PANEL CUT-OUT DIAGRAM

3 9/16 in. (90 mm)

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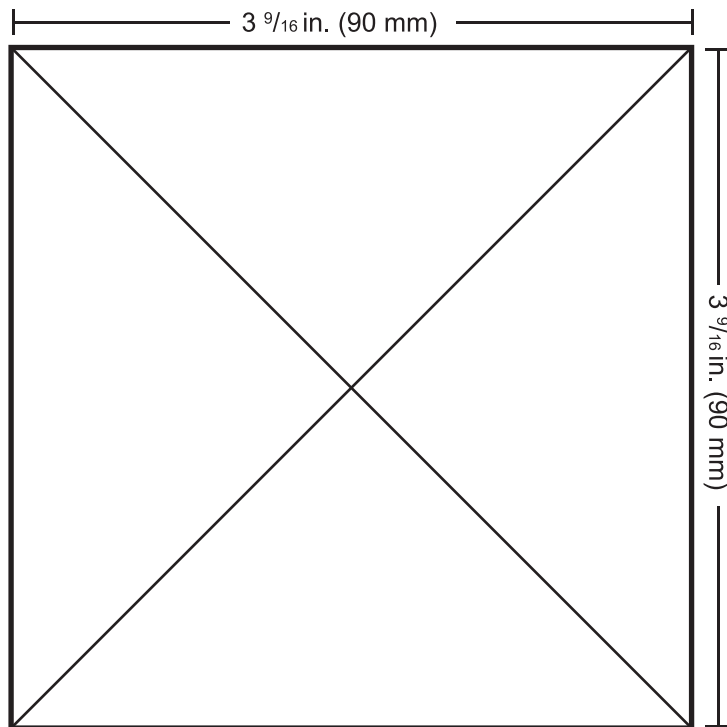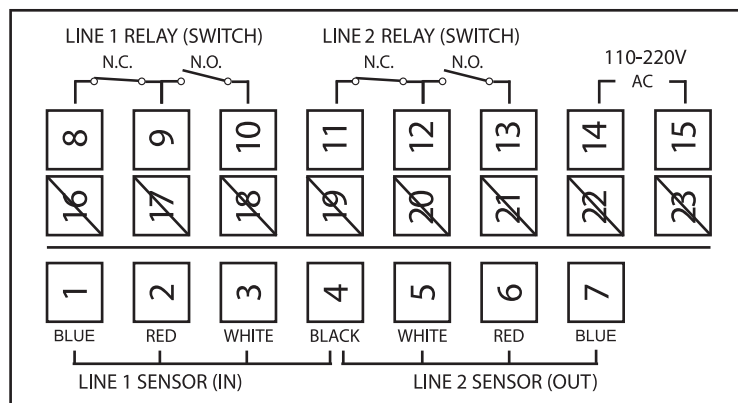
1. Using a knife, cut the diagram out (cut on the outer part of the line).
2. Align the cut-out to your panel and draw cut marks.
3. Cut the hole in the panel to the precise dimensions of the cut-out:
   3-9/16 in. x -3-9/16 in. (90 mm x 90 mm)

-> See the intallation setion for complete instructions.

CONTACT DIAGRAM

LINE 1 RELAY (SWITCH)   LINE 2 RELAY (SWITCH)   110-220V
N.C.   N.O.   N.C.   N.O.   AC

8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
1	2	3	4	5	6	7
BLUE	RED	WHITE	BLACK	WHITE	RED	BLUE

LINE 1 SENSOR (IN)   LINE 2 SENSOR (OUT)

USER'S GUIDE

POWER

SET POINT 1

SET POINT 2

371
LINE 1 (INPUT)   PPM

11.7
LINE 2 (OUTPUT)   PPM

ALARM   SET
ESC   CAL   UP   DOWN   ENTER

DUAL TDS CONTROLLER   PS-203

PS-203
PANEL MOUNT DUAL DISPLAY
TDS CONTROLLER

HM DIGITAL

Thank you for purchasing HM Digital's PS-203. The PS-203 is a dual display panel mount total dissolved solids (TDS) controller that monitors and controls levels of TDS in water. The controller has two independent maximum set point to help maintain a limit of TDS allowed in two water lines, such as the product water and the feed water. If the TDS level rises to either set point, the controller will activate a warning light, sound an alarm (optional) and switch the dry contact position from the normal position (to operate a valve, pump, etc.). Once the TDS level drops below the set point, this will deactivate the light and alarm and switch the contacts back to the normal position (normally open or closed).

CONTACT INFO

If you have any problems or questions regarding your controller, please contact HM Digital, Inc.

HM Digital, Inc.   info@HMDigital.com
Los Angeles, CA USA   HMDigital.com
                                                  1-800-383-2777

BOX CONTENTS

1. Controller   3. Two sensor cables (black)   5. Mounting brackets
2. Two sensors (OC-100)   4. Power cord (black)   6. U.S. plug adapter

SPECIFICATIONS

TDS Range: 0 - 9999 ppm (mg/L)
Resolution: 0.1ppm(0-99.9), 1ppm(100-9999)
Accuracy: ±2% (F.S)
Temperature Compensation: Automatic (ATC) (1-60°C)
Calibration: Up and Down push button Digital calibration.
Set-Point: Single point, controlled by on-screen up/down buttons (to any point within the range)
Set-Point Relay: dual, isolated, 2A, Max. 220V, resistive load 100,000 strokes
Relay Control: The unit will open or close a circuit via dry contacts when the ppm level of either sensor reaches or exceeds the control setting (simple switch). It can be used to control a pump, solenoid valve or other device. Each relay control is independent.
Relay Voltage: 5V (the connected device needs its own power source)
Alarm: Optional steady beep (set by user), one for each set point.
Probe: 1/2" NPTF
Cable Length: 3 meter (9.8 ft) shielded cable
Display: FND Type
Power Supply: 110V/230V, +10% Vac; 50/60Hz
Enclosure: Front and back with ABS
Environment: -10 to 50°C (4 to 122°F); RH max 95% non-condensing
Dimensions: 9.6 x 9.6 x 12.6 cm (3.78 x 3.78 x 4.96 in.)
**Monitor Weight:** 476 grams (1 lb 0.8 02)

TROUBLESHOOTING

Problem	Potential Solution(s)
The controller will not power on.	Check the power wires are properly connected to the terminal. (See the "CONTACT DIAGRAM" on page 8)
Incorrect readings.	1. Check for possible interference by other peripheral machinery or electrical devices. 2. Re-calibrate the controller. Please refer to the "Calibration" instruction on page 5.
The relay control does not work.	1. Check the relay contacts are properly connected. 2. Check the set points are correctly set.
The display shows "oor".	The TDS level of the water is out of the controller's range.
The display shows "----".	The sensor(s) is not connected.
The display shows "Err".	The sensor(s) is dirty or damaged.
The display shows the feed water TDS level, instead of the product.	The sensors are reversed. Connect the sensor for the feed water to Line 1 sensor contacts, and the sensor for the product water water to the Line 2 sensor contacts.

If troubleshooting does not solve the problem, please contact HM Digital for assistance. If your controller is still under warranty, please return the controller to HM Digital for repair or replacement. (see page 6)

ATTACHING THE MOUNTING BRACKETS

1. Slide the controller through the hole in the panel.
2. From the rear of the controller, place one long bracket with the ridge side facing up, on the top of the controller.
3. Place a short bracket, with the legs facing down, through the holes in the long bracket, and into the holes in the controller. The hooked leg should be closer to the controller face.
4. Slide the long bracket towards the controller face, so that the front end is pressed against the panel.
5. Secure a screw from the hole in the long bracket through the hole in the short bracket. Tighten, but do not overtighten.
6. Do the same for the bracket on the bottom of the controller. Tighten both brackets equally.

SIDE VIEW (of the top bracket)

TOP VIEW
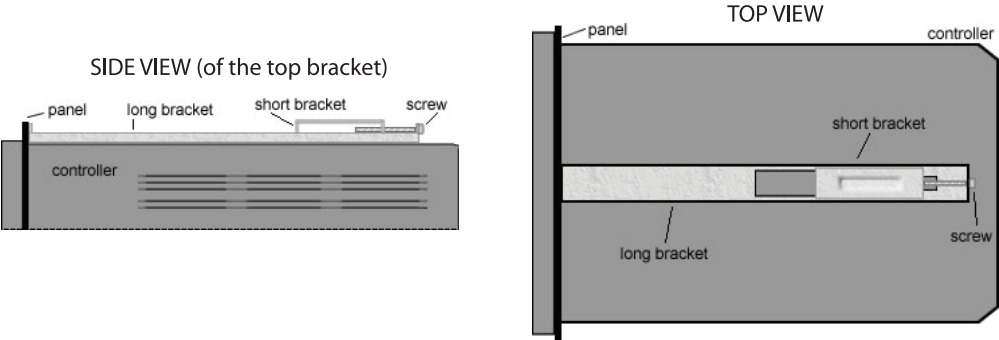
WARRANTY

ONE YEAR LIMITED WARRANTY

The PS-203, including the <u>controller</u> and <u>both sensors</u>, is warranted by HM Digital, Inc. ("the Company") to the purchaser against defective materials and workmanship for one (1) year from the date of purchase.

What is covered: Repair parts and labor, or replacement at the Company's option. Transportation charges for repaired of new product to be returned to the purchaser.

What is not covered: Transportation charges for the defective product to be sent to the Company. Any consequential damages, incidental damages, or incidental expenses, including damages to property. This includes damages from abuse or improper maintenance such as tampering, wear and tear, water damage, or any other physical damage. The Company's products are not waterproof and should not be fully submerged in water. Products with any evidence of such damage will not be repaired or replaced. See additional note below.

To obtain warranty service, please contact 800.383.2777 or email <u>Warranty@HMDigital.com</u> to receive further instructions. Before sending the product back to us, please include the following below,

- •Your name
- •Phone number/ Address
- •Description of problem
- •Proof of purchase, must include Date

> ** If a returned product does not include the above-mentioned items, the Company Reserves the right to refuse warranty service.*

Implied Warranties: Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to five years from date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. To the extent any provision of this warranty is prohibited by federal and state law and cannot be preempted, it shall not be applicable. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

NOTE: Warranties are product-specific. Third-party products and products deemed by HM Digital as "accessories" are not covered under warranty. Third-party products and accessories include, but are not limited to, batteries, fuses, mounting brackets, plug adaptors and fittings.

INSTALLATION INSTRUCTIONS

IMPORTANT: *Double-check your contacts prior to connecting the controller to a power source. Incorrect connections could result in shorting out the unit.*

1. Remove the contents from the box.
2. Insert the controller into the panel. A square hole must be cut into the panel with dimensions of 3 $^9/_{16}$ in. (90 mm) x 3 $^9/_{16}$ in. (90 mm). Page 8 includes a cut-out diagram.
3. Mount the controller to the panel by inserting the mounting brackets into the grooves on the bottom and top of the controller. See page 7 for mounting instructions.
4. View the contact diagram on the side of the controller (also on page 8).
5. **<u>Do NOT connect to a power source yet!</u>** Connect the black power cord to the contacts #14 & #15 (110 V- 220V). It does not matter which color wire is connected to the contacts. Screw in tight with a Phillips head screwdriver. (Note - If in the U.S. (or a country that uses Type A or B plugs/sockets), connect the included plug adapter to the power cord).
6. If using a pump, valve, etc., for Line 1 (feed water), connect a relay wire (not included) to contacts #9 and#10 for a normally open (N.O.) position OR to contacts #8 and #9 for a normally closed (N.C.) position.
7. If using a pump, valve, etc. for Line 2 (product water), connect a relay wire (not included) to contacts #12 and #13 for a normally open (N.O.) position OR to contacts #11and #12 for a normally closed (N.C.) position.
8. Connect a black sensor cable by attaching the blue wire to contact #1, the red to #2, and the white to #3, and the black #4. Do not connect the sensors to the sensor cables yet.
9. Connect the second sensor cable by attaching the black wire to contact #4, the white to #5, and the red to #6 and the blue to #7. The cables are identical and can be swapped.
10. Align the pins of each sensor to each cable and attach. Screw the tightening ring closed. The sensors are identical and can be swapped. Note which sensor is now the Line 1 sensor (feed water) and which is the Line 2 sensor (product water).
11. Insert each sensor electrode into a female 1/2" NPTF threaded fitting.
12. Attach the fitting connected to the Line 1 sensor to the feed water tube, hose or tank.
13. Attach the fitting connected to the Line 2 sensor to the product water tube, hose or tank.
14. Ensure the orientation of the sensor is perpendicular to the flow of the water. Water should flow equally over both pins. (If using a T, if you look through the top of the T, you should see both pins equally side-by-side. If using the sensor in a tank, ensure that there are no air bubbles trapped between the pins or in a fitting.)

USAGE INSTRUCTIONS

Controller Power

1. The controller will turn on when the power cord is plugged into an electrical outlet.
2. The TDS levels for Line 1 and Line 2 will display continuously on the screen.
3. To turn off the controller, unplug it from the electrical outlet.

Setting the Control Set Point

1. To set the control set points (to activate the alarm or a device via the relay), press the SET button once. The TDS reading for Line 1 will switch to a flashing number (the current set point). The factory default is 150 ppm for both lines.
2. Press the UP or DOWN buttons until the desired set point is reached. Pressing once will advance the reading by a single digit. Press and hold the button to advance the reading quickly.
3. Press the ENTER button. This will save the Line 1 set point to memory and advance to Line 2.
4, Press the UP or DOWN buttons until the desired set point is reached for Line 2. Press the ENTER button again. This will save the Line 2 set point to memory.
5. If the TDS level for either line reaches the saved set point for that particular line, the controller will switch the contacts from the normal position (either normally open or normally closed), thereby operating the pump, solenoid valve, or other device attached to the contacts. The set points are independent of each other. For example, if the set point for Line 1 (feed water) is 400 ppm and the set point for Line 2 (product water) is 50 ppm, the feed water must exceed 400 ppm for set point 1 to activate, and the product water must exceed 50 ppm for set point 2 to activate.
6. Once the TDS level falls below the set point, the contacts will switch back to the normal position for the corresponding water line.
7. The alarm (if not disabled) will sound continuously while the TDS level is over the set point. The only way to turn the alarm off is by lowering the TDS level below the set point or disabling it.
8. The set points are saved to memory even if the power is disrupted. If power is disconnected to the controller, you will not need to re-enter the set points.

Setting the Alarm

1. Press the ALARM key to change to the alarm setting mode.
2. Press the UP or DOWN key to select LINE 1 alarm ON/OFF, and then press the ENTER key to change to the LINE 2 alarm setting. 3. Press the UP or DOWN key to select LINE 2 alarm ON/OFF and press the ENTER key. After "End" blinks briefly, The Controller changes to measurement mode.

Calibration

Your controller was factory calibrated. This level is suitable for most tap water/filtered water applications, so it is ready to use out of the box. However, you may need to re-calibrate based on your needs, as well as from time-to-time to ensure best results.

To calibrate:

1. Prior to the calibration procedure, please check the sensor is dry and free of any TDS residue that could affect the reading.

2. The LINE 1 and LINE 2 sensors must be calibrated separately.

3. Connect the LINE 1 sensor to the fitting as it should be installed. Collect the water from the fitting and test with a calibrated handheld meter as the reference meter. Ensure the fitting is filled with water to prevent air bubble lodging in the fitting which will affect the reading.

4. If the reading on the controller does not match the reference TDS reading, press and hold the CAL key to change to calibration mode. Press the UP or DOWN key to select L1 or L2 to be calibrated and then press the ENTER key.

5. The measured value is displayed blinking. Press the UP or DOWN key to change the calibration solution value.

6. If the calibration value has been changed, press the ENTER key to proceed with calibration. During calibration, C.. CA. CALs are displayed sequentially. When finished, "End" flashes briefly and automatically changes to measurement mode. The LINE1 or LINE2 calibration method is the same.

To reset to the default TDS settings:

1. Press and hold the CAL key to change to calibration mode.
2. After selecting L1 or L2 to be initialized by pressing the UP or DOWN key, press and hold the UP and DOWN keys at the same time."CLr" blinks for a moment and automatically changes to the measurement mode. Calibration initialization must be performed separately for LINE 1 and LINE 2.

Cleaning

To clean the sensor electrodes, use rubbing alcohol and a cotton swab. Lightly clean the electrodes. Rinse with DI, RO or distilled water. Air dry.

Sensor Replacement

If your sensor has been damaged, you can purchase a new one (model SP-1) without the need to purchase a new controller.

Contact your authorized HM Digital distributor for a replacement sensor. If you cannot locate an HM Digital distributor, contact HM Digital at info@hmdigital.com