

Reliable®

Model C Electronic Accelerator

cULus Listed, FM Approved

Features

- Fast operation of dry-pipe and preaction system valves
- High/Low system air pressure supervision
- Riser mount or wall mount
- Batteries for 90-hr backup within the cabinet
- Trouble & High/Low air solid state relays
- No internal restricted orifices
- No disassembly required when resetting/testing

Product Description

The Reliable Model C Electronic Accelerator is a quick opening device designed to hasten the operation of a dry pipe or preaction system valve once sprinkler activation has occurred. Unlike a conventional mechanical accelerator that uses a series of pressure chambers and restricted orifices to detect drastic pressure changes (which can indicate a sprinkler activation), the electronic accelerator incorporates a circuit board and microprocessor to continuously monitor system pressures via a pressure transducer. The microprocessor monitors the system air pressure at a prescribed sampling rate while continuously evaluating the decay rate of the air pressure. When a minimum specific decay rate is detected across three distinct algorithms the circuit board activates a solenoid valve to release air pressure. Depending on the system configuration, air pressure is either released to the underside of the valve clapper to decrease the pressure differential across the clapper (accelerator configuration) or to atmosphere to vent air from the valve at an increased rate (exhauster configuration).

The elimination of the internal pressure chambers found in mechanical accelerators reduces the risk of clogging due to debris. This eliminates the need to disassemble the unit for cleaning/inspection after system operation or testing.

The integration of two solid state relays allows for system supervisory air pressure monitoring. The air pressure high/low limits can be user set via a rotary switch per the nominal operational pressure of the system.



Model C Electronic Accelerator

Application

NFPA 13 permits the installation of approved quick-opening devices on dry pipe and double-interlock preaction systems. When installed on systems with a capacity over 500 gallons but less than 750 gallons, a requirement to deliver water to a test connection in 60 seconds or less may be waived. When installed on systems with a capacity over 750 gallons, the quick-opening device may accelerate the operation of the dry pipe or preaction valve, allowing maximum time for water transit throughout the piping network. Systems with a capacity below 500 gallons do not generally utilize quick-opening devices.

Notes:

1. Installation of the Model C Electronic Accelerator, or any accelerator, does not guarantee that the water deliver time of the system will meet the requirements of the authority having jurisdiction. Water delivery time is a function of the overall system design and many unique variables impact water transit time in any given system.
2. Where the term "air" is used throughout this bulletin, it shall also include the use of nitrogen or other approved gas.

Technical Specifications

Table A

Maximum Rated Pressure	Air or Nitrogen Pressure Operating Range	Decay Rate for Activation	Power Supply	Batteries	Max. Charging Current	Environmental Limitations
300 psi (20.7 bar)	10-70 psi (0.7 - 4.8 bar)	0.05 psi/sec (0.34 kPa/sec)	120 VAC 60 Hz 0.4A 230 VAC 50 Hz 0.4A	Two 12 VDC (5 AH) for 90-hr backup	156mA	NEMA 2 Indoor Use 40°F to 120°F (4°C to 49°C)

Operation

The Reliable Model C Electronic Accelerator is a microprocessor-based quick-opening device that continuously monitors the air pressure of dry pipe and preaction systems. The accelerator is designed to hasten the operation of the dry pipe or preaction system valve and decrease the time for water to flow from activated sprinklers.

A pressure transducer coupled to the circuit board will recognize a reduction in dry system air pressure that is indicative of sprinkler activation. Algorithms compare system air pressure readings multiple times per second to detect a sustained air pressure drop exceeding the activation threshold. The Model C Electronic Accelerator is designed to operate when the sustained decrease in system air pressure exceeds an activation threshold of 0.05 psi/second. Once this occurs, the solenoid valve in the unit opens and the accelerator exhausts system pressure (or redirects air to intermediate chamber of the dry pipe valve) to facilitate faster activation of the valve. The solenoid valve automatically closes 30 seconds following the operation of the accelerator.

For systems with a properly sized and installed test connection, the Model C Electronic Accelerator will result in a three second valve trip time when the appropriate decay rate is detected. The accelerator will operate (fail safe) anytime the system pressure drops to 5.5 psi (0.4 bar).

The Model C Electronic Accelerator is continuously monitoring system air pressure, therefore, it is important to minimize air pressure fluctuations that could be interpreted as sprinkler activations. This can be accomplished by utilizing a tank-mounted compressor and an approved air maintenance device to minimize false trips and high/low air trouble conditions.

The use of the Model C Electronic Accelerator with tank-less air compressors controlled directly by a pressure switch is not recommended.

The Model C Electronic Accelerator incorporates two normally open solid state relays. The High/Low Supervisory relay closes if the system air pressure increases or decreases past the user designated settings. A ten-position rotary switch is used to set the system air pressure range (Table B).

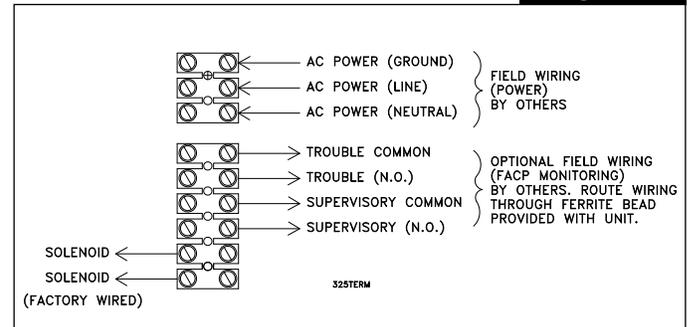
The trouble relay closes and an internal buzzer sounds upon the following events:

- Low Battery
- AC Power Loss
- SET/OFF Switch in OFF (unarmed) Position
- Trip or Alarm Event

Dry contact relays are rated for 3.5A @ 80 VDC.

Terminal Connections

Figure 1



Pressure Settings

Table B

Switch Position	Low Alarm	System Pressure	High Alarm
0	Not Used		
1	10	15	20
2	15	20	25
3	15	25	30
4	20	30	35
5	25	35	40
6	35	45	50
7	45	55	60
8	55	60	65
9	65	70	75

Note: Factory setting is switch position number 3.

Controls and Indicators

- AC Power (Green LED): On steady when AC power is present.
- Battery Trouble (Yellow LED): Fast blink when no battery connected. On Steady for low battery.
- Trouble/Supervisory (Yellow LED): On steady for Trouble. Slow blink for low air pressure condition. Fast blink for high air pressure condition.
- Alarm (Red): Fast blink while ALARM event is occurring. On steady when an ALARM event has occurred.
- SET/OFF Switch (Two Position Switch): Up to ON to place accelerator in the on/armed condition upon reaching operating air pressure. Down to OFF to take accelerator out of service.
- RESET/SILENCE Switch (Three Position Momentary Switch): Up to RESET system after activation. Down to SILENCE to silence the buzzer.
- Buzzer: Alarms whenever a Trouble event occurs, or the system is in an unarmed state.
- Trouble Relay: Closes on any TROUBLE condition.
- High/Low Relay: Closes when system pressure is outside of user defined rotary switch setting.

Installation

WARNING: Electric Shock and Spark Hazards. Use in indoor, dry locations only. Do not use near unvented flammable vapors, liquids, or combustible solids.

Notes:

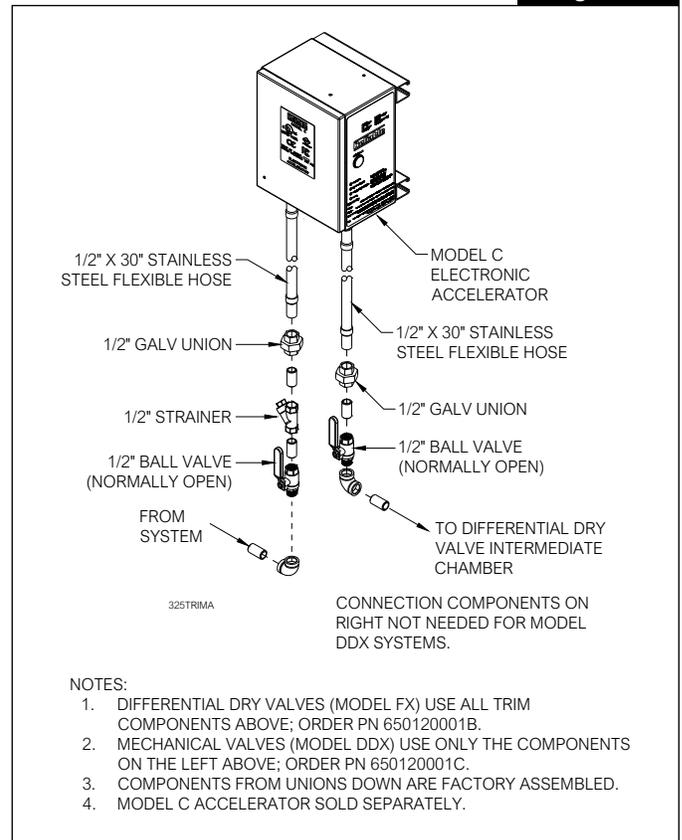
1. When installing or working on the Model C Electronic Accelerator or the corresponding system, the device should be in the OFF (unarmed) position. If not, the system may inadvertently trip.
2. AC power must be hard wired to complete the installation. When connecting conduit or field wiring to the device, AC power must be off.
3. All applicable NFPA and local jurisdiction codes must be followed during installation of this device.
4. When properly installed, the design for the Model C Electronic Accelerator provides reasonable protection against false operation due to limited electromagnetic interference (EMI). See the Listings and Approvals section for further information on electromagnetic compatibility (EMC) testing conducted. Locating the accelerator where strong EMI is present may result in unintended operation of the accelerator.

Installation Procedure

1. Securely mount the accelerator to the system riser or to a structurally sound adjacent wall surface. Strut is provided on the back of the accelerator for mounting the accelerator to the system riser with strut clamps (ordered separately).
2. Connect the accelerator to the dry pipe valve or preaction system valve using the appropriate Reliable Trim Kit (ordered separately). Refer to the installation instructions for the dry pipe valve or preaction system valve for appropriate accelerator port locations. Connection ports are located on the bottom of the accelerator. Use a back-up wrench on the flats of the port when tightening or loosening connections. The accelerator connection port marked "IN" is connected to the valve port that monitors system air pressure. For Model FX dry pipe valves, the accelerator connection port marked "OUT" is connect to the dry pipe valve port for the intermediate chamber. For Model DDX valves, the accelerator connection port marked "OUT" is not used and must be left open to atmosphere. See Figure 2 for trim kit components and connection locations. Ensure that all connections are leak-free before proceeding. **Note:** Avoid the possibility of trapped water in the piping and hoses attached to the device by avoiding low (trapped) sections of pipe and hoses.
3. Attach the supplied battery wiring harness (P/N 98021104, Figure 3) to two batteries, PN 661112200 each (ordered separately). Place the batteries side by side with the terminals arranged as shown in Figure 4. Connect one lead of the white cable on the negative terminal of one battery and connect the other to the positive terminal of the second battery. Next, connect the black cable to the remaining negative terminal and the red cable to the remaining positive terminal.
4. Place the batteries into the battery tray inside the accelerator enclosure. Connect the battery wiring harness to the circuit board via connection J3 on the circuit board. See Figure 5 for location of connector J3.
5. With a small flat head screwdriver, set the rotary switch to the desired system air pressure setting as detailed in Table B.

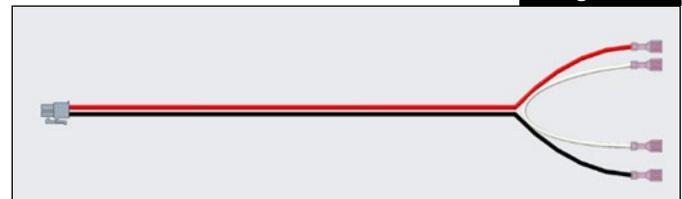
Connection Trim

Figure 2



Battery Wiring Harness

Figure 3



6. If desired or required by local authorities, hard-wired monitoring circuits are available for the Trouble and High/Low Air supervisory relays. Connect monitoring circuits to the appropriate terminal block locations (see Figure 1). Next, route wiring through the ferrite bead provided with the unit, passing through the ferrite bead twice as shown in Figure 6. Finally, route the dry contact wiring out the bottom of the enclosure through the opening provided using an appropriate grommet.
7. Route the AC power line into the enclosure, taking care to provide ¼" space between the AC lines and the power limited wiring within the enclosure. Connect the appropriate wire leads to the terminal block on the circuit board labeled "AC LINE." It is recommended that a dedicated, 15 amp circuit is used to connect to the Model C Accelerator to prevent unintended power loss. Once AC power is delivered to the device the Green AC light, Yellow Trouble/Supervisory light, and the Red Trip Light should illuminate while the buzzer sounds.
8. The buzzer can be silenced by pressing "Silence" on the Reset/Silence momentary switch. Continue to the Setup Procedure to complete installation.

Setup Procedure

1. Place the Set/Off button to the "Off" position. The system is now unarmed. The internal buzzer can be silenced by pressing the Reset/Silence momentary button down at any time.

Note: Placing the toggle switch to the "Off" position disables the solenoid from tripping. If necessary, to completely power down the Model C Accelerator, remove AC power from the device and disconnect the battery backup.

2. Set the dry pipe or preaction system valve according to the manufacturer's bulletin.
3. Verify that the accelerator inlet valve and outlet valve (where present) are open.
4. Fill the system to the appropriate pneumatic pressure as specified in the manufacturer's technical bulletin and set the air/nitrogen supply to automatic operation.
5. When the system has reached the desired pressure allow the pressure to stabilize for 5 minutes. This will prevent unintended operation due to temperature related air pressure fluctuations in the system after filling.
6. Briefly press the Reset/Silence momentary button to the "Reset" position to clear any trip notifications.
7. Place the Set/Off button in the "Set" position. Under normal operation only the green AC power LED should be illuminated.
8. Advise the owner, occupant, central station, or other concerned parties that the system has been placed into service.

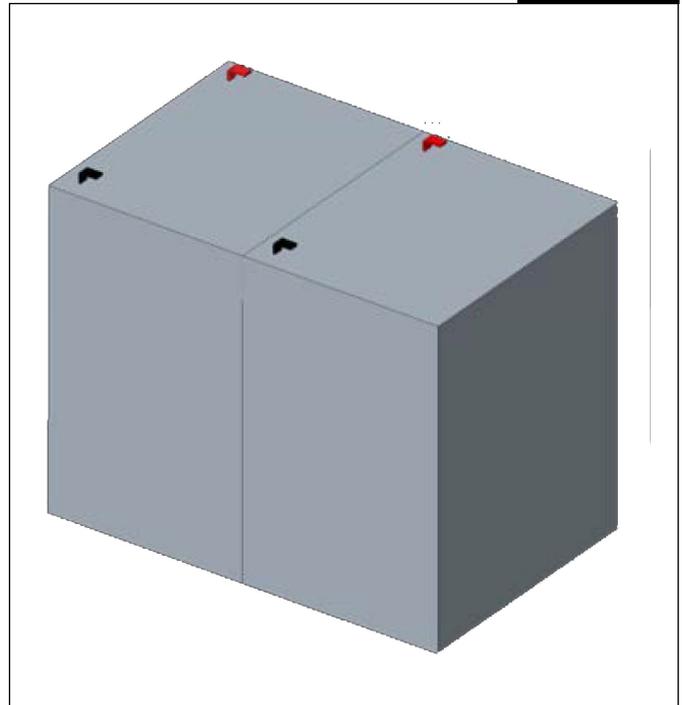
Testing

Partial and full trip tests of systems shall be performed in accordance with NFPA 25 with the Model C Electronic Accelerator in a normal operating condition. When necessary, the accelerator may be tested separately without releasing the dry pipe or preaction system valve by following these steps:

1. Notify the owner, occupants, and/or central monitoring station that testing is being performed on the system.
2. Close the main valve controlling water supply to the system.
3. Open the main drain valve to relieve water pressure below the valve clapper.
4. Open the Inspector's Test Connection. A momentary burst of air from the dry pipe valve's automatic drain valve, or from the discharge fitting of the device (when used on preaction systems) indicates that the Model C Accelerator has operated. Verify that the trip time of the device is the same as in previous tests.
5. Confirm that the following notifications occur:
 - Red Alarm LED activates
 - Amber Trouble/Supervisory LED activates
 - Buzzer sounds
 - High/Low Contacts transfer
6. Following testing, reset the system, and place the Model C Accelerator into operation (see Setup Procedure above).
7. Advise the owner, occupant, central station, or other concerned parties that the system has been placed into service.

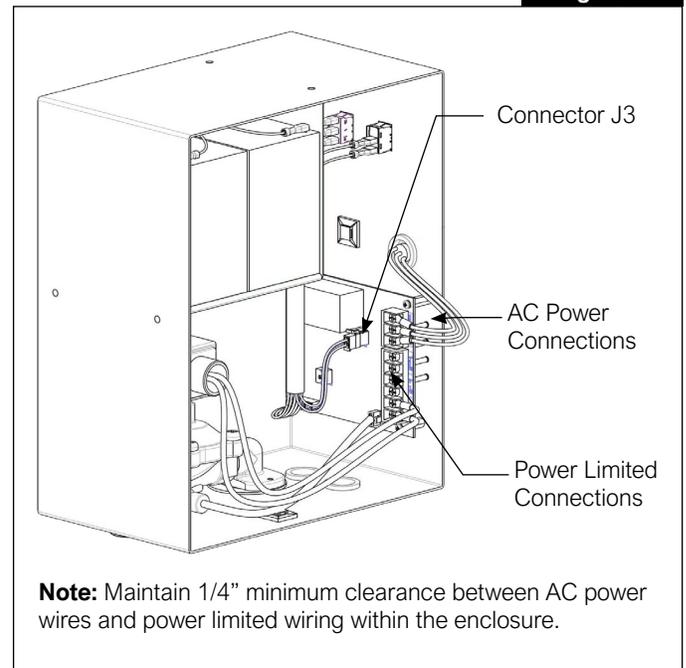
90 Hour Battery Orientation

Figure 4



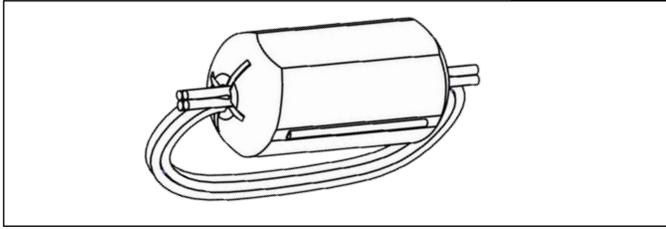
Circuit Board Connection Points

Figure 5



Example of Ferrite Bead Installation

Figure 6



Maintenance

The owner is responsible for maintaining all parts of the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system component out of service may eliminate the fire protection that is provided by the fire protection system.

The Reliable Model C Electronic Accelerator shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing, and Maintenance of Water Based Fire Protection Systems" and NFPA 72, "National Fire Alarm Code" provide minimum requirements. System components shall be tested, operated, cleaned, and inspected in accordance with NFPA 25 and NFPA 72, including but not limited to a quarterly trip test of the accelerator.

Per NFPA 72, a battery load test shall be conducted annually to verify capacity. In addition, a test of the battery supervision shall be conducted semi-annually by disconnecting the lead from a battery terminal, verifying that a battery trouble is indicated and that the internal buzzer sounds, reconnecting the lead to the battery, and verifying that the battery trouble clears and the internal buzzer is silenced.

Listings and Approvals

- cULus Listed to UL 1486, "Quick Opening Devices for Dry Pipe Valves for Fire Protection Service"
- FM Approved to FM 1031, "Quick Opening Devices (Accelerators and Exhausters) for Dry Pipe Valves"

The Reliable Model C Electronic Accelerator is cULus Listed and FM Approved for Indoor/Dry use with all sizes of the following Reliable valves/systems:

- Model FX Dry-pipe Valve
- Model DDX-LP Dry-pipe Valve
- Model DDX Type F Double Interlock Preaction System
- Model DDX Type PL Double Interlock Preaction System

The maximum system size permitted by UL is 1,690 gallons (6,400 Liters). For information regarding the size of the sprinkler system for FM, see FM Global Property Loss Prevention Data Sheet 2-0 Installation Guidelines for Automatic Sprinklers.

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CE Compliance Statement

The Reliable Model C Electronic Accelerator is in conformance with the following EMC Directive: 2014/30/EU. Compliance with this directive has been assessed by demonstrating compliance with the following harmonized standards: EN 50130-4:2011 and EN 55011 Class A.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

- Model C Electronic Accelerator
- Battery: PN 6611112200 (2 required)
- Trim Kit
 - [FX Valve: PN 650120001B]
 - [DDX Valve: PN 650120001C]
- Strut Clamp (2 required; specify size)