The add-on module for automatic control of drinking water production.

MAB WATERMAKER

User manual and technical description

Dokumentversion AA

Table of contents

1 Introduction

1.1 Regarding this manual

The manual purpose and target group

This manual contains instructions for the installation and use of the add-on module for automatic control of drinking water production to the MAB Watermaker, as well as a technical description of the product to facilitate maintenance and service.

This manual is intended for users of the MAB Watermaker, as well as for service personnel.

Typographical rules

Text found on the screen is written in **bold**.

References to other documents are written in *italics*.

Clickable links are written in color and with underlines.

Related documentation for MAB Watermaker

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

Document	Description
1. Float switch	Manual for mounting the float switch in the water tank.

1.2 Important information for the user

Intended Use of the Product

- The MAB Watermaker automation module is intended to control drinking water production and flushing and put the system on standby until the next start of drinking water production.
  It is easy to return to manual mode by turning off the automatic with the switch and then the MAB watermaker works completely manually again according to the basic manual.

Prerequisites for use

In order to follow this manual and use the product, you are required to:

- Have read through and understood the instructions in the basic manual for the MAB watermaker

1.3 Safety precautions

Use

OBSERVE

When the automatic is switched off on the MAB watermaker, it is important that the needle valve is turned back so that it does not form a high working pressure when the high-pressure pump starts in manual mode.

It can damage the high-pressure housing and osmosis diaphragm due to hydraulic shock.

OBSERVE

Never start your MAB Watermaker in manual mode with the pressure control valve (needle valve) closed as this may damage the high-pressure housing and osmosis diaphragm due to hydraulic shock.

2 Description of the product

About this chapter

This chapter briefly describes the product:

- Introduction to the product
- Product Parts

2.1 Introduction of the add-on product

products syfte

The MAB Watermaker automation module is intended to control drinking water production and flushing and put the system on standby until the next start of drinking water production. The procedure works that a float switch (alternating switch) is mounted in the drinking water tank and controls the automatic system for starting and stopping drinking water production and subsequent purification flushing, and is put on hold until the next start of drinking water production. Timing relays and solenoid needle valves arrange for the dumping of water and pressure valves to absorb hydraulic shocks.

It is easy to return to manual mode by turning off the automatic with the switch.

Note: *When the automatic is disconnected and the MAB watermaker is in manual mode, it is important that the needle valve is turned back so that it does not form a high working pressure when the high-pressure pump starts.*
It can damage the high-pressure housing and osmosis membrane

2.2 Product Parts

Description of the different parts of the product upon delivery

The MAB Watermaker automation module is supplied with a water level sensor and a relay and dump valve module that are connected according to the assembly instructions in this manual.

The parts of the system consist of:

Part	Description
Float switch 	Float switches (alternating switches) are mounted in the drinking water tank and control the automatic system for starting and stopping drinking water production, and subsequent flushing and standby are set until the next start of drinking water production.
Reläbox-modul 	• Analogue Multifunctional Timer Relays • Diode bridges • Terminal block to power supply (12 or 24 volts DC) • Terminal block connection for float switch • Terminal block to switch for the automatic to the control panel alternative, the switch is located directly on the relay box module. • Terminal block connection to connection control panel and dump valve module
Dumpvalve-module 	• Magnetic needle valves for dumping water and pressure valve to absorb hydraulic shocks • Terminal block to connection relay box module

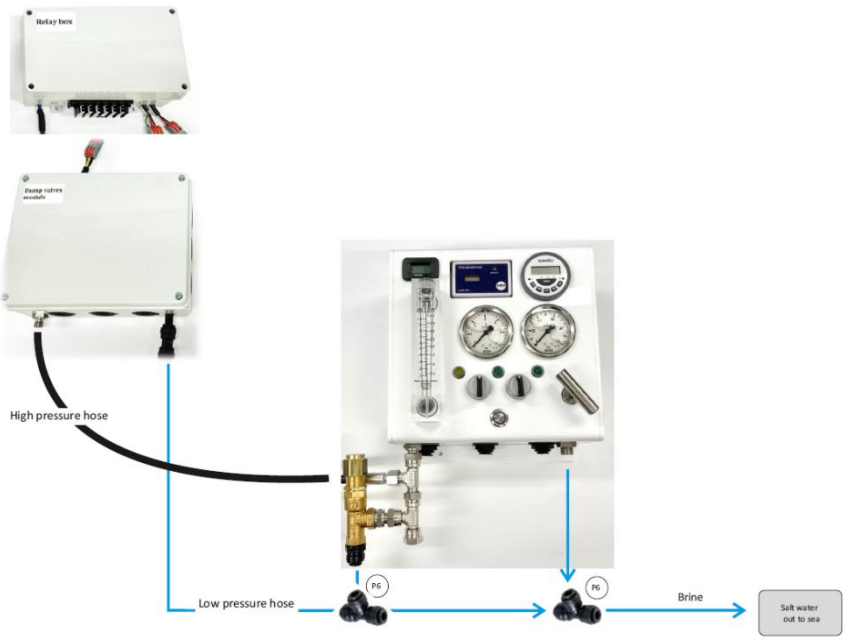
High pressure hose with bypass coupling. 	• High-pressure hose, the hose is 1 meter long unless otherwise specified. This hose is mounted between the MAB control panel and the dump valve module. • Bypass connection between the MAB control panel and the dump valve module.
Quick release 	• Push-fit type T-piece for connecting outgoing waste water/seawater to the existing hose connector in the MAB watermaker.

2.2.1 Placement of the parts in the product

Snapshot

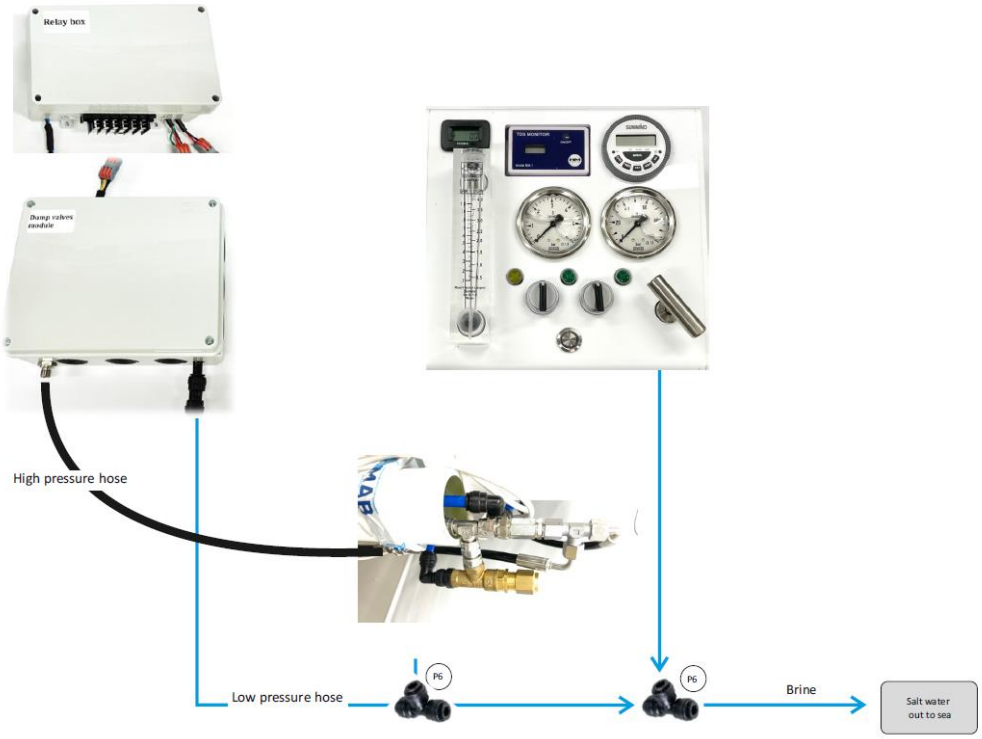
The picture below shows an overview of how the parts of the product should be placed in the system with the control panel "Box" for connecting the high-pressure and low-pressure hoses

See *Chapter 4* for detailed installation instructions.



The picture below shows an overview of how the product's parts should be placed in the system with the "Flush" control panel for connecting the high-pressure and low-pressure hoses

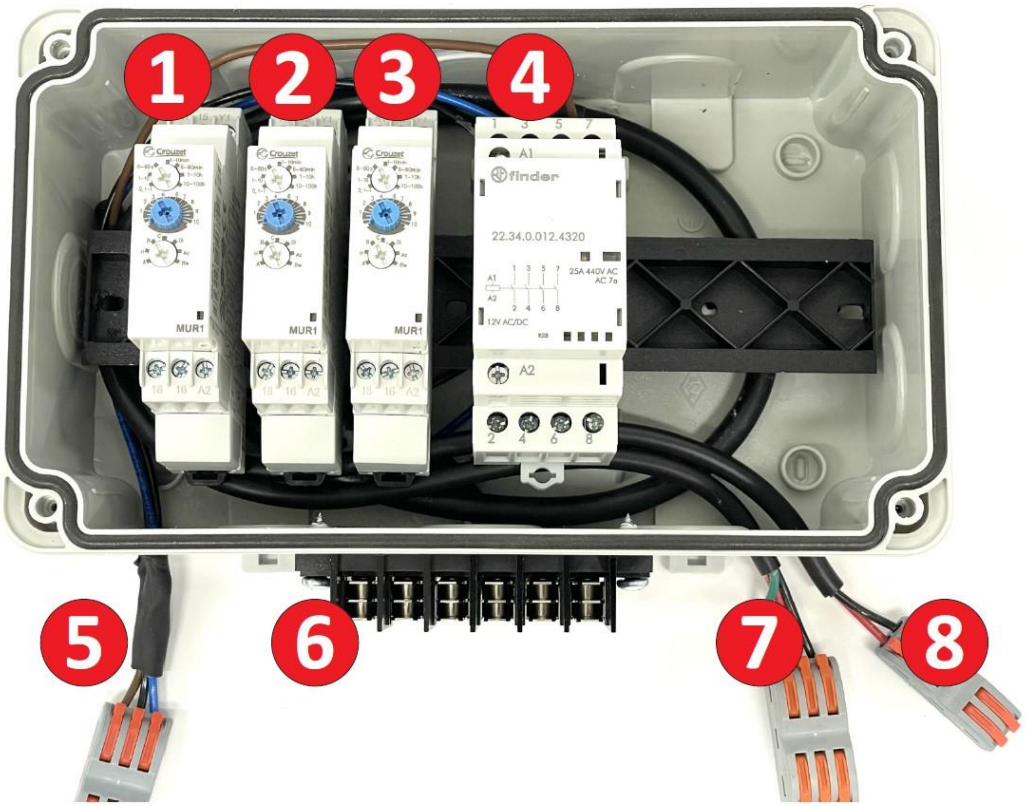
See *Chapter 4* for detailed installation instructions.



2.2.2 The relay box for the automatics.

Relay Box Module Components

The image and table below point out and describe the components found in the relay box module



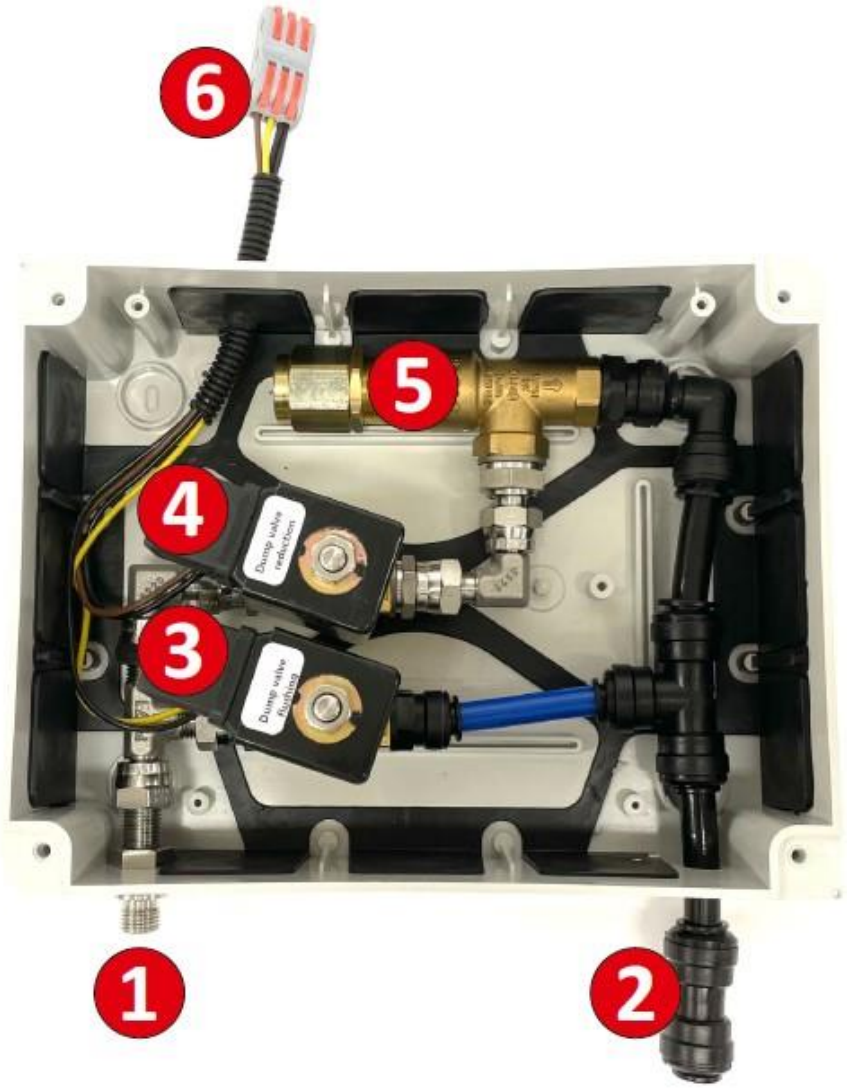
Component	Description
1	**Flush flush**, Timer relay for controlling the flush time to standby mode. Change to the desired flush time using the timer switches. The relay is set to about 4 min by default.
2	**Start delay of the high-pressure pump** Tidrelay to delay the start of the high-pressure pump so that the working pressure is equalized and stabilized. The relay is set to about 10 seconds by default. After the seawater boost pump starts and stabilized working pressure and reached > 0.3bar, the high-pressure

	pump can start. This has to do with the water pressure in the system having to stabilize itself.
3	**Timer relay for reduced working pressure of to high-pressure housing.** Timer relay opens dump valve to reduce working pressure and to absorb hydraulic shocks to the high-pressure housing. The relay is set to about 10 seconds by default.
4	Relay control between manual and automatic setting
5	Terminal block for float sensor for water tank.
6	Terminal block for connection, MAB control panel and dump valve module.
7	Terminal block to automatic switch on the control panel (if such panel selected)
8	Terminal block to power supply the system. (12 or 24 volt DC)

2.2.3 The dump valve module for the automatic.

Components of the dump valve module

The picture and table below point out and describe the components of the dump valve module.



Component	Description
1	**High pressure hose between MAB watermaker and module** Connection of the high-pressure bypass connection between the MAB watermaker and the dump valve module.

2	**Pipe connection for outgoing waste water (brine)** Quick coupling of push-fit type for 12 mm water hose
3	**Dump valve for flushing** Solenoid valve that opens while the flushing of the system is being carried out.
4	**Dump valve to reduce the working pressure to the high-pressure housing.** This absorbs hydraulic shocks to the high-pressure housing.
5	High pressure relief valve
6	Terminal block for connection relay box module and dump valve module.

3 Installation and assembly of the parts.

About this chapter

This chapter describes how to assemble the system.

It also describes what you need to do when using the system.

3.1 Assembly of the various parts of the automatic system

Assembly instructions per component

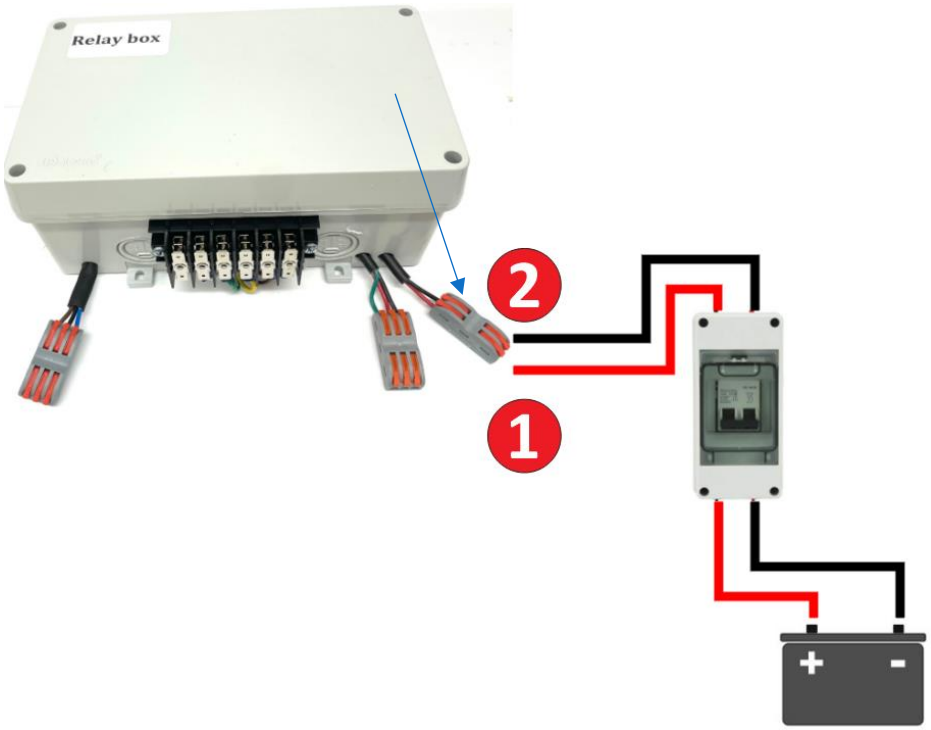
Component	Placement
Control panel box 	With the control panel "box", **the high-pressure hose with the bypass coupling is mounted** directly on the bulkhead coupling of the high-pressure inlet of the box either before or after the safety valve.
Control panel flush or hatch	With a "flush or with a hatch" control panel, **the high-pressure hose is mounted with the bypass coupling** at the location of the safety valve on the high-pressure housing. Alternatively, the bypass coupling on the back connects directly to the high-pressure input of the high-pressure pressure gauge. In that case, this must be stated when ordering as the high-pressure pressure gauge has millimeter thread.

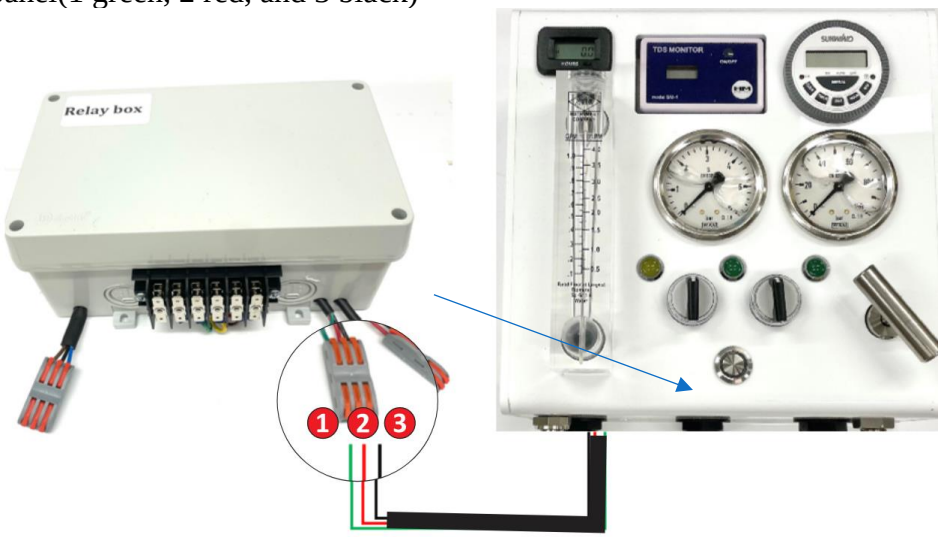
	
Dummy valve box 	The dump valve box is placed in a suitable location near the safety valve location. The high-pressure hose from is screwed to the bulkhead connection on the west side of the picture and a 12 mm plastic hose is mounted on the push-fit type quick coupling.
Relay Box 	The relay box is placed in a suitable place in the boat that is relatively dry and not exposed to splashes.

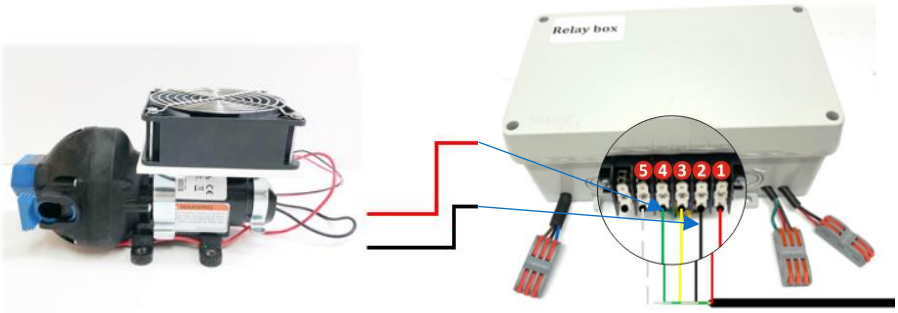
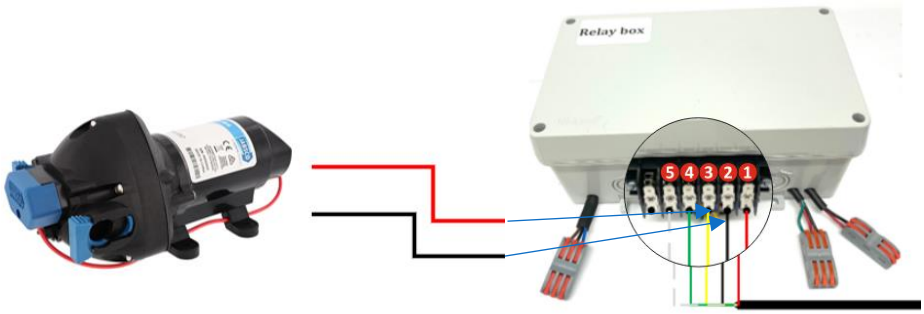
3.2 Connect to voltage source

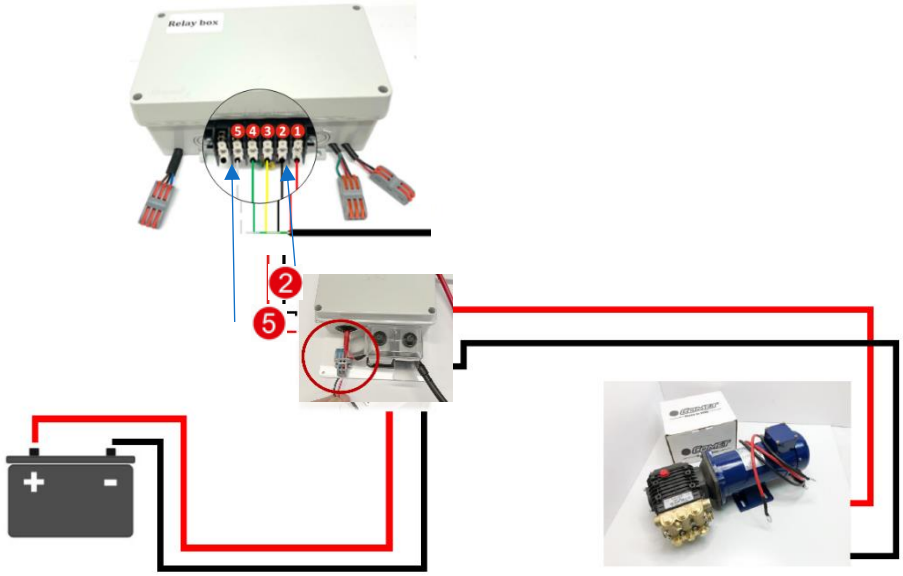
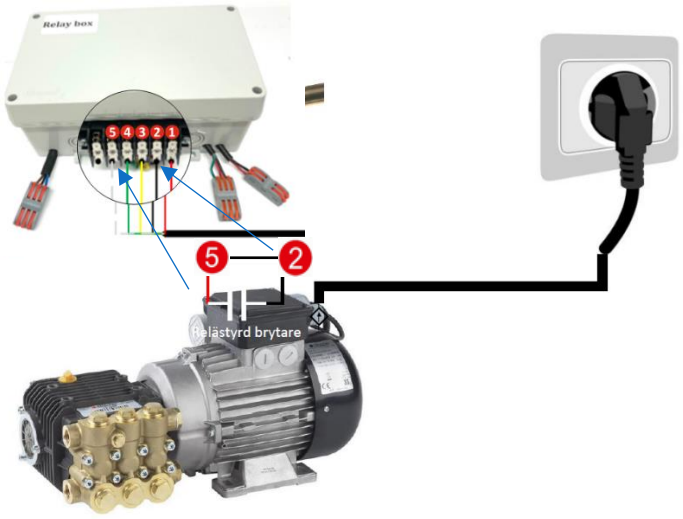
Connect your boat's battery bank to the MAB Watermaker

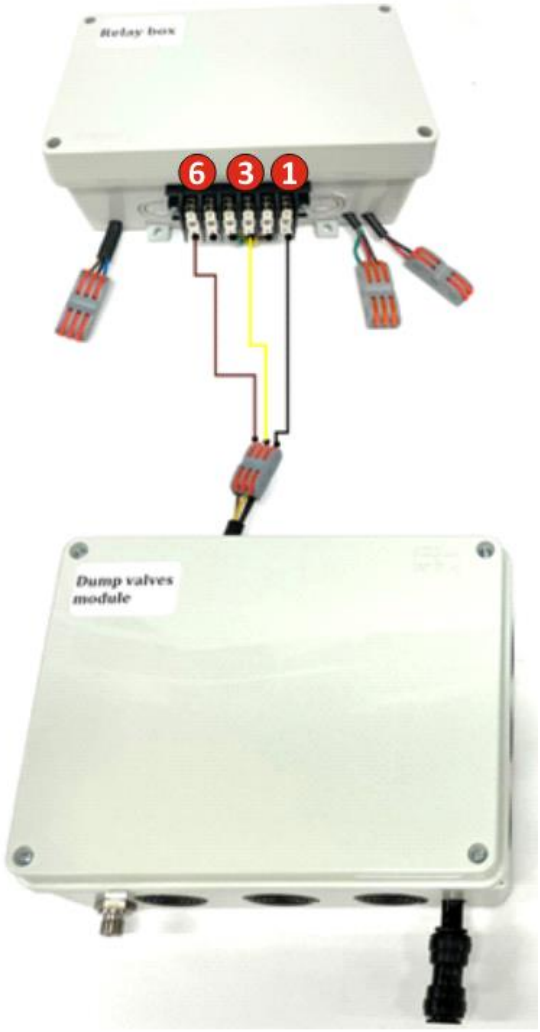
Follow the instruction below to connect the MAB Watermaker to a power source.

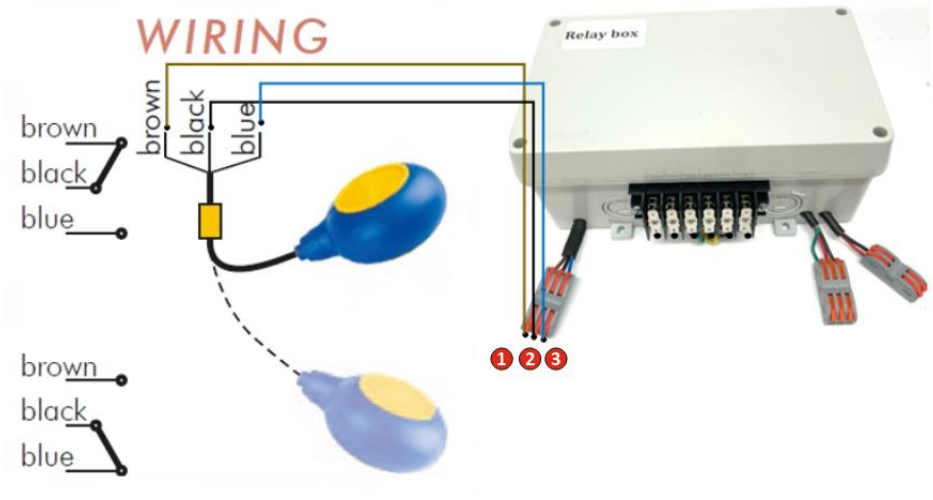
Step	Measure
1	**The main power** is now connected for the entire MAB watermaker system to the relay box. This now enables the switch from manual to automatic control and back. A low-voltage cable from the boat's battery bank 12V or 24V to the miniature circuit breaker 10A and on to the quick-connect terminal block on the far right of the picture + (1 red) and – (2 black). This allows the main power on the boat to be disconnected and only the MAB Watermaker is connected for the automatic timer flush to work. 
Step	Measure

2	Connect the three-wire cable to the terminal block from the control panel(1 green, 2 red, and 3 black) 
3	**The wiring harness from the control panel** is connected to the terminal block of the relay box (1. Red) (2. Brown) (3. Yellow) (4. Green) (5. White) 

4	Connect the boost pump (seawater pump**)** with the cooling fan to the terminal block + (4 green) and – (2 black). 
5	Connect **the purge pump** to the terminal block + (3 yellow) and – (2 black) 

Step	Measure
6	**For systems with high-pressure motor (direct current) 12V or 24V**: • Connect from the high-pressure motor relay box low current connection to (5 white) and (2 black) on the terminal block 
7	**For 230 volt AC motor systems**: • Connect the 230 power cable directly from your boat's 230 V power source to the high-pressure pump. • Connect the low-voltage cable of the AC motor to the relay control of the terminal block + (5 white) and – (2 black). 

Step	Measure
8	**The dump valve box is connected to the relay box** Connected (6. brown) (3. Yellow) (1.black) to the terminal block on the relay box 

Step	Measure
9	**The float sensor** Connect the float sensor cables (1. Brown) (2. Black) (3.Blue) to the corresponding color of the terminal block on the relay box. If the cable from the float sensor needs to be extended, it is recommended to use a tinned three-wire 3 x 1.5 mm². 

4 Use the automation in the MAB Watermaker

About this chapter

This chapter describes how to use the automation in the MAB Watermaker to control drinking water production.

4.1 Start of the automation for water production

Safety precautions

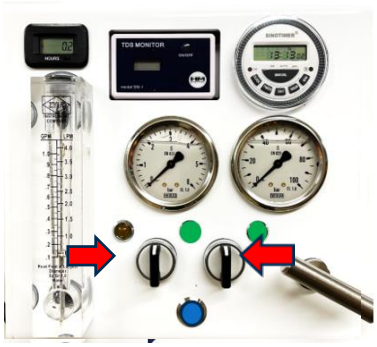
OBSERVE

Never start your MAB Watermaker in manual mode with the pressure control valve (needle valve) closed, as this may damage the high-pressure housing and osmosis membrane as the protection of hydraulic shocks to the high-pressure housing only works when the automatic is engaged.

OBSERVE

Do not use your MAB Watermaker where oil, chlorine, or other chemicals may be present in the seawater. It destroys the osmosis membrane.

Starting off automatically

Step	Measure
1	If the MAB watermaker is already running with the right working pressure to produce drinking water, it is fine to turn on the automatic. The automation now takes over drinking water production and purification and puts the system on standby until the next start of drinking water production. *Result*: The light for the automatic on the switch comes on.
2	Reset the manual switches to the off position. This is so that the pumps do not start after the automatic has been switched off. *Result*: The green lights for the boost pump and the high-pressure pump are kept on. 
3	In order to start the automation when the MAB watermaker is turned off, a new drinking water production needs to be done. This is to be able to set the correct working pressure on the needle valve when the high-pressure pump is running. Press the automatic power button. *Result*: The light for the automatic on the switch comes on 
4	If a new start of drinking water production is needed, the system will start when the boost pump starts and after about 10 seconds the high-pressure pump will start. *Result*: The lights for the boost pump and high-pressure pump as well as the automatic switch are on. 

5	Now set the correct working pressure with the needle valve for your drinking water production. *Result*: Drinking water production is up and running and is shown on the water flow meter. You can now hand over the work cycle to the automatic.	

4.2 Switching off the automatic system

Turn off the automatic

Step	Measure
1	Check that the manual switches are in the off position so that the pumps do not start after the automatic has been switched off.
2	Switch off the automatic with the switch. *Result*: All lights on the panel should now be off.
3	If you have turned off the automatic system during an ongoing drinking water production, you should do a manual flush of the system to get the seawater out into the system. (see basic manual for MAB watermaker)

Contact our support

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