



ERS ASSEMBLY AND DISASSEMBLY PROCEDURE



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Necessary tools:

- 1 wrench #7
- 1 wrench #14
- 1 wrench #17
- 2 wrenches #22
- 1 wrench #27
- 1 hammer
- 1 flat-bladed screwdriver
- 1 allen wrench #6
- 1 flat-nose plier

Disassembly

External fittings

- 1) Remove the in and out sea water stainless steel bands; remove the 8x6 fitting connected to the fresh water production (Fig.1);

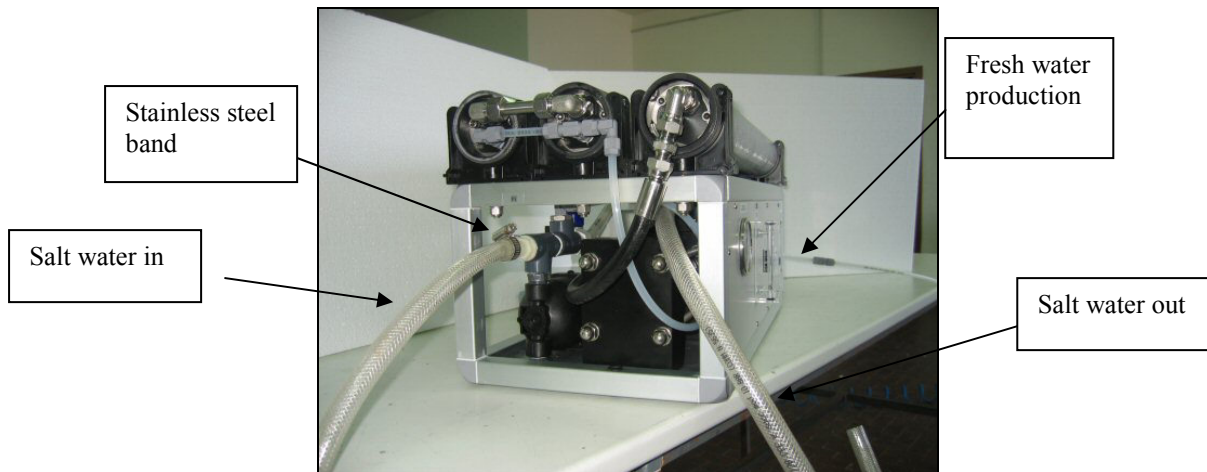


Fig. 1

- 2) Disconnect, using 2 wrenches, the 3/8 high pressure hose coming from the first tube, and the fresh water plastic fitting (fig. 2)
- 3) Disconnect, using 2 wrenches, the 3/8 high pressure hose coming from the third tube, and the plastic fittings of the depressurization valve and the plastic fitting positioned on the first cylinder (fig. 3)

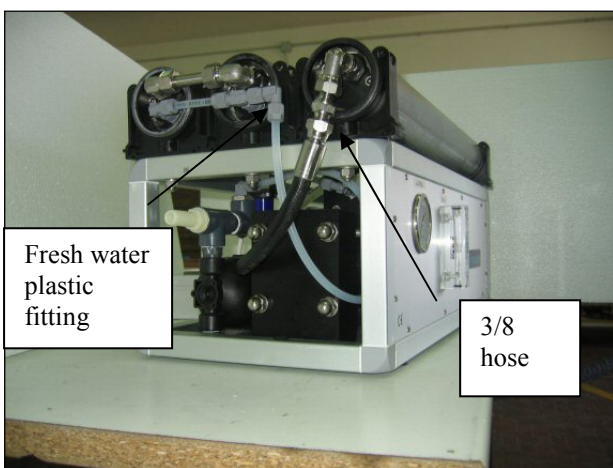


Fig. 2 – Left view

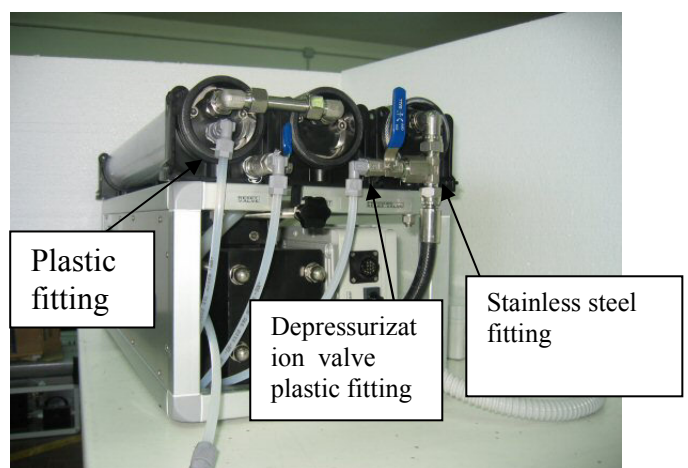


Fig. 3 – Right view

- 4) With a rigid tool (i.e. an hammer handle) make a lever between cylinders and aluminium structure.



Fig. 4 – High pressure cylinders lifting

- 5) Lift and handle with care the cylinders and put them on a clean horizontal plan (Fig.5);



Fig. 5

Internal fittings

- 6) Disconnect the white 5/8 fitting (sea water inlet) from the top of the accumulator;
7) Disconnect the grey plastic fitting coming from the reset valve, close the exhaust outlet)

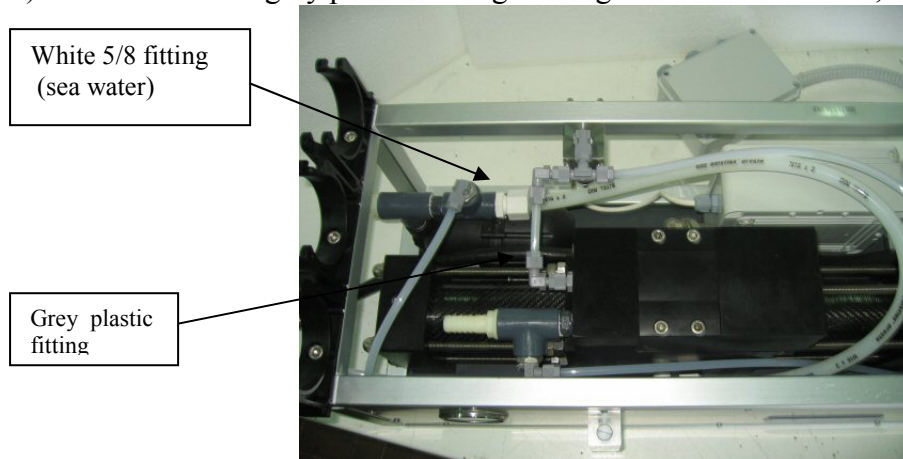


Fig. 6 – Top ERS view

Energy Recovery System

- 8) Unscrew the 2 DIN 963 screws 8x16 from the bottom of the structure (Fig. 7);
- 9) Unscrew the 4 DIN 912 screws M8x80 and pick-up the top part of the ERS (main valve) (Fig.8);

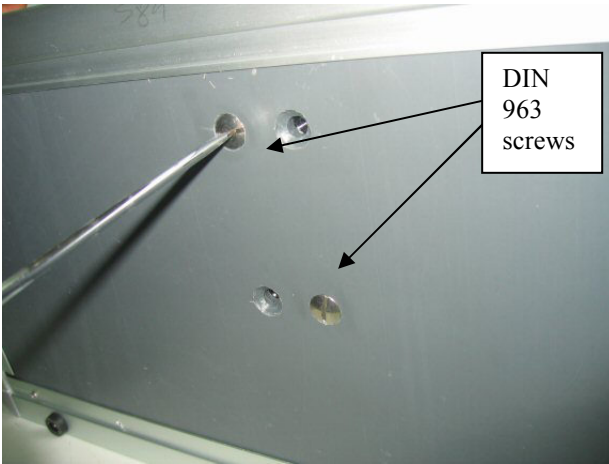


Fig. 7 – Bottom view

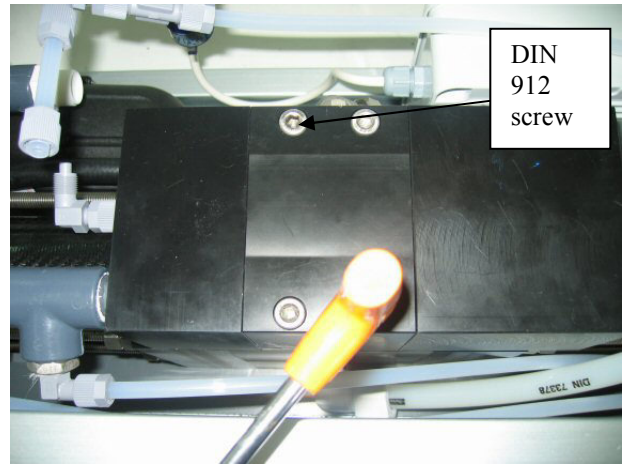


Fig. 8 – Top ERS view

- 10) Pick-up the bottom part of the ERS, with the two cylinders, and put it on a clean horizontal plan (Fig.9-10);

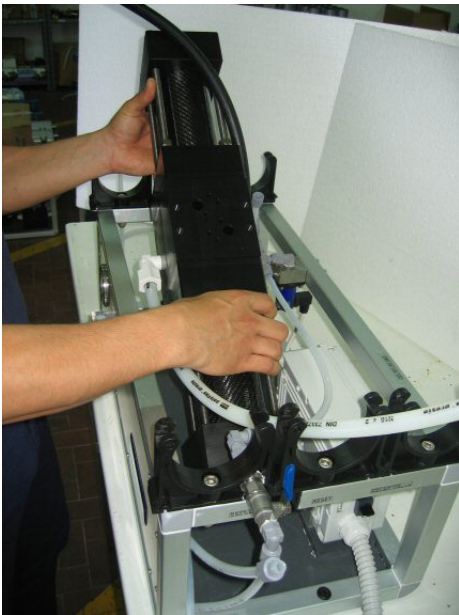


Fig. 9 – ERS removing

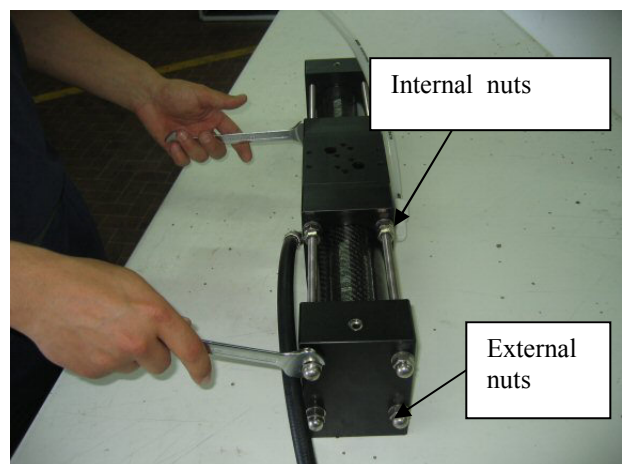


Fig. 10 – ERS dismantling

- 11) Remove the 8 external nuts M10 and the 16 M10 nuts (Fig.10);
- 12) Pull out the two carbon cylinders from the central part of the ERS;
- 13) Pull out the pistons from the rod;
- 14) Pull out the rod from the central part of ERS (pulling and rotating it slightly) (Fig.11);

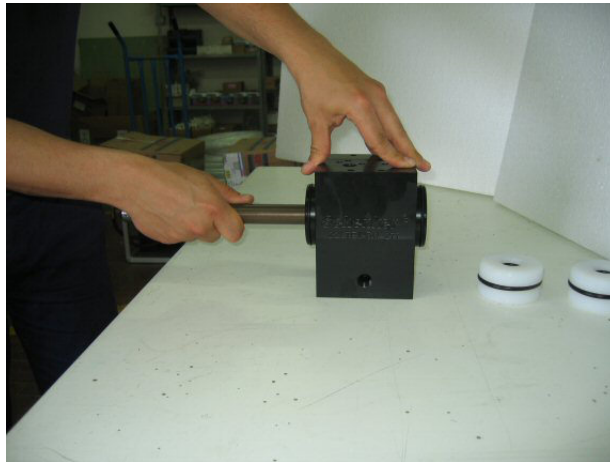


Fig. 11 – Extracting the ERS rod

Non return valves

- 15) With a flat-nose pliers, extract (if necessary) the non-return valves (Figg.12-14);



Fig. 12 – Removing cylindrical ring



Fig. 13 – Unmounted non-return valve

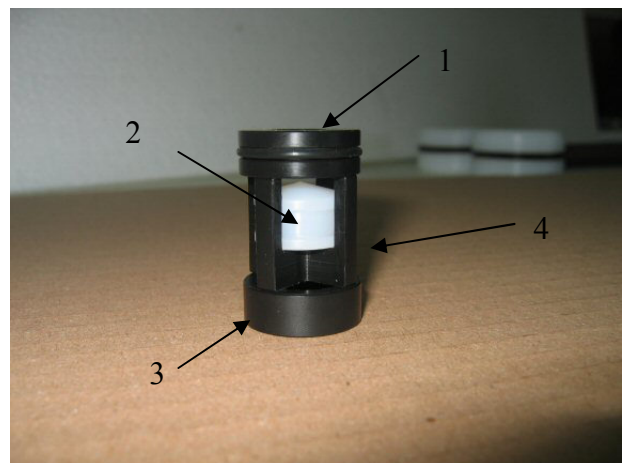


Fig. 14 – mounted non –return valve

Warning: do not use sharpened objects to remove the o-ring in order to avoid damaging the o-ring housing (Fig.15)

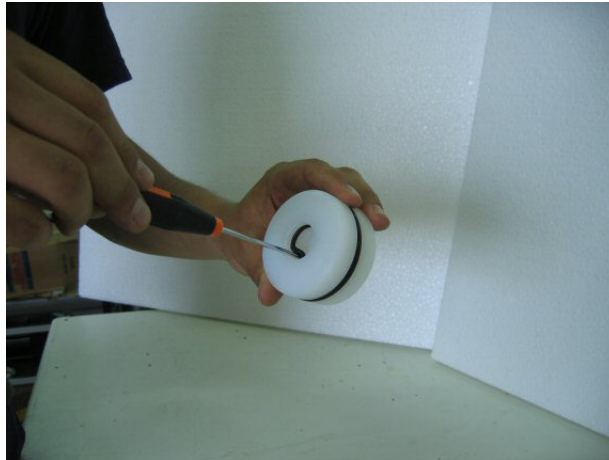


Fig. 15 – O-ring removal

Top ERS part (commutation valve)

- 16) Dismount left valve body (exhaust sea water side) unscrewing the 4 screws M8x70 DIN 912 (fig. 16);
- 17) Dismount the right valve body (reset arm side) unscrewing the 4 screws M8x100 DIN 912 (Fig.16);
- 18) Extract the small rod of the valve pushing out it strongly.(Fig.17);

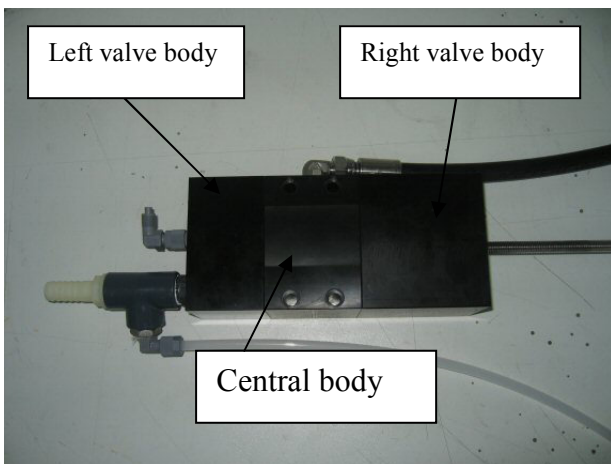


Fig. 16

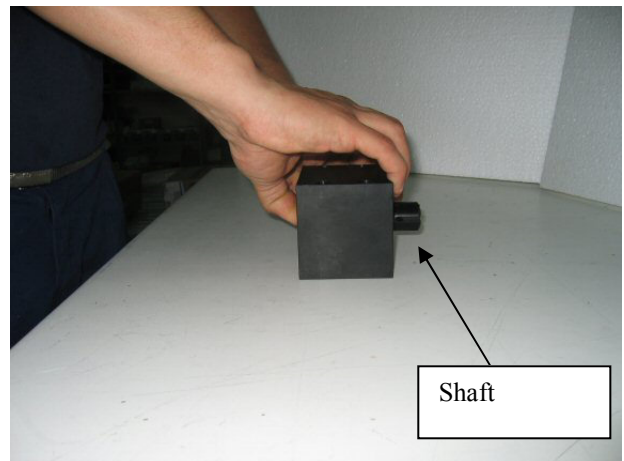


Fig. 17 – Extracting top ERS (Valve) shaft

Assembly

ERS bottom part

- 1) Insert the 4 non return valves into their housing;
- 2) Reinstall the external green o-rings eventually removed;
- 3) Insert the rod on the new central body;
Introduce 2 small fishing lines, well greased, between the terminal of the rod and the pistons (the fishing line is necessary to purge the air between pistons and rod)
Press strongly one pistons againsts the other.
Pull out the fishing lines
- 4) Remount cylinders and passing pivots.

The internal 8+8 nuts must be tighten very strong (up to 30-35 Nm). The external 8 nuts must be tighten (in cross way, like the car tires) with a **max torque of 20Nm**

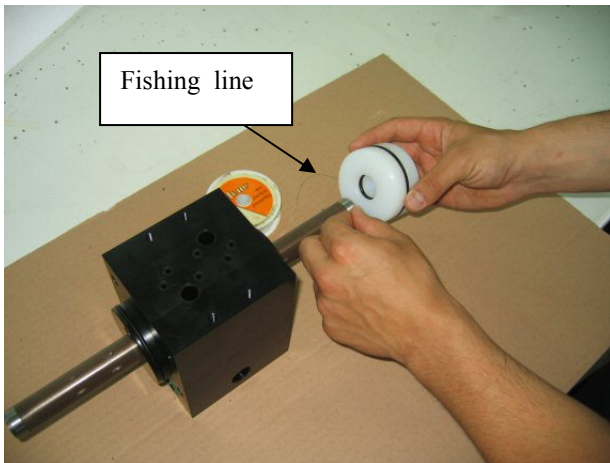


Fig. 18 – Mounting pistons

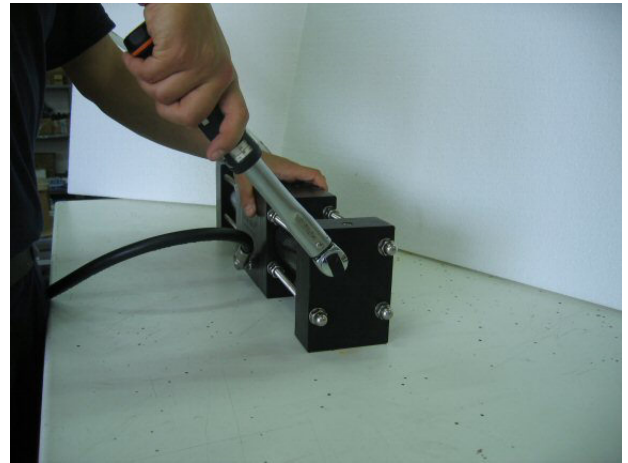


Fig. 19 – Mounting bottom ERS

- 5) Position the bottom ERS part inside the watermaker chassis. Fix the 2 DIN 963 screws on the bottom of the structure;

ERS top part

- 6) Grease the small rod with white silicone grease and insert it inside the main valve body (Fig.20);

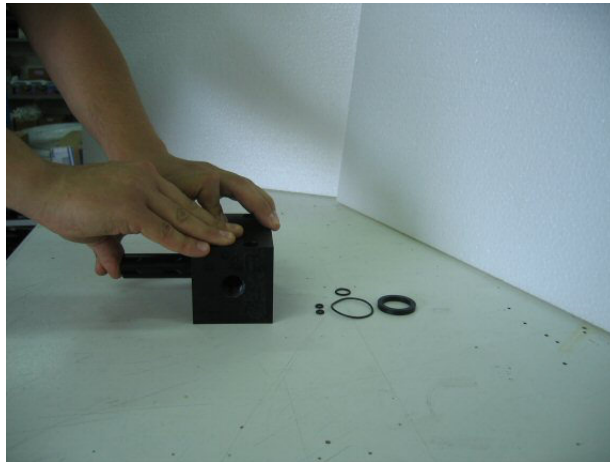


Fig. 20 – Mounting top ERS shaft

- 7) Assembly the left and right valve body, taking care to the correct o-rings position and fix through the 4 + 4 screws.
- 8) Position the 8 o-rings between the top and bottom ERS parts (Fig.21);
- 9) Put the top ERS part on the bottom part correctly, and connect them using the 4 DIN 912 screws (Fig. 8);

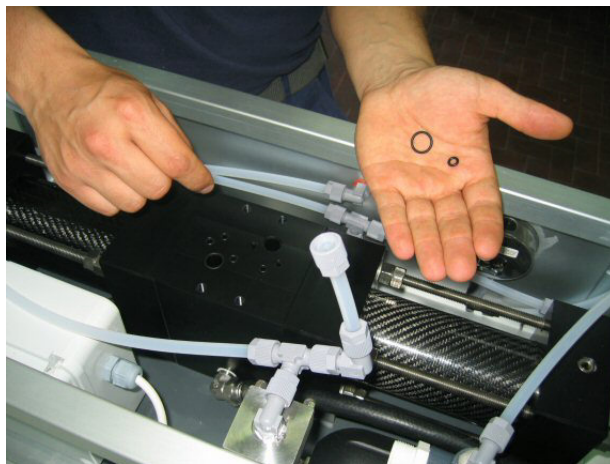


Fig. 21 – Positioning orings

Internal fittings

- 10) Screw the 5/8 white plastic fitting on the sea water inlet;
- 11) Screw the 8x6 grey plastic fitting on the left side of the valve to connect it to the reset valve (Fig. 6);

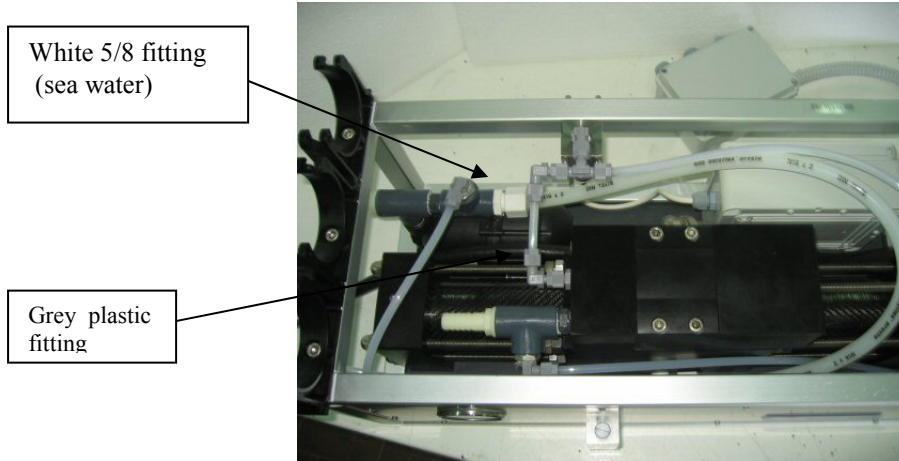


Fig. 6 – Top ERS view

- 12) Reinstall the high pressure cylinders on the supports pushing strongly on both sides with the hands (Fig. 22);



Fig. 22 – Mounting cylinders

External fittings

13) Reconnect, on the left side of the watermaker , the 3/8 high pressure and the fresh water plastic fitting (fig. 2)

14) Reconnect, on the right side, the 3/8 high pressure hose coming from the third tube, and all the plastic fittings (fig. 3).

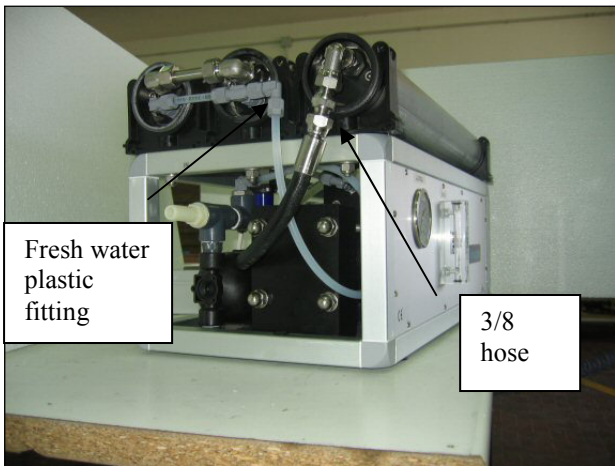


Fig.2 – Left view

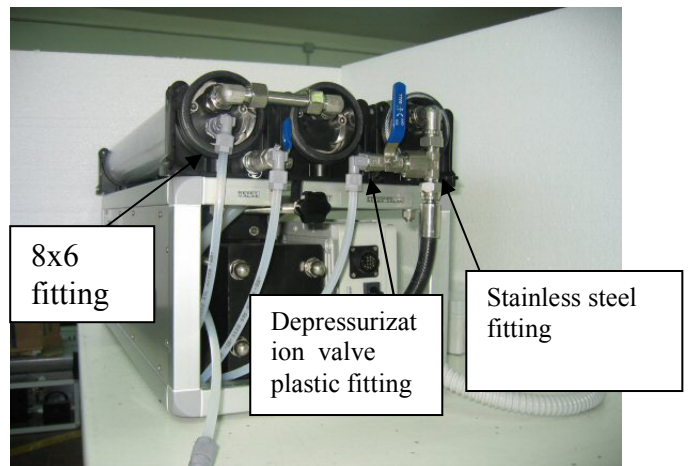


Fig.3 – Right view

Exploded views

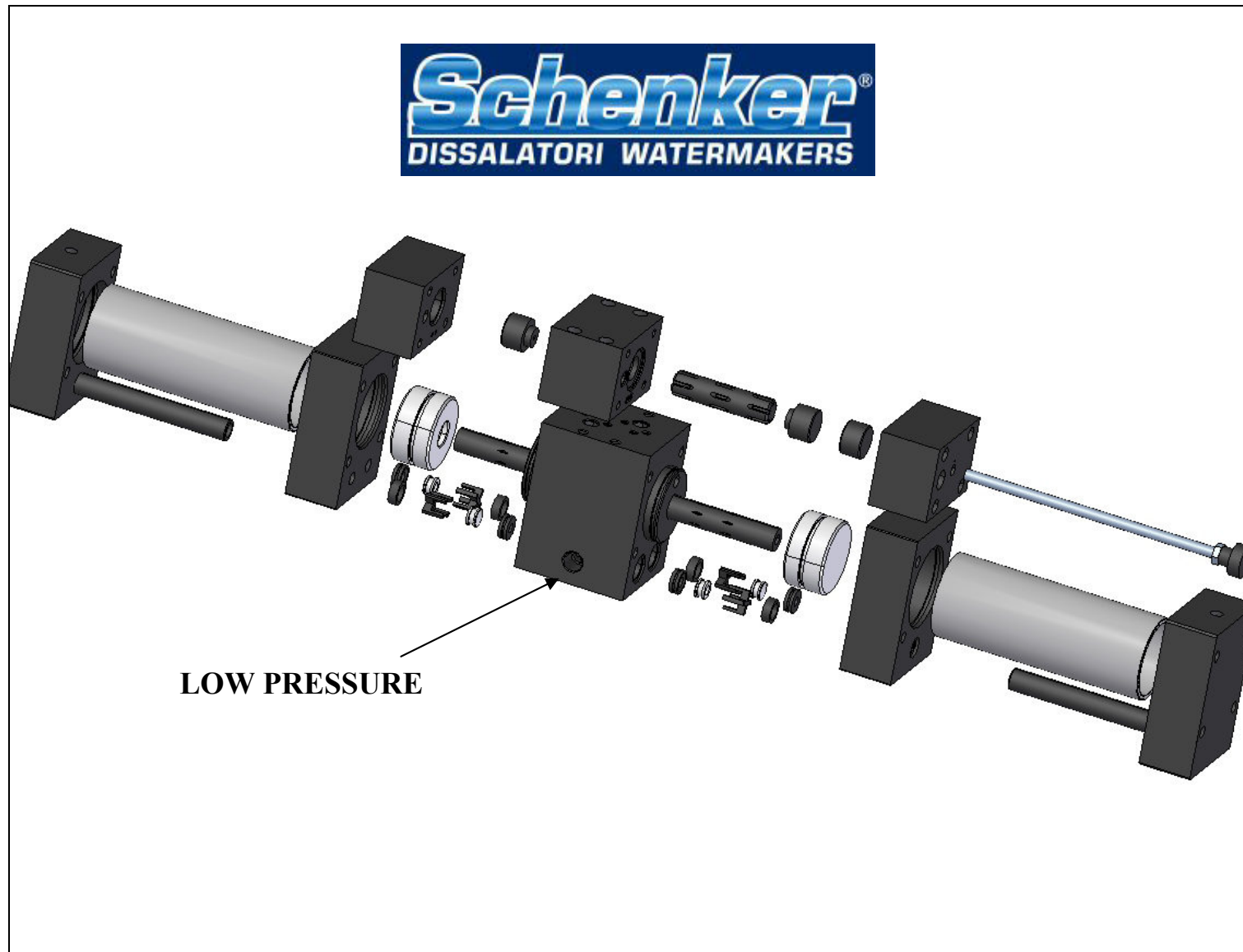


Fig. 24 – ERS – Exploded view

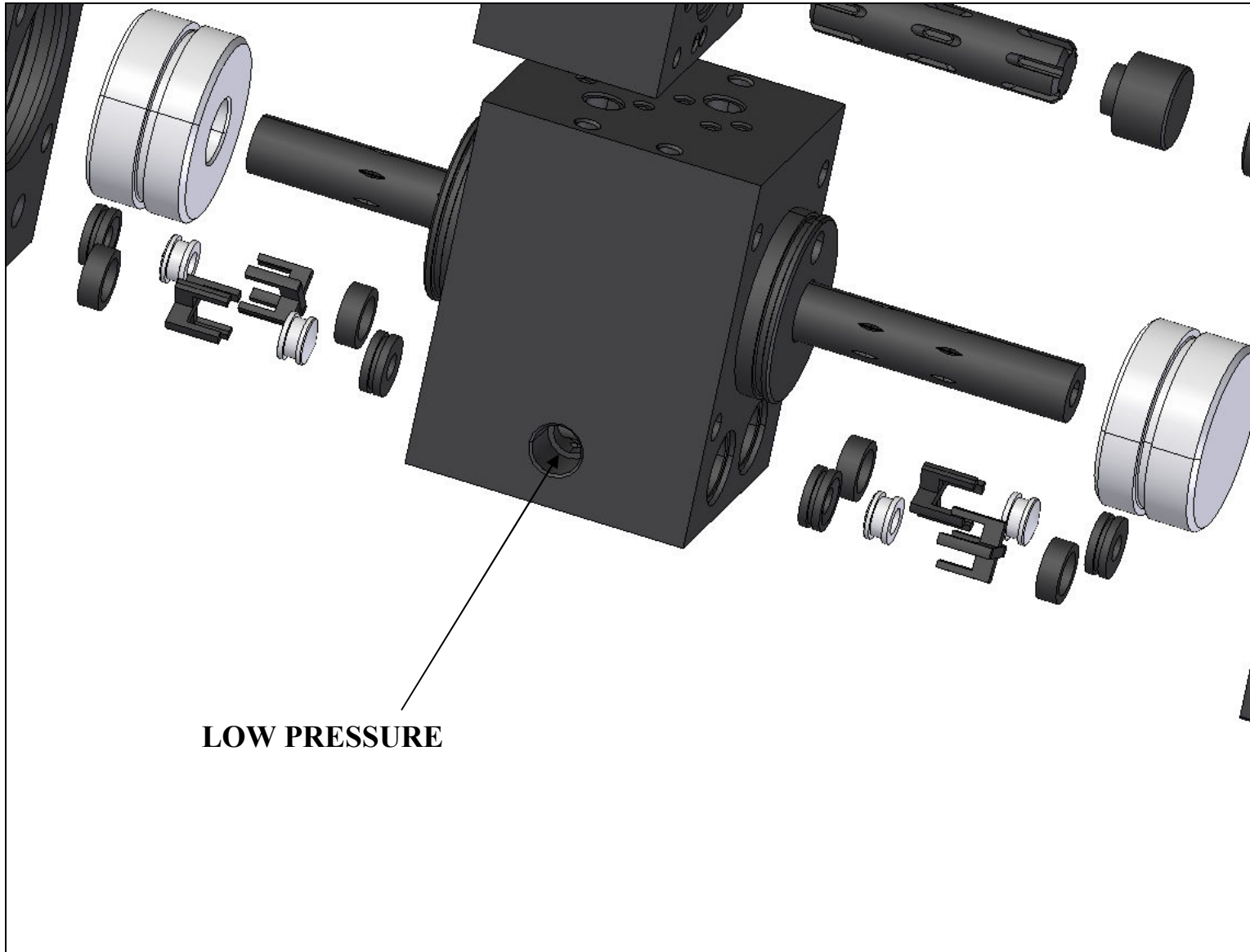


Fig. 25 – Detail of non return valves

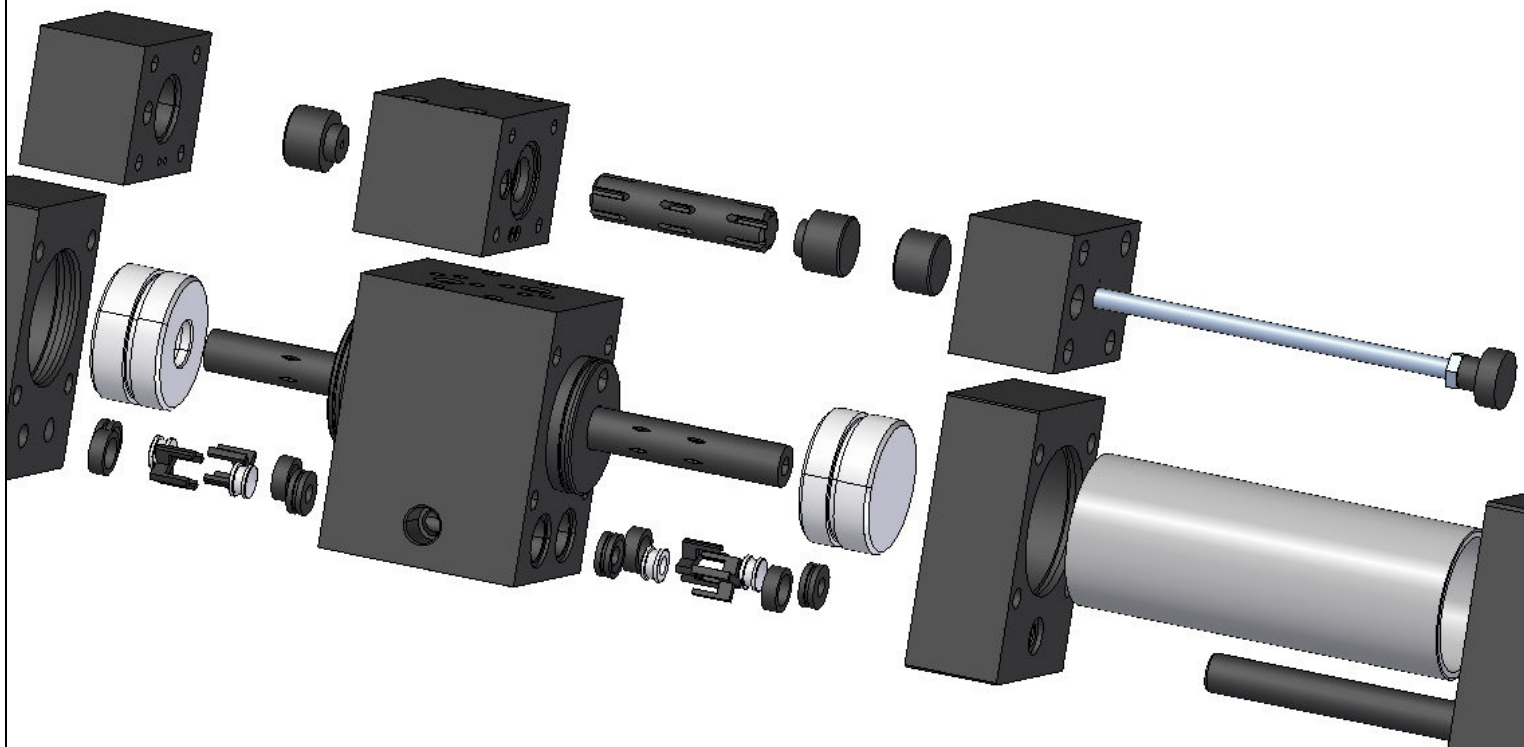


Fig. 26 – Detail of Ers – top part

O-RINGS TABLE

CODE	QUANTITY	MATERIAL	DIMENSIONS (mm)	USE
ORP2347262	4	POLYURETHANE	23,47x2,62	DYNAMIC O-RINGS
ORN3792178	2	NBR 70°SHORE A	37,92x1,78	TOP ERS: SEAL BETWEEN CENTRAL AND LATERAL BODIES
ORN447178	4	NBR 70°SHORE A	4,47x1,78	TOP ERS: SEAL BETWEEN MAIN AND LATERAL BODIES
ORN1250178	2	NBR 70°SHORE A	12,50x1,78	TOP ERS: SEAL BETWEEN MAIN AND LATERAL BODIES
ORN3142262	3	NBR 70°SHORE A	31,42x2,62	TOP ERS, PADS
ORN447178	6	NBR 70°SHORE A	4,47x1,78	SEAL BETWEEN BOTTOM AND TOP ERS
ORN1250178	2	NBR 70°SHORE A	12,50x1,78	SEAL BETWEEN BOTTOM AND TOP ERS
ORN7897353	8	NBR 70°SHORE A	78,97x3,53	BOTTOM ERS: CARBON CYLINDER SEAL
ORN2099262	4	NBR 70°SHORE A	20,99x2,62	BOTTOM ERS: LITTLE CARBON CYLINDERR SEAL
ORN5969533	2	NBR 70°SHORE A	59,69x5,33	PISTONS, EXTERNAL SEALS
ORN2339353	2	NBR 70°SHORE A	23,39x3,53	PISTONS, INTERNAL SEALS
ORN6477262	2	NBR 70°SHORE A	64,77x2,62	BOTTOM ERS, MAIN BODY: INTERNAL SEALS
ORN1877178	4	NBR 70°SHORE A	18,77x1,78	NON-RETURN VALVES SEALS
ORP2347262	4	POLYURETHANE	23,47x2,62	NON-RETURN VALVES SEALS
ORP2347262	6	POLYURETHANE	23,47x2,62	BOTTOM ERS, MAIN BODY: INTERNAL SEALS
ORN2352178	6	NBR 70°SHORE A	23,52x1,78	BOTTOM ERS, MAIN BODY: INTERNAL SEALS