MASTER

MASTER CONTROL SYSTEMS, INC

MODEL ECV VARIABLE SPEED

FIRE PUMP CONTROLLERS

TRANSFER SWITCH CONTROLLERS

ENHANCED

G4 Innovation

UL LISTED

FM APPROVED

Made in America

Master introduced the industry's first variable speed fire pump controller in 2003 and now adds the Enhanced G4 innovation to provide many more advanced capabilities.

EC Series enhances G4 performance

- NEMA, type 12, dusttight enclosure
- 5.7 inch color touch screen HMI display
- Modbus TCP/IP over Ethernet
- Waterproof adapter for Ethernet connection
- 8 programmable remote alarm relays
- 8 programmable Pump House Trouble inputs
- Conformal coating on all printed circuit boards
- Lightning guarantee
- 5 year warranty on the entire controller

HMI Special Features

- Simultaneous display of 3 phase voltages and currents, System Pressure, Start/Reset, Manual/Auto, and Weekly/Monthly testing
- Starting sequence displayed
- Setup assistant
- Setup summary screen
- Start setting with auto 10 PSI increment for Reset setting
- Automatic weekly or monthly testing
- Transducer testing during weekly or monthly testing
- Remote alarm contact testing
- Annual testing reminder
- Service contact information displayed
- Alarm silence with auto re-sound
- Instant conversion from PSI to BAR for pressure settings
- Multiple passwords levels

Controller Special Features

- Data Recorder tracks 48 digital and 11 analog signals and outputs CSV file to USB adapter
- Waterproof USB adapter on outside

- PhaseSmart single phase protection in accordance with NFPA 20
- 3 second restart time delay
- HMI not needed for controller operation
- No water connections inside enclosure
- Protective bracket for external transducer
- Y-strainer to protect test valve solenoid
- 50 C ambient temperature rating

Standard Features

- Sequence start
- Remote/Deluge Start – normally closed
- Automatic stop
- Auto test valve solenoid
- Manual pressure drop test button
- High Zone delayed start
- Manual, Non-automatic operation
- Lockout when authorized by the AHJ
- 30mm mechanical Start/Stop pushbuttons
- Motherboard in steel chassis with latched connectors
- DC circuit breaker shunt trip
- Vertically mounted Isolating Switch and Circuit Breaker for safe separation

Standards and Approvals

Controllers are designed to the requirements of NFPA 20, Underwriters Laboratories, and Factory Mutual Approvals.

Constant Output Pressure Regardless of Suction Variation

Since the output pressure of a centrifugal pump varies with the square of the speed, pressure can be controlled accurately by controlling the speed of the pump. For example, if a pump runs at 1785 RPM during shutoff with an output pressure of 204 PSI and the speed is reduced by 10 percent to 1607 RPM, the new output pressure will be 165 PSI. Since a constant output pressure is the desired outcome, one simply sets the desired pressure—say 165 PSI. The control system then varies the pump speed depending on the actual suction pressure and flow conditions to maintain a precise, constant output pressure.

Technology – Backed Up by a Traditional Fire Pump Controller

Master ECV and ECVT variable speed controllers combine the reliability of the EC series fire pump controller with the high technology of a variable frequency drive into one robust package. By using an independent pressure sensor that senses the system pressure, the fire pump controller bypasses the drive if the pressure is not adequate. Therefore, the same high reliability is maintained as if the variable frequency drive were not even in the system.

To help protect the drive from lightning strikes, surges, and transients, a line side isolating contactor and a 5% line reactor is provided. The line reactor also helps to prevent harmonic electrical noise from going back into the power system. Further, power fuses are provided to take the drive off-line due to an internal fault without damaging or disabling the fire pump controller

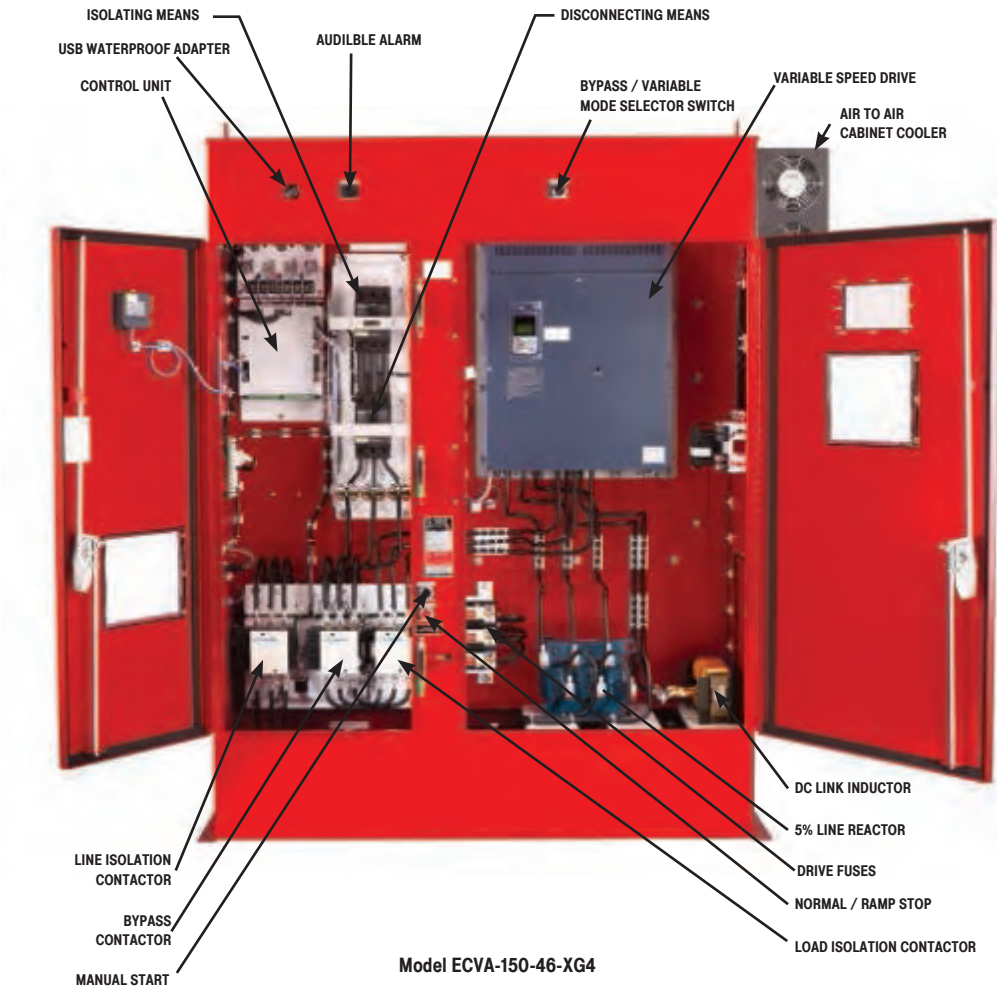
NEMA type 12 Dusttight Enclosure with External Wet Parts

The complete variable speed fire pump controller and drive is enclosed in a lockable, dusttight, NEMA 12 enclosure with a NEMA 12 external heat sink and NEMA 12 air-to-air cabinet cooler. This protects the high technology components from damage due to water spray, concrete dust, and physical tampering and eliminates the need for air conditioning.

Externally mounted transducer, test solenoid, and pressurized wet parts eliminate any chance of water spray on electrical parts.

Smooth Hydraulic Operation

Process controls dynamically regulate the motor speed and system pressure for smooth pressure adjustments due to changing flows or suction pressure variations. They also provide both Soft Starting and Soft Stopping to reduce or avoid start up water surges and shut down water hammer.



Model ECVA-150-46-XG4

100,000 Short Circuit Current rating

Controllers are short circuit current rated for 100,000 amps @ 200–480 vac. If a transfer switch is provided, these ratings also apply to the Emergency side.

Visual and Audible Alarms

- AC Failure
- AC Volts Low
- Bypass Mode
- CB Trip (requires SP1 or SP2)
- Drive Failure
- Failure to Start
- Load Shed
- Lockout
- Low Discharge Pressure
- Low Suction Pressure (83LT)
- Low Zone Start (On Demand)
- Motor Overload
- Overpressure
- Phase Reversal
- PhaseSmart
- Pump House Trouble Alarms 1–8
- Pump Running
- Single Phase Running
- Transducer Failure

On transfer switch controllers:

- Normal Position
- Normal Power Available
- Emergency Position
- Emergency Power Available
- Emergency CB Open

Voltage Free Remote Contacts

- Pump Running (2 sets)
- AC Failure
- Phase Reversal
- System Trouble
- Low Zone start (On Demand)
- Bypass Mode
- Overpress
- Drive Failure

On transfer switch controllers:

- Normal Position
- Emergency Position
- Emergency CB Open
- Generator Start

Highlighted Modification Codes

48E—Email notifications through ethernet. Monitors 5 alarms and notifies 3 different email addresses.

48J—External Remote Alarm connection box

Additional Voltage Free Remote Contacts

5 programmable inputs and 5 programmable relay outputs. Contacts rated 6 amps at 30 vdc, 6 amps at 250 vac. UL pilot duty ratings R300 and B300.
Relays can be programmed for any of the following:

AC Failure, AC Volts Low, Bypass Mode, CB Trip, Drive Failure, Fail to Start, Load Shed, Lockout, Low Discharge Pressure, Low Suction Pressure, Low Zone Start (On Demand), Motor Overload, Over Pressure, Phase Reversal, PhaseSmart, Pump House Trouble Alarms 1-8, Pump Run, Single Phase Running, Transducer Failure, Tsw Normal, Tsw Normal Available, Tsw Emergency, Tsw Emergency Available, Emergency CB Open.

Three Motor Starting Types

Whether it's across-the-line for best economy, primary reactor for best value, or soft start for smooth ramp starting, Master offers the three best motor starting types for your application

Combination Transfer Switch Controllers

Transfer switch controllers are built in accordance with NFPA 20 as a combination fire pump controller and transfer switch. To select, just add a "T" to the basic model number. For example, a Primary Reactor transfer switch controllers is a model ECVRT.

Model Number Construction – Fire Pump Controllers and Transfer Switch Controllers

ECVR or ECVRT		150	46	XG4, 48J
Basic Model		**Horsepower**	**Voltage***	**Modifications**
ECVA	Across-the-Line Bypass	15,20,25,30	20 = 200v, 60 hz	Contact Factory for List of Modification Codes
ECVR	Primary Reactor Bypass	40,50,60,75	21 = 208v, 60 hz	
ECVS	Soft Start Bypass	100,125,150	23 = 230-240v, 60 hz	
ECVAT	Transfer Switch with Across-the-line Bypass	200,250,300	38 = 380-400v, 50 hz	
ECVRT	Transfer Switch with Primary Reactor Bypass	350, 400	39 = 380-400v, 60 hz	
ECVST	Transfer Switch with Soft Start Bypass		41 = 415v, 50 hz	
			46 = 460-480v, 60 hz	
			57 = 575-600v, 60 hz	

**Horsepowers are not available at all voltages*