Ultimate Performance Solution

World's First 480V 3-Level Inverter

G7 Drive 1/2 - 500 HP

The G7 Drive: This amazing AC drive is the ultimate performance solution with increased speed and torque response to provide servo-like performance from an induction motor. In addition, the G7 drive has the world's first 480V 3-level inverter architecture that eliminates or minimizes the installation problems associated with IGBT switching and protects the entire motor-drive system.

G7 drive performance makes it the ideal drive for high performance speed, torque, or position control applications. Several control modes are provided. In open loop vector mode, the latest flux observer algorithms extend speed range and provide maximum starting torque. In closed loop vector mode, 0.01% speed regulation and 1000:1 control range can be achieved. Zero-servo capability provides position control at zero speed.

The G7 drive has the world's first 480V 3-level inverter architecture for total system protection. This patented design
can eliminate peripheral components typically required to solve installation problems. The G7 allows motor operation at very long cable lengths, meeting NEMA MG1 Part 31, with peak voltage being 30% less than conventional drives. With motor bearing current being typically 50% less than standard drives, the G7 provides four times the motor bearing life. Audible motor noise on the 480V G7 drive is 5-10dB (20%) less than the prior generation drive, even when operating at half the carrier frequency. Common mode current is half that of competitor drives.

The G7 drive has three autotuning methods to optimize motor control, including the new static autotuning which does not require load decoupling nor motor rotation.

The LCD operator displays 5 lines x 16 characters, in any of 7 languages. The keypad is intuitive and includes memory for parameter settings, making it easy to transfer settings from one drive to another. To further aid in parameter management, Drive Wizard™ software for the PC is available at no charge, for upload, download, archiving, trending, and graphing.

The G7 drive has a large programming feature set to handle sophisticated industrial applications. If the standard feature set does not meet your specific requirement, the G7 can be programmed using DriveWorksEZ™. This is a PC-based, object-oriented, graphical icon programming tool that is friendly to the user. The drive firmware can also be modified by custom or pre-written application-specific modules such as *Motion Control* or *Electronic Lineshaft*.

The G7 drive supports the industry's preference for open network architecture and connectivity with network choices such as EtherNet/IP, Modbus TCP/IP, Profibus-DP, DeviceNet, and others.

The G7 is not intended for the simple, routine AC drive application, it is for the challenges. The G7 drive offers the ultimate performance, the best system protection, and the most flexible configurations of any drive available.

YASKAWA
The Drive for Quality™

Performance Features

- Ratings: 0.5 to 150HP, 240VAC
  0.5 to 500HP, 480VAC
- Overload capacity: Heavy duty, 150% for 1 minute, 200% peak
- Starting torque: 150% at frequency; 1.0Hz (V/f), 0.5Hz (open loop vector), 0.0Hz (closed loop vector)
- Output frequency: 0.01 to 400Hz
- Output frequency resolution: 0.001Hz
- Speed control range: 40:1 (V/f), 200:1 (open loop vector), 1000:1 (closed loop vector)
- Speed regulation: 1.0% (V/f), 0.2% (open loop vector), 0.01% (closed loop vector)
- Speed response: 60Hz
- Torque response: 300Hz
- Speed reference resolution: 0.01Hz with digital reference, 0.03Hz with analog reference, 0.01Hz with network reference
- Speed/Torque/Position control
- Zero-servo mode
- Adjustable accel/decel: 0.01 to 6000 seconds
- S-Curve: 0.00 to 2.50 seconds, adjustable for each corner
- Stall prevention: Accel / decel / running
- Power loss ride-thru: Auto-restart or inertia ride-thru

Protective Features

- Torque limit (four quadrant)
- Electronic motor overload (UL 508C)
- Over-torque / under-torque detection
- Phase-to-phase and ground fault short circuit protection
- Over-current, over-voltage, and over-temperature protection
- Input / output phase loss protection
- Optically-isolated controls
- DC bus charge indicator
- Motor thermistor input

Design Features

- LCD keypad display: 5 lines x 16 characters, backlit, 7 languages, copy function
- Simple programming: Quick start and modified parameter groups
- Microprocessor logic: 32-bit
- Memory type: Flash memory for easy updates, custom software applications, and non-volatile program retention
- Control logic: 24VDC (sinking or sourcing)
- Terminal strip: Quick disconnect
- Front cover: Split for easy wiring
- Heat sink fan: Plug-in with on-off control
- Motor auto-tuning: Static and rotational
- Speed search: Bi-directional into rotating motor
- Process control: PID, reference with PID trim
- Motor parameters: 2 sets
- Stopping methods: Ramp stop, coast stop, fast stop, or high-slip braking
- DC injection braking: Adjustable level and time
- Speed reference presets: 17 available
- Timer function: Programmable on / off delay
- Digital M.O.P.: Up / down / hold / reset reference
- Bias and gain: All analog and pulse train I/O
- Common DC bus capability: All models
- Dynamic braking transistor: 20HP and below (240VAC), 25HP and below (480VAC)
- DC bus choke: 25HP and above (240VAC), 30HP and above (480VAC)
- Twelve-pulse capability: 25HP and above (240VAC), 30HP and above (480VAC)

Service Conditions

- Enclosure: NEMA 1 or protected chassis
- Ambient service temperatures: -10 to 40˚C (104˚F) NEMA 1, -10 to 45˚C (113˚F) protected chassis
- Input frequency: 50 / 60Hz ± 5%
- Input voltage: +10% / -15%, 3 phase, 240 or 480VAC, phase insensitive
- Humidity: Non-condensing, 95% maximum
- Altitude: 3300 feet (1000 meters) w/o derate
- Vibration: 1G (10 to 20Hz), 0.6G or less (20 to 55Hz)

Inputs and Outputs

- Analog inputs: 3 (2 programmable), -10 to +10VDC (20kΩ) or 4 to 20mA (250Ω), 11 bit plus sign
- Analog outputs: 2 programmable, -10 to +10VDC or 4-20mA, 9 bit plus sign
- Digital inputs: 12 (10 programmable), sinking or sourcing
- Digital outputs: 5 programmable, 3 form A and 2 open collector
- Pulse train input: 1 programmable, 32 kHz max
- Pulse train output: 1 programmable, 32 kHz max
- Fault contact: 1 form C
- RS-232/422/485: Modbus RTU

Standards & Reliability

- UL, cUL, and CE listed
- MTBF: Exceeds 28 years

Options

- DriveWorksEZ™ programming tool
- DriveWizard™ management software
- Custom drive software
- EtherNet/IP, Modbus TCP/IP, Profibus-DP, DeviceNet, and others
- Remote display / keypad
- High resolution I/O cards
- 120VAC interface
- NEMA 12 enclosures
- Input breaker, disconnect, fuses
- Input reactors
- EMC-compliant filters
- Dynamic braking transistor (if not standard)
- DC bus choke (if not standard)
- Line regeneration (RC5 or DC5)

480V 3-Level Inverter Benefits

- Lead Length: Unlimited (Meets NEMA MG1 part 31)
- Four times the motor bearing life
- Quiet operation: 5-10dB of noise reduction
- Common mode noise: 50% reduction

Related Products

F7 Drive Industrial Workhorse, Normal and Heavy Duty, 1/2 - 500 HP. *Flyer FL.F7.01*

P7 Drive Industrial Fan/Pump, V/f, Normal Duty 5 - 500 HP. *Flyer FL.P7.01*

V7 Drive General Purpose, V/Hz or Open Loop Vector, 1/8 - 10 HP. *Flyer FL.V7.01*

V7N V/Hz or Open Loop Vector, Embedded DeviceNet, 1/8 - 10 HP. *Flyer FL.V7N.01*

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The Drive for Quality™

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G7 Drive

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