

## Specifications and Features for 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 includes the world's first Inverter architecture that eliminates or minimizes the installation problems associated with IGBT switching on 480 volt systems 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 3-Level architecture can eliminate peripheral components typically required to solve installation problems sometimes encountered on 480 volt systems. The G7 allows motor operation at very long cable lengths, meeting NEMA MG1 Part 31, with peak voltage being 30% less than conventional. With motor bearing current being typically 50% less than standard inverters, the G7 provides four times the motor bearing life. Audible motor noise on the 480 volt G7 drive is 5-10 dB (20%) less than the prior generation drive, even when operating at half the carrier frequency. Common mode current is half that of conventional drives. The G7 power section includes built-in bus choke (most ratings), 12-pulse input capability (most ratings), common DC bus capability, and regeneration options.

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, DriveWizard™ 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 prewritten 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 DeviceNet, Profibus-DP, Ethernet, 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.

## Performance Features

- Ratings: 0.5 to 150 HP, 240 VAC  
0.5 to 500 HP, 480 VAC
- 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 400 Hz
- Output frequency resolution: 0.001  
Hz
- 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: 60 Hz
- Torque response: 300 Hz
- Speed reference resolution:  
0.01 Hz with digital reference,  
0.03 Hz with analog reference,  
0.01 Hz 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  
overtemperature protection

## 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: 24 VDC (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: 20 HP  
and below (240 VAC), 25 HP and  
below (480 VAC)
- DC bus choke: 25 HP and above  
(240 VAC) 30 HP and above (480  
VAC)
- Twelve-pulse capability: 25 HP and  
above (240 VAC), 30 HP and above

- Input / output phase loss protection (480 VAC)
- Optically-isolated controls
- DC bus charge indicator
- Motor thermistor input

### Service Conditions

### Inputs and Outputs

- Analog inputs: 3 (2 programmable), -10 to +10 VDC (20k) or 4 to 20 mA (250), 11 bit plus sign
- Analog outputs: 2 programmable, -10 to +10 VDC or 4-20 mA, 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

- 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 / 60 Hz ± 5%
- Input voltage: +10% / -15%, 3 phase, 240 or 480 VAC, phase insensitive
- Humidity: Non-condensing, 95% maximum
- Altitude: 3300 feet (1000 meters) w/o derate
- Vibration: 1G (10 to 20 Hz), 0.6G or less (20 to 55 Hz)

### Three-Level 480V Inverter Benefits

### Standards & Reliability

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

- Lead length: Meets NEMA MG1 Part 31
- Four times the motor bearing life
- Quiet operation: 5-10 dB of noise reduction
- Common mode current: 50% reduction