Badger Meter

Admix Controller

Model AC-151

CTL-UM-01204-EN-02 (October 2014)

User Manual

CONTENTS

SCOPE OF THIS MANUAL

This manual contains information concerning the installation and operation of the Model AC-151 Admix Controller. To ensure proper performance of this controller, the instructions given in this manual should be thoroughly understood and followed. Keep this manual in an accessible location for future reference.

DESCRIPTION

The controller is designed to provide control functions for a single unit admixture dispensing system or a direct-feed dispenser system. Enclosed in a non-metallic enclosure rated NEMA 4X, this unit provides manual and automatic operation modes, front panel indication for zero, fill, fill complete, discharge, and overfill. Special features include discharge hold, remote operation, time delay discharge, time discharge, and batching in ounces or ounces per 100/wt.

SPECIFICATIONS

Power Supply	117V AC ±10%
	Power entry module with power cord & Off/on switch provided
Enclosure	Non-metallic NEMA 4X rated Three 1/2" threaded conduit openings One 3/4" threaded conduit opening
Front Panel Switches & Display	Membrane switch with feedback and LED indication.
Outputs	Fused I/O module, 117V AC 5 Amp max. For fill and discharge solenoid valves.
Inputs	117V AC for zero, overfill, and meter. Controller requires probe amplifier for interface between dispenser and itself.
Display	4 character LED

UNPACKING AND INSPECTION

Upon opening the shipping container, visually inspect the product and applicable accessories for any physical damage such as scratches, loose or broken parts, or any other sign of damage that may have occurred during shipment.

NOTE: If damage is found, request an inspection by the carrier's agent within 48 hours of delivery and file a claim with the carrier. A claim for equipment damage in transit is the sole responsibility of the purchaser.

OPERATIONAL CONSIDERATIONS

The controller requires a Badger Meter® Model DP-10 Probe Amplifier or a probe amplifier of equal operation. The dispenser level probes cannot be directly connected to the controller. Doing so may result in personal injury.

The controller also requires a scalable type pulse transmitter. The controller counts pulses from the transmitter. If the transmitter is set for 16 ounces per pulse, then each count on the controller will equal 16 ounces. These instructions are based on a meter pulse rate of 1 ounce per pulse.

INSTALLATION

The controller can be installed wherever convenient for operation of the batching process.

The controller is enclosed in a rugged non-metallic enclosure rated NEMA 4X and intended for desk or wall mounting.

To mount the enclosure to a desk or other working surface:

1. Using a flat-head screwdriver, loosen the four mounting brackets on the back of the enclosure.
2. Turn the mounting ears to the desired position.
3. Re-tighten the screws and mount the enclosure.

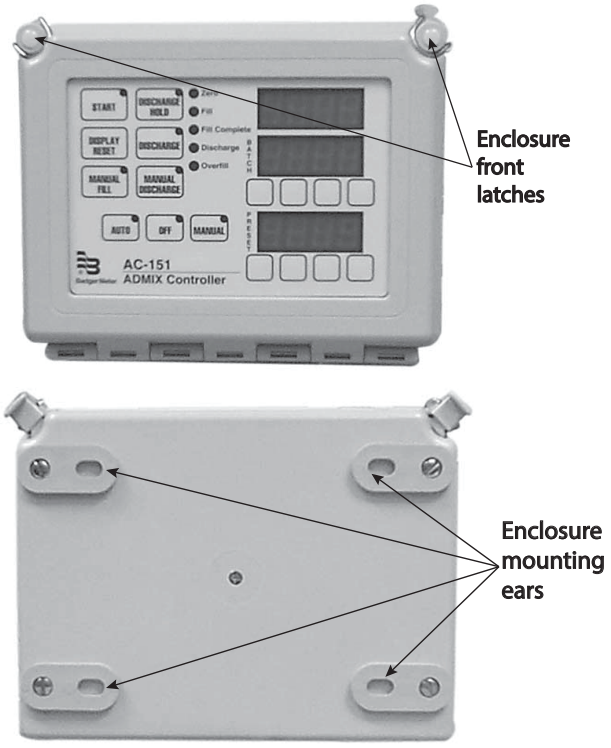


Figure 1: Enclosure

WIRING PROCEDURE

The AC-151 Admix Controller is designed to be used in conjunction with the Badger Meter Model DP-10 Probe Amplifier (or a probe amplifier of equal operation), Badger Meter Models PFT-1E Electronic Scalable Transmitter, PM-5 Reed Switch Transmitter, and CT Reed Switch Transmitter.

The terminal strip inside the controller contains 14 terminals for wire connections. The terminal strip is a plug-in type that can be removed from the controller circuit board for ease of making connections.

The controller is equipped with a power entry module for the main power supply. Included in the package is a power supply cord. Connect the female end of this cord to the power entry module. Plug the opposite end into a standard 15 Amp 117V AC outlet.

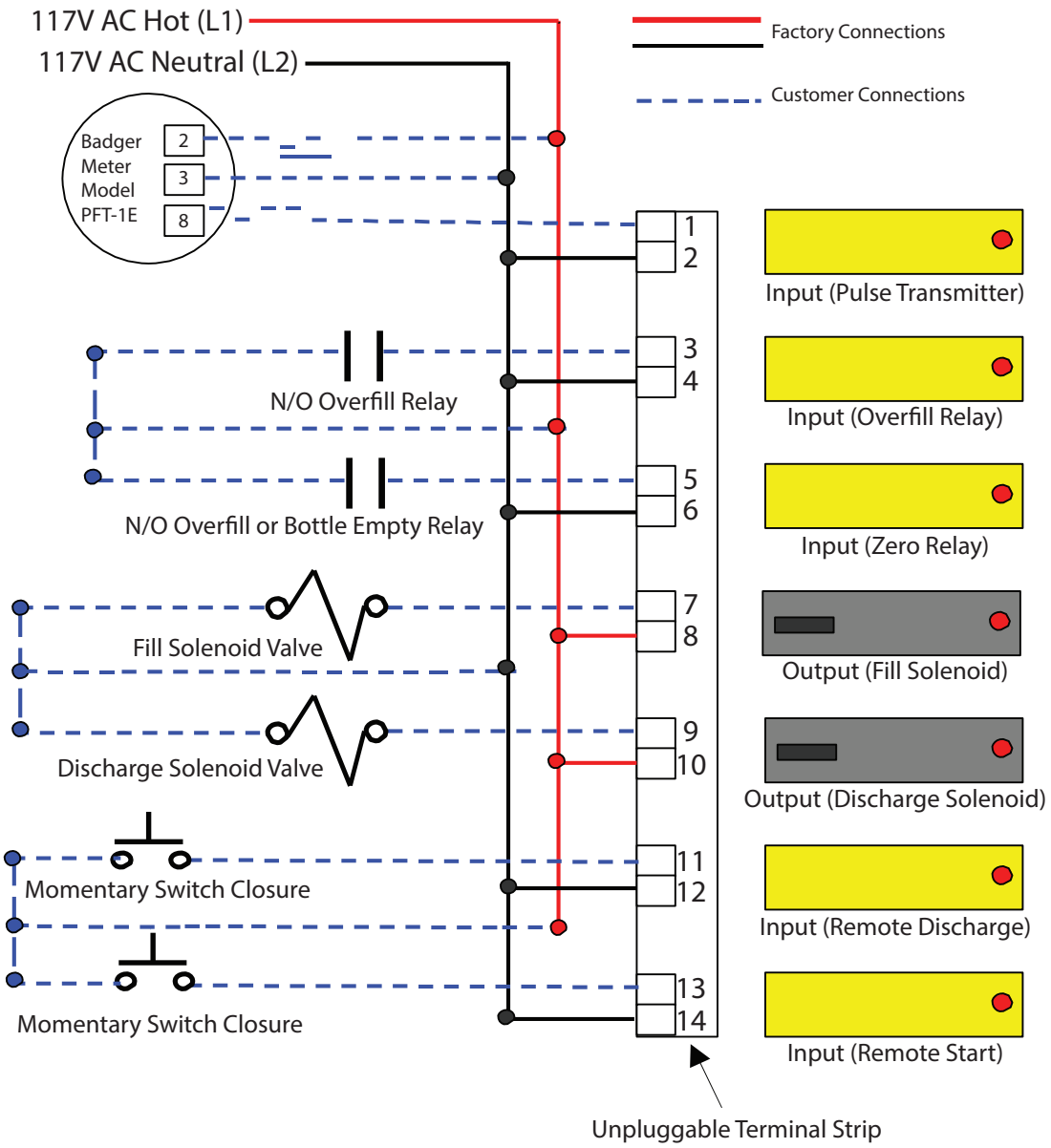


Figure 2: AC-151 controller wiring connections

OPERATING THE CONTROLLER

The AC-151 Admix Controller can be operated in Manual or Automatic mode by setting the switches on the front panel.

Manual Operation

1. Press the **MANUAL** switch. The LED switch light illuminates when the switch is ON.
2. Press the **MANUAL FILL** switch. This switch is a momentary switch and stays on only while being pressed. When Manual Fill is on, the Fill indicator light illuminates to indicate the controller is in the fill cycle. While filling, the Zero light illuminates to indicate that admixture is in contact with the zero probe.

Also during the fill cycle, the meter pulse count shows on the top display of the controller.

3. To discharge, press the **MANUAL DISCHARGE** switch. This switch is a momentary switch and stays on only while being pressed. The discharge cycle stays activated until you release the switch.

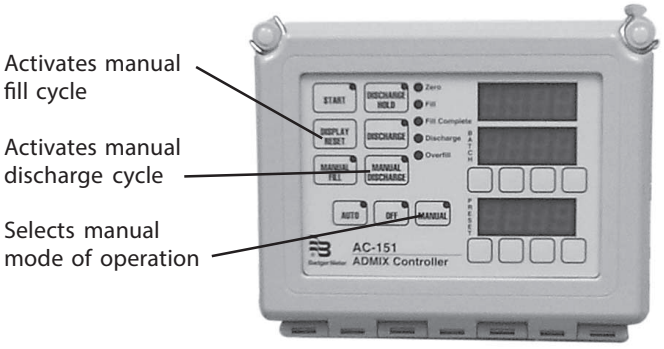


Figure 3: Manual mode switches

Automatic Operation

The controller allows three ways of presetting an admixture dosage:

- Total ounces per batch
- Ounces per 100/wt of cement
- Ounces per cubic yard of concrete

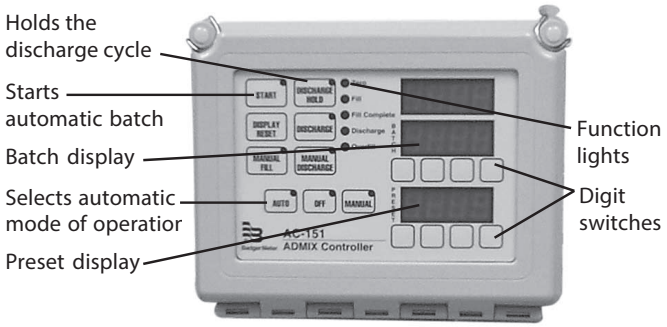
Use the front panel switches to preset a dosage:

1. Press the **AUTO** switch. The switch light illuminates when the switch is ON.
2. Preset the admixture dosage:
   - ◊ To set *total ounces per batch*, use the four digit switches below the Preset display to select the total number of ounces required (0000…9999). Hold down the digit switches to scroll through the numbers. The controller is ready for automatic operation.
   - ◊ To set *ounces per 100/wt of cement*, use the four digit switches below the Batch display to select the total cement weight. As you set the amount, a decimal point appears between the second and third digits on both the Batch and Preset displays. Use the Preset display to select the number of *ounces per 100/wt of cement*. (Example: For 3500 lb of cement @ 2-1/2 oz, set the Batch display to **35.00** and the Preset display to **02.50**.) After you set these two displays, the total ounces required shows on the top display.
   - ◊ To set *ounces per cubic yard,* use the same procedure as *ounces per 100/wt of cement*. (Example: For 8-1/4 yards of concrete @ 22-1/2 ounces per yard, set the Batch display to **08.25** and the Preset display to **22.50**.)
3. To begin the automatic batch mode, press and release the **START** switch. The Fill light illuminates to indicate the controller is in the fill cycle. The Zero light illuminates to indicate that admixture is in contact with the zero probe. The top display shows the number of pulses received from the flow meter transmitter.

When the preset amount is reached, the Fill light turns off and Fill Complete illuminates.

The controller activates the discharge cycle and the Discharge light illuminates. The discharge cycle ends when admixture drops off the zero probe. All function indicator lights turn off and the controller resets itself for the next batch.

4. To hold the discharge cycle, press the **DISCHARGE HOLD** switch. The light on this switch illuminates when the switch is ON.



OPERATIONAL FEATURES

The AC-151 Admix Controller is equipped with four operational features:

- Delay discharge
- Time discharge
- Remote start
- Remote discharge

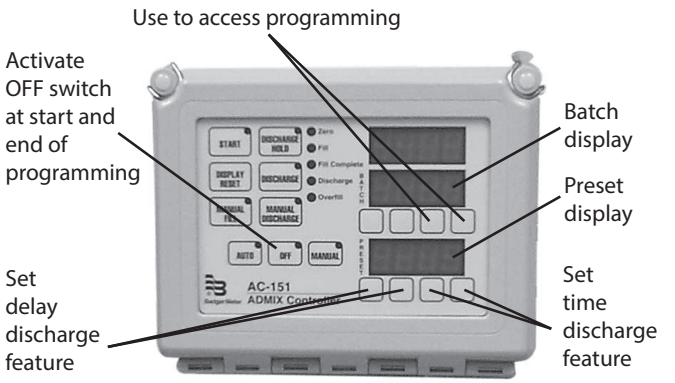


Figure 4: Rotary switches for time-discharge and time-delay-discharge features

Delay Discharge

The Delay Discharge feature is operator settable from 0…99 seconds. The delay discharge timer begins timing at the beginning of the automatic discharge cycle.

At the end of the timing cycle, the Automatic Discharge will begin. To set this feature:

1. Press the **OFF** switch on the front panel. The switch light illuminates and the three displays go blank.
2. Press the right-most digit switch under the Batch display and then immediately press the second-from-right digit switch under the Batch display. The displays light up to indicate the controller is in Program mode.
3. Using the two left digit switches under the Preset display, set the delay discharge timer (00…99 seconds).
4. Press the **OFF** switch to store the time setting into the processor.

Time Discharge

The Time Discharge feature is operator settable from 0…99 seconds. The delay discharge timer begins timing at the end of the automatic discharge cycle, keeping the discharge cycle on for the set time period. Use this feature to empty discharge lines after each batch.

To set this feature:

1. Press the **OFF** switch on the front panel. The switch light illuminates and the three displays go blank.
2. Press the right-most digit switch under the Batch display and then immediately press the second-from-right digit switch under the Batch display. The displays light up to indicate the controller is in Program mode.
3. Using the two right digit switches under the Preset display, set the time discharge timer (00…99 seconds).
4. Press the **OFF** switch to store the time setting into the processor.

NOTE: When using the Time Discharge feature, a wiring change may be required. The discharge output from the AC-151 controller will need to be connected directly to the discharge solenoid valve rather than the discharge input on the Badger Meter Model DP-10 Probe Amplifier.

Remote Start

The Remote Start feature requires a momentary switch closure. If the remote start source is a voltage signal, an external relay may be needed to interface between the remote source and the AC-151 controller. See *"Wiring Procedure" on page 4* for remote start wiring.

After you wire the remote start, turn on the **AUTO** switch. The switch light illuminates when the switch is ON.

Remote Discharge

The Remote Discharge feature requires a momentary switch closure. If the remote signal source is a voltage signal, an external relay may be needed to interface between the remote source and the AC-151 controller. See *"Wiring Procedure" on page 4* for remote start wiring.

After you wire the remote start, turn on the **AUTO** switch. The switch light illuminates when the switch is ON.

To activate the remote discharge feature:

1. Place a jumper between the two pins of the J3 jumper (located on the front half of the circuit board inside the controller).
2. Turn on the **AUTO** switch. The switch light illuminates when the switch is ON.

SAFETY FEATURES

The AC-151 Admix Controller has two safety features to aid in overdose protection:

- Overfill protection
- Fail-safe

Overfill Protection

The Overfill Protection feature requires a normally open relay contact for operation. See *"Wiring Procedure" on page 4* for connection of the overfill relay. When admixture comes in contact with the overfill probe, the overfill relay closes, sending a signal to the controller. The controller stops the fill cycle, which prevents an overflow. If this condition occurs, place the controller in manual mode of operation, and manually discharge the admixture.

NOTE: The overfill feature stops the fill cycle *electrically* and does not protect from an overfill condition that happens due to a *mechanical* failure.

Fail-Safe

The Fail-Safe feature requires no customer connections for operation. This feature is pre-programmed from the factory. The fail-safe protects against flow meter failure. After the controller's automatic batch is activated, the flow meter must send a pulse within a 5-second time period. If no pulse is received, the controller shuts down and shows FAIL on the top display. The fail-safe also monitors the meter pulse during the fill cycle. If there is a 5-second hesitation between pulses, the fail-safe feature engages.

When this occurs, place the controller in manual mode and operate it manually until the flow meter problem is corrected.

Control. Manage. Optimize.

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