MARLEY®

user manual

MarleyGard CD sensors | measuring components

INSTALLATION - OPERATION - MAINTENANCE

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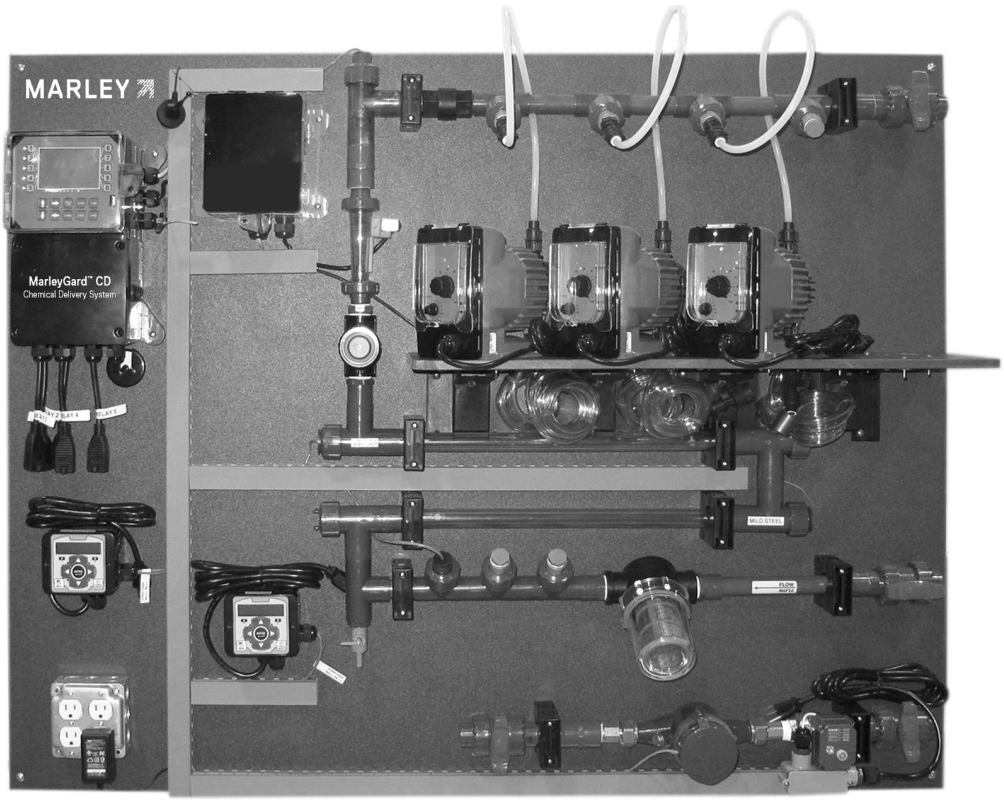
READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.



installation - maintenance

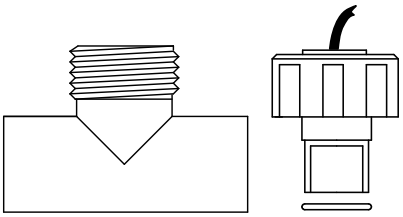
Description

These instructions are intended to assure that field connections are completed properly and the MarleyGard CD chemical delivery system operates for the maximum time possible. Since product warranty may depend on your actions, please read these instructions thoroughly prior to operation.

If you have questions about the operation and/or maintenance of this system and you do not find the answers in this manual, please contact your Marley sales representative.

Conductivity Probe

The conductivity probe is used to measure either solution conductivity or total ion concentration of water samples being investigated. The probe is constructed of PVC with carbon sensor tips installed in a quick release tee. Maximum prssure is150 psi (10.4 bar), 140°F (60°C).



Conductivity Electrode Cleaning Procedure

To determine the required cleaning frequency, record the reading on the controller before the electrode is removed for cleaning. After cleaning, record the new reading. If a change is observed in the two readings, the electrode was dirty. The more significant the change, the dirtier the electrode. If no change occurs, cleaning needs to be done less often.

1. Record the current conductivity reading.
2. Turn off water flow through the electrode loop, bleed pressure from the line and remove electrode.
3. Use a clean cloth and a mild cleaning solution to remove loose dirt etc., from the flat surface of the electrode.
4. If the electrode has deposits such as scale attached to the electrode surface a more aggressive cleaning approach will be needed. There are several ways

to do this, the preferred method being the one that is easiest for the user.

a. Use a mild acid solution to dissolve deposits.

b. Lay a piece of sandpaper (200 grit or finer) on a flat surface such as a bench top. “Sand” electrode to remove stubborn deposits. (Do not wipe surface with your finger.) Oil from your skin will foul carbon tips.

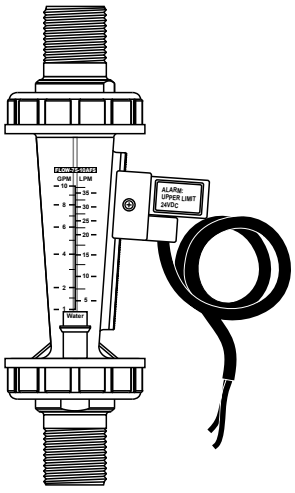
5. Reinstall the electrode in the system. After the reading stabilizes, calibrate the unit to a reliable test reading.

Many times an electrode can appear to be clean, but the unit still cannot be calibrated. If this is the case, use one of the more aggressive electrode cleaning procedures listed in step 4 above.

Recheck the calibration after completion of this procedure. If no change was observed in the reading, replace the electrode. If a change occurred but the unit still will not calibrate, repeat procedure as many times as necessary.

Flow Meter

The flow indicator switch offers visual flow rate indication and an adjustable flow alarm to close AC electrical circuits, trigger warning lights, or activate other process control equipment. Flow indicator 0-10 gpm (0-35 L/s), adjustable flow switch, ¾" MNPT, PVC assembly with polysulfone body. Maximum pressure 100 PSI@ 125°F.



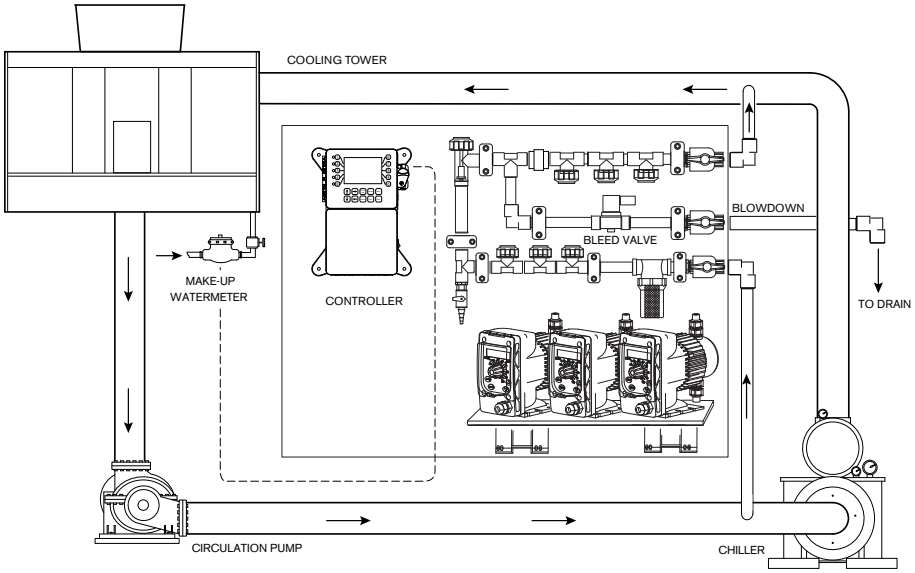
Electrode Installation

The standard probe(s) and/or flow assembly for cooling tower installations is constructed of schedule 80 PVC and supplied with 3/4" slip fittings. To insure proper operation the sample line must have a flow rate of 3-10 gpm. Inlet pressure must be higher than outlet pressure in order for water to flow past the electrode(s) to achieve the required rate. The probes are temperature compensated for increased accuracy.

1. An isolation valve is installed on either side of the flow assembly so electrodes can be easily isolated for removal and cleaning.
2. A line strainer is recommended upstream from the probes to protect against fouling and damage.
3. Systems with a flow switch require 2-3 gpm flow rate to operate outputs.

⚠ Caution

- ***Electrodes are O-ring sealed, which if damaged will cause a leak.***
- ***Do not allow pH sensor tips to dry out, damage will occur.***
- ***Do not exceed a water temperature range of 32°F to 140°F.***
- ***Do not exceed a maximum pressure of 125 psi.***



Installation Diagram

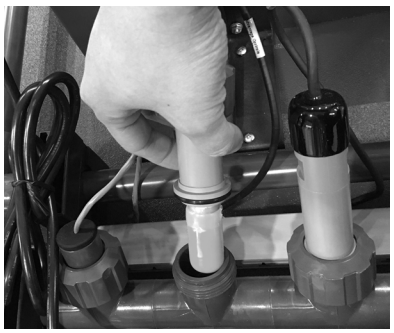
pH Sensor Option

The pH Electrode is shipped in a cap containing a solution of pH 4 buffer and potassium chloride. The electrode should remain in the cap until it is used.

Preparation of the Electrode for Initial Use

Required Equipment and Solutions

- Known value of system water pH
- Clean beakers
- pH Buffer 7.0
- pH Buffer 10.0
- Wash bottle filled with distilled or de-ionized water



1. Remove the protective bottle or cover from the electrode and thoroughly rinse the electrode with distilled water. Wipe carefully with a clean lab wipe.
2. During shipment, air bubbles may have migrated into the electrode sensing bulb. Hold the electrode up to the light and inspect the sensing bulb for air bubbles. If air is seen, carefully shake the electrode downward to dispel any air bubble from the sensing bulb at the tip of the electrode.

In-Line Standardizing the Electrode with Controller

1. Install the electrode in the sample line and turn flow on. The tip of the electrode must be pointed down no more than 40° from vertical. Wait 2-3 minutes.
2. While the reading is stabilizing navigate to the controller's pH calibration menu and reset to factory defaults if available.
3. If the pH reading is stable and within 1-2 pH of your tested known value for the solution perform a 1 point calibration to match controller and electrode to tested value.

Electrode Cleaning

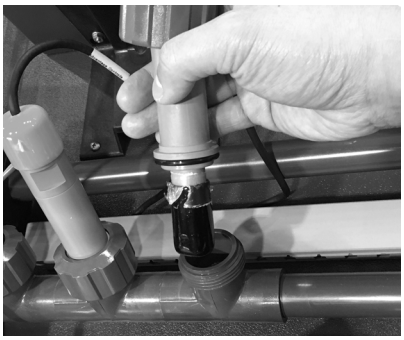
Contamination of the sensing element often results in slow response and inaccurate readings. Clean the element by one of the following procedures:

1. Inorganic Deposits: Immerse electrode tip in 0.1 N HC1 for 10 minutes. Wash the tip with distilled water.
2. Organic Oil and Grease Films: Wash electrode tip in a liquid detergent and water.
3. After above treatment, soak the electrode tip in alcohol for 5 minutes and wipe dry, then, soak in quinhydrone saturated pH 4.01 for 15 minutes; rinse with distilled water afterwards.

ORP Sensor Option

ORP Electrodes are shipped in caps containing a piece of cotton wetted with tap water. The electrode should remain in the cap until it is used.

Preparation of the Electrode for Initial Use



1. Remove the protective bottle or cover from the electrode and thoroughly rinse the electrode with distilled water. Wipe carefully with a clean lab wipe.
2. It may be useful to condition the electrode reference junction by soaking the electrode in warm water for a few hours prior to use.

In-Line Standardizing the Electrode with Controller

1. Install the electrode in the sample line and turn flow on. Wait 20-30 minutes for the sensor to acclimate to the solution.
2. While the reading is stabilizing navigate to the controller's calibration menu and reset to factory defaults if available.
3. If the reading is stable the value displayed will be the mV value of the solution.

Standardizing the Electrode to Solutions

1. Place the electrode into a beaker containing a known mV value buffer and stir. While reading is stabilizing navigate to the 1 Point Calibration menu of controller, if available.
2. When the reading is stable, adjust the controller to read the value of the buffer.

Electrode Cleaning

Contamination of the sensing element often results in slow response and inaccurate readings. Clean the element by one of the following procedures:

1. Inorganic Deposits: Immerse electrode tip in 0.1 N HC1 for 10 minutes. Wash the tip with distilled water.
2. Organic Oil and Grease Films: Wash electrode tip in a liquid detergent and water.

3. After above treatment, soak the electrode tip in alcohol for 5 minutes and wipe dry, then, soak in quinhydrone saturated pH 4.01 for 15 minutes; rinse with distilled water afterwards.

⚠ Caution

Do not attempt to sand or polish the sensing element with sand paper or other polishing material

LD2 Inline Fluorometer Option

The LD2 Fluorometer is an accurate, single-channel fluorometer designed to measure the concentration of fluorophore in the water. The sample water's fluorescence intensity is measured by passing the sample water, containing the fluorophore of interest, past the fluorometer's optical window. An excitation light source illuminates the solution and excites the fluorophore in the solution which fluoresces at a different wavelength. The intensity of the emitted light is proportional to the concentration of the fluorophore in the sample or source water. The LD2 is factory calibrated to read 0-200ppb PTSA.

Maintenance

A maintenance check should be made once per month to ensure the optical window is free from any chemical or biological fouling. Frequency of maintenance checks are dependent on the fouling rate of the system being monitored. Systems that have a higher fouling rate might require more frequent maintenance checks.

Visual Inspection and Cleaning

To visually check if the optical window has been fouled:

1. Remove the fluorometer from the mounting tee.
2. If there is any noticeable fouling, use a soft bristle brush or non-abrasive cloth material and soapy water to clean the optical window. Be sure to rinse thoroughly.
3. If the fouled window is unable to be cleaned with soapy water and the soft bristle brush, make a 10% HCL solution and use that solution, in place of the soapy water, with the soft bristle brush to clean the window.

⚠ Caution

Hydrochloric acid is a hazardous material and should only be handled by qualified personnel.

4. Once the optical window has been cleaned, reinstall.

Inline Water Meter Option

The MarleyGard contacting head water meter provides an electrical dry contact out for proportional control when used with the appropriately optioned controller or pump based on water flow.

Calibration

MarleyGard water meters have been individually tested to meet the AWWA C708 calibration standard at various gpm flow rates. If this turbine style meter is used for revenue-billing purposes where periodic calibration checking is required it is most commonly checked every four years.

Testing should be done by a private or municipal meter shop or a local mobile meter service depending on the local municipality's requirements. Changes in calibration should be made at a local municipality's authorized meter shop. SPX does not provide this service.

Setting Pulse Rate

The pulse rate is determined by the dial on which the magnet pointer is located. The pointer is set at the factory, but can be changed in the field as follows.

In the table below locate your meter size, find your desired pulse rate and note the magnet pointer position. Move the magnet pointer to the appropriate dial position.

Meter Size	Pulse Rate	Magnet Pointer Dial Position
3/4"	1 P/G	x 0.1
	10 G/P	x 1
	100 G/P	x 10
1"	1 P/G	x 0.1
	10 G/P	x 1
	100 G/P	x 10
2"	1 P/G	x 0.1
	10 G/P	x 1
	100 G/P	x 10

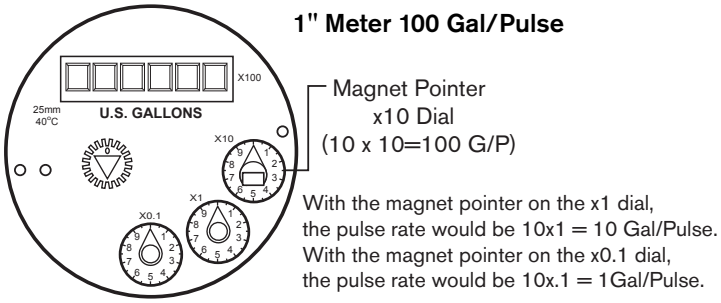
Moving the Magnetic Pointer Dial Position

Remove meter top and lens, taking care not to lose the sealing ring. With fingers, lift the magnet pointer off its shaft and remove the plain pointer from the target dial. Reverse their positions and press them firmly into place.

Securely seat the sealing ring and replace the lens, matching the tab on the lens to the notch on the meter to align the sensor with the magnetic pointer dial. Thread the meter top on and tighten.

Sample Set-Up

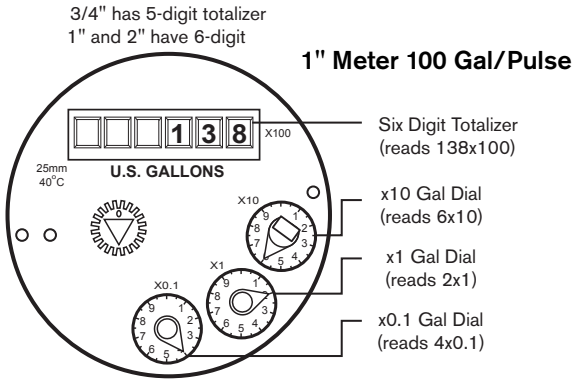
A 1" meter is shown with the magnet pointer set at the x10 dial, with a pulse rate of 100 Gallons per Pulse (that is, 10 increments on the x10 dial, or 10 x10 = 100 Gal/Pulse).



Reading the Meter

The Total Flow that has passed through your meter is read by starting at the top of the register with the Six-Digit Totalizer, and then reading clockwise around the small dials. In the example below, the Six-Digit Totalizer reads 13,800 (138 x 100), and the dials read 60 (6 x 10), 2 (2 x 1), and .4 (4 x .1) respectively. The Total Flow is 13,862.4 gallons.

Disregard the color of the numbers on the totalizer when reading your total.) The “ones” digit is significant but the fact that it is red is not significant.



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