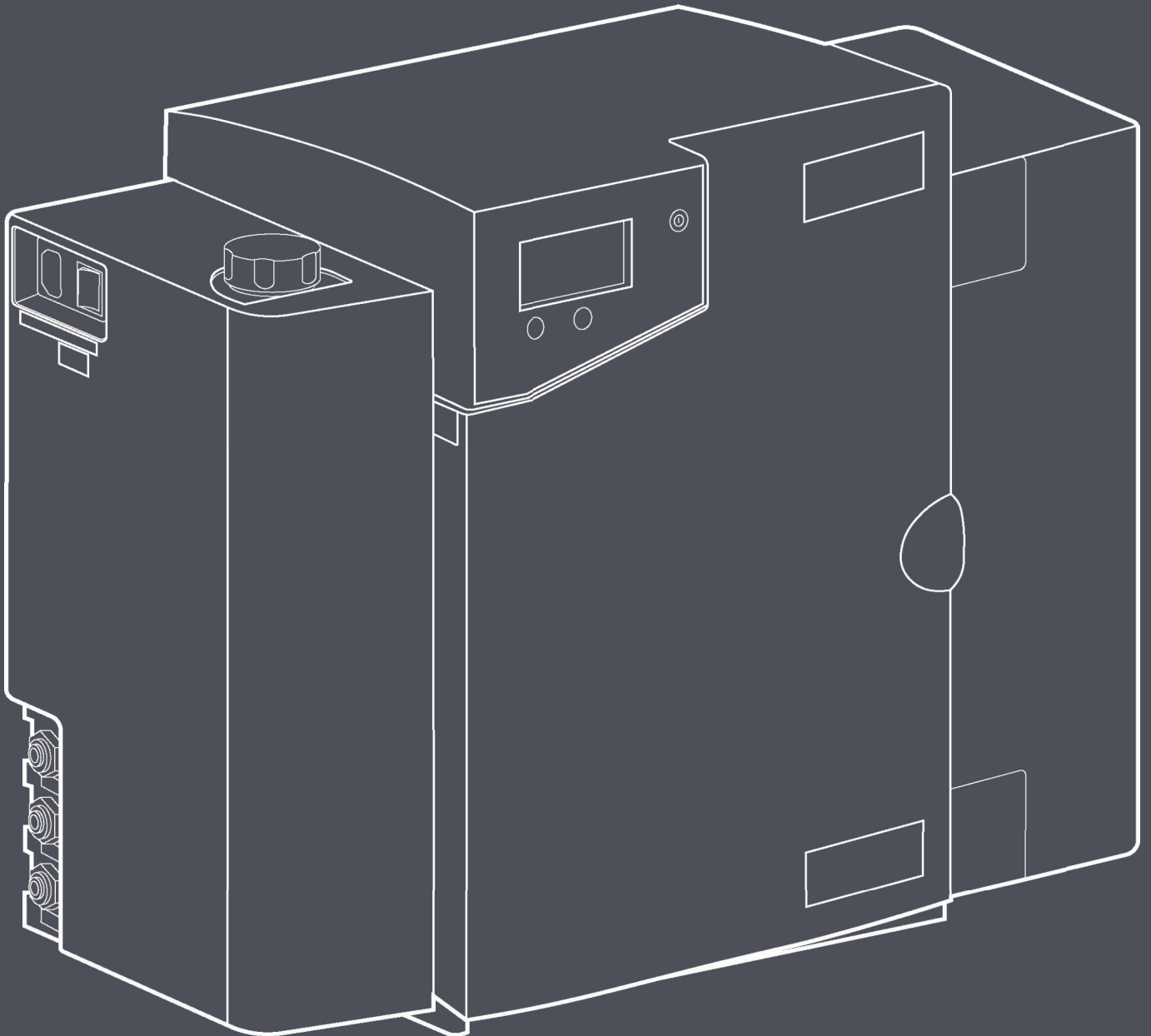


PUREENERGY OPERATOR MANUAL



MANU41636

Version 3

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Version 3 - 01/24

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1.1 Use of this Manual

This manual contains full details on installation, commissioning and operation of the **PUREENERGY 30 System**. If this system is used contrary to the instructions in this document, then the safety of the user may be compromised. The PUREENERGY 30 is a compact, high performance water purification unit for PEM Electrolyser systems with purified demands of up to 30l/hr.

1.2 Customer Support

Service support and consumable items are available from your local supplier or distributor. Refer to customer service contact details shown at the end of this publication.

1.3 Product Range

This Operator Manual has been prepared for the **PUREENERGY 30** product models.

PUREENERGY 30 products are designed to be safe, however, it is important that personnel working on these systems understand any potential dangers. All safety information detailed in this handbook is highlighted as **WARNING** and **CAUTION** instructions. These are used as follows:



WARNING! WARNINGS ARE GIVEN WHERE FAILING 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 process.

2.1 Electricity

It is essential that the electrical supply to the **PUREENERGY 30 System** is isolated before any items are changed or maintenance work performed. The ON/OFF switch is located on the left hand side of the system. The mains power lead is located just next to the ON/OFF switch and must be disconnected from the units or the mains supply plug.



WARNING! ONLY USE THE APPLIANCE COUPLER (MAINS LEAD) SUPPLIED. THE USE OF THIS WILL ENSURE ADEQUATE EARTH PROTECTION IS PROVIDED!



WARNING! IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY ELGA, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED!

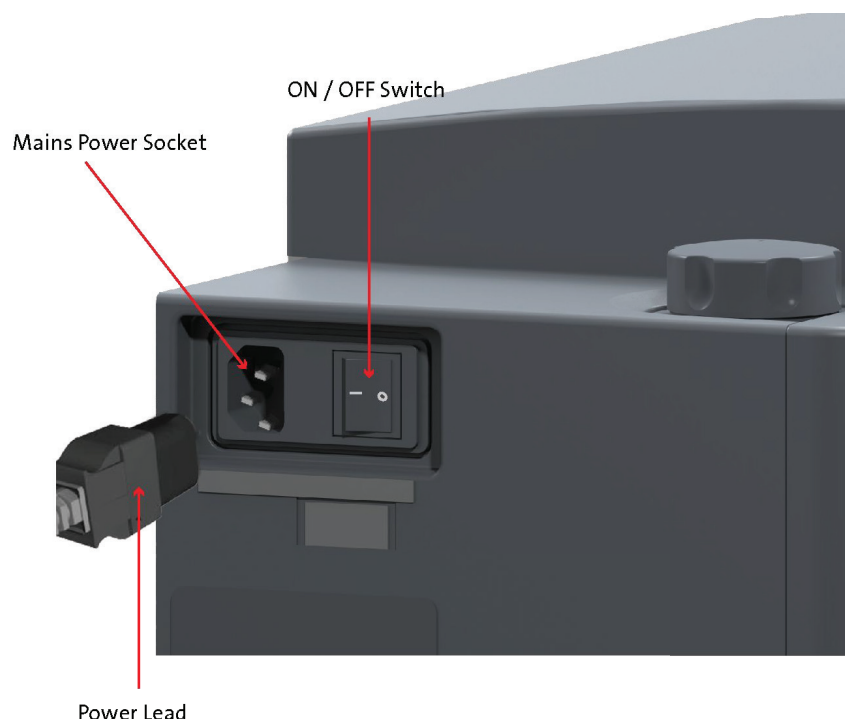


WARNING! ALWAYS ENSURE THAT THE ELECTRICAL POWER SUPPLY IS ISOLATED BEFORE WORKING INSIDE THE PRODUCT!

2.2 Pressure

The mains water supply pressure should be isolated and residual pressure released prior to remove of any cartridges or carrying out work on the system.

Switching off the electrical supply will isolate the source of pressure.



2.3 Ultra-Violet Light

The **PUREENERGY 30 System** is fitted with an ultra-violet lamp. The UV lamp is enclosed in a stainless steel enclosure ensuring the operator will not be exposed to UV light.



WARNING! LIGHT FROM THE UV LAMP IS EXTREMELY HARMFUL TO THE EYES AND SKIN! UV LAMPS SHOULD ONLY BE USED IN THE UV ENCLOSURE WITH SUITABLE PROTECTION CAPS FITTED. PERSONS SHOULD NEVER BE EXPOSED TO LIGHT FROM THE LAMP!

2.4 Control of Substances Hazardous to Health (COSHH)

Material safety data sheets covering various aspects of the product are available where applicable upon request. Contact your local supplier or distributor.

2.5 Environment

The **PUREENERGY 30 System** should be installed on a flat, level surface, in a clean, dry environment. The system can also be wall mounted against a vertical wall capable of supporting the weight. For this we recommend the use of the wall mounting kit.



WARNING! THIS PRODUCT IS NOT SUITABLE TO BE INSTALLED IN AN EXPLOSIVE OR FLAMMABLE ATMOSPHERE!
HAZARDOUS AREA CLASSIFICATION MUST BE CARRIED OUT TO ASSESS POTENTIAL LOCATIONS AND LIKELIHOODS OF AN EXPLOSIVE ATMOSPHERE BEING PRESENT TO ENSURE THAT THIS PRODUCT AND ITS ACCESSORIES CANNOT ACT AS A SOURCE OF IGNITION!

2.6 Commissioning

The **PUREENERGY Systems** are supplied containing traces of bacteriostatic solution which must be rinsed from the pipework and fittings.



CAUTION! It is recommended to commission this unit individually, separate to the electrolyser and confirm all functionality before pairing the system to the electrolyser.



WARNING! WHILE UNDER COMMISSIONING, THE SYSTEM WILL RINSE. THIS COULD LEAD TO UNDESIRABLE WATER QUALITY BEING FED INTO THE ELECTROLYSER!



WARNING! THIS PRODUCT IS NOT SUITABLE TO BE INSTALLED IN AN EXPLOSIVE OR FLAMMABLE ATMOSPHERE!



WARNING! THIS UNIT MUST BE LIFTED BY 2 PEOPLE AND SHOULD BE CARRIED FROM THE BASE OF THE PRODUCT ONLY!

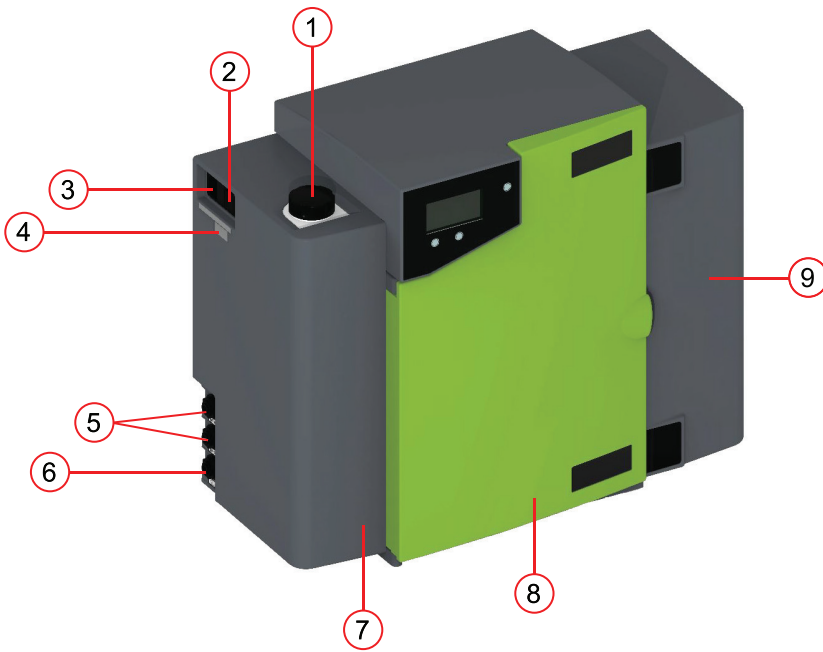
CONSUMABLE	MAX. SERVICE LIFE*	MAX. SHELF LIFE
LC143 (Reverse Osmosis Cartridge Module)	Typical Life 2 - 3 Years	2 Years
LC302** (Conditioning & DI Dual Cartridge Pack)	12 Months Recommended*	2 Years
LC105 (UV Lamp)	12 Months	2 Years
LC219 (EDI Module)	5 Years	2 Years
LC181 (Degasser)	2 Years	2 Years
LC136M2*** (Composite Vent Filter)	6 Months	2 Years

*Replacement frequency of the LC302 Dual Conditioning & DI Cartridge pack is affected by the feed water quality and water usage.

**LC302 Cartridge pack is available separately.

***Required for reservoirs (LA611, LA612, LA613) and docking vessel (LA652)

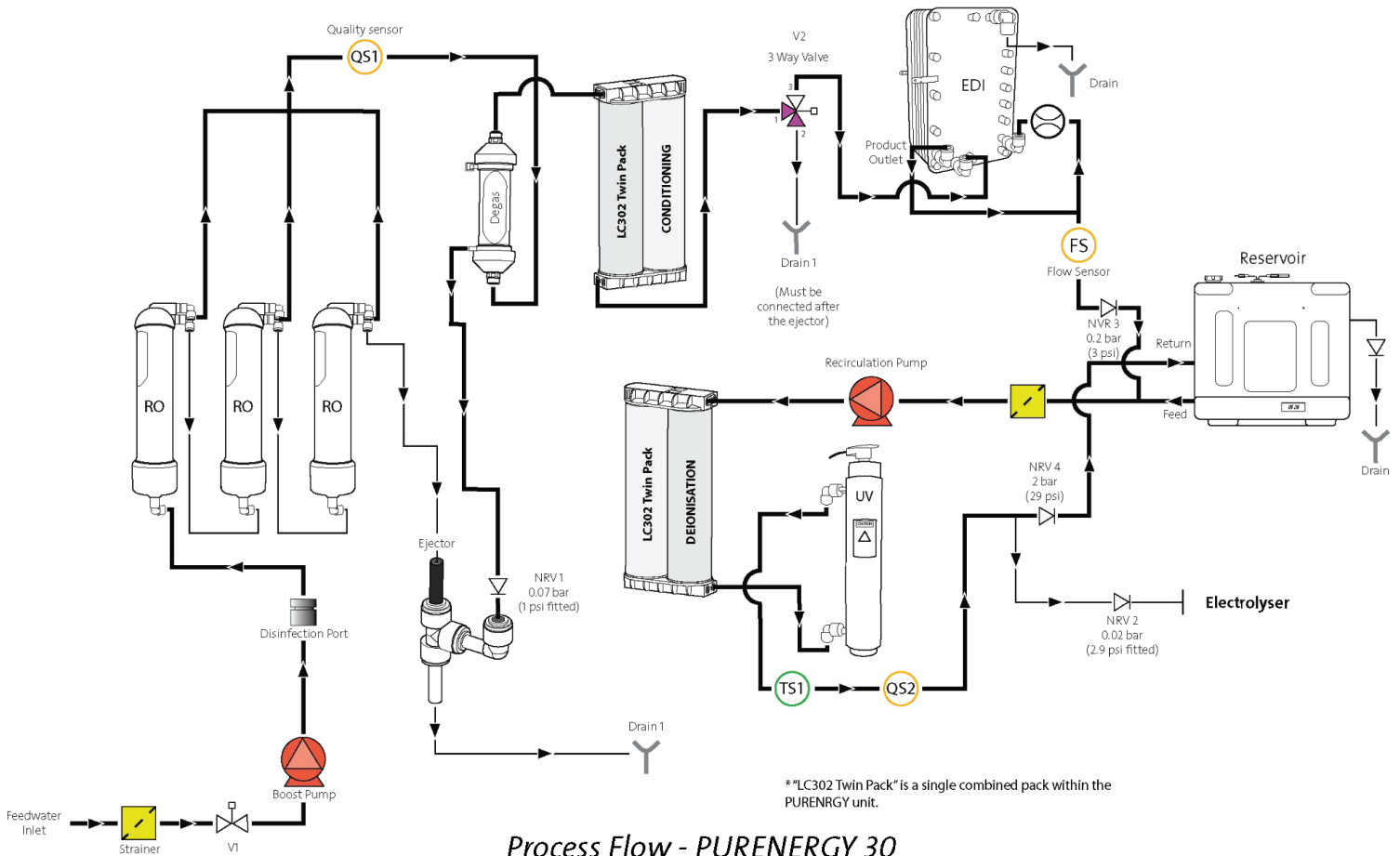
ACCESSORY	CAT NO
Installation Kit	LA637
0 - 60 PSI Pressure Regulator Valve (Inlet)	LA652
Wall Mounting Kit - Small Box Products	LA610
Wall Mounting Kit - Small Box Products (Partitioned Walls)	LA622
Wall Mounting Kit - (25 & 40 Litre Reservoir)	LA591
Wall Mounting Kit - (75 Litre Reservoir)	LA592
25 Litre Reservoir	LA611
40 Litre Reservoir	LA612
75 Litre Reservoir	LA613



- ① Sanitization Port
- ② Power Switch ON / OFF
- ③ Mains Power Socket
- ④ Fuse
- ⑤ Drain
- ⑥ Feed Water Inlet Connection
- ⑦ Removable Cover
- ⑧ Door
- ⑨ Removable Cover

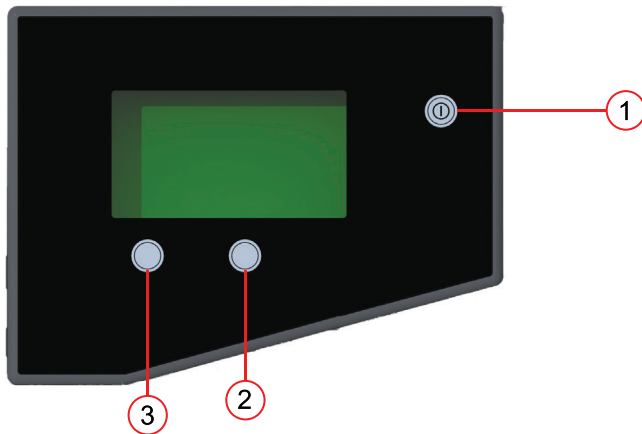
4.1 Product Description

The **PUREENERGY 30** can be bench or wall mounted with the optional wall mounting kit. A range of accessories are available to complement the system. (See Section 3 - Consumables (page 8) for details).











Process Flow - PUREENERGY 30

Control Panel























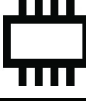


- ① Process Button
- ② Right Hand Control Button
- ③ Left Hand Control Button

The **PUREENERGY 30** operates with a tactile membrane touch pad control panel which has a graphics display window and two program function control buttons and a process button. Details of how to use the controls are provided in the appropriate sections. The **PUREENERGY 30** control panel has a range of controls icons as follows:

BUTTON	ICON	FUNCTION
PROCESS		Turns the system ON / OFF
LEFT		Menu
		Scroll
		Shift
RIGHT		Replacement dates
		Accept
		Up
		Mute Alarm

6.1 Icons

The PUREENERGY 30 control panel icons continue as follows:

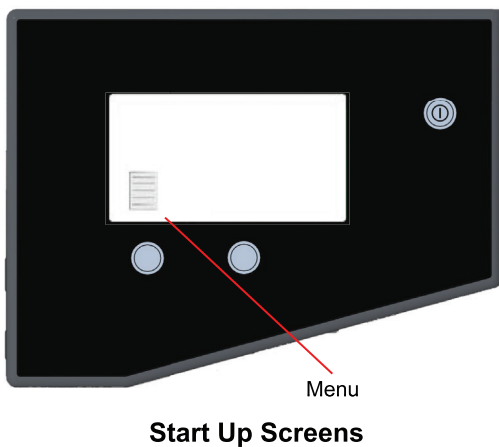
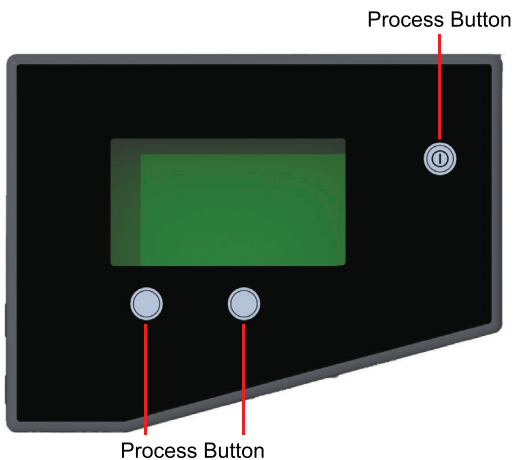
ICON	DESCRIPTION	ICON	DESCRIPTION
	Auto Restart		Option OFF
	Scroll Back		Option ON
	Step Back		Output
	Bell		Reset
	Standby		Right
	Calibration Point		Sanitization Reminder
	Cancel		Viewing Angle
	Clock		Recirculation
	Consumable Reminder		Reservoir Partially Filled
	Drain		Feed
	Save Data		Fill
	Hazard		

6.2 User Alarm Codes

The **PUREENERGY 30 System** alarm codes are as follows:

CODE	ALARM CONDITIONS
56	Conditioning Cartridge Reminder - 10% Remaining
57	Replace Conditioning Cartridge
58	EDI Low Flow
59	Replace Degasser
60	Power Supply Unit - PSU Fault (High Voltage)
69	Replace Pre-treatment
70	Replace UV Lamp
72	Replace Composite Vent Filter (CVF)
82	Fault with Clock Function
83	Inter-integrated Circuit (I2C) Error
85	UV Fail
89	Outlet Water Temperature (TS1) Out of Range
90	Low Product Water Quality (QS2)
91	Reservoir Low Level
94	Product Water Over Temperature Alarm
97	Reservoir Level - Disconnect Fault
99	Low Voltage - Electrical Supply Fault

Please refer to on screen instructions for repair instructions.



7.1 Initial Controller Set Up

The **PUREENERGY 30 System** control panel is fitted with three control buttons. These are:

1. The **PROCESS** button, which switches the purification process ON and OFF.
2. Two soft touch pad buttons, which are used to control set-up and process control functions.

When the **PUREENERGY 30 System** is started for the first time after installation the following steps should be followed to set up system Preferences:

Step 1 - Setting Up Menu Options

1. **SWITCH** the mains power on to initialize the controller hardware set-up sequence.

*Note: Allow up to 5 seconds for the initialization process to complete. This is indicated by the appearance of the **MENU** icon on the control screen.*

2. **PRESS** the **MENU** button to go to the next screen to activate the set up menu sequence.
3. 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 ↶
 - An "accept" icon indicated by a tick ✓
 - A "selection" icon indicated by a ►

Step 2 – Set Clock

1. **PRESS** ↶ to edit time

OR

PRESS ✓ to proceed to step 3.

2. **PRESS** and **HOLD** ▲ to cycle through hour.
3. **PRESS** ► to step cursor through minutes.
4. **PRESS** ▲ to cycle through minutes.
5. **PRESS** ► to reach confirmation screen
6. **PRESS** ✓ to confirm selection.

Step 3 – Set Date

The date is used to initiate change reminders.

1. **PRESS** to edit date

OR

PRESS ✓ to proceed to step 4.

2. **PRESS** and **HOLD** to cycle through day.
3. **PRESS** to step cursor onto month.



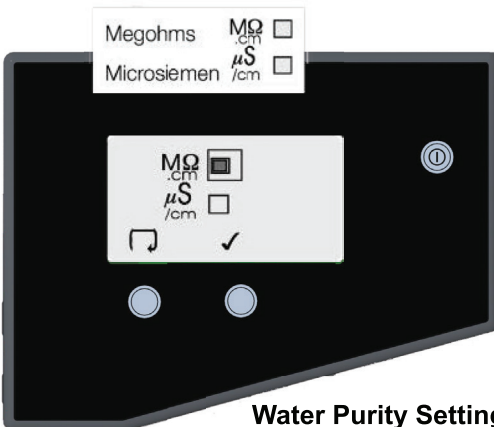
6. PRESS ▲ to cycle through year.
7. PRESS ► to reach confirmation screen
8. PRESS ✓ to confirm selection.

Step 4 - Audible Alarm Enabled/Disabled Screen

This screen provides the option of either enabling the audible alarm causing it to sound, or disabling the audible alarm causing it to remain muted whilst the alarm icon flashes.

1. 1. PRESS ↶ to change mode (■ = ON)
- OR
- PRESS ✓ to proceed to step 5.
2. PRESS ✓ to confirm selection.

Note: The visual alarm cannot be disabled.

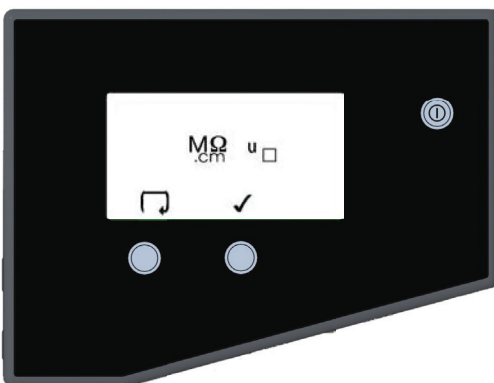


Water Purity Settings

Step 5 – Water purity unit Setting

This screen allows preferred displayed units of water purity to be set, to either MΩ cm or μS/cm. This only refers to the quality measurement in the recirculation loop.

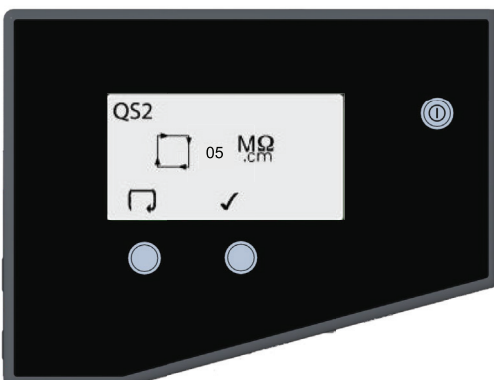
1. PRESS SCROLL ↶ to change mode (MΩ cm or μS/cm)
- OR
- PRESS ✓ to proceed to step 6.
2. PRESS ✓ to confirm selection.



Step 6 - Uncompensated water quality

A “U” will indicate uncompensated readings (recirculation loop only) in the normal process screen.

1. PRESS ↶ to change (■ = Uncompensated water quality ON)
- OR
- PRESS ✓ to proceed to step 7.
2. PRESS ✓ to confirm selection.



Step 7 - Product water purity alarm settings QS2


This screen is used to select the value at which the product water purity alarm will activate. The alarm does not stop the system and will automatically reset if the purity level recovers.

1. PRESS ↶ to select alarm point (increments of 1, ranging from 1 to 5 MΩ cm).
- OR
- PRESS ✓ to proceed to step 8.
2. PRESS ✓ to confirm selection.





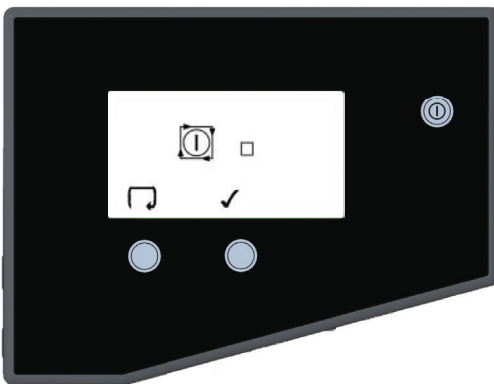
Step 8 - Product water temperature alarm settings TS2

This screen is used to select the value at which the product water temperature alarm will activate. The alarm does not stop the system and will automatically reset if the temperature returns below the set point.

1. PRESS  to select alarm point (increments of 1°C, ranging from 20°C to 50°C)


OR

1. PRESS  to proceed to step 9.
2. PRESS  to confirm selection.





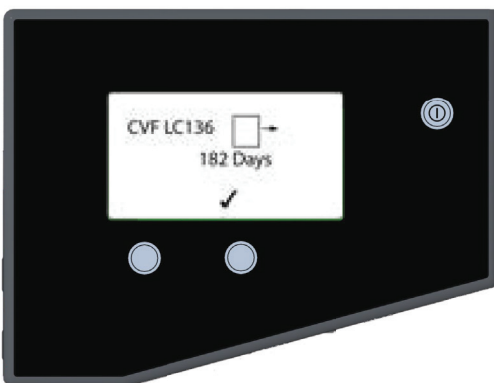
Step 9 - Auto-restart

This allows selection of the AUTO restart option. If auto restart is selected the system will automatically restart after a power failure. In manual mode the system will stay in standby after a power failure.

1. PRESS  to change mode ( = ON)


OR

1. PRESS  to proceed to step 18.
2. PRESS  to confirm selection.



Step 10 – CVF replacement alarm setting


This allows confirmation of when to sound the alarm to indicate recommended replacement of the LC136 CVF. The default setting is 182 days.

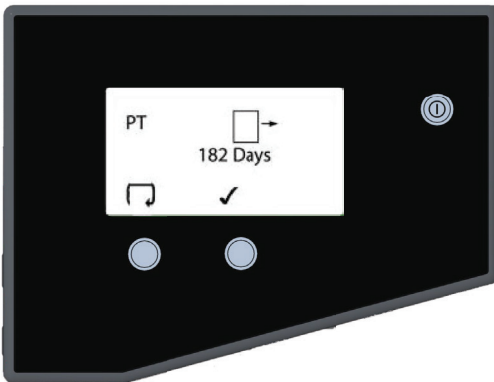
1. PRESS  to confirm selection.



Step 11 – UV replacement alarm setting


This allows confirmation of when to sound the alarm to indicate recommended replacement of the UV lamp. The default setting is 364 days.

1. PRESS  to confirm selection.





Step 12 – Pre-treatment replacement alarm setting

This allows the setting of when to sound the alarm to indicate recommended replacement of the external pre-treatment filters.

1. PRESS  to scroll through the available replacement periods.

OR

2. PRESS  to proceed to step 13.
PRESS  to confirm selection.

Step 13 – Feedwater

This screen provides information on whether the unit is using hardwater or softwater and % or time left before the LC302 need replacing



Step 14 - Degasser Timer

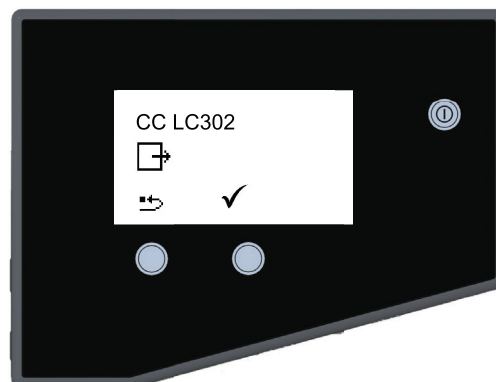
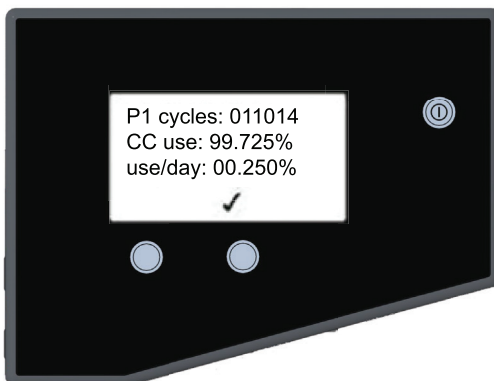
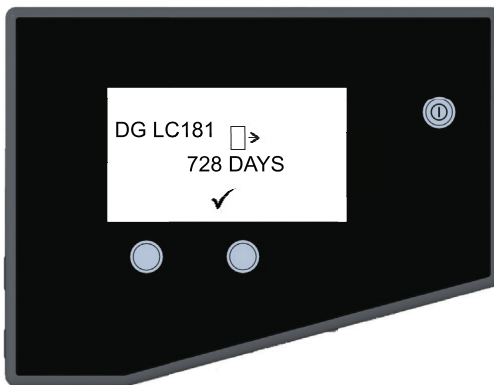
This screen displays the suggested date that the LC181 Degasser Membrane should be replaced

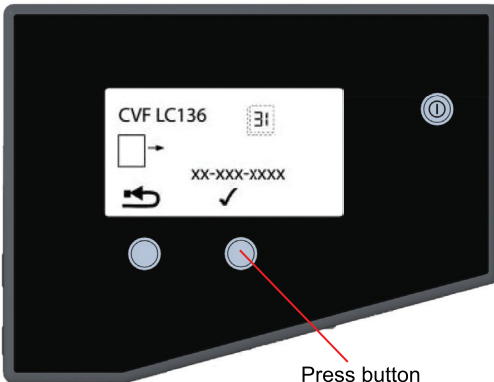
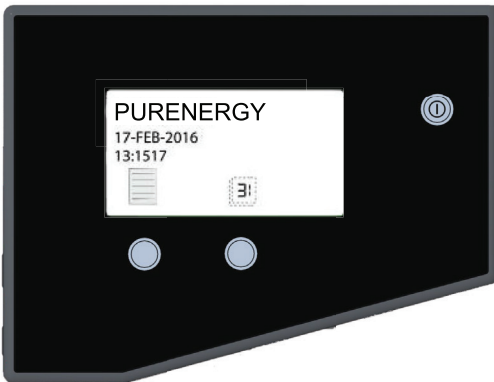
Step 15 - Cartridge pack exhaustion calculator

This screen provides information on pump usage, conditioning cartridge % remaining, and % system usage per day (only shown after 7 days).

Step 16 - Replacement reminder menu

This shows the suggested times that consumables like the LC302 should be replaced





Stand-by Screen




7.2 Setting Display and Consumable Replacement Reminders

From the stand-by screen, press the right hand touchpad button to enter the replacement date screen.





CAUTION! Before resetting any of the cartridge timers, ensure that the appropriate new cartridges have been installed and secured correctly in the **PUREENERGY 30 System**.



Step 1 – Composite Vent Filter (CVF) LC136M2 replacement date
Setting this screen will cause the CVF timer to reset to the value preset within section 7.1 - Step 10 (page 15).

1. PRESS  button to reset CVF replacement date (proceed to operation 2).

OR

2. PRESS  to accept date and proceed to Step 2.
PRESS  to confirm that resetting is required

OR



3. PRESS  to abort reset.
PRESS .

Step 2 - UV Lamp (LC105) replacement date



Setting this screen will cause the UV Lamp timer to reset to the value preset within section 7.1 - Step 11 (page 15).

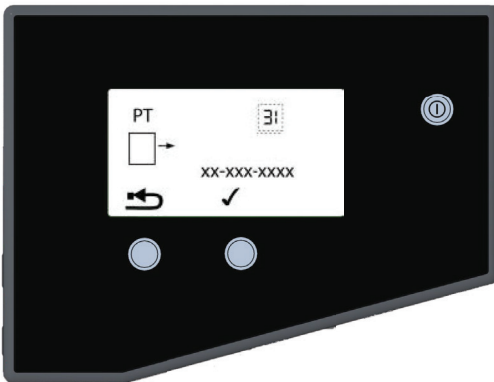
1. PRESS button to reset UV lamp replacement date (proceed to operation 2)

OR

2. PRESS  to accept replacement date and proceed to Step 3.
PRESS  confirm that resetting is required


OR

3. PRESS  to abort reset.
PRESS .





Step 3 - Pre-treatment Filter replacement date

Setting this screen will cause the Pre-treatment filters timer to reset to the value preset within section 7.1 step 12 (page 16).

1. PRESS  button to reset PT replacement date (proceed to operation 2)

OR

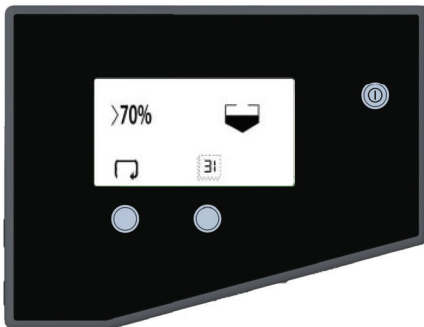
PRESS  to accept replacement date and proceed to operation 3.

2. PRESS  confirm that resetting is required

OR

PRESS  to abort reset.

3. PRESS .



7.3 Accessing the Process On Display Screens

The normal process screen will display newly installed SETUP preferences and auto-scroll through the following process information, depending on current operation mode:

- RO Permeate water conductivity
- Product water resistivity
- Water temperature
- Reservoir level
- Scroll and print icons



By pressing the right hand control button you can either manually scroll or allow auto-scroll of the following consumable reminder settings:

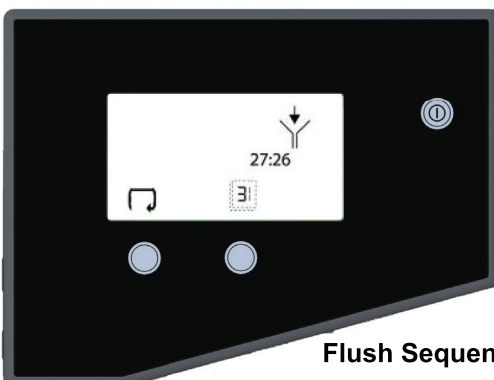
- CVF replacement date
- UV lamp replacement date
- Pre-treatment filter replacement date
- Conditioning cartridge usage data (% remaining).



7.4 Commissioning

The **PUREENERGY Systems** are supplied containing traces of bacteriostatic solution which must be rinsed from the pipework and fittings.

1. CHECK the water supply is turned on.
2. POWER on the unit.
3. PRESS the PROCESS button and the system will start a 30 minute flush sequence, where water will be directed to drain through a flush valve.
4. LEAVE the system to complete this process. During this period, the bacteriostatic solution will be rinsed from the system.
5. The system has now been rinsed and will automatically start filling the reservoir.
6. CHECK for leaks.



Flush Sequence

8.1 Unpacking the PUREENERGY 30

The following items should be supplied with your **PUREENERGY 30 System**:

- **PUREENERGY 30**
- Installation Kit (LA637)
- Operator Manual
- Mains Lead
- LC302 Conditioning Cartridge

8.2 Positioning the PUREENERGY 30

Before commencing with the installation and operation of the **PUREENERGY 30 System**, please read and observe the following points;

Environment:



WARNING! THIS PRODUCT IS NOT SUITABLE TO BE INSTALLED IN AN EXPLOSIVE OR FLAMMABLE ATMOSPHERE! HAZARDOUS AREA CLASSIFICATION MUST BE CARRIED OUT TO ASSESS POTENTIAL LOCATIONS AND LIKELIHOODS OF AN EXPLOSIVE ATMOSPHERE BEING PRESENT TO ENSURE THAT THIS PRODUCT AND ITS ACCESSORIES CANNOT ACT AS A SOURCE OF IGNITION!



CAUTION! PUREENERGY 30 generates a small amount of hydrogen (0.56l/hr) from the drain port when purifying water. Ensure the unit is installed in an actively ventilated space to avoid hydrogen accumulation.

The system should be installed on a flat, level surface, in a clean, dry environment.

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

- Indoor use
- Attitude up to 2000m
- Temperature Range 5°C - 40°C
- Storage Conditions 2°C - 50°C
- Maximum Relative Humidity 80% @ 31°C decreasing linearly to 50% @ 40°C non-condensing
- The system is in installation Category II, Pollution Degree 2, as per IEC1010-1.
- Noise Levels - dBa - <45

Electrical:

The systems can be connected to any electrical supply in the range of 100 - 240V ± 10% and 50 - 60Hz - 200VA. The mains lead is supplied with a moulded plug on one end and a moulded connector to the system on the other. The system should be connected to an earth.

Drain:

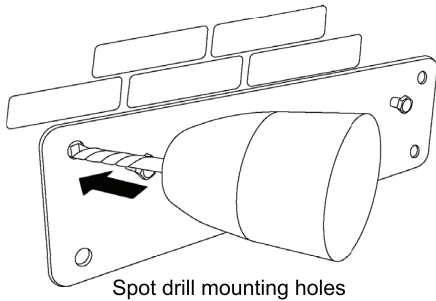
A semi-rigid flexible connection to a sink or suitable drain capable of handling at least 2 l/min is required. The drain point should be within 10 meters (33 ft) and have a gravity fall at a maximum of 1 meter (3 ft) above the system. Any connections directly coupled to drain should have an air-break device fitted.



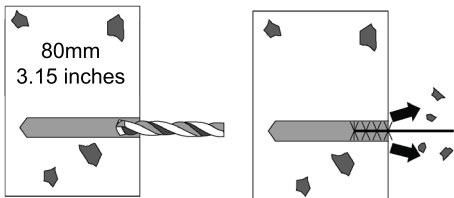
WARNING! IN COMMON WITH OTHER ELECTRO-DEIONIZATION SYSTEMS THIS, SYSTEM PRODUCES SMALL AMOUNTS OF HYDROGEN IN THE DRAIN LINE. IF THIS IS ALLOWED TO BUILD UP IN A RESTRICTED ENVIRONMENT THIS COULD BECOME A HAZARD!



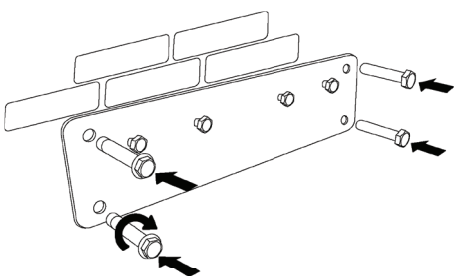
LA800 External pre-treatment filter assembly



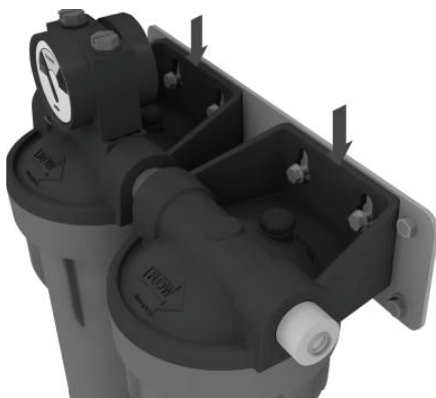
Spot drill mounting holes



Drilling & cleaning mounting holes



Inserting anchor bolts



Aligning assembly to bracket

Feed Water:

The feed water should comply with the specifications provided. This should enter the system via an 8mm (5/16") O/D semi-rigid tube, and should be in the temperature range 5°C - 40°C.



CAUTION! Feed Water temperature outside the range 5°C - 40°C will cause damage to the **PUREENERGY 30 System**.

For pressurized feeds, the maximum inlet pressure is 2 bar (30 psi). Higher feed water pressures must be reduced using a pressure regulator (Part No. LA652).

8.3 Installing the External Pre-treatment Assembly

It is essential for the **PUREENERGY 30 System** to be fed with pretreated water. These instructions must be followed to ensure correct installation of this accessory.

Parts supplied:

- 1 off Pre-treatment housing assembly
- 1 off Bowl Removal Spanner
- 1 off Wall-mount bracket
- 4 off Anchor Bolts
- 1 off 3/8" Isolation Valve
- 2 off 3/8" – 5/16" Stem Elbow
- 2 off 3/8" – 5/16" Stem Reducer

Tools required:

- Hand Drill
- 8mm diameter Masonry Drill Bit
- 10mm Spanner



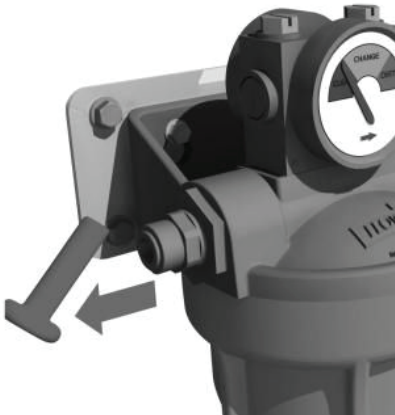
WARNING! THIS ACCESSORY IS SUITABLE FOR MOUNTING TO MOST TYPES OF MASONRY OR CONCRETE TYPE WALLS!

Step 1 – Secure mounting plate to the wall

1. Select an appropriate location for the assembly to be mounted.
2. Using the wall mount plate as a template, spot drill the four mounting holes into the wall.
3. Remove the plate and drill each hole to the depth as illustrated.
4. ENSURE all holes are clean and free from debris.
5. Re-position bracket and INSERT a sleeved anchor bolt (supplied) within each drilled hole in the wall.
6. TIGHTEN each bolt to secure bracket to wall.



CAUTION! Anchor bolts to be tightened to a minimum torque of 20Nm.



Remove Transit Plugs



Feed Water Supply Connection

Step 2 – Install housing assembly to wall-mount plate

1. ALIGN the four off pegs of the mounting plate with the corresponding keyhole slots of the filter housing assembly integral brackets.

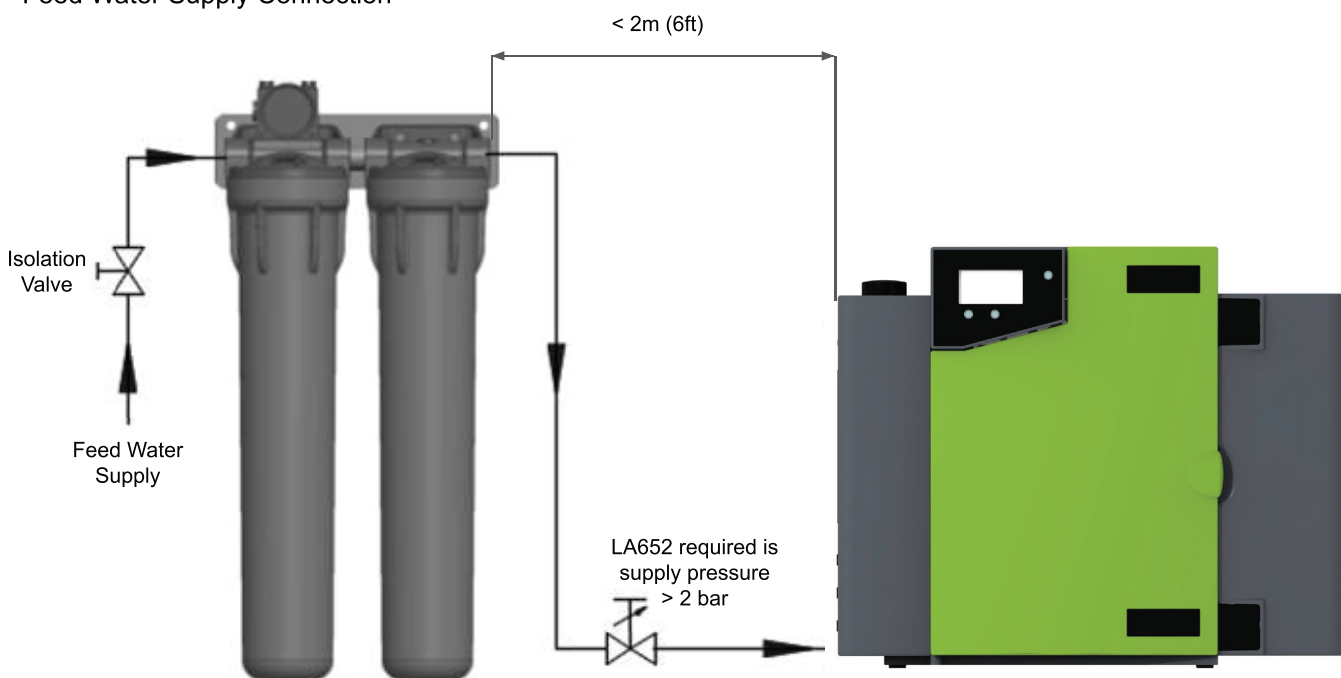
Step 3 – Install pre-treatment filters

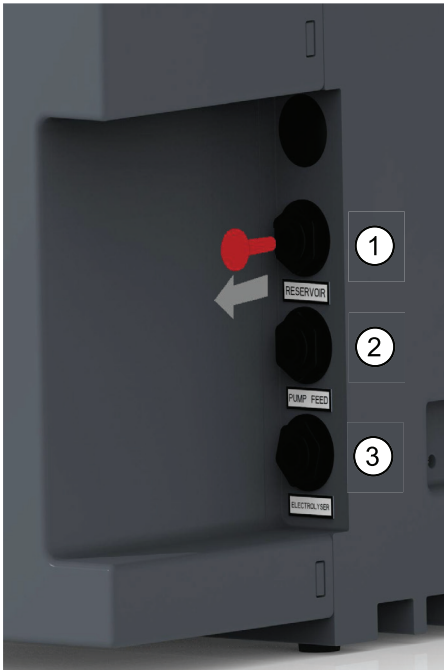
1. Refer to Section 9.1 “Replacing the pre-treatment filters” (page 28).

Step 4 – Connection to feed water & system

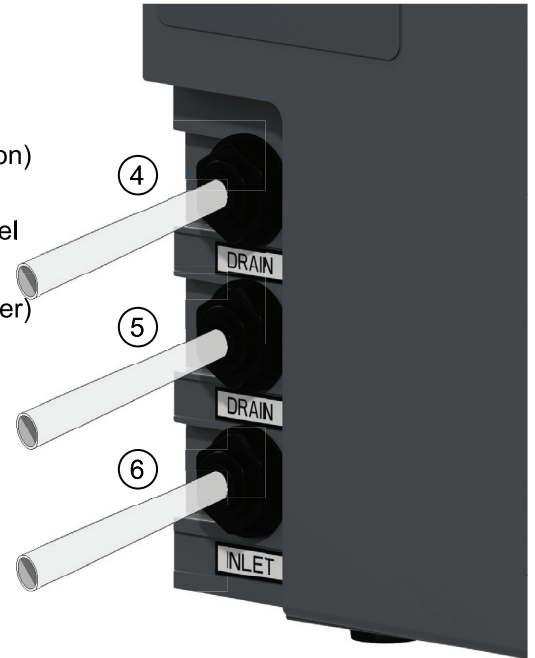
1. REMOVE 3/8” transit plugs from the housing assembly inlet & outlet ports.
2. INSTALL 3/8” – 5/16” Stem Elbows into the housing assembly inlet & outlet ports.
3. CUT a 50mm length of 5/16” (8mm) OD tube, supplied within LA637 installation kit, and INSTALL to inlet elbow.
4. INSTALL 1 off 3/8” – 5/16” Stem Reducer to outlet port of Isolation Valve and CONNECT to free end of 5/16” (8mm) tube.
5. If feedwater tube is 3/8” OD, CONNECT directly to inlet port of Isolation Valve.
6. If feedwater tube is 5/16” (8mm) OD, INSTALL 3/8” – 5/16” Stem Reducer before connecting.
7. CUT appropriate length of 5/16” (8mm) OD tube and CONNECT one end to outlet elbow.
8. CONNECT free end of tube to **PUREENERGY System** inlet port.

Note: Ensure Isolation Valve is in the CLOSED position.





- ① Outlet to Reservoir (Recirculation)
- ② Pump Feed from Docking Vessel
- ③ Outlet to Application (Electrolyser)
- ④ Drain (EDI)
- ⑤ Drain (RO)
- ⑥ Inlet (Potable Supply)



8.4 Connecting the PUREENERGY 30

Once the **PUREENERGY 30 System** has been positioned either on a wall or on a bench, it should be connected as follows:

- Pre-treated water inlet tube
- RO drain
- EDI drain
- Pump feed
- Outlet to Reservoir (RO Permeate)
- Outlet to Reservoir (Recirculation loop)

Step 1 - Fitting Tubes

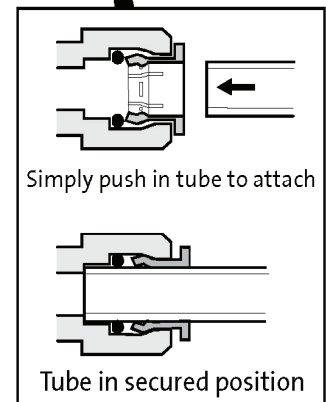
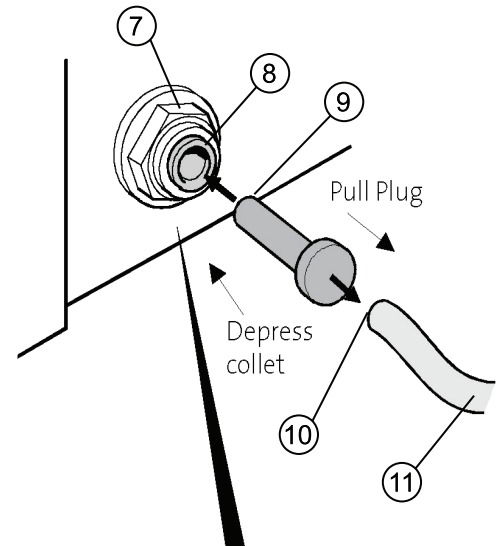
1. PUSH in collet on connector.
2. PULL out transit plug.
3. CUT a clean square end on an 8mm (5/16") OD semi-rigid drain tube.
4. PUSH tube into connector.



CAUTION! Do not restrict drain line.



CAUTION! If the water supply into the system is at a pressure greater than 2 bar (30 psi) fit a pressure regulator (LA652).



Fitting Tubes

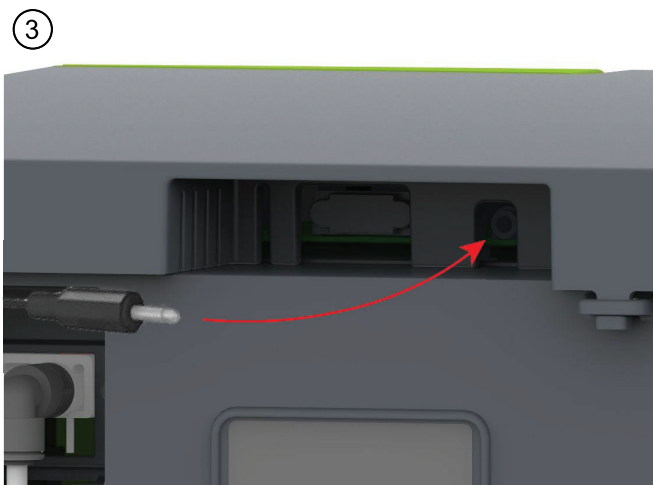
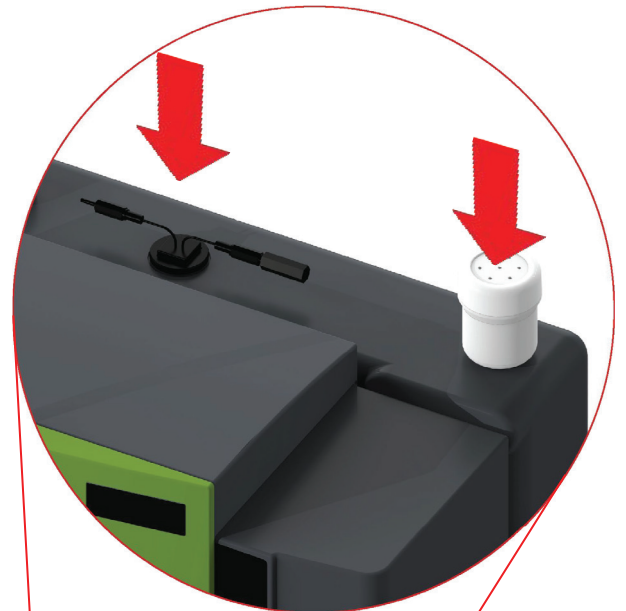
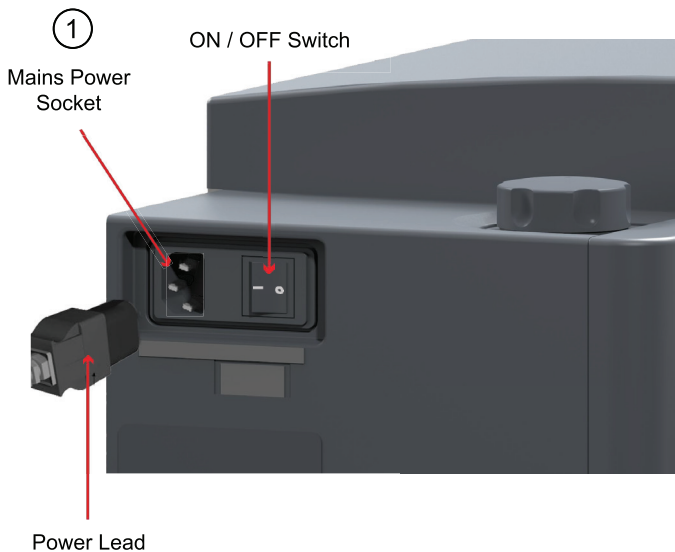
- ⑦ Connector
- ⑧ Collet
- ⑨ Blanking transit plug
- ⑩ Clean square cut end
- ⑪ Tube 8mm OD

Step 2 - Connect Electrical Supply

1. PLUG mains lead into the socket on the left hand side of the **PUREENERGY 30 System** (refer to image 1).
2. PLUG mains lead into mains socket.

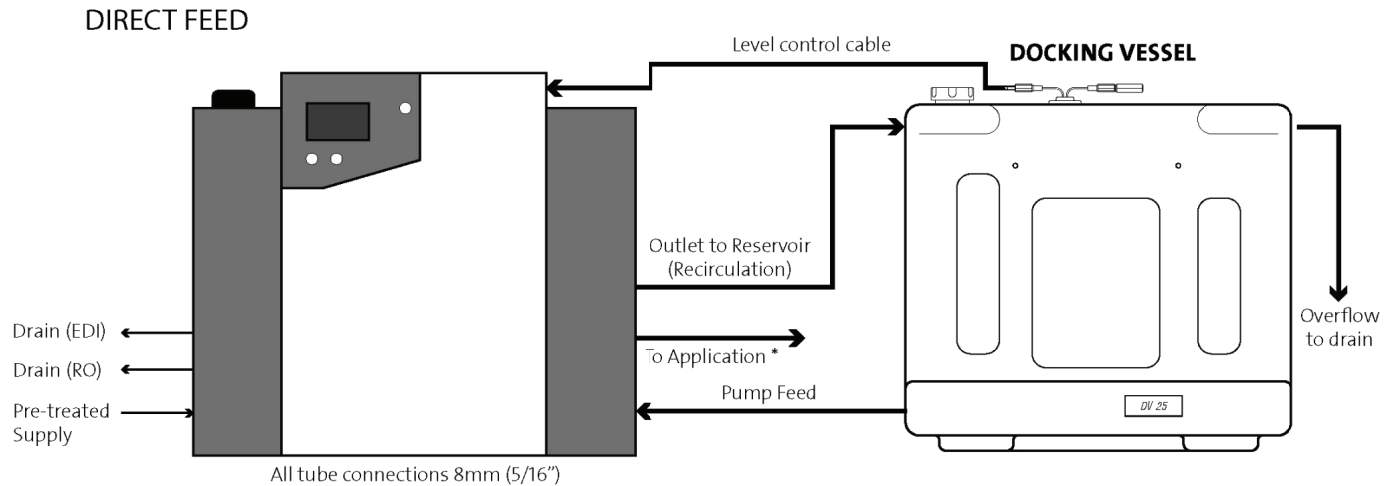
Step 3 - Connect Level Switch to Reservoir and Install Composite Vent Filter (CVF)

1. UNPACK the Level Control Switch (SWIT37075-03) from the box
2. Remove the yellow transit plugs on the reservoir.
3. INSERT Level Control Switch into docking vessel (hand tight only) (refer to image 2).
4. UNPACK CVF (LC136M2) and write the date of install.
5. Insert new LC136M2 Composite Vent Filter (hand tight only) (refer to image 2).
6. ATTACH Level Control jack plug into main PCB (refer to image 3).



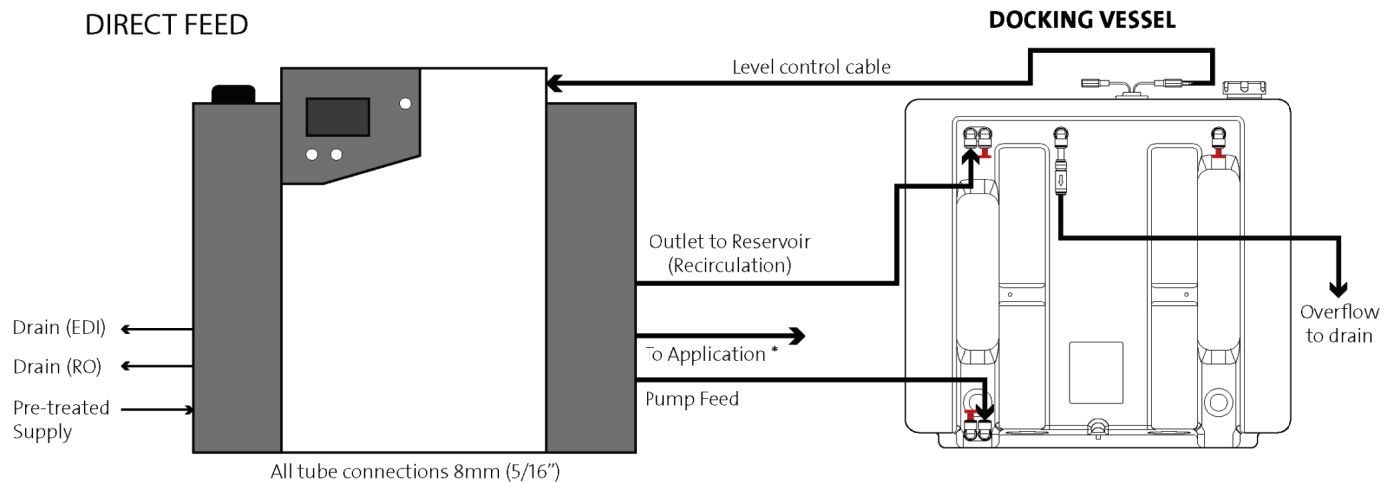
Note: When installing a PUREENERGY 30 with the reservoir the general scheme is illustrated below as are the recirculation/delivery pump connections.

Front of Reservoir:



* Pressurised flow of electrolyser of 1.5 L/min at 1.5 bar

Back of Reservoir:



* Pressurised flow of electrolyser of 1.5 L/min at 1.5 bar

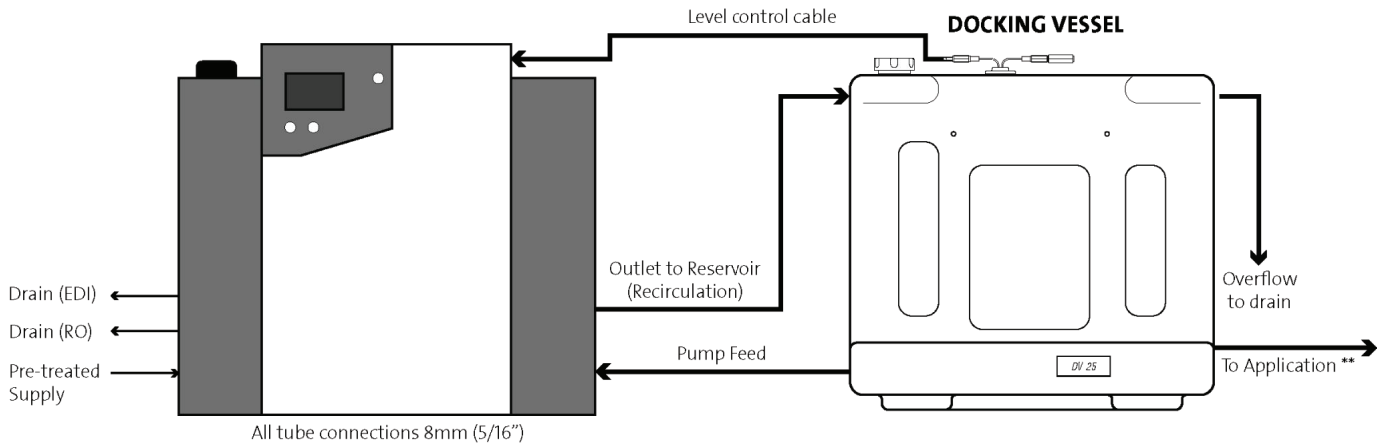
Note. This system is not rated to Directive 99/92/EC or Directive 2014/34/EU (ATEX) and should be kept outside any area that will be working within this rating. This unit **MUST NOT** be installed within the protective ATEX environment of a hydrogen electrolyser.

PUREENERGY 30 System installed with Docking Vessel



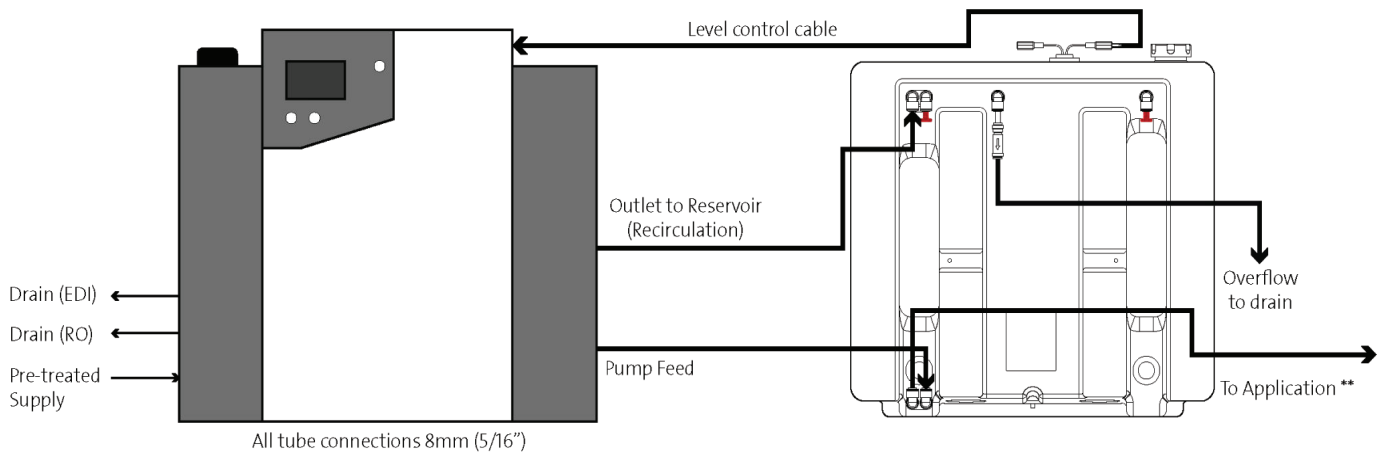
CAUTION! The system must be positioned at a distance of no greater than 5 meters (16ft) from the electrolyser to achieve the specified outlet flow rates (ref: Product water specification - Page 36)

Front of Reservoir: RESERVOIR FEED

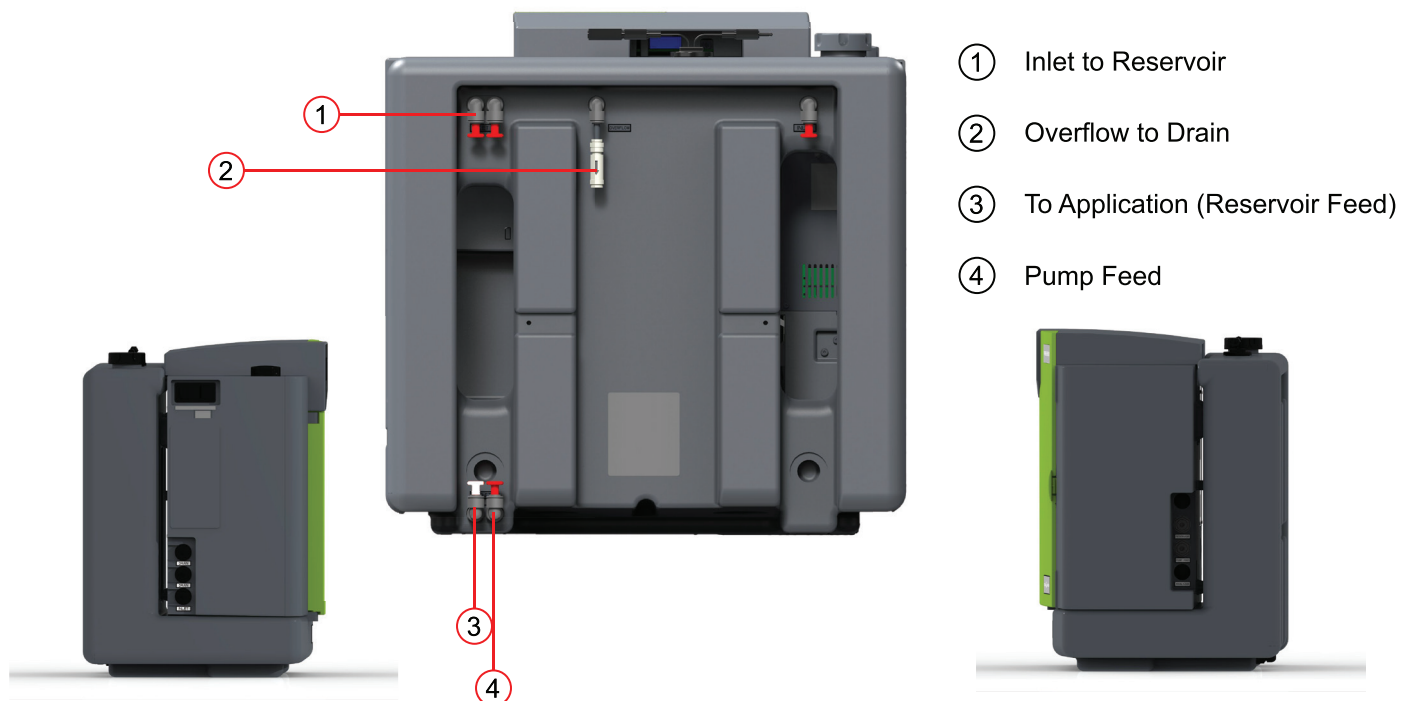


** Maximum take off flow of 2 L/min. A delivery pump matched to the feed pressure of the electrolyser will be required

Back of Reservoir: RESERVOIR FEED



** Maximum take off flow of 2 L/min. A delivery pump matched to the feed pressure of the electrolyser will be required



8.5 Pre-Start Up

1. The **PUREENERGY 30** and external pre-treatment system should be installed correctly as described previously in Section 9.1 (page 28).
2. TURN ON the feed water supply to external pre-treatment assembly.
3. OPEN the pre-treatment inlet isolation valve and adjust the inlet system pressure if necessary. The **PUREENERGY 30 System** will operate on inlet pressure flood suction with the water flowing.
4. CHECK all hydraulic connections are water-tight and that there are no leaks.
5. INSTALL the LC302 dual cartridge pack supplied.
6. POWER ON & press the PROCESS ON button.
7. The **PUREENERGY 30 System** will start commissioning for 30 minutes.

Once commissioning mode is finished, flushing of reservoir is recommended.

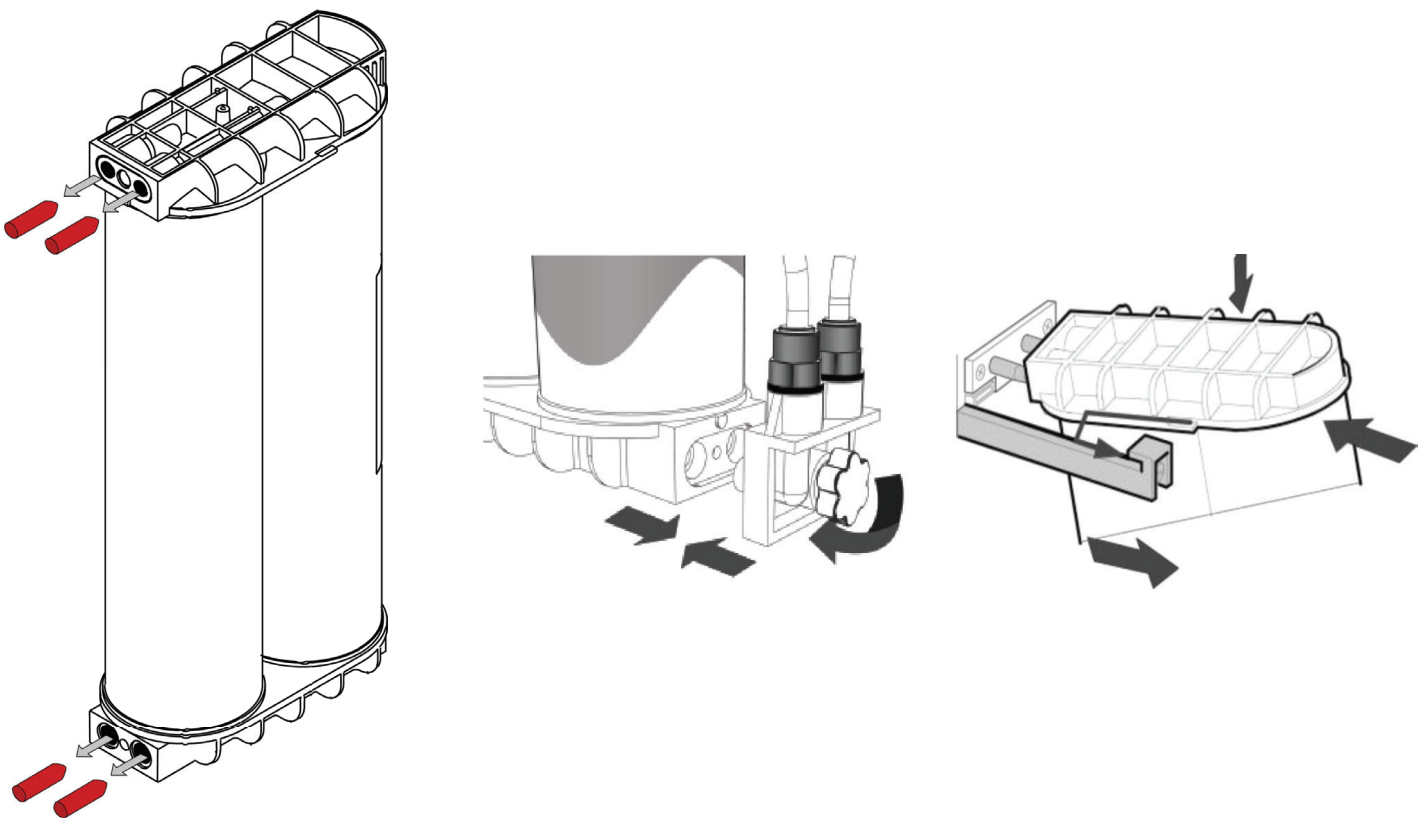
Note: The PUREENERGY 30 Systems are supplied without the LC302 dual cartridge pack fitted. If the system is powered on without installing this pack, there is a risk of splashing water. Wipe down the LC302 Dual Cartridge pack before insertion.



CAUTION! It is recommended to commission this unit individually, separate to the electrolyser and confirm all functionality before pairing the system to the electrolyser.



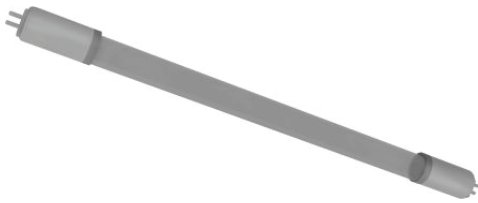
WARNING! WHILE UNDER COMMISSIONING, THE SYSTEM WILL RINSE. THIS COULD LEAD TO UNDESIRABLE WATER QUALITY BEING FED INTO THE ELECTROLYSER!



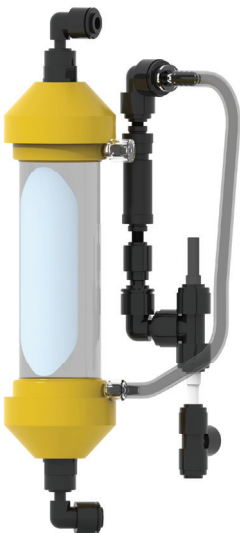
Installing LC302 Cartridge Pack



LC302 Cartridge Pack



LC105 UV Lamp



SP1264 Degassing Membrane

**PUREENERGY 30
Replacement Consumables**

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

Identification of Consumables:

There are six types of unique replacement consumables designed for use in the **PUREENERGY System** and these are illustrated with the following part numbers:

- LC281 Pre-treatment filters
- LC302 Conditioning & DI dual cartridge pack
- LC105 UV lamp
- LC181 Degasser
- LC136M2 Composite vent filter (Reservoir/DV)
- LC143 Reverse Osmosis

Consumables are accessible after opening the front swing door cover, with the exception of the pre-treatment filters which are installed external to the system. To protect the inlet solenoid valve, RO boost pump and recirculation pump from possible debris in the water, the system incorporates two strainers.



WARNING! ALWAYS CHECK THAT THE MAINS ELECTRICAL POWER AND FEED WATER SUPPLIES ARE SWITCHED OFF BEFORE ATTEMPTING TO REPLACE THE **PUREENERGY SYSTEM** CONSUMABLES!

Frequency of Consumable Replacement:

The following frequency of consumable replacement is recommended as a guide assuming typical usage:

• Pre-Treatment	-	LC281	max 6 months
• Dual cartridge pack	-	LC302	max 6 months
• UV lamp	-	LC105	max 12 months
• Degasser Membrane	-	LC181	max 24 months
• Composite vent filter	-	LC136M2	max 6 months
• Reverse Osmosis	-	LC143	every 2-3 years (not an operator replacement item)

If parts require replacing (LC143 and LC181) please contact your local service provider to change them.

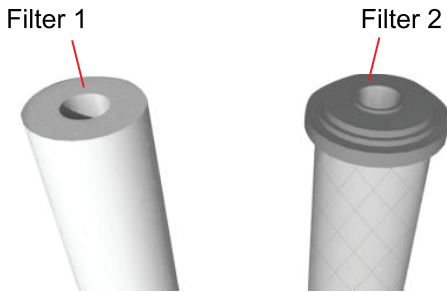
Note: These frequencies are only estimates and replacement will depend on the application and feed water quality.



CAUTION! As failure to replace the LC302 conditioning cartridge at the specified intervals will result in serious damage to the EDI module, the system will not operate once the cartridge has exhausted. The system will alarm when the cartridge nears its end of life.



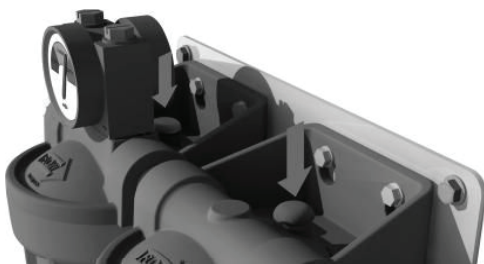
CAUTION! Ensure that the display and replacement timer settings are reset after replacing consumables. (Refer to Section 8.3 (page 20).



LC281 Filter Set



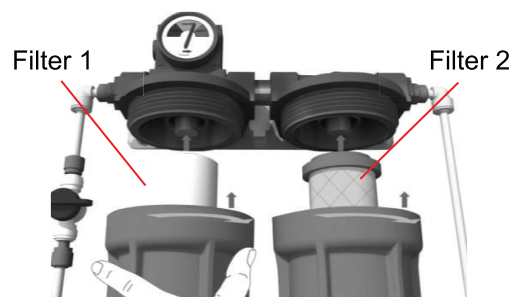
Quality Indication Gauge



Relieving Residual Pressure



Unscrewing Filter Bowl



Re-fitting Filter Bowl

9.1 Replacing the LC281 Pre-treatment filters

The pre-treatment filter arrangement consists of two 20" filter housing assemblies aligned in series. Within these housings are two types of filter;

Filter 1 – 20" Spun bonded filter to remove particulates from the feed water.
 Filter 2 – 20" Carbon block filter to remove chlorine from the feed water.

Note: *These filters are available as a set under part no. LC281.*

Replace the pre-treatment filters when indicated by the change reminder or if indicated by the quality gauge on the primary filter housing.

Step 1 - Switch system off and Isolate water supply

1. SWITCH the **PUREENERGY System** off at the power switch at the top left side of the system.
2. CLOSE the isolation valve, installed at the inlet of the pre-treatment housing assembly (refer to section 8.3 step 4 (page 21) and for process flow diagram).

Step 2 - Remove Pre-treatment filters

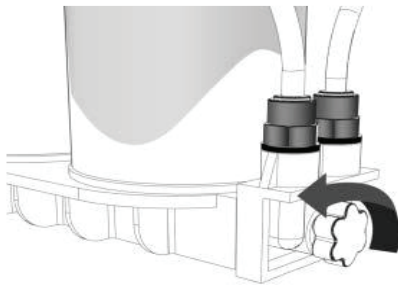
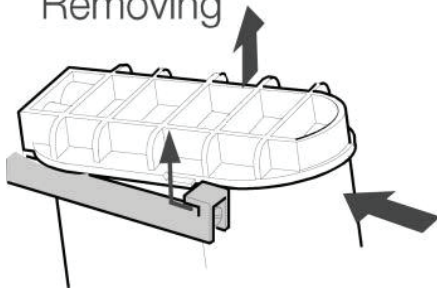
1. PRESS both red pressure relief buttons, located on top of the pre-treatment housings, to relieve residual pressure from the system.
2. UNSCREW each 20" filter bowl, using the bowl removal spanner (supplied with housing assembly).
3. REMOVE both 20" filters and discard.

Note: *These consumables are non-hazardous. Dispose of as ordinary waste, observing all local and national regulations.*

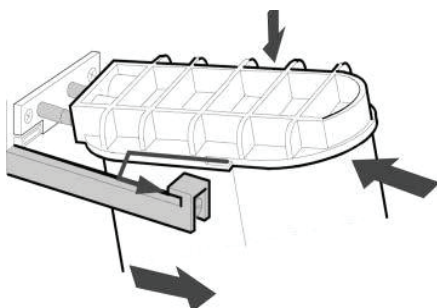
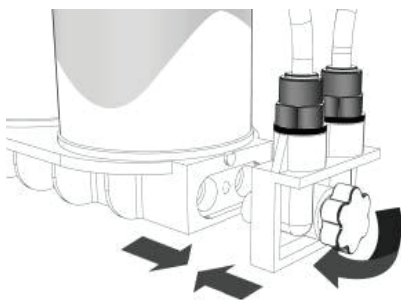
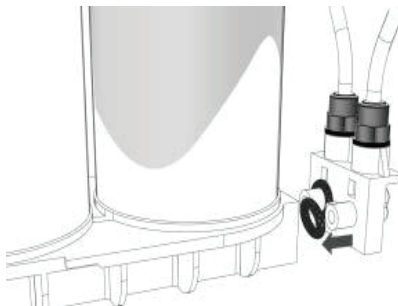
Step 3 - Replace the Pre-treatment filters

1. UNPACK each new pre-treatment filter.
2. INSERT the filters into the corresponding filter bowls.
3. SCREW the filter bowls to their respective manifolds and tighten hand-tight.
4. OPEN the isolation valve and check for leaks.
5. DISCONNECT outlet tube from **PUREENERGY System** inlet and DIRECT to drain. Flush approximately 10 liters to drain.
6. RE-CONNECT outlet tube to **PUREENERGY System** inlet.
7. SWITCH the **PUREENERGY System** on at the power inlet module.
8. RESET pre-treatment filter reminder. (See Section 7.2 step 3 (page 18)).
9. PRESS the PROCESS button to start the system.

Removing



Removing Cartridge Pack



Replacing Cartridge Pack

9.2 Replacing the LC302 dual cartridge pack

The dual cartridge pack should be replaced in the following circumstances:

- The water purity alarm monitor indicates that water purity has fallen below limits.
- If the system is being re-commissioned or sanitized after an extended period in which it has not been used.
- When indicated by the change reminder.

Step 1 – Switch System Off

1. SWITCH the **PUREENERGY System** off at the power switch at the top left hand side of the system.
2. RELIEVE any residual pressure from the system by waiting several minutes before proceeding.



WARNING! ENSURE THE SYSTEM IS ISOLATED BEFORE REMOVING THE CARTRIDGE PACK!

Step 2 - Remove Cartridge Pack

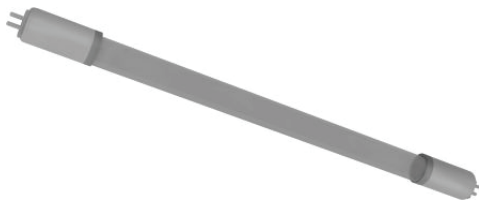
1. OPEN the front door.
2. PUSH on cartridge top cap.
3. LIFT up and SLIDE out cartridge.
4. UNSCREW thumbwheel to remove lower manifold.
5. DISCARD used cartridge.

Note: *These consumables are non-hazardous. Dispose of as ordinary waste, observing all local and national regulations.*

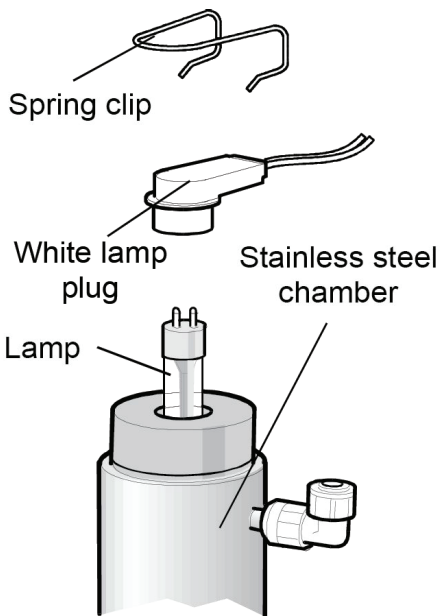
Step 3 - Replace Cartridge Pack

1. REMOVE the new LC302 cartridge pack from its packaging.
 2. REMOVE the sealing plugs from the inlet and outlet ports of both end caps.
 3. CHECK O-rings to ensure they are functional and replace if necessary.
 4. ATTACH lower manifold to the bottom cap ports and secure using thumbwheel.
 5. WET 'O' rings and SLIDE new cartridge into system.
 6. POSITION cartridge onto upper spigots, PUSH into system.
- CAUTION!** Ensure neither of the lower manifold tubes are not restricted by installation of the pack.
7. ENSURE guide has dropped past retainer.
 8. SWITCH system on at the power switch.
 9. Direct permeate water to drain for 5 minutes and PRESS the PROCESS button to flush the LC302.
 10. PRESS the PROCESS button to stop flow. After 5 minutes reconnect permeate line.
 11. PRESS the process button to start the water purification.
 12. CHECK system for leaks.
 13. CLOSE the front door.

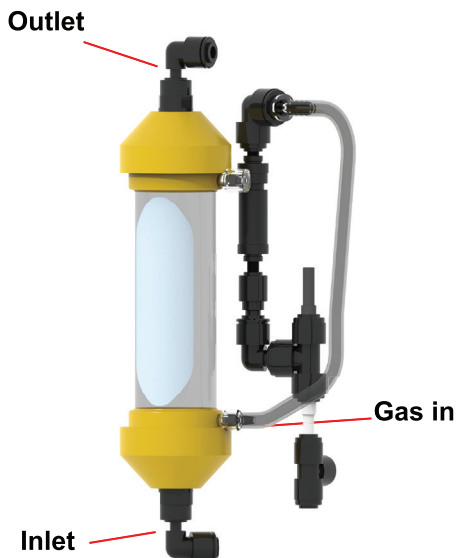
Note: *If the reservoir is below 70% full, the system will flush to drain for 30 minutes and then start to fill the reservoir. If the reservoir is above 70%, the 30 minute flush will take place the next time that the level drops below 70%.*



LC105 UV Lamp



UV Housing Assembly



9.3 Replacing the LC105 Ultraviolet Lamp

The UV lamp should be changed under the following circumstances:

- When indicated by the change reminder.
- If LAMP FAIL alarm occurs.

Step 1 - Switch System Off

1. SWITCH off the electrical supply at the mains.
2. DISCONNECT the mains plug from the system.
3. RELIEVE any residual pressure from the system by waiting several minutes before proceeding.

Step 2 - Remove UV from PUREENERGY System

1. OPEN the front door panel.
2. PULL UV housing out of the top and bottom retaining clips.
3. REMOVE top and bottom spring clips.
4. UNPLUG the white lamp plug fitted to the top of the UV lamp.
5. UNPLUG the white lamp plug fitted to the bottom of the UV lamp.



CAUTION! Hold on to the lamp pins in case the lamp falls out and breaks.

Step 3 - Remove UV Lamp (LC105)

1. REMOVE the old UV lamp from the center bore of the housing and discard.

Note: Disposal of all end of life consumable items should be in accordance with all local and national regulations.

Step 4 - Replace UV Lamp (LC105)

1. UNPACK new UV lamp.

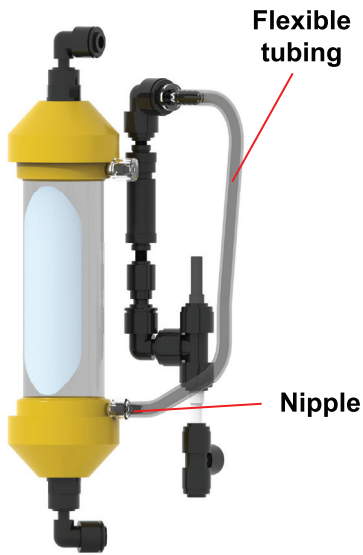


CAUTION! Take care not to touch the surface of the glass. Ideally handle with soft cloth and wipe the surface with alcohol wipe supplied before fitting into the housing.

2. SLIDE the new UV lamp into the center bore of the UV housing.
3. PLUG the white lamp plug to the bottom of the UV lamp.
4. REFIT spring clip.
5. PLUG the white lamp plug to the top of the UV lamp.
6. REFIT spring clip.
7. PUSH UV housing into the retaining clips.
8. CLOSE the front door.
9. RESET UV alarm settings. (See Section 7.2 step 2 (page 17)).
10. PRESS the PROCESS button to start the system.

9.4 Replacing LC181 Degasser Membrane:

1. TURN process button off.
2. SWITCH off the electrical supply at the mains.
3. OPEN door.
4. LOCATE LC181 Degasser Membrane on left hand side of the main unit.
5. CUT cable ties that secured the degassing membrane to chassis.
6. NOTE orientation of degasser (inlet, outlet and gas-in)



7. REMOVE new LC181 Degasser Membrane from packaging
8. CONNECT inlet port first to new LC181 Degasser Membrane.
9. CONNECT outlet port second to new LC181 Degasser Membrane.
10. UNSCREW nipple and flexible tubing from old LC181 Degasser Membrane.
11. REMOVE old LC181 Degasser Membrane.
12. INSERT new LC181 Degasser Membrane
13. SECURE nipple and flexible tubing to new LC181 Degasser Membrane.
14. SECURE with cable ties (not supplied)
15. THROW away old LC181 Degasser Membrane

9.5 Removing and Refitting the LC219 EDI Module



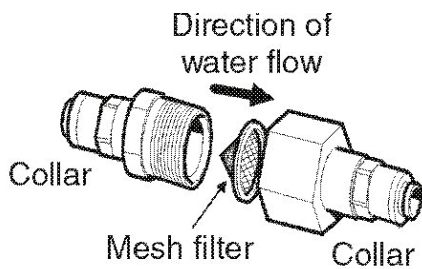
CAUTION! The removal and replacement of the EDI module should only be carried out by a certified service engineer. Please contact your local service provider to replace the EDI module.

9.6 Cleaning the Inlet Strainer

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

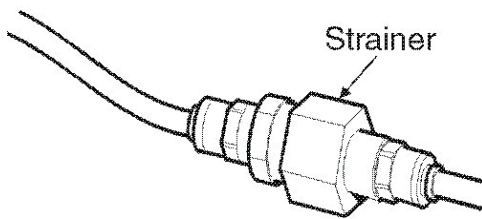
Step 1 - Remove the Inlet Strainer

1. SWITCH OFF electrical supply.
2. OPEN front door.
3. ISOLATE inlet water supply.
4. If necessary, REMOVE the LC181 Degasser Module from its clip and set aside to gain access to the inlet strainer.
5. DEPRESS collars on both sides of strainer elbows 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 clean as necessary.



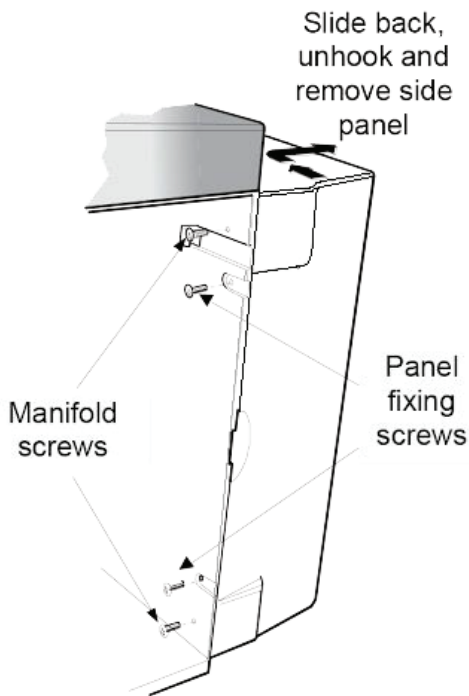
Inlet Strainer

Step 3 - Reassemble the Inlet Strainer

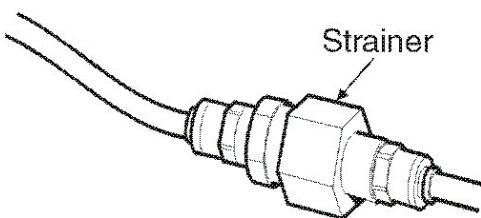
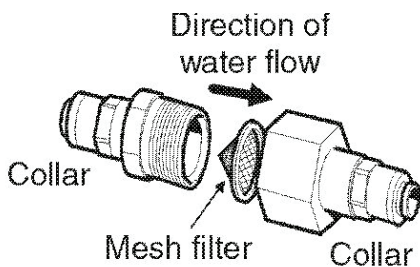
1. INSERT mesh filter into strainer. ENSURE it is facing the correct direction.
2. TIGHTEN up the inlet strainer.

Step 4 - Replace the Inlet Strainer

1. REPOSITION the inlet strainer.
2. REFIT tubes to inlet strainer. ENSURE it is orientated in the correct flow direction.
3. If necessary, REPOSITION the LC181 Degasser Module into its support clips.
4. RE-ESTABLISH the inlet water supply.
5. TURN on power.



Removing side panel



Re-circulation Strainer

9.7 Cleaning the Re-Circulation Strainer

The re-circulation strainer should be checked and cleaned periodically to ensure that the strainer does not become clogged or broken.

Step 1 - Remove Re-circulation Strainer

1. OPEN front door.
2. ISOLATE inlet water from reservoir to the recirculation strainer.
3. REMOVE the right hand side panel.
4. REMOVE the dual cartridge pack to gain access to the recirculation strainer.
5. REMOVE the re-circulation strainer by depressing the collars on either side of the strainer and disconnect tubing.

Step 2 - Dismantle the Re-circulation Strainer

1. HOLD re-circulation strainer over a sink or receptacle.
2. UNSCREW re-circulation strainer.
3. REMOVE mesh filter.
4. CHECK mesh filter for signs of wear or damage, replace or clean as necessary.

Step 3 - Reassemble the Re-circulation Strainer

1. INSERT mesh filter into strainer, ENSURE it is facing the correct direction.
2. TIGHTEN up the re-circulation strainer.

Step 4 - Replace the Recirculation Strainer

1. REPOSITION the re-circulation strainer.
2. REFIT tubes to re-circulation strainer, ENSURE it facing the correct direction.
3. REPOSITION the conditioning cartridge.
4. REPOSITION the side panel.
5. RE-ESTABLISH inlet water supply.
6. TURN on power.

9.8 Replacement of LC143 Reverse Osmosis Cartridge

The purity and flow of purified water from the reverse osmosis module(s) will often very gradually reduce over a period of months or years. Extra impurities in the water will be removed by the ion exchange resin. The reverse osmosis cartridge should be replaced if the permeate water purity or flow rate does not meet predicted or previous performance.

Replacement of the LC143 Reverse Osmosis Cartridge(s) must only be performed by a certified service engineer. For information regarding this replacement contact your Local Service Provider.



CAUTION! The removal and replacement of the Reverse Osmosis Cartridge should only be carried out by a certified service engineer. Please contact your local service provider to replace the cartridge.

The **PUREENERGY 30 System** will function automatically and signal alarm conditions to ensure efficient system management and corrective action.

Note: To ensure water purity is maintained it is important to leave the system in process mode.



WARNING! SANITIZATION OF THE **PUREENERGY SYSTEM** IS NOT RECOMMENDED ON THIS UNIT DUE TO THE POTENTIAL DAMAGE IT COULD CAUSE TO THE HYDROGEN GENERATOR!

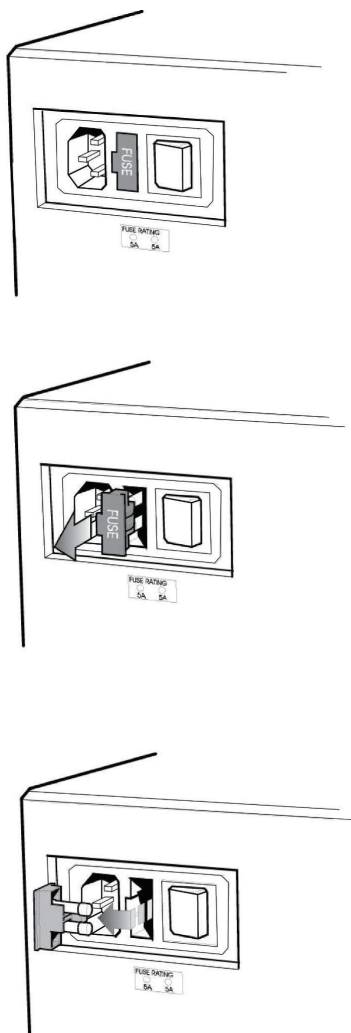
10.1 Intermittent Mode

During periods of non-use, the system will automatically operate in intermittent mode to maintain water quality. This mode will function after the reservoir has been filled and the level maintained for 60 minutes. The system will then recirculate the reservoir contents for 5 minutes every 30 minutes.

10.2 Alarm conditions

See Section 6.2 User Alarm Codes (page 12)

This section highlights the problems that can occur with the **PUREENERGY System** and how to rectify them. The system will normally sound an alarm and the respective icons will flash. The alarm sound can be silenced by pressing the mute button. If the system cannot be repaired using this manual please call either your supplier or local distributor. (See Section 15 - Useful Contact Details (page 39)).



Fuse Removal

Problems	Action
No Display Message	Check mains supply and lead. Check that the mains power is switched on. Check fuse in power inlet module and replace if blown.
Reservoir low level audible alarm sounds	Press the crossed bell button to mute alarm. The reservoir will automatically refill. Check the display icon is showing reservoir filling. Check feedwater supply. Check connections to reservoir.
UV Lamp	Press the crossed bell button to mute alarm Check that all electrical connections have been secured. Follow UV lamp replacement procedure when applicable. Optionally you can temporarily continue without the UV lamp.
Ion-exchange Cartridge Replacement Alarm	Replace ion-exchange cartridge pack, (see Section 9.8 - Replacing the LC143 Reverse Osmosis Cartridge Module (page 32)).
Pre-treatment Cartridge Replacement Alarm	Replace pre-treatment filters (see Section 9.1 - Replacing the pre-treatment filters (page 28)
Water Purity Alarm	Check alarm set value is correct (see Section 7.1, Step 7 - Purity Alarm Setting (page 14)). Allow system to recirculate. If alarm persists replace dual cartridge pack - (see Section 9.2 - Replacing the LC302 cartridge pack (page 29)). If problem persists beyond that expected from normal operating conditions, contact your local distributor.
Reservoir Level Disconnect Fault Alarm	Check that the level controls are correctly connected (see Section 8.4 -- Step 3 – Connect Level Controls (page 22)). If problem persists contact your local distributor.
Output Flow Below Specification	Check supply pressure (see Section 8.2 - Positioning the PUREENERGY System (page 19)). Low water temperature will reduce flow. Check the inlet strainer / recirculation strainer are clean (see Section 9.6/9.7 - Cleaning Inlet Strainer/Cleaning recirculation Strainer (pages 31-32)).
UV Replacement Alarm	Replace UV lamp, (see Section 9.3 - Replacing the ultraviolet lamp (page 30)).
System Noisy	Replace UV lamp, (see Section 9.3 - Replacing the ultraviolet lamp (page 30)).

The Technical Specifications for the **PUREENERGY 30** are as follows:

Feed Water Requirements	Potable Water	
	Soft Water	Hard Water
Water Type	Soft Water	Hard Water
Conductivity, $\mu\text{S/cm}$	<2000	<1400
Hardness, Ca ppm as CaCO_3	<5	<350
Free Chlorine, Ppm Cl_2	<0.05	
Chloramine, ppm Cl_2	<0.02	
Silica, ppm SiO_2	<30	
FI	<10	
CO_2 , ppm	<30 (<20 recommended)	
Organics TOC, ppmC	<20 Recommended	
Iron / Manganese ppm Fe / Mn	<0.5	
Temperature, $^{\circ}\text{C}$	4 - 40 (10 - 25 recommended)	
Inlet flow rate, L/hr	100	
Drain requirements, L/hr	75	
Inlet Pressure, bar	Flooded Suction - 2 bar (30 psi)	

Dimensions and Parameters	
Height	460mm (18.1")
Width	550mm (21.7")
Depth	270mm (10.6")
System Weight - Dry (30l variant c/w LC302 installed exc. Pre-treatment assembly)	29kg (64 lbs)

The Technical Specifications for the **PUREENERGY 30** continue as follows:

Product Water Specification	
Resistivity	1 M Ω . cm
Total Organic Carbon (TOC)	<50ppbC (feedwater dependant)
Iron	<0.1 μ g/L
Chromium	<0.1 μ g/L
Nickel	<0.1 μ g/L
Molybdenum	<0.1 μ g/L
Aluminium	<0.1 μ g/L
Copper	<0.1 μ g/L
Titanium	<0.1 μ g/L
Make Up Rates @ 20 °C	30 L/hr
Usage Flow Rate	Up to 1.5 L/min recommended
Recovery	>30%
External Reservoir (<i>gross volume</i>)	25 litre docking vessel
Daily output (nominal max)	720L

As part of our policy of continual improvement we reserve the right to alter the specifications given in this document.

14.1 General Limited Warranty

VWS (UK) Ltd warrants the products manufactured by it against defects in materials and workmanship when used in accordance with applicable instructions for a period of one year from the date of shipment for the products. VWS (UK) LTD MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THERE

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14.2 Water System Limited Warranty

VWS (UK) Ltd warrants the water systems manufactured by it, BUT EXCLUDING MEMBRANES AND PURIFICATION PACKS, against defects in materials and workmanship when used in accordance with the applicable instructions and within the operating conditions specified for the systems for a period of one year from the earlier of:

- a) the date of installation, or
- b) the 120th day following the date of shipment.

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<http://www.elgalabwater.com>

Or contact ELGA LabWater at the number above.

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