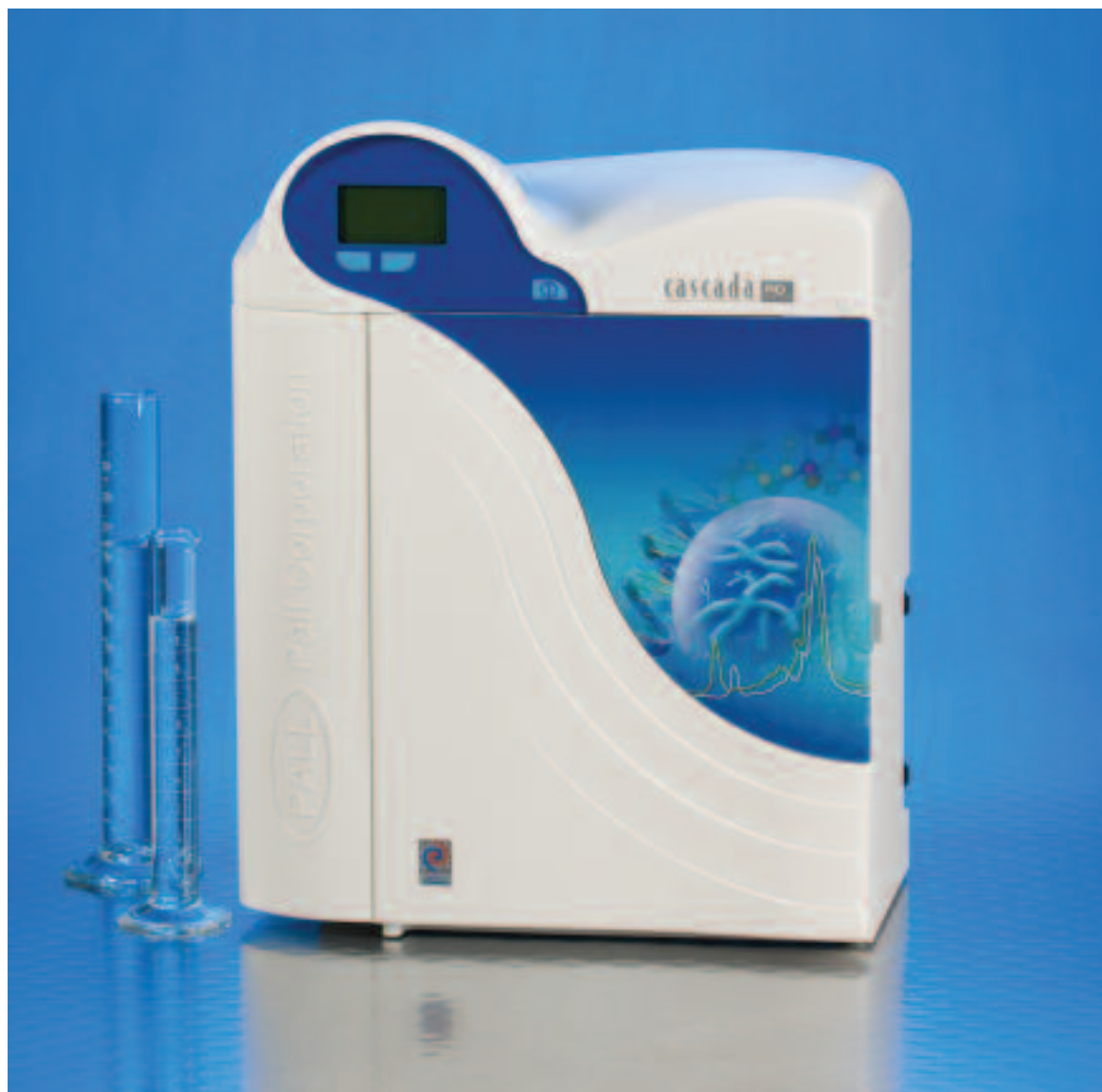


# Cascada™ Lab Water Systems



**Operation Manual**  
Cascada RO Lab Water System  
100 to 240 VAC  
50 to 60Hz



RO-water  
Model

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## Foreword

This manual is provided to serve as the installation, operation, and maintenance guide for the Cascada™ Lab Water system model:

<b>Part Number</b>	<b>Description</b>
PAL-CAXXROM2	Cascada RO-water System

The manual should be read before attempting any cycle of installation, operation, and maintenance. If the instructions in this manual are not followed, the performance of this product and/or the safety of the user may be compromised.

Unpack and inspect all items carefully to ensure they have not been damaged in transit.

Service support and consumable items are available from your local Pall office or distributor. Refer to customer service contact information on back cover.



**Cascada RO-water System** for purified primary-grade water for laboratory applications.

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## User's Responsibility

**Do not attempt to operate or maintain the system without first reading this manual.**

The basic rules of safety set forth in this manual are intended as a guide for safe operation of Pall Corporation equipment. This general safety information, along with explicit service, maintenance, and operational materials for the specific machine, make up the complete instruction manual. All personnel who will operate, service, or be involved with this equipment in any way should be completely familiar with this information prior to start-up. It is the user's responsibility to make certain that the procedures set forth are followed.

Cascada™ Lab Water Systems have been designed to be safe; however, it is important that personnel working on these units understand any potential dangers. All safety information in this manual is highlighted as **WARNING** and **CAUTION** instructions. These are used as follows:

**WARNING!** **WARNINGS ARE GIVEN WHERE FAILURE TO OBSERVE THE INSTRUCTION COULD RESULT IN INJURY OR DEATH TO PERSONS.**



**CAUTION!** **Cautions are given where failure to observe the instruction could result in damage to the equipment, associated equipment, and processes.**

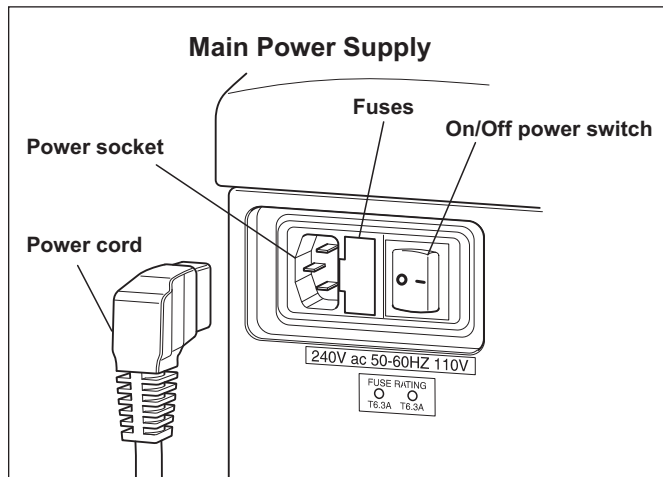


## Electrical

It is essential that the power switch on the Cascada Lab Water system is turned off before any items are changed or maintenance work performed.

The On/Off switch is located at the left-hand side of the unit. The main power cord is located just behind the On/Off switch.

**WARNING!** **THIS APPLIANCE MUST BE GROUNDED. PLUG INTO A PROPERLY GROUNDED (GFI) WALL OUTLET.**



## Pressure

The main water supply valve should be turned off and residual pressure released prior to removal of any cartridges or carrying out work on the unit.

**CAUTION!** **Switching off the electrical power will isolate the source of pressure, but pressure trapped within the unit should be released.**



## Sanitization Chemicals

During the sanitization cycle, a PAL-C100 sanitization tablet is used and relevant safety information is included in this manual. A safety data sheet conforming to COSHH and/or OSHA regulations is also provided with the tablets and should be read before a tablet is used.

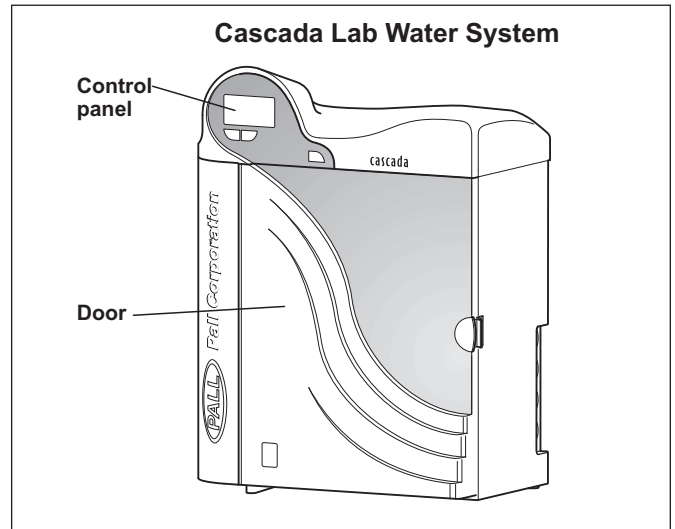
## Control of Substances Hazardous to Health (COSHH)

Material safety data sheets covering the various replaceable Purification Packs are available upon request. Contact your local Pall supplier or distributor.

## Product Description

Pall's Cascada™ Lab Water purification unit is engineered to provide purified 'primary' grade water for laboratory applications.

The system is designed for benchtop or wall mounting with an optional wall mounting kit. A range of accessories are available to complement the unit. See Consumables and Accessories section for details (page 21).



## Purification System Flow

The Cascada Lab Water process links two purification technologies, adsorption and reverse osmosis, as well as incorporates an RO feed water boost pump.

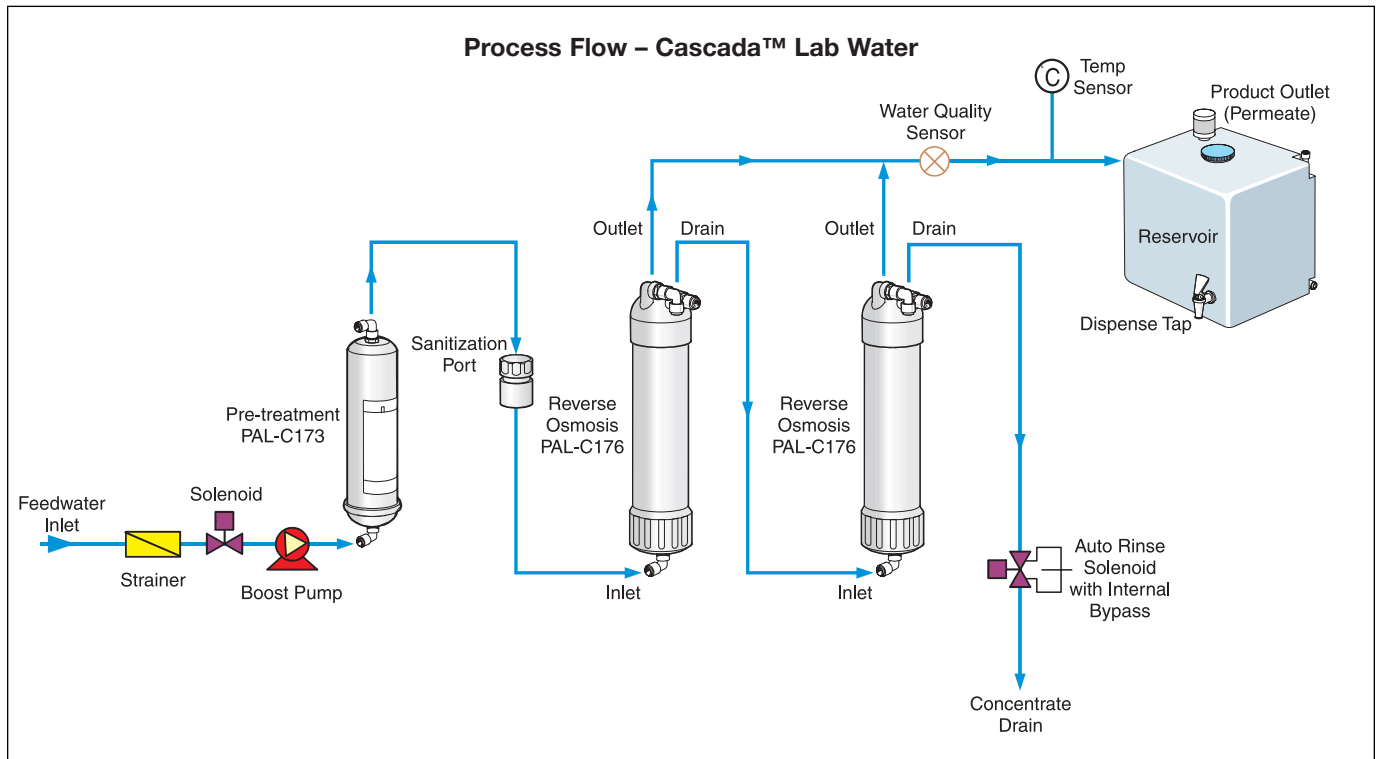
The unit is designed to operate from a good quality potable water supply, and will produce 15 liters (15 °C, 59 °F) per hour of purified reverse osmosis grade water, which is delivered to a treated water reservoir.

A graphics screen displays the system status and provides control by means of three function buttons.

The water is processed and treated by the Cascada Lab Water unit as follows:

- Potable water enters through a strainer and inlet solenoid valve at either regulated main water pressure, or is pumped by means of a feed water pump and passed through the pre-treatment cartridge. The pre-treatment cartridge has been designed to protect the reverse osmosis cartridges from particulate/colloidal matter and excessive free chlorine that may be present in the incoming feed water.
- The water passes the sanitization port and through two reverse osmosis cartridges, set up in series, which split the flow into permeate and concentrate streams. The concentrate stream is passed to drain.
- The permeate water is passed through a:
  1. Water quality sensor, which measures the conductivity of the water; and
  2. Temperature sensor, which provides accurate temperature measurement.
- Finally, the purified water is delivered to a treated water reservoir.
- To ensure water quality is maintained at its highest levels, the unit has a built-in, automated, auto-rinse cycle. This cycle is performed every time the process is initiated and consists of a 1-minute high flow rinse to drain across the reverse osmosis cartridges.

## Purification System Flow (continued)



## Technical Specifications

### Feed Water

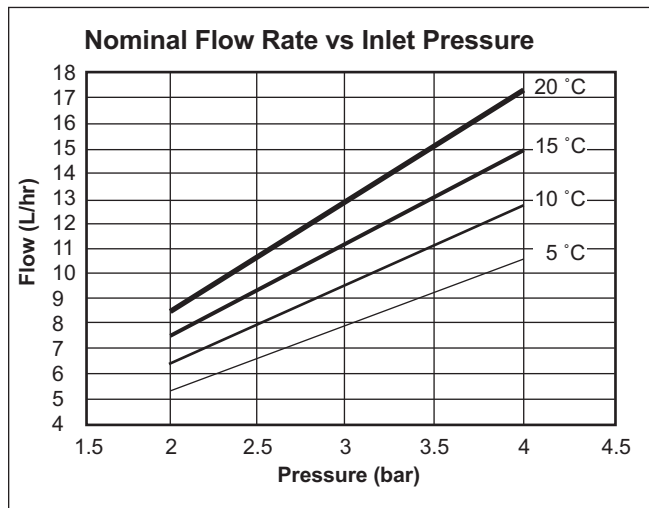
Parameter	Limits
Source quality	Potable main water supply
Fouling index (SDI test)	< 10
Total dissolved solids	≤ 1400 µS/cm
Free chlorine	≤ 0.5 ppm
Heavy metals	≤ 0.05 ppm
Silica	≤ 30 ppm

### Temperature

1-35 °C (34-95 °F)

### Flow Rate

Maximum	≤ 150 L/hr
Drain requirements (gravity fall with air gap), maximum during service	≤ 70 L/hr



### Feed Water Pressure

Maximum	2.0 bar (200 kPa, 30 psi)
Minimum	Flooded suction

### Dimensions

Height	520 mm (20.5 in.)
Width	410 mm (16.2 in.)
Depth	260 mm (10.5 in.)

### Weight

13.0 Kg (28.5 lbs.)

### Connections

Inlet-quick connect	8 mm (5/16 in.) OD
Outlet-quick connect	8 mm (5/16 in.) OD
Drain RO-quick connect	8 mm (5/16 in.) OD
Positioning	Wall, bench, or under bench mounted
Environment	Clean, dry, indoor temp 5-40 °C (41-104 °F) Humidity max 80% non-condensing

### Electrical Requirements

Electrical input	100-240V AC, 50-60Hz all models
System voltage	24V DC
Power consumption with boost pump	52VA
Fuses	2 x T3.15 Amp
Reservoir level connector	Jack plug 3.5 mm
Noise level during recirculation	< 45 dBA

## Technical Specifications *(continued)*

### User Interface

<b>Display</b>	Continuous graphical and numerical reservoir level display	
	Graphical flow schematic on screen with mimic display	
	Intuitive icons	
<b>Adjustable</b>	Auto restart after power failure	Selectable (On/Off)
	Audible alarm	Selectable (On/Off)
	Water purity	Alarm set points
<b>Indicators</b>	Reverse osmosis permeate water	Conductivity
	Temperature	Degrees centigrade
	Reservoir	% full
	Pre-treatment cartridge	Maximum remaining life indicator
<b>Alarms-Audiovisual</b>	Purified water purity	Outside set point alarm
	Reservoir	Low level control disconnect alarm
	Pre-treatment cartridge	Change reminder
<b>Outputs</b>	RS232 printer connection	
	RS232 remote display connection	
	Volt free contact-internal	

### Technologies

Purification methods	Adsorption, reverse osmosis
----------------------	-----------------------------

### Purified Water Specification

*Make up rate	15 L/hr
*Daily output (nominal maximum)	360 L/24 hour day
Output reverse pressure (maximum)	0.1 bar (10 kPa, 1 psi)

### Purity

Inorganic – minimum	> 90% rejection
Inorganic – typical	Up to 98% rejection
Organics (MW > 100 Dalton)	> 99% rejection
Total Organic Carbon (TOC) typical	< 0.1 ppm
**Bacteria	< 5 CFU/mL
Particles	> 99% rejection

### Features

<b>Safety</b>	Power fail safe
	Boost pump protection from particulates
	Low operating voltage 24V
	Audiovisual alarms
	Adjustable alarm settings

### Operational Features

Low noise levels – minimum intrusion
Flow rate upgradable
Optional internal boost pump for low pressure feed waters
Optional printer kit to record operating parameters
Optional remote display

\* Standard conditions are 4.0 bar inlet pressure, < 0.1 bar back pressure at 15 °C, fed with potable water and a clean pre-treatment cartridge. Refer to flow tables outside these conditions.

\*\* Subject to correct operating and maintenance procedures.

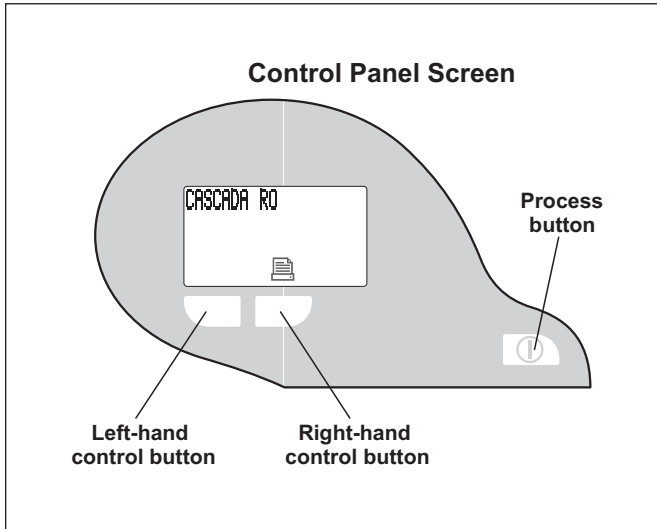
Contact technical support for advice on feed waters outside the range listed.

As part of our commitment to continual improvement, we reserve the right to update the specifications given in this document.

## Controls

The Cascada™ Lab Water System operates with a tactile membrane touch pad control panel. It has a graphics display window and three program function control buttons.

Details of how to use the controls will be given in the appropriate sections.



Control Button	Function
Process	Turns the process On/Off

The Cascada Lab Water System control panel has a range of control icons as follows:

Button	Icon	Function
Left		Menu
		Scroll
Right		Reset
		Mute alarm
		Accept
		Printer

## Unpacking the Cascada™ Lab Water System

The following items are supplied with your Cascada Lab Water System:


1. Cascada Lab Water unit
2. Installation kit (PAL-A667)
3. Operation manual
4. Power cord

## Positioning the Cascada Lab Water System

Before installation and operation of the Cascada Lab Water unit, please read and observe the following points.

### Environment

The unit must be installed on a flat, level surface in a clean, dry environment. The unit can also be wall mounted against a vertical wall capable of supporting the unit weight (use wall mounting kit Part No. PAL-A643 for Europe and Asia and PAL-A655 for Americas and Canada).

**WARNING!**  **IF UNIT IS TO BE WALL MOUNTED, ENSURE IT IS MOUNTED ON A SUBSTANTIAL BRICK OR CONCRETE SOLID WALL CAPABLE OF SUPPORTING THE OPERATING WEIGHT OF THE SYSTEM. CAREFULLY FOLLOW THE INSTRUCTIONS INCLUDED IN THE KIT.**

**Note:** Refer to Specifications on page 4 for unit weights.

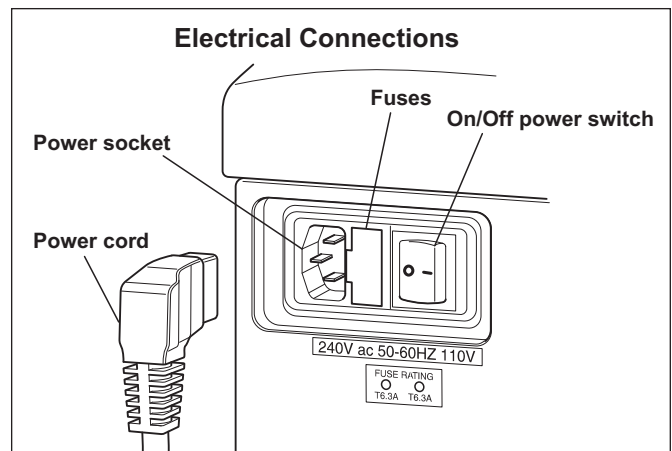
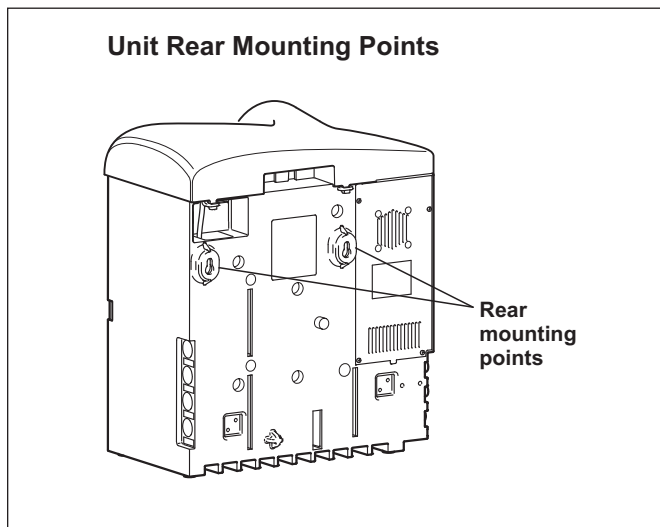
The unit is designed to operate safely under the following conditions:

- Indoor use.
- Altitude up to 2,000 meters (6,561 ft.).
- Temperature range 5-40 °C (41-104 °F).
- Maximum relative humidity 80% @ 31 °C (88 °F) decreasing linearly to 50% @ 40 °C (104 °F), non-condensating.

The unit is in Installation Category II, Pollution Degree 2, as per IEC1010-1.

### Electrical

The unit can be connected universally to any electrical supply in the range of 100-240V and 50-60Hz. The power cord is supplied with a molded plug on one end and a molded connector to the unit on the other. **The unit should be connected to a grounded outlet.**



## Positioning the Cascada™ Lab Water System (continued)

### Drain

A semi-rigid flexible connection to a sink or suitable drain capable of handling at least 1.5 L/min is required. The drain point should have a gravity fall below the level of the unit and any connections direct to drain should have an air-break device fitted.

### Feed Water

Use good quality feed water and comply with specifications provided (page 4). The feed water should enter the Cascada Lab Water unit via an 8 mm (5/16 in.) OD semi-rigid tube, and should be in the temperature range of 1-35 °C (34-95 °F).

**CAUTION!** **Operating with feed water temperatures outside the range of 1-35 °C (34-95 °F) will cause damage to the Cascada Lab Water unit.**

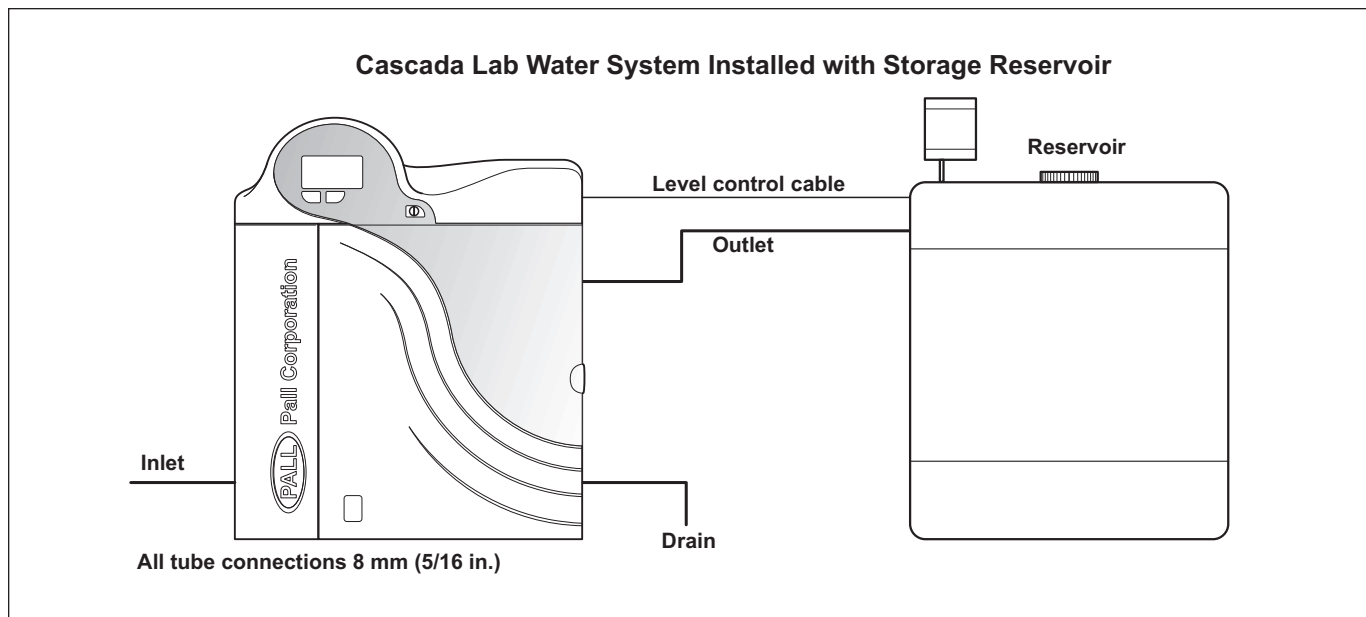
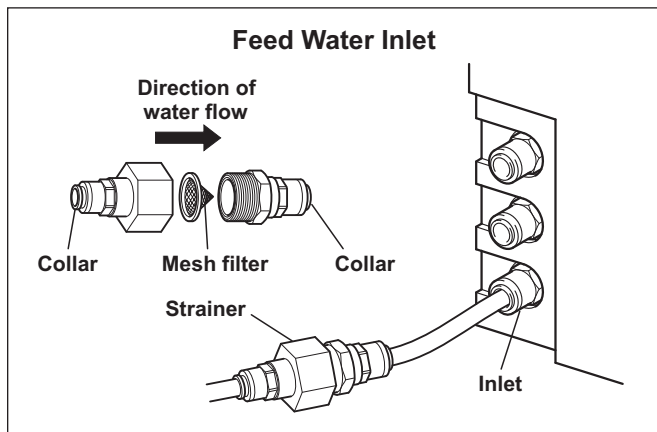


Maximum inlet pressure is 2 bar (30 psi). Higher feed water pressures must be reduced using a pressure regulator valve (Part No. PAL-A500).

**CAUTION!** **Failure to install the correct pressure regulator will cause damage to the Cascada Lab Water unit.**



Reservoir feeds to the Cascada Lab Water unit should be positioned at the same height, or above the unit, to provide a positive, flooded inlet pressure of approximately 0.07 bar (7 kPa, 1.0 psi).



## Connecting the Cascada™ Lab Water System

Once the Cascada Lab Water unit has been positioned either on a wall or on a bench, it should be connected as follows:

- Pressure regulator
- Main water inlet tube
- Drain
- Outlet to reservoir

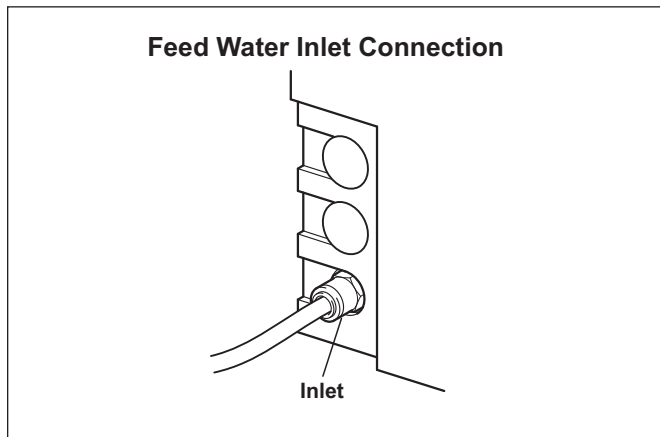
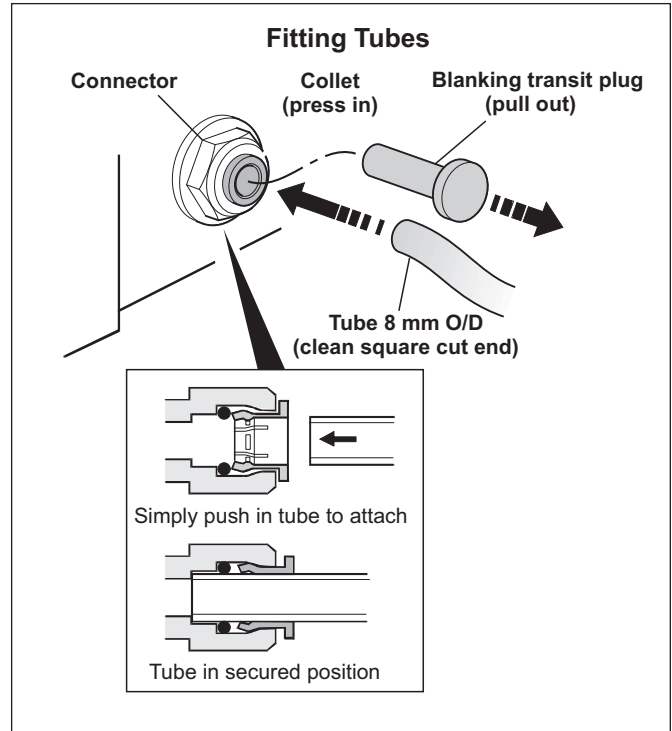
### Step 1 - Remove Transit Plugs

1. Push in collet on connector.
2. Pull out transit plug.
3. Cut a clean, square end on an 8 mm (5/16 in.) OD semi-rigid drain tube.
4. Push tube into connector.

**CAUTION!** Do not restrict drain line.

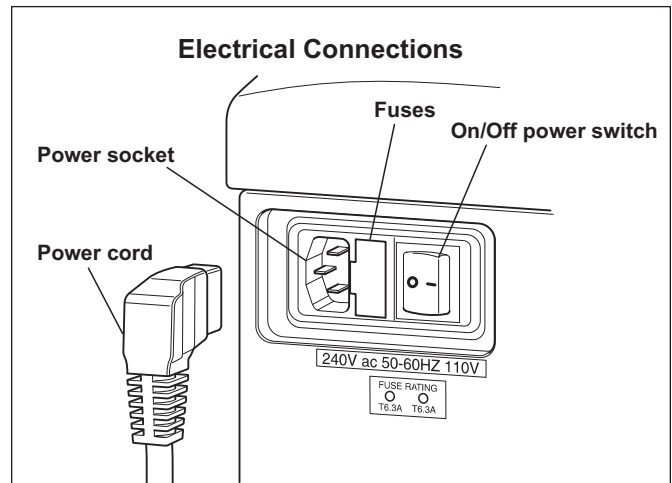


**CAUTION!** If the water supply is at a pressure greater than 2.0 bar (200 kPa, 30 psi), fit a pressure regulator (Part No. PAL-A500).



### Step 2 - Connect Electrical Supply

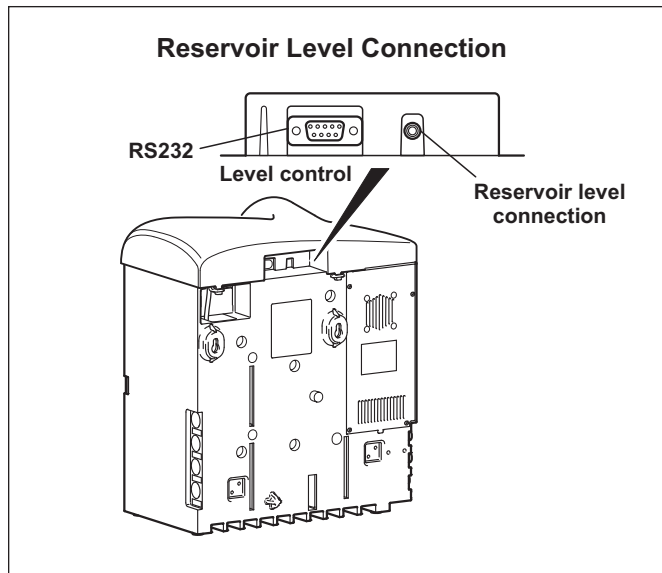
1. Plug power cord into the power socket on the left-hand side of the Cascada Lab Water unit.
2. Plug power cord into grounded electrical wall outlet.



## Connecting the Cascada™ Lab Water System (continued)

### Step 3 - Reservoir Level Connection

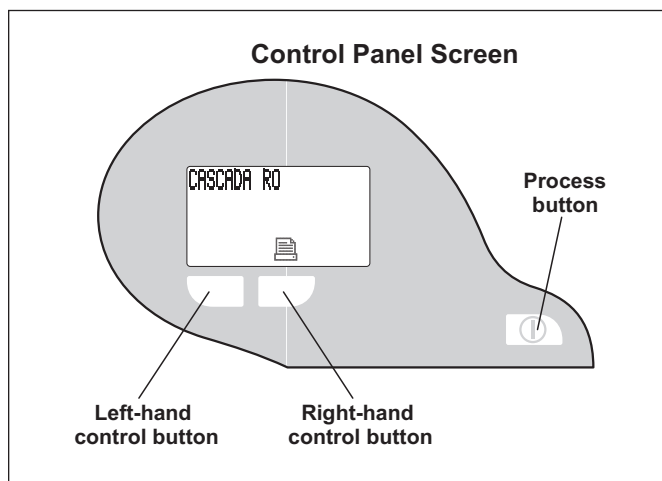
1. Insert jack plugs into the level control socket located at rear of unit and reservoir.



### Initial Controller Set-Up

The Cascada™ Lab Water unit control panel is fitted with three control buttons. These are:

1. The Process button (power icon), which switches the purification process on and off.
2. Two software controlled touch pad buttons that are used to control set-up and process control functions.



When the Cascada Lab Water unit is started for the first time after installation, the following steps should be carried out to set up system preferences.

### Step 1 - Setting Up Menu Options

1. Switch the power on to initialize the controller hardware set-up sequence.

**Note:** Always allow the initialization process to complete. This is indicated by the appearance of the Menu icon on the control screen.

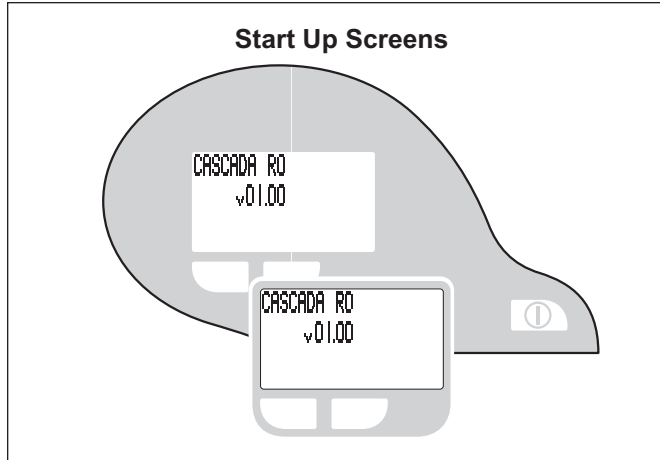
2. Press Menu button (list icon) to go to the next screen to activate the set-up menu sequence.

A series of set-up screens will now be displayed. Various control icons are used to allow you to step through the set-up instruction process. These icons include:

- A "scroll" icon indicated by an arrow (arrow icon).
- An "accept" icon indicated by a checkmark (checkmark icon).
- A "selection" icon indicated by a left-pointing arrow (left arrow icon).

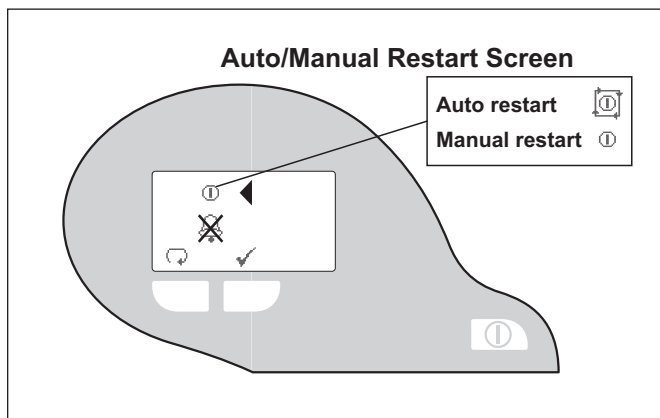
At any stage during the Controller Set-up, the Process button can be pressed to escape back to the initial power-up screen.

## Initial Controller Set-Up (continued)



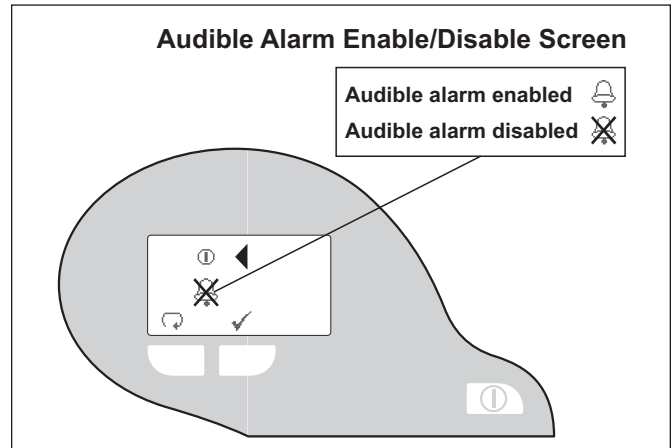
### Step 2 - Auto/Manual Restart

This allows the selection of the auto/manual restart option. If auto restart is selected, the unit will automatically restart after a power failure. In manual mode, the unit will remain in standby. Select the option required using the button and accept with the button.



### Step 3 - Audible Alarm Enabled/Disabled

This display provides the option of either enabling the audible alarm, causing it to sound (while the alarm icon flashes), or disabling the audible alarm causing it to remain muted. Select the option required using the button and accept with the button.



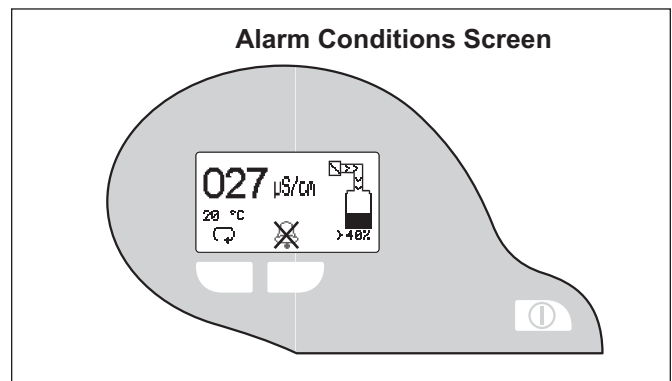
### Step 4 - Purity Alarm Setting

The following water purity alarm choices will be displayed.

- 100  $\mu\text{S}/\text{cm}$
- 50  $\mu\text{S}/\text{cm}$
- 20  $\mu\text{S}/\text{cm}$

Select the alarm setting required using the button and accept with the button.

**Note:** To reset any of the setup parameters, restart from the set up menu and follow instructions from Step 1.



## Replacement Timer/Process Screens

Turn the unit off at the power switch. To enter the replacement timer set up, press the left-hand touch pad button while simultaneously turning the power on.

A graphic of the pre-treatment cartridge and clock graphics are displayed with hourly timer status.

**CAUTION!** Before resetting any of the cartridge timers, ensure that the appropriate cartridges have been correctly installed new and securely located in the Cascada™ Lab Water unit.



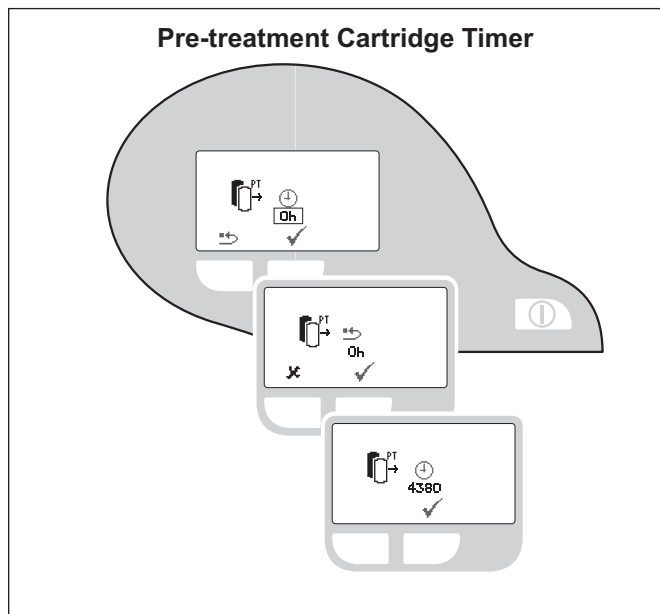
### Step 1 - Pre-treatment Cartridge Replacement Timer

Setting this screen will cause the pre-treatment cartridge timer to reset to the preset value of 4380 hours (6 months).

Press ✓ to jump to the next consumable or ↺ to initiate reset.

Press ✓ to reset timer or press ✗ to abort reset.

Press ✓ to jump to the next consumable.



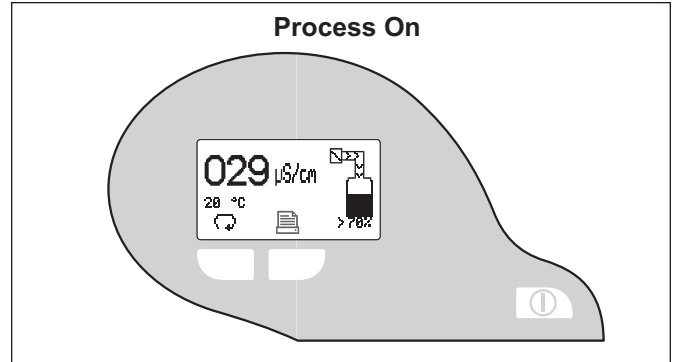
### Step 2 - Process Screens

The normal process screen will display newly installed Setup preferences showing the following process information:

- Output water purity
- Water temperature
- Process mimic
- Reservoir level
- Scroll ↻ and Print 🖨 icons

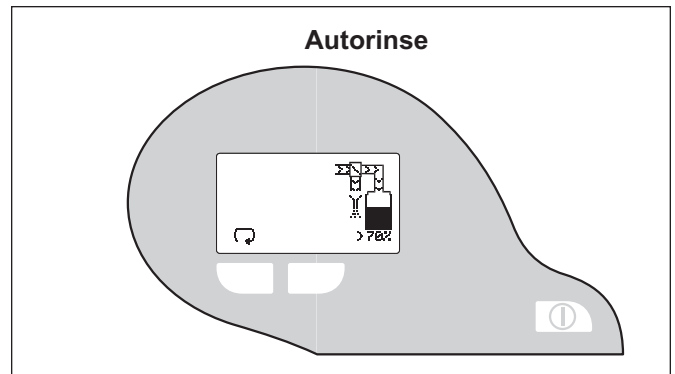
You can scroll through the following display screens:

- Pre-treatment, cartridge, replacement (hours remaining)



### Step 3 - Report Printing (only if connected to LA618)

To print a report, press the 🖨 icon.



### Step 4 - System Autorinse

The system will perform an autorinse cycle upon initiation of a fill cycle.

## Initial Start Up

### Step 1 - Prepare Water Supply

1. The Cascada™ Lab Water System should be installed correctly as described in the Installation Instructions - Connecting section (page 9).
2. Turn on the feed water supply to the unit and adjust the inlet pressure. The Cascada Lab Water unit will operate on a feed water pressure up to 2.0 bar (200 kPa, 30 psi).
3. Check to make sure all tube connections are watertight and that there are no leaks.

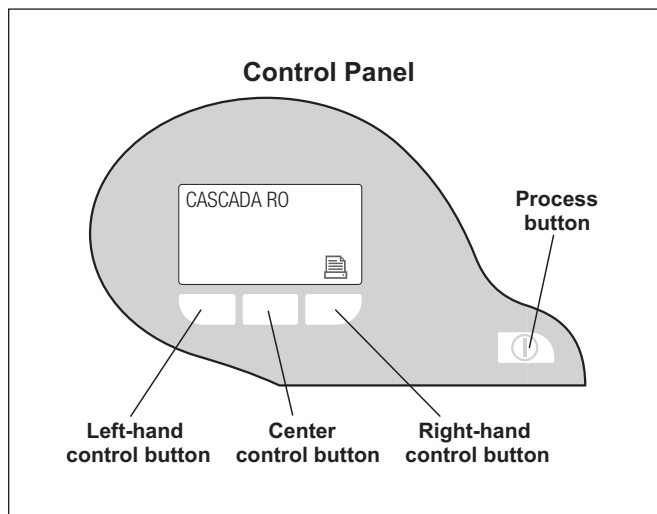
**Note:** The Cascada Lab Water units are supplied containing traces of bacteriostatic solution, which must be rinsed out from the pipework and fittings. The solution is rinsed through both the 'drain' and 'outlet' tubes, which both need to be directed to a drain or sink.

4. Disconnect the outlet tube at the reservoir inlet and direct to a drain or sink.

### Step 2 - Initial Rinse

1. Turn on the electrical supply to the unit and press the power switch on the left-hand side of the unit to the On position.
2. Having checked that the water supply has been turned on, press the Process button and the unit will start.
3. Leave the unit running for 2 hours to drain. During this period, the bacteriostatic solution will be rinsed from the unit. For critical applications, the unit should be left to rinse overnight.

4. After 2 hours, press the Process button to stop the unit. The outlet tubing can now be reconnected to the reservoir.
5. The unit has now been rinsed and is ready for use.
6. Press the Process button and the water purification process will start.




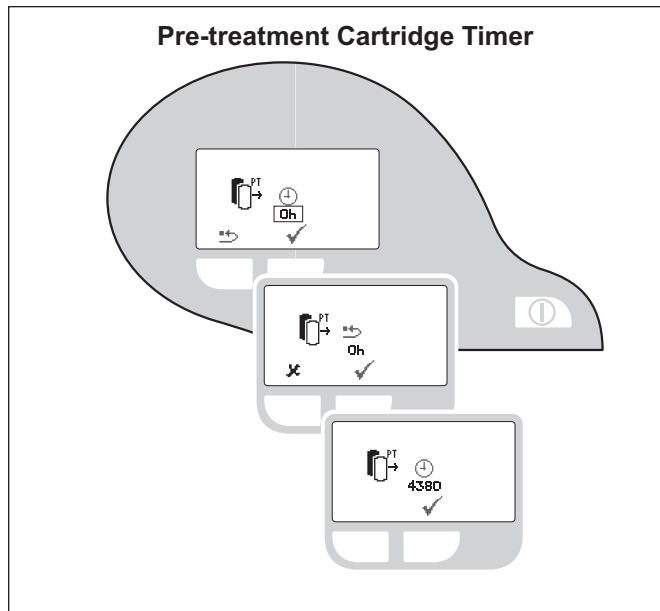
## Alarm Conditions

The Cascada™ Lab Water unit will run automatically and will signal alarm conditions to ensure prompt efficient system management and corrective action.

Alarms will signal at the following conditions:

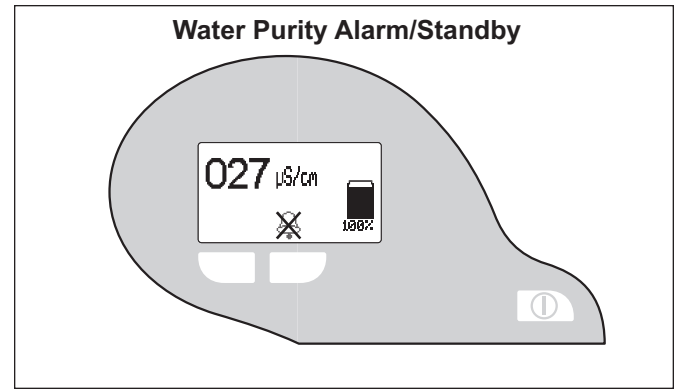
### Replace Pre-treatment Cartridge

The pre-treatment cartridge replacement alarm is signalled by an audible alarm and flashing icon at the default setting of 4380 hrs (6 months) of use. Press the  button to mute the audible alarm. Follow the instructions to replace the pre-treatment cartridge. See Maintenance Section - Replacing the PAL-C173 Pre-treatment Cartridge (page 16).




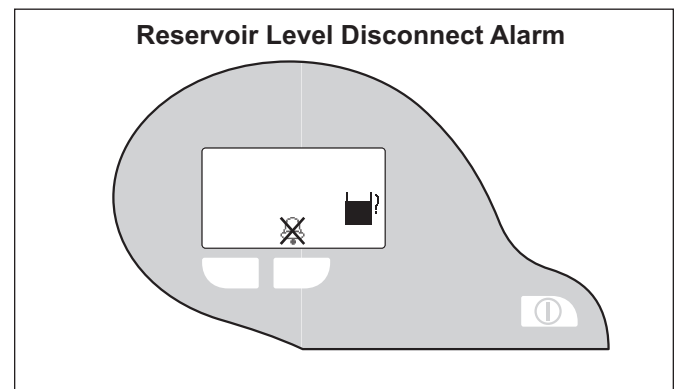
### Water Purity Alarm

This alarm will signal if the water purity deviates from the preset parameters and will cause the water purity to flash until water purity improves to within acceptable purity limits. If water purity stays outside acceptable limits, contact your local Pall supplier or distributor.



### Reservoir Level Disconnect Fault Alarm

The reservoir level disconnect fault alarm condition will signal with an audible alarm and flashing icon. Press the  button to mute the alarm. This alarm condition will cause the process to turn off. Connect the reservoir level, switch the unit off and on, and press the process key to clear the alarm.




## Maintenance

Any maintenance work not detailed in this handbook should be carried out by an approved supplier or distributor. If further information is required on any aspect of maintenance, please contact Technical Service.

### Identification of Consumable

**PAL-C173** Pre-treatment cartridge

The cartridge is accessible after opening the front door. A strainer is incorporated in the unit to protect the inlet solenoid valve and RO boost pump (when fitted).

**WARNING!**  **ALWAYS CHECK THAT THE ELECTRICAL POWER SWITCH AND FEED WATER SUPPLY ARE SWITCHED OFF BEFORE ATTEMPTING TO CHANGE A CONSUMABLE ITEM.**

### Frequency of Consumable Replacement


The following frequency of consumable replacement is recommended as a guide assuming typical usage\*.

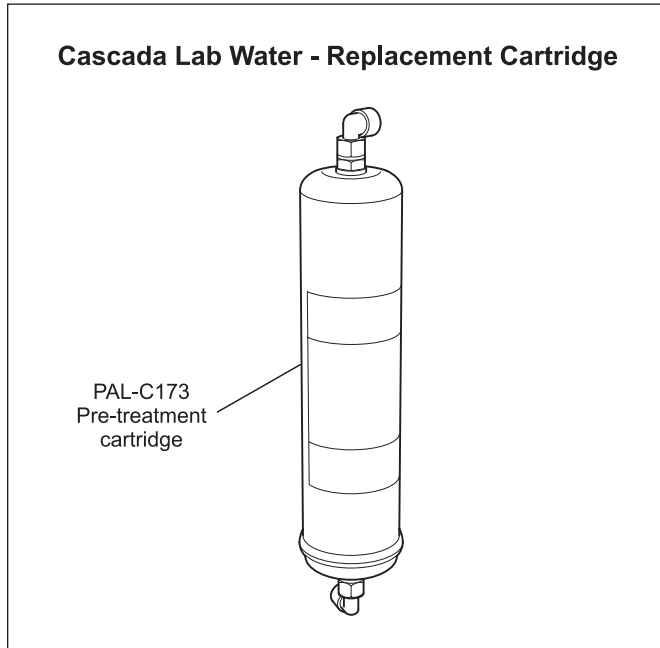
**Pre-treatment** PAL-C173 every 6 months or sooner

**Reverse Osmosis** PAL-C176 every 2-3 years\*\*  
(not an operator replacement item)

\* *These frequencies are only estimates and replacement will depend on the application and feed water quality.*

\*\* *Standard conditions are 2.0 bar (200 kPa, 30 psi) inlet pressure at 15 °C (59 °F), potable water with clean pre-filter.*

**CAUTION!**  **Ensure that the display and replacement timer settings are reset after replacing consumable. See Installation Instructions Section - Replacement Timer/Process Screen (page 12).**



## Replacing the PAL-C173 Pre-treatment Cartridge

The pre-treatment cartridge should be replaced when indicated by the change reminder.

### Step 1 - Switch Unit Off

1. Switch the Cascada Lab Water system off at the power switch at the top left-hand side of the unit.
2. Ensure pressure has dissipated from the unit by waiting a few minutes after switching off the power.

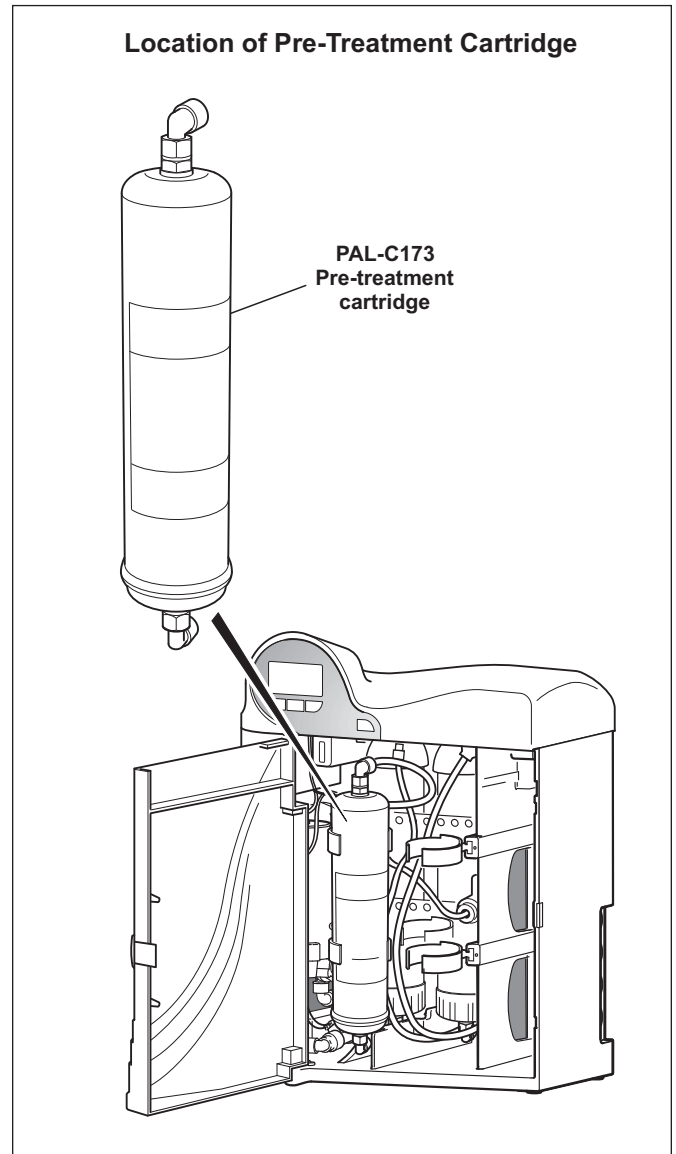
### Step 2 - Remove Pre-treatment Cartridge

1. Open front door.
2. Identify the pre-treatment cartridge (PAL-C173).
3. Remove the reducing fitting from the elbow at the bottom of the cartridge by pushing back the retaining collet on the push fit connector and withdrawing the reducer.
4. Remove the reducing fitting from the top of the cartridge.
5. Remove exhausted cartridge from retaining clips and discard.

**Note:** The consumable is non-hazardous. Dispose of as ordinary waste, observing all local and national regulations.

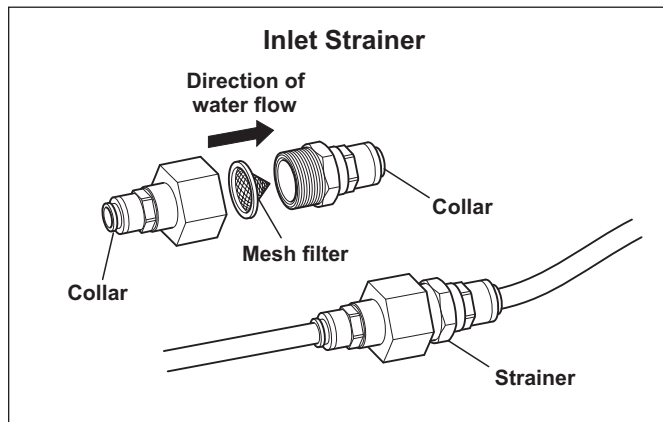
### Step 3 - Replacing the Pre-treatment Cartridge

1. Unpack new cartridge and remove the two protective transit plugs sealing the inlet and outlet connection.
2. Secure the new cartridge into its retaining clips ensuring the cartridge is positioned the correct way up.
3. Refit the reducing fitting from the elbow at the bottom of the cartridge by pushing the reducer into the elbow connector until locked and held by the retaining collet.
4. Refit the outlet tubing to the top of the cartridge.
5. Reset pre-treatment cartridge timer. See Installation Instructions Section - Replacement Timer/Process Screen (page 12).
6. Press the Process button to start the unit.
7. Check the unit for leaks and close front door.



## Cleaning the Inlet Strainer

The Inlet Strainer should be checked and cleaned every six months to ensure the strainer does not become clogged.



### Step 1 - Remove the Inlet Strainer

1. Turn off inlet water supply valve.
2. Switch off electrical power switch.
3. Open front door.
4. Remove the pre-treatment cartridge from its clips and set aside to gain access to the inlet strainer.
5. Depress collars on both sides of strainer and disconnect tubing.
6. Remove the inlet strainer from its position.

### Step 2 - Dismantle the Inlet Strainer

1. Hold inlet strainer over a sink or receptacle.
2. Unscrew inlet strainer.
3. Remove mesh filter.
4. Check mesh filter for signs of wear or damage, replace or flush with water as necessary.

### Step 3 - Reassemble the Inlet Strainer

1. Insert mesh filter into strainer. Ensure it is facing the correct direction (See diagram).
2. Reassemble in the inlet strainer.

### Step 4 - Replace the Inlet Strainer

1. Reposition the inlet strainer.
2. Refit tubes to inlet strainer. Ensure it is facing the correct direction.
3. Reposition the pre-treatment cartridge into its support clips.
4. Turn on inlet water supply valve.
5. Switch on power.

## Replacement of PAL-C176 Reverse Osmosis Cartridge(s)

The reverse osmosis cartridge should be replaced if the permeate water purity or flow rate is not adequate and does not meet predicted or previous performance.

For information regarding the replacement of the PAL-C176 reverse osmosis cartridge, contact Technical Service.

### WARNING!



**ALL NEW RO CARTRIDGES ARE FILLED WITH A BACTERIOSTATIC SOLUTION TO PREVENT BACTERIAL CONTAMINATION DURING STORAGE. THE RO CARTRIDGES WILL REQUIRE RINSING PRIOR TO USE (SEE INSTALLATION INSTRUCTIONS, INITIAL START UP SECTION—PAGE 13).**

## Sanitization Procedure

The Cascade™ Lab Water unit has a sanitization port which allows the sanitization agent to be introduced into the system in the form of a tablet. Recommended maximum frequency of cleaning is once per month.

The unit is sanitized to destroy the bacteria within the pipework and the filters of the unit. Read this entire section to become familiar with the procedure before you start. Sanitization may be required in the following circumstances:

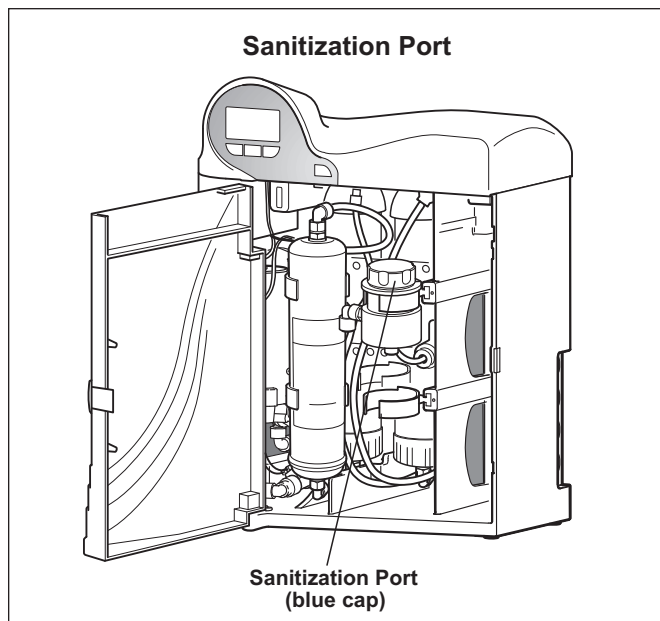
- Once a month to maintain low bacterial counts.
- If the unit has not been used for a prolonged period of time.

### Step 1 - Start Sanitization Cycle

1. Ensure reservoir is less than 70% full of treated water.
2. Press the Process button to stop the process.
3. Turn off the electrical power switch.
4. Relieve residual pressure in the system by waiting a few minutes after switching off the power.

### Step 2 - Insert Tablet into Sanitization Port

1. Unscrew cap on sanitization port.
2. Insert PAL-C100 cleaning tablet.
3. Refit cap on sanitization port and hand-tighten.



### Step 3 - Start the Sanitization Process

1. Disconnect outlet tube at the reservoir inlet and re-direct to drain.
2. Restore the power.
3. Press the Process button to start the process.
4. Allow the sanitization cycle to continue for 30 minutes.
5. Press the Process button to stop the process.
6. Turn electrical supply off.

### Step 4 - Return to Normal Operation

1. Reconnect the outlet tube to the reservoir.
2. Turn on power.
3. Press Process button to return to normal operation.
4. Check the system for leaks.

---

## PAL-C100 Sanitization Tablet - Safety Information

### General Description:

White, solid tablet which rapidly dissolves in water and is used for sanitization applications.

### Hazard Assessment:

Contains sodium dichloroisocyanurate dihydrate and is toxic by inhalation, ingestion, and skin contact.

### Properties:

Soluble in water and pH 6. Non-combustible.

### Handling Precautions:

Keep container tightly closed in a dry place. Wear protective clothing when handling.

### Spillages:

If tablets are dry and uncontaminated, gather and place in heavy-duty plastic bag. Do not return to original container. Wash away any residues with copious amounts of water.

### Toxicity:

Serious risk of poisoning by inhalation or ingestion. Irritating to skin, eyes, and respiratory system.

### First Aid:

**Eyes** - thoroughly wash out with clean water for at least 15 minutes. Seek medical advice.

**Inhalation** - remove from chemical exposure, rest, and expose self to fresh air. In severe cases, obtain medical attention and treat for acute chlorine poisoning.

**Skin** - drench the skin with plenty of water. Remove contaminated clothing and wash before reuse. Obtain medical advice in severe cases.

**Mouth** - wash out the mouth thoroughly with water and give a large quantity of milk to drink. Obtain medical advice.

**Note:** *A comprehensive data sheet is available on request and is supplied with each packet of tablets.*

## Troubleshooting

This section highlights the problems that can occur with the Cascada™ Lab Water System and how to rectify them. The unit will normally sound an alarm and the respective icons will flash. Silence the alarm by pressing the mute button. If the problem cannot be solved using this manual, please call either your local Pall office or distributor. See Contact Information on back cover.

Problems	Action
<b>No display message</b>	<p>Check main power supply and cord.</p> <p>Check that the main power is switched on.</p> <p>Check fuses in power inlet module and replace if blown.</p>
<b>Reservoir low level audible alarm sounds</b>	<p>Press the crossed bell button to mute alarm.</p> <p>The reservoir will automatically refill.</p> <p>Check process mimic is showing reservoir filling.</p> <p>Check feed water supply. Check connections to Reservoir.</p>
<b>Pre-treatment cartridge replacement alarm</b>	<p>Replace pre-treatment cartridge. See Maintenance section – Replacing the PAL-C173 Pre-treatment Cartridge (page 16).</p>
<b>Water purity alarm</b>	<p>Check alarm set value is correct. See Installation Instructions section – Initial Controller Set-up, Step 4 Purity Alarm Setting (page 11).</p> <p>If problem persists beyond normal operating conditions, contact your Pall distributor.</p>

Problems	Action
<b>Reservoir level disconnect fault alarm</b>	<p>Check that the level controls are correct. See Installation Instructions section – Connecting, Step 3 – Reservoir Level Connection (page 10).</p> <p>If problem persists, contact your Pall distributor.</p>
<b>Output flow below specification</b>	<p>Check supply pressure. See Installation Instructions section – Positioning the Cascada Lab Water System (page 7).</p> <p>Check RO flow-rate for the unit against the graph shown in Technical Specifications section (page 4), which details treated water output vs temperature and feed water pressure.</p> <p>Check that the inlet strainer is clean. See Maintenance section – Cleaning the Inlet Strainer (page 17).</p> <p>Contact service technician to replace booster pump.</p>
<b>Unit noisy</b>	<p>Open front door and secure pipework to stop vibration.</p>

## Consumables and Accessories

Consumable	Maximum Service Life*	Maximum Shelf Life
PAL-C173 (Pre-treatment cartridge)	6 months	2 years
PAL-C176 (Reverse osmosis cartridge module)	2-3 years	2 years
PAL-C100 (Sanitization tablets)	1 per month	2 years
PAL-C169** (Composite vent filter)	6 months	2 years
LC123*** (Pre-treatment filter)	6 months	2 years

\* Service Life is an estimate only and will depend on the application and feed water quality. Care should be taken to order the correct consumable items.

\*\* Required for reservoirs (PAL-A644, PAL-A645, PAL-A646).

\*\*\* Required for optional pre-treatment filter housing (LA518).

Accessory	Part Number
Installation kit	PAL-A667
Installation kit (with saddle valve)	LA506
Pressure regulator valve (inlet)	PAL-A500
Pre-treatment filter housing	LA518
Americas	LA622
Wall mounting kit (RO-water unit) for Europe and Asia	PAL-A643
Wall mounting kit (RO-water unit) for Americas and Canada	PAL-A655
25 liter reservoir	PAL-A644
40 liter reservoir	PAL-A645
75 liter reservoir	PAL-A646
Wall mounting kit (25 and 40 liter reservoir)	PAL-A624
Wall mounting kit (75 liter reservoir)	PAL-A625
Flow upgrade kit (15-20 liter per hour)	LA615
RS232 printer kit	LA618
RS232 remote display kit	LA628
Docking vessel - 35 Liter	PAL-A653
Pre-filter	LA582

## Key to Control Panel

### Icons

Icon	Description
	Mute Alarm
	Accept
	Scroll
	Auto Restart
	Manual Restart
	Set Up Menu
	Cursor Option Choice
	Cursor Selection Choice
	Cancel
	Reset
	Printer

### Alarm Conditions

Icon	Alarm Conditions
	Replace Pre-treatment Cartridge
	Reservoir Level - Disconnect Fault

### Replacement Timers

Icon	Replacement Time	Preset
	Pre-treatment Cartridge	4380 hours (= 6 months)

### Quality and Standby Alarms

Screen	Description
	Process On and Water Purity
	Standby and Purity Alarm
	Standby Position

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## Warranty, Limitation of Liability and Remedies

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2. For a period of 12 months from the date of delivery from Seller (the "Warranty Period"), Seller warrants that products manufactured by Seller, when properly installed and maintained, and operated at ratings, specifications, and design conditions, will be free from defects in material and workmanship.
3. Seller's liability under any warranty is limited solely (in Seller's discretion) to replacing (F.O.B. original ship point), repairing, or issuing credit for products which become defective during the Warranty Period. Purchaser shall notify Seller promptly in writing of any claims and provide Seller with an opportunity to inspect and test the product claimed to be defective.
4. Buyer shall provide Seller with a copy of the original invoice for the product, and prepay all freights charges to return any products to Seller's factory, or other facility designated by Seller. All claims must be accompanied by full particulars, including system operating conditions, if applicable.
4. In no event shall Seller be liable for any product altered outside of the Seller's factory by someone other than Seller or for a product subjected to misuse, abuse, improper installation, application, operation, maintenance or repair, alteration, accident or negligence in use, storage, transportation, or handling.
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- B) THE 120<sup>TH</sup> DAY FOLLOWING THE DATE OF SHIPMENT.

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## Contact Information

Pall Life Sciences filtration products can be ordered through Pall Life Sciences offices and distributors worldwide. For information contact:

**Pall Life Sciences**  
**600 South Wagner Road**  
**Ann Arbor, MI 48103-9019**  
**USA**

Tel: 800.521.1520 (in USA)  
734.665.0651  
Fax: 734.913.6114

### Customer Service:

Tel: 800.521.1520 (in USA)  
734.913.6194  
Fax: 734.913.6495

### Technical Service:

Tel: 800.521.1520 (in USA)  
734.913.6123  
Fax: 734.913.6576  
Email: Lab@pall.com  
Live help: www.pall.com/lab

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## Worldwide Offices

### Australia

Cheltenham, VIC  
Tel: 03 8586 8150  
1800-635 082  
Fax: 1800 228 825

### Austria

Wien  
Tel: 00 43 2236 533880  
Fax: 00 43 2236 53389

### Canada

Ontario  
Tel: 905-542-0330  
800-263-5910  
(in Canada)  
Fax: 905-542-0331

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800-435-6268 (in Canada)  
Fax: 514-332-0996  
800-808-6268 (in Canada)

### China

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Tel: 86-10 8458 4010  
Fax: 86-10 8458 4001

### France

St. Germain-en-Laye  
Tel: 01 30 61 39 92  
Fax: 01 30 61 58 01  
Lab-FR@pall.com

### Germany

Dreieich  
Tel: 06103-307 333  
Fax: 06103-307 399  
Lab-de@pall.com

### India

Mumbai  
Tel: 91-22-55995555  
Fax: 91-22-55995556

### Italy

Milano  
Tel: 02-477961  
Fax: 02-47796394  
or 02-4122985

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Fax: 03-5322-2134

### Korea

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Fax: 2-560-7822

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Fax: 60 3 5569 4896

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### Poland

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Tel: (+ 48 22) 510 2100  
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### South Africa

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Fax: +27-11-3253243

### Spain

Madrid  
Tel: 91-657-9876  
Fax: 91-657-9836

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Lund  
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Fax: 061-638 39 40

### Taiwan

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Fax: 2-2545-5990

### Thailand

Bangkok  
Tel: 66 2937 1055  
Fax: 66 2937 1066

### United Kingdom

Farlington  
Tel: 023 92 302600  
Fax: 023 92 303424  
Lab-UK@europe.pall.com




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