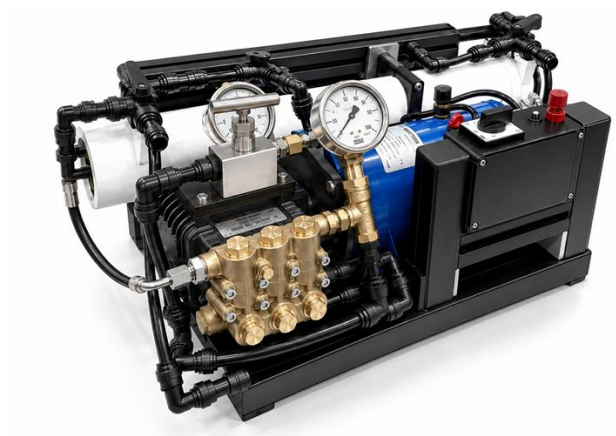




MAB SW30

MAB WATERMAKER

User Manual and Technical Description

Document revision history

The table below lists the revisions of this document.

Revision	Date	Author	Description: _____
AA	2026-08-02	Ulf Bergsten	User Manual and Technical Description
AB	2026-08-02	Ulf Bergsten	User Manual and Technical Description
AC	2026-08-17	Ulf Bergsten	Clarified operation, protection function, flushing, maintenance and troubleshooting
AD	2026-08-17	Ulf Bergsten	Clarified warranty, statutory claims, service and transport terms



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Introduction

About this manual

Purpose and intended audience of this manual

This manual contains instructions for installation, operation, fresh-water flushing, maintenance and troubleshooting of the MAB SW30, together with a technical description to facilitate servicing.

This manual is intended for users of the MAB SW30 as well as installers and service personnel.

Typographic conventions

Names of controls and important operating modes are shown in bold.

References to other documents are shown in italics.

Clickable links are shown in colour and underlined.

Related documentation for MAB Watermaker

The user documentation listed in the table below is supplied with the MAB Watermaker in addition to this manual.

Important information for the user

Intended use

The MAB SW30 is a manually operated watermaker designed to produce product water from seawater or brackish water by reverse osmosis.

The product is intended for use on recreational boats and in other protected off-grid installations where suitable raw water and a 12 V DC supply are available.

The MAB SW30 is intended to be operated under supervision and to produce water for a separate water tank or outlet.

Nominal production is approximately 30–45 litres per hour. Actual production is affected by water temperature, salinity, membrane condition, supply voltage and operating pressure.

The user must

- Read and understand this manual
- Know how to stop the product and disconnect the power supply
- Check filters, hoses, valves and water flow before starting
- Check product-water quality before directing it to the tank
- Ensure that the raw-water intake does not draw in air during, for example, heeling, rough seas or turbulence



Prohibited and improper use

- In water containing oil, fuel, chlorine, solvents or other chemicals that may damage the membrane
- With well water containing iron, manganese or other substances that may cause deposits, without prior water analysis and suitable pretreatment
- Without a mesh strainer upstream of the Marco UP2
- Without the specified prefilters
- Without a correctly rated fuse
- Above the specified maximum operating pressure
- Unattended
- In rain, exposed to wash-over water, or submerged
- In an explosive or flammable environment

Safety instructions

This manual contains safety instructions (WARNING, CAUTION and NOTICE) to help you use the product safely. See the definitions below.



WARNING

Indicates a hazardous situation that may cause serious injury or death.



CAUTION

Indicates a hazardous situation that may cause minor or moderate injury.



NOTICE

Indicates a risk of damage to the product, other equipment or the surroundings.

Notes and tips

Note: *Important information for correct and safe use.*

Tip: *Practical information that may make the product easier to use.*

1.4 EU Declaration of Conformity

The EU Declaration of Conformity for the current MAB SW30 shall accompany the product or be made available by MAB Watermaker AB once final CE verification has been completed.

This version of the manual is a working version. Information marked as not yet specified must be verified in the final CE documentation before the manual is issued as the final customer version.

Safety

About this chapter

This chapter describes the safety measures and actions to be taken in the event of an emergency shutdown of the product.

General safety instructions

Warning – High pressure



WARNING – HIGH PRESSURE

The MAB SW30 operates at a pressure of approximately 55 bar. Never loosen hoses, fittings, pressure gauges, valves or membrane housings while the system is pressurised. Stop the unit and relieve the pressure before servicing.



WARNING – ELECTRICAL FIRE HAZARD

The system operates at low voltage but high current. Incorrect cable size, a loose kabelsko, incorrect fuse or a short circuit can cause severe heat build-up and fire.



CAUTION - DO NOT START WITH THE NEEDLE VALVE CLOSED

The needle valve must be open before starting. Pressure must then be increased slowly.



NOTICE – RAW WATER

Do not operate the unit in water contaminated with oil, fuel, solvents, chlorine or other harmful chemicals.



NOTICE – DRY RUNNING AND BLOCKAGE

Check mesh strainer, prefilters and raw-water flow if boostpumpens thermal motor protection trips. Do not repeatedly reset the protection without first identifying the cause.



NOTICE – VENTILATION

Install the unit in a dry and ventilated space. Do not block the motor ventilation openings.



NOTICE – TRANSPORT AND LIFTING

Do not lift the unit by pressure gauges, hoses, membrane housings or valves. Use the frame or designated lifting points.

Maintenance

**NOTICE**

Flush the MAB Watermaker with clean water after each use to remove seawater and help keep hoses, fittings and the RO membrane free from microorganisms and bacterial growth.

Product description

MAB SW30

The MAB SW30 is a complete 12 V DC watermaker mounted on a load-bearing aluminium frame. The unit includes a boost pump, high-pressure pump, DC motor, membrane housing, pressure gauges, needle valve, safety valve, valves and electrical controls.

The unit produces product water by first filtering and pressurising the raw water and then forcing it through an RO membrane.

Purpose of the product

The MAB SW30 is used to produce product water from seawater or brackish water. After the water quality has been checked, the product water can be directed to the boat's water tank, a separate buffer tank or an outlet.

The MAB SW30 normally produces approximately 30–45 litres of product water per hour. Production is mainly affected by raw-water temperature and salinity, operating pressure, membrane condition and supply voltage.

The MAB SW30 is not intended for untreated well water that may contain iron, manganese or other substances that cause deposits. Such water requires water analysis and suitable pretreatment.

Main components

Description of the main parts of the product as supplied

The system consists of the following components:

- Raw-water inlet
- Mesh strainer
- Marco UP2 boost pump
- Connection to dual filter housing
- 20 µm prefilter
- 5 µm prefilter
- Low-pressure gauge
- High-pressure pump
- 12 V DC motor
- High-pressure gauge
- Needle valve
- Safety valve

- Membrane housing with RO membrane
- Product-water outlet
- Concentrate outlet
- Control selector 0–1–2
- Thermal motor protection for Marco UP2
- Positive and negative terminals

Control selector

Position 0 – Stop

Both pumps are off.

Position 1 – Boost/flushing

The Marco UP2 is running. The high-pressure pump is off.

Position 2 – Production

The Marco UP2 is running. The high-pressure pump starts automatically when sufficient feed pressure is available. If the feed pressure falls below the permitted level, the high-pressure pump stops. The boost pump then continues briefly in an attempt to restore water flow. If correct feed pressure is not restored, the system stops and the cause must be checked before restarting.

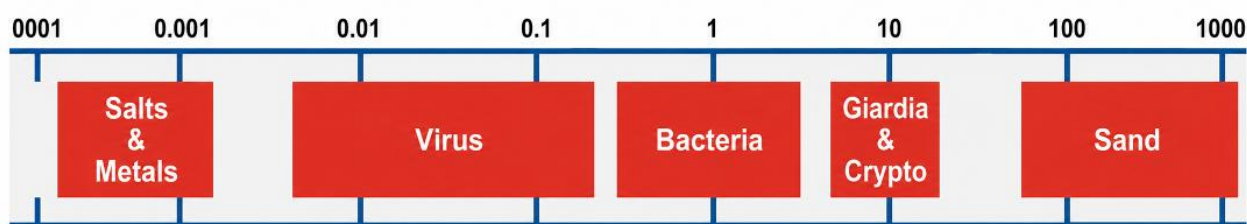
This protection function reduces the risk of the high-pressure pump running with insufficient raw-water supply or air in the system. It does not replace the pre-start checks of the raw-water intake, mesh strainer and prefilters.

Contaminants removed by reverse osmosis

Reverse osmosis removes a wide range of contaminants from water, including:

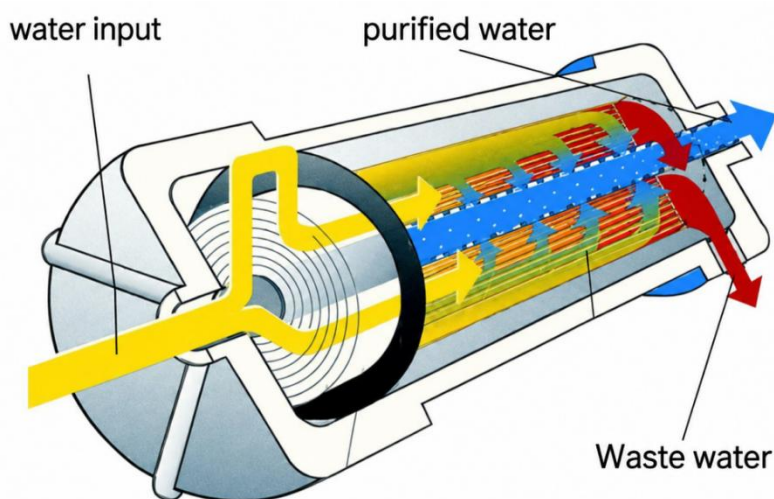
- Dissolved salts
- Dissolved organic compounds
- Viruses
- Bacteria
- Many other microparticles

Reverse osmosis is therefore well suited to desalinating seawater. The figure below illustrates the size range of contaminants that an RO membrane can remove, from the smallest on the left to the largest on the right.



How reverse-osmosis purification works

Reverse osmosis uses high pressure to force water through the microscopic structure of the RO membrane, separating contaminants from the purified water.



Water flow through a Reverse Osmosis Cartridge.

FIGURE 1. THE ILLUSTRATION SHOWS HOW WATER IS FORCED THROUGH THE RO MEMBRANE AND PURIFIED.

Measuring water quality

Water quality is measured using TDS

Total dissolved solids (TDS) is used as an indication of the amount of dissolved inorganic substances in a water sample.

TDS can consist of compounds such as calcium, magnesium, iron, sodium chloride (salt) and sulphides. The TDS meter measures conductivity and displays the result in ppm (parts per million).

TDS limits

Normally, the TDS value of the product water should be clearly lower than that of the raw water and should stabilise after start-up. As a practical operating reference, product water below 300 ppm may be used as a check, but this does not replace a hygienic assessment. A TDS value that is clearly higher than the system normally produces is often a more useful fault indication than a single exact ppm limit.



Water quality after treatment with MAB Watermaker

Performance at different water temperatures

RO membrane production is rated at a seawater temperature of 25 °C and a salinity of 3.2%. According to the manufacturer's specification, product-water flow for individual membrane elements may vary by $\pm 20\%$.

Water flow changes with temperature:

- As the water becomes colder, its viscosity increases and flow through the RO membrane decreases.
- As the water becomes warmer, its viscosity decreases and flow from the RO membrane increases.

The exact temperature correction depends on the membrane specification. The stated production of the MAB SW30 should therefore be regarded as nominal and may be noticeably lower in cold water.

Installation

Location

Install the MAB SW30:

- on a stable and level surface
- in a dry and ventilated space
- so that pressure gauges and controls can be read
- so that filters can be inspected and replaced
- so that leaks can be detected
- with sufficient free space around the motor ventilation openings
- so that the unit can be secured against movement in rough seas
- The ambient temperature must not exceed the value stated in the technical data. The unit must not be exposed to rain, wash-over water or immersion.

Raw-water intake

Connect the raw-water supply to the raw-water inlet on the right-hand side of the unit.

The raw-water flow must pass through:

1. raw-water intake
2. mesh strainer

3. shut-off valve
4. Marco UP2 boost pump
5. 20 µm prefilter
6. 5 µm prefilter
7. high-pressure pump

The mesh strainer must always be installed upstream of the Marco UP2.

Operation without the mesh strainer may allow particles to block or damage the pump.

The raw-water intake must be positioned so that it does not draw in air during heeling, rough seas or turbulence.

Product water and concentrate water

Connect the product-water outlet to a tank or separate outlet. At start-up, direct product water to a test outlet or drain until water quality has stabilised.

The concentrate water must discharge freely back to the sea or to a suitable drain. The hose must not be blocked, kinked or fitted with a valve that can completely shut off the flow.

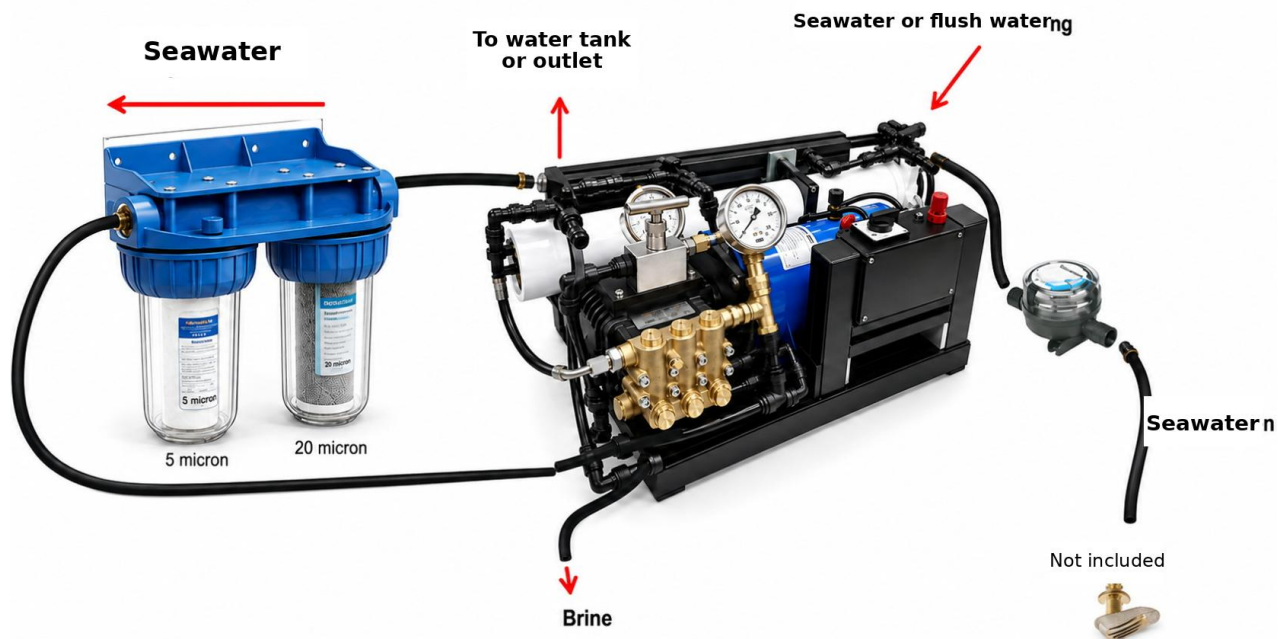
Electrical connection

The MAB SW30 must be connected to 12 V DC.

- Red terminal: positive
- Black terminal: negative
- Recommended main fuse: 60 A
- The fuse must be installed close to the battery positive terminal
- Recommended cable cross-section for a maximum of 1.5 m positive and 1.5 m negative cable: at least 16 mm²
- For longer cable runs, increase the cable cross-section to limit voltage drop and heat build-up.
- Check polarity before connection. Incorrect polarity can damage electrical components.
- The installation must include a suitable main isolator switch.

After installation, check all hoses and fittings for leaks. Pay particular attention to the suction line up to the boost pump to ensure that the system cannot draw in air.

Hose connection principle



Connecting hoses

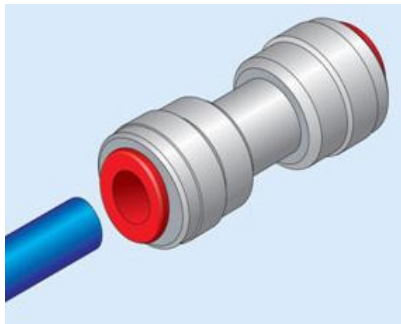
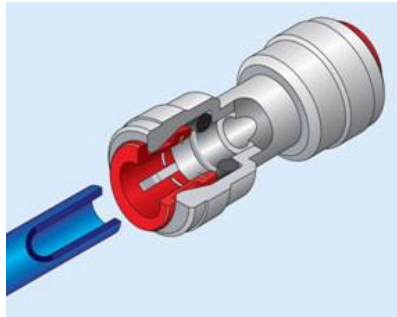
Maximum operating pressure for hose fittings

The table below shows the operating pressure rating of the hose fittings when used with 12 mm tubing at different temperatures.

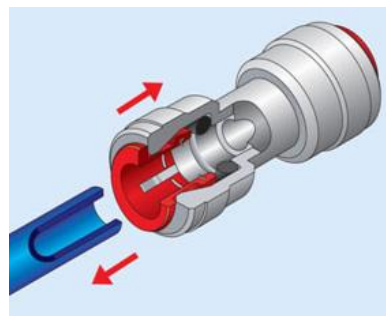
Temperature	Max. operating pressure
1°C	11 bar
20 °C	11 bar
65 °C	7 bar

Connecting low-pressure hoses with push-fit fittings

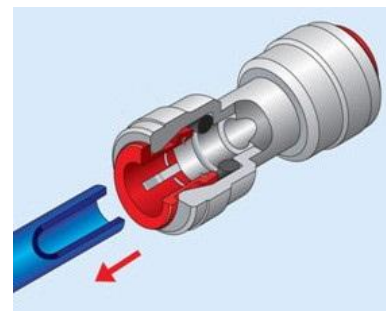
Push-fit fittings provide a convenient method for routing hoses and connecting the different parts of the MAB SW30 system.

Step	Dimensions
1	Cut the end of the tubing square before inserting it into the fitting. Use a clean tube end free from dirt or cracks. 
2	Push the tubing into the fitting and make sure it is fully inserted. Moderate force is required; slight resistance may be felt just before the tubing seals around the O-ring in the fitting. 

- 3** To make sure the fitting is properly connected, pull gently on the tubing and check that it is securely retained.



- 4** **To disconnect the tubing from the fitting**
Press in the outer collar to release the locking mechanism, then pull the tubing out.
A 12 mm open-ended spanner can be used to press the outer collar in evenly.



Operation

Quick start – normal operation

Use this short procedure once the installation has been checked and the system is ready for normal operation. For first start-up, servicing or a fault condition, follow the full instructions in the relevant section.

1. Open the raw-water intake and check that the mesh strainer and prefilters are clean.
2. Open the needle valve so that the system starts without high backpressure.
3. Set the control selector to position 1 and check for stable raw-water flow and approximately 1 bar feed pressure.
4. Set the control selector to position 2. The high-pressure pump starts automatically when the feed pressure is sufficient.
5. Slowly increase the operating pressure with the needle valve to approximately 55 bar in normal seawater.
6. Direct the first product water to the test outlet and check TDS, appearance and odour.
7. Direct product water to the tank only after the water quality has stabilised.
8. When stopping: first reduce the operating pressure, return to position 1 and perform a fresh-water flush before switching the system off.

Pre-start check

Check the following:

- that the unit is stable
- that the raw-water intake is open
- that the mesh strainer is clean
- that the 20 and 5 µm prefilters are installed
- that the hoses are correctly connected
- that product water can be directed to the test outlet
- that the concentrate outlet is open
- that the needle valve is open by at least approximately one turn
- that battery voltage is sufficient
- that there are no visible leaks

Starting water production

1. Set the control selector to position 1 and allow the boost pump to fill the system with raw water.

2. Check that the Marco UP2 starts and that the low-pressure gauge indicates approximately 1 bar. The pressure must be stable.
3. Check that the water flow is stable and that air is being purged from the system.
4. Set the selector to position 2.
5. The Marco UP2 continues to run. The high-pressure pump starts automatically when the feed pressure is sufficient.
6. Turn the needle valve clockwise until the operating pressure rises.
7. Set the operating pressure to approximately 55 bar in normal seawater.
8. Check that the safety valve is not relieving pressure.
9. Direct the first product water to the test outlet or drain.
10. Check the TDS, appearance and odour of the product water.
11. Direct the water to the tank only after the quality has stabilised.

NOTICE

Approximately 55 bar is the normal operating pressure in normal seawater. Do not increase the pressure in an attempt to force production above the membrane's normal capacity. Brackish water requires a lower operating pressure; limit production so that the membrane's specified flow rate is not exceeded.

First start with a new membrane

A new membrane contains preservative. Discard at least the first 10 litres of product water, or continue discarding until the water is clear and odour-free and the TDS value has stabilised.

Stopping water production

12. Turn the needle valve counter-clockwise to reduce the operating pressure.
13. Set the control selector to position 1.
14. Allow raw water or flushing water to flow briefly without high pressure.
15. Perform a fresh-water flush as described in the Fresh-water flushing section.
16. Set the control selector to position 0.
17. Close the raw-water valve in a fixed installation.

Fresh-water flushing and preservation

Fresh-water flushing

Flush the MAB SW30 after every use with clean, chlorine-free product water. The purpose is to replace seawater or brackish water in the system and reduce the risk of deposits and biological growth.

1. Open the needle valve fully so that no high pressure is generated during flushing.
2. Select flushing water with the three-way valve and normally use approximately 2–3 litres of clean product water, or enough to replace the raw water in the system.
3. Set the control selector to position 1. Only the boost pump should run during flushing.
4. Run until the flushing water has passed through the system and the container is nearly empty. Do not allow the boost pump to run dry.
5. Set the selector to position 0.
6. Return the three-way valves and other valves to their normal operating positions.

Do not pass chlorinated water directly through the RO membrane.

If municipal water is used, it must first pass through a suitable activated-carbon filter.

Preservation

If the system will remain unused for an extended period, the RO membrane must be preserved. Use only preservatives and dosages intended for RO membranes. For the MAB SW30, approximately 2–3 litres of prepared preservation solution is normally used. Always follow the current dosage instructions supplied with the preservation product.

1. First flush the system with clean, chlorine-free water.
2. Mix the preservation solution in a clean container according to the current dosage instructions.
3. Open the needle valve fully. High pressure must not be generated during preservation.
4. Select the container with preservation solution as the water source and run the boost pump in position 1 until the solution has filled the system.
5. Switch off before the container is empty so that the pump does not draw in air.
6. Close or plug the hoses so that the preservation solution remains in the system, in accordance with the separate preservation instructions.
7. Before the next normal operation, flush the system thoroughly and discard the product water until TDS, odour and appearance have stabilised.

NOTICE – Do not pass chlorinated water directly through the RO membrane. If municipal water is used for flushing, chlorine must be removed with a suitable activated-carbon

filter. Do not confuse propylene glycol with ethylene glycol; never use ethylene glycol in the system.

Lay-up and winter storage

After normal use, the system must be fresh-water flushed. For longer periods of inactivity, preserve the membrane as described above. If there is a risk of freezing, winterise the system according to the separate instructions so that water cannot freeze in pumps, membrane housings, filters or hoses.

Maintenance schedule

The intervals below are practical minimum checks. Under heavy use, with dirty raw water or if readings are abnormal, inspection and servicing must be carried out more frequently.

Action	Interval / when
Check raw-water intake and mesh strainer	Before every run
Check 20 and 5 micron prefilters	Before operation and if feed pressure falls
Check hoses, fittings and leaks	Before operation and regularly during operation
Flush with clean chlorine-free water	After every use
Check TDS and product water	Every run before water is directed to the tank
Check electrical cables, cable lugs and fuse	At least annually and if abnormal heating occurs
Check high-pressure pump oil	According to the pump service instructions
Preserve the RO membrane	For extended lay-up, according to the preservation instructions

Troubleshooting

Symptom	Possible cause	Action
Marco UP2 does not start	No voltage, motor protection tripped, pump blocked	Check the fuse, voltage and filters. Allow the pump to cool and reset the motor protection
Motor protection trips	Blocked mesh strainer, clogged hose or pump	Stop and clean before resetting
Low pressure drops on start-up	Clogged filter, air ingress or insufficient raw-water flow	Check filters, hoses and through-hull fitting
Operating pressure does not increase	Needle valve open, air in system, pump fault	Purge air and check the needle valve and pump
Safety valve opens	Pressure too high	Reduce the pressure
Low production	Cold water, low voltage, low pressure, worn membrane	Check temperature, voltage, pressure and membrane
High TDS	Pressure too low, air in system, damaged or exhausted membrane	Flush and check pressure and membrane
Abnormal noise	Air, cavitation, loose component or blockage	Stop and check raw-water flow and mounting
Leakage	Loose or damaged fitting/hose	Stop, disconnect power and relieve pressure
High-pressure pump does not start in position 2	Feed pressure too low, air in the system or the protection function has tripped	Check the raw-water intake, mesh strainer, prefilters, hoses and that low pressure is stable. Restart only after the cause has been corrected.
High-pressure pump stops during operation	Feed pressure has fallen or air has entered the system	Check whether the boost pump restores the flow. If the system stops, correct the cause before restarting.

Technical data

Parameter	MAB SW30
Supply voltage	12 V DC
Normal current	approx. 42–46 A
Power	approx. 500–600 W
Recommended fuse	60 A
Recommended cable	at least 16 mm ² for a total cable length of 3 m
Production	approx. 30–45 l/h

Parameter	MAB SW30
Normal operating pressure in seawater	approx. 55 bar
Safety valve	relieves above approx. 60 bar
Boost pressure	approx. 1 bar
Membrane	1 × 2521
Dimensions	approx. 68 × 45 × 34 cm
Weight	approx. 30 kg
Ambient temperature	Not specified in this working version – to be verified in the CE documentation
Water temperature	Not specified in this working version – to be verified against the membrane specification
Ingress protection rating	Not specified in this working version

Warranty and statutory claims

Warranty

A warranty is a voluntary undertaking by MAB Watermaker AB. The scope and duration of the warranty are stated in the purchase documentation or separate warranty terms. The warranty does not affect any rights a consumer has under mandatory law.

For an approved warranty claim, the fault will be remedied in a manner appropriate to the nature of the fault. In the first instance, this may be by repair or replacement of the defective component. Replacement of the complete unit is normally considered only when repair or component replacement is not an appropriate solution.

The warranty does not cover damage that, under the warranty terms, results for example from incorrect installation or use, inadequate maintenance, operation without the specified filters, contaminated raw water, chlorine, freezing, overpressure, incorrect polarity or unauthorised modifications to the product. This does not limit liability arising under mandatory consumer law.

Statutory claims for consumer purchases

Warranty rights and statutory rights to make a claim are not the same. For purchases made by a consumer from MAB Watermaker AB, the Swedish Consumer Sales Act applies. The consumer has the right to make a claim for defects for which the seller is responsible

under the Act within three years from delivery of the product. A voluntary warranty does not replace or restrict this right.

In the event of a defect, remedies under the Swedish Consumer Sales Act may include repair or replacement. The consumer may have the right to choose the remedy, but a requested remedy does not have to be provided if it is impossible or would entail unreasonable cost. For a repairable product such as the MAB SW30, an established defect can therefore often be remedied by repairing or replacing the defective component rather than replacing the entire unit, provided that the remedy meets the requirements of applicable law.

How to make a warranty or statutory claim

Contact MAB Watermaker AB as soon as a fault is discovered and before the product is dismantled, shipped or handed to an external repairer. State the model, serial number, date of purchase and provide a clear description of the fault.

To determine the cause, MAB may request photographs, video and relevant measurements such as feed pressure, operating pressure, TDS and supply voltage. In many cases, troubleshooting can be carried out remotely before any component or complete unit needs to be shipped.

Depending on the fault, the remedy may consist of technical support, supply of a spare part, component replacement, local service by prior agreement, or return of the product for inspection and repair.

Do not order external repairs or costly transport without first giving MAB the opportunity to assess the fault and propose a remedy. Costs for work or transport ordered without prior agreement are not automatically reimbursed. This does not apply where the consumer is entitled to reimbursement under mandatory law in the particular circumstances.

Service and transport outside Sweden

If the product is used or located outside Sweden, contact MAB before arranging international transport or local service. MAB and the customer will then agree on a practical method of troubleshooting and remedy. This may, for example, involve remote troubleshooting, supply of a replacement component, service by an approved local technician, or return of the product to a designated service location.

The fact that the product is located outside Sweden does not in itself remove a consumer's statutory rights. The handling of transport and service costs is assessed according to the circumstances of the individual case, applicable law and any warranty terms. The customer should therefore always contact MAB before costs are incurred.

Business-to-business purchases

Where the purchaser is a business, the warranty, claims and delivery terms agreed between the parties apply together with applicable law. The mandatory provisions of the Swedish Consumer Sales Act do not apply to such purchases.