
VMS-1

Troubleshooting Guide





Table of contents


Warning	4
Introduction	5
Specifications	6
Troubleshooting	7
· Troubleshooting via status LED	7
· Troubleshooting via service codes	9
Parts replacement	10
· Drain plug replacement	10
· Wet-end cover, wet-end cover O-ring, wear ring replacement	11
· Fixation stand replacement	14
· Door replacement	15
· Communication cable replacement	15

Warnings



WARNINGS:

Before installing or connecting the unit, please read the following:

- * IF THE SUPPLY CORD IS DAMAGED, IT MUST BE REPLACED BY THE MANUFACTURER, ITS SERVICE AGENT OR SIMILARLY QUALIFIED PERSONS IN ORDER TO AVOID A HAZARD.
- * AFTER VMS-1 IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE SERVICING OR MODIFYING ANY CABLE CONNECTIONS IN THIS UNIT TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.
- * THIS PUMP MUST NOT BE INSTALLED IN PROXIMITY TO HIGHLY FLAMMABLE MATERIALS.
- * THIS PUMP MUST BE SUPPLIED THROUGH A RESIDUAL CURRENT DEVICE (RCD) HAVING A RATED RESIDUAL OPERATING CURRENT NOT EXCEEDING 30 MA.
- * LOW SUPPLY VOLTAGE OR IMPROPER WIRING MAY CAUSE DAMAGE TO THIS PUMP. READ AND FOLLOW ALL WIRING INSTRUCTIONS WHEN CONNECTING TO POWER SUPPLY.
- * THIS PUMP CONTAINS NO USER SERVICEABLE PARTS. CONTACT AN AUTHORIZED SERVICE CENTER FOR SERVICE.
- * PRODUCT MUST BE DISPOSED OF SEPARATELY IN ACCORDANCE WITH LOCAL WASTE DISPOSAL LEGISLATION. 
- * THIS APPLIANCE IS NOT INTENDED FOR USE BY PERSONS (INCLUDING CHILDREN) WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES, OR LACK OF EXPERIENCE AND KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING USE OF THE APPLIANCE BY A PERSON RESPONSIBLE FOR THEIR SAFETY.
- * CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE.
- * PARTS INCORPORATING ELECTRICAL COMPONENTS, EXCEPT REMOTE CONTROL DEVICES, MUST BE LOCATED OR FIXED SO THAT THEY CANNOT FALL INTO THE BATH OR hot tub.
- * CLEARANCE AND MINIMUM DISTANCE BETWEEN THE VARIOUS PARTS OF THE APPLIANCE AND THE SURROUNDING STRUCTURE ARE NOT SPECIFIED AS LONG AS THEY ARE SUFFICIENT SO THAT THE AMBIENT TEMPERATURE AROUND THE PUMP DOES NOT EXCEED 60°C.
- * PARTS ARE TO BE INSTALLED IN THE CORRECT ZONE AND EQUIPOTENTIAL BONDING CARRIED OUT IN ACCORDANCE WITH WIRING RULES.

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Introduction

This document

This document is intended for technicians of an authorized service center and will help to troubleshoot common problems of the VMS-1 and safely replace some of its components.

IMPORTANT!

ONLY COMPONENTS DESCRIBED IN THE SECTION “PARTS REPLACEMENT” OF THIS DOCUMENT CAN BE REPLACED BY TECHNICIANS OF AN AUTHORIZED SERVICE CENTER OR SIMILARLY AUTHORIZED QUALIFIED PERSONS.

WARRANTY CAN BE VOIDED IF A COMPONENT NOT DESCRIBED IN THE SECTION “PARTS REPLACEMENT” OF THIS DOCUMENT IS REPLACED OR IF THE ENCLOSURE IS OPENED.

WARRANTY CAN BE VOIDED IF ANY COMPONENT IS REPLACED BY A NON-AUTHORIZED PERSONS.

REPROGRAMMING THE APPLICATION AND MOTOR DRIVE FIRMWARE REQUIRES SPECIAL EQUIPMENT AND SOFTWARE AND SHOULD ONLY BE PERFORMED BY A TECHNICIAN PROPERLY TRAINED BY GECKO R&D. CONTACT GECKO R&D FOR EQUIPMENT, FIRMWARE FILES AND TRAINING. IF YOU ARE UNABLE TO REPROGRAM THE APPLICATION, RETURN THE VMS PUMP TO GECKO.

Technical support

If your problem is not resolved, you can send an assistance request to our technical support team.

Call us: +1 800-784-3256

European tech support toll free hotline : +33 80 50 80 352

UK toll free phone number : +44 800 060 8300

Specifications

Environmental ratings

Operating temperature:	32°F (0°C) to 140°F (60°C)
Storage temperature:	-13°F (-25°C) to 149°F (65°C); 6 months max. storage
Humidity:	Up to 85% RH, non-condensing
Level of waterproofing:	IPX5

Physical specifications

Weight:	29.20 lb (13.24 kg)
Dimensions (W x H x D):	See pages 6 and 7

Hydraulic specifications

Flow rate:	255 gpm (965 lpm) max
Max pressure:	27 psi (0.186 MPa)
Max total head:	62 ft (18.9 m)

North American electrical specifications

Input rating:	220–240 V; 50–60 Hz; 10.7 A max
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North American standards

UL 1081 (File : E62386)

CSA 22.2 No.108 (File : E62386)



FCC part 15 subpart B

ICES-003 issue 7

European electrical specifications

Input rating:	220–240 V; 50–60 Hz; 10.7 A max
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European and international standards

IEC 60335-2-41: 2012

IEC 60335-1: 2010 + AMD1: 2013 + AMD2: 2016

EN IEC 60335-2-41: 2021 / A11: 2021

EN 60335-1: 2012 + A11: 2014 + A13: 2017 + A1: 2019 + A14: 2019 + A2: 2019 + A15: 2021

EN 62233: 2008 + AC: 2008

AS/NZS 60335.2.41: 2013 + AMD 1: 2018

AS/NZS 60335.1: 2020 + AMD 1: 2021

EN 55014-1: 2021

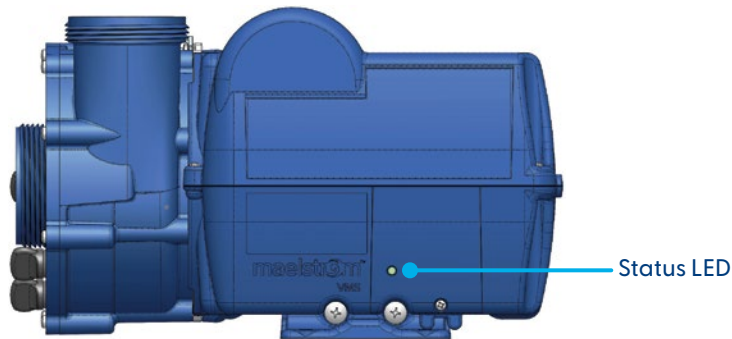
EN 55014-2: 2021



Troubleshooting

Troubleshooting via status LED

The VMS-1 has a status LED that can be used for troubleshooting purposes. The table below describes the different LED colors and error signals related and what actions to take to fix each error. These actions should be tried in the sequence they are presented in the table below, and the next action should only be attempted if the previous one didn't fix the problem.



WARNING! TURN OFF POWER BEFORE OPENING THE DOOR OF THE PUMP.



WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE OPENING THE DOOR TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.

LED color	Description	Actions
Green	Pump running : No error, this is part of normal operation.	No action required; the VMS-1 pump is operating as expected.
Blue	VMS-1 application started : No error, this is part of normal operation.	No action required; wait for initialization to complete.
Yellow	Ready and on standby, waiting for commands : No error, this is part of normal operation.	No action required; wait for pack to send commands. If this state persists, try to force a command by activating the pump via the keypad.
Red	Waiting for communication from control system.	This state normally lasts only a few seconds. If this state persists, check if the control system is powered up and running. Check if the communication cable isn't unplugged, damaged, or cut. Also check the communication cable of any other VMS-1 installed on the hot tub.
Red Blinking	Error: Bad Modbus address.	Check if the DIP switches positions match configuration. See VMS-1 Techbook for instructions on how to set the DIP switches.
White Blinking	Error: No application in flash memory or data is corrupted.	Reprogram the application firmware via FTDI cable (special equipment; contact Gecko Technical support or R&D).
Purple	Error: No firmware loaded in Infineon motor drive.	Reprogram the Infineon motor drive firmware using Infineon iMotion Link probe (special equipment; contact Gecko Technical support or R&D).

Troubleshooting

Troubleshooting via service codes

If the VMS-1 is correctly initialized and works correctly (the status LED is green or yellow), but an error is detected in the VMS-1 control logic, the keypad (in.k1000+, in.k1001+ or flx.go) will display a service code.

Service codes are binary-coded. They can be described as a 1-byte bitfield. This means multiple service codes can be combined into one displayed code. Since there is always only one possible combination of service codes that results in a combined service code, this also means we can identify each and every individual service code that has been combined. Here are a few examples :

Example 1 : Service code 65 = Service codes 64 + 1

Example 2 : Service code 100 = Service codes 64 + 32 + 4

Example 3 : Service code 24 = Service codes 16 + 8

The table below describes the different service codes and what actions to take to fix each of them. These actions should be tried in the sequence they are presented in the table below, and the next action should only be attempted if the previous one didn't fix the problem.



WARNING! TURN OFF POWER BEFORE OPENING THE DOOR OF THE PUMP.



WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE OPENING THE DOOR TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.

Service Code	Description	Actions
Lost communication	Control system lost communication with VMS-1.	Check if the VMS-1 is powered on and running. Also check if the VMS-1 power cable is unplugged, damaged, or cut. Check if the communication cable is unplugged, damaged, or cut. Also check the communication cable of any other VMS-1 installed on the hot tub.
1	Drive overcurrent : Motor control failure or rotor might be stuck.	Disassemble the impeller and check if it is broken, obstructed by a foreign object or otherwise blocked. Carefully clear obstructions. Replace the impeller if damaged. Check the proper operation of bearings and seals. If this error persists, motor drive might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.
2	DC voltage error : Under/over voltage fault	Might be caused by temporary power fluctuations. Check electrical installation of the VMS-1. If this error persists, motor drive might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.
4	AC voltage error : Under/over voltage or frequency fault	Might be caused by temporary power fluctuations. Check electrical installation of the VMS-1. If this error persists, motor drive might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.

Service Code	Description	Actions
8	Over Temperature	<p>Allow the VMS-1 to cool down.</p> <p>If this error persists, motor drive might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.</p>
16	UART error	<p>Internal error typically caused by faulty electronics. Reprogram the application firmware via FTDI cable (special equipment; contact Gecko Technical support or R&D).</p> <p>Reprogram the Infineon motor drive firmware using Infineon iMotion Link probe (special equipment; contact Gecko Technical support or R&D).</p> <p>If this error persists, motor drive might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.</p>
32	CPU overload	<p>Internal error typically caused by faulty firmware. Reprogram the application firmware via FTDI cable (special equipment; contact Gecko Technical support or R&D).</p> <p>If this error persists, microcontroller might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.</p>
64	System error	<p>Internal error typically caused by bad motor drive parameters. Reprogram the Infineon motor drive firmware using Infineon iMotion Link probe (special equipment; contact Gecko Technical support or R&D).</p> <p>If this error persists, motor drive might be faulty; VMS-1 control board must be replaced. Contact Gecko Technical support.</p>
Other service codes	Combined service codes (127 and under) or unknown service code (128 and over)	<p>Apply the calculation described at the beginning of the section “Troubleshooting via service codes” to decipher combined service codes and apply the actions related to each service code deciphered.</p> <p>If a service code greater than 127 appears, this service code is unknown, which typically means the error data is corrupted, or it is a new service code added after this troubleshooting guide was written.</p> <p>Verify the latest version of this troubleshooting guide via Gecko’s website.</p> <p>Otherwise, contact Gecko Technical support or R&D.</p>

Parts replacement

Drain plug replacement

Drain plug : part number 92290070

Drain plug O-ring : part number 92200060

(O-rings for drain plugs and wet-end cover replacement kit : part number 0820-500002)



WARNING! TURN OFF POWER BEFORE REMOVING THE DRAIN PLUG.

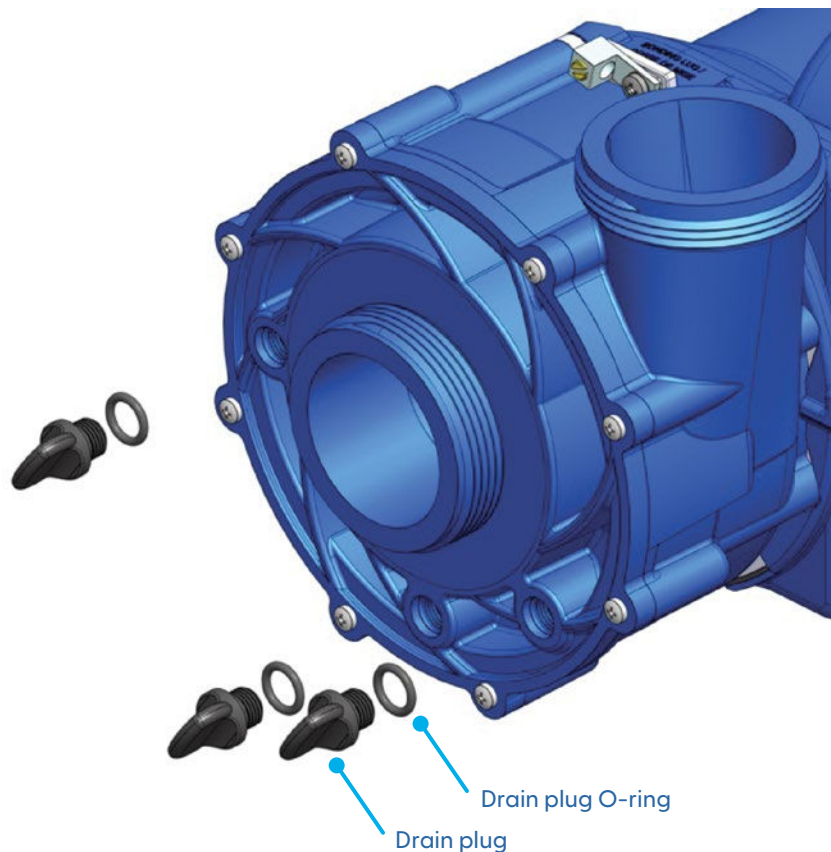


WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE REMOVING THE DRAIN PLUG TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.



WARNING! CLOSE THE PIPING VALVES CLOSEST TO THE PUMP BEFORE REMOVING THE DRAIN PLUG.

1. Unscrew the drain plug you need to change. You can use pliers to do so.
2. Make sure that the O-ring is properly installed on the replacement drain plug and screw it on the pump's wet-end cover. Torque the drain plug to 20 ± 2 lb.in (2.26 ± 0.23 N.m).



Parts replacement

Wet-end cover, wet-end cover O-ring, wear ring replacement

Wet-end cover replacement kit (includes drain plugs, O-rings, wear ring, screws) : part number 0820-500001

Wet-end cover : part number 9917-106839

Wet-end cover O-ring : part number 282KA0299

Wear ring : part number 92830070

Phillips screws : 99730050

Drain plug : part number 92290070

Drain plug O-ring : part number 92200060

(O-rings for drain plugs and wet-end cover replacement kit : part number 0820-500002)

IMPORTANT: Always replace the wet-end cover O-ring with a new one when the wet-end cover is removed or replaced.



WARNING! TURN OFF POWER BEFORE REMOVING THE WET-END COVER.

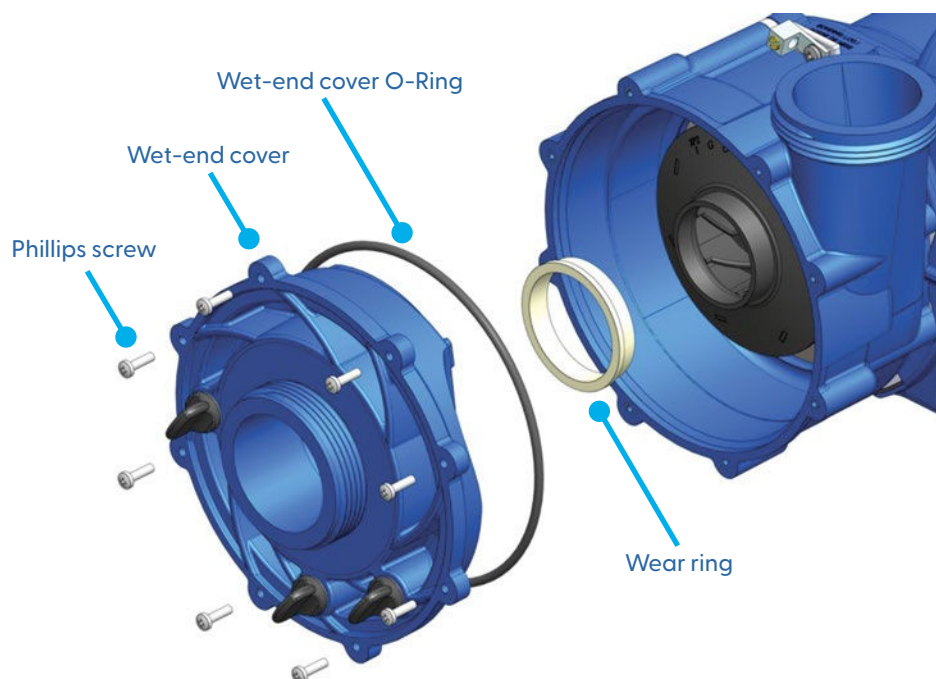


WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE REMOVING THE WET-END COVER TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.



WARNING! CLOSE THE PIPING VALVES CLOSEST TO THE PUMP AND DRAIN THE PUMP'S WET-END BEFORE REMOVING THE WET-END COVER.

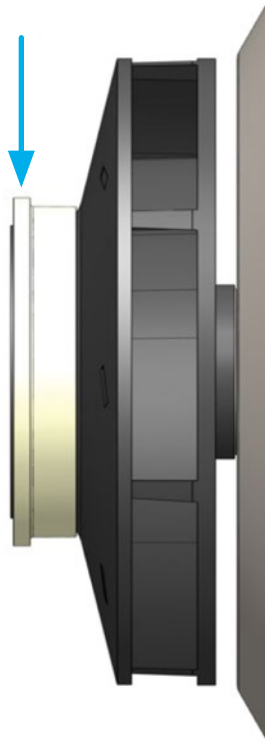
1. If the wet-end cover is replaced, remove the 3 drain plugs and drain plug O-rings from the cover and put them aside (see page 10 – Drain plug replacement).
2. Remove the 8 Phillips screws holding the wet-end cover to the wet-end volute.
3. Remove the wet-end cover, the wet-end cover O-ring and the wear ring if required.



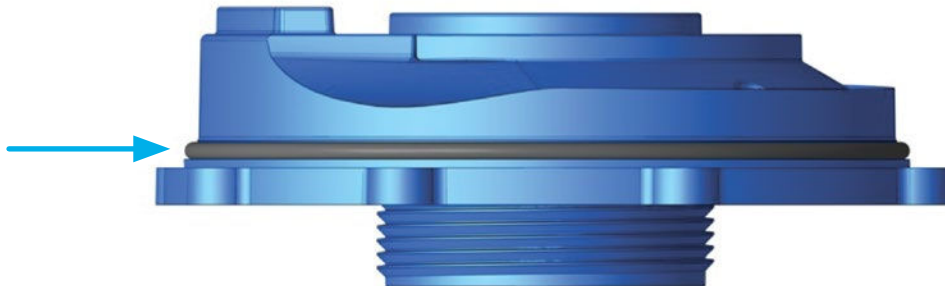
Parts replacement

Wet-end cover, wet-end cover O-ring, wear ring replacement (continued)

4. Install the replacement wear ring on the impeller of the pump if required.
Make sure it is installed in the correct orientation.



5. Install the replacement wet-end cover O-ring on the wet-end cover. It must be located as shown below on the wet-end cover.

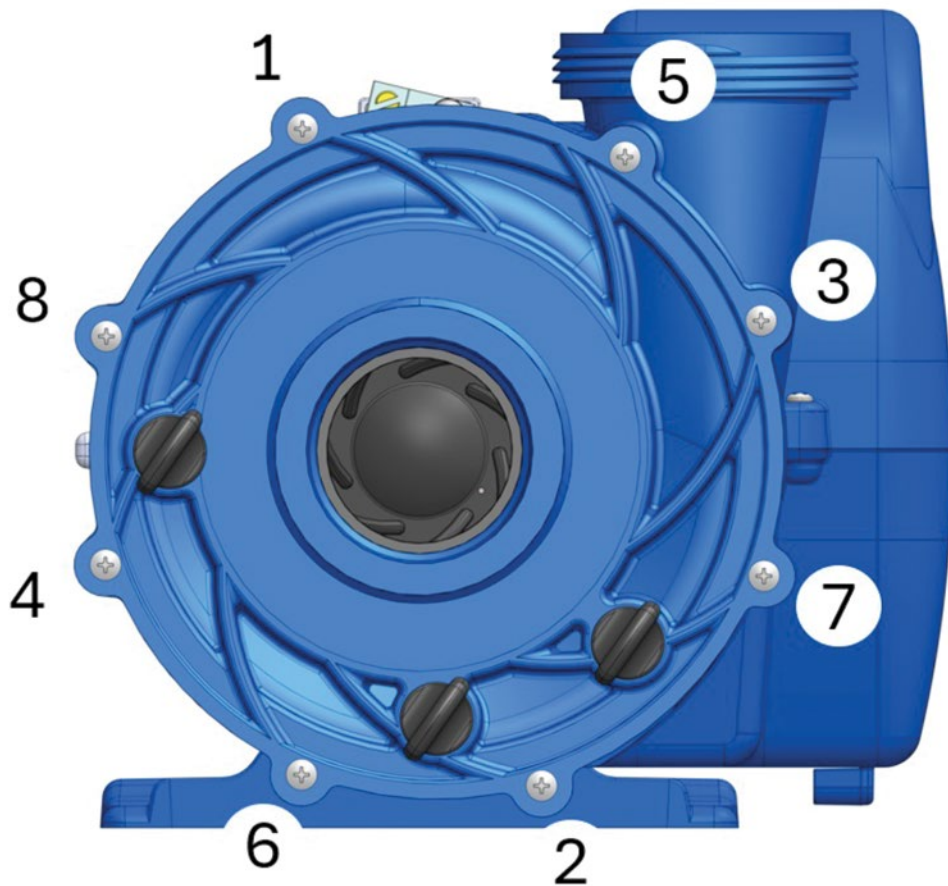


Parts replacement

Wet-end cover, wet-end cover O-ring, wear ring replacement (continued)

6. Install the wet-end cover on the wet-end volute and start screwing the 8 Phillips screws in the order shown below while applying a pressure on the cover.

IMPORTANT: Do not torque immediately.



7. Torque the 8 Phillips screws to 20 ± 2 lbf.in (2.26 ± 0.23 N.m) in the same order as the previous step.

8. Check the torque of the 8 Phillips screws again. Some screws may not be torqued properly the first time.

9. Reinstall the 3 drain plugs and drain plug O-rings on the wet-end cover if required (see page 10 – Drain plug replacement).

10. Open the piping valve to fill the wet-end with water. Check that there is no leakage before restarting the pump.

IMPORTANT: Wait at least 1 hour before restarting the pump to make sure there is no leakage.

11. After restarting the pump, check again that there is no leakage.

Parts replacement

Fixation stand replacement

Fixation stand replacement kit : part number 9920-102293



WARNING! TURN OFF POWER BEFORE CHANGING THE PUMP FIXATION STAND.



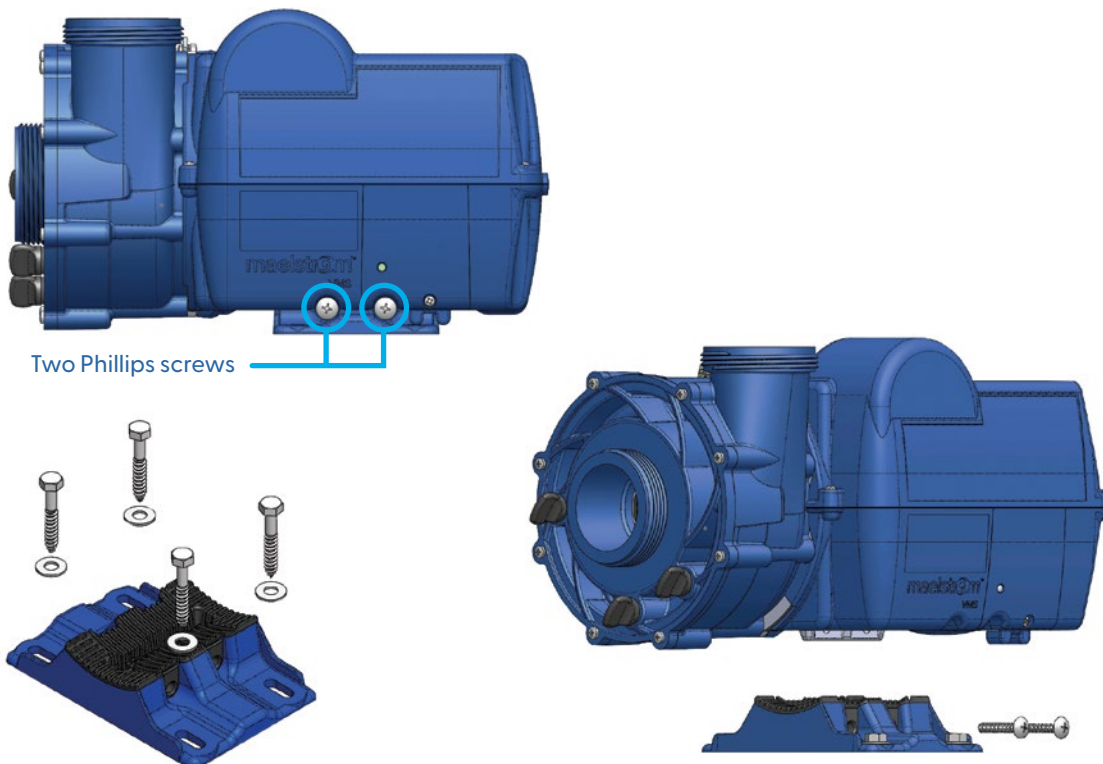
WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE REMOVING THE PUMP FROM ITS FIXATION STAND TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.



WARNING! CLOSE THE PIPING VALVES CLOSEST TO THE PUMP AND DRAIN THE PUMP'S WET-END BEFORE CHANGING THE PUMP FIXATION STAND.

1. Remove the two Phillips screws holding the pump to the fixation stand.
2. Remove the pump from the fixation stand.
3. Remove the fixation stand from the base of the hot tub.
4. Install the replacement fixation stand and firmly attach it to the base of the hot tub using four screws size 1/4 in (M7) or 5/16 in (M8) backed by four washers. Torque screws to 18 lbf.in max (2.03 N.m).
5. Install the pump on the fixation stand and fix the pump to the stand using the two Phillips screws furnished with the replacement kit.

IMPORTANT: Do not overtighten the two Phillips screws when reinstalling the pump on the fixation stand. Torque above 8 lbf.in (0.90 N.m) is considered excessive and might damage the rubber, and overtightening the rubber mount will increase the vibration transmission.



Parts replacement

Door replacement

Door replacement kit : part number 0820-500004

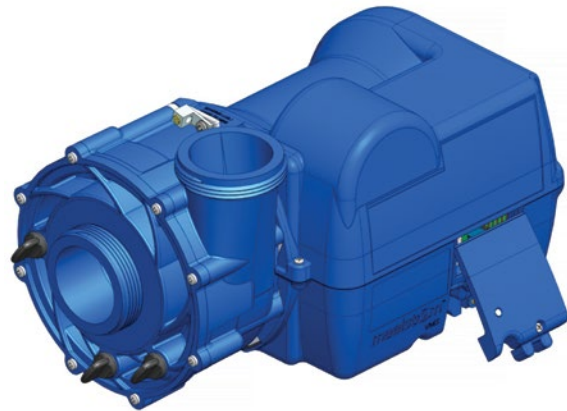
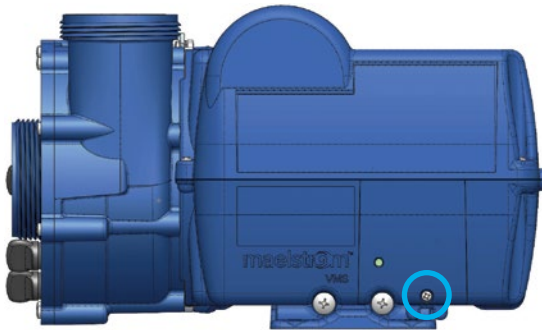


WARNING! TURN OFF POWER BEFORE OPENING THE DOOR OF THE PUMP.



WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE OPENING THE DOOR TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.

1. Unscrew the captive Phillips screw of the door.
2. Remove the door by pulling it from the bottom part.
3. Install the replacement door and screw its captive Phillips screw.
Torque screw to 8 lbf.in (0.90 N.m).



Parts replacement

Communication cable replacement

Communication cable 10 ft : part number 9920-401560

Communication cable 25 ft : part number 9920-401770

Ferrite (for CE models only) : part number 185AA0004

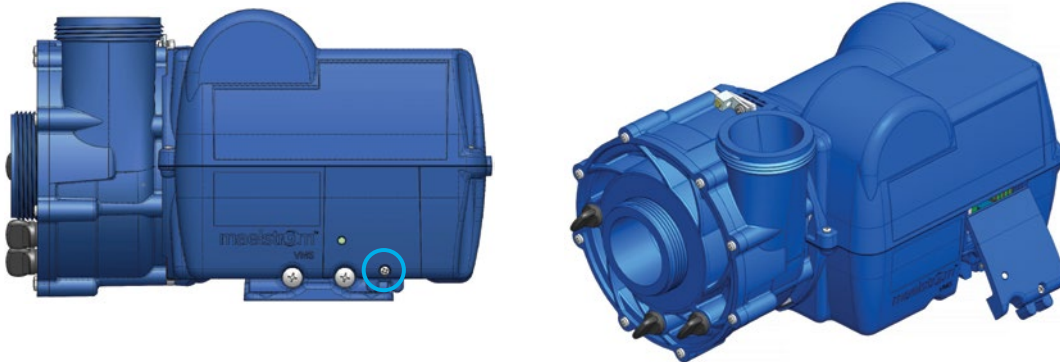


WARNING! TURN OFF POWER BEFORE OPENING THE DOOR OF THE PUMP.



WARNING! AFTER THE PUMP IS DE-ENERGIZED (TURNED POWER OFF), THERE WILL BE A RESIDUAL CHARGE IN THE UNIT. WAIT AT LEAST TWO MINUTES BEFORE OPENING THE DOOR TO ALLOW SUFFICIENT TIME FOR THE CAPACITOR TO DISSIPATE STORED ENERGY.

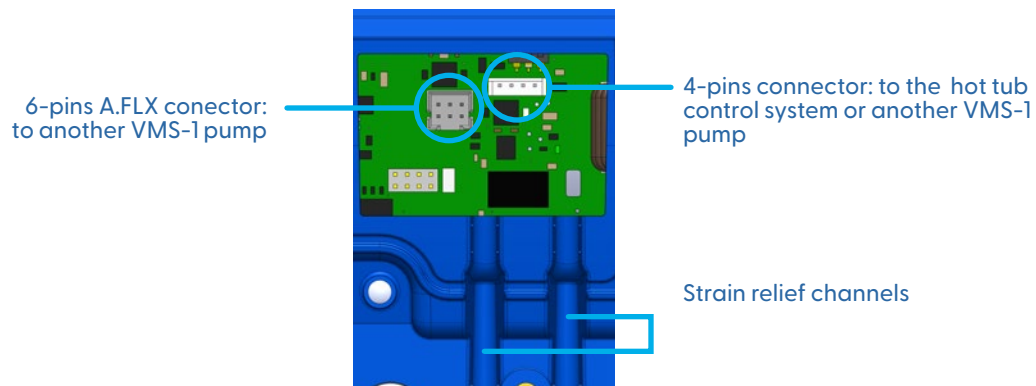
1. Unscrew the captive Phillips screw of the door.
2. Remove the door by pulling it from the bottom part.



3. Disconnect the communication cable by pulling it close to the connector and remove it from the unit.
4. Connect the replacement communication cable to the same connector and pass the cable into one of the two strain relief channels.

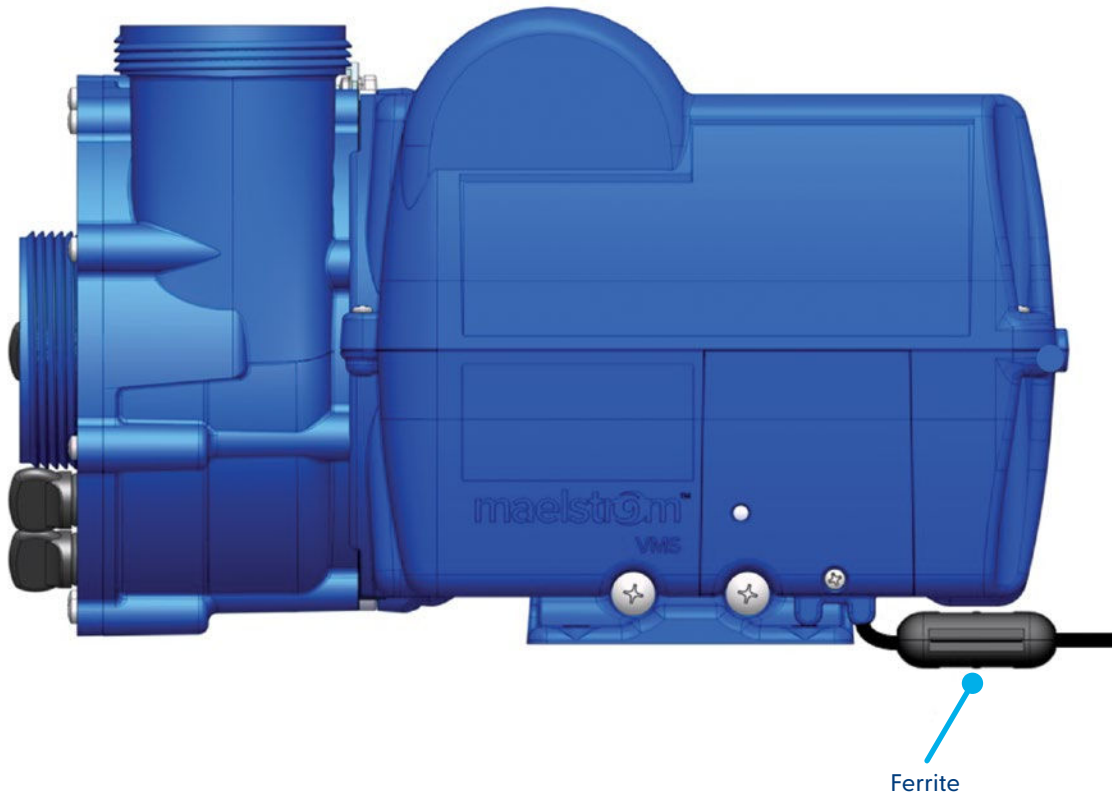
IMPORTANT: Make sure to insert the connector in the proper side. Do not force to insert it. If force is required, it may be because the connector is not inserted in the proper side.

NOTE: if the hot tub is equipped with 2 or more VMS-1 pumps, there might be 2 communication cables connected to the pump. See below connectors location.



Communication cable replacement (continued)

5. Reinstall the door and screw its captive Phillips screw. Torque screw to 8 lbf.in (0.90 N.m).
6. For CE models only : Clamp the ferrite on the communication cable.
Clamp it close to the door.







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Gecko Alliance
450 des Canetons, Québec (Qc), G2E 5W6 Canada, 1.800.78.GECKO
www.geckoalliance.com