



NEPTUNE® Variable Speed Pool Pump Motor



Important Safety Information



- Read all instructions thoroughly and be familiar with the equipment before installing or working on it.
- DO NOT lift the pool pump motor by the control unit.
- Before connecting or disconnecting cables or other electrical connections, verify that the electrical
 power to the system is removed. Failure to comply may cause serious damage to the pool pump
 motor or pump system or injury.
- There are no serviceable parts in the pool pump motor or control.
- Because of the risk of electric shock, only individuals thoroughly trained in the use of multimeters should conduct electrical tests.
- Never touch the metal contacts on the multimeter during a test.
- Always check testing equipment for proper operation before use.

Installation, operation, and maintenance must be performed by qualified personnel. Familiarization with and adherence to the National Electrical Code (NEC), National Fire Protection Association (NFPA) standards and to local codes are required. It is important to observe safety precautions to protect personnel from possible injury. Personnel should be instructed for handling each of the following:

- Insulate all connections carefully to prevent grounding or short circuits. Reinstall all conduit and terminal box covers.
- To avoid overheating, voltage to the motor control unit must be within plus or minus 10% of the nameplate voltage.
- Make sure the unit is electrically grounded and that proper electrical installation, wiring, and controls are used consistent with local and national electric codes. Refer to NEC Handbook and NFPA No. 70. Employ qualified electricians for the installation and maintenance of the unit.
- Code requirements differ from state to state. Install equipment using qualified electricians in
 accordance with the applicable codes and ordinances in your area and in accordance with NEC. All
 electrical connections should be made and maintained by a qualified or licensed electrician.
- Make sure there are no unusual noises or vibrations when the pool pump motor is running.
- Avoid contact with energized circuits and rotating parts.



- Always disconnect electrical power at the fuse box or circuit breaker panel before handling electrical
 connections or performing maintenance on this unit. Allow the pool pump motor to come to a
 complete stop and wait four (4) minutes. This allows the capacitors to discharge any residual
 voltage for safety.
- All aspects of the installation must conform to the applicable requirements of the NEC, including Article 430 (Motor Circuits and Controllers), as well as all local codes.
- Double-check to make sure that electrical power is removed and that it cannot be turned on while you are working on the equipment.
- A poor electrical connection can overheat and cause terminal and/or terminal board failures.
 Examine the connections carefully for any signs of physical deterioration or loose fit to the motor terminal block.
- Care must be taken to assure connections are made to the proper terminals and adequate electrical clearances are maintained.
- The control unit on the pool pump motor contains hazardous voltage.

Wear safety glasses to inspect the equipment while it is running or while working on equipment.

NOTICE

The pool pump motor and control unit are assembled and calibrated as a set. There are no serviceable parts in the motor or control.

- To prevent permanent damage to the unit, only apply nameplate voltage.
- DO NOT strike the pool pump motor shaft with a hammer or other tool as this may cause damage.
- Voltage symbols vary among different multimeters and may be displayed as Vac, AC, V, or a V beneath a wavy line. Select the correct symbol and set the multimeter to the voltage closest to but higher than the voltage you are measuring.
- Although designed for outdoor application, the pool pump motor is properly packaged for shipment
 and storage and should be kept in a clean and dry indoor area until installed for use.





User Interface

Be sure to program your Neptune VS Motor User Interface before connecting to time clock or automation, utilizing the quick start guide inside its cover. The **Neptune VS Motor comes** preprogrammed to default settings or it can be modified to meet any special needs.





4th – INPUT #1

5th – User Interface Program



Pump Control via the Drive Interface Board

The Drive Interface (DI) Board is powered by an isolated low voltage (+12 Vdc) power supply. The DI Board supports the following customer inputs, in addition to the User Interface:

Four (4) Discrete Switch Inputs

Discrete Switch Inputs

The DI Board uses a pre-set hierarchy for establishing which input has priority.

- Switch Inputs (with INP # 4 having the highest priority)
- User Interface (lowest priority)
- 9-30 Vac/dc

Switch closures on the discrete inputs operate the motor at pre-defined speeds shown in the table below. Switches may be sourced from the +12V terminal, or an external DC supply can be used. When using an external supply, make sure to complete the circuit by connecting the GND terminal to the external supply's ground.

Discrete Input	RPM
INP # 4	3450
INP # 3	2933
INP # 2	1898
INP # 1	1380

Discrete switch Inputs take priority over User Interface programming



Neptune VS Motor has the ability to connect/communicate with any time clock or source of automation. Determine which scenario you have and proceed to the proper page in the manual.

- Connecting to a Time Clock proceed to page 8
- Connecting to Automation Assigning a speed to be used with installed equipment – proceed to page 10
- Connecting to Automation Assigning a speed to a relay with no associated/installed equipment – proceed to page 12
- Connecting to an Actuator (in conjunction with Automation) proceed to page 14



Connecting Neptune Motor to a Time Clock

- Determine if Fireman Switch is already installed in Time Clock
- Install Fireman Switch into Time Clock (if missing) per clock manufacturer's instructions
- Connect one side of Fireman Switch to 12V supply input on DI Board terminal block
- Connect other side of Fireman Switch to desired speed input on DI Board terminal block
- See page 9 for schematic







Connecting Neptune to Automation – Assign a speed to an existing installed/automated piece of equipment

- All connections will be made to the low voltage (coil) side of relay
- Connect ground lead to terminal 1 on relay and ground on DI Board terminal block
- Connect terminal 2 on relay to desired speed input on DI Board terminal block
- Continue to connect other relays in same manner as needed
- See page 11 for schematic



Verify voltages prior to making all connections.





Connecting Neptune to Automation – Assigning a speed to a specific relay.

- All connections will be made to high voltage side of relay
- Connect 12V supply to terminal 1 on relay
- Connect terminal 1 on relay to terminal 1 on any other relays to be used (this will supply low voltage power to each terminal)
- Connect terminal 2 on relay to desired speed input on DI Board terminal block
- See page 13 for schematic







+ 12 V from DI Board Red Wire INP # 1 - White Wire INP # 2 - Green Wire INP # 3 – Black Wire INP # 4 – Not Used on this Installation





Connecting Neptune to Actuator (through Automation)

- All connections from Automation to Actuator should be made according to manufacturer's instructions (if not already done)
- Power used for this connection will be 9-30VAC
- Connect ground lead from Neutral on Actuator to ground on DI Board terminal block
- Connect one positive on Actuator to desired speed input on DI Board terminal block
- See page 15 for schematic





Input	RPM
1	1380
2	1896
3	2933
4	3450

Connecting to an Actuator

Actuator connection must have a dedicated discrete switch input. No other connection should be made to this input.

