

VMT Retrofit Master Controller

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1 FEATURES

The Allen Engineering VMT Retrofit Master Controller and VMT Retrofit Remote Controller operate similarly to the original Village Marine (or Offshore Marine Labs) master controller. The VMT Retrofit Remote Controller is an exact repeater of the VMT Retrofit Master Controller. Both OEM and Retrofit Master controllers do the following: start and stop the low- and high-pressure pumps; manage a timed fresh water flush cycle; keep track of maintenance intervals; and monitor for pressure faults. There are a few key differences and enhancements.

1.1 Multi-color Backlight

The backlight of the Allen Engineering VMT Retrofit Master Controller remains off during standby mode. During normal operation, the backlight color is white. During fresh water flushing and when non-critical “caution” messages are displayed, the backlight color is amber. In the event of a serious fault, a “warning” message is displayed, and the backlight color is flashing red.

1.2 Automatic Flushing

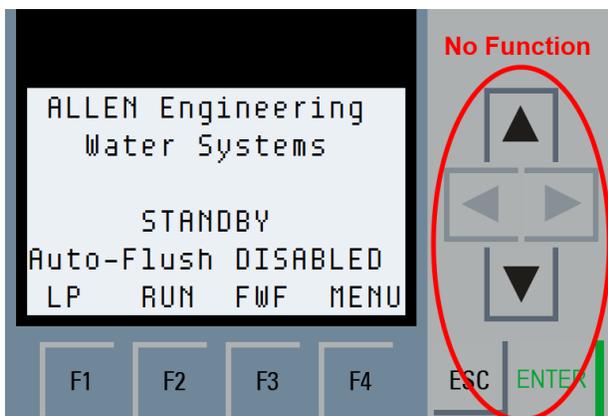
At long last, programmable automatic flushing is available for your Village Marine or Offshore Marine Labs watermaker. The watermaker can now be left unattended for extended periods without the need for preserving the membranes. System power and fresh water pressure are required for this to function. See Section 3, Menu.

2 OPERATION

2.1 Standby Screen

Depending on the setting for automatic fresh water flush, one of the following screens will be displayed at startup:

Fig 1



Auto-Flush Disabled (Default)

Fig 2



Auto-Flush Enabled

The bottom row of text indicates the function of the control buttons, F1-F4. The text above the button indicates the function. The arrow keys, “Esc” and “Enter” have no function at this time.

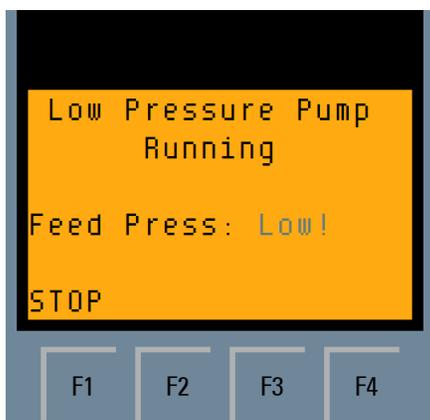
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2.2 Low-Pressure Pump Only Mode (F1)

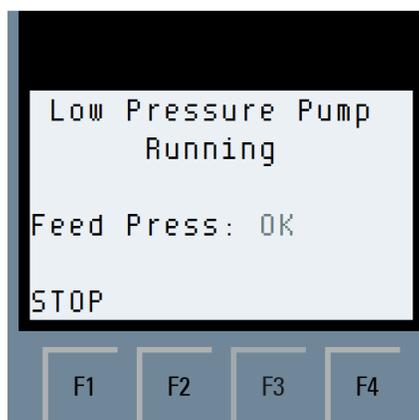
The Allen Engineering VMT Retrofit Master Controller allows operation of the low-pressure pump for system priming and troubleshooting purposes. Press the F1 button (under “LP”) to start the low pressure pump. Press F1 again to stop the pump. The controller monitors the low-pressure safety switch to ensure the pump cannot run dry. The pump is stopped and a warning is displayed if the feed pressure does not satisfy the pressure safety switch within 15 seconds, or if the feed pressure drops due to loss of prime or blockage (Fig 7).

Fig 3



LP Pump Only Mode, Pressure Too Low

Fig 4

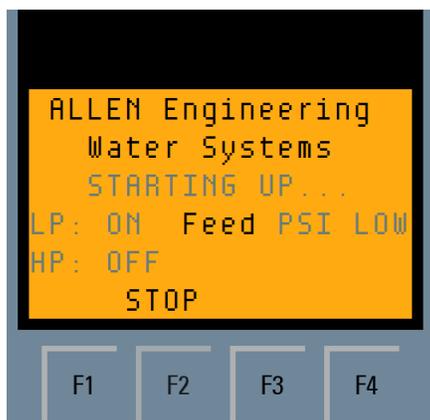


LP Pump Only Mode, Pressure Adequate

2.3 Normal Operation “Run” Mode (F2)

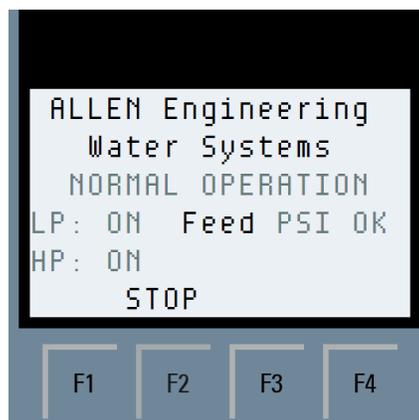
Pressing F2 sets the controller in “Run” mode. First, the controller starts the low-pressure pump. The high-pressure pump will be started a short time after the feed pressure comes up. Press F2 again to stop the cycle. If Auto-Flush is enabled, the fresh water flush cycle will begin automatically after a short delay (Fig 7).

Fig 5



Run Mode, Feed Pressure Too Low

Fig 6

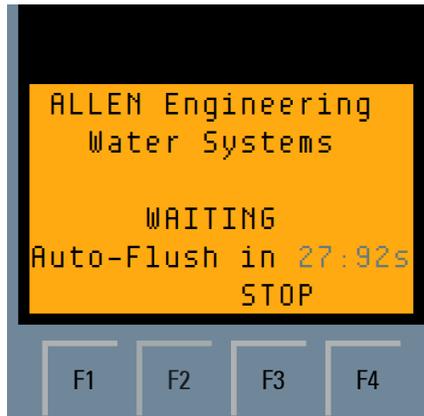


Run Mode, Feed Pressure Adequate

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Fig 7

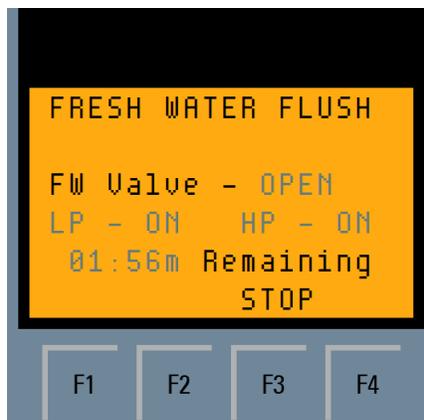


Auto-Flush Waiting After Run

2.4 Fresh Water Flush (F3)

The automated fresh water flush cycle can be started by pressing F3. Pressing F3 again stops the flush cycle. First, the fresh water solenoid valve is opened, then the low-pressure pump is started. Soon after the feed pressure comes up, the high-pressure pump is started and the flush duration countdown timer begins (Fig 8). The duration of the flush cycle is controlled in system settings.

Fig 8



Fresh Water Flush Mode

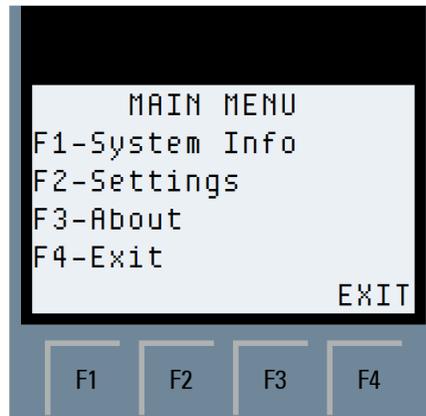
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3 MENU

Press F4 to enter the main menu (Fig 9).

Fig 9

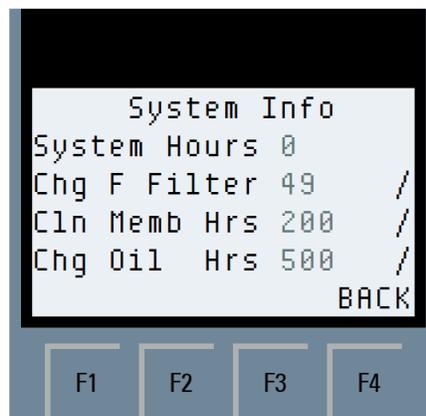


Main Menu

3.1 System Info (F1)

Press F1 to view system information (Fig 10). Total system operating hours are accumulated when the high-pressure pump is running. "Chg F Filter" displays how many fresh water flush cycles remain before the carbon filter should be changed. The displayed line scrolls toward the left to show the maximum recommended cycles for the carbon filter. "Cln Memb Hrs" indicates the number of hours remaining before the membranes should be treated with cleaning chemicals #1 and #2 (see watermaker operator's manual). "Chg Oil Hrs" indicates how many system hours remain before the high-pressure pump oil should be changed. Press F4 to return to the main menu.

Fig 10



System Information Display

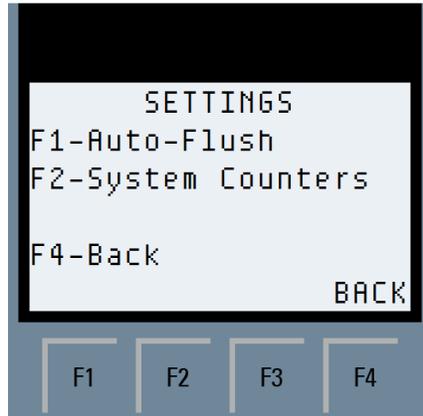
3.2 Settings (F2)

Press F2 to enter the settings menu (Fig 11). Press F4 to return to the main menu.

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Fig 11

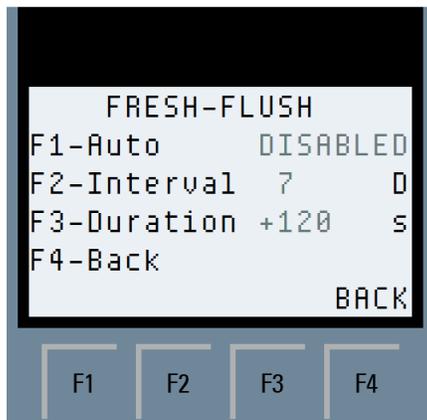


Settings Menu

3.2.1 Auto-Flush (F1)

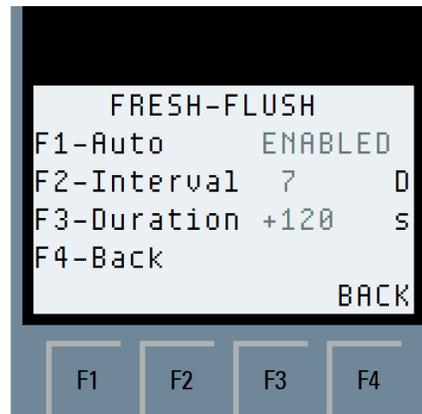
Press F1 to enter the Auto-Flush menu (Fig 12a & 12b). Press F4 to return to the Settings menu.

Fig 12a



Auto-Flush Disabled (Default)

Fig 12b



Auto-Flush Enabled

Pressing F1 in this menu toggles the Auto-Flush feature on and off. When Auto-Flush is enabled, the Fresh Water Flush cycle is run automatically after every time the watermaker is run. After that, the Fresh Water Flush cycle will run again once the number of days in the flush interval has passed. When the watermaker is used to make water, the interval clock is reset.

Pressing F2 allows adjustment of the Auto-Flush interval (Fig 13). The interval can be increased or decreased one day at a time. The default interval is seven (7) days.

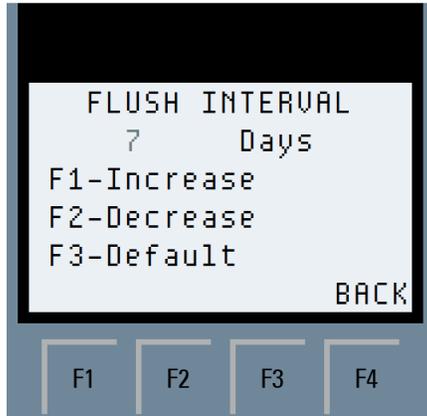
Pressing F3 allows adjustment of the Fresh Water Flush duration (Fig 14). The duration can be increased or decreased 10 seconds at a time. The default flush duration is 120 seconds (two minutes).

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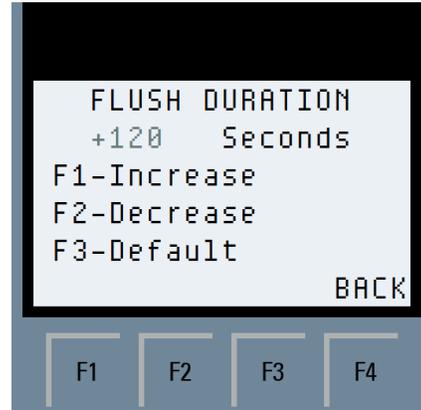
Press F4 to return to the Auto-Flush menu.

Fig 13



Auto-Flush Interval

Fig 14

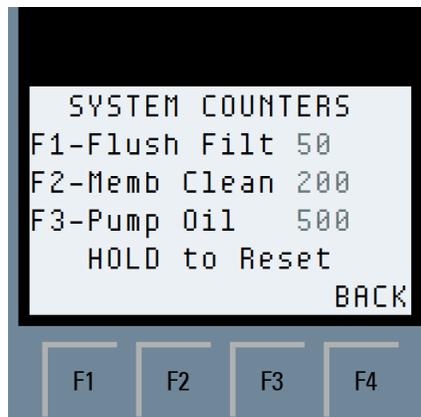


Fresh Water Flush Duration

3.2.2 System Counters (F2)

Pressing F2 from the Settings menu enters the System Counters menu (Fig 15).

Fig 15



System Counters Menu

This menu is similar to the System Info page, except this screen allows the counters to be reset. Press and hold the appropriate button to reset the counter assigned. Resetting any counter will clear the Caution display that appears when the counter limits are exceeded.

4 SYSTEM MESSAGES

Caution Messages indicate non-critical system maintenance reminders. Caution Messages have an amber backlight color. Warning Messages indicate critical system maintenance events, and are displayed

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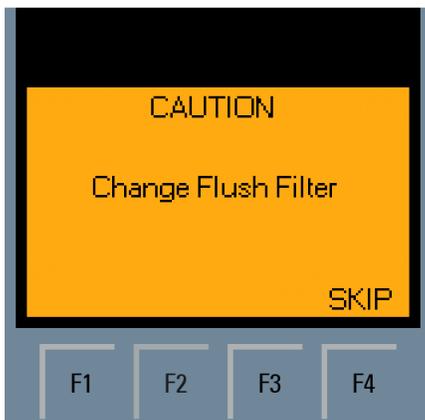
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when the watermaker experiences a problem that requires emergency (automatic) shutdown. Warning Messages display with a flashing red backlight color.

4.1 Caution Messages

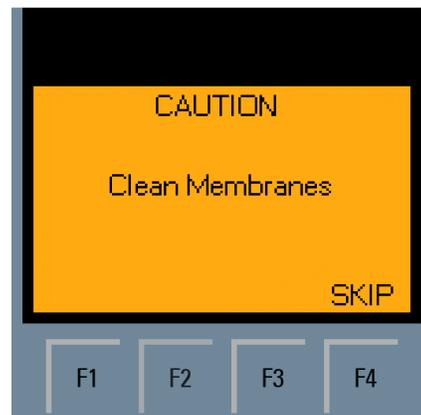
Various Caution Messages are displayed once the system counter limit for a given maintenance item is reached. The watermaker is still permitted to run normally when these messages are displayed. Simply press the F4 key to clear the message screen and run normally. After performing the required maintenance, the appropriate system counter should be reset using the System Counters menu.

Fig 16



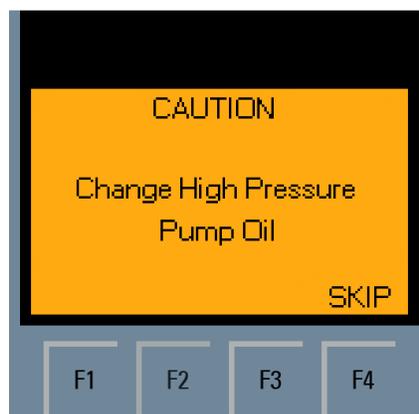
Caution Message

Fig 17



Caution Message

Fig 18



Caution Message

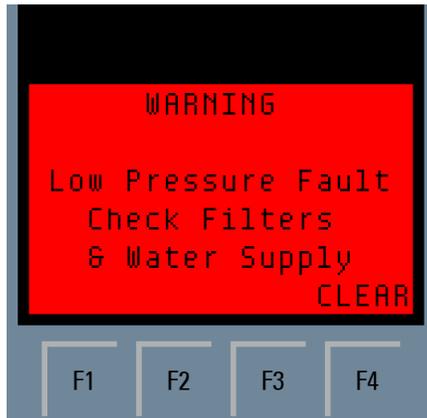
4.2 Warning Messages

If the feed pressure drops below the required level (all watermaker models), or the system (RO) pressure exceeds limits (certain watermaker models), all pumps will stop and the appropriate Warning Message will be displayed (Fig 19 & 20). Press F4 to clear the warning and begin troubleshooting.

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Fig 19



Feed Pressure Too Low

Fig 20



System Pressure Limit Exceeded

5 CIRCUIT PROTECTION

There are two reset-only circuit breakers on the bottom of the VMT Retrofit Master Controller. One is rated at four (4) amps, and protects the low-pressure pump circuit. The other circuit breaker is rated at two (2) amps, and protects the internal circuitry of the master controller, pressure switches, motor contactor, and flush solenoid valve circuits. If one of these circuit breakers should trip, identify and remedy the root cause before resetting the breaker.

6 INSTALLATION

Begin the installation by removing all electric power from the watermaker, and ensure that power cannot be accidentally restored during this procedure.

6.1 Remove Old Master Controller

Remove the control panel cover to gain access to the back of the master controller. Loosen the retaining screws and disconnect the two 8-pin connectors from the back of the master controller. Disconnect the multi-wire cable connecting between the master controller and the water quality monitor. This will not be reused. If installed, disconnect the remote control cable from the master controller. This will only be reused if you purchased the Remote Ready VMT Retrofit Master Controller. If using Remote Controller, please disconnect the OEM Remote Controller NOW.

Insert a small phillips screwdriver through each corner of the master controller circuit board to remove the four mounting screws that attach the master controller to the cover panel (Fig 21). You may have to slightly bend the voltage spike protector disc (Fig 22) to gain access to one of the mounting screws.

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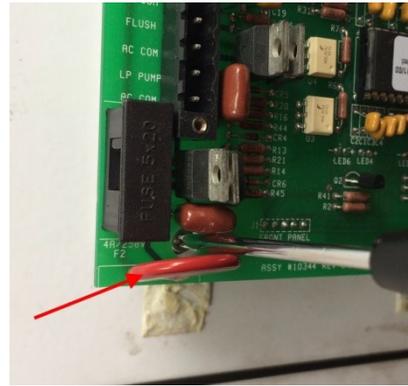
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Fig 21



OEM Master Controller Screw Locations

Fig 22



Voltage Spike Protector Location

6.2 Mount New Master Controller

Remove one nut and washer from each of the four mounting studs on the back of the VMT Retrofit Master Controller. Carefully insert the new master controller in the cover panel by passing the mounting studs through the large opening in the cover panel. Ensure that it is mounted in the correct orientation (Fig 23). The controller mounts on the outside of the cover panel.

Fig 23



Front View

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Remote Controller. Once you have verified appropriate clearance, plug the remote cable into the supplied cable adapter. Reinstall the four screws.

7 SPECIFICATIONS*

	WMC-VMTR-2	WMC-VMTR-3 (Remote)
Replaces Part Number(s)	20-0386 (Village Marine Tech, VMT) 20-1348 (Offshore Marine Labs, OML) 20-1399 (Village Marine USCG)	20-4095 (Village Marine Tech, VMT) 20-1349 (Offshore Marine Labs, OML) 20-4090 (Village Marine USCG)
Compatible with Remote	YES (Requires WMC-VMTR-3)	
Input Voltage	85-264 VAC, 47-63 Hz	Powered by WMC-VMTR-2
Output Voltage	= Input Voltage (Pump/Coils) 24 VDC (Pressure Switches)	N/A
Dimensions (W x H x D)	6.75 x 5.0 x 3.5 in [172 x 127 x 89 mm]	5.10 x 4.69 x 1.52 in [130 x 119 x 39 mm]
Degree of Protection	NOT RATED	

*Specifications subject to change without notice.

8 REVISIONS

Initial Release

- A – Updated name & screen-shots
- B – Updated specifications
- C – Added remote display features
- D – Added license agreement
- E – Clarified IMPORTANT NOTE
- F – Updated images & specifications

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9 WARRANTY STATEMENT

Allen Engineering (Seller) warrants the VMT Retrofit Master Controller (Controller) and VMT Retrofit Remote Controller (Remote) to be free of defects in material and/or workmanship under normal, non-commercial, use for a period of One (1) Year from the date of original retail purchase. This warranty applies to the original retail purchaser (Buyer) only. Seller does not warrant the Controller against any defect except as set forth above, and Seller is not responsible for, and it does not warrant against, any defect or damage caused by transportation, storage, improper installation, maintenance, internal or external hostile environment, misuse, abuse, negligence, accident, modification, tampering, the attachment of any unauthorized accessory, alteration to the Controller, or any other conditions whatsoever that do not constitute a defect in material and/or workmanship. Seller accepts no liability or responsibility for on-site labor, transportation charges, duties, or consequential damages that may result from the installation and use of the Controller, regardless of cause. Seller's sole responsibility under this Express warranty shall be, at its option, to either repair or replace any goods which fail during the warranty period, provided that Buyer has promptly reported same to Seller in writing, and complies with the provisions of this Express Warranty. By installing the Controller and/or Remote, the Buyer accepts this warranty.

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