UNIQUELY DESIGNED FOR YOUR HVAC APPLICATIONS

Yaskawa has supplied quality HVAC solutions for over 30 years.

Yaskawa Variable Frequency Drives (VFDs) deliver high quality, top-tier solutions that maximize building energy efficiency performance, saving you money.

HIGH PERFORMANCE THAT PUSHES EXPECTATIONS

Building owners, facility managers, and mechanical contractors specifying VFDs. They all trust Yaskawa to deliver reliable performance in HVAC applications.

Yaskawa offers:
- Industry experience
- Easy-to-use interface
- Product quality
- Award-winning technical support
- Use for both indoor and outdoor applications
- Space saving, vertical design
- Enhanced pump control & protection
- Easy access to wiring
- Emergency Override for increased safety
- High ambient temperature ratings
- Fastest to commission
- High performance that pushes expectations

The HV600 family of VFDs pushes past industry requirements to establish a new benchmark for industry expectations.

In fact, the HV600 addresses all of the most pressing demands, including more flexibility and control, less downtime and more packaging options.

Yaskawa’s Building Automation Group is dedicated to listening to each of our different customer types to better understand each of their needs.

BUILDING OWNERS
Expect maximum customer comfort at minimal cost.

FACILITY MANAGERS
Expect simple maintenance, error free operation and specifications to be met.

SPECIFYING ENGINEERS
Expect compliance to industry trends, customer acceptance, and quick and accurate commissioning.

MECHANICAL OR ELECTRICAL CONTRACTORS
Expect easy installation and programming and quick response to any questions.

HVAC CONTROL CONTRACTORS
Expect integrated control, stable software, and compatibility across various platforms.

MAINTENANCE & SERVICE CONTRACTORS
Expect to easily identify and quickly resolve problems by replacement or field maintenance.

Yaskawa has supplied quality HVAC solutions for over 30 years.

YASKAWA HAS WHAT YOU NEED

- Use for both indoor and outdoor applications
- Space saving, vertical design
- Enhanced pump control & protection
- Easy access to wiring
- Emergency Override for increased safety
- High ambient temperature ratings
- Fastest to commission

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<th>HV600 Series VFD Product</th>
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<td>Standalone VFDs</td>
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EXCEEDING YOUR EXPECTATIONS

More than a quarter million installed Yaskawa VFDs reliably save energy and supply fresh air and water to the buildings we use every day.

Office buildings are probably the most common type of facility that benefit from using Variable Frequency Drives. But many other buildings can benefit from the energy savings and carbon footprint reduction provided by VFDs, including:

- Data Centers
- Educational Facilities
- Entertainment Venues
- Government Facilities
- Housing Developments
- Medical Facilities
- Parking Structures
- Retail Stores
- Booster pumps
- Chiller compressors
- Chilled water pumps
- Condenser water pumps
- Condensing fans
- Cooling tower fans
- Fan arrays
- Supply and return fans

A Yaskawa representative, or partner, can help you wherever usage can deliver the biggest return on your investment.

Variable Frequency Drives Reduce Energy Use

A typical fan or pump running at 50% speed will use one-fifth as much energy compared to systems using mechanical control methods. The primary reason VFDs reduce energy and improve system efficiency is due to the elimination of throttling, which has been the traditional method of mechanically adjusting air or water flow in a system. VFDs control the speed of fans, pumps and compressors.

Building owners can typically expect 20-70% energy savings when applying VFDs to fan and pump systems while creating a more comfortable work environment. VFDs are the perfect marriage between comfort and sustainability.

The HV600 family of VFDs also contributes toward LEED credits and help buildings meet or exceed Energy Star Certification.

- Reduced mechanical and electrical stress on fan belts, compressors and pumps
- Reduction or elimination of demand charges
- Power factor improvement
- Control and monitoring via communication protocol

Yaskawa VFDs can reduce air handling and cooling energy costs up to 70%.

SAVE ENERGY
SAVE MONEY

Yaskawa will commit 100% to providing you the best quality, service and training possible.
ADVANTAGE YASKAWA

The latest offering for the HVAC industry from Yaskawa, the HV600, is sustainable, flexible, and easy.

EXCEPTIONAL DESIGN

Specifically designed for building automation applications, the HV600 helps minimize energy costs and maximize occupant comfort.

Available in IP20/UL Type 1 and IP55/UL Type 12 versions, the HV600 can be mounted without the need for an expensive additional enclosure. With a high contrast display HOA keypad, a high visibility status ring, and enhanced pump control functionality, the HV600 is perfectly suited to building automation application needs.

HV600 Intelligent Electronic Bypass

DESIGNED FOR EASE-OF-USE

The easy-to-integrate HV600 electronic bypass is designed in the bookshelf style. The electronic bypass cover has a streamlined, visually appealing shape and the HV600 keypad stays with the frame, not the cover, when the cover is removed.

All programming is done through a single keypad with intuitive interface. All BACnet® control is implemented through a single node. The electronic bypass mirrors the VFD multifunction digital outputs and and serial communication is maintained with building controls while in bypass.

PREMIER RELIABILITY

The HV600 is the next step closer to tripless operation. Rapid detection of the incoming line voltage enables extended power-loss ride-through and consistent operation during switchover to generator supply. With zero-cross switching, the electronic bypass contactors will be opened and closed when the control voltage sine wave is at its zero point, thus reducing electrical noise and relay arcing.

The HV600 eliminates premature VFD failures when output disconnect is inadvertently opened under power.

The HV600 electronic bypass integrated motor overload relays accomplish motor overload protection in software as opposed to traditional magnetic overloads, which means fewer mechanical points of potential failure.

QUICK AND EASY SET-UP

- Simple steps for efficient commissioning
- DriveWizard® HVAC support tool for PCs
- DriveWizard Mobile app for VFD management on smart mobile devices
- Safe programming without main three-phase power

EASE OF INSTALLATION

- Side-by-side mounting*
- IP20/UL Type 1, IP55/UL Type 12, IP20/Protected Chassis
- -10°C to +60°C ambient*
- Plenum rated

SIMPLE OPERATION

- Real-time clock for scheduled functions
- Hand-Off-Auto keypad with LCD display and tactile buttons
- Timer controls for starting, stopping, and speed changes

DESIGNED FOR BUILDING AUTOMATION

- Built-in building automation protocols
- Emergency Override for occupant safety in fire events
- Compliance with global certifications and standards

BUILDING-SPECIFIC DESIGN

- Built-in line impedance for harmonic reduction
- On board EMC/RFI filter*
- Conformal coating for circuit board protection

APPLICATION PRESETS

- Fan
- Fan with PI Control
- Return Fan with PI Control
- Cooling Tower Fan
- Cooling Tower Fan with PI Control
- Pump
- Pump with PI Control

*See manual for specific VFD ratings

Control for a wide variety of motor types, along with mobile device programming and clear status indication, make the HV600 the efficient, reliable choice for smart building control.
HVAC MADE EASY

The HV600 keypad has all the features you need intuitively at your fingertips, its simplicity is what makes it easy and simple to commission.

CHOICE OF PROTECTION RATINGs

The HV600 comes standard from the factory with a choice of IP20/UL Type 1, IP55/UL Type 12, and IP20/Protected Chassis with ambient temperature ratings up to 50°C. Ratings up to 60°C can be achieved with current derating.

SIDE-BY-SIDE

Most HV600 models can be mounted side-by-side with bottom entry wiring to maximize cabinet space.

PANEL MOUNTING

When mounted in a separate enclosure, heat management can be accomplished by removing detachable top and bottom covers on the VFD or by “back side” mounting the standard VFD with the heatsink external to the enclosure.

DIGITAL AND ANALOG I/O

All the features expected for efficient building operation come standard with the HV600. Customer-supplied 24 VDC input control power ensures network communications are maintained even during loss of main input power. A full complement of analog and digital inputs are built in and are customizable for user requirements.

ENHANCED PUMP CONTROL

The HV600 includes intelligent pump control capable of single failure-proof booster pump control. It also has built-in deadhead protection, loss of prime detection, and many other pump system protection features. The HV600 protects your building.

FLEXIBLE MOTOR CONTROL

- Induction and permanent magnet motors
- Synchronous reluctance (SynRM) motors
- 400 Hz output frequency

PLENUM RATED

HV600 IP20/UL Type 1 and IP55/UL Type 12* models are plenum rated for building automation applications. *excludes models with switch

CONFORMANCE TO INDUSTRY STANDARDS

HV600 VFDs conform to a variety of industry standards from various governing bodies:

NETWORK COMPATIBILITY

HV600 VFDs are compatible with the most popular HVAC protocols:
EXTENSIVE PROGRAMMING SOLUTIONS

The HV600 can be programmed with its resident keypad, a mobile device or personal computer. Whatever you choose, enjoy easy navigation and guided wizards for configuration, monitoring and troubleshooting.

MOBILE DEVICE CONNECTIVITY

Use the free Yaskawa DriveWizard Mobile Application for iPhone®, iPad®, or Android™ to manage your VFD. Connect with Bluetooth or to the built-in USB port using a USB On-The-Go (OTG) enabled Android device.

DRIVEWIZARD MOBILE

The DriveWizard Mobile app turns your smartphone or tablet into an interface for your HV600 VFD. All information for parameter setup and troubleshooting are in your pocket, anytime, anywhere. Save HV600 settings to your smart device or to the free and secure Yaskawa Drive Cloud™ service.

DriveWizard Mobile also provides:

- Intuitive parameter editing with help and search function
- Custom parameter and monitor lists
- Compare setting differences between the VFD and backup files
- Simple support activities, such as the ability to email VFD settings
- Parameter backup/verify with or without main power applied to the VFD
- Backup and restore VFD settings to the free and secure Yaskawa Drive Cloud service
- Parameter file compatibility with DriveWizard HVAC

CONVENIENT PROGRAMMING WITHOUT MAIN POWER

Simplify commissioning. Program the VFD in its packaging without the need for three-phase power. Simply use a USB On-The-Go (OTG) enabled Android device and USB OTG cable.

IPhone and iPad are registered trademarks of Apple Inc. Android is a trademark of Google LLC

DRIVEWIZARD® HVAC

- Connect via USB and interface with the HV600 even without main power
- Create configurations offline, then later connect and download them to HV600
- Monitor a dashboard of dynamic variables and discrete information
- Chart your process with up to 16 channels of recorded data
- Create reports for exporting and emailing
- Import and export DriveWizard mobile parameter files
- Convert settings from previous generation VFD series to the new HV600 series

NO MAIN POWER?

CONNECT VIA USB!
HVAC SOFTWARE TOOLS

Yaskawa’s collection of HVAC software support tools can be used to upload and download VFD parameters, calculate energy savings, or identify how to reduce your operating costs and meet harmonic compliance requirements.

**DRIVEWIZARD® HVAC**

Innovative software tool that allows users to commission, start up and diagnose the Yaskawa family of HVAC VFDs quickly and easily. Built-in features include a monitor panel, status panel, 16-channel trend recorder, and application wizard. Easily convert settings of previous generation Yaskawa HVAC VFDs to the HV600 VFD.

**DRIVEWIZARD® MOBILE WITH YASKAWA DRIVE CLOUD**

Start-up, adjust, and monitor Yaskawa’s HV600 with your smartphone or tablet. Use DriveWizard Mobile to backup, store, and retrieve your VFD settings locally or to your personal Yaskawa Drive Cloud account.

**DRIVEWORKSEZ**

Software tool that provides the means to create custom logic and mathematic functionality inside the HV600. This functionality is built-in to the HV600 VFD. Simply create application programs by arranging function block icons in a visual flow chart. Total VFD and machine control are only a few mouse clicks away.

**ENERGY SAVINGS PREDICTOR**

Predicts energy savings achieved when using Yaskawa HVAC VFDs instead of conventional control methods in HVAC applications. The results can be viewed in graphical and text format with built-in functions to generate an energy prediction report, especially designed for consultants.

**HARMONICS ESTIMATOR**

Estimates total harmonic distortion when using Yaskawa HVAC VFDs and references IEEE 519 to determine if the defined system meets the required standard. The results can be viewed in graphical and text format with built-in functions to generate a harmonics estimation report especially designed for consultants.

**PROGRAMMING SIMULATORS**

Provide a realistic simulation of the programming and operation of an HV600 or HV600 Electronic bypass package. All major functions of the VFDs are simulated by these PC tools with the addition of I/O, trending, diagnostic operations. The software has an integrated automatic update function that allows for updating the actual program – when connected to the internet.
ENGINEERING CAPABILITY
Yaskawa has the engineering capability to design and build UL508A control panels to meet any customer needs. Fan array control panels, redundant VFD panels, and multi-pulse arrangements with a wide range of accessories and options can be quoted and delivered in minimal time. Let Yaskawa deliver per your specific needs.

TECHNICAL TRAINING
Both standard and customized courses are available with hands-on activities and demonstrations. Instruction is offered at Yaskawa locations as well as traveling road schools, and is supplemented by live web classes and e-Learning modules/videos to provide the right level of training to fit your needs. Trainers are degreed engineers with extensive industry experience who train over 3,000 customers worldwide each year, with thousands more viewing learning modules online.

WORLDWIDE CUSTOMER SUPPORT
Yaskawa offers worldwide support with application assistance, start up, maintenance, troubleshooting and repair, as well as internet tools and telephone support. Sales and service offices are located around the world.

Yaskawa SOLUTION CENTER
The Yaskawa Solution Center is a web portal for learning about all things Yaskawa. More specifically, it is designed to help customers get specific support for their product questions and needs.

We recognize that our customers may not want to get help only by phone. That’s why we created the Yaskawa Solution Center, an online tool to readily find resources for things like:

- Step-by-step instructions, including video tutorials
- Help configuring a product for a new application
- Starting up a product for the first time
- Transitioning from an older legacy product to a current one

This information is delivered via technical documents and manuals, video, and authored content based on real case scenarios in real time.

The Solutions Center also includes a crowd-sourcing feature. By allowing all visitors to provide feedback on anything they find on the site, we can improve, correct and add content. Even Yaskawa sales associates continuously submit feedback to content based on what they see and learn in the field. The site is literally updated in real time!

All of this collaboration between Yaskawa associates, distributors, OEMs and end-users makes the Solution Center more and more valuable to our customers every day.

VISIT HTTPS://SOLUTIONCENTER.YASKAWA.COM/

Bridging the gap between what you are trying to do and the technical information you need to accomplish it.

Videos
Easy-to-use and follow instructional videos.

User Manuals
Online access to instructions on how to install, operate and troubleshoot.

Technical Documents
Complete library of parts and specs for our products.
HV600 PRODUCT PORTFOLIO
For all your HVAC VFD and package needs

STANDALONE VFDS

IP20
UL TYPE 1
Product Range
• 208 V AC: 3 to 100 HP
• 480 V AC: 3 to 250 HP

IP55
UL TYPE 12
Product Range
• 208 V AC: 3 to 100 HP
• 480 V AC: 3 to 250 HP

NARROW CONFIGURED PACKAGES

UL TYPE 1
Product Range
• 208 V AC: 0.5 to 40 HP
• 480 V AC: 0.75 to 75 HP

UL TYPE 12
Product Range
• 208 V AC: 0.5 to 40 HP
• 480 V AC: 0.75 to 40 HP

NARROW ELECTRONIC BYPASS PACKAGES

UL TYPE 1
Product Range
• 208 V AC: 0.5 to 25 HP
• 480 V AC: 0.5 to 60 HP

UL TYPE 12
Product Range
• 208 V AC: 0.5 to 25 HP
• 480 V AC: 0.5 to 60 HP

UL TYPE 3R
Product Range
• 208 V AC: 0.5 to 100 HP
• 240 V AC: 0.5 to 100 HP
• 480 V AC: 0.5 to 250 HP

ENCLOSED ELECTRONIC BYPASS AND CONFIGURED PACKAGES

UL TYPE 1
UL TYPE 12
Product Range
• 208 V AC: 0.5 to 100 HP
• 240 V AC: 0.5 to 100 HP
• 480 V AC: 0.5 to 250 HP

UL TYPE 3R
Product Range
• 208 V AC: 0.5 to 100 HP
• 240 V AC: 0.5 to 100 HP
• 480 V AC: 0.5 to 250 HP
HV600 AC DRIVE

Catalog Code Designation

HV60 U 4 005 C F A

Product Series
HV600 Series

Region Code
U: Americas

Voltage Class
2: 208 VAC Three-phase
4: 480 VAC Three-phase

Rated Output Current
See Ratings Table

Environmental Specifications
A: Standard

Enclosure
F: IP20/UL Type 1
V: IP55/UL Type 12
B: IP20/Protected Chassis
T: IP55/UL Type 12 with switch

EMC Filter Option
C: Built-in EMC Filter for C2

Note: Optional Bluetooth keypad (JVN0-KPLC04ABB) ordered separately

Models and Ratings

IP20/UL TYPE 1

208 VAC MODELS

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<tr>
<td></td>
<td>973</td>
<td>332</td>
<td>1780</td>
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</tbody>
</table>

Enclosure Options

- IP20/UL Type 1
- IP55/UL Type 12
- IP55/UL Type 12 with switch
- IP20/Protected Chassis

Note: Optional Bluetooth keypad (JVN0-KPLC04ABB) ordered separately
# HV600 AC Drive Models and Ratings (cont.)

## 208 V AC MODELS

<table>
<thead>
<tr>
<th>HV60U2</th>
<th>017</th>
<th>024</th>
<th>031</th>
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<tr>
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<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
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## Dimensions (in)

### Height

### Width
- Enclosure V (w/o switch): 4.9, 4.9, 4.9, 4.9, 7.9, 7.9, 10.0, 10.0, 10.0
- Enclosure V (w/ switch): 4.9, 4.9, 4.9, 4.9, 7.9, 7.9, 10.9, 10.9, 10.9

### Depth
- Enclosure V (w/o switch): 9.0, 9.0, 9.6, 9.6, 9.7, 9.7, 10.7, 10.7, 10.7
- Enclosure V (w/ switch): 10.0, 10.0, 10.5, 10.5, 10.9, 10.9, 12.0, 12.0, 12.0

### Heat Loss (W)
- Heatsink: 211, 273
- Internal: 55
- Total: 266

## 480 V AC MODELS

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<th>011</th>
<th>014</th>
<th>021</th>
<th>027</th>
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## Dimensions (in)

### Height

### Width
- Enclosure V (w/o switch): 4.9, 4.9, 4.9, 4.9, 4.9, 7.9, 7.9, 10.0, 10.0, 10.0
- Enclosure V (w/ switch): 4.9, 4.9, 4.9, 4.9, 4.9, 7.9, 7.9, 10.9, 10.9, 10.9

### Depth
- Enclosure V (w/o switch): 9.0, 9.0, 9.6, 9.6, 9.6, 9.7, 9.7, 10.7, 10.7, 10.7
- Enclosure V (w/ switch): 10.0, 10.0, 10.5, 10.5, 10.9, 10.9, 12.0, 12.0, 12.0

### Heat Loss (W)
- Heatsink: 112, 150
- Internal: 112, 150
- Total: 262

## IP55/UL TYPE 12

## IP20/PROTECTED CHASSIS

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## Dimensions (in)

### Height
- Enclosure V (w/o switch): 27.6 |
- Enclosure V (w/ switch): 12.3 |

### Width
- Enclosure V (w/o switch): 16.5 |
- Enclosure V (w/ switch): 16.5 |

### Depth
- Enclosure V (w/o switch): 18.5 |
- Enclosure V (w/ switch): 18.5 |

### Heat Loss (W)
- Heatsink: 100 |
- Internal: 423 |
- Total: 2244 |
### CONNECTION DIAGRAM

#### HV600 AC DRIVE

#### SPECIFICATIONS

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<tr>
<th>Item</th>
<th>Specifications</th>
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<tr>
<td><strong>Input Voltage</strong></td>
<td>Three-phase 200 to 240 VAC, 380 to 480 VAC, +10%/−15%, 50/60 Hz +/-5%</td>
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<tr>
<td><strong>Ambient Operating Temperature</strong></td>
<td>-10°C to +50°C (14°F to 122°F), up to 60°C (140°F) with derating</td>
</tr>
<tr>
<td><strong>Ambient Storage Temperature</strong></td>
<td>-20°C to +70°C (-4°F to 158°F)</td>
</tr>
<tr>
<td><strong>Overload Capacity</strong></td>
<td>110% for 60 seconds, 140% for 2 seconds, 175% instantaneous</td>
</tr>
<tr>
<td><strong>Output Frequency</strong></td>
<td>0 to 400 Hz</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>1,000 meters altitude, up to 4,000 meters with derating</td>
</tr>
<tr>
<td><strong>Overload Capacity</strong></td>
<td>Class 3C2 and 3S2 operation for IP20/UL Type 1, Class 3C2 and 3S3 for IP55/UL Type 12</td>
</tr>
<tr>
<td><strong>Output Frequency</strong></td>
<td>95% humidity, non-condensing</td>
</tr>
<tr>
<td><strong>EMC and Harmonics</strong></td>
<td>IP20/UL Type 1 and IP55/Type 12 plenum rated</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>EMC filter built in, complies with IEC 61800-3 restricted distribution for first environment</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>95% split choke built in both positive and negative DC bus leg as standard</td>
</tr>
<tr>
<td><strong>Control Methods</strong></td>
<td>Open Loop V/f</td>
</tr>
<tr>
<td><strong>Motor Types</strong></td>
<td>Induction</td>
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<td><strong>Protective Design Types</strong></td>
<td>Permanent Magnet</td>
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<td><strong>Motor Types</strong></td>
<td>Synchronous Reluctance</td>
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<tr>
<td><strong>Motor Types</strong></td>
<td>IP20/UL Type 1</td>
</tr>
<tr>
<td><strong>Motor Types</strong></td>
<td>IP55/UL Type 12</td>
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<tr>
<td><strong>Motor Types</strong></td>
<td>IP55/UL Type 12 with switch</td>
</tr>
<tr>
<td><strong>Motor Types</strong></td>
<td>IP20/Protected Chassis</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>LCD keypad with Hand-Off-Auto and Status Ring, Bluetooth keypad optional</td>
</tr>
<tr>
<td><strong>Global Certifications</strong></td>
<td>UL, cUL, CE, RoHS 2, WEEE, TUV SUD</td>
</tr>
<tr>
<td><strong>Seismic Certification</strong></td>
<td>CBC, IBC, ASCE7, ICC-ES 156</td>
</tr>
<tr>
<td><strong>Software Support Tools</strong></td>
<td>DriveWizard® HVAC</td>
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<tr>
<td><strong>Software Support Tools</strong></td>
<td>DriveWizard Mobile</td>
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<td><strong>Software Support Tools</strong></td>
<td>Programming Simulator</td>
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<td><strong>Software Support Tools</strong></td>
<td>Energy Savings Predictor</td>
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<td><strong>Software Support Tools</strong></td>
<td>Harmonics Estimator</td>
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<td><strong>Software Support Tools</strong></td>
<td>DriveWorksEZ®</td>
</tr>
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</table>

* See manual for specific VFD ratings

---

**HV600**

**Power Supply:** 50/60 Hz

**Ambient Operating Temperature:** -10°C to +50°C (14°F to 122°F), up to 60°C (140°F) with derating

**Ambient Storage Temperature:** -20°C to +70°C (-4°F to 158°F)

**Overload Capacity:** 110% for 60 seconds, 140% for 2 seconds, 175% instantaneous

**Output Frequency:** 0 to 400 Hz

**Environmental:** 1,000 meters altitude, up to 4,000 meters with derating

**EMC and Harmonics:** EMC filter built in, complies with IEC 61800-3 restricted distribution for first environment, 95% split choke built in both positive and negative DC bus leg as standard

**Control Methods:** Open Loop V/f

**Motor Types:** Induction, Permanent Magnet, Synchronous Reluctance

**Motor Types:** IP20/UL Type 1, IP55/UL Type 12, IP55/UL Type 12 with switch, IP20/Protected Chassis

**Interface:** LCD keypad with Hand-Off-Auto and Status Ring, Bluetooth keypad optional

**Global Certifications:** UL, cUL, CE, RoHS 2, WEEE, TUV SUD

**Seismic Certification:** CBC, IBC, ASCE7, ICC-ES 156, HCAI (Special Seismic Certification Pre-approval OSP-0687)

**Software Support Tools:** DriveWizard® HVAC, DriveWizard Mobile, Programming Simulator, Energy Savings Predictor, Harmonics Estimator, DriveWorksEZ®

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**Notes:**

* APOGEE® is a registered trademark of Siemens Building Technologies.
* Metasys® is a registered trademark of Johnson Controls.
* Modbus® is a registered trademark of Schneider Electric, licensed to the Modbus Organization, Inc.
* LonWorks® is a registered trademark of Echelon Corporation.
* EtherNet/IP™ is a trademark of ODVA, Inc.
HOW TO SELECT AN HV600 NARROW ELECTRONIC BYPASS PACKAGE

To construct a Narrow Electronic Bypass model number, find the base number for the required enclosure type, voltage, and current rating. Add the option code for each required option. Power options are preceded by 'P', control options are preceded by 'T'.

FEATURES
- Electronic bypass
- 100 kAIC package rating
- Non-fused disconnect
- HOA keypad
- Standard digital inputs
- Run
- Safety
- BAS interlock
- Auto transfer to electronic bypass
- Emergency override
- (3) Programmable digital inputs
- (4) Form C programmable relays
- Built-in communications: BACnet, APOGEE, Metasys, Modbus
- Built-in communications: BACnet, APOGEE, Metasys, Modbus
- Multi-protocol Ethernet (Default BACnet/IP)
- Bluetooth HOA keypad option
- Custom Nameplate
- LonWorks
- EtherNet/IP
- BACnet/IP
- APOGEE
- Metasys
- Modbus

OPTIONS
- Circuit breaker: 100 kAIC
- VFD service switch
- Three-contactor electronic bypass
- Custom nameplate
- LonWorks
- EtherNet/IP
- BACnet/IP
- Bluetooth HOA keypad

Models and Ratings

208 V AC MODELS

<table>
<thead>
<tr>
<th>Base No.</th>
<th>Base Number</th>
<th>Power Options</th>
<th>Control Options</th>
<th>Special Options</th>
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</thead>
<tbody>
<tr>
<td>H6B</td>
<td>P B 040</td>
<td>M Choose None or One</td>
<td>T Choose None or One</td>
<td>S</td>
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<table>
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<tr>
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<th>3.5</th>
<th>4.6</th>
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<th>15.7</th>
<th>24.2</th>
<th>30.8</th>
<th>46.2</th>
<th>59.4</th>
<th>74.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal HP</td>
<td>0.5</td>
<td>0.75</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>7.5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
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<table>
<thead>
<tr>
<th>Base No.</th>
<th>Base Number</th>
<th>Power Options</th>
<th>Control Options</th>
<th>Special Options</th>
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<tbody>
<tr>
<td>H6B</td>
<td>P B 040</td>
<td>M Choose None or One</td>
<td>T Choose None or One</td>
<td>S</td>
</tr>
</tbody>
</table>

| Rated Output Current (A) | 1 | 1.6 | 2.1 | 3.4 | 4.8 | 7.6 | 11 | 14 | 21 | 27 | 34 | 40 | 52 | 65 | 77 |
|--------------------------|----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| Nominal HP               | 0.5 | 0.75 | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 77 |

480 V AC MODELS

<table>
<thead>
<tr>
<th>Base No.</th>
<th>Base Number</th>
<th>Power Options</th>
<th>Control Options</th>
<th>Special Options</th>
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<tr>
<td>H6B</td>
<td>B 040</td>
<td>M Choose None or One</td>
<td>T Choose None or One</td>
<td>S</td>
</tr>
</tbody>
</table>

| Rated Output Current (A) | 11 | 16 | 21 | 3.4 | 4.8 | 7.6 | 11 | 14 | 21 | 27 | 34 | 40 | 52 | 65 | 77 |
|--------------------------|----|----|----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| Nominal HP               | 0.5 | 0.75 | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 77 |

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<th>Base No.</th>
<th>Base Number</th>
<th>Power Options</th>
<th>Control Options</th>
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<td>H6B</td>
<td>B 040</td>
<td>M Choose None or One</td>
<td>T Choose None or One</td>
<td>S</td>
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| Rated Output Current (A) | 11 | 16 | 21 | 3.4 | 4.8 | 7.6 | 11 | 14 | 21 | 27 | 34 | 40 | 52 | 65 | 77 |
|--------------------------|----|----|----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| Nominal HP               | 0.5 | 0.75 | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 77 |

Base Number is assigned to the desired enclosure type, voltage, and current rating. For custom nameplates, choose the Multi-Protocol Ethernet option for BACnet IP. For Bluetooth HOA keypads, choose the Bluetooth HOA keypad option. Note: Contact Yaskawa representative for possible exclusions.
HV600 ENCLOSED ELECTRONIC BYPASS

HVAC Optimized with Intelligent Electronic Bypass and Advanced BAS Interface

HOW TO SELECT AN HV600 ENCLOSED ELECTRONIC BYPASS PACKAGE

To construct an Enclosed Electronic Bypass model number, find the base number for the required enclosure type, voltage, and current rating. Add the option code for each required option. Power options are preceded by ‘P’, control options are preceded by ‘C’.

FEATURES

- Electronic bypass
- 100 KAIC package rating
- Non-fused disconnect
- HOA keypad
- Standard digital inputs
- Run
- Safety
- BAS interlock
- Auto transfer to electronic bypass
- Emergency override
- (3) Programmable digital inputs
- (4) Form C programmable relays
- Built-in communications
- BACnet
- APOGEE
- Metasys
- Modbus

OPTIONS

- Circuit breaker: 100 A NEMA
- VFD service switch
- Three contactor electronic bypass
- Custom nameplate
- LoriWorks
- EtherNet/IP
- BACnet/IP
- Bluetooth HOA keypad

MODELS AND RATINGS

208 V AC MODELS

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240 V AC MODELS

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480 V AC MODELS

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|----------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Nominal HP | 0.5 | 0.75 | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 100 |
| Height | 25.9 | 25.9 | 25.9 | 25.9 | 25.9 | 25.9 | 33.9 | 37.1 | 42.1 | 42.1 | 55.1 | 61.1 | 70.0 | 87.0 | 87.0 | 87.0 |
| Weight | 15.7 | 15.7 | 15.7 | 15.7 | 15.7 | 15.7 | 18.7 | 18.7 | 18.7 | 20.8 | 20.8 | 25.6 | 25.6 | 25.6 | 33.6 | 42.0 | 42.0 |
| Depth | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 17.6 | 17.6 | 17.6 | 18.5 | 18.5 | 18.9 | 18.9 | 18.9 | 20.5 | 20.5 | 20.5 |
| Width | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 12.9 | 15.9 | 16.3 | 16.3 | 23.4 | 24.8 | 41.9 | 43.4 | 85.2 | 85.2 |
| Capacity | 27.1 | 27.1 | 27.1 | 27.1 | 27.1 | 34.1 | 54.1 | 37.3 | 37.3 | 43.6 | 43.6 | 43.6 | 55.0 | 55.0 | 85.4 | 85.4 |
| FEA TURES | 18.5 | 24.4 | 28.3 | 28.3 | 28.3 | 28.3 | 35.3 | 35.3 | 41.5 | 41.5 |

Notes:
- Contact Yaskawa representative for possible exclusions.
**HV600 NARROW CONFIGURED**

HV600 VFD packages with features and options to fit specific application needs

**HOW TO SELECT AN HV600 NARROW CONFIGURED PACKAGE**

To construct a Narrow Configured model number, find the base number for the required enclosure type, voltage, and current rating. Add the option code for each required option. Power options are preceded by 'P', control options are preceded by 'T':

**FEATURES**

- Lockable main input disconnect switch
- PID control with selectable engineering units
- Independent PID control for use with external device
- Differential PID feedback feature
- Sleep function
- 24 VDC, 150 mA power supply
- Input and output status indication
- Serial communication loss detection and selectable response
- Built-in communications
  - BACnet
  - APOGEE
  - Metasys
  - Modbus
  - HOA keypad
  - Flash upgradeable firmware
  - Bumpless transfer between Hand and Auto modes
  - Emergency Override

**OPTIONS**

- Circuit breaker: 100 kAIC
- Input fuses
- Custom nameplate
- LonWorks
- EtherNet/IP
- BACnet/IP
- Bluetooth HOA keypad

---

**Models and Ratings**

**208 VAC MODELS**

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**480 VAC MODELS**

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Note: Contact Yaskawa representative for possible exclusions.
HV600 ENCLOSED CONFIGURED

HV600 VFD packages with features and options to fit specific application needs.

HOW TO SELECT AN HV600 ENCLOSED CONFIGURED PACKAGE

To construct an Enclosed Configured model number, find the base number for the required enclosure type, voltage, and current rating. Add the option code for each required option. Power options are preceded by ‘P’, control options are preceded by ‘T’.

FEATURES

- Lockable main input disconnect switch
- PID control with selectable engineering units
- Independent PID control for use with external device
- Differential PID feedback feature
- Sleep function
- 240 VAC, 150 mA power supply
- Input and output status indication
- Serial communication loss detection and selectable response
- Built-in communications
  - BACnet
  - APOGEE
  - Metasys
  - Modbus
  - HOA keypad
- Flash upgradable firmware
- Bumpless transfer between Hand and Auto modes
- Emergency override

OPTIONS

- Circuit Breaker
- Input fuses
- Line Reactor
- Custom nameplate
- LiniWorks
- EtherNet/IP
- BACNet/IP
- Speed pot
- 200 VA transformer
- Keypad viewing window
- Bluetooth HOA keypad

MODELS AND RATINGS

208 VAC MODELS

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480 VAC MODELS

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Floor and Wall Mount Packages

Note: Contact Yaskawa representative for possible exclusions.
HVAC MATRIX DRIVE

Z1000U

Increase your green space with the Yaskawa Z1000U HVAC Matrix Drive, the product that goes beyond conventional VFDs by combining excellent harmonic mitigation, input power factor control and energy saving capabilities.

The Z1000U HVAC Matrix drive provides extremely low harmonic distortion in a space-saving design, along with the same HVAC-specific features as the standard HV600. This single-component solution achieves excellent low distortion levels without the need for harmonics mitigation, such as passive filters or multi-pulse arrangements. Unlike conventional VFDs, Yaskawa’s Matrix technology creates a variable output by switching directly from the AC input power, thus eliminating the DC bus. The Matrix drive’s outstanding harmonic performance helps system designers achieve harmonics performance levels well within the recommended practice of IEEE 519.

APPLICATIONS
• Supply & return fans
• Cooling tower fans
• Chilled water pumps
• Chiller compressors

POWER RANGE
• 10–100 HP, 208 V
• 75–350 HP, 480 V

AVAILABLE PACKAGES
• Electronic bypass
• Configured

ENCLOSURES
• Open Type (IP00)
• UL Type 1 Kit

PRIMARY FEATURES AND BENEFITS
• Facilitates IEEE 519 Compliance
• Low input distortion across a wide load and speed range
• < 5% THD
• Eco-mode to achieve near across-the-line THD
• High efficiency design provides extra energy savings as compared to other low harmonic solutions
• Near unity True Power Factor at full load
• Integrated Input Fusing provides 100kA SCCR
• Integrated C2 EMC filter
• Compact design
• High reliability with an MTBF of 28 years
• Embedded BACnet Communications (BTL Certified)
• Embedded Real Time Clock for event stamping
• High Carrier Frequency (Law Motor Noise) capability
• 0-400 Hz output frequency
• 120% overload for 60 seconds
• Motor auto-tuning
• Multi-language LCD display, with Hand/Off/Auto and copy function
• DriveWizard® HVAC software
• Embedded Timer functions for starting, stopping and speed changes
• Start into spinning load (speed search)
• Both induction and Permanent Magnet motor control
• Available I/O
• (8) Multi-function digital inputs
• (5) Multi-function analog inputs
• (5) Multi-function relay outputs
• (2) Multi-function 0-10 VDC or 4-20 mA analog outputs
• (1) Fault relay

Models and Ratings

208 V MODELS

<table>
<thead>
<tr>
<th>CIMR-ZU2E</th>
<th>D400A AUA</th>
<th>Q028</th>
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480 V MODELS

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Note: Data subject to change.
Z1000U ENCLOSED ELECTRONIC BYPASS

Matrix VFD packages with electronic bypass for low harmonics and IEEE 519 compliance

HOW TO SELECT A Z1000U ENCLOSED ELECTRONIC BYPASS PACKAGE

To construct an Enclosed Electronic Bypass model number, find the base number for the required enclosure type, voltage, and current rating. Add the option code preceded by ‘T’. Power options are preceded by ‘PN’, control options are preceded by ‘T’.

<table>
<thead>
<tr>
<th>Package</th>
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<th>Z1000U Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Series</td>
<td>Voltage Class</td>
<td>Enclosure and Duty</td>
</tr>
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<td>Z1D1B</td>
<td>208 V</td>
<td>1: UL Type 1</td>
</tr>
<tr>
<td>Z1D2B</td>
<td>480 V</td>
<td>2: UL Type 12</td>
</tr>
<tr>
<td>Z1D3B</td>
<td>480 V</td>
<td>3: UL Type 3R</td>
</tr>
</tbody>
</table>

Model Selection:
- Choose None or One of options:  B: 480 V AC MODELS
- Choose None or One of options:  D: 208 V AC MODELS
- Choose None or One of options:  K: 200 VA Transformer (CPT)
- Choose None or One of options:  Z: Speed Potentiometer
- Choose None or One of options:  L: LonWorks
- Choose None or One of options:  D: EtherNet/IP (dual port)
- Choose None or One of options:  W: Custom Nameplates
- Choose None or One of options:  M: Keypad Viewing Window
- Choose None or One of options:  G: 200 VA Transformer (CPT)
- Choose None or One of options:  K: Output Reactor 5%
- Choose None or One of options:  W: Soft Start Bypass
- Choose None or One of options:  G: Drive Input Disconnect Switch
- Choose None or One of options:  N: EMC filter
- Choose None or One of options:  B: 3-Contactor Bypass
- Choose None or One of options:  K: Drive Input Disconnect Switch
- Choose None or One of options:  L: LonWorks
- Choose None or One of options:  D: EtherNet/IP
- Choose None or One of options:  W: Custom Nameplates
- Choose None or One of options:  M: Keypad Viewing Window

Features:
- Facilitates IEEE 519 compliance
- Electronic bypass
- 100 kAIC package rating
- Lockable main input disconnect switch
- Standard digital inputs
- Run
- Safety
- BAS Interlock
- Auto transfer to bypass
- Emergency override
- (3) Programmable digital inputs
- (4) Form C programmable relays
- Built-in communications
- (2) BACnet
- (2) APOGEE
- (2) Metasys
- Modbus
- HOA Keypad
- Flash upgradeable firmware

Options:
- Drive input service switch
- 3-contactor bypass
- Output Reactor
- Soft start bypass
- Surge Suppressor
- Space Heater
- Custom nameplate
- LonWorks
- EtherNet/IP
- BACnet/IP
- Speed pot
- 200 VA transformer
- Keypad viewing window

UL Type 3R, UL Type 12, and UL Type 1 Matrix Drive Packages

Physical Size
- Nominal HP
- Base No. : Z1D1B
- Base No. : Z1D2B
- Base No. : Z1D3B

Models and Ratings

208 VAC MODELS

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Note: UL Type 3R package dimensions (Z1D3B) represent approximate dimensions for a package without power option K, W, and control option K selected. For the dimensions of a specific Z1D3B configuration, reference PD.Z1000.02.
Z1000U ENCLOSED CONFIGURED

Matrix VFD packages with features & options to achieve low harmonics and IEEE 519 compliance

HOW TO SELECT A Z1000U ENCLOSED CONFIGURED PACKAGE

To construct an Enclosed Configured model number, find the base number for the required enclosure type, voltage, and current rating. Add the option code for each required option. Power options are preceded by ‘PN’, control options are preceded by ‘T’.

**FEATURES**

- Facilitates IEEE 519 compliance
- Lockable main input disconnect switch
- PID control with selectable engineering units
- Independent PID control for use with external device
- Differential PID feedback feature
- Sleep function
- 24 VDC, 150 mA power supply
- Input and output status indication
- Serial communication loss detection and selectable response
- Built-in communications
  - BACnet
  - APOGEE
  - Modbus
  - Modbus
  - HDA Keypad
  - Flash upgradeable firmware
- Bumpless transfer between Hand and Auto Modes
- Lockable Input Circuit Breaker
- Output Reactor
- Surge Suppressor
- Space Heater
- Custom nameplate
- Ethernet/IP
- BACnet/IP
- Speed pot
- 200 VA transformer
- Keypad viewing window

**OPTIONS**

- Lockable main input disconnect switch
- PID control with selectable engineering units
- Independent PID control for use with external device
- Differential PID feedback feature
- Sleep function
- 24 VDC, 150 mA power supply
- Input and output status indication
- Serial communication loss detection and selectable response
- Built-in communications
  - BACnet
  - APOGEE
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  - Modbus
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- Surge Suppressor
- Space Heater
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- BACnet/IP
- Speed pot
- 200 VA transformer
- Keypad viewing window

Models and Ratings

208 VAC MODELS

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Note: UL Type 3R package dimensions (Z1E3D) represent approximate dimensions for a package without power option K, 3 and control option K selected.

480 VAC MODELS

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Note: UL Type 3R package dimensions (Z1E3D) represent approximate dimensions for a package without power option K, 3 and control option K selected.

For the dimensions of a specific Z1E3D configuration, reference PD.Z1000.06.
Yaskawa is the leading global manufacturer of low and medium voltage variable frequency drives, servo systems, machine controllers and industrial robots. Our standard products, as well as tailor-made solutions, are well known and have a high reputation for outstanding quality and reliability.