Use this Specification Template to develope a specification to be used for requesting a quote or defining a job work description.

This document is a framework for creating a specification. It may contain more or it may contain less information than you need. Review the document and determine how to edit it by adding or deleting information to make it specific to the job you to which you want it to apply.

For example, under “Chemical Dosing Pumps, what GPD do you want? Is the pump on/off, pulsed, or modulated? Does it have stroke and frequency adjustments?

For additional assistance, you can contact Lakewood and ask for the Application Engineer.

Lakewood Instruments, LLC, 7838 N. Faulkner Rd, Milwaukee, WI 53224

Tel. 800-228-0839 or by E-mail at csd@lakewoodinstruments.com

Specification
for
COOLING WATER TREATMENT
Conductivity

Sections

A. General description

Contractor shall install a complete water treatment system consisting of a Model 1575e controller, sensors, plumbing and associated water meters, valves and chemical pumps as manufactured or supplied by Lakewood Instruments. The system shall have a two year warranty on electronics and one year warranty on sensors for defects in workmanship and consist of the following items as specified herein:

1. Model 1575e with selective control features
2. Blowdown valve assembly
3. Flow totalization for makeup and blowdown
4. Flow meter to totalize makeup
5. Flow meter to totalize blowdown
6. Drum Level Switches
7. Chemical Dosing Pumps

B. Specifications

1.0 Conductivity control of blowdown shall include the Lakewood Instruments Model 1575e Controller.

- 1.1 The blowdown valve shall open when conductivity exceeds a setpoint which may activate on above or below the setpoint, or when makeup gallons reach desired setting to blowdown (User choice).
- 1.2 The conductivity sensor shall be of two-electrode design.
- 1.3 The controller will shut off all powered outputs on a no flow condition.
- 1.4 The controller will be UL/CSA/CE Listed
- 1.5 The enclosure shall be Nema 4X.
- 1.6 Front panel shall have six LED indicator lights
  - 1.6.1 One Green Power On Indicator
  - 1.6.2 One Red Alarm Indicator
  - 1.6.3 Four Amber Relay On/Off Indicators

2.0 Controller Functions and Features

- 2.1 Sensor- Conductivity

Two-electrode	Carbon tips
Temperature compensation	Automatic
Reading Accuracy	+/- 1% full range
Range	0 to 10,000 uS
Body	PVC
Sensor removal	Twist lock ring. No tools required.

2.2 Relay control shall be automatic or manual, menu selectable and include an automatic time-out feature in manual mode. Relay operation shall be user programmable and include the following at a minimum:

A. Relay One, Blowdown dedicated
   By set point
   By makeup totalized gallons (Does not require sensor assembly)
B. All other relays
   By set point
   By percent of blowdown time after blowdown
   By makeup totalized gallons
   By blowdown totalized gallons
   By percent of time
   By schedule by Date and Time, with lockout and pre-bleed.
   By Alarm condition

2.3 Setpoints and calibration shall be retained in the event of loss of power.

2.4 Flow meter totalizer shall display both makeup and blowdown flow totals to enable the user to calculate actual cooling tower evaporation.

2.5 Biocide feed by use of Real Time Clock (RTC). Clock time and day shall be displayed for the schedule. Biocide shall feed on a programmed number of days cycle or by day of the week.

2.6 Keyboard and display

- Keypad 16 button, steel domed, tactile membrane type
- Display Illuminated 128x64 Pixel LCD

2.7 Alarms A relay contact shall be selectable to either feed biocide or to alarm on the following conditions.

High/low conductivity
Time exceeded
No flow
Temperature compensation not working
Drum Switch, one and two

The high conductivity alarm shall cause the blowdown relay to activate.

2.8 Inputs:

- Conductivity, one
- Water meter, two - Watermeters inputs shall be user programmable and capable of using:
  - Dry contact water meters
  - Autotrol Turbine 1" or 2" Inputs
  - Paddle wheel with K factor
- Flow switch, one
- Drum switch, two (Model DS)

- Remote 4-20MA input for transmitted conductivity signal. This requires a remote sensor and transmitter (User provided) and disables the normal conductivity sensor input.

2.9 Outputs:

2.9.1 Four relays rated at 115/220 VAC. Shipped with removable hanging outlets. Relay ratings, 3 AMP per relay, 10 amps total for the set of four relays. 1/5 HP motor max. The set of relays is fused by a common 10 AMP fuse.

2.9.2 A single 4-20mA signal that tracks conductivity. Operating range user configurable, manual stepped operation from menu. Calibration can be performed in the field.

2.10 Integral flow switch, flow sight and back check valve shall be included in the plumbing assembly.

2.11 Power ratings 120/240 VAC 50/60 Hz.

2.12 The controller will have a security code to prevent unathorized program changes.

3.0 Blowdown valve assembly.

(Specify the valve size, type and brand)

4.0 Flow meter to totalize makeup or blowdown

(Specify the meter size, type, and brand)

5.0 Chemical Dosing Pumps

(Specify the pump size, type, and brand)

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Specification
for
BOILER WATER TREATMENT
Conductivity

Sections

A. General description

Contractor shall install a Boiler control system consisting of a Model 1575e as manufactured by Lakewood Instruments, LLC and its associated sensors, plumbing, water meters, valves and chemical pumps. The system shall have a two year warranty on electronics and one year warranty on sensors for defects in workmanship and consist of the following items as specified herein:

8. Model 1575e with selective control features
9. Motorized Ball valve assembly (Manufacturers Warranty Applies)
10. Plumbing for blowdown and conductivity sampling lines
11. Flow meter to totalize makeup
12. Drum Level Switches
13. Chemical Dosing Pumps

B. Specifications

1.0 Conductivity control of blowdown shall include the Lakewood Instruments Model 1575e Controller.

- 1.1 The Motorized Ball valve shall open and close according to the desired control scheme. The two schemes are Sample/Cycle or Continuous Blowdown (User choice).
- 1.2 The conductivity sensor shall be of two-electrode design.
- 1.3 The controller will shut off all powered outputs on a no flow condition.
- 1.4 The controller will be UL/CSA/CE Listed
- 1.5 The enclosure shall be Nema 4X.
- 1.6 Front panel shall have six LED indicator lights
  - 1.6.1 One Green Power On Indicator
  - 1.6.2 One Red Alarm Indicator
  - 1.6.3 Four amber Relay On/Off Indicators

2.0 Controller Functions and Features

- 2.1 Sensor- Conductivity

Two-electrode	416 SS
Temperature compensation	None
Reading Accuracy	+/- 1% full range
Range	0 to 10,000 uS
Body	Carbon Steel
Insulator	Peek
Pressure rating	600 PSI
Temperature rating	486 ° F
Sensor removal	NPT Fitting
Process Thread	¾ Inch MNPT

2.2 Relay control shall be automatic or manual, menu selectable and include an automatic time-out feature in manual mode. Relay operation shall be user programmable and include the following at a minimum:

A. Relay One, Blowdown dedicated
   By Sample/Cycle. A timed sample taken at the end of each cycle. If above setpoint at end of sample, continues to blowdown to satisfy setpoint.
   By set point from Continuous Sample monitoring.
   By makeup totalized gallons (Does not require sensor assembly)

B. All other relays
   By set point
   By percent of blowdown time after blowdown
   By makeup totalized gallons
   By blowdown totalized gallons
   By percent of time
   By schedule by Date and Time, with lockout and pre-bleed.
   By Alarm condition

2.3 Setpoints and calibration shall be retained in the event of loss of power.

2.4 Scheduled feeds feed by use of Real Time Clock (RTC). Clock time and day shall be displayed for the schedule. Scheduled feed shall be on a programmed number of days cycle or by day of the week.

2.6 Keyboard and display

- Keypad 16 button, steel domed, tactile membrane type
- Display Illuminated 128x64 Pixel LCD

2.7 Alarms. A relay contact shall be selectable to either feed biocide or to use to alarm on the following conditions.

High/low conductivity
Time exceeded
Drum levels, one and two
No Flow
The high conductivity alarm shall force the blowdown relay to activate.

2.8 Inputs:

- Conductivity, one
- Water meter, two Watermeters inputs shall be User programmable and capable of using:
  - Dry contact water meters
  - Autotrol Turbine 1” or 2” Inputs
  - Paddle wheel with K factor
- Drum level switch, two
- Remote 4-20MA input for transmitted conductivity signal. This requires a remote sensor and transmitter (User provided) and disables the normal probe input.
- No Flow input. This requires a normally open dry contact that opens on a loss of flow.

2.9 Outputs:

2.9.1 Four relays rated at 115/220 VAC. Shipped with removable hanging outlets. Relay ratings, 3 AMP per relay, 10 amps total for the set of four relays. 1/5 HP motor max. The set of relays is fused by a common 10 AMP fuse.

2.9.2 A single 4-20mA signal that tracks conductivity. This output will be either isolated or non-isolated based on need. Operating range user configurable, manual stepped operation from menu. Calibration can be performed in the field.

2.10 Power ratings 120/240 VAC 50/60 Hz.

2.12 The controller will have a security code to prevent unauthorized program changes.

3.0 Motorized Ball Valve.

The motorized Ball valve shall the MBV1 (1/2” Plumbing) or MBV2 (3/4” Plumbing) or equivalent in materials, construction and operation.

Body	Carbon steel
Rating	400 PSI
Seals	Reinforced TFE
Ball	316 SS

4.0 Flow meter to totalize makeup.

(Specify flow meter size, type, and brand)

5.0 Plumbing

Plumbing shall be installed per Lakewood Instruments drawings and instructions. It shall match the plumbing designs available from Lakewood Instruments. An orifice union or Globe valve is required to provide backpressure and must be mounted per the installation drawing. Cycle Sample layout and/or Continuous Sample layout plumbing shall be set-up by using the Lakewood Instruments PLKT plumbing kit.

6.0 Chemical Dosing Pumps

(Specify size, type, and brand)

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