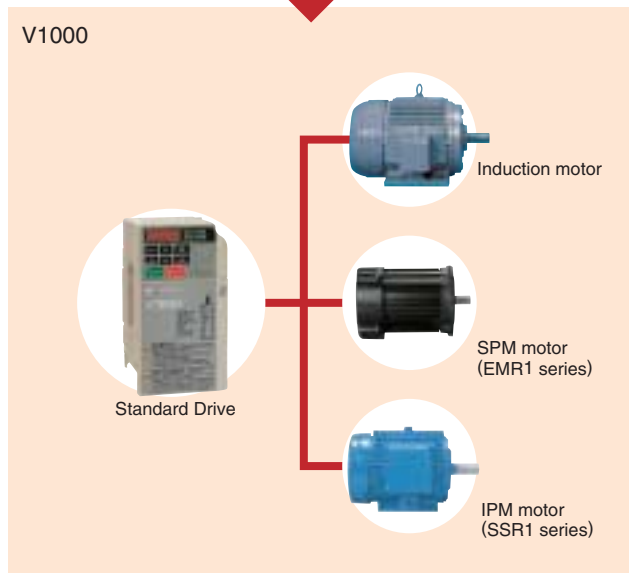
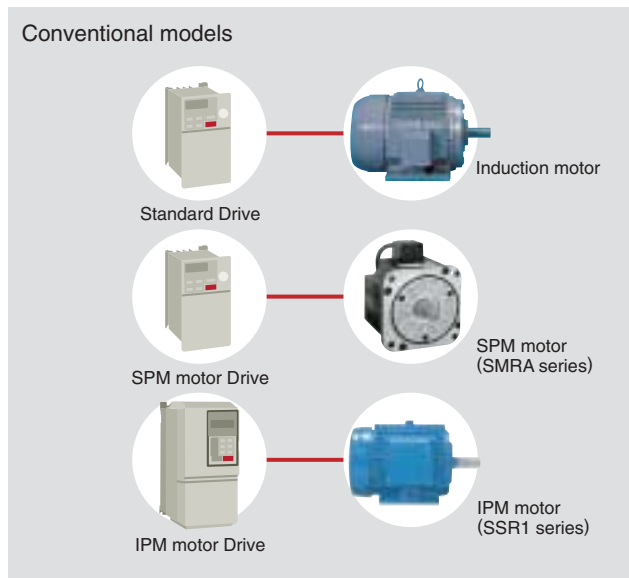
So advanced!

Sensorless Control of PM Motors Capability

Two drives in one

V1000 runs not only induction motors, but synchronous motors like IPM and SPM motors as well. Get a single drive for all your application needs, and save on spare parts.

Note: See product specifications for information on motor precision.
The variable torque ratio of synchronous motors is 1 to 10.

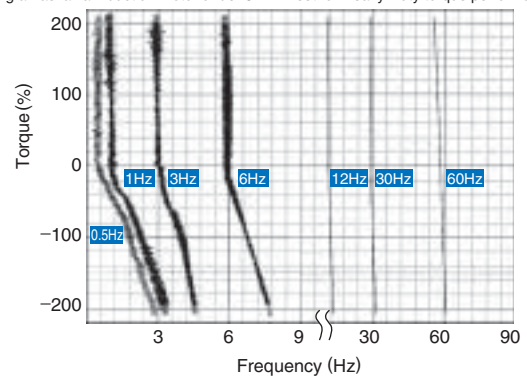


Top of Its Class

Impressive Torque Characteristics

V1000 is the first in its class fully equipped with current vector control. Current Vector control providing a powerful starting torque of 200% at 0.5 Hz* and precise torque limit operations. The motor Auto-Tuning function saves valuable start up time and assures high performance operation at the highest efficiency.

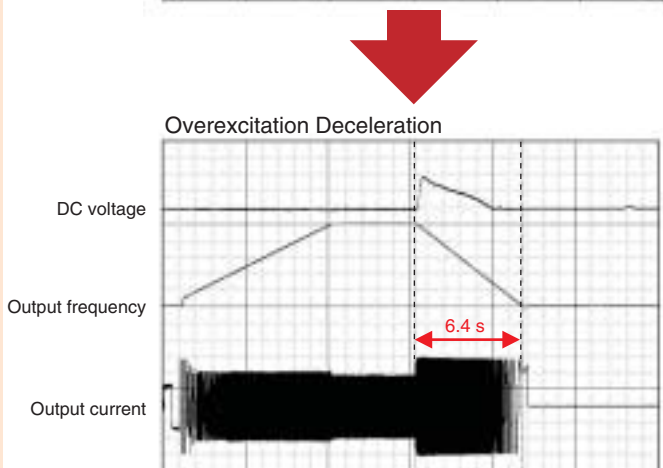
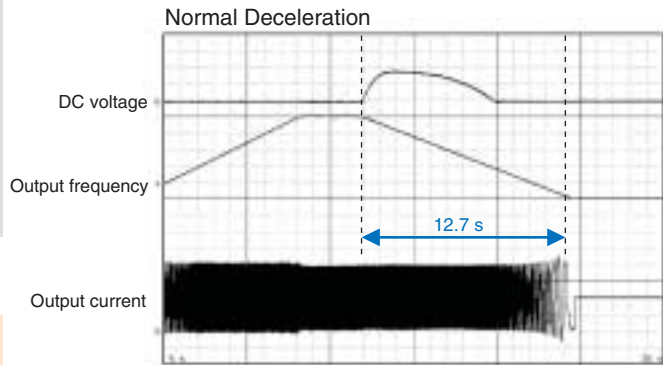
*: Using a Yaskawa induction motor under 3.7 kW set for Heavy Duty torque performance.



Increased braking power during deceleration.

Faster deceleration time with overexcitation braking.*

*: Example shown is for a 400 V 3.7 kW drive without braking resistor. Circumstances depends on the motor and load.



50% faster!

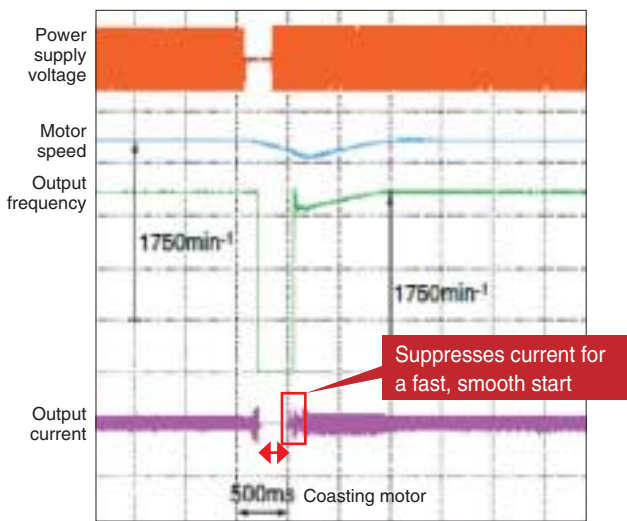
simplest, smallest drive of its class.

No more trouble from power loss.

V1000 is fully equipped with speed search and KEB Ride-Thru functions for your application needs, whether running an induction motor or permanent magnet motor.

● Speed Search Method

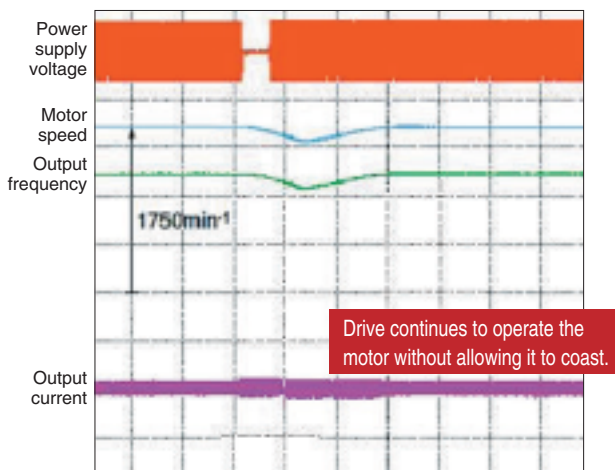
Easily restart the motor without cumbersome speed sensors. Perfect for fan, blowers, and other rotating, fluid-type applications.



Speed Search performs smooth restart by finding the coasting motors speed.

● KEB Ride-Thru

Drive continues operation by using motor regen. Perfect for HVAC



Note: Requires a sensor to detect when power loss occurs. Load conditions may still trip a fault and cause the motor to coast.

Customize the Drive

Optional visual programming software lets you instantly customize V1000 to your application. Let the drive do external device or PLC functions! Easy Drag and Drop functions starting from simple timers up to complex application blocks let you create your very own drive.



So much variation possible

Global Networking

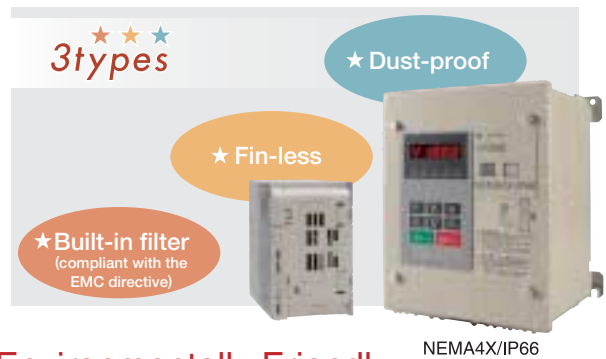
The built in high speed RS-422/485 MEMOBUS and a variety of option units connect V1000 to all popular fieldbus networks. The optional 24 V power supply keeps the drive controller alive under all conditions, providing network communications and monitoring functions even during a main power loss.

Open Field Network	MECHATROLINK-II
	CC-Link
	DeviceNet
	PROFIBUS-DP
	CANopen
	LONWORKS*

*: Available soon
 Note: DeviceNet is a trademark of ODVA.
 LONWORKS is a trademark of Echelon.

Specialized Types

Single-unit filter, finless design, and dust-proof models also available.



Environmentally Friendly

Protecting Against Harsh Environments

Various products are available to protect your drive against humidity, dust, oil mist, and vibration. Contact Yaskawa for more information.

EU's RoHS Compliance

All V1000 models are fully compliant with the EU's RoHS initiative.

Features

From setup to maintenance, V1000 makes life easy.

So easy!

Parameters set automatically—hassle free programming!

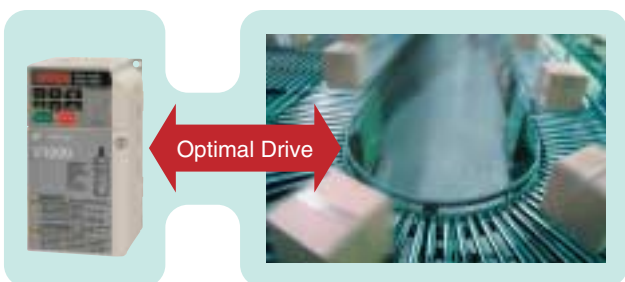
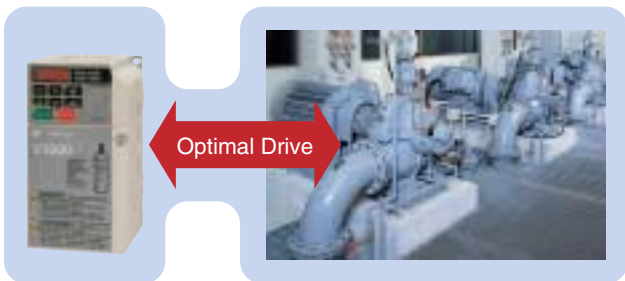
Start up instantly with application presets!

V1000 automatically sets the parameters needed for various applications. Presets for water supply pumps, conveyor systems, exhaust fans, and other applications program the drive instantly for optimized performance—saving enormous hassle setting up for a test run.



Setting	Application Preset
00	General-purpose
01	Water Supply Pump
02	Conveyor
03	Exhaust Fan
04	HVAC Fan
05	Air Compressor
06	Crane (Hoist)
07	Crane (Travel)

Parameters are programmed automatically:	
b1-01	Frequency Reference Selection 1
b1-02	Run Command Selection 1
C1-01	Acceleration Time 1
C1-02	Deceleration Time 1
⋮	⋮



Breeze-Easy Setup

Install Multiple Drive Immediately with the USB Copy Unit

Get several drives up and running easily using the USB copy unit. The same copy unit is fully PC compatible.

Hassle free setting and maintenance straight from a PC

DriveWizard Plus lets you manage the unique settings for all your drives right on your PC.

With DriveWizard's preset operation sequences, built-in oscilloscope function, fine tuning the drive and maintenance checks have never been easier.



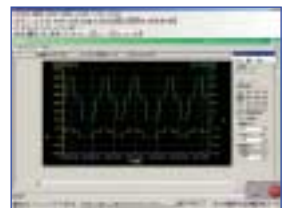
- **Drive Replacement Function**
Saves valuable time during drive set up when replacing or upgrading drives.



- **Sequence Operation**
View and edit drive parameters.



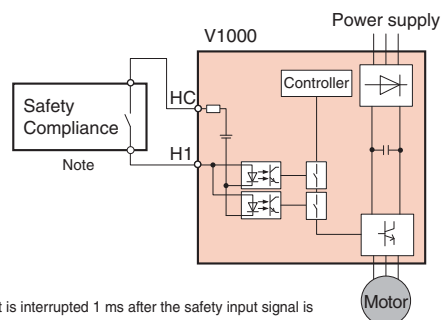
- **Oscilloscope Function**
Displays operation status and drive performance in real time.



Safety Standard Compliance TÜV approved

V1000 is the first drive in its class to come standard with safety input features compliant with EN954-1, safety category 3, IEC/EN61508 SIL2.

Through compliance with EN60204-1 (stop category 0), V1000 reduces the number of peripheral devices needed to satisfy safety regulations.



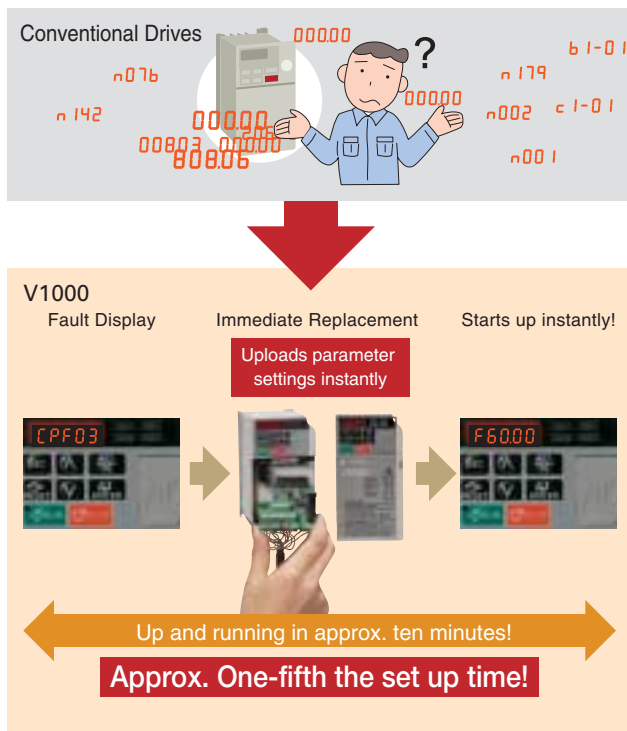
Note: Output is interrupted 1 ms after the safety input signal is triggered.
Make sure safety input wiring does not exceed 30 m.

Application Example: Safety Compliance

Hassle-Free Maintenance

Less Downtime

The first-ever pluggable terminal board with a Parameter Back-Up function lets you replace a drive instantly in the event of failure. No need to re-program the replacement drive—an amazingly convenient time saver!



Exceptional Performance Life

Cooling fan and capacitors have an expected performance life of ten years. In addition, Maintenance Monitors keep track of part wear.

Note: Assumes operation conditions of 40°C, 80% rated load, and 24 hour continuous performance. Performance life may vary with operation conditions.

Simple Wiring

A pluggable terminal block option is available. Screwless terminals do away with time consuming wiring and periodic maintenance to check wire connections, which in turn makes the drive more reliable. Contact Yaskawa for inquiries.

Wide Array of Monitors

Monitor functions like output frequency, output current, I/O status and watt hour counter give a clear picture of the drive operation status and helps to keep track of the energy consumption.

Verify Menu

The Verify Menu lists all setting that have been changed from their original default values. This includes parameters changed by Auto-Tuning, Application Presets, and those edited by the technician. This list makes it easy to reference changes to drive setup.

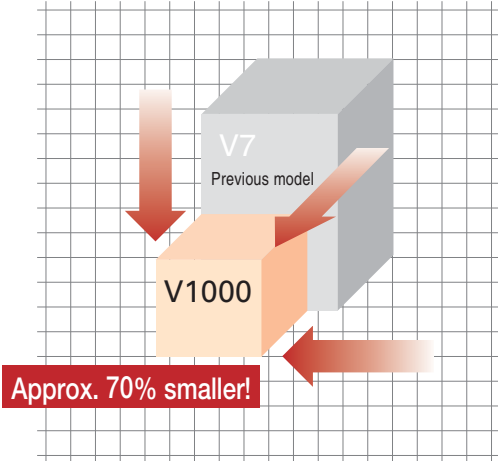
The world's smallest!

The perfect space-saving design

World's Smallest Class

Yaskawa has applied the most advanced thermal simulation technology and top reliability to create the world's smallest compact drive. V1000 reduces the space required up to 70% when compared to our earlier models.

● Compare the size difference of a 200 V 5.5 kW drive with V1000 rated for Normal Duty operation:

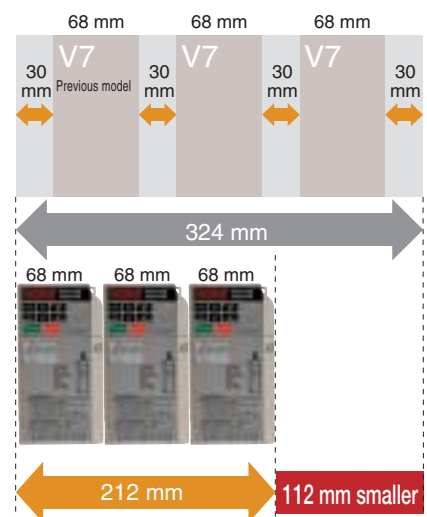


Side-by-Side

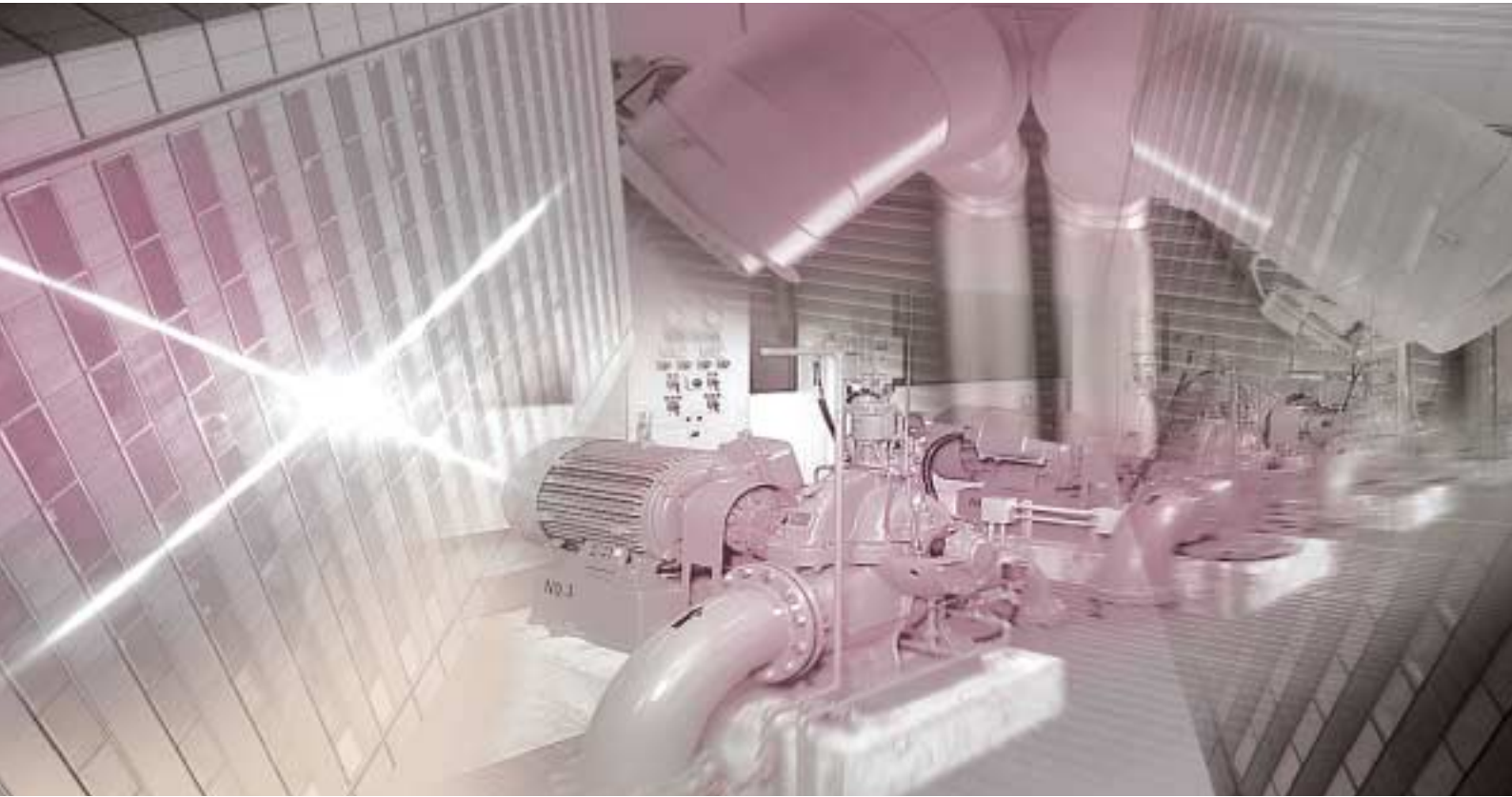
V1000 allows for a truly compact installation, requiring minimal space between units even in a tight enclosure.

Note: Current derating must be considered.

● Example: Side-by-Side installation of 200 V 0.75 kW units



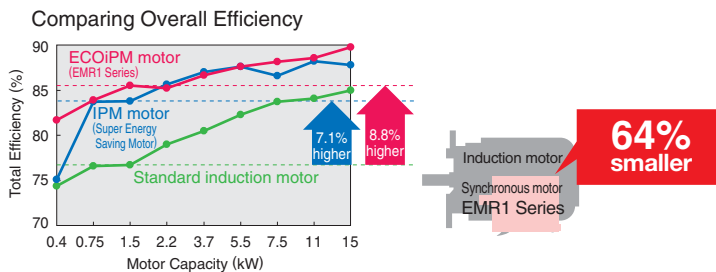
Note: Only 2 mm needed between V1000 drives. If the last drive in a series is installed next to a wall, a 30 mm gap is required.



Fluid Applications

Advantages

- 1 Selecting “Fan” or “Pump” presets automatically programs V1000 for optimal performance.
- 2 Compact design saves installation space. Use a permanent magnet motor to shrink the installation even further while conserving impressive amounts of energy.



- 3 Pulse output provided to keep track of kilowatt hours-- no power meter needed. (Cannot legally be used as proof of power consumption.)
- 4 Speed Search prevents loss from down time by keeping the application running smoothly through a power loss.
- 5 An optional 24 V power supply lets you monitor drive performance from a PLC even when the power goes out.
- 6 Replace drives immediately and easily thanks to a pluggable terminal board with a built-in Parameter Back-Up function.

Functions

NEW Application Presets	NEW Watt Hour Pulse Monitor	Undertorque Detection
NEW Overexcitation Braking	Energy Saving	Momentary Power Loss Ride-Thru
Speed Search	NEW Drive WorksEZ	Stall Prevention
Multi-Step Speed	NEW PTC Input	NEW Overvoltage Suppression
NEW LOCAL/REMOTE	PID Control	Reference Loss Operation
NEW IM/PM Control	Overtorque Detection	Fault Restart

NEW Functions New software functions for V1000

Applications



Fan



Pump



HVAC



Conveyor, Transport, and Civil Applications

Advantages

- 1** Selecting the “Conveyor” preset automatically programs V1000 for optimal performance.
- 2** Safety input functions standard. Easily complies with various safety regulations.
- 3** Overexcitation braking provides more powerful braking capabilities.
- 4** Easily customize the drive through visual programming with DriveWorksEZ.
- 5** With a variety of communication protocols options available, V1000 can be networked instantly. A separate 24 V power supply is also available, allowing the technician to monitor drive performance from a PLC even when the power goes out.
- 6** IP66 and NEMA 4 Type 1 models are available. Provides water-proof and dust-proof protection and separate installation.

Functions

NEW Application Presets	NEW LOCAL/REMOTE	Pulse Train Output
NEW Overexcitation Braking	NEW IM/PM Control	NEW Torque Limit
S-Curve Characteristics	NEW Online Tuning	NEW Current Vector
Multi-Step Speed	NEW Drive WorksEZ	Stall Prevention
Up/Down	Pulse Train Input	Fault Restart

NEW New Functions New software functions for V1000

Applications





Software Functions

Loaded with software functions just right for your application.

Note: Major functions listed below.



New software available to upgrade from V7 to V1000, automatically matching function and sequence settings.

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.*

DC Injection Braking at Start

Halt a coasting motor and start it back up again. When the direction of a coasting motor is unknown, the drive automatically performs DC Injection to bring the motor to a halt and then start it back up again.

Speed Search

Start a coasting motor. Automatically brings a coasting motor back to the target frequency without the need for extra speed sensors.

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 change accel/decel times when operating at high speed.

S-Curve Characteristics

Prevent sudden shock when starting and stopping the application. Drive lets the user fine-tune the S-curve characteristics, allowing for smooth acceleration and deceleration.

Reference Functions

Frequency Reference Upper/Lower Limits

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

Multi-Step Speed

Easily program a speed sequence with multiple steps. Set up to 17 separate speeds to create a speed sequence for the application. The drive can easily be connected to a PLC and allow for a simple positioning with limit switches.

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.

Up/Down

Improved operability. Raise or lower the frequency reference using a remote switch.

NEW
LOCAL/REMOTE

Switch between remote operating locations. Easily switch between controlling the drive directly with the keypad or from a control panel at some remote location.

Functions for Top Performance

NEW
IM/PM Control

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.

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.

NEW
Current Vector

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.

NEW

Timer Function**No need for extra hardware.**

Control timing by opening and closing the output signal relative to the input signal.

NEW

PTC Input**Thermal protection provided by a PTC located in the motor windings.**

Protect the motor from over heat by directly connecting the PTC to the drive.

PID Control**Automatic PID control.**

The internal PID controller fine-adjusts the output frequency for precise control of pressure, flow or other process parameters.

NEW

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.

Frequency Detection**Use frequency detection for brake control.**

The drive can output a signal when the output frequency exceeds a specified level.

Overtorque Detection**Keep the application running while protecting connected machinery.**

Overtorque detection senses motor torque and notifies the user immediately when a filter clogs or the machine is blocked by mechanical problems.

Undertorque Detection**Better reliability: Keep the application running while protecting the load.**

Fault detection senses any drop in motor torque due to broken belts or worn transmission.

NEW

Torque Limit**Better reliability: Keep the application running while protecting the load.**

V1000 helps protect your application by restricting the amount of torque the motor can create.

Protective Functions**Momentary Power Loss Ride-Thru****Keep running even during a momentary loss in power.**

V1000 automatically restarts the motor and keeps the application going in the event of a power loss.

NEW

KEB Function**Decelerate to stop when the power goes out.**

V1000 uses regenerative energy from the motor to bring the application to a stop, rather than simply letting it coast.

Stall Prevention**Better reliability: Keep the application running while protecting the load.**

Keeps the machine running by preventing motor stall caused by motor overload or rapid speed changes.

NEW

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.

Reference Loss Operation**Better reliability for continuous operation.**

The drive can keep running at the most recent frequency reference it was given in the event that the upper controller should fail. An absolute must for HVAC systems.

Fault Restart**Keep running when a fault occurs.**

V1000 has full self-diagnostic features and can restart the application in the event of a fault. Up to 10 restarts possible.

