

# *Operating and Maintenance manual*

## *Autopure*

**WR600A**

**WR600G**

**WR600B**

**WR600S**

***Yamato Scientific co., ltd***

# **INTRODUCTION**

## **General Information**

The Autopure WR600 system is used as a final step of water purification. The feedwater to a Autopure WR600 system can come from electrodeionisation (ELIX), Reverse Osmosis (RO), distillation or demineralisation. The Milli-Q system produces water of Type 1 quality. This is equal to or better than ASTM, CAP and NCCLS water quality standards.

The principal components of the Autopure WR600, Figure 1, are:

|     |                                                          |
|-----|----------------------------------------------------------|
| (A) | Control Panel                                            |
| (B) | Q-Gard pack adapter                                      |
| (C) | Q-Gard pack                                              |
| (D) | Door for installing / removing QUANTUM purification pack |
| (E) | Liquid Crystal Display (LCD)                             |
| (F) | LED Indicator                                            |
| (G) | Keypad                                                   |
| (H) | ON / OFF Power Switch                                    |
| (I) | Power cord socket                                        |
| (J) | Fuse Holder                                              |
| (K) | Fittings / inserts for water connection                  |
| (L) | Sanitisation port plug for cleaning the UF module        |
| (M) | Point of Use Gun with support arm                        |
| (N) | Sticker with serial number, lot number and system type   |
| (O) | Screw for attachment piece                               |
| (P) | Attachment piece to hold cover to system                 |

## **How the system works**

Pre-treated water (from EDI, Reverse Osmosis, distillation or demineralisation) enters the system and is pumped through the Q-Gard pack for an initial purification step.

The water is then exposed to UV light at both 185 and 254 nm wavelengths which oxidises organic matter and kills bacteria.

The function of the QUANTUM cartridge is remove ions produced from the action of the UV light.

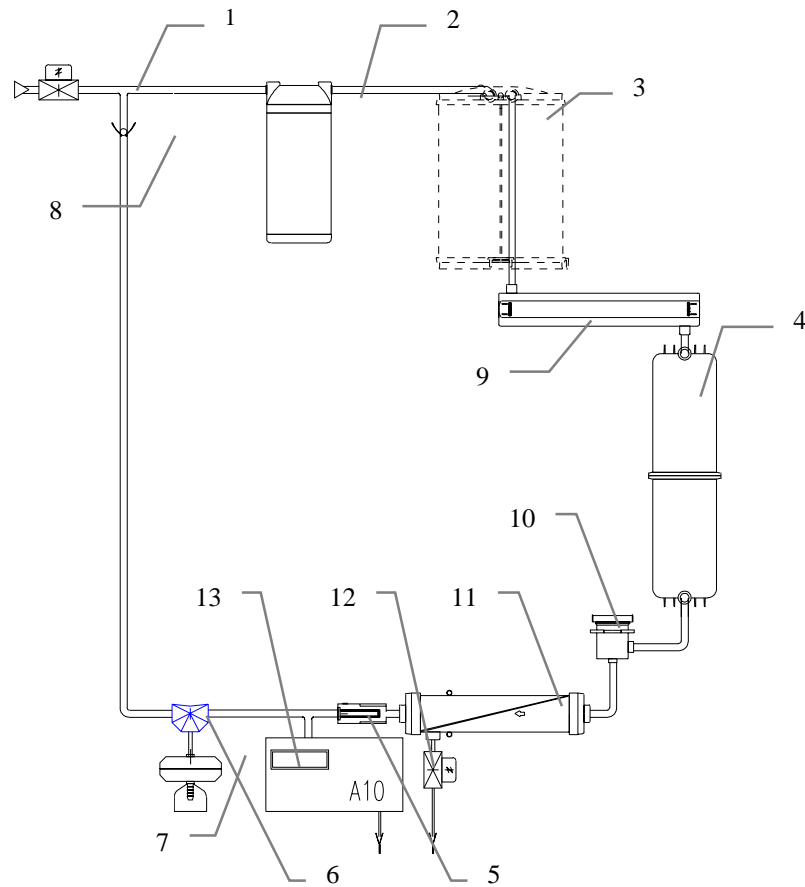
Purified water then passes through an Ultrafiltration (UF) module. The UF module acts as a barrier to colloids, particles and other organic molecules with a molecular size higher than 5000 Daltons. The contaminants retained by the UF are periodically flushed out of the system via tubing to a drain.

A manual 3 way valve directs ultrapure water through a final filter made up of a 0.22 um membrane (MilliPak-40). The final filter prevents particles and bacteria greater than 0.22 um in size from being dispensed from the system.

The A-10 TOC monitor takes a sample of ultrapure water and determines the trace levels of organic material in it. The samples are taken periodically in PRODUCT mode. Because of the sampling frequency, the displayed water quality is representative of an instantaneous value.

## System Schematic

The water flow schematic of a Autopure WR600 system is shown below. Only the main components are shown.



|                                                                     |    |
|---------------------------------------------------------------------|----|
| Inlet solenoid valve                                                | 1  |
| Pump                                                                | 2  |
| Q-Gard Pack (presence depends upon the type of feedwater)           | 3  |
| QUANTUM cartridge                                                   | 4  |
| Resistivity cell                                                    | 5  |
| Point of use with dispensing valve                                  | 6  |
| MILLIPAK 40 final filter                                            | 7  |
| Check valve                                                         | 8  |
| UV light                                                            | 9  |
| Sanitisation port used to introduce chemical sanitants to UF module | 10 |
| Ultrafiltration cartridge                                           | 11 |
| UF cartridge reject solenoid valve                                  | 12 |
| A-10 TOC monitor                                                    | 13 |

## Characteristics

### Composition of materials in contact with water

| Pieces                  | Material                                | Pieces             | Material                                        |
|-------------------------|-----------------------------------------|--------------------|-------------------------------------------------|
| Pack Adapter :          | ABS                                     | MILLIPAK 40        | Polycarbonate, PVDF                             |
| Q-Gard Pack             | PP, PE                                  | Fittings :         | PE, PA, PVDF                                    |
| Inlet solenoid valve :  | Stainless steel                         | Resistivity cell : | Stainless steel (# 316), PE                     |
| QUANTUM cartridge       | Ultra-High density polyethylene         | Manifold :         | PPO                                             |
| Pump head:              | NSF* listed and FDA* approved materials | Tubing :           | PE                                              |
|                         |                                         | Three way valve :  | Copolymer of butadiene and styrene, Viton, PTFE |
|                         |                                         | O-rings :          | EPDM                                            |
| UV lamp and housing:    | Stainless steel, Quartz                 |                    |                                                 |
| UF housing :            | ABS                                     |                    |                                                 |
| UF sanitisation port :  | ABS                                     |                    |                                                 |
| Reject solenoid valve : | Stainless steel                         |                    |                                                 |

\*NSF = National Sanitation Foundation \* FDA = Food and Drug Administration

### Electrical specifications

| Voltage   | Electrical consumption | Frequency | Main power fuse | RS 232 Output                     |
|-----------|------------------------|-----------|-----------------|-----------------------------------|
| 230 Volts | 60 VA                  | 50 Hz     | 1.0 A Slo-Blo™  |                                   |
| 120 Volts | 60 VA                  | 60 Hz     | 2.0 A Slo-Blo   |                                   |
|           |                        |           |                 |                                   |
| 230 Volts | 100 VA                 | 50 Hz     | 1.0 A Slo-Blo.  |                                   |
| 120 Volts | 100 VA                 | 60 Hz     | 2.0 A Slo-Blo.  |                                   |
|           |                        |           |                 | RS 232<br>type RJ 11<br>connector |

### Dimensions and operating weight (with Q-Gard and Quantum)

|           |                                                                           |
|-----------|---------------------------------------------------------------------------|
| Height    | 455 mm                                                                    |
| Length    | 255 mm                                                                    |
| Depth     | 355 mm (includes the wall mounting inserts on rear)                       |
| Weight(s) | 16.0 Kg<br>16.8 Kg<br>16.3 Kg<br>17.1 Kg<br>+ 0.6 Kg with A-10 TOC module |

## Environmental Conditions

|                                           |                                  |
|-------------------------------------------|----------------------------------|
| Ambient storage and operating temperature | 5°C < T < 40°C                   |
| Humidity                                  | 20 % - 80 % without condensation |

## Hydraulic specifications

|                             |                                                        |
|-----------------------------|--------------------------------------------------------|
| Feedwater tubing            | 8 mm outer diameter (OD), length : 3 meters maximum    |
| Reject tubing               | 8 mm and 6 mm OD, length : 2.5 meters maximum          |
| Inlet feedwater pressure    | Minimum: 0.1 bar (1.5 psi)<br>Maximum: 0.5 bar (7 psi) |
| Feedwater delivery flowrate | ≥ 1.5 litre/minute (LPM)                               |
| Feedwater temperature       | 5 °C to 37 °C                                          |

## Feedwater quality

Yamato recommends using water treated by distilled water or Reverse Osmosis.

## System performances

|                                       |                                                                          |
|---------------------------------------|--------------------------------------------------------------------------|
| Purified water quality                |                                                                          |
| Resistivity                           | 18.2 MΩ-cm at 25 °C                                                      |
| Pyrogens                              | < 0.02 EU/ml                                                             |
| TOC*                                  | <20 ppb (WR600A)<br><5 ppb(WR600G)<br><25 ppb(WR600B)<br><10 ppb(WR600S) |
| Flowrates                             |                                                                          |
| Product water flowrate                | Up to 1.5 litre/minute<br>Up to 1.0 litre/minute                         |
| Sound level at 1 metre distance in dB | extremely low                                                            |

- Test conditions: Autopure WR600 was equipped with a Q-Gard pre-treatment pack and a QUANTUM EX cartridge. The feedwater to the Autopure WR600 came from a RiOs Reverse Osmosis system. TOC levels in the feedwater were < 50 ppb. The quality of the Autopure WR600 product water can vary as a function of the quality of the feedwater.

# **INSTALLATION**

## **Unpacking**

The different components supplied with the system are shown in figure 2 and are listed below.

|           |
|-----------|
| Present ? |
|-----------|

- (A) Autopure WR600 water purification system
- (B) Electrical power cord
- (C) Folder with documents to insert
- (D) Tubing 8 mm OD, 5 meters length for :
  - inlet water connection
  - reject stream for ultrafiltration module
- (E) Tubing (6 mm OD), 2.5 meters length for A-10 waste stream
- (F) Tubing used when UF module is sanitised
- (G) Fitting 1/4" MNPT - hose barb (MNPT = male national pipe thread)
- (H) Fitting 1/2" FNPT - 8 mm OD tubing with screen filter inside
- (I) Teflon™ tape
- (J) Plastic bag containing elbow fittings
- (K) Six sided key used to loosen / tighten point of use arm

| yes | no |
|-----|----|
|     |    |
|     |    |
|     |    |
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|     |    |

Items ordered / obtained separately

- (L) Q-Gard purification pack
- (M) QUANTUM cartridge
- (N) MILLIPAK 40 final filter 0.22 µm size for point of use gun

Checked by

\_\_\_\_\_ Name

\_\_\_\_\_ Signature

\_\_\_\_\_ Date

Verified by

\_\_\_\_\_ Name

\_\_\_\_\_ Signature

\_\_\_\_\_ Date

## **Installation of the system**



The system can either be placed on a bench or wall mounted. If the system is to be wall mounted, then it is necessary to first verify that the wall can support the weight of the system. Contact Yamato Technical Service for further instructions on wall mounting the system.

Some versions of the Autopure WR600 systems require a drain nearby. When a reservoir is used as a feedwater supply, locate the system and reservoir close together whenever possible.

**Note:** The pressure regulator and pressure gauge are not supplied with the Autopure WR600 and must be ordered separately. Contact Millipore Technical Service for more information.

## Installation

### Connection of feed water to the system (Figure 3)

System fed from a reservoir :

1. Cut the feed water tubing, 8 mm OD (Figure 2, D) to the desired length (< 2.5 meters)
2. Remove the protective plug (B) from the “FEED 1” connection (H) by pressing on collar (A) and pulling the plug out.
3. For wall mounting of the system, install elbow connectors (figure 2, J).
4. Connect the feed water tubing (C) (8 mm OD) to inlet “FEED 1”(H) by inserting it firmly in the fitting. Verify that the connection is correctly made by pulling several times on the tubing once inserted.
5. Connect the other end of the feedwater tubing to the reservoir at an appropriate location ( Figure 5).

System fed from a pressurised source :

1. Cut the feed water tubing, 8 mm OD (Figure 2, D) to the desired length (< 2.5 meters)
2. Remove the protective plug (B) from the “FEED 1” connection (H) by pressing on collar (A) and pulling the plug out.
3. The feed water valve or the fitting (D) should terminate in a 1/2” MNPT fitting.  
The 1/2” FNPT fitting (E) is screwed on to the fitting (D). Use the Teflon tape (Figure 2, I), which is supplied with the unit, to ensure a good seal against leaks.
4. Connect the tubing (C) to the fitting (F). Pull on the tubing afterwards to insure it is secure.
5. Pressurised feedwater entering the Milli-Q system must be regulated between 0.2 Bar (3 psi ) and 0.5 Bar (7 psi) . **Installation of a pressure regulator is necessary if the feedwater pressure is over 0.5 Bar (7 psi). The regulator should be adjusted while water is dispensed from the system.**

### Connection of the reject tubing(s) (figure 3).

Any Autopure WR600 system with the A-10 TOC or UF option(s) has to have reject tubing on the system. The procedure to connect the reject tubing is the same as that used for the feed water tubing.

1. Connect the Ultrafiltration cartridge reject tubing (8 mm OD) (Figure 2, D), < 2.5 m to the “DRAIN 3” (I) outlet.
2. Connect the A10 waste stream tubing (6 mm OD) (Figure 2, E), < 2.5 m to the “OUT 5” (J) outlet.

Note: If the Autopure WR600 System is fed by a reservoir, the A10 reject water can be recycled.



When starting up the system, place all the ends of all reject tubing(s) to the drain.

## Installation of the Q-Gard purification pack (Figure 4)

(The Q-Gard is only used on Autopure WR600 systems equipped with a pack adapter)

1. Raise the pack adapter (A) to its highest position. Remove the two protective plastic inserts (B) on the pack adapter.
2. Remove the two protective inserts on the Q-Gard pack (C). Wet the two O-rings with water.
3. Push the Q-Gard so that the pack adapter metal rod (D) goes through the hole at the top of the Q-Gard.
  - Lift the Q-Gard slightly and push the bottom of it into the small opening (E) on the system.
  - At the upper pack adapter, push the pack completely in until secure.
4. Lock the Q-Gard in place with the metal locking clip (F) clip on the end of the metal guide pin (D).
5. Bring the adapter cap down to its lowest position (G) so that it covers the top of the Q-Gard.

## Electrical connection of system

1. Connect the power cord (Figure 2, B) to the Autopure WR600 (Figure 3,L). Connect the other end of the power cord to an earth grounded power source.
2. Check that the point of use gun trigger is in the up-right position.
3. Turn on the system electrical switch (figure 1, H) by putting it to position **I**.
4. The serial number is displayed. Note the serial in the table below.

Example:

|          |                     |
|----------|---------------------|
| GRADIENT | V I . 0 0           |
| SR . N ° | Z 5 A L 5 6 8 A 5 C |

| Type of Milli-Q system |
|------------------------|
| SR.#                   |

Note : Contact Yamato Technical Service when connecting a level sensor to the Autopure WR600 system. As an option, it is possible to get a “NO FEED WATER” message when there is no water in the reservoir.

## Installation of the QUANTUM Polisher Cartridge (Figure 4)

1. Open the blue door on the front of the Autopure WR600 by pressing the 2 latches (H) on the door to the left to open it.
2. Remove the two protective inserts from the QUANTUM cartridge. Wet the two rubber O-rings on the QUANTUM polisher with water.
3. Install the QUANTUM polisher. Push it straight in so that the QUANTUM is fully inside.
4. Close the door. It is necessary to fully snap the latches (H) shut to hold the QUANTUM cartridge inside.



## Rinsing the Autopure WR600 for the first time

A 5 minute rinsing cycle “AIR PURGE” occurs automatically whenever new cartridges are installed in the Autopure WR600 system.

1. Open the feedwater isolation valve if there is one.
2. The system will be waiting to begin the AIR PURGE cycle.
3. Start the AIR PURGE by moving the point of use gun trigger forward. Direct all water from the point of use to a drain.
4. At the end of 5 minutes the system will go into PRODUCT mode. **Close the point of use gun trigger (bring it vertically straight up).**
5. If possible, leave the system in PRE-OPERATE mode overnight. This helps to hydrate the ion exchange resin inside the cartridges.
6. In PRE-OPERATE mode, purge the QUANTUM cartridge of any trapped air by pushing in on the small hole located on the blue door (figure 4, K).
7. Quickly push in a small screwdriver into the hole to purge out the trapped air.

|                   |
|-------------------|
| PREOPERATE        |
| AIR PURGE : 5 m n |

|                   |
|-------------------|
| PRODUCT           |
| AIR PURGE : 4 m n |

|               |
|---------------|
| 18 . 2 MΩ c m |
|---------------|

|            |
|------------|
| PREOPERATE |
|------------|

## Cleaning the A-10 measurement cell.

When a Autopure WR600 system is configured as an A-10 model, an automatic cleaning of the A-10 analysis cell takes place. This cleaning lasts for 1 hour.

## Connection of an RS 232 interface with the system.

The Autopure WR600 system offers the possibility of transmitting information to a printer. It can be done by in MENU mode in the MEASURE section.

For further information, contact Yamato Technical Service.

# **OPERATING THE AUTOPURE WR600 SYSTEM**

## **Modes of operation**

Your Autopure WR600 system has a number of operating modes which can be activated via the keypad. Other modes are automatically activated by the microprocessor.

These different modes are displayed on the screen, and are described below :

## **Routinely seen displays**

| OPERATING MODE                   | ACTION                                                                                                                        | STATUS OF SYSTEM                                                                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STANDBY                          | Press the OPERATE / STANDBY button while the system is in PRE OPERATE mode.                                                   | The system is in a STANDBY mode. While in this mode, system operation is not possible. Automatic recirculation does not occur in this mode.                                                                                  |
| PRE OPERATE                      | Press the OPERATE / STANDBY button while the system is in STANDBY mode.                                                       | The system is recirculating water at a low flow rate all the time. For 5 minutes an hour, the low flow changes to high flow recirculation.                                                                                   |
| 18.2 MΩcm                        | Automatically occurs from PRE OPERATE mode when point of use trigger is moved forward. This is referred to a PRODUCTION mode. | During PRODUCT mode, the system measures and displays the product water resistivity compensated at 25 °C .                                                                                                                   |
| 25.5 MΩ-cm 18.6 °C               | Automatically occurs from PRE OPERATE mode when point of use trigger is moved forward.                                        | During PRODUCT mode, the system can display the product water resistivity <u>non temperature compensated</u> at 25 °C as well as the water temperature.                                                                      |
| TEMP: 18.6 °C<br>TOC: 4 ppb      | Press the MEASURE keypad button when the system is in PRE-OPERATE or PRODUCT mode.                                            | The product water temperature is displayed. For systems with the A-10 option, the product water TOC is displayed.                                                                                                            |
| PROD. TIME SETUP<br>COUNTER: 9mn | In PRE OPERATE mode, press the MENU button for 2 seconds to view the counter.                                                 | The counter can be used to dispense water from the system for a specific amount of time. This time can be selected and changed with the keypad. After the counter finishes, the system automatically goes into STANDBY mode. |
| FAST FLUSH                       | Automatic with Biocel and Synthesis Milli-Q systems.                                                                          | This is a rinsing of the ultrafiltration module and lasts 30 seconds. It does not effect normal use of the system.                                                                                                           |
| TOC : 3 ppb                      |                                                                                                                               | Display of the last TOC measure or oxidation in process.                                                                                                                                                                     |

## Additional displays

### System maintenance messages

| DISPLAYED MESSAGE | ACTION                                                                                                                                                                             | SYSTEM STATUS                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| EXCH. CARTRIDGES  | Occurs automatically.<br><b>See MAINTENANCE chapter for further information</b>                                                                                                    | <b>SERVICE LED blinking</b><br>The operational lifetime of the purification / polisher cartridges has expired. |
| START SANIT.      | Occurs automatically.<br><b>See MAINTENANCE chapter for further information</b>                                                                                                    | <b>SERVICE LED blinking</b><br>A cleaning of the ultrafiltration module is necessary.                          |
| EXCHANGE UV LAMP  | Occurs automatically.<br><b>Call Yamato Technical Service</b>                                                                                                                      | <b>SERVICE LED blinking</b><br>The operational lifetime of the system UV lamp has expired.                     |
| EXCHANGE A10 UV   | Occurs automatically.<br><b>Call Yamato Technical Service</b>                                                                                                                      | <b>SERVICE LED blinking</b><br>The operational lifetime of the UV lamp inside the A10 has expired.             |
| A10 CLEANING 59   | Occurs automatically after installing new purification / polisher pack(s). It also can be started via the software.<br><b>See the MAINTENANCE chapter for further information.</b> | <b>SERVICE LED blinking</b><br>A cleaning cycle of the A-10 is in progress. Duration is 60 minutes.            |

## Alarm displays

| DISPLAYS       | STATUS of the SYSTEM                                                                                                                                                                      |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CARTRIDGE OUT  | The Autopure WR600 has stopped operating because either the QUANTUM or Q-Gard purification pack is loose.<br><b>See the QUANTUM and Q-Gard installation section for more information.</b> |
| NO FEED WATER  | The Autopure WR600 system is connected to a reservoir level sensor and has detected that the reservoir is empty.<br><b>Wait until there is water in the reservoir.</b>                    |
| SYSTEM ERROR # | Indication of a specific fault or malfunction with an internal component of the system.<br><b>See the MAINTENANCE chapter for more information.</b>                                       |
| RS 232 ERROR   | There is a problem with or service is needed for the RS 232 output.<br><b>See the MAINTENANCE chapter for more information.</b>                                                           |
| A10 ERROR #    | Service or maintenance needed for the A10 TOC accessory.<br><b>See the MAINTENANCE chapter for more information.</b>                                                                      |

**NOTE:** The ALARM LED will blink while the ALARM messages are displayed on the LCD.

# Use of the Keypad

The keypad allows the user to activate the different operating modes or to review information about system performance.

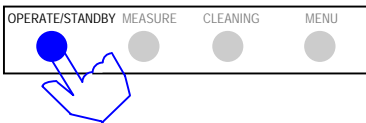
## KEYPAD

## ACTION

## DISPLAY

### STANDBY and PRE-OPERATE

Press the OPERATE / STANDBY keypad button for at least 2 seconds to switch between these two operating modes.



STANDBY

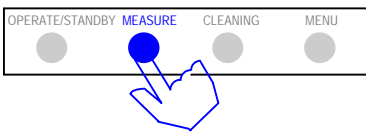
|               |  |
|---------------|--|
| S T A N D B Y |  |
|---------------|--|

PRE-OPERATE

|                       |  |
|-----------------------|--|
| P R E - O P E R A T E |  |
| T O C                 |  |

### MEASURE

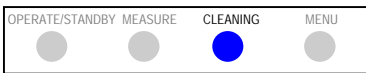
In PRODUCT or PRE-OPERATE mode,  
Press MEASURE to display temperature and last TOC value.



|        |             |
|--------|-------------|
| TEMP : | 2 2 . 6 ° C |
| TOC :  | 3 p p b     |

### CLEANING

The CLEANING function is described in the MAINTENANCE chapter. This is for cleaning and sanitising the ultrafiltration module.



### MENU FUNCTION

#### Changing the COUNTER time

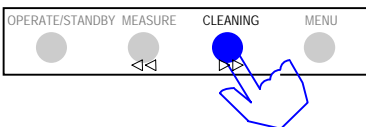
In PRE-OPERATE mode only,  
press MENU for at least 2 seconds.



|                 |           |
|-----------------|-----------|
| PROD . T I M E  | S E T U P |
| C O U N T E R : | 0 m n     |



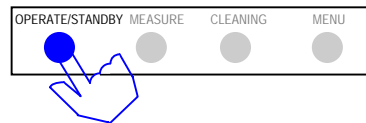
Select or change the COUNTER time by pressing the arrow keys. or



|                 |           |
|-----------------|-----------|
| PROD . T I M E  | S E T U P |
| C O U N T E R : | 1 3 m n   |



Press OPERATE / STANDBY for at least 2 seconds to accept the COUNTER time.



|                     |  |
|---------------------|--|
| P R E O P E R A T E |  |
|---------------------|--|

**Note:** Moving the point of use trigger forward will initiate the COUNTER and start to dispense water. The system will dispense water from the point of use gun for the amount of time that the COUNTER is set to. When the dispensing time is finished (COUNT = 0), the system will automatically go to STANDBY mode. Move the Trigger back to the vertical position to go to PRE OPERATE mode.

# Use of Keypad continued

## KEYPAD

## ACTION

## DISPLAY

### MENU function continued

#### Printer



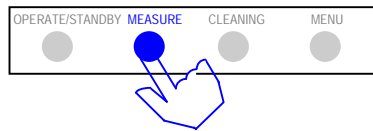
In either PRE-OPERATE or PRODUCT  
Press MENU for at least 2 seconds

|             |       |
|-------------|-------|
| PROD . TIME | SETUP |
| COUNTER :   | 0 m n |



Press MENU

|                   |
|-------------------|
| SERVICE : PRINTER |
| PRESS "MEASURE "  |



One press on the MEASURE button starts printing



Press MENU for at least 2 seconds,  
display returns back to initial operating mode.

|                 |
|-----------------|
| 1 8 . 2 MΩ c m  |
| T O C : 3 p p b |

### Displaying the UV light(s) age, cartridges ages



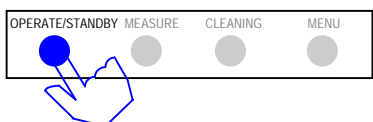
In either PRE-OPERATE or PRODUCT  
Press MENU for at least 2 seconds

|             |       |
|-------------|-------|
| PROD . TIME | SETUP |
| COUNTER :   | 0 m n |



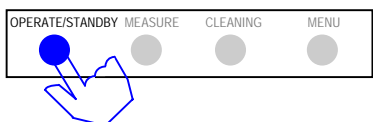
Press MENU twice,  
the age of the UV light is shown

|                  |
|------------------|
| SERVICE : AGE    |
| UV LAMP 6 8 DAYS |



Press OPERATE/STANDBY once,  
the age of the UV in the A10 TOC is shown

|                 |
|-----------------|
| SERVICE : AGE   |
| UV A10 6 8 DAYS |



Press OPERATE/STANDBY,  
the age of the cartridge (s) is shown

|                      |
|----------------------|
| SERVICE : AGE        |
| CARTR . : 1 1 8 DAYS |



Press MENU for at least 2 seconds,  
display returns back to initial operating mode.

|                |
|----------------|
| 1 8 . 2 MΩ c m |
| TOC : 3 p p b  |

## Use of Keypad continued

### KEYPAD

### ACTION

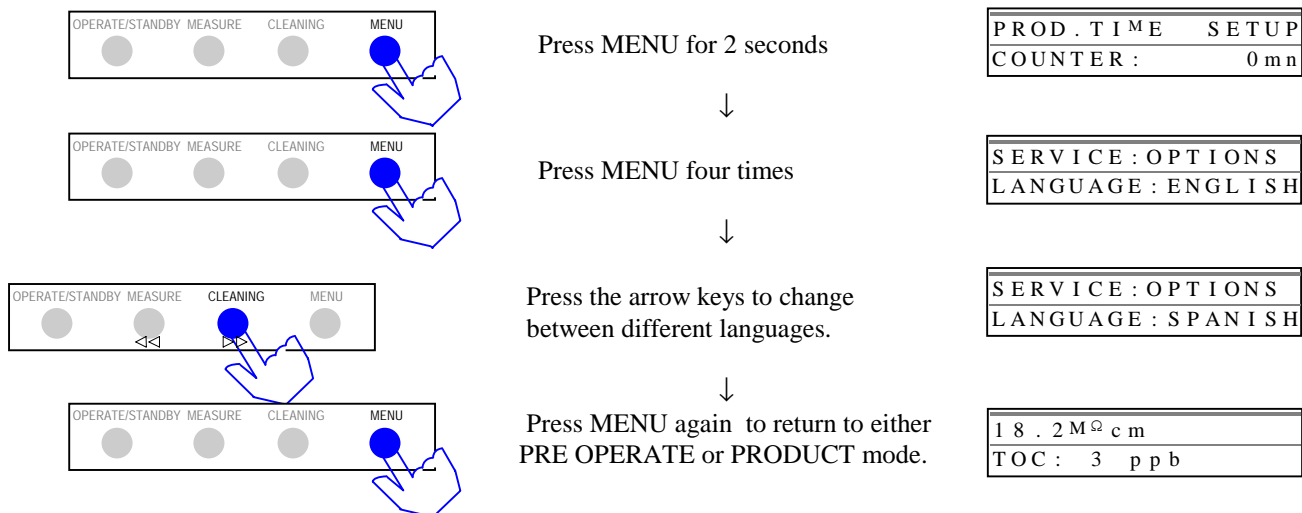
### DISPLAY

#### Cleaning the A10 module (1 hour duration)

The A-10 CLEANING mode is used to clean the oxidation chamber of the A-10 and is described in details in the MAINTENANCE section

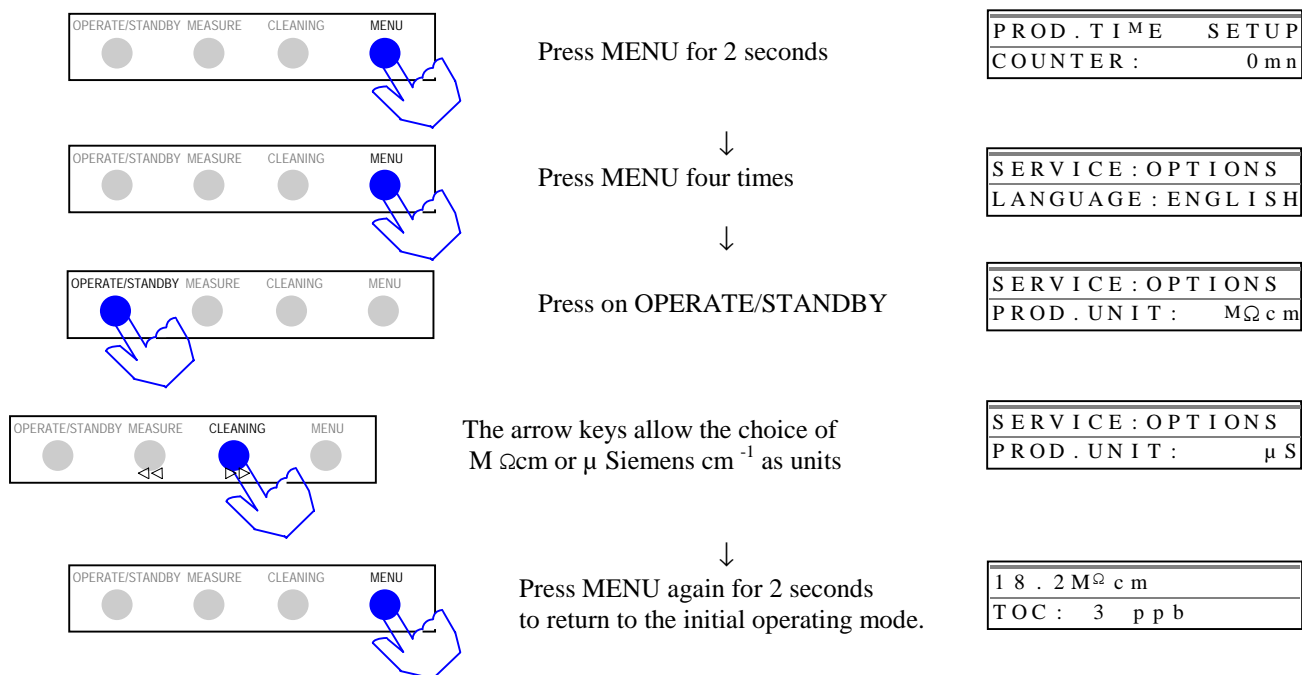
#### Choosing the displayed language

In either PRE OPERATE or PRODUCT mode



#### Choosing the units of measurement

In either PRE OPERATE or PRODUCT mode



## Using the keypad continued

### KEYPAD

### ACTION

### DISPLAY

#### MENU function continued

#### Non temperature compensated resistivity display.

In either PRE OPERATE or PRODUCT mode



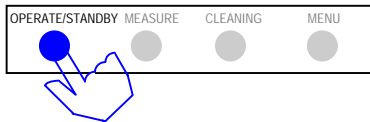
Press MENU for 2 seconds

|            |       |
|------------|-------|
| PROD. TIME | SETUP |
| COUNTER :  | 0 m n |



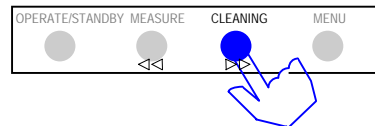
Press MENU four times

|                    |
|--------------------|
| SERVICE : OPTIONS  |
| LANGUAGE : ENGLISH |



Press twice on  
OPERATE/STANDBY

|                     |
|---------------------|
| SERVICE : OPTIONS   |
| T ° CORRECTION : ON |



The arrow keys allow the choice of  
a compensated or a non temperature  
compensated resistivity display.

|                      |
|----------------------|
| SERVICE : OPTIONS    |
| T ° CORRECTION : OFF |



Press MENU again for 2 seconds  
to return to the initial operating mode.

|                     |          |
|---------------------|----------|
| 19.4 M $\Omega$ c m | 23.4 ° C |
| TOC : 3             | ppb      |

#### Purging the air out of the Ultrafiltration Cartridge.

See Appendix 1, Purging the air from the UF cartridge.



## **Servicing the Autopure WR600**

The intermittent recirculation of water inside the Autopure WR600 allows the cartridge(s) to become fully hydrated. Before installing the point of use filter (MILLIPAK 40), dispense about 2-3 litres of water from the system the next day.

### **Changing the MILLIPAK 40 final filter (Figure 7)**

1. Remove the venting cap (A) from the MILLIPAK 40.
2. Screw the MILLIPAK 40 onto the point of use thread (B). Turn it a maximum of 2-3 times.
3. Replace the venting cap but do not tighten it onto the MILLIPAK 40.
4. Start to purge the MILLIPAK 40 by bringing the point of use gun trigger forward (C).
5. When all of the air is purged from the MILLIPAK 40, tighten the venting cap (A).
6. Close the point of use gun trigger (C) by moving it to the vertical position. The system will automatically go into PRE-OPERATE mode.

### **Purpose of the LED on the point of use gun**

When the point of use trigger is brought slightly forward, the Autopure WR600 system goes into a RECIRCULATION mode. The green LED will flash when the water quality is not optimal. Once the product water resistivity is above a software determined setpoint, the green LED will flash for an additional 30 seconds. Once the green LED is lit steadily, the trigger can be brought forward to dispense water from the point of use gun. If the product water resistivity is below the setpoint, the green LED will blink continuously.

# **MAINTENANCE**

## **Table of periodic maintenance**

| <b>Every month</b>                                                                    | <b>Annually (once a year)</b>                                           | <b>Following a message on the LCD</b>                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note the operating parameters for the system as indicated in the back of this manual. | Clean the screen filter in the feedwater line. See ROUTINE MAINTENANCE. | <p><u>Display:</u> EXCH. CARTRIDGES.<br/>Replace the expendable cartridges.<br/>See ROUTINE MAINTENANCE</p> <p><u>Display:</u> START SANIT.<br/>Clean the Ultrafiltration module. See ROUTINE MAINTENANCE</p> <p><u>Display:</u> EXCHANGE UV LAMP<br/>Replace the UV lamp.<br/>See MAINTENANCE</p> <p><u>Display:</u> EXCHANGE A10 UV<br/>Replace the UV A10 lamp<br/>See MAINTENANCE</p> |

Note: When the product water flowrate becomes low (< 0.5 l/min.), change the final filter MILLIPAK 40. If the MILLIPAK 40 has been in place a short time and becomes clogged, then check the quality of the feedwater.

## **ROUTINE MAINTENANCE**

### **Replacing the QUANTUM cartridge**

1. Put the Autopure WR600 system into STANDBY mode by pressing the OPERATE/STANDBY button for 2 seconds. Do not turn off the electrical power.
2. Open the front blue door by pulling the 2 latches open (figure 4,H)
3. Remove the QUANTUM cartridge.
4. Install the new QUANTUM cartridge by following the instructions in the "INSTALLATION" chapter.

Note: After replacing the QUANTUM cartridge, the system will begin a 5 minute AIR PURGE cycle. The Synthesis and A-10 models will also have a TOC rinsing cycle.

### **Sanitisation of the Ultrafiltration module**

A regular sanitisation of the UF cartridge is necessary to obtain the best water quality and to have the maximum life of the UF module. The Autopure WR600 system will periodically display the message "START SANIT." to inform you that a sanitisation is necessary.

There are two choices of sanitisation cycles in the software.

#### **Cycle 1**

This is a short sanitisation maintenance program. This allows the UF module to be sanitised at the start of an evening and throughout that night.

Cycle 2:

This is a longer sanitisation maintenance program. This program allows for a more rigorous cleaning of the UF module whenever flowrate is diminished from the system or the UF module is severely contaminated.

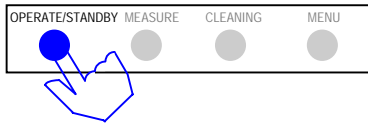


**Before starting a sanitisation, it is necessary to have more than 25 litres of feedwater.**

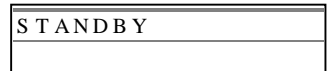
KEYPAD

ACTION

DISPLAY



Put the Autopure WR600 into STANDBY mode by pressing OPERATE / STANDBY for 2 seconds



↓  
Remove the MILLIPAK 40 from the point of use (figure 6)

↓  
Screw the adapter fitting (figure 2, G) onto the point of use.

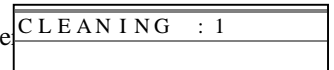
↓  
Insert the 12 mm OD tubing (figure 2, F) onto the end of the barb fitting. Place the other end of this tubing into a drain or sink.

↓  
Remove the sanitisation port plug from the system. Keep it near the system

↓  
Introduce 3 grams of sodium hydroxide into the sanitisation port.

↓  
Screw the sanitisation port plug back onto the system. Check that it is secure.

↓  
Press CLEANING for 2 seconds (Pressing CLEANING again allows the choice of the longer sanitisation cycle).



↓  
Wait 10 seconds to validate the selection.



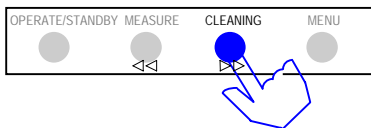
↓  
Bring the point of use trigger forward to begin the sanitisation cycle.



↓  
At 400 minutes on the LCD, put the trigger back to its upright position.



↓  
**At the end of the sanitisation cycle, the system will automatically go into PRE-OPERATE mode.**



↓  
Remove the tubing from the point of use. Remove the adapter fitting. Replace the MILLIPAK 40. The Autopure WR600 system is now ready for normal use.

## Replacing the Q-Gard pack (figure 4)

1. Put the Autopure WR600 system into STANDBY mode by pressing OPERATE / STANDBY for 2 seconds. Do not turn off the electrical power to the system.
2. Put the pack adapter cover (A) to its highest position.  
Remove the metal retaining clip (F)  
Remove the Q-Gard pack from the system.
3. Install the new Q-Gard pack as described in the “INSTALLATION” chapter and in ROUTINE MAINTENANCE.

Note: After replacing the Q-Gard pack, the Autopure WR600 will begin a purge cycle for 5 minutes followed by a TOC rinsing cycle (60 minutes) for A10 models.

## Replacing the MILLIPAK 40 (Figure 7)

The final filter MILLIPAK 40 should be changed whenever the product flowrate becomes too low (< 0.5 LPM) or whenever the QUANTUM and Q-Gard cartridges are replaced. The lifetime of the MILLIPAK 40 is dependent upon the quality of the feedwater and dependent upon the amount of water dispensed through the Autopure WR600 .

To change the MILLIPAK 40:

1. Make sure that the point of use trigger (C) is in the closed (vertical) position.
2. Remove the venting cap (A) from the MILLIPAK 40.
3. Unscrew the MILLIPAK 40 from the female thread (B) on the point of use gun. Turn it counterclockwise to unscrew it.
4. Install the MILLIPAK 40 as described in the INSTALLATION chapter.

## Cleaning the screen filter in the feedwater line (Figure 3)

1. Close the valve on the feedwater line.
2. Remove the feedwater tubing (C) from the fitting (F).
3. Unscrew the fitting (E) from the feedwater piping (D) and the other fitting (F).
4. Clean the screen filter (G).
5. Proceed in the opposite order to reinstall the screen filter.

## Cleaning the A10

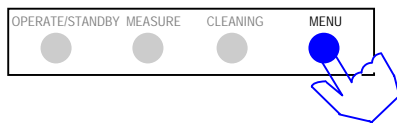
After performing several A-10 TOC measurements, the detection cell in the A-10 needs to be cleaned of any built-up residual organic matter. If this build-up happens, then the displayed TOC values could be erratic or higher than previously seen. To fix this, an autocleaning cycle is needed to oxidise any organic contaminants present in the A-10 detection cell. To perform a cleaning cycle of the A-10, follow these instructions:

In PRE OPERATE mode



↓  
Press MENU for 2 seconds

|             |       |
|-------------|-------|
| PROD . TIME | SETUP |
| COUNTER :   | 0 m n |



↓  
Press MENU 3 times

|                 |
|-----------------|
| SERVICE : A10   |
| A10 CLEANING 60 |

Wait 5 seconds to validate the A-10 cycle. After 60 mins. the system will automatically return to its initial operating mode.

(To interrupt the cleaning cycle)



↓  
Press MENU for 2 seconds,  
to return to the initial operating mode.

|               |
|---------------|
| 18 . 2 MΩ c m |
| TOC : 3 p p b |

Note: It is possible to get water from the point of use valve during the A-10 CLEANING mode

# MAINTENANCE

## Maintenance messages

Whenever the SERVICE LED is blinking, a message is displayed on the screen which indicates the nature of the service needed.

| STATUS / PROBLEM                                                                            | CAUSE                                                                                                                                                                                                                                                                                                                                | REMEDY                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| There is no electrical power to the system.                                                 | <ul style="list-style-type: none"> <li>- No electrical power.</li> <li>- The power cord is not plugged into the wall.</li> <li>- The system power fuse is defective or blown.</li> </ul>                                                                                                                                             | <p>Check the source of power.<br/>Check the power cord.</p> <p>Change the main power fuse.<br/>See APPENDIX 1</p>                                                                                                                                                                                                                                                                                                                               |
| The Autopure WR600 system is in PRODUCT mode but does not produce any or very little water. | <ul style="list-style-type: none"> <li>- The feedwater line valve is closed.</li> <li>- The pump does not work..</li> <li>- Inlet solenoid valve not opening..</li> <li>- Feedwater pressure is too low.</li> </ul> <p>- Air is trapped in the final filter</p> <p>Clogged final filter.</p> <p>Air is trapped in the UF module.</p> | <p>Open the feedwater line valve.<br/>Contact Millipore Technical Service<br/>Contact Millipore Technical Service<br/>Verify that the feedwater pressure is at least 0.1 Bar.</p> <p>Purge air from the final filter. See MAINTENANCE section., <i>Replacing the MILLIPAK filter.</i></p> <p>See MAINTENANCE section, <i>Replacing the MILLIPAK filter.</i></p> <p>Purge the UF cartridge. See Appendix 1, <i>Purging the UF cartridge.</i></p> |
| EXCH. CARTRIDGES.                                                                           | The Cartridge(s) are at the end of their useful life.                                                                                                                                                                                                                                                                                | Change the cartridge(s)<br>See the ROUTINE MAINTENANCE chapter                                                                                                                                                                                                                                                                                                                                                                                  |
| CARTRIDGE OUT                                                                               | The cartridge(s) are either not installed properly or are loose.                                                                                                                                                                                                                                                                     | Put the cartridge(s) back in place.<br>See the ROUTINE MAINTENANCE chapter.                                                                                                                                                                                                                                                                                                                                                                     |
| AIR PURGE                                                                                   | The cartridges were just replaced.                                                                                                                                                                                                                                                                                                   | Wait for the 5 minute AIR PURGE to finish before using water..                                                                                                                                                                                                                                                                                                                                                                                  |
| SYSTEM ERROR #                                                                              | The error number corresponds to a particular equipment error inside.                                                                                                                                                                                                                                                                 | These error code numbers are listed later in this manual.                                                                                                                                                                                                                                                                                                                                                                                       |
| RS232 ERROR                                                                                 | The Autopure WR600 is connected to a printer. A transmission error has occurred between the Autopure WR600 and the printer.                                                                                                                                                                                                          | Press the OPERATE / STANDBY button to reinitialise the system. If the error persists, <b>contact Yamato technical service.</b>                                                                                                                                                                                                                                                                                                                  |
| NO FEED WATER                                                                               | The Autopure WR600 is connected to a level sensor of a feed reservoir.                                                                                                                                                                                                                                                               | Fill the reservoir with water before using the Autopure WR600 again.                                                                                                                                                                                                                                                                                                                                                                            |
| OPEN THE VALVE, FAST FLUSH, SAN. CYCLE or CLOSE THE VALVE                                   | The Autopure WR600 is operating in a particular software cycle.                                                                                                                                                                                                                                                                      | Follow the displayed instructions and wait for the program to end.                                                                                                                                                                                                                                                                                                                                                                              |
| EXCHANGE UV LAMP                                                                            | The life duration of the UV lamp has been reached.                                                                                                                                                                                                                                                                                   | Replace the UV lamp. <b>Call Yamato Technical Service.</b>                                                                                                                                                                                                                                                                                                                                                                                      |

| STATUS / PROBLEM | CAUSE                                                                                                                           | REMEDY                                                                                                                            |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| START SANIT.     | A cleaning cycle of the UF cartridge needs to be started.                                                                       | Start a cleaning procedure.<br>See the MAINTENANCE chapter.                                                                       |
| A10 ERROR #      | A error has occurred with the A-10 TOC measuring equipment.                                                                     | Press OPERATE / STANDBY to reinitialise the Autopure WR600 . If the error persists, then <b>contact Yamato Technical Service.</b> |
| EXCHANGE A10 UV  | The life duration of the UV lamp has been reached.                                                                              | Replace the UV lamp in the A-10.<br><b>Contact Yamato technical Service.</b>                                                      |
| A10 CLEANING     | The Autopure WR600 has the A-10 inside. The cartridges were just replaced or an A-10 cleaning was starting in the SERVICE MENU. | Let the Autopure WR600 finish the 60 minute A-10 cleaning cycle. The Autopure WR600 can dispense water during this mode.          |

## **List of ALARM errors and ALARM messages**

When the ALARM LED is flashing, an error code number will be displayed which indicates the nature of the problem inside the Autopure WR600 .

| <b>SYSTEM ERROR #</b> | <b>DESCRIPTION</b>                                          | <b>REMEDY</b>                                                                                                                                                                                               |
|-----------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b>              | The motor voltage is above its recommended operating value. | <b>Contact Yamato Technical Service.</b>                                                                                                                                                                    |
| <b>2</b>              | Temperature < minimum                                       | The measured temperature needs a short period of time to stabilise. If the message persists, <b>contact Yamato Technical Service.</b>                                                                       |
| <b>3</b>              | Temperature > maximum.                                      | The measured temperature needs a short period of time to stabilise. If the message persists, <b>contact Yamato Technical Service.</b>                                                                       |
| <b>4</b>              | Resistivity < minimum (off-scale).                          | Resistivity of product water is off-scale. Let the Autopure WR600 operate for a few minutes to force any air out of the resistivity cell. If the message persists, <b>Contact Yamato Technical Service.</b> |
| <b>5</b>              | Resistivity > maximum (measurement is not representative).  | Resistivity of water is off-scale. Let the Autopure WR600 operate for a few minutes to force any air out of the resistivity cell. If the message persists, <b>Contact Yamato Technical Service.</b>         |
| <b>6</b>              | Motor voltage error.                                        | <b>Contact Yamato Technical Service.</b>                                                                                                                                                                    |
| <b>7</b>              | UV lamp voltage error.                                      | <b>Contact Yamato Technical Service.</b>                                                                                                                                                                    |
| <b>8</b>              | Defective UV lamp.                                          | <b>Contact Yamato Technical Service.</b>                                                                                                                                                                    |
| <b>9</b>              | Error with the reference signal for the electronics.        | <b>Contact Yamato Technical Service.</b>                                                                                                                                                                    |
| <b>10</b>             | Error with the EEPROM storage.                              | <b>Contact Yamato Technical Service.</b>                                                                                                                                                                    |
| <b>11</b>             | Error with communication with the A-10.                     | Press OPERATE/STANDBY to reinitialise the Autopure WR600. If the problem persists, then <b>contact Yamato Technical Service.</b>                                                                            |

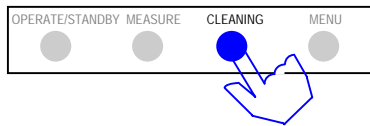


| <b>A-10<br/>ERROR #</b> | <b>DESCRIPTION</b>                                                                   | <b>REMEDY</b>                                                                                                                                                                     |
|-------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0                       | EEPROM savings error                                                                 | If the error persists, then contact Yamato <b>Technical Service</b> .                                                                                                             |
| 1                       | Error in analogue to digital conversion                                              | If the error persists, then <b>contact Yamato Technical Service</b> .                                                                                                             |
| 2                       | Temperature range error.                                                             | The temperature exceeded acceptable limits during analysis.<br>If the error persists, <b>contact Yamato Technical Service</b> .                                                   |
| 3                       | The resistivity of the water in the A-10 is not accepted at the current temperature. | The correlation between these two measurements has passed the allowed limits during the TOC measurement.<br>If the error persists, then <b>contact Yamato Technical Service</b> . |
| 4                       | Temperature too cold.                                                                | The water temperature is below 5 °C. It is necessary that the temperature be above this value.                                                                                    |
| 5                       | Temperature too high.                                                                | The water temperature is above 41 °C. It is necessary that the water temperature is below this temperature.                                                                       |
| 6                       | Conductivity too high                                                                | Conductivity of the sample water exceeded.                                                                                                                                        |
| 7                       | Overheating                                                                          | The temperature exceeded 60 °C during oxidation.<br>If the error persists, then contact Yamato Technical Service.                                                                 |
| 8                       | Incomplete oxidation                                                                 | The sample oxidation was not completed in an allotted time.<br>If the error persists, then <b>contact Yamato Technical Service</b> .                                              |
| 9                       | Low oxidation rate                                                                   | The sample oxidation rate was abnormally low..<br>If the error persists, <b>contact Yamato Technical Service</b> .                                                                |

# APPENDIX 1

## Interrupting the sanitisation cycle of an UF cartridge

If a sanitant chemical has been introduced into the Autopure WR600 , it is absolutely necessary to let the sanitisation cycle finish. If no sanitant has been introduced, then the sanitisation cycle can be cancelled by following these instructions.



Press CLEANING for 10 seconds

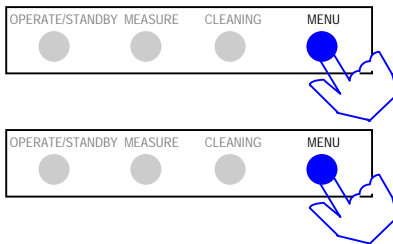
|             |           |
|-------------|-----------|
| SAN . CYCLE | 4 2 0 m n |
|-------------|-----------|

|               |
|---------------|
| S T A N D B Y |
|---------------|



At the end of the sanitisation cycle, the will go back to its initial mode of operation.

## Purging entrapped air from the UF cartridge.



In either PRE OPERATE or PRODUCT

Press MENU for 2 seconds

|             |       |
|-------------|-------|
| PROD . TIME | SETUP |
| COUNTER :   | 0 m n |



press MENU 5 times

|              |
|--------------|
| SERVICE : UF |
| AIR PURGE    |

Open the point of use trigger to begin the air purge cycle. The product water from the system will go to the drain via the reject tubing.

At the end of the air purge, the system will go back into PRODUCT mode.

Close the point of use trigger (vertical position).

## Interrupting the A-10 cleaning cycle

If an A-10 cleaning cycle has been started from the MENU service mode, then it can be cancelled by pressing on the MENU button.

## **Replacing the main electrical power fuse**

1. Put the system into STANDBY mode by pressing OPERATE / STANDBY for 2 seconds.



2. Turn off the power switch (figure 1, G ) by putting it into the '0' position..
3. Unplug the electrical power cord from the wall and from the system.
4. Remove the fuse holder (figure 1,J ).
5. Remove the blown fuse and replace it with the spare fuse.

Note: Replace the spare fuse in the event that it may need to be replaced later.

6. Replace the fuse holder and plug the power cord back in to the system and to the wall.

## **Regulating the mobility of the point of use arm**

The point of use arm can be adjusted in 2 locations. This adjustment is done by tightening the arm screw(s) with the 6 sided key (figure 2, K)



Do not overtighten the arm screws. This may block water flow through the arm.

## **Recycling the reject water from the A-10 TOC**

The reject water from the use of the A-10 can be recycled to a feed reservoir. Contact Yamato Technical Service for more details.

## **System is not operated for a long time**

Keep the Autopure WR600 in PRE OPERATE mode when water is not needed. In this mode, the Autopure WR600 will operate through various cycles to keep the water quality optimum.

**If the Autopure WR600 is to shut down for a long time, contact Yamato Technical Service for further information.**

## **Warranty**

Millipore Corporation (“Millipore”) warrants the products manufactured by it against defects in materials and workmanship when used in accordance with the applicable instructions for a period of one year from the date of shipment of the products. **MILLIPORE** MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

The warranty provided herein and the data, specification and descriptions of Millipore products appearing in Millipore’s published catalogues and product literature may not be altered except by express written agreement signed by an officer of Millipore. Representations, oral or written, which are inconsistent with this warranty or such publications are not authorised and if given, should not be relied upon.

In the event of a breach of the foregoing warranty, Millipore’s sole obligation shall be to repair or replace, at its option, any product or part thereof that proves defective in materials or workmanship within the warranty period, provided the customer notifies Millipore promptly of any such defect. The exclusive remedy provided herein shall not be deemed to have failed of its essential purpose so long as Millipore is willing to repair or replace any non conforming Millipore product or part. Millipore shall not be liable for consequential damages resulting from economic loss or property damages sustained by a customer from the use of its products.

However, in some states the purchaser may have rights under state law in addition to those provided by this warranty.