



Manual

Kyma Watermaker Light Version

Instructions for installing, operating, and maintaining your
watermaker.

Version 1.2

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Manufactured and distributed by Ocean-Spring Watermakers e.K.

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1. Intended Use & Compliance

The plant is designed for desalination of seawater for the production of fresh water.
The facility is intended for the installation of pleasure boats and privately used yachts.

Declaration of Conformity

The manufacturer confirms that the product mentioned conforms to the following EU directives.

If the product is changed without our consent, this declaration becomes invalid.

Product: Watermaker, Modell Kyma series

Manufacturer:

Ocean-Spring Watermakers e.K.

Julian Schlichtenmayer

Gartenstr. 95/3

73430 Aalen

Fulfilled directives:

- 2006/42/EU Machine directive; 17.05.2006
- 2011/65/EU ROHS; 08.06.2011
- 2014/30/EU EMC; 26.02.2014



Aalen, 10.12.25

Julian Schlichtenmayer

Owner Ocean-Spring Watermakers e.K.

2. Scope of delivery

Designation	Quantity
Coarse dirt filter housing with insert and fittings	1
Sediment filter housing with expansion tank	1
Filter housing with activated carbon filter	1
Opening wrench for filter housings	1
Pump unit (Membrane pump for Kyma 30 light)	1
Control panel	1
Connection cable for control panel	1
Watermaker main unit	1
Hose barbs 16mm 3/8" plastic	2
90° elbow fitting 3/8" plastic	1
Quick connect line PE 3/8" product water	10 m
Hose clamps	25
Teflon Tape Industrial grade for Low-Pressure Fittings	1 roll
Connection box for BLDC motor (K60)	1

3. Specifications

Kyma 30 Light

Power consumption ¹	110 W / 9A @ 12V / 4,5A @ 24V
Output ¹	30 l/h +- 15%
Weight	24 kg

Kyma 60 Light

Power consumption ¹	280 W / 22A @ 12V / 11 A @ 24V / 5,5 A @ 48V
Output ¹	60 l/h +- 15%
Weight	30 kg

PH range	2-11
Chlorine tolerance	<0.1ppm
Salt retention capacity	>99.4%

¹ Specification based on salinity 35000ppm & 25°C water temperature

Reverse osmosis depends on the conditions of the sea water – Salinity and temperature have a big influence on the output of a conventional desalination plant. The Kyma Watermaker works with a fixed displacement keeping the output almost constant over a wide range conditions. However the different sea water conditions result in different pressure levels required to maintain this fixed output and therefore have an influence on the energy demand of the system.

4. Warnings

 Warning!	Never operate the system unattended. The system is only to be operated by persons who have been instructed in its use. Check the system regularly for leaks and close seacocks after using the system.
 Warning!	The membrane is provided with a preservative when new. If ingested, this can cause health problems such as irritation of the gastrointestinal tract. During initial and re-commissioning, the system must be operated in the discard for 30 minutes before product water is collected.
 Hint!	The watermaker must only be operated in clean seawater. Contamination such as oil and chlorine cannot be ruled out in ports or other closed waters. These contaminants lead to damage to the system, especially the membrane.
 Hint!	The watermaker must be put into operation within 12 months of delivery to avoid damage to the membrane due to bacterial growth.
 Hint!	Do not make adjustments to the over pressure valve on the pump unit as this has a safety function to prevent damages to the system.
 Hint!	Never completely shut off the product water line, as this can cause damage to the pipe system and the membranes.

5. Operation

The operation of the system is done via 2 buttons on the control panel.

The left button activates the pump and is used for starting and stopping the water production.

The right button activates both the pump and the solenoid valve at the carbon filter and is used to perform a fresh water flush of the system.



Illustration 1 – Control Panel of the Kyma light models

For bleeding the system and running chemics without pressure through the system the relief valve needs to be operated. It can be found on top of the main unit.

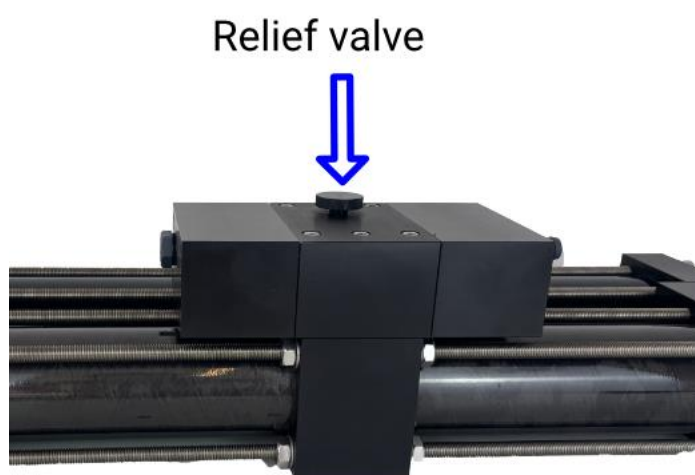


Illustration 2 – Position of the relief valve on top of energy recovery unit

Initial commissioning & start up of winterized systems

Please note when commissioning with a fresh membrane or after preservation:

The preservative, when new and used for extended downtime, must be flushed out of the system before storing product water in your tanks. To do this, let the system work for 10 minutes without pressure and another 10 minutes producing water in the discard.

Commissioning the system:

1. Make sure the relief valve is open.
2. Make sure that the necessary seacocks are open and all the hoses properly connected.
3. Make sure your boats fresh water pump is on.
4. Press flush to fill the carbon filter and system with fresh water. Wait at least until fresh water reached the inlet of the pump. Then stop the flush by disengaging the Flush button.
5. Press Start/Stop to activate the pump and let it run for 10 minutes with the relief valve still open.
6. Close the relief valve by turning the knob clockwise until it is hand tight.
 - a. The unit will now start producing water.
7. Wait for 10 more minutes to allow the chemics in the membrane to be fully flushed out before you check the product water and decide to let it into your tanks.

The unit is now commissioned and in use. For normal operation read following section.

Regular operation

Start up of the system:

1. Check if sea cocks are open and the condition of the strainer and sediment filter.
2. Press Start/Stop
3. Let the product water go to waste for a few minutes, test it and then direct it to your tanks.

Shutting down the system:

1. Disengage the Start/Stop button to stop the system.

If you use the system on a daily basis, you can generally go without fresh water flushing. However, we recommend flushing after each use to maintain the system in the best possible way.

Flushing

If the system is not used for several days, it is mandatory to flush with fresh water to prevent the growth of microorganisms, especially in the membrane.

Flushing should be repeated every 7 days if not in use.

For longer periods of non-use, it is advisable to preserve the system.

Procedure:

1. Press the Flush button on the control panel
2. The flushing process should take about the following times depending on your model:
 - a. Kyma 30: 2 minutes
 - b. Kyma 60: 1:30 minutes
3. Disengage the Flush button

The fresh water for flushing requires a sufficient pressure and therefore performance of the boats fresh water pump to allow for an effective flush procedure.

Required flow data for your boats fresh water pump:

Kyma 30: 5 l/min at 1 bar.

Kyma 60: 10 l/min at 1 bar.

6. Maintenance

Maintenance item	Intervall	Comment
Check for leaks	With every use	
Check of Strainer	With every use	cleaning in case of contamination
Pre filter change	Visual Check: Black outside= Change Pressure on gauge 1 bar lower than usual = Check	With low usage the filters are to be changed every 3 months at least (bacterial growth)
Cleaning of membranes	Once at end of season or upon indication see section Cleaning of the membrane	
Inspection and replacement of energy recovery systems seals	2000 h	

Pre-filter replacement

If the feed pressure drops below usual levels during operation and the output of the system drops, this is a sign of dirty pre-filters. Also a visual check is a good indication – If the filter is almost black on its outside it's time to change.

This applies in particular to the filter cartridge in the filter housing between the pump and the main unit.

Strainer:

The coarse dirt filter between the seacock and the pump must be checked regularly and cleaned if necessary, regardless of the gauge.

The coarse dirt filter can be washed out with clean water and reused.

Sediment filter:

The filter cartridges of the pre-filter unit must be replaced once fully loaded.

Use 9 3/4" melt blown filter cartridges with fineness of 5 µm and a specified efficiency of >90%.

Do not use pre-filters containing cellulose. These can decompose and damage the system.

Procedure:

1. Open the respective filter housing using the supplied wrenches.
2. Clean the filter element (coarse filter) or replace the filter element.
3. Clean the filter housing cup as well.
4. Open the pressure relief valve on the main unit.
5. Start the device and let it run until no more air bubbles are visible at the concentrate outlet of the main unit.
6. Close the pressure relief valve.

Preservation & winterization

If you do not use your system for a long time, or want to make it winter-proof, it must be conserved.

Do not use Sodium Disulfite /Sodium Metabisulfite!

For preservation, we recommend using propylene glycol or our acidic cleaning agents depending on the duration of shutdown and the expected storage temperatures.

Option Propylene glycol:

Propylene glycol fulfils two purposes in one: The system is protected against biological fouling in a material-friendly way and also frost protection is achieved.

If you expect frost, the product water hose must also be emptied or blown out.

Preservation with this substance protects your plant for up to 12 months of non-use.

Important! Use only undiluted propylene glycol without alcohol. Alcohol leads to damage to the membrane.

60% mixing ratio protects against frost down to about -27°C. For microbial protection, a mixing ratio of at least 25% is required.

Approximate information on the internal volume of the system to calculate the required amount of propylene glycol:

Kyma 30 – 3 l

Kyma 60 – 4 l

Required amount of propylene glycol for a mixing ratio of 30% (based on residual volume of water in the plant):

Kyma 30 – 1 l

Kyma 60 – 1,2 l

Option Acidic cleaning agent:

The acidic cleaner removes mineral deposits from the system and membrane and therefore is also part of regular maintenance of the system. If left in the system it also protects from bacterial growth on the membrane for up to 6 months. It does not provide any frost protection.

Use one 250g Container of our acidic cleaner and mix it with 10l fresh unchlorinated water. Pump the liquid into the and leave it in there for the whole storage period as described below.

Do not use Sodium Disulfite /Sodium Metabisulfite!

Conservation process:

1. Open the relief valve by half a turn.
2. Place a fresh sediment filter to the system and flush with fresh water before starting.
3. Connect the feed pump to a hose to be able to suck the preservative out of the container being used.
4. Lead the brine discharge hose from the main unit into the container with the preservative

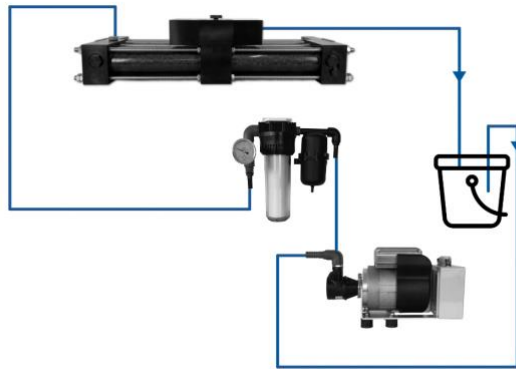


Illustration 3 – Water flow diagram for preservation and cleaning procedure

5. Fill the suction hose with preservative or water to prime the feed pump. Insert the hose into the container with the preservative.
6. Turn on the pump by pressing Start/Stop and check that the preservative is being sucked in.
7. Attention: The relief valve must be half way opened in order to reduce the pressure but still keep the energy recovery device cycling in order to get the liquid everywhere.
8. Leave the pump on for about 10 minutes.
9. Turn off the pump by disengaging the Start/Stop button.
10. Restore the original hose connections.

Cleaning of the membrane

Over the useful life of the watermaker, deposits can form in the membrane, which affect the performance of the system and the quality of the product water.

The use of a membrane cleaner can restore the performance of the system.

Indications for choosing the respective cleaner:

Acidic cleaner for the removal of mineral deposits (including limescale):

- The product water output is reduced / feed pressure increased compared to usual levels.
- the TDS may be slightly increased
- There is no foul smell in the product water

Alkaline cleaner to remove biofouling and light oil deposits:

- The product water output is reduced
- the TDS may be slightly increased
- There is a foul smell or taste in the product water
- The watermaker was operated in contaminated water

Never mix acidic and alkaline cleaners. The products must be used separately.

If you are unsure which cleaner to use, start with the acidic cleaner and use the alkaline cleaner only if the acidic cleaner has not brought any improvement.

Alkaline cleaners typically have a negative impact on the life of the membrane – so use them only when needed.

Procedure:

- Mix the cleaner
 - o Make a 2% solution of the respective cleaner and fresh, chlorine-free water. For only light contamination, a 1% solution may be sufficient.
 - o For a 2% solution, mix 250 g of cleaner with about 12.5 L of water.
 - o For a better effect of the cleaner, it is recommended to use warm water at about 40°C.
- The cleaning solution must now be circulated through the system. Proceed here in the same way as for preservation with the relief valve opened half a turn.
 - o No pressure must be built up during cleaning.
- At the beginning of the cleaning process, discard the first 3 litres of the solution.
- The remaining solution is now to be circulated for at least 60 minutes.
 - o In the case of heavy contamination, the cleaner can also remain in the system for several hours or overnight.
- Finally, the cleaning solution must be flushed out of the system, either with fresh water or with sea water.

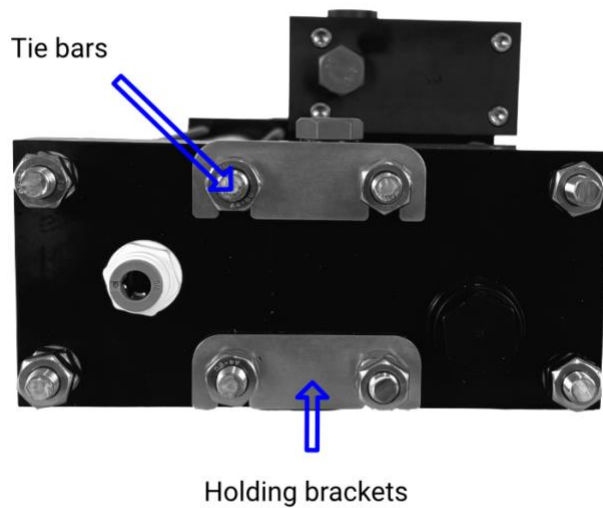
Changing the membrane

Required membrane size: 2521

If you need to remove or replace the membranes from the membrane housing, proceed as follows:

1. Disconnect the product water hose connections from the membrane unit.
2. Loosen the tension on the tie rods holding the fixation brackets in place
3. Pull out the fixation brackets
4. Push or pull the membrane unit away from the Energy recovery device.
5. Once the Membrane unit is detached loosen all its tie bars and remove them from the membrane housing.
6. Remove the end caps to open the Membrane housing. Turning the caps helps to overcome initial friction and to get them moving.

7. The membranes can be pulled out of its pipes now in the flow direction indicated on the pipe.
8. New membranes must be placed considering the flow direction. The seal on the Membrane must be on the inlet side.
9. Reattach the end caps into the pressure tubes.
10. Reassemble the tie rods and nuts
 - a. The nuts should be tightened so that the threaded rods do not flap loosely and got a little pretension.
 - b. A particularly high preload is not necessary or expedient.
11. Reattach the membrane unit to the energy recovery device and insert the fixation brackets.
12. Tighten the tie rods to secure the fixation brackets.
13. Reattach the product water line.



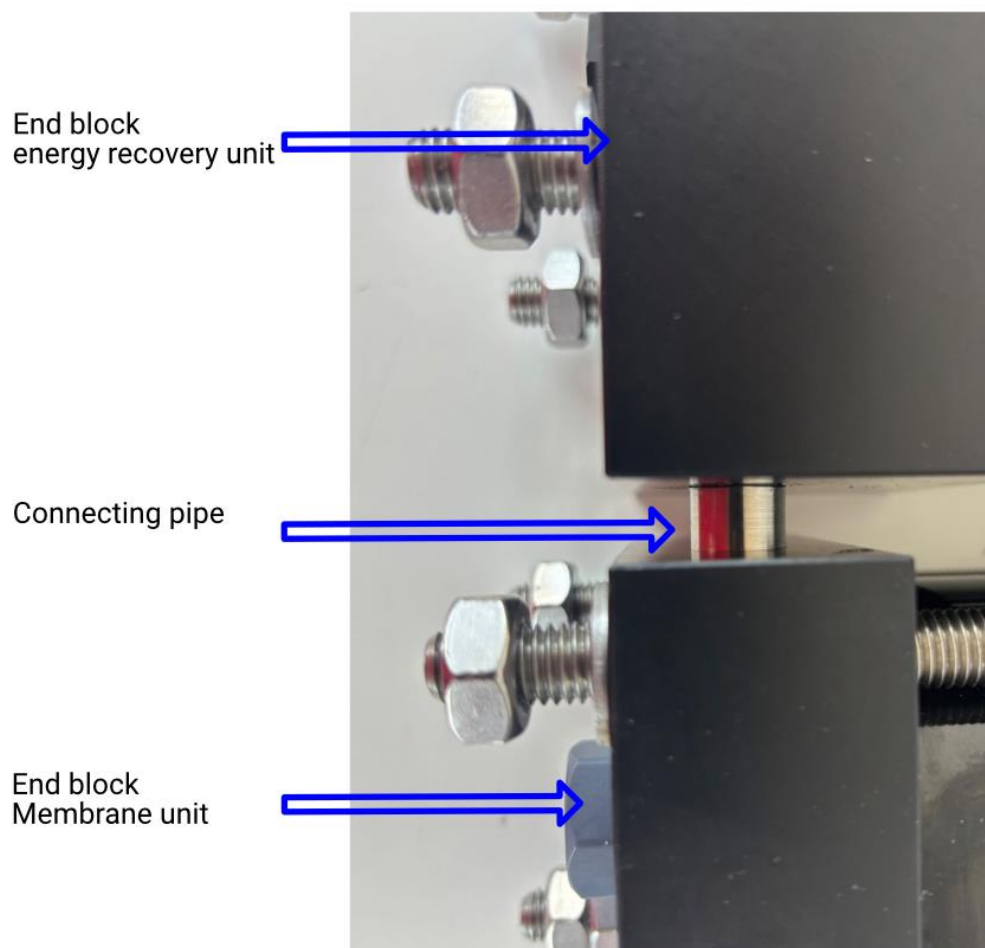


Illustration 4 -Dettachment of membrane unit from energy recovery system

7. Installation

Installation Location & Notes

The following are relevant installation notes for the respective components of the system.

Please read this section carefully before assembling the components.

You can choose the arrangement of the components as shown in Illustration 5 below.

 Hint!	To prevent the membrane from drying out, the main unit should be lower than the seawater outlet, or a loop in the brine discharge hose above the main units level should be done.
 Hint!	The supplied pump and the coarse dirt filter should be installed below or only slightly above the waterline.
 Hint!	The fresh water for flushing requires a sufficient pressure and therefore performance of the boats fresh water pump to allow for an effective flush procedure. Required flow data for your boats fresh water pump: Kyma 30: 5 l/min at 1 bar. Kyma 60: 10 l/min at 1 bar.

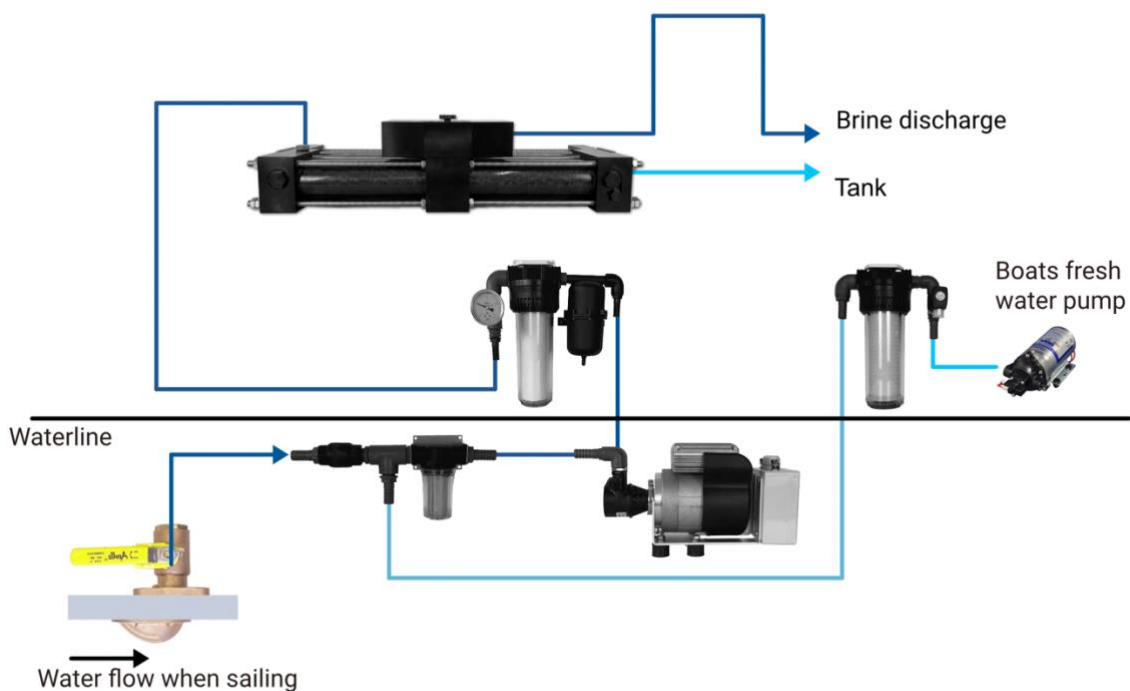


Illustration 5 - Arrangement of the assemblies

Seawater inlet and outlet

 Hint!	The seawater inlet must be designed in such a way that air intake is reliably avoided. Air in the system can cause damage to the high-pressure pump and membrane!
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For operation while driving, a seacock with water spoon (see example in Illustration 6) is required.

Location of the seacock:

Sailboats: Location below the waterline as amidships as possible.

Motor Boats & Yachts: Location below the waterline around the centerline in a further aft position.

Be aware of the state of the sea, as well as the movements of your vessel in relation to the location of the seacock, if you want to operate the watermaker. It must be avoided suck in air at any time.

Dimensioning of the Thru-hulls:

Model Kyma 30: min. ½"

Other models: min. ¾"

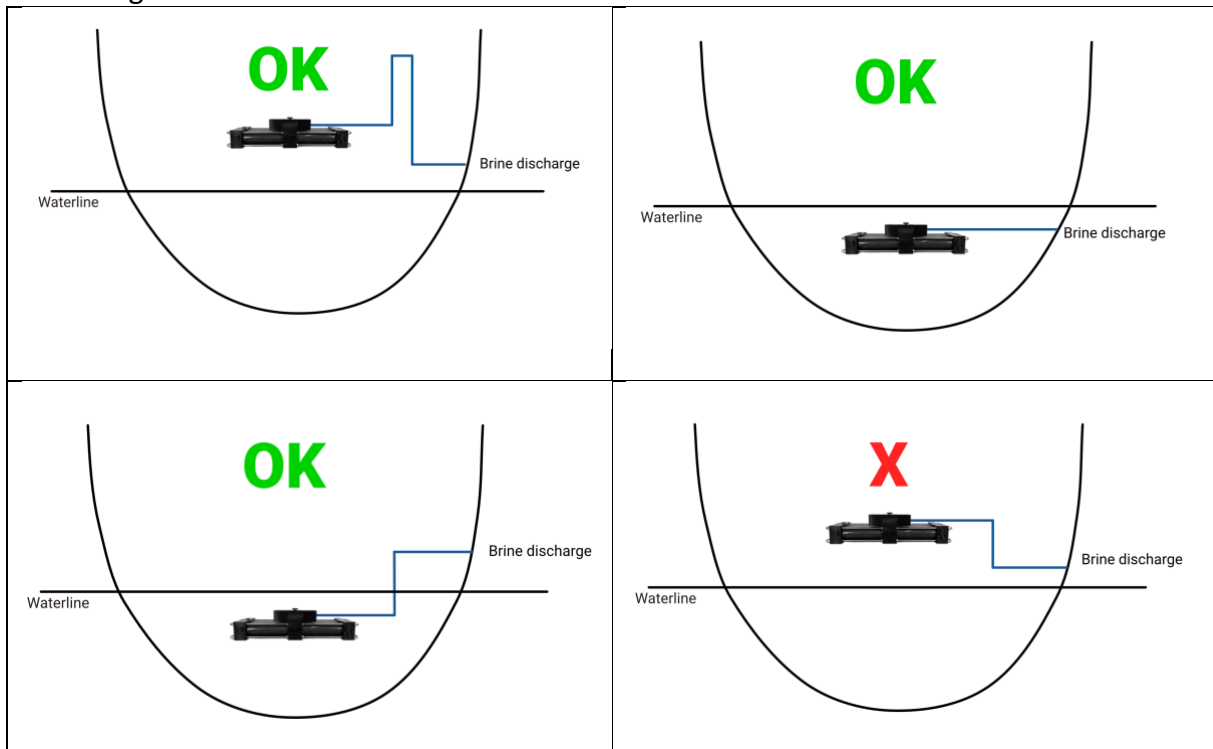
Thru-hull Not Supplied



Illustration 6 – Through hull with water spoon and marked direction of flow of the water while sailing

Brine outlet

The system could drain slowly if the through hull for brine discharge sits below the watermaker. Either you have the through hull for discharge higher than the watermaker, or you should raise the brine discharge hose above the main unit in a loop before leading it to the through hull.



Installation of the filter housings

 Hint!	All filter housings have a flow direction that must be considered during installation. To do this, pay attention to the arrow markings visible on the respective housings.
 Hint!	Do not use excessive force to tighten the locking rings of the filter housings.

In order to facilitate the replacement of the pre-filter cartridges, an easily accessible installation location for the pre-filter housings must be selected.

The filter housings are to be mounted vertically.

Mounting the pump unit

Installation of the pump unit

 Hint!	The supplied pump should not be operated dry. Before initial commissioning, make sure that the supply line to the feed pump is completely filled with water.
 Hint!	The used pumps are self priming however excessive suction pressure reduced efficiency and might shortens life span of the pump. Therefore it is still advised to place the pump below the waterline.
 Hint!	The pumps motors is cooled by air. The installation location must be either ventilated or large enough to avoid heating up the surrounding air and therefore overheating the motor.

The pump must be mounted either horizontally with its longitudinal axis, or vertically with the pump head facing downwards.

The hose lines from the seacock to the pump should rise continuously to avoid air pockets.



Illustration 7 - Pump Kyma 30 light (left) and Kyma 60 (right) with possible assembly orientations

Mounting the control panel

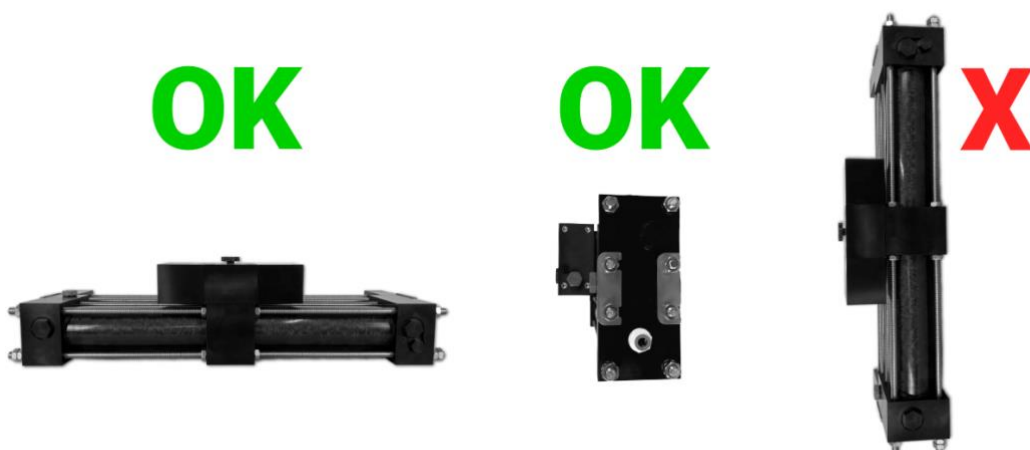
The control panel requires a rectangular cut-out of 82 x 42 mm.

Connect the control panel electrically by using the supplied cable to the connection box of the pump unit.

Mounting the main unit

 Hint!	In the state of delivery, the main unit is sealed and filled with liquid that may run out when opening the seal plugs.
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Installation position: The main unit should be mounted with its longitudinal axis horizontally either sitting flat on a horizontal board or mounted against a Wall.



Waterline

Illustration 8 – Possible assembly orientations for the main unit

Attach the supplied mounting brackets to the main unit. Mount the membrane unit using appropriate screw for your base. Either M6 bolts or diameter 6 wood screws should be used.

It is recommended to place a small piece of rubber mat below the mounting brackets to reduce sound transmission.

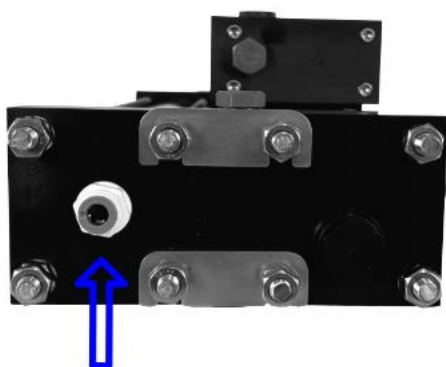
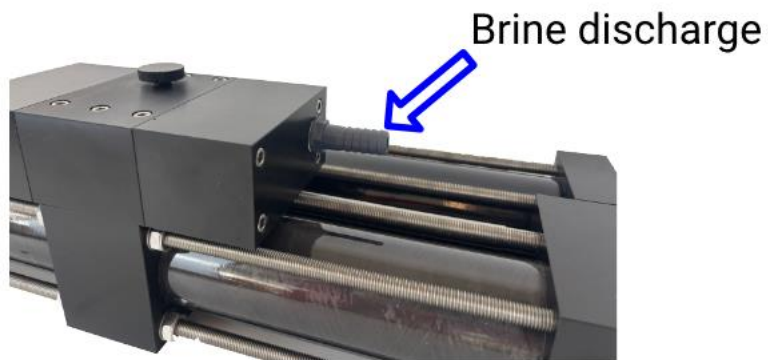


Illustration 9 – Connection ports at main unit

Installation of hose lines

 Hint!	For all hose connections, we recommend the use of two hose clamps per connection.
 Hint!	Kinks and constrictions in the hose lines must be avoided at all costs, as these can lead to damage to the system.
 Hint!	Use cable ties at regular intervals to avoid chafing. The edges of bulkhead penetrations must be rounded to avoid damage to cables and hoses. Depending on the material and condition, additional protection must also be provided on bulkhead penetrations
 Hint!	The product water pipe must never be completely closed during operation.

The required hose material for the installation:

1. A suction hose with steel spiral for the feed line to the pump, as well as for the salty wastewater from the main unit to the through hull.
2. Medium Pressure hose from EPDM rubber with a working pressure of at least 20bar.
3. 3/8" quick connect hose for product water

Cut the hose at right angles with a sharp knife.
Avoid sharp bends

Sea water and flushing water lines

In order to keep pressure losses along the hose lines low, it is advisable to keep the hose lengths from the seacock to the pump as short as possible.

Please take this into account when choosing the installation location and, if possible, do not use more than the supplied hose material for these sections.

Product water pipes

For the product water, remove the sealing plugs on the membrane unit and plug in the supplied 3/8" hose. Be sure to insert it completely to achieve a tight connection. From there, this is to be led to the tank preferably installing a 3-way diverter valve in between to allow testing and discharging product water at the beginning of each production run.

Electrical connections

 Hint!	The electrical connection must be left to trained specialists.
 Hint!	The supply line to the pump must be equipped with an appropriate fuse.

The included components are already wired and equipped with connectors allowing for a plug & play installation.

For the connectors, make sure to close them completely. The plugs can only be joined together in one position. Do not apply force.

Connections to be made:

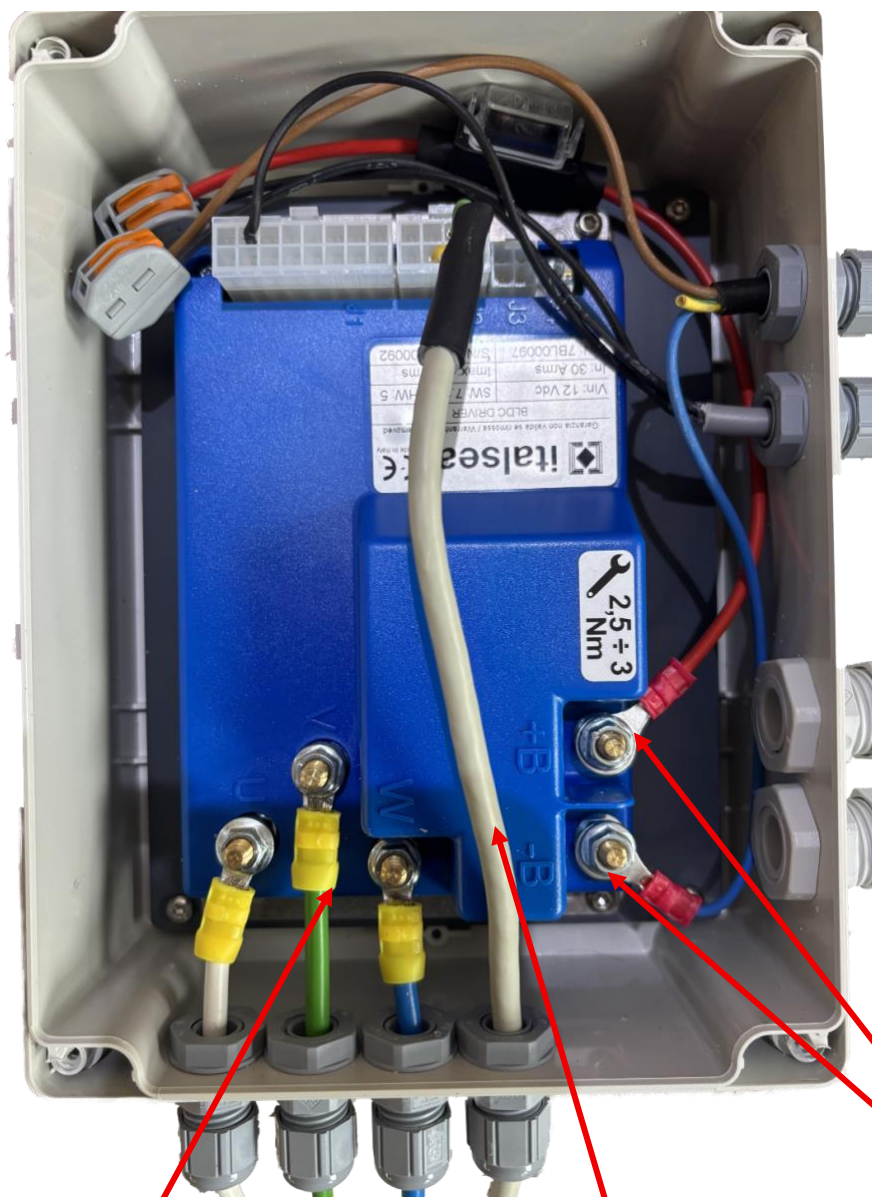
- Connection cable from pump to control panel
- Connection cable from pump to solenoid valve on active carbon filter.
- DC power supply to the pump unit on its M6 studs.

Connections to be made K60 Light:

- Connection cable from electrical box to control panel
- Connection cable from electrical box to solenoid valve on active carbon filter.
- Motor phases- and sensor cable from electrical box to Motor
- DC supply of the unit via the M5 studs in the electrical box



Illustration 1- Wiring of the BLDC motor



Motor phases
U: Yellow
V: Green
W: Blue

Hall Sensor

Battery input +/-

Excess cable lengths can be wound up and fixed for the system internal connecting cables.

For the main power supply you need to use cables and sufficient cross section and crimped lugs for M6 studs.

The main power supply line also needs to be equipped with an appropriate fuse.

Cable length battery to pump	3 m	5 m	10 m	Recommended fuse
Kyma 30				
Required cross section 12 V	6 mm ²	6 mm ²	10 mm ²	15 A
Required cross section 24 V	4mm ²	4 mm ²	4 mm ²	7 A
Kyma 60				
Required cross section 12 V	6 mm ²	10 mm ²	16 mm ²	30 A
Required cross section 24 & 48 V	4 mm ²	6 mm ²	6 mm ²	15 A (24V) / 7 A (48V)

To disconnect the connectors, the respective latching mechanism must be released:

- Plug to control panel: Rotate the locking ring to the position of the open lock symbol
- Solenoid valve: Unscrew the fixation screw and disconnect the plug by pulling it.

8. Documentation Attachment

Electrical wiring diagram

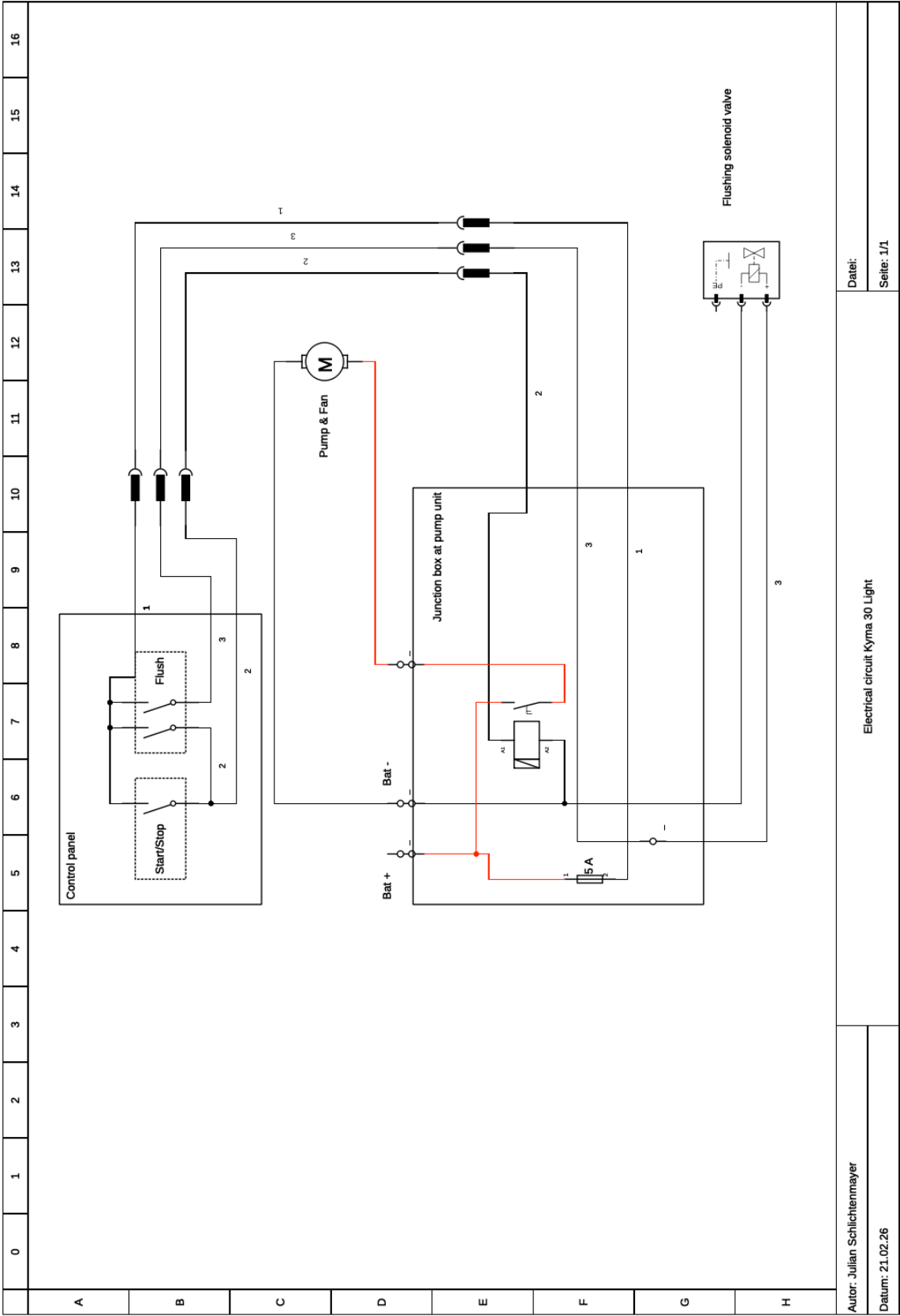


Illustration 10 - Wiring diagram electrical installation

Spare parts list

Part	Part number
Main unit	
Seal Kit Kyma 30	300101-01
Seal Kit Kyma 60	600101-01
Check valve Kit	300101-02
Main Rod	300101-05
Spool valve rings	300101-02
Pump unit	
Kyma 30 light – Membrane Pump – complete unit	300101-11 (12V) 300101-12 (24V)
Kyma 30 light – Membrane Pump – only pump	300101-13 (12V) 300101-14 (24V)
Kyma 60 pump head	600101-11