

## AQUARIUS

# "Peri" Dosage Pumps

Peristaltic Dosage Pumps  
for the dosage of liquid  
Water Treatment Chemicals  
- rated to 250 kPa.



### For Reliable Dosage of

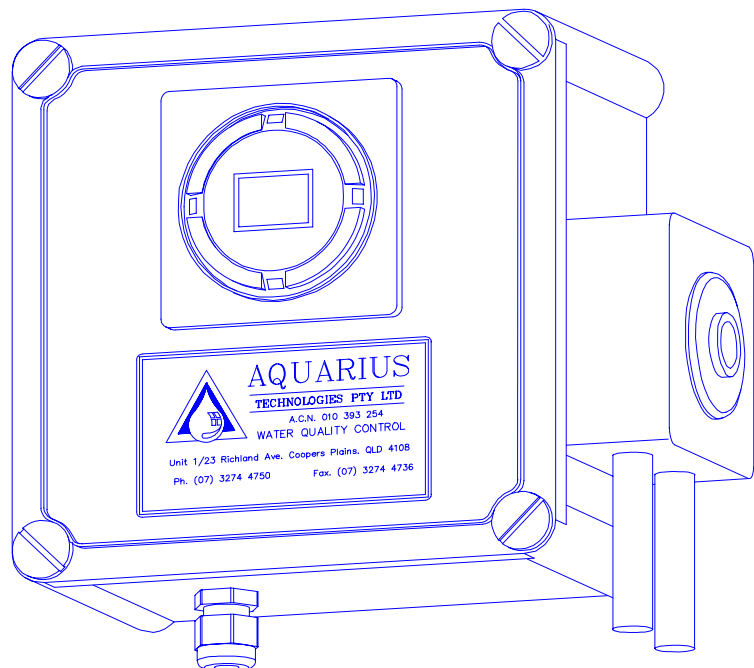
- ✓ Hydrogen Peroxide
- ✓ Sodium Hypochlorite
- ✓ Liquid Biocides
- ✓ Most Inhibitors
- ✓ Disinfectants
- ✓ Deodorants
- ✓ Enzymes or Bacteria

and

### With the Option of

- ✓ 0.4 lts, 0.85 lts, or 4.5 lts./hr.
- ✓ 7 Day Timer Control or
- ✓ Pulse Width Control
- ✓ Water Meter - Proportional Dosage to Flow

### Model - MIC/16B



### ADVANCED TECHNOLOGY FOR THE NEW MILLENIUM

# Aquarius "Peri" Dosage Pumps

## Features

1. Reliable dosage pumps for most chemicals used in water treatment applications, having a rugged motor drive and gear box.
2. Operating on the peristaltic principle, are the **ONLY reliable dosage pump for Hydrogen Peroxide or Sodium Hypochlorite solutions** which liberate gas and "air-lock" magnetic pulse pumps.
3. Presented in weatherproof enclosures rated to IP65 standard
4. Offered as complete units complete with suction and discharge tubing and fittings.
5. Available as either 0.85 lts./hr. for small dose rates or optional 0.4 lts./hr. for larger dose rates.
6. Manufactured under a Q.A. system to ISO9001:1994 standard.

## Benefits

1. **INEXPENSIVE**
2. Reliable dosage of most chemical solutions **up to 250 kPa. head pressure**
3. Simple to install, operate, and service.
4. Have **NO** non return valves to clog or block up - will pump gas, liquid, or "gravy"
5. Pump squeeze tube is very easy to replace and inexpensive.
6. Can be used with a very wide variety of chemical solutions
7. The **NORPRENE** squeeze tube is extremely chemical resistant, very resilient, and long lasting.

## Models available

### 1. Models - MIC/SS1 or MIC/SS5 - page 4

are 0.85 or 4.5 lts./hr. maximum at up to 250 kPa. head pressure, with **pulse variable control to allow for dosage settings over 5 - 100% of the output range** and have applications where continuous dosage of the chemical solution is required.

### 2. Model - MIC/WP5 - page 5

uses the 4.5 lts/hr peristaltic pump and **is used in conjunction with a Impulse Water Meter to accurately control dosage rates in proportion to flow, from 0 - 1000 ppm**, using either a 1 impulse/litre or 4 impulse/litre water meter. Maximum water flow rate to allow for 1000 ppm, is 5000 litre per hour. This model can also be **used for manual dosing of 0 - 5000 mls./hr.**, where, for example, the water meter is defective.

### 3. Models - MIC/16B1 or MIC/16B5 - page 6

are 0.85 or 4.5 lts./hr. maximum at up to 250 kPa. head pressure, **controlled by a 7 Day Digital Timer for day & time based dosage** such as Liquid Biocides to cooling towers, Enzymes to grease traps, or periodic application of disinfectants or deodorants to garbage

### 4. Models - BHS/211 or BHS/255 - page 8

are **Dual 0.85 or Dual 4.5 lts./hr.** pumps at 250 kPa. head pressure, controlled by a **DUAL channel 7 day Timer for individual control of each pump** based on Day and Time period periodic dosage with applications similar to above, where two installations are side by side or where two different chemicals are required to be dosed.

## Applications

**Dosage of Hydrogen Peroxide,  
Dosage of Sodium Hypochlorite,  
Dosing Liquid Biocides to Cooling Systems,  
Inhibitor Dosage to Cooling Towers,  
Enzymes or Bacteria dosing to Grease Traps,  
Dosing of Disinfectants to Garbage Containers,  
Dosing of Deodorants to Garbage Containers,  
Dosage on Effluent or Waste Water Treatment,  
Dosage of Boiler Chemicals to Feed Tank,  
Dosage to Swimming Pools & Spa's,  
Dosage of Nutrients in Hydroponics Mediums.  
etc, etc, etc,**

# Aquarius "Peri" Dosage Pumps

## Technical Description

**Aquarius "Peri" Dosing** systems utilise a robust motor drive and gear box, to rotate a 3 lobe roller which progressively squeezes the Norprene tube to provide for delivery of solution at up to 250 kPa.

The pumps are housed in weatherproof electrical type enclosures rated to IP65, and offered as complete packages complete with suction and delivery hoses and fittings, and with lead and 3 pin plug for 220 - 250 Vac operation.

The pumps are rated at 850 mls./hour (14.1 mls. per minute) on **--/1 models** and 4.5 lts./hr. (75 mls. per minute) on the larger **--/5 models**

The 7 Day Digital Time clocks on models MIC16B1 or 5 and BHS/211 or 255 models utilise a microprocessor based time clock with battery back up, and can be programmed from as little as 1 minute ON per week to ten ON periods per day to provide for a very wide dosage range. (See operating instructions for single and dual channel timers on subsequent pages).

The MIC/WP5 model utilises a microprocessor which controls the pump according to ppm set point, mode of operation (Manual / 1 imp/Lt. / 4 imp/Lt.), and water meter flow rate. Both the mode of operation and ppm set point are easily set by clearly labelled controls on the front plate, while two indicator leds provide information on the rate of water meter impulses and when the pump is operating. The MIC/WP5 is designed to operate with all types of readily available water meters utilising the No Volt reed switch technique of flow rate measurement. At the maximum set point of 1000 ppm, the maximum flow rate which the unit can track is 5000 lts./hr., however the unit will continue to work at higher flow rates up to approximately 7200 lts./hr. with a corresponding decrease in the maximum ppm set point ( at 7200 lts./hr. max ppm =  $5000/7200 * 1000 = 700$  ppm).

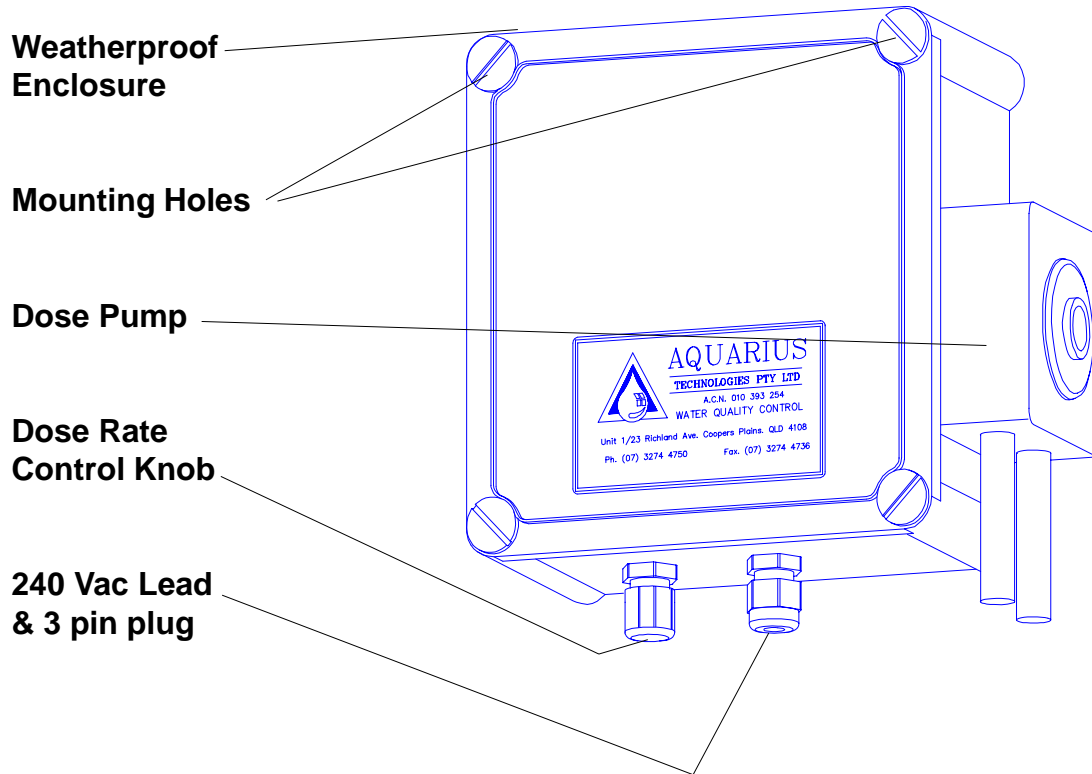
**NORPRENE** tubing is used as the squeeze tube in the peristaltic pumps and provides for excellent resistance to the majority of chemicals normally encountered and also to provide a very high degree of resilience and thus provide accurate dosages over long periods before replacement. Service life of the squeeze tubing normally exceeds 12 months, with 3 - 4 years being common.

## Specifications

Model Designation	MIC/SS1	MIC/SS5	MIC/16B1	MIC/16B5	BHS/211	BHS/255	MIC/WP5
Pump Capacity Max lts./hr.	0.85	4.5	0.85	4.5	2 x 0.85	2 x 4.5	4.5 l/hr ( 0 - 1000 ppm)
Pump Capacity Min mls./hr.	45.0	250	14.1	75.0	14.1	75.0	0.0
Control on Dosage	Pulse width Control 5 - 100%		Single Channel 7 Day Timer		Dual Channel 7 Day Timer		Water Meter or Manual
Max Working Pressure	250kPa	250kPa	250kPa	250kPa	250kPa	250kPa	250kPa
Electrical Ratings	220 -250 Vac - 50 Hz. - 10 Amperes - all models						
Squeeze Tube Material	Norprene - part number - Tube 2N - all models						
Dimensions	250 mm W x 220 L x 125 D		250 mm W x 220 L x 125 D		350 mm x 220 L x 125 D		250mm W x 220 L x 125 D
Shipping Weights Kgs.	3.0	3.0	3.0	3.0	5.0	5.0	3.0

# Aquarius "Peri" Dosage Pumps

## Models - MIC/SS1 or MIC/SS5



## MICSS1 or MICSS5 - operating instructions

1. Establish the dose rate required in mls/hr for the particular operation. MICSS1 can deliver approx 45 mls/hr minimum to 850 mls/hr maximum, and MICSS5 can deliver approx 225 mls/hr minimum to 5000 mls/hr maximum.
2. Set the Dose Knob to give the approximate dose rate required, and verify the dose rate by measuring the output into a graduated cylinder over a period of 10 - 15 minutes. The Dose Knob controls the dose pulse width or the dose ON to OFF ratio to vary the dosage output per hour.
3. Fine tune the setting on the Dose Knob to give the exact dosage required, and again verify, by measuring to a cylinder over a 10 - 15 minute time period.
4. The power to this pump may be a controlled power source so that the pump doses in proportion to the flow rate of another pump. e.g. controlled from a bore pump so as to dose when the bore pump is ON only

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# Aquarius "Peri" Dosage Pumps

## Model - MIC/WP5

Weatherproof Enclosure

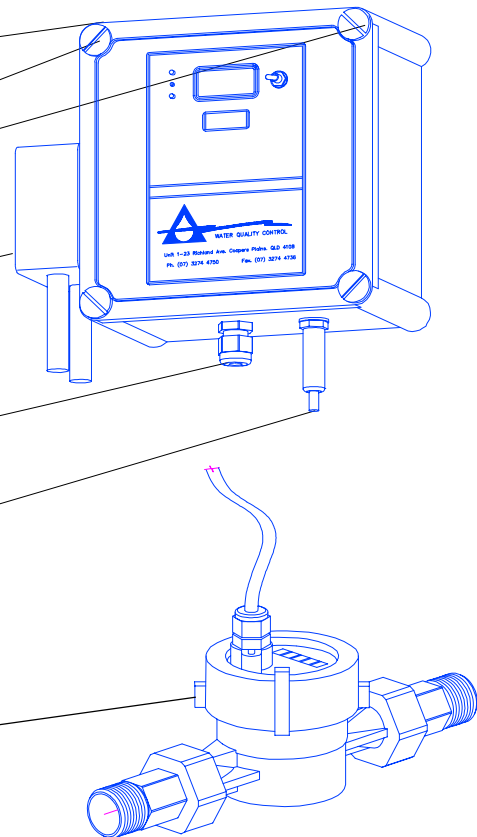
Mounting Holes

Dose Pump

240 Vac Lead & 3 pin plug

Water Meter Connector

Impulse Water Meter



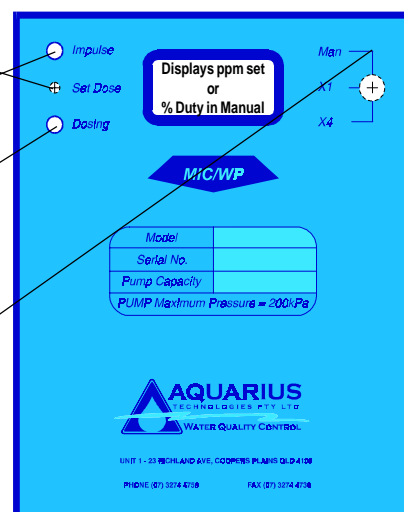
## MIC/WP5 - operating instructions

1. **Water Meter Mode** - Adjust the **Set Dose** potentiometer until the display reads the required dosing rate (0 - 1000 ppm).

2. Set the **Mode Switch** to match the impulses/litre of the particular water meter. e.g. **x4** for DCH203. Ensure that the water meter is connected via the bottom connector. Ensure that the unit is acknowledging Water Meter impulses as indicated by the **Impulse Led**, and that the pump operates in short bursts (indicated by **Dosing Led**) according to the flow rate and ppm setting.

3. Monitor the units performance via independent chemical analysis and fine tune as required.

4. **Manual Mode**, set the **Mode Switch** to **Manual** position, set dosing rate via **Set Dose** to the required percentage duty (**0 - 100% duty is displayed** = Zero to 5000 mls./hr.). Monitor the units performance via independent chemical analysis and fine tune as required.



**MIC/WP5  
Front Panel  
Functions**

# Aquarius "Peri" Dosage Pumps

## Installation - General

1. The units are intended for wall mounting, having a suction lift no greater than 1.5 metres.
2. The mounting holes are located in the four corners of the enclosure beneath the clear front locking screws.
3. Use appropriate screws and wall plugs for mounting.
4. The arrow on the clear pump head points to the discharge tubing and the discharge line should be run to the desired dose injection point and terminated with the injection fitting supplied.
5. Push fit the rigid grey PVC tubing, and run the flexible suction line through the PVC tube, ensuring that the white retainer is push fitted to the end of the flexible suction hose.
6. Locate the suction hose with the PVC tube in the chemical tank.
7. Power up the unit from a standard weatherproof power point, rated 220 - 250 Vac and 10 Amp.
8. **Prime up the pumps as follows :-**

(a) **MICSS1 or MICSS5** - Turn the Dose knob fully to the right (100 % output) and pump should run continuously and prime up to fill the tubing to the injection point and beyond.

(d) **MIC/WP5** - Set the mode switch to Manual and adjust the rate potentiometer to 100%. The pump should run continuously and prime up to fill the tubing to the injection point and beyond.

(c) **MIC16B1 or MIC16B5** - Proceed to set the current Day and Time in the 7 day time clock as per instructions on page 6. When the time clock has the current day and time set, pressing the **manual** button powers up the pump and allows it to run continuously until the pump is fully primed, and the **manual** button is now reset to off.

(d) **BHS211 or BHS255** - Proceed to set the current Day and Time in the 7 day time clock as per instructions on page 6. When the time clock has the current day and time set, pressing the **1 manual** button powers up the left pump and allows it to run continuously until the pump is fully primed, and the **1 manual** button is now reset to off. Similarly using the **2 manual** button allows the right hand pump to be primed.

## Safety Considerations on the Chemicals involved in Water Treatment.

The majority of chemical products involved with water treatment control, are somewhat hazardous to say the least,

Please refer to the full MSDS sheets provided by your chemical supplier and ensure all personnel involved are aware of the particular chemical handling and safety procedures.

Please read and understand all safety warnings on chemical containers before servicing any dosing equipment.

Wear as a minimum - safety goggles and gloves when servicing the dosing equipment.

Do not mix concentrated acids and oxidising agents as explosion, and/or toxic and lethal gas may be evolved, and/or fire result.

Keep all chemical containers sealed and free from contamination.

## Routine Maintenance

For optimum results and continued accuracy, the operation of the dose pump system should be verified on at least on a monthly service basis, and should be inspected, cleaned and calibrated as necessary every month.

Injection non return valves should be cleaned and checked at least annually.

Sodium Hypochlorite being highly alkaline may lead to scale formation on its dose injector and this may require acid cleaning on a frequent basis

On these peristaltic dose pumps, the squeeze tubes and roller block should be checked at least annually and should be replaced every 12-24 months.

More regular maintenance may be required for 4.5 l/hr pumps, due to increased pumping rates.

Chemical suction and discharge tubes should be inspected monthly and replaced as necessary

As hazardous chemicals are in use the appropriate safety equipment should be worn whilst servicing this equipment.

# Aquarius "Peri" Dosage Pumps

## Models - MIC16B/1 or MIC16B/5

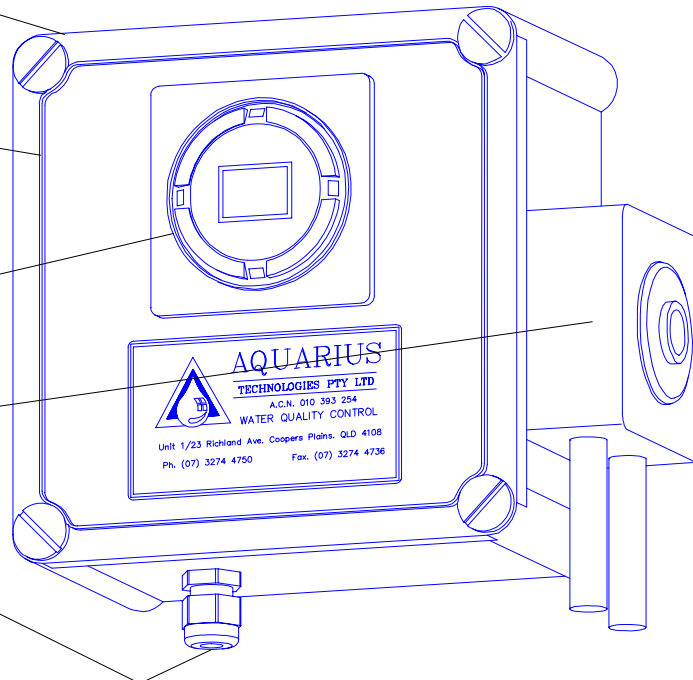
Weatherproof  
Enclosure

Clear View  
Front

Single Channel  
7 Day Timer

Dose Pump

240 Vac Lead  
& 3 pin plug



## MIC16B/1 or /5 - 7 Day Time Clocks - Operating Instructions

### I. General Remarks

There are many special features in the electronic time switch. Firstly it has a variety of programming possibilities for an individual switching program and secondly, its ease of operation which has been considerably simplified by an integrated microcomputer. — **In spite of this, you are strongly advised to familiarise yourself thoroughly with the Operating Instructions initially and then you will be able to make the best use of your advantages right from the beginning.**

### II Starting Operation.

**A.** Power up and allow the back up battery to charge up. When symbols starts to appear in the display window (after approximately two minutes) - operate key "**Reset**" with a pencil or similar. **A complete display will appear followed by "Auto - Off - CH 1 and 00.00"**— will appear in the display. Clock is now ready for operation.

**B. Setting of Day, Week and Time of Day.**— 1. Keep key "**Clock**"— depressed during the entire setting operation!

2. Use key "**h+**"— and "**m+**"— to set the actual time of day ("**h+**" = *hours* / "**m+**" = *minutes*).

3. If keys "**h+**" and "**m+**" are depressed continually for longer than 1 second then counting at the display will continue automatically.

4. Use key "**Day**"— to bring the actual day of the week into the display.

5. Release key "**Clock**"— The time is now set with a flashing colon appearing in the display. If precise time is required, the releasing of the Clock key can be synchronised with an external time signal ie. telephone or radio.

### III. Programming of Switching Times— (alteration or cancellation)

#### **A. Programming of Switching ON Operation.**

Operate key "**Prog.**"— **push once**. The unit will now display all 7 day numbers and areas for entering in nominated time for commencement of 'on' operation. Select the day to dose by pressing the "**Day**" key. The unit provides options to select either days 1-7 (every-day), days 1-6, days 1-5, days 6-7, or individual days. When the group of days or individual day has been selected, enter the nominated time by pressing the "**h**" and "**m**" keys. To select the ON operation, press the **MANUAL** key until a **⊙** symbol appears on the bottom of the display. The On time has now been programmed and is now ready for the Off time.

# Aquarius "Peri" Dosage Pumps

## MIC16B/1 or MIC16B/5 - Time Clock Instructions - cont'd

**B. Programming of Switching Off Operation.** Press the "Prog." key to enter the next program into the timer. Input the day(s) and off time selections as described in the ON Operation. To select the OFF operation, press the **MANUAL** key until a ○ symbol appears on the bottom of the display. The Off time has now been programmed and is now ready for the next On time or, if all programs have been inputted, to return to automatic operation.

### **C. - To insert further switching times - ON or OFF times :-**

Follow the instructions of the previous two paragraphs to enter the next ON and OFF times. A maximum of 20 programs (10 ON and 10 OFF) can be inputted.

### **IV. Configuring timer operation**

Once all programs have been inputted, press the Clock key to obtain a small clock symbol at the bottom of the display. This indicates the unit is in Automatic mode with the unit switching as dictated by the inputted program(s). By pressing the "Manual" key, the timer can be set to Manual On, with a ● symbol with small hand appearing at the bottom of the display. The timer will remain in this mode until the next programmed time at which time the unit will revert to automatic operation. Pressing the "Manual" key again will place the timer in FIX ON mode with a symbol [●] appearing at the bottom of the display. The timer will remain in this mode indefinitely or until another mode is selected. Pressing the "Manual" key again will place the timer in FIX OFF mode with a symbol [○] appearing at the bottom of the display. The timer will remain in this mode indefinitely or until another mode is selected. **To ensure correct operation, ensure that the timer is left in automatic mode.**

### **V. Cancellation of Switching Commands.**

If keys "h+" and "m+" are used to superscribe a switching command in such a way that the hour and/or minute area in the display shows the symbol --:--, the input is no longer effective but it remains in the storage compartment as an inactive part.

### **VI. Switching Condition Indication.**

The actual switching condition is shown in the display as either ● for ON operation or ○ for OFF Operation at the bottom of the display.

### **VII. +1h symbol**

The +1h symbol if pressed once adds 1 hour to the Clock time (summer time) or pressed again subtracts 1 hour off Clock Time (winter time).

### **VIII. Running Reserve. —**

In the case of mains failure the integrated back up battery ensures that the actual time of day continues to

operate and that the automatic switching program remains intact.— The instrument can be programmed completely even without mains supply, provided the back up battery is fully charged (charging time 70 hours).

### **IX. Resistance to Interference Voltage.—**

The electronic mechanism is protected against outside interference. It must however be borne in mind that according to installation methods extremely strong interference and/or voltage peaks are superimposed on the supply voltage.— The switching of contactors results in interference which can influence an electronic instrument despite all internal protection measures.

In order to increase resistance to interference voltages the following points have to be observed during assembly: -

(a) Supply voltage and general control voltages to be, supplied from separate phases. (b) Inductive loads, particularly fluorescent lamps, represent a particular stress on the switching contacts. One should always check every individual case to determine whether the installation of a cut off relay or contractor is advisable.

(c) In case of larger plants, it is necessary to eliminate jamming of contractor coils, which are switched directly by the time switch by means of a suitable resistor of an RC Component (see also technical data of switch contactor manufactures).

(d) If inductive loads DC Voltage are to be switched an additional appropriate quenching diode had to be fitted.

### **XI. Technical Data.—**

#### **Grasslin Single Channel Timer**

Dimensions (H x W x D) 45 x 53 x 68

Supply voltage = 220 - 240 Vac

Switching capacity resistive load = 10 Amp.

Switching exit Relay Switching contact

1 x change over switch

Surrounding temperature - 10.C to +50.C

Protection Class II

Operational accuracy +/-1 sec/day



# Aquarius "Peri" Dosage Pumps

## Models - BHS/211 or BHS/255

Weatherproof  
Enclosure

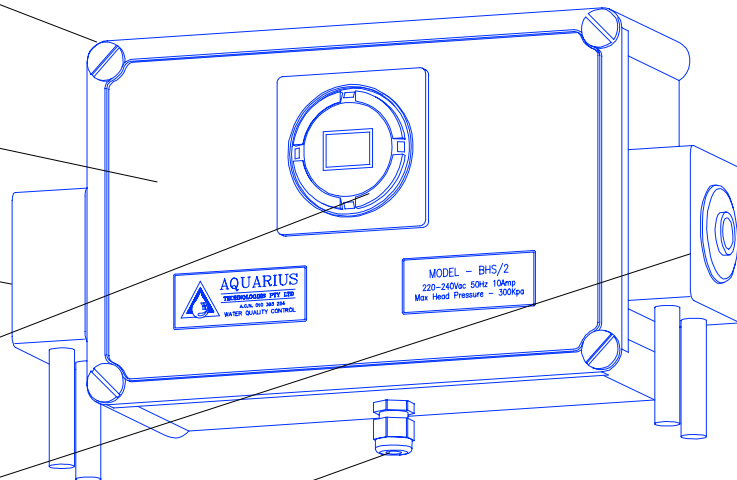
Clear View  
Front

Dose Pump 1

Dual Channel  
7 Day Timer

Dose Pump 2

240 Vac Lead  
& 3 pin plug



## BHS/211 or BHS/255 - Grasslin Dual Channel Time Clock Instructions

### General Remarks

There are many special features in the electronic time switch. Firstly it has a variety of programming possibilities for an individual switching program and secondly, its ease of operation which has been considerably simplified by an integrated microcomputer. — **In spite of this, you are strongly advised to familiarise yourself thoroughly with the Operating Instructions initially and then you will be able to make the best use of your advantages right from the beginning.**

### Starting Operation.

A. Power up and allow the back up battery to charge up. When symbols starts to appear in the display window (after approximately two minutes) - operate key "Reset" with a pencil or similar. **A complete display of all days, 00:00, and both channels in Auto - Off will appear.** Clock is now ready for operation.

### Setting of Day, Week and Time of Day.—


1. Keep key "Clock"— depressed during the entire setting operation!
2. Use key "h+"— and "m+"— to set the actual time of day ("h+" = hours / "m+" = minutes).
3. If keys "h+ and "m+" are depressed continually for longer than 1 second then counting at the display will continue automatically.
4. Use key "Day"— to bring the actual day of the week into the display (1=Monday.....7=Sunday).
5. Release key "Clock"— Time in operation indication is the flashing colon in the display. In this way it is possible to start the clock accurately to the second using an external time signal for instance a telephone or radio.

### Programming of Switching Times—

**42 memory locations are available with each switching time occupying 1 memory location.** If both channels are to be controlled separately, this timer allows for 10 separate dosing periods for each channel.


Press and release the "Prog" key.

# Aquarius "Peri" Dosage Pumps

Select the switching function by pressing the channel 1 or channel 2 manual keys until the required function is displayed. For example, if channel 1 is to be set on, depress channel 1 manual key until  is displayed in the bottom left hand corner.




Using keys **h** and **m**, select the time for the switching function to occur.

Select the day(s) that the selection is required by pressing the **Day** key. The cursor will now be positioned under Day 1. If this day is not required, press the **Sel** key at which time Day 1 will flash. If a day is required, simply press the **Day** key again to leave the day as it was. In this way, individual days, or any combination of days can be set (ie. days 2,4,5,6 only). Press the **Prog** key to enter the program and move onto the next program.

Repeat the previous steps for the next program. Normally this would be the accompanying OFF time for the ON time just programmed so the days selection would be just the same, the hours and minutes would be set to allow a satisfactory dose period, and the switching function would be set so that the symbol  is displayed against the corresponding channel.

When all programs have been entered, press the **Clock** key to enter into automatic mode (indicated by small clock symbols against both channels in the bottom section of the display).

## **Configuring timer operation**

By pressing the **channel 1 or channel 2 Manual** keys, one or both of the channel can be set to Manual On, with a  appearing at the bottom of the display. The timer will remain in this mode until the next switching time at which time the unit will revert to automatic operation. Pressing the **channel 1 or channel 2 Manual** key again will place the timer in FIX ON mode with a  appearing at the bottom of the display. The timer will remain in this mode indefinitely or until another mode is selected. Pressing the **channel 1 or channel 2 Manual** key again will place the timer in FIX OFF mode with a  appearing at the bottom of the display. The timer will remain in this mode indefinitely or until another mode is selected. **To ensure correct operation, ensure that the timer is left in automatic mode.**

## **Programming at a later time**



If in future, further switching **ON** and switching **OFF** times are to be added, press the **Prog** key until the next free storage space appears (--:--) and follow the previous instructions.

## **Cancellation of Switching Commands**

Press the **Prog** key until the required switching time to be deleted is displayed.

Press the **h** and **m** keys until --:-- is displayed and then press the **Clock** key for about three seconds.

## **Switching Condition Indication.**

The actual switching condition is shown in the display as either  for ON operation or  for OFF operation.

## **Running Reserve.**

In the case of mains failure the integrated back up battery ensures that the actual time of day continues to operate and that the automatic switching program remains intact.— The instrument can be programmed completely even without mains supply, provided the back up battery is fully charged (charging time 140 hours).

## **Resistance to Interference Voltage.**

The electronic mechanism is protected against outside interference. It must however be borne in mind that according to installation methods extremely strong interference and/or voltage peaks are superimposed on the supply voltage.— The switching of contactors results in interference which can influence an electronic instrument despite all internal protection measures.

In order to increase resistance to interference voltages the following points have to be observed during assembly: - (a) Supply voltage and general control voltages to be, supplied from separate phases. (b) Inductive loads, particularly fluorescent lamps, represent a particular stress on the switching contacts. One should always check every individual case to determine whether the installation of a cut off relay or contractor is advisable. (c) In case of larger plants, it is necessary to eliminate jamming of contractor coils, which are switched directly by the time switch by means of a suitable resistor of an RC Component (see also technical data of switch contactor manufactures). (d) If inductive loads DC Voltage are to be switched an additional appropriate quenching diode had to be fitted.

## **Technical Data.** Grasslin Timer Dual Channel

Dimensions (H x W x D) 72 x 72 x 56 mm

Supply voltage = 220 - 240 Vac

Switching capacity resistive load = 10 Amp.

Surrounding temperature - 10 °C to + 50 °C

Protection Class II

Operational accuracy +/- 2.5 sec/day at + 20 °C

Running reserve 150 hours after 140 hrs. charge

Storage spaces 42 total (21 x On, 21 x Off)

Shortest switching time 1 minute Programmable

Type and height of figures - LCD 7 mm

Switching condition indication - yes

Special functions - Multiple weekday groups.  
daily and weekly program