

SMEVA*

INSTALLATION AND SERVICE MANUAL

HYDRO 65-3

Version 2006



Enter Our World of Freshness



Enter Our World of Freshness

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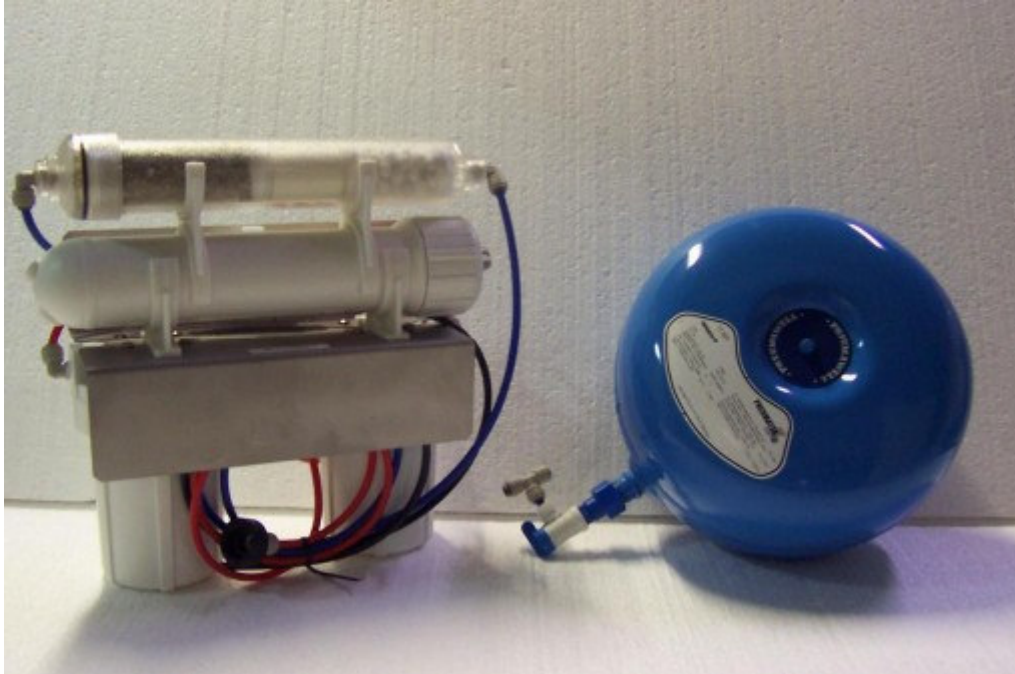
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2 HOW DOES REVERSE OSMOSIS WORK

The principle

Hydro 65-3 is a compact water purification system based on RO principle. RO is one of the most effective filtration methods to achieve enduring humidification, a semi permeable membrane only permits pure water to penetrate its core thus creating pure water with only 5% of its original contamination.

Two pre filters are used to prolong the life of the membrane by filtering out the above 5-micron sediments and chlorides. They are called Sediment and Active Carbon filters.

The post filter is specifically applied for the Weight Saver. It increases the conductivity of the pure RO water thus guaranteeing the function of the water level sensor.

3 Water consumption

The pure water production capacity of a Hydro 65-3 is related to the water supply pressure and temperature, as shown below.

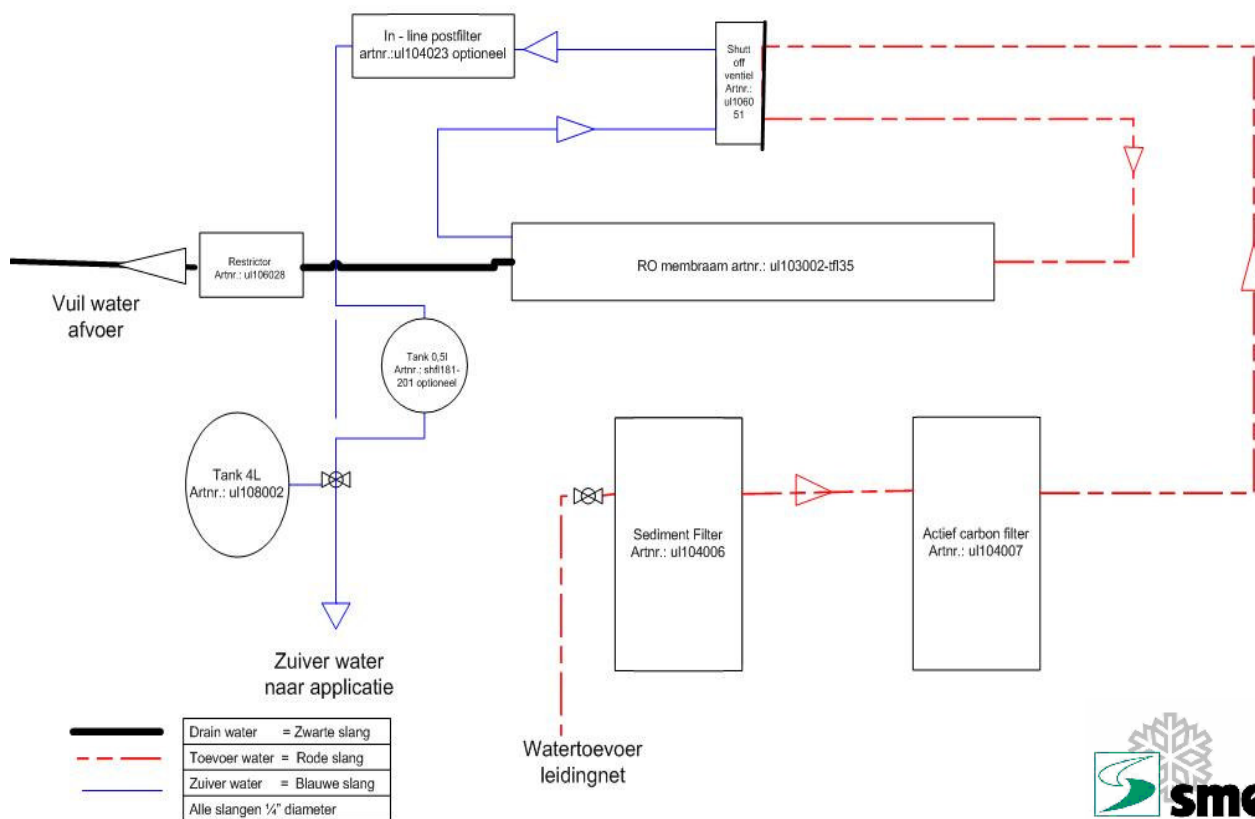
Water pressure	4 Bar	3Bar	2 Bar
Membrane 36 in l/day	95	75	60
Maximum water consumption l/day	235	225	210

Data is measured at 15 C° water temperature, if temperature is less deduct 2,7% per degree Celsius of RO water production.



4 Flow-schedule.

Flow schema Hydro 65-3 omgekeerde osmose waterfilter met nafiltratie INLINE



1. Pre filter S (Sediment), removes above 5 micron particles from the mains water supply.
2. Pre filter A (Active Carbon) removes odours, taste, chlorides etc to protect membrane.
3. RO membrane removes up to 95 % of all dissolved minerals from feed water.
4. Shut off valve regulates feed water supply.
5. Flow restrictor manages water discharged as rejected water.
6. Post filter increases water conductivity of RO water.
7. Pressurised storage tank for RO water.
8. For installation and maintenance purposes are 2 on/off valves incorporated.
Nr. 1 on 1/4 side of sediment filter. (S)
Nr. 2 on outlet of 4L Tank



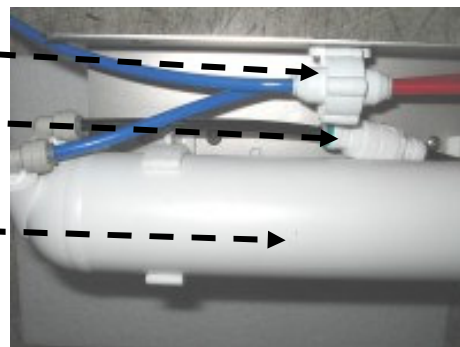
5 Components

The Hydro 65-3 water purification system is mounted on a stainless steel bracket. This is fitted with:

- 2 pre filter housing of ABS plastic.
- Pre filter S, containing a white sediment cartridge 0170822
- Pre filter A, containing an active carbon cartridge 0170824
- 1 piece 1/4" on/off valve 170850 mounted on housing of pre filter S, with attached 1,5m red 1/4" tube and a single internal 3/4" bsp union connector to water supply valve.



- Shut-off valve 0170832. Connected to red and blue tubes.
- Flow restrictor 0170834. Connected to 1,5m black drain tube.
- 1 horizontal mounted white RO membrane housing, which contains a 36 GpD membrane 0170828.



- 1 horizontal on top of membrane mounted post filter 0170826. It contains of 3 sections and is connected to the 1,5m tube and connected to the 4L tank.



Ancillaries supplied depend on the model:

- Compact 0.5L pressurised water storage tank for maximum 1 Weight Saver.



- A 4L pressurised water storage tank 0170858 inclusive Elbow valve and connection kit with T. For maximum 3 Weight Savers.



N.B.

All connections are 1/4" push/pull fittings to release tube from fitting, hold back small O-ring, while pulling tube out.



6 Conditions of water supply

1. A water supply valve equipped with a non-return valve and others must install $\frac{3}{4}$ BSP external thread on site.
2. A free flow drainage connection of at least 25mm must be present at location
3. Check mains water pressure, if lower than 2 bar equip Hydro 65-3 with a booster pump (0170842) Be Aware this is not a stock item, so delivery time can be expected. Pump will require a 230VAC power supply.
4. Take a water sample and check the quality with a dH tester or TDS tester, this determines the life span of the membrane. It may not exceed 25 dH; if higher a water softener is mandatory.

ASK YOUR LOCAL WATER SUPPLY COMPANY FOR THIS DATA!

Check the water with a dH water test set (0170856), or a TDS-meter (0170846).
For more information see chapter 4.

7 Construction preparation

Hydro 65-3 is a standard item to be placed inside the counter with the humidification system. If desired the unit can be placed in another room, where it is accessible for service and maintenance. Mount the HYDRO 65-3 vertically on a wall close to a water supply and drain point. Distance between Hydro 65-3 and Weight Saver must not exceed 25 meters. The pure RO water is distributed by a pipe or tube which suitable for slightly aggressive water.

PURE RO WATER IS CORROSIVE TO COPPER, IRON AND BRASS

8 Tools

There is no need for special tooling. Installation is simple with the proper tools. We recommend following:

- A powerful cordless drill.
- Wrench.
- A screwdriver set.
- Tube cutter. (0170838)
- Unlock key set. (0170836)
- A set of pliers.
- TDS water tester. (0170846)
- dH test set. (0170856)



9 Installation.

Before commencing check if determinations of chapter 2 have met, if so follow these instructions for easy installation.

DISCONNECT ALL ELECTRICAL APPLIANCES IN THE IMMEDIATE AREA TO GUARANTEE YOUR OWN SAFETY.

In general

- Push in tube fully into fittings. Do not shorten tubing, this makes maintenance easier.
 - Hold back O ring while pulling tube to release it from fitting.
1. Shut off all Weight Savers connected to the Hydro 65-3.
 2. Connect black tube to open water drain.
 3. Connect red tube with union connector to mains water supply fitted with $\frac{3}{4}$ bsp external thread, supplied by others.
 4. Be sure that on/off valve Nr. 1 is closed.
 5. Mount the pressure tank vertical or horizontal and use connection kit supplied to connect it with the blue tube from the post filter.
 6. Attach to other end of T piece the blue tube to make connection with Weight Saver.
 7. WATCH out! Close on/off valve Nr. 2 and do NOT connect blue tube to Weight Saver, but place it in a bucket, drain or sink.
 8. Open water supply valve and on/off valve Nr. 1. Flush the Hydro 65-3 for 10 minutes.
 9. Open on/off valve Nr. 2 and connect blue tube immediately to Weight Saver. (DO NOT STARTUP WEIGHT SAVER)
 10. Wait for about 7 minutes after opening valve Nr. 2, the water leaving the black tube (drain) must stop. In which case the shut off valve is fully working
 11. Hydro 65-3 is now ready to use! Turn on Weight Saver and check all connections for leakage.
 12. About 15 minutes after turning on the Weight Saver it should have enough water to function correctly.



10 Maintenance program

All RO systems need regular maintenance to guarantee its proper function. It is highly recommended to replace the A and S cartridges as well as the complete post filter every 12 months. At the same time commissioning of the humidification systems can be carried out. Non-standard sites, with very hard water will require shorter maintenance intervals for the S and A cartridge.

COMMISSION SCHEME			
Every:	4 months	8 months	12 months
Conductivity test in TDS	X		V
S, A and post filter	X		V
RO Membrane	X	Replace if TDS is too high	Replace if TDS is too high
Disinfection humidification unit	X	X	V

11 WATER dH HARDNESS AND TDS TEST

dH hardness test

Lifespan of membrane depends on the hardness of the water. It may not exceed 25 dH. If higher a water softener is mandatory. Lifespan in relation to dH may be estimated in relation to the figures shown below. TDS values are guidelines since it does not deduct the hardness but also other minerals.

- Lifespan of membrane is minimum 3 years if dH < 20 dH < 500 TDS.
- Lifespan of membrane is minimum 1 year of dH < 25 dH > 500 TDS < 800 TDS.
- Lifespan of membrane is minimum 6 months if dH >25 dH <30 dH > 800 TDS.

Tools

- dH test set (0170856)

TDS test

RO membranes must be checked yearly on its ability to remove TDS out of the water.

Tools

- TDS test set (0170846)

If recovery rate of conductivity is less than 65% (measured directly before Post filter) compared to mains water supply it needs to be replaced.



Protocol of test:

1. Take water sample before post filter after membrane.
 - Close water supply valve.
 - Close on/off valve Nr. 1 and Nr. 2 after 30 seconds.
 - Disconnect blue tube before post filter
 - Open briefly on/off valve Nr. 2 to get sufficient water into a clean water tray.
 - Write down value (A in formula).
 - Connect blue tube.

2. Take sample of mains water supply.
 - Disconnect red tube of on/off valve Nr. 1.
 - Briefly open water valve to get sufficient water into a clean water tray.
 - Write down value (B in formula)
 - Connect red tube
 - Open on/off valve Nr. 1 and Nr. 2 and water supply valve.

3. Calculate recovery rate with formula:

$$\text{Recovery rate} = 100\% - (A/B \times 100\%)$$

$$\text{Recovery rate} \geq 65\%$$

(A is RO water, B is mains water)

Example 1

Mains water: 800 ms/cm
 RO water: 80 ms/cm
 Purity: 90%

$100\% - (80/800 \times 100\%) = 90\% \rightarrow$ membrane is correct.

Example 2

Mains water: 800 ms/cm
 RO water: 320 ms/cm
 Purity: 60%

$100\% - (320/800 \times 100\%) = 60\% \rightarrow$ membrane needs to be replaced.



12 REPLACEMENT OF RO MEMBRANE

If membrane is OK, proceed with pre filter maintenance. If not carry out these instructions:

1. Disconnect red tube on housing.
2. Unscrew housing and take out old membrane.
3. Check and remove any visible dirt on the inside of the housing with a cloth or warm water.
4. Remove seal of membrane and rinse thoroughly.
5. Fit a new membrane identical to old membrane and screw housing together.
6. Reconnect red tube to housing.

13 REPLACEMENT OF PRE AND POSTFILTERS

Tools

- Unlock key set (0170836)

Pre filters

1. Close on/off valve Nr. 1 and wait 30 seconds before closing on/off valve Nr. 2.
2. Turn off all Weight Savers !
3. Remove blue tube of Weight Saver and drain water.
4. Replace cartridge in housing marked S.
5. If cartridge is dark brown or black reduce service interval to 3 months.
6. If cartridge is grey or white lengthen service interval by 3 months.
7. Close housing and take care that rubber O - ring is in the right position to prevent leakage.
8. Repeat above procedure for active carbon.

Post filter

1. Remove post filter and replace with new filter.
2. Open valve Nr. 1 and flush for 15 minutes.
3. Connect blue tube to Weight Saver and open valve Nr. 2.
4. Check for leakage and turn Weight Savers on.
5. Within 10 minutes the Weight Saver function correctly.



14 Trouble shooting

SYMPTOM	PROBABLE CAUSE	SOLUTION
Continuous water feed	RO membrane bad	Replace
	Leakage	Check fittings
RO systems produces noise	Lose screws or uneven balance	Tighten mounting screws
	Lose parts	Check and tighten
Leaking membrane housing	Check for small cracks	Replace item
	O ring defect	Grease O ring or replace
High conductivity of water after membrane	Damaged membrane	Replace
	Incorrect insertion of membrane	Change mounting
	Flow restrictor blocked	Replace or clean
	Drain tube blocked	Unblock or replace



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15 TECHNICAL DATA

Type

Model : Hydro 65-3
 S/N : Serial number
 MFD : Date of manufacturing.

Technical data

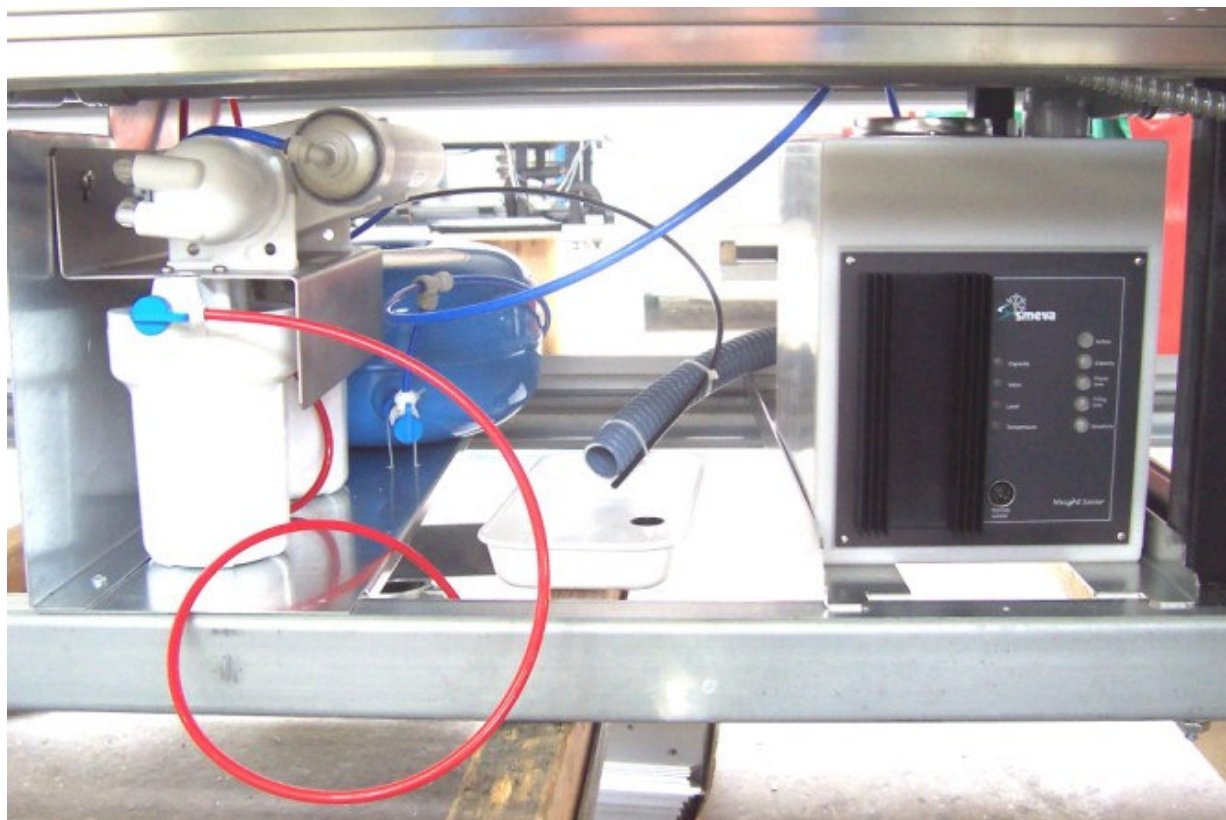
Power supply : 230 VAC (only with booster pump).
 Capacity nominal : 70L / 24h.
 Consumption nominal : 220L / 24h.
 Dimensions : 38cm x 15cm x 29cm (LxDxH)
 Built in filters : 1 micron sediment pre filter (5").
 1 Active Carbon pre filter (5").
 1 RO membrane type TFC
 1 post filter inline 10" – 2".
 Used materials : FDA (Food and Drug Administration)
 approved, JG push in fittings.
 Used filter : NSF (National Security Foundation) registered.
 Connection : 1 piece 3/4" - 1/4" union connector to mains supply.
 1 piece PP on/off valve on sediment filter.
 1,5m tube.
 All tubes colour coded for easy installation.
 Options : Water storage tank 0.5L.
 Water storage tank 4L incl. connection kit.
 Booster pump incl. transformer 230V-24VAC

Operating conditions

Maximum hardness of mains water : 25 dH
 Water pressure : 2 – 10 bar
 Temperature : +5 tot 35°C
 Humidity : 20 tot 100% rH



16 Example of installation in the technical area of counter



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17 Conversion Table

dh	fH	eH	milliecuivalent/ millival	ppm CaCO ₃	mmol/l CaCO ₃
1	1,78	1,24	0,36	17,80	0,18
2	3,56	2,49	0,71	35,60	0,36
3	5,34	3,73	1,07	53,40	0,53
4	7,12	4,98	1,42	71,20	0,71
5	8,90	6,22	1,78	89,00	0,89
6	10,70	7,47	2,14	107,00	1,07
7	12,50	8,71	2,49	125,00	1,25
8	14,20	9,96	2,85	142,00	1,42
9	16,00	11,20	3,20	160,00	1,60
10	17,80	12,40	3,56	178,00	1,78
11	19,60	13,70	3,92	196,00	1,96
12	21,40	14,90	4,27	214,00	2,14
13	23,10	16,20	4,63	231,00	2,31
14	24,90	17,40	4,98	249,00	2,49
15	26,70	18,70	5,34	267,00	2,67
16	28,50	19,90	5,70	285,00	2,85
17	30,30	21,20	6,05	303,00	3,03
18	32,00	22,40	6,41	320,00	3,20
19	33,80	23,70	6,76	338,00	3,38
20	35,60	24,90	7,12	356,00	3,56
21	37,40	26,10	7,48	374,00	3,74
22	39,20	27,40	7,83	392,00	3,92
23	40,90	28,60	8,19	409,00	4,09
24	42,70	29,90	8,54	427,00	4,27
25	44,50	31,10	8,90	445,00	4,45
26	46,30	32,40	9,26	463,00	4,63
27	48,10	33,60	9,61	481,00	4,81
28	49,80	34,90	9,97	498,00	4,98
29	51,60	36,10	10,30	516,00	5,16
30	53,40	37,30	10,70	534,00	5,34

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