



**Installation and Operation
Applies to Waterous Model**

**Dual Tank
Selector System**

Rev 1

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Warnings, Cautions, and Notes

Warning: A warning alerts you to a procedure, practice or condition that may result in death or long term injury to personnel or destruction of equipment.

Caution: A caution alerts you to a procedure or condition that may result in serious damage to equipment or its failure to operate as expected

Note: A note points out important information. Failure to read the note may not result in physical harm to personnel or equipment. It may waste time and money.

ATTENTION:

Defects in replacement part(s), component(s) or product(s) manufactured by others and furnished by WATEROUS is understood that the only warranty provided for such replacement part(s), component(s) or product(s), shall be the warranty provided by the manufacturer of said replacement part(s), component(s) or product thereof which, if assignable, WATEROUS will assign to Buyer, if requested by Buyer.

Defects in replacement part(s), component(s) or product(s), not furnished by Waterous, but suggested in the installation guide, are the responsibility of the installer and the manufacturer of said replacement part(s), component(s) or product(s). Waterous will not be responsible for any replacement part(s), component(s) or product(s) that are not furnished or purchased from Waterous.

WARRANTY INSERT: (last page)

The aforesaid warranty excludes any responsibility or liability of WATEROUS for:

- c) any product or part, altered, modified, serviced or repaired other than by WATEROUS, without its prior written consent; and
- d) the cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation.

Revision History

Revision	Date Issued	Comments
---	9/25/2007	Original Release
1	6/18/10	Added inserts in warning section

Disclaimer: These instructions are guidelines only and in no way meant to be definitive. During installation, standard safety precautions and equipment should be used where appropriate. Because the tools used and the skill/experience of the installer can vary widely, it is impossible to anticipate all conditions under which this installation is made, or to provide cautions for all possible hazards. Proper installation is the responsibility of the purchaser. All bolts, setscrews, and belts must be checked prior to start-up AND after the initial operation. Damages due to poor installation are the responsibility of the installer.

Waterous reserves the right to make modifications to the system without notice

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Always include the unit serial number in correspondence.

SECTION 1. SAFETY

Please read all of the following safety precautions and follow them carefully. They are important to the prevention of personal injury or damage to the equipment.

1. Always disconnect the power source before attempting to service any part of the dual tank system.
2. Release all pressure within the system before servicing any of its components.
3. Drain all liquids from the system before servicing any of its component parts.
4. Check all hoses for weak or worn conditions monthly.
5. Ensure that all connections and fittings are tight and secure.
6. All plumbing should be vacuum / pressure rated for 23 in. Hg vacuum (584 mm Hg) and 50 psi (3 BARS) pressure. Refer to Figure 8 for installation schematic.
7. Any electrical system has the potential to cause sparks during service. Take care to eliminate explosive or hazardous environments during service/repair.
8. The components and fittings used in this system must be compatible with the foam concentrates used and pressures at which the pump system operates.

CAUTIONS:

- Do not attempt to operate the system at or above a temperature of 160° F (71°C).
 - Ensure that the electrical source of power for the unit is a constant 12-volt or 24-volt, negative ground DC system.
 - Periodically inspect all foam pump and all system components. Perform routine preventive maintenance as required.
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SECTION 2. HOW THE SYSTEM WORKS

The electric dual tank system provides for the connection of two foam tanks into your Waterous Advantus Proportioning System.

The system provides an interface with the main system controller and a flush position. There are separate systems for 12-volt or 24-volt DC systems.

The flush position allows for flushing of the system when switching from one tank to another. This feature prevents mixing of different foam concentrate types in the injection system.

When the selector is in the flush position (center position), water discharge pressure is open to the suction of the foam pump. Since the discharge of the foam pump is piped into the water discharge. Flushing action will take place when the foam pump is run until it is switched to either A or B tank. How long the system flushes is up to the operator and the type of foam concentrate being flushed.

A low-tank level sensor (not supplied) should be provided for "each" foam concentrate tank. The tank being used is monitored for low concentrate.

The Advantus OIT will display which concentrate tank is in use.

SECTION 3. WHAT YOU RECEIVE



Figure 1 Controller

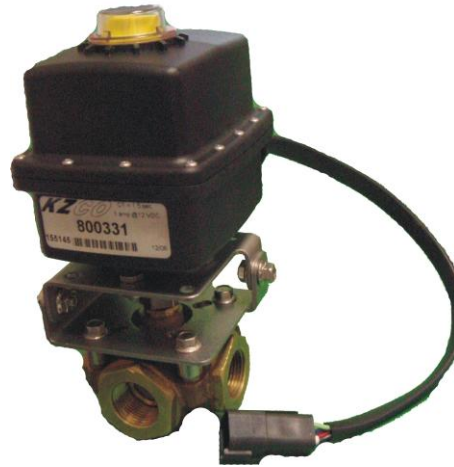


Figure 2 Valve

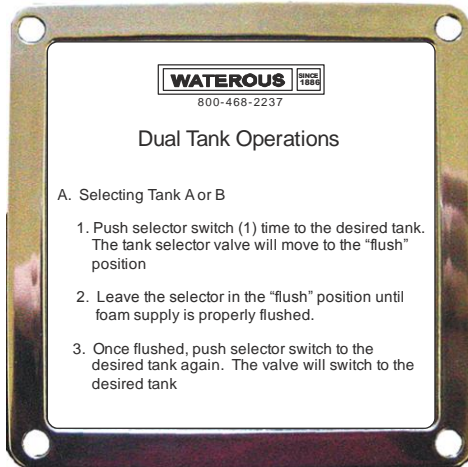


Figure 3 Operation Placard



2 Included

Figure 4 1" Wye Strainer

Plus miscellaneous fittings

A. Optional Items

10 Gal (302005)

20 Gal (302006)

Figure 5 Foam Tank

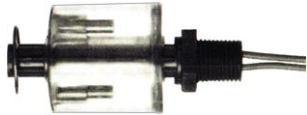


Figure 6 Vertical Low Tank Level Switch



Figure 7 Horizontal Low Tank Level Switch

SECTION 4. PARTS IDENTIFICATION

 Part #: 0390107 >**12VDC**< Advantus Dual Tank Selector

Part#	Description	Details	Qty
/9000229	Plug 3/4" Hex Brass		1
/9000284	Nipple 3/4" Hex Pipe		3
/9000303	Elbow 3/4" 90 deg	3400x12	3
0310424	Mounting Bracket Elect Valve		1
0315314	Instruction Placard		1
2410132	Check Valve 3/4" BRZ EPR Seat		3
2410167	Valve 5 Port & Electric Actuator	12VDC	1
2450004	Wye Strainer w/ screen 1"		2
4010019	Controller Advantus Dual Tank		1
4310015	Cable – Dual Tank Selector		1

 Part #: 0390166 >**24VDC**< Advantus Dual Tank Selector

Part#	Description	Details	Qty
/9000229	Plug 3/4" Hex Brass		1
/9000284	Nipple 3/4" Hex Pipe		3
/9000303	Elbow 3/4" 90 deg	3400x12	3
0310424	Mounting Bracket Elect Valve		1
0315314	Instruction Placard		1
2410132	Check Valve 3/4" BRZ EPR Seat		3
2410170	Valve 5 Port & Electric Actuator	24VDC	1
2450004	Wye Strainer w/ screen 1"		2
4010019	Controller Advantus Dual Tank		1
4310015	Cable – Dual Tank Selector		1

Options

0302005	10 gal Foam Tank		
0302006	20 gal Foam Tank		
0315315	Schematic		1
2450003	Wye Strainer w/ screen 3/4"		AR
2450006	Replacement Screen 3/4"		AR
2450007	Replacement Screen 1"		AR
4190000	Horizontal Low Tank Level Switch		AR
4190001	Vertical Low Tank Level Switch		AR

SECTION 5. PLAN AHEAD

Because of the potential differences in fire apparatus plumbing and foam system configuration, it is not practical to depict exactly how each Waterous unit will be installed on a particular apparatus. Most of the information contained in the following sections, however, will apply to any situation. It is recommended that you read it thoroughly.

It is also recommended that you spend time planning and designing where and how you intend to install this equipment in the apparatus before beginning the actual installation. The following diagrams provide recommended guidelines for the location of the system components.

SECTION 6. PLUMBING THE SYSTEM

The system diagram shows the foam tank to foam pump inlet piping. Always use hose, fittings and pipe compatible with foam agents. All connections must be vacuum tight to ensure proper operation. The electric operated valve does not have to be mounted in a position to allow gravity feed from the foam tank.

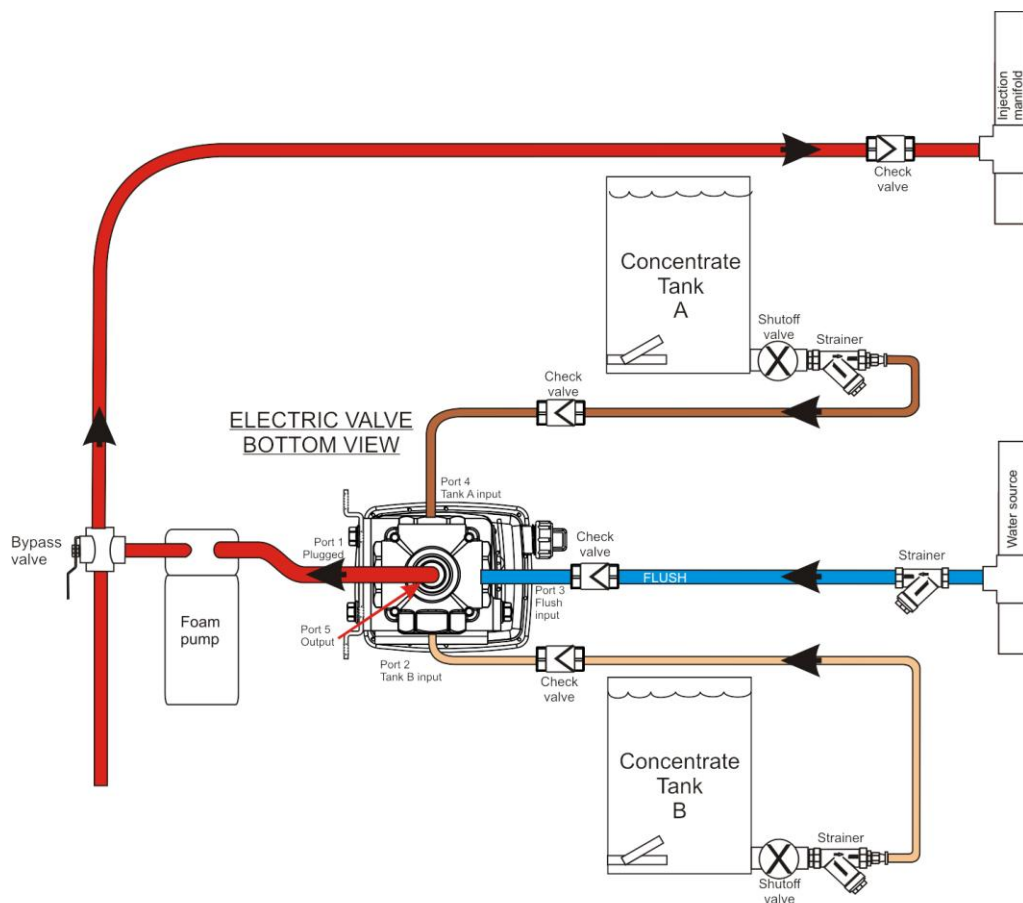


Figure 8 Flush Valve Plumbing Diagram

- NOTES:**
1. Make sure strainer is mounted in an accessible location because it is a regular maintenance item.
 2. Low pressure hoses and fittings should be good for 23 in. (584 mm) Hg vacuum and 50 psi (3 BARS) working pressure. All other hoses should be rated for full discharge pressure of the main water pump [400 PSIG (28 BARS) minimum working pressure].
 3. All hoses in the above diagram are high pressure [400 PSIG (28 BARS) minimum working pressure] unless otherwise noted.

SECTION 7. COMPONENT INSTALLATION AND HOOKUP

The controller is ready for dual tank configuration. Refer to the main system operator's manual for calibration and default setting procedures.

The diagram on the following page shows how to wire the electrical components. The system draws less than 3 amps.

Use of standard 14 AWG automotive wire that is grease and fuel resistant is recommended.

When connecting the wires to the terminals, remove only 1/4 inch of the insulation from the end of the wire.

Refer to the electrical connection diagram. Support all wiring, and take care to prevent short circuits.

A. Foam Tank Low-Level Sensor

A foam tank low-level sensor must be mounted into the bottom of each foam tank to monitor low concentrate condition. The sensor has 1/8 inch NPT threads.

Mount the sensor in the bottom of the foam tank in an upright position. Use suitable sealant to prevent concentrate leakage. There must be room under the tank to route the cable back to the pump/motor base unit.

When the bottom of the tank is not accessible, the low-level sensor float switches can be hung from a long nipple attached to the top of the tank.

Take care to ensure the nipple is strong enough to withstand the force of sloshing foam when the vehicle is in motion. Since wire connections must be made inside the nipple, a 3/8 inch NPT nipple with a 3/8 x 1/8 inch NPT reducer at the lower end is the minimum recommended size.

Check the low-level sensor with a powered test light. With no foam in the tank, the switch contacts should be closed and the test light should be on. If this is not the case, remove the clip from the end of the low tank sensor. Remove the float, and reinstall 180° out of position. Reinstall the clip. Retest the switch to ensure it is working properly.

A side mount, low-tank sensor is available to be used if both the top and bottom of the foam tank is not accessible. The side mount, low-tank sensor has 1/2 inch NPT threads and must be installed as close to the bottom of the foam tank as possible. After installation, the sensor must be sealed with a suitable sealant to prevent concentrate leakage.

Check the side mount, low-tank sensor with a powered test light. With no foam in the tank, the light should be on. If the light does not come on, reposition the switch until the test light is on. Reseal the switch to prevent concentrate leakage after the switch is in the proper position.

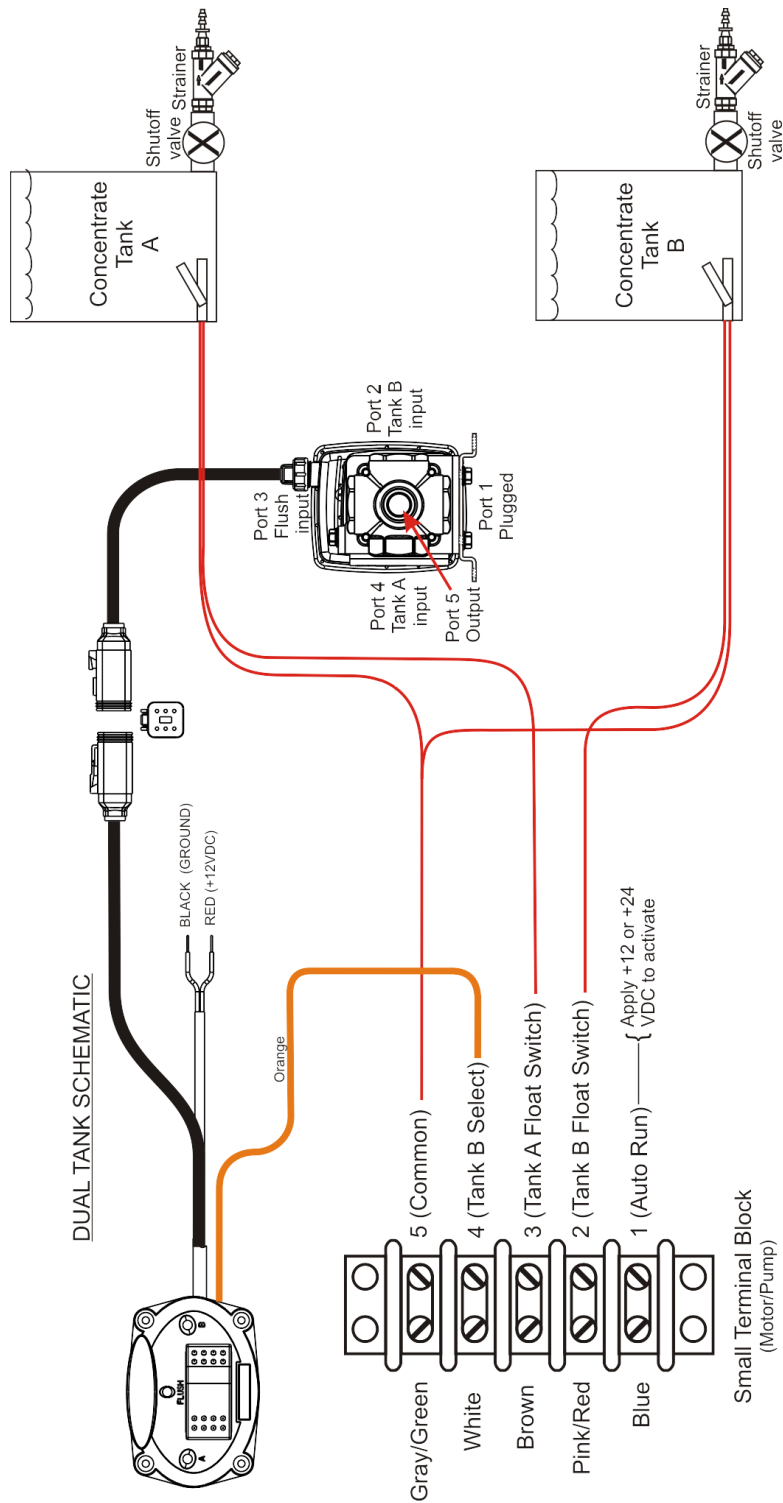


Figure 9 Electrical Hookup

CAUTION: Prevent system short circuits by stripping only 1/4 inch of insulation from wire ends when making connections.

SECTION 8. OPERATING INSTRUCTIONS

Operation of the Advantus dual tank selector

NOTE: The tank selector will remain in the location as was last shut down.

A. Selecting from tank A to tank B.

1. Push selector switch one time on the B side the tank selector valve will move to the flush position.
2. Leave the selector in the Flush position until valve and foam supply is properly flushed.
3. Once flushed push selector valve switch again to the B tank side.
4. The selector valve will operate from B tank side.

B. Selecting from tank B to tank A.

1. Push selector switch one time on the A side the tank selector valve will move to the flush position.
2. Leave the selector in the flush position until valve and foam supply is properly flushed.
3. Once flushed, push selector valve switch again to the A tank side.
4. The selector valve will operate from A tank side.

If the same product is in both tanks then flushing is not necessary between tanks, simply push selector switch two times to the desired tank and the selector will bypass the flush position.

If the selector valve is in the Flush position either tank can be selected by simply pushing the switch to the desired A or B tank.

There is no set time as to how long the system must stay in the Flush position as different foam concentrates require different flushing times therefore the time for flushing concentrates is up to the system operator.

If there are any questions regarding flushing specific concentrates contact the concentrate manufacture or Waterous.

NOTE: When servicing the strainers, close the shutoff valves to prevent tank drainage. Make sure the valve is open and the foam pump primed prior to operating the foam system.

SECTION 9. TROUBLESHOOTING

Most Electric Dual Tank System problems can be traced to faulty wiring.

Follow the diagrams carefully and check all connections.

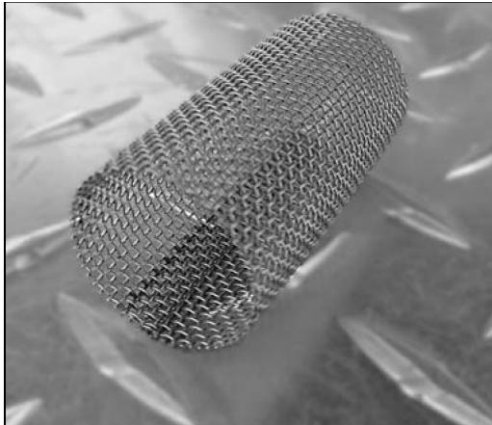
Make sure the appropriate, constant DC power is supplied.

Excessive electrical interference or momentary low voltage on the power line can cause erratic operation.

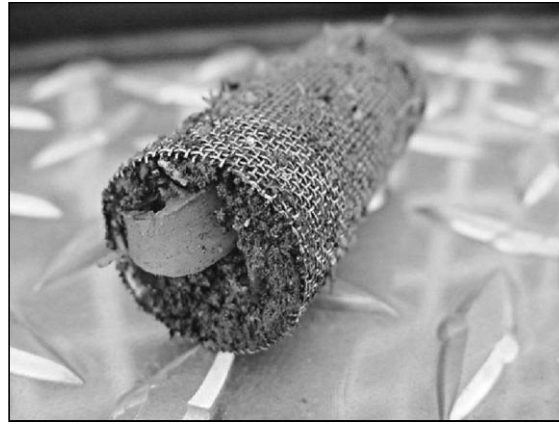
Often strainers on a new installation will clog immediately due to excessive debris in the foam tank and hoses from assembly.

If strainers are clear and the foam flow rate is low, debris may have become lodged in the valves during assembly.

Remove the hose assemblies, and carefully check the valves for debris or obstructions that could block flow. Make sure all strainers are kept clear.



Clean



Dirty



Clogged



A vertical-mounted (from top or bottom of the tank) foam tank low-level sensor that has the float installed upside down will show a low concentrate reading on the Waterous display even with a full tank.

In this situation, remove the clip, turn float 180° and reinstall the clip.

Recheck the sensor.

SECTION 10. INSTALLATION ILLUSTRATIONS

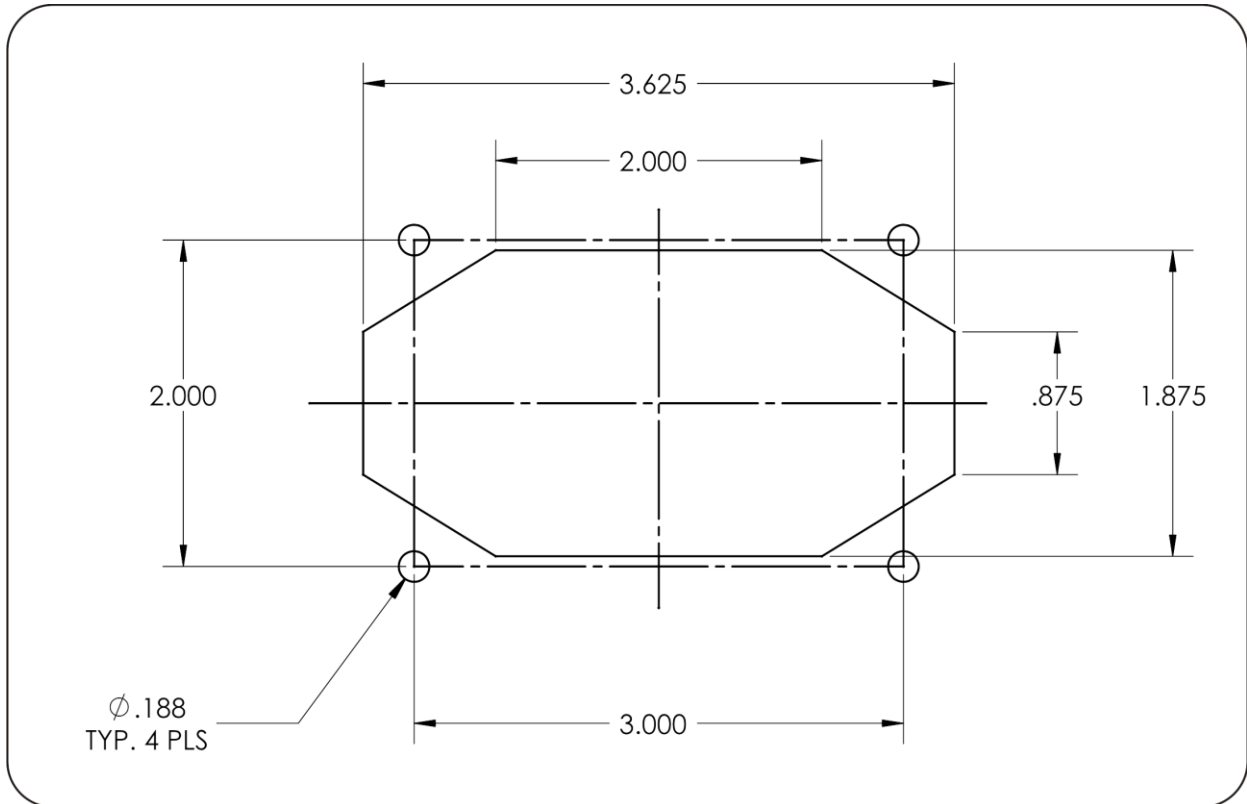


Figure 10 Controller Cutout

SECTION 11. CONDITIONAL 2-YEAR WARRANTY POLICY

WATEROUS warrants, to the original Buyer only, that products and parts manufactured by WATEROUS will be free from defects in material and workmanship under normal use and service for a period of two (2) years from the date the product is first placed in service, or two and one-half (2-1/2) years from the date of shipment by WATEROUS, whichever period shall be the first to expire; provided the Buyer notifies WATEROUS, in writing, of the defect in said product within the warranty period, and said product is found by WATEROUS to be nonconforming with the aforesaid warranty. When required in writing by WATEROUS, defective products must be promptly returned by Buyer to WATEROUS at WATEROUS plant at Peoria, Arizona, or at such other place as may be specified by WATEROUS, with transportation and other charges prepaid. A Returned Material Authorization (RMA) is required for all products and parts and may be requested by phone, fax or mail. The aforesaid warranty excludes any responsibility or liability of WATEROUS for:

- a) damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes, or improper maintenance, or attributable to written specifications or instructions furnished by Buyer;
- b) defects in products manufactured by others and furnished by WATEROUS hereunder, it being understood and agreed by the parties that the only warranty provided for such products shall be the warranty provided by the manufacturer thereof which, if assignable, WATEROUS will assign to Buyer, if requested by Buyer;
- c) any product or part, altered, modified, serviced or repaired other than by WATEROUS, without its prior written consent; and
- d) the cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation.
- e) normal wear items (including, but not limited to belts, hoses, check valves, packing, strainers, filters, light bulbs, anodes, intake screens, mechanical seals, etc.).

This warranty is subject to WATEROUS Conditions of Sale (detailed on WATEROUS Invoice) as currently in effect all of which are herein incorporated and by this reference made a part hereof

All other warranties are excluded, whether express or implied by operation **of law or otherwise, including all implied warranties of merchantability or fitness for purpose. WATEROUS shall not be liable for consequential or incidental damages directly or indirectly arising or resulting from the breach of any of the terms of this limited warranty or from the sale, handling, or used of any WATEROUS product or part. WATEROUS liability hereunder, either for breach of warranty or for negligence, is expressly limited at WATEROUS option:**

- a) to the replacement at the agreed point of delivery of any product or part, which upon inspection by WATEROUS or its duly authorized representative, is found not to conform to the limited warranty set forth above, or
- b) to the repair of such product or part, or
- c) to the refund or crediting to buyer of the net sales price of the defective product or part. Buyers remedies contained herein are exclusive of any other remedy otherwise available to Buyer.

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