

# Master Control Systems, Inc.

## **EC\*\* Series**

### **Fire Pump Controllers**

#### **Advantages - and - Salient Features**

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Master Control Systems offers a complete line of seven starting types; six reduced voltage or current starting types: Autotransformer, Primary Reactor, SCR Soft Start, Part Winding, Closed transition Wye-Delta, Open Transition Wye-Delta. Single source or Dual Source (Transfer Switch) units. Low voltage (to 600 Vac) or Medium Voltage (to 7,200 Vac). The following list of features, advantages, and performance of our **Series EC** Fire Pump Controllers not available from any other manufacturer.

Support - See Warrantee and Guarantee sheets for details:

- Exclusive FIVE YEAR no-quibble, no "tie-in" warrantee. Covers ALL parts and components against any defects in parts and factory labor.
- Exclusive TWO YEAR replacement labor coverage.
- Exclusive \$5,000 Lightning Damage Guarantee.
- UL, FM, CSA, CE approvals.
- Exclusive UL-VDE EMC Certification and Listing. Tested for the full suite of Electro-Magnetic susceptibility and radiation. Tested for line voltage fluctuations, drop-outs and flicker. Tested well above the required minimums for voltage surges, line transients, and electrostatic discharge. Tested for immunity to interference from portable radios and the like.
- Numerous features listed below to protect the motor, increase equipment and personnel safety and diminish the likelihood of inadvertent (false) circuit breaker tripping.
- Proven design and construction. Made with pride in the U.S.A.
- High level of proven field support. Service, support and manufacture at the same location.

Standard Features and Performance of EC\* Series controllers:

- PhaseSmart™ Motor Burnout Protection is Standard Equipment. Keeps the motor ready for service.
- "Instant On" hard wired pump control circuitry. No "Boot-up" or initialization time. Controller is ready for service when needed. Especially important on transfer switch, high zone and reduced voltage starting applications such as in high rise fire protection.
- Triple Redundant PhaseSmart™ Power Transformers and rectifier circuitry for highest reliability. Includes special design high dielectric strength, electrostatically shielded, control power transformers.
- Restart Delay circuit is standard. Reduces chance of breaker tripping on momentary loss of demand (due to pressure switch cycling on low flow demands) or line power interruptions.
- Three position Circuit Breaker (Motor Overload) Test Switch to test both instant trip and timed trip.
- True Three Phase Precise Circuit Breaker calibration. Operates on any phase including single phase and ground currents for both personnel and equipment safety. No A.C. powered shunt trip coils are used. D.C. powered shunt trip circuit works even if one or two other phases are lost. A.C. powered shunt trip controllers can't trip if either control power phase is lost or is too low in voltage.

More Standard Features and Performance:

- Standard 2% accuracy (traceable to NIST) digital volts and amps metering LED digital display. Includes "Min. of Three" voltage and "Max. of Three" current readings.
- Phase Sequence toggle switch is used to change Phase Sequence Alarm from A-B-C to C-A-B. No moving of wires or line voltage circuitry or jumpers ever needed.
- Trouble free Phase Reversal circuit. Connected to low voltage secondary and interlocked to the three power available circuit. No false alarms on line voltage dips, surges, or transients.
- Full Three Phase voltage sensing, not just "Phase Loss". Detects brown-out and low line conditions.
- Mult-LED type Light Bars for indicator lites (in place of filament or neon type light bulbs).
- Twelve standard supervisory Status LED's indicate: Start Demands, Timing, and Control Status.
- Extensive module diagnostic LEDs Sixteen total supplied on the four standard modules and up to a total of 25 when optional modules are installed. These diagnostic LED's show the status of various power supplies and states of important signals.
- Exclusive air-gap isolation of control circuitry during stand-by. Circuitry is normally de-energized and isolated from line surges, sags, and transients.
- Full 100% modular plug-in control relays and modules for ease of servicing and modification. Cables and connectors also used for control chassis inter-wiring and for cabinet wiring. Plug connected current transformers and circuit breaker shunt trip unit for ease of service.
- No line voltage connected control or sensing circuitry at all. Phase sequence circuit and power failure relays are on secondary side for full isolation from line voltage transients and surges.
- No continuously energized line voltage components (relays, lights, modules). Highly immune to line voltage transients and disturbances including high line voltages as often occurs at night.
- Very high dielectric strength (voltage withstand). Every unit factory tested to the following breakdown (high-pot) levels. 5.0 KVac or 6.0 KVdc on all line (mains) circuitry. These are far above agency (UL, CSA, FM) requirements of 2,500 Vac for 480 Vac circuitry and 1,500 Vac for 120 Vac circuitry.
- Fused surge arresters. Proven to prevent catastrophic controller failure. Connection on LOAD side of isolating switch allows safe testing and servicing. Mounted out of sight for even more safety.
- EVERY controller thermal tested at 125% of full load current (FLA) for voltage drop and heating through the entire power path. EVERY controller calibration tested at 300% and at 600% of full load current (FLA) through the entire power path.
- Exclusive 1300% (13 times FLA) minimum instantaneous breaker trip level. Avoids false tripping.

Also found in every unit:

- ALL units use Mercoird pressure switches, 100% tested by M.C.S.
- Separate Isolating Switch and Circuit Breaker operating handles for safe and sure operation. Fully staged mechanical interlocking between isolating switch and circuit breaker for safety.
- Long life solid state LED indicators. No filament type lamps used.
- Flange mounted operators. No door mounted rotary operators with dangerous protruding shafts used. Heavy duty three point door latches used with continuous full-length heavy-duty piano type door hinges.

Unit Construction:

- Standard controllers are U.L. listed and labeled as U.L. "Type 12" (NEMA 12) dust-tight, oil-tight drip-proof construction. No operator slots, no louvers, and no venting is ever used on any M.C.S. controller enclosure.
- All optional NEMA 3R, NEMA 4 and NEMA 4X types are U.L. listed and labeled as U.L. Type 3R, Type 4 or Type 4X. This provides "third party verification" of design and construction.
- Full size (1-1/8", 30mm) NEMA 4 oil-tight and push-buttons. Heavy duty industrial control relays (U.L. P600 rated) and 10 amp plug-in relays used. All electronic components are heavy duty industrial or military grade components.
- Heavy duty enclosure sheet metal. All cabinet metal is #14 MSG (0.075") or thicker with extra bracing. Double door cabinets are #13 MSG (0.090") or thicker. Heavy duty #11 MSG internal mounting panels and brackets are standard.
- All enclosures are continuous seam welded to provide very tight and very rigid enclosures. No "bolt together" cabinets or cabinet panels ever used to insure consistent high fault integrity and safety.
- All exterior and interior metal is painted using baked enamel or powder paint.
- All EC\* series controllers are full height enclosures designed for floor mounting. No legs or leg kits ever used or required. Floor mounting bolt holes are through heavy gauge angles spaced away from sidewalls, not underneath the unit for easy and safe installation.
- Full NFPA-20 required 12" floor clearance is provided inside the enclosure. No legs, floor pad, or wall mounting needed to obtain necessary floor clearances.
- No "Bottom Connection" pressure plumbing. All pressure connections are on a side wall for easy installation and convenient test valve connections.

Model specific features:

- Alarm and Pressure Recorder, when supplied, is "Medialess" and totally independent of the controller operating circuitry. No interdependence either way between the recorder and the controller. No paper, no floppy disks, no ink cartridges or ink ribbons. No paper slots. No need to open the controller door.
- Accelerate timer (EC-AT) module has two digit push-wheel switch with 0.0 to 9.9 seconds time setting control. Used on all reduced voltage starting controllers. No timing limitations for Wye-Delta starting.
- Exclusive patented Leading Phase Monitor™ in all open transition Wye-Delta start controllers. Allows full ten second acceleration while avoiding transition current spikes and false breaker tripping.
- Demand Delay timer, Sequence Start or High-Zone Delay Start, module has two digit push-wheel time setting control. Used for Option "D" or Option "Z" respectively; either one can be field added.
- Exclusive supplier of Primary Reactor start units. Patented high efficiency, lower power factor reactor design reduces need of over-sizing stand-by gen sets. No venting, no smoking or glowing resistors.
- Exclusive vendor of Soft Start units with the following features: 1) Isolation Contactor and pilot contacts provides complete air-gap isolation of entire soft starter unit, 2) Mode Switch to allow Across the Line operation for testing and maintenance, and 3) extensive built-in self testing to avoid damage due to motor or wiring shorts.

Transfer Switch fire Pump Controllers:

- Exclusive Mechanical Interlocking between normal and emergency source isolating switches on transfer switch units for safety.
- Heavy duty, high withstand Zenith transfer switches supplied as factory choice.
- Large manual mechanical operator lever for safe speedy manual mechanical transfer.
- Emergency isolating switch includes blow-apart high fault contacts for protection of emergency circuit.
- No line side Voltage Sensing or Phase Detection circuitry. Circuitry is on transformer secondaries.
- No Normal Side Breaker contacts to inhibit transfer or gen-set engine starting. Turning off the normal side Circuit Breaker can be used to test the operation of the transfer switch and gen-set operation.

Popular EC\* Series Options and Mod's include:

- Paperless Alarm and Pressure Recorder with exclusive 160 character display (4 lines by 40 characters each). Exclusive 12 hour battery back-up for contiguous recording during power outages. Built-in modem or optional ethernet LAN, WAN or Internet network connection. Available today.
- Lamp Test of all front panel Signal and Alarm Lights, Status LED's and digital display (Mod. 35).
- Failure to Start Alarm at 20% of motor FLA with settable delays (Option "J").
- Motor Overload Alarm at 125% of motor FLA (Option "Y").
- Close Differential Voltage Monitor & alarm (Option "N").
- Built-in Alarm System with 6" alarm bell and silence switch (Option "K").
- Pump Room Alarms and Signals (Option "O").

For more information Contact Master Controls at:

- by phone at **1-800-462-7457** or at **1-847-295-1010**,
- by FAX at **1-847-295-0704**,
- by E-Mail to: [sales@mastercontrols.com](mailto:sales@mastercontrols.com) or
- See our Web Page at: <http://WWW.MasterControls.com> for; bulletins, slide shows, drawings, client lists, and for technical and application information.

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