

## **Specifications and Features for E7L Drive Bypass**

The E7L Drive/Bypass System is an E7 drive with Bypass and Touchpad Control. This variable torque AC drive system is designed specifically for HVAC applications in building automation. The E7 drive sets a new benchmark for cost, performance, benefits and quality. It includes numerous built-in features such as Network Communications, H/O/A, PI (set point control), and energy-saving functions.

The E7 drive has embedded serial communication 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 Touchpad Control/Operator is equipped with 6 LED illuminated selector buttons: Hand, Off, Auto, Drive Select, Bypass Select and Drive Test. The E7L also features 11 other status LED indicators: Control Power, Drive Ready, Drive Run, Drive Fault, Bypass Run, Motor O/L, Safety Open, Damper/BAS Interlock, Smoke Purge, Auto Transfer, and Auto Run.

DriveWizard 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 the User Re-initialization function.

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 closed loop output signals from a BAS. The PI includes feedback display, inverse, square root and differential control functions.

The E7L Drive/Bypass standard inputs are Safety Interlocks, Auto Run/Stop, Damper/BAS Interlock, Remote Transfer to Bypass, Smoke Purge, 0-10 VDC or 4-20 mA input speed signal and an RS485 communication port. The standard outputs include 3 Programmable (Form C) Relays, 1 Motor Run (Form A) Relay (all output relays rated 250 VAC, 1 Amp) and 2 programmable analog outputs (0-10 VDC or 4-20 mA).

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 responsive to actual motor load. Real-time energy saving is based on motor algorithms. Motor efficiency is increased by several percent. Built-in kW-hour and kW display eliminates the need for an external signal conditioner for energy monitoring.

The standard enclosure is NEMA 1 with an option for NEMA 12 FVFF.

### **Performance Features**

### **Design Features**

- VT Ratings: 1/2-25 HP, 208 VAC  
1/2-30 HP, 230 / 240 VAC  
1/2-60 HP, 480 VAC
- Overload capacity: 110% for 60 sec (150% peak)
- Starting torque: 100% at 3 Hz
- 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
- Current limiting: 30-180%
- Energy Saving control
- Torque boost: full range, automatic
- Power loss ride-thru: 2 seconds
- Inertia ride-thru
- Auto restart after power loss or resettable fault, selectable, programmable
- Feedback signal loss detection
- Serial communication 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
- Copy keypad
- 32-bit microprocessor logic
- Flash upgradeable firmware
- Non-volatile memory, program retention
- Surface-mount devices
- Displacement power factor: 0.98
- Output frequency: 0.1 to 120 Hz
- Frequency resolution: 0.06 Hz
- Frequency regulation: 0.1%
- Carrier frequency: selectable to 15 kHz
- 3% DC bus reactor: 30 HP, 240 VAC; 40-60 HP, 480 VAC (optional on lower ratings)
- LED display
- 24 VDC control logic
- Transmitter/Option power supply
- Input/output terminal status
- Timer function: Elapsed time, Delay on start, Delay on stop
- Embedded Metasys N2, APOGEE FLN, and Modbus
- Volts/hertz ratio: Preset and programmable V/Hz patterns
- 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
- Meter Functions: Volt, amp, kilowatt, elapsed run time, speed command
- Output Current Transformers: qty 3
- UL, cUL listed and CE marked; IEC 146;
- MTBF: exceeds 28 years

### **Protective Features**

- Current-limited stall prevention
- Heat sink over-temperature, speed fold-back
- Cooling fan operating hours recorded

### **Service Conditions**

- Ambient Temperature: -10°C to 40°C (14° F to 104° F)
- Humidity: 95% RH, non-condensing
- Altitude: 3300 ft; higher by derate

- 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 trace capabilities
- Over torque and under torque protection
- Program security code
- "Hunting" prevention logic
- Input source protection (MOV's)
- Input/output phase loss protection
- Input voltage: +10%/-15%
- Input frequency: 50/60 Hz  $\pm$  5%
- 3-phase, 3-wire, phase sequence insensitive
- Plenum rated (UL 1995)

### **Bypass Features**

- Bypass and Drive are factory assembled, and electrically interlocked, utilizing 2 contactors with Electronic Control System
- NEMA 1 metal enclosure standard
- Input disconnect switch with a lockable, through-the-door operating mechanism
- Sealed Bypass Control Keypad mounted on front door with integrated Drive touchpad control
- Drive Output and Bypass contactors
- Bi-metallic thermal overload relay, provides motor protection in both the "drive" and "bypass" modes
- 120 VAC control power transformer
- Control and safety circuit terminal strip (Selectable for 120 VAC or 24 VDC input)
- Indicator LED's for Control Power, Drive Ready, Drive Run, Drive Selected, Drive Fault, Drive Test, Bypass Selected, Bypass Run, Motor OL, Safety Open, Damper/BAS, Auto Run, Auto Transfer, Smoke Purge, Hand Mode, Off Mode, and Auto Mode.
- 3 programmable Form C contacts (250 VAC, 1 Amp) for: Motor Run, Damper/BAS, Drive Run, Hand Mode, Auto Mode, Bypass Run, Fault or 1 selectable from the drive menu
- Remote Run/Stop via contact closure or serial communication
- Input speed command via 0-10 VDC, 4-20 mA or serial communication

### **E7L Available Options**

- Circuit Breaker/Motor Circuit Protection
- RFI/EMI filter
- Drive input fuses
- Drive input disconnect
- Input impedance
- Custom name plate
- LCD drive option
- 3-15 PSI transducer
- LonWorks communication
- NEMA 12 FVFF

- 2 Programmable analog outputs (0-10 VDC or 4-20 mA )
- Damper control circuit
- Programmable auto transfer to bypass on drive fault
- Remote transfer to bypass via contact closure
- Smoke purge function via contact closure
- Safety (freezestat, firestat, duct pressure, etc) interlock
- Building Automation System (BAS) interlock