

# BIOCLERE™

BIOLOGICAL WASTEWATER TREATMENT SYSTEM

## OPERATION & MAINTENANCE MANUAL

**BIOCLERE MODELS:  
16/12-SS, 16/12-LS,  
16/15 & 16/19**



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[www.aquapoint.com](http://www.aquapoint.com)

# BIOCLERE™

## BIOLOGICAL TREATMENT SYSTEM

Congratulations on your purchase of a Bioclere biological treatment system. The Bioclere is a modification of the classic trickling filter. Trickling filters have been used for over one hundred years for the treatment of wastewater due to their reliability and simplicity of operation.

Naturally occurring microorganisms break down waste (organic matter) in the Bioclere and create harmless byproducts, mainly: water, carbon dioxide and additional microorganisms (sludge). The sludge created in the Bioclere is automatically returned and stored in your primary settling or sludge holding tank. Therefore, the Bioclere unit(s) do NOT require pumping.

However, regular pumping of your grease trap(s) (if applicable) and primary tank(s) is required. Failure to maintain a regular pumping schedule will have an adverse impact on the biology in the Bioclere system. If pumping is ignored for an extended period it may become costly to get the system back to efficient operation.

Aquapoint recommends that the grease trap(s) and primary tank(s) are checked every 3 and 6 months respectively by a certified operator or septic hauler and pumped as needed. For seasonal applications, pumping of the tanks should occur during mid-season to protect the microbiology in the filter. Failure to adhere to this pumping schedule will result in compromised treatment and will void the Bioclere warranty.

The Bioclere units are designed to reduce the effects of toxic substances that may enter the system from your facility. However, it is in your best interest to evaluate what is discharged to the system. Be aware of daily/weekly/monthly/annual activities and the quantities of chemicals that are being discharged. While the bacteria are resistant to many forms of toxic chemicals discharged in small quantities, large volumes or certain combinations of chemicals may have detrimental effects. Some items to be aware of include: cleaning agents, floor strippers, harsh chemicals, paints and solvents, as well as abnormal quantities of soaps and milk. If at any time you are unsure about using a particular chemical please call Aquapoint. If necessary, we will arrange a site meeting to evaluate your products.

Aquapoint wants you to have a good experience with your new Bioclere treatment system. If you treat the bugs with respect, they will treat you to decades of clean water and help to preserve the environment.

Please call our office if you have ANY questions concerning your new system.

Sincerely,

AQUAPOINT  
(508) 985-9050

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This Technical Manual is supplied for the benefit of the user and is not applicable to any other customer. Aquapoint.3 LLC is not responsible for any other equipment used in conjunction with this installation. Please refer to contractor or other suppliers for information and use of their equipment.

## **1.0 GENERAL DESCRIPTION AND FUNCTION**

1.1 The Bioclere is a secondary wastewater treatment system. The first stage of treatment occurs in the primary tank in which the solids are settled and partially digested. Wastewater then flows from the primary tank to the Bioclere where treatment by the natural process of biochemical oxidation takes place followed by final clarification prior to discharge.

1.2 The wastewater enters the baffled zone located in the clarifier beneath the Bioclere filter module. It is then pumped to the distribution assembly, which doses the surface of the filter media.

The oxidation process occurs as the water trickles over the biological film that grows on the media surface. The pump operates on a timed sequence that is specific to the individual facility wastewater characteristics to ensure that the dosing rate optimizes filter performance.

In the filter module the biological film thickens until carbonaceous material and oxygen no longer penetrate to the bacteria nearest the media surface. When this occurs the biological film sloughs from the media and passes through the media bed into the clarifier where it settles to the bottom. A sludge return pump periodically returns this sludge to the primary tank.

Thus, the filter media is self-purging and maintenance free.

1.3 Oxygen is provided by a fan located in the top housing of the Bioclere and is vented either through the effluent line of the system or the influent line to the biofilter. The fan is sized to provide the proper supply of oxygen to the treatment process.

1.4 Wastewater flows by gravity through the Bioclere. The pumps are used only for the treatment process. In the event of a power or pump failure the effluent will continue to pass by gravity through the sump portion of the Bioclere to its point of discharge. However, this situation should not be allowed to continue for an extended period of time because without the pumps operating the secondary treatment of the wastewater is no longer occurring.

## **2.0 SPECIFICATIONS & SCOPE OF SUPPLY**

### **2.1 BIOCLERE MODELS 16/12-SS – 16/12-LS – 16/15 – 16/19**

### **2.2 BIOCLERE EQUIPMENT SUPPLIED:**

<b><u>Item</u></b>	<b><u>Quantity Per Unit</u></b>
Tank assembly	1 each
Filter media	1-4 cubic meters depending on model
Pipes, fittings & connectors	Misc.
Distribution system	1 each
Nozzles	3 each
Dosing pump	1 each
Recycle pump	1 each
Latches, Moore 702-L-C-SS	4 each
Baffle	1 each
Fan module assembly	1 each
Control panel	1 each
Misc. hardware	1 set
O & M manual	1 each
Padlocks, Abus	2 each
1 ½” key KA8302	2 each

### **2.3 PUMP TIMER SETTINGS:**

Dosing pump <b><u>ON</u></b>	3 min.
Dosing pump <b><u>OFF</u></b>	5 min.
Recycle pump <b><u>ON</u></b>	2 min.
Recycle pump <b><u>OFF</u></b>	2.5 hrs.

## 2.4 SPECIFICATIONS (continued):

The following is a list of critical parts with specifications. It is recommended that the user have spare parts on hand at all times. They may be obtained through Aquapoint.

### DOSING PUMPS:

Manufacturer:	Goulds
Type: LSP0311F	1/3 horsepower
# Required per unit:	One (1)
Electrical:	115v/1ph/60Hz

### RECYCLE PUMPS:

Manufacturer:	Goulds
Type: LSP0311F	1/3 horsepower
# Required per unit:	One (1)
Electrical:	115v/1ph/60Hz

### FAN:

Manufacturer:	Papst
Type: 4800X	58 cfm
# Required per unit:	One (1)
Electrical:	115v/1ph/60Hz

### FLOAT SWITCH:

Manufacturer:	SJE Rhombus
Type: Vertical Master	1003778
# Required per unit:	One (1)
Electrical:	115v/1ph/60Hz

The above will assist when using the other sections of this manual and when ordering any spare parts.

## **3.0 INSTALLATION**

### **3.1 INTRODUCTION:**

This document establishes the installation procedures for the Bioclere secondary wastewater treatment system. It is recommended that these procedures be reviewed and approved by the engineer of record to ensure compatibility with specific site characteristics.

Aquapoint assigns a project manager for each installation to provide onsite supervision of the installation, the fresh water commissioning system and certification that the system is operational. Aquapoint will also arrange for the transportation of the system. Effective execution of these procedures requires coordination with the site contractor.

We request that the site contractor contact Aquapoint at 508-985-9050 to coordinate delivery, installation schedule and fresh water commissioning of the system.

### **3.2 PROCEDURE:**

- A. Locate Bioclere from site engineering plans.
- B. Excavate to 16" below clarifier. De-water excavation if required.
- C. Add 12" (1.00 ft.) of clean 3/8" pea stone.
- D. Install pre-cast mounting pad approximately centered to Bioclere location. (See drawing PMW/AWT3015).
- E. Check to ensure mounting pad is level and elevation is correct.
- F. Carefully lower Bioclere into position with proper rigging and lifting techniques.
- G. Orient and align Bioclere to inlet and outlet directions. Confirm Bioclere is level.
- H. Fill Bioclere with clean fresh water to bottom of outlet pipe to stabilize unit.
- I. If Bioclere is installed in groundwater refer to anchoring requirements on site plan and/or contact site engineer.
- J. If Bioclere is not installed in groundwater backfill excavation with clean 3/8" pea stone and/or sand to within 12" of the inlet pipe. Check level of Bioclere.

NOTE: Use care while backfilling to prevent Bioclere movement and/or damage to Bioclere.

- K. Install inlet, outlet and vent/test port piping.

NOTE: If installation specifies venting through house stack, bring vent pipe to grade and cap.

- L. Install recycle piping from Bioclere back to the inlet end of primary (septic) tank. The recycle line is 1 ½" Schedule 40 PVC from the Bioclere to the outside of the primary tank and Schedule 80 PVC inside the primary tank. Schedule 80 PVC to be installed against inside wall and at ½ the tank's liquid depth terminating with a 90° elbow. (See drawing PMW/1256-1). Use pressure fittings. If possible, slope recycle line to the primary tank to allow the recycle pipe to drain.
- M. Install wiring with watertight conduit from control location to Bioclere.
- N. Backfill around Bioclere with sand and/or pea stone to final grade.
- O. Install control box in protected location preferably on exterior of home or building to facilitate access by the operator. Connect power feed and Bioclere. (Drawing AWT 3308).

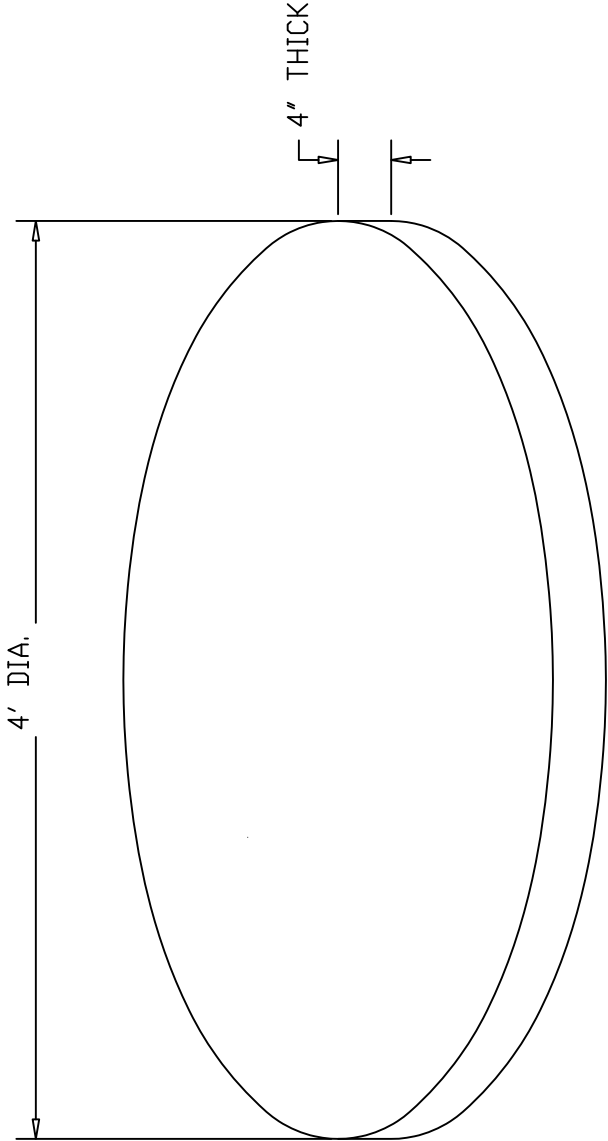
The following items are performed by the Aquapoint Authorized Representative unless otherwise specified:

- P. Install dosing and recycle pumps with safety ropes to the appropriate pipes.
- Q. Install pump wiring to junction box in fan module. (See drawing AWT 3308)




NOTES:

- 1) CONCRETE MINIMUM STRENGTH: 4000 PSI @ 28 DAYS
- STEEL REINFORCEMENT: 6 X 6 10 GA. STEEL WIRE MESH
- 2) 4' SQUARE PAD - OPTIONAL
- 3) PAD TO BE SUPPLIED AND INSTALLED BY CONTRACTOR



TITLE: PRECAST MOUNTING PAD (SERIES 16 BIOFILTERS)	
DRAWING NO:	PMW/AVT3015
REVISION:	A
DATE:	9 Feb 09
DWN BY:	P.VILLEY
SCALE:	N.T.S.
SHEET #:	1 of 1
B/A3	



39 TARKILN PLACE

NEW BEDFORD, MA 02745

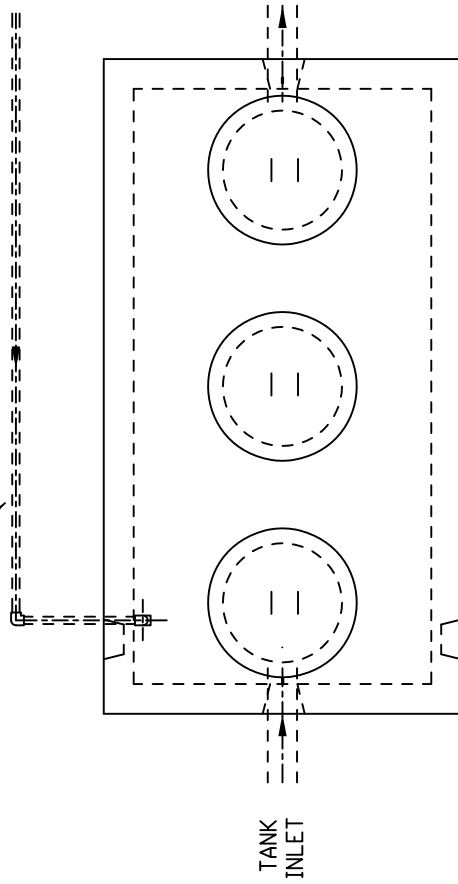
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1½" PVC SCHD 40  
RECYCLE LINE FROM  
BIODCLERE UNIT(S)

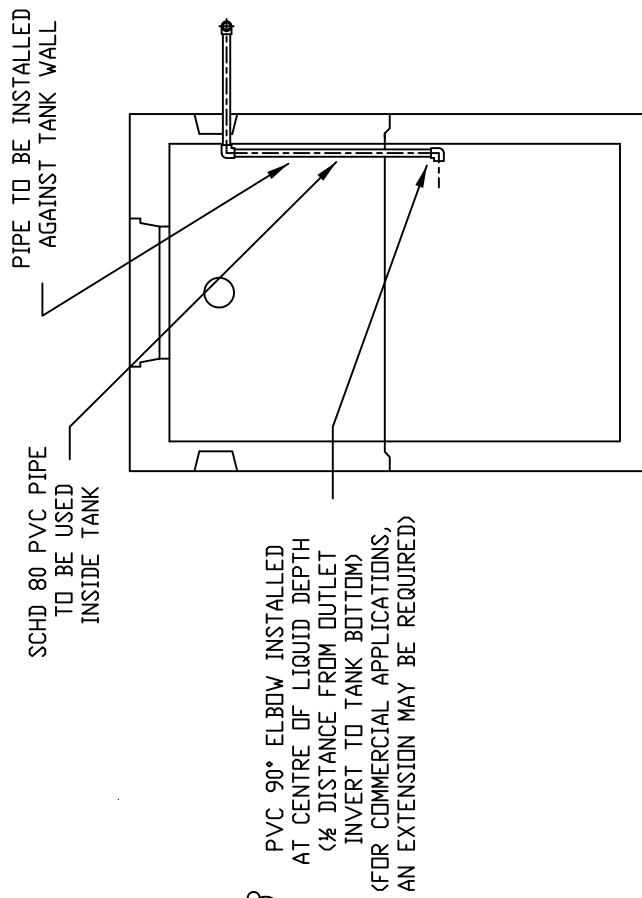
# 1½" Biofilter Recycle Line Installation at Primary Tank.

## NOTES FOR CONTRACTOR:

1. SLOPE PIPE BACK TO SEPTIC TANK WITH NO LOW POINTS.
2. USE PRESSURE FITTINGS ONLY.



TYPICAL PRIMARY (SEPTIC) TANK



1.5BiofRecyc.dwg

TITLE: 1½" Recycle Line Installation.  
(Primary Tank)

DRAWING NO.	PMW/1256-1
REVISION	B
DATE	9 Feb 09
DWN BY	P. WILLEY
SCALE	1 : 40
SIZE	A / A4
SHEET #	1 of 1

# AQUAPOINT

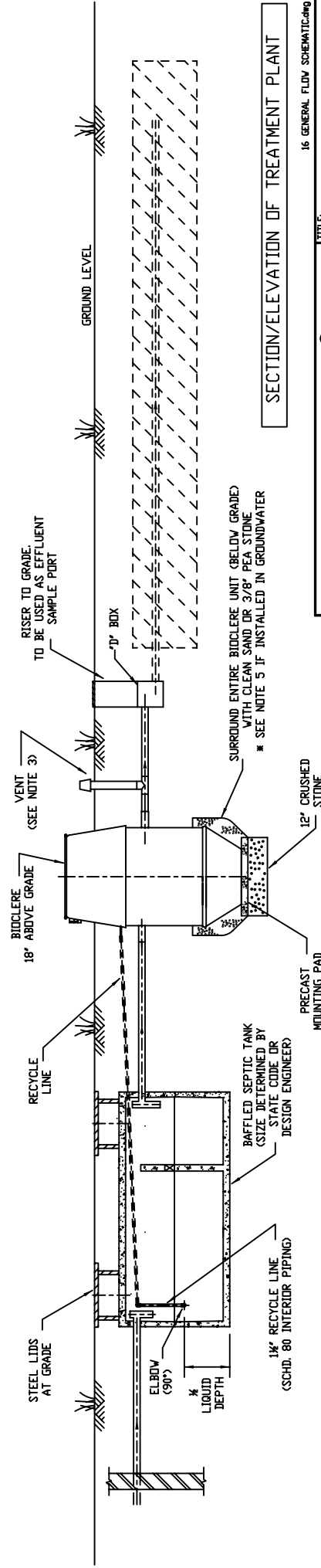
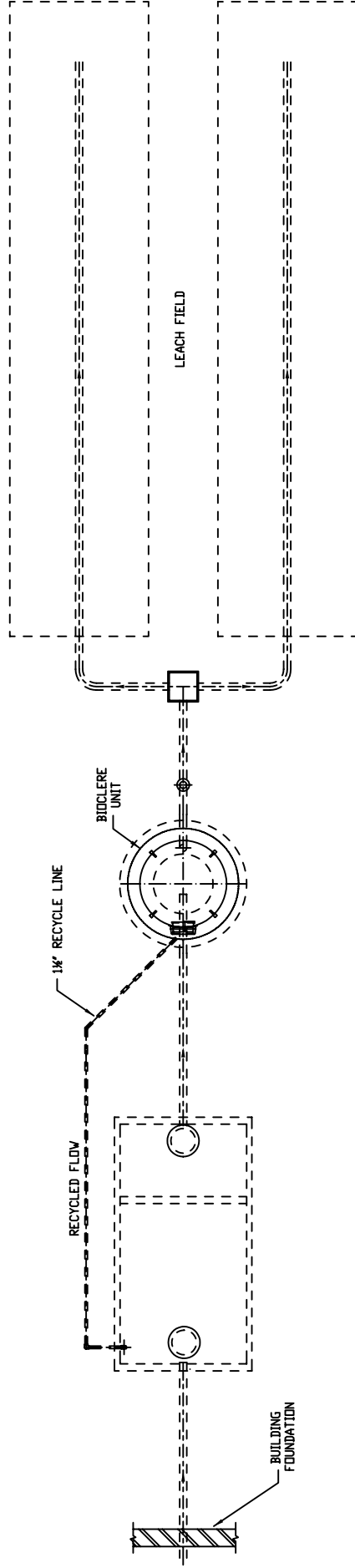
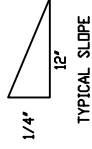
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# 16 GENERAL FLOW SCHEMATIC

## PLAN ON TREATMENT PLANT

NOTES: UNLESS OTHERWISE SPECIFIED:

1. THIS INSTALLATION REPRESENTS BIODCLERE MODEL 16 SERIES.
2. OTHER MODELS MAY BE SUBSTITUTED.
3. IF VENTING IS ACCOMPLISHED THROUGH BUILDING, VENT IS TO BE BROUGHT TO GRADE AND CAPPED.
4. IF INSTALLED IN GROUND WATER CONTACT SITE ENGINEER FOR ANCHORING REQUIREMENTS.
5. CONTRACTOR IS TO SUPPLY ALL CONCRETE STRUCTURES AND PERFORM INSTALLATION.



## SECTION/ELEVATION OF TREATMENT PLANT

16 GENERAL FLOW SCHEMATIC.dwg

**AquaPoint**  
Performance Based Wastewater Treatment Systems

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(508) 985-9050 FAX (508) 985-9072

DISTRIBUTION STATEMENT  
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CONNECTION WITH OUR WORK DESIGN AND  
INVENTION RIGHTS ARE RESERVED NO FURTHER  
DUPLICATION OR DISTRIBUTION OF THIS  
DOCUMENT ARE PERMITTED WITHOUT PRIOR  
WRITTEN PERMISSION

TITLE	16 GENERAL FLOW SCHEMATIC.dwg
TYPICAL GROUND INSTALLATION	
DRAWING NO.	UK1265-4
REVISION	D
DATE	3/22/01
DWN BY	P.WILLEY
SCALE	1 : 60
SIZE	B / A3
SHEET #	1 of 1

0	3'	6'	9'	12'	15'	18'	21'	24'	27'	30'
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## 4.0 **BIOCLERE START-UP**

- A. During installation the Bioclere and primary tanks should be filled with potable water. Be certain that all water is clean and clear. Under no circumstances is silt laden or muddy water to be used in the Bioclere.
- B. Check that the dosing pump is immersed and that the pipe connected and the distribution assembly is level. Check that the sludge recycle pump is standing on the floor of the sump and that the discharge pipe is connected to the sludge recycle line.
- C. The Bioclere system is controlled by a Programmable Logic Relay (PLR) with integral HMI screen (interface). PLR operating instructions are provided in Appendix B of this manual and should be reviewed prior to proceeding with this startup procedure.
- D. Turn **ON** the toggle switch in the fan box module on the side of the Bioclere unit. When this is turned **OFF**, the fan and all pumps are disconnected and the alarm will sound if the main circuit breaker in the Bioclere control panel is **ON**.
- E. Turn the main power breaker in the control panel to **ON**. The green power light will turn **ON** and the PLR control screen will be illuminated. Note that the screen will go into sleep mode and the screen will go black after about 10 seconds if the PLR control buttons are not being used. To re-illuminate the screen press the (esc) key.
- F. Using the (+/-) navigation buttons on the PLR access the dosing pump and recycle pump timer setting screens and set the dosing and recycle pump timers to short test cycles for the initial startup process. We recommend the following settings.

	<b><u>ON</u></b>	<b><u>OFF</u></b>
Dosing	1 min.	1 min.
Recycle	1 min.	2 min.

- G. Access the recycle pump control screen and set the recycle pump to **AUTO**. The recycle pump should turn **ON** and **OFF** in a continuous cycle according to the above timer settings. The sludge recycle operation can be confirmed by observing flow from the recycle line at the head of the primary tank or at the tell tail hole in the recycle piping inside the Biocloere unit.
- H. Access the dosing pump control screen and set the dosing pump to **AUTO**. The dosing pump should turn **ON** and **OFF** in a continuous cycle according to the above timer settings. Dosing pump operation can be confirmed by observing flow from the Bioclere dosing array assembly inside the unit.
- I. Manually activate the float switch using by pulling one of the float switch wires out of the terminal strip in the control panel or by lowering the water level in the Bioclere clarifier. The

recycle pump operation should terminate when the float switch is in the extended position (open circuit).

- J. Confirm the Bioclere ventilation fan is operational.
- K. **ALARMS:** All alarm conditions are controlled by and logged in the PLR module. The alarm circuit consists of (1) current sensor (shared by the dosing and recycle pumps) and (1) AR power alarm relay. The PLR is set for a 3 second delay before the alarm will energize. This allows the pumps time to attain operating amperage. The visual alarm is a light on the top left side of the enclosure, while a Sonalert type audible alarm is located on the bottom right of the enclosure. Alarm conditions must be silenced by accessing the PLR interface screen and by pressing the **(A)** button. Acknowledging an alarm will reset the alarm function, stop the beacon and silences the horn. If applicable, a USP (United Security Products) autodialer is utilized to provide two functions:

1. Immediate notification of an alarm condition to a maximum of (4) telephone numbers and,
2. Weekly call-in to a telephone number verifying that the unit is on line and operating normally.

The current sensing relay (inside the control panel) senses when the dosing and/or recycle pump is running. If a pump fails, draws less current than normal or the circuit breakers trip, the alarm will be activated. These contacts are connected to an audio/visual alarm.

External alarm indication:

A dry contact between terminals 23 and 24 closes for an alarm condition and is used for connection to an automatic voice/ pager dialer system (120 VAC max).

Alarm conditions are as follows:

1. Fan circuit breaker trips/power loss: AR contact opens to indicate either condition and energizing local alarms.
2. Pump failure: Upon loss of amperage as detected by the current sensor the alarm will be initiated.
3. Power switch off in fan module at unit.

- L. Testing of dosing and sludge recycle pumps in **MANUAL** mode:

Turn **ON** system as described above and put dosing and recycle pumps in **MANUAL** position. When the pumps start observe the water flowing from the dosing array and into the inlet of the primary tank or observe flow through the recycle “telltale” inside the Bioclere.

- M. If any of the functions described above fail, check with the trouble shooting section of this manual (Section 7).
- N. Reset timers as described in section 2.3 “Timer Settings” of this manual.

- O. If the unit is ready for treatment it may be left in the operating condition with PLR screens set to **AUTO**.
- P. If there is some delay before the plant is needed it is recommended that the shut down procedure in Section 5 is followed.

## 5.0 **BIOCLERE SHUTDOWN**

- A. No action needs to be taken if there is a temporary cessation of flow to the plant for a period of time which does not exceed up to twelve (12) weeks. Leave the plant in operation with power **ON**.
- B. Should the plant not need to be operational for any period in excess of 12 weeks, the following shut down procedure will apply:
  - 1. Run the sludge recycle pump for 2 minutes to remove any secondary sludge from the Bioclere.
  - 2. If possible, keep the power **ON** to the Bioclere control panel and turn **OFF** the dosing and recycle pumps and leave the fan running. Otherwise, turn the power **OFF** and remove the fan unit. Reinstall the fan unit when the Bioclere is placed back in service.
  - 3. If “B” is not possible, turn the main power on the Bioclere control panel to **OFF** position.
- C. On resumption of wastewater flow to the plant the Bioclere should be re-started as described in Section 4.

## **6.0 MAINTENANCE PROCEDURES**

### **6.1 INTRODUCTION:**

The treatment system shall be operated by an Aquapoint Certified Wastewater Treatment Plant Operator. The treatment system shall also be operated in accordance with the Manufacturers recommendations contained in the Bioclere System Technical Manual. Reporting of test analyses will be done in conformance with applicable rules and local regulations for the use of the system.

Turn the main power switch to **OFF** before servicing the pump, fan or electrical panel box.

### **6.2 FREQUENCY OF MAINTENANCE:**

- A. Initial start-up visit to ensure proper commissioning and system operation
- B. Weekly (first two weeks): Check pump and fan operation visually via access hatch. Check the accuracy of the timers through two (2) complete cycles.
- C. Standard Quarterly Maintenance:
  - 1. Check general condition/appearance of Bioclere unit.
  - 2. Check vent flow, odor.
  - 3. Check general condition of fan box including internal and external wiring, lock, latch, gaskets, etc.
  - 4. Check for quiet fan operation.
  - 5. Check condition of cover locks, latches, gaskets.
  - 6. Check and characterize biomass growth (thickness, color, uniformity).
  - 7. Check recycle pump operation and timing
  - 8. Check dosing pump operation, timing and spray pattern.
  - 9. Check general condition of dosing assembly and clean spray nozzles as necessary.
  - 10. Check general condition of control box including locks, gaskets, etc.
  - 11. Check control panel switches, alarms, timers, etc.
  - 12. Complete and maintain service report file.

See attached Bioclere field report for complete O&M procedures.



### **6.3 PROCESS CONTROL FOR CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND (CBOD<sub>5</sub>) REMOVAL WITH THE BIOCLERE SYSTEM:**

Wastewater flows from the primary settling tank into a baffled chamber in the clarifier of the Bioclere. Dosing pumps located in this clarifier intermittently dose the PVC filter media bed with the wastewater.

In the Bioclere trickling filter the organic material in the wastewater is reduced by a population of microorganisms which attach to the filter media and form a biological slime layer. In the outer portion of the slime layer treatment is accomplished by aerobic microorganisms. As the microorganisms multiply the biological film thickens and diffused oxygen and organic substrate are consumed before penetrating the full depth of the slime layer. Consequently the biological film develops aerobic, anoxic and anaerobic zones.

Absent oxygen and a sufficient organic carbon source (CBOD<sub>5</sub>) the microorganisms near the media surface lose their ability to cling to the media. The wastewater flowing over the media washes the slime layer off the media and a new slime layer begins to form. This process of losing the slime layer is called “sloughing” and it is primarily a function of organic and hydraulic loading on the filter. This natural process allows a properly designed media bed to be self-purging and maintenance free.

The sloughed biomass settles to the bottom of the clarifier as sludge. This secondary sludge is periodically pumped back to the primary tank to enhance the digestion and denitrification processes which is further discussed in *Section 6.4.2 below*.

#### **6.3.1 Bioclere Trickling Filter Dosing Rates:**

The Bioclere uses a dosing pump to distribute wastewater over the trickling filter. It is critical to periodically clean the nozzles of excess biomass using a bottle brush to ensure uniform distribution. The Bioclere dosing rates that were set at the time of commissioning are listed in *Section 2.0* of this Technical Manual. The dosing rates are set so that the flow of water and pollutants (CBOD<sub>5</sub> and ammonium) over the biofilm are maximized. This in turn, will maximize the pollutant removal efficiencies and facilitate biomass sloughing through the filter. Therefore, it is not necessary to adjust the dosing timers. In fact, the dosing timers should only be adjusted if the Bioclere receives little or no flow for extended periods.

#### **6.3.2 Bioclere Recirculation Rates:**

Recirculation of sludge and treated effluent is accomplished in each unit using a submersible stainless steel pump controlled by a fully adjustable timer. The biological solids generated in the filter are returned to the sludge storage facility at regular intervals, typically every hour or two. Therefore, the sludge will not collect in the secondary settling tank and a sludge blanket will not form.

The benefits of recirculation are numerous and include: 1) removing biological sludge from the Bioclere so that only the primary tank(s) need periodic pumping, 2) diluting the influent pollutant concentrations which results in a thinner and more effective biofilm on the media bed, 3) odors are reduced in the primary tanks and the treatment components, 4) diluting biological inhibitors (cleaning agent, sanitizers, etc.) that may exist in the wastewater, 5) achieving nitrogen removal through denitrification due to the recirculation of nitrate to the primary tank.

The recirculation rates that were set at the time of commissioning are listed in *Section 2.0* of the Technical Manual. These rates may need adjusting depending on the 1) actual average daily flow, and 2) actual measured strength of the wastewater (concentrations of influent BOD<sub>5</sub>, TKN etc.). Please contact AquaPoint prior to adjusting the recirculation rates.

## 6.4 PROCESS CONTROL FOR NITROGEN REMOVAL WITH THE BIOCLERE SYSTEM:

Below is a brief description of how nitrogen removal is accomplished in the Bioclere unit.

### 6.4.1 Nitrification:

Nitrification is the sequential biological oxidation of  $\text{NH}_4\text{-N}$ , first to nitrite ( $\text{NO}_2\text{-N}$ ) by *Nitrosomonas* bacteria then to nitrate ( $\text{NO}_3\text{-N}$ ) by *Nitrobacter* bacteria according to the following overall equation:



Oxidation of 1 mg/l of  $\text{NH}_4\text{-N}$  requires approximately 4.6 mg/l of dissolved oxygen and produces acid resulting in the consumption of approximately 7.1 mg alkalinity as  $\text{CaCO}_3$ /mg  $\text{NH}_4\text{-N}$  oxidized. Alkalinity is the inorganic carbon source nitrifying bacteria require to oxidize ammonia. **Therefore it is critical that alkalinity is monitored on a regular basis to ensure complete nitrification.** Alkalinity concentrations in the Bioclere effluent must remain above 75 mg/l as  $\text{CaCO}_3$  to allow nitrification to proceed. If the alkalinity drops below this value then it is likely that nitrification will be inhibited and the effluent may not meet permit requirements. It is best to measure the alkalinity in the Bioclere effluent with a field test kit each time you are onsite to inspect the treatment system. Bioclere effluent can be collected from the final pump chamber. Effluent can be collected with a bailer.

If required, alkalinity can be added in the form of baking soda (sodium bicarbonate). It can be purchased as a powder in 50 pound bags. Contact Aquapoint if assistance is required to determine the alkalinity dosing rate.

Please note that nitrifying bacteria require a stable and consistent environment because of their sensitivity to numerous inhibitory and toxic substances and an array of environmental factors including temperature, pH, dissolved oxygen, and alkalinity. If nitrification is not being achieved then it will be necessary to verify the influent average daily flow, pH,  $\text{BOD}_5$ , TSS, TKN. It may also be necessary to conduct an inventory of the type and quantity of cleaning and process solutions that are used that may impact the microorganisms in the Bioclere units (i.e. daily, weekly, monthly, yearly).

### 6.4.2 Denitrification:

Dissimilating denitrification, the biological reduction of nitrate ( $\text{NO}_3\text{-N}$ ) to nitrite ( $\text{NO}_2\text{-N}$ ) and ultimately nitrogen gas in an anoxic environment (dissolved oxygen  $<0.5$  mg/l), involves the transfer of electrons from a reduced electron donor (organic carbon substrate) to an oxidized electron acceptor ( $\text{NO}_3\text{-N}$ ). It is an important reaction as it restores approximately (3.57 mg alkalinity/mg of  $\text{NO}_3\text{-N}$  reduced), and partially offsets the effects of nitrification in a combined nitrification/denitrification process. The microorganisms responsible for completing the reaction are facultative heterotrophic aerobes contained in the wastewater that are also responsible for  $\text{CBOD}_5$  oxidation in the Bioclere.

Denitrification in the Bioclere system is accomplished by periodically recirculating secondary sludge and treated nitrified effluent to the septic tank which provides an anoxic environment. Recirculation typically occurs several minutes every hour via a timer in the control panel. See **Section 2** of the Bioclere Technical Manual for Bioclere recycle and dosing rates. For typical residential strength wastewater, recirculation of treated effluent from the Bioclere to the septic tank will achieve  $>70\%$  removal of total nitrogen. This is because weight ratios of carbon to nitrogen, as measured as **BOD:TKN** in the influent wastewater are usually greater than the generally accepted ratio of **4:1** in which denitrification has been proven to proceed without an external carbon source.

## FIELD REPORT

Date	<input type="text"/>
Client	<input type="text"/>
Address	<input type="text"/>
City	<input type="text"/>
State	<input type="text"/>
Inspector	<input type="text"/>
Bioclere Model #(s)	<input type="text"/>

## Reason For Site Visit:

☐ O & M      ☐ Commissioning

☐ Testing      ☐ Other:

**(1) Odor**
1) Is there odor around the site? ☐ Yes      ☐ No

2) Where is the source of odor?

3) If odor is present, check all that apply: ☐ Mild      ☐ Medium      ☐ Strong

☐ Musty      ☐ Septic
**(2) Sludge & Scum Depth Measurements**

	Scum	Sludge
Grease Trap	<input type="text"/>	<input type="text"/>
Primary Tank #1	<input type="text"/>	<input type="text"/>
Primary Tank #2 (if applicable)	<input type="text"/>	<input type="text"/>
Bioclere 1A	<input type="text"/>	<input type="text"/>
Bioclere 1B (if applicable)	<input type="text"/>	<input type="text"/>

	Scum	Sludge
Bioclere 2A (if applicable)	<input type="text"/>	<input type="text"/>
Bioclere 2B (if applicable)	<input type="text"/>	<input type="text"/>
Effluent Tank	<input type="text"/>	<input type="text"/>
Other: _____	<input type="text"/>	<input type="text"/>

**(3) Bioclere Venting**

1) Record the Bioclere fan model #(s):

2) Is air passing through the vent(s)? ☐ Yes      ☐ No

*(if in doubt, put a small plastic bag around vent and allow to fill)*

3) Is the fan operating and in good condition...

for Bioclere 1A? ☐ Yes      ☐ No

for Bioclere 2A? (if applicable) ☐ Yes      ☐ No

for Bioclere 1B? (if applicable) ☐ Yes      ☐ No

for Bioclere 2B? (if applicable) ☐ Yes      ☐ No

*(Please provide necessary details in the report summary section)*

## FIELD REPORT

**(4) General**

	Bioclere 1A	Bioclere 1B (IF APPLICABLE)	Bioclere 2A (IF APPLICABLE)	Bioclere 2B (IF APPLICABLE)
Are there any filter flies in the unit?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If so, how many?	<input type="checkbox"/> Many <input type="checkbox"/> Few	<input type="checkbox"/> Many <input type="checkbox"/> Few	<input type="checkbox"/> Many <input type="checkbox"/> Few	<input type="checkbox"/> Many <input type="checkbox"/> Few
Is the lid gasket in good condition?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Locks/latches/handles in good condition?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is there any external damage to the units?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cover, fan box, & control panel securely locked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the fan box contain standing water?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

(Please provide necessary details in the report summary section)

Were influent/effluent samples taken for lab analysis? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If process control test samples were taken, please provide the following information:					
Alkalinity (as CaCO <sub>3</sub> )	<input type="text"/>	pH	<input type="text"/>	Turbidity (NTU)	<input type="text"/>
Sample Locations:	<input type="text"/>	Temperature (F)	<input type="text"/>	DO (mg/l)	<input type="text"/>
	<input type="text"/>	NO <sub>3</sub> -N (mg/l)	<input type="text"/>	NH <sub>3</sub> -N (mg/l)	<input type="text"/>
	<input type="text"/>	Other:	<input type="text"/>		

**(5) Biomass Characterization**

	Bioclere 1A	Bioclere 1B (IF APPLICABLE)	Bioclere 2A (IF APPLICABLE)	Bioclere 2B (IF APPLICABLE)
What is the color of the biomass?	<input type="checkbox"/> White	<input type="checkbox"/> White	<input type="checkbox"/> White	<input type="checkbox"/> White
	<input type="checkbox"/> White/Gray	<input type="checkbox"/> White/Gray	<input type="checkbox"/> White/Gray	<input type="checkbox"/> White/Gray
	<input type="checkbox"/> Gray	<input type="checkbox"/> Gray	<input type="checkbox"/> Gray	<input type="checkbox"/> Gray
	<input type="checkbox"/> Gray/Brown	<input type="checkbox"/> Gray/Brown	<input type="checkbox"/> Gray/Brown	<input type="checkbox"/> Gray/Brown
	<input type="checkbox"/> Brown	<input type="checkbox"/> Brown	<input type="checkbox"/> Brown	<input type="checkbox"/> Brown
	<input type="checkbox"/> Red/Brown	<input type="checkbox"/> Red/Brown	<input type="checkbox"/> Red/Brown	<input type="checkbox"/> Red/Brown
	<input type="checkbox"/> Black	<input type="checkbox"/> Black	<input type="checkbox"/> Black	<input type="checkbox"/> Black
Classify the growth of the biomass 6-12 inches below the media surface. 1=light 2=medium 3=heavy	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**(6) Nozzle Spray Pattern**

	Bioclere 1A	Bioclere 1B (IF APPLICABLE)	Bioclere 2A (IF APPLICABLE)	Bioclere 2B (IF APPLICABLE)
1) Does spray cover the entire media surface area?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
(If not, clean each nozzle with a bottle brush)				
2) Does the spray now cover entire surface area?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If not, then: a. remove nozzles and soak them in a bleach solution. b. manually engage both dosing pumps for 2 min. c. replace nozzles				
3) Does the spray now cover entire surface area?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If not, consult AQUAPOINT				

## FIELD REPORT

**(7) Pumps and Control Panel**

	Bioclere 1A		Bioclere 1B (IF APPLICABLE)		Bioclere 2A (IF APPLICABLE)		Bioclere 2B (IF APPLICABLE)	
What is the dosing pump timer setting?	min on:	<input type="text"/>	min off:	<input type="text"/>	min on:	<input type="text"/>	min off:	<input type="text"/>
What is the recycle pump timer setting?	min on:	<input type="text"/>	hrs off:	<input type="text"/>	min on:	<input type="text"/>	hrs off:	<input type="text"/>

For the following checklist, set dosing and recycle timers to a test cycle.

What is the amperage of dosing pump 1?	<input type="text"/> Amps	<input type="text"/> Amps	<input type="text"/> Amps	<input type="text"/> Amps
What is the amperage of dosing pump 2?	<input type="text"/> Amps	<input type="text"/> Amps	<input type="text"/> Amps	<input type="text"/> Amps
What is the amperage of recycle pump?	<input type="text"/> Amps	<input type="text"/> Amps	<input type="text"/> Amps	<input type="text"/> Amps
Is dosing pump operating according to test cycle?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is recycle pump operating according to test cycle?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the dosing pumps alternating?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

(Please provide necessary details in the report summary section)

**(8) Plumbing**

Are the unions in the Bioclere leaking?  
(If "yes", then tighten with pipe wrench) ☐ Yes ☐ No

Is the recycle siphon break weep hole operating as designed?  
(If "no", clean weep hole) ☐ Yes ☐ No

**(9) Final Check**

- ☐ Main Power set to "On" and toggle for all pumps set to "Normal" (or "Auto")
- ☐ Alarm toggle set to the "On" position
- ☐ Recycle and dosing pump timers are set back to original cycles in control panel
- ☐ Control panel, Bioclere cover, and fan box locked
- ☐ Record daily flow rate or water meter reading (if possible):

**(10) Report Summary:**

Note: Contact Aquapoint for pump, fan and control component replacement parts.

Signature: \_\_\_\_\_

## 7.0 TROUBLE SHOOTING

- 7.1 Before conducting any repair work on the fan or pump, replacing fuses, or doing any work on the panel or fan module:

**SWITCH THE MAIN BIOCLERE BREAKER AND POWER PANEL TOGGLE SWITCH TO OFF**

<b><u>FAULT</u></b>	<b><u>POSSIBLE CAUSE</u></b>	<b><u>CORRECTIVE ACTION</u></b>
Fan not working	Power failure	Check circuit breaker and replace if necessary.
	Fan motor failure	Check wiring and terminal connections. Replace fan if necessary.
Dosing pump not working	Power failure	As for fan above.
	Low-level protection	Check that pump is fully submerged.
	Timer control failure.	Check that power switch is ON <input type="checkbox"/> Replace timer if necessary.
	Pump failure	Check pump in accordance with manufacturer's instructions supplied.
Excessive build-up of biomass	Plant overload	Check that hydraulic and organic load are within design limits. Contact Aquapoint Inc. if capacity is to be increased.
	High sludge levels	Check sludge levels in each unit and de-sludge as necessary.
No biomass in filter	Excess shedding of biomass.	investigate and eliminate any source of biofilm poisoning such as disinfectant, household bleach, acids, etc. showing up in waste.
Odorous	Inefficient treatment.	Check that dosing assembly sprinkles evenly over media surface. Clean dosing assembly.
	Inadequate air supply	Check fan and air intake. See fan not working above.

## **8.0 FINAL EFFLUENT QUALITY PROBLEMS**

### **8.1 HIGH SUSPENDED SOLIDS**

If effluent levels are exceeded carry out the following checks:

1. Examine primary settlement tank. If excessive sludge or floating matter in the chamber is discharging to the Bioclere arrange for the primary tank to be de-sludged.
2. Inspect sludge recycle pump, clean and test to ensure pump is operating satisfactorily.
3. Consult distributor for assistance.

### **8.2 HIGH C.B.O.D. (Carbonaceous Biochemical Oxygen Demand)**

If effluent levels are exceeded carry out the following checks:

1. Check for signs of excessive sludge in the system and for suspended solids.
2. Check that the fan is operating continuously and that the air inlet to the fan is unobstructed. Clean and replace as necessary.
3. Check that the spray distribution system is clean and that the effluent is being distributed evenly to the filter media.
4. Check whether the loading to the plant has increased beyond the design basis. Consult distributor if loading has increased.
5. Ensure that there are no toxic or concentrated cleansing chemicals being discharged to the plant.

### **8.3 HIGH NH<sub>3</sub>N (ammonia-nitrogen)**

Carry out check procedure as for Item 8.2.

### **8.4 HIGH NO<sub>3</sub> (Nitrate-nitrogen)**

If effluent levels are exceeded carry out the following checks:

1. Check the recirculation pump and confirm it is operating properly.
2. Check the dissolved oxygen (DO) concentration in the primary settling tank effluent tee. The conditions should be anoxic (between 0.2 and 0.5 mg/l DO). If the DO concentration is high, reduce the recycle rate. If the DO concentration is low, increase the recycle rate.

For additional assistance contact:

**AQUAPOINT.3 LLC**  
**39 Tarkiln Place**  
**New Bedford, MA 02745**  
**Tel. 508-985-9050**  
**Fax 508-985-9072**

## 8.5 TOXIC MATERIALS WARNING

**In order to maintain proper Bioclere operation the following must be noted:**

This Bioclere system is designed to provide treatment for a specific waste stream. Its fixed film biological process is exceptionally stable and will tolerate shocks of high strengths of organic loading. However, toxic shock loading may adversely impact effluent characteristics.

**None of the following should be introduced into the Bioclere plant:**

1. Gasoline, kerosene, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid or gas.
2. Any non-latex paints, paint thinners, paint removers, or strippers.
3. Any organic solvent or any liquid containing any organic solvent.
4. Any quaternary ammonium sanitizers.
5. Any photographic fluids including waste developer, fixer and rinse water.
6. Any pesticide including insecticides, fungicides, rodenticide, and herbicides of any sort.
7. Any water or wastes containing toxic poisonous solids, liquids, or gases, in sufficient quantity to interfere with the sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the ground water.
8. Any waters or wastes having a pH higher than 9.5 or lower than 5.5.
9. Solid or viscous substances in quantities capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewage works such as, but not limited to, ash, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, ungrounded garbage, whole blood, paunch, manure, hair, fleshing, and entrails, and paper dishes, cups, milk containers, etc. either whole or in parts.
10. Any water or waste containing fats, wax, grease, or oils, whether emulsified or not, in excess of 100 mg/l, or containing substances which may solidify or become viscous at temperatures between 32 and 150 degrees Fahrenheit (0-65 degrees Celsius).
11. Any shredded garbage. The installation and operation of any garbage grinders in systems using the Bioclere is prohibited.
12. Any storm water, surface water, roof runoff, or subsurface drainage unless the system is designed to accept such sources of water.
13. Rubber gloves, gauze pads, etc. which are typical from medical facilities.

Similarly, substances, which might enhance or inhibit biological activity, should not be discharged into the system.

In the event these or other inhibiting substances inadvertently enter the waste stream contact Aquapoint immediately.



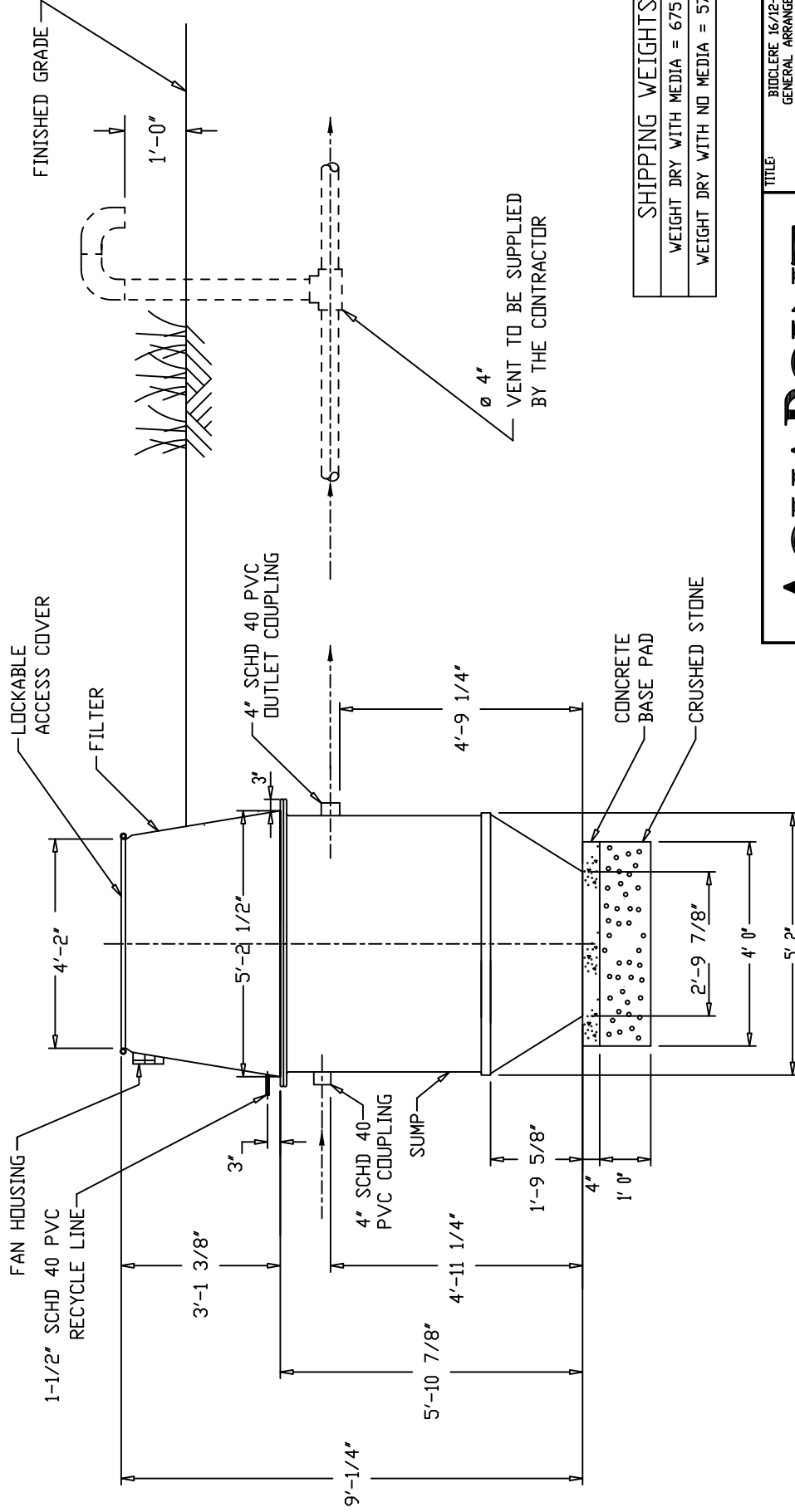
# **APPENDIX A**

## **BIOCLERE DRAWINGS**



NOTES:

1. VENT MAY BE RUN UP THE SIDE OF BUILDING.
2. SEE DRAWING PMW/AWT3015 FOR MOUNTING PAD CONSTRUCTION DETAILS.



SHIPPING WEIGHTS	
WEIGHT DRY WITH MEDIA = 675 lbs	
WEIGHT DRY WITH NO MEDIA = 575 lbs	

16.12-LS.dwg

TITLE:	BIDCLERE 16/12-LS
DRAWING NO.:	UK1259-2
REVISION:	B
DATE:	10/25/00
DWN BY:	P. WILLEY
SCALE:	1 : 25
SHEET #:	1 of 1

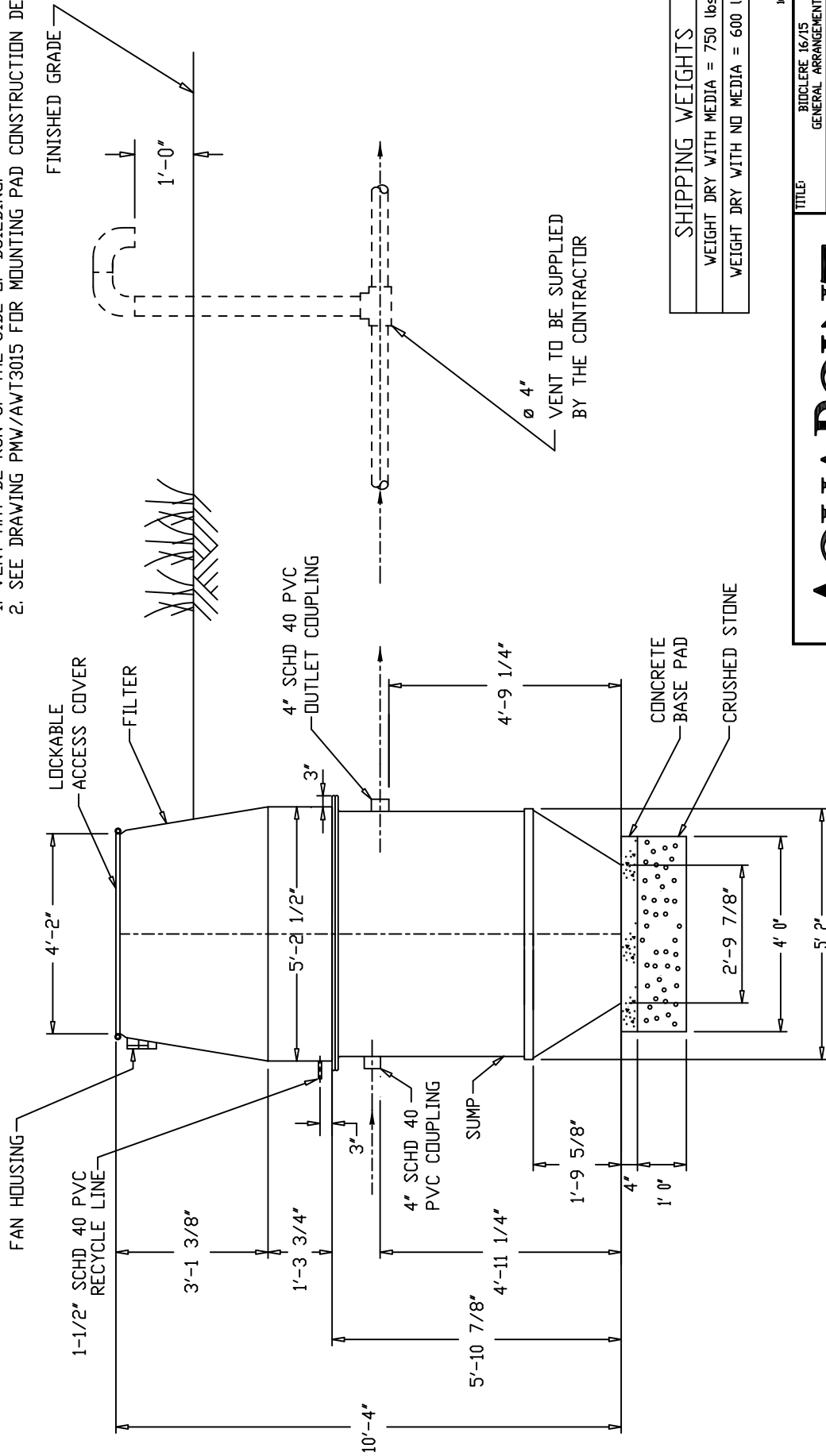
# AQUAPOINT

39 TARKILN PLACE  
NEW BEDFORD, MA 02745  
(508) 985-9050 FAX (508) 985-9072

MODEL 16/12-LS

DISTRIBUTION STATEMENT  
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DUPLICATION OR DISTRIBUTION OF THIS  
DOCUMENT IS PERMITTED WITHOUT PRIOR  
WRITTEN PERMISSION.

2. SEE DRAWING PMW/AWT3015 FOR MOUNTING PAD CONSTRUCTION DETAILS.



SHIPPING WEIGHTS
WEIGHT DRY WITH MEDIA = 750 lbs
WEIGHT DRY WITH NO MEDIA = 600 lbs

16-15 std GADMO

TITLE:	BIDCLERE 16/15 GENERAL ARRANGEMENT
DRAWING NO:	UK.1259-3
REVISION:	A
DATE:	10/25/00
DWN BY:	P.Willey
SCALE:	1 : 25
SHEET #:	1 of 1

# AQUAPOINT

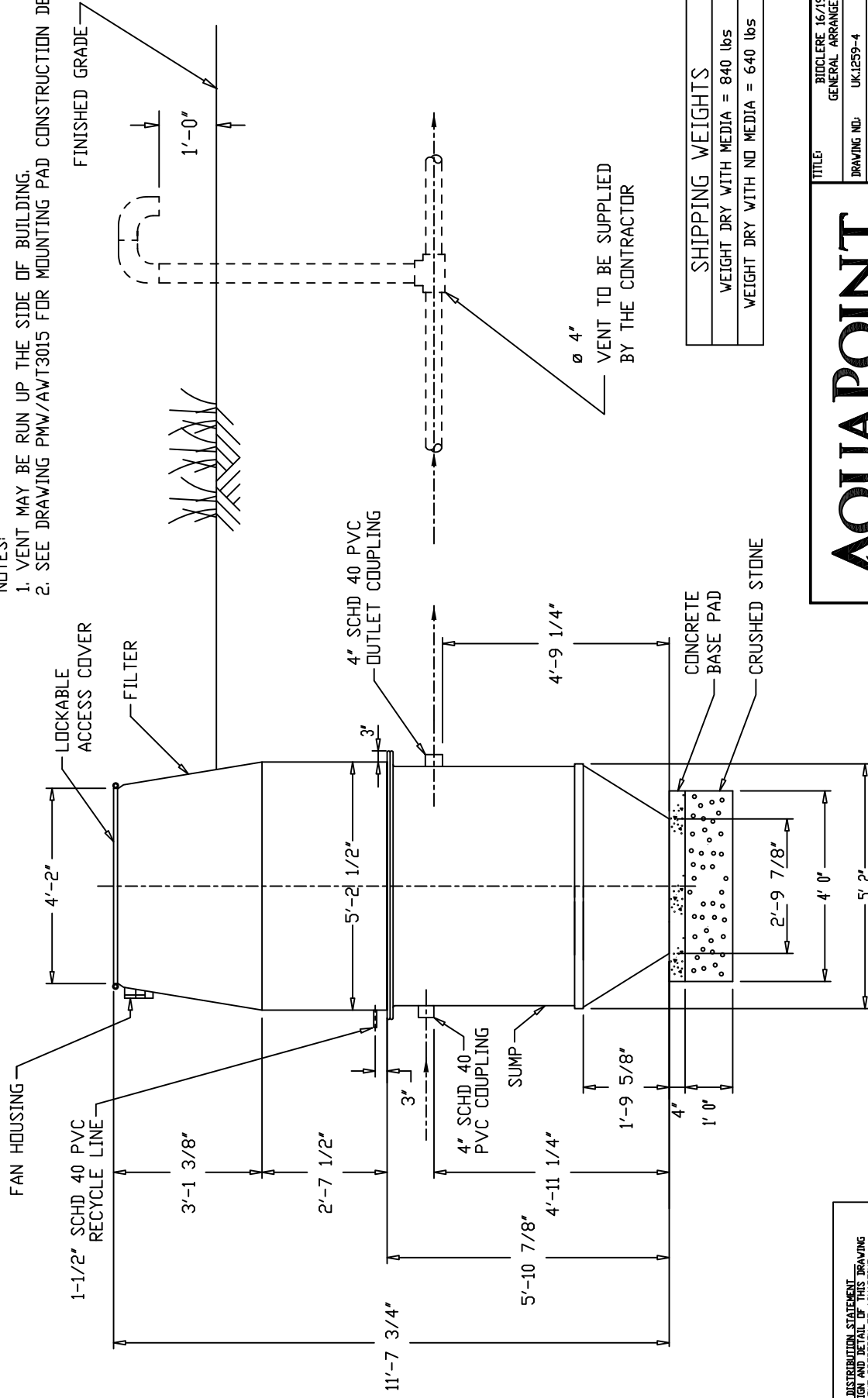
39 TARKILN PLACE  
NEW BEDFORD, MA 02745  
(508) 985-9050 FAX (508) 985-9072

BIÖCLERE MODEL 16/15

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WRITTEN PERMISSION.

NOTES:

1. VENT MAY BE RUN UP THE SIDE OF BUILDING.
2. SEE DRAWING PMW/AWT3015 FOR MOUNTING PAD CONSTRUCTION DETAILS.



SHIPPING WEIGHTS	
WEIGHT DRY WITH MEDIA = 840 lbs	
WEIGHT DRY WITH NO MEDIA = 640 lbs	

16-19 std Glazing

TITLE:	BIOCLERE 16/19
GENERAL ARRANGEMENT	
DRAWING NO:	UK1259-4
REVISION:	B
DATE:	10/25/00
DWN BY:	P.Willey
SCALE:	1 : 25
SIZE:	B
SHEET #:	1 of 1

# AQUAPOINT

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NEW BEDFORD, MA 02745  
(508) 985-9050 FAX (508) 985-9072

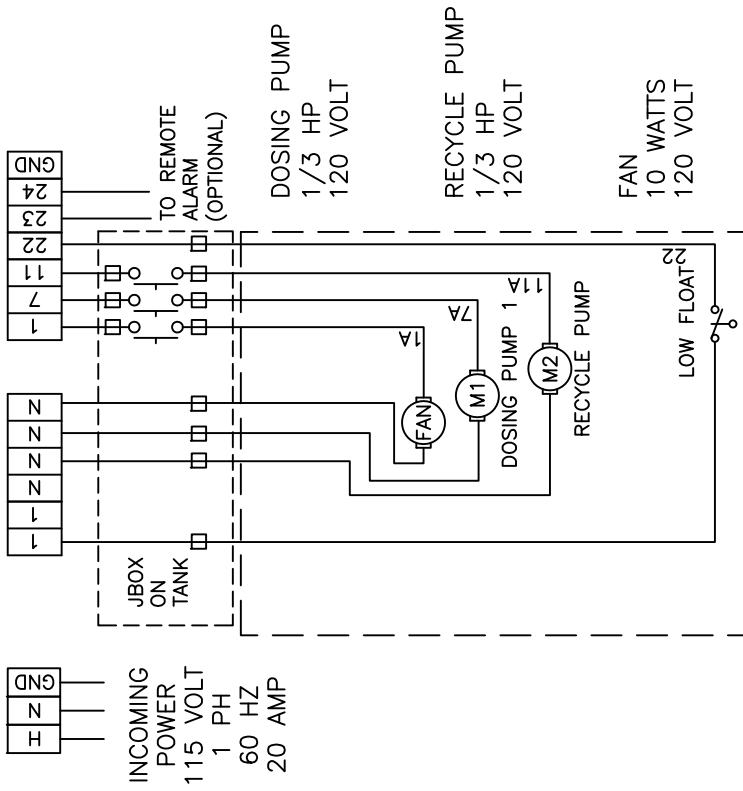
BIOCLERE MODEL 16/19

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**APPENDIX B**

**BIOCLERE ELECTRICAL SCHEMATICS & PLR  
OPERATING INSTRUCTIONS**

NOTES:

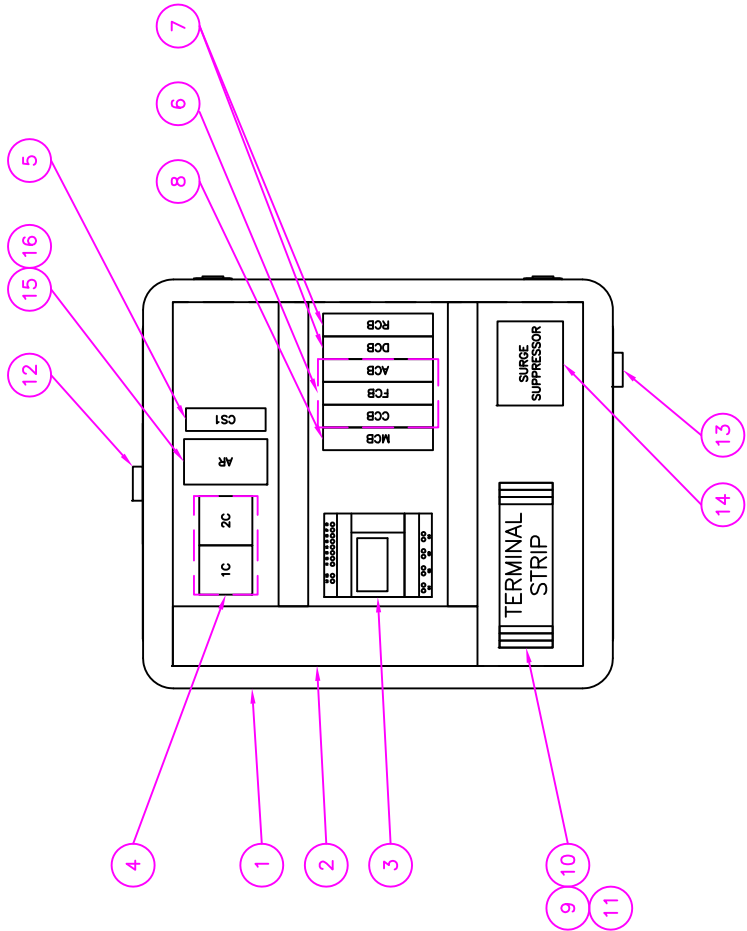


# CONTRACTOR EXTERNAL WIRING

**DISTRIBUTION STATEMENT**

				781.935.1515 781.935.1516 781.935.1517 781.935.1518 781.935.1519 781.935.1520 781.935.1521 781.935.1522 781.935.1523 781.935.1524 781.935.1525 781.935.1526 781.935.1527 781.935.1528 781.935.1529 781.935.1530 781.935.1531 781.935.1532 781.935.1533 781.935.1534 781.935.1535 781.935.1536 781.935.1537 781.935.1538 781.935.1539 781.935.1540 781.935.1541 781.935.1542 781.935.1543 781.935.1544 781.935.1545 781.935.1546 781.935.1547 781.935.1548 781.935.1549 781.935.1550 781.935.1551 781.935.1552 781.935.1553 781.935.1554 781.935.1555 781.935.1556 781.935.1557 781.935.1558 781.935.1559 781.935.1560 781.935.1561 781.935.1562 781.935.1563 781.935.1564 781.935.1565 781.935.1566 781.935.1567 781.935.1568 781.935.1569 781.935.1570 781.935.1571 781.935.1572 781.935.1573 781.935.1574 781.935.1575 781.935.1576 781.935.1577 781.935.1578 781.935.1579 781.935.1580 781.935.1581 781.935.1582 781.935.1583 781.935.1584 781.935.1585 781.935.1586 781.935.1587 781.935.1588 781.935.1589 781.935.1590 781.935.1591 781.935.1592 781.935.1593 781.935.1594 781.935.1595 781.935.1596 781.935.1597 781.935.1598 781.935.1599 781.935.1600 781.935.1601 781.935.1602 781.935.1603 781.935.1604 781.935.1605 781.935.1606 781.935.1607 781.935.1608 781.935.1609 781.935.1610 781.935.1611 781.935.1612 781.935.1613 781.935.1614 781.935.1615 781.935.1616 781.935.1617 781.935.1618 781.935.1619 781.935.1620 781.935.1621 781.935.1622 781.935.1623 781.935.1624 781.935.1625 781.935.1626 781.935.1627 781.935.1628 781.935.1629 781.935.1630 781.935.1631 781.935.1632 781.935.1633 781.935.1634 781.935.1635 781.935.1636 781.935.1637 781.935.1638 781.935.1639 781.935.1640 781.935.1641 781.935.1642 781.935.1643 781.935.1644 781.935.1645 781.935.1646 781.935.1647 781.935.1648 781.935.1649 781.935.1650 781.935.1651 781.935.1652 781.935.1653 781.935.1654 781.935.1655 781.935.1656 781.935.1657 781.935.1658 781.935.1659 781.935.1660 781.935.1661 781.935.1662 781.935.1663 781.935.1664 781.935.1665 781.935.1666 781.935.1667 781.935.1668 781.935.1669 781.935.1670 781.935.1671 781.935.1672 781.935.1673 781.935.1674 781.935.1675 781.935.1676 781.935.1677 781.935.1678 781.935.1679 781.935.1680 781.935.1681 781.935.1682 781.935.1683 781.935.1684 781.935.1685 781.935.1686 781.935.1687 781.935.1688 781.935.1689 781.935.1690 781.935.1691 781.935.1692 781.935.1693 781.935.1694 781.935.1695 781.935.1696 781.935.1697 781.935.1698 781.935.1699 781.935.1700 781.935.1701 781.935.1702 781.935.1703 781.935.1704 781.935.1705 781.935.1706 781.935.1707 781.935.1708 781.935.1709 781.935.1710 781.935.1711 781.935.1712 781.935.1713 781.935.1714 781.935.1715 781.935.1716 781.935.1717 781.935.1718 781.935.1719 781.935.1720 781.935.1721 781.935.1722 781.935.1723 781.935.1724 781.935.1725 781.935.1726 781.935.1727 781.935.1728 781.935.1729 781.935.1730 781.935.1731 781.935.1732 781.935.1733 781.935.1734 781.935.1735 781.935.1736 781.935.1737 781.935.1738 781.935.1739 781.935.1740 781.935.1741 781.935.1742 781.935.1743 781.935.1744 781.935.1745 781.935.1746 781.935.1747 781.935.1748 781.935.1749 781.935.1750 781.935.1751 781	
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NOTE:



17	1	IDEC	120V GREEN LIGHT	APW199G120
16	1	IDEC	2 POLE RELAY	RH2BLAC120
15	1	IDEC	2 POLE RELAY SOCKET	SH2B-05
14	1	SQUARE D	SURGE SUPPRESSOR	AS9003
13	1	FLOYD BELL	HORN	XC-09-201S
12	1	IDEC	120V RED LIGHT	APW199R120
11	3	ENTRELEC	GROUND TERMINALS	16511316
10	19	ENTRELEC	TERMINALS	11511807
9	2	ENTRELEC	TERMINALS(H, N)	11511811
8	1	ABB	20 AMP CIRCUIT BREAKER	S201K20A
7	2	ABB	8 AMP CIRCUIT BREAKER	S201K8A
6	3	ABB	1 AMP CIRCUIT BREAKER	S201K1A
5	1	DIVERSIFIED	CURRENT SENSOR	CMG0100-20
4	2	AEG	CONTACTORS	LS0710M0
3	1	CROUZET	PLR CD12	88974043
2	1	ALLIED MOULDED	14 X 12 BACKPANEL	PA142
1	1	ALLIED MOULDED	14 X 12 ENCLOSURE	AM1426L
ITEM NO.	QTY	MANUFACTURE	DESCRIPTION	PART NO.

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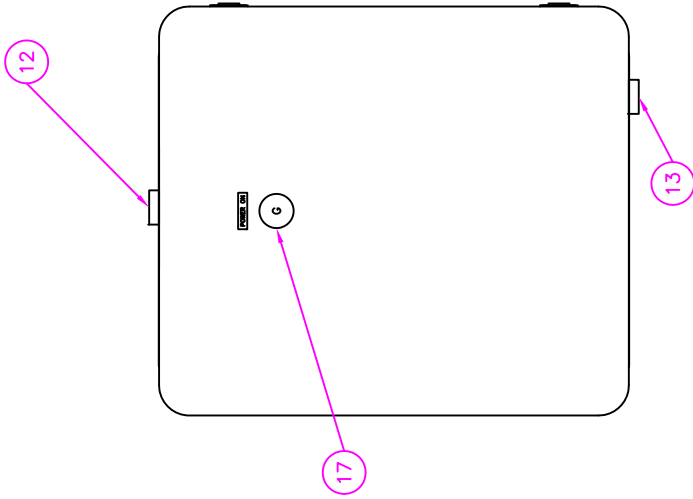
FILE: SINGLE BIOCLERE 16 SERIES PLR

B	REVISED	C	ISSUED	NO.	AWT3308
14	14	14	14	14	14

SHEET # 2 OF 5



NOTE:



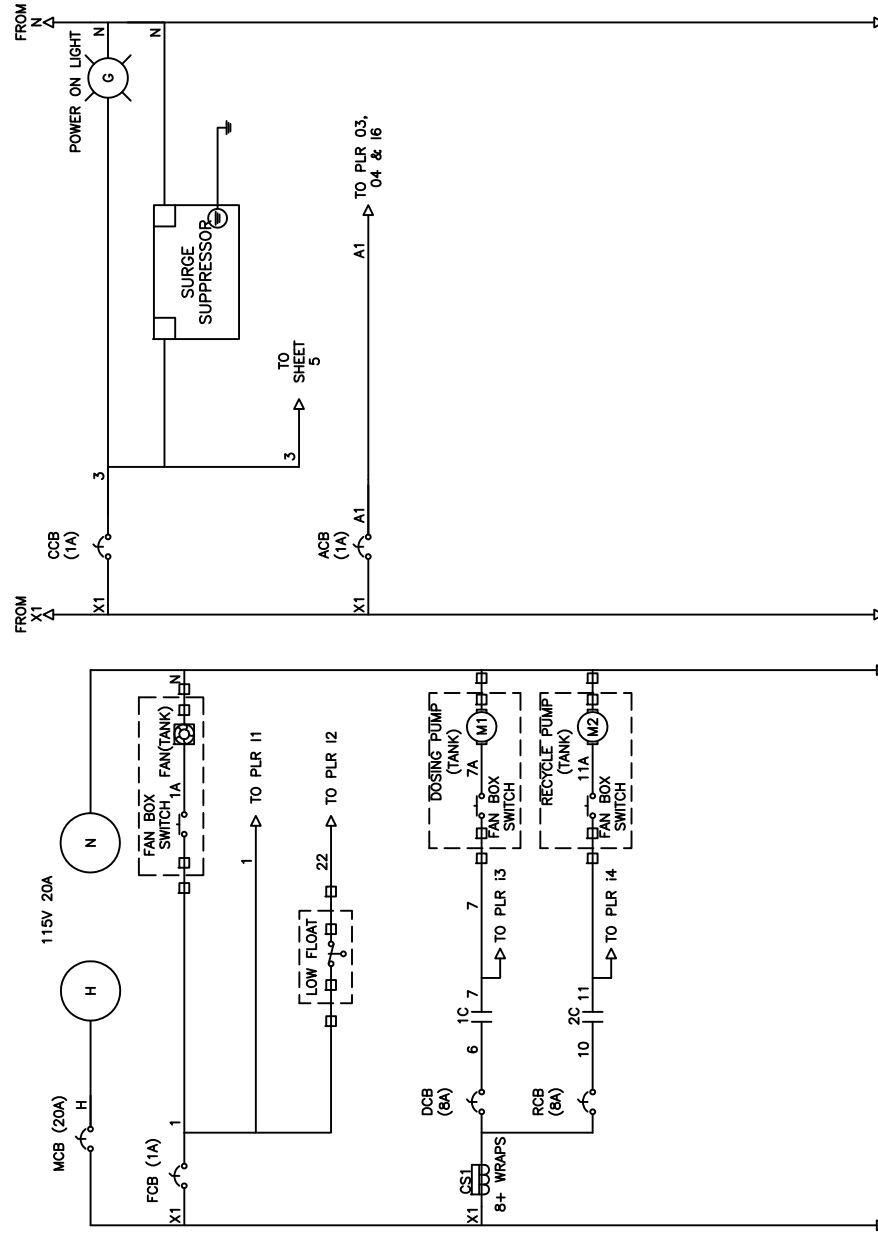
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**AquaPoint**  
Water Treatment Systems  
10000 10th Street, Suite 100  
San Diego, CA 92121  
Tel: 619-594-1000  
Fax: 619-594-1001  
Email: info@aquapoint.com

FILE: SINGLE BIOCLERE 16 SERIES PLR

REV	DESCRIPTION	DATE	BY	CHKD
1	AWT3308	10/1/08	AWT	AWT

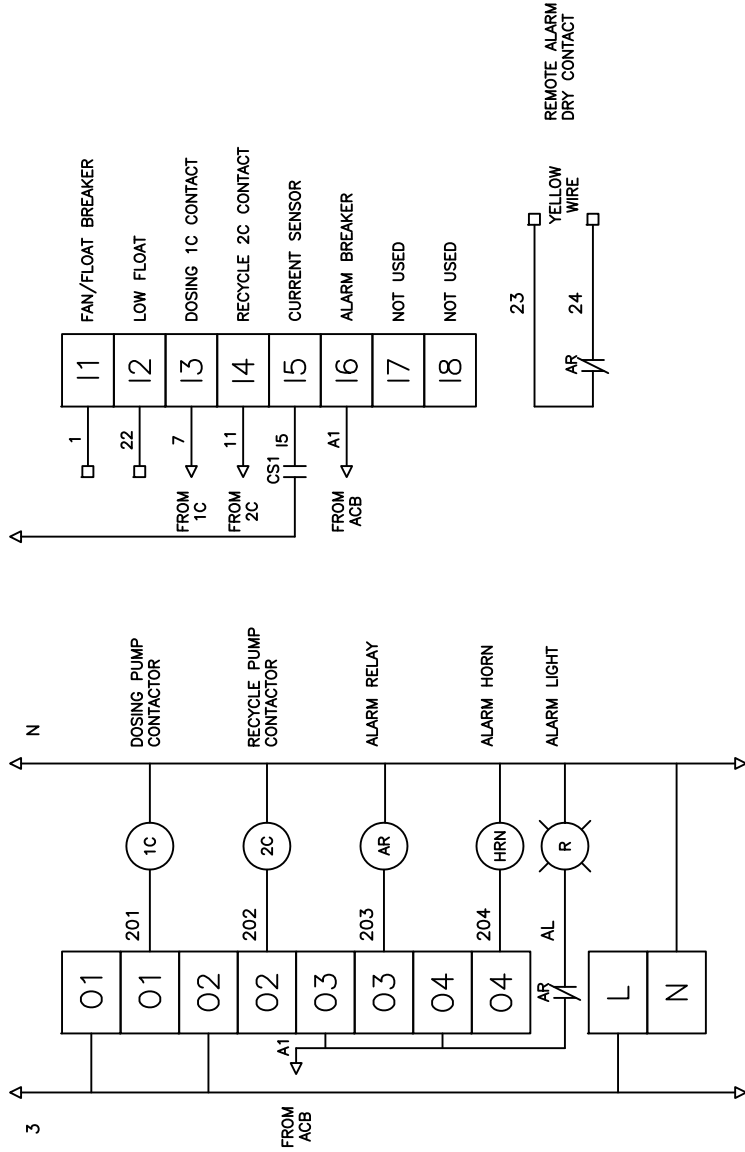
NOTES:



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NOTES:



CROUZET CD12 SMART PLR  
BASE UNIT 88974043

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# Aquapoint Control Systems

## 16 SERIES BIOCLERE™

### Programmable Logic Relay (PLR)

### Operating Instructions

## System Description

The AquaPoint provided control panel operates a single Bioclere™ Treatment Unit. A Crouzet Millenium3 Programmable Logic Relay (PLR) executes all system functions. The PLR controller has an integrated Human Machine Interface (HMI) LCD screen to provide access to timer values and to manually control pump operation. The HMI also provides the operator access to pump cumulative run times, as well as alarm status.

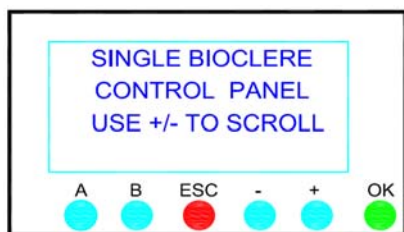
## Operating Instructions

Before starting the System, it must be installed according to installation instructions, applicable national and local codes, and by a qualified professional.

The system is controlled entirely from the HMI. Upon power up, the Main HMI screen will automatically appear (pictured below).

## Main Screen

#1 HMI SCREEN



Control screens for different system functions are accessed scrolling from the screen above.

To move to the next HMI screen use the (+) key until the screen you are looking for appears. Press the OK key to access a sub-screen which provides access to a related topic. To scroll backwards through the list of HMI screens use the (-) key. If the HMI goes to sleep press the (**ESC**) key to restore the display. If an alarm condition takes place press the (**B**) key to silence the alarm. Note the alarm horn will be silenced, but the alarm light will still be illuminated and the alarm will not sound again for that event. Press the (**A**) button to acknowledge an alarm. Note: Acknowledging an alarm will reset the alarm function, stop the beacon and silence the horn. If the same alarm event takes place again the alarm will also take place.

## Overview of the Main Screen

The first two lines of the Main Screen will contain the name of the control panel. The name will include the type of equipment the panel is controlling.

The third line of the Main screen indicates how to access other HMI screens.

The forth line of the Main screen will display the program's version letter.

## Control Keys

The **(A & B)** keys are used for different functions throughout the HMI. The HMI screen will display what the keys are used for if they have a particular function on that HMI Screen.

The **(ESC)** key typically allows the operator to “back up” from a sub-screen and return to the set of main screens.

Note: The **(ESC)** key is a good key to press if the HMI has gone to sleep and you want to wake it up. This is because no matter what screen the HMI has been left on pressing the **(ESC)** key will not change anything in the PLR program.

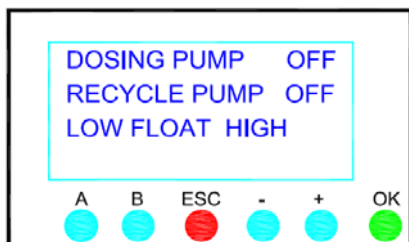
The **(-&+)** key allows the operator to scroll through a list and increase or decrease an entered value. The function will change depending on what HMI screen you are on.

The **(OK)** key is typically used as a enter key or except key.

## Status Screen

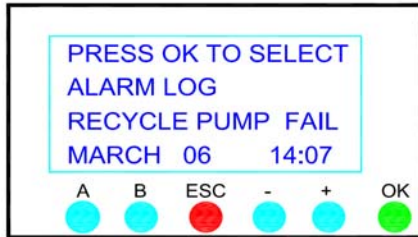
The second screen in the scrolling list of HMI Screens is the STATUS Screen.

#2 HMI SCREEN



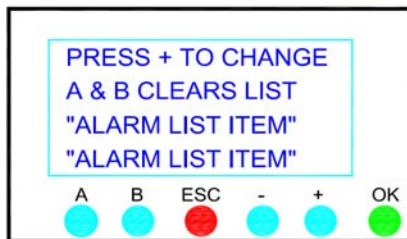
The Status Screen shows the operator the status of each device in the Bioclere™. The status of a device is the instantaneous condition of that device. It does not describe the mode of operation. For instance you can have a pump in AUTO mode but the actual condition of the pump is OFF because it is controlled by a repeat cycle timer.

### #3 HMI SCREEN



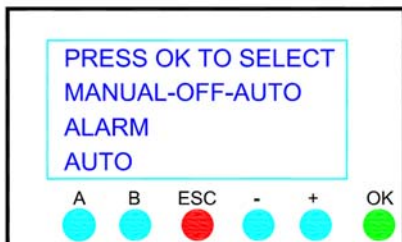
The third screen in the HMI is the Alarm Log Screen. This log will display the last four alarm events that took place. If fewer than four events exist then only the amount of events will be logged and the other lines will be blank. The date (month and day) will be recorded as well as the time of the event. To display or clear the alarm log list press the (**OK**) button on the screen above and the screen below will appear. To scroll through the alarm list, press the (- or +) key.

### #3 SCREEN'S SUBSCREEN (3A)



The Alarm Log screen above will display, at most, the last four alarm events in order of occurrence. From the screen above you can view the list by scrolling with the (-/+ ) buttons. You can clear the list by simultaneously pressing and holding the (**A & B**) button or the operator can press the (**ESC**) button to return to the previous screen.

### #4 HMI SCREEN

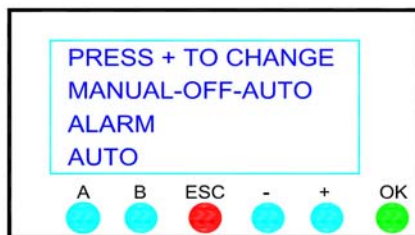


The next HMI Screen as you scroll down using the arrow key is the ALARM Mode Screen. The ALARM can be set to one of three modes of operation: Manual, Off and Auto. To change the mode of operation press the (**OK**) button and the screen below will appear. From the screen below scroll using the (+) key to the desired mode of operation. To select that mode press the (**OK**) button.

In Manual mode the alarm will sound constantly. This mode is typically used to test the alarm system. In the Off mode the Alarm will stay off regardless if the system has an alarm condition. If the Alarm System has been turned off the HMI will display a message: "The alarm is turned off". When the alarm is turned back on, the Alarm will sound since a defined alarm condition is if the alarm is turned off. This alarm condition will need to be silenced and reset to stop the alarm.

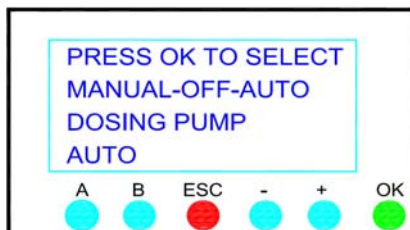
In normal operation the Alarm is set to AUTO mode. In AUTO mode the alarm horn and light will be activated if an alarm condition is detected by the system and recorded in the alarm history screen.

#### #4 SCREEN'S SUBSCREEN (4A)



Press the (**ESC**) key to leave the screen without making a change.

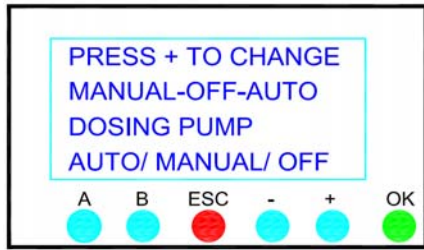
#### #5 HMI SCREEN



The next HMI Screen as you scroll down using the arrow key is the Dosing Pump Mode Screen. The Dosing Pump can be set to one of three modes of operation: Manual, Off and Auto. To change the mode of operation press the (**OK**) button on the screen above and the screen below will appear. From the screen below scroll using the (**+**) key to the desired mode of operation. To select that mode, press the (**OK**) button. If you do not want to change the pump mode while you are in the Dosing Pump Mode Selection Screen press the (**ESC**) button.

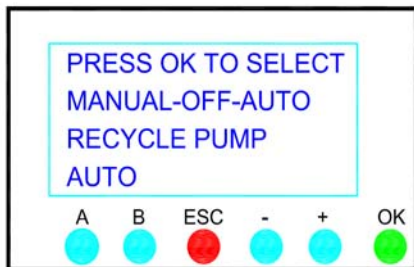
In Manual mode the dosing pump will operate constantly. This mode is typically used to test the operation of the pump. In the Off mode the dosing pump will stay off. If the dosing pump has been turned off the System will alert the operator of this condition. In normal operation the Dosing Pump is set to AUTO mode. In AUTO mode the Dosing Pump will operate on an ON and OFF operator adjustable timer cycle. If the pump is called to operate and does not have amperage then the alarm will sound indicating a pump failure and display this message in the alarm history screen.

#### #5 SCREEN'S SUBSCREEN (5A)



If you are on the screen above and do not want to make a change, press the (**ESC**) button to return you to the previous screen.

#### #6 HMI SCREEN

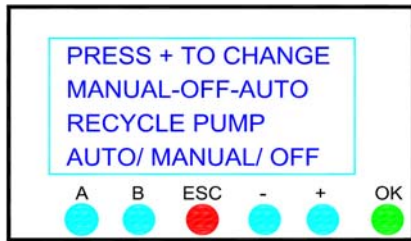


The Recycle Pump Screen is the next HMI screen as you scroll. The Recycle Pump can be set to one of three modes of operation: Manual, Off and Auto. To change the mode of operation press the (**OK**) button on the screen above and the screen below will appear. From the screen below use the (**+**) key to scroll to the desired mode of operation. To select that mode, press the (**OK**) button on the screen below. If you do not want to change the pump mode while you are in the Dosing Pump Mode Selection Screen press the (**ESC**) button.

In Manual mode the recycle pump will operate constantly. This mode is typically used to test the operation of the pump. In the Off mode the recycle pump will stay off. If the recycle pump has been turned off the System will alert the operator of this condition. In normal operation the Recycle Pump is set to AUTO mode. In AUTO mode the Recycle Pump operates off of a PLR timer cycle and the low float condition. If the low float is closed (tipped up) the pump will operate on an ON and OFF operator adjustable timer. When the float condition opens (extended) the recycle pump will stop operation without alarming and wait for the float condition to change. If the pump is called to operate but does not show amperage then the alarm will sound indicating a pump failure and display this message in the alarm history screen.

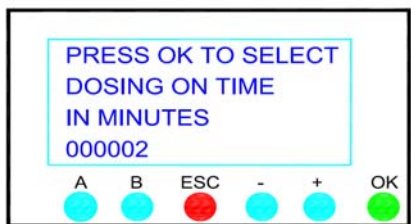


#### #6 SCREEN'S SUBSCREEN (6A)



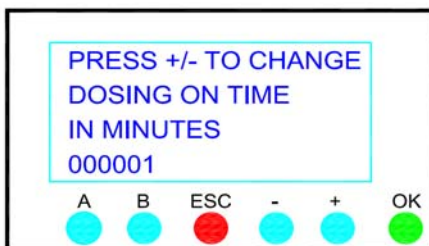
If you are on the screen above and do not want to alter a setting, press the **(ESC)** button to return to the previous screen.

#### #7 HMI SCREEN



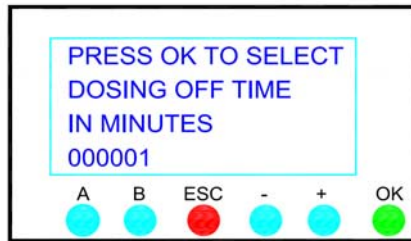
The Bioclere™ Dosing Pump On Timer Screen is accessed through the screen depicted above. The Dosing On Timer Screen allows the operator to set the ON timer settings for the Dosing Pump. All Bioclere™ timers are set in minutes. For the sixteen series Bioclere™ the ON timer is set to 3 minutes and the OFF timer is set to 5 minutes. To adjust the ON time press the OK button and the screen below will appear. From the screen below use the (+/-) button to alter the timer setting and press the **(OK)** button to except the change. The new timer value will be displayed at the bottom of the screen above (000002 minutes).

#### #7 SCREEN'S SUBSCREEN (7A)



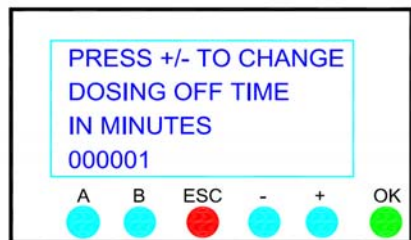
If you are on the screen above, and do not want to alter the time parameter, press the **(ESC)** button to return to the previous screen.

#### #8 HMI SCREEN



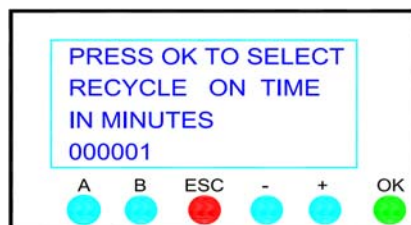
The Bioclere™ Dosing Pump Off Timer Screen is accessed through the screen depicted above and is the next screen as you scroll using the (+) button. The Dosing Off Timer Screen allows the operator to set the OFF timer settings for the Dosing Pump. All Bioclere™ timers are set in minutes. For the sixteen series Bioclere™ the OFF timer is typically set to 5 minutes. To adjust the Off time press the (**OK**) button and the screen below will appear. From the screen below use the (+/-) keys to alter the timer setting and press the (**OK**) button to except the change. The new timer value will be displayed at the bottom of the screen as is shown above (000001 minutes).

#### #8 SCREEN'S SUBSCREEN (8A)



If you are on the screen above and do not want to alter the time parameter press the (**ESC**) button to return you to the previous screen.

#### #9 HMI SCREEN



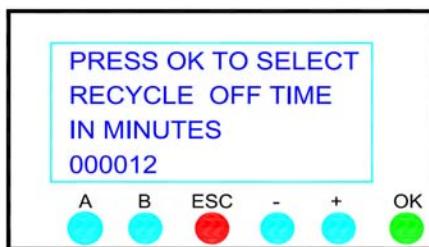
The Bioclere™ Recycle Pump On Timer Screen is accessed through the screen depicted above. The Recycle Pump On Timer Screen allows the operator to set the ON timer settings for the Recycle Pump that returns settled solids from the Bioclere back to the primary tank. All Bioclere™ timers are set in minutes. For the 16 series Bioclere™ the ON timer is typically set to 2 minutes. To adjust the ON time press the (**OK**) button from the screen above and that will bring you to the screen below. From the screen below use the (+/-) keys to alter the timer setting and press the (**OK**) button to except the change. The new timer value will be displayed at the bottom of the screen above as shown (000001 minutes).

#### #9 SCREEN'S SUBSCREEN (9A)



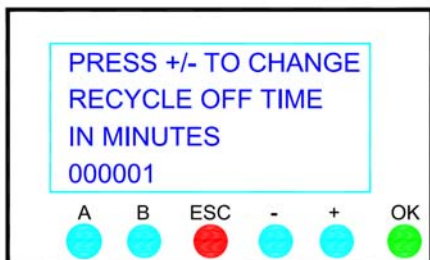
If you are on the screen above, and do not want to alter the time parameter, press the (**ESC**) button to return to the previous screen.

#### #10 HMI SCREEN



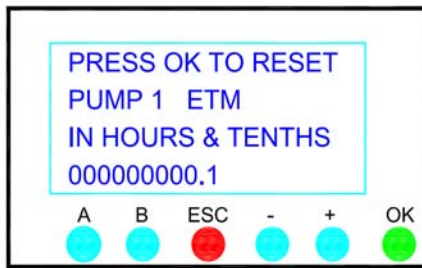
The Bioclere™ Recycle Pump Off Timer Screen is accessed through the screen depicted above and is the next screen as you scroll using the (+) button. The Recycle Pump Off Timer Screen allows the operator to set the OFF timer settings for the Recycle Pump. For the sixteen series Bioclere™ the OFF timer is typically set to 150 minutes. To adjust the Off time press the (**OK**) button and it will display the screen below. On the screen below use the (+/-) keys to alter the timer setting and press the OK button to except the change. The new timer value will be displayed at the bottom of the screen as is shown above (000012 minutes).

#### #10 SCREEN'S SUBSCREEN (10A)



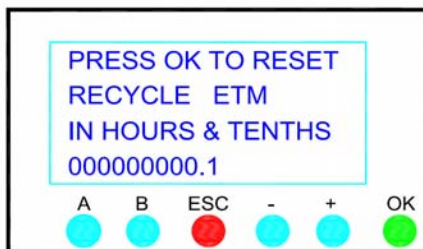
If you are on the screen above, and do not want to alter the time parameter, press the (**ESC**) button to return to the previous screen.

#### #11 HMI SCREEN



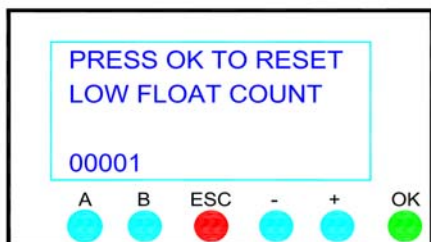
Above is the Dosing Pump elapsed time meter (ETM) screen. The screen will display the amount of cumulative time the Dosing Pump has operated since the last time the ETM was reset. To reset the ETM value for this pump press the **(OK)** button. If the operator does not want to reset the ETM scroll to another screen using the **(-/+)** keys.

#### #12 HMI SCREEN



Above is the Recycle Pump elapsed time meter (ETM) screen. The screen will display the amount of cumulative time the Recycle Pump has operated since the last time the ETM was reset. To reset the ETM value for this pump, press the **(OK)** button. If the operator does not want to reset the ETM scroll to another screen using the **(-/+)** keys.

#### #13 HMI SCREEN

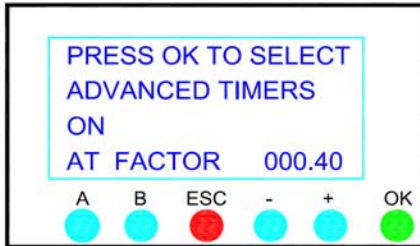


The screen above is the Bioclere™ Low Float Counter Screen. This screen displays the amount of times the Bioclere™ low float condition has OPENED. To reset this value from the screen above press the **(OK)** button and the value in the bottom left hand corner of the screen will return to zero.

During a low float condition the water level in the Bioclere™ clarifier is low. To prevent the level from dropping any lower the control system will stop the recycle pump's normal operation until the level rises again. This signal will also make sure that the level in the Bioclere™ is high enough so the dosing pump can operate properly and sustain the life of the biological activity in the filter bed.

Note: The low float condition is not an alarm condition.

#### #14 HMI SCREEN



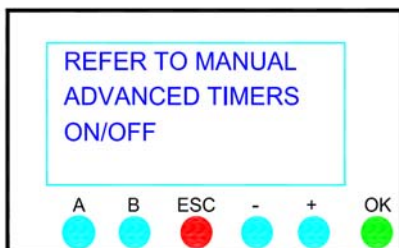
The Advanced Timers Screen (optional equipment) allows the operator to select the Advanced Timer Operation. To select, press the **(OK)** button on the screen above and the screen below will appear. If the Advanced Timers are off then consult Aquapoint if the Advanced Timers Optional Equipment was purchased and not active.

If active the Advanced Timer (AT) Factor will be displayed as shown on the screen above (AT FACTOR 000.40). When an AT FACTOR is displayed this will indicate the actual displayed dosing and recycle pump timer values will be adjusted by a factor to correct for the facility's normal diurnal hydraulic wastewater flow. This setting allows the system to make more efficient use of pumps and increase the efficiency of the nutrient removal process while reducing component cycling and power consumption.

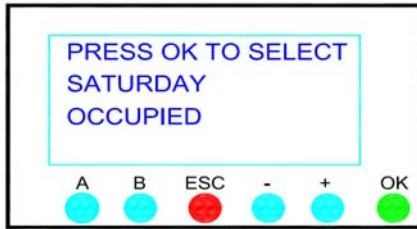
The Advanced Timers have two settings, the Standard AT Mode and the Work Week Mode. The Standard AT setting optimizes timer control taking into account the home is occupied during the day, throughout the week (Monday-Friday).

The Work Week Mode setting optimizes timer control taking into account the facility is unoccupied during the day, throughout the week (Monday-Friday). This Work Week Mode can only be set if the AT setting is ON. The Work Week Mode is either set to ON or OFF. During the system's commissioning the appropriate setting will be implemented.

#### #14 SCREEN'S SUBSCREEN (14A)



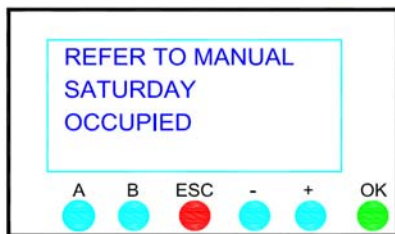
#### #15 HMI SCREEN



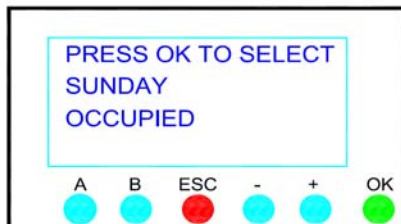
When the Bioclere™ system is operated using the AT system the above screen will allow the operator to tell the system if the dwelling is occupied on Saturday. By pressing (**OK**) the screen below will appear, allowing the operator to select the occupied or not occupied setting to fit existing conditions. The selected condition will be displayed on the screen above.

Note: During unoccupied operation the system does not shut down but operation is modified to better fit the unoccupied condition.

#### #15 SCREEN'S SUBSCREEN (15A)



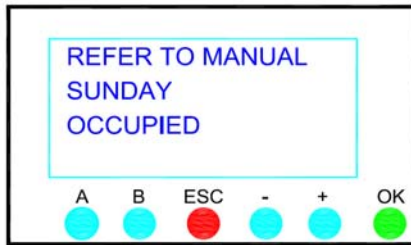
#### #16 HMI SCREEN



When the Bioclere™ system is operated using the AT system the above screen will allow the operator to tell the system if the dwelling is occupied on Sunday. By pressing OK, the screen on the next page will appear allowing the operator to select the occupied or not occupied setting to fit the conditions. The selected condition will be displayed on the screen above.

Note: During unoccupied operation the system does not shut down but operation is modified to better fit the unoccupied condition.

#### #16 SCREEN'S SUBSCREEN (16A)



## **ALARM/ALERT CONDITIONS/TROUBLESHOOTING**

### **Caution: Turn off disconnect switch, lock out and tag out power, and verify prior to servicing!**

Bioclere™ # Fan Fail: The fan circuit breaker has tripped.

Solution: Verify the fan and inlet vent does not have debris clogging it. Verify the fan turns freely. Confirm the junction box is free from water/condensation and terminals are in good working condition. Reset fan circuit breaker.

Bioclere™ Dosing Pump Fail: Bioclere™ Dosing Pump is not running when it should be.

Solution: Possible problems or failure conditions consists of the following: pump clogged, pump internal thermal switch tripped or faulty current sensor, loose wire connection, switch at junction box off or malfunctioning, motor contactor malfunction, or pump circuit breaker tripped/malfunction.

Bioclere™ Recycle Pump Fail: Bioclere™ Recycle Pump is not running when it should be.

Solution: Possible problems or failure conditions consists of the following: pump clogged, pump internal thermal switch tripped or faulty current sensor, loose wire connection, switch at junction box off or malfunctioning, motor contactor malfunction, or pump circuit breaker tripped/malfunction.

PLR Run Mode Failure: Bioclere™ programmable logic relay output voltage source is not functioning properly.

Solution: Possible problems or failure conditions consist of the following: Circuit breaker supplying the output power has tripped or malfunctioned.

Float Condition is Low: The Bioclere™ waster level has fallen below the Low Level Float Switch. **This is not an alarm condition!** In this condition the recycle pump will not run until the clarifier level in the Bioclere™ returns to normal. This event is logged in the Alarm Log but the alarm light and horn will not be activated. This event is logged to let the operator now that the condition is taking place and when it is happening.

## **APPENDIX C**

### **PURCHASERS WARRANTY**





## BIOCLERE™

### PURCHASERS WARRANTY

Project/Site: \_\_\_\_\_

Commissioned date: \_\_\_\_\_

Aquapoint.3, LLC, a Massachusetts Corporation, warrants to the purchaser that the Bioclere™ wastewater treatment plant is free from defects in material and workmanship for a period of one (1) year from the date of installation. Date of warranty shall mean the day specified on the Installation Report.

Aquapoint.3, LLC shall fulfill this warranty by repairing or exchanging any component that in our judgment shows evidence of defect during the warranty period.

This warranty does not cover treatment processes, or Bioclere™ units which have been flooded by external means, which have been disassembled by unauthorized persons, which have been improperly installed, which have been subjected to external damage or which have not been operated and maintained in accordance with the manufacturer's recommended procedures.

This warranty applies only to the Bioclere™ wastewater treatment plant and does not include any of the building wiring, plumbing, drainage, or disposal systems. Aquapoint.3, LLC is not responsible for any delay or damages caused by defective components or material, or for loss incurred because of interruption of service, or for any other special or consequential damages or incidental expenses arising from the manufacture, sale or use of this treatment plant.

Aquapoint.3, LLC reserves the right to revise, change or modify the construction or design of the Bioclere™ wastewater treatment plant or any component part thereof without incurring any obligation to make such changes or modification in previously sold equipment. Aquapoint.3, LLC also reserves the right to make replacements of component parts under this warranty, to furnish component parts, which, in its judgment, are equivalent to the component part, replaced.

Under no circumstances will Aquapoint.3, LLC be responsible for any other direct or consequential damages, including but not limited to lost profits, lost income, labor charges, delays in production and/or idle production, which damages are caused by a defect in material and/or workmanship in parts.

This warranty is expressly in lieu to any other expressed or implied warranty, excluding any warranty of merchantability or fitness, and of any other obligation on the part of Aquapoint.3, LLC

Please fill out and return no later than ten (10) days after installation to:

**AquaPoint.3, LLC**  
**39 Tarkiln Place**  
**New Bedford, MA 02745**  
**Ph: 508-985-9050**  
**Fax: 508-985-9072**

Signed: \_\_\_\_\_  
Aquapoint.3, LLC / Date

Signed: \_\_\_\_\_  
Property Owner / Date

## **APPENDIX D**

### **PUMP & FAN SPECIFICATIONS**



# ITT

Wastewater

## Goulds Pumps

### LSP03/LSP07 Submersible Sump Pumps



LSP03AT



LSP07



LSP03AV

#### FEATURES

- Corrosion-resistant construction.
- Stainless Steel motor casing and fasteners.
- Glass-filled thermoplastic impeller and casing.
- Upper and lower heavy duty ball bearing construction.
- Motor is permanently lubricated for extended service life and is powered for continuous operation. All ratings are within the working limits of the motor.
- Hard coated 400 series stainless steel shaft for improved corrosion resistance.
- Float switch is adjustable for various liquid levels. Easily removed for direct pump operation or switch replacement.
- Complete unit is lightweight, portable and easy to service.
- Available in manual and automatic versions. See next page for specific order numbers.
- A double labyrinth lip seal system protects the motor. It consists of three lip seals and a V-ring in addition to an impeller counterblade system which keeps solid particles away from the seal unit.



Goulds Pumps is a brand of ITT  
Residential and Commercial Water.

[www.goulds.com](http://www.goulds.com)

*Engineered for life*



# ITT

## GOULDS PUMPS Wastewater

### APPLICATIONS

Specially designed for the following uses:

- Basement draining
- Water transfer
- Dewatering

### SPECIFICATIONS

- Discharge size: 1 1/2" NPT.
- Capacities: to 57 GPM.
- Maximum head: 34 feet TDH.
- Max. solids: 3/8" spherical
- Temperature: 104°F (40°C) maximum liquid temperature.
- Maximum pump submergence is 10 ft. for LSP03; 16 ft. for LSP07.

### MOTOR

- Single phase, 3450 RPM, 60 Hz
  - LSP03, 1/3 HP, 115 V, 2.9 maximum amps.
  - LSP07, 3/4 HP, 115 V (7.1 amps) or 230 V (3.5 amps).
- Built-in thermal overload protection with automatic reset.
- Permanent-split-capacitor type.

- Class B insulation.
- Stainless steel shaft.
- Air filled design.
- Power cord length: LSP03; 10 feet standard, 20 feet optional, LSP07; 20 feet.

### FLOAT SWITCH OPTIONS

- Models are available with a float switch. Several options for automatic operation.
- "AV" models are supplied with a vertical float switch.
- "A" models are supplied with a built in float switch.
- "AT" models are supplied with a piggy-back replaceable float switch.

### AGENCY LISTING



Canadian Standards Association  
File #LR114251



Underwriters Laboratories  
File #83318

Goulds Pumps is ISO 9001 Registered.

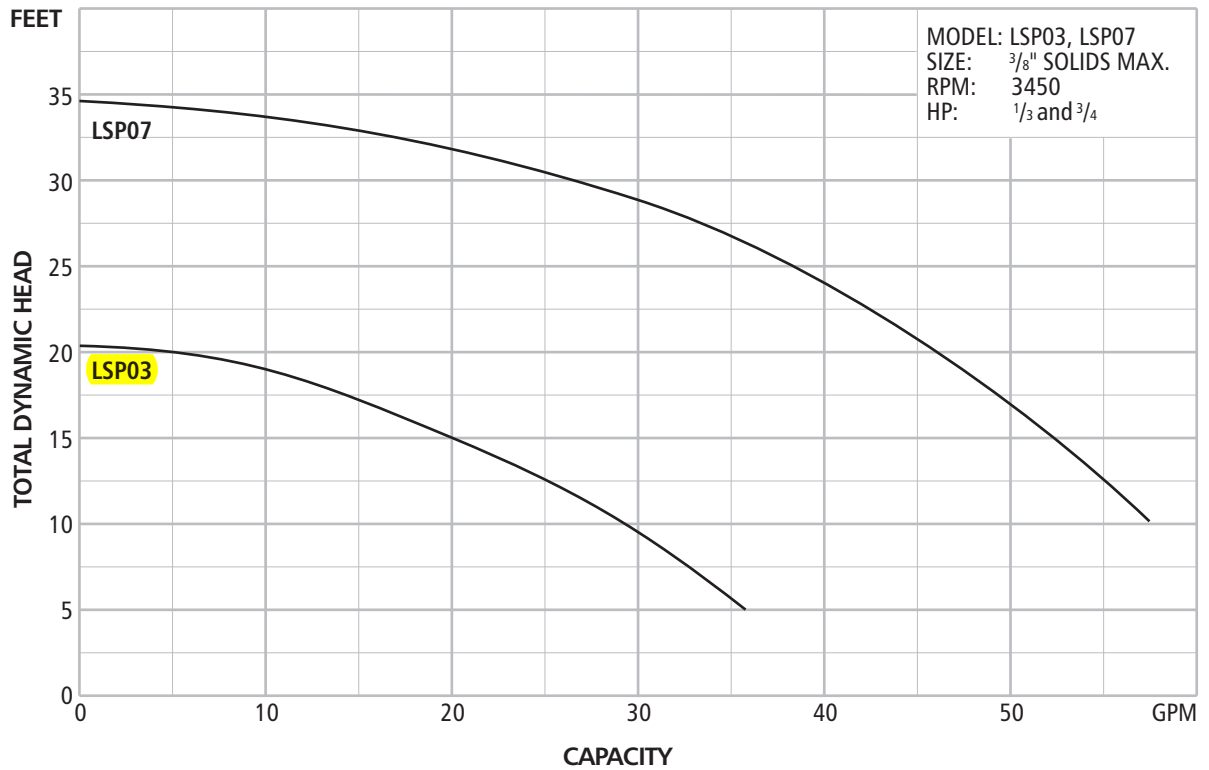
### MODEL INFORMATION

Order No.	HP	Volts	Amps	Minimum Circuit Breaker	Phase	Float Switch Style	Cord Length	Discharge Connection	Min. On Level	Min. Off Level	Minimum Basin Diameter	Maximum Solids Size	Shipping Weight lbs/kg
LSP0311	1/3	115	2.9	10	1	Plug / No Switch	10'	1 1/2"	Manual	Manual	9"	3/8"	11 / 5
LSP0311A						Built-In Wide Angle			11"	5"	12"		
LSP0311AT						Piggyback Wide Angle			11"	5"	12"		
LSP0311AV						Piggyback Vertical			8.5"	2"	12"		
LSP0311F						Plug / No Switch	Manual		Manual	9"			
LSP0311AF						Built-In Wide Angle	11"		5"	12"			
LSP0311ATF						Piggyback Wide Angle	11"		5"	12"			
LSP0711F	3/4	115	7.1	10	1	Plug / No Switch	20'	1 1/2"	Manual	Manual	9"	3/8"	15 / 6.8
LSP0711AF						Built-In Wide Angle			12.5"	6.5"	12"		
LSP0711ATF						Piggyback Wide Angle			12.5"	6.5"	12"		
LSP0712F		Plug / No Switch	Manual			Manual			9"				
LSP0712AF		Built-In Wide Angle	12.5"			6.5"			12"				
LSP0712ATF		Piggyback Wide Angle	12.5"			6.5"			12"				



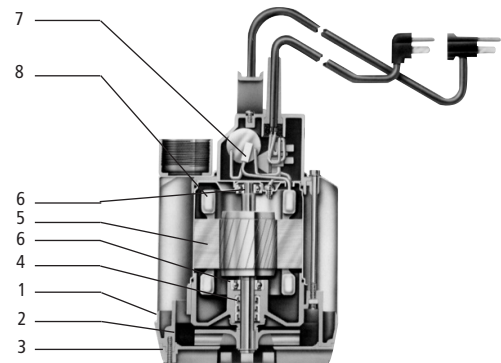
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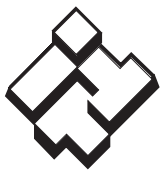
## GOULDS PUMPS Wastewater



### COMPONENTS

Item No.	Description
1	Casing
2	Impeller
3	Suction strainer
4	Shaft seal with cover
5	Motor
6	Ball Bearing
7	Capacitor
8	O-ring





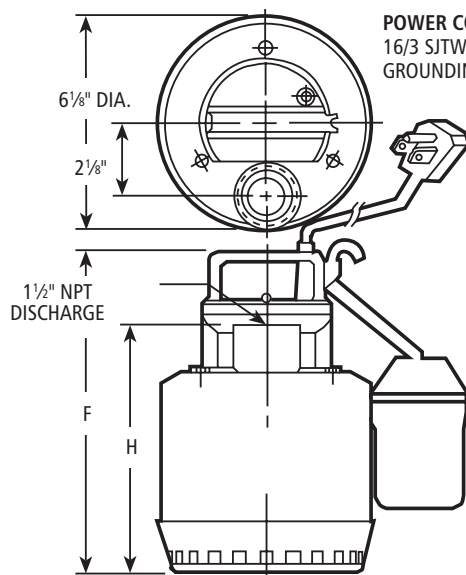
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## Wastewater

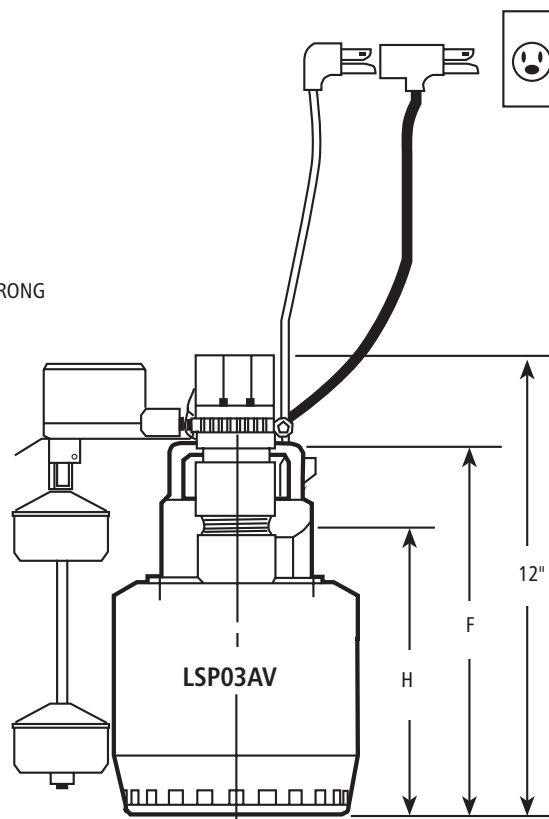
### DIMENSIONS

(All dimensions are in inches and weights in lbs. Do not use for construction purposes.)

	F	H
LSP03	9 $\frac{3}{4}$ "	7 $\frac{5}{8}$ "
LSP07	11 $\frac{1}{4}$ "	9 $\frac{1}{8}$ "
LSP03AV	9 $\frac{3}{4}$ "	7 $\frac{5}{8}$ "



**POWER CORD:**  
16/3 SJTW WITH THREE PRONG  
GROUNDING PLUG



Goulds Pumps and the ITT Engineered Blocks Symbol are registered trademarks and tradenames of ITT Corporation.

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

**BLSP03 August, 2006**

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## 4000N Series

Tubeaxial

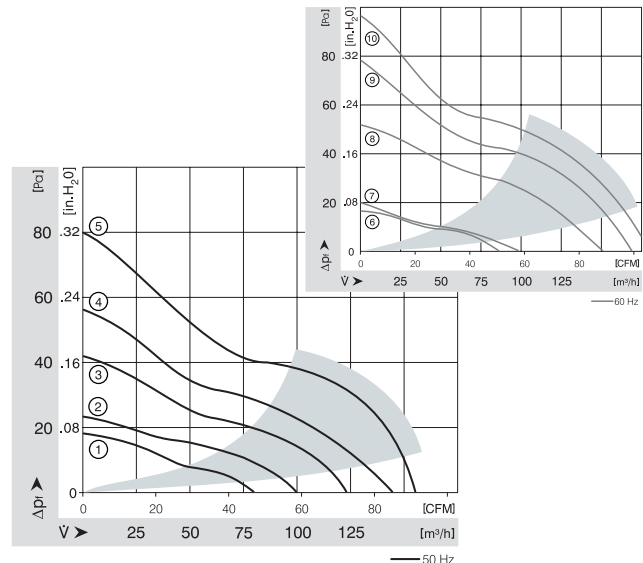
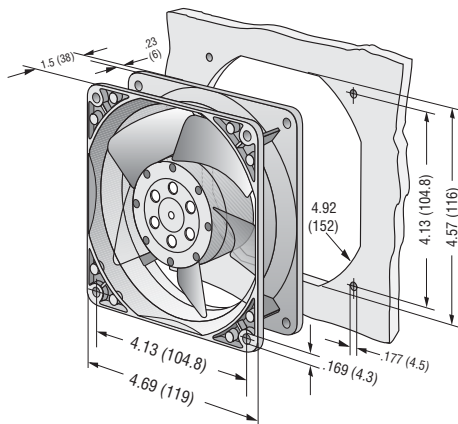
119x119x38mm

- AC fans with external rotor shaded-pole motor. Impedance protected against overloading.
- Metal fan housing and impeller.
- Air intake over struts. Rotational direction CW looking at rotor. Types 4890N and 4840N air exhaust over struts.
- Mounting from either face using four 4.3 mm holes.
- Electrical connection: Terminals with 2 flat pins 2.8 x 0.5 mm.
- Fan housing with ground lug for screw M4 and UNC.
- UL, CSA, VDE approvals on most models, please contact application engineering.

Part Number	Curve	CFM @ 0	VAC	Hertz	Power (W)	dBA	Max Amb. Temp C	Bearing Type	Speed (RPM)	Features	Wgt. (lbs)
4624N	10	105.9	24	60	18.0	50	60	Sintec	3100	Terminals	1.21
4840N	6	50.0	115	60	10.0	26	75	Sintec	1650	Terminals	1.21
<b>4800N</b>	<b>7</b>	<b>57.1</b>	<b>115</b>	<b>60</b>	<b>9.0</b>	<b>32</b>	<b>75</b>	<b>Sintec</b>	<b>1750</b>	<b>Terminals</b>	<b>1.21</b>
4530N	8	88.9	115	60	16.0	45	65	Sintec	2700	Terminals	1.21
4500N	9	99.5	115	60	15.0	48	65	Sintec	3000	Terminals	1.21
4600N	10	105.9	115	60	18.0	50	60	Sintec	3100	Terminals	1.21
4606N	10	105.9	115	60	18.0	51	90	Ball	3100	Terminals	1.21
4890N	1	47.1	230	50/60	11.0	25	70	Sintec	1550	Terminals	1.21
4850N	2	58.9	230	50/60	10.0	32	70	Sintec	1800	Terminals	1.21
4580N	3	72.4	230	50/60	18.0	41	55	Sintec	2350	Terminals	1.21
4550N	4	85.3	230	50/60	16.5	44	55	Sintec	2550	Terminals	1.21
4650N	5	94.2	230	50/60	19.0	46	55	Sintec	2650	Terminals	1.21
4656N	5	94.2	230	50/60	19.0	47	85	Ball	2650	Terminals	1.21
4660N	10	105.9	115/230	50/60	18.0	51	60	Sintec	2650	Terminals	1.21

Available on request:

- Fan housing with mounting bosses.
- Electrical connection via 2 single leads.
- 3.7 mm mounting holes.



**ebm-papst**

e-mail: [sales@us.ebmpapst.com](mailto:sales@us.ebmpapst.com) · TEL: 860-674-1515 · FAX: 860-674-8536

ebm-papst Inc., 100 Hyde Road, Farmington, CT 06034 USA

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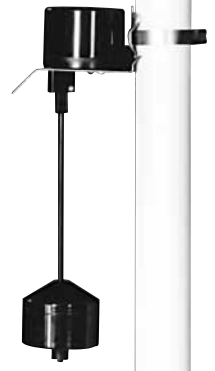
# SJE VERTICALMASTER® Pump Switch

Mechanically-activated switch designed for direct control of pumps up to 1/2 HP at 120 VAC and 1 HP at 230 VAC.

This mechanically-activated pump switch is designed to operate in non-potable water and sewage applications with limited space. It works well in small sump chambers, effluent applications, and laundry trays, as well as in large tanks.

The SJE VerticalMaster® pump switch is not sensitive to turbulence.

It is available for pump down applications only.

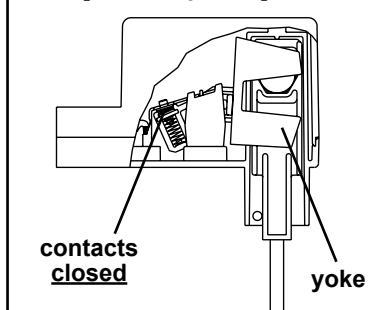


## FEATURES

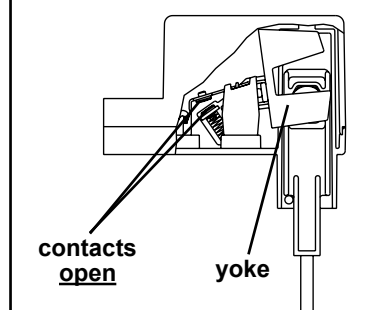
- Heavy-duty contacts.
- Controls pumps up to 1/2 HP at 120 VAC and 1 HP at 230 VAC.
- Adjustable pumping range of .75 to 6.5 inches (2 to 17 cm).
- Includes standard boxed packaging.
- UL Recognized for use in non-potable water and sewage.
- CSA Certified.
- Three-year limited warranty.



**Pump Down / ON position**



**Pump Down / OFF position**



## OPTIONS

This switch is available:

- with a 120 VAC or 230 VAC piggy-back plug.
- without a plug for direct wiring in 120 VAC or 230 VAC applications.
- in standard cable lengths of 10, 15, 20, or 30 feet and 3, 5, 6, or 10 meters (longer lengths available).

## SPECIFICATIONS

**CABLE:** flexible 16 gauge, 2 conductor (UL, CSA) SJOW or SJTOW, water-resistant (CPE)

**MOUNTING BRACKET & HOSE CLAMP:** stainless steel

**LIFT ROD:** injection molded acetal plastic

**FLOAT STOP:** neoprene

**SWITCH AND FLOAT HOUSING:** high impact, corrosion resistant, PVC housing for use in sewage and non-potable water up to 125°F (52°C)

**overall dimensions:** 12 inch high x 5 inch x 3 inch wide (30.5 cm high x 12.7 cm x 7.6 cm wide)

**switch housing dimensions (excluding cable entrance):** 2 inch high x 2.8 inch wide (5 cm high x 7.1 cm wide)

**float housing dimensions:** 2.3 inch high x 2.7 inch wide (5.8 cm high x 6.9 cm wide)

### ELECTRICAL:

#### 120 VAC 50/60Hz Single Phase:

**Maximum Pump Running Current:**

13 amps

**Maximum Pump Starting Current:**

60 amps

**Recommended Pump HP:**

1/2 HP or less

#### 230 VAC 50/60Hz Single Phase:

**Maximum Pump Running Current:**

12 amps

**Maximum Pump Starting Current:**

60 amps

**Recommended Pump HP:**

1 HP or less

**NOTE:** This switch must be used with pumps that provide integral thermal overload protection.

**SJE**  
**Rhombus**®

PO Box 1708, Detroit Lakes, MN 56502

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[www.sjerhombus.com](http://www.sjerhombus.com)


SEE BACKSIDE FOR ORDERING INFORMATION.  
SEE PRICE BOOK FOR LIST PRICE.



# SJE VERTICALMASTER® Pump Switch

Mechanically-activated pump switch designed for direct control of pumps up to 1/2 HP at 120 VAC and 1 HP at 230 VAC.

## ORDERING INFORMATION

PUMP DOWN ONLY 		Shipping Weight
Part Number	Description	
1003590	10VM1WP	1.73 lbs.
1003772	10VM2WP	1.77 lbs.
1003776	10VMWOP	1.65 lbs.
1003769	15VM1WP	2.08 lbs.
1003773	15VM2WP	2.12 lbs.
1003777	15VMWOP	2.00 lbs.
1003770	20VM1WP	2.43 lbs.
1003774	20VM2WP	2.47 lbs.
1003778	20VMWOP	2.35 lbs.
1003771	30VM1WP	3.13 lbs.
1003775	30VM2WP	3.17 lbs.
1003779	30VMWOP	3.05 lbs.

1 = 120VAC 2 = 230VAC WP = With Plug WOP = With Out Plug

NOTE: Descriptions are grouped by cable length measured in feet (10, 15, 20, 30).

SEE PRICE BOOK FOR LIST PRICE.

## OPTIONS

**MOUNTING BRACKET AND HOSE CLAMP** are standard.

**PACKAGING**  
Boxed - standard

**ADDITIONAL CABLE**  
Additional cable length over 30 feet is available.

UL Recognized for  
Water & Sewage



LR54245

## SPECIFICATIONS

**PUMPING RANGE:** 0.75 to 6.5 inches (2 cm to 17 cm)

**CABLE:** flexible 16 gauge, 2 conductor (UL, CSA) SJOW or SJTOW, water-resistant (CPE).

**MOUNTING BRACKET AND CLAMP:** stainless steel

**LIFT ROD:** injection molded acetal plastic

**FLOAT STOP:** neoprene

**SWITCH AND FLOAT HOUSING:** high impact, corrosion resistant, PVC housing for use in sewage and non-potable water up to 125°F (52°C)

- Overall dimensions: 12 inch high x 5 inch x 3 inch wide (30.5 cm x 12.7 cm x 7.6 cm)
- Switch housing dimensions: 2 inch high x 2.8 inch diameter (5 cm x 7.1 cm)
- Float housing dimensions: 2.3 inch high x 2.8 inch diameter (5.8 cm x 6.9 cm)

## ELECTRICAL:

Voltage 50Hz/60Hz Single Phase	Max. Pump Run Current	Max. Pump Start Current	Recommended Pump HP
120 VAC 230 VAC	13 amps 12 amps	60 amps 60 amps	1/2 HP or less 1 HP or less

## OTHER INFORMATION

**PUMP DOWN** is normally open contacts for emptying.

### DIRECT WIRING

Units used for direct wiring (without plug) may be used in either 120 VAC or 230 VAC applications within specified amp ratings.

**SJE**  
**Rhombus**

[www.sjerhombus.com](http://www.sjerhombus.com)  
[sje@sjerhombus.com](mailto:sje@sjerhombus.com)

**Call or fax your order!**  
**1-888-DIAL-SJE (1-888-342-5753) / Fax 218-847-4617**

**APPENDIX E**

**RECOMMENDED SPARE PARTS &  
MATERIAL REQUEST FORM**

## **RECOMMENDED SPARE PARTS**

The following recommended spare parts are NOT provided with the wastewater treatment system unless otherwise specified in Section 2 of this manual.

A Material Request Form is included in this section. It can be used to request replacement parts within the warranty period or to order spare parts beyond the warranty period. This form is also available on our website at [www.aquapoint.com](http://www.aquapoint.com)

### **CONTROL PANEL SPARE PARTS:**

<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part No.</u></b>
One (1)	Diversified current sensor	CMG-0100-20
One (1)	AEG Contactor	LS0710A0-120V
One (1)	IDEC2 pole relay	RH2BULAC120
One (1)	IDEC2 pole relay socket	SH2B-05
One (1)	ABB 20 Amp Circuit Breakers	S201-K20
One (1)	ABB 8 Amp Circuit Breakers	S201-K8
One (1)	ABB 1 Amp Circuit Breakers	S201-K1
Four (4)	Entrelec terminals	0115 116 07

### **PUMPS & MECHANICAL SPARE PARTS:**

<b><u>Quantity</u></b>	<b><u>Description</u></b>	<b><u>Part No.</u></b>
One (1)	Bioclere Fan	Papst 4800
One (1)	Bioclere Dosing & Recycle Pump	Goulds LSP0311F
One (1)	Float Switch	SJE 1003259

# RETURN AND/OR MATERIAL AUTHORIZATION REQUEST FORM

FAX: 508-985-9072

Date:

*Please complete all applicable fields.*

Requested by:

Company Name:

Address:

City:

State:

ZIP:

Site Name:

Address:

City:

State:

ZIP:

Part # :

Description:

Qty:

Date Installed (M/D/Y):

Date Failed (M/D/Y):

Reason for return or additional material request (note specific equipment and pump number):

## RETURN SHIPPING INFORMATION (if applicable):

Please note unit # and pump # that is to be replaced:

AQUAPOINT.3,LLC  
39 Tarkiln Place  
New Bedford, MA 02745  
ATTN: Returns

NOTE: Return freight must be prepaid. Return Material Request Form must accompany packages(s).

Approved by:

\_\_\_\_\_

☐ Warranty

☐ Bill replacement

☐ Send replacement part

☐ Return

☐ Discard