

Demand more

Eaton's complete line of variable frequency drives



Powering Business Worldwide

Demand more expertise

Demand more expertise means working with a variable frequency drives manufacturer for whom every detail, every idea and every concept counts.

Demand Eaton variable frequency drives.

Eaton.com/drives



A drive for any application

Your application might call for an ultra-compact solution, clean power or future configurability.

Whether it is a standard product from the catalog or a custom-enclosed or high-performance variable frequency drive (VFD) solution, Eaton delivers. Eaton drives are designed for industrial, HVAC, water/wastewater treatment, machinery OEM, specialized process requirements and other application demands.

Whether controlling complex or customized applications, designing a new industrial complex, renovating an existing structure or developing a new machine, Eaton has the right product for your application.



Product selection matrix

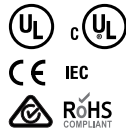
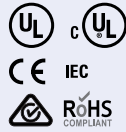
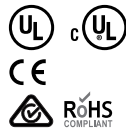
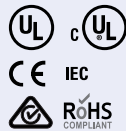
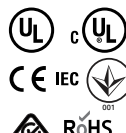
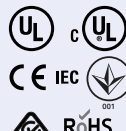
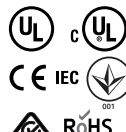


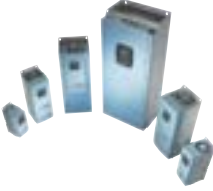




Application	DE1	DM1	DC1	DA1	DH1	DG1	SPX	DX1	EGS/EGF/EGP
Single-phase input	Yes	Yes	Yes	Yes	—	Yes	Yes	—	—
Maximum 230 V hp	3	20	5	7.5	125	125	125	100	125/—/—
Maximum 480 V hp	10	30	15	15	250	1000	1800	200	1000/400/800
Maximum 575 V hp	—	25	—	20	250	800	2300	200	—
OEM drives	●	●	●	●		●			
HVAC drives		●	●		● ■				
General purpose						● ■			
High performance							● ■	● ■	■
Harmonic mitigating									■

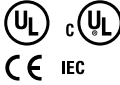




● = Open drive standard

■ = Enclosed drive standard

Drive	Applications	Description	Offering/range	
DE1 	<ul style="list-style-type: none"> Variable speed starter 	<p>The DE1 variable speed starter (VSS) is designed for customers who have basic applications but still require variable frequency and advanced motor protection. With industry-leading ease of use and a narrow, compact housing, the DE1 allows customers to simplify their design and reduce installation time.</p>	Single-phase to three-phase 230 V to 3 hp	Three-phase to three-phase 480 V to 10 hp
DM1 	<ul style="list-style-type: none"> General-purpose microdrive Machinery OEM drive HVAC drive 	<p>The DM1 and DM1 PRO microdrives are part of Eaton's next generation PowerXL™ Series of variable frequency drives specifically engineered for today's more demanding commercial and industrial applications. The power unit makes use of the most sophisticated semiconductor technology and a highly modular construction that can be flexibly adapted to meet the customer's needs. The control module was designed to include today's standard communication protocols and I/O while still having the modularity to add additional option cards.</p>	Single-phase to three-phase 115 V to 2 hp 230 V to 7.5 hp	Three-phase to three-phase 230 V to 20 hp 480 V to 30 hp 575 V to 25 hp
DC1 	<ul style="list-style-type: none"> General-purpose microdrive Machinery OEM drive 	<p>The DC1 is a compact VFD with only 14 basic parameters, SmartWire-DT™ connectivity and outstanding ease of mounting and installation. The DC1 is perfect for quick commissioning and is ideal for panel builders. This drive supports single-phase motor applications, and an IP66 offering provides unique mounting with integrated disconnect and cover controls.</p>	Single-phase to single-phase 115 V to 0.75 hp 230 V to 1.5 hp Single-phase to three-phase 115 V to 1.5 hp 230 V to 5 hp	Three-phase to three-phase 230 V to 15 hp 480 V to 30 hp
DA1 	<ul style="list-style-type: none"> General-purpose OEM drive 	<p>The DA1 is the perfect match for demanding OEM applications. High-performance processor, safe torque off, multiple fieldbus protocols including SmartWire-DT, sensorless vector control and the possibility to operate permanent magnet motors make the DA1 an ideal solution for a variety of applications that are speed and torque dependent.</p>	Single-phase to three-phase 230 V to 3 hp	Three-phase to three-phase 230 V to 7.5 hp 480 V to 15 hp 575 V to 20 hp
DH1/EH 	<ul style="list-style-type: none"> HVAC drive 	<p>The DH1 and EH HVAC/R drives are part of the Eaton next generation PowerXL Series of variable frequency drives specifically engineered to exceed the demands of the HVAC/R market. With an industry-leading energy-efficiency algorithm, high short-circuit current rating and robust design, DH1 and EH drives offer customers increased efficiency, safety and reliability.</p>	—	Three-phase to three-phase 230 V to 125 hp 480 V to 250 hp 575 V to 250 hp
DG1/EGS 	<ul style="list-style-type: none"> General-purpose drive 	<p>The DG1 and EGS enclosed general-purpose drives are part of the Eaton next-generation PowerXL Series of variable frequency drives specifically engineered for today's more demanding commercial and industrial applications. With an industry-leading energy-efficiency algorithm, high short-circuit current rating and robust design, the DG1 and EGS enclosed drives offer customers increased efficiency, safety and reliability in both an open and enclosed product.</p>	Single-phase to three-phase 230 V to 40 hp 480 V to 60 hp	Three-phase to three-phase 230 V to 125 hp 480 V to 1000 hp 575 V to 800 hp
DX1 	<ul style="list-style-type: none"> High-performance drive 	<p>The easy-to-handle DX1 VFD is configurable to specialized process requirements, particularly when controlling complex or customized applications powered by permanent magnet or induction motors. The DX1 has the precise speed and torque control required for high-performance motor control applications, a wide 1000:1 speed range, and an easy-to-use interface designed to save time and money.</p>	—	Three-phase to three-phase 230 V to 100 hp 480 V to 200 hp 575 V to 200 hp

Benefits	Acceptance	Communication options	Cross-reference	Enclosure
<p>Ease of use: Copy/paste tool, programmable multi-function inputs, configuration module for quick programming.</p> <p>Space-saving design: DIN rail mountable, side-by-side mounting, numerous orientations, small footprint.</p> <p>Efficiency: Temperature-controlled fan.</p> <p>Rugged and reliable: High overload rating (CT), ambient temperature -10°C to $+60^{\circ}\text{C}$ without derating, harmonic mitigating design.</p>		<ul style="list-style-type: none"> • Modbus® RTU • SmartWire-DT 	<ul style="list-style-type: none"> • ABB (ACS Series 55) • Lenze / AC Tech (8400 Series) • Schneider/Square D™ (Altivar™ Series 12) • Yaskawa J1000 • Siemens G110 	<ul style="list-style-type: none"> • Open IP20
<p>Ease of use: Easily programmed through on-board keypad, remote keypad, inControl software or web server.</p> <p>Space-saving design: Compact footprint allows for side-by-side mounting.</p> <p>Efficiency: Features Active Energy Control®.</p> <p>Rugged and reliable: SCCR combination ratings with molded case circuit breakers, miniature circuit breakers, manual motor protectors and fuses.</p>		<ul style="list-style-type: none"> • Modbus RTU • Modbus TCP • EtherNet/IP • BACnet MSTP • BACnet/IP • SmartWire-DT • PROFIBUS • CANopen® • Dual-port PROFINET 	<ul style="list-style-type: none"> • Rockwell PowerFlex® 525 • Schneider Altivar 320 • Danfoss FC51 • Lenze i500 • Delta MS300 	<ul style="list-style-type: none"> • Open IP20, IP21 with kit
<p>Ease of use: Only 14 standard parameters for startup—quick commissioning, parameter copy function from drive to drive and PC connectivity via COM-STICK, integrated info card.</p> <p>Space-saving design: DIN rail mountable, side-by-side mounting, contactor style wiring.</p> <p>Efficiency: Temperature-controlled fan.</p> <p>Rugged and reliable: Ambient temperature -10°C to $+50^{\circ}\text{C}$ without any derating, high protection degree classes: IP66 for decentralized applications.</p>		<ul style="list-style-type: none"> • Modbus RTU • CANopen • SmartWire™ 	<ul style="list-style-type: none"> • ABB (ACS 55, 150) • Danfoss (Micro Drive, VLT® 2800) • Hitachi (WJ200) • Yaskawa (J1000, V1000) • Lenze (SMD, 8400 BaseLine/StateLine) • Siemens (Micromaster 420, G110, Sinamics G120C) • WEG (CFW-10, CFW-08, CFW-09) 	<ul style="list-style-type: none"> • Open IP20, IP66
<p>Ease of use: Integrated EMC filter and braking chopper; Modbus RTU and CANopen protocols onboard</p> <p>Space-saving design: DIN rail and screw mountable (FS1 and FS2), side-by-side mounting</p> <p>Efficiency: Temperature-controlled fan</p> <p>Rugged and reliable: 200% for 4s 50°C rated without derating, conformal coated boards standard, high protection classes up to IP66 with or without disconnect</p>		<ul style="list-style-type: none"> • Modbus RTU • CANopen • Modbus TCP • EtherNet/IP • DeviceNet • PROFIBUS-DP • EtherCAT • PROFINET • BACnet 	<ul style="list-style-type: none"> • Rockwell Automation PF527 • Danfoss FC51 • Schneider Altivar320 • Lenze i500 • ABB ACS355 	<ul style="list-style-type: none"> • Open IP20, IP66
<p>Ease of use: Startup Wizard, three built-in applications; customizable software, real-time clock, on-board communications, modular design, full text display, keypad copy/paste functionality, two configurable keypad soft keys.</p> <p>Space-saving design: Compact design, open NEMA® 12 option, on-board I/O expansion provisions.</p> <p>Efficiency: Built-in 5% DC Link Choke with input surge protection.</p> <p>Rugged and reliable: Robust time-proven design, durable metal power section, temperature deratings up to 60°C, conformal coated boards standard.</p>		<ul style="list-style-type: none"> • Modbus/TCP • Modbus RTU • BACnet MS/TP • BACnet/IP 	<ul style="list-style-type: none"> • ABB (ACS310, ACS550) • GE (AF-650) • Rockwell/Allen-Bradley (PowerFlex 70, 753) • Schneider/Square D (Altivar 61, 71) • Siemens (Sinamics G120) • Vacon (NXS) • Yaskawa (P1000, A1000) 	<ul style="list-style-type: none"> • Open IP21, IP54 • Open NEMA 1, 12 • Enclosed NEMA 1, 12, 3R • Consult Eaton for NEMA 4X, bypass, disconnect, and compact disconnect enclosed options
<p>Ease of use: Startup Wizard, four built-in applications, real-time clock, on-board communications, modular design, full text display, keypad copy/paste functionality.</p> <p>Space-saving design: Compact design, open NEMA 12 option, on-board I/O expansion provisions.</p> <p>Efficiency: Built-in 5% DC Link Choke with input surge protection and EMC Category C2 standard.</p> <p>Rugged and reliable: High overload (CT) and low overload (VT) rated, robust time-proven design, durable metal power section, brake chopper circuit, temperature deratings up to 60°C.</p>		<ul style="list-style-type: none"> • EtherNet/IP • Modbus RTU/TCP • PROFIBUS DP • DeviceNet™ • CANopen • BACnet MS/TP • SmartWire-DT 	<ul style="list-style-type: none"> • ABB (ACS550, ACS580) • Danfoss/Vacon (VLT Series, NXS, 100 Series) • Rockwell/Allen-Bradley (PowerFlex 753, 755) • Schneider/Square D (ATV 630, 930, Altivar 61, 71) • Siemens (Sinamics G120, G130, G150) • Yaskawa (P1000, A1000) 	<ul style="list-style-type: none"> • Open IP00, IP20, IP21, IP54 • Open NEMA 1, 12 • Enclosed NEMA 1, 12, 3R, 7 • Consult Eaton for NEMA 4X
<p>Ease of use: Advanced touchscreen with graphics, trending and parameter cloning, and easy troubleshooting and Setup Wizards.</p> <p>Space-saving design: Compact design, open NEMA 12 option, on-board I/O expansion provisions.</p> <p>Efficiency: High dynamic response (<2 ms on 100% step torque change), wide speed range (1000:1)—full torque at zero speed.</p> <p>Rugged and reliable: High overload (CT) and low overload (VT) rated, robust time-proven design, durable metal power section, brake chopper circuit.</p>		<ul style="list-style-type: none"> • Modbus RTU/TCP • Bluetooth • Dualport EtherNet/IP • Dualport PROFINET 	<ul style="list-style-type: none"> • ABB (ACS880) • Danfoss (iC7) • Danfoss (VLT FC301/302) • Rockwell (PowerFlex 755) • Schneider (Altivar ATV930) • Siemens (S120) • Yaskawa (A1000) 	<ul style="list-style-type: none"> • Open IP21, IP54 • Open NEMA 1, 12

Drive	Applications	Description	Offering/range	
SVX/SPX 	<ul style="list-style-type: none"> • General-purpose drive • High-performance drive 	<p>The SVX VFD is a general-purpose, compact, modular solution for variable speed applications and offers a variety of features and application capabilities. If high performance is critical to a customer's application, the SPX VFD is the ideal choice. They are equipped with high processing power, capable of closed loop feedback, safe torque off, permanent magnet motor operation and very precise motor control.</p>	Single-phase to three-phase 230 V to 40 hp 480 V to 60 hp	Three-phase to three-phase 230 V to 125 hp 480 V to 1800 hp 575 V to 2300 hp
EGP/CPX 	<ul style="list-style-type: none"> • 18-pulse drive • Low harmonic drive 	<p>EGP drives use advanced 18-pulse clean power technology that significantly reduces line harmonics at the drive input terminals and is designed to exceed IEEE® 519-1992 requirements. Delivering true power factor and reducing harmonic distortion prevents upstream transformer overheating and overloading of breakers and feeders, enabling the application of variable frequency drives on generators and other high-impedance power systems.</p>	—	Three-phase to three-phase 480 V to 800 hp (Consult Eaton for larger hp or 230 V and 575 V engineered-to-order designs)
EGF/CFX 	<ul style="list-style-type: none"> • Passive filtered drive • Low harmonic drive 	<p>EGF drives use a tuned passive filter to significantly reduce the line harmonics generated by a standard 6-pulse drive. Designed for small to mid-sized drive applications, the EGF, in conjunction with the EGP, offers the user a tiered approach to harmonic mitigation.</p>	—	Three-phase to three-phase 480 V to 400 hp (Consult Eaton for larger hp or 230 V and 575 V engineered-to-order designs)
EGS pump panel 	<ul style="list-style-type: none"> • Remote pumping • Irrigation • Outdoor applications • IoT enabled for remote monitoring and control via Eaton's Control Xpert mobile app 	<p>The Eaton PowerXL DG1 three-phase irrigation drive pump panel is specifically designed for the irrigation pumping industry. With a weathertight, painted white NEMA 3R enclosure, the PowerXL DG1 drive pump panel is an energy-efficient and environmentally friendly solution for motor-driven equipment.</p>	Single-phase to three-phase 230 V to 40 hp 480 V to 60 hp	Three-phase to three-phase 480 V to 200 hp
RGX 	<ul style="list-style-type: none"> • Active front end drive • Regenerative drive 	<p>The Eaton RGX is specifically designed to meet regenerative and/or low harmonic needs through the use of an active, bidirectional power converter on the front end of a common DC bus drive. The RGX provides dynamic performance for great motor handling, eliminating the need for an external resistor or mechanical braking, thus simplifying system design. It also delivers superior reliability, reducing total current distortion to 2–3%. The active front end design offers great energy savings and design compatibility for a wide range of applications.</p>	—	Three-phase to three-phase 480 V to 800 hp 575 V to 650 hp

Benefits	Acceptance	Communication options	Cross-reference	Enclosure
<p>Ease of use: Startup Wizard, seven built-in applications, customizable software, advanced capabilities and inputs, local/remote button, modular design, text display.</p> <p>Space-saving design: Compact design, open NEMA 12 option, on-board I/O expansion provisions.</p> <p>Efficiency: Built-in 3% line reactor and EMI RFI filter H standard, increased microprocessing power.</p> <p>Rugged and reliable: High overload (CT) and low overload (VT) rated, robust time-proven design, durable metal power section, brake chopper circuit.</p>		<ul style="list-style-type: none"> • EtherNet/IP • Modbus RTU/TCP • PROFIBUS DP • DeviceNet • CANopen • LonWorks® 	<ul style="list-style-type: none"> • ABB (ACS880) • Rockwell/Allen-Bradley (PowerFlex 700, 755) • Schneider/Square D (Altivar 71) • Siemens (Sinamics G130, G180, S120) • Vacon (NXS) • Yaskawa (A1000) 	<ul style="list-style-type: none"> • Open IP20, IP21, IP54 • Open NEMA 1, 12 • Enclosed NEMA 1, 12, 3R • AGSVX (agriculture config) • Consult Eaton for NEMA 4X
<p>Ease of use: Uses the core DG1 and SVX/SPX drive platforms; therefore, sharing many of the drive-related characteristics of the component drive including Startup Wizard and built-in applications.</p> <p>Space-saving design: Designed and engineered to optimize space, including flange mounting the drive with the heat sink external to the enclosure. Smallest footprint in the industry.</p> <p>Efficiency: Designed and tested to provide maximum efficiency through best-in-class components.</p> <p>Rugged and reliable: Proven design built on 10+ years of experience in 18-pulse engineering.</p>		<ul style="list-style-type: none"> • EtherNet/IP • Modbus RTU/TCP • PROFIBUS DP • DeviceNet • CANopen • LonWorks 	<ul style="list-style-type: none"> • ABB • Rockwell/Allen-Bradley • Schneider/Square D • Yaskawa 	<ul style="list-style-type: none"> • Enclosed NEMA 1, 12, 3R • Consult Eaton for NEMA 4X
<p>Ease of use: Uses the core DG1 and SVX drive platforms, Startup Wizard, built-in applications.</p> <p>Space-saving design: Designed and engineered to optimize space including flange mounting the drive with the heat sink external to the enclosure. Smallest footprint in the industry.</p> <p>Efficiency: Designed and tested to provide maximum efficiency through best-in-class components.</p> <p>Rugged and reliable: Tested and proven solution built to meeting commercial and industrial applications. Engineered solutions to further protect filter and drive available.</p>		<ul style="list-style-type: none"> • EtherNet/IP • Modbus RTU/TCP • PROFIBUS DP • DeviceNet • CANopen • LonWorks 	<ul style="list-style-type: none"> • ABB • Rockwell/Allen-Bradley • Schneider/Square D • Yaskawa 	<ul style="list-style-type: none"> • Enclosed NEMA 1, 12, 3R • Consult Eaton for NEMA 4X
<p>Ease of use: Is enclosed in a painted white NEMA 3R panel to provide weathertight protection, allowing panel installation outdoors near irrigation equipment without additional shelter. Internet of Things (IoT) connectivity via cellular gateway enables remote monitoring and control.</p> <p>Space-saving design: One of the first irrigation panels with an easy-to-use bottom entry. The floor stand enables mounting the panel as a standalone electrical panel.</p> <p>Efficiency: An efficient and cost-effective solution.</p> <ul style="list-style-type: none"> • Eliminates pump motor inrush current • Lower energy consumption than rotary phase converters <p>Rugged and reliable: Greatly reduces environmental impact and the high costs associated with powering agricultural and irrigation pump equipment.</p> <ul style="list-style-type: none"> • Reduces air and groundwater contamination • Decreases fuel and lubricant leakage 		<ul style="list-style-type: none"> • EtherNet/IP • Modbus RTU/TCP • PROFIBUS DP • DeviceNet • CANopen • LonWorks • Cellular connectivity 	<ul style="list-style-type: none"> • ABB • Rockwell/Allen-Bradley • Schneider/Square D • Yaskawa 	<ul style="list-style-type: none"> • Enclosed NEMA 3R painted white
<p>Ease of use: Shares many of the drive-related characteristics of the component drive including Startup Wizard and built-in applications for easy programming.</p> <p>Space-saving design: The RGX is an all-in-one package that includes circuit protection, LCL filtering, and AFE drive in a single enclosure.</p> <p>Efficiency: Exceptional energy savings is achieved through the use of regenerative braking.</p> <p>Rugged and reliable: Same reliable control module and operating system as SPX, shared components for inverter and active front end for reduced spare parts.</p>		<ul style="list-style-type: none"> • EtherNet/IP • Modbus RTU/TCP • PROFIBUS DP • DeviceNet • CANopen • LonWorks 	<ul style="list-style-type: none"> • ABB • Rockwell/Allen-Bradley • Yaskawa 	<ul style="list-style-type: none"> • Enclosed NEMA 1

Selection considerations

- What is your system application?
- Is your load constant torque or variable torque?
- What are your voltage and horsepower requirements?
- What is the motor full load amps (FLA)?
- Do you need an open or enclosed product?
- What NEMA enclosure rating do you need?
- Do you need a main breaker or a bypass?
- Do you need any accessories or communication cards?

EatonCare Technical Resource Center (TRC)—low-voltage variable frequency drives support

24/7 phone support

- 1-877-386-2273 option 2, option 6
 - Option 1: Pre-sale application support, new or aftermarket part number identification
 - Option 2: Network and communication questions
 - Option 3: Startup or programming questions
 - Option 4: Troubleshooting assistance
- Email
 - Technical support: TRCDrivesTechSupport@Eaton.com
 - Pre-sale support: PresaleVFD@Eaton.com
 - Aftermarket: VFDAftermarketEG@Eaton.com

Startup and service

Startup and service support can be provided by Eaton's Electrical Engineering Services & Systems (EESS) or an Eaton certified independent service provider (ISP).

www.eaton.com/vfdaftermarket

Startup Wizard and built-in applications allow for easy programming.

Online resources

Resource	Website
Eaton drives	Eaton.com/drives
Eaton engineer services	Eaton.com/EESS
Eaton software downloads	Eaton.com/software
Eaton Europe	Eaton.eu/electrical
Eaton Asia	Eaton.com.cn

PC software

Software

Power Xpert inControl—Used with PowerXL DG1, DH1, DM1 and DX1

DrivesConnect—Used with DE1, DC1 and DA1

9000XDrive and 9000XLoad—Used with SVX, SPX and all enclosed drives using these units

Notes:

Download at Eaton.com/software → Adjustable Frequency Drives → select your product in the next drop down.

Download at Eaton.com/drives → Resources → Software.

Online training

PowerXL DG1 VFD demo simulator—online DG1 demo simulation

Online PowerXL DG1 training simulator that reviews the keypad, display, menu navigation, basic parameter changes and the operation of the demo cases (www.eaton.com/DG1)

Classroom training

Certification and service training

Commissioner certification training (SVX, SPX, CPX, CFX)

Service provider training (SVX, SPX, CPX, CFX, HVX)

Access via Eaton.com/drivetraining

Calculators

Harmonics estimator—estimate total harmonic distortion (THD) of system

By having the transformer information and the one-line diagrams, a harmonics analysis can be quickly put together to ensure that the system will meet requirements set by IEEE 519. Drive configurations can quickly be changed, allowing engineers to provide the most cost-effective solution (www.eaton.com/drives → Resources → Harmonics Calculator)

Energy savings estimator—estimate ROI for system

The program creates an energy savings estimation report that details yearly energy savings, reduction in CO2 emissions and estimated payback time by analyzing system configuration, total installation costs and duty cycle (www.eaton.com/drives → Resources → Energy Savings Estimator)

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