

MASTER

MASTER CONTROL SYSTEMS, INC

**MODEL ECV VARIABLE SPEED
FIRE PUMP CONTROLLERS
TRANSFER SWITCH CONTROLLERS**



Constant Pressure Regardless of Suction Variations

Master introduces the industry's first variable speed electric fire pump controller that adjusts the pump speed to maintain a truly constant output pressure from shut-off to rated flow. It even adjusts for large suction pressure variations without wasting a drop of water, and it's UL listed for fire protection in accordance with NFPA 20-2003.

How it Works

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 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 switch 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.

Tamperproof Enclosure

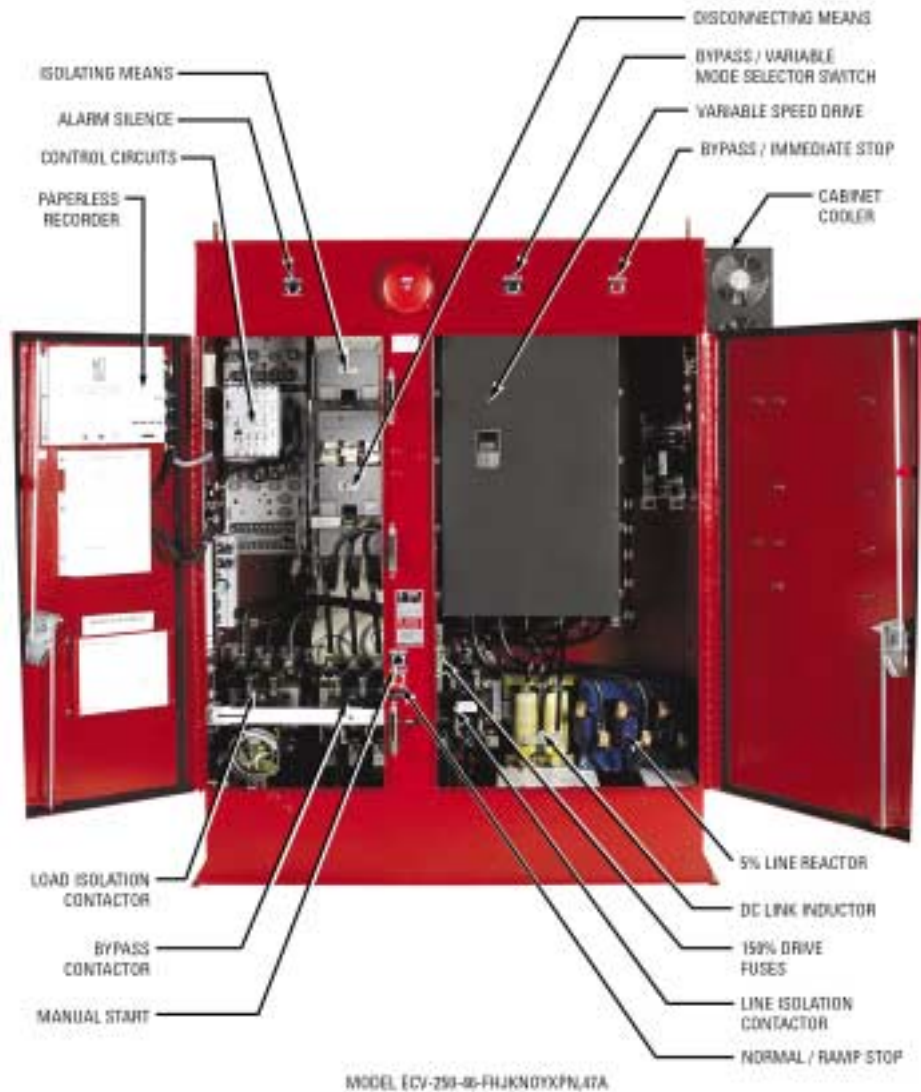
Since physical protection of the equipment is as important as the reliability when it comes to fire protection, the complete variable speed fire pump controller and drive is enclosed in a lockable, dusttight, NEMA 12 enclosure. This protects the high technology components from damage due to water spray, concrete dust, and physical tampering.

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.

Standard Alarms and Remote Contacts

In addition to the standard EC series alarms and contacts, model ECV or ECVT controllers provide visual alarms for "Drive Failure" and "Bypass" indication.



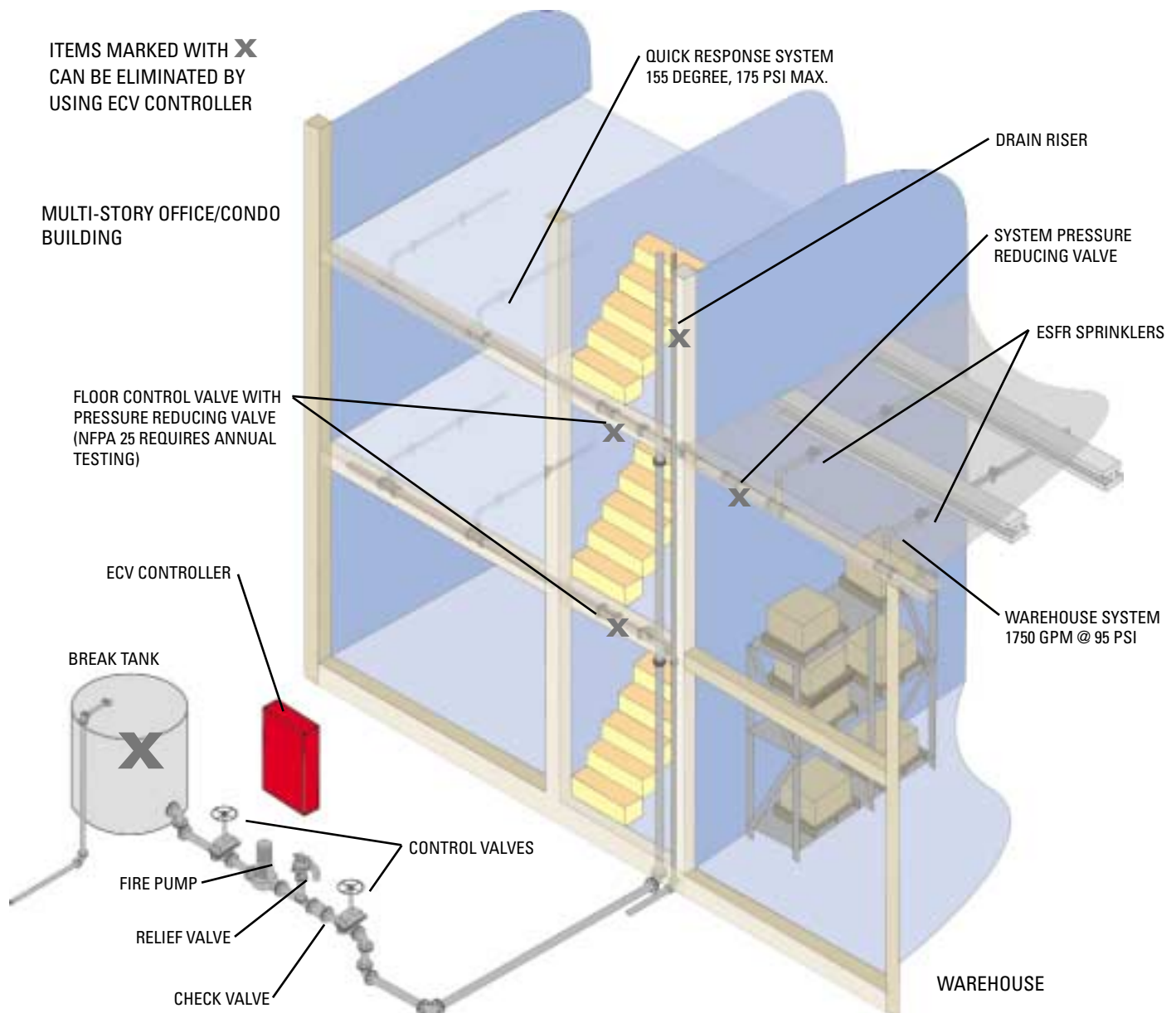
Huge Cost Savings in the Right Applications

- Eliminates the need for a break tank.
- Allows smaller pipe and better head selection, and eliminates PRVs in ESFR systems.
- Reduces the use of high pressure fittings.
- Reduces the gen-set size by only drawing 125% current.
- Allows taller buildings without adding zones or may eliminate a zone.
- Eliminate system and floor PRVs and the annual testing.
- Eliminate or reduce the size of the drain riser.
- Eliminates wasteful dumping of water through the relief valve under no-flow conditions.

Emergency Power Applications

In the Variable Speed mode, the drive limits the current to 125% full load current while still producing at least rated torque at any speed. Thus, for centrifugal pumps, the gen-set size can be minimized.

In the Bypass mode, the motor will start Across-the-line. As an option, Master offers Primary Reactor reduced voltage starting to help reduce the gen-set size in this mode as well.



MODEL NUMBER CONSTRUCTION

ECVRT		—	150	—	46	—	FHJKNOYXPN,47A
Describes Basic Model			Describes Horsepower		Describes Voltage*		Describes Options
ECV	ATL starting in bypass		15, 20, 25, 30,		20 = 200-208		Select from Below
ECVR	Primary Reactor starting in bypass		40, 50, 60, 75,		23 = 220-240		
ECVT	Transfer Switch with ATL starting in bypass		100, 125, 150,		38 = 380-415 (50Hz)		
ECVRT	Transfer Switch with Primary Reactor starting in bypass		200, 250, 300, 350, 400		46 = 440-480 57 = 550-600		

* Horsepowers limited to 150 @ 208V-240V, 250 @ 415V, 350 @ 480, and 400 @ 600V

OPTIONAL EQUIPMENT

C 200,000 AMP WITHSTAND RATING	K BUILT-IN ALARM SYSTEM	R REMOTE AND DELUGE VALVE START
D SEQUENCE START	M MANUAL NON-AUTOMATIC	T WEEKLY TEST
F PUMP RUNNING LIGHT	N PRECISE LOW VOLTAGE SENSOR	X SPECIAL MODIFICATIONS
G SUPERVISORY POWER LOSS START	O PUMP ROOM ALARMS AND SIGNALS	Y MOTOR OVERLOAD ALARM
H 100,000 AMP WITHSTAND RATING	P DIGITAL PRESSURE READOUT	Z HIGH ZONE DELAYED START
J FAILURE TO START ALARM	Q INDIVIDUAL REMOTE CONTACTS	

MODIFICATION CODES

PN - Paperless pressure and alarm recorder	17F - Two extra SPDT sets of contacts to indicate phase reversal
PNT - Network server connection to the Internet (requires PN)	19 - Space heater
PS - Digital pressure switch (requires PN)	20 - Space heater with thermostat
3R - NEMA 3R raintight enclosure	20A - Space heater with humidistat
4 - NEMA 4 watertight enclosure	21 - Lockout relay
4XA - NEMA 4X corrosion resistant, organic coating, watertight encl.	22A - Delayed start
4XB - NEMA 4X corrosion resistant, 304 ss, watertight encl.	32 - Pump room thermostat
4XC - NEMA 4X corrosion resistant, 316 ss, watertight encl.	33 - 115V auxiliary fused power output (200VA)
15 - 300 PSI 316 stainless steel pressure switch and plumbing	34 - Control power loss start
16 - 600 PSI pressure switch	35 - LED lamp test push button
17A - Extra SPDT set of contacts to indicate pump running (1 set std.)	42A - Drive failure contacts (1 SPDT set)
17B - Two extra SPDT sets of contacts indicate pump running	42B - Drive failure contacts (2 SPDT sets)
17C - Extra SPDT set of contacts to indicate AC failure (1 set std.)	43 - Drive failure light
17D - Two extra SPDT sets of contacts to indicate AC failure	45 - Keyed mode selector switch
17E - Extra SPDT set of contacts to indicate phase reversal (1 set std.)	47A - 5% line reactance for drive

ORDERING INFORMATION

When ordering a MASTER electric fire pump controller, specify the following to ensure prompt order entry and delivery:

- Complete MASTER model number
- Motor horsepower
- Motor rated voltage and frequency
- Withstand rating
- Optional equipment
- Special modifications

SHIPPING INFORMATION

Model ECV controllers weigh between 490 lbs (223 kg) and 1500 lbs (682 kg), depending on horsepower and voltage ratings.

Model ECVT controllers weigh between 710 lbs (323 kg) and 1700 lbs (773 kg), depending on horsepower and voltage ratings.

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