

R.O. SYSTEMS

# LP-10/10BP/20BP/30BP/60BP/100BP

USER MANUAL





Contronics Engineering B.V., Ambachtsweg 8, 5492 NJ Sint-Oedenrode, The Netherlands, hereby declares that products LP-10BP, LP-20BP, LP-30BP, LP-60BP and LP-100BP, produced and delivered by Contronics Engineering B.V., are in accordance with the following CE directives:

EMC-Directive	: 2014/30/EU
Directive for low-voltage electrical installation	: 2014/35/EU

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## 1. INTRODUCTION

The use of demineralised water is recommended with Contronics humidifiers for the following reasons:

- Any minerals, salts and bacteria that enter the humidifier will cause the water reservoir to become polluted. The integrated flushing programme will delay this process but will not prevent it entirely. Depending on the quality of the added water, the water reservoir will eventually become blocked. As a result, the energy of the transducers will no longer be effective, and they will wear out more quickly. In addition, the float switch could transmit the wrong information to the electronics system, thereby causing damage to the electronics.
- The minerals and salts (calcium) present in the water will end up in the area to be humidified and could cause annoying deposits of dust.
- Any bacteria present in the water (*Legionella*) could multiply easily in the relatively warm water in the tank and could thereby constitute a health hazard.

### The use of demineralised water reduces:

- Maintenance
- Wear and tear to the transducers
- Deposits of dust in the area
- Bacterial growth

### System components

The Contronics LP series is fitted with a high-quality (Dow Chemical) membrane. Working on the principle of Reverse Osmosis (R.O.), the membrane only allows water molecules to pass through. A flushing system prevents clogging, increases the service life of the membrane and improves performance.

Systems can be supplied with a capacity of 375 – 3,600 l per day (at a temperature of 25°C and depending on the water pressure).

Two preliminary filters are positioned ahead of the membrane: a 5 micron pre-filter and an active carbon filter.

In the BP version, an electric pump has been added to increase the capacity in order to cope with low water pressure or higher consumption.

The system also incorporates an automatic shut-off valve. When the system does not need to supply demineralised water and is at the correct pressure, this will ensure that the supply water will be shut off in order to prevent water from being unnecessarily wasted through flushing.

A buffer tank is also included in the delivery (including the T-piece connector) and must be fitted in the supply line to the humidifier. This tank will supply additional water whenever the humidifier is consuming more than the osmosis system is able to supply. This occurs during flushing and filling. At any other time, the system supplies more than the required consumption and any excess water will be used to top-up the tank. The tank incorporates a rubber bag in which the demineralised water is stored. The air

pressure is higher between the bag and the external shell.

In the LP-30BP, LP-60BP and LP-100BP models, an electronic water leakage detector is supplied that will cut off the water supply if any leakage is detected.

## 2. KNOW YOUR REVERSE OSMOSIS (R.O.) SYSTEM

Before starting the installation, take a few moments to become familiar with the names of the components. Compare the device you have unpacked to the drawing below. Once you are familiar with the lay-out, you can start the installation.

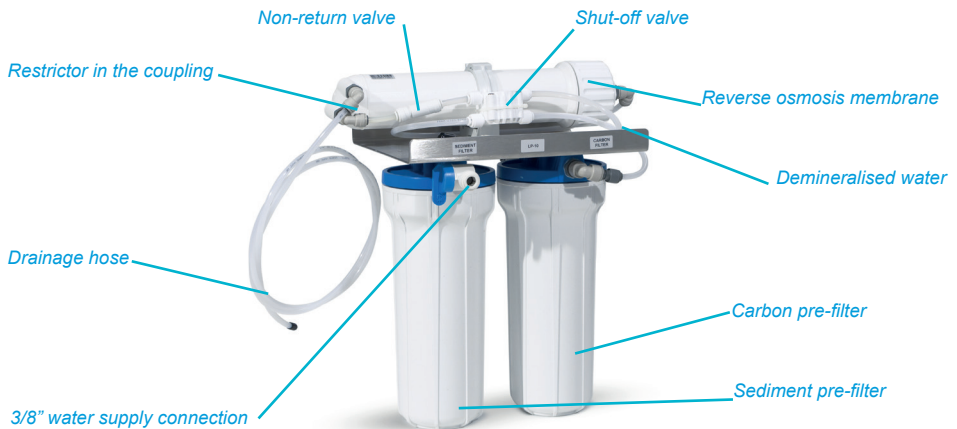


Figure 1. LP-10

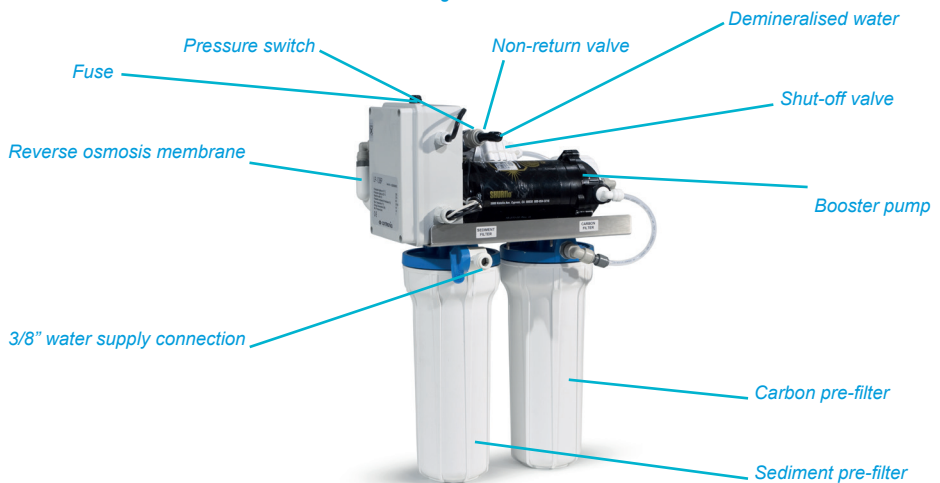


Figure 2. LP-10BP



Figure 3. LP-20BP

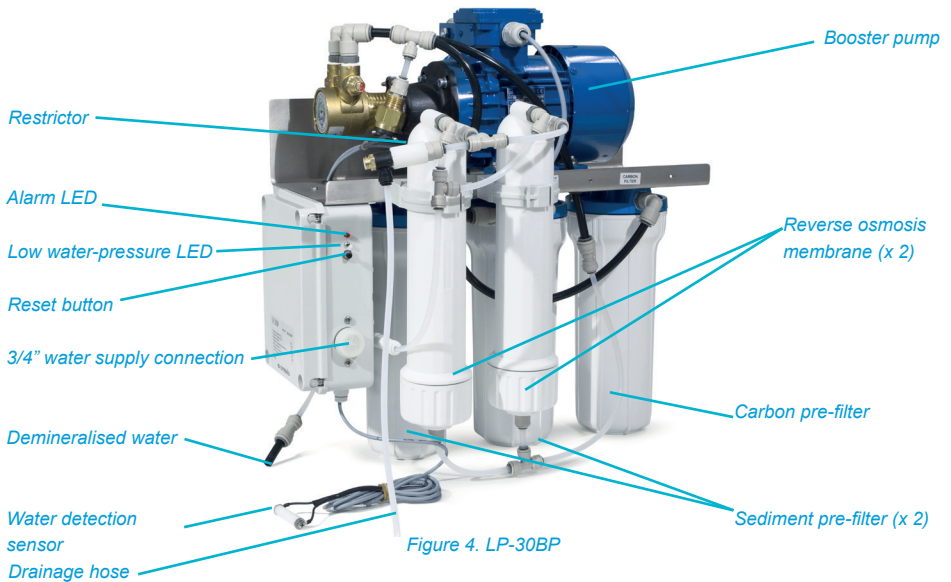


Figure 4. LP-30BP

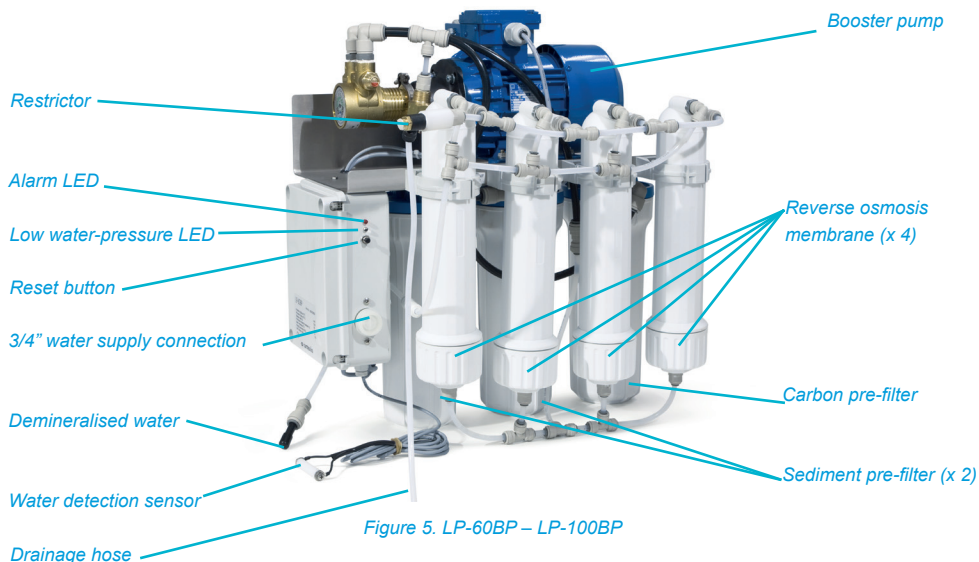


Figure 5. LP-60BP – LP-100BP

### 3. AVAILABLE SYSTEMS

- |         |  |
|---------|--|
| LP-10   | <p>Reverse osmosis filter with a maximum capacity of 375 kg/day (15.6 kg/hr) at a water pressure of 3.5 bar (50 PSI) and a water temperature of 25 °C.</p> <p>Under normal operating conditions (10 °C), 240 kg/day, 3.5 bar, suitable for maximum:</p> <p>5 x HU-25 or<br/>2 x HU-45 or<br/>1 x HU-85</p>               |
| LP-10BP | <p>Reverse osmosis filter with booster pump and a maximum capacity of 375 kg/day (15.6 kg/hr) at a minimum water pressure of 1 bar (15 PSI) and a water temperature of 25 °C.</p> <p>Under normal operating conditions (10 °C), 240 kg/day, suitable for maximum:</p> <p>5 x HU-25 or<br/>2 x HU-45 or<br/>1 x HU-85</p> |

LP-20BP	Reverse osmosis filter with booster pump and a maximum capacity of 750 kg/day (31.2 kg/hr) at a minimum water pressure of 1 bar (15 PSI) and a water temperature of 25 °C. Under normal operating conditions (10 °C), 480 kg/day, suitable for maximum: 4 x HU-45 or 2 x HU-85
LP-30BP	Reverse osmosis filter with booster pump and a maximum capacity of 1125 kg/day (47 kg/hr) at a minimum water pressure of 1 bar (15 PSI) and a water temperature of 25 °C. Under normal operating conditions (10 °C), 720 kg/day, suitable for maximum: 4 x HU-85 or 1 x HU-245
LP-60BP	Reverse osmosis filter with booster pump and a maximum capacity of 2250 kg/day (114 kg/hr) at a minimum water pressure of 1 bar (15 PSI) and a water temperature of 25 °C. Under normal operating conditions (10 °C), 1440 kg/day, suitable for maximum: 8 x HU-85 or 2 x HU-245
LP-100BP	Reverse osmosis filter with booster pump and a maximum capacity of 3600 kg/day (140 kg/hr) at a minimum water pressure of 1 bar (15 PSI) and a water temperature of 25 °C. Under normal operating conditions (10 °C), 2310 kg/day, suitable for maximum: 4 x HU-245

## 4. CONTENT OF THE DELIVERY

- R.O. unit with 1/4" supply tap
- Buffer tank (hydro-pneumatic) with shut-off tap
- 3/8" hose, 4 metres
- 3/8" T-piece
- Coupling 3/4" screw thread - 3/8" hose
- 1/4" discharge hose, 2 metres



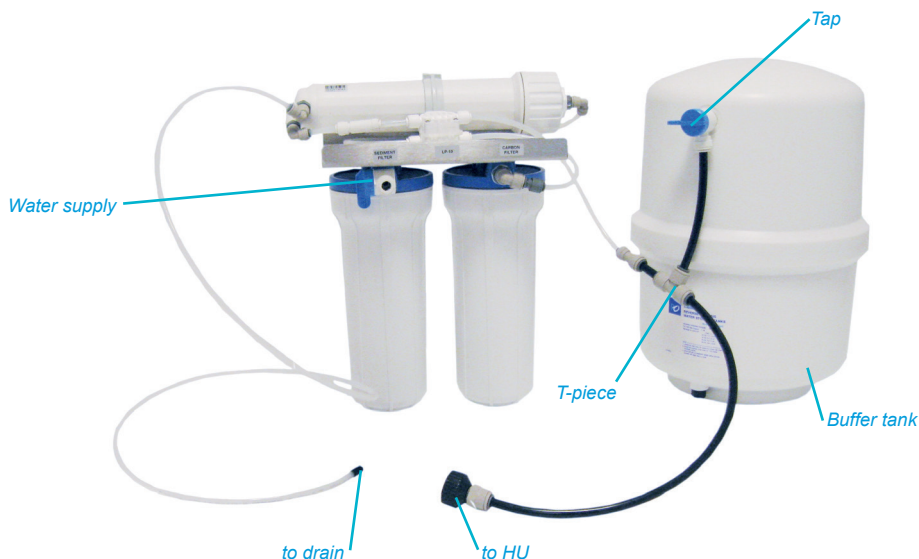


Figure 6 LP-10 with pressure tank and connections

## 5. INSTALLATION PROCEDURE

Place the device in a suitable location. Place the pre-filter (for LP-30BP/60BP/100BP 2 x) in the left-hand holder.

Place the carbon filter in the right-hand holder (remove the cellophane).

**When doing this, ensure that the O-rings on the holders are seated correctly.**

**The carbon filter is fitted with a flat rubber flange at the top and the bottom.**

Remember to make allowance for the connections for the water supply, discharge, buffer tank and socket. It is recommended to fit the device against the wall in the vertical position. This will speed up the air bleeding and will enable easy replacement of the filters. Although it is possible to mount the device in a horizontal position, the preferred position is vertical with an eye to the easy replacement of the pre-filters.

### Supply water connection:

#### **WARNING**

**Do not place an automatic stop valve in the water supply to the R.O. system. No inlet pressure, or inadequate inlet pressure, can damage the pump and/or motor.**

Check that the supply pressure is at least 2 bar. Where the inlet pressure < 2 bar it is recommended to install a device incorporating a booster pump (BP).

For maximum performance, the inlet pressure must be a minimum of 4 bar for the LP-10.

Connect the R.O. unit to a washing machine tap with an air bleed valve. The R.O. unit has a shut-off tap in the water supply with 1/4" inner thread. A shut-off valve ensures that the water supply is cut off when the buffer tank is completely full and no water is being consumed.

#### R.O. water connection:

##### **WARNING**

**Use only plastic or stainless steel tubing for demineralised water.**

1. Fit a 3/8" tube from the R.O. water connection (Figure 6) to the T-piece and from the T-piece to the inlet valve on the storage tank.
2. Fit a tube from the T-piece to the humidifier. The 3/4" connection coupling to the humidifier is included in the delivery.

#### Discharge connection:

Fit a tube (1/4" minimum) from the discharge connection (Figure 6) to the drain.

Important: Always leave a gap between the discharge tube and the drain in order to prevent the water from flowing back into the R.O. system.

#### Electrical connection (BP model only):

Insert the plug into the socket.

## 6. WATER DETECTION CIRCUIT (LP-30BP/60BP/100BP)

Position the water detector in an area where you would expect water to collect first in case of a leak. If the surface here is conductive, first lay an insulating layer. If the water detector detects a leak, the supply valve to the system will be closed immediately. It is, however, possible that the content of the buffer tank will continue to leak (10 l water). A reset button has been located on the electronics housing; if this button is briefly pressed, the system will be re-activated.

In addition, a connection for an external alarm is also provided on the electronics housing in the form of a potential-free contact.

## 7. TEMPERATURE PROTECTION (LP-30BP/60BP/100BP)

The LP-30BP/60BP/100BP are fitted with a temperature cut-out device that will temporarily interrupt the power supply if the pump motor becomes overheated.

## 8. LOW-PRESSURE PROTECTION (LP-30BP/60BP/100BP)

The LP-30BP/60BP/100BP are fitted with a low-pressure protection device to protect the pump. If the inlet pressure to the pump falls below 1 bar, the system will be switched off and the blue LED will light up. A reset button has been located on the electronics housing; if this button is briefly pressed, the system will be re-activated.

## 9. START-UP PROCEDURE

1. Check all connections once again.
2. Close the tap on the buffer tank. This will bring the system up to pressure quickly without the need to wait until the buffer tank is filled.
3. Open the supply tap and check for any leaks. If any are found, close the supply tap and repair the leaks first.
- 3a. For the BP model: Insert the plug into the wall socket.
4. Disconnect the water supply tube from the humidifier and allow the water to flow freely for about 2 minutes in order to flush the membrane, which is saturated with a disinfecting agent.
5. Re-connect the tube to the humidifier.
6. Open the tap on the storage tank and wait until the tank is completely filled (the discharge water will stop).
7. Only now can you switch the humidifier on.

## 10. MAINTENANCE

Some maintenance is necessary in order to guarantee the long service life of the system. Normal maintenance consists of replacing the sediment filter and the active carbon filter(s). This should be done at least once a year if the humidifier is in continuous use. If the supply water is heavily polluted with minerals or chlorine, however, it is recommended to do this more often.

### Procedure:

Before replacing the filters, the system must be de-pressurised.

1. Cut off the power from the pump (BP model only).
2. Switch the humidifier off.
3. Close the supply tap.
4. Close the tap on the storage tank.
5. Disconnect one of the tubes from the storage tank and collect the excess water.
6. Exchange the filters by unscrewing the filter holders.  
Beware: The filter holders still contain water.

7. Before re-installing the filters, the O-ring must be checked for damage and correct seating.
8. The holders can be cleaned with soap and water or with chlorine, if necessary. Rinse thoroughly afterwards.
9. After re-installing, screw the holders back into place (hand-tight!).

#### Starting up again:

1. Open the supply tap and let the system flush through for about 5 minutes (in order to flush out any air).
2. Supply voltage to the pump.
3. Reconnect the tube to the storage tank.
4. Open the tap on the storage tank.
5. Wait until the system reaches the correct pressure (the discharge water will stop).
6. Switch the humidifier on again.

## 11. CHECKING THE DEMINERALISED WATER

- Take a sample of the supply water.
- Measure the conductivity of the supplied tap water using a micro-siemens meter.
- Take a sample of the demineralised water.
- Measure the conductivity of the demineralised water using a micro-siemens meter.
- Divide the value found for the demineralised water by the value found for the supplied tap water and multiply the result by 100%:
  - < 10%: the water quality is good
  - Between 10% and 20%: the water quality is acceptable
  - > 20%: the water quality is poor – replace the membrane.
- If the micro-siemens value for the supplied tap water is >500 uS, it is recommended to install a de-scaling system ahead of the R.O. system.

## 12. CHECKING THE BUFFER TANK

If the buffer tank is not completely filled during the start-up procedure, it is possible that the pressure in the tank is too high compared to the pressure of the supplied water. In this case it is possible to release some of the (air) pressure step-by-step via the valve situated underneath the tank under a black cap, until the tank is filled. It is also possible to measure the pressure with the same kind of meter that is used for car tyres.

To check that the pressure is not too low, the tank must be disconnected with the tap closed. Open the tap in an area where this is possible and allow the tank to empty completely.

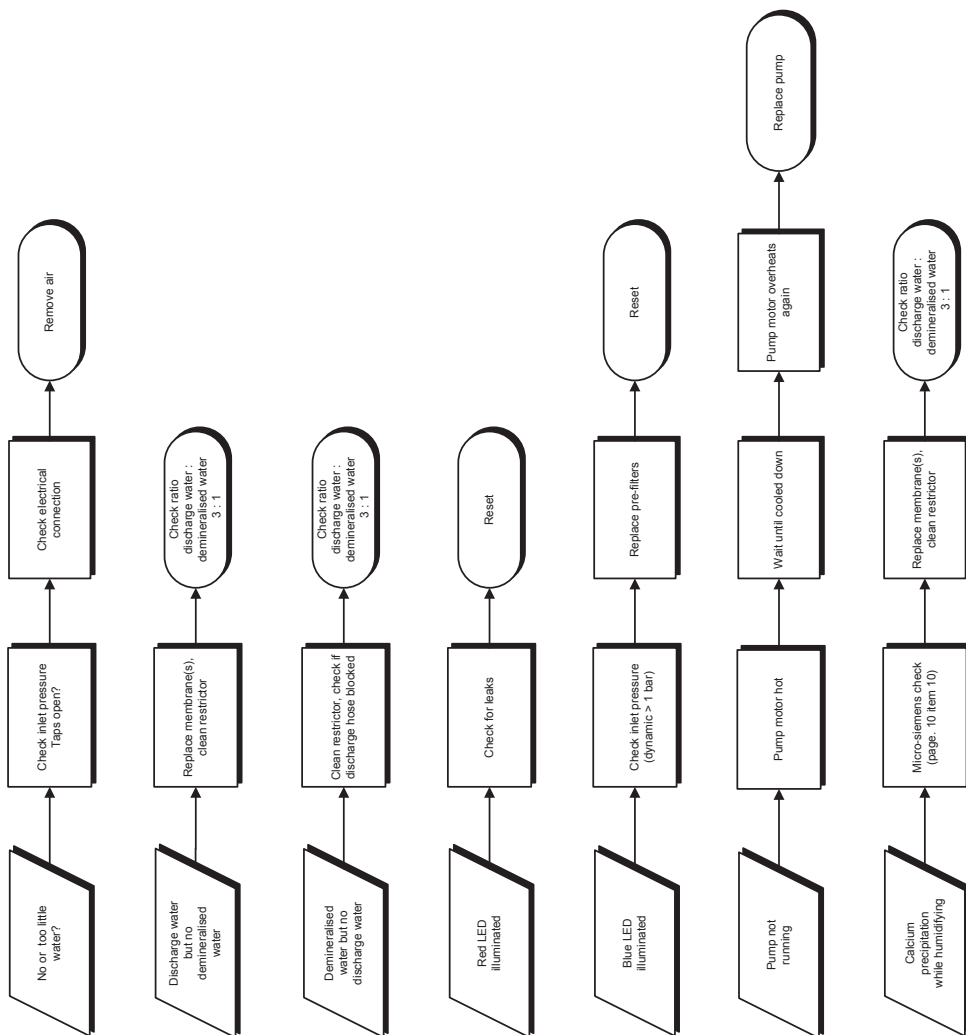
If the pressure is too low, it is possible to increase the pressure using the valve and the same system that is used to increase the pressure in car tyres. The pressure is normally adjusted to 0.45 bar.

If the humidifiers are installed at a higher elevation than the buffer tank, 0.1 bar must be added for every metre of height difference.

### 13. STORING THE SYSTEM

Always store the system in a frost-free area, but with a temperature that is as low as possible. If the storage period is to exceed 3 months, remove the membrane and store it fully immersed in disinfected water in order to prevent desiccation and/or bacterial growth.

## 14. MALFUNCTIONS



## 15. SPECIFICATIONS

	LP-10	LP-10BP	LP-20BP	LP-30BP	LP-60BP	LP-100BP
Maximum production in kg/day at 25 °C water temperature	375	560	750	1125	2250	3600
Maximum production in kg/day at 10 °C water temperature	240	360	480	720	1440	2310
Retention of salts and minerals (%)	98	98	98	98	98	90
Yield compared to supplied water (%)	20-35	20-35	20-35	20-35	20-35	20-35
Ambient temperature	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C
Water temperature	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C	0 °C till 25 °C
Power consumption (W)	0	25	25	250	250	250
Minimum pressure	2 bar	1 bar	1 bar	1 bar	1 bar	1 bar
Dimensions (LxWxH cm)	36x23x38	36x23x46	36x23x46	50x35x54	50x35x54	50x35x54
Content of buffer tank (kg)	10	10	10	10	10	10 (2 x)
Buffer tank dimensions	26 x 40	26 x 40	26 x 40	26 x 40	26 x 40	26 x 40
Inlet pressure (bar)	0,45	0,45	0,45	0,45	0,45	0,45
Net weight (kg)	3,9	7,7	8,7	16,3	18,1	18,1

## 16. OPTIONS LP-10WS, LP-10WSG en LP-10WSWSG

This extra user manual provides specific operating, installation and maintenance instructions for the LP-10WS, LP-10WSG and LP-10WSWSG options.



Figure 7. LP-10WS

LP-10WS is an LP-10 combined with a permeate pump. The pump, which is powered by water, ensures that the rinsing water is used more efficiently. The LP-10 needs 30 litres of rinsing water to produce 10 litres of demineralised water. The LP-10WS uses only 20 litres. Annually the LP-10WS saves 85 m<sup>3</sup>. See the graph and specifications on page 19.



Figure 8. LP-10WSG

The LP-10WSG monitors the membrane function continuously. Normally the membrane is checked 1 x a year. This is now done automatically and will show when the membrane needs to be replaced. If the quality of the membrane sinks below a certain level, the humidification system that is connected to the LP-10WSG is switched off. See specifications page 19.



Figure 9. LP-10WSWSG combines the options WS en WSG



## 17. INSTALLATION PROCEDURE

Ditto LP-10. See page 9. The only difference being putting the plug for the LP-10WSG and the 10WSWSG in the socket.

## 18. STARTPROCEDURE

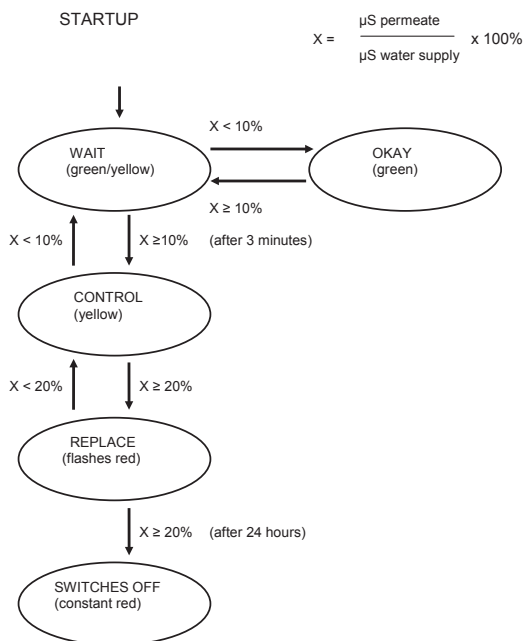
See page 11. The green or green/yellow LED lights up when LP-10WSG and LP-10WSWSG has been installed. After a few minutes, and with a good supply of water, the green LED is the only one lit up.

## 19. MAINTENANCE

The LP-10WS, LP-10WSG and the LP-10WSWSG only need the maintenance described on page 11. There is no maintenance for the WS and WSG options.

## 20. OPERATION OF LP-10WSG

The osmosis is working properly if the green LED is lit up. The membrane needs replacing during the maintenance inspection if the yellow LED lights up. If the red LED flashes the membrane must be replaced at once. If it is not replaced within 24 hours, the red LED will light up and the connected humidifier will be switched off.

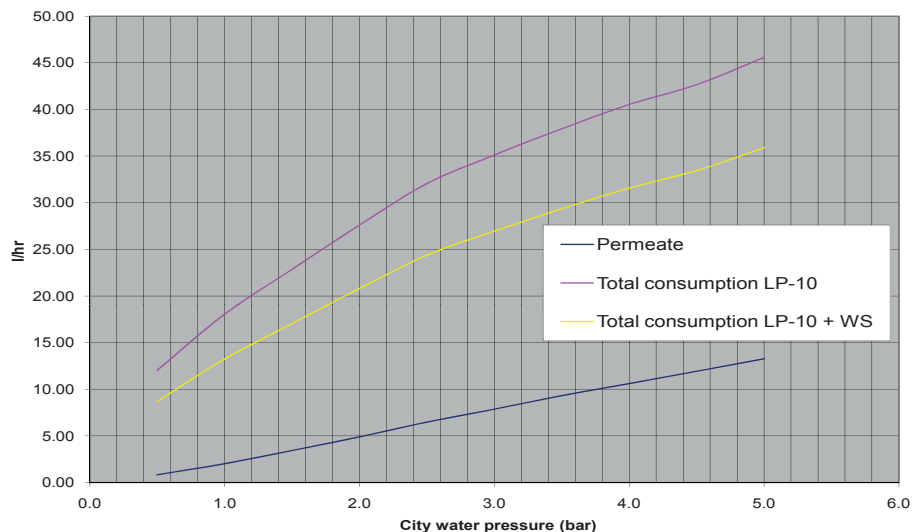


## 21. SPECIFICATIONS

	<b>LP-10WS</b>	<b>LP-10WSG</b>	<b>LP-10WSWSG</b>
Electricity consumption (W)	n/a	2	2
Mains voltage (V)	n/a	230	230
Maximum switching capacity (W)	n/a	500	500
Yield in respect to added water (%)	1 : 2	1 : 3	1 : 2
Water yield per hour (L) (3.5 bar)	10	10	10
Dimensions LxBxH (cm)	36x23x43	36x23x43	36x23x43
Net weight (kg)	4,5	4,8	5,2

	<b>LP-10BPWS</b>	<b>LP-10BPWSG</b>	<b>LP-10BPWSWSG</b>
Electricity consumption (W)	25	277	27
Mains voltage (V)	230	230	230
Maximum switching capacity (W)	500	500	500
Yield in respect to added water (%)	1 : 2	1 : 3	1 : 2
Water yield per hour (L) (3.5 bar)	18	15	18
Dimensions LxBxH (cm)	36x23x46	36x23x46	36x23x46
Net weight (kg)	7,6	7,9	8,3

	<b>LP-20BPWS</b>	<b>LP-20BPWSG</b>	<b>LP-20BPWSWSG</b>
Electricity consumption (W)	25	27	27
Mains voltage (V)	230	230	230
Maximum switching capacity (W)	500	500	500
Yield in respect to added water (%)	1 : 2	1 : 3	1 : 2
Water yield per hour (L) (3.5 bar)	23	20	23
Dimensions LxBxH (cm)	43x23x46	43x23x46	43x23x46
Net weight (kg)	9	9,3	9,7

**LP-10 CAPACITY<>CONSUMPTION**

**DISCLAIMER**

Contronics works continuously on the further development of its R.O. systems. We therefore reserve the right to modify the design, construction and technology of the product at any time. For this reason, no claims can be made based on the data, illustrations and description in this user manual.

**Additional, up-to-date information is available on [www.contronics.nl](http://www.contronics.nl).**

