



# Gutter/Filter & Miscellaneous Operation & Maintenance Manual

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# **ATTENTION!**

**This Instruction Manual includes important safety information that should be read by the Engineer, Contractor, Owner, Operator, and Maintenance Personnel.**

**Paddock Recommends That A Copy of The Filter Operation Instructions Be Posted In The Filter Room.**

# **Equipment Templates**

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**Helena Memorial Park  
Helena, MT**

**PRESSURE SAND FILTER - 2 cell Vertical, Central  
Header, With Manual Linkage Control**

**Introduction**

The filter on your pool is a 2 cell vertical pressure filter, which utilizes sand as a filtering medium. A pressure sand filter is one in which the water to be filtered is pumped through a layer of sand contained within a pressure vessel. High flow sand filters are designed for filtering rates of up to 20 gallons per minute per square foot of filtering area. This filter system will, with proper care and maintenance, give trouble-free and efficient operation.

The filtering principle is simple. Fine sand is used to filter out all of the dirt suspended in the water. Pool water is forced by the pump through a distributor system in the top of the filtering tank. This distributor system is designed to maintain a uniform flow downward through the sand and out a second collector system in the bottom of the tank.

In high rate sand filtration, penetration or depth filtration occurs within the sand; the dirt in the water passes down several inches into the sand rather than being collected on the surface of the sand or in a bed of alum as in the lower rate rapid sand pressure filters.

When dirt accumulates in the sand the influent pressure increases, causing a decrease in flow. If the desired flow rate can no longer be maintained, the filter is cleaned by simply reversing the flow. High rate sand filtration is made possible by the proper internal design of the filter. So long as the flow is uniform, without jets or eddy currents, these high rates may be maintained without disrupting the filter bed.

**This system is designed to run 24 hours a day. Filter cycles will vary. Bathing loads, suntan lotions, and wind conditions among other things create variances in the filter cycle. Health departments in many areas maintain and exercise sanitary procedures; nevertheless, even though the flow rate is maintained, we recommend that the filters be put through the backwash cycle when the differential pressure between the influent and effluent reaches 10+ psi or when the designed flow rate cannot be maintained (whichever occurs first). This will keep the filter in excellent, healthful, maintenance-free operation year round. Any backwash requirements of local or state regulatory agencies should also be met. The filters are usually cleaned in two to four minutes by reversing the flow of the water.**

**Initial Start-Up:**

The following steps are to be taken when you place your high flow filter in operation for the first time:

- 1. Check pump strainer. Make sure it is clean and full of water.
- 2. Check pump rotation to ensure that the motor has been correctly wired.

Note: The impeller should rotate in a clockwise direction when viewed from the motor end. If rotation is opposite, the motor has been incorrectly wired.

- 3. Set the filter for backwash (see operating instructions). Backwash a minimum of five (5) minutes to clean the filter media. Backwash until the sight glass runs clear.

In many areas when a new pool is filled, the water will appear green and/or cloudy. This green and/or cloudy appearance can be caused by plaster fines present in the water, traces of iron or organic matter, algae in the make-up water, or by a combination of all. This type of contamination always will clog any type filter in a relatively short period of time. It is recommended that the pool be super-chlorinated immediately after filling and that the filter be backwashed promptly when the differential pressure between the influent and effluent reaches  $10 \pm$  psi or when the designed flow rate cannot be maintained. If this procedure is followed, the pool will be cleaned up in a minimum of time. After super-chlorination, do not enter the pool until chlorine level has returned to normal.

**If any appreciable amounts of iron are present, they will turn brown upon chlorination and may stain the interior finish of the swimming pool. Chlorinate a small sample of water first. If it turns brown, the water should be treated to remove the iron.**

**The backwash operation may be required daily or several times a day for the first few days until the water becomes a sparkling blue. After the cloudiness and/or green appearance is gone, you need only backwash as covered elsewhere in this manual.**

**Check the pump strainer, the converter strainer basket and any skimmer baskets daily and clean as required, establishing regular schedules.**

**Operating Instructions**

**Valve Legend:**

All normal functions of the filter are controlled by wafer valves. It is good practice to stop the pump and motor before changing the position of the valves. For convenience in operation, all valves have been tagged:

1. Main suction (at pump)
2. Return to pool\*
3. Backwash to waste\*
4. Filter influent\*
5. Backwash influent\*

\*These valves are connected by linkage and change position simultaneously. Valves 2 and 4 are both open for filter mode and closed during backwash mode. Valves 3 and 5 are opposite.

All valves are considered closed unless otherwise stated in these instructions. Pools equipped with the Paddock pipeless recirculating systems will have only a single suction valve. The pump will draw water from either an open top balancing tank, or from the main drain and balancing line.

**Checking The Flow Rate:**

The recirculating pump is designed to deliver the designed flow rate of \_\_\_\_\_ gpm at a total dynamic head of \_\_\_\_\_ feet. Total head on the pump is the combination of the vacuum and discharge pressure losses.

The conversion factors for the vacuum and pressure reading to feet of head are:

1. One inch of mercury vacuum equals 1.13 feet of head.
2. One psi equals 2.31 feet of head.

**Procedure For Checking:**

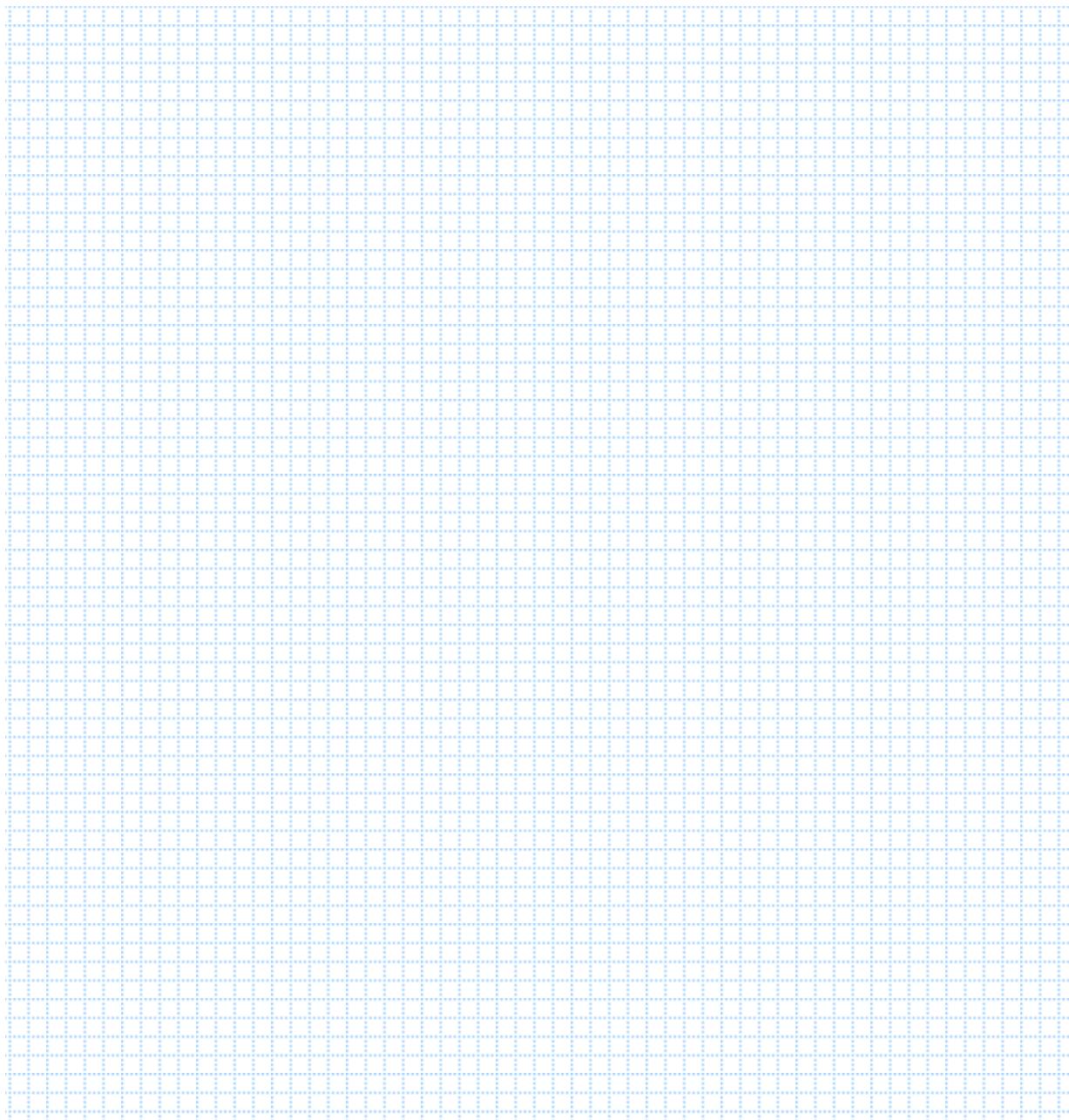
(Assume a freshly backwashed filter)

1. Set the system to filter with all valves fully opened.
2. Read the vacuum gauge.
3. Convert vacuum reading to feet of head by multiplying by 1.13.
4. Subtract the results of No. 3 from the design head of your pump.
5. Divide the results of no. 4 by 2.31. This gives the pump discharge pressure to obtain the desired total dynamic head and, hence, the designed flow rate.

6. Should the vacuum reading drop appreciably, repeat steps 2 through 5.

Like a properly installed flowmeter, a pump performance curve is guaranteed accurate within 5%. Flowmeter installations vary, thus when pump pressures are set as described here, the flowmeter reading should be noted as the proper recirculation rate, regardless of its actual reading.

### **Calculations & Notes**



The differential pressure on a clean filter is \_\_\_\_\_.

**To Filter Pool:** Filter rate is \_\_\_\_\_ Influent Pressure \_\_\_\_\_.  
Effluent Pressure \_\_\_\_\_.

Open valve #1 and move linkage handle to the Filter (up) position, insert locking pin in linkage, and start pump.

#### **To Filter With Balancing Line (Pipeless Pools):**

With system set to filter pool and the proper flow rate established, restrict the main drain valve just upstream of the connection with the balancing line until the Minimum Operating Level (MOL—the red line on the water level gauge) has been established in the balancing line. This level should be set when there is no activity in the pool and all water is being drawn from the main drain. As water enters the gutter and fills the balancing line, the pressure in this line will increase, resulting in less flow from through the main drain line. When the perimeter overflow channel is running nearly full, most of the water required for the full recirculating rate will be taken from the surface of the pool through the balancing line.

#### **To Filter Pool With Balancing Tank (Pipeless Pools):**

With system set to filter and the proper recirculating rate set, the suction valve on the pump connected to the tank is opened fully. With no water entering from the perimeter overflow channel, the main drain valve, at its entrance to the balancing tank, is adjusted until there is about 6" of water over the pump suction line. This establishes the minimum level in the balancing tank and the point at which all of the water is being supplied by the main drain.

#### **To Filter Pool And Vacuum - Portable Vacuum:**

Open valve #1 and place linkage handle in the filter position. Discharge portable pump into the overflow channel. If a considerable amount of dirt is being vacuumed and the pressure builds up in the filter tank, it should be backwashed.

#### **To Clean Strainer:**

Stop pump. Close strainer isolation valves. Remove strainer cover and remove and clean basket. Do not bang on basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open valves for desired operation. Start pump.

**To Backwash Filter:** Backwash rate is \_\_\_\_\_ Influent Pressure \_\_\_\_\_.  
Effluent Pressure \_\_\_\_\_.

**PADDOCK POOL EQUIPMENT COMPANY, INC.**

When the differential pressure between the influent and effluent reaches  $10 \pm$  psi, or if the flow rate can no longer be maintained, the filter should be backwashed.

Remove linkage lock pin, and move linkage handle to Backwash (down) position. Continue the backwashing until the water runs clear in the sight glass. This normally takes two (2) to four (4) minutes. Move linkage handle to the Filter (up) position and replace linkage lock pin.

**To Empty Pool with Pump and Motor:**

Open the balance line (or tank) bypass valve. Close the main drain influent valve supplying the balance line (or tank). Move the linkage handle to the Backwash (down) position and drain the pool through the filter in the backwash mode.

Exercise every possible precaution in this operation to prevent air from entering the main drain line or other piping, as this will cause the pump to lose its prime. It is advisable, when emptying the pool (unless the pump is located beneath the lowest point of the pool) to complete the operation without interruption, because turning off the pump motor will normally result in loss of prime.

**For Further Information Contact:**

**PADDOCK POOL EQUIPMENT CO., INC.**

P.O. BOX 11676  
ROCK HILL, SOUTH CAROLINA 29731

**PHONE: 803-324-1111**

**FAX: 803-324-1116**



## JOB NAME, CITY STATE

### 2-CELL VERTICEL PRESSURE SAND With Electrically Actuated/Manual Linkage& Iso Valves

#### Introduction

A pressure sand filter is one in which the water to be filtered is pumped through a layer of sand contained within a pressure vessel. High flow sand filters are designed for filtering rates of up to 20 gallons per minute per square foot of filtering area. This filter system will, with proper care and maintenance, give trouble-free and efficient operation.

The filtering principle is simple. Fine sand is used to filter out all of the dirt suspended in the water. Pool water is forced by the pump through a distributor system in the top of the filtering tank. This distributor system is designed to maintain a uniform flow downward through the sand and out a second collector system in the bottom of the tank.

In sand filtration, at these high rates, penetration or depth filtration occurs within the sand; the dirt entrapped in the water passes down several inches into the sand rather than being collected on the surface of the sand or in a bed of alum as in the lower rate rapid sand pressure filters.

The influent pressure increases as dirt accumulates in the sand. When the desired flow rate can no longer be maintained, the filter is cleaned by simply reversing the flow. High-rate sand filtration is possible through the proper internal design of the filter. So long as the flow, either upward or downward, is uniform without jets or eddy currents, these high rates may be maintained without disrupting the filter bed.

This system is designed to run 24 hours a day. Filter cycles will vary. Bathing loads, suntan lotions and wind conditions, among other things, create variances in filter cycles. Health departments in many areas maintain and exercise sanitary procedures; nevertheless, even though the flow rate is maintained, we recommend that the filters be put through the backwash cycle when the differential pressure between the influent and effluent reaches 10+ psi or when the designed flow rate cannot be maintained (whichever occurs first). This will keep the filter in excellent, healthy, maintenance-free operation for many years. Any backwash requirements of local or state regulatory agencies should also be met. The filters are usually cleaned in two to four minutes by reversing the flow of the water.



## Operating Instructions

### Valve Legend:

All normal functions of the filter are controlled by wafer valves. It is good practice to stop the pump and motor before changing the position of the valves. For convenience in operation, all valves have been tagged and correspond with the filter valve legend on the filter drawings.

VALVE #	DESCRIPTION	Filter Mode	Backwash CELL #1	Backwash CELL #2
	Main Drain Valve (not shown)			
2	Return to Pool	O	X	X
3	CELL #1 Filter INFLUENT	O	X	O
4	CELL#1 BW EFFLUENT	X	O	X
5	CELL#2 Filter INFLUENT	O	O	X
6	CELL#2 BW EFFLUENT	X	X	O

O – OPEN    X – CLOSED

### Initial Start-Up:

The following steps are to be taken when you place your 2-Cell Vertical filter in operation for the first time:

1. Check pump strainer. Make sure it is clean and full of water.
2. Check pump rotation to ensure that the motor has been correctly wired.  
**Note:** the impeller should rotate in a clockwise direction when viewed from the motor end. If rotation is opposite, the motor has been incorrectly wired.
3. Set the filter for backwash (see backwash instructions). Backwash a minimum of 3-5 minutes to clean the filter media or backwash until the sight glass runs clear.

In many areas when a new pool is filled, the water will appear green and/or cloudy. This green and/or cloudy appearance can be caused by plaster fines present in the water, traces of iron or organic matter, algae in the make-up water or by a combination of all. This type of contamination always will clog any type filter in a relatively short period of time.

If any appreciable amounts of iron or other metals are present, they may turn the pool water brown upon chlorination and stain the interior finish of the swimming pool. The pool water supply should be laboratory tested and the water should be treated to remove the iron or other materials found in it before filling and/or super-chlorinating.



It is recommended that the pool be super-chlorinated immediately after filling and that the filter be backwashed promptly when the differential pressure between the influent and effluent reaches 10± psi or when the designed flow rate cannot be maintained. If this procedure is followed, the pool will be cleaned up in a minimum of time. After super-chlorination, do not enter the pool until chlorine level has returned to normal.

The backwash operation may be required daily or several times a day for the first few days until the water becomes a sparkling blue. After the cloudiness and/or green appearance is gone, you need only backwash as instructed elsewhere in this manual. Check the pump strainer, the converter strainer basket and any skimmer baskets daily and clean as required, establishing regular schedules.

### **To Backwash Filter:**

**BACKWASH RATE IS: \_\_\_\_\_ REFER TO DRAWING**

As the filter becomes dirty and the flow rate drops, valve #2 should be opened as required to maintain flow.

The filter should be backwashed when the differential pressure reaches 10 ± psi, or the flow rate can no longer be maintained.

All chemical systems, heaters, and auxiliary pumping equipment should be shut off 15 minutes prior to backwash. Heater isolation valves should be closed just prior to backwashing.

### **Backwashing Cell #1 and Cell #2**

#### **TANK CELL #1 (TOP)**

1. Stop pump.
2. Close valves #2, #4 (using Linkage/Actuator), & manually close valve #6-Cell #2.
3. Open valves #3 & #5
4. Start pump.
5. Backwash Cell #1 for approximately two to three minutes or until the water in the sight glass is clean.

#### **TANK CELL #2 (BOTTOM)**

1. Stop pump.
2. Close valves #2, #4 & #5 (using Linkage/Actuator).
3. Open valves #3 & #6.
4. Start pump.
5. Backwash Cell #2 for approximately two to three minutes or until the water in the sight glass is clean.

The backwash flow rate is observed with the flow meter in the backwash line or in the pump discharge line. The proper backwash flow rate is controlled with valve #3 or with **#6-1 and #6-2**.



**isolation valves.** Once the correct backwash flow rate is established, mark the notched valve plate on each valve to indicate the correct backwash rate.

### **AFTER BOTH CELLS IN EACH TANK HAVE BEEN BACKWASHED:**

1. Stop pump.
2. **Open valves #2, #3 & #5, (using Linkage/Actuator) filter mode.**
3. **Close valves #4 & #6 (using Linkage/Actuator) filter mode.**
4. Restart pump.

**NOTE: When linkage handle (refer to drawing for -Position) – Filter Mode.**

**When linkage handle (refer to drawing for -Position) – Backwash Mode.**

When initially starting the filter system, record the normal influent and effluent pressures with a clean filter operating at the prescribed filter flow rate.

Influent Pressure : \_\_\_\_\_ psi      Effluent Pressure : \_\_\_\_\_ psi

**FLOW RATE:** \_\_\_\_\_

### **To Filter Pool:**

Open **valves #2, #3 & #5**. The balance should be Close (**Valve #4 and valve #6**). With a clean filter, restrict valve #2 until the designed flow rate is achieved and mark its position.

In operation, flow is balanced from the perimeter overflow channel (PO) and the main drain. To balance flow, the minimum operating level (MOL) will need to be set, the **instructions can be found on page 5.**

As activity increases in the pool, more water will flow from the PO channel causing the water level in the balance line/tank to rise. This increase in water level in the balance line (balance tank) will increase the head on the main drain line and less water will flow through from the main drain and the system will balance.

### **Checking the Flow Rate:**

The recirculating pump is designed to deliver the designated flow rate at a specified total dynamic head. Total head on the pump is the combination of the vacuum and discharge pressure losses. The conversion factors for the vacuum and pressure reading to feet of head are:

1. One inch of vacuum equals 1.13 feet of head.
2. One psi equals 2.31 feet of head.

### **Procedure: - (Assume a newly backwashed filter)**

1. Set the system to filter position.



2. Read the vacuum gauge.
3. Convert vacuum reading to feet of head by multiplying by 1.13.
4. Subtract the results of no. 3 from the design head of your pump.
5. Divide the results of no. 4 by 2.31. This gives the pump discharge pressure to obtain the desired total dynamic head and, hence, the designed flow rate. (You will need to throttle valve #2 or pump discharge valve.)
6. Should the vacuum reading drop appreciably, repeat steps 2 through 5.

Like a properly installed flow meter, a pump performance curve is guaranteed accurate within 5%. Flow meter installations vary, thus when pump pressures are set as described here, the flow meter reading should be noted as the proper recirculation rate, regardless of its actual reading.

### **TO SET MOL:**

This level should be set with a clean filter when there is no activity in the pool and all water is being drawn from the main drain. The system should be set to filter and the proper flow rate established with valve #2.

**For a Balancing Line:** Restrict the Main Drain valve just upstream of the connection with the balancing line until the minimum operating level (MOL) is established.

**For closed balance tank:** Restrict Main Drain valve until the red line on the water level gauge (Indicating MOL) has been reached.

**For an open balance tank:** Restrict the Main Drain valve at its entrance to the balancing tank until there is about 6" of water covering the pump suction line.

As water enters the gutter and fills the balancing line, the pressure in will increase and water will be taken from this line. When the perimeter overflow channel is running nearly full, most of the water required for the full re-circulating rate will be taken from the surface of the pool through the balancing line.

### **To Filter Pool and Vacuum - Portable Vacuum:**

With valves in filter position, discharge portable pump into overflow channel. If a considerable amount of dirt is being vacuumed and the pressure builds up in the filter tank, it should be backwashed.

### **To Clean the Strainer:**

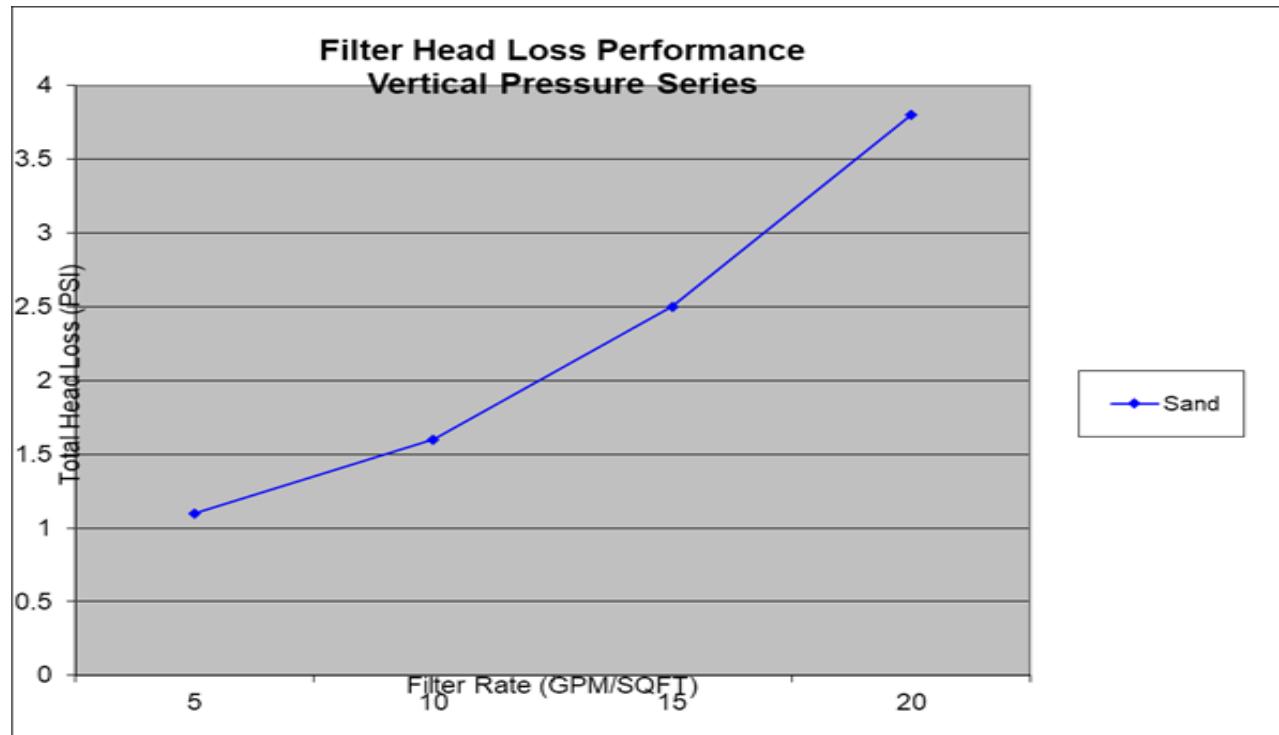


Slowly close isolation valve downstream of pump, then stop pump. Close isolation valve upstream of the strainer. Remove cover and clean basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open upstream valve and start pump. Slowly open valve downstream of pump. Establish a regular schedule for checking the strainer.

### **To Empty Pool with Pump and Motor:**

Close valve #2 and open Valves #3, #4, #5, and #6 to bypass the filter. Maintain a positive pressure at all times with valves #4 and #6. Exercise every possible care in this operation to prevent air from entering the main drain line or other piping, as this will cause the pump to lose its prime. It is advisable, when emptying the pool (unless the pump is located beneath the lowest point of the pool); to complete the operation without interruption, inasmuch as turning off the pump and motor will normally result in loss of prime. However, if it becomes necessary to interrupt the emptying operation, Close valves #3, #5, and the valve upstream from the strainer basket before stopping the pump and motor. When continuing the operation, turn on the pump and motor; open downstream valve, then open valves #3 and #5 slowly.

For further information, please contact Paddock Pool Equipment Company customer service.





## JOB NAME, CITY, STATE

### 3-CELL VERTICEL PRESSURE SAND WITH MANUAL CONTROL VALVES

#### Introduction

A pressure sand filter is one in which the water to be filtered is pumped through a layer of sand contained within a pressure vessel. High flow sand filters are designed for filtering rates of up to 20 gallons per minute per square foot of filtering area. This filter system will, with proper care and maintenance, give trouble-free and efficient operation.

The filtering principle is simple. Fine sand is used to filter out all the dirt suspended in the water. Pool water is forced by the pump through a distributor system in the top of the filtering tank. This distributor system is designed to maintain a uniform flow downward through the sand and out a second collector system in the bottom of the tank.

In sand filtration, at these high rates, penetration or depth filtration occurs within the sand; the dirt entrapped in the water passes down several inches into the sand rather than being collected on the surface of the sand or in a bed of alum as in the lower rate rapid sand pressure filters.

The influent pressure increases as dirt accumulates in the sand. When the desired flow rate can no longer be maintained, the filter is cleaned by simply reversing the flow. High-rate sand filtration is possible through the proper internal design of the filter. So long as the flow, either upward or downward, is uniform without jets or eddy currents, these high rates may be maintained without disrupting the filter bed.

This system is designed to run 24 hours a day. Filter cycles will vary. Bathing loads, suntan lotions and wind conditions, among other things, create variances in filter cycles. Health departments in many areas maintain and exercise sanitary procedures; nevertheless, even though the flow rate is maintained, we recommend that the filters be put through the backwash cycle when the differential pressure between the influent and effluent reaches 10± psi or when the designed flow rate cannot be maintained (whichever occurs first). This will keep the filter in excellent, healthy, maintenance-free operation for many years. Any backwash requirements of local or state regulatory agencies should also be met. The filters are usually cleaned in two to four minutes by reversing the flow of the water.



## Operating Instructions

### Valve Legend:

All normal functions of the filter are controlled by wafer valves. It is good practice to stop the pump and motor before changing the position of the valves. For convenience in operation, all valves have been tagged and correspond with the filter valve legend on the filter drawings.

1. Main drain	5. Filter Influent cell #2
2. Return to pool	6. Backwash Effluent cell #2
3. Filter Influent cell #1	7. Filter Influent cell #3
4. Backwash Effluent cell #1	8. Backwash Effluent cell #3

### Initial Start-Up:

**The following steps are to be taken when you place your 3-Cell Verticel filter in operation for the first time:**

1. Check pump strainer. Make sure it is clean and full of water.
2. Check pump rotation to ensure that the motor has been correctly wired.  
**Note:** the impeller should rotate in a clockwise direction when viewed from the motor end. If rotation is opposite, the motor has been incorrectly wired.
3. Set the filter for backwash (see operating instructions). Backwash a minimum of 3-5 minutes to clean the filter media or Backwash until the sight glass runs clear.

In many areas when a new pool is filled, the water will appear green and/or cloudy. This green and/or cloudy appearance can be caused by plaster fines present in the water, traces of iron or organic matter, algae in the make-up water or by a combination of all. This type of contamination always will clog any type of filter in a relatively short period of time.

If any appreciable amounts of iron or other metals are present, they may turn the pool water brown upon chlorination and stain the interior finish of the swimming pool. The pool water supply should be laboratory tested and the water should be treated to remove the iron or other materials found in it before filling and/or super-chlorinating.

It is recommended that the pool be super-chlorinated immediately after filling and that the filter be backwashed promptly when the differential pressure between the influent and effluent reaches 10+ psi or when the designed flow rate cannot be maintained. If this procedure is followed, the pool will be cleaned up in a minimum of time. After super-chlorination, do not enter the pool until chlorine level has returned to normal.

The backwash operation may be required daily or several times a day for the first few days until the water becomes a sparkling blue. After the cloudiness and/or green appearance is gone, you need only backwash as instructed elsewhere in this manual.



Check the pump strainer, the converter strainer basket and any skimmer baskets daily and clean as required, establishing regular schedules.

**To Backwash Filter:** **BACKWASH RATE IS: \_\_\_\_\_ GPM - REFER TO FILTER DRAWING(s)**

As the filter becomes dirty and the flow rate drops, valve #2 should be opened as required to maintain flow.

The filter should be backwashed when the differential pressure reaches  $10 \pm$  psi, or the flow rate can no longer be maintained.

All chemical systems, heaters, and auxiliary pumping equipment should be shut off 15 minutes prior to backwash. Heater isolation valves should be closed just prior to backwashing.

**Follow these steps to backwash both Filters A and B, one at a time.**

### **Backwashing Cells #1, #2, and #3**

1. Turn off pump
2. Close Return to Pool valve #2
3. Close Filter Influent Valve #3 for Cell #1
4. Open Backwash Effluent valve #4 for Cell #1
5. Restart pump and backwash Cell #1 for 3-5 minutes or until water runs clear
6. Turn off pump
7. Close Backwash Effluent Valve #4 for Cell #1
8. Open Filter Influent Valve #3 for Cell #1
9. Close Filter Influent Valve #5 for Cell #2
10. Open Backwash Effluent Valve #6 for Cell #2
11. Restart pump and backwash Cell #2 for 3-5 minutes or until water runs clear
12. Turn off pump
13. Close Filter Backwash Effluent Valve #6 for Cell #2
14. Open Filter Influent Valve #5 for cell #2
15. Close Filter Influent Valve #7 for Cell #3
16. Open Backwash Effluent valve #8 for Cell #3
17. Restart pump and backwash Cell #3 for 3-5 minutes or until water runs clear
18. Turn off pump
19. Close Backwash Effluent Valve #8 for Cell #3
20. Open Filter Influent Valve #7 for Cell #3
21. Open Return to Pool Valve #2 to marked position for proper flow rate
22. Restart Pump



When initially starting the filter system, record the normal influent and effluent pressures with a clean filter operating at the prescribed filter flow rate.

Influent Pressure : \_\_\_\_\_ psi      Effluent Pressure : \_\_\_\_\_ psi

**FLOW RATE: \_\_\_\_\_ GPM - REFER TO FILTER DRAWING(s)**

### **To Filter Pool:**

Open valves #1, #2, #3, #5, and #7 fully. Valves #4, #6, and #8 should be closed. With a clean filter, restrict valve #2 until the designed flow rate is achieved and mark its position.

In operation, flow is balanced from the perimeter overflow channel (PO) and the main drain. To balance flow, the MOL will need to be set. Instructions on how to do so can be found on the following page.

As activity increases in the pool, more water will flow from the PO channel causing the water level in the balance line/tank to rise. This increase in water level in the balance line (balance tank) will increase the head on the main drain line and less water will flow through valve 1 from the main drain and the system will balance.

### **Checking the Flow Rate:**

The recirculating pump is designed to deliver the designed flow rate at a specified total dynamic head. Total head on the pump is the combination of the vacuum and discharge pressure losses. The conversion factors for the vacuum and pressure reading to feet of head are:

1. One inch of vacuum equals 1.13 feet of head.
2. One psi equals 2.31 feet of head.

### **Procedure: (Assume a newly backwashed filter)**

1. Set the system to filter position.
2. Read the vacuum gauge.
3. Convert vacuum reading to feet of head by multiplying by 1.13.
4. Subtract the results of no. 3 from the design head of your pump.
5. Divide the results of no. 4 by 2.31. This gives the pump discharge pressure to obtain the desired total dynamic head and, hence, the designed flow rate. (You will need to throttle valve #2 or pump discharge valve.)
6. Should the vacuum reading drop appreciably, repeat steps 2 through 5.



Like a properly installed flow meter, a pump performance curve is guaranteed accurate within 5%. Flow meter installations vary, thus when pump pressures are set as described here, the flow meter reading should be noted as the proper recirculation rate, regardless of its actual reading.

### **To Set MOL:**

This level should be set with a clean filter when there is no activity in the pool and all water is being drawn from the main drain. The system should be set to filter and the proper flow rate established with valve #2.

**For a Balancing Line:** Restrict the Main Drain valve just upstream of the connection with the balancing line until the minimum operating level (MOL) is established.

**For closed balance tank:** Restrict Main Drain valve until the red line on the water level gauge (Indicating MOL) has been reached.

**For an open balance tank:** Restrict the Main Drain valve at its entrance to the balancing tank until there is about 6" of water covering the pump suction line.

As water enters the gutter and fills the balancing line, the pressure will increase and water will be taken from this line. When the perimeter overflow channel is running nearly full, most of the water required for the full re-circulating rate will be taken from the surface of the pool through the balancing line.

### **To Filter Pool and Vacuum - Portable Vacuum:**

With valves in filter position, discharge portable pump into overflow channel. If a considerable amount of dirt is being vacuumed and the pressure builds up in the filter tank, it should be backwashed.

### **To Clean the Strainer:**

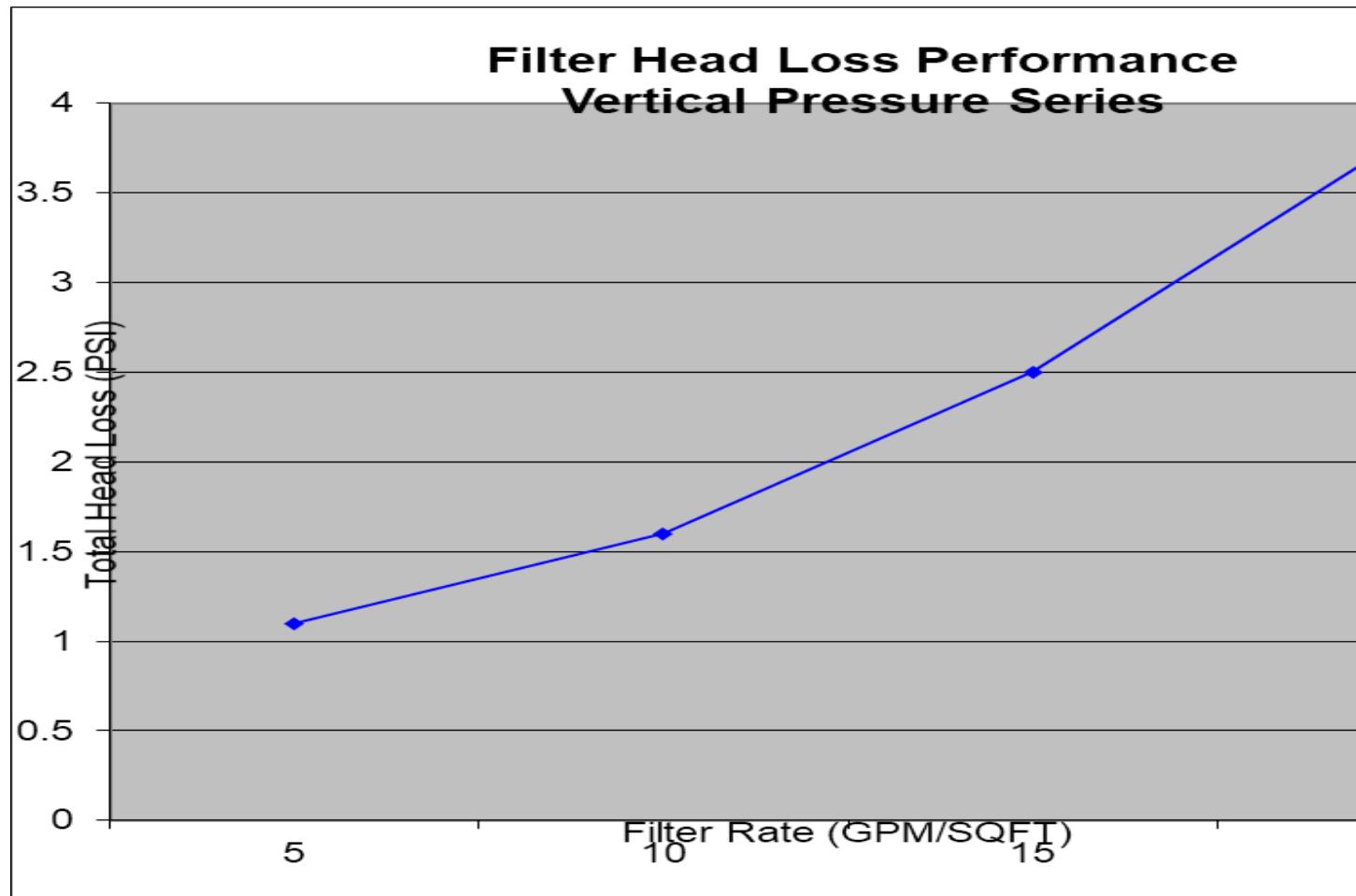
Slowly close the isolation valve downstream of pump, then stop pump. Close isolation valve upstream of the strainer. Remove cover and clean basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open upstream valve and start pump. Slowly open valve downstream of pump. Establish a regular schedule for checking the strainer.



### **To Empty Pool with Pump and Motor:**

Close valve #2 and open Valves #3, #4, #5, #6, #7, and #8 to bypass the filter. Maintain a positive pressure at all times with valves #4, #6, and #8. Exercise every possible care in this operation to prevent air from entering the main drain line or other piping, as this will cause the pump to lose its prime. It is advisable, when emptying the pool (unless the pump is located beneath the lowest point of the pool); to complete the operation without interruption, inasmuch as turning off the pump and motor will normally result in loss of prime. However, if it becomes necessary to interrupt the emptying operation, the main drain valve and valve #3 should be closed before stopping the pump and motor. When continuing the operation, turn on the pump and motor; open the main drain valve, then open valve #3 slowly.

For further information, please contact Paddock Pool Equipment Company customer service.





## JOB NAME, CITY, STATE

### 2-CELL HORIZONTAL PRESSURE SAND WITH MANUAL LINKAGE CONTROL VALVES

#### Introduction

A pressure sand filter is one in which the water to be filtered is pumped through a layer of sand contained within a pressure vessel. High flow sand filters are designed for filtering rates of up to 20 gallons per minute per square foot of filtering area. This filter system will, with proper care and maintenance, give trouble-free and efficient operation.

The filtering principle is simple. Fine sand is used to filter out all the dirt suspended in the water. Pool water is forced by the pump through a distributor system in the top of the filtering tank. This distributor system is designed to maintain a uniform flow downward through the sand and out a second collector system in the bottom of the tank.

In sand filtration, at these high rates, penetration or depth filtration occurs within the sand; the dirt entrapped in the water passes down several inches into the sand rather than being collected on the surface of the sand or in a bed of alum as in the lower rate rapid sand pressure filters.

The influent pressure increases as dirt accumulates in the sand. When the desired flow rate can no longer be maintained, the filter is cleaned by simply reversing the flow. High-rate sand filtration is possible through the proper internal design of the filter. So long as the flow, either upward or downward, is uniform without jets or eddy currents, these high rates may be maintained without disrupting the filter bed.

This system is designed to run 24 hours a day. Filter cycles will vary. Bathing loads, suntan lotions and wind conditions, among other things, create variances in filter cycles. Health departments in many areas maintain and exercise sanitary procedures; nevertheless, even though the flow rate is maintained, we recommend that the filters be put through the backwash cycle when the differential pressure between the influent and effluent reaches 10+ psi or when the designed flow rate cannot be maintained (whichever occurs first). This will keep the filter in excellent, healthy, maintenance-free operation for many years. Any backwash requirements of local or state regulatory agencies should also be met. The filters are usually cleaned in two to four minutes by reversing the flow of the water.



## Operating Instructions

### Valve Legend:

All normal functions of the filter are controlled by wafer valves. It is good practice to stop the pump and motor before changing the position of the valves. For convenience in operation, all valves have been tagged and correspond with the filter valve legend on the filter drawings.

2. Return to pool	5. Filter influent cell #2
3. Filter influent cell #1	6. Backwash Effluent cell #2
4. Backwash Effluent cell #1	7. Backwash Discharge (NOT SHOWN)

Valves #3 and #4 are connected via a lever-controlled linkage

Valves #5 and #6 are connected via a lever-controlled linkage

**NOTE: All valves are shipped in FILTER POSITION/MODE (REFER TO FILTER DRAWING(S)).**

### Initial Start-Up:

**The following steps are to be taken when you place your high flow filter in operation for the first time:**

1. Check pump strainer. Make sure it is clean and full of water.
2. Check pump rotation to ensure that the motor has been correctly wired.  
  
**Note:** the impeller should rotate in a clockwise direction when viewed from the motor end. If rotation is opposite, the motor has been incorrectly wired.
3. Set the filter for backwash (see operating instructions). Backwash a minimum of 2-4 minutes to clean the filter media or Backwash until the sight glass runs clear.

In many areas when a new pool is filled, the water will appear green and/or cloudy. This green and/or cloudy appearance can be caused by plaster fines present in the water, traces of iron or organic matter, algae in the make-up water or by a combination of all. This type of contamination always will clog any type of filter in a relatively short period of time.

If any appreciable amounts of iron or other metals are present, they may turn the pool water brown upon chlorination and stain the interior finish of the swimming pool. The pool water supply should be laboratory tested and the water should be treated to remove the iron or other materials found in it before filling and/or super-chlorinating.

It is recommended that the pool be super-chlorinated immediately after filling and that the filter be backwashed promptly when the differential pressure between the influent and effluent reaches 10+ psi or when the designed flow rate cannot be maintained. If this procedure is followed, the pool will be cleaned up in a minimum of time. After super-chlorination, do not enter the pool until chlorine level has returned to normal.



The backwash operation may be required daily or several times a day for the first few days until the water becomes a sparkling blue. After the cloudiness and/or green appearance is gone, you need only backwash as instructed elsewhere in this manual. Check the pump strainer, the converter strainer basket and any skimmer baskets daily and clean as required, establishing regular schedules.

### **To Backwash Filter:**

**BACKWASH RATE: \_\_\_\_\_ GPM TOTAL TANK**

The filter should be backwashed when the differential pressure reaches 10  $\pm$  psi, or the flow rate can no longer be maintained.

All chemical systems, heaters, and auxiliary pumping equipment should be shut off 15 minutes prior to backwash. Heater isolation valves should be closed just prior to backwashing.

### **Backwashing Cell #1 and Cell #2**

#### **Cell #1**

1. Turn off the pump.
2. Close Return to Pool valve #2.
3. **Move** linkage handle from filter to backwash position for **Cell #1** and lock it into place.
4. Restart pump and backwash **Cell #1** for 3-5 minutes or until water runs clear.
5. Turn off the pump.
6. **Return** linkage handle for **Cell #1** to filter position and lock it into place.

#### **Cell #2**

7. **Move** linkage handle from filter to backwash position for **Cell #2** and lock it into place.
8. Restart pump and backwash **Cell #2** for 3-5 minutes or until water runs clear.
9. Turn off the pump.
10. **Return** linkage handle for **Cell #2** to filter position and lock it into place.
11. Open Return to Pool Valve #2 to marked position for proper flow rate.
12. Restart Pump.

When initially starting the filter system, record the normal influent and effluent pressures with a clean filter operating at the prescribed filter flow rate.

Influent Pressure : \_\_\_\_\_ psi      Effluent Pressure : \_\_\_\_\_ psi

**FLOW RATE : \_\_\_\_\_ GPM PER CELL**



### **To Filter Pool:**

Open valve #2 and put both linkage handles into filter position/mode. With a clean filter, restrict valve #2 until the designed flow rate is achieved and mark its position.

### **Checking the Flow Rate:**

The recirculating pump is designed to deliver the designed flow rate at a specified total dynamic head. Total head on the pump is the combination of the vacuum and discharge pressure losses. The conversion factors for the vacuum and pressure reading to feet of head are:

1. One inch of vacuum equals 1.13 feet of head.
2. One psi equals 2.31 feet of head.

### **Procedure:** (Assume a newly backwashed filter)

1. Set the system to filter position.
2. Read the vacuum gauge.
3. Convert vacuum reading to feet of head by multiplying by 1.13.
4. Subtract the results of no. 3 from the design head of your pump.
5. Divide the results of no. 4 by 2.31. This gives the pump discharge pressure to obtain the desired total dynamic head and, hence, the designed flow rate. (You will need to throttle valve #2 or pump discharge valve.)
6. Should the vacuum reading drop appreciably, repeat steps 2 through 5.

Like a properly installed flow meter, a pump performance curve is guaranteed accurate within 5%. Flow meter installations vary, thus when pump pressures are set as described here, the flow meter reading should be noted as the proper recirculation rate, regardless of its actual reading.



### **To Set MOL: (Minimum Operating Level)**

This level should be set with a clean filter when there is no activity in the pool. Fill pool water level to just below the rim of the gutter on a rim flow pool or below weir slot on a weir pool during quiescent conditions. There should be no water coming from the gutter. Filter will be operating with main drain water only. Adjust main drain valve to achieve a water level roughly equal to centerline of main drain inlet. Set return to pool valve to proper flow to verify main drain setting is correct and providing full flow to pump to prevent cavitation. Once M.O.L. is established, lock main drain valve at this setting. As water enters the gutter, the pressure on the main drain line will increase and water will be taken from the gutter. When the perimeter overflow channel is running near full, most of the water required for the full re-circulating rate will be taken from the surface of the pool.

### **To Filter Pool and Vacuum - Portable Vacuum:**

With all valves in filter position, discharge portable pump into overflow channel. If a considerable amount of dirt is being vacuumed and the pressure builds up in the filter tank, it should be backwashed.

### **To Clean the Strainer:**

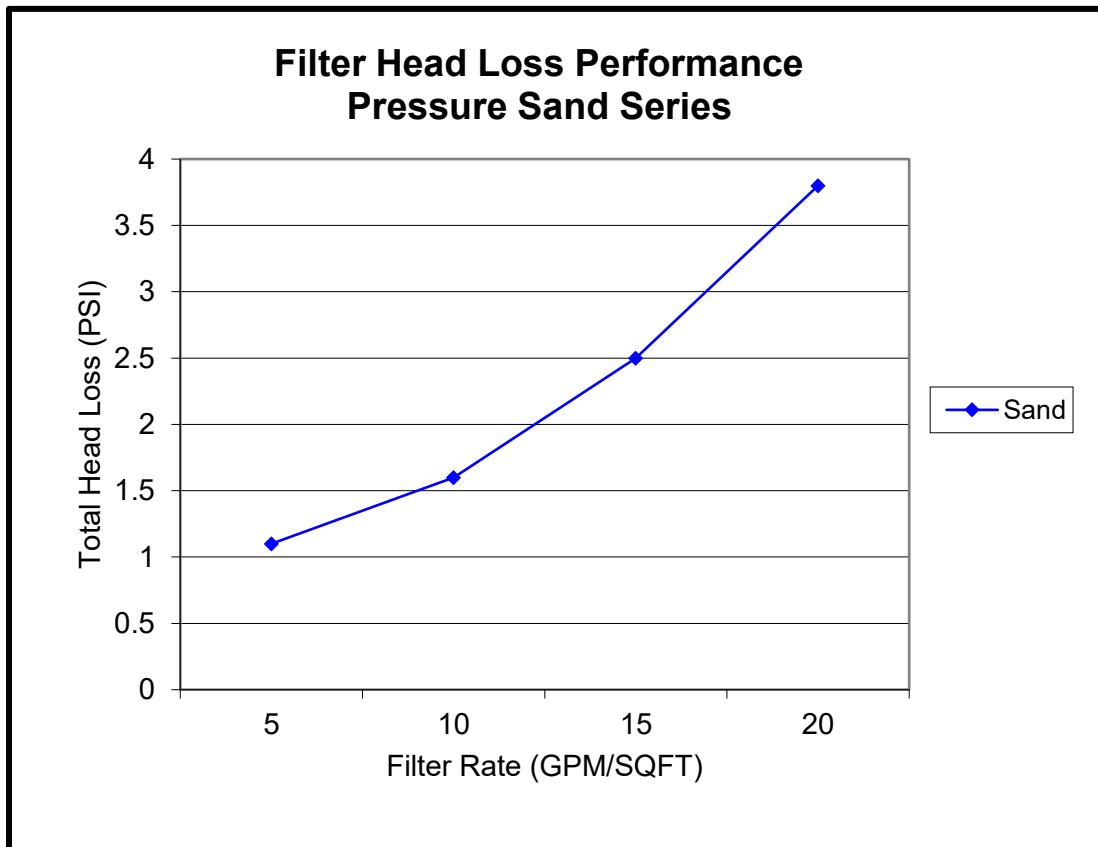
Slowly close isolation valve downstream of pump, then stop pump. Close isolation valve upstream of the strainer. Remove cover and clean basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open upstream valve and start pump. Slowly open valve downstream of pump. Establish a regular schedule for checking the strainer.



### **To Empty Pool with Pump and Motor:**

Stop pump and set filter valves in their backwash positions. Start pump and drain the pool through the filter system. If there is a filter bypass to waste valve, use it to bypass the filter and pump directly to waste. Exercise every possible care in this operation to prevent air from entering the main drain line or other piping, as this will cause the pump to lose its prime. It is advisable, when emptying the pool (unless the pump is located beneath the lowest point of the pool); to complete the operation without interruption, since turning off the pump and motor will normally result in loss of prime. However, if it becomes necessary to interrupt the emptying operation, close the valve downstream of the strainer before stopping the pump. When continuing the operation, turn on the pump and motor, then open the downstream valve slowly.

**For further information contact Paddock Pool Equipment Company Customer Service.**





## JOB NAME, CITY, STATE

Type of pool if required

# **Horizontal Pressure Sand Filter System is:**

## **Two Stacked Filter Tanks - Dual Cells - Manual Valves**

### **Introduction**

A pressure sand filter is one in which the water to be filtered is pumped through a layer of sand contained within a pressure vessel. High flow sand filters are designed for filtering rates of up to 20 gallons per minute per square foot of filtering area. This filter system will, with proper care and maintenance, give trouble-free and efficient operation.

The filtering principle is simple. Fine sand is used to filter out all of the dirt suspended in the water. Pool water is forced by the pump through a distributor system in the top of the filtering tank. This distributor system is designed to maintain a uniform flow downward through the sand and out a second collector system in the bottom of the tank.

In sand filtration, at these high rates, penetration or depth filtration occurs within the sand; the dirt entrapped in the water passes down several inches into the sand rather than being collected on the surface of the sand or in a bed of alum as in the lower rate rapid sand pressure filters.

When dirt accumulates in the sand the influent pressure increases. When the desired flow rate can no longer be maintained, the filter is cleaned by simply reversing the flow. High rate sand filtration is possible through the proper internal design of the filter. So long as the flow, either upward or downward, is uniform without jets or eddy currents, these high rates may be maintained without disrupting the filter bed.

This system is designed to run 24 hours a day. Filter cycles will vary. Bathing loads, suntan lotions and wind conditions, among other things, create variances in the filter cycle. Health departments in many areas maintain and exercise sanitary procedures; nevertheless, even though the flow rate is maintained, we recommend that the filters be put through the backwash cycle when the differential pressure between the influent and effluent reaches  $10\pm$  psi or when the designed flow rate cannot be maintained (whichever occurs first). This will keep the filter in excellent, healthful, maintenance-free operation, year-in and year-out. Any backwash requirements of local or state regulatory agencies should also be met. The filters are usually cleaned in two to four minutes by reversing the flow of the water.



## **Initial Start-Up:**

**The following steps are to be taken when you place your high flow filter in operation for the first time:**

1. Check pump strainer. Make sure it is clean and full of water.
2. Check pump rotation to ensure that the motor has been correctly wired.

**Note:** the impeller should rotate in a clockwise direction when viewed from the motor end. If rotation is opposite, the motor has been incorrectly wired.

3. Set the filter for backwash (see operating instructions). Backwash a minimum of (2 - 4) minutes to clean the filter media or Backwash until the sight glass runs clear.

In many areas when a new pool is filled, the water will appear green and/or cloudy. This green and/or cloudy appearance can be caused by plaster fines present in the water, traces of iron or organic matter, algae in the make-up water or by a combination of all. This type of contamination always will clog any type filter in a relatively short period of time.

If any appreciable amounts of iron or other metals are present, they may turn the pool water brown upon chlorination and stain the interior finish of the swimming pool. The pool water supply should be laboratory tested and the water should be treated to remove the iron or other materials found in it before filling and/or super-chlorinating.

It is recommended that the pool be super-chlorinated immediately after filling and that the filter be backwashed promptly when the differential pressure between the influent and effluent reaches 10± psi or when the designed flow rate cannot be maintained. If this procedure is followed, the pool will be cleaned up in a minimum of time. After super-chlorination, do not enter the pool until chlorine level has returned to normal.

The backwash operation may be required daily or several times a day for the first few days until the water becomes a sparkling blue. After the cloudiness and/or green appearance is gone, you need only backwash as covered elsewhere in this manual. Check the pump strainer, the converter strainer basket and any skimmer baskets daily and clean as required, establishing regular schedules.



## **Operating Instructions**

### **Valve Legend:**

All normal functions of the filter(s) are controlled by wafer valves. It is good practice to stop the pump and motor before changing the position of the valves. For convenience in operation, all valves have been tagged and correspond with the filter valve legend on the filter drawings.

1. MAIN DRAIN	5. FILTER INFLUENT- CELL 2
2A. RETURN TO POOL- TANK A	6. BACKWASH EFFLUENT- CELL 2
2B. RETURN TO POOL - TANK B	7. FILTER INFLUENT- CELL 3
3. FILTER INFLUENT-CELL 1	8. BACKWASH EFFLUENT- CELL-3
4. BACKWASH EFFLUENT-CELL 1	9. FILTER INFLUENT- CELL-4
	10. BACKWASH EFFLUENT- CELL-4

Valves #2A & #2B are open for filter mode, closed for backwash mode. Valves #3, 5, 8 & 9 are open for filter and closed for their respective cell's backwash. Valves #4, 6, 7 & 10 are closed for filtration and open for their respective cell's backwash.

### **Checking the Flow Rate:**

The re-circulating pump is designed to deliver the designed flow rate of                 GPM at a total minimum dynamic head of                 Feet each. Total head on the pump is the combination of the vacuum and discharge pressure losses. The conversion factors for the vacuum and pressure reading to feet of head are:

1. One inch of vacuum equals 1.13 feet of head.
2. One psi equals 2.31 feet of head.

**Procedure:** (Assume a newly backwashed filter)

#### HEAD LOSS

All models 2.5 psi @ 15 GPM

\* Clean filter loss through internal piping and media.

1. Set the system to filter position.
2. Read the vacuum gauge.
3. Convert vacuum reading to feet of head by multiplying by 1.13.
4. Subtract the results of No. 3 from the design head of your pump.
5. Divide the results of No. 4 by 2.31. This gives the pump discharge pressure to obtain the desired total dynamic head and, hence, the designed flow rate. (You will need to throttle valve #2 or pump discharge valve.)
6. Should the vacuum reading drop appreciably, repeat steps 2 through 5.

Like a properly installed flow meter, a pump performance curve is guaranteed accurate within 5%. Flow meter installations vary, thus when pump pressures are set as described here, the flow meter reading should be noted as the proper recirculation rate, regardless of its actual reading.



### **EXAMPLE OF CALIBRATION**

**Calculating TDH and determining flow from pump performance curve**

Using your Vacuum gauge and Pressure gauge on the gauge panel, calculate your TDH at current operational load. By using the example below you can determine the flow (GPM) of the pump and can calibrate your flow meter to correspond to your current flow.

Example:

**Vacuum Gauge Reading (4 in.Hg) x 1.13 = 4.52**

**Pressure Gauge Reading (22 psi) x 2.31 = 50.82**

To calculate TDH, add the vacuum gauge reading from the pressure gauge reading to determine your TDH. Example:

$$\begin{aligned} &\text{Pressure Gauge (22 psi)} \times 2.31 = 50.83 \\ &+ \text{Vacuum Gauge (4 in.Hg)} \times 1.13 = 4.52 \\ &= \text{TDH of } 55.35 \end{aligned}$$

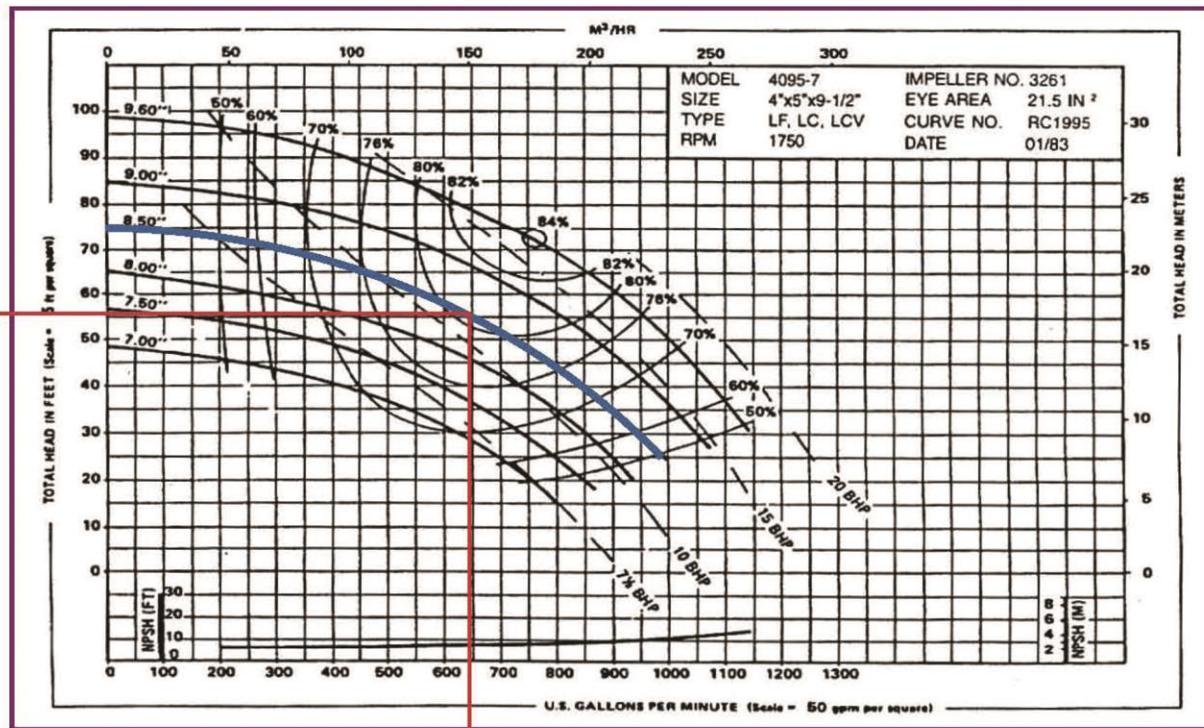
Use the example performance curve below to determine flow (GPM) with calculated TDH. Please notice the blue curve is the installed pump performance line and the red line indicates the TDH and Flow intersection on the performance curve.

**PACO PUMPS**

**LC - 40957 - 1750 RPM - Performance Curve**

Project:	Tag #	P.O. #	By:
Location:	Model: 40957	Cust Ref#	Date: 2/23/2010
Contractor:	Stages: 1	Agent/Rep:	Rev. #
Engineer:	Service:	Doc #	Qty:

Calculated TDH  
55.35 (TDH)



Flow 645 GPM at Calculated TDH



**When initially starting the filter system up, record the normal influent and effluent pressures with a clean filter operating at the prescribed filter flow rate.**

**Influent Pressure** \_\_\_\_\_ **Effluent Pressure** \_\_\_\_\_

**Flow Rate:**       GPM

**To Filter Pool:**

Open valve #1, place manual valves in filter position and start the pump.

In operation, valve #1 is open and flow is balanced from the perimeter overflow channel (PO) and the main drain. To balance the flow with the filter set in the "filter" mode, slowly close valve #1 to set the minimum operating level (MOL) in the surge tank. Note and record the number of turns or which notch the handle is in, to facilitate resetting the main drain valve when necessary. Using valve #2A & #2B set the re-circulating pump to the designed re-circulating rate and readjust valve #1 as necessary.

As activity increases in the pool, more water will flow from the PO channel, causing the water level in the surge tank to rise. This increase in water level in the surge tank will increase the head on the main drain line and less water will flow through valve #1 from the main drain and the system will balance.

**To Clean The Strainer:**

Slowly close isolation valve downstream of pump, then stop pump. Close isolation valve upstream of the strainer. Remove cover and clean basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open upstream valve and start pump. Slowly open valve downstream of pump. Establish a regular schedule for checking the strainer.



### **To Backwash Filter:**

**Backwash rate is: \_\_\_\_\_ GPM PER CELL**

**As the filter becomes dirty the flow rate drops and valve #2A & #2B should be opened as required to maintain flow.**

The filter should be backwashed when the differential pressure reaches 10  $\pm$  psi, or the flow rate can no longer be maintained.

All chemical systems, heaters and auxiliary pumping equipment should be shut off 15 minutes prior to backwash. Heater isolation valves should be closed just prior to backwashing.

### **Manual**

Shut off pump, with Tank 'B' valves in filter position, manually close valves #2A, #3 and # 6, open valve #5 and #4 to Cell #1 backwash position and restart pump. Continue backwashing Cell #1 until water runs clear in the sight glass (usually 2 to 4 minutes). Shut off pump, with Tank' B' valves still in filter position & valve #2A closed, close valves #4 & #5 open valves #3 & #6 to Cell #2 backwash position and restart pump. Continue backwashing Cell #2 until water runs clear in the sight glass. Shut off pump. Position Tank 'A' valves to filter. Close valves #2B, #8, & #10, open valves #9 & #7 to Cell#3 backwash position and restart pump. Continue backwashing Cell #3 until water runs clear in the sight glass. Shut-off pump, with Tank 'A' valves still in filter position and valve #2B closed, close valves #7 & #9, open valves #8 & #10 to Cell #4 backwash position and restart pump. Continue backwashing Cell #4 until water runs clear in the sight glass. Shut off pump. Reset all valves in filter position and restart pump to return to normal operation. Return to pool valves #2A & # 2B, should be set to the mark established during set up, the designed flow rate.

### **To Empty Pool With Pump And Motor:**

Shut off pump, close valves #2A, #2B, #5, #6, #9 & #10 and open valves #3, #4, #7, & #8 to bypass the filter system. Start pump. Maintain a positive pressure at all times with valve #3 & #8. Exercise every possible care in this operation to prevent air from entering the main drain line or other piping, as this will cause the pump to lose its prime. It is advisable, when emptying the pool (unless the pump is located beneath the lowest point of the pool), to complete the operation without interruption, inasmuch as turning off the pump and motor will normally result in loss of prime. However, if it becomes necessary to interrupt the emptying operation, close valve #3 & #8 first, then close the main drain valve #1 before stopping the pump and motor. When continuing the operation, turn on the pump and motor; open the main drain valve, then open valve #3 & #8 slowly.



## **Calculations and Notes**

A large rectangular area filled with a uniform grid of light blue horizontal and vertical lines, creating a pattern of small squares. This grid covers most of the page below the title, intended for users to perform calculations or take notes.

**For further information contact us below.**

# Filter Instructions



## Operation and Maintenance Manual





# "PPEC" Regenerative Series Filter

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# FILTER OVERVIEW



**PADDOCK**  
POOL EQUIPMENT COMPANY

**PADDOCK REGENERATOR**  
REGENERATIVE MEDIA FILTER

# "PPEC" Regenerative Series Filters

## SCOPE

The filter in this manual is a Regenerative pressure diatomite or perlite design, manufactured by Paddock Pool Equipment Company, Inc. It is capable of sustaining the application now throughout the entire filter cycle without continuous body feed.

Each filter is a standard product of Paddock Pool Equipment Company, manufacturer of filtration equipment. Primary filter components include a tank, Flexible filter element assembly, and Regenerator™ "Bump" mechanism. All components and related subassemblies are factory assembled and tested prior to shipment.

## PRINCIPLE OF OPERATION

Liquid travels through the filter in an up-flow direction. Unfiltered liquid typically enters a side connection in the tank, travels through a diffuser, then upward through the flexible filter element assembly leaving the filter via an outlet in the head.

When the system is initially started, the filter is pre-coated with diatomite or perlite filter media introduced through a vacuum transfer system. Pre-coat is pumped through filter where media is retained on the outer surface of elements forming the filter's "working surface." Similarly, particulates in the flow stream are held on the surface of the filter media while liquid passes through.

The filtration process is a mechanical straining of liquid through a porous layer of filter aid.

After a period of operation, accumulated solids gradually lessen the porosity of the "working surface" resulting in a decrease in effluent flow.

By activating the "Bump" mechanism, flow is restored and filter cycle is readily extended without backwashing or filter media change. This process, termed regeneration, repositions solids-laden pre-coat within the filter cake while randomly exposing new filter surface so the flow of liquid is no longer impeded. Following regeneration, filtration continues at full flow and at approximately original influent pressure. All "PPEC" series filters are capable of extended cycle operation and complete utilization of pre-coat. These automated filters provide programmed control of the regeneration cycle.

When solids-holding capacity of filter is finally reached (determined when regeneration no longer restores flow and pressure), the particulates and spent filter media are bumped from filter elements and drained from the tank. Reverse flow backwashing is neither necessary or recommended.



**PADDOCK**  
POOL EQUIPMENT COMPANY

**PADDOCK REGENERATOR**  
REGENERATIVE MEDIA FILTER

## **FILTER TANK**

Filter tank is diametrically divided into head and body components. The two are bolted together and made watertight by an O-ring seal.

Both body and head are of welded construction, with all wetted surfaces and connections fabricated from low carbon stainless steel. External brackets and support legs are also fabricated from stainless steel.

Tanks are designed for a 50 PSI working pressure using a safety factor of 4 to 1. All tanks are hydrostatically tested to 1.5 times the design working pressure.

Standard tank construction incorporates connections for filter influent, effluent and drain, pre-coat inlet, pressure and vacuum relief, instrumentation, and inspection window and lift shaft gland.

Inspection window is made of Pyrex glass, and is covered by a clear plastic safety shield.

### **ELEMENT ASSEMBLY**

Principal components include a tube sheet, flexible filter elements, seals and a lift shaft. These combine to diametrically separate filter tank into upper and lower sections. Seals prevent unfiltered water from bypassing to the upper section, clean side of the filter. All components in assembly are constructed from materials inherently passive to the application.

For servicing, assembly can be removed from filter tank as a unit, or, if desired, by dismantling individual parts.

In its operating format, the entire assembly moves down and up on a vertical axis. During filtration it is in an up or sealed position so unfiltered liquid must pass through flexible filter elements before it can leave the tank. When bumping, the entire assembly slowly moves to a down position, and then is rapidly raised.



**PADDOCK**  
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**PADDOCK REGENERATOR**  
REGENERATIVE MEDIA FILTER

## **FLEXIBLE FILTER ELEMENTS**

Flexible filter elements are the porous support structures for diatomite or perlite filter media. Cylindrical in shape, each element is closed at bottom and open at top. The open end of a filter element is flanged and used for attaching each element to the tube sheet.

Outer wall of the filter element is made of filaments arranged so that external pressure causes a diminution of the tube diameter and pore size. Conversely, internal pressure results in an enlargement of diameter and pore size. Each element has an internal stainless steel spring to limit diameter diminution. During filtration the filter element is retentive. When bumped for regeneration or cleaning, it freely responds to internal pressure generated by a "Bump" stroke, propelling filter media and accumulated solids from its surface.

Filter elements have a maximum recommended operating differential of 20 psi and an ultimate of 75 psi.

## **"BUMP" MECHANISM**

The "Bump" mechanism includes a pneumatically actuated Air-Stroke™ mounted on the head of the filter. It is connected to the flexible element assembly by a stainless steel shaft.

During bumping the Air-Stroke™ is alternately de-pressurized, then pressurized causing the flexible element assembly to move in a downward, then upward fashion. Total stroke travel is about 1-1/2 inches.

Bumping is operator-initiated on manual systems, and controller initiated on automated systems.

## **MODULAR SYSTEMS**

System building through modular application of two or more filters is recommended. Dedicated pumps are used for each filter module. Pumps are sized for an equal portion of the total system flow rate. Thus, each filter module functions independently of each other.



## APPLICATION DATA

### SPECIFICATIONS

MODEL	TANK DIAMETER	WORKING PRESSURE	TANK MATERIAL	INLET OUTLET	DRAIN
PPEC 140	16 in.	50 psi	304L	3 x 8	3 x 7 1/2
PPEC 145	18 in.	50 psi	304L	3 x 8	3 x 7 1/2
PPEC 225	24 in.	50 psi	304L	4 x 9	3 x 7 1/2
PPEC 225S	24 in.	50 psi	304L	4 x 9	3 x 7 1/2
PPEC 350	30 in.	50 psi	304L	6 x 11	4 x 9
PPEC 350S	30 in.	50 psi	304L	6 x 11	4 x 9
PPEC 500	36 in.	50 psi	304L	6 x 11	4 x 9
PPEC 500S	36 in.	50 psi	304L	6 x 11	4 x 9
PPEC 700	42 in.	50 psi	304L	8 x 13 1/2	4 x 9
PPEC 700S	42 in.	50 psi	304L	8 x 13 1/2	4 x 9
PPEC 900	46 in.	50 psi	304L	8 x 13 1/2	4 x 9
PPEC 900S	46 in.	50 psi	304L	8 x 13 1/2	4 x 9
PPEC 1000	48 in.	50 psi	304L	8 x 13 1/2	4 x 9
PPEC 1275	48 in.	50 psi	304L	8 x 13 1/2	4 x 9
PPEC 1400	56 in.	50 psi	304L	10 x 16	4 x 9
PPEC 1400S	56 in.	50 psi	304L	10 x 16	4 x 9
PPEC 1675	60 in.	50 psi	304L	10 x 16	4 x 9
PPEC 2100	60 in.	50 psi	304L	10 x 16	4 x 9

Standard tank construction is non-code, safety factor = 4

### OPERATING DATA

MODEL	GPM RANGE	PRE-	PRE-	** STATIC HEAD LOSS	** STATIC HEAD LOSS	* TOTAL HEAD LOSS	** TOTAL HEAD LOSS	"BUMP" SYSTEM HEAD LOSS	OPER. WEIGHT
		COAT LBS	COAT LBS DE			CLEAN			
PPEC 140	75-122	9	17	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	600
PPEC 145	105-171	12.5	24	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	800
PPEC 225	171-264	21	40	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	1200
PPEC 225S	212-335	26	50	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	1500
PPEC 350	300-444	33	63	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	2560
PPEC 350S	337-565	41	79	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	2600
PPEC 500	550-657	61	117	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	3200
PPEC 500S	528-835	65.5	126	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	3250
PPEC 700	750-895	76	146	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	4560
PPEC 700S	719-1138	82	158	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	4800
PPEC 900	647-1035	75	147	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	5860
PPEC 900S	819-1310	95	190	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	6000
PPEC 1000	730-1184	87.5	168	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	6160
PPEC 1275	950-1505	109	210	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	6500
PPEC 1400	901-1416	103	205	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	8910
PPEC 1400S	1141-1825	135	260	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	9900
PPEC 1675	1225-1670	141.5	272	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	10,400
PPEC 2100	1560-2490	182	350	1.5 ft.	23 ft.	3.02 ft.	26 ft.	Elec-Air	11,600

\* Measured at gauge taps located on filter body and head

\*\* Solids laden filter before regeneration



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## PERFORMANCE (SWIMMING POOL SERVICE)

MODEL	OPTIMUM GPM	TURNOVER – U.S. GALLONS		
		4 HRS.	6 HRS.	8 HRS.
PPEC 140	100	24,000	36,000	48,000
PPEC 145	140	33,600	50,400	67,200
PPEC 225	233	56,000	84,000	112,045
PPEC 225S	285	68,400	102,600	136,800
PPEC 350	393	94,241	141,362	188,483
PPEC 350S	475	114,000	171,000	228,000
PPEC 500	581	139,344	209,016	278,688
PPEC 500S	703	168,720	253,080	337,440
PPEC 700	791	189,768	284,652	379,536
PPEC 700S	958	229,920	344,880	459,840
PPEC 900	914	219,411	329,116	438,821
PPEC 900S	1157	277,739	416,609	555,479
PPEC 1000	1046	251,118	376,678	502,237
PPEC 1275	1268	304,320	456,480	608,640
PPEC 1400	1273	305,581	458,372	611,162
PPEC1400S	1612	386,936	580,404	773,872
PPEC 1675	1650	396,000	594,000	792,000
PPEC 2100	2085	500,400	750,600	1,000,800

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Rev. 07/2021



## FLEXIBLE FILTER ELEMENT DATA



The flexible element is a porous support structure for diatomite or perlite filter aid used in Paddock Pool Equipment Company Regenerator™ filters. Several elements are vertically installed within the filter to form a tube nest assembly.

The outer wall of an element is made of braided groups of filaments arranged at a specific angle. Thus, external pressure causes a diminishing of tube diameter and pore size. Each element has an internal stainless-steel spring to limit diameter diminution. Filament material varies with application.

During filtration the element is retentive. Conversely, when bumped for regeneration or cleaning the element responds to internal pressure generated by a "Bump" stroke, propelling filter media and accumulated solids from its surface.

Flexible elements have a recommended operating differential of 20 psi and an ultimate of 75 psi.

Model	FLEXIBLE ELEMENTS	BARE AREA	COATED AREA
PPEC 140	126	52.4	77.3
PPEC 145	168	69.9	103.2
PPEC 225	340	111.9	165.1
PPEC 225S	340	141.4	208.7
PPEC 350	572	188.3	277.7
PPEC 350S	572	237.9	351.2
PPEC 500	846	278.4	410.7
PPEC 500S	846	351.9	519.4
PPEC 700	1152	379.2	559.3
PPEC 700S	1152	479.2	707.3
PPEC 900	1342	441.7	651.5
PPEC 900S	1342	558.3	819.0
PPEC 1000	1524	501.6	739.9
PPEC 1275	1524	633.9	935.8
PPEC 1400	1871	616.1	908.8
PPEC 1400S	1871	778.8	1141.0
PPEC 1675	2506	824.8	1216.6
PPEC 2100	2506	1042.5	1538.8



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## REGENERATOR™ "BUMP" MECHANISM

### DESCRIPTION

Paddock Pool Equipment Company's Regenerator™ filters utilize a DOWN-UP stroke of the flexible filter element assembly to cause a relative flow reversal through filter elements. This process, termed "Bump" cycle, enables periodic reorganization of filter media for maximum utilization of the media and extended filter cycles. It also assures resource efficient cleaning of the filter without resorting to conventional reverse-flow backwashing.

To transmit force needed for "Bump" stroke, internal filter parts are connected to an Air-Stroke™ actuator mounted on top of filter head. Stops are provided in both directions in order to achieve a specific stroke length.





## OPERATION

Downstroke (compression stroke) allows gravity (weight of parts) to lower element assembly. Upstroke (extension stroke) is accomplished pneumatically by quickly filling actuator with compressed air.

Since actuator and element assemblies are mechanically connected, extension of Air-Stroke™ causes a rapid lifting of the element assembly to its upstroke position. This movement of the element cluster through an incompressible surrounding liquid propels filter media and accumulated particulates from the elements.

Regenerator™ "Bump" cycling is automatically initiated by the filter controller, while cleaning cycles are operator-initiated.

## MECHANICAL

While Air-Stroke™ actuator can operate without damage through an arc of up to 30"; its application in Paddock Pool Equipment Company's "Bump" mechanism is along a single vertical axis, thus assuring a long service life. Compressed air used to fill and exhaust actuator is controlled by a 3-way solenoid valve triggered by control circuits in filter controller.

## OPERATING LIMITS

- Pressure: 90 psi maximum
- Temperature: -35 F to +135 F
- Electrical Requirements: 1-60-120 VAC, 6.8 Watts
- Service Life: Exceeds 10 million cycles
- Maintenance: Maintain in an externally clean condition
- Air-Stroke™ Adjustment: None
- Compressed Air Requirements: **2 scfm @ 90 psig; 1" to 1-1/2" supply to regulator depending on length of pipe run**

## CAUTION

Never inflate actuator when it is unrestricted; i.e., with compression and extension stops removed.

Do not inflate beyond specified pressure limit.

Improper use or over-inflation may cause a failure of the actuator with component damage or resulting in personal injury.



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## PPEC 225-350 AIR FILTER/ REGULATOR

Ref. Parker Hannifin "Piggyback"

### Features:

- A. Space-saving "Piggyback" combines all filter and regulator features to yield optimal performance
- B. High water-removal efficiency
- C. Quick response and accurate pressure regulation regardless of changing flow or inlet pressure

### OPERATION:

If no air is supplied to unit, piston and valve poppet are held in open position by regulator's adjusting spring. Pressurized air flows through louvered deflector and is directed into a swirling pattern. Liquids and large dirt particles are thrown against inside wall of bowl and fall into "quiet zone" below lower baffle. The baffle prevents liquids and solids from re-entering air stream. Clean air passes through element and open poppet valve to outlet port. Pressure increases in outlet line and below regulating piston, causing piston to move against the adjusting spring. The poppet, following this movement, closes and stops air flow as soon as preset pressure level is reached. This pressure level is determined by adjusting spring through T-handle. Pressure level is now controlled automatically. Valve opens for more flow if secondary pressure decreases. Excess pressure causes regulating piston to move away from relief tube. Air can exhaust through vent hole in the piston and bonnet. (This happens for standard relieving type only.)





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## AIR LUBRICATOR

Ref. Parker Hannifin Mist Lubricate

### Features:

- A. Lubricates through broad air flow range
- B. Venturi By-Pass disc develops a linear oil delivery as air flow varies
- C. Precision needle valve results in repeatable oil delivery and minimum drip-rate change
- D. Bowl can be filled while air-line is under pressure
- E. Reverse flow capability

### OPERATION:

Some of the air entering lubricator is passing through a nozzle at increased velocity. This creates a pressure differential which is used to inject oil into air stream. Higher pressure in the bowl forces oil through a pickup tube, adjustment needle, and sight dome into the low-pressure area above nozzle.

The By-Pass disc deflects at higher flow rates and governs amount of injected oil proportionally to the air flow. Rate of lubrication can be adjusted by the precision needle valve. Rotation of the needle counter-clockwise will increase drip rate. Drip rate can be observed in sight dome. After adjustment, drip rate is controlled automatically with changes in air flow. The bowl can be filled through the fill cap, while lubricator remains pressurized.





## PANEL MOUNT FILTER CONTROLLER (Refer to Fig. 1 on following page)

1. The filter controller is factory-programmed and will power up in OFF/MANUAL mode
2. There are multiple functions on the touchscreen and they are as follows:

### **OPERATING MODES** - Toggles between the three modes:

1. **OFF/MANUAL MODE** – This mode turns the filtration system off and is used during recharging of the filter and to adjust the On-stream time. When selected, the motor will stop, On-stream valve will close, and interlocks will be turned off. It is also used to exit the CLEANING/DEGREASING mode.
  - 1A. Press the number in the box to adjust the On-stream time. A numerical pad will appear and any number between 1-12 can be selected. This will set the time interval (in hours) between bump cycles.
  - 1B. The green “JOG” button is a momentary switch that when pressed and released will turn the motor on and off. The motor will run as long as the button is pressed. This is used to controllably fill the filter with water.
  - 1C. The green “JOG” button is a momentary switch that when pressed and released will actuate the bump mechanism on top of the filter. This is used to manually bump the filter during the recharging process.
  - 1D. Controls the vacuum transfer system for when the filter is being charged.
2. **ON/AUTO** – This mode turns the filtration system on and automatically controls the motor and cycling of the filter.
3. **CLEANING/DEGREASING** – This mode is used for degreasing and demineralizing the filter. When placed in this mode, the filter will continuously bump at a predetermined interval until the OFF/MANUAL mode is selected.

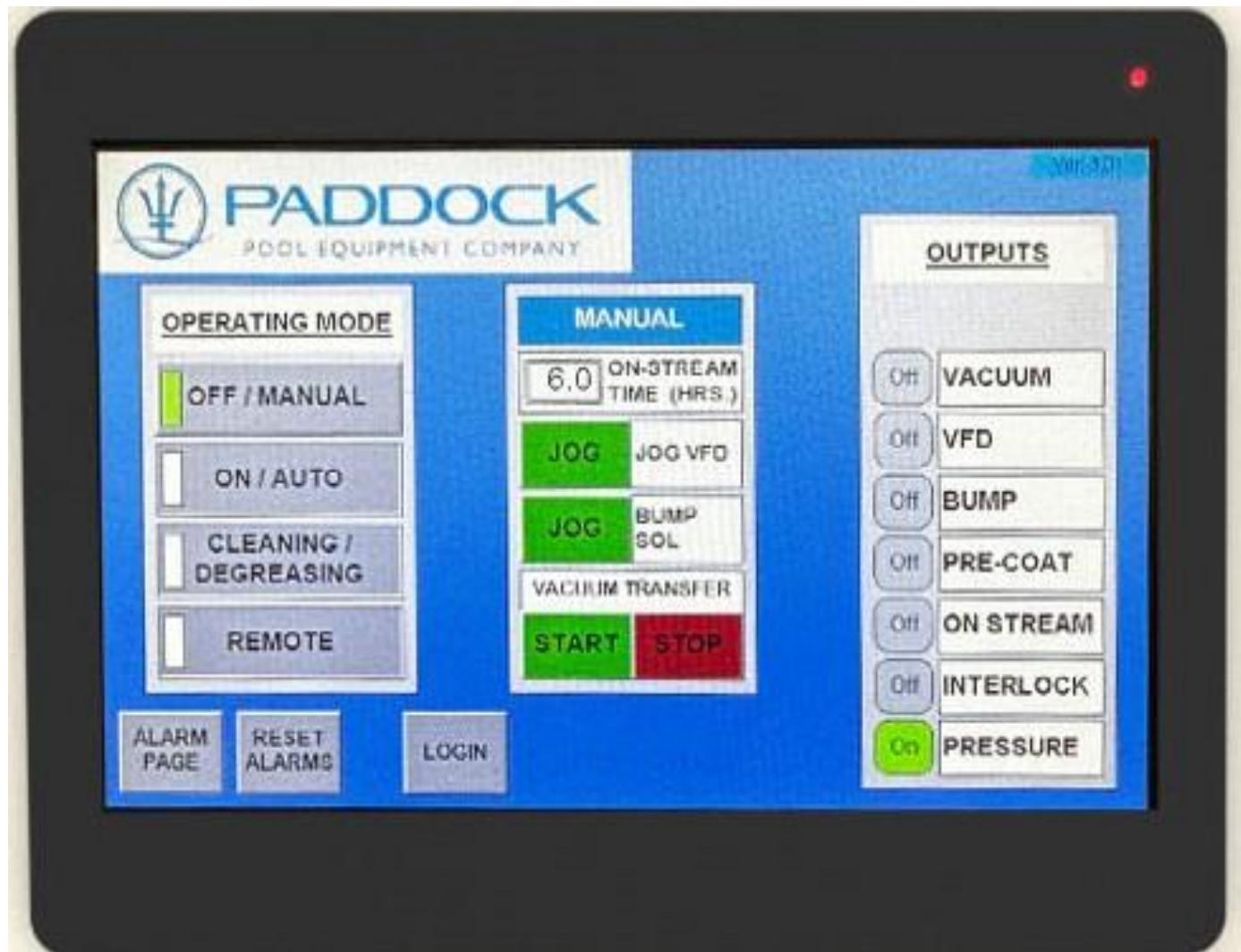


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## FILTER CONTROLLER

Fig. 1



# OPERATING INSTRUCTIONS



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## OPERATING DATA

### Pre-Operating Checklist

- Power switches in panel – ON
- Enclosure door – SECURE
- Operating mode – OFF/MANUAL
- Vacuum Transfer – OFF
- On-Stream duration – SET
- Air supply to filter – ON
- Regulator set to proper setting – 90 PSI

### CAUTION – TO PREVENT ELECTRIC SHOCK

**DISCONNECT SUPPLY CIRCUIT(S) BEFORE ATTEMPTING SERVICE TO THE SYSTEM OR  
CONTROLLER; AND BEFORE OPENING ENCLOSURE DOOR**

### IMPORTANT INFORMATION

1. Automatic Program can be interrupted at any time. On repowering, the controller will automatically initiate a new filter cycle beginning with a “BUMP” cycle.
2. The PPEC filter controller incorporates a system air pressure sensing circuit. If the system air pressure falls below set point, and alarm will trip, the screen will turn red, and the controller will STOP filter cycle. Upon restoration of normal air pressure, controller will restart filter beginning with a “BUMP” cycle.
3. If power is interrupted to the filter controller, once it is restored, it will revert to the OFF/Manual mode. The operator will need to place it back into ON/AUTO mode
4. If a fault occurs on the filter controller while it is in its ON/AUTO mode, once the fault has been corrected, it will automatically restart beginning with a “BUMP” cycle.



## Filter Media Dump/Recharge Process

### **The following steps should be taken to properly dump the media from the filter:**

1. Manually turn off heaters and chemical control systems 5-10 minutes before shutting filter down
2. Push the OFF/MANUAL MODE button on filter controller. The box to the left should turn green.
3. Close pump discharge valve if below grade
4. Push and hold the green jog button for the Bump solenoid on the filter controller until actuator boot on top of filter is fully relieved of air. Release the button and repeat two more times
5. Open high air vent line valve
6. Open dump valve on bottom of filter and drain completely
7. Push the green jog button for the VFD on the filter controller for 5-8 seconds to jog the pump washing out any solids left in bottom of filter. If below grade, opening and closing pump discharge valve for the same duration should be sufficient.
8. Close dump valve on bottom of filter and use the VFD jog button or open pump discharge valve if below grade to slowly refill filter completely (water should come out of the air vent line). Close air vent line valve and repeat steps 3-7 one more time
9. After completing step 7 for the second time, close dump valve, close air vent line, and open Vacuum Transfer drain valve letting the line drain completely. (Illustration of Vacuum Transfer valve orientations found on following page of this manual) If below grade, pump discharge valve should still be closed.

### **The following steps should be taken to properly charge the filter with media:**

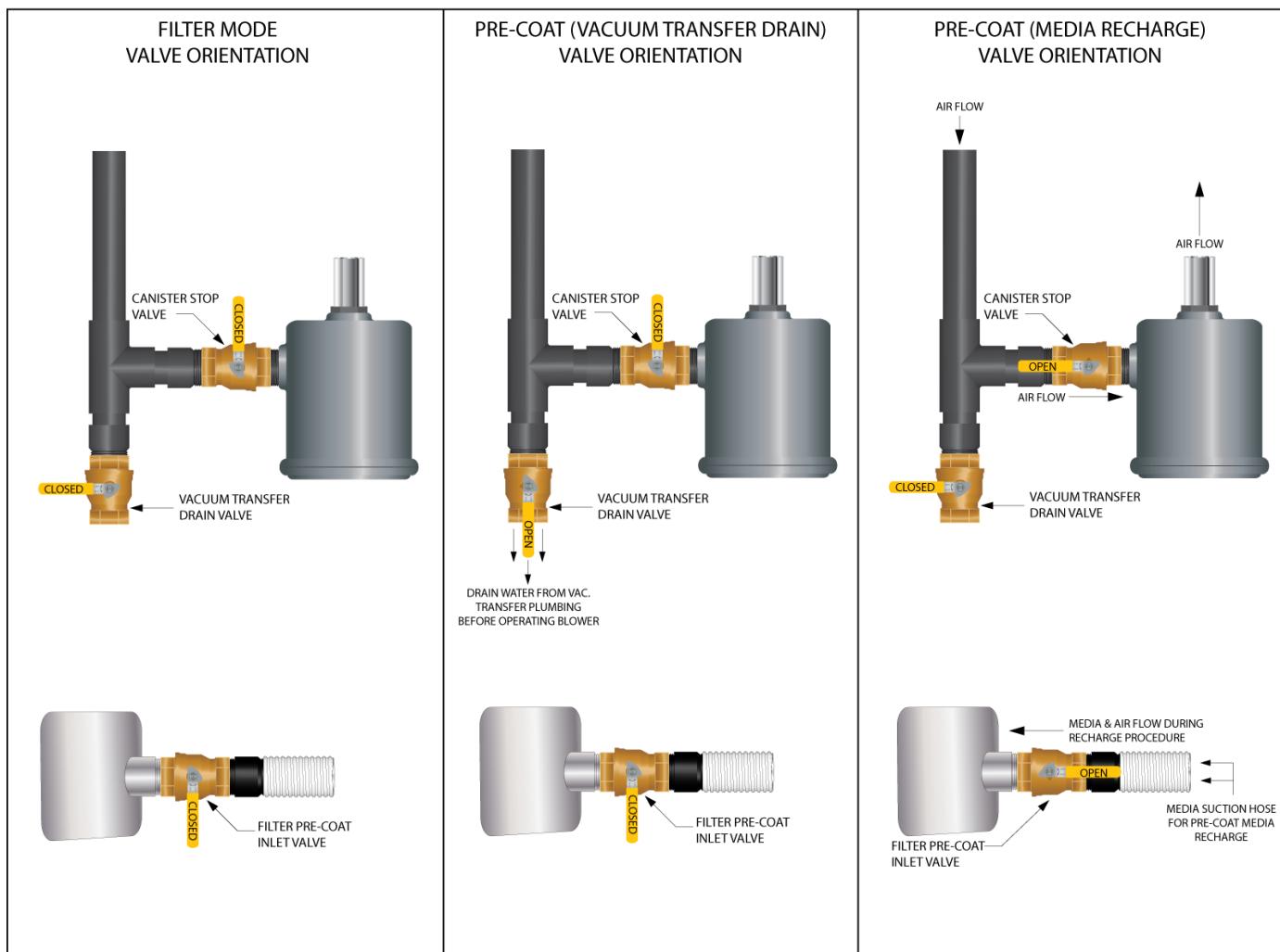
1. Close Vacuum Transfer drain valve and open Canister Stop valve and Filter Pre-Coat Inlet valve. Make sure the Vacuum Canister lid is securely fastened (illustration of valve orientation found on flowing page of this manual)
2. Press the green start button for the Vacuum Transfer on the filter panel and vacuum in proper quantity of media. Close Canister Stop and Filter Pre-Coat Inlet valves. Hang Vacuum Canister lid to allow any moisture to dry.
3. Open air vent line valve and use the VFD jog button or open pump discharge valve if below grade to slowly fill filter until a steady stream of water comes out of air vent line.
4. Close air vent line
5. Push the ON/AUTO button on filter controller. The box to the left should turn green and the sequence start
6. Monitor filter as it goes through pre-coat cycle and return to pool
7. Turn on heaters and chemical control systems



## VACUUM TRANSFER SYSTEM

The Vacuum Transfer system is used to introduce media and cleaning agents into the filter. The following diagrams display the valve orientations on the Vacuum Transfer piping for proper operation.

### VACUUM TRANSFER VALVE ORIENTATION

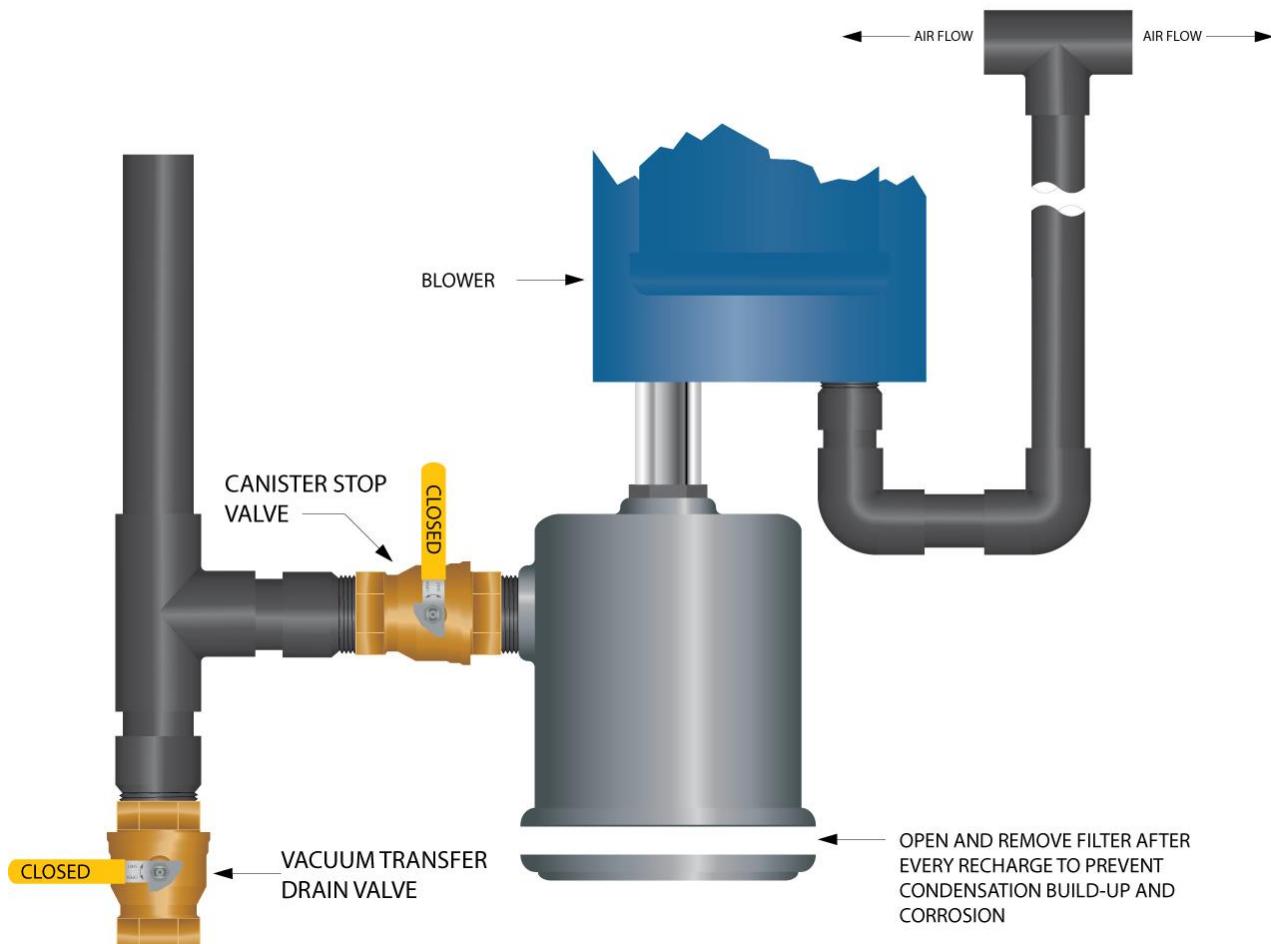




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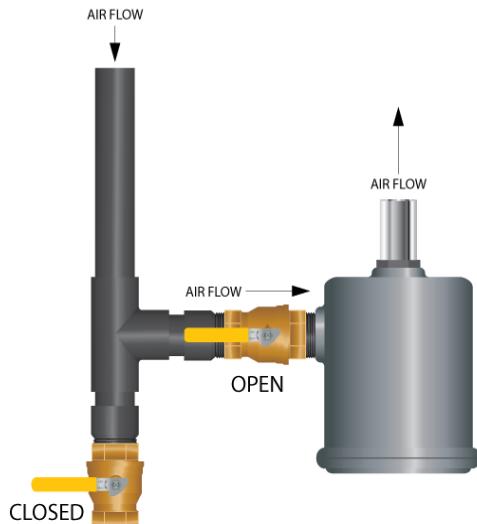
## VACUUM TRANSFER FILTER CLEANING AND OPERATION





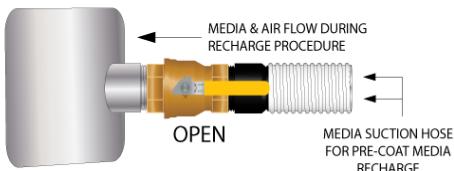
## VACUUM TRANSFER INSTRUCTIONS

### PRE-COAT (MEDIA RECHARGE) VALVE ORIENTATION



RECHARGING FILTER IS AN EASY PROCESS AND ONLY REQUIRES A FEW MINUTES. MAKE SURE SYSTEM IS OFF, ISOLATED, DRAINED AND RINSED PRIOR TO FOLLOWING STEPS.

1. DRAIN WATER FROM VACUUM TRANSFER PLUMBING (SEE VACUUM TRANSFER VALVE ORIENTATION DRAWING).
2. MAKE SURE HE PA FILTER IS IN FILTER CANISTER AND CLOSED
3. OPEN VALVES AS SHOWN
4. TURN VACUUM TRANSFER BLOWER ON (LOCATED ON FILTER CONTROLLER PANEL)
5. OPEN MEDIA BAGS AND BEGIN TRANSFERRING CORRECT AMOUNT OF MEDIA INTO FILTER BY USING VACUUM TRANSFER HOSE LOCATED ON FRONT OF FILTER. THE CORRECT AMOUNT OF MEDIA IS LOCATED ON FILTER LABEL AND IN OPERATORS MANUAL
6. ONCE ALL MEDIA HAS BEEN TRANSFERRED, TURN OFF VACUUM TRANSFER BLOWER, CLOSE ALL VALVES ON VACUUM TRANSFER AND FOLLOW VACUUM TRANSFER VALVE ORIENTATION DRAWING.



# MAINTENANCE & CARE



## FILTER MAINTENANCE

### ESTABLISH A SCHEDULE

While Paddock Pool Equipment Company Regenerator™ filters are inherently resistant to effects of contaminants normally found in swimming pools, it is important to remember that body oils, sunscreen lotions, and cosmetics tend to form gummy residues inside filters. In addition, mineral content in a pool increases daily as a result of continuous chemical treatment and normal water evaporation process. Accordingly, if contaminant levels are allowed to get too high, deposits can form on filter elements that may eventually shorten filter cycles.

To guard against this, degreasing and chemical cleaning of the element assembly is suggested at approximately **six-month intervals**.

### DEGREASING ELEMENT ASSEMBLY

The most effective means for removing gummy residues of body oils, sunscreen lotions, and cosmetics is through a soak cycle using a cold-water saponification, such as Paddock Pool Equipment Company Sodium Percarbonate (Degreasing Concentrate).

To initiate procedure:

- Perform normal filter media dump cycle and rinse as described earlier.
- Using the Vacuum Transfer system, add prescribed amount of Degreasing Concentrate (see table next page), then fill the filter tank slowly utilizing the green “Jog VFD” button.
- Press the “Cleaning/Degreasing” button (box to the left should turn green).
- Allow solution to remain in contact with elements for a minimum of 8 hours while in “Cleaning/Degreasing” mode.
- **High vent bleed valve must remain fully open during the degreasing cycle. Failure to do so will result in pressurization of the tank causing park failure and/or injury!**

After completing soak cycle, drain solution from filter tank. Refill and drain filter at least twice with pool water to thoroughly flush all wetted parts.



## **CLEANING / REMOVING MINERAL DEPOSITS**

To complete maintenance procedure, a chemical cleaner such as Paddock Pool Equipment Company Citric Acid (Demineralizer) Again, fill filter with pool water and allow solution to remain in contact with elements for a minimum of 8 hours in its "Cleaning/Degreasing" mode.

After completing soak cycle, drain solution from filter. Refill and drain filter at least twice with pool water to thoroughly flush all of the wetted parts. Filter is now ready to go back into service.

## **GUIDELINE CHART QUANTITY**

The following table should be used to determine amount of Degreasing Concentrate and Chemical Cleaner needed for each model.

<b>Filter Model</b>	<b>Tank Volume (gals.)</b>	<b>Degreasing Concentrate (lbs.)</b>	<b>Note 1 Demineralizer (lbs.)</b>
PPEC140	89	6.4	4.0
PPEC145	98	8.0	6.0
PPEC225S	129	17.6	10.0
PPEC350S	244	31.7	17.0
PPEC500S	291	41.6	24.0
PPEC700S	396	59.2	34.0
PPEC900S	496	64.5	35.0
PPEC1275	595	77.0	42.0
PPEC1400S	721	93.7	50.0
PPEC1675	801	126.4	75.0
PPEC2100	890	149.0	90.0

Note 1: Suggested pounds of Paddock Pool Equipment Company Degreasing Concentrate (packaged in 50-lb bag)

Note 2: Suggested pounds of Paddock Pool Equipment Company Demineralizer (packaged in 50-lb bag)



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## **SOME PRECAUTIONS**

Take extreme care when handling cleaning agents for they can be harmful to the eyes, skin and clothing. [Read manufacturer's label instructions and Safety Data Sheet \(SDS\) before using.](#)

Isolate filter from the pool and recirculation system by closing valves, etc. before introducing cleaning solutions to filter.

**Caution:**

The use of muriatic acid as a cleaning chemical should be [AVOIDED](#). Muriatic acid, even in weak concentration, will quickly corrode most metals including stainless steel tank. It will also destroy filter elements.

## **SPEED CLEANING PROCEDURE - DEGREASING ONLY**

Following the procedure outlined in degreasing the element assembly:

1. Place filter in ON/AUTO mode
2. Let the filter bump and then precoat for 10-15 seconds
3. Press the OFF/MANUAL button, then the CLEANING/DEGREASING button
4. Repeat steps 1-3 at hourly intervals for 4 hours
5. Drain and rinse (2) times
6. Charge filter and operate normally

For further information or question(s), see below to contact Paddock Pool Equipment Company, Customer Service.



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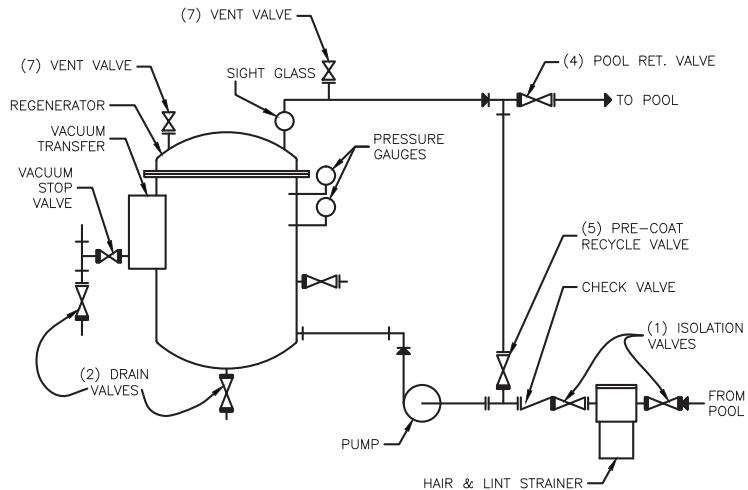


Certified to  
NSF/ANSI Standard 50

MODEL NO.	<b>PPEC 700S</b>	SERIAL NO.	<b>1123-PPEC700S-1147</b>
EFF. FILTER AREA	<b>707.3 AREA/SQ. FT</b>	MAX. DESIGN FLOW	<b>1138 GPM</b>
		MAXIMUM TANK WORKING PRESSURE	<b>50 PSI</b>
		DIATOMACEOUS EARTH DE OR Perlite Material	<b>158 DE LBS</b> <b>82 LBS</b>
REQ'D CLEARANCE	<b>13 INCHES -VERT.</b>		<b>45.0 INCHES-HORIZ.</b>

APPROVED FOR SWIMMING POOLS

## SCHENECTADY CENTRAL PARK POOL NOBERTO POOLS, INC.



Rev. 05/2021

PART NO. XXXXX

**PADDOCK**  
POOL EQUIPMENT COMPANY

ROCK HILL, SC 29730

### OPERATING INSTRUCTIONS

#### BEFORE STARTING

Fill the air lubricator to the mark with clean pneumatic lubricating oil – Mobil Almo 525 air-tool oil or equal is preferred, though non-detergent SAE 10 motor oil can be used temporarily. Turn on the air supply and regulate to 100 psi. Cycle-check the bump mechanism through one complete operation. Prime the recirculation pump following the manufacturer's instructions. Close all filter-related valves.

For systems equipped with an automatic filter controller, follow operating procedure specified for the controller.

#### PRECOATING

##### A. CHARGE (filter tank must be empty)

Open filter drain valve (6). Drain any water from vacuum transfer line. Close valve (6). Install canister filter. Open valves (9) and (8). Activate vacuum transfer system using the vacuum hose connected to valve (8). Vacuum in the prescribed amount of filter aid into the filter. Turn off vacuum transfer.

##### B. FILL

Close valves (9) and (8). Open valves (1) and (7). Start pump.

**NOTE:** If the filter is installed below the pool water line, open valve (1), and allow the tank to fill by gravity with the pump off. Completely fill the filter with water, venting air through valve (7). Close valve (7) after all air has been eliminated.

##### C. RECYCLE

Open valve (5). The water flow is now recycled around the filter until the sight glass shows clear. It may be necessary to occasionally open valve (7) to keep the system purged of air.

#### FILTERING

After the sight glass clears, open valve (4). Close valve (5).

Use valve (4) to adjust the system flow rate. Note the difference in the pressure gauge readings. This is the "starting" differential pressure.

As the filter accumulates dirt, the differential across the gauges will increase. When the differential reaches 15 psi, or the flow diminishes to 80% of the design rate, regenerate the filter. **CAUTION:** At no time should the differential be allowed to exceed 25 psi.

#### REGENERATION (Extending the Cycle)

Switch off pump. Close valve (4). Activate the Bump Controller. When bumping stops, start pump and proceed as in PRECOATING–RECYCLE and FILTERING.

After each regeneration, and until the filter is ready to be cleaned, a slight increase in the starting differential can be expected. This is the result of dirt accumulating in the filter and is completely normal.

#### CLEANING

The filter should be cleaned when it becomes necessary to regenerate more frequently than every six hours.

Close valve (4), switch off pump. Close valve (1). Activate the Bump Controller. When bumping stops, open valve (2), and allow water and dirt to drain completely. Do not vent filter during the draining process.

After the filter has drained and with the drain still open, open valve (1) and run pump for a few seconds to flush filter bottom. **NOTE:** If the filter is installed below the pool water line, opening valve (1) briefly with the pump off will adequately flush the filter.

The filter is now ready for a fresh precoat. Proceed as in PRECOATING & FILTERING.

#### VACUUMING

Vacuuming can be performed directly into the filter whenever needed. For faster results, regenerate the filter before and after each vacuuming operation.

#### PREVENTATIVE MAINTENANCE (Flex-Tube Elements)

While Paddock Regenerator filters are inherently resistant to fouling, it is important to remember the mineral content of the pool water increases everyday as a result of the chemicals used and the normal water evaporation process. If the concentration of minerals gets too high, deposits may form on the filter elements and eventually shorten filter cycles. Accordingly, a chemical and detergent cleaning of the element assembly is suggested at about six-month intervals. For specific instructions, please refer to Filtrex Service Recommendation IS 5545-A.

#### WINTERIZING

For outdoor installations exposed to freezing temperatures, cycle the filter as described under CLEANING. Perform PREVENTATIVE MAINTENANCE prior to any seasonal shutdown. Pressure gauges tend to hold water even after draining, and should be removed and stored in a heated location.

PLEASE REFER TO OPERATOR'S MANUAL.



## JOB NUMBER, JOB NAME, CITY, STATE

VACUUM SAND COMPACT (VSC) FILTER WITH AIR SCOUR BACKWASH

Standard Compak-with Evacuator for indoor filter rooms

### Introduction

The filter on your pool is a vacuum type filter, which utilizes sand as the filtering medium. A vacuum filter is one in which the water to be filtered is in a tank open to atmospheric pressure into which the unfiltered water flows by gravity and is drawn out by the pump through the filter media. This filter system, with proper care and maintenance, will give trouble free and efficient operation.

The filtering principle is simple. Sand is used to filter out all of the dirt suspended in the water. Pool water is drawn in through this layer of sand and it is returned to the pool. Pool water enters the filter chamber from both the bottom of the pool and from the perimeter overflow system channel.

The perimeter overflow channel flows freely to the filter. When the flow increases a preset hydraulic balance will cause less water to come from the bottom of the pool. When there is little or no water flowing from the channel, the main drain line is designed to supply the total required flow rate.

The filter compartment receives water from the main drain and the perimeter overflow (PO). Water entering the filter chamber passes downward through a water distribution and vacuum equalization screen, through sand, and out the underdrain system. When dirt builds up in the sand and the desired flow rate can no longer be maintained, the filter is cleaned by simply reversing the flow.

The water in the lower part of the sand bed is under vacuum. As the pressure of the swimming pool water in the filter is reduced below atmospheric, dissolved gases are released. The order of release will follow their vapor pressures with the more volatile being released first. Among the first will be nitrogen trichloride. This has a beneficial effect on the water in that many of these gases, such as nitrogen trichloride, are irritating to the swimmers. An automatic electrical control device is provided with the paddock vacuum sand filter to ensure the release of the entrapped gases.

Studies have shown the gases, if not allowed to bubble out of the media bed, will impede the flow of water through the sand. This has much the same effect as contaminant particles reducing the filtration efficiency and increasing the frequency of backwashing. The gases removed are released at regular intervals by the automatic gas release system.



The filter is designed to run 24 hours a day. To operate economically and efficiently, the system has been designed to shut off approximately one minute in each 10-hour period to allow for the escape of accumulated gases. The automatic gas release system also provides vacuum protection for the pump and motor. Should the preset maximum vacuum of 16" be reached, the pump will automatically be shut off and remain off until the vacuum limit switch (VLS) is manually reset and the pump restarted.

### **Operating Instructions:**

To assist in these operating instructions, all valves on your VSC filter have been permanently tagged with a tag containing a number. The valves are numbered as follows:

1. Main drain	7. Perimeter overflow
1A. MOL set valve	8. Main drain backwash influent
2. Pump header suction	9. Automatic water make-up (solenoid)
3. Filtered water return to pool	10. Manual make up water control
4. Backwash trough suction	11. Water make up solenoid isolation valve
5. Backwash discharge (pump to waste)	12. Air scour control
6. Underdrain control	12A. Manual air bleed

**Note:** All valves open counter-clockwise and close clockwise as indicated on the valve handle or gear operator.

### **Construction Details:**

The filter tank contains:

- a. A main drain control valve.
- b. A piping header, which controls the main drain influent flow for filtering, backwashing, and draining pool.
- c. An underdrain system of the header lateral type placed at the bottom of the tank.
- d. An air scour system of the header lateral type placed at the bottom of the tank.
- e. The sand bed consisting of an 18" layer of 0.45 to 0.55 mm filter sand supported by a layer of 1/16" to 1/8" (roofing) gravel.
- f. A water distribution and vacuum equalization screen. This is perforated corrugated fiberglass supported by angles welded to the tank. This screen covers the entire filter chamber and is installed over the sand bed just above the backwash trough.



The purpose of this screen is to evenly distribute water entering the chamber and to create a uniform vacuum above the sand bed. The equalization screen is installed in sections with each section being light and easy to remove if required. All sections have holes 3/8" in diameter drilled on 6" centers.

- g. The P.O. channel outlet valve(s). This is above the equalization screen and controls the entry of water from the P.O. channel.
- h. The recirculation pump.
- i. The return and waste line control valves.
- j. The automatic gas release system consisting of an adjustable 24-hour timer preset to 10 hours, a vacuum limit switch on the filtered water outlet that stops the recirculation pump when preset 16" hg is reached, and a manual on/off recirculating pump control switch.
- k. Variable Frequency Drives (VFD) are an option for this filter.

### **Initial Start-Up:**

The following steps are to be taken when you place your Vacuum Sand Compak (VSC) filter in operation for the first time:

1. Check pump rotation to ensure that the motor has been correctly wired.
  - a. **Note:** the impeller should rotate in a clockwise direction when viewed from the motor end. If rotation is opposite, the motor has been incorrectly wired.
2. Flush out main drain line before filling pool.
3. Clean interior of filter of debris and check all bolts and nuts for tightness.
4. Check all electrical connections to Mark V filter control panel and motor starter.
5. 110v input power to 1 & 2 on terminal strip in Mark V box.
6. Output power from terminals 3 & 4 to motor starter coil, auxiliary remote contacts, or VFD if present.
7. Heater and UV connections from 7 & 8 on terminal strip.



8. Gauges on Mark V should be connected with  $\frac{1}{4}$ " tubing to proper fittings provided—compound to suction usually located on pump box wall and pressure to discharge side of pump usually on volute.
9. Place valves in backwash configuration (refer to backwash instructions) and backwash filter thoroughly, then place into filter.
10. Check timers on interior of Mark V panel for proper settings. Start with the left timer representing burp hours. The small window of this timer should indicate 24 HRS. If not, adjust small screwdriver slot on top right of timer. Dial on front of timer should be set on 10. Next timer to the right is the Heater/UV timer. The top right window of this timer should indicate 10 MIN. Adjust on top of timer as before if necessary. The dial on front should be set on 10. The final timer should indicate 1 MIN and can be adjusted as before if necessary. This timer should be set for 30 seconds for Burp time. Note: On rare occasions if pump loses prime with this timer set at 30 seconds it should be adjusted to 1 minute.
11. Vacuum switch should be checked for proper setting and operation by slowly closing down pump suction. When 16" of vacuum is achieved, pump should shut off and VLS light should come on. If this doesn't happen, remove gray metal cover from vacuum limit switch just below Mark V box. Adjust the screw on the top right of switch until the motor shuts off. Reset VLS and try again to be sure of setting. Replace cover.
12. Run filter overnight and then backwash again to be sure filter is clean.
13. Set minimum operating level (MOL) by closing return to pool valve (#3) to specified recirculation rate. Close the perimeter overflow valve(s) (#7) and slowly restrict Valve (#1A) to achieve a water level in the filter roughly equal to the centerline of the main drain pipe in the filter. Lock Valve (#1A) in position and MOL is set.

In many areas, when a new pool is filled, the water may appear green or cloudy. This green and/or cloudy appearance can be caused by "marcite" plaster, traces of iron or organic matter or algae in the makeup water and will clog any type of filter in a relatively short period of time. If the pool is cloudy, we recommend that it be super chlorinated immediately after filling and that the filter be backwashed promptly when the vacuum limit switch causes the filter to shut down and the vacuum is not appreciably reduced upon restarting.



If any appreciable amounts of iron are present, they will turn brown upon chlorination and may stain the interior finish of the swimming pool. Chlorinate a small sample of water first. If it turns brown, the water should be treated to remove the iron. The backwashing operation may be required daily or even several times a day until the water becomes sparkling blue.

### **Backwashing the Filter:**

The filter should be backwashed when the pump is stopped by the VLS indicating backwashing is required or if visual vacuum readings are high (14" hg plus) and pool clarity is poor. (Pool clarity issues can also be due to chemical imbalance)

**Shut off UV, Heaters, chemical controller(s), Water Level Controller, etc. 5-10 minutes prior to Backwash.**

1. Reset vacuum limit switch if tripped. Close Main Drain valve (#1) and Perimeter Overflow valve (#7). Draw the filter tank level down to top of sand bed, opening backwash viewport to see. Slowly close return to pool valve (#3), then shut off pump. Close Pump Suction Valve (#2).
2. Open Air Scour Control valve (#12) and turn on air scour blower. Run 3-5 minutes while monitoring sand bed to ensure water is not bypassing valves. Once the sand bed is thoroughly agitated, turn off air scour blower and close valve (#12). **If the water level does start to rise during air scouring, turn off the air scour blower immediately. Re-check valves (#1, #7, and #3) for full closure. If water rises above backwash trough during air scouring, it will allow sand to enter said trough and potentially return to the pool after the backwashing cycle.**
3. Open Backwash Influent valve (#8) and Air Relief valve (#12A). **Allow water level in the tank to rise until it reaches the bottom of the motor box.** Close Backwash Influent valve (#8) and Air Relief valve (#12A).
4. Open Backwash Suction valve (#4). Start pump and open Backwash-To-Waste valve (#5) slowly to the designated flow. Draw the filter tank level down to the equalization screen. Look through backwash viewport and open Backwash Influent valve (#8) to regulate and maintain water level just below equalization screen, allowing dirty water to flow over edge of backwash trough. Backwash 3-4 minutes or until the sight glass is clear.
5. Close Backwash Influent valve (#8) and turn off pump. Close Backwash Suction valve (#4). Close backwash viewport window. Open Perimeter Overflow Valve(s) (#7) and Main Drain Valve (#1) allowing water level to rise to maximum level. Open Pump Suction Header valve (#2) and turn on filter pump. Rinse filter to waste 15-20 seconds.



6. Open Return to Pool #3 to first setting or notch while slowly closing Backwash-To-Waste valve (#5). Then set Return to Pool valve (#3) to marked position for designated flow rate.
7. Run 2-3 minutes and check operation, turn on UV, heaters, controllers, etc.

When backwashing, it is important to keep the water level in the filter compartment just above the top lip of the backwash trough partition to maximize the efficiency of the backwash flow and dirt removal. This can be observed through the viewport window in the equalization screen. With the proper setting of the backwash discharge to waste valve (#5), the backwash flow can be easily maintained at the proper level in the filter tank and in the backwash trough by modulating Backwash Influent valve (#8).

**Helpful Hint:** It is recommended that a manual backwash at the maximum flow rate allowable by backwash water receptacle capabilities for an extended time of 5-6 minutes is done a minimum of once a year. The air scour feature is not used during this suggested preventive maintenance backwash. This suggested manual extended flow backwash extends the media life & could prevent having to replace the sand in your filter.

### **To Filter:**

**Ensure that pump rotation is in the correct direction at startup.**

Valves (#1), (#2), (#3), (#6), (#7), & (#11) are open. Valve (#1A) is closed to the previously set MOL and locked in place. Valve (#1A) should be left in this position for all filter operations. All other valves are closed.

### **Checking the Flow Rate:**

The recirculation pump is designed to deliver the required recirculation flow of \_\_\_\_\_ GPM at a total dynamic head of \_\_\_\_\_ feet. **REFER TO DRAWING(S)**

Total dynamic head on the pump is a combination of the vacuum and discharge pressure losses. The conversion factors for the vacuum and pressure reading to feet of head are:

1. 1" of vacuum equals 1.13 feet of head.
2. 1 psi equals 2.31 feet of head.



### **Procedure (With A Clean Filter):**

1. Set all valves to "filter" mode. Valve (#1A) is already set.
2. Start the pump and read the vacuum gauge.
3. Convert the vacuum reading to feet of head by multiplying by 1.13.
4. Subtract the vacuum reading expressed in feet (as found in #3 above) from the design total dynamic head of your pump.
5. Divide the results of #4 by 2.31. This is the desired pump discharge pressure to obtain the total designed dynamic head and, hence, with the diameter pump impeller supplied the designed flow rate.
6. Restrict valve (#3) by adjusting the gear operator until the pressure on the pump discharge gauge reads the result of #5. Recheck the vacuum gauge and make adjustments if necessary.

The pump manufacturer guarantees the flow based on their pump curves to within 5%, which is more accurate than the flow meter which is subject to distortion. When the system is properly set as described here, the reading on your flow meter is (and should be noted as) the proper recirculation rate for your pool. Mark the position of the indicator arrow on the gear operator on valve (#3) and return it to this setting after each backwash.

**Note:** If the filter pump for the pool loses prime during filter or backwash, follow these steps:

1. Turn the filter pump off.
2. Open manual air bleed tube located in the pump box and open valve (#12A) to allow any trapped air to escape.
3. Check to make sure all valves are in the proper position.
4. Allow the water in the filter tank to equalize with the pool.
5. Once the water in the filter tank has equalized with the pool, close air bleed tube in pump box and valve (#12A).
6. Turn the filter pump back on.



## **General:**

If debris accumulates on the vacuum equalization screen, it should be removed at regular intervals. This can be accomplished during backwashing. If it is necessary to enter the filter chamber, use the ladder provided and put your weight directly over the support angles.

The Vacuum Equalization Screen (VES) is held in place with fasteners. There is a window in the VES to permit visual inspection of the condition of the media surface. One section near the access ladder is made for easy removal for inspection of the area beneath the screen. All sections may be removed for maintenance operation if required.

If pump loses prime for any reason, let tank fill with pump "off" to displace air, then start pump.

**NOTE:** **IT IS IMPORTANT TO CALIBRATE FLOW METER WITH PUMP AS DESCRIBED ABOVE.**

## ***Use the actual info***

### **EXAMPLE OF CALIBRATION**

#### **Calculating Total Dynamic Head (TDH) and determining flow from pump performance curve**

Using your Vacuum gauge and Pressure gauge from the Mark V gauge bar, calculate your TDH at current operational load. By using the example below, you can determine the flow (GPM) of the pump and can calibrate your flow meter to correspond to your current flow.

Example:

**Vacuum Gauge Reading (4 in. Hg) x 1.13 = 4.52**

**Pressure Gauge Reading (22 psi) x 2.31 = 50.82**

To calculate TDH, add the vacuum gauge reading from the pressure gauge reading to determine your TDH.

Example:

Pressure Gauge (22 psi) x 2.31 = 50.83

+ Vacuum Gauge (4 in.Hg) x 1.13 = 4.52

= TDH of 55.35

#### **HEAD LOSS**

All models 2.5 psi @ 15 GPM

\* Clean filter loss through internal piping and media.

Use the example performance curve below to determine flow (GPM) with calculated TDH. Please notice the blue curve is the installed pump performance line and the red line indicates the TDH and Flow intersection on the performance curve.

### **Evacuator Feature**

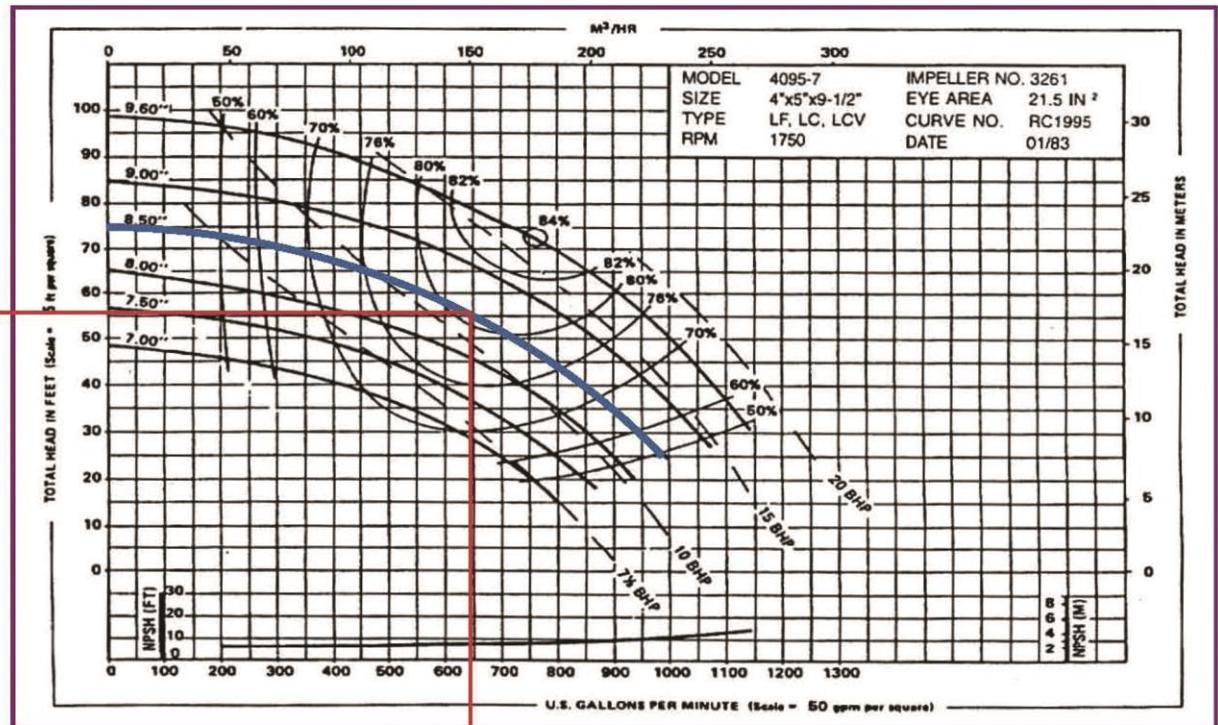
Your filter is equipped with an Evacuator chamber to remove chloramines from the pool water as it is filtered before they can accumulate in the filter room. There is a 4" flanged connection on the side of the tank to which air duct should be connected. This duct should either be tied into the facilities air handling system or routed to a fan (supplied) and vented to atmosphere.

This is not the actual pump curve - EXAMPLE ONLY

**PACO PUMPS**

**LC - 40957 - 1750 RPM - Performance Curve**

Project:	Tag #	P.O. #	By:
Location:	Model: 40957	Cust Ref#	Date: 2/23/2010
Contractor:	Stages: 1	Agent/Rep:	Rev. #
Engineer:	Service:	Doc #	Qty:



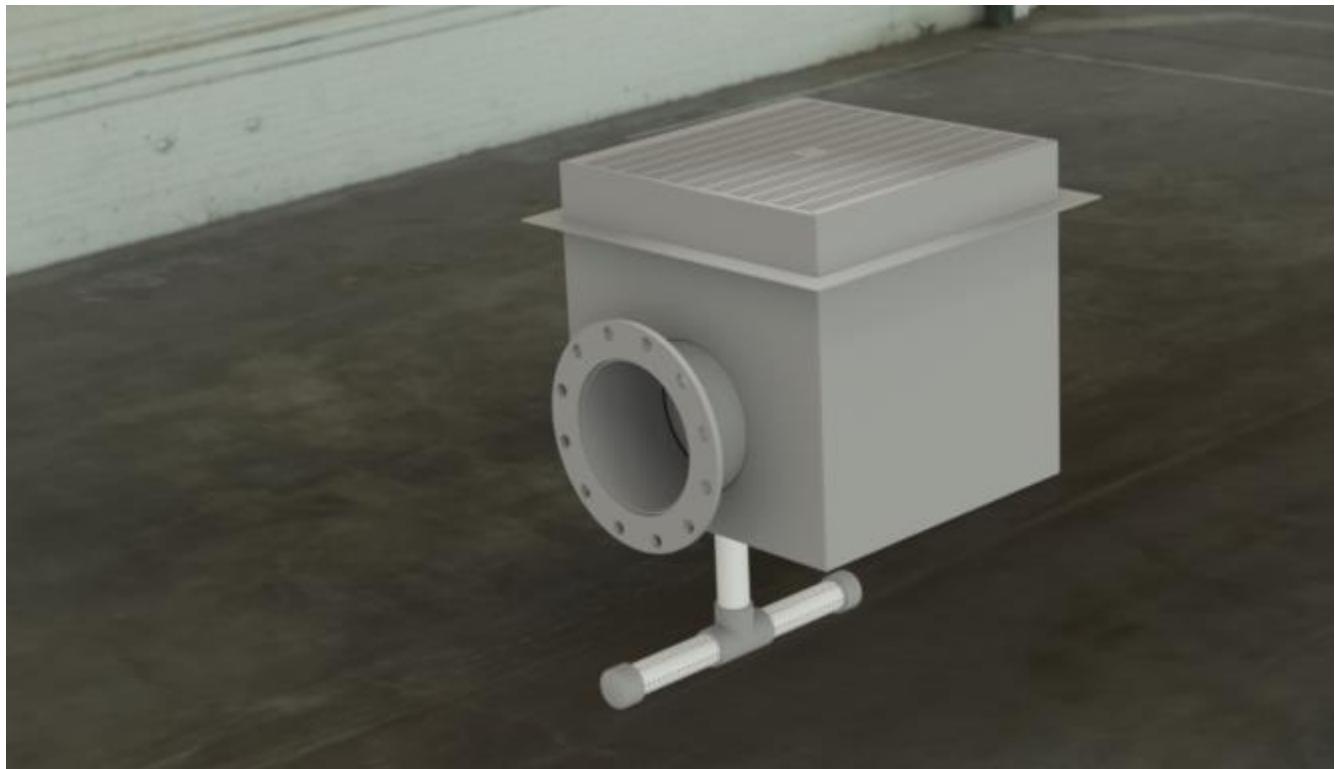
For further information contact Customer Service below.

# Maintenance & Operation Guides

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# Main Drain Installation & Operation Manual



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## 1.0 REVISIONS

REVISION	DATE	DESCRIPTION	BY	CHECK
0	04/23/2024	Submission	VCC	
1	5/01/2024	Revised IAPMO R&T filing & content	VCC	

## 2.0 GENERAL INFORMATION

### Introduction

For over fifty-five years, professionals of the most distinctive aquatic centers have come to rely on Paddock Pool Equipment Company to provide total project solutions. Far from just a pool equipment manufacturer, Paddock offers innovative high-performance products, and construction expertise to builders — all tailored to meet the unique demands of each individual project.

Paddock Suction Outlet Fitting Assemblies (SOFA) are certified by IAPMO R&T to comply with ANSI/APSP/ICC-16 2017 (PA 2021). These SOFAs shall not be installed in seating or backrest areas. There shall be no less than a 3-foot separation between suction fittings installed on a common line. These fittings are designed for installation with concrete, vinyl or composite lined pools.

Paddock's SOFA's have passed all required tests for body entrapment and hair entanglement. They have been approved to the maximum flow indicated on the SOFA flow rate chart.

**THIS DOCUMENT CONTAINS IMPORTANT SAFETY INSTRUCTIONS. READ, UNDERSTAND, AND FOLLOW ALL WARNINGS AND INSTRUCTIONS.**

## **SAVE THESE INSTRUCTIONS!**

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**Patents:** Paddock has patents pending on the product(s) which it manufactures depicted in this document.

## VGBA Compliant Sump and Cover Key Terminology



**ESMD** - Entrapment Safe Main Drain (Sump Unit)  
**AVRD** - Anti-Vortex Reduction Device (Stainless Steel)  
**PCFC** - Paddock Certified Flat Cover (Flat Cover)  
**SOFA** – Suction Outlet Fitting Assembly

**ANSI/APSP/ICC-16 2007 (PA 2021)**

### Paddock VGBA Compliant SOFA models available

Model #	Description
<b>9300046</b>	18" X 18" ESMD W/6" Connection, 6" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 915 GPM
<b>9300044</b>	18" X 18" ESMD W/8" Connection, 8" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 920 GPM
<b>9300006</b>	24" X 24" ESMD W/8" Connection, 8" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 920 GPM
<b>9300007</b>	24 X 24 ESMD W/10" Connection, 10" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 920 GPM
<b>9300011</b>	24" X 48" ESMD W/12" Connection, 12" AVRD, Relief Valve And (2) 24" X 24" PCFC, Floor Flow Rating at 3500 GPM and Wall Flow Rating at 3000 GPM
<b>9300013</b>	24" X 48" ESMD W/ (2)-12" Connection, (2)-12" AVRD, Relief Valve And (2) 24" X 24" PCFC, Floor Flow Rating at 3500 GPM and Wall Flow Rating at 3000 GPM
<b>9300056</b>	24" X 48" ESMD W/14" Connection, 14" AVRD, Relief Valve And (2) 24" X 24" PCFC, Floor Flow Rating at 3500 GPM and Wall Flow Rating at 3000 GPM

**Specifications:**

**Paddock ANSI/APSP/ICC-16 2017 (PA 2021)**

**Compliant and IAPMO R&T Certified Swimming Pool Suction Outlet Fitting Assemblies**

- The Swimming Pool Suction Outlet Fitting Assemblies (SOFA) shall include a velocity, vacuum entrapment, hair entanglement **ANTI-VORTEX REDUCTION DEVICE (AVRD)** which has been submitted under ANSI/APSP/ICC-16 2017 (PA 2021) for testing by IAPMO R&T and found to be in compliance with this standard.
- The SOFA both cover/grate and sump, shall be fabricated from 304L stainless steel. The outlet and outlet piping assembly shall be fabricated with stainless steel piping and designed for compliance with the testing requirements ANSI/APSP/ICC-16 2017 (PA 2021).
- The open area of the SOFA shall be equal to or exceeds the open area of the outlet pipe of the SOFA.
- All grating fasteners in the assembly shall be 316L stainless steel Pan Head Phillips fasteners. All exposed security fasteners shall be inserted or removed with #2 Phillips Screwdriver with a maximum torque of 19.8-inch pounds. All fasteners shall be engaged by a minimum of three (3) threads.
- The velocity of water entering any orifice on the cover/grate of the SOFA during normal operation shall not exceed 1.5 feet per second.
- Blockable SOFAs in existing pools with single SOFA systems shall be installed with an additional anti-entrapment device or system (listed in section 9.4 of ANSI/APSP/ICC-16 2017).
- Paddock's SOFAs must be installed as a multiple SOFA system.
- SOFAs shall be chosen so that the individual flow rate is great than the pumping system's MAX system flow rate (not including secondary circulation systems - skimmer, gutters, etc.)
- Paddock SOFAs are not designed to use any pool surface as a portion of the flow path.

## Paddock Suction Outlet Fittings Flow Rates

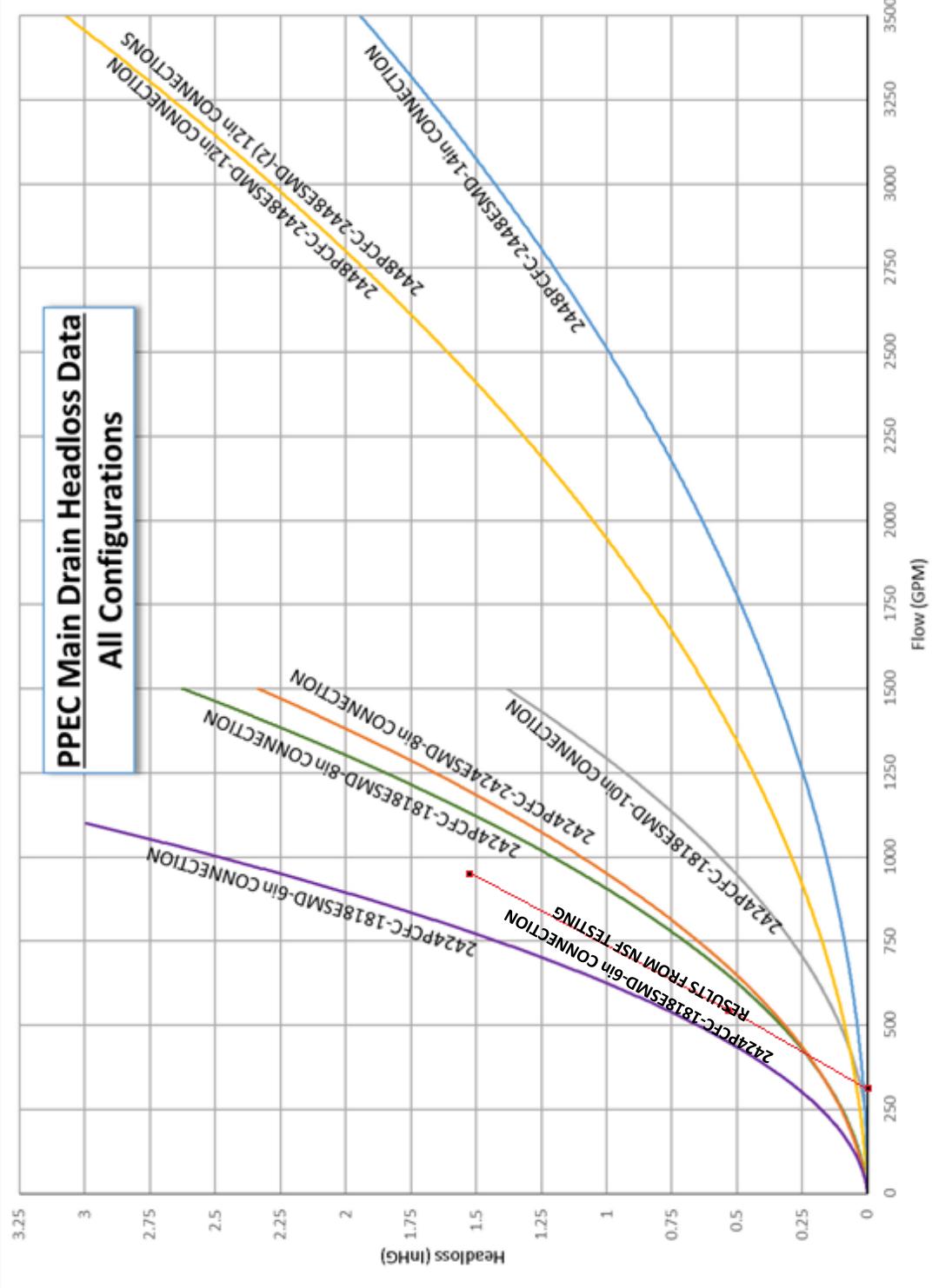
Suction Outlet P/N & Model #	Mounting Position	Total Open Area	Recommended Flow	Maximum Flow per NSF	Blockable or Unblockable
P/N 9300046 Model # 2424PCFC 1818ESMD (sump), 6" Connection	Floor or Wall Use	219.6 sq. inches	915 GPM @ 1.38 fps	915 GPM	Unblockable
P/N 9300044 Model # 2424PCFC 1818ESMD (sump), 8" Connection	Floor or Wall Use	219.6 sq. inches	920 GPM @ 1.38 fps	920 GPM	Unblockable
P/N 9300006 Model # 2424PCFC 2424ESMD (sump), 8" Connection	Floor or Wall Use	219.6 sq. inches	920 GPM @ 1.38 fps	920 GPM	Unblockable
P/N 9300007 Model # 2424PCFC-AVRD 2424ESMD (sump), 10" Connection	Floor or Wall Use	219.6 sq. inches	920 GPM @ 1.38 fps	920 GPM	Unblockable
P/N 9300011 Model # 2448PCFC-AVRD 2448ESMD (sump), 12" Connection	Floor Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3500 GPM	Unblockable
	Wall Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3000 GPM	Unblockable
P/N 9300013 Model # 2448PCFC-AVRD 2448ESMD (sump), (2) 12" Connections	Floor Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3500 GPM	Unblockable
	Wall Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3000 GPM	Unblockable
P/N 9300056 Model # 2448PCFC-AVRD 2448ESMD (sump), 14" Connection	Floor Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3500 GPM	Unblockable
	Wall Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3000 GPM	Unblockable

### **ONLY INSTALL ON SOFA CONFIGURATIONS LISTED.**

#### CAUTIONARY NOTES:

- Do not exceed maximum allowable flow rate as stated above.
- If pump needs to be changed, a replacement must be the same as the original pump. If a different pump is required, a Registered Design Professional must be contracted to assure original flow rate is not exceeded.

## Paddock Suction Outlet Fittings Head Loss Data (from CFD Study)



HEADLOSS MEASUREMENT TAKEN AS CLOSE AS PRACTICAL TO THE SUMP CONNECTION.

### 3.0 SERVICE LIFE OF PRODUCTS & COMPONENTS

#### Paddock Main Drain Cover Lifespan

- **Component Lifespans** – The SOFA cover and sump have a lifespan greater than 20 years. The screws should be replaced every 7 years.
- **Requirement** – Inspect cover at 10 years minimum for any signs of damage and replace if needed. (Covers older than 10 years must be inspected yearly by facility operators and documented, then every year thereafter for any damage compromising unit which would necessitate replacement.)
- **Requirement** – Replace screws every 7 years at minimum and document information for records (use only the size and grade of stainless-steel screws 8/32 x 1/2" SS 316 recommended by Paddock).
- **Recommendation** – Establish a yearly checklist for facility operators to document inspection of covers and screws for damage – replace any covers or screws immediately that are compromised, damaged or broken in any way. If threaded holes become damaged contact PPEC immediately to determine the best means of repair (brittle/missing pieces, cracks, non-superficial changes to color).
- The 2424ESMD and 2448ESMD Stainless Steel Sump Box and their components are permanently mounted in the pool shell and will not require replacement. This includes all integral parts listed on ESMD Parts List Breakdown.
- Paddock Main Drain Covers do not need to be replaced unless they are compromised, damaged or broken and all above requirements are met. These are stainless steel covers and should last life of facility if properly maintained. Ultraviolet light test which establishes life expectancy is for degradation of resin products such as PVC or plastics.
- SOFA(s) should be chosen so that the individual suction system flow rate is greater than the pumping system's **MAXIMUM** system flow rate.
- The capacity of the secondary circulation systems should not be included when evaluating an individual suction system flow rating.
- To determine the flow rating for pools with multiple blockable SOFAs in one body of water without isolation valves combine all SOFAs minus the flow rate of one. If not, all SOFAs flow rates are equal subtract the largest flow rate. The flow rating for existing pools with a single blockable SOFA is the flow rating of the SOFA when also installed w/an additional device to prevent suction entrapment. The flow rating of a single blockable SOFA without an additional device is zero.
- The flow rating for pools with single or multiple unblockable SOFAs shall be the combined flow rate of al SOFAs pipe together on one body of water.
- SOFAs shall not be located on backrests or seats.
- When installing and using this equipment basic safety precautions shall always be followed including the "**Important Safety Instructions**" included in Section 4 Installation Instructions.
- Service life begins when the SOFA is installed (with or without water).

## 4.0 INSTALLATION INSTRUCTIONS

# SAVE THESE INSTRUCTIONS!

## **IMPORTANT SAFETY INSTRUCTIONS READ, UNDERSTAND, AND FOLLOW ALL WARNINGS AND INSTRUCTIONS**

**IMPORTANT:** READ AND STORE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

**WARNING!** Install this equipment in accordance with the instructions provided. FAILURE TO FOLLOW INSTRUCTION AND/OR USE WITH COMPONENTS NOT PROVIDED BY PADDOCK AND INTENDED TO BE USED WITH THIS PRODUCT MAY RESULT IN IMPROPER POSITIONING OR FUNCTIONING OF SUCTION OUTLET AND MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.

**CAUTION LABEL:** REMOVE AND INSTALL ALL EXPOSED SCREWS WITH A PHILLIP #2 SCREWDRIVER. APPLY A MAXIMUM TORQUE OF 19.8 INCH POUNDS. DO NOT USE POWER TOOLS TO INSTALL FASTENERS.

**NOTE:** GRATE ALIGNMENT & ELEVATION IS CRUCIAL. IF NOT PROPERLY ALIGNED, HOLES WILL NOT MATCH. MARK GRATE LOCATION ON FRAME TO MATCH FOR REINSTALLATION LATER. THE GRATE MUST BE SET FLUSH WITH POOL FLOOR, IF NOT THE EDGES POSE A HAZARD FOR POOL OCCUPANTS. FIELD MODIFICATIONS NOT AUTHORIZED BY PADDOCK POOL EQUIPMENT COMPANY OR THESE INSTALLATION INSTRUCTIONS SHALL VOID THE SOFA CERTIFICATION. ANY MODIFICATION THAT INCREASES THE FLOW RATE OF THE CIRCULATION SYSTEM SHALL REQUIRE RE-EVALUATION OF THE COVER/GRADE AND SUMP TO ENSURE THAT THE FLOW RATING OF THE SUCTION OUTLET FITTING ASSEMBLY (SOFA) IS NOT EXCEEDED.

NO CONFIGURATION CHANGES TO THE STRUCTURE OR FLOW PATH OF THIS DRAIN ASSEMBLY ARE ALLOWED UNLESS THE NEW CONFIGURATION HAS BEEN CERTIFIED.

ADHESIVES AND PERMANENT ATTACHMENT METHODS ARE PROHIBITED. THE COVER IS TO REMAIN REMOVABLE.

INSPECT FOR MISSING, BROKEN OR CRACKED SUCTION FITTINGS, THESE SHALL BE REPLACED BEFORE BATHERS ARE ALLOWED TO USE THE POOL.

ANY LOOSE COVER/GRAVES AND ASSOCIATED COMPONENTS SHALL BE REATTACHED BEFORE BATHERS ARE ALLOWED TO USE THE POOL.

\*\*\* **Make** sure product is properly cleaned with Sheila Shine or similar after installation. Carbon contamination could show up as surface rust in a couple of months from dissimilar materials coming in contact with stainless steel. Example: carbon drill bits or saw blades.

## Installation: RENOVATION

1. Bonding SOFAs (Electrical Inspection may be required).
  - a. Chip to find rebar in structural frame of pool, which is grounded.
  - b. Attach grounding lug to existing structural rebar. (reference National Electric Code Article 680)
  - c. Attach grounding lug and 8-gauge grounding wire to structural frame of pool.



2. Drain Assembly for Testing
  - a. The Paddock SOFA includes a blanking plate to allow for plumbing pressure testing.
  - b. The supplied hardware will allow for installation of the blanking plate and the AVR. Ensure the blank plate is removed prior to putting the pool in operation.

3. Completing installation

- a. Confirm all suction outlet fitting components and fastener receptacles are clean and free of debris or obstructions during installation of cover/grate and fasteners.
- b. Start all fasteners by hand to ensure proper thread engagement and prevent cross threading then tighten to a maximum torque of 19.8-inch pounds. **Do not use power tools to install fasteners.**
- c. Make sure that cover is flush to the existing pool finish and confirm snugness of the cover/grate to the sump/frame by a hand check after installation.
- d. Marcite voids around frame if needed.
- e. Give owner certificate of compliance and extra screw pack for cover.
- f. **Log date of installation once work is completed.**

Contact Paddock Pool Equipment Company, Customer Service for assistance.

## 5.0 USER MAINTENANCE

### Inspection Schedule

#### Daily (or before each use of the facility):

- a. Inspect the cover/grate, including fasteners, for damage or tampering each operation day.
- b. Missing, broken or cracked covers/grates, including fasteners, shall be replaced before bathers are allowed to use the pool.

#### Important Notes

- Before removing the cover/grate(s), mark the cover/grate that matches the screw hole(s) and make sure the smooth side is facing up. This will insure placement of cover/grate(s) will line-up correctly. Improper install of the cover/grate(s) will cause the screws to not fit the sump and a hazard to the bathers.
- Any loose cover/grates and associated components shall be reattached before bathers are allowed to use the pool.
- All exposed fasteners on Paddock Main Drain Cover/Grate require a Phillip #2 Screwdriver for insertion and removal. Start all fasteners by hand to ensure proper thread engagement and prevent cross threading then tighten to a maximum torque of 19.8-inch pounds. DO NOT USE POWER TOOLS TO INSTALL FASTENERS.
  - a. Confirm all SOFA components and fastener receptacles are clean and free of debris or obstructions during installation of cover/grate and fasteners.
  - b. Make sure that cover is flush to the existing pool finish and confirm snugness of the cover/grate to the sump/frame by a hand check after installation.
- Paddock Pool Equipment Company must be contacted in the event a fastener fails to engage (stripped or cross threaded hold) the stainless sump/frame prior to allowing bathers to return to the pool.

#### Winterization

The **winterization procedure** is to inspect drain(s) for cracks and damages.

- Replace grate if damaged. Also, inspect screws and make sure grate(s) is secure. Replace any missing screws. If required, remove grate(s) and associated hardware to allow for a sump pump to be utilized to prevent water from freezing in the sump.
- Store removed components in a well-marked box and store in a location that allows for easy retrieval for installation prior to putting the pool back into service. See above Important Notes.



Main Drain Operation Manual

## 6.0 DRAWINGS

# Main Drain Assembly Drawing(s) (In Drawing Folder)



Main Drain Operation Manual

## 7.0 APPENDIX

# Appendix



## MAIN DRAIN INSTALLATION - SIGNOFF FORM

Job Name, City, State: \_\_\_\_\_ Job No.: \_\_\_\_\_

The following information is required to validate the expressed warranty. Complete this form upon start-up of pool and return via email (subject: Main Drain Installation) or mail to the address below.

[info@paddockindustries.com](mailto:info@paddockindustries.com)

**PLEASE NOTE:** Warranty **DOES NOT** go into effect until completed installation form has been received by Paddock Pool Equipment Company.

Date of Main Drain Installation: \_\_\_\_\_

Service Life of Cover/Grate: **> 20 years -- This SOFA is UNBLOCKABLE**

Select Installed P/N & Model	Qty	Location (comp., therapy, warm-up,lifestyle)	Mounting Position	Suction Outlet P/N & Model #	Maximum Flow per IAPMO R&T
<input type="checkbox"/>			Floor Use	P/N 9300046 Model # 2424PCFC - 1818ESMD (sump),6" Connection	915 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300044 Model # 2424PCFC - 1818ESMD (sump),8" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300006 Model # 2424PCFC - 2424ESMD (sump), 8" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300007 Model # 2424PCFC-AVRD - 2424ESMD (sump), 10" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300011 Model # 2448PCFC-AVRD - 2448ESMD (sump), 12" Connection	3500 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300013 Model # 2448PCFC-AVRD - 2448ESMD (sump), (2) 12" Conn's	3000 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300056 Model # 2448PCFC-AVRD - 2448ESMD (sump), 14" Connection	3500 GPM
<input type="checkbox"/>			Wall Use		

Contractor/ Installer:

Signature: \_\_\_\_\_

Owner/Owner Representative:

Signature: \_\_\_\_\_

Contractor/Installer: \_\_\_\_\_

(Print name)

Owner: \_\_\_\_\_

(Print name)

Date: \_\_\_\_\_

Date: \_\_\_\_\_

I have instructed customer on proper maintenance of drains.

I have read and understand instructions as instructed by contractor/installer as to proper operations.

THE INSTALLATION SIGNOFF FORM TO BE PERMANENTLY POSTED NEAR THE PUMP CONTROLS, A COPY GIVEN TO THE POOL OWNER & A COPY KEPT WITH OTHER POOL RELATED DOCUMENTS



# Starting Platforms Non-skid

## Non-Skid Change &/or Replace Material

### Removal:

1. Heat (hair dryer) can be applied to help loosen material.
2. Pick edge of vinyl away until you can get a grip.
3. Pull back vinyl against itself to remove. This will help keep adhesive from being left behind.
4. If any glue/adhesive is left, remove with Acetone using a lint-free paper towel. **Do not** get on the decals or hand grips. Clean thoroughly, then wipe with alcohol, we use Isopropyl 70/30. **DO NOT USE A METAL SCRAPER TO REMOVE ADHESIVE!**

### Installation:

1. Lay Vinyl on top, positioning to where it is to be installed.
2. Tape vinyl through center to the platform. Creating a "hinge" in center where the tape is located.
3. Lift up one side of the hinge, remove liner all the way back to tape and then cut liner off.
4. Lay vinyl back down, keeping tight to not create wrinkles. Using a decal squeegee work from middle out, all the way down with firm, steady, even pressure. If a small bubble appears use pin (like a needle) to bleed out air.
5. Remove tape, repeat for second side of hinge.
6. Utilize an edge sealer such a Sealitpen <http://www.sealitpen.com/> or 3M 3950 edge sealer to complete seal. This is not required but will prolong life.
7. Let material set for a day before any use.

If you have questions or need assistance, contact our Customer Service.

# Powder Coated Metal Care & Maintenance

Powder coating is a type of coating that is applied as a free-flowing, dry powder. Unlike conventional liquid paint which is delivered via an evaporating solvent, powder coating is typically applied electrostatically and then cured under heat or with ultraviolet light. It's very durable and can last for many years if treated well.

1. Clean as follow:
  - a. **Clean with mild soap and fresh water (not pool water)**, after washed, rinse off completely.
  - b. **Dry the surface completely after cleaning**; when water is left on the surface it can cause staining. **Avoid using any type of abrasive cleaner, pads or brushes as this can damage the finish.**
  - c. If you need to remove a **tough stain**, try using a soft cloth dampened with white vinegar. Gently rub the stained area until the stain is removed. Be sure to rinse the area off with fresh water (not pool water) afterwards then dry it completely. If tough stain(s) are still there, use a soft cloth or non-abrasive sponge with a water-based gentle cleaner for cleaning powder-coating surfaces.
2. **Power Wash on Low Settings** is one of the best ways to clean your powder-coated items. However, power washers are **super powerful**, so be prudent and use the low setting to avoid damage. **Dry the surface completely after cleaning/rinsing**; when water is left on the surface it can cause staining.
3. **Protecting the surface of the powder-coated metal by Waxing the Exposed Areas:**
  - a. Waxing the exposed areas of your powder-coated metal will help to protect it from the elements and keep it looking shiny and new. You can use commercial car wax or beeswax furniture polish by applying the wax with a soft cloth and rub it in using circular motions. Allow the wax to dry for at least 20 minutes before buffing it off with a clean, dry cloth.
  - b. **DO NOT** put wax on **non-skid surfaces**, this will cause safety hazard on the surface.

## AVOID

**Harsh Chemical Cleaners, Abrasives and Harsh Weather Conditions** - these things can damage the finish on your product(s).

If you have any question contact Paddock Pool Equipment Customer Service.

# SAFETY INFORMATION

**This bulletin includes important safety information that should be read by owners, managers, service personnel, and anyone in charge of the pool or pool area. Also, we suggest a copy be posted for quick reference.**

1. Only personnel trained and familiar with the proper use of pool chemicals should handle acid, liquid chlorine or chlorine compounds. Chemicals should never be used when swimmers are in the pool. Acid and liquid chlorine should always be stored, carried, or handled in plastic containers.
2. If grating is a part of the perimeter system, it should be kept firmly clamped down and in good repair at all times. When a section of grating become loose or damaged that particular area must be immediately covered and a replacement of grating ordered. Under no circumstances should swimmers be allowed to use any portion of the perimeter that contains loose or damaged grating. Perimeter grating is not intended for foot traffic. Swimmers should be advised not to walk, stand, or jump on perimeter grates.
3. Ladders and grab rails are intended for the use of one swimmer at a time; they are not designed for handstands or other gymnastic stunts and they should not be used for this purpose. Ladder treads should be inspected regularly. If a tread becomes loose or damaged, the ladder should be taken out of service until repairs are made.
4. Lifeguard Chairs are intended for the individual use of trained "on duty" lifeguards, one (1) guard per chair. Lifeguard chairs are not to be used by swimmers, spectators, or by more than one (1) person at a time. There should be no diving from portable lifeguard chairs. Umbrellas should be closed or removed from portable lifeguard chairs during windy conditions. All frame connections are to be checked for tightness. The seat is bolted to the frame assembly. It is important to advise all users to periodically check to determine that the studs are firmly fastened to the seat and the nuts are tight. If they become loose or detached, it could result in serious injury. On outdoor installations or usage, it is suggested that the seat be removed and stored inside during the winter.
5. Starting Platforms should only be used by trained competitive swimmers or under the direct supervision of an instructor. Swimmers should execute shallow racing dives only. Impact with the pool bottom can cause severe injury. Starting platforms have warning labels and inform the purchaser of the need to remove the platforms during non usage. If your starting platforms do not have warning labels, please contact the manufacturer immediately.
6. Bulkheads are designed and built for strength and safety. Any grating should be kept fully secured to avoid injury. **NO swimming under bulkhead. Never use bulkhead as a support or staging for equipment.** The bulkhead includes a compressor; please refer to owner's manual provided with the unit.

For questions concerning the usage of our equipment, please contact Paddock Pool Equipment Co., customer service.



# STARTING PLATFORMS

## INSTALLATION & REMOVAL WITH CARE & MAINTENANCE

Paddock starting platforms are manufactured using 304L and/or 316L material and will require general maintenance over time. Please refer to and utilize Paddock's Care and Maintenance for Stainless Steel provided to you in your Operations Manual. For installation and removal, please follow the instructions listed below:

### Installation

1. Remove each cover plate (**DO NOT DISCARD!**) and check anchors for debris.
2. Locate the brass compression collars, loosen the set screw on the side to prevent scratching and place one per platform leg.
3. Inspect the starting platform legs for debris and clean if required
  - a. If cleaning is required, use a green 3M® Scotch-Brite Pad to clean area going with the grain.
4. Use of a non water soluble grease to lubricate anchor is suggested for ease of placement.
  - a. Lubrication suggestions include marine bearing grease and/or white lithium grease.
5. Using two people, one on each side, lift the starting platform into position over the anchors. Slowly lower the platform continuing alignment until completely set in anchors.
6. Brass compression collars should be hand started to prevent cross threading. Once started by hand tighten with an 18" smooth faced adjustable wrench making sure **not to over tighten** and strip the brass compression collars.
7. Tighten set screw on brass compression collars to complete installation.

### Removal

1. Remove all components from starting platforms including any timing and speakers.
2. Loosen the set screw on brass compression collars. Make sure to loosen set screw enough to prevent from damaging finish on starting platform legs while loosening brass compression collars.
3. Using an 18" smooth faced adjustable wrench loosens the brass compression collars. Use caution while loosening collars to prevent injury from slippage.
4. Using two people, one on each side, lift in a vertical direction, gently rocking back and forth to dislodge platforms from anchors. Continue rocking and lifting until platform is removed.
  - a. Ease of removal will vary based on frequency of the removal process.
5. Inspect the starting platform legs and anchors for debris and clean if required.
  - a. If cleaning is required, use a green 3M® Scotch-Brite Pad to clean area going with the grain.
6. **Replace the cover plates on anchors while not in use.**



## Care and Maintenance

These materials require little if any maintenance. The following tips are intended as a guide to help you maintain your Paddock starting platforms.

1. Wash down the starting platforms including the tops weekly and / or as needed with fresh water to remove dirt and debris. After the final rinse using clean water, dry wipe will complete the process this will eliminate possibility of water stains. The longer the stain(s) is on the surface of stainless equipment, the higher chance of permanent discoloration or damage.
2. All starting platforms have warning labels, if yours starting platforms do not have the warning labels, contact our customer service immediately.
3. Follow general stainless steel cleaning procedures for cleaning - see the section on **Maintenance & Product Information** in the **Operation & Maintenance manual – Stainless Steel Products Care & Maintenance for cleaning**.
4. **If non-skid surface becomes dirty**, it can be cleaned using a stiff polypropylene hand brush. The use of the brush will help speed up the process by lifting the accumulated dirt from between the gritted surface.

Paddock Fast Track Starting Platforms are equipped with kick (wedge) plate.

1. For Fast Track Starting Platform Operation and Maintenance Manual (**if applicable**).



## To Backwash Using Air Scour:

Shut off UV, Heaters, chemical controller(s), Water Level Controller, etc. 5-10 minutes prior to Backwash.

1. Reset vacuum limit switch if tripped. Close Main Drain valve #1 and Perimeter Overflow valve (#7). Draw the filter tank level down to top of sand bed, opening backwash viewport to see. Slowly close return to pool valve (#3), then shut off pump. Close Pump Suction Valve (#2).
2. Open Air Scour Control valve (#12) and turn on air scour blower. Run 3-5 minutes while monitoring sand bed to ensure water is not bypassing valves. Once the sand bed is thoroughly agitated, turn off air scour blower and close valve (#12). **If the water level does start to rise during air scouring, turn off the air scour blower immediately. Re-check valves #1, #7, and #3 for full closure. If water rises above backwash trough during air scouring, it will allow sand to enter said trough and potentially return to the pool after the backwashing cycle.**
3. Open Backwash Influent valve (#8) and open Air Relief valve (#12A). Allow water level in the tank to rise until it stops. Close Backwash Influent valve (#8) and Air Relief valve (#12A).
4. Open Backwash Suction valve (#4). Start pump and open Backwash-To-Waste valve #5 slowly to the designated flow. Draw the filter tank level down to the equalization screen. Look through backwash viewport and open Backwash Influent valve (#8) to regulate and maintain water level just below equalization screen, allowing dirty water to flow over edge of backwash trough. Backwash 3-4 minutes or until the sight glass is clear.
5. Close Backwash Influent valve #8 and turn off pump. Close Backwash Suction valve #4. Close backwash viewport window. Open Perimeter Overflow Valve(s) #7 and Main Drain Valve #1 allowing water level to rise to maximum level. Open Pump Suction Header valve #2 and turn on filter pump. Rinse filter to waste 15-20 seconds
6. Open Return to Pool (#3) to first setting or notch while slowly closing Backwash-To-Waste valve (#5). Then set Return to Pool valve (#3) to marked position for designated flow rate.
7. Run 2-3 minutes and check operation, turn on UV, heaters, controllers, etc.

When backwashing, it is important to keep the water level in the filter compartment just above the top lip of the backwash trough partition to maximize the efficiency of the backwash flow and dirt removal. This can be observed through the viewport window in the equalization screen. With the proper setting of the backwash discharge to waste valve (#5), the backwash flow can be easily maintained at the proper level in the filter tank and in the backwash trough by modulating Backwash Influent valve (#8).

Helpful hint: It is recommended that a manual backwash at the maximum flow rate allowable by backwash water receptacle capabilities for an extended time of 5-6 minutes is done a minimum of once a year. The air scour feature is not used during this suggested preventive maintenance backwash. This suggested manual extended flow backwash extends the media life & could prevent having to replace the sand in your filter.



**Note:** If the filter pump for the pool loses prime during the backwash procedure, follow these steps:

1. Turn the filter pump off.
2. Open manual air bleed tube located in the pump box and open valve #12A to allow any trapped air to escape.
3. Check to make sure all valves are in the proper position.
4. Allow the water in the filter tank to equalize with the pool.
5. Once the water in the filter tank has equalized with the pool, close air bleed tube in pump box and valve # 12A.
6. Turn the filter pump back on.

**General:**

If debris accumulates on the vacuum equalization screen, it should be removed at regular intervals. This can be accomplished during backwashing. If it is necessary to enter the filter chamber, use the ladder provided and put your weight directly over the support angles.

The Vacuum Equalization Screen (VES) is held in place with fasteners. There is a window in the VES to permit visual inspection of the condition of the media surface. One section near the access ladder is made for easy removal for inspection of the area beneath the screen. All sections may be removed for maintenance operation if required.

If pump loses prime for any reason, let tank fill with pump "off" to displace air, then start pump.



## **Gutter Depth Marker/ Target - Vinyl Decal Installation**

Your graphics will come in three layers, a backing paper layer on the bottom to keep the adhesive from being exposed, the vinyl layer (this is your graphic), and a masking layer on top. The masking layer makes the vinyl easier to handle and keeps everything pre-spaced for you to apply your graphic as one piece.

You will need:

- Clean rags
- Denatured alcohol
- Microfiber towel
- Vinyl applicator

It is best to do this process when the pool is not in use.

1. Lower Water Level
  - a. Water level should be lowered at least an inch below the bottom level of the decal.
  - b. Make sure to turn off any auto-fill devices to keep water from rising while applying decals.
2. Clean Gutter Thoroughly
  - a. Wipe away any moisture.
  - b. Clean the entire area where the decals will be applied using denatured alcohol and a clean rag.
  - c. Wipe dry with a clean microfiber cloth.
3. Apply Decal
  - a. Peel the backing from the decal making sure they stay attached to the protective paper on the front.
  - b. Take care to make sure the decal is level and spaced correctly.
  - c. Apply the decal sticking the top part first to the cleaned gutter surface and using your hand or applicator, slowly starting from the top, slide down the decal gently pressing it onto the gutter until the decal is fully applied.
  - d. Using the applicator, firmly press the decal from the center out to push any air bubbles to the edge.
  - e. Carefully peel the protective paper off making sure the decal sticks to the gutter (If decal starts to come off with the protective paper, stop, put the protective paper back as far as needed, and use applicator to press decal to gutter surface).
4. Cure
  - a. Wait at least 12 hours before introducing water to decals.
5. You can use a SEALITPEN to seal the edges of the graphic for longer durability. Follow directions on the pen.

If you have any question(s) contact customer service see below for our information.

# **GRATING**

## **High Density Polyethylene (HDPE)**

### **ADJUSTMENTS & CHARACTERISTICS with CARE & CLEANING MAINTENANCE**

#### **HDPE Grating Adjustments & Characteristics**

HPDE grating is highly durable and will give years of good service in the pool environment. The grating is held in place by either a front capture strip and a rear HDPE camlock or by a HDPE camlock front and back. A 1/4" x 1 1/2" x 3/16" allen head screw is used to tighten the camlock.

- Grating can be gapped up to 3/8" (three-eighths of inch), however at normal operating temperatures, the gap for indoor pool is 1/8" (one-eighth of inch) and outdoor pool is 1/4" (one-fourth of inch). An outdoor pool grating will contract and expand with sizeable temperature swings. Larger gaps can be expected in cold temperatures. At initial startup grating may need to be adjusted when pool reaches operating temperature.
- Grating fasteners needs to be inspected at the start of the swim season and periodically throughout the year. Adjust as needed, by hand loosening cam-locks with a 3/16" allen wrench, re-adjust gaps as listed above and re-tighten.

#### **Care and Maintenance**

- Paddock's HDPE grating is marine-grade polymer sheeting which is resistant to most chemicals and requires little maintenance to keep it looking new.
- Keep harsh solvents, acids, wood stains and wood preservatives away from Paddock HDPE finish. They may cause permanent staining and damage.
- Staining from rust is very difficult to remove so keep uncoated non stainless metals away from HDPE material.
- Shoes with marking soles can leave scuff marks that can be difficult to remove

#### **Cleaning**

- For daily cleaning of everyday dirt and stains, use a non-abrasive cleaner such as "Zud" or "Soft Scrub" and a nylon brush to scrub lightly. Excessively hard scrubbing can mar the finish.
- Hard to remove stains will usually go away if you soak the area with bleach. **When using this method, you must remove the grating from the stainless steel so it will not cause corrosion.** Do not use 100% granular or tablet chlorine as a bleach alternate.
- Pressure washing can mar the finish.
- Petroleum based stains can be difficult to remove, soak the area with WD-40®. Then use acetone or toluene with a white nylon scrub pad (color-based pads can transfer dye color to finish when combined with acetone)
- Do not use MEK, turpentine or naphtha solvent.
- Do not use polishes such as Armor-All ® to non-skid areas, this will reduce the slip coefficient and cause a fall/slip hazard.

# MAIN DRAIN INSTALLATION - SIGNOFF FORM

Job Name, City, State: \_\_\_\_\_ Job No.: \_\_\_\_\_

The following information is required to validate the expressed warranty. Complete this form upon start-up of pool and return via email (subject: Main Drain Installation) or mail to the address below.  
[info@paddockindustries.com](mailto:info@paddockindustries.com)

**PLEASE NOTE:** Warranty **DOES NOT** go into effect until completed installation form has been received by Paddock Pool Equipment Company.

**Date of Main Drain Installation:** \_\_\_\_\_

**Service Life of Cover/Grate: > 20 years -- This SOFA is UNBLOCKABLE**

Select Installed P/N & Model	Qty	Location (comp., therapy, warm-up, lifestyle)	Mounting Position	Suction Outlet P/N & Model #	Maximum Flow per IAPMO R&T
<input type="checkbox"/>			Floor Use	P/N 9300046 Model # 2424PCFC - 1818ESMD (sump), 6" Connection	915 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300044 Model # 2424PCFC - 1818ESMD (sump), 8" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300006 Model # 2424PCFC - 2424ESMD (sump), 8" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300007 Model # 2424PCFC-AVRD - 2424ESMD (sump), 10" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300011 Model # 2448PCFC-AVRD - 2448ESMD (sump), 12" Connection	3500 GPM
<input type="checkbox"/>			Wall Use		3000 GPM
<input type="checkbox"/>			Floor Use	P/N 9300013 Model # 2448PCFC-AVRD - 2448ESMD (sump), (2) 12" Conn's	3500 GPM
<input type="checkbox"/>			Wall Use		3000 GPM
<input type="checkbox"/>			Floor Use	P/N 9300056 Model # 2448PCFC-AVRD - 2448ESMD (sump), 14" Connection	3500 GPM
<input type="checkbox"/>			Wall Use		3000 GPM

**Signature:** \_\_\_\_\_

Contractor/ Installer:

Contractor/Installer: (Print name)

**Signature:** \_\_\_\_\_

Owner/Owner Representative:

Owner: (Print name)

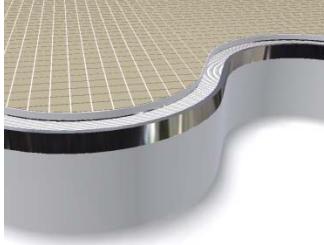
**Date:** \_\_\_\_\_

**Date:** \_\_\_\_\_

I have instructed customer proper maintenance of main drains.

I have read and understand instructions as instructed by contractor/installer as to proper operations.

THE INSTALLATION SIGNOFF FORM TO BE PERMANENTLY POSTED NEAR THE PUMP CONTROLS, & A COPY GIVEN TO THE POOL OWNER & A COPY KEPT WITH OTHER POOL RELATED DOCUMENTS



Designing the future of stainless steel perimeters

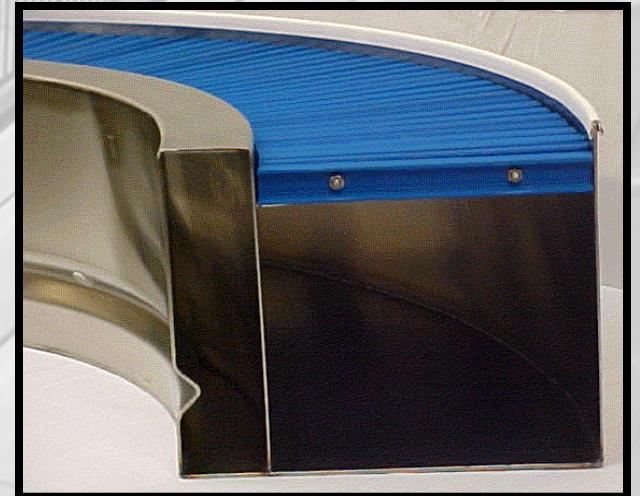
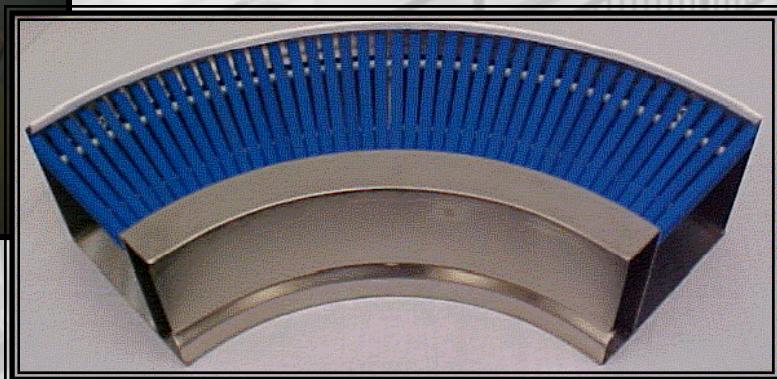


PADDOCK  
POOL EQUIPMENT COMPANY

*The best stainless steel perimeter just got better!*

## *The Radius Section*

- Increased Channel Efficiency and Flow
  - Safer Configuration for the User
  - Corner Maintenance Eliminated
    - Aesthetic Free Form Design





## STAINLESS STEEL PRODUCTS

### Care & Maintenance Guide

#### General Precautions:

Scratching can occur on a bright finish by cleaners that contain hard abrasives or even by “grit” in wash water. The best preventive measure is to avoid using abrasive cleaners unless absolutely necessary. When abrasives are needed first experiment on an inconspicuous area. A “soft abrasive”, such as Zud liquid or Bon Ami should be tried first to see initial test results. While cleaning with products mentioned be sure to observe direction of grain in material. Following grain while cleaning material will limit scratching. Many cleaners contain corrosive ingredients which require thorough cleaning and rinsing with clean water and is recommended for all cleaning procedures.

#### General Maintenance Procedures:

Stainless steel equipment will need to be cleaned on a regular basis for aesthetic considerations and to preserve corrosion resistance against evaporated chloramines or spotting. Stainless steel is protected from corrosion by a thin layer of chromium oxide. Oxygen from the atmosphere combines with chromium in stainless steel to form this passive chromium oxide film that helps protect against corrosion. Any contamination of surface by dirt, chlorides, greases, or other material will hinder this passivation process, and traps corrosive agents thus reducing corrosion protection. Chlorine and bromine used for sanitation are highly caustic chemicals to stainless steel, while heat and humidity enhance corrosiveness of these chemicals especially in natatoriums. Thus, some form of routine maintenance is necessary to preserve appearance and integrity of surface. Stainless steel is easily cleaned by many different methods. They actually thrive with frequent cleaning, and unlike some other materials it is impossible to “wear out” stainless steel by excessive cleaning. Your goal should be a robust cleaning and maintenance program to keep stainless steels protective chromium oxide layer intact which helps prevent corrosion.

To increase longevity of your stainless steel equipment, follow these steps:

1. Establish a proper grounding of all equipment being installed at aquatic facilities. Make it a point that dissimilar metals are not in direct contact of one another. Taking this precaution will minimize risk of forming an electrolytic cell between equipment, pool water and atmosphere at facility.



2. Once all equipment has been installed at facility, apply a coat of paste wax (automotive or marine wax) and buff equipment with soft cloth to assist in extended corrosion protection. Redo this process with waxing after using cleaners or at six-month intervals on stainless equipment. This wax will form a protective barrier between stainless steel and environmental elements left behind by evaporating pool water on equipment.
3. As stated previously rinse all equipment frequently with fresh water and dry with soft clean cloth. This should wash away any accumulated halogen salts such as chlorine or bromine. **DO NOT** use pool water, salt water, high PH or iron in water to clean your stainless steel products.
4. Pool equipment should be inspected regularly. Look for any tarnish, discoloration, stubborn stains, grease build up, blemishes or water spotting of stainless equipment. If apparent, then take appropriate steps to remove corrosive elements with a non-chlorinated stainless steel cleaner and water rinse.

**NEVER** use steel wool, sandpaper, hydrochloric acid, muriatic acid, mineral acids or harsh abrasive cleaners on stainless steel equipment. Steel wool will add to corrosion due to dissimilar metal materials coming into contact with equipment. Discoloration should be removed at first sign with a cleaner or polisher recommended for stainless steel equipment.

**Note:** Avoid adding chlorine in close proximity to stainless steel equipment. Dilute chlorine in 5-gallon bucket and pour as far from stainless equipment as possible. Also avoid cleaning masonry and pool decks with strong acid solutions that come in contact with stainless steel products. Do not pour straight muriac acid directly into pool for PH control. This method increases corrosion to stainless steel around application area.

#### **Effective Cleaning Methods:**

There are many choices available for cleaning stainless steel in market that consumers may utilize. Depending upon cleaning needed and degree of contamination, some products may be better than others. Although some products are listed as stainless steel cleaners, they may scratch surface and may contain chloride bleach which will discolor, tarnish or dull finish if not removed completely.

There are many industry associations that have listed available product that can be utilized in cleaning stainless steel products. Use of these proprietary names is intended only to indicate a type of product available and does not constitute an endorsement. Omission of any proprietary product does not imply inadequacy. Review each product being utilized in strict accordance with instructions on packaging. No one product is best for every form of cleaning, since there are many levels of corrosion.



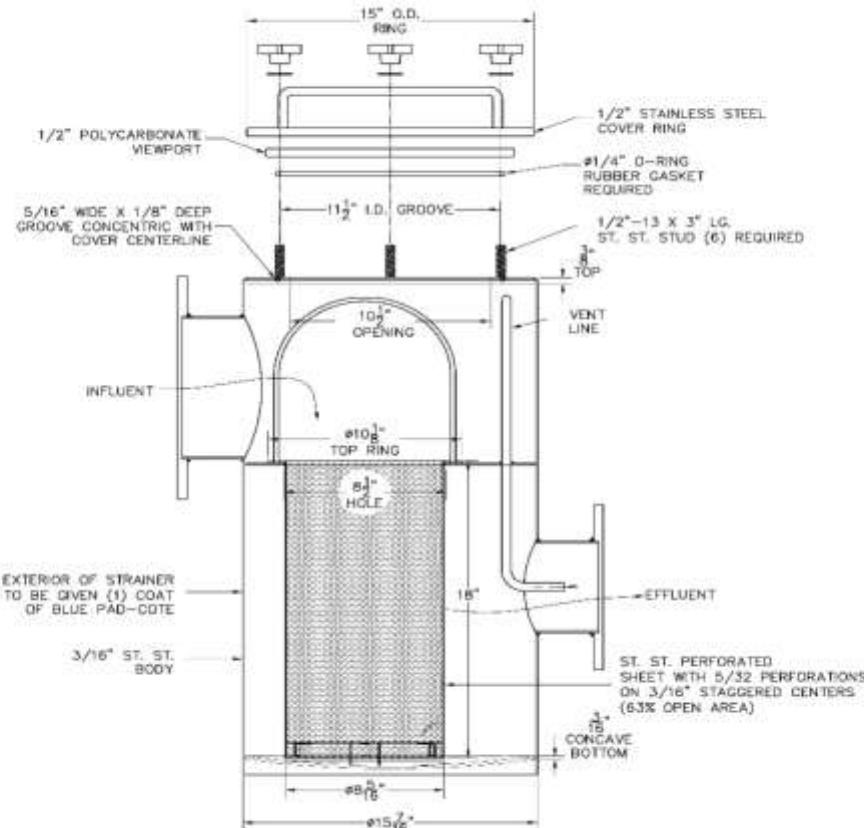
The simplest, safest and least costly method that will adequately do the job is always best. The longer a stain is on surface of stainless equipment, the higher chance of permanent discoloration or damage. Stainless steel surfaces thrive with frequent cleaning because there is no surface coating to wear off material. A soft cloth and clean warm water should always be first choice for mild stains and loose dirt and soils. A final rinse with clean water and a dry wipe will complete process and eliminate possibility of water stains. **DO NOT** use pool water, salt water, and water with high PH or iron content to clean your stainless steel products.

Dealing with stubborn stains, discolored or tarnished stainless steel product try and utilize recommended merchandise per various manufacturers. Some recommended product: CitiSurf product such as 77 plus or 2310, Sta-clean, Zud liquid, Samae, Bon Ami, Allchem concentrated cleaner, Twinkle, 3M stainless steel cleaner and polish, Sheila Shine, Perfect Sink, Liquid Nu Steel, Lumin cleaner, Gade FFF or Grade F Italian pumice, Highlite and many others.

Surface restoration may be needed when stainless steel is scratched or pitted due to heavy corrosion. This can be accomplished by mechanically polishing as opposed to chemical cleaning above. A professional familiar with process should be contacted to handle.

## Paddock Industries Pump Strainer Installation, Start-Up, Shut-Down

The Pump Strainer is a high-quality stainless-steel vessel incorporating a perforated stainless-steel basket designed to strain hair, lint, and other large particles from the fluid stream that might clog or damage the pump's impeller. A typical design is shown in the cross-sectional view below.



### Installation

Support the strainer, pump, and plumbing independently using standard concrete pedestals to mount the pump and standard pipe supports for the plumbing. Typically, the strainer sits on the floor, but a pedestal can be constructed for it, if necessary. Attach the strainer flange to the pump flange using standard flange gaskets and hardware. Likewise, attach the influent plumbing to the strainer. Install an isolation valve in the influent line upstream of the strainer, and another in the effluent line downstream of the pump.

### Start-Up

Close both isolation valves, remove the strainer lid, and fill the strainer and pump volute with water through the lid opening if pump is installed above water level. In a flooded-suction situation, crack open the influent isolation valve to allow the strainer and volute to fill with water, then close influent isolation valve. Re-install the strainer lid, making sure it is secured and sealed tightly. Open the influent isolation valve and start the pump. After about five seconds, slowly open the effluent isolation valve, taking 5-10 seconds to open the valve. This slow opening of the effluent isolation valve after pump is started eliminates the possibility of creating a water hammer (also known as hydraulic shock).

555 Paddock Parkway, Rock Hill, SC 29730

Telephone: 803 324 1111 \* Facsimile: 803 324 1116 \* Email: [info@paddockindustries.com](mailto:info@paddockindustries.com)  
[www.paddockindustries.com](http://www.paddockindustries.com)



### **Shut-Down....**

Gradually close the effluent isolation valve, taking 5-10 seconds, before turning pump off. This slow closing of the effluent isolation valve prior to turning the pump off prevents water hammer. This “dead-heading” of the pump for a few seconds will in no way damage it. If the strainer is to be opened at this time for cleaning, close the influent isolation valve before removing the lid. Upon replacement of a clean basket, re-install the lid and secure it tightly, and open the influent isolation valve. Do not open the effluent isolation valve until after the pump is started so as to prevent water hammer.

### **A Word About Water Hammer....**

Water hammer is a destructive pressure spike caused by the sudden deceleration of water flow. The pressure spike potential can be easily calculated by multiplying the water velocity at normal flow in feet per second by 65. This gives the pressure spike potential in pounds per square inch. For example, water flowing at 6 ft/s will cause a 390 psi water hammer if the water flow is suddenly stopped. This can occur upon starting a pump with air in the plumbing every time the water flow encounters an elbow or tee, or upon closing a valve suddenly, or even upon simply turning off a pump without first slowing the water flow down. **Failure to prevent water hammer constitutes abuse and will render any warranties void.**



## Winterizing

### Compak Vacuum Sand Filter

Follow the suggested procedures below:

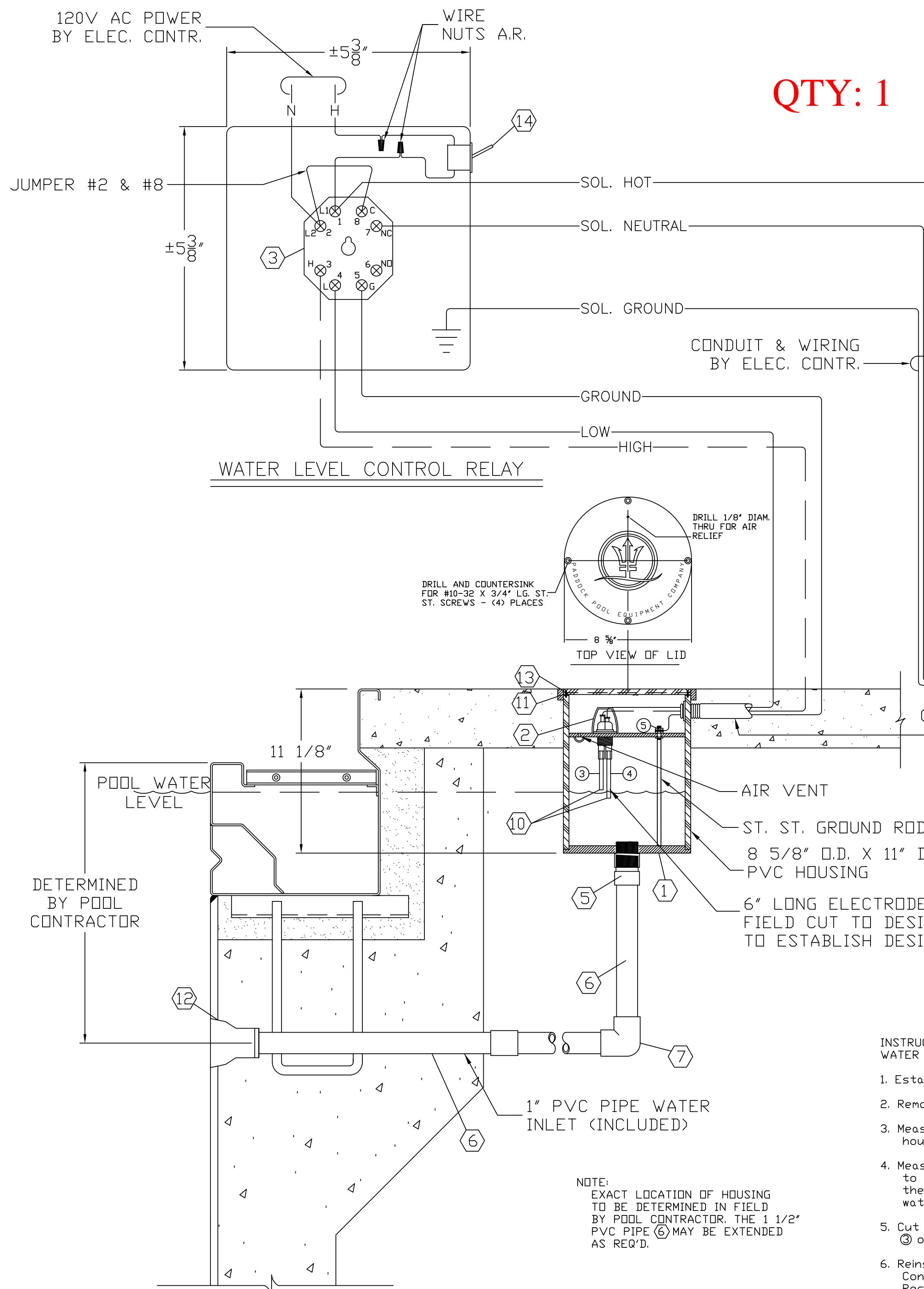
1. Lower water level in pool below stainless steel gutter.
2. Shut down auto-fill controller and domestic water supply.
3. Once the water level is lowered, close the main drain valve, perimeter overflow valve, return to pool valve to isolate the filter from the pool and open remaining valve(s) to prevent pipes breaking if freeze occurs.
  - a. In high water table areas we recommend that some water is left in the filter to prevent lifting from hydrostatic pressure from ground water. If this is not an issue please pull water level down to the sand level, turn off pump, refer to step #3, and place a small bilge pump in the backwash trough to remove remaining water.
4. Remove drain plugs from pump box (if available) on filter tank and pump housing.
5. Drain and blow out all auxiliary lines such as chlorinators, heaters, sample lines, etc.
6. Check filter and pipes periodically through winter months for possible excess water in these areas in case of valve leakage or rain water.
7. Cover pool if possible or remove debris ASAP to prevent surface damage or excess algae.
8. Power down Mark 5, recirculation pump and VFD (if provided). Put the VFD disconnect switch in the off position. Supplemental heat will be required if the room temperature drops below (-20° F).
9. Disconnects for recirculation pump and optional VFD should be lockout / tag out to prevent accidental powering of equipment.

**Helpful Hint:**

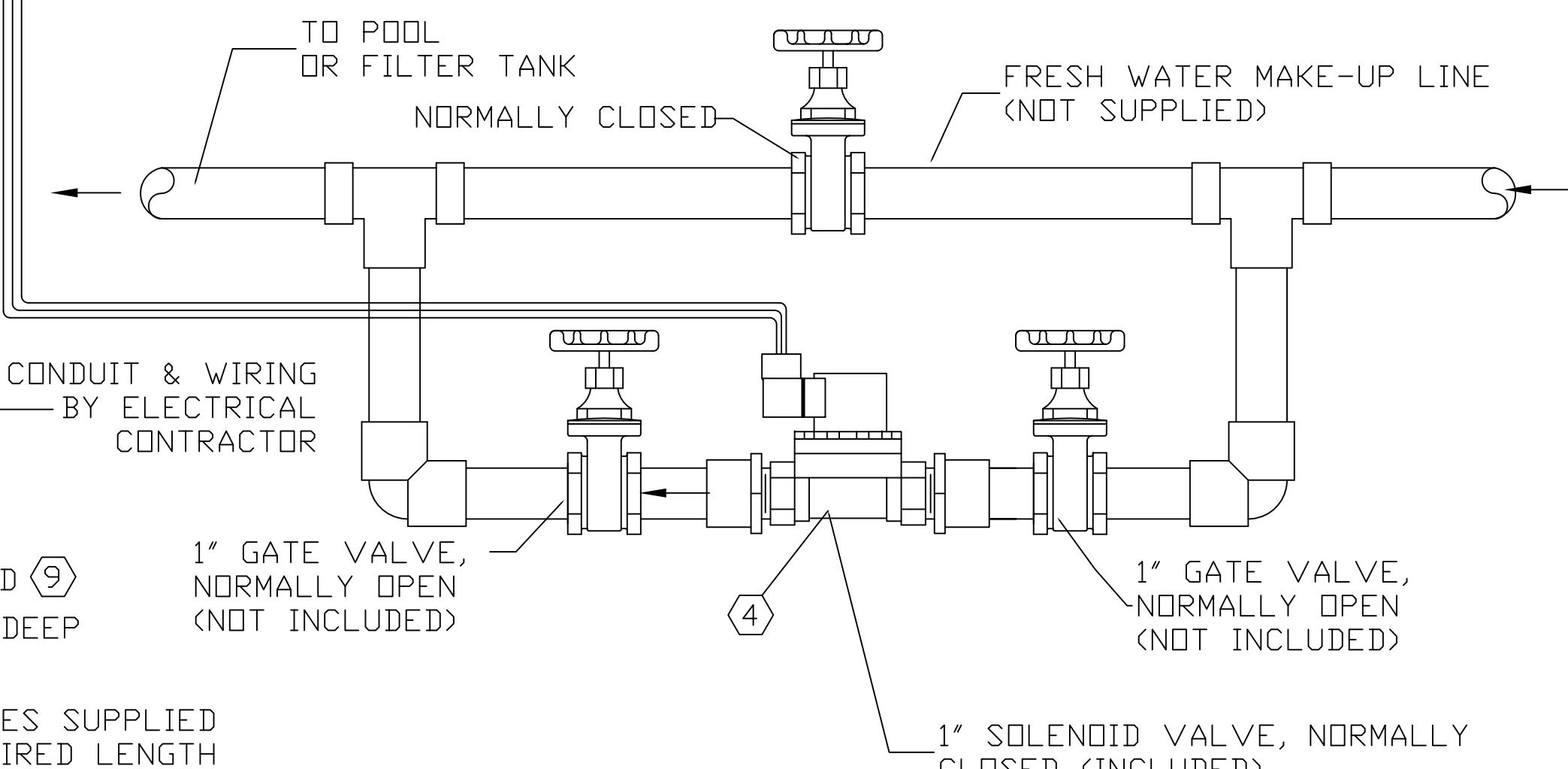
It is recommended that a manual backwash at a full flow rate for an extended time of 5 to 6 minutes is done a minimum of once a year. If your system has the optional air scour feature, it is recommended that the air scour feature is not used during this suggested preventive maintenance backwash. This suggested manual extended flow backwash extends the media life and could prevent having to replace the sand in your filter.

# **Project Documentation**

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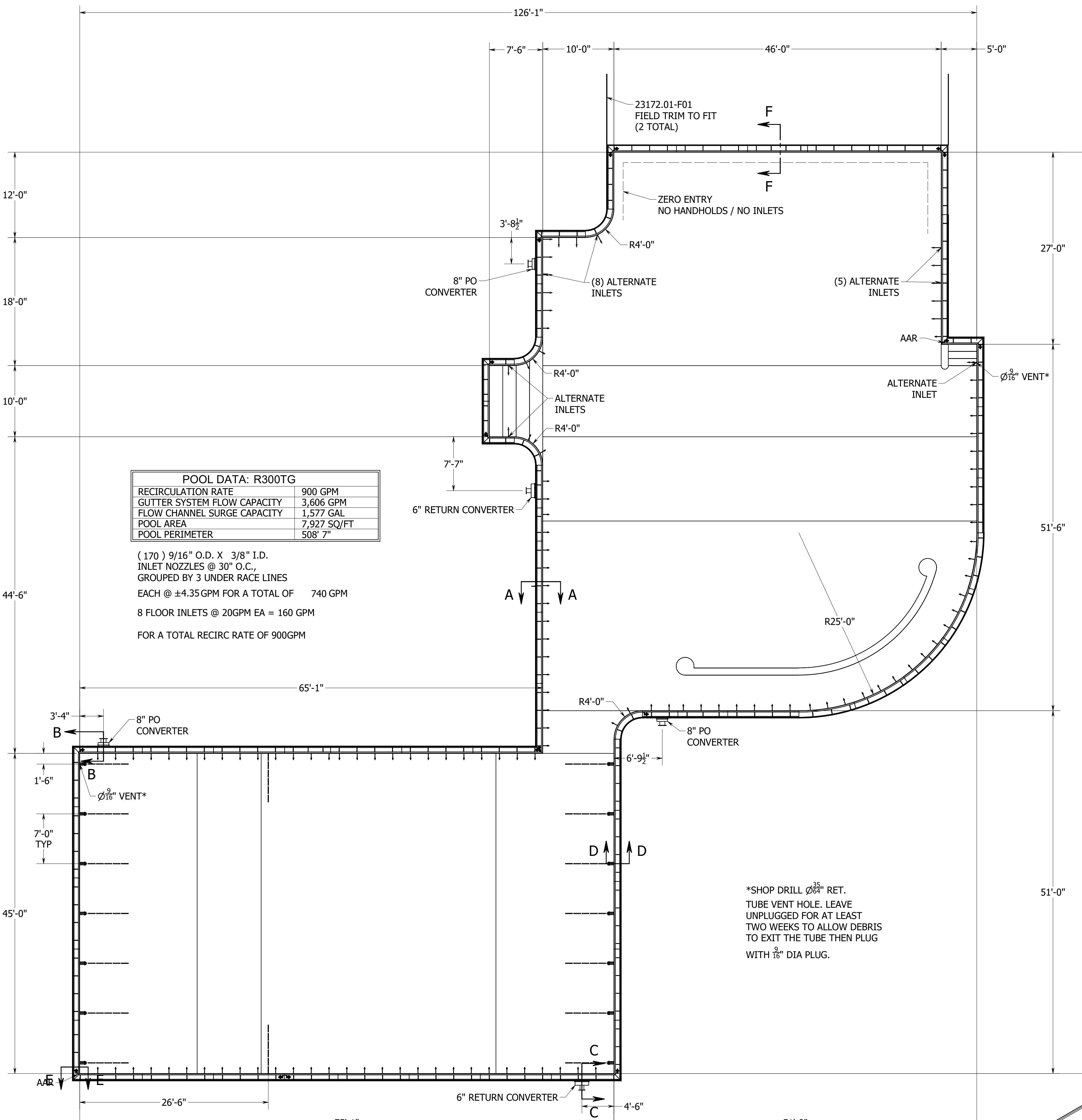
ITEM	QTY	DESCRIPTION
1	1	PVC HOUSING W/AIR VENT (AB-1325-A)
2	1	ELECTRODE HOLDER - TYPE CE 2 44500 OA B/W A-10-536
3	1	WARRICK RELAY MODEL #16MC1A1 & 5 3/8" x 5 3/8" x 3 3/4" MNT. BOX
4	1	SOLENOID VALVE-1" -110 V SLOW CLOSING ADJUSTABLE FROM 1/2 SEC. TO 4 1/2 SEC.
5	1	1" PVC MALE ADAPTOR
6	2	1" X 24" LG. PVC SCH. 80 NIPPLE T.O.E.
7	1	1" PVC SCH. 80 90° SOCKET ELL
8		
9	1	1/4"Ø X 7" L W/ 1 1/2" THD. 1 END & (3) ST. ST. NUTS & WASHERS
10	2	ELECTRODE RODS TYPE 316 ST. ST. X 6" LONG X 1/4"Ø
11	1	SOFT RUBBER GASKET (DWG. AB-2347)
12	1	HAYWARD SP-1019 GUTTER DRAIN 2" W/2" X 1" SOC X SOC BUSHING
13	4	#10-32 FLATHEAD PHILLIPS X 3/4" LONG ST. ST. SCREWS
14	1	TOGGLE SWITCH-SERVALITE #91086U, 10A, 125VAC, DOUPLE INSULATED



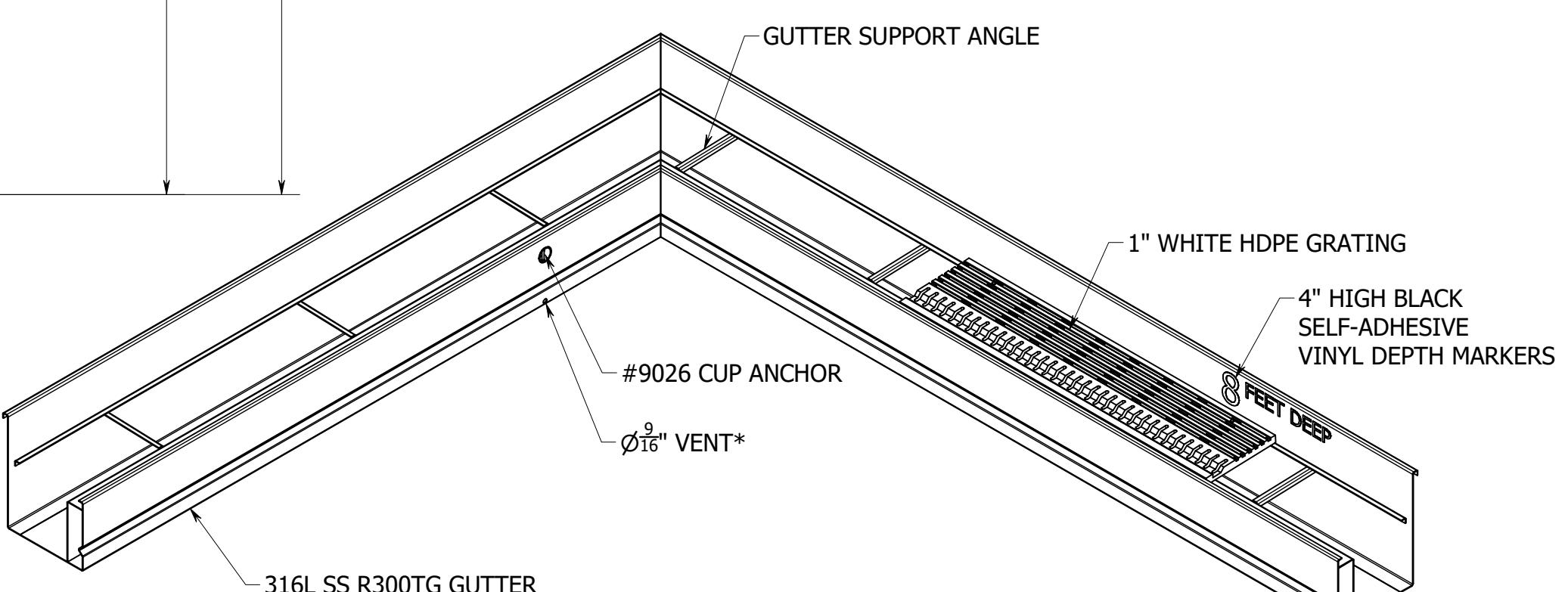
**NOTE:**  
SOLENOID VALVE MUST BE INSTALLED IN THE POSITION SHOWN

**PN9500032**

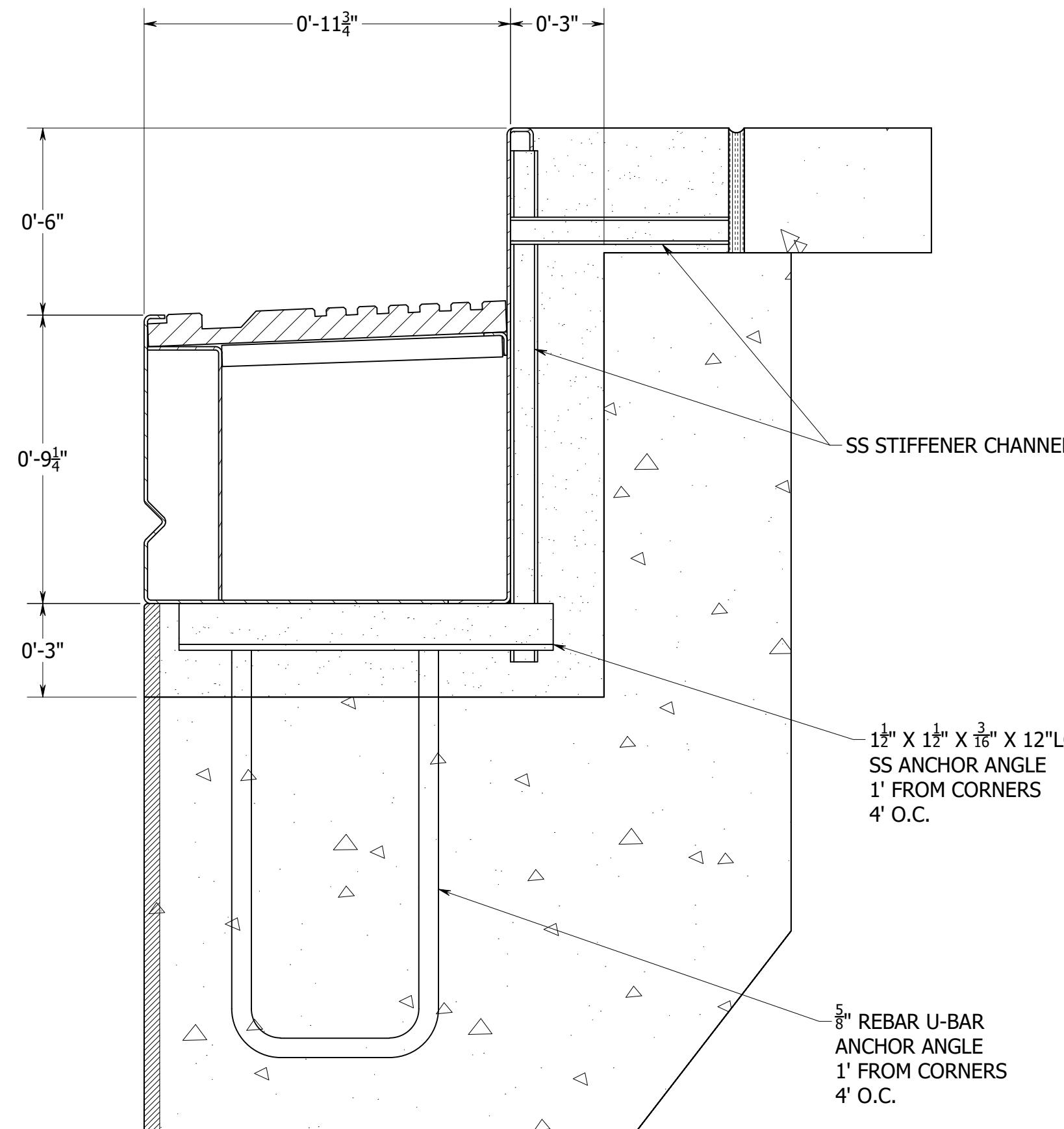
555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com	DESCRIPTION <b>#6610 WATER LEVEL CONTROLLER DETAILS-1" SOLENOID</b>
DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE NOTED: X. ± 1/16      .X. ± .020 1/X ± 1/32      .XX. ± .010 X ± 1/4"      .XXX. ± .005	JOB NAME <b>XXXXXX</b>
DRAWN DCR 4/11/15	LOCATION <b>XXXXXXXX</b>
CHECKED	CUSTOMER <b>XXXXXXX</b>
APPROVED	SCALE (UNLESS NOTED): AS SPECIFIED SIZE <b>C</b> PART NO. <b>XXXX</b>
MATL: PVC	QTY. <b>XXX</b> W.O. # <b>XXX</b> REV. <b>0</b>
	DWG. NO. <b>A-1326-1"SOLE</b>



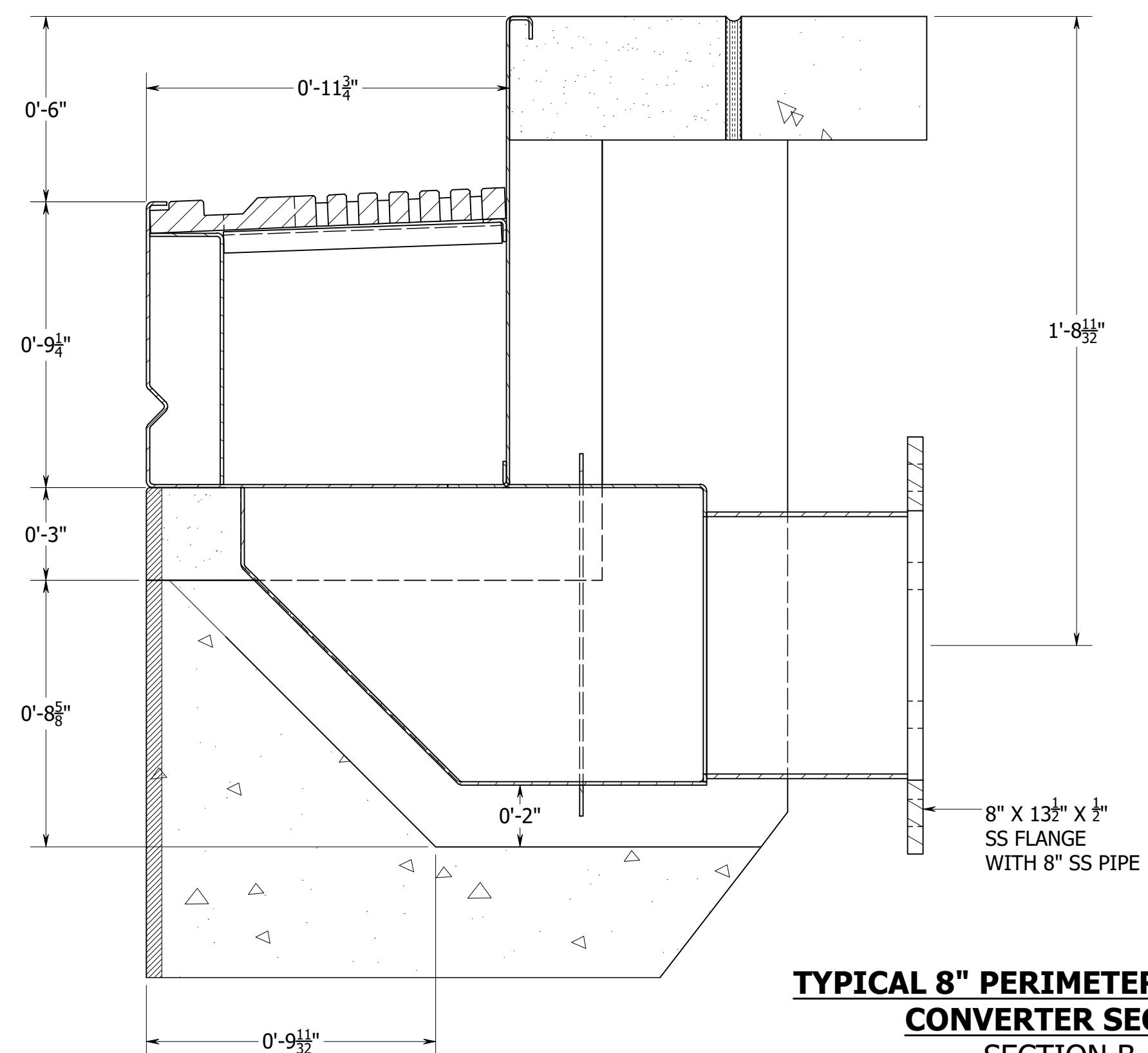
PARTS LIST		
PART NUMBER	QTY	DESCRIPTION
23172.01-SG01	11	R300, 120"
23172.01-SG02	1	R300, 105 1/2", CORNER
23172.01-SG03	1	R300, 120", CUP ANCHOR
23172.01-SG04	1	R300, 77 1/2"
23172.01-SG05	1	R300, 118", CORNER, (L) JETWASH
23172.01-SG06	1	R300, 118", CORNER, (R) JETWASH
23172.01-SG07	1	R300, 56"
23172.01-SG08	1	R300, 72"
23172.01-SG09	1	R300, 42", CORNER, ALT INLET
23172.01-SG10	1	R300, 60", CORNER, (R) JETWASH, NO INLETS
23172.01-SG11	1	R300, 60", CORNER, NO INLETS
23172.01-SG12	1	R300, 42", CORNER, (R) JETWASH, ALT INLET
23172.01-SG13	1	R300, 90", ALT INLETS
23172.01-SG14	1	R300, 78", CORNER, (L) JETWASH, ALT INLETS
23172.01-SG15	1	R300, 72", CORNER, ALT INLETS
23172.01-SG16	1	R300, 96", CORNER, (L) JETWASH, NO INLETS
23172.01-SG17	1	R300, 105 1/2", CORNER, (R) JETWASH, NO INLETS
23172.01-SG18	2	R300, 120", NO INLETS
23172.01-SG19	1	R300, 101", NO INLETS
23172.01-SG20	1	R300, 105 1/2", CORNER, (L) JETWASH, NO INLETS
23172.01-SG21	1	R300, 100 1/2", ALT INLETS
23172.01-SG22	1	R300, 118", CORNER, ALT INLETS
23172.01-SG23	1	R300, 60", DBL CORNER, NO INLETS, (R) JETWASH, AAR
23172.01-SG24	1	R300, 92 1/2"
23172.01-SG25	1	R300, 84"
23172.01-SG26	1	R300, 60", (L) JETWASH
23172.01-SG27	1	R300, 120", CUP ANCHOR
23172.01-SG28	1	R300, 120", (2) CUP ANCHORS
23172.01-SG29	1	R300, 114", CUP ANCHOR
23172.01-SG30	2	R300, 120", (2) CUP ANCHORS
23172.01-SG31	1	R300, 90", CORNER, CUP ANCHOR, (L) JETWASH
23172.01-SG32	1	R300, 90", (L) JETWASH
23172.01-SG33	1	R300, 120", CUP ANCHOR, (R) JETWASH
23172.01-SG34	1	R300, 105 1/2", CORNER
23172.01-SG35	1	R300, 90", CORNER, CUP ANCHOR, (R) JETWASH, AAR
23172.01-SG36	1	R300, 120", (2) CUP ANCHORS
23172.01-SG37	1	R300, 120", CUP ANCHOR
23172.01-SG38	1	R300, 105 1/2", CORNER, (R) JETWASH, VENT, ALT INLET
23172.01-SG39	1	R300, 90", CORNER, CUP ANCHOR, VENT
23172.01-SG40	1	R300, 105 1/2", CORNER, (R) JETWASH
23172.01-SG41	1	R300, 105 1/2", CORNER, (R) JETWASH, NO INLETS
23172.01-RG01	3	RADIUS R300TG, 75 13/32"
23172.01-RG02	1	RADIUS R300TG, 75 13/32", ALT INLETS
23172.01-RG03	5	RADIUS R300TG, 94 1/4"
P0813-R300-8PO	3	R300 8" PERIMETER OVERFLOW CONVERTER
P0813-R300-6RET-8IN-R1	2	R300 6" RETURN CONVERTER
23172.01-F01	2	PL12GA x 16 13/32" x 120"
P0802-3750	187	INLET NOZZLE, 9/16" O.D. X 3/8" I.D. NYLON
P0802-0000	2	INLET NOZZLE, BLIND, Ø9/16" O.D. NYLON
P0802-0-PLUG	189	TEST PLUG, 0 RUBBER
P0801.01-1200-R0	145	ANCHOR ANGLE, L1 1/2" x 1 1/2" x 3/16" x 12"
P0810-10x140x060	145	UBAR ANCHOR, RB Ø5/8" x 32 15/16"
P2103-00700.04-R0	145	STIFFENER CHANNEL, C7/8" x 9/16" x 12GA x 7"
P2103-01564.01-R0	130	STIFFENER CHANNEL, C7/8" x 9/16" x 12GA x 16 13/32"
P2103-01000.01-R0	15	STIFFENER CHANNEL, C7/8" x 9/16" x 3/32" x 10"
P0806-F14000	11	CORNER GRATE SUPPORT, p12GA x 2" x 14"
P0899-R300TG-GG-11.5	2	INST GUIDE, SH 1" x 11 1/2" x 12"
P0899-GG-025-10	2	GRATE INSTALL GUIDE, SH 1" x 10" x 12"
P2104-12000.02-R0	2	EXTRA ANGLE, PL12GA x 5 3/32" x 120"
23172.01-P0899-DEPTH MARKER	1	VINYL DEPTH MARKER SET
P0899-APPO	1	ACCESSORY PACK OF PUNCH OUTS
ZSSC-001	1	ZUD SS CLEANER
SBP-001	6	SCOTCH BRITE PAD



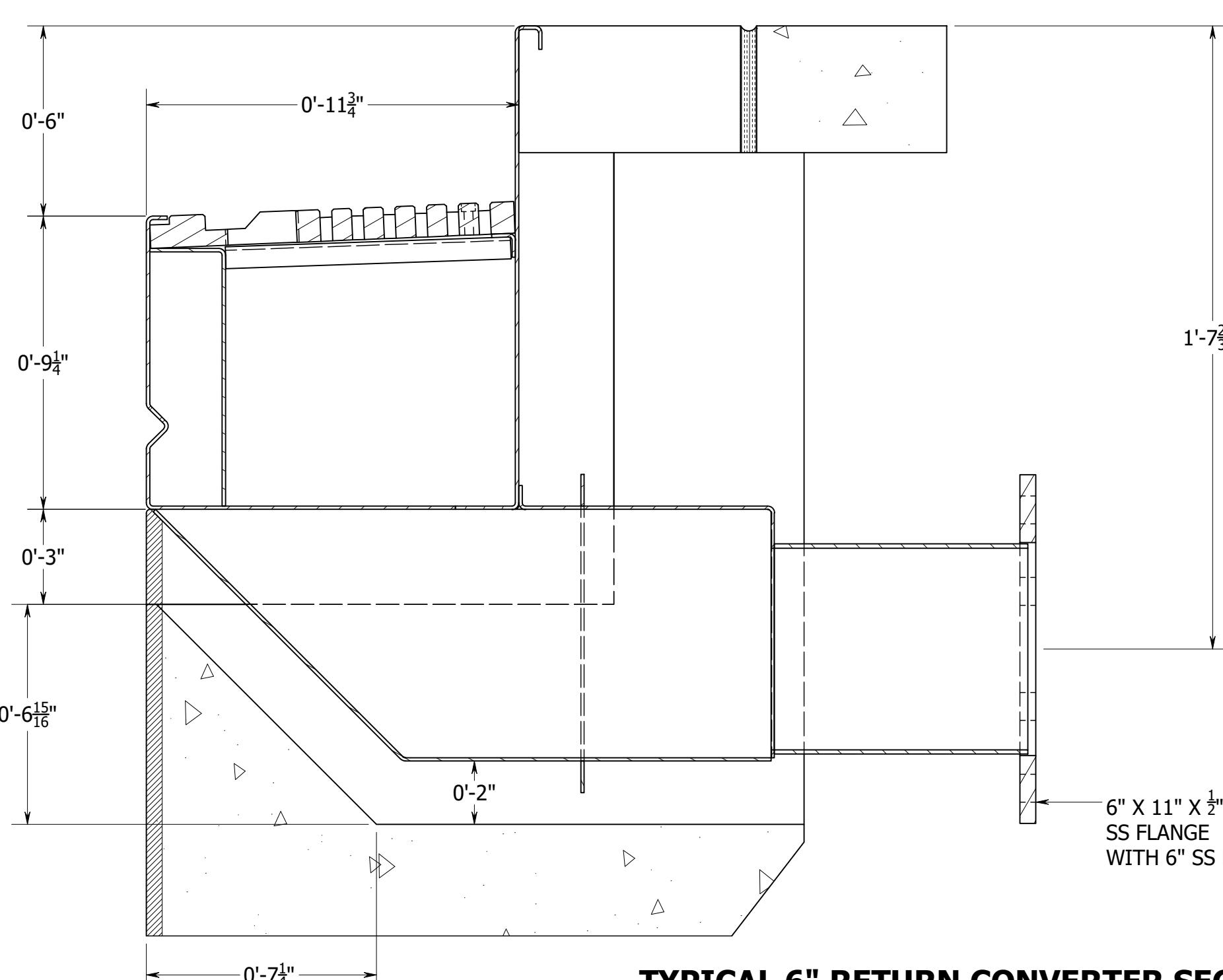
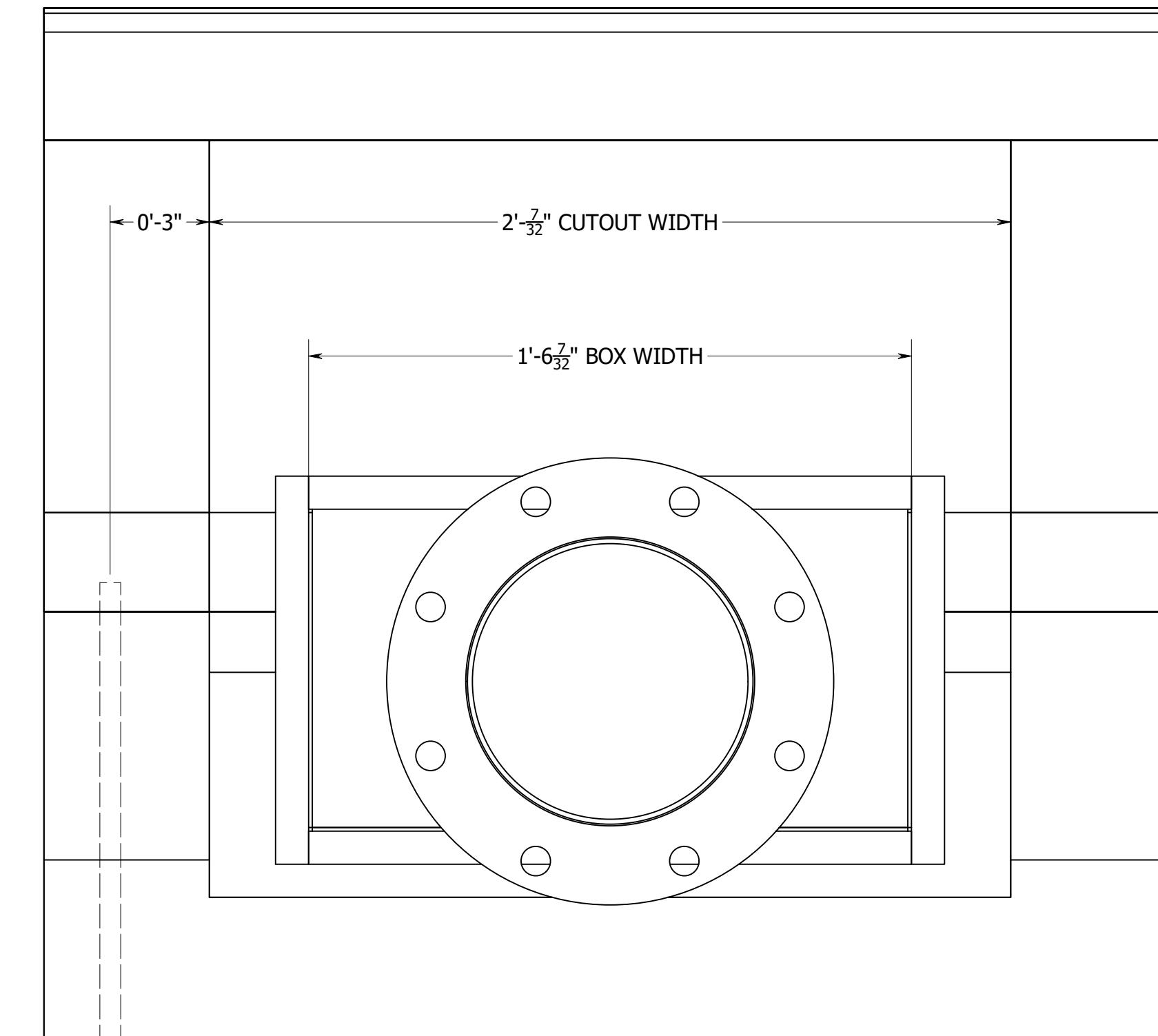
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REV	DATE	BY	DESCRIPTION
REVISION HISTORY			
555 Paddock Parkway Rock Hill, SC 29738 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com			
DO NOT SCALE DRAWING			
TOLERANCE UNLESS OTHERWISE NOTED:			
X ± 1/16"	.XX ± 0.010"		
1/X ± 1/32"	.XXX ± 0.005"		
X ± 1/4"			
JOB NAME: SCHENECTADY CENTRAL PARK			
DRAWN	BY	DATE	
CHECKED			
APPROVED			
MATERIAL	QTY:	W.O. #	DWG. NO.
		23172.01	SHEET #
			1 OF 2



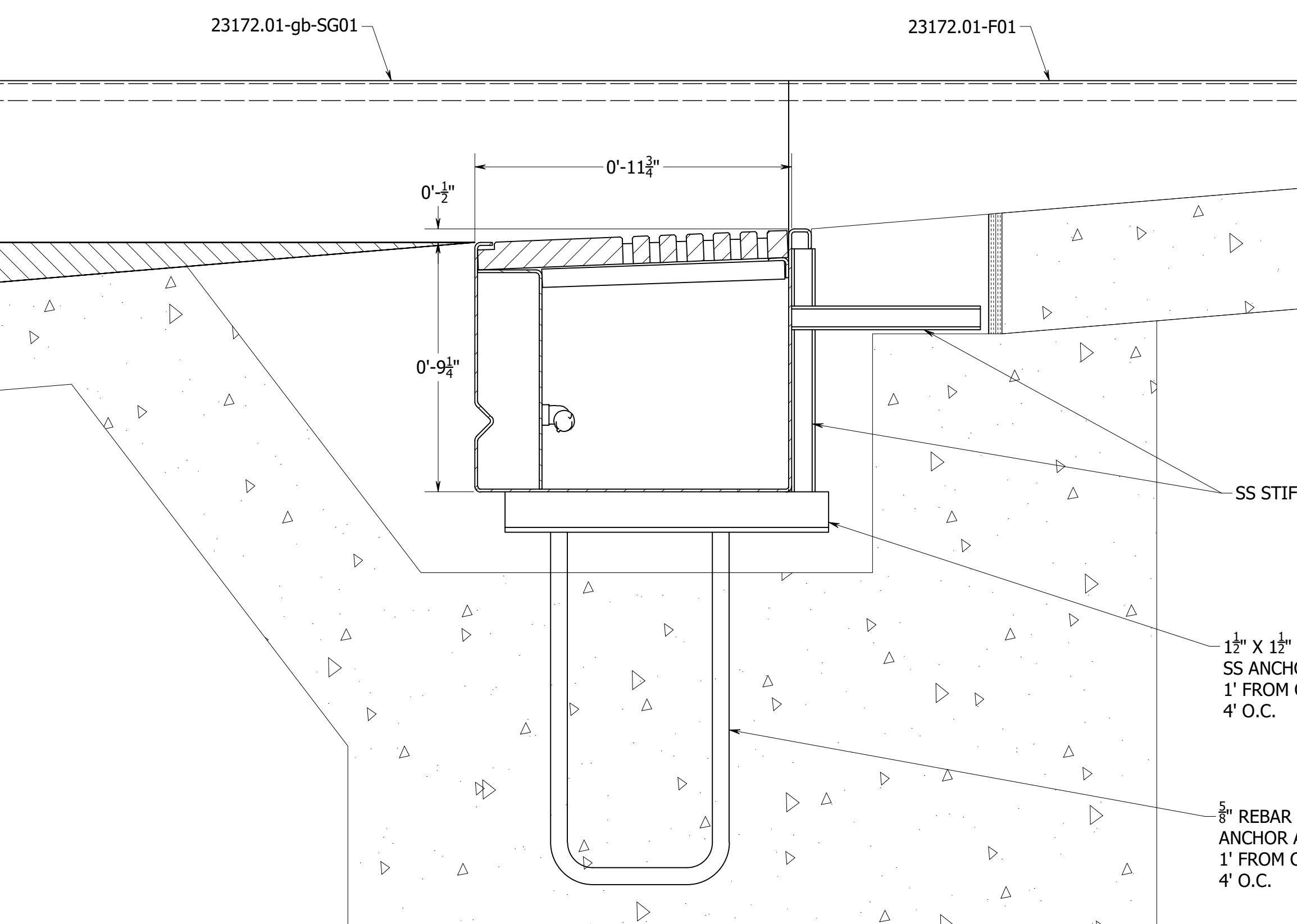
**TYPICAL R300TG GUTTER SECTION**  
SECTION A-A  
SCALE 1/4" = 1"



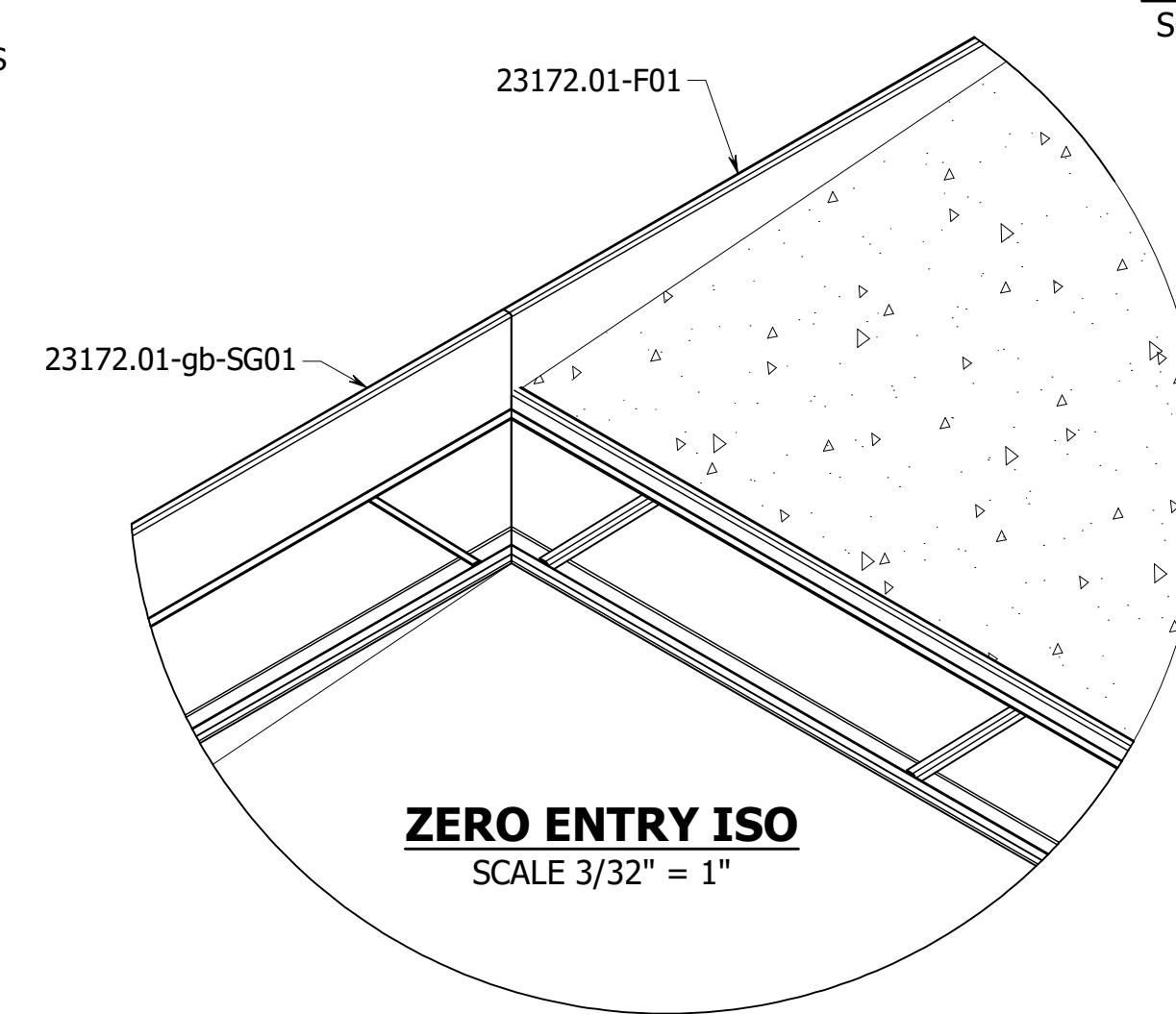
**TYPICAL 8" PERIMETER OVERFLOW CONVENTER SECTION**  
SECTION B-B  
SCALE 1/4" = 1"



**TYPICAL 6" RETURN CONVERTER SECTION**  
SECTION C-C  
SCALE 1/4" = 1"

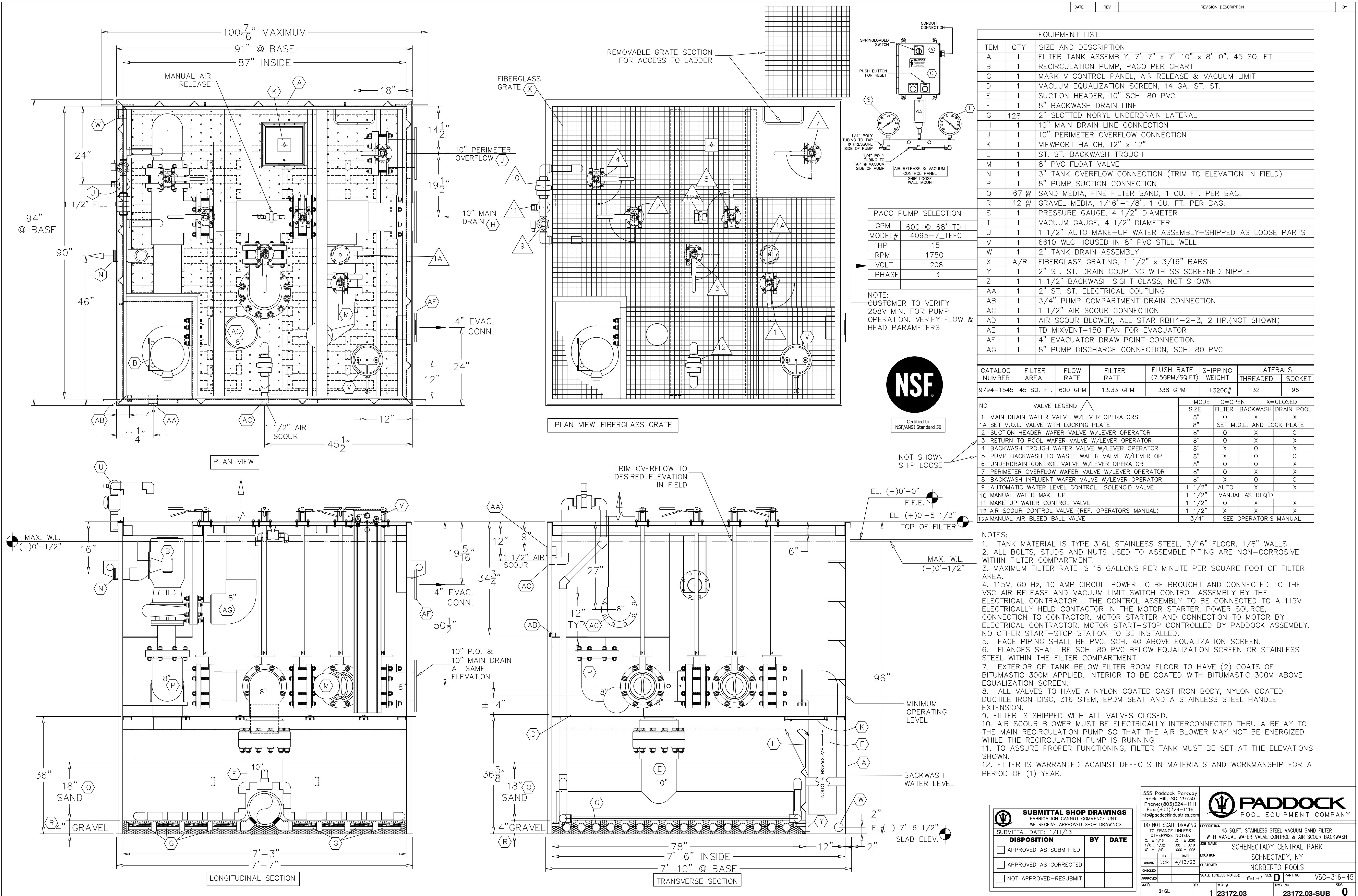


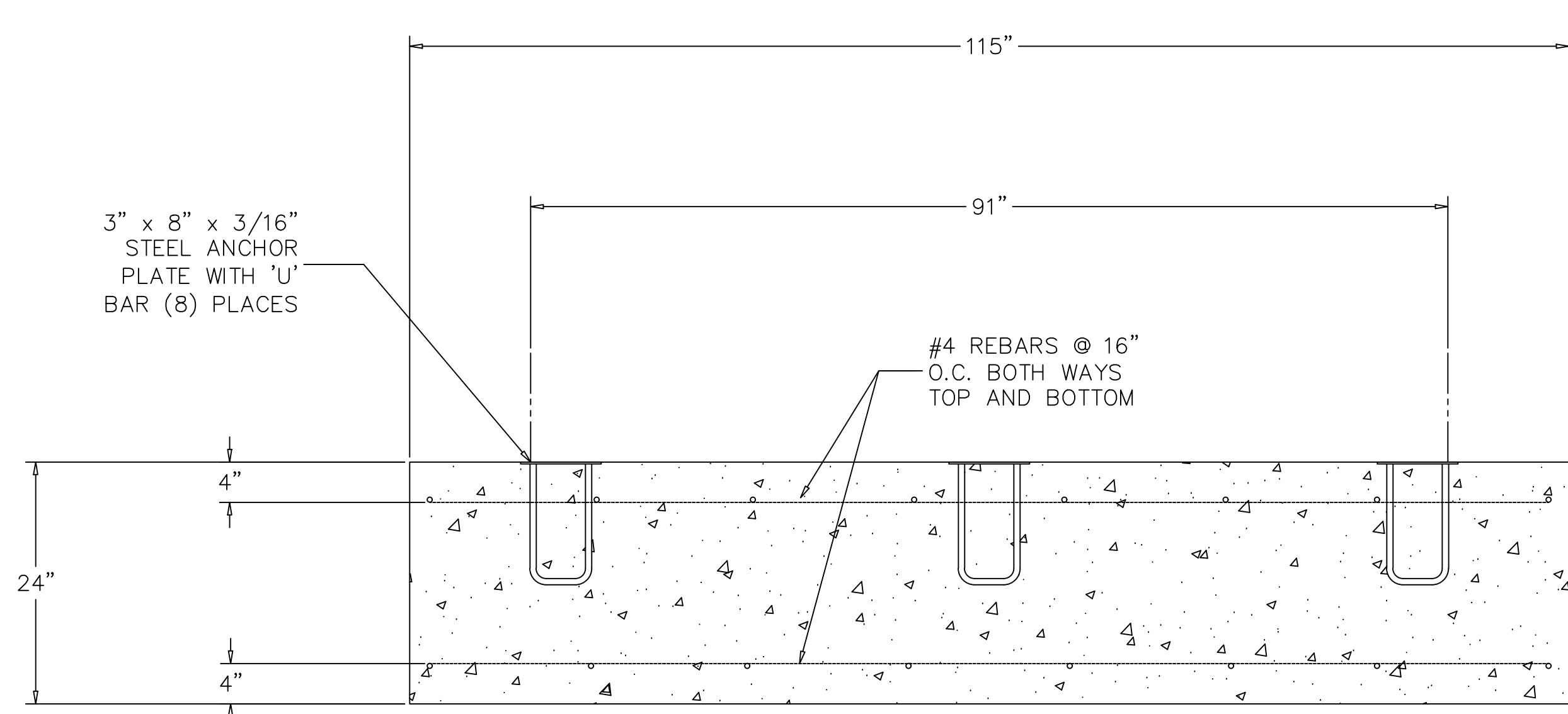
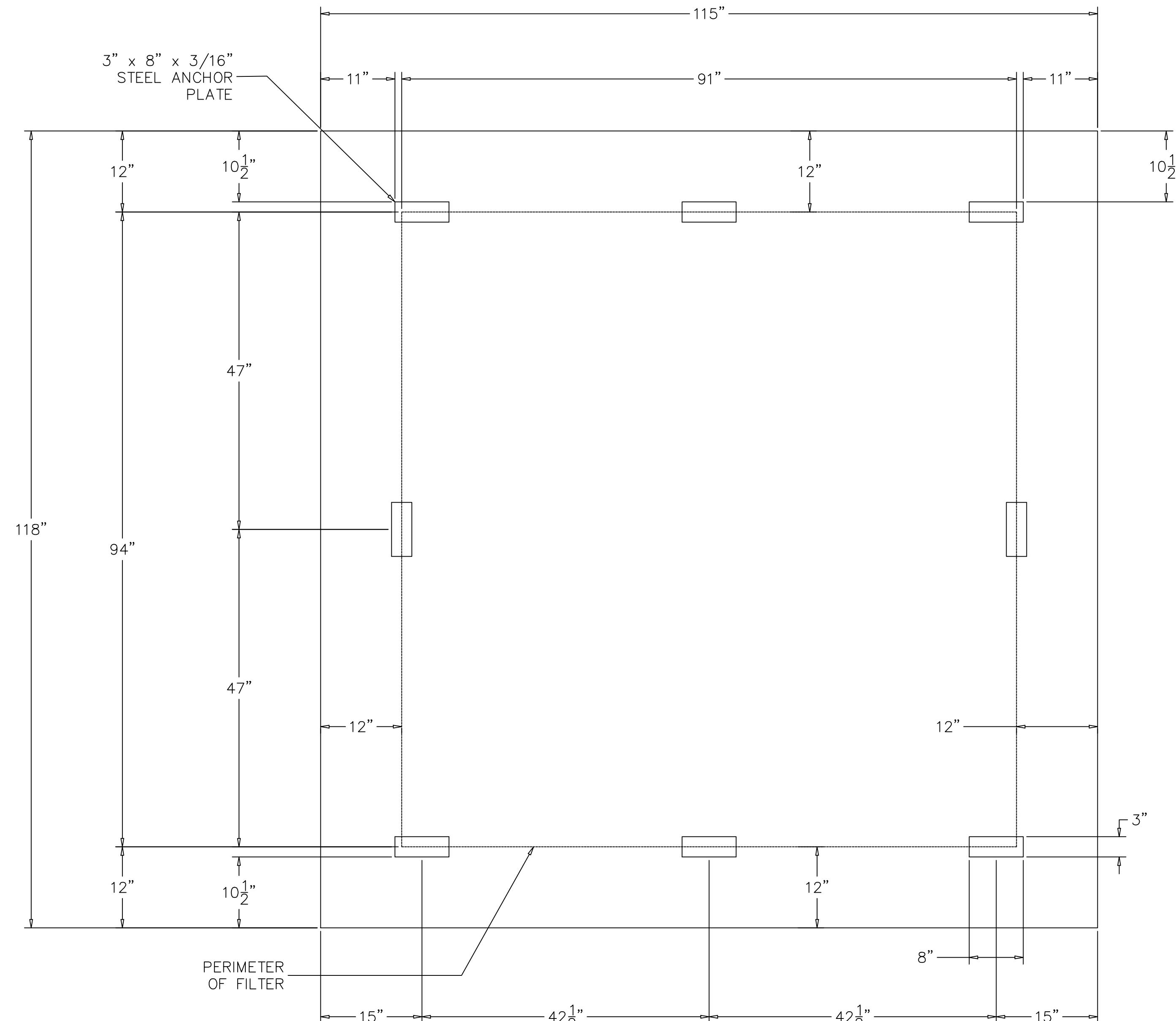
**TYPICAL R300TG @ ZERO ENTRY SECTION**  
SECTION F-F  
SCALE 1/4" = 1"



**ZERO ENTRY ISO**

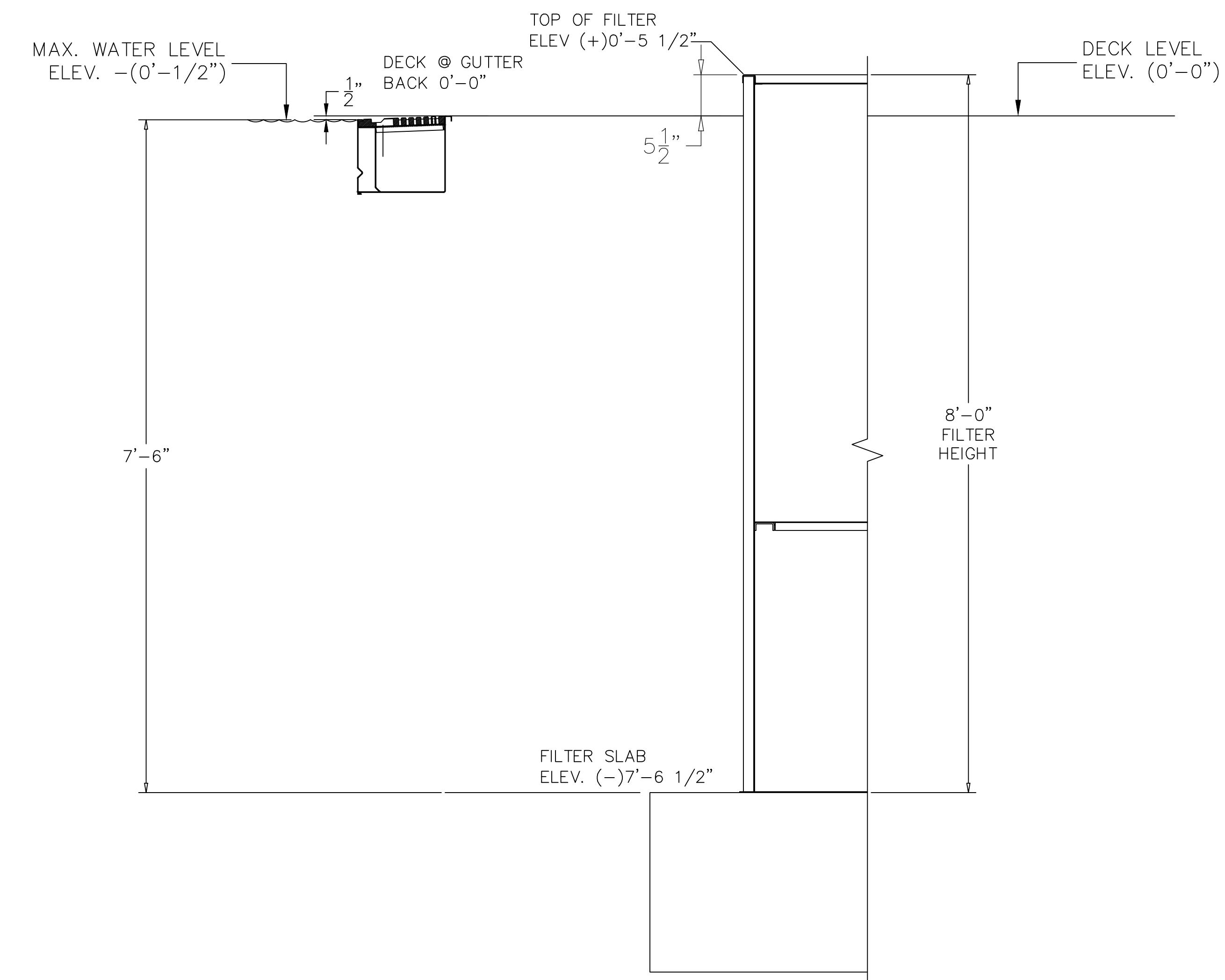
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REV	DATE	BY	DESCRIPTION
REVISION HISTORY			
555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com			PADDOCK
DO NOT SCALE DRAWING			POOL EQUIPMENT COMPANY
DIMENSION UNLESS OTHERWISE NOTED:			DESCRIPTION 508" 7" 316L SS R300TG GUTTER
X ± 1/16"      .XX ± 0.010"			JOB NAME SCHENECTADY CENTRAL PARK
1/X ± 1/32"      .XXX ± 0.005"			CUSTOMER NORBERTO POOLS
X ± 1/4"      .XXXX ± 0.002"			APPROVED
DRAWN BY DATE	7/18/23	CHECKED	SCALE (UNLESS NOTED)
REVISED BY DATE		APPROVED	SIZE PART NO.
MATERIAL QTY. DWG. NO.		QTY. DWG. NO.	23172.01
W.O. #		W.O. #	
SHEET #		SHEET #	
REV.		REV.	2 OF 2





NOTES:

1. COMPAK VSC TANK SHIPPING WEIGHT: ±3,200 LBS
2. FILTER FOOTPRINT: 59.4 SQ. FT.
3. (8) 3" x 8" x 3/16" ANCHOR PLATES W/ 'U' BARS REQUIRED



SUBMITTAL SHOP DRAWINGS		
FABRICATION CANNOT COMMENCE UNTIL WE RECEIVE APPROVED SHOP DRAWINGS		
SUBMITTAL DATE: 1/11/13		
DISPOSITION	BY	DATE
<input type="checkbox"/> APPROVED AS SUBMITTED		
<input type="checkbox"/> APPROVED AS CORRECTED		
<input type="checkbox"/> NOT APPROVED-RESUBMIT		

555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com	<b>PADDOCK</b> POOL EQUIPMENT COMPANY
DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE SPECIFIED X ± 1/16" X ± .020 1/X ± 1/32" XX ± .010 X ± 1/4" XXX ± .005	
DESCRIPTION: ANTI-FLOATATION SLAB FOR MANUAL 45 SQ.FT. VACUUM SAND FILTER	
JOB NAME: SCHENECTADY CENTRAL PARK	
LOCATION: SCHENECTADY, NY	
DRAWN: DCR 4/13/23	CUSTOMER: NORBERTO POOLS
CHECKED:	APPROVED:
SCALE (UNLESS NOTED): 1"-1'-0"	
MATL: XXX	SIZE: D PART NO.: VSC-316-45
QTY: 1	W.O. #: 23172.03
DWG. NO. 23172.03-S	REV. 0

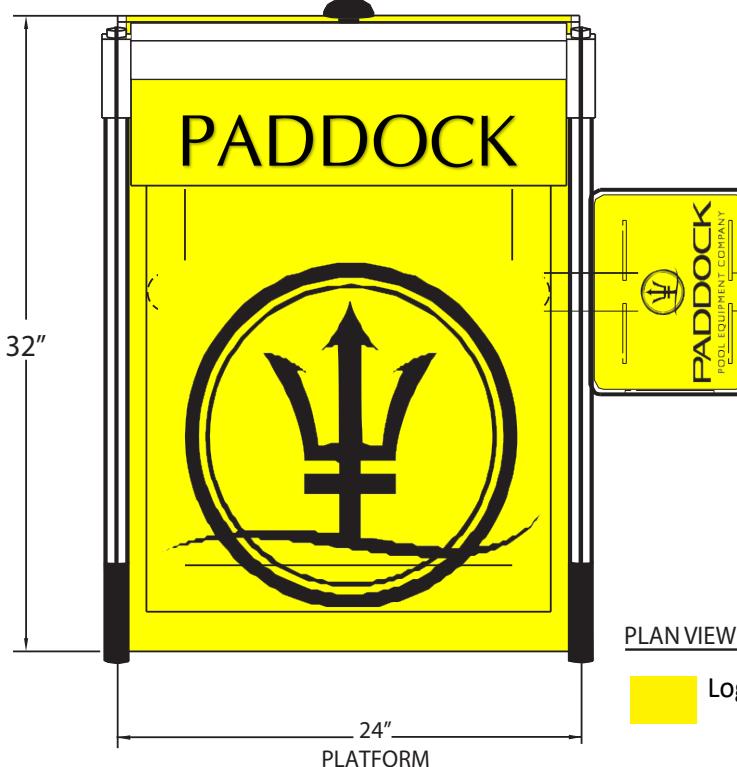


## 4912 Fast Track Starting Platform Custom Logo

Name of Job SO23172 Schnectady Central Park Pool

### Custom Logo Art Requirements:

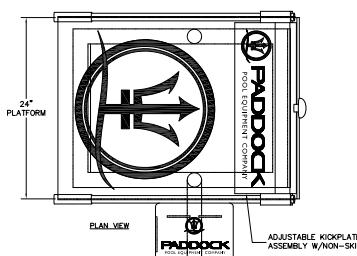
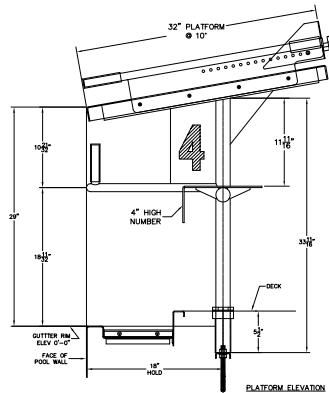
- Facility's Contact person name \_\_\_\_\_
  - phone # \_\_\_\_\_
  - email address \_\_\_\_\_
- Vector format saved as CS6 Adobe Illustrator or eps format with **all layers**.
- Resolution at full scale.
- Send all fonts (name & size) used in the artwork or convert all text to outlines before saving.
- Logo guidelines for fonts and colors are also required.
- **Note: - PMS code color for all color(s) that are used in the logo. Please include the name & size of the font(s).**



Logo Area - We do not recommend using solid white background due to the maintenance.



## Fast Track Starting Platform



Paddock's **Fast Track Starting Platform** is quickly and easily removable.

The platform shall be side mounted and have a 24" wide x 32" long stainless steel top.

Flush with front edge of platform is a backstroke starting bar. There are also two vertical backstroke grips made of stainless steel positioned 15" on center.

Lane numbers will be visible from all four sides of platform.

On top of starting platform shall be equipped with side rails made from 1" O.D. stainless steel tube welded to 1/8" stainless steel plate.

Mounted to side rails will be a removable "wedge" made of 12 gauge, stainless steel with a 45 degree incline on the surface facing forward to pool. Front surface shall have a non-slip surface. The wedge will use spring loaded plunger pins to lock securely into place. Single mechanism will be used to retract both pins simultaneously with one hand for ease of adjustment. Wedge shall slide uninhibited along guide rails on sides of platform.

Top of starting platform shall be with a non-slip solid surface.

Colors and custom logos are available as options.

Anchors with 19" spacing are sold separately, P/N 9400110, Model 4912-A.

P/N 9400115, Model 4912, Type 304, Qty \_\_\_\_

P/N 9400113 Model 4912, Type 316L, Qty 6

**# 4ME98 - Electric Air Compressor: 5 hp, 1 Stage, Vertical, 60 gal Tank,  
14.2 cfm, Splash Lubricated**



**PN210021**

Auto Drain Valve

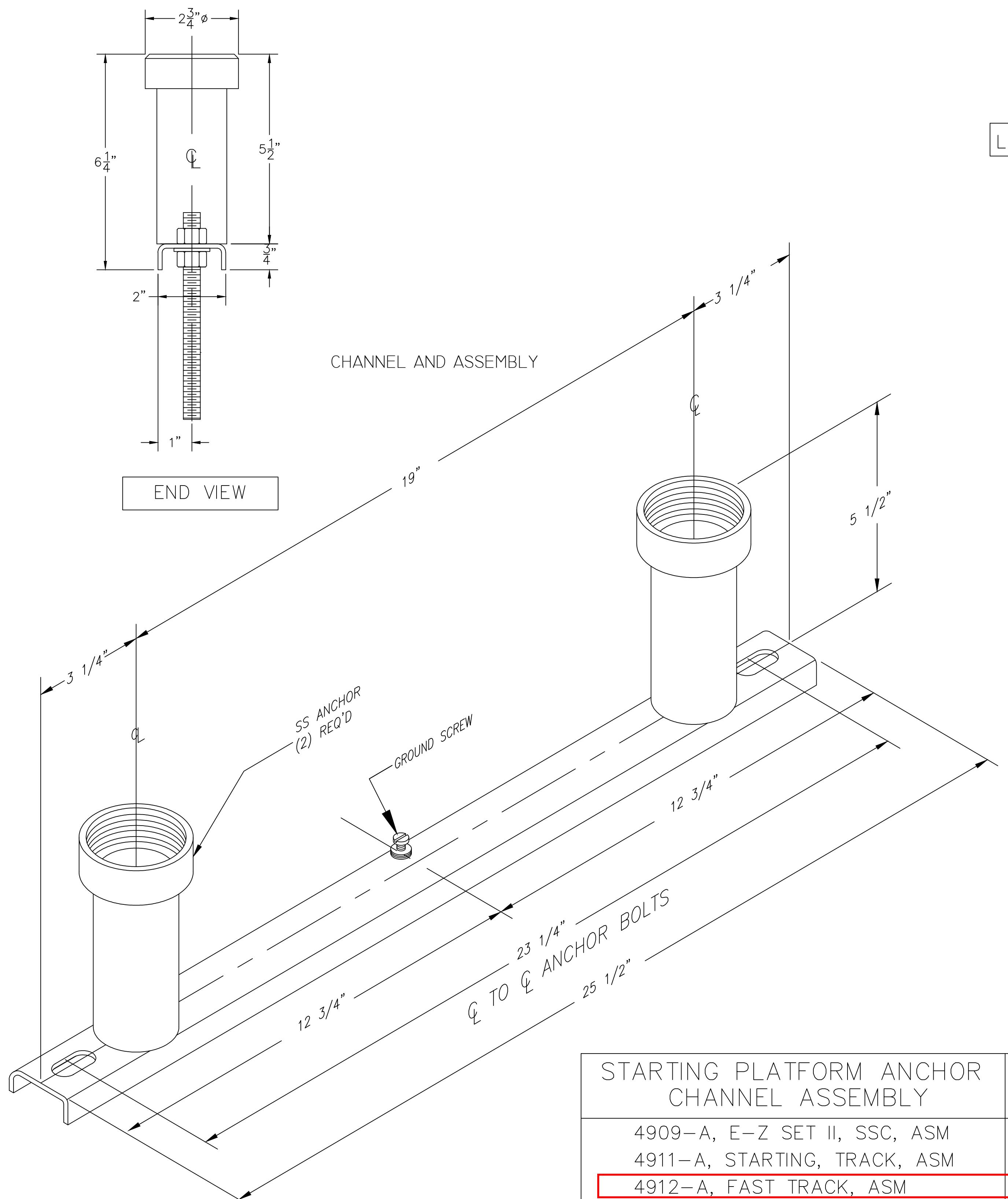
**PN210024**

.5 HP, 60 gal., Vertical Splash Lubricated  
Tank Mounted Electric Air Compressor  
14.2

.Item # **4ME98**

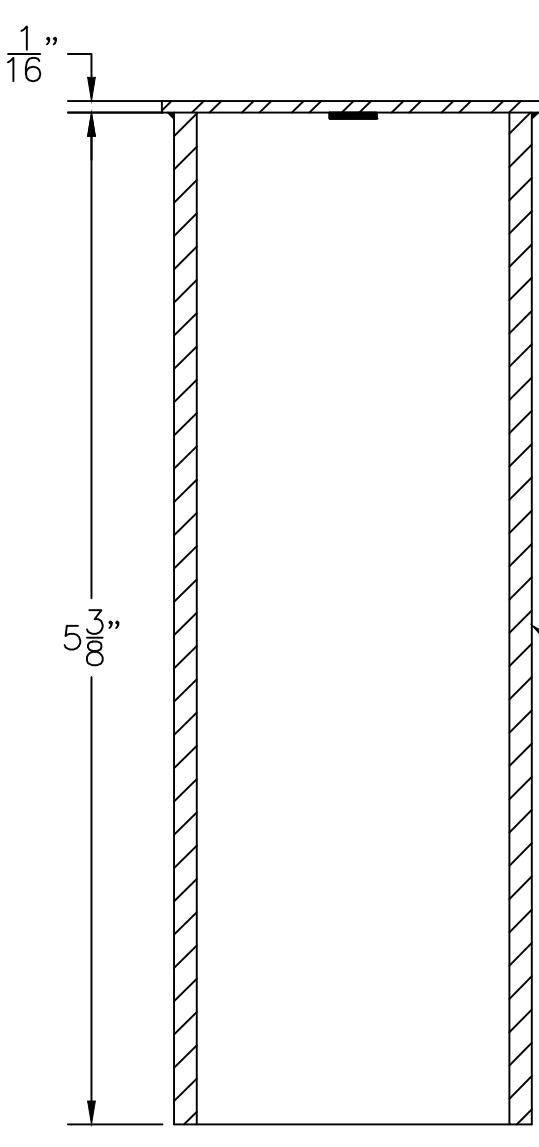
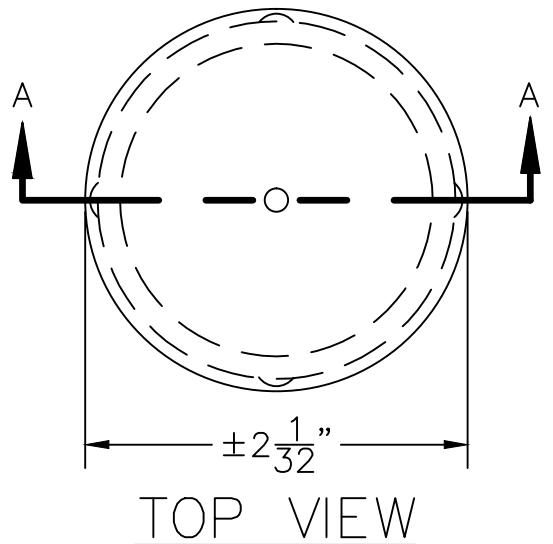
Mfr. Model #4ME98

ITEM	ELECTRIC AIR COMPRESSOR	DUTY CYCLE	INTERMITTENT
LUBRICATION TYPE	SPLASH LUBRICATED	THERMAL PROTECTION	YES
AIR TANK STYLE	VERTICAL	SOUND LEVEL	85 dBA
Number of stages	1	INCLUDES	MANUAL DRAIN VALVE, OIL SIGHT GLASS, PRESSURE GAUGE, PRESSURE SAFETY VALVE
OUTPUT POWER	5 HP	CYLINDER MATERIAL	CAST IRON
FREE AIR FLOW RATE @ MAXIMUM PRESSURE	14.2 CFM	FINISH	POWDER COATED
MAXIMUM OPER. PRESSURE	135 PSI	ASME TANK	YES
AIR TANK SIZE	60 GAL	CONTROL TYPE	PRESSURE SWITCH
INPUT VOLTAGE	208-240V AC, 480V AC	ON PRESSURE SWITCH SETTING	105 PSI
PHASE	THREE	OFF PRESSURE SWITCH SETTING	140 PSI
FREQUENCY	60Hz	INLET SIZE	¾ IN
COMPRESSOR PACKAGE TYPE	BASE MODEL	OUTLET SIZE	¾ IN
PUMP STYLE	SIMPLEX	OUTLET TYPE	NPT
PUMP TYPE	RECIPROCATING	OUTLET GENDER	FEMALE
PUMP LOCATION	TOP MOUNT	OVERALL LENGTH	23 IN
PUMP OIL CAPACITY	40 FLOZ	OVERALL WIDTH	31 IN
MOTOR TYPE	OPEN DRIPPROOF	OVERALL HEIGHT	71 IN
CURRENT RATING	13.4 TO 13.2 A, 6.6 A	STANDARDS	ASME APPROVED, CSA, CALIFORNIA CODE 462(L)(2), UL LISTED, UL1450
MAXIMUM SPEED	950 RPM		

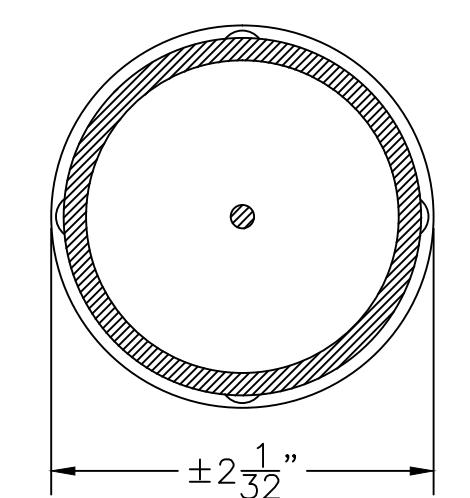


LOCKING COLLAR (BUSHING)  
PART NO. 8000158

SS CLOSURE CAP



SECTION A-A



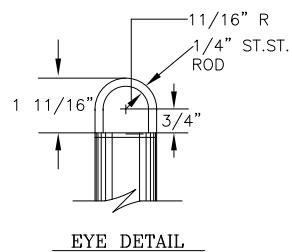
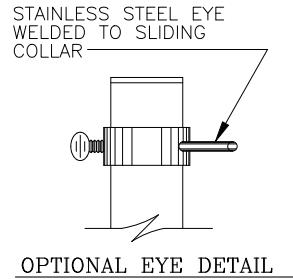
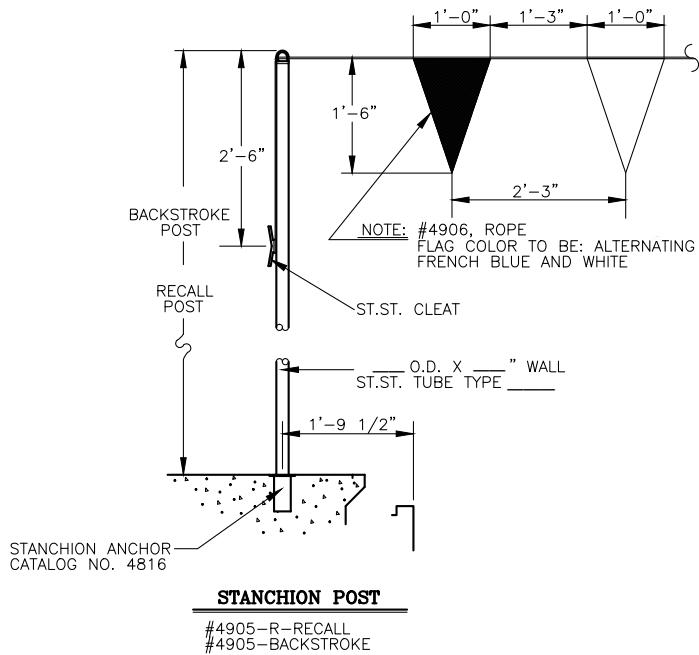
BOTTOM VIEW

STARTING PLATFORM ANCHOR CHANNEL ASSEMBLY	PART NO.	MODEL NO.	QTY
4909-A, E-Z SET II, SSC, ASM		4909S	
4911-A, STARTING, TRACK, ASM		4911S	
4912-A, FAST TRACK, ASM	9400154	4912	6
LOCKING COLLAR (BUSHING)	8000158	ALL MODELS	

CAP SLIP-IN FOR ANCHOR ASSEMBLY	PART NO.	MODEL NO.	QTY
SS CAP, SLIP-IN FOR ANCHOR ASM	8000162	ALL MODELS	



## Stanchion Post



Paddock's **Backstroke Posts and Recall Posts** are fabricated from Type 304 or 316L stainless steel tubing with outside diameter of 1.90" and standard wall thickness .083" (.120" and .145" are also available)

Each post is provided with an eyebolt at the top and a cleat for securing rope.

Posts are held by anchor sockets located in pool bottom and pool deck so they can be removed if necessary.

Standard height of backstroke post is 7 feet. Also available in other heights.

Standard height of recall post is 5 feet. Also available in other heights.

Sliding collar is optional.

P/N **9400181**, Model 4905-\_\_\_\_, Backstroke Post Height Required **8** FT **1.9**" OD x **.109**" Wall Type **316** Qty **4**

P/N \_\_\_\_\_, Model 4905R-\_\_\_\_, Recall Post Height Required \_\_\_\_\_ FT \_\_\_\_\_" OD x \_\_\_\_\_" Wall Type \_\_\_\_\_ Qty \_\_\_\_\_

P/N 9500043, Model 4905SC, Sliding Collar with Eyebolt Qty **4**

P/N \_\_\_\_\_, Model 4906, Backstroke Pennant Line, 48 Nylon Pennants per 100' Line Qty \_\_\_\_\_

# DECK EQUIPMENT

## Escutcheon

4  
8  
3  
7



The polished stainless steel round 1.90" escutcheon plates are used with mounting anchors.

Note: 4 1/2" diameter

### *Submittal Information:*

QTY: 28 Type: 316L

PN 200058

### *Additional Information*

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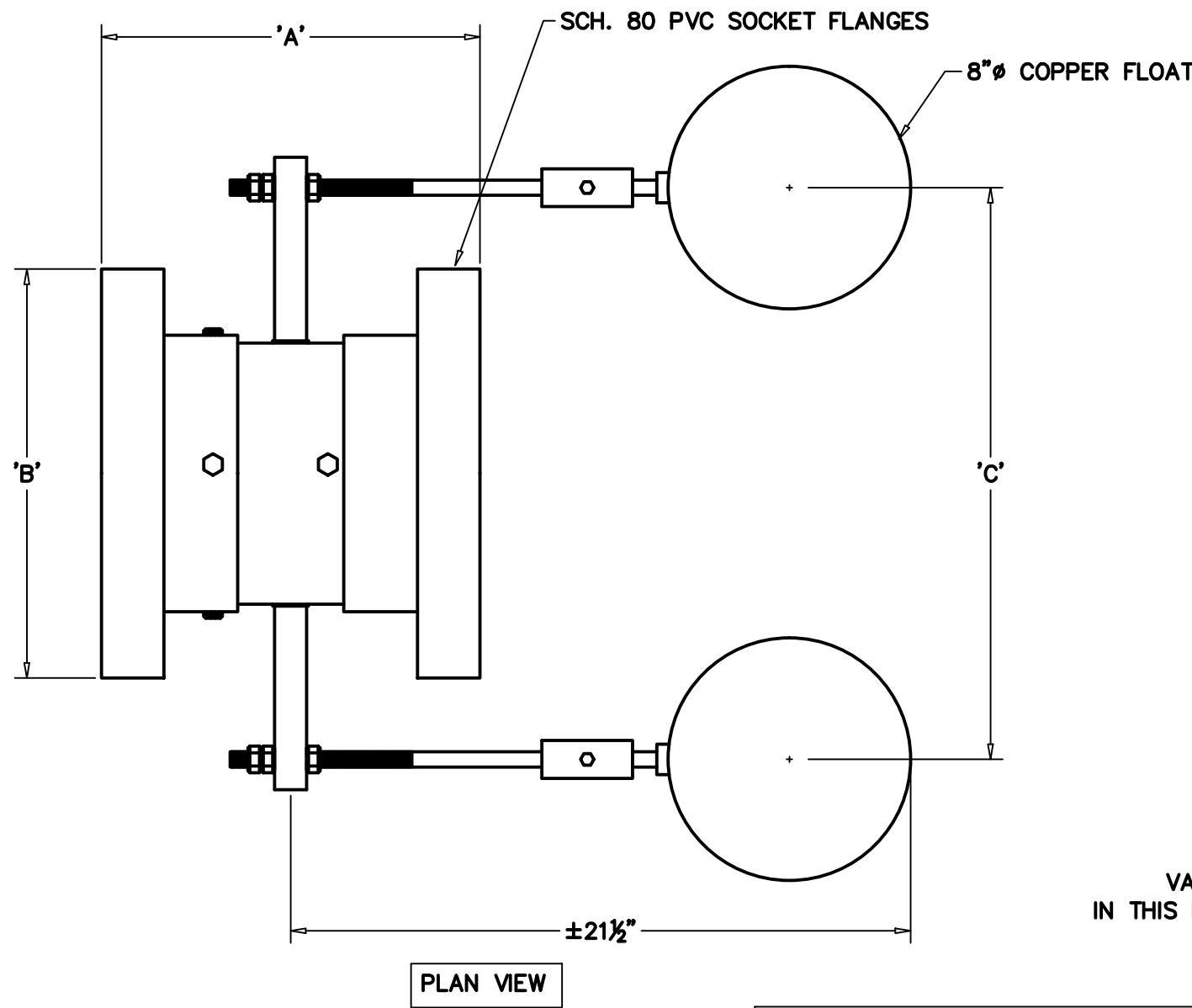


555 Paddock Parkway  
Rock Hill, SC 29730  
Ph: 803-324-1111  
Fx: 803-324-1116



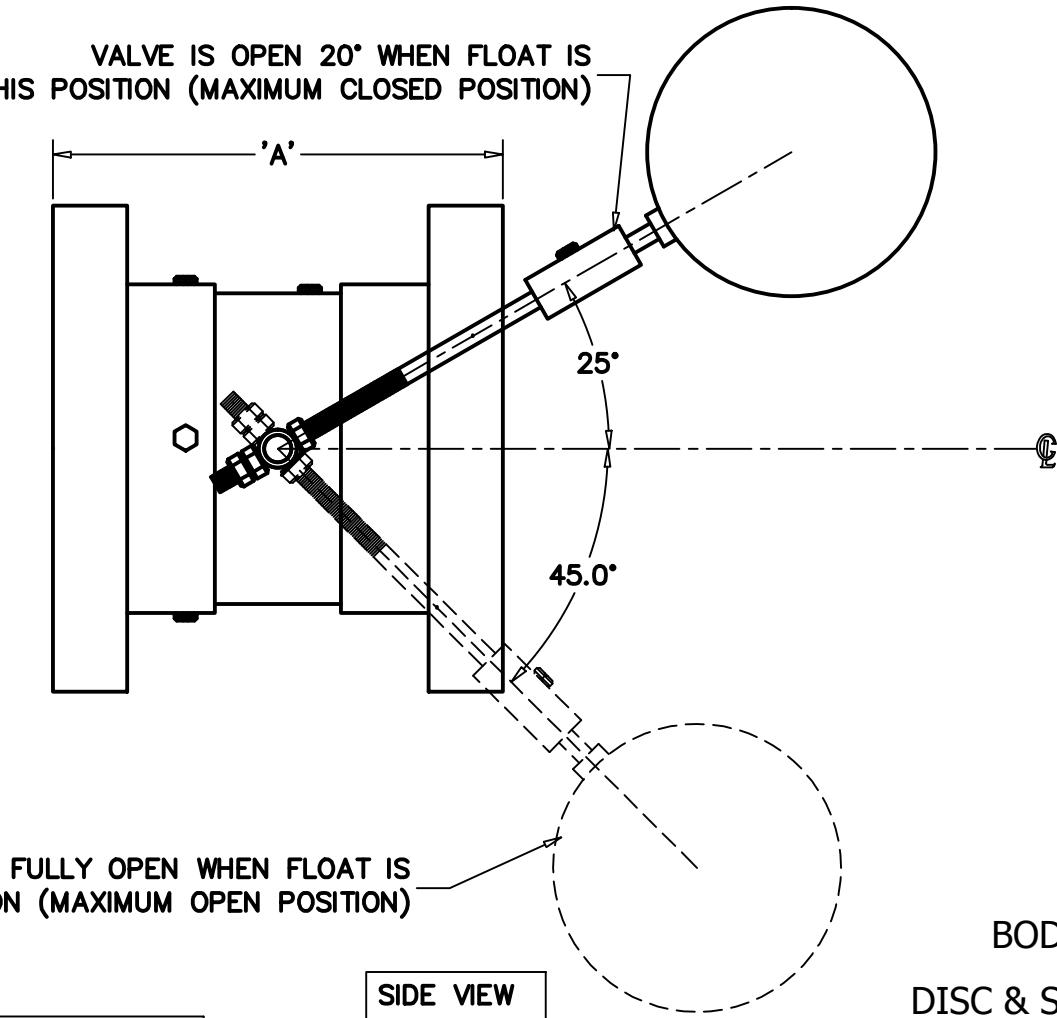
FILTER SYSTEM: Schenectady Central Park			QTY
REGENERATOR FILTER PPEC	700S		1
MAGMETER	SIGNET 2551 BLIND		1
AIR COMPRESSOR PN210021	4ME98, 60 GAL	5HP, 3 PHASE	1

DATE	REV	REVISIONS DESCRIPTION		BY



PLAN VIEW

VALVE IS OPEN 20° WHEN FLOAT IS  
IN THIS POSITION (MAXIMUM CLOSED POSITION)



VALVE IS FULLY OPEN WHEN FLOAT IS  
IN THIS POSITION (MAXIMUM OPEN POSITION)

SIDE VIEW

BODY - SCH 80 PVC  
DISC & SHAFT - T304 ST. ST.  
FLOAT ARMS - T304 ST. ST.  
FLOATS - COPPER

VALVE SIZE, PIPE,  
FLANGE, & FLOAT  
CENTER DISTANCE

PN #	QTY.	SIZE	A	B	C
9000150		3"	9 1/2"	7 1/2"	12 3/4"
9000151		4"	10"	9"	14 1/4"
9000152		6"	12 1/2"	11"	16 3/8"
9000153		8"	12 1/2"	13 1/2"	18 7/8"
9000154	1	10"	16 1/2"	16"	26"
9000155		12"	18"	19"	29"

555 Paddock Parkway  
Rock Hill, SC 29730  
Phone: (803)324-1111  
Fax: (803)324-1116  
email@paddockpool.com



DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE NOTED: X. ± 1/16      .X. ± .020 1/X ± 1/32      .XX. ± .010 X' ± 1/4"      .XXX ± .005			DESCRIPTION <b>3"-12" PVC FLOAT VALVE WITH DUAL FLOATS</b>			
JOB NAME <b>XXX</b>						
DRAWN	BY <b>TK</b>	DATE <b>3/26/07</b>	LOCATION <b>XXX</b>			
CHECKED			CUSTOMER <b>XXX</b>			
APPROVED			SCALE (UNLESS NOTED): NTS      SIZE <b>B</b> STD. DWG. NO. <b>XXX</b> SHEET <b>1</b> OF <b>1</b>			
MATL.:	CALC. WT.	QTY.	W.O. #	DWG. NO.		REV.
PVC	XXX	X	P-	XXX	XXX	0

## IP66

### Up to 22kW

- ✓ Outdoor rated
- ✓ Dust-tight
- ✓ Washdown ready

See [Page 5](#)



## Key Features

- ✓ Internal Category C1 EMC filter
- ✓ Internal PI control
- ✓ Internal brake chopper
- ✓ Dual analogue inputs
- ✓ Operates up to 50°C
- ✓ **Bluetooth®** connectivity
- ✓ Option for control of single phase motors (see [Page 8](#))

## Modbus RTU CAN

on-board as standard

## Internal Category C1 EMC Filter

An internal filter in every Optidrive E3 saves cost and time for installation.

Cat C1 according to EN61800-3:2004



# OPTIDRIVE™ E<sup>3</sup>

**IP66 Outdoor**

**Up to 22kW**

Outdoor rated enclosed drives for direct machine mounting, dust tight and ready for washdown duty



## Locally customisable

Flat front to terminal cover with mounting points for switches and an internal PCB.



Switched or non-switched

Conformal coating as standard



## Coated Heatsink as Standard

Ideal for hygiene based operations requiring washdown — such as food and beverage



### 1 2 x RJ45 ports

eliminate the need for a splitter.

### 2 Easily accessible EMC disconnect

### 3 Easy to wire

due to the large, accessible chamber and removable gland plate.

## IP66/Nema 4X outdoor rated

Built with tough polycarbonate plastics specifically chosen to withstand degradation by ultra violet (UV), greases, oils and acids. Also robust enough not to be brittle at -20°C.

## Dust-Tight Design

Install directly on your processing equipment and be sure of protection from dust and contaminants.

## Washdown Ready

With a sealed ABS enclosure and corrosion resistant heatsink, the Optidrive E3 IP66 is ideal for high-pressure washdown applications.

## Switched models

Simply wire up the drive, turn the inbuilt potentiometer and the motor will start running – allowing immediate energy savings.

Saving energy cannot be easier than this!

For ultimate ease of use



Local Speed Potentiometer

Run Reverse / Off / Run Forward Switch

Lockable Mains Disconnect / Isolator



# Application Macros

Switch modes at the touch of a button to optimise Optidrive E3 for your application

Single parameter application macro selection



## Industrial Mode

**Industrial Mode** optimises Optidrive E3 for load characteristics of typical industrial applications.

### Applications include:

- ✓ Conveyors
- ✓ Mixers
- ✓ Treadmills

**Sensorless Vector** provides high starting torque and excellent speed regulation

**IP20** panel mount units or  
**IP66** for direct machine mounting



Rapid parameter cloning using  
**OPTISTICK Smart**



## Pump Mode

**Pump Mode** makes energy efficient pump control easier than ever.

### Applications include:

- ✓ Dosing Pumps
- ✓ Borehole Pumps
- ✓ Transfer Pumps
- ✓ Swimming Pools
- ✓ Spas
- ✓ Fountains

- Constant or variable torque
- Internal PI control



## Fan Mode

**Fan Mode** (inc. fire operation) makes air handling a breeze, ideal for simple HVAC systems.

### Applications include:

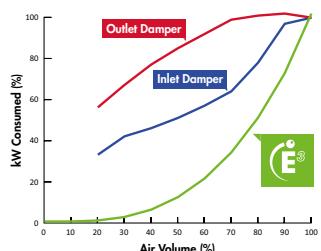
- ✓ Air Handling Units
- ✓ Ventilation Fans
- ✓ Circulating Fans
- ✓ Air Curtains
- ✓ Kitchen Extract



- High efficiency **variable torque** motor control
- Flying start capability
- Mains loss ride through
- PI control

## Instant Power Savings

The graph below shows the incredible efficiency of Optidrive E3 for controlling airflow compared to traditional damper control methods.



## Modbus RTU CAN

on-board as standard

## How much energy could you save?

Estimate potential energy savings, CO<sub>2</sub> emissions and financial savings for your application with the Invertek Drives Energy Savings Calculator app.



Download on the  
App Store

GET IT ON  
Google Play

[www.invertekdrives.com/calculator](http://www.invertekdrives.com/calculator)



# OPTIDRIVE™ E<sup>3</sup>

	kW	HP	Amps	Frame	Model Code	Product Family	Generation	Frame Size	Voltage Code	Output Current x 10	Supply Phases	EMC Filter	Breaker Monitor	Enclosure Option
110–115V±10% 1 Phase Input	0.37	0.5	2.3	1	ODE - 3 - 1 1 0023 - 1 0 1 #									
	0.75	1	4.3	1	ODE - 3 - 1 1 0043 - 1 0 1 #									
	1.1	1.5	5.8	2	ODE - 3 - 2 1 0058 - 1 0 4 #									
200–240V±10% 1 Phase Input	0.37	0.5	2.3	1	ODE - 3 - 1 2 0023 - 1 # 1 #									
	0.75	1	4.3	1	ODE - 3 - 1 2 0043 - 1 # 1 #									
	1.5	2	7	1	ODE - 3 - 1 2 0070 - 1 # 1 #									
	1.5	2	7	2	ODE - 3 - 2 2 0070 - 1 # 4 #									
	2.2	3	10.5	2	ODE - 3 - 2 2 0105 - 1 # 4 #									
	4	5	15.3	3	ODE - 3 - 3 2 0153 - 1 0 4 #									
200–240V±10% 3 Phase Input	0.37	0.5	2.3	1	ODE - 3 - 1 2 0023 - 3 0 1 #									
	0.75	1	4.3	1	ODE - 3 - 1 2 0043 - 3 0 1 #									
	1.5	2	7	1	ODE - 3 - 1 2 0070 - 3 0 1 #									
	1.5	2	7	2	ODE - 3 - 2 2 0070 - 3 # 4 #									
	2.2	3	10.5	2	ODE - 3 - 2 2 0105 - 3 # 4 #									
	4	5	18	3	ODE - 3 - 3 2 0180 - 3 # 4 #									
	5.5	7.5	24	3	ODE - 3 - 3 2 0240 - 3 # 4 #									
	7.5	10	30	4	ODE - 3 - 4 2 0300 - 3 # 4 #									
	11	15	46	4	ODE - 3 - 4 2 0460 - 3 # 4 #									
	15	20	61	5	ODE - 3 - 5 2 0610 - 3 F 4 2									
	18.5	25	72	5	ODE - 3 - 5 2 0720 - 3 F 4 2									
380–480V±10% 3 Phase Input	0.75	1	2.2	1	ODE - 3 - 1 4 0022 - 3 # 1 #									
	1.5	2	4.1	1	ODE - 3 - 1 4 0041 - 3 # 1 #									
	1.5	2	4.1	2	ODE - 3 - 2 4 0041 - 3 # 4 #									
	2.2	3	5.8	2	ODE - 3 - 2 4 0058 - 3 # 4 #									
	4	5	9.5	2	ODE - 3 - 2 4 0095 - 3 # 4 #									
	5.5	7.5	14	3	ODE - 3 - 3 4 0140 - 3 # 4 #									
	7.5	10	18	3	ODE - 3 - 3 4 0180 - 3 # 4 #									
	11	15	24	3	ODE - 3 - 3 4 0240 - 3 # 4 #									
	15	20	30	4	ODE - 3 - 4 4 0300 - 3 # 4 #									
	18.5	25	39	4	ODE - 3 - 4 4 0390 - 3 # 4 #									
	22	30	46	4	ODE - 3 - 4 4 0460 - 3 # 4 #									
	30	40	61	5	ODE - 3 - 5 4 0610 - 3 F 4 2									
	37	50	72	5	ODE - 3 - 5 4 0720 - 3 F 4 2									

Replace # in model code with colour-coded option

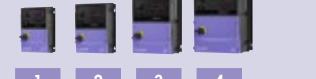
### Enclosure Types

<b>A</b>		<b>IP66</b> <b>Outdoor Use</b> Non-switched
<b>B</b>		<b>IP66</b> <b>Outdoor Use</b> Switched

### IP20

<b>2</b>		<b>IP20</b>
<b>F</b>		<b>Internal EMC Filter</b>
<b>0</b>		<b>No Internal EMC Filter</b>

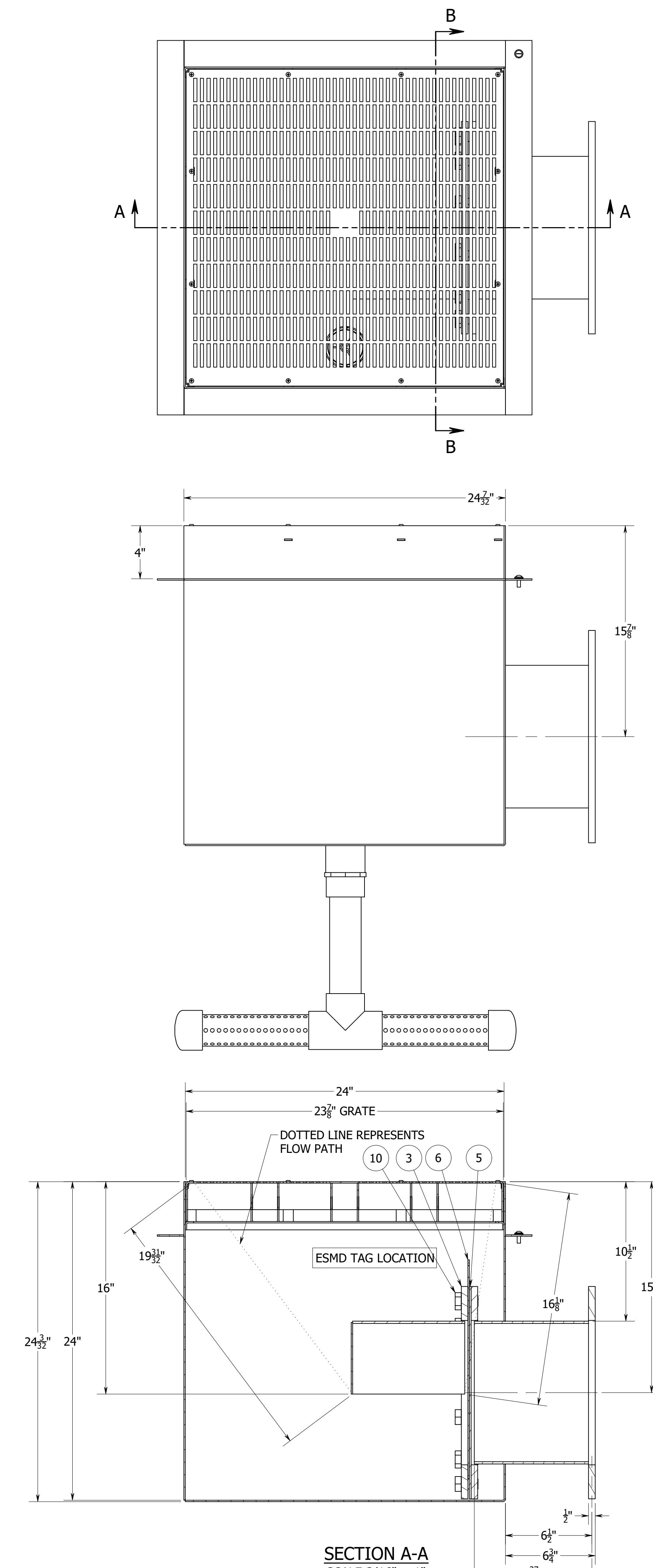
<b>IP20</b>	
<b>Size</b>	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b>
mm Height	173    221    261    420    486
mm Width	83    110    131    171    222
mm Depth	123    150    175    212    226
kg Weight	1.0    1.7    3.2    9.1    18.1
Fixings	4xM5    4xM5    4xM5    4xM8    4xM8

<b>IP66</b>	
<b>Size</b>	<b>1</b> <b>2</b> <b>3</b> <b>4</b>
mm Height	232    257    310    360
mm Width	161    188    210.5    240
mm Depth	162    182    238    275
kg Weight	2.5    3.5    7.0    9.5
Fixings	4xM4    4xM4    4xM4    4xM4

## Drive Specification

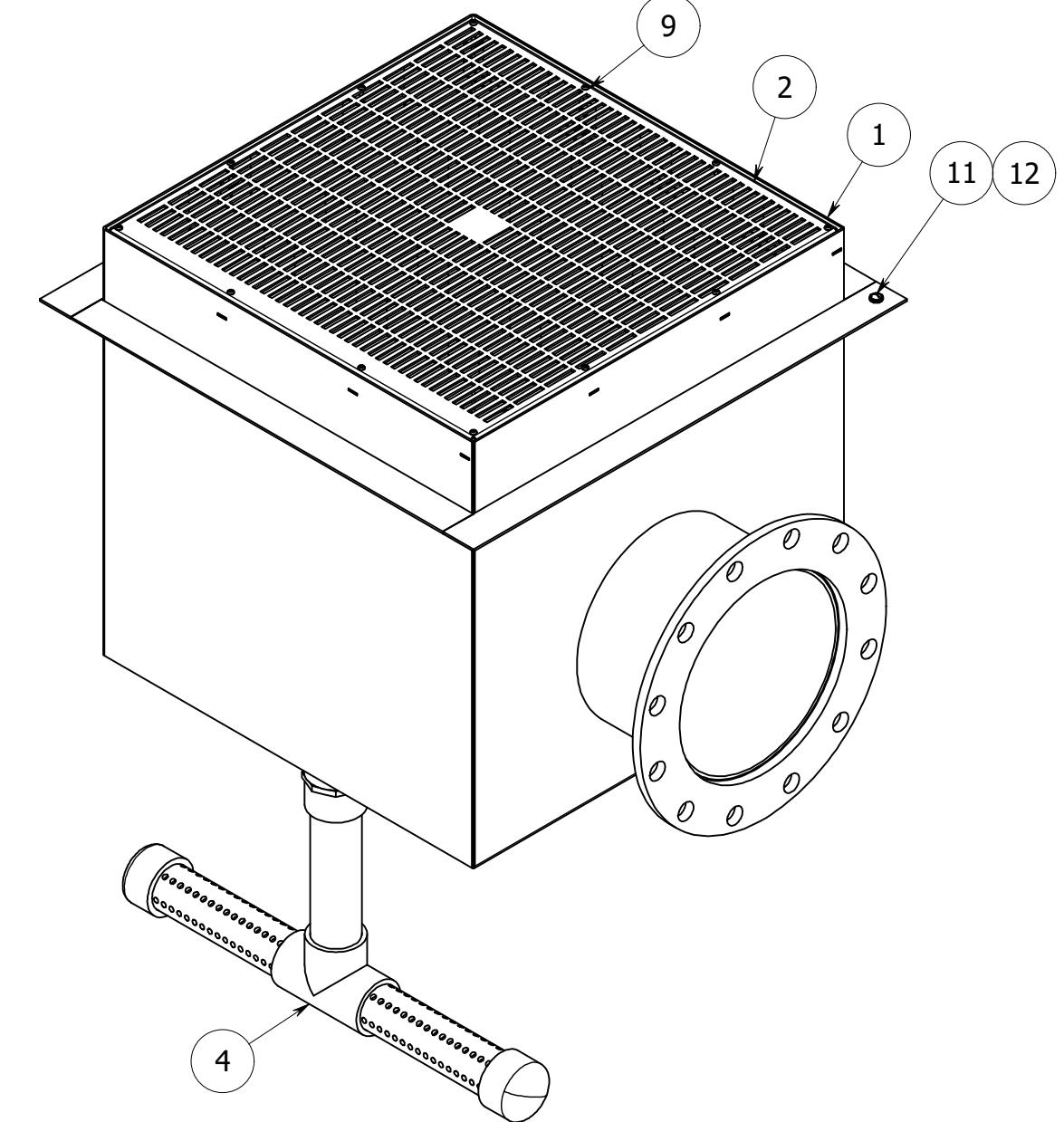
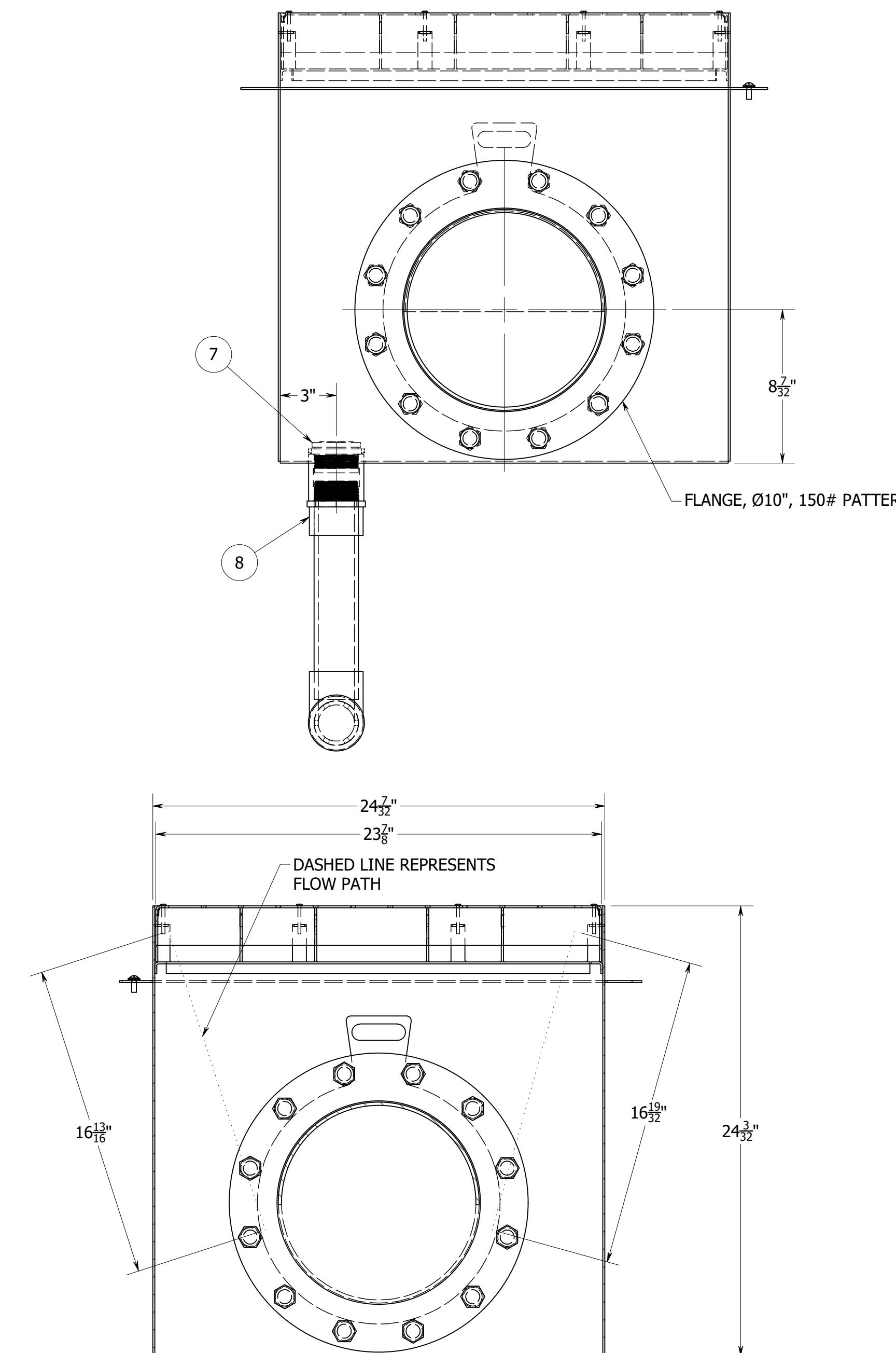
<b>Input Ratings</b>	Supply Voltage 110 – 115V ± 10% 200 – 240V ± 10% 380 – 480V ± 10%	Programming Keypad Display PC	I/O Specification Power Supply Programmable Inputs Digital Inputs Analog Inputs Programmable Outputs Relay Outputs Analog Outputs Application Features Fire Mode Maintenance & Diagnostics Standards Compliance
<b>Output Ratings</b>	Output Power 110V 1 Ph Input: 0.5–1.5HP [230V 3 Ph Output] 230V 1 Ph Input: 0.37–4kW [0.5–5HP] 230V 3 Ph Input: 0.37–11kW [0.5–15HP] 400V 3 Ph Input: 0.75–22kW 460V 3 Ph Input: 1–30HP	Control Specification Control Method PWM Frequency Stopping Mode Braking Skip Frequency	Fault Memory Data Logging Monitoring
Ambient Conditions	Temperature Storage: -40 to 60°C Operating: -20 to 50°C	Setpoint Control Analog Signal Digital	Low Voltage Directive EMC Directive Machinery Directive Conformance
Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL approved Up to 4000m maximum (non UL)	Fieldbus Built-in Modbus RTU	Adjustable speed electrical power drive systems. EMC requirements 2014/30/EU Cat C1 according to EN61800-3:2004 2006/42/EC CE, UL, RCM
Humidity	95% Max, non condensing	CANopen 125–1000 kbps	
Vibration	Conforms to EN61800-5-1	Modbus RTU 9.6–115.2 kbps selectable	
Enclosure	Ingress Protection IP20, IP66		

**QTY: 2 - Lap Pool  
Area A**



PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	ESMD-2424-10-1.01-R0
2	1	FC-2424.01-R1
3	1	AVRD-10.01-R0
4	1	HSRL-01
5	1	P2104-100x02.11-R0
6	1	BP10-304
7	1	SP1056
8	1	ADPTR-0200MPTx0200SOC.08-R0
9	12	PHMP-#08Cx0108-316
10	12	HHMB-075Cx0104-316
11	1	RHMSL-025Cx0012-BR
12	2	FW-025-BR

REVISION HISTORY  
DO NOT SCALE DRAWING  
TOLERANCE UNLESS OTHERWISE NOTED:  
X ± 1/16" X ± 0.020"  
1/8 ± 1/32" XX ± 0.010"  
X ± 1/4" XXX ± 0.005"  
SPEC. NO.: MD-304-2424FC-2424-10-1-R0  
DRAWN BY PTT DATE 02/25/22  
CHECKED BY DATE 02/28/22  
APPROVED BY DATE 11/07/22  
DWG. NO. SHEET # 1 OF 1



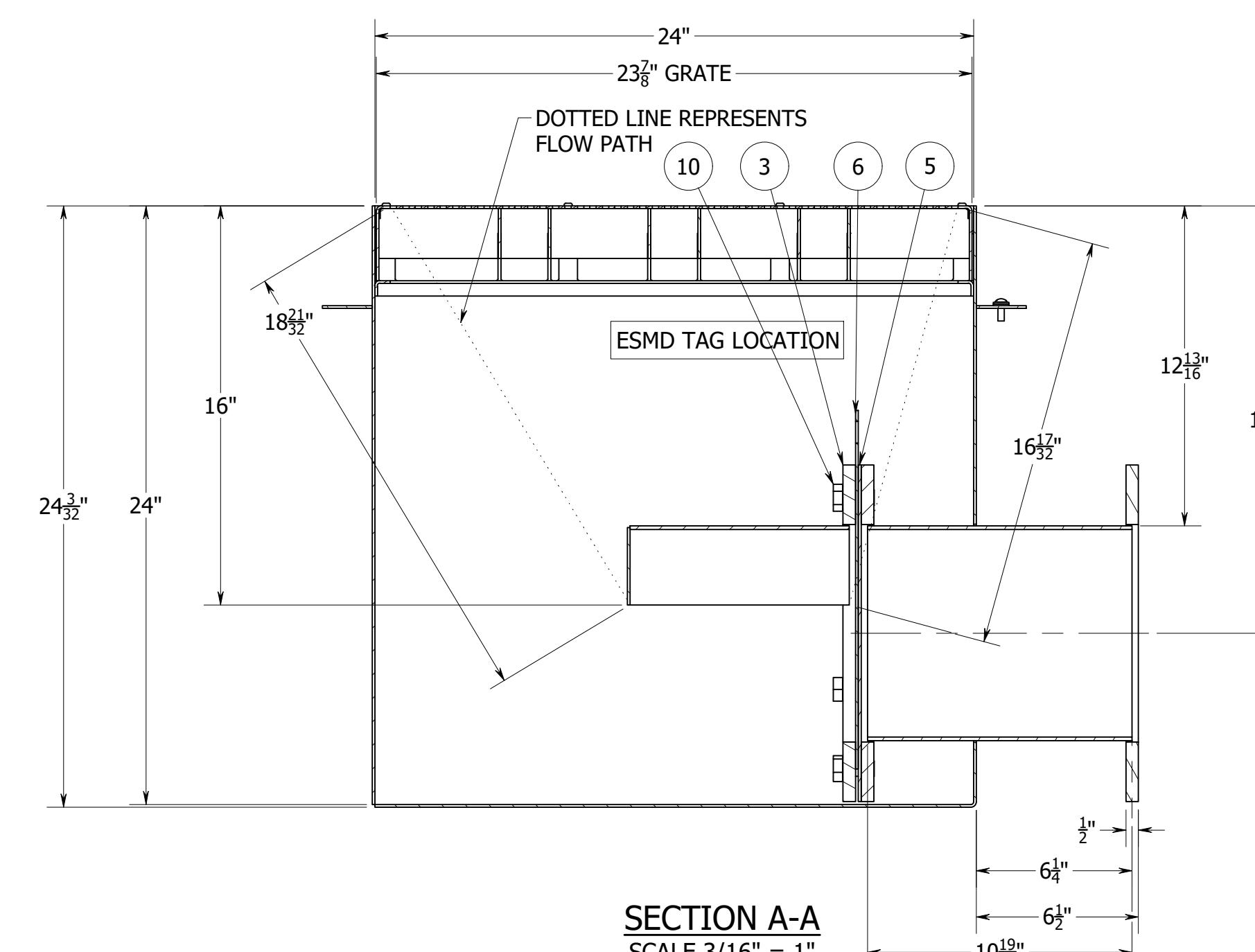
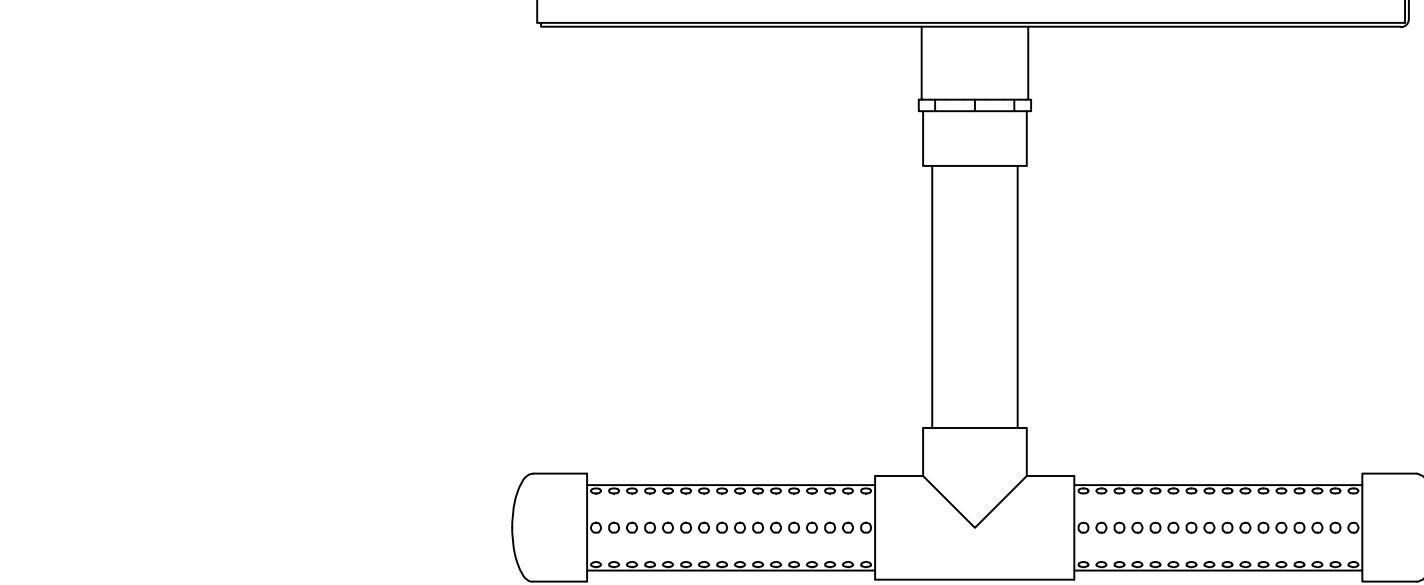
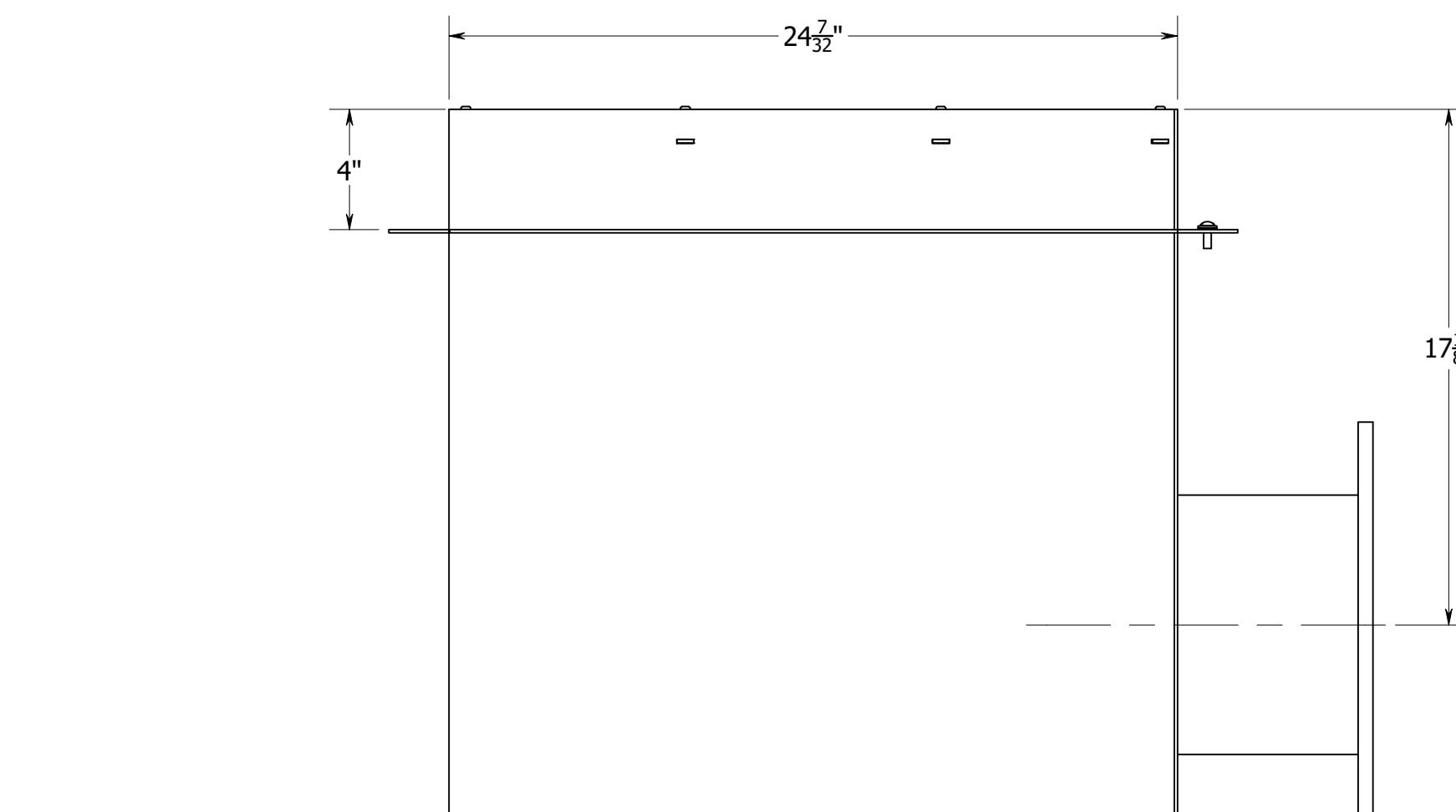
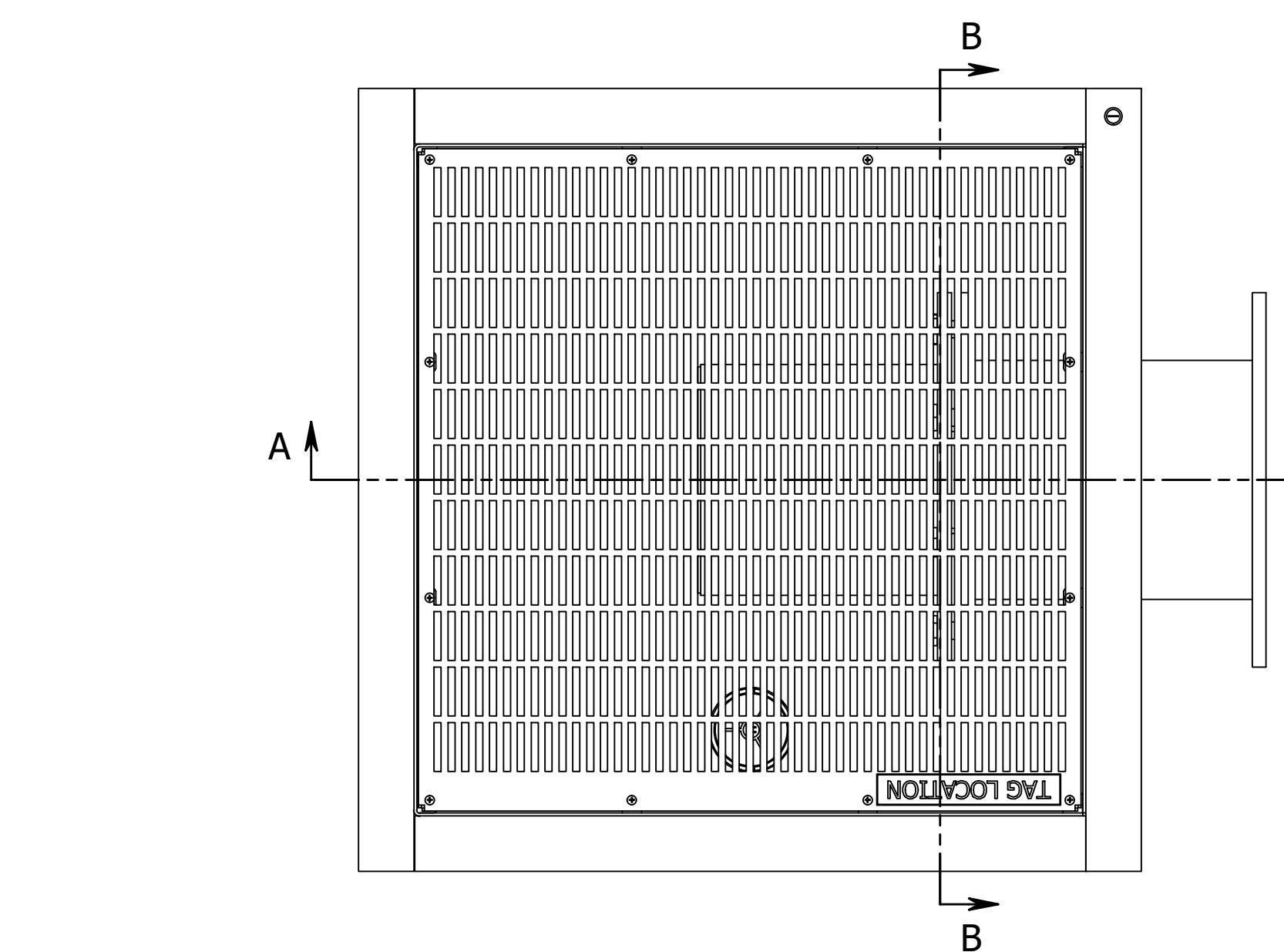
2424 PCFC STAINLESS STEEL FRAME AND GRATE IN 24x24 SUMP					
VELOCITY (FT/SEC)	OPEN AREA (IN²)	MAX FLOW (GPM)	TOTAL QTY	TOTAL OPEN AREA (IN²)	TOTAL MAX FLOW (GPM)
1.39	212.89	920	1	212.89	920
1.0	212.89	663.55	1	212.89	663.55
0.5	212.89	331.78	1	212.89	331.78

NSF MAXIMUM SAFE FLOW RATE OF ONE (1) 2424PCFC EQUALS 920GPM  
\* THE NSF SAFETY FLOW IS THE MAXIMUM FLOW MEETING THE ANSI/APSP/ICC-16 2017 REQUIREMENTS. THE RECOMMENDED MAXIMUM DESIGN FLOW IS BASED ON A VELOCITY THAT DOES NOT EXCEED 1.39 FT/SEC. PADDOCK CERTIFIED COVERS & GRATES COMPLY WITH BODY BLOCKING ELEMENT TEST PER ANSI/APSP/ICC-16 2017

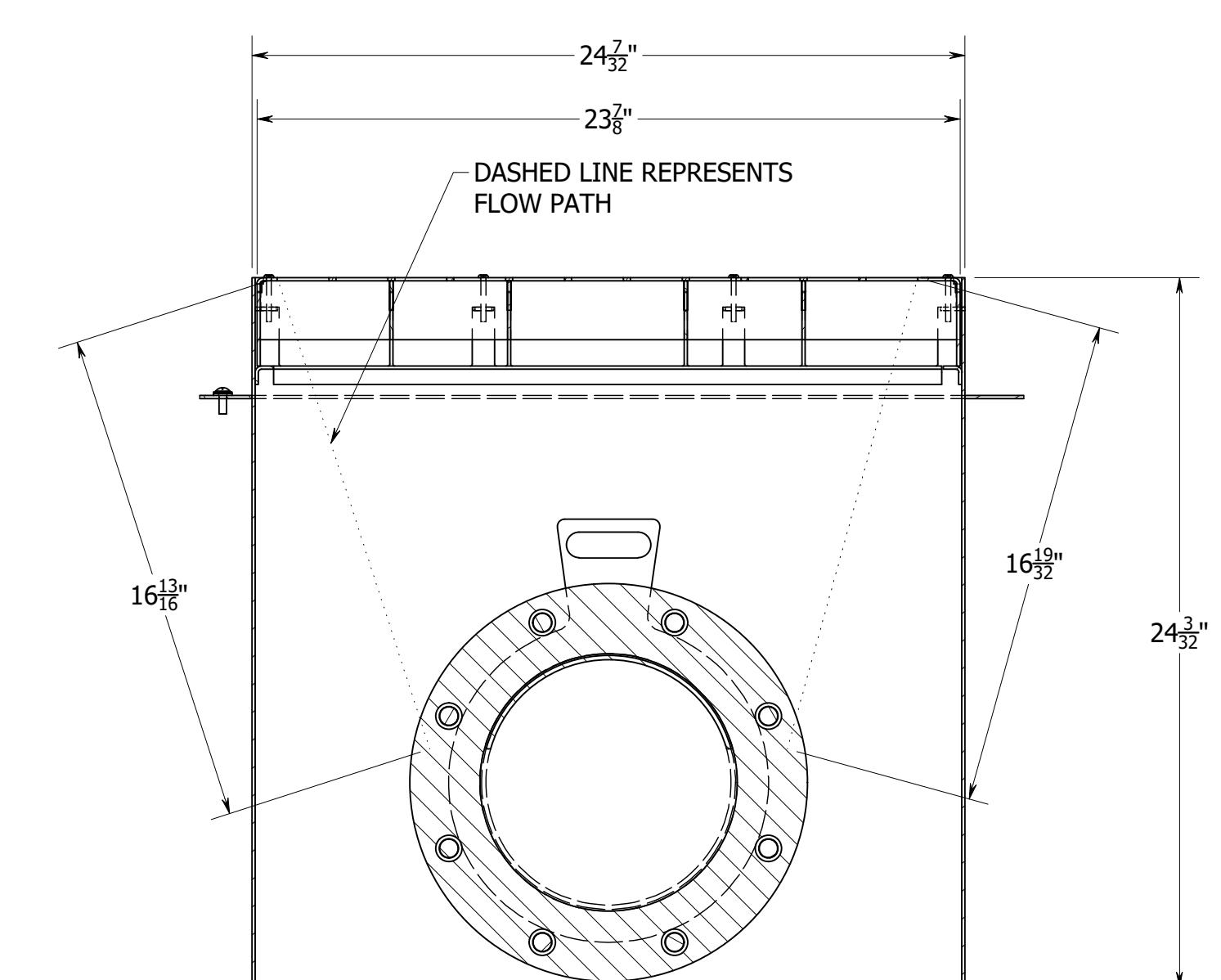
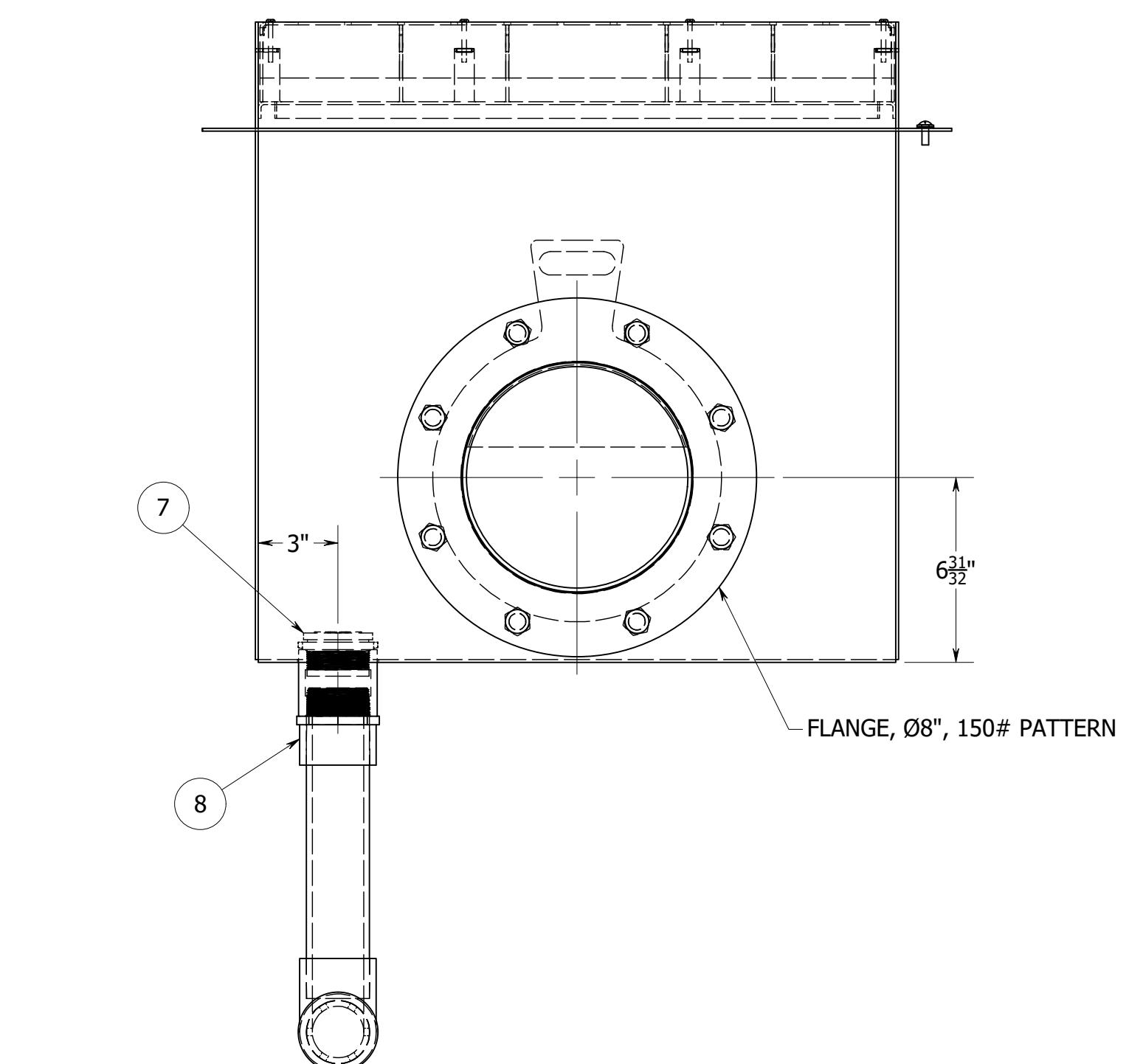


NSF/ANSI/CAN 50 &  
ANSI/APSP - 16

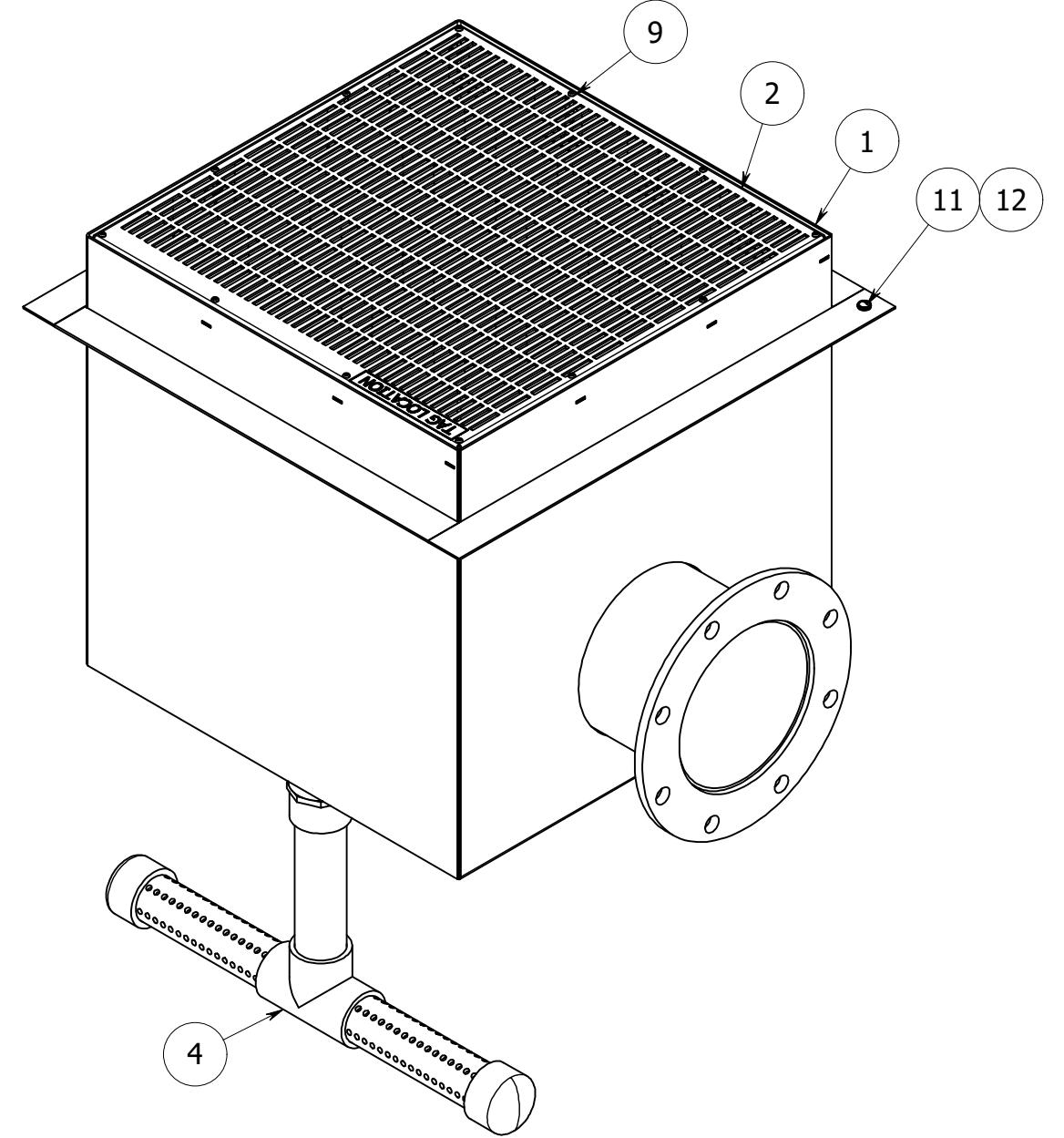
**PART NUMBER: 9300007**



**QTY:2 - Leisure Pool  
Area B**



ITEM	QTY	PART NUMBER	DESCRIPTION	COMMENTS
1	1	ESMD-2424-8-1	WELDMENT, 24" X 24" ESMD, (1) 8" CONNECTION	304L SS
2	1	FC-2424	WELDMENT, 24" X 24" FLAT MD COVER	304L SS
3	1	AVRD-08	WELDMENT, 8" AVRD FOR 24" X 24"	304L SS
4	1	HSRL-01	SHOP ASSEMBLY, HYDROSTATIC RELIEF FOR MAIN DRAIN BOXES	PVC
5	1	P2104-080x02.11-R0	GASKET, Ø8", 150# PATTERN, PL 1/8" x Ø13 1/2"	NEO
6	1	BP08-304	BLANKING PLATE, PL12GA x 14 3/8" x 10 7/8"	304L SS
7	1	SP1056	CYC HYDRO RELIEF VALVE, 1.5IN/2IN - ABS WHITE	CYCOLAC/HAYWARD
8	1	ADPTR-0200MPTx0200SOC.08-R0	2" MALE ADAPTER SOCKET	PVC
9	12	PHMP-#08Cx0108-316	PAN HEAD PHILLIPS SCREW, TORQUE RATING 19.8 INCH LBS, #8-32 X 1 1/2"	316 SS
10	8	HHMB-063Cx0104-316	HEX HEAD BOLT, 5/8"-11 X 1 1/4"	316 SS
11	1	RHMSL-025Cx0012-BR	ROUND HEAD SLOT MACHINE SCREW, 1/4"-20 X 3/4"	BRONZE
12	2	FW-025-BR	FLAT WASHER, Ø1/4"	BRONZE



**PART NUMBER: 9300006**

0	02/28/22	PTT	ORIGINAL ISSUE
REV	DATE	BY	DESCRIPTION
<b>REVISION HISTORY</b>			
DO NOT SCALE DRAWING			
TOLERANCE UNLESS OTHERWISE NOTED: X ± 1/16" X ± 0.020" 1/X ± 1/32" XX ± 0.010" X ± 1/4" XXX ± 0.005"			
DESCRIPTION 24" X 24" MAIN DRAIN W/ (1) 24" X 24" FLAT COVER & (1) Ø8" CONN.			
DRAWN BY	DATE	SPEC JOB NUMBER:	
PTT	02/25/22		
CHECKED	APPROVED	DWG. NO.	MD-304-2424FC-2424-8-1
APPROVED		SHEET #	1 OF 1



# PADDOCK

EMPLOYEE OWNED SINCE 2019

## PPEC REGENERATOR FILTER COMPONENTS

Included in Regenerator Pkg

Item	Name
R1	PPEC Regenerator Filter
R2	Pneumatic On-Stream Valve
R3	Pneumatic Precoat Valve
R4	Precoat Fill Valve
R5	Flow Meter
R6	Control Panel
R7	Bump Assembly
R8	Vacuum Transfer Pump
R9	Drain Valve

Optional Filter Accessories

F10	Check Valve
F11	Valve
F12	Strainer
F13	Reducing Precoat Tee
F14	Pump (not by PPEC)
F15	Reducer
F16	Air Compressor
F17	Auto Air Bleed
F18	Receiver Tank
F19	Air Dryer
F20	Air Line
F21	VFD
F22	Air Bleed (not by PPEC)



# REGENERATOR FILTER SCHEMATIC

#### Drain Requirements:

- Gravity drainage of filter is needed to properly waste heavily laden media.
- Slop drainage pipe away from filter, terminating in an open sump/sewer connection. (Check local codes for air-break requirements and media discharge containment.)
- Filter drainage rate is controlled at approximately 50 GPM. Ideally, drainage plumbing should be designed for 500 GPM, providing adequate run-off capacity in case of operator error.
- If sewer is higher than the filter drain, a gravity sump with a sump pump to lift the waste the sewer is required. Match sump to filter volume notated on attached chart.

#### Electrical Requirements:

- The Control Panel requires a dedicated 120V 20-amp circuit.
- VFD - 2 pairs of 22/4 or 18/4 shielded wire for interface (single conduit)
- UV System, Chemical Controller, Heater, Dehumidification - 22/4 or 18/4 shielded wire for interface (single conduit per unit)
- Flow Meter - 22/4 or 18/4 shielded wire from meter to MOD1 control box(single conduit)
- All panel penetrations should be made on the sides or bottom of panel.
- The filter & all other equipment need to be bonded.

#### Filter Location:

- Side clearance of three feet should be provided around the filter to allow for operator access.
- Minimum clearance over the filter is 13", more clearance improves service access.
- Provide a mount point(one-ton minimum safe load) above the filter to facilitate head removal.
- Typical clearance underneath the filter (measured from face of drain flange to floor) is 14".

#### Flow Meter Installation Location:

- The flow meter should be installed on the straight run of pipe into the influent connection between the pump and the filter (allows flow to be monitored through the pre-coat & on-stream cycles).
- The flow meter requires a distance of 20x the pipe diameter before and 5x the pipe diameter after.

#### Air Supply:

- The PPEC Regenerative filters require a continuous supply of dry 80 PSI air to operate 2 pneumatic valves & a pneumatic "bump" mechanism.
- Multiple filters may require multiple compressors/receivers.
- Air lines should be Ø3/4" braided 300 PSI hose or ¼" copper.
- Do not heat fittings within 2' of filter connection, direct heat can damage regulator components.
- An air dryer may be installed and plumbed between the air supply and the filter. This will help pull any remaining moisture out before it reaches the filter. By-Pass valve to be provided with dryer.

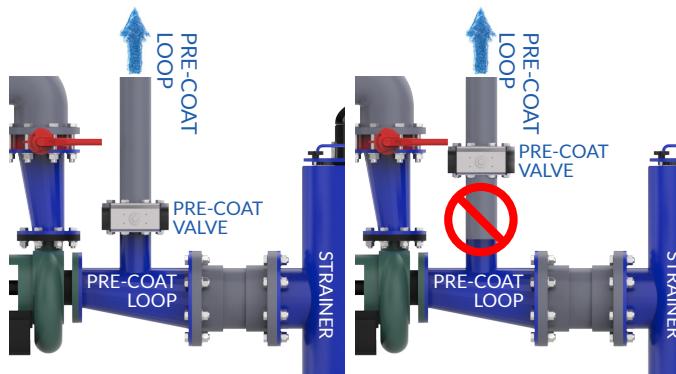
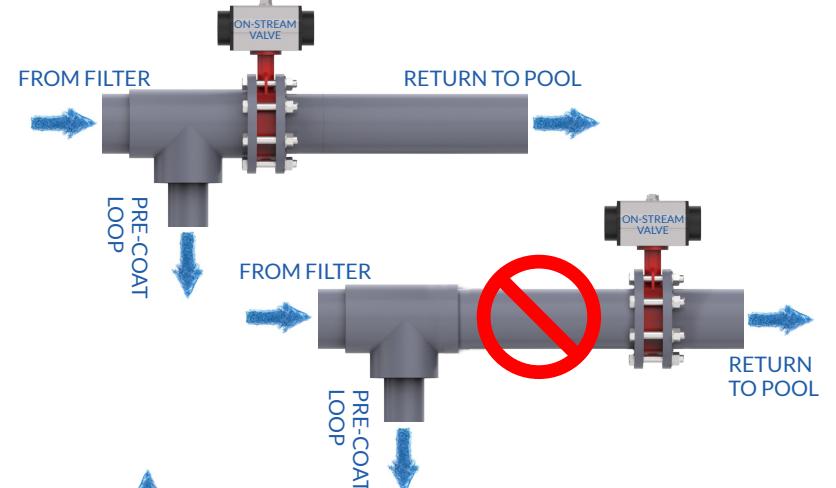


#### Plumbing Design Guidelines:

- The PPEC Regenerator filters will operate efficiently above or below pool level. A check valve is needed either in front of the pump strainer or between the pump strainer & pre-coat tee. If the pump is below water level a check valve is suggested above the pump discharge as well.
- Efficient filter operation requires a minimum 5' straight run of pipe going into the influent connection. Refer to flow meter location for more information.
- Reduce the number of fittings and plane changes between the pump discharge and the filter.
- Use sweeping 90's or two 45's to decrease turbulence if 5' straight run is not possible.
- Any increase or reduction in piping size should be done as close to the pump discharge as possible.

#### On-Stream Valve Location:

- Locate valve actuator to allow operator to view valve status, do not mount below pipe.
- Install On-Stream Valve with a spigot flange to decrease the area prior to the valve to prevent media build-up. This reduces media returning to the pool.



#### Pre-coat Valve Location:

- The pre-coat valve should be installed as close as possible to the pre-coat tee between the pump and strainer. If this is not done, the resulting entrained air can be pushed into the filter and cause media separation which will result in media getting into the pool.
- The pre-coat line and valve are one significant pipe size smaller than the filter connections.

#### Filter Media Selection:

- Regenerators are NSF approved for diatomaceous earth (DE)\* or perlite filter media.
- PPEC provides PF-60 perlite media

\*PPEC's preferred media

#### Air Lines to Valves:

- Pneumatic valves should be connected to their respective control solenoid located on the right side of the filter control mounting bracket (top is on-stream, bottom of pre-coat) using ¼" x 0.04" wall nylon or poly tubing.
- Speed control set screws for valves are located on the front of the solenoid, adjust to a 3-5 sec open & closure rate.

#### High Vent Air Bleed:

- Must be installed at the highest point in the return line between filter effluent & the on-stream valve to prevent entrained air from re-circulation.
- If the air bleed is improperly installed it could result in decreased filter performance.



Model #	Width (inches) "A"	Overall & Shipping Height (inches) "B"	Tank Influent Connection (inches) "C"	Max Design Filtration Rate (GPM/ft <sup>2</sup> )**	Effective Filtration (Area/sq.ft.)	Design Flow Range (gpm)	Tank Volume (gals)	PreCoat Perlite (lbs)	PreCoat (+) DE (lbs)	Operating Weight (lbs)	Shipping Weight (lbs)	Drain Connection (Nom. Pipe Size)	Tank Connection (Nom. Pipe Size)	Minimum Sump Size (gals)	Compressor / Receiver Tank Sizes (gals)
PPEC 225S	27.00	86.75	24.00	1.60	208.7	212-335	129	26	50	1500	1025	4	4	100	60 / N/A
PPEC 350S	33.00	88.25	24.44	1.60	351.2	337-565	244	41	79	2600	1300	4	6	165	60 / N/A
PPEC 500S	39.50	92.48	25.88	1.60	519.4	528-835	291	65.5	126	4250	1750	4	6	225	60 / N/A
PPEC 700S	45.00	96.69	28.25	1.60	707.3	719-1138	396	82	158	4800	2200	4	8	390	60 / N/A
PPEC 900S	50.63	104.19	30.13	1.60	819.0	819-1310	496	95	190	6000	2750	4	8	446	60 / N/A
PPEC 1275	51.00	103.63	30.81	1.60	935.8	950-1505	525	109	210	6500	3100	4	8	670	60 / 30
PPEC 1400S	58.63	107.69	32.63	1.60	1141.0	1141-1825	721	135	260	9900	4100	4	10	810	60 / 30
PPEC 2100	63.50	116.49	34.19	1.60	1538.8	1560-2490	890	182	350	11600	5800	4	10	960	60 / 30

\*\*Contact manufacturer for assistance in proper plumbing layout.

(+) Preferred Media

# REGENERATOR DESIGN BEST PRACTICES

# PADDOCK DEMINERALIZING COMPOUND

## Paddock Regenerator™ Environmental Regenerative Filter



## PADDOCK DEGREASING CONCENTRATE

## Paddock Regenerator™ Environmental Regenerative Filter



### PRECAUTIONARY INFORMATION

Avoid contact with eyes or skin. The use of safety goggles, rubber gloves and dust mask is recommended when handling this product.

#### CONTAINS

Citric Acid  
Methyl Red Hydrochloride

#### CAS #

77-92-9  
439-52-7

**EYES:** Do not wear contact lenses when working with this material. Flush immediately with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of entire eye surface.  
SEEK MEDICAL ATTENTION IMMEDIATELY.

**SKIN:** Wash with soap and water. If irritation develops, SEEK MEDICAL ATTENTION IMMEDIATELY.

**INGESTION:** If swallowed, induce vomiting by sticking finger down throat. Drink large quantities of water. NEVER give anything by mouth to an unconscious person.  
SEEK MEDICAL ATTENTION IMMEDIATELY.

For Technical Support call 1-800-849-2729

**NET CONTENTS: 50 LBS.**

### PRECAUTIONARY INFORMATION

Avoid contact with eyes or skin. The use of safety goggles, and rubber gloves is recommended when handling this product.

#### CONTAINS

Sodium Metasilicate  
Sodium Carbonate  
Ethoxylated Alcohols, C9-C11  
Na-A-Zeolite

#### CAS #

6834-92-0  
497-19-8  
68439-46-3  
68989-22-0

**EYES:** Flush immediately with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of entire eye surface.  
SEEK MEDICAL ATTENTION IMMEDIATELY.

**SKIN:** Wash with water. If irritation develops, SEEK MEDICAL ATTENTION IMMEDIATELY.

**INGESTION:** If swallowed, DO NOT induce vomiting. Drink large quantities of water. If available, drink several glasses of milk. NEVER give anything by mouth to an unconscious person. SEEK MEDICAL ATTENTION IMMEDIATELY.

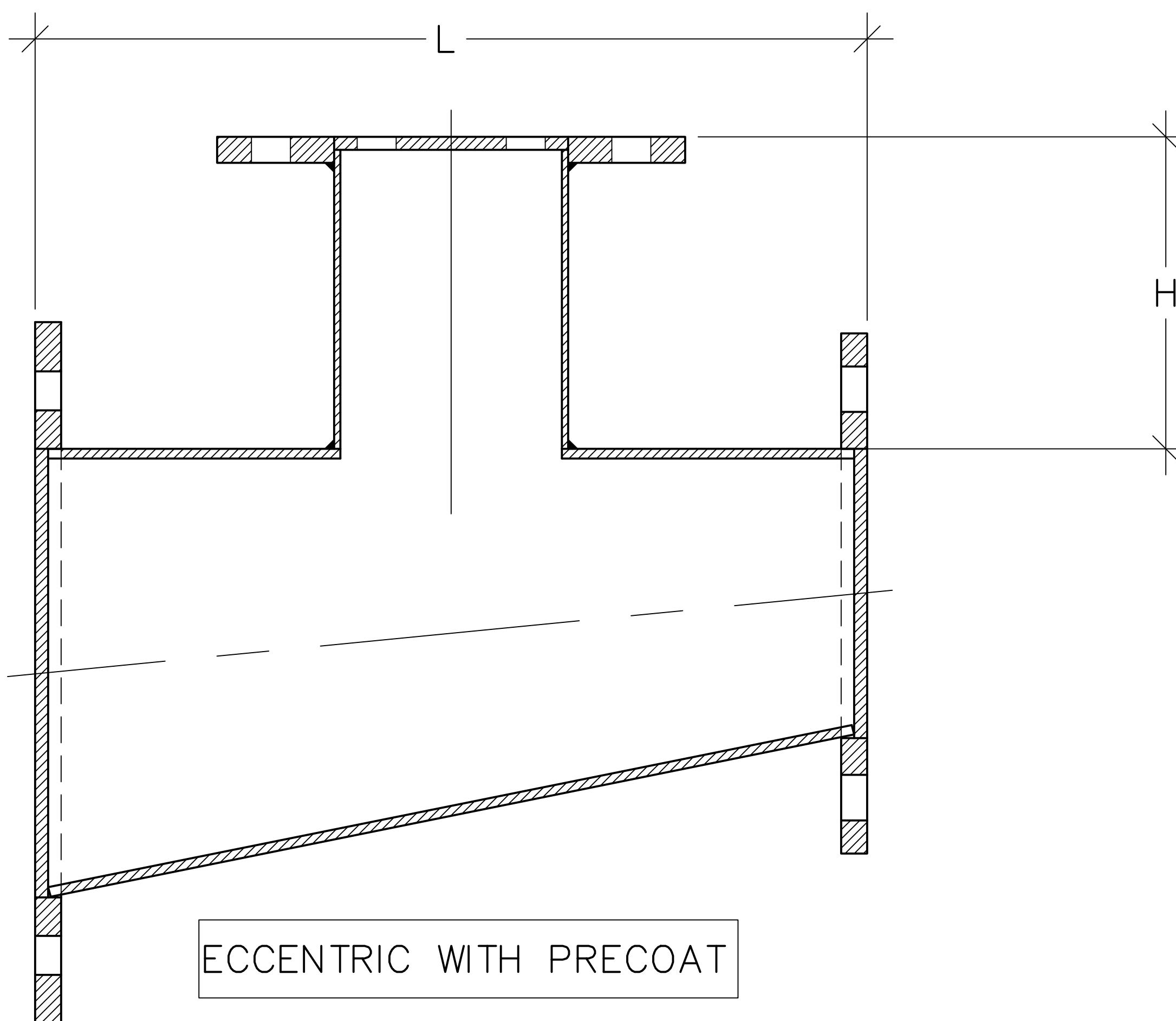
For Technical Support call 1-800-849-2729

**NET CONTENTS: 50 LBS.**

# STAINLESS STEEL FLANGED REDUCERS WITH PRECOAT CONNECTION

REDUCER FLANGES MEET ANSI STANDARD 125# FLANGE DRILLING

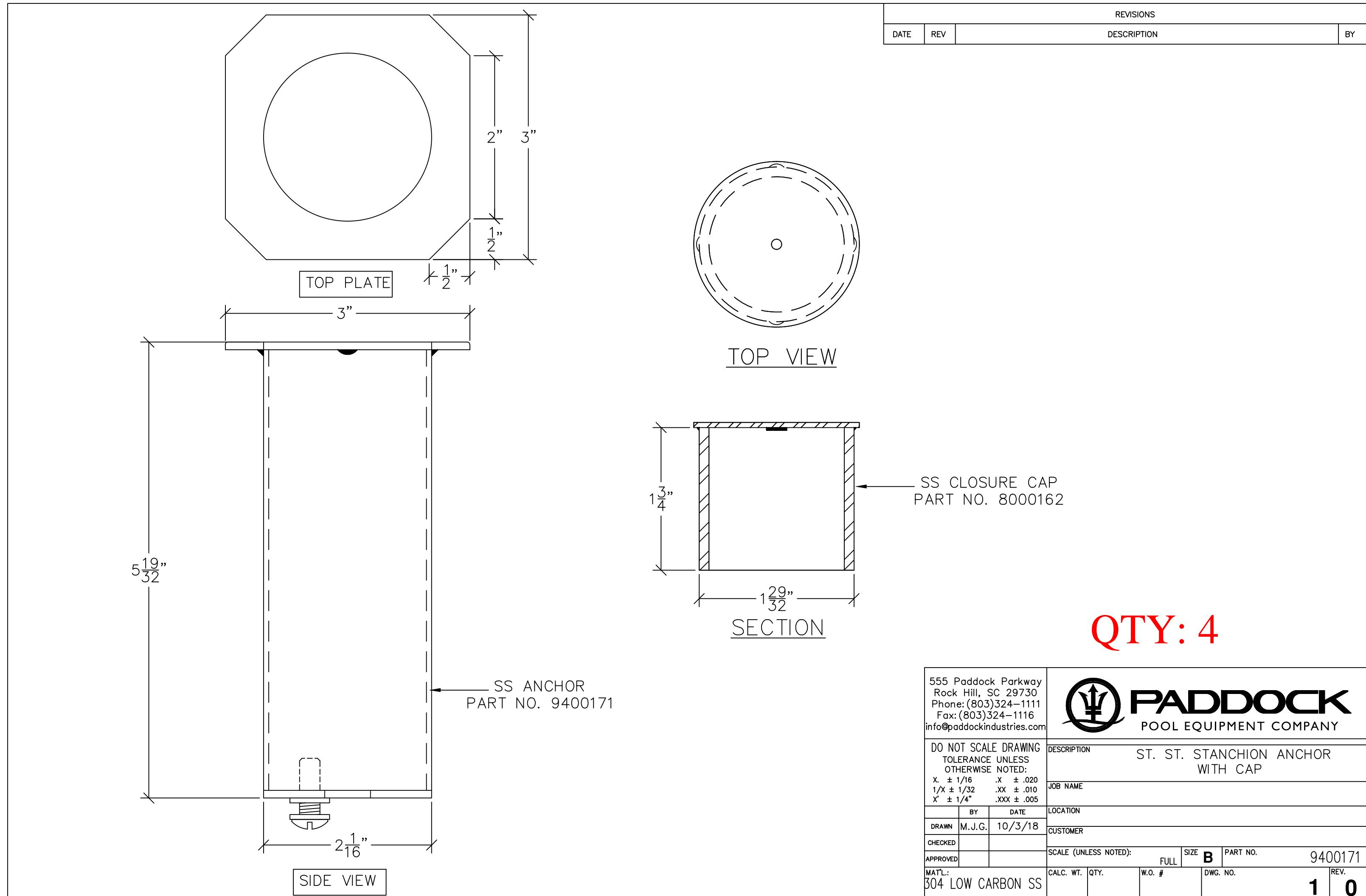
Paddock Pool Equipment Co.  
555 Paddock Parkway  
Rock Hill SC 29730

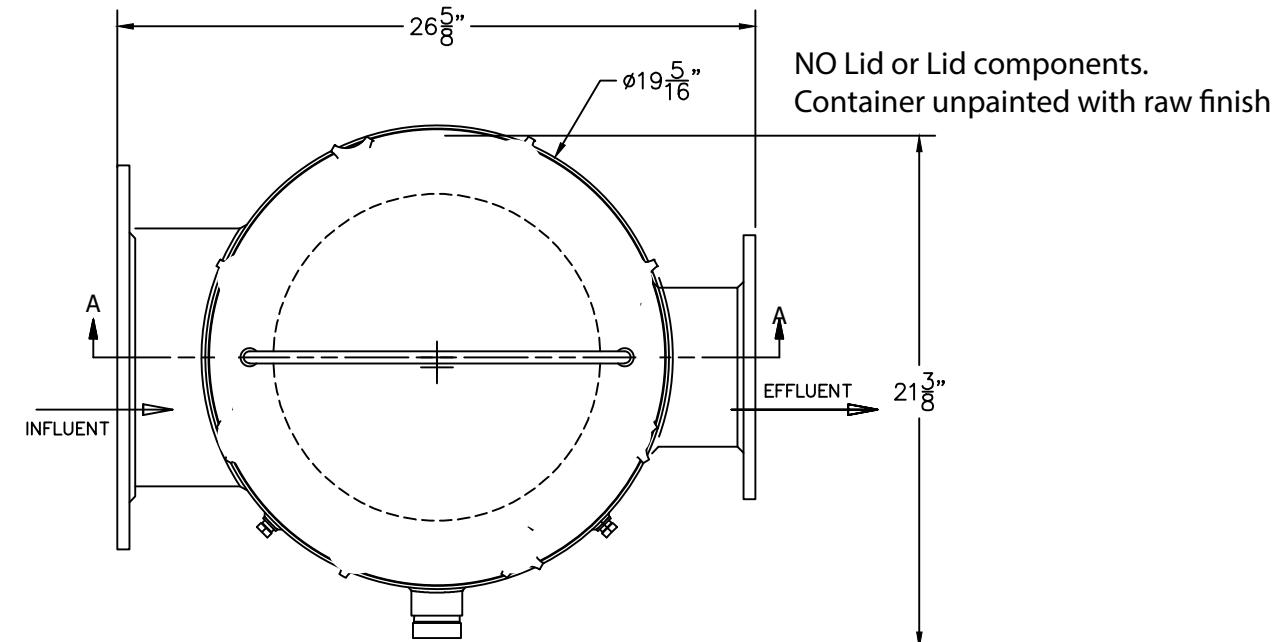


## ECCENTRIC REDUCERS W/PRECOAT

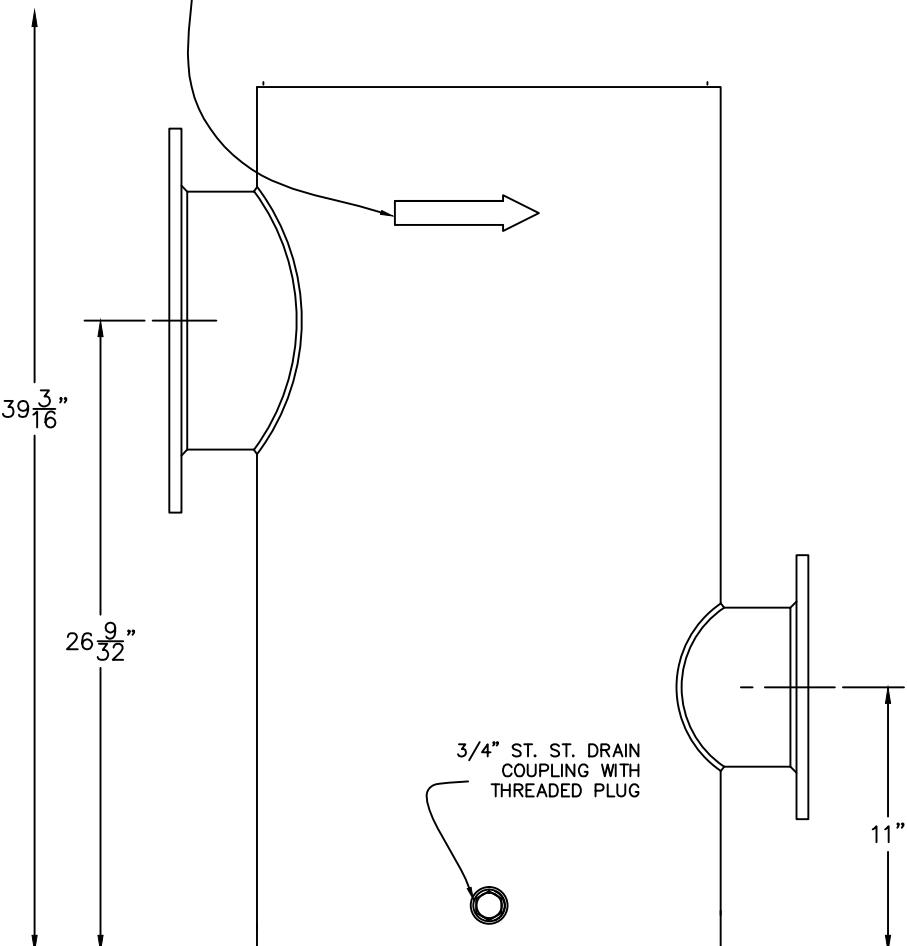
SIZE	"L"	"H"	PRECOAT	PART NUMBER	SIZE	"L"	"H"	PRECOAT	PART NUMBER
3" X 2"	16"	6"	NONE		10" X 5"	16"	6"	4"	
3" X 2½"	16"	6"	NONE					6"	
4" X 2"	16"	6"	4"		10" X 6"	16"	6"	8"	
4" X 2½"	16"	6"	4"					4"	
4" X 3"	16"	6"	4"		10" X 8"	16"	6"	6"	
5" X 4"	16"	6"	4"					8"	
6" X 3"	16"	6"	4"		12" X 6"	16"	6"	4"	
6" X 4"	16"	6"	4"					6"	
6" X 5"	16"	6"	4"		12" X 8"	16"	6"	8"	
8" X 4"	16"	6"	4"					4"	
8" X 5"	16"	6"	4"		12" X 10"	16"	6"	6"	
8" X 6"	16"	6"	4"					8"	
			6"					4"	
			8"					6"	
			4"					8"	
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			6"					4"	
			8"					6"	
			4"					8"	

QTY- 1

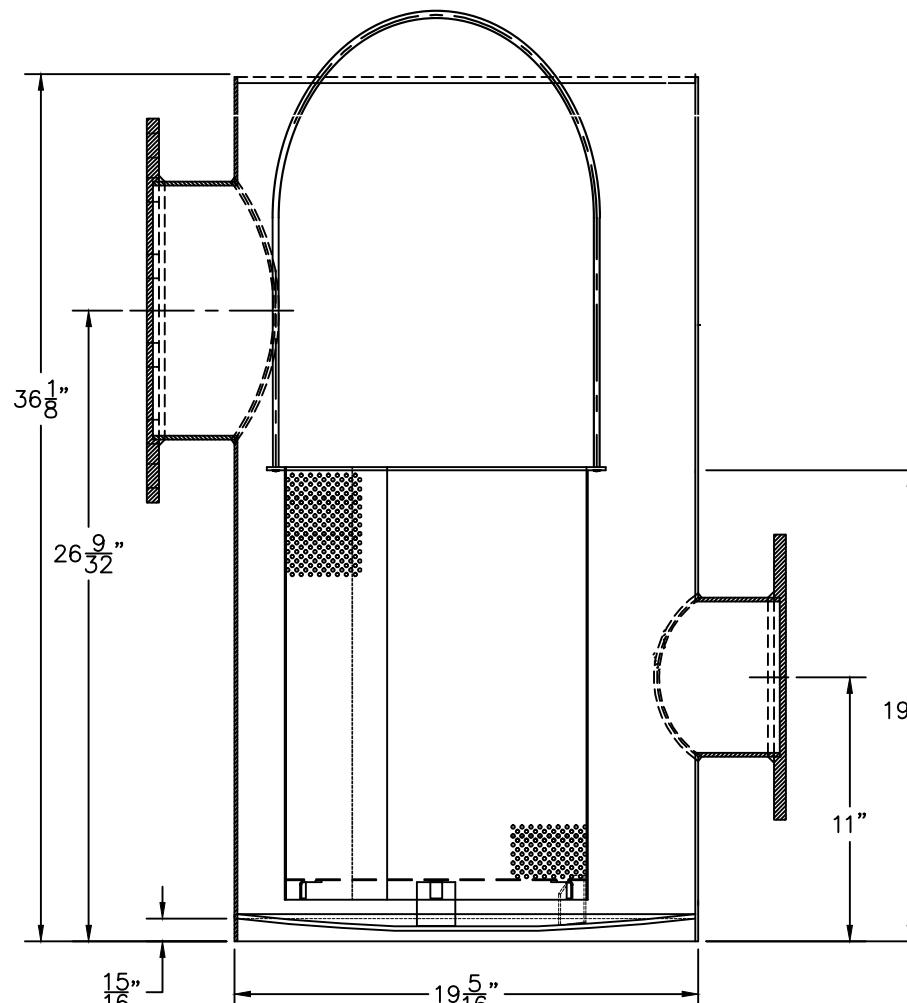




TOP VIEW  
SCALE 1/8" = 1"



FRONT ELEVATION  
SCALE 1/8" = 1"



SECTION A-A  
SCALE 1/8" = 1"

QTY	STRAINER SIZE	INLET SIZE	FLANGE DIAMETER	OUTLET SIZE	FLANGE DIAMETER	OPEN AREA	RATIO	WT (#)
1	10 X 10	10"	16"	10"	16"	71.8 IN <sup>2</sup>	5.66:1	303.0
	10 X 8	10"	16"	8"	13 1/2"	71.8 IN <sup>2</sup>	5.66:1	301.2
	10 X 6	10"	16"	6"	11"	71.8 IN <sup>2</sup>	5.66:1	299.9
	10 X 5	10"	16"	5"	10"	71.8 IN <sup>2</sup>	5.66:1	299.4
	12 X 12	12"	19"	12"	19"	101.64 IN <sup>2</sup>	4:1	315.0
	12 X 10	12"	19"	10"	16"	101.64 IN <sup>2</sup>	4:1	313.2
	12 X 8	12"	19"	8"	13 1/2"	101.64 IN <sup>2</sup>	4:1	311.4
	12 X 6	12"	19"	6"	11"	101.64 IN <sup>2</sup>	4:1	310.0
	12 X 5	12"	19"	5"	10"	101.64 IN <sup>2</sup>	4:1	309.5

#### WITH EXTRA STRAINER BASKET

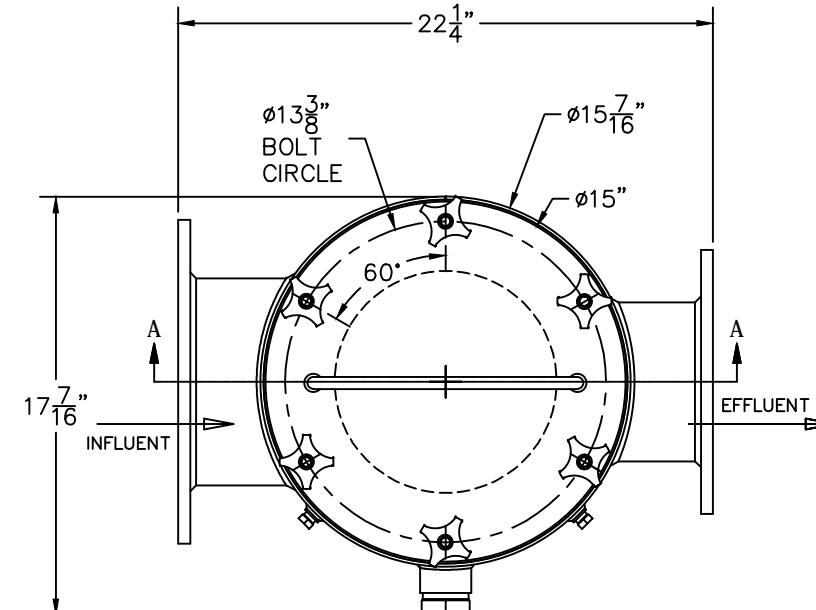
PADDOCK HAIR AND LINT STRAINERS ARE FABRICATED FROM TYPE 304 1/8" THICK STAINLESS STEEL.

**STAINLESS STEEL DRAIN COUPLING WITH THREADED PLUG ARE PROVIDED**

PERFORATED BASKET IS CONSTRUCTED OF 18 GAUGE TYPE 304 STAINLESS STEEL W/A 52% OPEN AREA AND 1/8" PERFORATED HOLES.

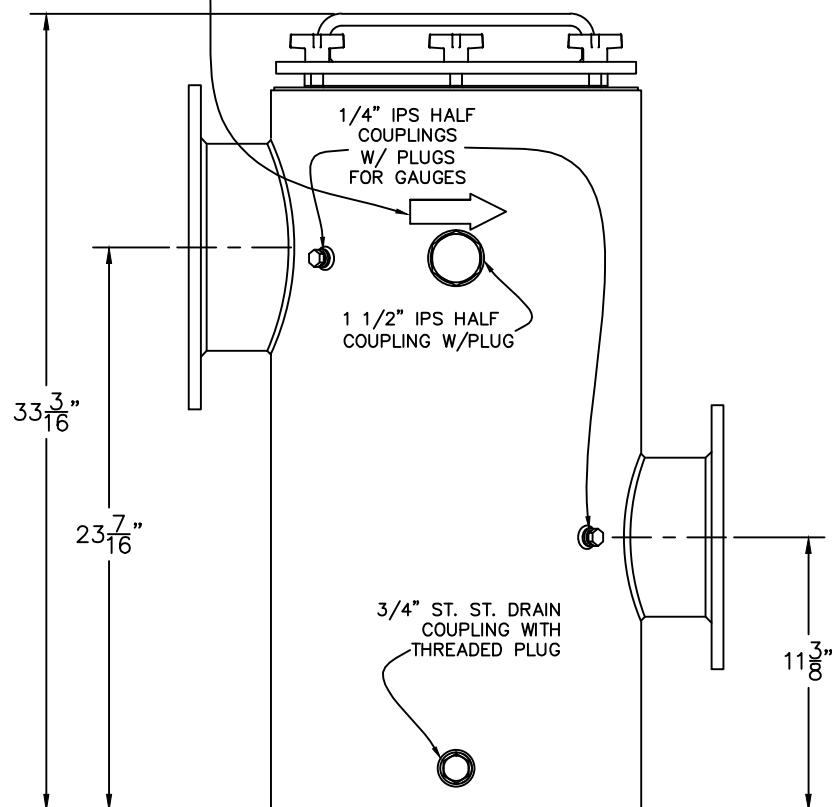
STRAINER IS SHIPPED WITH (1) EXTRA BASKET.

555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com			 <b>PADDOCK</b> POOL EQUIPMENT COMPANY					
DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE NOTED: X. ± 1/16      .X. ± .020 1/X ± 1/32      .XX. ± .010 X' ± 1/4"      .XXX ± .005			DESCRIPTION MEDIUM 304 STAINLESS STEEL ROUND STRAINERS					
JOB NAME _____			LOCATION _____					
DRAWN	BY	DATE	CUSTOMER	_____				
BLC		5/7/12		_____				
CHECKED			SCALE (UNLESS NOTED):	1/8" = 1"	SIZE B	STD. DWG. NO. XXX	SHEET 1 OF 1	
APPROVED			MATL.:	CALC. WT.	QTY.	W.O. # P-	DWG. NO. _____	REV. 0

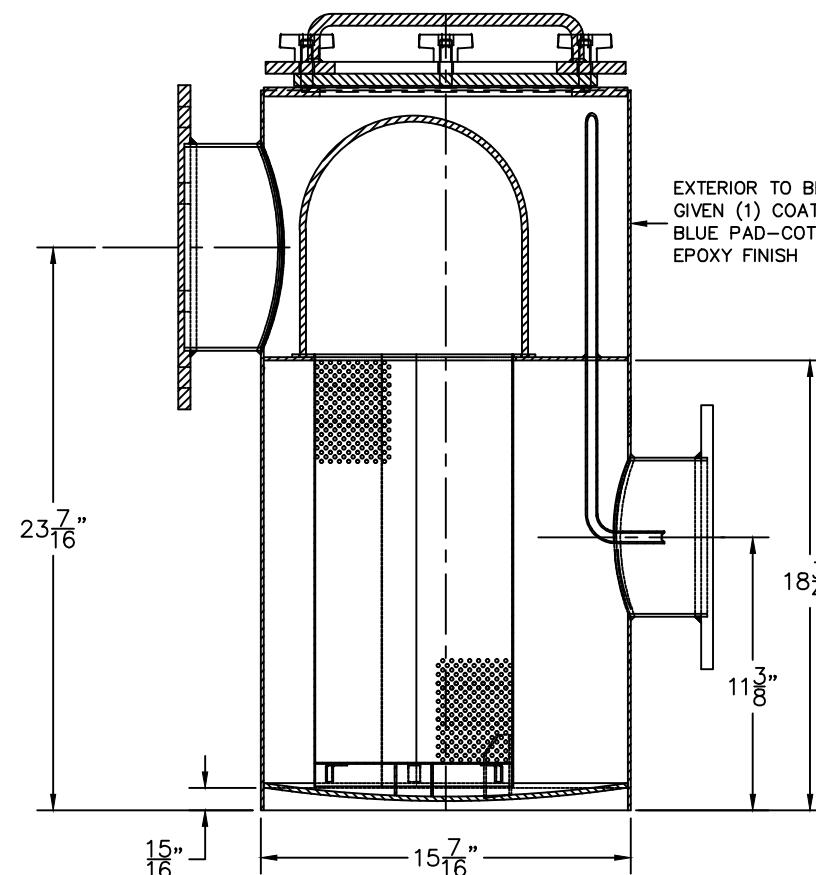


TOP VIEW  
SCALE 1/8" = 1"

FLOW DIRECTIONAL  
ARROW DECAL ON  
SIDE OF STRAINER



FRONT ELEVATION  
SCALE 1/8" = 1"



SECTION A-A  
SCALE 1/8" = 1"

QTY	STRAINER SIZE	INLET SIZE	FLANGE DIAMETER	OUTLET SIZE	FLANGE DIAMETER	OPEN AREA	RATIO	WT (#)
1	4 X 4	4"	9"	4"	9"	11.5 IN <sup>2</sup>	20.6:1	191.7
	4 X 3	4"	9"	3"	7 1/2"	11.5 IN <sup>2</sup>	20.6:1	191.3
	6 X 6	6"	11"	6"	11"	26.07 IN <sup>2</sup>	9.16:1	194.2
	6 X 5	6"	11"	5"	10"	26.07 IN <sup>2</sup>	9.16:1	193.7
1	6 X 4	6"	11"	4"	9"	26.07 IN <sup>2</sup>	9.16:1	193.0
	6 X 3	6"	11"	3"	7 1/2"	26.07 IN <sup>2</sup>	9.16:1	192.5
1	8 X 8	8"	13 1/2"	8"	13 1/2"	45.7 IN <sup>2</sup>	5.22:1	196.9
	8 X 6	8"	13 1/2"	6"	11"	45.7 IN <sup>2</sup>	5.22:1	195.6
1	8 X 5	8"	13 1/2"	5"	10"	45.7 IN <sup>2</sup>	5.22:1	195.1
	8 X 4	8"	13 1/2"	4"	9"	45.7 IN <sup>2</sup>	5.22:1	194.3

WITH EXTRA STRAINER BASKET

## Per Strainer Size

PADDOCK HAIR AND LINT STRAINERS ARE FABRICATED FROM TYPE 304 1/8" THICK STAINLESS STEEL.

4", 6", AND 8" STRAINERS FEATURE A 1/2" STAINLESS STEEL COVER RING WITH 1/2" THICK POLYCARBONATE VIEWPORT.

LIDS ARE MACHINED TO ELIMINATE SHARP EDGES AND ARE SEALED WITH A 1/4" DIAMETER RUBBER 'O'-RING GASKET.

LOCKING ASSEMBLIES PERMIT EASY ACCESS AND CLOSING WITHOUT USE OF TOOLS.

STAINLESS STEEL DRAIN AND VACUUM COUPLINGS WITH THREADED PLUGS ARE PROVIDED ALONG WITH DRILLED AND TAPPED GAUGE CONNECTIONS.

SYSTEM IS DESIGNED FOR 60 PSI WORKING PRESSURE.

PERFORATED BASKET IS CONSTRUCTED OF 18 GAUGE TYPE 304 STAINLESS STEEL W/A 52% OPEN AREA AND 1/8" PERFORATED HOLES.

STRAINER IS SHIPPED WITH (1) EXTRA BASKET.

555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com	 <b>PADDOCK</b> POOL EQUIPMENT COMPANY			
DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE NOTED: X. $\pm 1/16$ .X. $\pm .020$ 1/X $\pm 1/32$ .XX. $\pm .010$ X' $\pm 1/4"$ .XXX. $\pm .005$	DESCRIPTION SMALL 304 STAINLESS STEEL ROUND STRAINERS			
JOB NAME	—			
DRAWN BY DATE	LOCATION —			
DRAWN BLC 5/4/12	CUSTOMER —			
CHECKED	SCALE (UNLESS NOTED):			
APPROVED	1/8" = 1"	SIZE B	STD. DWG. NO. XXX	SHEET 1 OF 1
MAT'L.: CALC. WT.	QTY.	W.O. # P-	DWG. NO.	REV. 0



# Paddock Regenerator™

Environmental Regenerative Filter



The Paddock **Regenerative Filter** provides a resource conserving solution. Utilizing a system of filter-aid regeneration and an innovative filter element called the Flex-Tube™, the Paddock **Regenerative Filter System** provides unparalleled water clarity and remarkable operating efficiency. Most reliable, stainless steel and cost effective regenerative filter in commercial pool market when considering life of facility investment on equipment. Contact Paddock on how to size regenerative filter to your specific facility.

#### Benefits:

- § Best available regenerative technology through reliable automation for over 45 years
- § Reduces operating costs by increasing filter run lengths per media charge. Conserve water, thermal heat loss, chemical loss and power usage due to increased filter run lengths
- § Provides superior water clarity using either Diatomaceous Earth (DE) or Perlite media
- § Filters are designed to run at full filtration range with minimal loss of effectiveness
- § True ASME flanged and dished head for superior flow collection / distribution in the filter top end
- § Maximum 36" element length. Conservative design limits rise rate and prolongs elements life
- § Head, body, internals, and other type 304 ELC stainless steel are fully passivated following fabrication to Federal Specification QQ-P-36D, (excludes fasteners)
- § Element cores are low carbon stainless steel, fully annealed and passivated to Federal Specifications QQ-P-35D
- § Double boot mechanism for extra air capacity to assist in more active regeneration and better pre-coat mixing of media
- § This regenerative filter is a **GREEN SYSTEM** and lends itself well for **LEED** accreditation



# PADDOCK

EMPLOYEE OWNED SINCE 2019

## PPEC REGENERATOR FILTER COMPONENTS

Included in Regenerator Pkg

Item	Name
R1	PPEC Regenerator Filter
R2	Pneumatic On-Stream Valve
R3	Pneumatic Precoat Valve
R4	Precoat Fill Valve
R5	Flow Meter
R6	Control Panel
R7	Bump Assembly
R8	Vacuum Transfer Pump
R9	Drain Valve

Optional Filter Accessories

F10	Check Valve
F11	Valve
F12	Strainer
F13	Reducing Precoat Tee
F14	Pump (not by PPEC)
F15	Reducer
F16	Air Compressor
F17	Auto Air Bleed
F18	Receiver Tank
F19	Air Dryer
F20	Air Line
F21	VFD
F22	Air Bleed (not by PPEC)



# REGENERATOR FILTER SCHEMATIC

#### Drain Requirements:

- Gravity drainage of filter is needed to properly waste heavily laden media.
- Slop drainage pipe away from filter, terminating in an open sump/sewer connection. (Check local codes for air-break requirements and media discharge containment.)
- Filter drainage rate is controlled at approximately 50 GPM. Ideally, drainage plumbing should be designed for 500 GPM, providing adequate run-off capacity in case of operator error.
- If sewer is higher than the filter drain, a gravity sump with a sump pump to lift the waste the sewer is required. Match sump to filter volume notated on attached chart.

#### Electrical Requirements:

- The Control Panel requires a dedicated 120V 20-amp circuit.
- VFD - 2 pairs of 22/4 or 18/4 shielded wire for interface (single conduit)
- UV System, Chemical Controller, Heater, Dehumidification - 22/4 or 18/4 shielded wire for interface (single conduit per unit)
- Flow Meter - 22/4 or 18/4 shielded wire from meter to MOD1 control box(single conduit)
- All panel penetrations should be made on the sides or bottom of panel.
- The filter & all other equipment need to be bonded.

#### Filter Location:

- Side clearance of three feet should be provided around the filter to allow for operator access.
- Minimum clearance over the filter is 13", more clearance improves service access.
- Provide a mount point(one-ton minimum safe load) above the filter to facilitate head removal.
- Typical clearance underneath the filter (measured from face of drain flange to floor) is 14".

#### Flow Meter Installation Location:

- The flow meter should be installed on the straight run of pipe into the influent connection between the pump and the filter (allows flow to be monitored through the pre-coat & on-stream cycles).
- The flow meter requires a distance of 20x the pipe diameter before and 5x the pipe diameter after.

#### Air Supply:

- The PPEC Regenerative filters require a continuous supply of dry 80 PSI air to operate 2 pneumatic valves & a pneumatic "bump" mechanism.
- Multiple filters may require multiple compressors/receivers.
- Air lines should be Ø3/4" braided 300 PSI hose or ¼" copper.
- Do not heat fittings within 2' of filter connection, direct heat can damage regulator components.
- An air dryer may be installed and plumbed between the air supply and the filter. This will help pull any remaining moisture out before it reaches the filter. By-Pass valve to be provided with dryer.

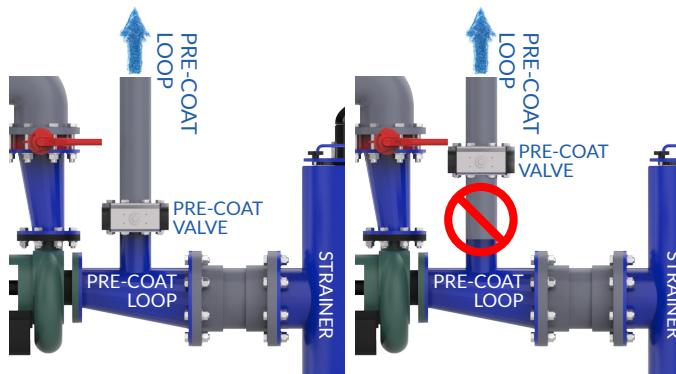
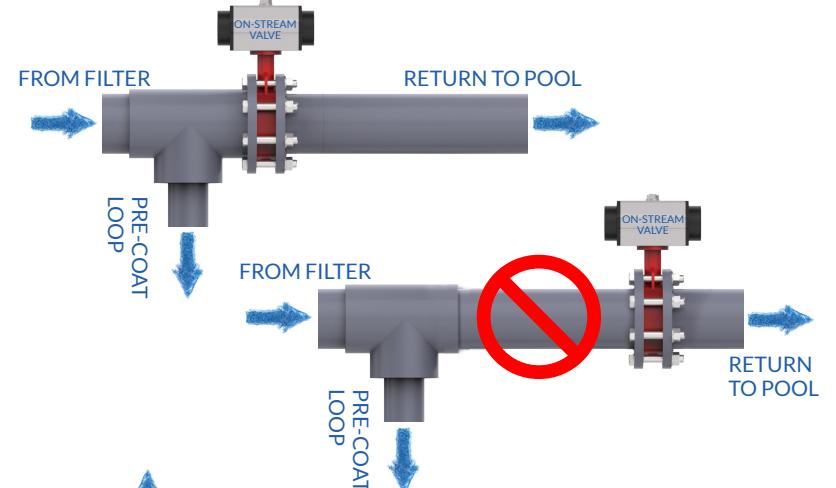


#### Plumbing Design Guidelines:

- The PPEC Regenerator filters will operate efficiently above or below pool level. A check valve is needed either in front of the pump strainer or between the pump strainer & pre-coat tee. If the pump is below water level a check valve is suggested above the pump discharge as well.
- Efficient filter operation requires a minimum 5' straight run of pipe going into the influent connection. Refer to flow meter location for more information.
- Reduce the number of fittings and plane changes between the pump discharge and the filter.
- Use sweeping 90's or two 45's to decrease turbulence if 5' straight run is not possible.
- Any increase or reduction in piping size should be done as close to the pump discharge as possible.

#### On-Stream Valve Location:

- Locate valve actuator to allow operator to view valve status, do not mount below pipe.
- Install On-Stream Valve with a spigot flange to decrease the area prior to the valve to prevent media build-up. This reduces media returning to the pool.



#### Pre-coat Valve Location:

- The pre-coat valve should be installed as close as possible to the pre-coat tee between the pump and strainer. If this is not done, the resulting entrained air can be pushed into the filter and cause media separation which will result in media getting into the pool.
- The pre-coat line and valve are one significant pipe size smaller than the filter connections.

#### Filter Media Selection:

- Regenerators are NSF approved for diatomaceous earth (DE)\* or perlite filter media.
- PPEC provides PF-60 perlite media

\*PPEC's preferred media

#### Air Lines to Valves:

- Pneumatic valves should be connected to their respective control solenoid located on the right side of the filter control mounting bracket (top is on-stream, bottom of pre-coat) using ¼" x 0.04" wall nylon or poly tubing.
- Speed control set screws for valves are located on the front of the solenoid, adjust to a 3-5 sec open & closure rate.

#### High Vent Air Bleed:

- Must be installed at the highest point in the return line between filter effluent & the on-stream valve to prevent entrained air from re-circulation.
- If the air bleed is improperly installed it could result in decreased filter performance.



Model #	Width (inches) "A"	Overall & Shipping Height (inches) "B"	Tank Influent Connection (inches) "C"	Max Design Filtration Rate (GPM/ft <sup>2</sup> )**	Effective Filtration (Area/sq.ft.)	Design Flow Range (gpm)	Tank Volume (gals)	PreCoat Perlite (lbs)	PreCoat (+) DE (lbs)	Operating Weight (lbs)	Shipping Weight (lbs)	Drain Connection (Nom. Pipe Size)	Tank Connection (Nom. Pipe Size)	Minimum Sump Size (gals)	Compressor / Receiver Tank Sizes (gals)
PPEC 225S	27.00	86.75	24.00	1.60	208.7	212-335	129	26	50	1500	1025	4	4	100	60 / N/A
PPEC 350S	33.00	88.25	24.44	1.60	351.2	337-565	244	41	79	2600	1300	4	6	165	60 / N/A
PPEC 500S	39.50	92.48	25.88	1.60	519.4	528-835	291	65.5	126	4250	1750	4	6	225	60 / N/A
PPEC 700S	45.00	96.69	28.25	1.60	707.3	719-1138	396	82	158	4800	2200	4	8	390	60 / N/A
PPEC 900S	50.63	104.19	30.13	1.60	819.0	819-1310	496	95	190	6000	2750	4	8	446	60 / N/A
PPEC 1275	51.00	103.63	30.81	1.60	935.8	950-1505	525	109	210	6500	3100	4	8	670	60 / 30
PPEC 1400S	58.63	107.69	32.63	1.60	1141.0	1141-1825	721	135	260	9900	4100	4	10	810	60 / 30
PPEC 2100	63.50	116.49	34.19	1.60	1538.8	1560-2490	890	182	350	11600	5800	4	10	960	60 / 30

\*\*Contact manufacturer for assistance in proper plumbing layout.

(+) Preferred Media

# REGENERATOR DESIGN BEST PRACTICES

**PADDOCK**

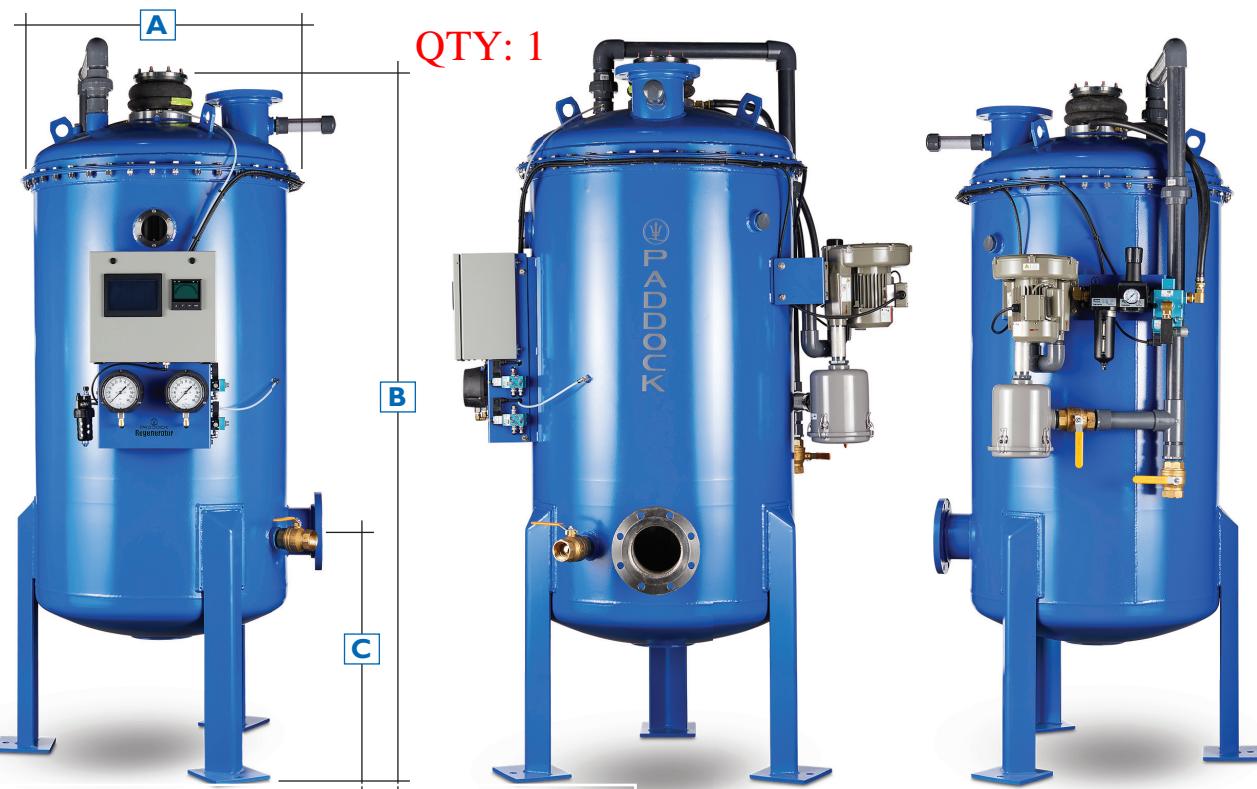
# Regenerator™

Environmental Regenerative Filter



## FEATURES

- Stainless Steel Components
- No Backwashing
- Fully Automated System with Manual Override Options Available
- Small Footprint in Equipment Room
- Integration with VFD and other secondary components
- True ASME Domed Head for Enhanced Hydraulics
- Double Convoluted Boot Mechanism for Superior Regeneration
- ROI on Heat, Water, & Chemical Loss
- 4" Drain Connection on All Series



QTY: 1

For Maintenance & Service add 2' (ft) Clearance to "B"

Regenerator Model #	Width 'A'	Overall Height 'B'	Tank Influent Connection 'C'	Maximum Design Filtration*	Effective Filtration Area	Flow Range	Tank Volume	PreCoat Perlite	PreCoat Diatomaceous Earth (DE)**	Operating Weight	Shipping Weight	Precoat Piping	Tank Connection Influent & Effluent
Unit	Inches	Inches	Inches	GPM/FT <sup>2</sup>	FT <sup>2</sup>	GPM	Gallons	Pounds	Pounds	Pounds	Pounds	Ø, Inches	Ø, Inches
PPEC 225S*	27.00	89.750	23.438	1.60	208.7	212 - 335	129	26.0	50	1500	1025	3	4
PPEC 350S*	33.00	90.188	24.469	1.60	351.2	337 - 565	244	41.0	79	2600	1300	4	6
PPEC 500S*	39.50	95.500	27.500	1.60	519.4	528 - 835	291	65.5	126	4250	1750	4	6
PPEC 700S*	45.00	98.031	28.313	1.60	707.3	719 - 1138	396	82.0	158	4800	2200	6	8
PPEC 900S*	50.63	104.344	30.125	1.60	819.0	819 - 1310	496	95.0	190	6000	2750	6	8
PPEC 1275*	51.00	105.563	29.063	1.60	935.8	950 - 1505	525	109.0	210	6500	3100	6	8
PPEC 1400S*	58.63	109.688	32.688	1.60	1141.0	1141 - 1825	721	135.0	260	9900	4100	8	10
PPEC 2100*	63.50	116.938	34.250	1.60	1538.8	1560 - 2490	890	182.0	350	11600	5800	8	10

\*Contact Manufacturer for assistance in proper plumbing layout

\*\*Preferred Media

Drain Connection Note: All models have a 4" drain connection.

REV 2021.07.08

Available in a variety of wetted materials and ideal for pipe sizes up to DN900 (36 in.)



Blind Version



The Signet 2551 Magmeter is an insertion style magnetic flow sensor that features no moving parts. The patented\* sensor design is available in corrosion-resistant materials to provide long-term reliability with minimal maintenance costs. Material options include PP with stainless steel, PVDF with Hastelloy-C, or PVDF with Titanium. Utilizing the comprehensive line of Signet installation fittings, sensor alignment and insertion depth is automatic. These versatile, simple-to-install sensors deliver accurate flow measurement over a wide dynamic range in pipe sizes ranging from DN15 to DN900 (½ to 36 inches), satisfying the requirements of many diverse applications.

Signet 2551 Magmeters offer many output options of frequency/digital (S<sup>3</sup>L) or 4 to 20 mA which are available on both the blind and display versions. The frequency or digital (S<sup>3</sup>L) sensor output can be used with Signet's extensive line of flow instruments while the 4 to 20 mA output can be used for a direct input to PLCs, chart recorders, etc. Both the 4 to 20 mA output and digital (S<sup>3</sup>L) sensor interface is available for long distance signal transmission. An additional benefit is the empty pipe detection which features a zero flow output when the sensors are not completely wetted. Also, the frequency output is bi-directional while the 4 to 20 mA output can be set for uni- or bi-directional flow using the display or the 3-0250 USB to Digital (S<sup>3</sup>L) Configuration/ Diagnostic setup tool which connects to PCs for programming capabilities.

In addition the display version of the 2551 Magmeter is available with relays and features permanent and resettable totalizer values which can be stored and seen on the display. Also, the display contains multi-languages with English, Spanish, German, French, Italian and Portuguese menu options.

## Features

- Test certificate included for -X0, -X1
- Patented Magmeter technology\*
- No moving parts
- Bi-directional flow
- Empty pipe detection
- Installs into pipe sizes DN15 to DN900 (0.5 to 36 in.)
- Operating range 0.05 to 10 m/s (0.15 to 33 ft/s)
- Accurate measurement even in dirty liquids
- Polypropylene or PVDF retaining nuts
- Blind 4 to 20 mA, digital (S<sup>3</sup>L), frequency, relay output
- No pressure drop
- Corrosion resistant materials; PP or PVDF with SS, Hastelloy-C, or Titanium
- Multi-language display menu available



Certified to  
NSF/ANSI 61 & 372

(3-2551-PX-XX  
version only)

## Applications

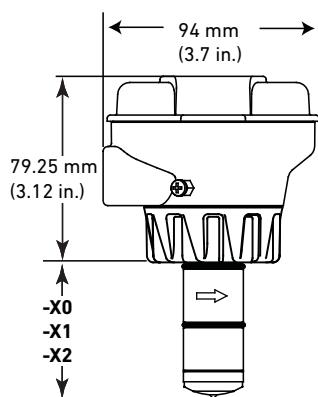
- Chemical Processing
- Water and Wastewater Monitoring
- Metal Recovery and Landfill Leachate
- Commercial Pools, Spas, and Aquariums
- HVAC
- Irrigation
- Scrubber Control
- Neutralization Systems
- Industrial Water Distribution

## Dimensions

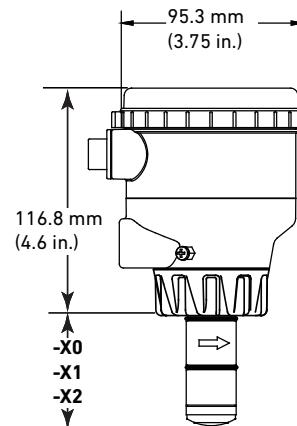
Pipe Range	
1/2 to 4 in.	-X0 = 58 mm (2.3 in.)
5 to 8 in.	-X1 = 91 mm (3.6 in.)
10 to 36 in.	-X2 = 167 mm (6.6 in.)

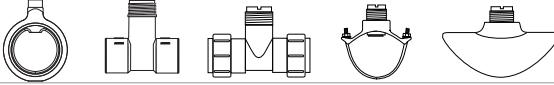
X = Sensor Body P, T, or V

### Blind version



### Display version



System Overview	Stand-Alone	Panel Mount	Field Mount - Pipe, Tank, Wall	4 to 20 mA Input
	<b>Signet Model 2551 Magmeter</b> 	Signet Instruments 8550 8900 9900 9900-1BC  	Signet Instruments 8550 9900 with 3-8050 Universal Mount Kit  + 	Customer Supplied Chart Recorder or Programmable Logic Controller  OR 
		<b>Signet 2551 Magmeter</b> 		
	Signet Fittings 			All sold separately

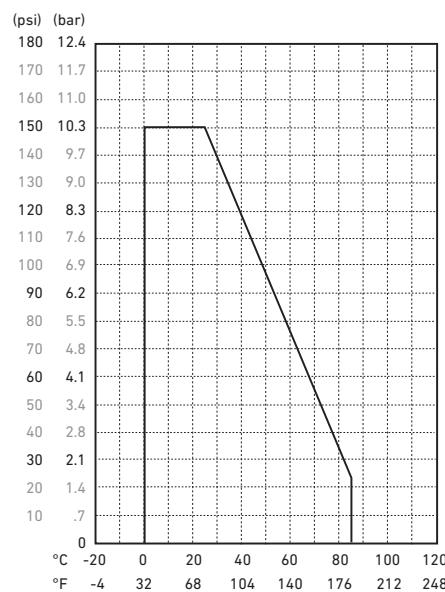
## Operating Temperature/Pressure Graphs

### Note:

The pressure/temperature graphs are specifically for the Signet sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, a plastic sensor will reduce the system specification. When using a PVDF sensor in a PVC piping system, the fitting will reduce the system specification.

### Application Tips

- Note minimum process liquid conductivity requirement is 20  $\mu\text{s}/\text{cm}$ .
- Install sensor using standard Signet installation fittings for best results.
- Sensor is capable of retrofitting into existing 515 and 2536 fittings.

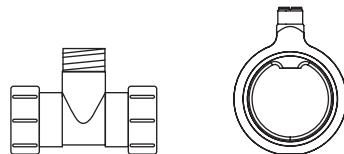
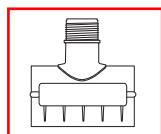
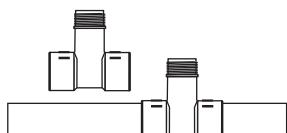


Please refer to Wiring, Installation, and Accessories sections for more information.

# Specifications

General		
Operating Range	0.05 to 10 m/s	0.15 to 33 ft/s
Pipe Size Range	DN15 to DN900	½ in. to 36 in.
Linearity	± 1% reading plus 0.1% of full scale	
Repeatability	±0.5% of reading @ 25 °C (77 °F)	
Minimum Conductivity	20 µS/cm	
Wetted Materials		
Sensor Body/Electrodes and Grounding Ring	-P0, -P1, -P2: PP/316L SS -T0, -T1, -T2: PVDF/Titanium -V0, -V1, -V2: PVDF/Hastelloy-C	
O-rings	FPM (standard) EPR (EPDM), FFFPM (optional)	
Case	PBT	
Display Window	Polyamide (transparent nylon)	
Protection Rating	NEMA 4X/IP65	
Electrical		
Power Requirements	4 to 20 mA Frequency Digital (S <sup>3</sup> L)	24 VDC ±10%, regulated, 22.1 mA max. 5 to 24 VDC ±10%, regulated, 15 mA max. 5 to 6.5 VDC, 15 mA max.
Auxiliary (only required for units with relays)		9 to 24 VDC, 0.4 A max.
Reverse Polarity and Short Circuit Protected		
Current Output 4 to 20 mA	Loop Accuracy Isolation Maximum Cable Error condition Max. Loop Resistance Compatible with PLC, PC or similar equipment 4 to 20 mA load needed	32 µA max. error (25 °C @ 24 VDC) Low voltage < 48 VAC/DC from electrodes and auxiliary power 300 m (1000 ft) 22.1 mA 300 Ω 4 to 20 mA load needed
Frequency Output	Output Modes Max. Pull-up Voltage Max. Current Sink Maximum Cable Compatible with Signet Model 8550, 8900, 9900, 9900-1BC	Freq., or Mirror Relay (display version only) 30 VDC 50 mA, current limited 300 m (1000 ft) Compatible with Signet Model 8550, 8900, 9900, 9900-1BC
Digital (S <sup>3</sup> L) Output	Serial ASCII, TTL level 9600 bps Compatible with Model Signet 8900 controller	
Relay Specifications		
#1, #2 Type	Mechanical SPDT	
Rating	5 A @ 30 VDC max., 5 A @ 250 VDC max.	
#3 Type	Solid State	
	50 mA @ 30 VDC, 50 mA @ 42 VAC	
Hysteresis	User adjustable for exiting alarm condition	
Alarm On Trigger Delay	Adjustable (0 to 9999.9 sec.)	
Relay Modes	Off, Low, High, Window, and Proportional Pulse	
Relay Source	Flow Rate, Resettable Totalizer	
Error Condition	Selectable; Fail Open or Closed	
Display		
Characters	2 x 16	
Contrast	User-set in four levels	
Backlighting (only on relay versions)	Requires external 9-24 VDC, 0.4 mA max.	
Max. Temperature/Pressure Rating		
Storage Temperature	-20 °C to 70 °C	-4 °F to 158 °F
Relative Humidity	0 to 95% (non-condensing)	
Operating Temperature	Ambient Media	-10 °C to 70 °C 0 °C to 85 °C
Maximum Operating Pressure		10.3 bar @ 25 °C 1.4 bar @ 85 °C
		150 psi @ 77 °F 20 psi @ 185 °F
Environmental		
		NEMA 4X / IP65 Enclosure (with cap installed)
Shipping Weight		
	0.680 kg	1.50 lb
Standards and Approvals		
		CE, FCC, UL, CUL, NSF (3-2551-PX-XX version only) RoHS compliant, China RoHS Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety

## Calibration Data: K-Factors and Full Scale Current Values



### Plastic Installation Fittings: PVC Tees and Saddles

Pipe Size (In.)	Fitting Type	K-Factor Gallons	K-Factor Liters	20 mA= in GPM	20 mA= in LPM
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#### SCH 80 PVC-U TEES FOR SCH 80 PVC PIPE

1/2	MPV8T005	2277.0	601.58	13.1	49.6
3/4	MPV8T007	1407.6	371.90	20.97	79.38
1	MPV8T010	861.17	227.52	34.21	129.5
1 1/4	MPV8T012	464.91	122.83	67.1	253.99
1 1/2	MPV8T015	331.43	87.56	92.54	350.25
2	MPV8T020	192.89	50.96	145.15	549.38

#### SCH 80 PVC TEES FOR SCH 80 PVC PIPE

2 1/2	PV8T025	131.46	34.73	228.2	863.74
3	PV8T030	82.52	21.80	363.55	1376.04
4	PV8T040	44.78	11.83	669.88	2535.49

#### SCH 80 PVC TEES FOR SCH 80 CPVC PIPE

1/2	MCPV8T005	2277.0	601.58	13.18	49.87
3/4	MCPV8T007	1407.6	371.90	21.31	80.67
1	MCPV8T010	861.17	227.52	34.84	131.86
1 1/4	MCPV8T012	464.91	122.83	64.53	244.24
1 1/2	MCPV8T015	331.43	87.56	90.52	342.62
2	MCPV8T020	192.89	50.96	155.53	588.70

#### SCH 80 PVC SADDLES FOR SCH 80 PVC PIPE

2	PV8S020	193.83	51.21	154.77	585.81
2 1/2	PV8S025	138.01	36.46	217.38	822.78
3	PV8S030	83.89	22.16	357.62	1353.60
4	PV8S040	40.88	10.80	733.88	2777.74
6	PV8S060	22.53	5.95	1331.85	5041.06
8	PV8S080	12.52	3.31	2395.41	9066.64
10	PV8S100	7.94	2.10	3778.75	14302.57
12	PV8S120	5.71	1.51	5256.69	19896.57

#### SCH 80 PVC SADDLES FOR SCH 40 PVC PIPE

2	PV8S020	180.01	47.56	166.66	630.81
2 1/2	PV8S025	123.72	32.69	242.49	917.82
3	PV8S030	75.81	20.03	395.71	1497.76
4	PV8S040	41.87	11.06	716.56	2712.19
6	PV8S060	19.71	5.21	1521.92	5760.46
8	PV8S080	11.73	3.10	2558.12	9682.50
10	PV8S100	7.43	1.96	4037.60	15282.3
12	PV8S120	5.23	1.38	5734.87	21706.48

### Plastic Installation Fittings for Metric Pipes:

Polypropylene True Union Tees and Wafers  
PVDF True Union Tees, PVC True Union Tees

Pipe Size (Metric)	Fitting Type	K-Factor Gallons	K-Factor Liters	20 mA= in GPM	20 mA= in LPM
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#### POLYPROPYLENE FITTINGS (DIN/ISO, BS, ANSI)

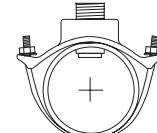
DN15	PPMT005	2192.73	579.32	13.68	51.78
DN20	PPMT007	1327.81	350.81	22.59	85.52
DN25	PPMT010	737.16	194.76	40.70	154.04
DN32	PPMT012	453.46	119.81	66.16	250.41
DN40	PPMT015	275.03	72.66	109.08	412.86
DN50	PPMT020	164.17	43.35	182.74	691.66

#### PVDF FITTINGS (DIN/ISO, BS, ANSI)

DN15	SFMT005	1946.49	514.26	15.41	58.34
DN20	SFMT007	1158.05	305.96	25.91	98.05
DN25	SFMT010	749.09	197.91	40.05	151.58
DN32	SFMT012	439.51	116.12	68.26	258.36
DN40	SFMT015	248.93	65.77	120.52	456.16
DN50	SFMT020	146.85	38.80	204.30	773.26

#### PVC FITTINGS (DIN/ISO, BS, ANSI)

DN15	PVMT005	2067.76	546.30	14.51	54.91
DN20	PVMT007	1136.61	300.29	26.39	99.90
DN25	PVMT010	716.52	189.31	41.87	158.47
DN32	PVMT012	446.07	117.85	67.25	254.56
DN40	PVMT015	278.83	73.67	107.59	407.23
DN50	PVMT020	159.36	42.10	188.26	712.55



### Metal Installation Fittings

Iron Saddles

Pipe Size (In.)	Fitting Type	K-Factor Gallons	K-Factor Liters	20 mA= in GPM	20 mA= in LPM
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#### SCH 80 IRON SADDLE ON SCH 80 PIPE

2	IR8S020	194.85	51.48	153.96	582.75
2 1/2	IR8S025	142.28	37.59	210.86	798.10
3	IR8S030	87.53	23.13	342.72	1297.20
4	IR8S040	40.62	10.73	738.58	2795.54
5	IR8S050	29.28	7.74	1024.43	3877.48
6	IR8S060	22.30	5.89	1345.58	5093.03
8	IR8S080	12.52	3.31	2395.41	9066.64
10	IR8S100	7.94	2.10	3778.75	14302.57
12	IR8S120	5.65	1.49	5311.45	20103.83

#### SCH 80 IRON SADDLE ON SCH 40 PIPE

2	IR8S020	185.35	48.97	161.85	612.61
2 1/2	IR8S025	127.47	33.68	235.36	890.83
3	IR8S030	76.62	20.24	391.54	1481.99
4	IR8S040	40.23	10.63	745.72	2822.57
5	IR8S050	27.32	7.22	1098.24	4156.83
6	IR8S060	19.71	5.21	1521.92	5760.46
8	IR8S080	11.61	3.07	2584.23	9781.30
10	IR8S100	7.36	1.94	4078.8	15438.2
12	IR8S120	5.18	1.37	5793.39	21927.98

# PADDOCK DEMINERALIZING COMPOUND

QTY: 1

## PRECAUTIONARY INFORMATION

Avoid contact with eyes or skin. The use of safety goggles, rubber gloves and dust mask is recommended when handling this product.

### CONTAINS

Citric Acid  
Methyl Red Hydrochloride

### CAS #

77-92-9  
439-52-7

**EYES:** Do not wear contact lenses when working with this material. Flush immediately with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of entire eye surface.  
SEEK MEDICAL ATTENTION IMMEDIATELY.

**SKIN:** Wash with soap and water. If irritation develops, SEEK MEDICAL ATTENTION IMMEDIATELY.

**INGESTION:** If swallowed, induce vomiting by sticking finger down throat. Drink large quantities of water. NEVER give anything by mouth to an unconscious person.  
SEEK MEDICAL ATTENTION IMMEDIATELY.

For Technical Support call 1-800-849-2729

**NET CONTENTS: 50 LBS.**

# Paddock Regenerator™ Environmental Regenerative Filter



# PADDOCK DEGREASING CONCENTRATE

QTY: 1

## PRECAUTIONARY INFORMATION

Avoid contact with eyes or skin. The use of safety goggles, and rubber gloves is recommended when handling this product.

### CONTAINS

Sodium Metasilicate  
Sodium Carbonate  
Ethoxylated Alcohols, C9-C11  
Na-A-Zeolite

### CAS #

6834-92-0  
497-19-8  
68439-46-3  
68989-22-0

**EYES:** Flush immediately with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of entire eye surface.  
SEEK MEDICAL ATTENTION IMMEDIATELY.

**SKIN:** Wash with water. If irritation develops, SEEK MEDICAL ATTENTION IMMEDIATELY.

**INGESTION:** If swallowed, DO NOT induce vomiting. Drink large quantities of water. If available, drink several glasses of milk. NEVER give anything by mouth to an unconscious person. SEEK MEDICAL ATTENTION IMMEDIATELY.

For Technical Support call 1-800-849-2729

**NET CONTENTS: 50 LBS.**

# Paddock Regenerator™ Environmental Regenerative Filter



**# 4ME98 - Electric Air Compressor: 5 hp, 1 Stage, Vertical, 60 gal Tank,  
14.2 cfm, Splash Lubricated**



**QTY: 1**

**PN210021**

**Auto Drain Valve**

**PN210024**

.5 HP, 60 gal., Vertical Splash Lubricated  
Tank Mounted Electric Air Compressor

14.2

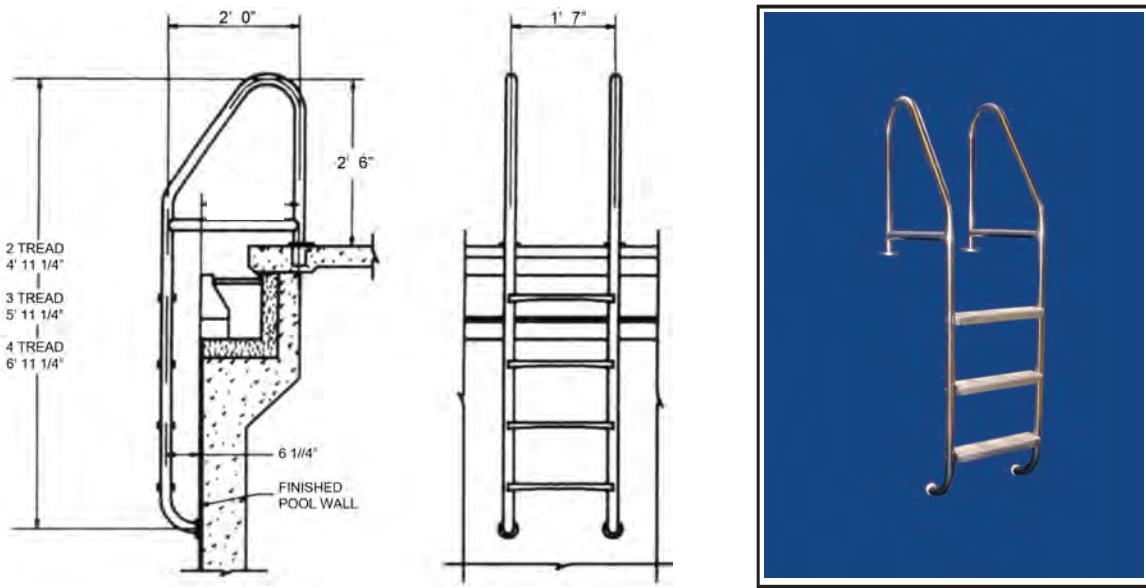
.Item # **4ME98**

Mfr. Model #4ME98

ITEM	ELECTRIC AIR COMPRESSOR	DUTY CYCLE	INTERMITTENT
LUBRICATION TYPE	SPLASH LUBRICATED	THERMAL PROTECTION	YES
AIR TANK STYLE	VERTICAL	SOUND LEVEL	85 dBA
Number of stages	1	INCLUDES	MANUAL DRAIN VALVE, OIL SIGHT GLASS, PRESSURE GAUGE, PRESSURE SAFETY VALVE
OUTPUT POWER	5 HP	CYLINDER MATERIAL	CAST IRON
FREE AIR FLOW RATE @ MAXIMUM PRESSURE	14.2 CFM	FINISH	POWDER COATED
MAXIMUM OPER. PRESSURE	135 PSI	ASME TANK	YES
AIR TANK SIZE	60 GAL	CONTROL TYPE	PRESSURE SWITCH
INPUT VOLTAGE	208-240V AC, 480V AC	ON PRESSURE SWITCH SETTING	105 PSI
PHASE	THREE	OFF PRESSURE SWITCH SETTING	140 PSI
FREQUENCY	60Hz	INLET SIZE	¾ IN
COMPRESSOR PACKAGE TYPE	BASE MODEL	OUTLET SIZE	¾ IN
PUMP STYLE	SIMPLEX	OUTLET TYPE	NPT
PUMP TYPE	RECIPROCATING	OUTLET GENDER	FEMALE
PUMP LOCATION	TOP MOUNT	OVERALL LENGTH	23 IN
PUMP OIL CAPACITY	40 FLOZ	OVERALL WIDTH	31 IN
MOTOR TYPE	OPEN DRIPPROOF	OVERALL HEIGHT	71 IN
CURRENT RATING	13.4 TO 13.2 A, 6.6 A	STANDARDS	ASME APPROVED, CSA, CALIFORNIA CODE 462(L)(2), UL LISTED, UL1450
MAXIMUM SPEED	950 RPM		



## Ladder



Paddock's **Ladders** are fabricated from Type 304 or 316L stainless steel tubing with an outside diameter of 1.90" and standard wall thickness of .083". (Outside diameter of 1.5" or wall thickness of .120" is also available.)

**Ladder** rails are spaced 19" apart with a cross brace for added stability and furnished with slip-resistant stainless steel treads.

Exposed surfaces shall be polished to a Paddock buff finish.

A rubber bumper on each rail protects the interior pool finish.

Paddock deck anchors with Paddock escutcheon plates are available.

P/N \_\_\_\_\_, Model 4539-\_\_\_\_\_, 2-Tread Ladder Type \_\_\_\_\_, \_\_\_\_\_" OD x \_\_\_\_\_ Wall Less Anchors, Qty \_\_\_\_\_

P/N \_\_\_\_\_, Model 4540-\_\_\_\_\_, 3-Tread Ladder Type **316**, **1.9**" OD x **.083** Wall Less Anchors, Qty **2**

P/N \_\_\_\_\_, Model 4541-\_\_\_\_\_, 4-Tread Ladder Type **316**, **1.9**" OD x **.083** Wall Less Anchors, Qty **2**

P/N \_\_\_\_\_, Model 4542-\_\_\_\_\_, 5-Tread Ladder Type \_\_\_\_\_, \_\_\_\_\_" OD x \_\_\_\_\_ Wall Less Anchors, Qty \_\_\_\_\_

# DECK EQUIPMENT

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## Wedge Deck Anchor

4  
8  
0  
1



The body shall be constructed of cast bronze and shall have a tapered chamber to receive wedge by means of which a ladder or other rail may be held securely.

Wedge shall be of cast bronze and shall be drawn against rail being anchored by means of a  $\frac{1}{2}$ " bolt.

Wedge deck anchor shall be provided with a ground connection at its base and shall have an anchoring protrusion at its center.

PN 200153

Paddock No. 4837 stainless steel escutcheon gracefully covers wedge deck anchor.

1.90" OD Tubing

*Submittal Information:*

QTY - 28

*Additional Information*

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555 Paddock Parkway  
Rock Hill, SC 29730  
Ph: 803-324-1111  
Fx: 803-324-1116

# Z1000 Bypass Package



1 - 500 HP

## HVAC Optimized with Intelligent Bypass and Advanced BAS Interface

### Features

- Two Contactor Bypass
- 100K AIC Package Rating
- Input "Non-Fused" Disconnect
- Drive H-O-A Keypad used for Bypass
- Standard Digital Inputs (5)
  - Run
  - Safety
  - BAS Interlock
  - Auto Transfer to Bypass
  - Smoke Purge
- Programmable Digital Inputs (3)
- Form "C" Programmable Relays (4)
- Built-in BACnet protocol (BTL certified), Apogee, Metasys, Modbus/Memobus accessible via RS-422/485 communication, which is standard
- All Bypass Functions Work with Serial Communications
- Phase Loss & Low Voltage Monitor – Protects Against Contactor Coil Burn-out
- Motor Amp Display in Bypass
- Duct Pressurization Function (Pre-run)
- Bypass Sync

**NEMA 1 Wall-Mount Enclosed**

- 50 - 100HP, 208V
- 100 - 200HP, 480V

**NEMA 1 Floor Mount**

- 125 - 150HP, 208V
- 250 - 500HP, 480V

### OPTIONS

- ▶ Circuit Breaker - 100K AIC
- ▶ Drive Service Switch
- ▶ Three Contactor Bypass
- ▶ Custom Nameplate
- ▶ EtherNet/IP
- ▶ LonWorks

# Z1000 Bypass Package

## Models and Ratings

### 208V Models

	D002	D003	D004	D007	D010	D016	D024	D030	D046	D059
Base No.: Z1Bx [ ] (x denotes enclosure type)										
Rated Output Current (A)	2.4	3.5	4.6	7.5	10.6	16.7	24.2	30.8	46.2	59.4
Nominal HP	0.5	0.75	1	2	3	5	7.5	10	15	20
Type 1	Height	41.60				45.10		48.20		
Type 12	Width	6.77						10.18		
Type 12	Depth	12.92						13.19		
Type 12	Weight	70				80		90		
Type 3R	Height	28.8				34.8		39.8		
Type 3R	Width	17.9				20.5		25.5		
Type 3R	Depth	17.9						17.3		
Type 3R	Weight	150				210		275		

	D074	D088	D114	D143	D169	D211	D273	D343	D396
Base No.: Z1Bx [ ] (x denotes enclosure type)									
Rated Output Current (A)	74.8	88.0	114.0	143.0	169.0	211.0	273	343	396
Nominal HP	25	30	40	50	60	75	100	125	150
Type 1	Height	52.80	42.79	49.09		84.16			
Type 12	Width	12.68	25.80	28.41		41.26			
Type 12	Depth	14.20	16.06	20.87		33.94			
Type 12	Weight	160	280	380		950	1250	1650	1700
Type 3R	Height	39.8	51.2	84.2					
Type 3R	Width	25.5	32.7	41.3					
Type 3R	Depth	17.3	22.8	32.0					
Type 3R	Weight	275	420	490	850	945	1215	1300	1350
Type 3R	Height	40.1	51.1	91.1					
Type 3R	Width	28.7	39.0	41.3					
Type 3R	Depth	21.4			50.7		46.6		
Type 3R	Weight	275	420	490	850	945	1215	1300	1350

Note: Data subject to change.



NEMA 1



NEMA 12



NEMA 3R

**YASKAWA**

# Z1000 Bypass Package

## Models and Ratings

### 480V Models

Base No.: Z1Bx [ ] (x denotes enclosure type)	B001	B002	B003	B004	B007	B011	B014	B021	B027	B034	B040	B52L	B052
Rated Output Current (A)	1.6	2.1	3.2	4.8	7.6	11.0	14.0	21.0	27.0	34.0	40.0	52.0	52.0
Nominal HP	0.5 / 0.75	1	2	3	5	7.5	10	15	20	25	30	40	40
Dimensions (in) and Weight (lb)	Type 1	Height	41.60				45.10			48.20	52.80		
	Type 12	Width	6.77							10.18	12.68		
	Type 12	Depth	12.92							13.19	14.20		
	Type 12	Weight	70			80			90		160		
	Type 3R	Height	28.8			34.8			39.8				
	Type 3R	Width	17.9			20.5			25.5				
	Type 3R	Depth	17.9						17.3				
	Type 3R	Weight	150			210			275				
	Type 1	Height	29.1			34.8			40.1				
	Type 1	Width	21.2			23.7			28.7				
	Type 1	Depth	21.4										
	Type 1	Weight	150			210			275				

Base No.: Z1Bx [ ] (x denotes enclosure type)	B065	B077	B096	B124	B156	B180	B240	B302	B361	B414	B477	B590		
Rated Output Current (A)	65.0	77.0	96.0	124.0	156.0	180.0	240.0	302	361	414	477	590		
Nominal HP	50	60	75	100	125	150	200	250	300	350	400	500		
Dimensions (in) and Weight (lb)	Type 1	Height	52.80	42.79		49.09	84.16							
	Type 12	Width	12.68	25.80		28.41	41.26			69.76				
	Type 12	Depth	14.20	16.06		20.87	33.94			30.50				
	Type 12	Weight	160	280		380	1250	1600	1700	1800	2100	2200		
	Type 3R	Height	51.2			84.2								
	Type 3R	Width	32.7			41.3	69.8							
	Type 3R	Depth	22.8			32.0	30.5							
	Type 3R	Weight	410	475	500	550	850	950	1200	1300	1315	1900	2100	
	Type 1	Height	51.1			91.1								
	Type 1	Width	39.0			41.3			66.3					
	Type 1	Depth	21.4			50.7			46.6		43.5			
	Type 1	Weight	410	475	500	550	850	950	1200	1300	1315	1900	2100	

Note: Data subject to change.



**NEMA 1**



**NEMA 12**

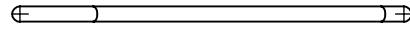


**NEMA 3R**

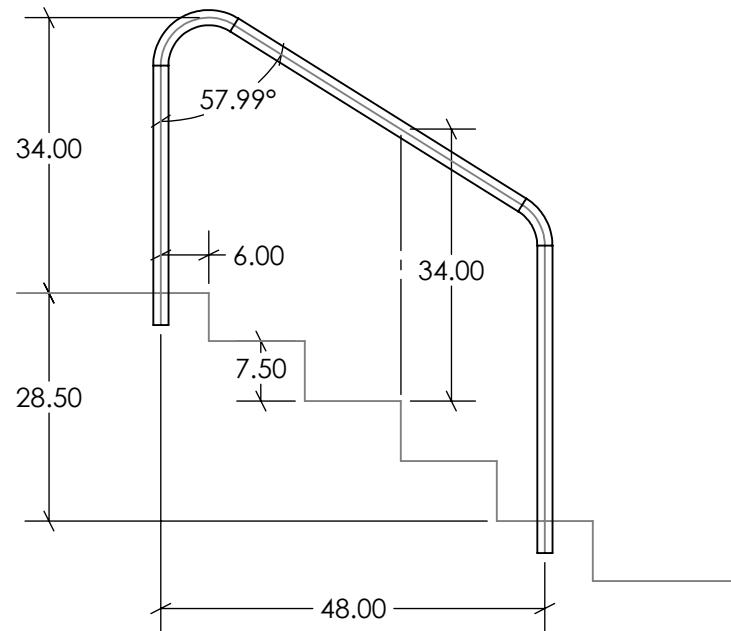
**Rail Drawings - Signature Block**

I authorize S.R. Smith, LLC to fabricate the custom rail product(s) shown on this drawing in accordance with Customer's Purchase Order No. \_\_\_\_\_

I understand and agree that custom rail products are unique and are made to the specifications shown on this drawing. SR Smith, LLC warrants only conformance to specification; not installation. ALL OTHER WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE ARE SPECIFICALLY DISCLAIMED.

**DO NOT INSTALL ANCHORS PRIOR TO RECEIVING ANY CUSTOM RAILING.**Customer Name: \_\_\_\_\_  
Date: \_\_\_\_\_Authorized Signature: \_\_\_\_\_  
Authorized Name (Print): \_\_\_\_\_

\* LEG LENGTHS INCLUDE 4"  
TO GO INTO ANCHORS.



RAIL #	JOB #	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES, TOLERANCES ARE:		DESCRIPTION: PADDOCK POOL EQUIPMENT	REV. A
QUANTITY: 2	WEIGHT: 30.0 LBS.	WELDED LEG LOCATION.....+/- .125 ANGLES.....+/- .5 DEGREES ELEVATIONS.....+/- .125 OVERALL LENGTH UNDER 18'.....+/- .188 OVER 18'.....+/- .375	MATERIAL: 1.90 x .109 (304) 600 GRIT S/S TUBING QUOTE NO.: 64367A	DRAWN BY: DTJ CHECKED BY: DATE: 2/18/24	
				DATE:	SIZE: A SCALE: 1:24 SHEET 1 OF 1

**SR Smith™**

P.O. BOX 400 - 1017 S.W. BERG PARKWAY  
CANBY, OREGON 97013  
PHONE (503) 266-2231

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Customer Name: \_\_\_\_\_

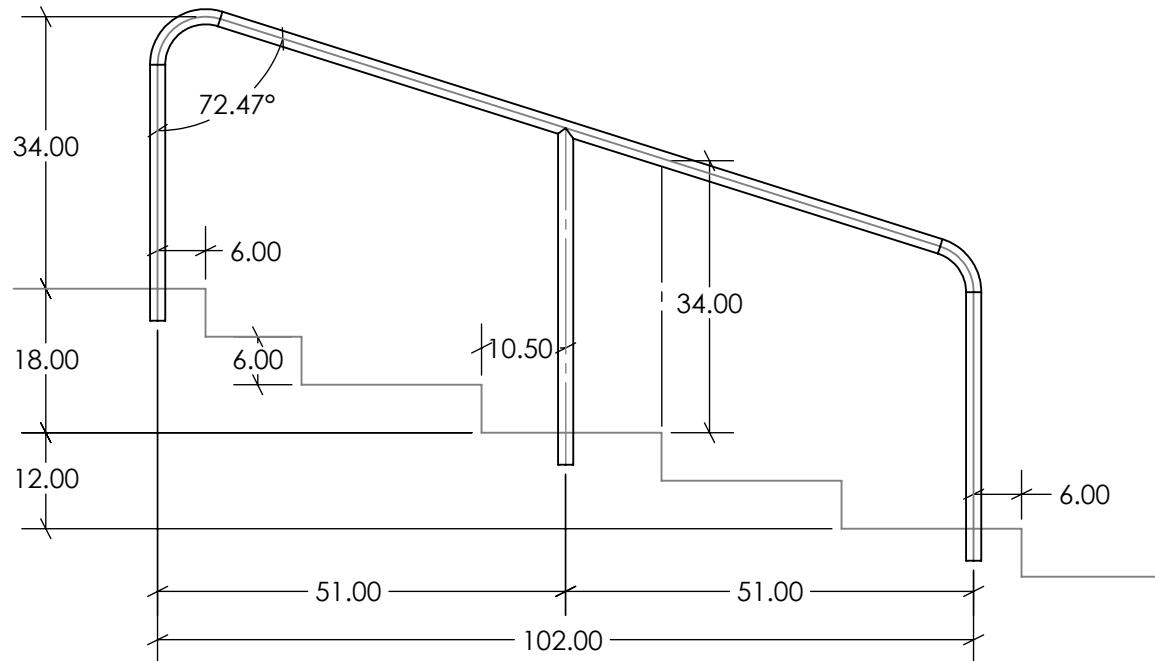
Date: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

Authorized Name (Print): \_\_\_\_\_



\* LEG LENGTHS INCLUDE 4"  
TO GO INTO ANCHORS.



RAIL #	JOB #	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES, TOLERANCES ARE:		DESCRIPTION: PADDOCK POOL EQUIPMENT	REV. A
QUANTITY:	WEIGHT:	WELDED LEG LOCATION.....+/- .125 ANGLES.....+/- .5 DEGREES ELEVATIONS.....+/- .125 OVERALL LENGTH UNDER 18'.....+/- .188 OVER 18'.....+/- .375	1.90 x .109 (304) 600 GRIT S/S TUBING	QUOTE NO.: 64367B	
2	50.0 LBS.		DRAWN BY: DTJ	DATE: 2/18/24	
		CHECKED BY:		DATE:	SIZE: A SCALE: 1:24 SHEET 1 OF 1

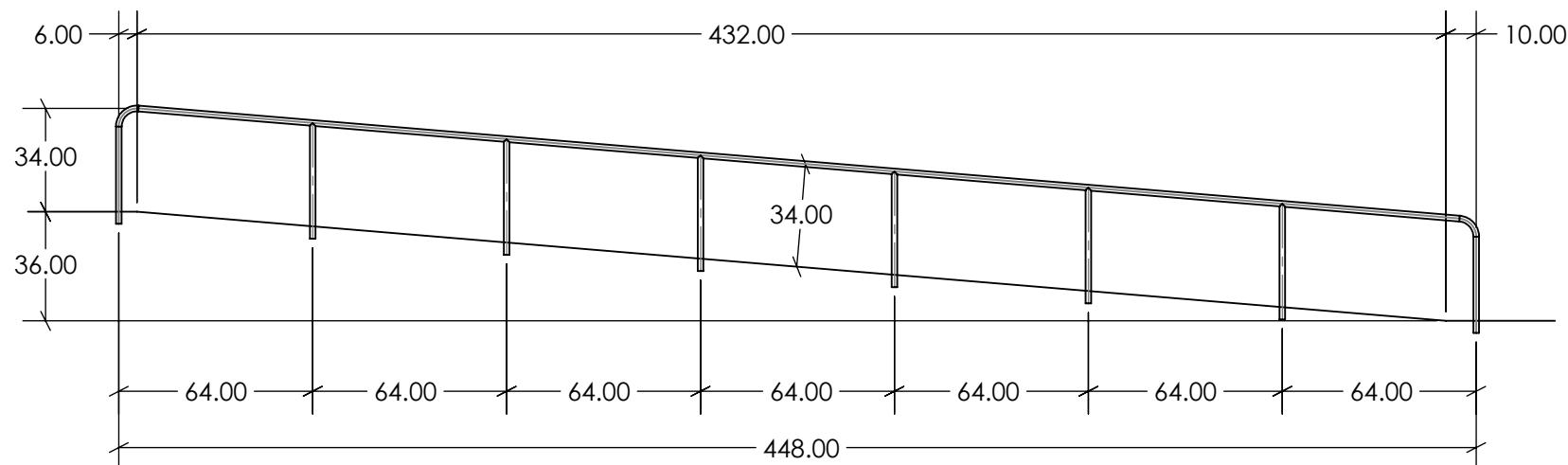
**SR Smith™**

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CANBY, OREGON 97013  
PHONE (503) 266-2231

**Rail Drawings - Signature Block**

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**DO NOT INSTALL ANCHORS PRIOR TO RECEIVING ANY CUSTOM RAILING.**Customer Name: \_\_\_\_\_  
Date: \_\_\_\_\_Authorized Signature: \_\_\_\_\_  
Authorized Name (Print): \_\_\_\_\_**\* LEG LENGTHS INCLUDE 4"  
TO GO INTO ANCHORS.**

RAIL #	JOB #	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES, TOLERANCES ARE:		DESCRIPTION:		
QUANTITY:	WEIGHT:	WELDED LEG LOCATION.....+/- .125 ANGLES.....+/- .5 DEGREES ELEVATIONS.....+/- .125 OVERALL LENGTH UNDER 18'.....+/- .188 OVER 18'.....+/- .375	DRAWN BY: DTJ CHECKED BY: DATE: 2/18/24 SIZE: A SCALE: 1:24 SHEET 1 OF 1	PADDOCK POOL EQUIPMENT	REV. A	P.O. BOX 400 - 1017 S.W. BERG PARKWAY CANBY, OREGON 97013 PHONE (503) 266-2231
2	170.0 LBS.	MATERIAL: 1.90 x .109 (304) 600 GRIT S/S TUBING QUOTE NO.: 64367C				
COPYRIGHT © 2024 S.R. SMITH, LLC. ALL RIGHTS RESERVED						

**SR Smith™**P.O. BOX 400 - 1017 S.W. BERG PARKWAY  
CANBY, OREGON 97013  
PHONE (503) 266-2231

**Rail Drawings - Signature Block**

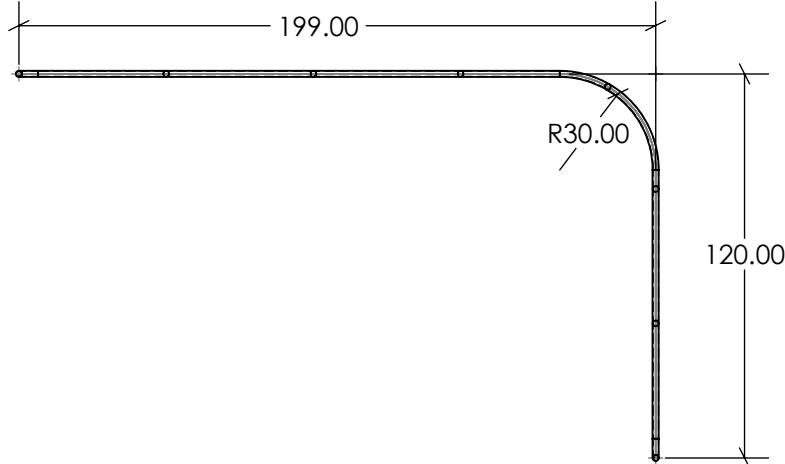
I authorize S.R. Smith, LLC to fabricate the custom rail product(s) shown on this drawing in accordance with Customer's Purchase Order No. \_\_\_\_\_

I understand and agree that custom rail products are unique and are made to the specifications shown on this drawing. SR Smith, LLC warrants only conformance to specification; not installation. ALL OTHER WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE ARE SPECIFICALLY DISCLAIMED.

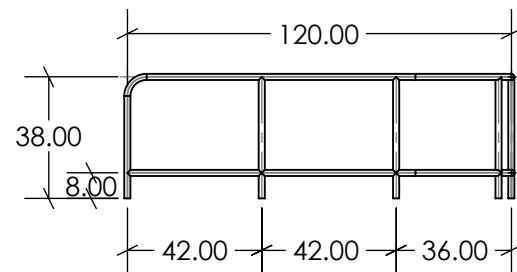
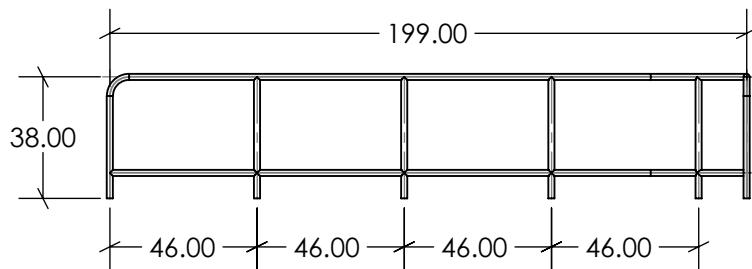
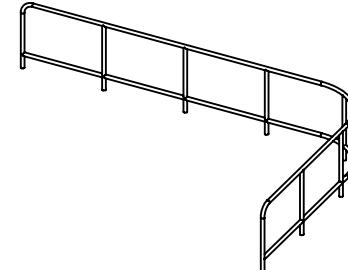
**DO NOT INSTALL ANCHORS PRIOR TO RECEIVING ANY CUSTOM RAILING.**

Customer Name: \_\_\_\_\_  
Date: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_  
Authorized Name (Print): \_\_\_\_\_



\* LEG LENGTHS INCLUDE 4"  
TO GO INTO ANCHORS.



RAIL #	JOB #
QUANTITY: 1	WEIGHT: 215.0 LBS.

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES,  
TOLERANCES ARE:

WELDED LEG LOCATION.....+/- .125  
ANGLES.....+/- .5 DEGREES  
ELEVATIONS.....+/- .125  
OVERALL LENGTH  
UNDER 18'.....+/- .188  
OVER 18'.....+/- .375

**DESCRIPTION:**  
**PADDOCK POOL EQUIPMENT**

**MATERIAL:**  
1.90 x .109 (304) 600 GRIT S/S TUBING

**QUOTE NO.:** 64367D **REV.** A

**DRAWN BY:** DTJ **DATE:** 2/18/24

**CHECKED BY:** **DATE:**

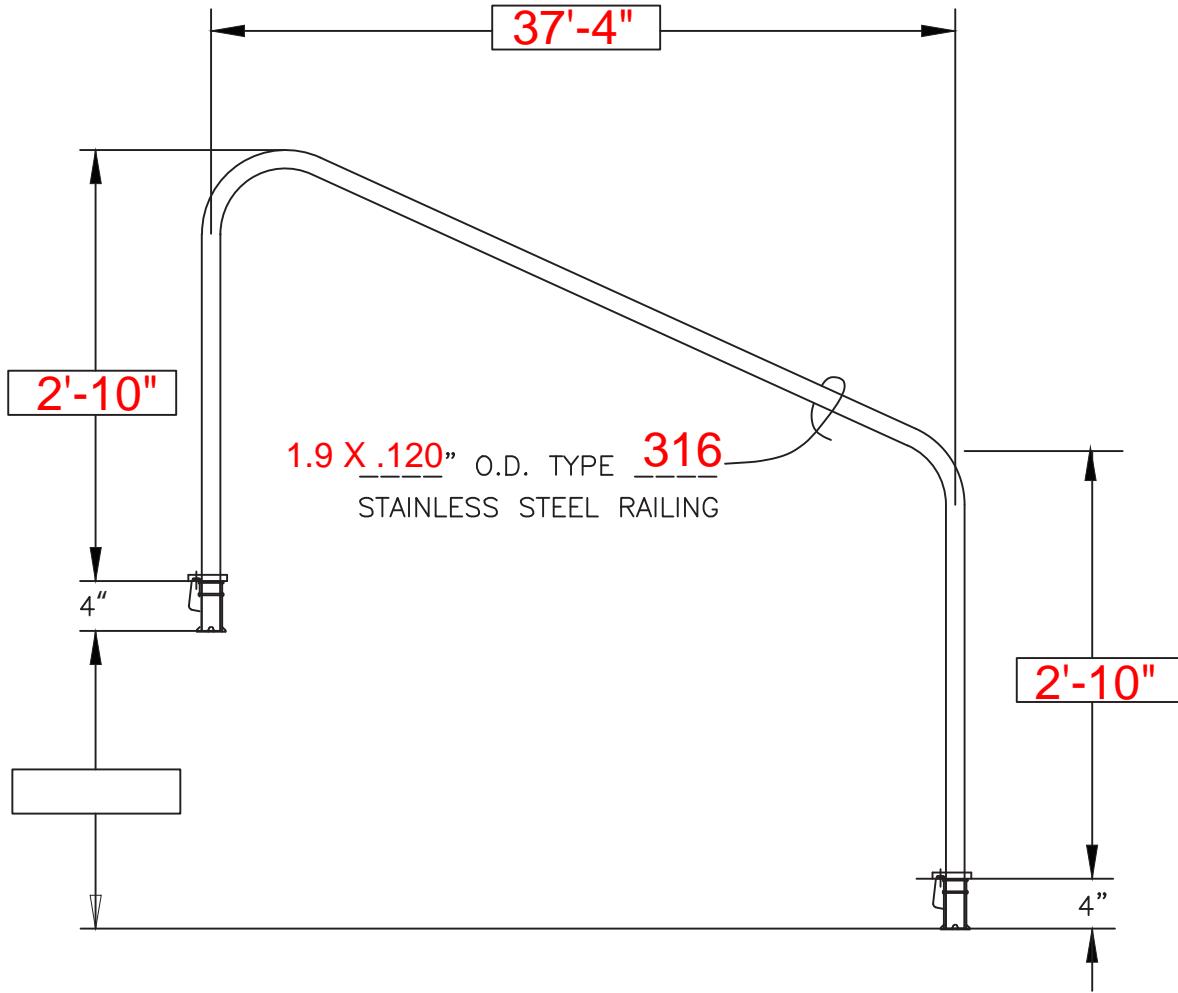
**SR Smith**  
TM

P.O. BOX 400 - 1017 S.W. BERG PARKWAY  
CANBY, OREGON 97013  
PHONE (503) 266-2231

**SIZE:** A **SCALE:** 1:24 **SHEET 1 OF 1**



## Ramp Rails Handrails



Paddock's **Handrails** are fabricated from Type 304 or 316L stainless steel tubing with an outside diameter of 1.90" and standard wall thickness of .083". (Outside diameter of 1.50", or wall thickness of .120" and .145" are also available)

Handrails are 34" above pool floor and inclines at same angle as that of stairs or ramp.

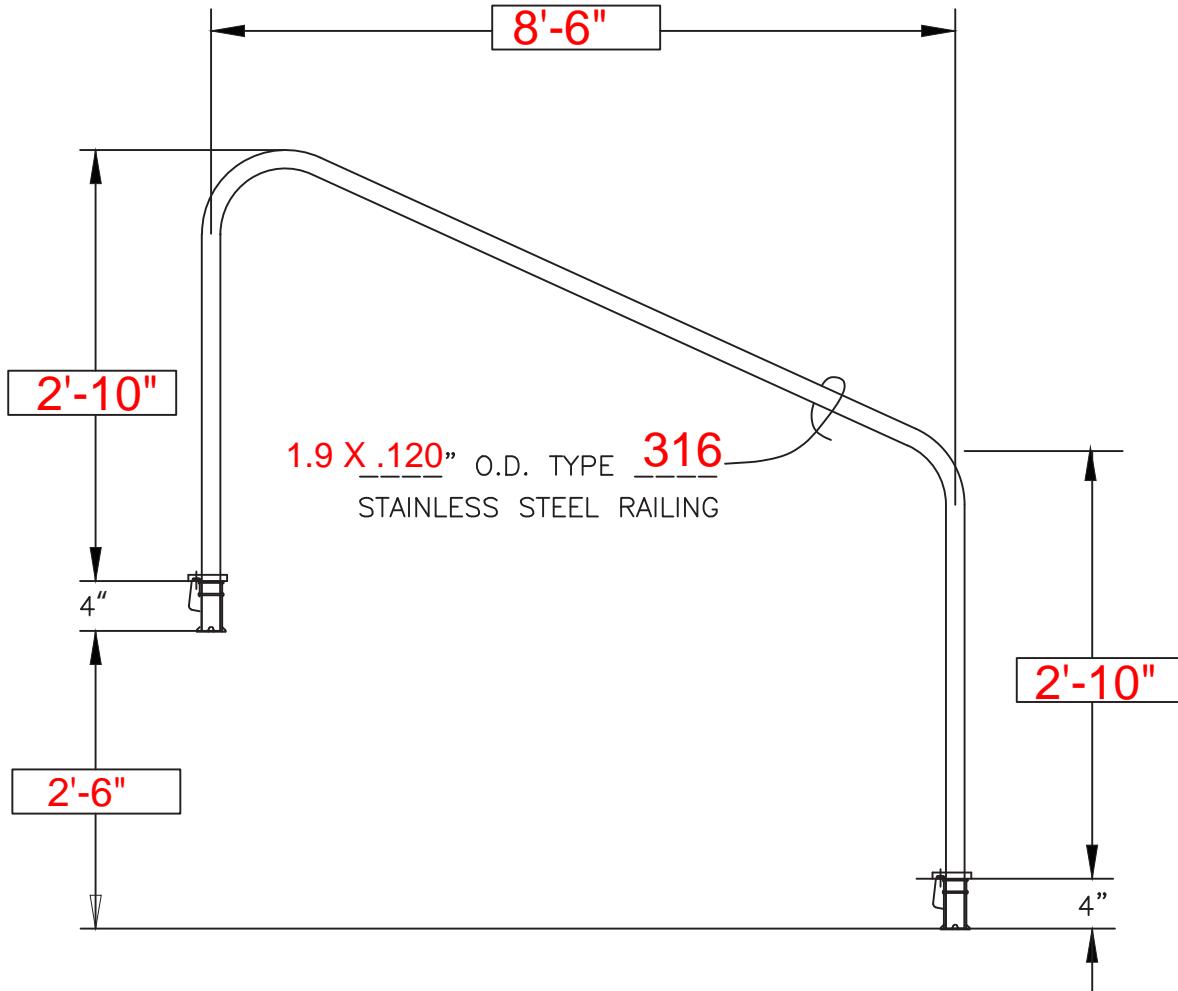
They are held by anchor sockets located in pool bottom and pool deck so they can be removed if necessary.

Paddock deck anchors with Paddock escutcheon plates are available.

P/N 9400128, Model 4718-C, Type 316, 1.9 " OD x .120 " Wall Less Anchors, Qty 2



## Step Rails Handrails



Paddock's **Handrails** are fabricated from Type 304 or 316L stainless steel tubing with an outside diameter of 1.90" and standard wall thickness of .083". (Outside diameter of 1.50", or wall thickness of .120" and .145" are also available)

Handrails are 34" above pool floor and inclines at same angle as that of stairs or ramp.

They are held by anchor sockets located in pool bottom and pool deck so they can be removed if necessary.

Paddock deck anchors with Paddock escutcheon plates are available.

P/N 9400119, Model 4718-C, Type 316, 1.9 " OD x .120 " Wall Less Anchors, Qty 2