

ELECTROVERT | AquaJet



AQUAJET ADDENDUM FOR CALIBRATIONS AND SETUP

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Speedline Technologies

A COOKSON ELECTRONICS COMPANY



Calibrations and Setup

Overview

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Pressure Control Valve Adjustment

Introduction

Refer to the following procedure to correctly adjust the setting on the Pressure Control Valve.

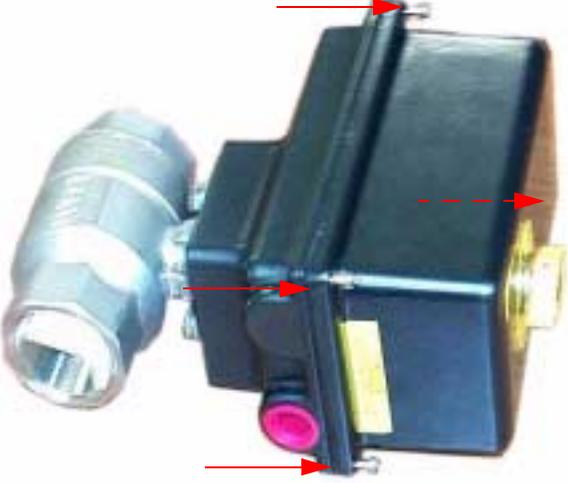
Description

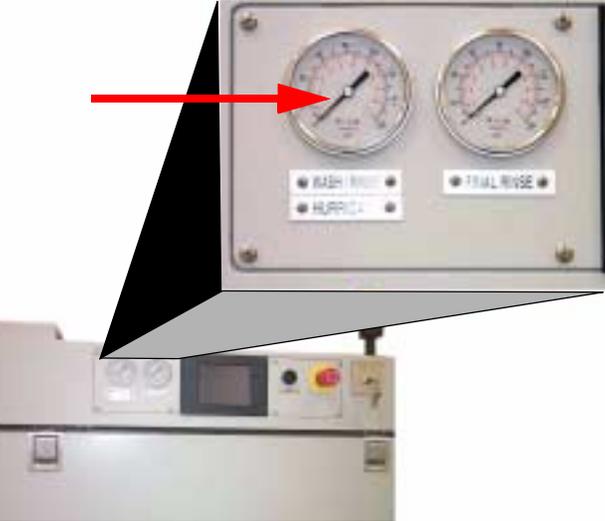
The Pressure Control Valve is located inside the body of the AquaJet on the right side of the machine. It is necessary to remove the side panel to access the valve. The AquaJet is preset at the factory to operate at two (2) pressures. High pressure is a fully open valve, and Low pressure measures approximately 20 psi lower than High. The exact psi measurement is dependent upon the options installed on the machine. In some process conditions where very low pressure may be desired, the low pressure adjustment can be decreased to accommodate the process environment.

Tools/Materials Needed

- 2 mm Hex Wrench
- Phillips Screwdriver

Procedure

Procedure	Photograph
Remove the cover of the Pressure Control Valve by removing the four (4) Phillips screws that secure the cover.	 A photograph of the Pressure Control Valve assembly. The assembly consists of a black plastic cover, a metal valve body, and a pink adjustment knob. Four red arrows point to the screws that secure the cover: one at the top, one at the bottom, one on the left side, and one on the right side.

Procedure	Photograph
<p>There are four (4) cams located inside the valve. Only the first (bottom) cam is operational. Adjust the cam by turning it with the 2 mm Hex Wrench.</p>	
<p>Monitor the pressure by viewing the Wash/Rinse pressure gauge located to the left of the graphical user interface on the front of the machine. Refer to the photograph at the right. Note the psi reading when the machine is set to High. With the machine set to Low, adjust the cam until the psi reading is 20 psi lower than the High reading. When a standard 7.5 HP pump is installed on the AquaJet, the psi will read approximately 60 psi for High and 40 psi for Low. When the optional 10 HP pump is installed, the psi reading is typically 90 psi for High and 70 psi for Low.</p>	
<p>When the pressure is satisfactorily adjusted, replace the cover of the Pressure Control Valve by replacing the four (4) Phillips head screws.</p>	

Flow Meter Calibration

Introduction

The Flow Meters are calibrated at the factory and should not need adjusted. If adjustment becomes necessary or if the meters are replaced, refer to the following procedure.

Flow Meter Calibration Procedure

Step	Action
1	Press the Enter button for five (5) seconds. The Option screen appears.
2	Press the Up arrow three (3) times.
3	Press the Down arrow once to access the Option settings.
4	Press the Right arrow to view the current settings for the flow decimal. When the symbol ">" appears, the decimal setting can be changed to one (1) digit.
5	Press the Enter button to save the settings.
6	Repeat Steps 1 – 5 for total decimal.
7	Press the Right arrow again until the loop adjust 4.00 mA appears. Verify 4.00 mA is shown. If not correct change the value to 4.00 mA.
8	Repeat Step 7 for 20 mA.
9	Press the Up and Down arrows simultaneously to return the flow meter to normal operation.
10	Press the Enter button for two (2) seconds. The Calibration Screen appears.
11	Press the Up arrow three (3) times, then the down arrow one (1) time to access the calibration settings.
12	Use the Up or Down arrow to locate the K-factor screen.
13	Press the Right arrow to view the current flow K-factor setting. When the symbol ">" appears, change the setting to 270.00.
14	Press the Enter button to save the settings.
15	Repeat Steps 9 – 14 for the total K-factor setting.
16	Repeat Step 9.

West Meter Setup

Introduction

The West Meters are calibrated at the factory. If they require calibration or are replaced refer to the following procedure.

Schematic Reference

The following diagram is located in the schematics and references the West meter setup.

Configuration Mode

	VALUES
i n P t	14LB CFI 14L7 CCI
C E r L	h i
A L A 1	P - h i
A L A 2	P - h i
C J C	E n A b
L o c	l 0

Setup Mode

	VALUES
S P	230
F i L t	2 0
h Y S t	1
h - A 1	212 IFI 100 ICI
h - A 2	212 IFI 100 ICI
L o c	l 0
d I S P	1

Figure 1-1

Setup Procedure

Step	Action
1	Within 5 seconds after powering up the AquaJet™, press the Up button and the Function button simultaneously. The machine is now in Configure Mode.

Step	Action
2	Set the Configuration values as follows using the Up and Down arrow keys: Input – 1418 (F), 1417 (C) Control — hi Alarm 1 — P_hi Alarm 2 — P_hi CJC — Enable Loc — 10
3	Once Loc is set to 10, press the Function button to access Setup Mode.
4	Set the Setup values as follows using the Up and Down arrow keys: Sp — 115 Filt — 20 hyse — 1 h_A1 — 212 (F), 100 (C) H_A2 — 212 (F), 100 (C) Loc 10 disp — 1
5	Return to operating mode by pressing the Up button and the Function buttons simultaneously.

Conveyor Carriage Speed Calibration

Conveyor Carriage Speed Calibration Procedure

Step	Action
1	In the AquaJet™ software access the Main Screen. Run the conveyor carriage speed to High. Refer to Figure 1–2.
2	Access the rear electrical panel. Using a voltmeter set to read dc voltage, locate TB5. Put the red lead on TB 80 and the black lead on TB 81. (This is the output of MSC1.) Refer to Figure 1–3.
3	Adjust the max speed pot to read 90 Vdc.
4	Return to the machine software control panel and set the conveyor carriage speed to Low.
5	Returning to the electrical panel, adjust the minimum pot fully counter clockwise. Adjust pot 1 to show an output voltage of 65 Vdc by reading TB 80 and TB 81.
6	The IR Comp and Current Limit pots should be in the 2 o'clock position.

After performing the above steps, calibration is complete.

Main Control Screen

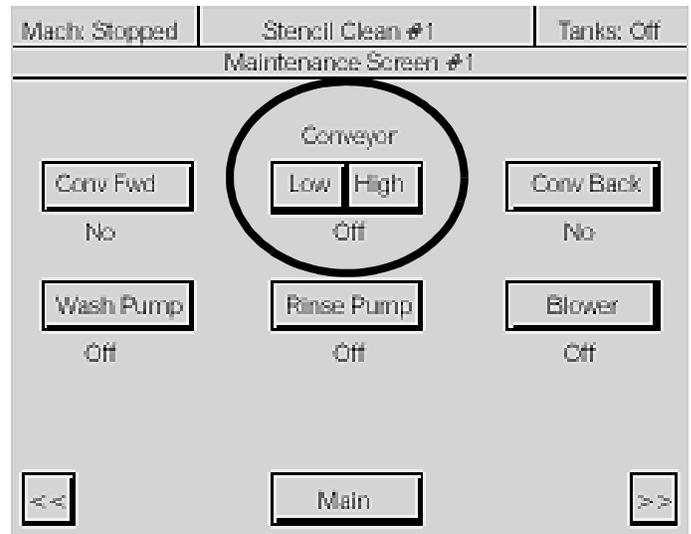


Figure 1–2

MSC 1

Figure 1–3

Resistivity Monitor Calibration

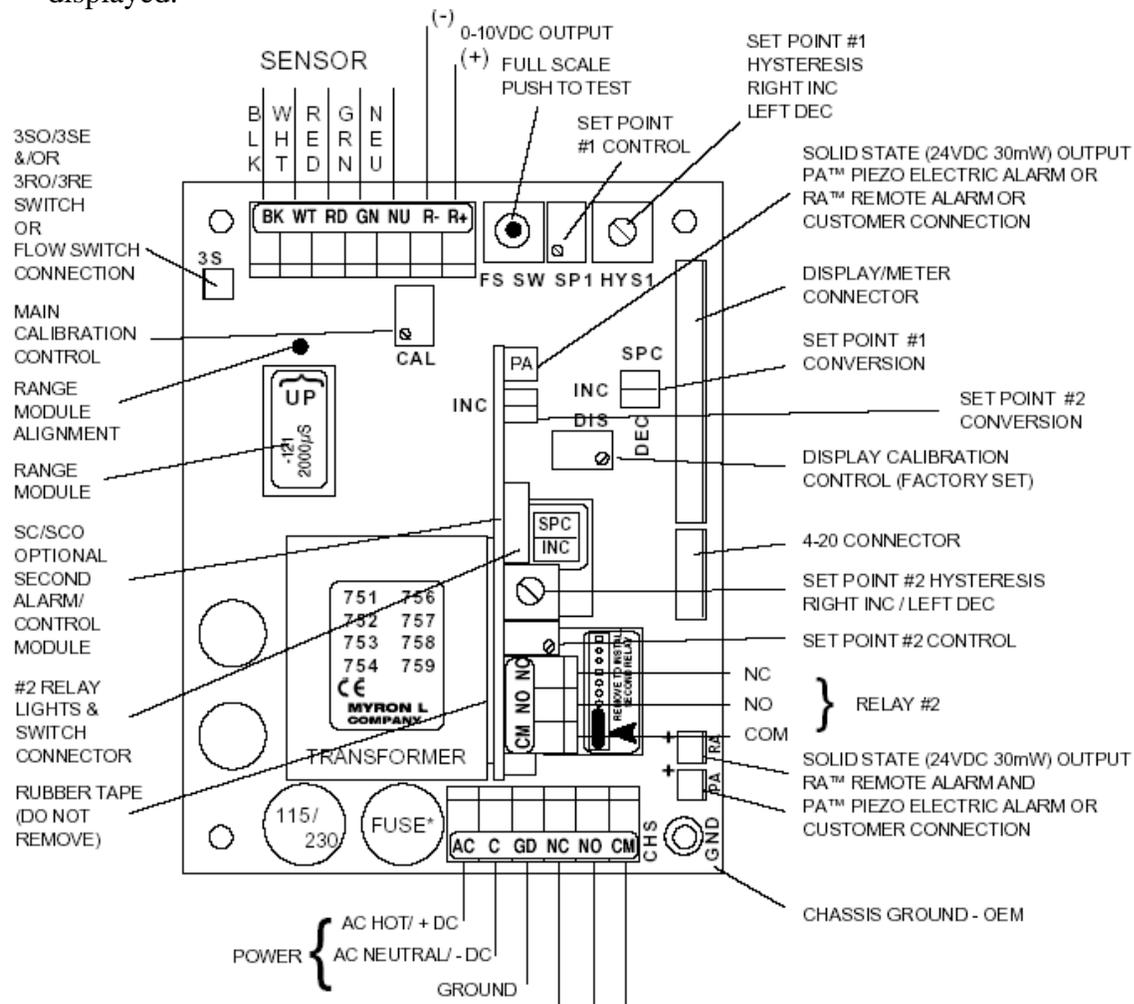
Resistivity Monitor Calibration Procedure

Step	Action
1	Set the computer control screen to system screen #4.
2	Press Cal F/R resistivity in simulate screen.
3	Remove the face of the meter by removing the two (2) screws securing it.
4	Put tape over the "set point check" switch on the face of the meter. It must remain depressed during the following adjustments.
5	Turn the set point trimmer (R31) until the display reads zero (0).
6	When the display unit reads zero (0) press the "complete" button on the computer screen.
7	The voltage on the computer screen represents the actual voltage when the setpoint is zero (0) on the monitor.
8	Remove tape and replace the cover face.

When the above steps are performed, calibration of the resistivity monitor is complete.

Aqua Jet Resistivity Monitor Calibration – Series 750II

1. Separate the Face of the Meter by removing the 2 screws securing it and carefully pulling it apart to prevent strain on the attached cable. Turn Panel so that display is visible.
2. Place DC Volt Meter across R+ and R-. Press and hold Full Scale Push to Test switch (FS SW). Voltage should be 10 volts. Adjust Main Calibration Control Pot (CAL) until correct voltage is read on Voltmeter across R+ and R -.
3. The Display Calibration should only be performed if absolutely necessary. This is performed at the factory. To calibrate the display perform the Calibration above first. Then Continue to hold the Full Scale Push to Test Switch and verify display reads around 19.90 – 19.99. If this is incorrect the Display Calibration Control Pot (DIS) can be adjusted until 19.90 is displayed.



4. On the Aqua Jet Control Display on System Screen #4, Press the CAL F/R Resistivity button to open the F/R Resistivity Calibration Screen.
5. On the Meter Display Panel Press and hold the Setpoint Button and adjust the Setpoint #1 Adjust (SP1) until the display reads 0. Have a helper press the Complete button on the Aqua Jet F/R Calibration Screen while the Setpoint Button is pressed on the Meter Display Panel Screen. This sets the 0 point on the Machine display with the Meter. Calibration is Complete.

750 SERIES II

Resistivity Monitor/controllers

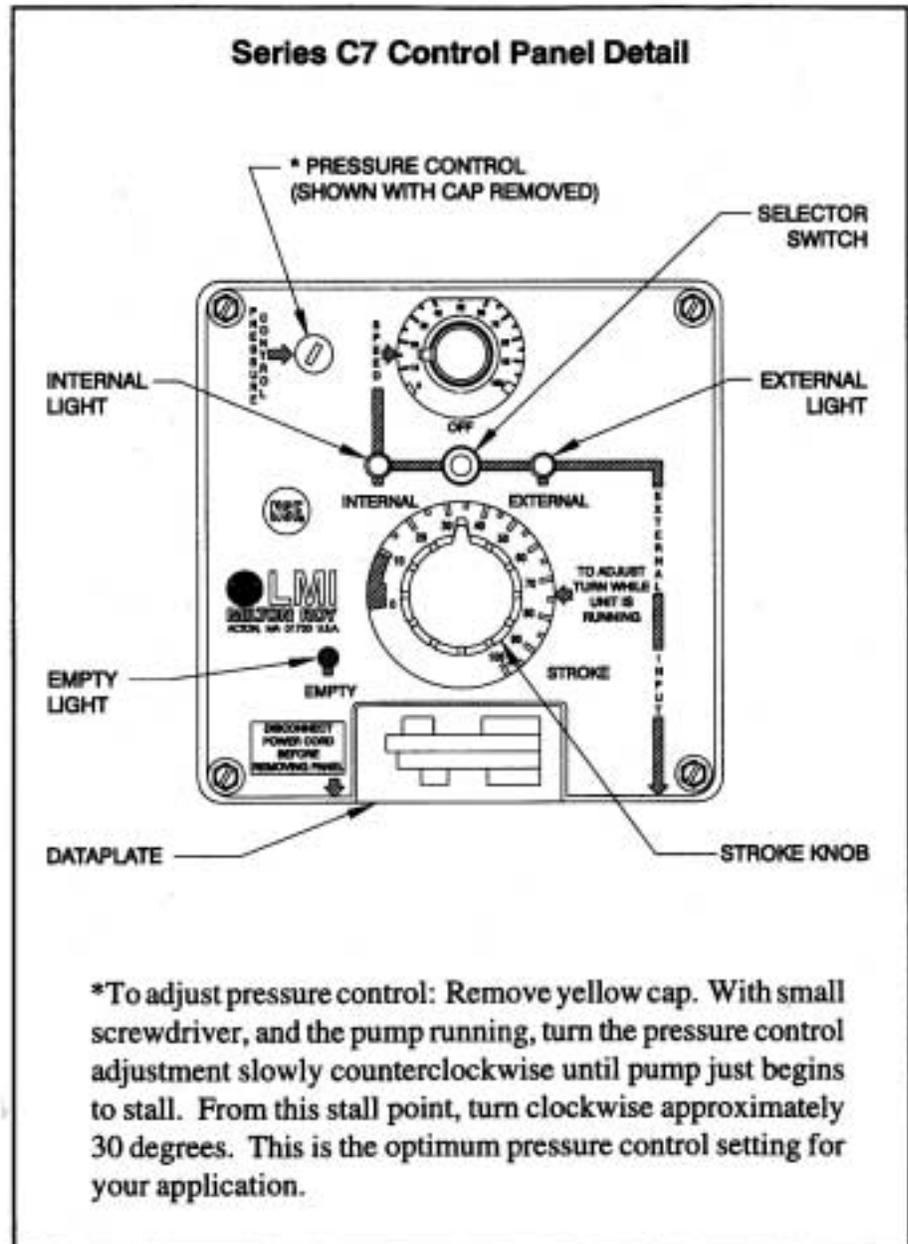


753II with single alarm

Detergent Injection Pump

Detergent Injection Pump Calibration

Refer to the following when calibrating the detergent injection pump:



Calibration Chart for Saponifier Injection Pump*(Use for concentrations that vary from 1 to 20%)*

Concentration %	Maximum Refill Flow GPM (GPM)	(A) Injection Rate (GPH)	(B) Maximum Pump Output (GPH)	(C) Pump Output (%)	(D) Stroke Knob Setting (%)	(E) Flow Meter Divider Setting
1%	2	1.2	25	4.8%	22%	6
2%	2	2.4	25	9.6%	31%	4
3%	2	3.6	25	14.4%	38%	3
4%	2	4.8	25	19.2%	44%	3
5%	2	6	25	24.0%	49%	3
6%	2	7.2	25	28.8%	54%	2
7%	2	8.4	25	33.6%	58%	2
8%	2	9.6	25	38.4%	62%	2
9%	2	10.8	25	43.2%	66%	2
10%	2	12	25	48.0%	69%	2
11%	2	13.2	25	52.8%	73%	2
12%	2	14.4	25	57.6%	76%	2
13%	2	15.6	25	62.4%	79%	2
14%	2	16.8	25	67.2%	82%	2
15%	2	18	25	72.0%	85%	1
16%	2	19.2	25	76.8%	88%	1
17%	2	20.4	25	81.6%	90%	1
18%	2	21.6	25	86.4%	93%	1
19%	2	22.8	25	91.2%	95%	1
20%	2	24	25	96.0%	98%	1

To make small increases and decreases, adjust the stroke knob

Increasing the divider box number will decrease the pump speed (strokes per minute)

Decreasing the divider box number will increase the pump speed (strokes per minute)

The maximum refill flow rate of 2 GPM is mandatory to allow the full range of concentrations listed

Adjust the back pressure valve on the incoming water line to achieve the 2 GPM maximum refill rate.

Calibration Chart for Saponifier Injection Pump*(Use for concentrations that vary from 1 to 10%)*

Concentration %	Maximum Refill Flow GPM (GPM)	(A) Injection Rate (GPH)	(B) Maximum Pump Output (GPH)	(C) Pump Output (%)	(D) Stroke Knob Setting (%)	(E) Flow Meter Divider Setting
1%	4	2.4	25	9.6%	31%	6
2%	4	4.8	25	19.2%	44%	6
3%	4	7.2	25	28.8%	54%	5
4%	4	9.6	25	38.4%	62%	4
5%	4	12	25	48.0%	69%	4
6%	4	14.4	25	57.6%	76%	3
7%	4	16.8	25	67.2%	82%	3
8%	4	19.2	25	76.8%	88%	3
9%	4	21.6	25	86.4%	93%	3
10%	4	24	25	96.0%	98%	3

To make small increases and decreases, adjust the stroke knob

Increasing the divider box number will decrease the pump speed (strokes per minute)

Decreasing the divider box number will increase the pump speed (strokes per minute)

The maximum refill flow rate of 4 GPM is mandatory to allow the full range of concentrations listed

Adjust the back pressure valve on the incoming water line to achieve the 4 GPM maximum refill rate.

$$\frac{\text{Max. flowrate of water through flowmeter (in GPM*)} \times \text{Desired concentration (in PPM*)}}{\text{Percent concentration of pumping solution (expressed as a whole number)}} = \boxed{} \times .006 = \boxed{\text{(A)}} \text{ (Required pump output in GPH*)}$$

Example A:

$$\frac{70 \text{ (GPM*)} \times 4 \text{ (PPM*)}}{5.25 \text{ (% solution expressed as a whole number)}} = \boxed{53.33} \times .006 = \boxed{.32} \text{ (A)}$$

Example Results: Select an A77 pump with $\boxed{.42}$ (B) GPH* max. output at 140 psi. (Use the pump selection guide.)

2. DETERMINE PERCENT OUTPUT REQUIRED FROM PUMP

$$\frac{\text{Required pump output from (A)}}{\text{Max output of metering pump selected (in GPH*) (B)}} = \boxed{} \text{ (C) (percent output required from the pump)}$$

Example B:

$$\frac{\boxed{.32} \text{ (A)}}{\boxed{.42} \text{ (B)}} = \boxed{.76} \text{ (C) (Percent output required from pump)}$$

3. DETERMINE THE STROKE SETTING

$$\sqrt{\frac{\text{Square Root of Percent output desired from pump (C)}}{}} = \boxed{} \text{ (D) (Stroke knob setting on pump and strokes per minute in step 5)}$$

Example C:

$$\sqrt{\frac{\text{Square Root of .76 (C)}}{}} = \boxed{.87} \text{ (D) (Stroke knob setting on pump and strokes per minute in step 5)}$$

Example Result: Set stroke knob to 87%

5. DETERMINE DIVIDER NUMBER**NOTE:**

If an LMI D7 metering pump is being used, multiply value (D) by 75% to determine correct Divider Number.

$$\frac{\text{Max. flowrate of water through flowmeter (in GPM*)}}{\text{Strokes per minute of pump (expressed as a whole number)}} \times \text{Primary pulses per U.S. gallon (from chart)} = \text{(E) Divide number}$$

(D)

Example D:

$$\frac{70 \text{ (GPM*)}}{\boxed{87} \text{ (D)}} \times 13.3 \text{ (PPPUSG*)} = \boxed{10.7} \text{ (E) Divide number (round off to nearest whole number)}$$

Example Result:

Round off the divider number to read $\boxed{0011}$ on the divider unit. The resulting divider number will cause the pump to run at 87 strokes per minute at the maximum flowrate of water through the flowmeter.

6. SET THE DIVIDER NUMBER

A. Remove the clear window on the programmable divider by removing the two black thumb screws.

B. Set thumbwheel numbers to divider number determined above.

Example:

Using the divider number determined in the previous example (divider number = 0011), you would set the thumbwheels as illustrated below:



C. Replace the clear window to activate divider.

IMPORTANT:

DIVIDER WILL NOT OPERATE UNLESS CLEAR WINDOW IS IN PLACE.

NOTES:

- To make small increases or decreases in output, adjust the stroke knob.
- Increasing the divider box number will decrease the pump speed (strokes per minute).
- Decreasing the divider box number will increase the pump speed (strokes per minute).
- Dilute pumping solutions when low PPM concentrations are required. This will allow you to increase the pump speed (strokes per minute).