

Use this Specification Template to develop 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
pH**

Sections

A. General description

Contractor shall install a complete water treatment system consisting of a Model 1520-30e 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 1520-30e with selective control features
2. Flow totalization
3. Flow meters to totalize makeup water meter inputs
4. Drum Level Switches
5. Chemical Dosing Pumps

B. Specifications

1.0 pH control of acid/caustic feed shall include the Lakewood Instruments Model 1520-30e Controller.

- 1.1 The selected relays shall operate when pH exceeds a setpoint which may activate on above or below the setpoint, or when makeup gallons reach a desired setting (User choice).
- 1.2 The pH sensor shall be a single glass combination electrode incorporating a solution ground.
- 1.3 The controller will shut off all powered outputs on a no flow condition.
- 1.4 The controller shall 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- pH

Sensor – Solution Ground	Glass Bulb
Temperature compensation	None
Reading Accuracy	+/- 1% full range
Range	0 to 14 pH
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:

All relays

- By set point
- 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 meter one and meter two flow totals.

2.5 Scheduled feed by use of Real Time Clock (RTC). Clock time and day shall be displayed for the schedule. Chemicals 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 use to alarm on the following conditions.

High/low pH

Time exceeded

No flow

Temperature compensation not working (When used with 520 Series pH sensor)

Drum Switch, one and two

2.8 Inputs:

- pH, 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 pH signal. This requires a remote sensor and transmitter (User provided) and disables the normal probe 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 pH. 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 unauthorized program changes.

3.0 Flow meter to totalize water flow inputs (e.g. make-up)

(Specify the meter size, type, and brand)

4.0 Chemical Dosing Pumps

(Specify the pump size, type, and brand)

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**Specification
for
COOLING WATER TREATMENT
ORP**

Sections

A. General description

Contractor shall install a complete water treatment system consisting of a Model 1520-30e 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:

6. Model 1520-30e with selective control features
7. Flow totalization
8. Flow meters to totalize makeup water meter inputs
9. Drum Level Switches
10. Chemical Dosing Pumps

B. Specifications

1.0 ORP control of halogens feed shall include the Lakewood Instruments Model 1520-30e Controller.

- 1.1 The selected relays shall operate when ORP expressed as millivolts exceeds a setpoint which may activate on above or below the setpoint, or when makeup gallons reach a desired setting (User choice).
- 1.2 The ORP sensor shall be a single glass combination electrode incorporating a solution ground.
- 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- ORP

Sensor – Solution Ground	Glass Bulb
Temperature compensation	NONE
Reading Accuracy	+/- 1% full range
Range	-2000 to +2000 Millivolts
Body	PVC
Sensor removal	Twist lock ring. No tools required.

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

All relays

By set point

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 meter one and meter two flow totals.

2.5 Scheduled feed by use of Real Time Clock (RTC). Clock time and day shall be displayed for the schedule. Chemicals 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 halogens or to to use to alarm on the following conditions.

High/low ORP

Time exceeded

No flow

Drum Switch, one and two

2.8 Inputs:

- ORP expressed as millivolts, 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 ORP signal. This requires a remote sensor and transmitter (User provided) and disables the normal probe 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 ORP. 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 unauthorized program changes.

3.0 Flow meters to measure water flow inputs (e.g. make-up)

(Specify the meter size, type, and brand)

5.0 Chemical Dosing Pumps

(Specify the pump size, type, and brand)

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