maelstrom™

VMS-1

TechBook

VMS-1

The quietest variable speed pump in the spa industry

Quiet

Compact

Energy-efficient

GECKO®

Table of contents

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.

VMS-1

The quietest variable speed pump in the hot tub industry

The quietest variable speed pump in the hot tub industry
The VMS-1 is a smart, variable speed pump that offers an enhanced experience with a strong but quiet 3hp output.

Compact
Outstanding performance in a compact design. Compared to a conventional pump of the same output power, the VMS-1 is four inches shorter: an impressive 23% difference! And with its exclusive stand design, there's no longer any need for the time-consuming wet-end rotation of standard pumps.

Energy-efficient
Thanks to its revolutionary electric motor, the VMS-1 moves water more efficiently. For example, at the same high-speed level, the VMS-1 reaches an impressive 10% more efficiency compared to the competition.

Introduction

This document

This document includes the necessary information to safely install and maintain your VMS-1. Please read this manual carefully before you operate the unit.

The VMS-1

The VMS-1 is the most versatile and quietest pump in the industry. It's high-efficiency even at low speed. The pump is electrically efficient, meaning the conversion from electrical power to mechanical power with the PMSM motor is at least 10% better than a standard induction motor. The pump is also thermally efficient since the pump uses hot tub water to cool itself. The heat generated from the pump is transferred to the hot tub water, lowering external heater usage and expanding its life. The other main advantage created from the water-cooling feature of the pump is the reduced pump noise.

Stainless steel heat exchanger plate

The stainless steel heat exchanger guarantees a longer life span, free of corrosion. It can be used with all types of water treatment, including chlorine, iodine, bromine and salt water.

Reliable operation

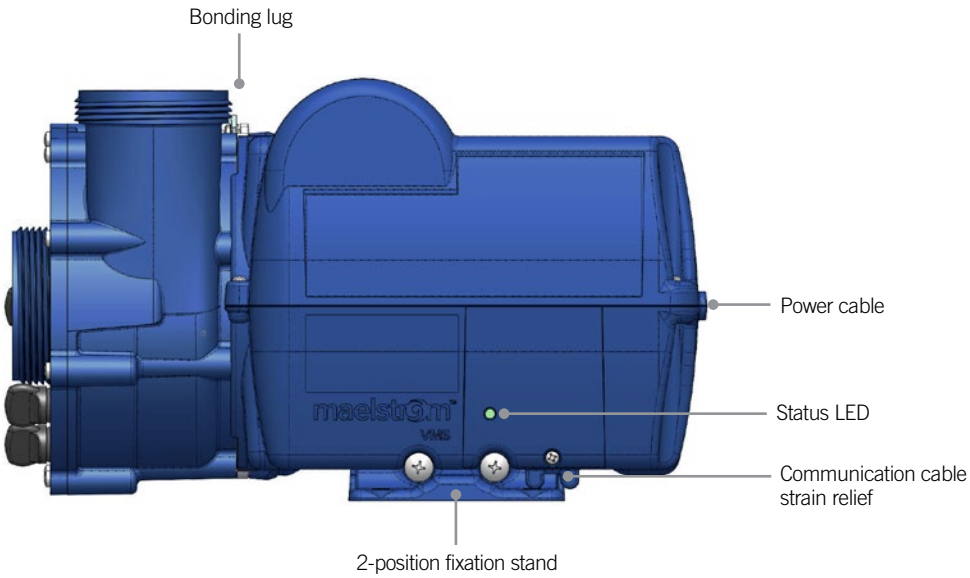
The VMS-1 has several built-in safety features. It has a lock-rotor protection in case debris prevents the motor from rotating. In addition, running overload protection avoids operating conditions outside the design parameters. The pump is designed to not overspeed in the event of no water or high restriction. The pump will always operate within design parameters no matter the differential pressure because, unlike an AC motor, the PMSM with the drive operates in a closed loop.

Self-diagnosis

In case of malfunction, the VMS will perform self-diagnosis by displaying an error code on the hot tub keypad.
To identify the problem, please refer to the ERROR CODES pages in this manual.

Overview

VMS-1



Model	Part number
VMS-1-V25-3.0: R0/R9-CE	0820-200001
VMS-1-V25-3.0: R0/R3-CE	0820-200002
VMS-1-V26-3.0: R0/R9-CUR	0820-300001
VMS-1-V26-3.0: R0/R3-CUR	0820-300002

Box content

- VMS-1
- Fixation Stand

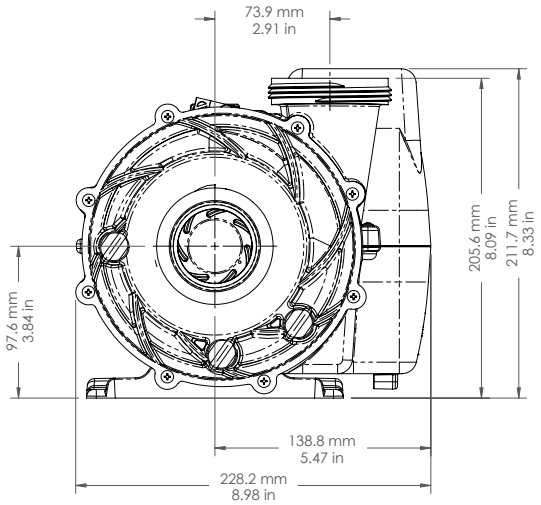
Status LED

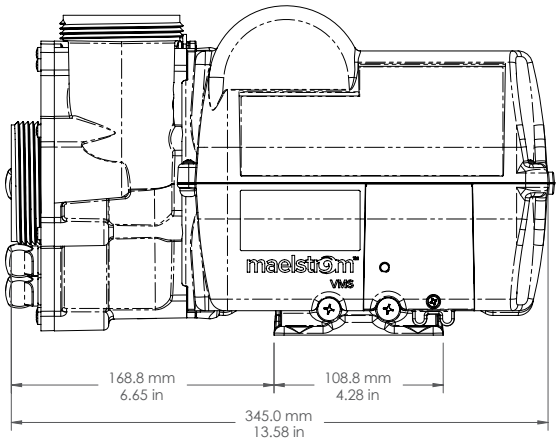
The VMS-1 has a status LED that can be used for troubleshooting purposes.

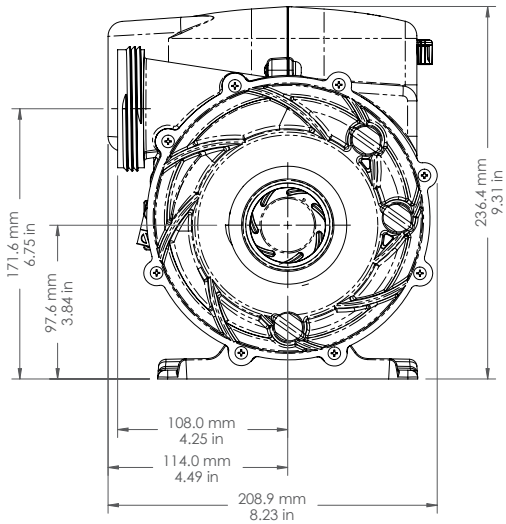
LED color		Description
Green	●	Pump running
Blue	●	VMS application started
Yellow	●	Ready and on standby, waiting for commands
Red	●	Waiting for communication from control system
Red blinking	●	Bad Modbus address, check DIP switch value
White blinking	○	No application in flash memory or data is corrupted
Purple	●	No firmware loaded in motor drive

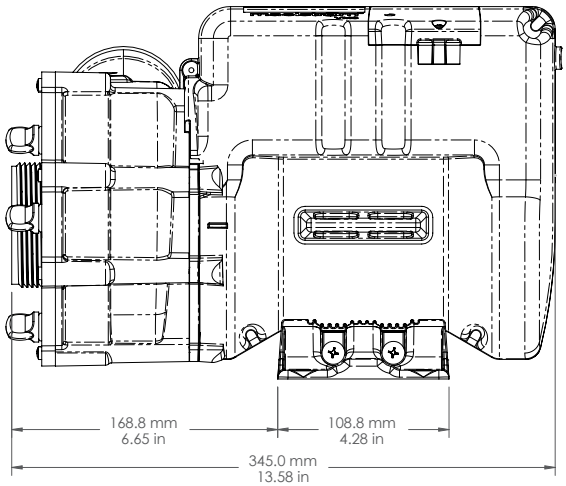
Dimensions

R0/R9 wet-end orientation



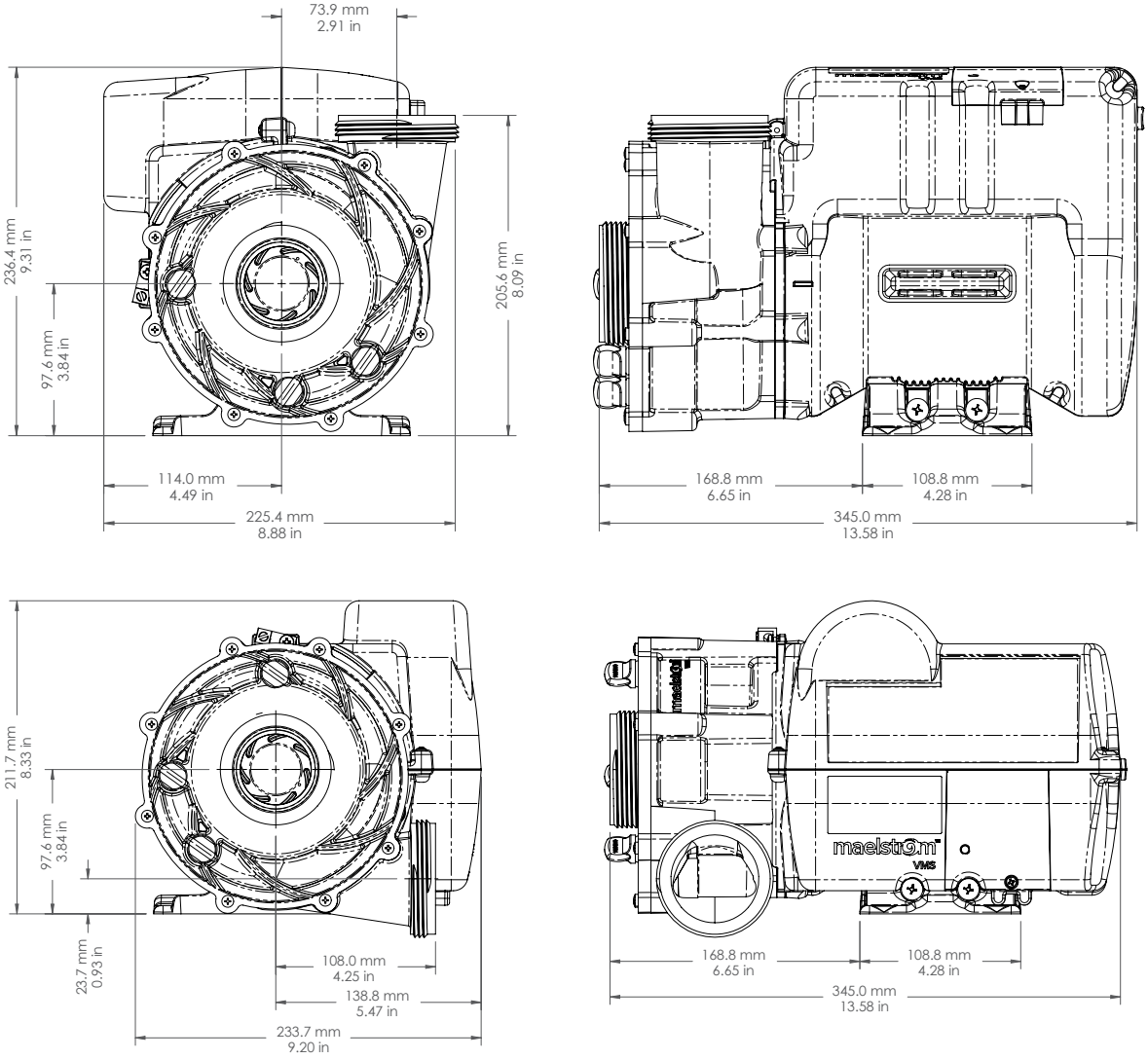




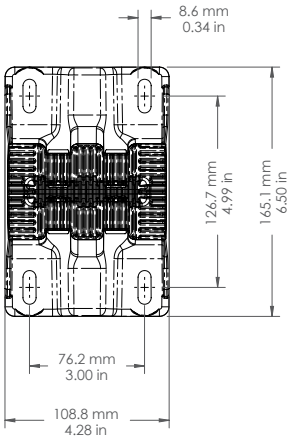


Dimensions

R0/R3 wet-end orientation



Stand



Installation

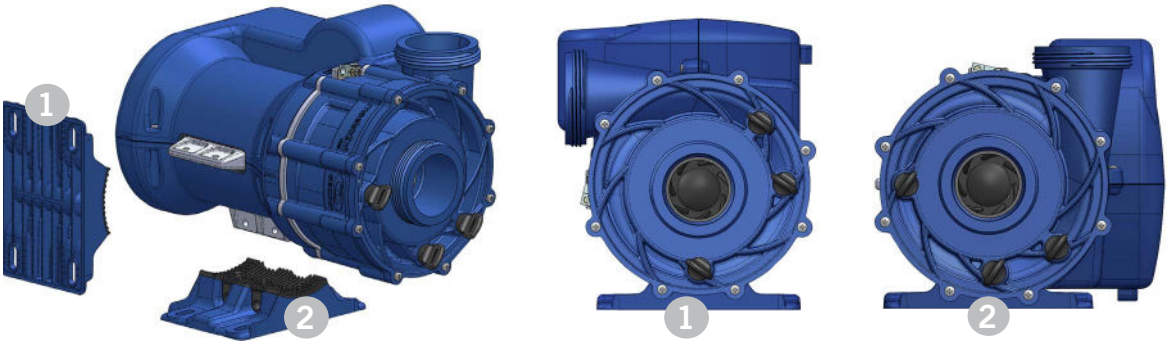
Important! Read before starting:

Please note that countersunk screws should not be used as they can damage the pump stand.

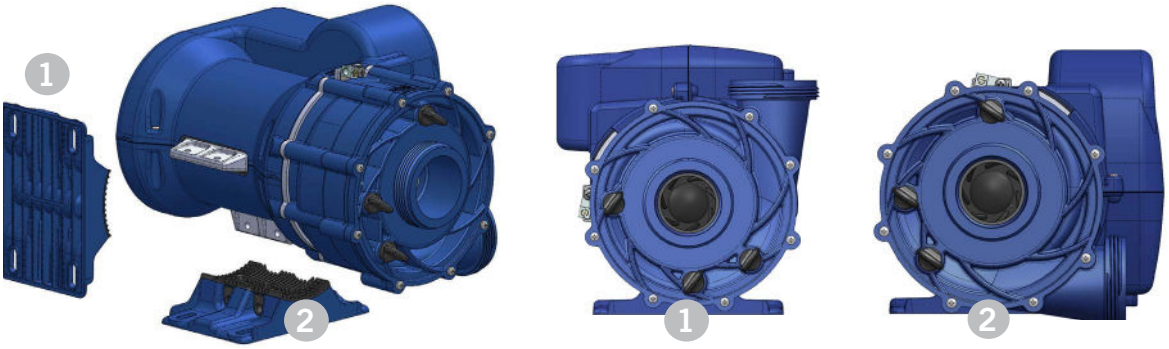
Warning! Beware of the application of some products commonly used against corrosion (such as the WD-40 family of products) as they could damage the pump, due to a negative chemical reaction between some industrial oils and its plastic enclosure. Any other materials that may come into contact with the enclosure must be carefully evaluated under end-use conditions for compatibility.

The VMS-1 pump can be installed in two different orientations: with the water output on top of the pump pushing water vertically or with the water output on the side of the pump pushing water horizontally. See pictures below.

R0/R9 wet-end orientation



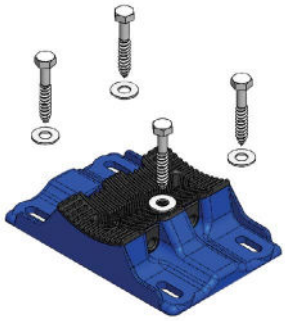
R0/R3 wet-end orientation

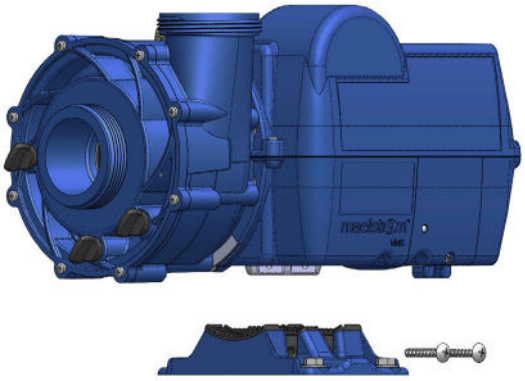


Installation

To change the pump orientation, you must remove the two Phillips screws holding the fixation stand to the pump.

Select the most appropriate location on the floor for the VMS-1 and firmly attach the stand to the wooden base 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)





Warning! Do not overtighten the two Phillips screws when reinstalling the pump on the fixation stand. Torque above 8 lbf.in is considered excessive and might damage the rubber, and overtightening the rubber mount will increase the vibration transmission.

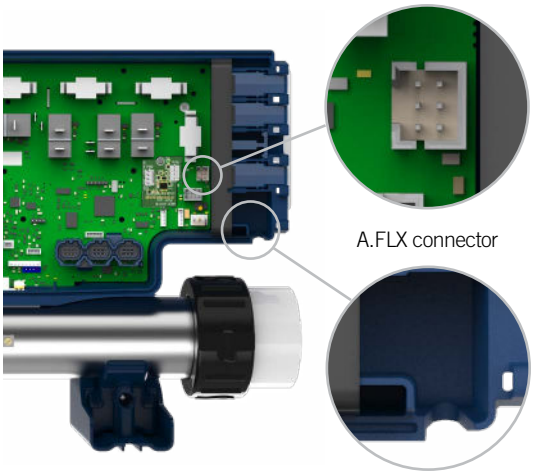
Connecting the pump to the hot tub control system

Turn off power before connecting the VMS-1 to the hot tub control system.

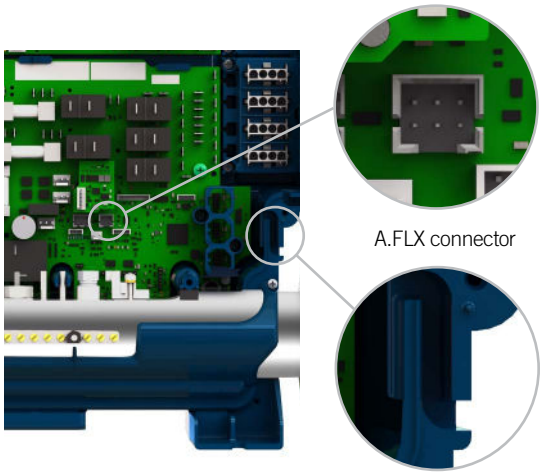
Note: Contact your sales representative for EMI-friendly wiring installation recommendations.

Communication cable connection to the hot tub control system

Once the pump is installed in the desired orientation, open the hot tub control system and connect the communication cable from the pump to the six-pin connector labeled A.FLX (see below).



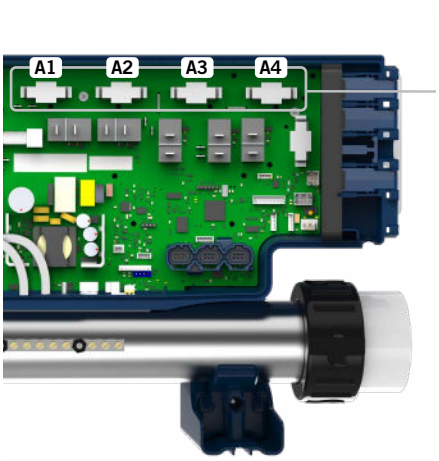
in.ye-V3 control system



in.yt-V2FLX control system

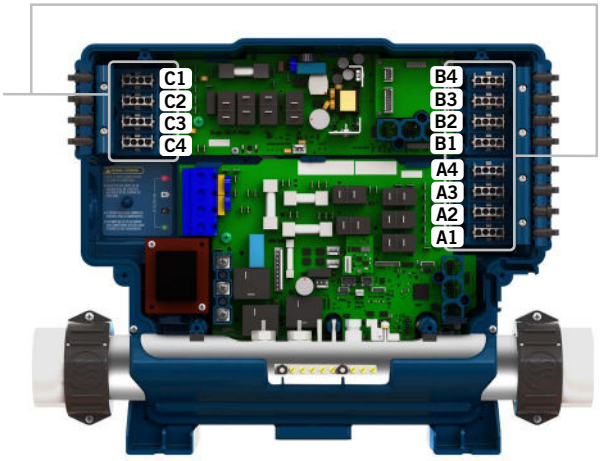
Pump power cable connection to the hot tub control system

Then connect the pump power cable to the hot tub control system. Make sure you use the output specified in your hot tub control system's low-level configuration. Close the hot tub control system enclosure and turn the power on.



in.ye-V3 control system

AMP connectors for outputs

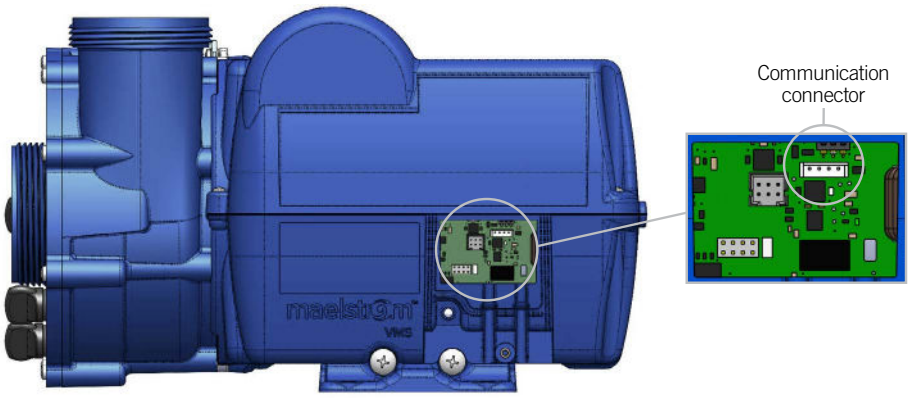


in.yt-V2FLX control system

Connections

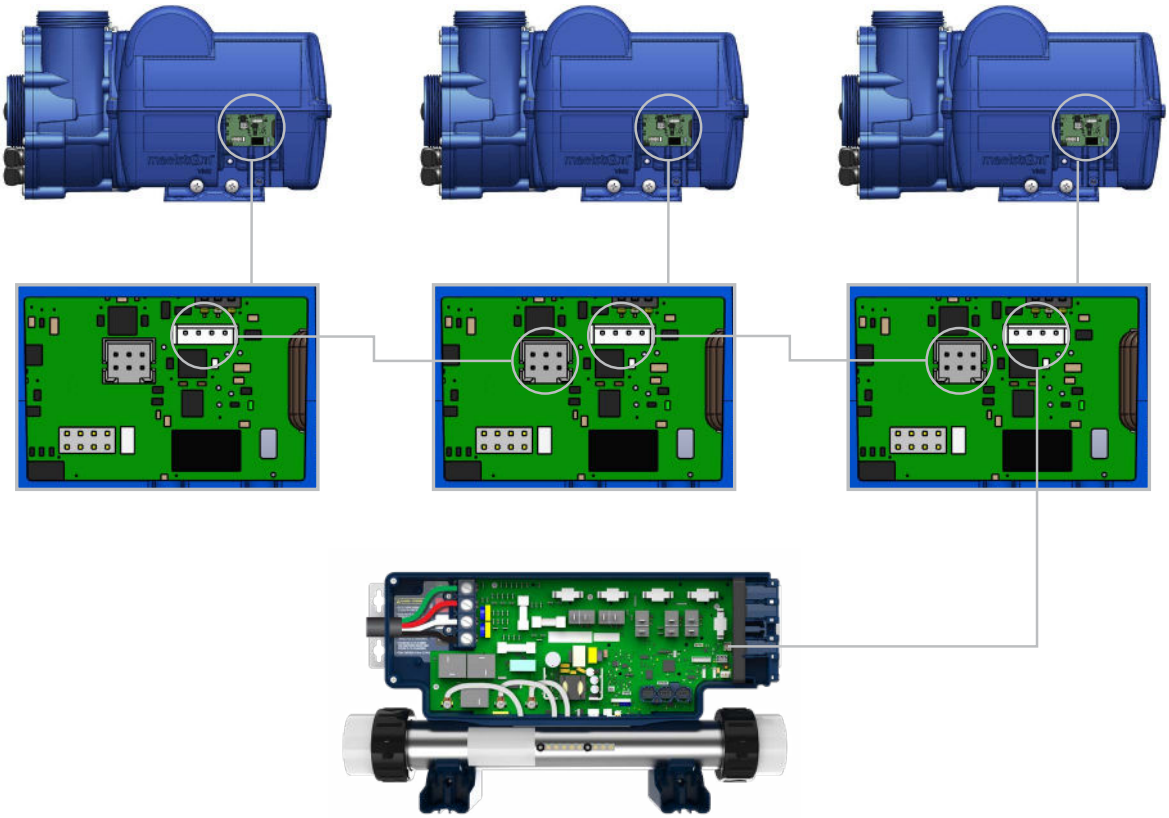
Communication cable connection to the pump: with single pump

The communication cable going to the hot tub control system should have been connected to the 4-pin communication connector (factory setting).



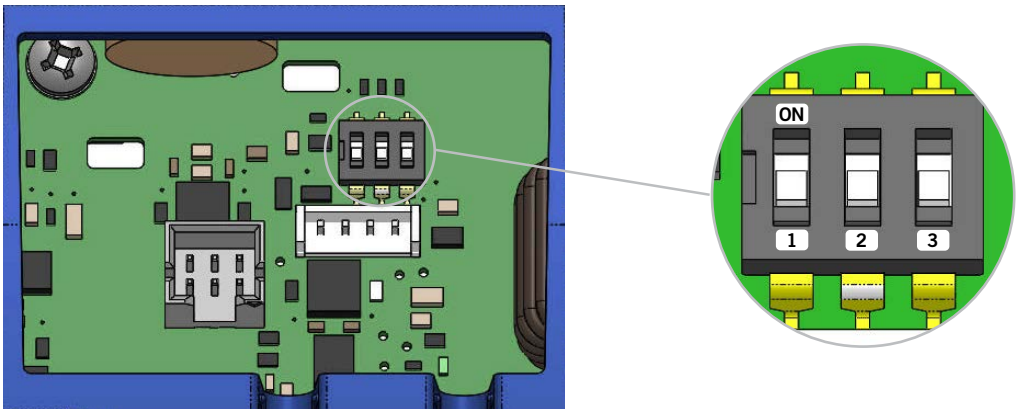
Communication cable connection to the pump: with multiple pumps

Multiple pumps can be daisy-chained via communication cables. Connect the first pump as instructed above. For every additional pump, a communication cable should have been connected to the 4-pin communication connector (factory setting). Connect this communication cable to the 6-pin A.FLX connector of the previous pump.



Configuring pump address using DIP switches

Each pump requires a software address to be configured to match the hot tub control system configuration. This address is configured via a DIP switch module mounted on the board.



The module has three switches, labeled 1, 2 and 3 on the module. Each switch can be either in the “on” or “off” position. Each VMS address is encoded in binary format from those positions. Refer to the following table to set the switches to the correct position for a given address. If your setup consists of a single VMS pump, the DIP switches should be set to the “VMS 1” configuration in the table.

Configuration	Switch 1	Switch 2	Switch 3
VMS 1	ON	**OFF**	**OFF**
VMS 2	**OFF**	ON	**OFF**
VMS 3	ON	ON	**OFF**
VMS 4	**OFF**	**OFF**	ON
VMS 5	ON	**OFF**	ON

List of compatible keypads for the Maelstrom VMS-1

For more information on the compatible keypads for your VMS-1, refer to the corresponding Techbook.

in.k1000+ main keypad
Firmware version 35 and above in its generic version
Color LCD capacitive touchscreen display

in.k1001+ main keypad
Firmware version 35 and above in its generic version
Color LCD capacitive touchscreen display

flx.go main keypad
Firmware version 5 and above in its generic version
Color LCD capacitive
turn and press
Not compatible with swim spas

Errors and service codes

If a protection kicks in or if an error is detected in the VMS-1 pump, an error code will be reported on the hot tub keypad.
If more than one error is detected, only the error with the highest priority will be displayed.

All error codes are listed below in priority order.

- **Lost communication:** Control system lost communication with VMS. Communication cable might be faulty. If this error persists, contact your dealer.
- **Service Code 1:** Drive overcurrent: Motor control failure or rotor might be stuck. Please contact your dealer.
- **Service Code 2:** DC voltage error: Under/over voltage fault. Might be caused by temporary power fluctuations. If this error persists, contact your dealer.
- **Service Code 4:** AC voltage error: Under/over voltage or frequency fault. Might be caused by temporary power fluctuations. If this error persists, contact your dealer.
- **Service Code 8:** Over Temperature: Allow the VMS to cool down. If this error persists, contact your dealer.
- **Service Code 16:** UART error: Internal error typically caused by faulty electronics. Please contact your dealer.
- **Service Code 32:** CPU overload: Internal error typically caused by faulty firmware. Please contact your dealer.
- **Service Code 64:** System error: Internal error typically caused by bad motor drive parameters. Please contact your dealer.

Other service codes: Please contact your dealer.

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

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

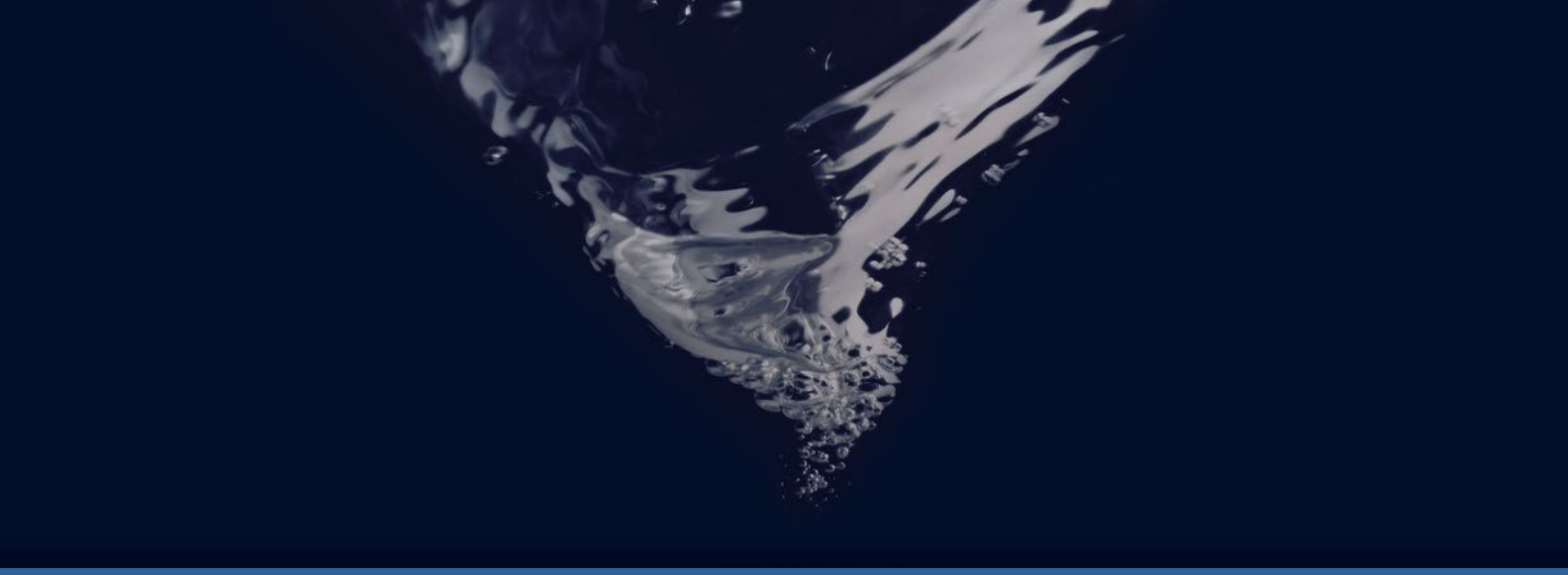
European and international standards

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



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