



# ADVANCED WATER ENGINEERING, INC.

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## COOLING TOWER TDS/BIOCIDE CONTROLLERS

AWEW Model MCFB-2E

### I. General

A. Provide in a single enclosure, a microprocessor based controller for use on recirculating cooling towers.

#### 1. The controller shall:

- a. Accurately control the level of dissolved solids in terms of electrolytic conductivity, measured in microSiemens (mS/cm)
- b. Allow for proportional feed on inhibitor chemicals based on make up water entering the system as measured by a contacting head water meter.
- c. Not require any battery backup, but shall store all pertinent information and programs for up to 10 years without being plugged in to electricity.
- d. Accept incoming line voltage from 95 to 135 VAC without requiring modification.
- e. Have an individual status Led for each output relay.
- f. Have selectable high/low alarm indicator, adjustable through the menu.
- g. Have a security code to prevent unauthorized changes to the program.
- h. Have accuracy of +/- 1% at point of measure excluding the electrode.
- i. Have on-board diagnostics to confirm proper operation of unit.
- j. Have dual biocide timers for biocide control.

## II.Product

A.Controller shall consist of a AWE Model MCFB-2E or equivalent.

- 1.Shall be housed in a NEMA 4X Type thermoplastic enclosure with dimensions being W 7" X H 6.5 X D 4.2" comes complete with:
  - a.A hinged, gasketed Lexan viewing door.
  - b.Padlockable door.
  - c.An 8-ft., 3 wire input power cord with molded plug.
  - d.Prewired 11" receptacle cords with molded female plugs for connection of electrical devices to be controlled.
- 2.Controller shall have an externally mounted flow sample stream assembly that is easily removable from the side of the enclosure and will include:
  - a.Flow switch that will disable the control outputs if there is no flow in the sample stream.
  - b.Provides a sample water port.
  - c.Electrode will be secured in the sample stream piping with a threaded hand nut with O-ring seal that requires no tools for assembly.
- 3.Controller shall have complete key pad control and shall consist of:
  - a.Unit shall be 100% adjustable through keypad, no mechanical adjustment will be required.
  - b.Keypad shall have 20 keys that are tactile dome sealed style.
  - c.Shall have override control of all relays through the keypad.
- 4.The controller shall utilize microprocessor technology including:
  - a.High resolution 12-bit A/O converter
  - b.Real time clock.
  - c.Menu driven program for ease of operation.
- 5.Display on controller shall be 1 X 16 character alpha numeric, vacuum florescent.
- 6.Conductivity monitor and control:
  - a.Shall provide linear measurements of the full controller range.

- b. Readings will be in increments of 1 MicroSiemen/cm with an adjustable deadband, or hysteresis.
- c. Temperature compensated conductivity readings will be displayed after active measurement of the conductivity and the temperature.
- d. Bleed off shall be controlled in the following manner. The controller activates a blowdown valve whenever conductivity exceeds the control level set.

7. Chemical feed control - four inhibitor feed modes shall be provided and the unit will be capable of operating in one of the following field programmable modes.

a. Counter timer - chemical feed proportional to make up water added.

i. Controller shall operate a feed relay or closure of a dry contact.

ii. Controller shall count contacts or switch closures from a contacting head water meter with a range of 0-999 counts. Upon completion of programmable counts will start the feed timer for a selected time then reset automatically for the next cycle.

iii. Contacts made shall be totalized and count capable of being reset.

b. Percentage timer - Chemical feed can be set to feed based on adjustable percentage of time.

c. After blow down percentage timer. Controller tracks the amount of time that the bleed off is activated and turns on a chemical pump for a percentage of that time.

d. Feed limit timer - Chemical feed can be limited to a preset amount of time for each bleed cycle.

8. Shall provide a 28 day programmable timer for the automatic addition of two separate biocides on a user selectable basis. Each timer shall provide two on and off programs for each of two biocides.

a. Each of the two timers shall be programmable to run every day, every other day, once per week, once every other week, or on even or odd weeks only of the 4 week (28 day) cycle.

b. Pump run times shall be programmable from 2 minute to 6 hours in one-minute increments.

- c. A programmable conductivity prebleed timer will be included. The purpose is to open the bleed valve for a user programmed time period prior to any biocide addition by either timer. This pre-bleed timer can have a run time from 1 minute to 6 hours programmable in one-minute increments.
- d. A post-feed bleed lock out timer is also provided. this programmable time function allows the operator to prevent the bleed valve from opening for a programmable length of time following the addition of biocide from either timer. This timer shall be programmable from one minute to six hours, in one-minute increments.

The system should also utilize two AWE-Plusa C+ 12 GPD chemical feed pumps or equivalent, one for biocide and the other for single component scale/corrosion control.