

# PENDRED Humidification and Water Systems

## Water filtration & de-mineralisation unit (ref LP-30 BP Fig M)

Pendred crop hydration systems are built with either LP-30BP or LP-60BP reverse osmosis water filtration systems. The parts of the LP-3-BP water filter system are shown as follows.



1. Sediment pre-filter
2. Activated carbon pre-filter
3. Reverse osmosis membranes. (LP-30-BP has 2)
4. Water pressure booster pump motor
5. Brass pump head
6. Brine/waste water flow restrictor
7. Waste water drain
8. LED re-set indicator light
9. Black re-set button
10. 1/2" feed water/city water inlet
11. Water detector/leak detector sensor

Fig M.

**LP-30BP (Fig M).** Reverse osmosis water filter with booster pump. Minimum capacity 720 Kg/litres per 24 hours at a mains/city water inlet pressure of a minimum 1 bar (15psi) and a water temperature of 10°C.

**LP-60BP (Fig N).** Reverse osmosis water filter with booster pump. Minimum capacity 1440 Kg/litres per 24 hours at a mains/city water inlet pressure of a minimum 1 bar (15psi) and a water temperature of 10°C.

1. Sediment pre-filter
2. Activated carbon pre-filter
3. Reverse osmosis membranes. (LP-60BP has 4)
4. Water pressure booster pump motor
5. Brass pump head
6. Brine/waste water flow restrictor
7. Waste water drain
8. LED re-set indicator light
9. Black re-set button
10. 1/2" feed water/city water inlet
11. Water detector/leak detector sensor



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Fig N.

**Installation of water detector / leak detector sensor.** Place the water detection sensor in a place where, in the event of a leak, you expect that water will collect first. When the water sensor detects a leak the system will close the mains city water supply valve immediately. It is still possible that the contents of the buffer tank (10 litres) will continue to supply the fogger until that water is exhausted.

**System reset procedure.** You will find a red warning LED light and a black re-set button on the housing/enclosure of the filter system electronics. When the red light is illuminated push the red button for a moment to re-activate the system.

**Filter water pump-thermal/temperature cut-out.** Thermal/temperature cut-out (LP-30/60BP). The blue painted water pressure booster pump has a high temperature protection system. In the event of the pump motor over-heating, the system automatically cuts the power to the booster pump temporarily until the temperature falls below a critical level.



**Brass water pump head.** Attached to the water pressure pump motor is a brass pump head. If the mains city water falls below 1 bar (15psi) this pump head will receive insufficient water and will start to over-heat. In normal, correct operation this brass pump head should always remain cold. If heat is detected in the pump head the system should be switched off and the mains fresh water supply checked otherwise the pump head can over-heat and seize up. (Fig F).



Fig.F

**Maintenance of water filter system.** Maintenance is necessary to maintain hygiene and to maintain the efficiency of the water filter/reverse osmosis demineralisation system. When the crop hydration system/humidifier is working continuously, pre-filters and activated carbon filters should be changed at least once every 12 months. When the mains city water supply is very hard, containing a lot of organic particles, minerals or chlorine, they will need to be replaced more often.

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**Procedure for changing pre-filters.** Take the pressure off the system by shutting down the mains/city water supply and draining down the filter system.

1. Disconnect the mains power supply to the water filter system.
2. Turn off the mains city water supply to the water filter system.
3. Close the water valve on the buffer tank/product water tank.
4. Detach the connection to relieve water pressure to the buffer tank from the water filter system.
5. Change the filters by unscrewing the white enclosures. Attention: the enclosures will still contain some water.
6. Disconnect the mains power supply to the humidifier.
7. Before replacing the filters, rubber 'O' rings that seal the filter enclosures have to be checked for damage and replaced if necessary. The use of silicon grease applied to the rubber 'O' rings will aid water sealing.  
The filter enclosures can be washed with soap and water or chlorine if necessary but make sure that they are flush thoroughly with clean water after cleaning.
8. Screw the enclosures back on tightly by hand.

## **Re-starting the system.**

1. Open the water supply and let the filter system run without power for 5 minutes to bleed the air from the system.
2. Re-Connect the water pump to the mains power.
3. Reconnect the tubing.
4. Open the tap to the product water buffer tank.
5. Wait until the system is pressurised and the product water/buffer tank is full.
6. Reconnect the power supply to the fogging unit.

## **Checking the quality of product water produced by the water filter system.**

1. Take a sample of the mains city water.
2. Measure the conductivity of the city water with a micro Siemens meter.
3. Take a sample of the demineralised and filtered product water.
4. Measure the conductivity of the demineralised water with a micro Siemens meter.
5. Dividing the value of the demineralised water by the value of the city water and multiply by 100%  
Less than 10% is good  
Between 10% and 20% is acceptable  
Above 20% is unacceptable and shows that the reverse osmosis filter unit is worn out and requires that the membrane be changed.

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## Specifications.

	LP-30BP	LP-60BP
Maximum production in Kg/day at 25°C	1125	2250
Maximum production in Kg/day 10°C	720	1140
Salt reduction minimum (%)	98	98
Output compared to feed water (%)	20-35	20-35
Maximum temperature (°C)	45	45
Electrical consumption (W)	250	250
Minimum pressure (Bar)	1	1
Dimensions (LxBxH cm)	50x35x54	50x35x54
Buffer tank contents (Kg)	10	10
Buffer tank dimension (ø x H cm)	26 x 40	26 x 40
Pre-pressure (bar)	0.45	0.45

## Maintenance of UltraViolet water degermification system.

Check 'shut-down' system by disconnecting both of the power plugs fitted to the top of the UVc lamp tubes (pull off). Change lamps every 6 months, even if they still illuminate, as this does not indicate that they are still producing sufficient UVc radiation.

After turning off the blue water tap, unscrew and remove the lamp tube. Fit new tube, turn on water tap and check for water leaks. Re-connect power plugs



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## Maintenance and testing of Frost-stat cabinet heater. (To follow)

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