

Specifications and Features for E7 Drive

The E7 Drive is a variable torque AC drive, designed specifically for HVAC applications in building automation. A new benchmark for size, cost, performance, benefits, and quality, the drive includes numerous built-in features such as Network Communications, H/O/A, PI, and energy-savings functions.

The E7 has embedded communications for the popular building automation protocols, Johnson Controls Metasys® N2 and Siemens APOGEE™FLN, as well as Modbus. An optional LonWorks® interface card is also available.

The LCD keypad/operator is equipped with Hand/Off/Auto functions, copy feature, 7 language choices, and 5 lines of display, 16 characters per line. Optional software allows upload/download, as well as graphing and monitoring of drive parameters from a PC for ease of drive management. User parameter settings can be recovered at any time via “user re-initialization”.

Built-in PI maintains set point for closed loop control of fans and pumps for pressure, flow or temperature regulation and eliminates the need for output signals from a BAS. It includes feedback display, inverse, square root and differential control functions.

A Sleep function provides significant energy savings by minimizing operating hours. Under-torque detection alerts the operator to conditions such as loss of load or broken belts.

Energy savings control is an automatic output voltage adjustment in response to actual motor load. Real-time energy savings is based on motor algorithms. Motor efficiency is increased by several percent. Built-in kw-hr and kw display eliminates the need for external signal conditioner for energy monitoring.

If a phase-shifting input transformer is used, the E7 dual-diode bridge can be operated in 12-pulse rectification mode, reducing input current harmonic distortion factor by over 90%. With lower EMI/RFI emission and lower total harmonic distortion contribution, the E7 meets or exceeds the generally accepted power quality standards. Inherent motor protection features resulting from low noise/low carrier technology provides for longer lead lengths without additional motor protection devices.

The standard enclosure is NEMA 1. NEMA 3R and 12 are optional.

Performance Features

- VT Ratings: 1/2-150 HP, 208 VAC, 1/2-150 HP, 230/240 VAC, 1/2-500 HP, 480 VAC
- Overload capacity: 110% for 60 sec (150% peak)
- Starting torque: 100% at 3 Hz

Design Features

- 32-bit microprocessor logic
- Flash upgradeable firmware
- Nonvolatile memory, program retention
- Surface-mount devices
- Displacement power factor: 0.98

- DC injection braking: at start or stop, adjustable, current limited (anti-windmilling)
- Motor preheat function
- Adjustable accel/decel: 0.1 to 6000 sec.
- Controlled speed range: 40:1
- Critical frequency rejection: 3 selectable, adjustable bands
- Torque limiting: 30-180%
- Energy Saving control
- Torque boost: full range, auto
- Power loss ride-thru: 2 sec
- Inertia ride-thru
- Auto restart after power loss or resettable fault, selectable, programmable
- Feedback signal loss detection
- Serial communications loss detection
- "Up/Down" floating point control capability
- Stationary motor auto-tuning
- Customizable monitor display
- Sleep function
- Run permissive input
- Ramp-to-stop or coast-to-stop selection
- Runtime changes in control and display
- Project-specific parameter reinitialization
- Output frequency: 0.1 to 120 Hz
- Frequency resolution: 0.06 Hz
- Frequency regulation: 0.1%
- Control Terminal Board: Quick disconnect, removable
- Carrier frequency: selectable to 15 kHz
- 3% DC bus reactor: 30-150 HP, 208 VAC; 30-150 HP, 240 VAC; 40-500 HP, 480 VAC; optional on lower ratings
- Keypad Operator: Hand/Off/Auto, built-in copy feature, 7 languages
- LCD display: 5 lines, 16 characters each
- 24 VDC control logic
- Transmitter/Option power supply
- Output contacts: One form C and two programmable form A
- Input/output terminal status
- Input terminals: 5 programmable multi-function input terminals
- Fault input: Programmable
- Diagnostic fault indication in selected language
- Timer function: Elapsed time, Delay on start, Delay on stop
- RS-422/485 port: Embedded Metasys N2, APOGEE FLN, and Modbus
- Volts/hertz ratio: Preset and programmable V/Hz patterns
- Multi-speed settings: 5 available
- Remote speed command: 0-10 VDC or 4-20 mA, direct or reverse-acting
- Setpoint (PI) control with inverse or square root input, differential control via two feedback capability
- Feedback signal: low pass filter
- Speed command: bias and gain
- Analog outputs: Programmable, two, 0-10 VDC
- Meter Functions: Volt, amp, kilowatt, elapsed run time, speed command
- Output Current Transformers, qty 3

Protective Features

- Current limited stall prevention
- Heat sink over-temperature, speed fold-back
- Cooling fan operating hours recorded
- Bi-directional start into rotating motor at synchronized speed
- DC bus charge indicator
- Current limiting DC bus fuse
- Optically-Isolated controls
- Short circuit protection: Phase-phase and phase-neutral
- Ground fault protection

- Short circuit withstand rating: 65K RMS, 100K RMS with bus reactor
- Electronic motor overload: UL
- Current and torque limit
- Fault display: last 10 faults
- Fault circuit: OC, OV, OT
- Over torque and under torque protection
- Program security code
- "Hunting" prevention logic
- Reverse prohibit selectability
- NEMA 1 or protected chassis
- UL, cUL listed and CE marked; IEC 146;
- MTBF: exceeds 28 years
- Service Conditions
- Ambient Temperature: -10°C to 40°C NEMA 1, 45°C protected chassis (14°F to 104°F, 113°F)
- Humidity: 95% RH, non-condensing
- Input voltage: +10%/-15%
- Input frequency: 50/60 Hz \pm 5%
- 3-phase, 3-wire, phase sequence insensitive
- Plenum rated (UL 1995)