



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.



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:

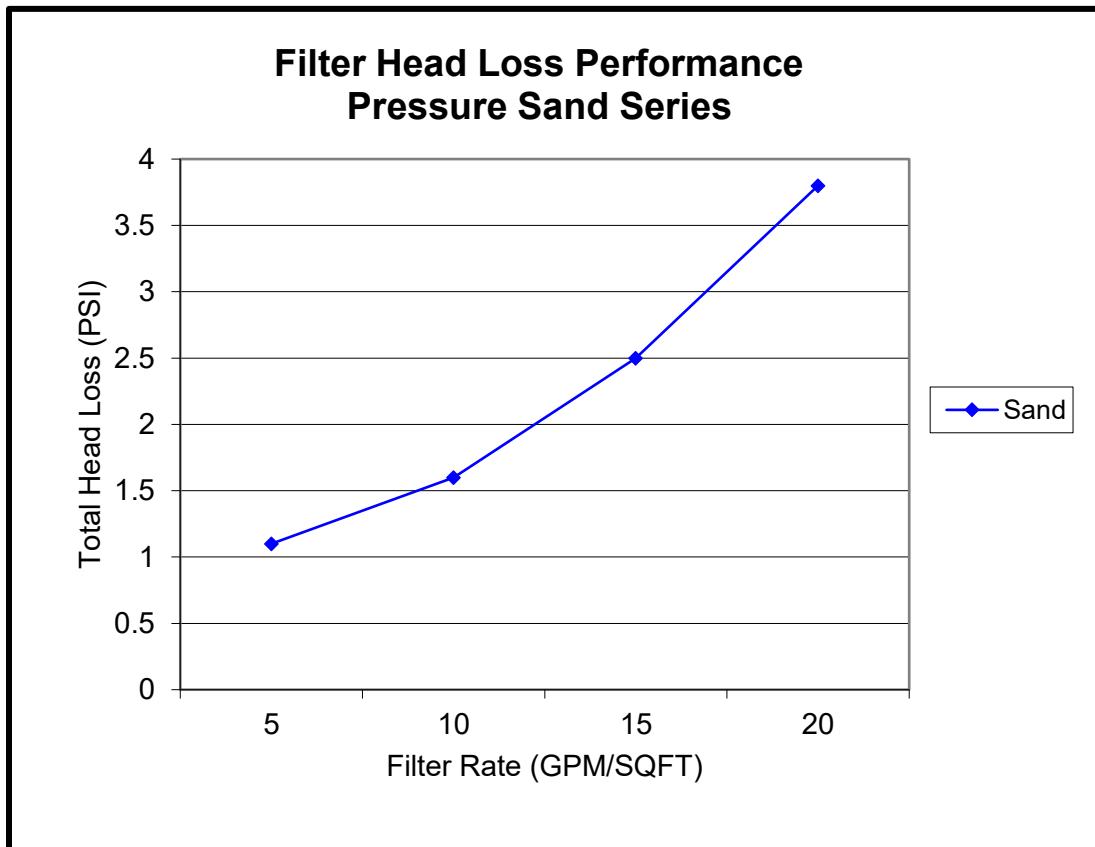
Slowly close isolation valve downstream of pump, then stop pump. Close isolation valve upstream of the strainer. Remove cover and clean basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open upstream valve and start pump. Slowly open valve downstream of pump. Establish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



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

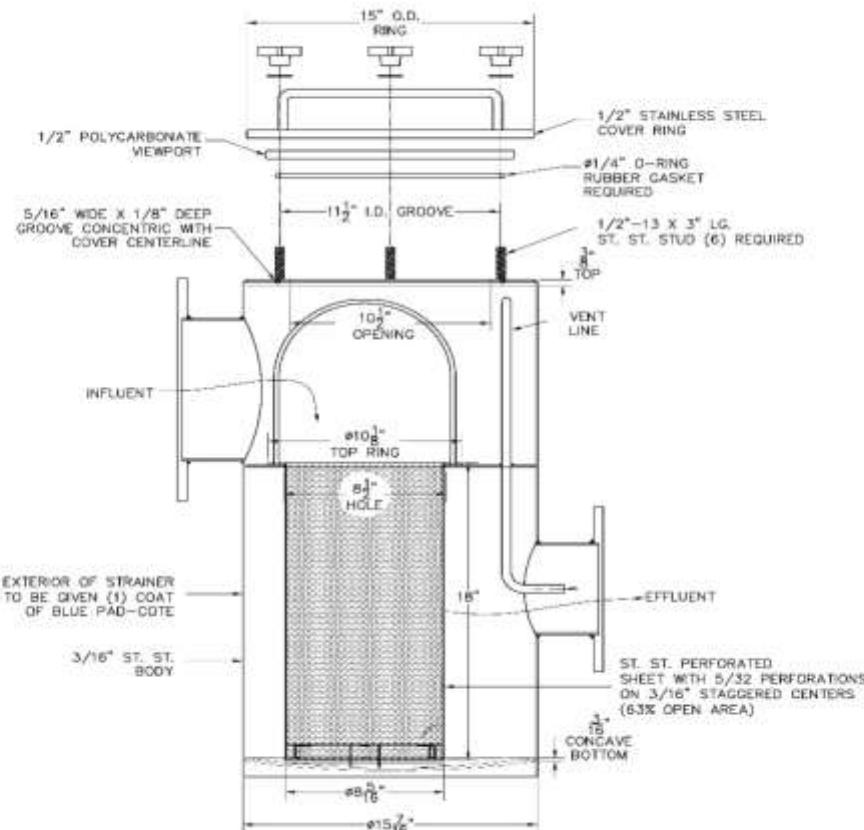
- Paddock's HDPE grating is marine-grade polymer sheeting which is resistant to most chemicals and requires little maintenance to keep it looking new.
- Keep harsh solvents, acids, wood stains and wood preservatives away from Paddock HDPE finish. They may cause permanent staining and damage.
- Staining 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.

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).

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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.**



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.



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.



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.



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:

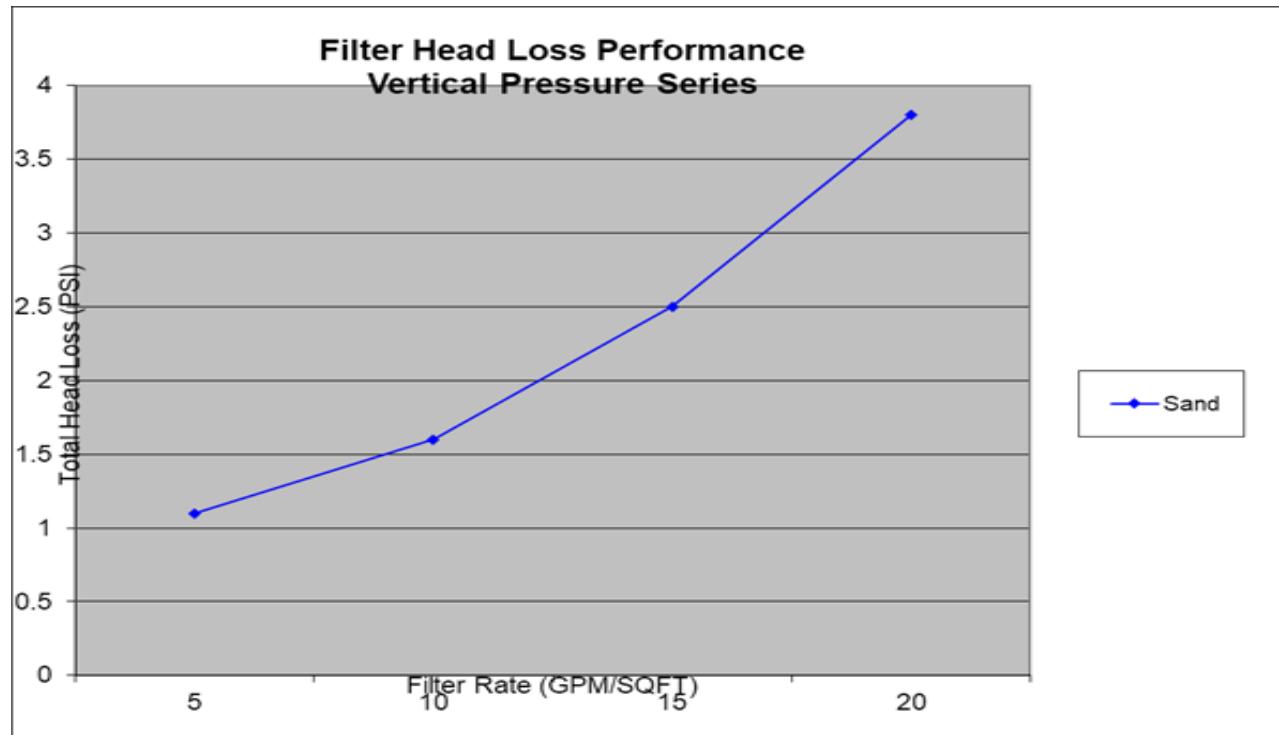


Slowly close isolation valve downstream of pump, then stop pump. Close isolation valve upstream of the strainer. Remove cover and clean basket. Be sure strainer is filled with water after cleaning. Replace cover tightly. Open upstream valve and start pump. Slowly open valve downstream of pump. Establish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



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.



Designing the future of stainless steel perimeters

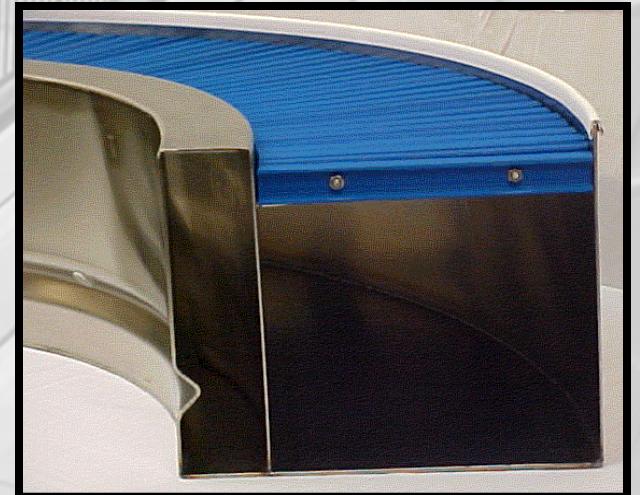
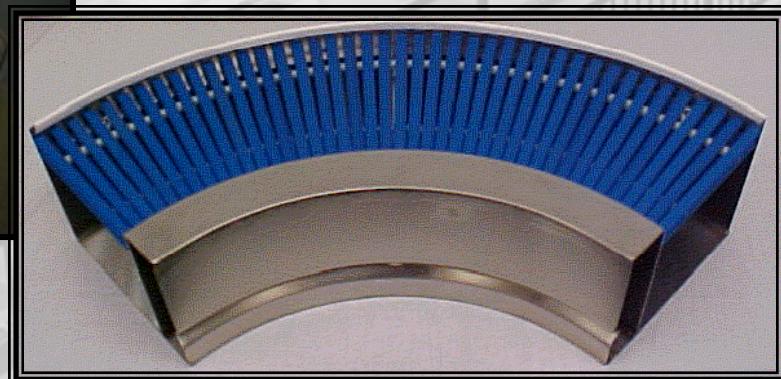


PADDOCK
POOL EQUIPMENT COMPANY

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





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.



Paddock Pool Equipment Company, Inc.
555 Paddock Parkway
Rock Hill, SC 29730
United States of America

Ph: 803-324-1111

Submittal

Number: SO23160 Date: **29-Mar-23**

To:

Cox Pools of the Southeast
22656 Canal Road
Orange Beach AL 36561
United States

Mark Kindergan

EMAIL: mark@coxpoolsse.com

PHONE #: 251 974 5244

Project Name: **Lake Willmore**

Project Manager: Trevor Ottley
ottley@paddockindustries.com
PHONE #: 803-372-6088

Qty	Description	Drawing	Approval
1	PPEC1400S Filter,Paddock,Regenerator,1400S Filter,Paddock,Regenerator,1400S, Type 304L ST. ST. with Filter Controller, 2551 Mag. Flow Meter with saddle, Actuated Valves (2), Vacuum Transfer System, Drain Flange, spacer, valve and 90° Elbow, Two Charges of Perlite Media 1141 SF - 1.11 GPM/SF - 1265 GPM (NO ADDITIONAL CHARGES OF MEDIA INCLUDED)		
1	210021 Compressor,Regen,5HP,60Gal,combo 230-460V (3PH) Compressor,Regen,5HP,60Gal,230V (3PH)	Cut Sheet	
1	200727 Dryer,Regen,15CFM,5HP,1PH Dryer,Regen,15CFM,5HP,1PH		
1	200371 Tank,Air,Receiver,30-Gallon Tank,Air,Receiver,30-Gallon		
1	STR-304-OS-12-12 Strainer,SS,12"X12" Strainer,SS,12"X12" with Extra Basket	Cut Sheet	
1	ER-304-12-06 Reducer,E,304L,12"X6" Reducer,E,304L,12"X6" add 6" Precoat Tee	Cut Sheet	

Paddock is requesting either a Resale or Exemption Certificate from all customers for every project



Paddock Pool Equipment Company, Inc.
555 Paddock Parkway
Rock Hill, SC 29730
United States of America

Ph: 803-324-1111

Submittal

Number: SO23160 Date: **30-Mar-23**

To:

Cox Pools of the Southeast
22656 Canal Road
Orange Beach AL 36561
United States

Mark Kindergan

EMAIL: mark@coxpoolsse.com

PHONE #: 251 974 5244

Project Name: **Lake Willmore**

Project Manager: Trevor Ottley
ottley@paddockindustries.com
PHONE #: 803-372-6088

Qty	Description	Drawing	Approval
448 ft	23160.01 R300-304-TG-G Gutter,R300,304L,TG,Gray Gutter,R300,304L,TG,Gray,3/4"x1",1/2 Slope - 8" PO, 8" Returns,Cup Anchors, Step Anchors	23160.01	

Paddock is requesting either a Resale or Exemption Certificate from all customers for every project

23-664 - Lake Wilmore Park Comm Center



2000 Grove Hill Road
Auburn, Alabama 36830
United States

Bailey-Harris Construction Co Inc
1600 Bailey Harris Drive
Auburn, Alabama 36830
United States
+1334-821-0807

Title	Submittal Manager
13 1143 Pool Stainless Steel Gutter - Shop Drawing	JT Jacob Cich
Spec Section	Type
13 1143 - Pool Stainless Steel Gutter	Shop Drawing
Number	Rev
13 1143-1	0

Description
1

BAILEY-HARRIS CONSTRUCTION CO., INC.	
<input type="checkbox"/> REVIEWED	<input type="checkbox"/> REVISE & RESUBMIT
<input checked="" type="checkbox"/> REVIEWED AS NOTED	<input type="checkbox"/> OTHER _____
SUBMITTAL HAS BEEN REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY. THE SUBCONTRACTOR/VENDOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOBSITE FOR TOLERANCE, CLEARANCE, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH OTHER TRADES AND FULL COMPLIANCE WITH CONTRACT DOCUMENTS. THIS REVIEW DOES NOT RELIEVE SUBCONTRACTOR/VENDOR FROM COMPLYING WITH CONTRACT DOCUMENTS.	
BY: <u>JT Cich</u>	

**To:**

Cox Pools of the Southeast
22656 Canal Road
Orange Beach AL 36561
United States

Ph: 803-324-1111

Submittal

Number: SO23160 Date: 30-Mar-23

Submitted To:

Mark Kindergan

EMAIL: mark@coxpoolsse.com**PHONE #:** 251 974 5244**Project Name:** Lake Willmore

Project Manager: Trevor Ottley
PHONE #: ottley@paddockindustries.com
PHONE #: 803-372-6088

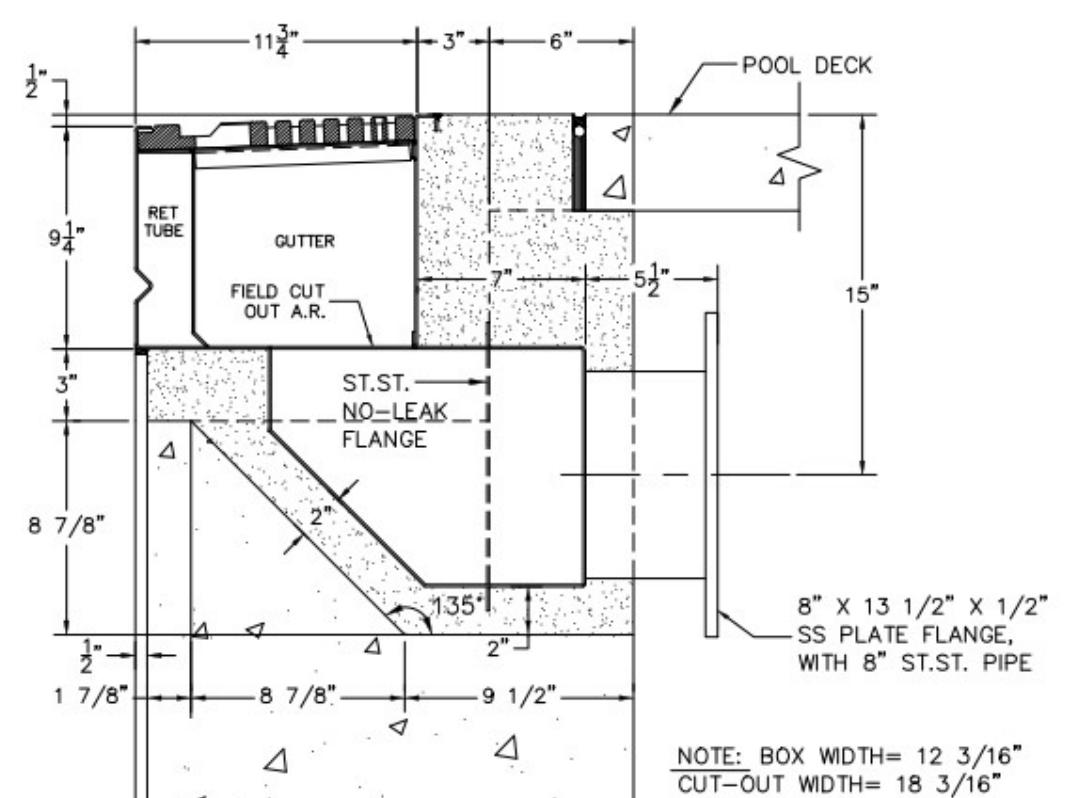
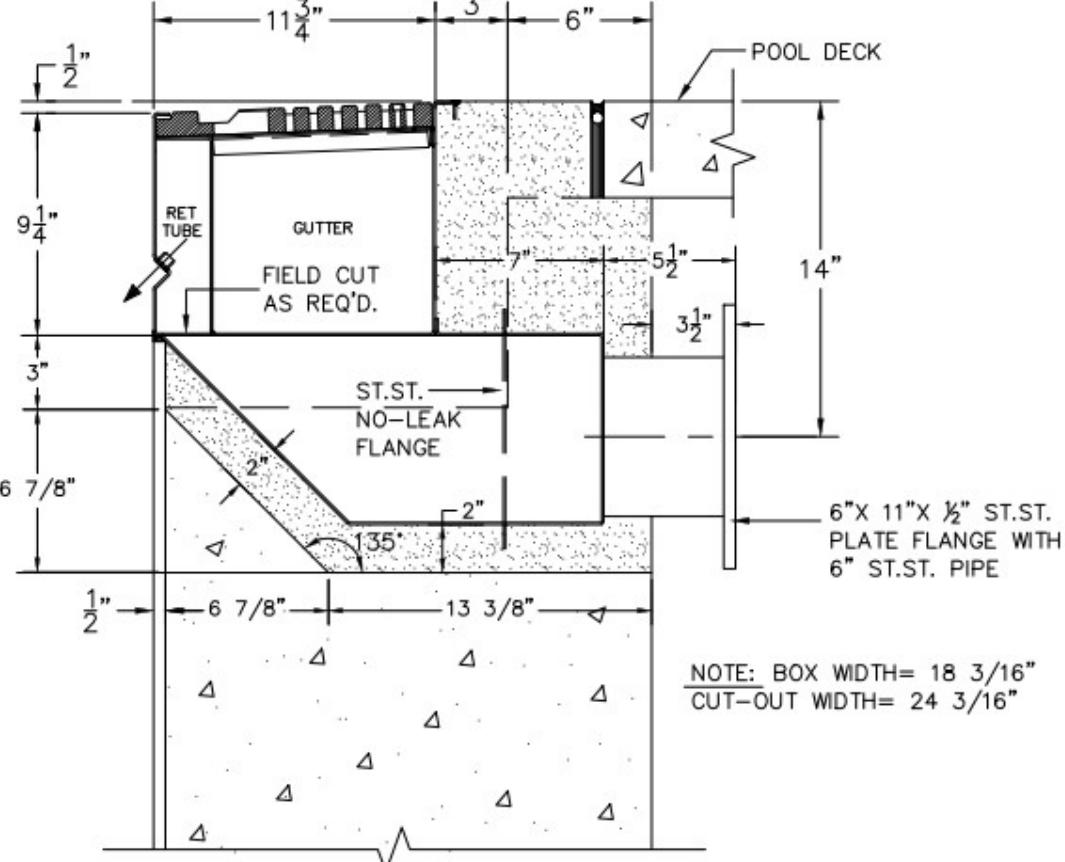
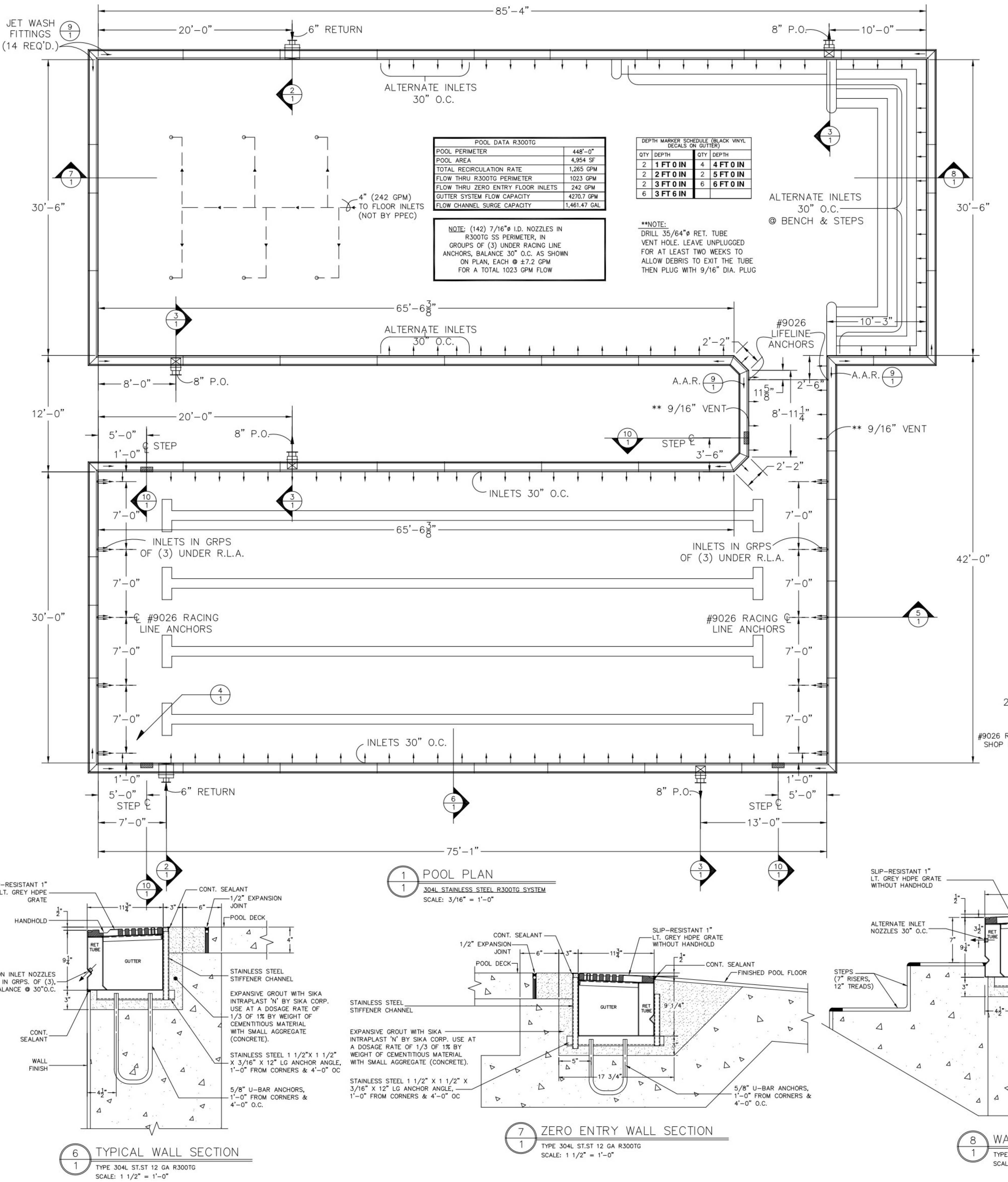
Qty	Description	Drawing	Approval
448 ft	23160.01 R300-304-TG-G Gutter,R300,304L,TG,Gray Gutter,R300,304L,TG,Gray,3/4"X1",1/2 Slope -8" PO, 8" Returns,Cup Anchors, Step Anchors	23160.01	

Specs call for 316L.
 Is a listed substitution
 in on line brochure.

Exceptions as Noted:
 The 304L material is an acceptable alternate. Provide VE costing reduction to owner.

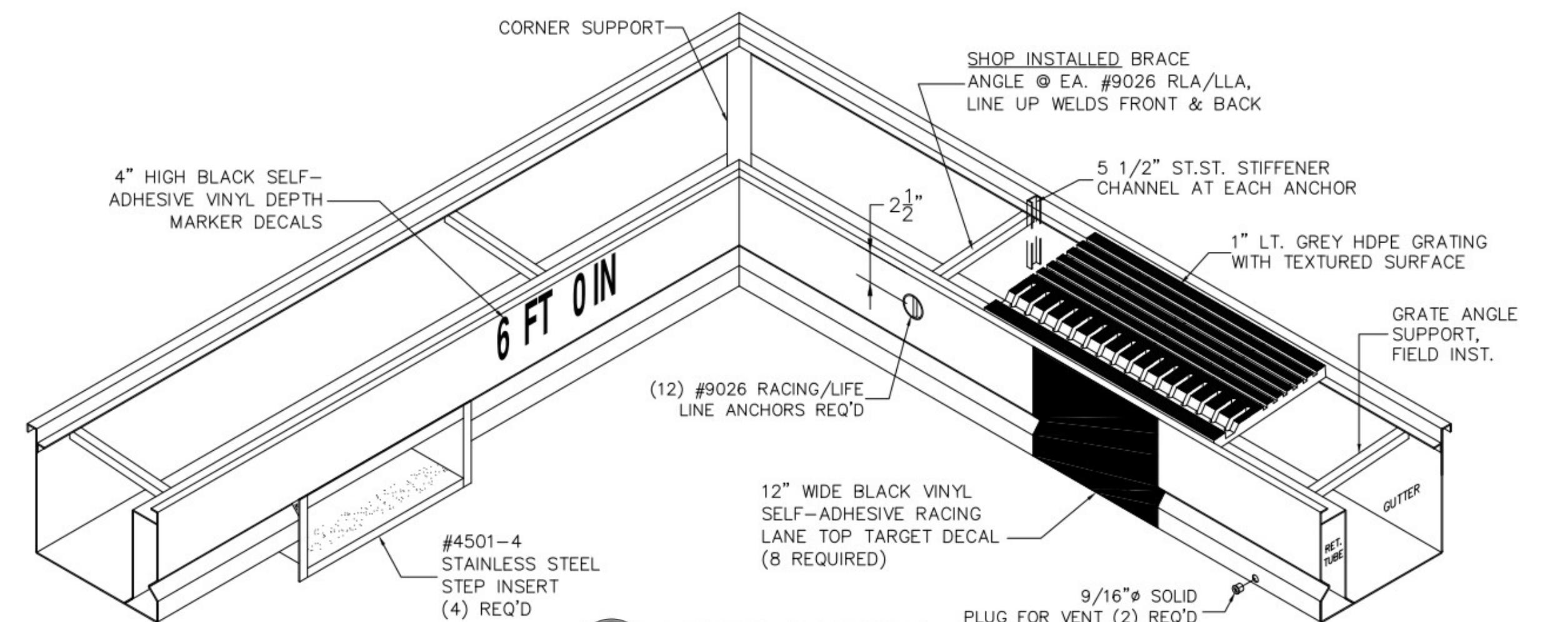
Water Technology Inc	
Submittal Review	
Project Name: Auburn AL Lake Wilmore Park Project Number: 19068 Submittal ID: 00001 Received On: 4/12/2023 Reviewed On: 4/21/2023 Reviewed By: James Breternitz	
Action:	Exceptions As Noted
WTI's review is for general conformance with the design concept of the project and the information given in the contract documents. The contractor is solely responsible for, and this review does not include: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating the work with that of other trades and performing all work in a safe and satisfactory manner. Corrections or comments made on this submittal during this review do not relieve contractor from compliance with the requirements of the contract documents or with its responsibilities listed above.	

Paddock Pool Equipment Company, Inc.
 555 Paddock Parkway
 Rock Hill, SC 29730
 United States of America

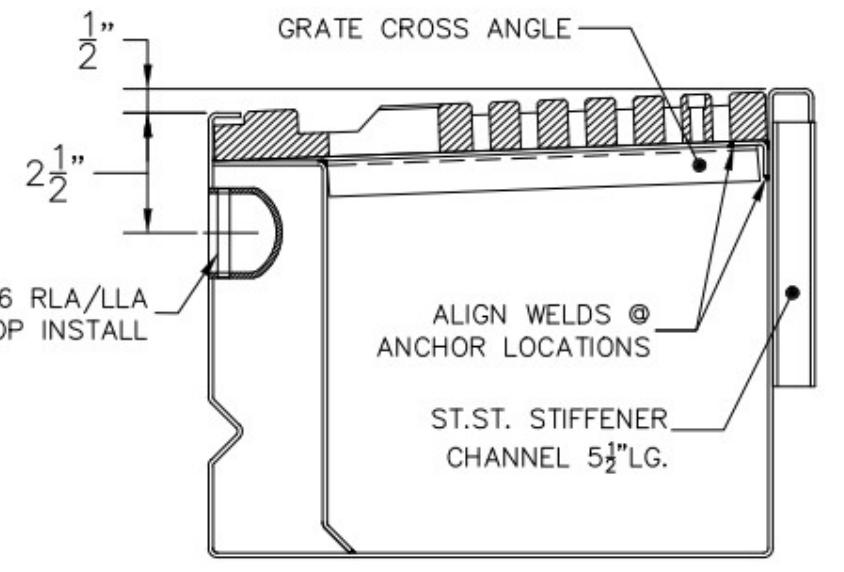


2 RETURN CONVERTER SECTION
1 SCALE: 1 1/2" = 1'-0" (2 REQUIRED)

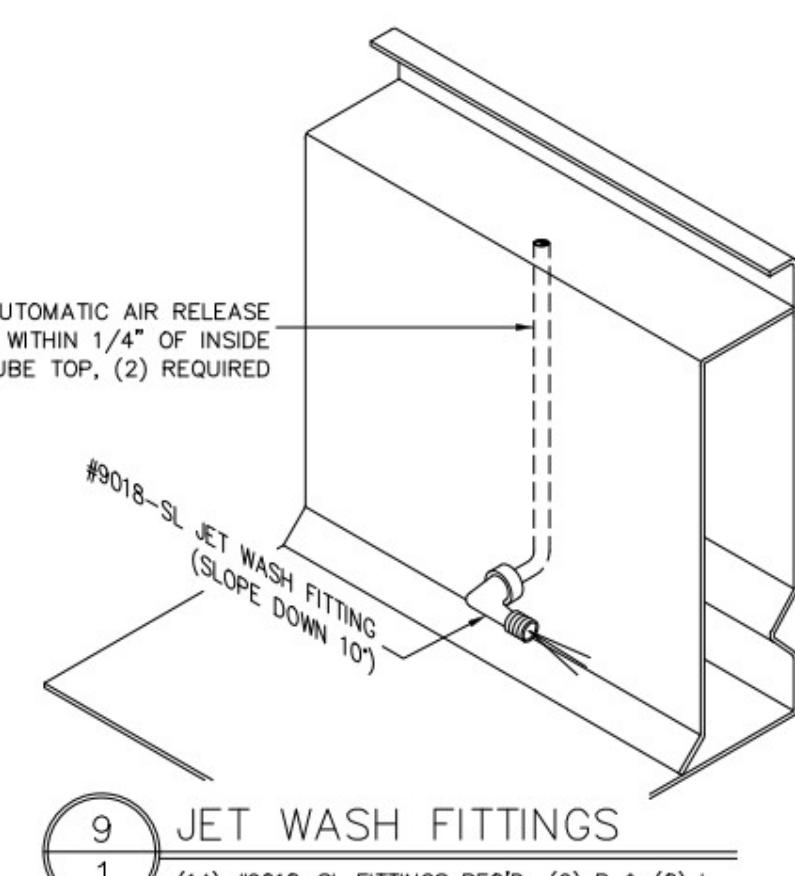
3 PERIMETER OVERFLOW CONVERTER SECTION
1 SCALE: 1 1/2" = 1'-0"



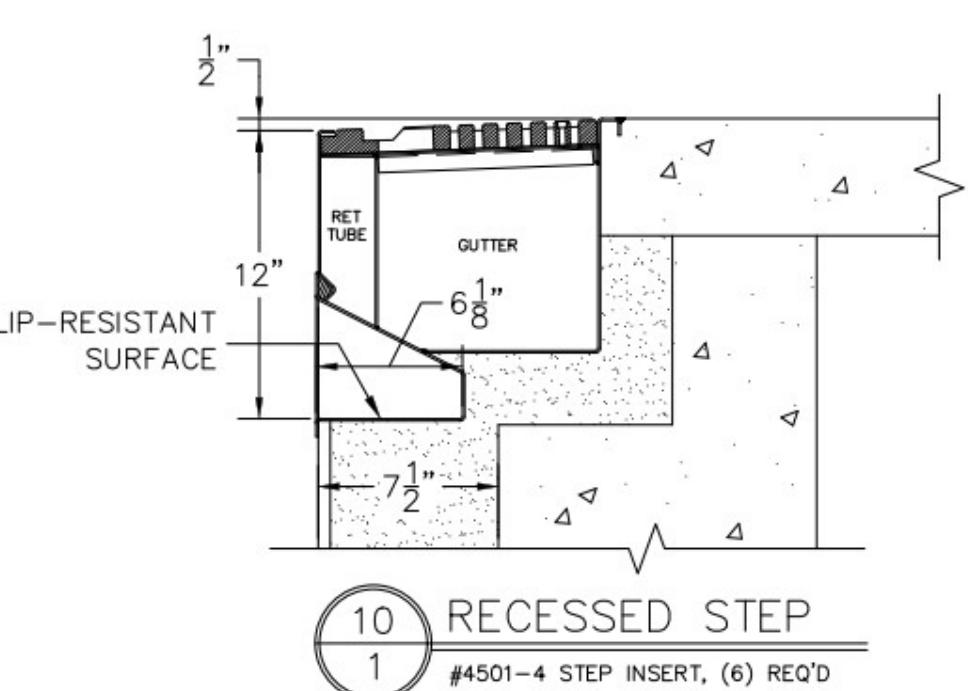
4 CORNER ISOMETRIC
1 ITEM LOCATIONS PER PLAN
SCALE: 1:10



5 #9026 RLA/LLA & BRACING
1 (12) #9026 ANCHORS REQ'D



	SUBMITTAL SHOP DRAWINGS FABRICATION CANNOT COMMENCE UNTIL WE RECEIVE APPROVED SHOP DRAWINGS		
SUBMITTAL DATE:			
DISPOSITION	BY	DATE	
<input type="checkbox"/> APPROVED AS SUBMITTED			
<input type="checkbox"/> APPROVED AS CORRECTED			
<input type="checkbox"/> NOT APPROVED-RESUBMIT			
<input type="checkbox"/> APPROVED-304L ST. ST.			
<input type="checkbox"/> APPROVED-LT. GREY GRATE			



V
10 RECESSED STEP
1 #4501-4 STEP INSERT. (6) REQ'D

Paddock Pool Equipment Company

Gutter Flow Calculations

Project

Lake Wilmore R300TG

Total Recirculation Rate, gpm

1023

Pool Perimeter, feet

448

Average Gutter Width, inches

9.19

Usable Gutter Depth, inches

7.81

Number of 90-degree corners

8

Number of 45-degree corners

4

Number of radiused corners

0

Number of PO Converters

4

Number of Return Converters

2

Supply tube area, square inches

18.1

Number of inlet nozzles

142

Max. tube pressure allowed, psi

7.5

Density of Fluid, lb_m/ft³

62.217 (Water at 80°F)

Local Gravity, ft/sec²

32.17

Absolute Viscosity (μ), lb_fsec/ft²

1.791E-05 (Water at 80°F)

Click on **Tools > Solver**, then press **Enter** twice

Total gutter system flow capacity is

4270.70 gpm

Gutter collection rate is

711.81 gpm

Design for surge weirs is:

Adequate

Design for rimflow conditions is:

Superior

Flow rate per nozzle

7.20 gpm

Nozzle Size

7

Nozzle Velocity

15.38 ft/sec

Supply Tube Velocity

4.53 ft/sec

Supply Tube Pressure

5.75 psi

Surge Capacity in Flow Channel

1461.47 gallons

Navier-Stokes Continuity Equation:

$$\left[1 - \left(\frac{\rho}{m} \right)^2 W^5 g \eta^3 \right] \partial \eta = \frac{f}{8} \partial \left(\frac{x}{W} \right)$$

Solving this equation for turbulent flow conditions with m as the unknown variable yields

$$Dm^2 + D_2 \sqrt[4]{m^7} + D_3 = 0$$

where ρ = density of the fluid, lb_m/ft²

m = mass flow rate, lb_m/sec

g = acceleration due to local gravity, ft/sec²

L = length of channel, ft

W = width of channel, ft

η = fluid height to width ratio

f = Darcy friction factor, $\frac{0.316}{\sqrt{R_e}}$

x = distance along centerline of channel

μ = absolute viscosity, lb_fsec/ft²

y = depth of fluid, ft

R_e = Reynold's Number, $\frac{4m}{\mu(2y+W)}$

Francis Weir Formula:

$$Q = 3.33 L \sqrt{H^3}$$

where

Q = flow rate, ft³/sec

L = length of weir, ft

H = height of water above crest of weir, ft

23-664 - Lake Wilmore Park Comm Center



2000 Grove Hill Road
Auburn, Alabama 36830
United States

Bailey-Harris Construction Co Inc
1600 Bailey Harris Drive
Auburn, Alabama 36830
United States
+1334-821-0807

Title
13 1130 Pool Regenerative Media Filters - Shop Drawing

Submittal Manager
JT Jacob Cich

Spec Section
13 1130 - Pool Regenerative Media Filters

Type
Shop Drawing

Number 13 1130-1 **Rev** 0

Description
1

DAVIS

Davis Architects, Inc.
Architecture • Design • Planning

Approved
 Approved as Noted
 Approved as Noted - Resubmit
Requested Information For Record

Proceed with the work covered by this Submittal provided it complies with the Contract Documents. Comments and corrections do not authorize changes to the Contract Documents.

Revise and Resubmit
 Rejected

Do not proceed with the work covered by this Submittal. Limit corrections in resubmissions to items noted in this Submittal.

Reviewed for Information
 Reviewed for Information as Noted

This Submittal is for information only and will be retained for record.

Comments and corrections do not authorize changes to the Contract Documents. Review of this submittal is for the limited purpose of checking for general conformance with the design concept noted in the Contract Documents and is not for determining the accuracy or completeness of details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, which remains the Contractor's responsibility. The Contractor shall coordinate Work of this submittal with other trades and field conditions. Review shall not constitute approval of safety precautions or of construction means, methods, or sequences. Approval of a specific component shall not indicate approval of an overall assembly.

CJB

4/25/23

Reviewed By

Date

BAILEY-HARRIS CONSTRUCTION CO., INC.

- REVIEWED REVISE & RESUBMIT
 REVIEWED AS NOTED OTHER _____

SUBMITTAL HAS BEEN REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY. THE SUBCONTRACTOR/VENDOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOBSITE FOR TOLERANCE, CLEARANCE, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH OTHER TRADES AND FULL COMPLIANCE WITH CONTRACT DOCUMENTS. THIS REVIEW DOES NOT RELIEVE SUBCONTRACTOR/VENDOR FROM COMPLYING WITH CONTRACT DOCUMENTS.

BY: JT Cich

**Water Technology Inc
Submittal Review**

Project Name: Auburn AL Lake Wilmore Park
Project Number: 19068
Submittal ID: 00001
Received On: 4/12/2023
Reviewed On: 4/21/2023
Reviewed By: James Breternitz

Action: No Exceptions

WTI's review is for general conformance with the design concept of the project and the information given in the contract documents. The contractor is solely responsible for, and this review does not include: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating the work with that of other trades and performing all work in a safe and satisfactory manner. Corrections or comments made on this submittal during this review do not relieve contractor from compliance with the requirements of the contract documents or with its responsibilities listed above.

- COORDINATE/VERIFY ELEC



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

regenerator™

Environmental Regenerative Filter



FEATURES

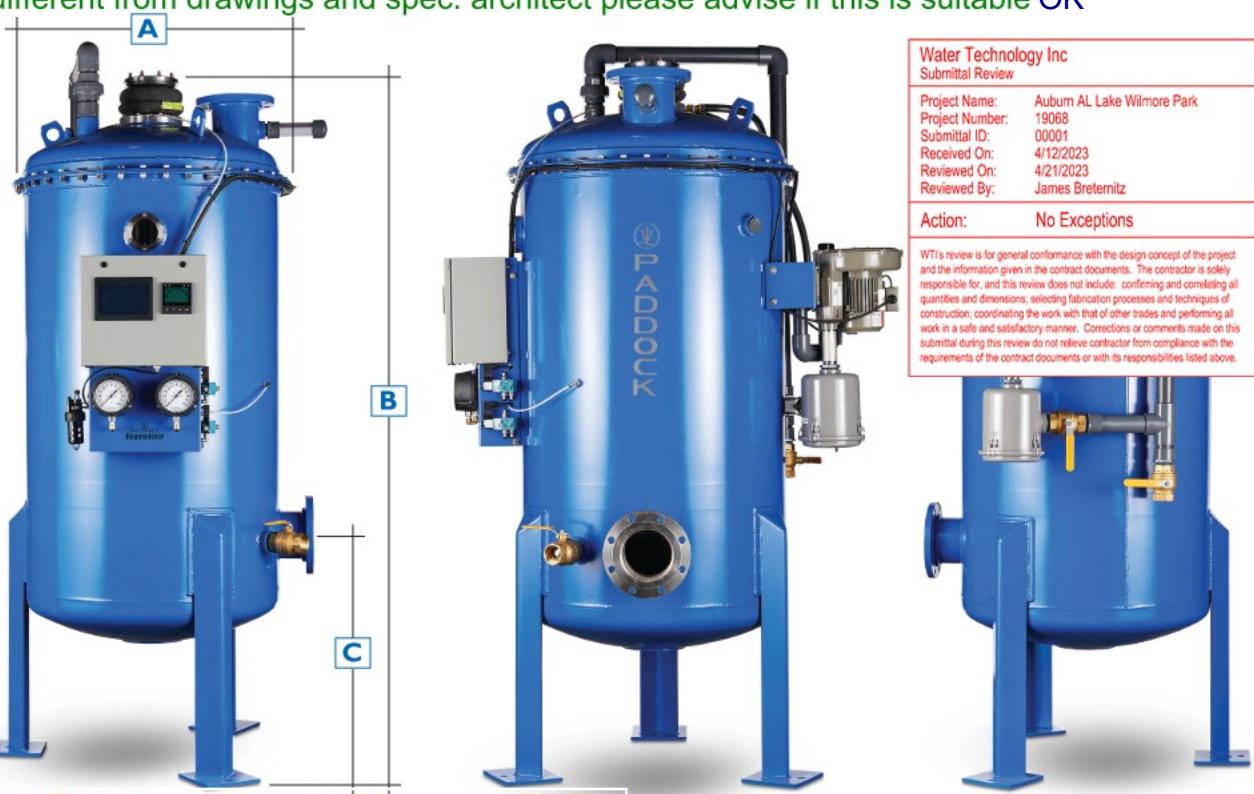
- Stainless Steel Components
- No Backwashing
- Fully Automated System with Manual Override Options Available
- Small Footprint in Equipment Room
- Integration with VFD and other secondary components
- True ASME Domed Head for Enhanced Hydraulics
- Double Convoluted Boot Mechanism for Superior Regeneration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

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 ²	FT ²	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.



Water Technology Inc Submittal Review	
Project Name:	Auburn AL Lake Wilmore Park
Project Number:	19068
Submittal ID:	00001
Received On:	4/12/2023
Reviewed On:	4/21/2023
Reviewed By:	James Breternitz
Action:	No Exceptions
WTI's review is for general conformance with the design concept of the project and the information given in the contract documents. The contractor is solely responsible for, and this review does not include: confirming and completing all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating the work with that of other trades and performing all work in a safe and satisfactory manner. Corrections or comments made on this submittal during this review do not relieve contractor from compliance with the requirements of the contract documents or with its responsibilities listed above.	

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

Water Technology Inc Submittal Review	
Project Name:	Auburn AL Lake Wilmore Park
Project Number:	19068
Submittal ID:	00001
Received On:	4/12/2023
Reviewed On:	4/21/2023
Reviewed By:	James Breternitz
Action:	No Exceptions
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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		

International Air Treatment Standards

ISO Quality Class	Solid Particle - Maximum Number			Water - Pressure			Oil (Including Vapor)
	0.1-0.5 Micron	0.1-1.0 Micron	0.1-5.0 Micron	Dew Point °F	Dew Point °C		
1	100	1	—	-100	-70	0.01	
2	100,000	1,000	10	-40	-40	0.1	
3	—	10,000	500	-4	-20	1	
4	—	—	1,000	37.4	3	5	
5	—	—	20,000	44.6	7	—	
6	—	—	—	50	10	—	

ISO 8573.1 Air Quality Classes

Maintaining air quality is so important that the International Standards Organization (ISO) developed 6 compressed air quality classes, as defined by ISO 8573.1. Testing methodology established at 100°F inlet temperature, 100°F ambient temperature, and 100 psig.



Refrigerated Air Dryers

HANKISON® SERIES

Fully automatic operation ensures maximum moisture removal. Easily installed units come preassembled with quality components for long service life. All units with max. air compressor HP over 25 include a coalescing filter and auto-drain. Nos. 3YA43 and 3YA44 include high-efficiency separators without air loss, Power On light, and 6-ft. power cord. Nos. 3YA48 to 1ZPT9 and 3YA45 to 3YA47 include On/Off switch, Power On light, dew point indicator, and 6-ft. power cord. Nos. 1ZPU3, 1ZPU2 to 1ZPU7 include EMM™ (Energy Management Monitor) and electric demand drain.

INGERSOLL RAND D SERIES

Permanently bonded freon plate heat exchanger enhances heat and moisture separation for maximum dew point

performance. Variable-speed fan further ensures continuous heat removal. Auto-drain included.

INGERSOLL RAND NONCYCLING

Patented stainless steel heat exchangers provide better energy efficiency and enhanced heat transfer with average pressure drops less than 3 psi. Corrosion-resistant. Include autodrain.

SPEEDAIRE® SERIES

Nos. 3YA49 and 3YA50 include an illuminated On/Off switch, high-efficiency separator, and no air loss float drain. Nos. 3YA51 to 3YA53 include an illuminated On/Off switch, high-efficiency separator and timed electric drain. Nos. 3YA54 to 2DAZ5 and 2DAZ6 to 2DBA1 are equipped with stainless steel heat exchanger, dew point temperature indicator, and timed electric drain.



Water Technology Inc Submittal Review

Project Name:	Auburn AL Lake Wilmore Park
Project Number:	19068
Submittal ID:	00001
Received On:	4/12/2023
Reviewed On:	4/21/2023
Reviewed By:	James Breternitz

Action: No Exceptions

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No. 2HUF1

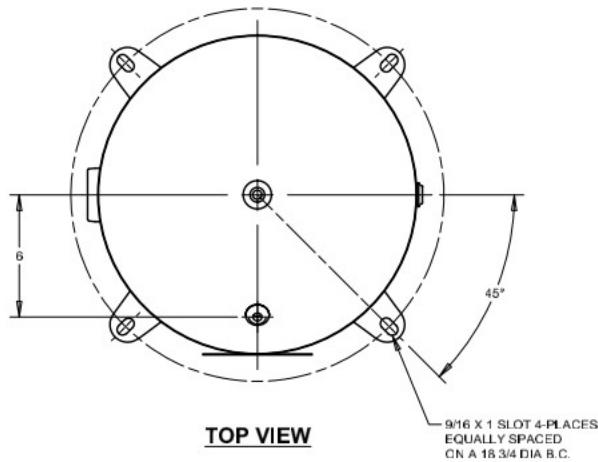
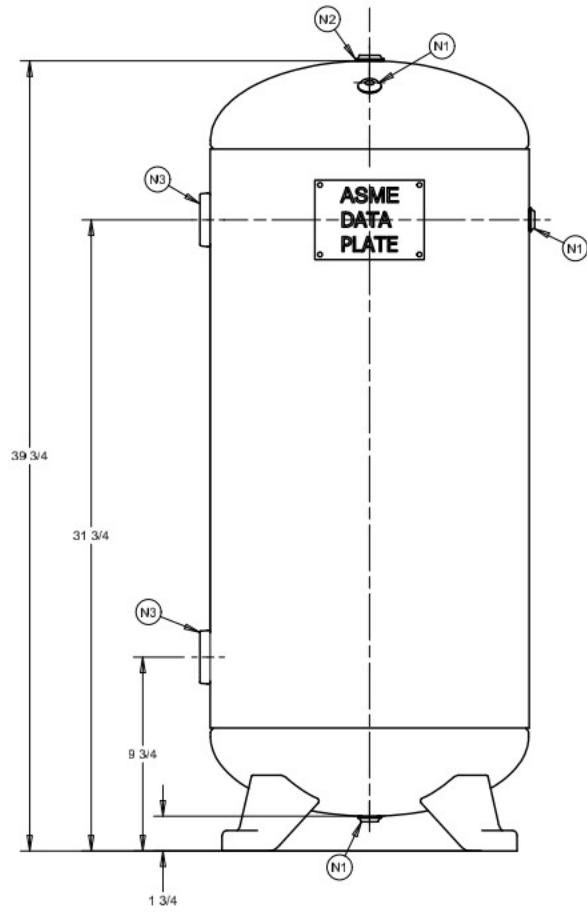
QTY:1

CFM Speedaire® Series	Max. Air Compressor HP	ISO Class*	Max. Pressure (psi)	Max. Inlet Temp. (°F)	Voltage	Amps AC	Phase	Inlet/ Outlet (in.)	H (in.)	W (in.)	D (in.)	Item No.	OPTIONAL MAINTENANCE KIT Item No.	
10	3	6	250	120	115	2.52	1	3/8 O.D.	15	13	13	3YA49 ✓	2DAY6	
PN200727	15	5	5	250	120	115	2.63	1	3/8 O.D.	15	13	13	3YA50 ✓	2DAY6
25	7.5	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA51 ✓	2DAY7	
35	10	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA52 ✓	2DAY7	
50	15	6	250	120	115	7.25	1	3/4 NPT	22	20	20	3YA53 ✓	2DAY7	
75	20	5	232	120	115	8.25	1	3/4 NPT	20 1/8	18 1/8	19 1/4	3YA54 ✓	2DAY8	
100	25	5	232	120	115	9.30	1	1NPT	20%	13	28 1/2	2DAZ3 ✓	2DAY8	
125	30	5	232	120	115	9.60	1	1NPT	20%	13	28 1/2	2DAZ4 ✓	2DAY8	
150	40	5	232	120	115	11.20	1	1NPT	20%	13	28 1/2	2DAZ5 ✓	2DAY8	
200	50	6	232	120	460	2.40	3	1 1/2 NPT	30	16 1/8	35 7/16	2DAZ6 ✓	2DAY9	
250	60	6	232	120	460	2.60	3	1 1/2 NPT	30	16 1/8	35 7/16	2DAZ7 ✓	2DAY9	
300	75	6	232	120	460	3.70	3	1 1/2 NPT	29 1/8	19 1/8	37 7/16	2DAZ8 ✓	2DAZ1	
400	75	6	232	120	460	4.00	3	2 NPT	29 1/8	19 1/8	37 7/16	2DAZ9 ✓	2DAZ1	
500	100	6	232	120	460	6.10	3	2 NPT	29 1/8	23 1/4	41 1/8	2DBA1 ✓	2DAZ2	
Hankison® Series														
10	3	6	250	120	115	2.52	1	3/8 O.D.	15	13	13	3YA43 ✓	2DAX5	
15	5	5	250	120	115	2.63	1	3/8 O.D.	15	13	13	3YA44 ✓	2DAX5	
25	7.5	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA45 ✓	2DAX6	
35	10	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA46 ✓	2DAX6	
50	15	6	250	120	115	7.25	1	3/4 NPT	22	20	20	3YA47 ✓	2DAX6	
75	20	5	232	120	115	8.25	1	3/4 NPT	20	19	21	3YA48 ✓	2DAX7	
100	25	5	250	120	115	10.20	1	1 NPT	38	29	20	1ZPT8 ✓	2DAX8	
125	30	5	250	120	115	15.20	1	1 NPT	38	29	20	1ZPT9 ✓	2DAX9	
200	50	5	232	120	460	7.50	3	1 1/2 NPT	39	34	32	1ZPU2 ✓	2DAY1	
250	60	4	232	120	460	10.40	3	1 1/2 NPT	39	34	32	1ZPU3 ✓	2DAY1	
300	75	5	232	120	460	10.40	3	1 1/2 NPT	46	35	32	1ZPU4 ✓	2DAY2	
400	75	5	232	120	460	10.40	3	2 NPT	46	35	32	1ZPU5 ✓	2DAY3	
500	100	5	232	120	460	11.40	3	2 1/2 NPT	58	32	42	1ZPU6 ✓	2DAY3	
600	125	5	232	120	460	7.1	3	2 1/2 NPT	58	32	42	2DAX4 ✓	2DAY4	
750	150	5	232	120	460	22.10	3	2 1/2 NPT	58	32	42	1ZPU7 ✓	2DAY5	
Ingersoll Rand D Series														
7	3 to 5	6	203	140	115	2.8	1	3/8	16	12	16	2HUE7 ✓	—	
11	5	6	203	140	115	2.8	1	3/8	16	12	15	2HUE8 ✓	—	
15	5	6	203	140	115	2.8	1	3/8	16	12	15	36H10B ✓	—	
25	7.5	6	203	140	115	3.6	1	1/2 NPT	18	15 1/8	18	2HUF1 ✓	—	
32	10	6	203	140	115	6	1	1/2 NPT	18	15 1/8	18	2HUF2 ✓	—	
64	20	6	203	140	115	8	1	3/4 NPT	22 1/2	16 1/8	21 1/2	2HUF3 ✓	—	
85	25	6	203	140	115	9	1	3/4 NPT	22 1/2	16 1/8	21 1/2	2HUF4 ✓	—	
106	30	6	203	140	115	12.6	1	3/4	22 1/2	16 1/8	21 1/2	2HUF5 ✓	—	
176	40	6	174	140	230	8.3	1	1 1/2 NPT	38 1/2	20	25 1/2	2HUF6 ✓	—	
212	50	6	174	140	230	8.3	1	1 1/2 NPT	38 1/2	20	25 1/2	2HUF7 ✓	—	
Ingersoll Rand Noncycling														
250	50	4	300	120	460	6	3	1.5	40	28	33	4NMH4 ✓	—	
300	60	4	300	120	460	8	3	2	40	28	33	4NMH5 ✓	—	
400	75	4	300	120	460	12	3	2	40	28	33	4NMH6 ✓	—	
500	100	4	300	120	460	12	3	3	62	42	42	4NMH7 ✓	—	
700	125	4	300	120	460	15	3	3	62	42	42	4NMH8 ✓	—	
800	150	4	300	120	460	15	3	3	62	42	42	4NMH9 ✓	—	

* ISO Class dryer capacities established at 100°F inlet temp., 100°F ambient temp., and 100 psig.

Get back on the job even faster now with grainger.com/repairparts

NOZZLE CHART	
NOZZLE ID	NPT SIZE
N1	1/4
N2	1/2
N3	1 1/2



PN200371

DESIGN INFORMATION	
SPECIFICATION	VALUE
DIAMETER O.D./I.D.	16 O.D.
MAWP	200 PSI AT 400°F
MDMT	-20°F AT 200 PSI
CAPACITY	APPROX 30 GALLONS
SHIPPING WEIGHT	84 LBS
CRN	L4032.5C

TITLE		CUSTOMER STOCK		DRAWN KAT 9/1/2016	CHECKED DMM 9/20/2016	DRAWING NO A10040	REV C16
VERTICAL AIR RECEIVER		QTY 1		TYPE ASME	SIZE: B	SHEET 1 OF 1	

(BUILT IN ACCORDANCE WITH LATEST EDITION OF SECTION VIII DIV 1 ASME CODE)

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C16	ISSUED	REV	DESCRIPTION	BY	DATE



Paddock Regenerator™

Environmental Regenerative Filter

Water Technology Inc
Submittal Review

Project Name: Auburn AL Lake Wilmore Park
Project Number: 19068
Submittal ID: 00001
Received On: 4/12/2023
Reviewed On: 4/21/2023
Reviewed By: James Breternitz

Action: No Exceptions

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FILTER SYSTEM Job Name:	Lake Willmore	QTY
REGENERATOR FILTER PPEC	1400S	1
MAGMETER/SADDLE	SIGNET 2551 BLIND	1
AIR COMPRESSOR PN210021	4ME98, 60 GAL	5HP, 3 PHASE
AIR DRYER PN200727	3YA50, 115 VOLTS	5HP, 1 PH, 15CFM
AIR TANK RECEIVER PN200371	ATLA102 DWGA10040	200PSI, 30GAL



Paddock Pool Equipment Company, Inc.
555 Paddock Parkway
Rock Hill, SC 29730
United States of America

Ph: 803-324-1111

Submittal

Number: SO23160 Date: **29-Mar-23**

To:

Cox Pools of the Southeast
22656 Canal Road
Orange Beach AL 36561
United States

Mark Kindergan

EMAIL: mark@coxpoolsse.com

PHONE #: 251 974 5244

Project Name: **Lake Willmore**

Project Manager: Trevor Ottley
ottley@paddockindustries.com
PHONE #: 803-372-6088

Qty	Description	Drawing	Approval
1	PPEC1400S Filter,Paddock,Regenerator,1400S Filter,Paddock,Regenerator,1400S, Type 304L ST. ST. with Filter Controller, 2551 Mag. Flow Meter with saddle, Actuated Valves (2), Vacuum Transfer System, Drain Flange, spacer, valve and 90° Elbow, Two Charges of Perlite Media 1141 SF - 1.11 GPM/SF - 1265 GPM (NO ADDITIONAL CHARGES OF MEDIA INCLUDED)		
1	210021 Compressor,Regen,5HP,60Gal,combo 230-460V (3PH) Compressor,Regen,5HP,60Gal,230V (3PH)	Cut Sheet	
1	200727 Dryer,Regen,15CFM,5HP,1PH Dryer,Regen,15CFM,5HP,1PH		
1	200371 Tank,Air,Receiver,30-Gallon Tank,Air,Receiver,30-Gallon		
1	STR-304-OS-12-12 Strainer,SS,12"X12" Strainer,SS,12"X12" with Extra Basket	Cut Sheet	
1	ER-304-12-06 Reducer,E,304L,12"X6" Reducer,E,304L,12"X6" add 6" Precoat Tee	Cut Sheet	

Paddock is requesting either a Resale or Exemption Certificate from all customers for every project



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

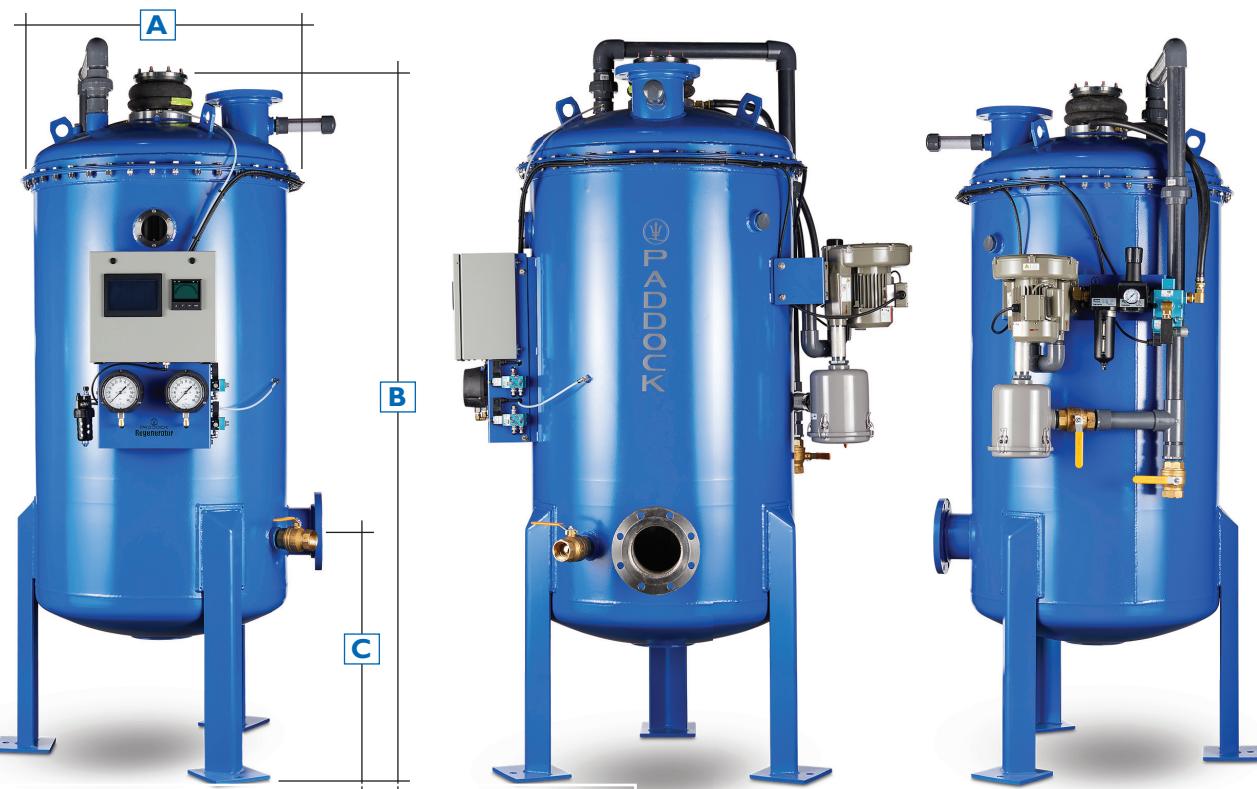
Regenerator™

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



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 ²	FT ²	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 (S³L) or 4 to 20 mA which are available on both the blind and display versions. The frequency or digital (S³L) 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 (S³L) 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 (S³L) 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 (S³L), 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

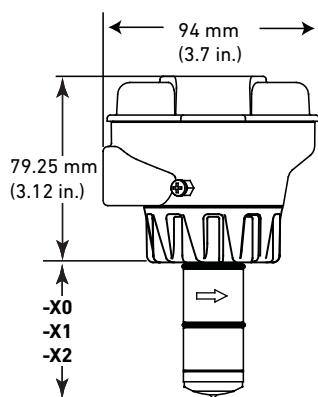
- Chemical Processing
- Water and Wastewater Monitoring
- Metal Recovery and Landfill Leachate
- Commercial Pools, Spas, and Aquariums
- HVAC
- Irrigation
- Scrubber Control
- Neutralization Systems
- Industrial Water Distribution

Dimensions

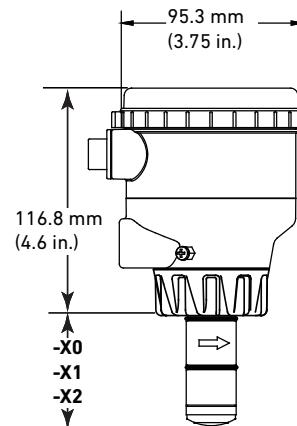
Pipe Range	
1/2 to 4 in.	-X0 = 58 mm (2.3 in.)
5 to 8 in.	-X1 = 91 mm (3.6 in.)
10 to 36 in.	-X2 = 167 mm (6.6 in.)

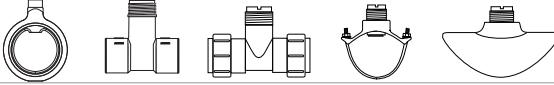
X = Sensor Body P, T, or V

Blind version



Display version



System Overview	Stand-Alone	Panel Mount	Field Mount - Pipe, Tank, Wall	4 to 20 mA Input
	Signet Model 2551 Magmeter 	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 
		Signet 2551 Magmeter 		
	Signet Fittings 			All sold separately

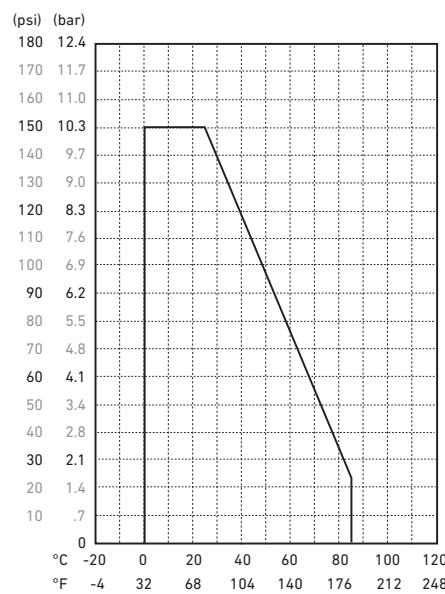
Operating Temperature/Pressure Graphs

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.

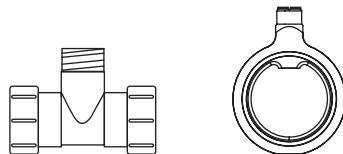
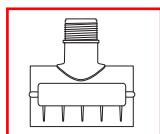
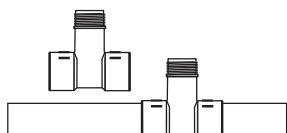


Please refer to Wiring, Installation, and Accessories sections for more information.

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 ³ 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 ³ 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)

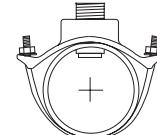
DN15	PPMT005	2192.73	579.32	13.68	51.78
DN20	PPMT007	1327.81	350.81	22.59	85.52
DN25	PPMT010	737.16	194.76	40.70	154.04
DN32	PPMT012	453.46	119.81	66.16	250.41
DN40	PPMT015	275.03	72.66	109.08	412.86
DN50	PPMT020	164.17	43.35	182.74	691.66

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

**# 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		

International Air Treatment Standards

ISO Quality Class	Solid Particle - Maximum Number			Water - Pressure			Oil (Including Vapor)
	0.1-0.5 Micron	0.1-1.0 Micron	0.1-5.0 Micron	°F	°C	Dew Point	
1	100	1	—	-100	-70	0.01	
2	100,000	1,000	10	-40	-40	0.1	
3	—	10,000	500	-4	-20	1	
4	—	—	1,000	37.4	3	5	
5	—	—	20,000	44.6	7	—	
6	—	—	—	50	10	—	

ISO 8573.1 Air Quality Classes

Maintaining air quality is so important that the International Standards Organization (ISO) developed 6 compressed air quality classes, as defined by ISO 8573.1. Testing methodology established at 100°F inlet temperature, 100°F ambient temperature, and 100 psig.



Refrigerated Air Dryers

HANKISON® SERIES

Fully automatic operation ensures maximum moisture removal. Easily installed units come preassembled with quality components for long service life. All units with max. air compressor HP over 25 include a coalescing filter and auto-drain. Nos. 3YA43 and 3YA44 include high-efficiency separators without air loss, Power On light, and 6-ft. power cord. Nos. 3YA48 to 1ZPT9 and 3YA45 to 3YA47 include On/Off switch, Power On light, dew point indicator, and 6-ft. power cord. Nos. 1ZPU3, 1ZPU2 to 1ZPU7 include EMM™ (Energy Management Monitor) and electric demand drain.

INGERSOLL RAND D SERIES

Permanently bonded freon plate heat exchanger enhances heat and moisture separation for maximum dew point

performance. Variable-speed fan further ensures continuous heat removal. Auto-drain included.

INGERSOLL RAND NONCYCLING

Patented stainless steel heat exchangers provide better energy efficiency and enhanced heat transfer with average pressure drops less than 3 psi. Corrosion-resistant. Include autodrain.

SPEEDAIRE® SERIES

Nos. 3YA49 and 3YA50 include an illuminated On/Off switch, high-efficiency separator, and no air loss float drain. Nos. 3YA51 to 3YA53 include an illuminated On/Off switch, high-efficiency separator and timed electric drain. Nos. 3YA54 to 2DAZ5 and 2DAZ6 to 2DBA1 are equipped with stainless steel heat exchanger, dew point temperature indicator, and timed electric drain.



No.
3YA53



No. 3YA44



No. 2HUF1



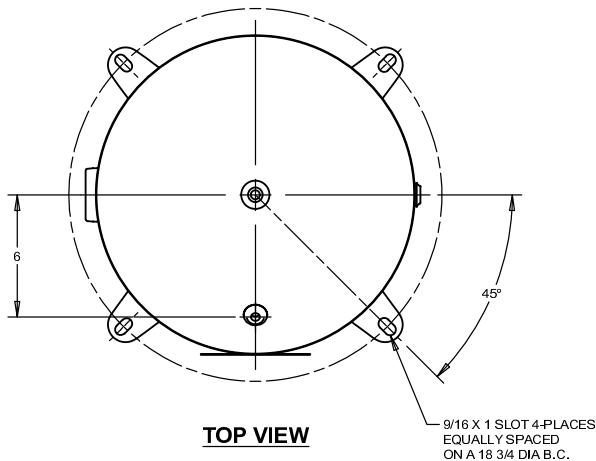
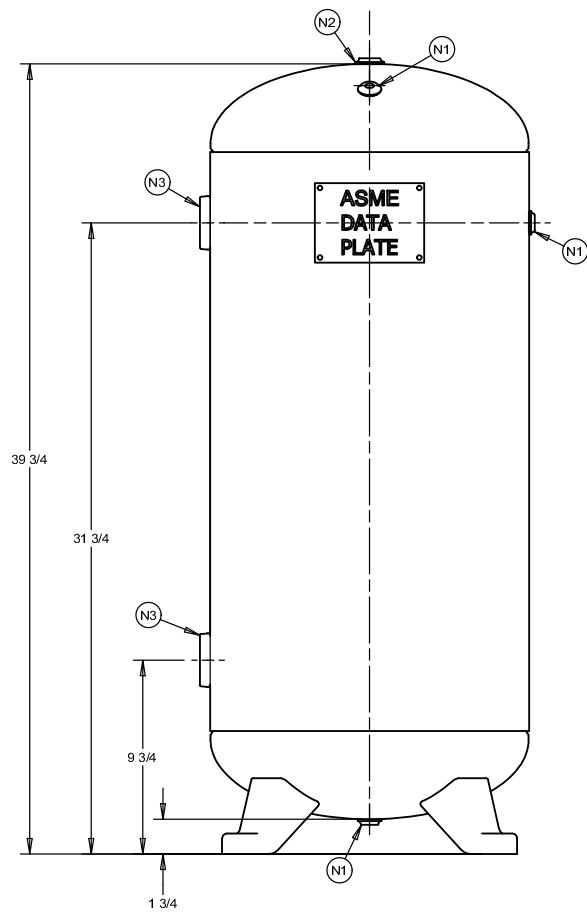
QTY:1

CFM Speedaire® Series	Max. Air Compressor HP	ISO Class*	Max. Pressure (psi)	Max. Inlet Temp. (°F)	Voltage	Amps AC	Phase	Inlet/ Outlet (in.)	H (in.)	W (in.)	D (in.)	Item No.	OPTIONAL MAINTENANCE KIT Item No.	
10	3	6	250	120	115	2.52	1	3/8 O.D.	15	13	13	3YA49 ✓	2DAY6	
PN200727	15	5	5	250	120	115	2.63	1	3/8 O.D.	15	13	13	3YA50 ✓	2DAY6
25	7.5	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA51 ✓	2DAY7	
35	10	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA52 ✓	2DAY7	
50	15	6	250	120	115	7.25	1	3/4 NPT	22	20	20	3YA53 ✓	2DAY7	
75	20	5	232	120	115	8.25	1	3/4 NPT	20 1/8	18 1/8	19 1/4	3YA54 ✓	2DAY8	
100	25	5	232	120	115	9.30	1	1NPT	20 1/8	13	28 1/8	2DAZ3 ✓	2DAY8	
125	30	5	232	120	115	9.60	1	1NPT	20 1/8	13	28 1/8	2DAZ4 ✓	2DAY8	
150	40	5	232	120	115	11.20	1	1NPT	20 1/8	13	28 1/8	2DAZ5 ✓	2DAY8	
200	50	6	232	120	460	2.40	3	1 1/2 NPT	30	16 1/8	35 7/16	2DAZ6 ✓	2DAY9	
250	60	6	232	120	460	2.60	3	1 1/2 NPT	30	16 1/8	35 7/16	2DAZ7 ✓	2DAY9	
300	75	6	232	120	460	3.70	3	1 1/2 NPT	29 7/16	19 1/8	37 7/16	2DAZ8 ✓	2DAZ1	
400	75	6	232	120	460	4.00	3	2 NPT	29 7/16	19 1/8	37 7/16	2DAZ9 ✓	2DAZ1	
500	100	6	232	120	460	6.10	3	2 NPT	29 7/16	23 1/4	41 1/8	2DBA1 ✓	2DAZ2	
Hankison® Series														
10	3	6	250	120	115	2.52	1	3/8 O.D.	15	13	13	3YA43 ✓	2DAX5	
15	5	5	250	120	115	2.63	1	3/8 O.D.	15	13	13	3YA44 ✓	2DAX5	
25	7.5	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA45 ✓	2DAX6	
35	10	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA46 ✓	2DAX6	
50	15	6	250	120	115	7.25	1	3/4 NPT	22	20	20	3YA47 ✓	2DAX6	
75	20	5	232	120	115	8.25	1	3/4 NPT	20	19	21	3YA48 ✓	2DAX7	
100	25	5	250	120	115	10.20	1	1 NPT	38	29	20	1ZPT8 ✓	2DAX8	
125	30	5	250	120	115	15.20	1	1 NPT	38	29	20	1ZPT9 ✓	2DAX9	
200	50	5	232	120	460	7.50	3	1 1/2 NPT	39	34	32	1ZPU2 ✓	2DAY1	
250	60	4	232	120	460	10.40	3	1 1/2 NPT	39	34	32	1ZPU3 ✓	2DAY1	
300	75	5	232	120	460	10.40	3	1 1/2 NPT	46	35	32	1ZPU4 ✓	2DAY2	
400	75	5	232	120	460	10.40	3	2 NPT	46	35	32	1ZPU5 ✓	2DAY3	
500	100	5	232	120	460	11.40	3	2 1/2 NPT	58	32	42	1ZPU6 ✓	2DAY3	
600	125	5	232	120	460	7.1	3	2 1/2 NPT	58	32	42	2DAZ4 ✓	2DAY4	
750	150	5	232	120	460	22.10	3	2 1/2 NPT	58	32	42	1ZPU7 ✓	2DAY5	
Ingersoll Rand D Series														
7	3 to 5	6	203	140	115	2.8	1	3/8	16	12	16	2HUE7 ✓	—	
11	5	6	203	140	115	2.8	1	3/8	16	12	15	2HUE8 ✓	—	
15	5	6	203	140	115	2.8	1	3/8	16	12	15	36H10B ✓	—	
25	7.5	6	203	140	115	3.6	1	1/2 NPT	18	15 1/8	18	2HUF1 ✓	—	
32	10	6	203	140	115	6	1	1/2 NPT	18	15 1/8	18	2HUF2 ✓	—	
64	20	6	203	140	115	8	1	3/4 NPT	22 1/2	16 1/8	21 1/2	2HUF3 ✓	—	
85	25	6	203	140	115	9	1	3/4 NPT	22 1/2	16 1/8	21 1/2	2HUF4 ✓	—	
106	30	6	203	140	115	12.6	1	3/4	22 1/2	16 1/8	21 1/2	2HUF5 ✓	—	
176	40	6	174	140	230	8.3	1	1 1/2 NPT	38 1/2	20	25 1/2	2HUF6 ✓	—	
212	50	6	174	140	230	8.3	1	1 1/2 NPT	38 1/2	20	25 1/2	2HUF7 ✓	—	
Ingersoll Rand Noncycling														
250	50	4	300	120	460	6	3	1.5	40	28	33	4NMH4 ✓	—	
300	60	4	300	120	460	8	3	2	40	28	33	4NMH5 ✓	—	
400	75	4	300	120	460	12	3	2	40	28	33	4NMH6 ✓	—	
500	100	4	300	120	460	15	3	3	62	42	42	4NMH7 ✓	—	
700	125	4	300	120	460	15	3	3	62	42	42	4NMH8 ✓	—	
800	150	4	300	120	460	15	3	3	62	42	42	4NMH9 ✓	—	

* ISO Class dryer capacities established at 100°F inlet temp., 100°F ambient temp., and 100 psig.

Get back on the job even faster now with grainger.com/repairparts

NOZZLE CHART	
NOZZLE ID	NPT SIZE
N1	1/4
N2	1/2
N3	1 1/2



PN200371

DESIGN INFORMATION	
SPECIFICATION	VALUE
DIAMETER O.D./I.D.	16 O.D.
MAWP	200 PSI AT 400°F
MDMT	-20°F AT 200 PSI
CAPACITY	APPROX 30 GALLONS
SHIPPING WEIGHT	84 LBS
CRN	L4032,5C

(BUILT IN ACCORDANCE WITH LATEST EDITION OF SECTION VIII DIV 1 ASME CODE)

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C16	ISSUED			
REV	DESCRIPTION	BY	DATE	
	QTY 1			TYPE ASME

TITLE		CUSTOMER STOCK		DRAWN BY	CHECKED BY	DRAWING NO	REV
VERTICAL AIR RECEIVER		KAT 9/1/2016		DMM 9/20/2016		A10040	C16
SIZE: B		SHEET 1 OF 1					

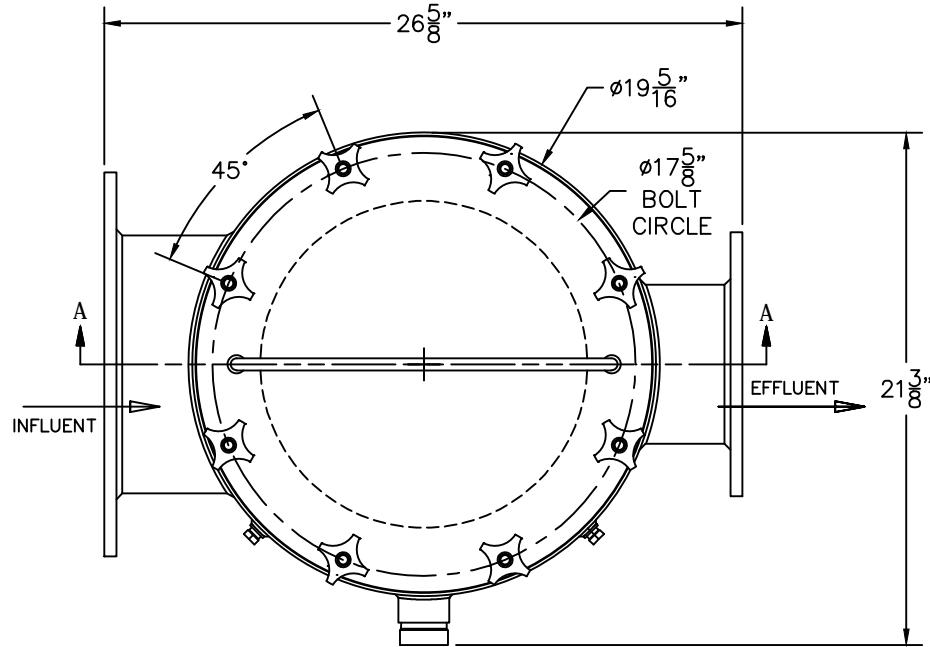


Paddock

Regenerator™

Environmental Regenerative Filter

FILTER SYSTEM Job Name:	Lake Willmore	QTY
REGENERATOR FILTER PPEC	1400S	1
MAGMETER/SADDLE	SIGNET 2551 BLIND	1
AIR COMPRESSOR PN210021	4ME98, 60 GAL	5HP, 3 PHASE
AIR DRYER PN200727	3YA50, 115 VOLTS	5HP, 1 PH, 15CFM
AIR TANK RECEIVER PN200371	ATLA102 DWGA10040	200PSI, 30GAL



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

WITH EXTRA STRAINER BASKET

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

10" AND 12" 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.

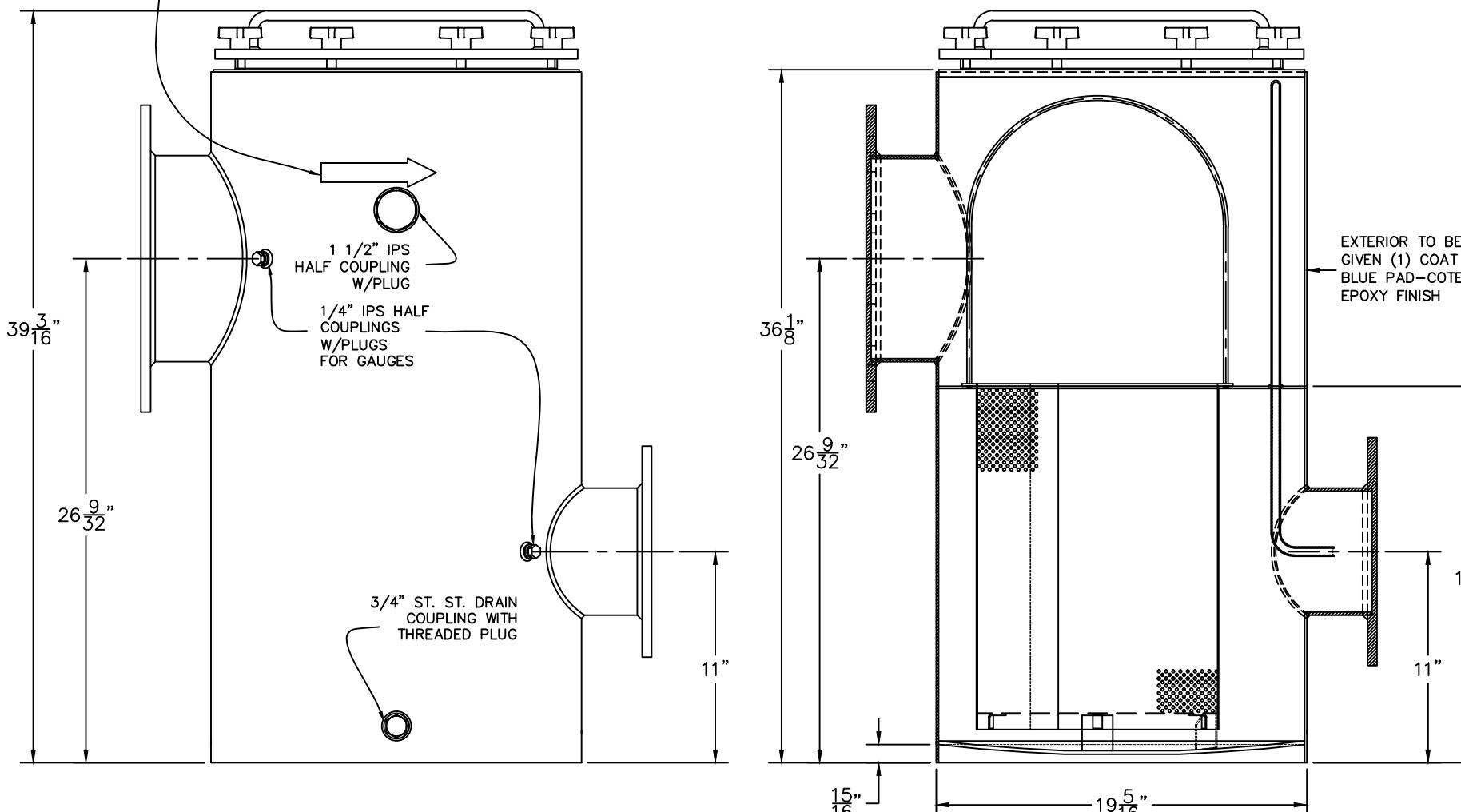
LOCKING ASSEMBLIES PERMIT EASY ACCESS AND CLOSING WITHOUT USE OF TOOLS.

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.

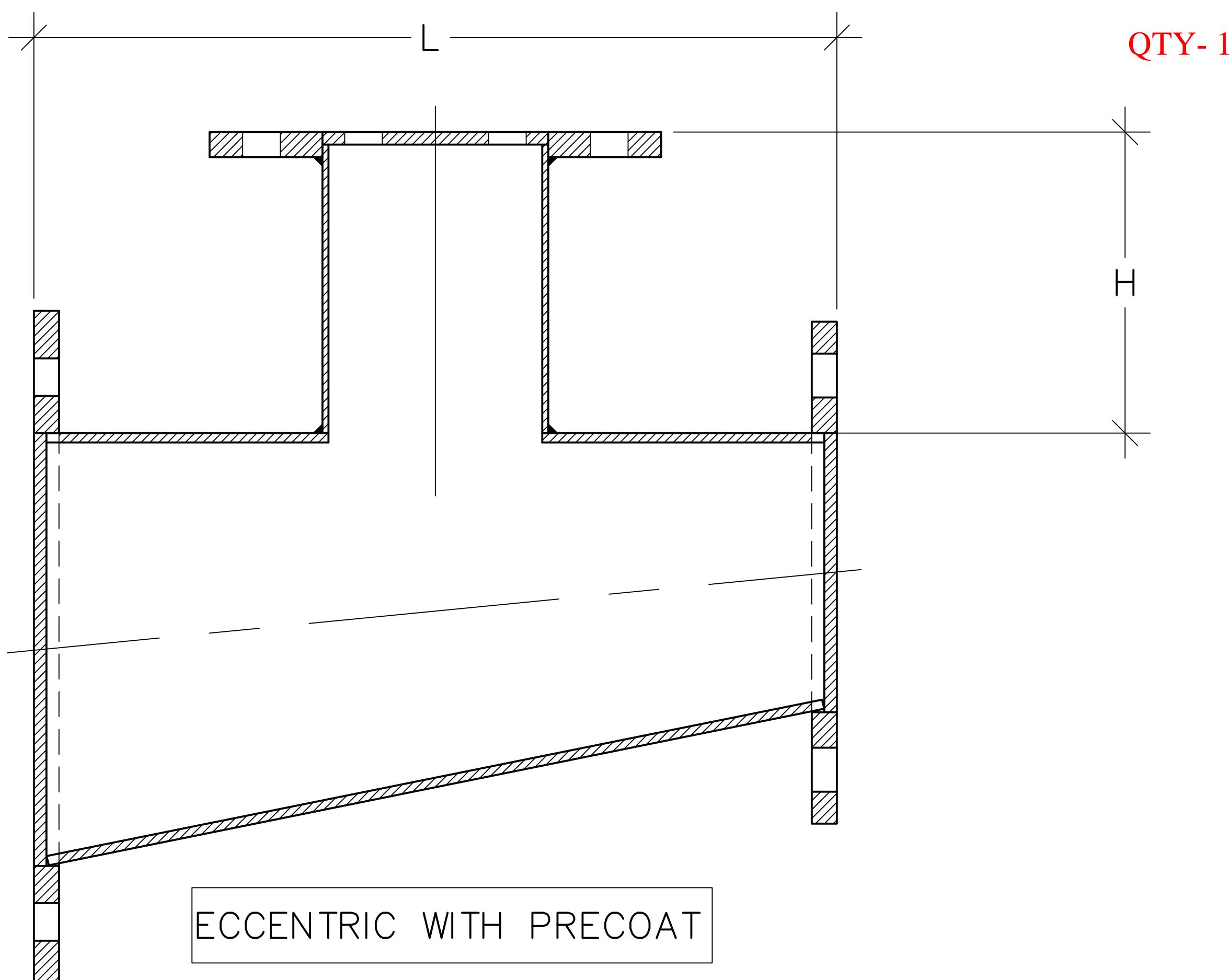


555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 info@paddockindustries.com			 PADDOCK POOL EQUIPMENT COMPANY		
DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE NOTED: X. ± 1/16 .X. ± .020 1/X ± 1/32 .XX. ± .010 X' ± 1/4" .XXX ± .005			DESCRIPTION MEDIUM 304 STAINLESS STEEL 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			MAT'L.:	CALC. WT.	QTY.
					W.O. # P-
					DWG. NO. _____ REV. 0

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 2 $\frac{1}{2}$ "	16"	6"	NONE		10" X 6"	16"	6"	6"	
4" X 2"	16"	6"	4"		10" X 8"	16"	6"	8"	
4" X 2 $\frac{1}{2}$ "	16"	6"	4"		12" X 6"	16"	6"	4"	
4" X 3"	16"	6"	4"		12" X 8"	16"	6"	6"	
5" X 4"	16"	6"	4"		12" X 10"	16"	6"	8"	
6" X 3"	16"	6"	4"		14" X 8"	16"	6"	4"	
6" X 4"	16"	6"	6"		14" X 10"	16"	6"	6"	
6" X 5"	16"	6"	4"		14" X 12"	16"	6"	8"	
8" X 4"	16"	6"	6"					4"	
8" X 5"	16"	6"	4"					6"	
8" X 6"	16"	6"	6"					8"	

ER-304-12-06



Paddock Pool Equipment Company, Inc.
555 Paddock Parkway
Rock Hill, SC 29730
United States of America

Ph: 803-324-1111

Submittal

Number: SO23160 Date: **30-Mar-23**

To:

Cox Pools of the Southeast
22656 Canal Road
Orange Beach AL 36561
United States

Mark Kindergan

EMAIL: mark@coxpoolsse.com

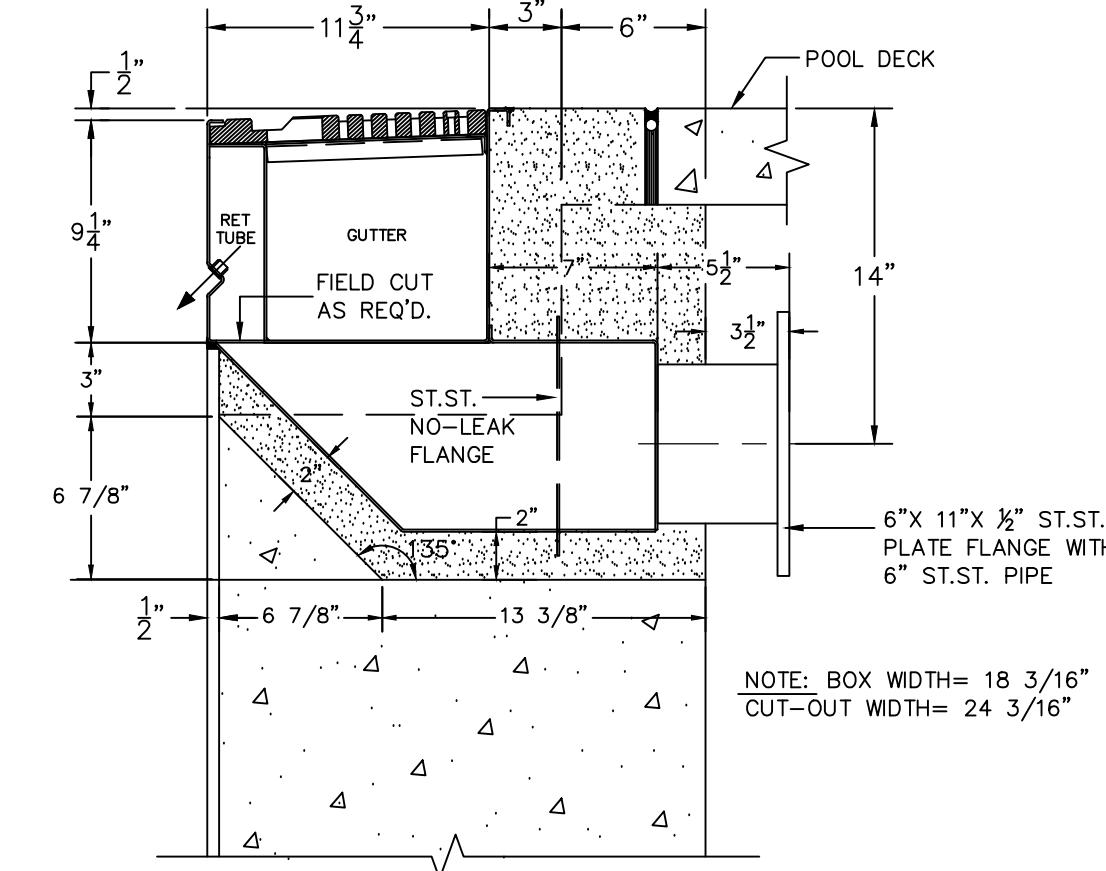
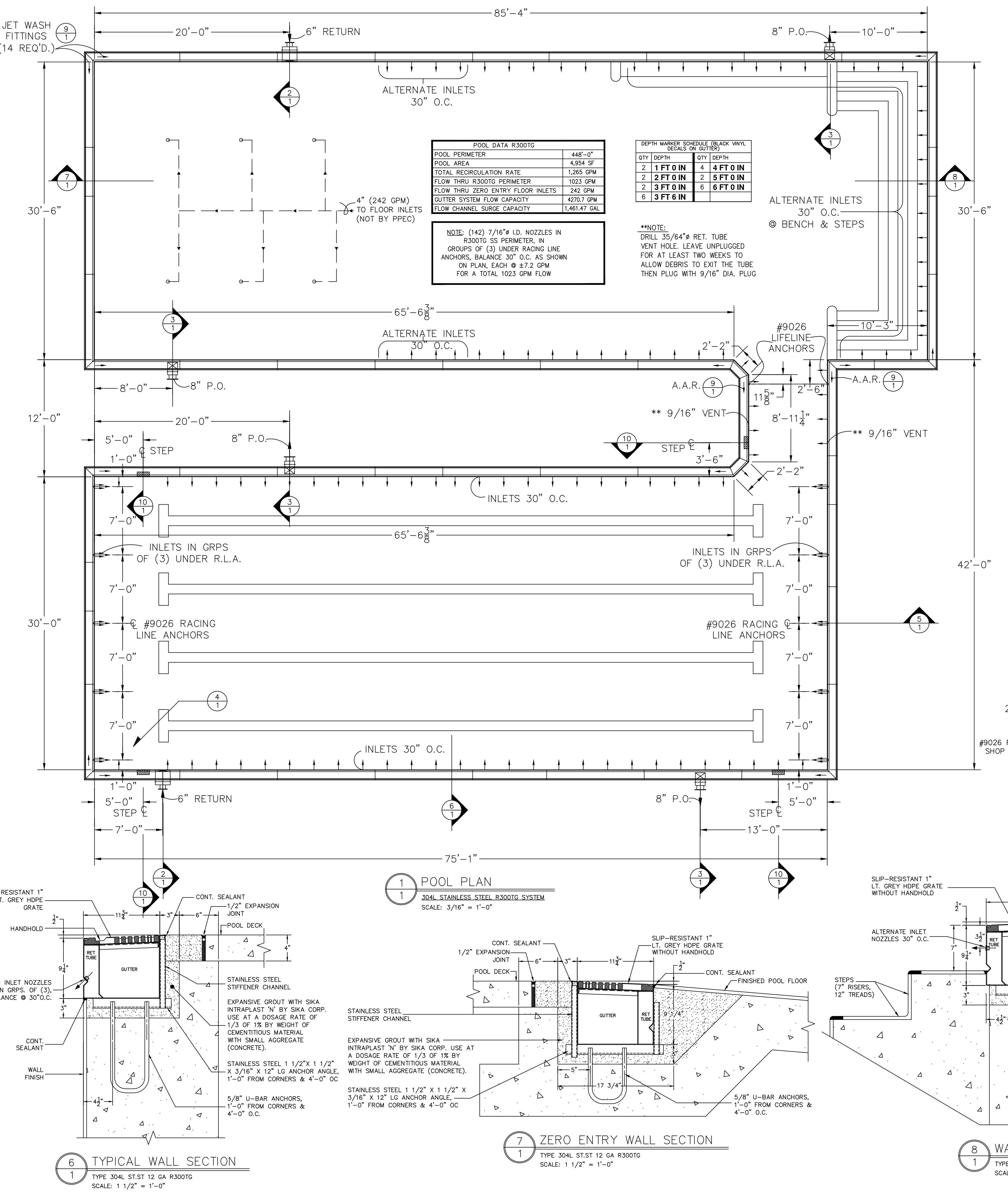
PHONE #: 251 974 5244

Project Name: **Lake Willmore**

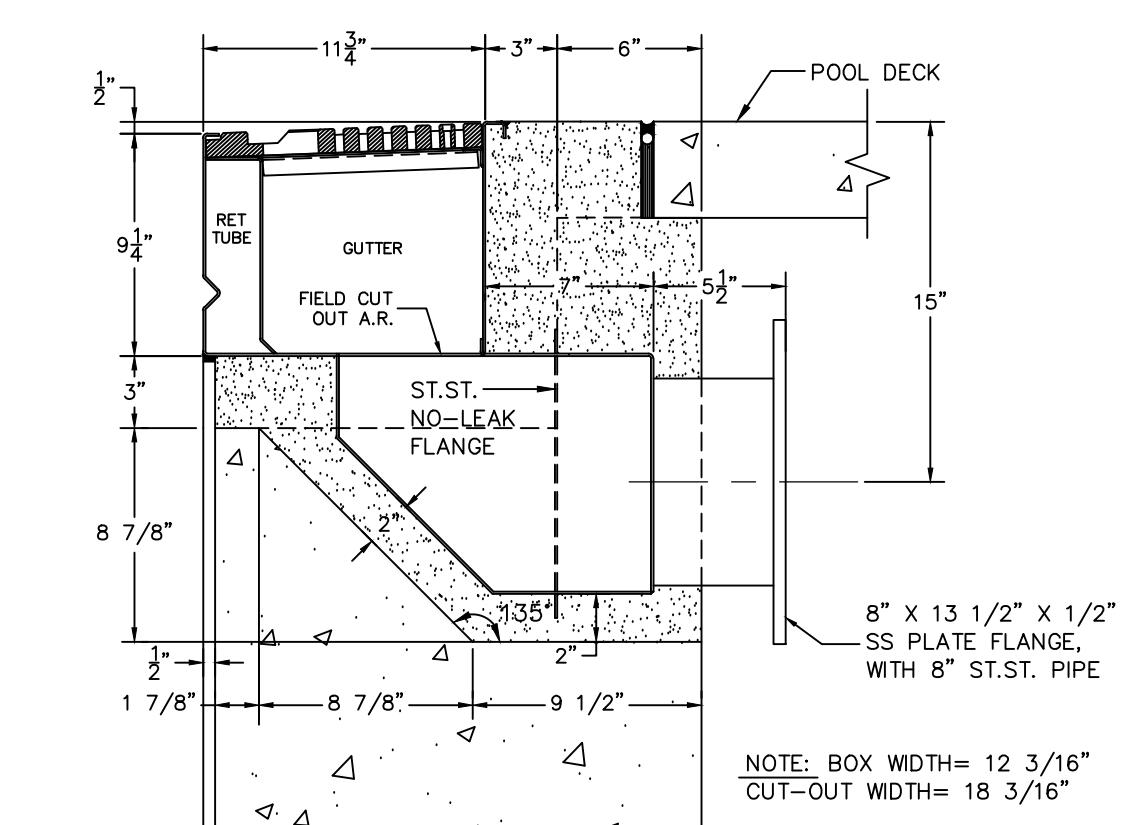
Project Manager: Trevor Ottley
ottley@paddockindustries.com
PHONE #: 803-372-6088

Qty	Description	Drawing	Approval
448 ft	23160.01 R300-304-TG-G Gutter,R300,304L,TG,Gray Gutter,R300,304L,TG,Gray,3/4"x1",1/2 Slope - 8" PO, 8" Returns,Cup Anchors, Step Anchors	23160.01	

Paddock is requesting either a Resale or Exemption Certificate from all customers for every project

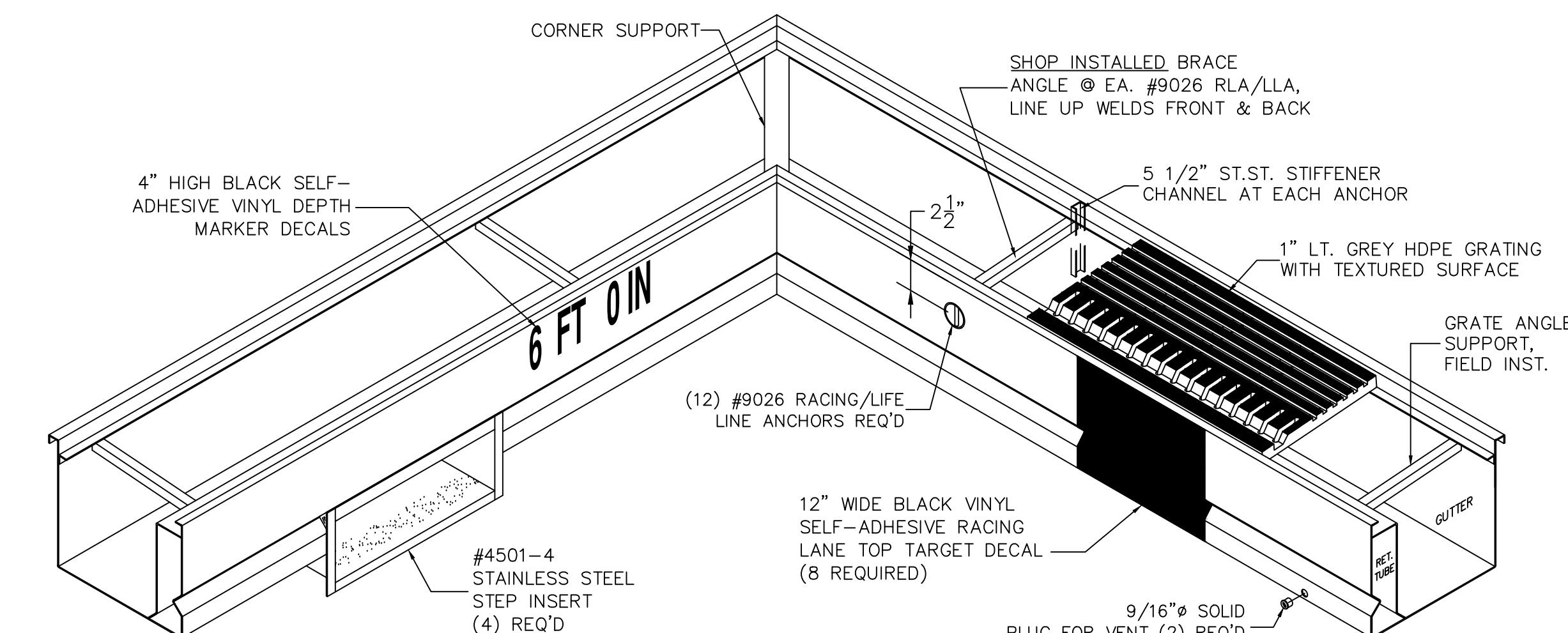


2 RETURN CONVERTER SECTION
1 SCALE: $1\frac{1}{2}'' = 1'-0''$ (2 REQUIRED)



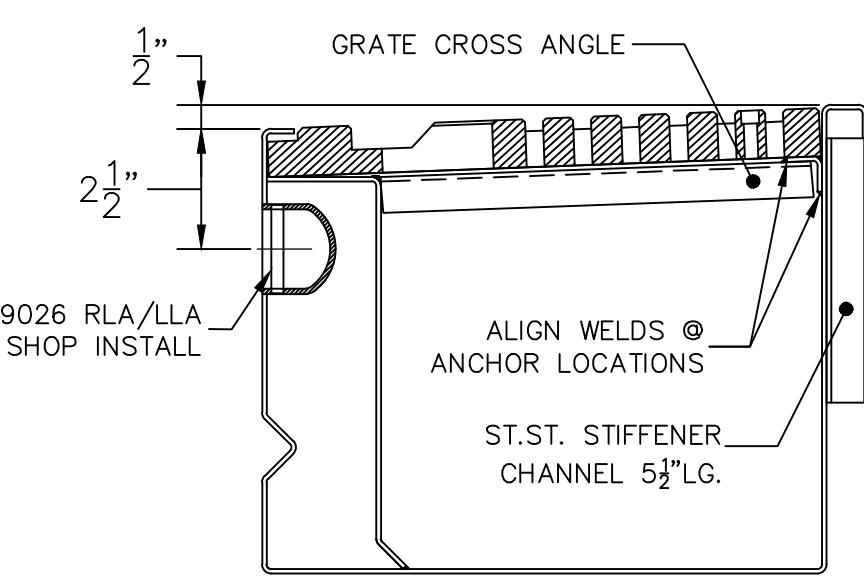
3 PERIMETER OVERFLOW CONVERTER SECTION
1

SCALE: $1\frac{1}{2}'' = 1'-0''$

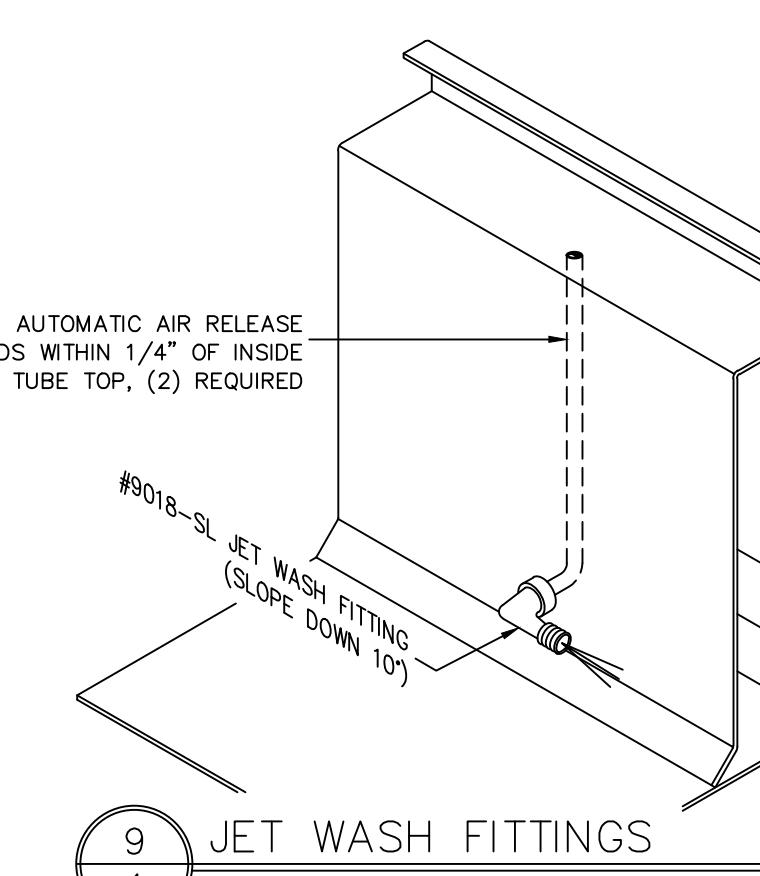


CORNER ISOMETRI

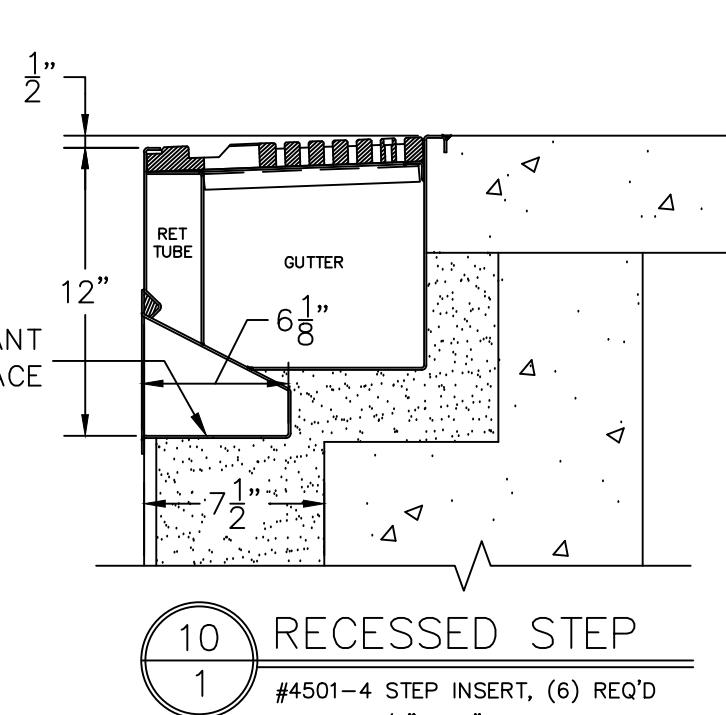
ITEM LOCATIONS PER PLAN



5 #9026 RLA/LLA & BRACING



9 JET WASH FITTINGS
1 (14) #9018-SL FITTINGS REQ'D: (6) R & (8) L



V
RECESSED STEP

	SUBMITTAL SHOP DRAWINGS		
FABRICATION CANNOT COMMENCE UNTIL WE RECEIVE APPROVED SHOP DRAWINGS			
SUBMITTAL DATE:			
DISPOSITION	BY	DATE	
<input type="checkbox"/> APPROVED AS SUBMITTED			
<input type="checkbox"/> APPROVED AS CORRECTED			
<input type="checkbox"/> NOT APPROVED-RESUBMIT			
<input type="checkbox"/> APPROVED-304L ST. ST.			
<input type="checkbox"/> APPROVED-LT. GREY GRATE			

555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 fo@paddockindustries.com		 PADDOCK 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 R300TG 1/2" DTR LAYOUT, POOL WALL & CONVERTER SECTIONS, CORNER ISOMETRIC & EQUIPMENT DETAILS		
		JOB NAME LAKE WILMORE COMMUNITY CENTER		
	BY	DATE	LOCATION	
DRAWN	M.J.G.	3-29-23	AUBURN, ALABAMA	
HECKED			CUSTOMER	
PROVED			SCALE (UNLESS NOTED):	SIZE
ATL.: 304L SS		QTY.	DWG. NO.	PART NO.
				-
			23160.01 Submittal	REV. 0

Paddock Pool Equipment Company

Gutter Flow Calculations

Project

Lake Wilmore R300TG

Total Recirculation Rate, gpm

1023

Pool Perimeter, feet

448

Average Gutter Width, inches

9.19

Usable Gutter Depth, inches

7.81

Number of 90-degree corners

8

Number of 45-degree corners

4

Number of radiused corners

0

Number of PO Converters

4

Number of Return Converters

2

Supply tube area, square inches

18.1

Number of inlet nozzles

142

Max. tube pressure allowed, psi

7.5

Density of Fluid, lb_m/ft³

62.217 (Water at 80°F)

Local Gravity, ft/sec²

32.17

Absolute Viscosity (μ), lb_fsec/ft²

1.791E-05 (Water at 80°F)

Click on **Tools > Solver**, then press **Enter** twice

Total gutter system flow capacity is

4270.70 gpm

Gutter collection rate is

711.81 gpm

Design for surge weirs is:

Adequate

Design for rimflow conditions is:

Superior

Flow rate per nozzle

7.20 gpm

Nozzle Size

7

Nozzle Velocity

15.38 ft/sec

Supply Tube Velocity

4.53 ft/sec

Supply Tube Pressure

5.75 psi

Surge Capacity in Flow Channel

1461.47 gallons

Navier-Stokes Continuity Equation:

$$\left[1 - \left(\frac{\rho}{m} \right)^2 W^5 g \eta^3 \right] \partial \eta = \frac{f}{8} \partial \left(\frac{x}{W} \right)$$

Solving this equation for turbulent flow conditions with m as the unknown variable yields

$$D_1 m^2 + D_2 \sqrt[4]{m^7} + D_3 = 0$$

where ρ = density of the fluid, lb_m/ft²

m = mass flow rate, lb_m/sec

g = acceleration due to local gravity, ft/sec²

L = length of channel, ft

W = width of channel, ft

η = fluid height to width ratio

f = Darcy friction factor, $\frac{0.316}{\sqrt{R_e}}$

x = distance along centerline of channel

μ = absolute viscosity, lb_fsec/ft²

y = depth of fluid, ft

R_e = Reynold's Number, $\frac{4m}{\mu(2y+W)}$

Francis Weir Formula:

$$Q = 3.33 L \sqrt{H^3}$$

where

Q = flow rate, ft³/sec

L = length of weir, ft

H = height of water above crest of weir, ft

Paddock Pool Equipment Company

Gutter Flow Calculations

Project

Lake Wilmore R300TG

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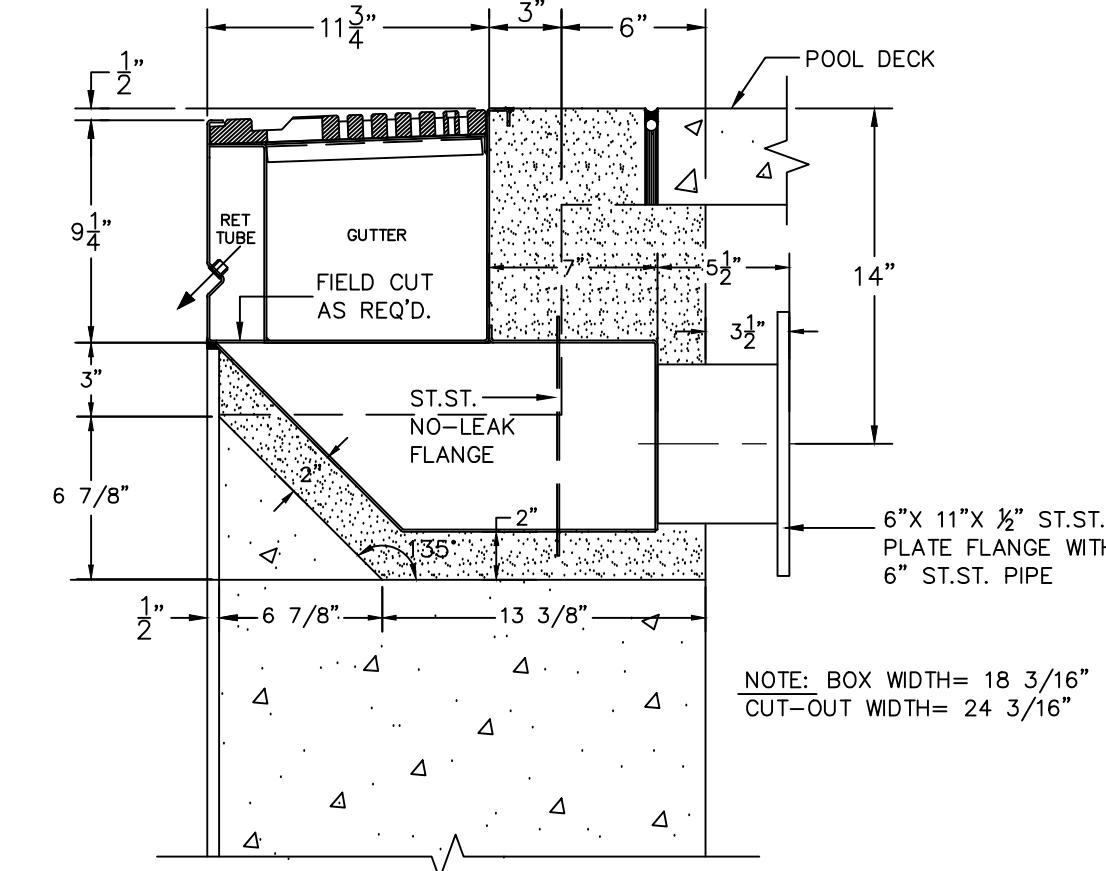
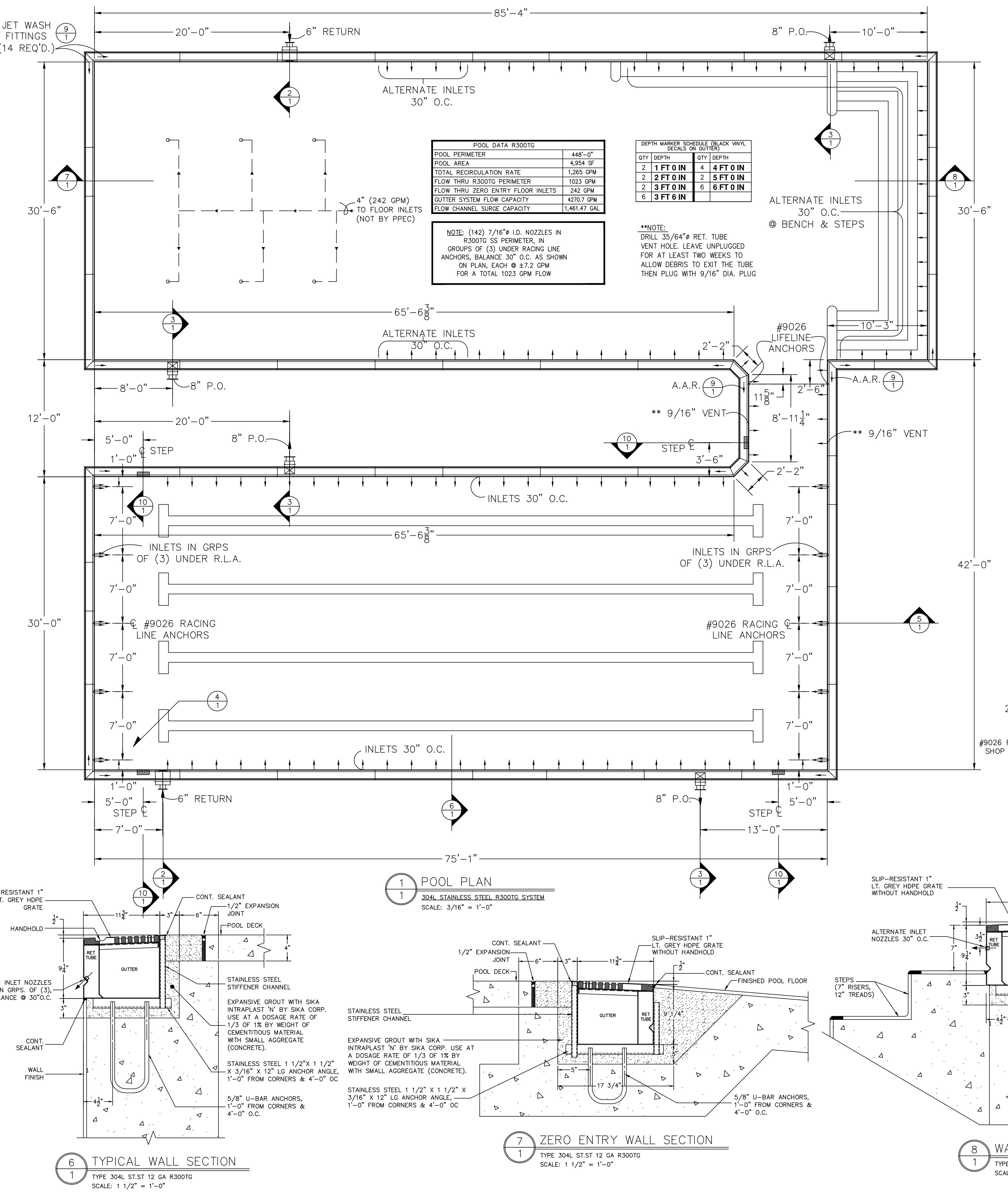
$$Q = 3.33 L \sqrt{H^3}$$

where

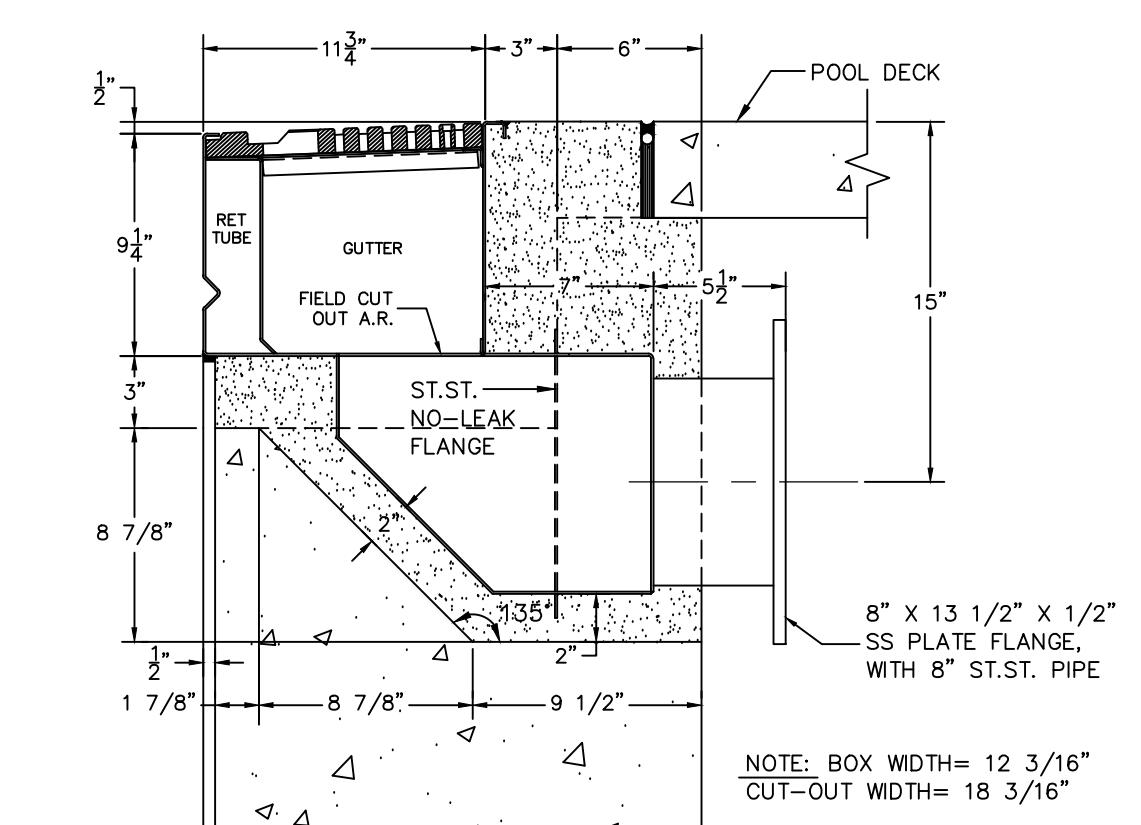
Q = flow rate, ft³/sec

L = length of weir, ft

H = height of water above crest of weir, ft

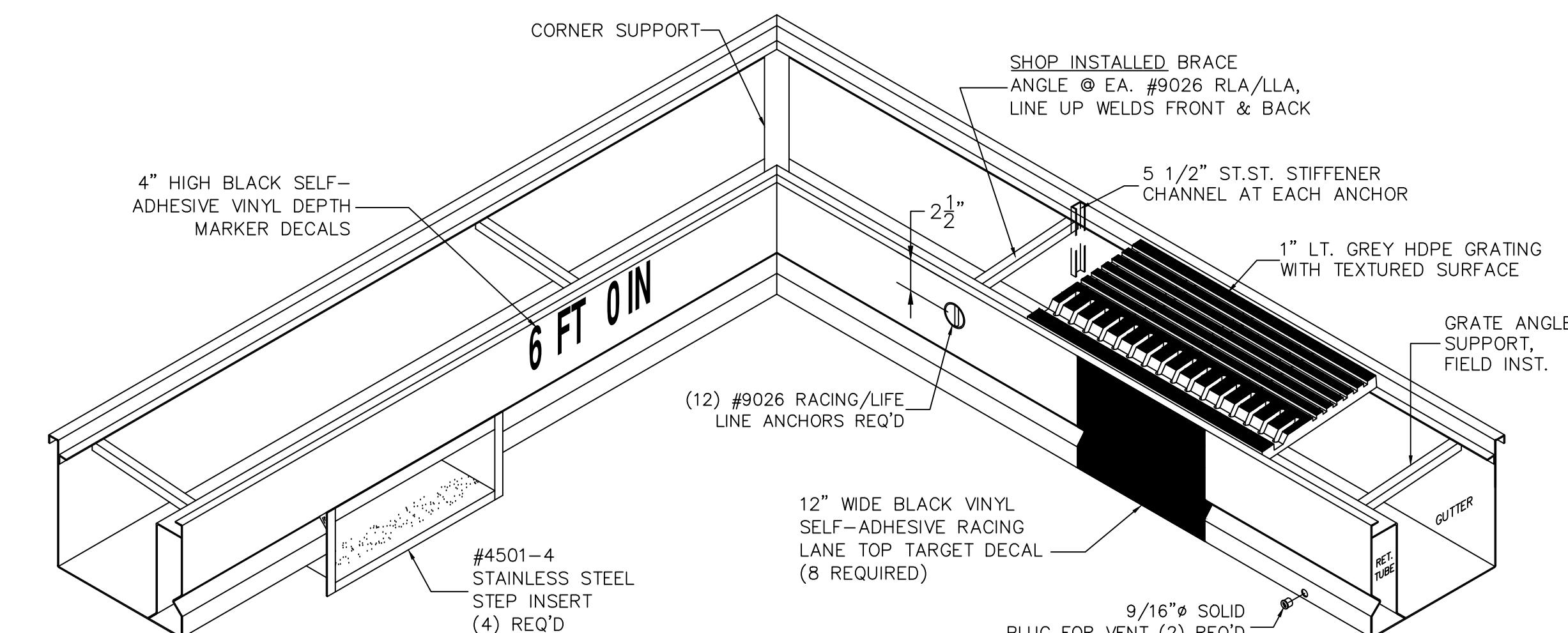


2 RETURN CONVERTER SECTION
1 SCALE: $1\frac{1}{2}'' = 1'-0''$ (2 REQUIRED)

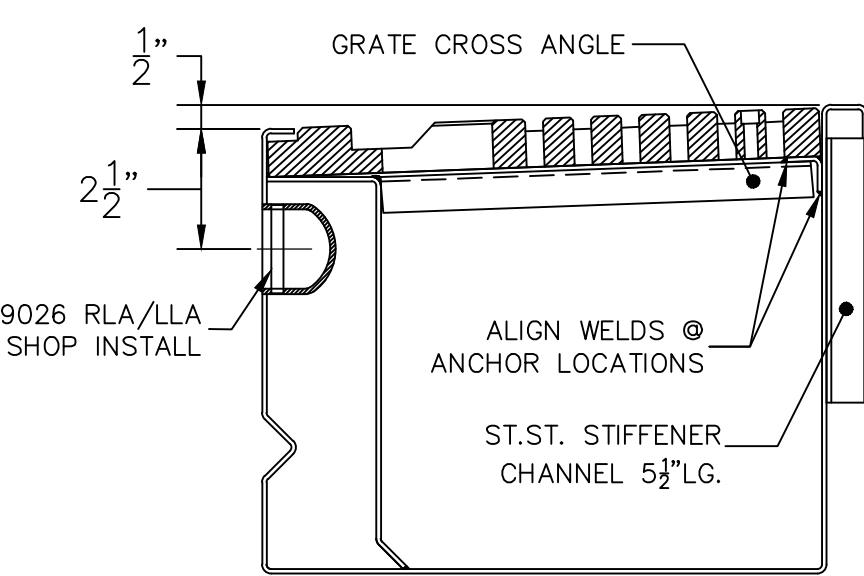


3 PERIMETER OVERFLOW CONVERTER SECTION
1

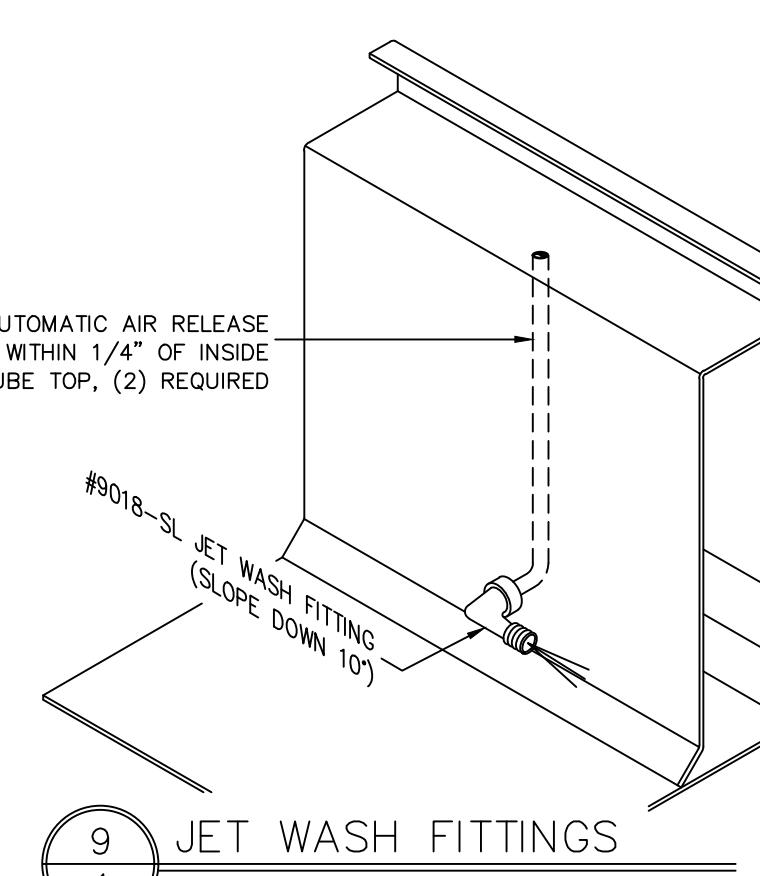
SCALE: $1\frac{1}{2}'' = 1'-0''$



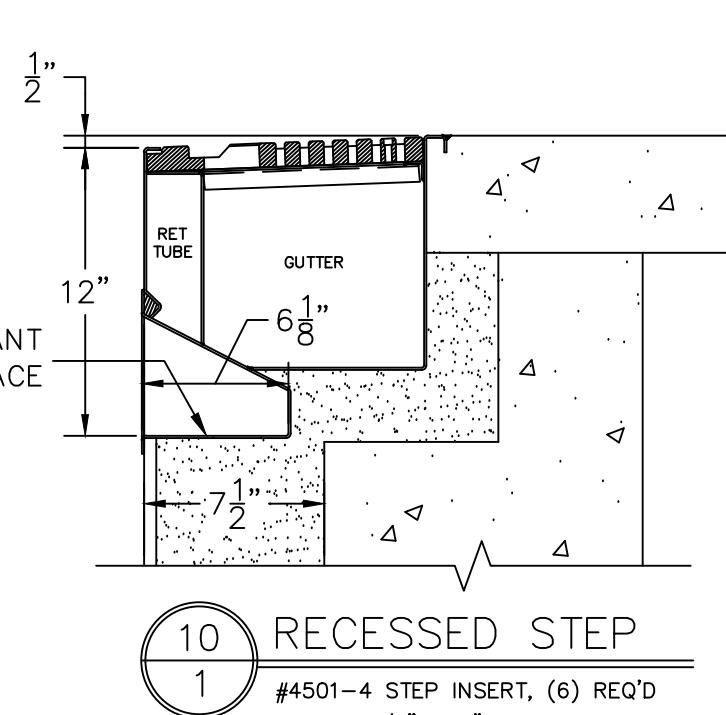
4 CORNER ISOMETRIC
1 ITEM LOCATIONS PER PLAN



5 #9026 RLA/LLA & BRACING



9 JET WASH FITTINGS
1 (14) #9018-SI FITTINGS REQ'D: (6) R & (8)



10 RECESSED ST

	SUBMITTAL SHOP DRAWINGS FABRICATION CANNOT COMMENCE UNTIL WE RECEIVE APPROVED SHOP DRAWINGS		
SUBMITTAL DATE:			
DISPOSITION	BY	DATE	
<input type="checkbox"/> APPROVED AS SUBMITTED			
<input type="checkbox"/> APPROVED AS CORRECTED			
<input type="checkbox"/> NOT APPROVED-RESUBMIT			
<input type="checkbox"/> APPROVED-304L ST. ST.			
<input type="checkbox"/> APPROVED-LT. GREY GRATE			

555 Paddock Parkway Rock Hill, SC 29730 Phone: (803)324-1111 Fax: (803)324-1116 fo@paddockindustries.com		 PADDOCK POOL EQUIPMENT COMPANY		
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		JOB NAME LAKE WILMORE COMMUNITY CENTER		
	BY	DATE	LOCATION	
DRAWN	M.J.G.	3-29-23	AUBURN, ALABAMA	
HECKED			CUSTOMER	
PROVED			SCALE (UNLESS NOTED):	SIZE
ATL.: 304L SS		QTY.	DWG. NO.	PART NO.
				-
			23160.01 Submittal	REV. 0



Paddock

Regenerator™

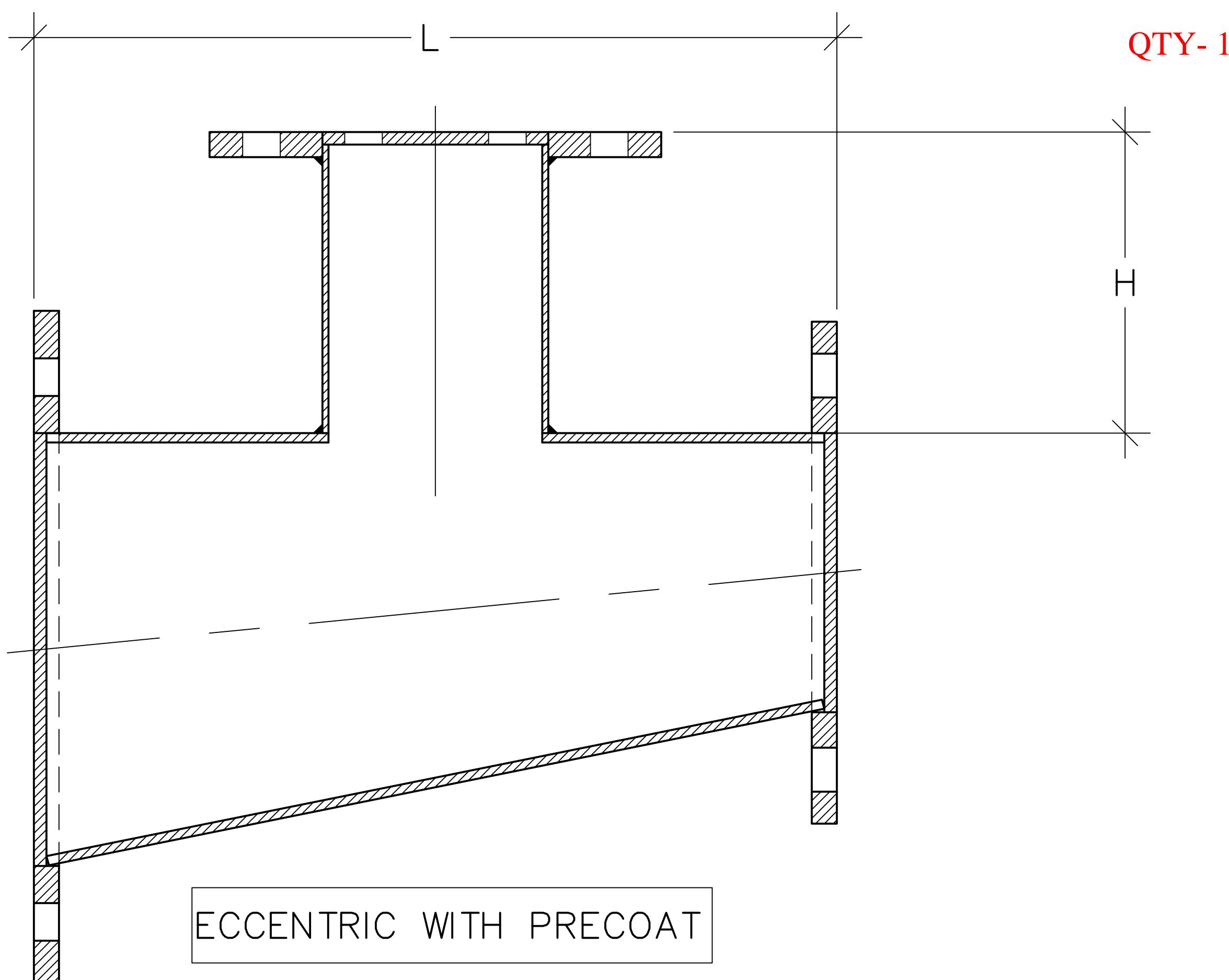
Environmental Regenerative Filter

FILTER SYSTEM Job Name:	Lake Willmore	QTY
REGENERATOR FILTER PPEC	1400S	1
MAGMETER/SADDLE	SIGNET 2551 BLIND	1
AIR COMPRESSOR PN210021	4ME98, 60 GAL	5HP, 3 PHASE
AIR DRYER PN200727	3YA50, 115 VOLTS	5HP, 1 PH, 15CFM
AIR TANK RECEIVER PN200371	ATLA102 DWGA10040	200PSI, 30GAL

STAINLESS STEEL FLANGED REDUCERS WITH PRECOAT CONNECTION

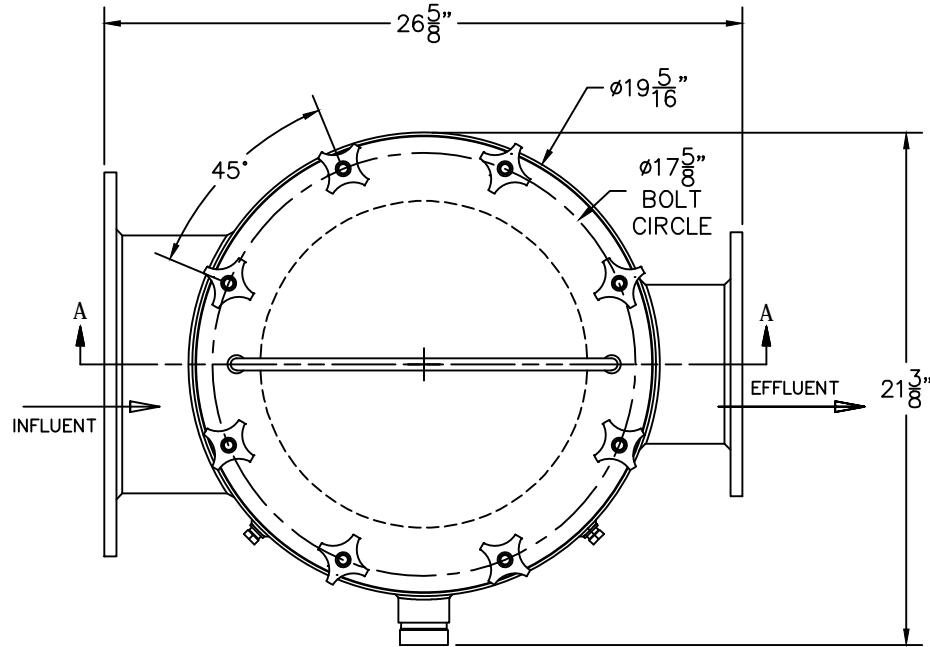
REDUCER FLANGES MEET ANSI STANDARD 125# FLANGE DRILLING

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

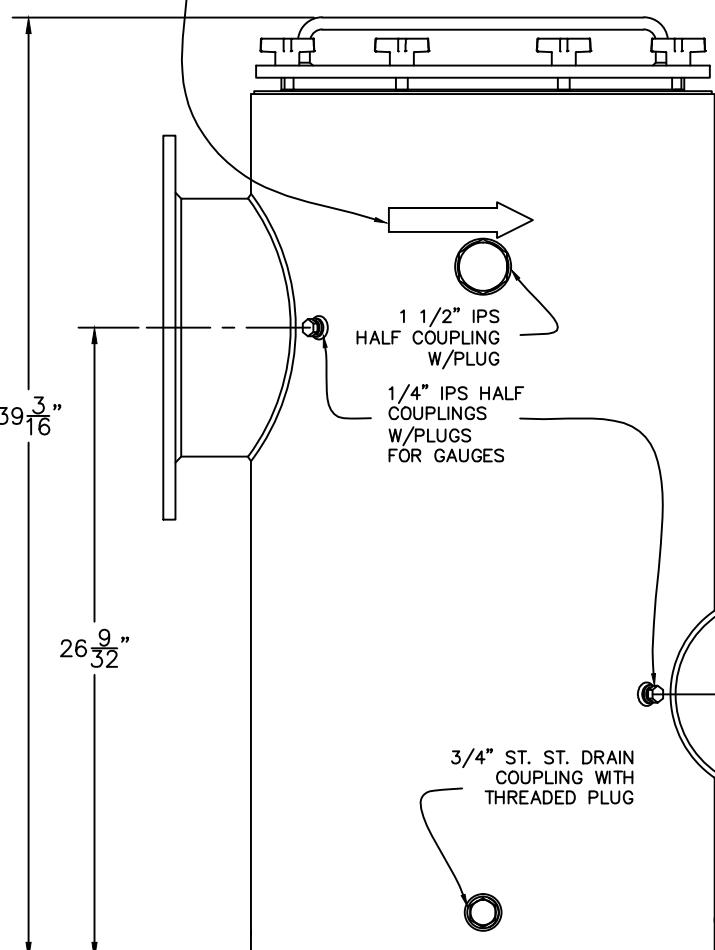


ECCENTRIC REDUCERS W/PRECOAT

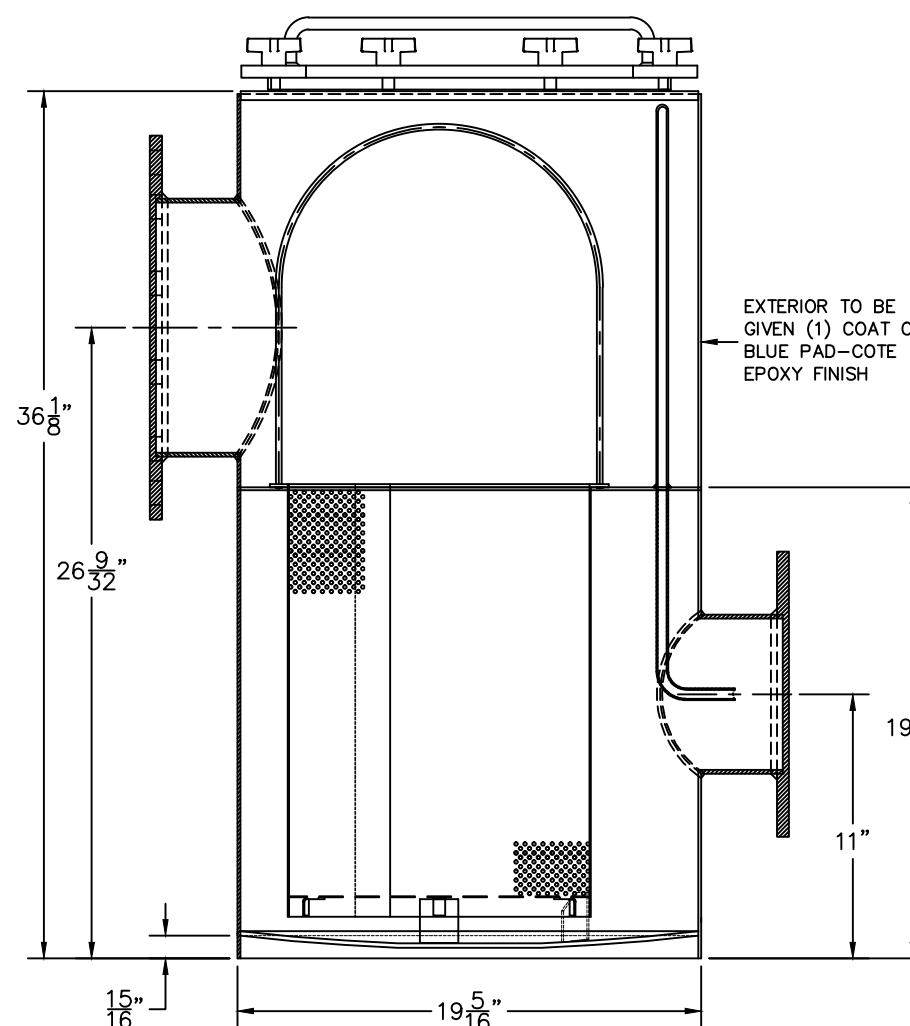
SIZE	"L"	"H"	PRECOAT	PART NUMBER	SIZE	"L"	"H"	PRECOAT	PART NUMBER
3" X 2"	16"	6"	NONE		10" X 5"	16"	6"	4"	
3" X 2 $\frac{1}{2}$ "	16"	6"	NONE		10" X 6"	16"	6"	6"	
4" X 2"	16"	6"	4"		10" X 8"	16"	6"	8"	
4" X 2 $\frac{1}{2}$ "	16"	6"	4"		12" X 6"	16"	6"	4"	
4" X 3"	16"	6"	4"		12" X 8"	16"	6"	6"	
5" X 4"	16"	6"	4"		12" X 10"	16"	6"	8"	ER-304-12-06
6" X 3"	16"	6"	4"		14" X 8"	16"	6"	4"	
6" X 4"	16"	6"	6"		14" X 10"	16"	6"	6"	
6" X 5"	16"	6"	4"		14" X 12"	16"	6"	8"	
8" X 4"	16"	6"	4"					4"	
8" X 5"	16"	6"	6"					6"	
8" X 6"	16"	6"	8"					8"	
			4"					4"	
			6"					6"	
			8"					8"	



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 (#)
	10 X 10	10"	16"	10"	16"	71.8 IN ²	5.66:1	303.0
	10 X 8	10"	16"	8"	13 1/2"	71.8 IN ²	5.66:1	301.2
	10 X 6	10"	16"	6"	11"	71.8 IN ²	5.66:1	299.9
	10 X 5	10"	16"	5"	10"	71.8 IN ²	5.66:1	299.4
1	12 X 12	12"	19"	12"	19"	101.64 IN ²	4:1	315.0
	12 X 10	12"	19"	10"	16"	101.64 IN ²	4:1	313.2
	12 X 8	12"	19"	8"	13 1/2"	101.64 IN ²	4:1	311.4
	12 X 6	12"	19"	6"	11"	101.64 IN ²	4:1	310.0
	12 X 5	12"	19"	5"	10"	101.64 IN ²	4:1	309.5

WITH EXTRA STRAINER BASKET

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

10" AND 12" 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			 PADDOCK POOL EQUIPMENT COMPANY		
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JOB NAME _____			LOCATION _____		
DRAWN	BY	DATE	CUSTOMER	_____	
BLC		5/7/12		_____	
CHECKED			SCALE (UNLESS NOTED):	1/8" = 1"	SIZE
				B	STD. DWG. NO. XXX
APPROVED			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

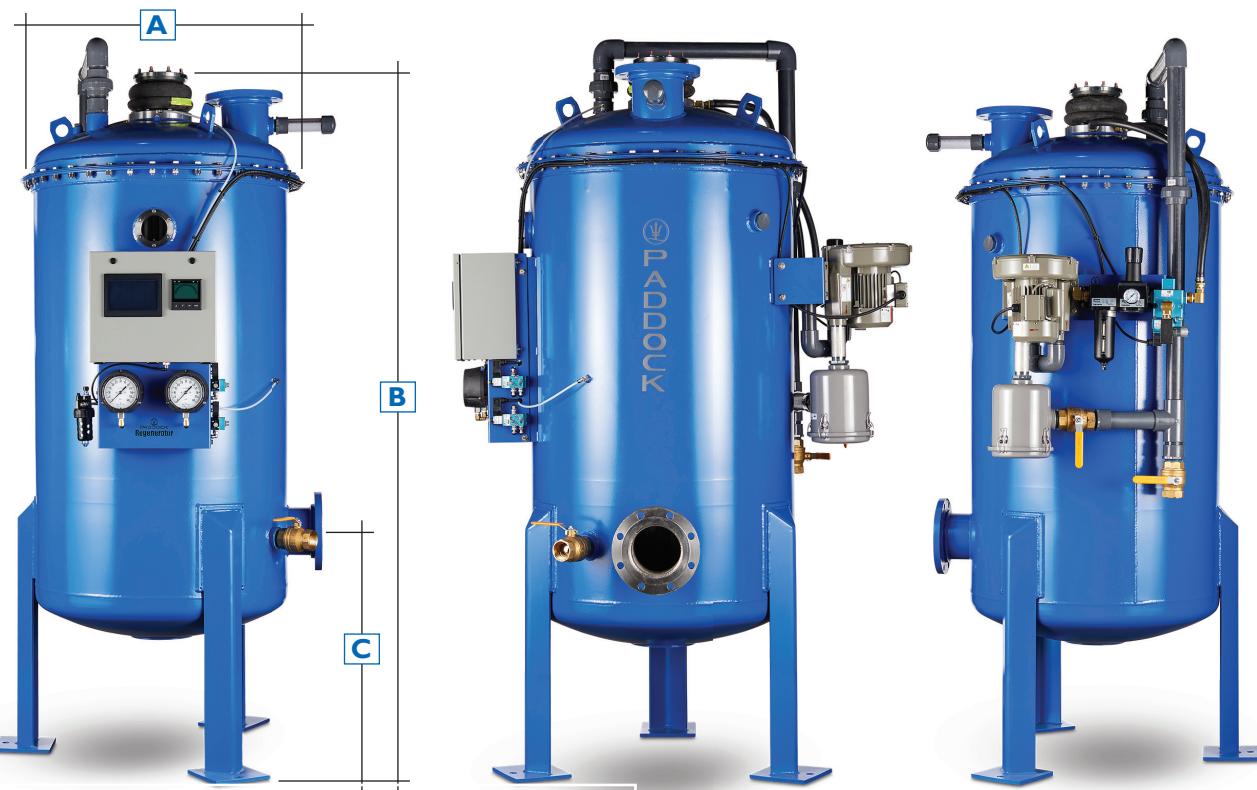
Regenerator™

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



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 ²	FT ²	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 (S³L) or 4 to 20 mA which are available on both the blind and display versions. The frequency or digital (S³L) 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 (S³L) 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 (S³L) 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 (S³L), 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

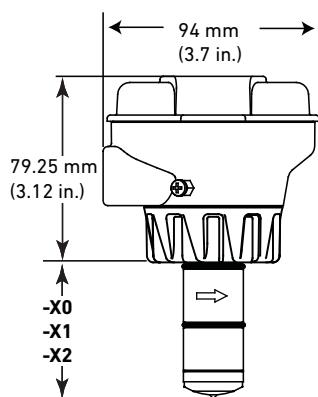
- Chemical Processing
- Water and Wastewater Monitoring
- Metal Recovery and Landfill Leachate
- Commercial Pools, Spas, and Aquariums
- HVAC
- Irrigation
- Scrubber Control
- Neutralization Systems
- Industrial Water Distribution

Dimensions

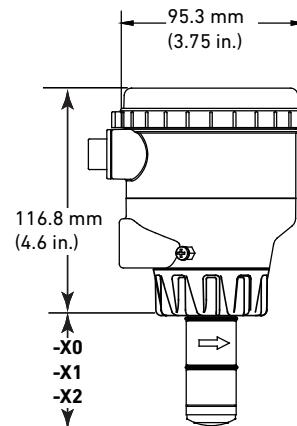
Pipe Range	
1/2 to 4 in.	-X0 = 58 mm (2.3 in.)
5 to 8 in.	-X1 = 91 mm (3.6 in.)
10 to 36 in.	-X2 = 167 mm (6.6 in.)

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
	Signet Model 2551 Magmeter	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
	Signet Fittings	 		All sold separately

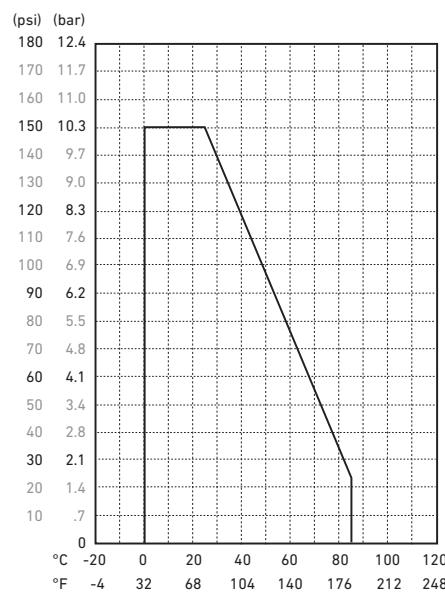
Operating Temperature/Pressure Graphs

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.

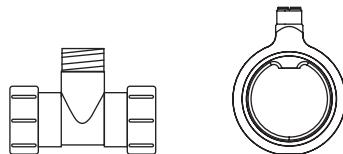
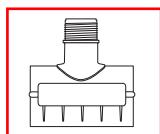
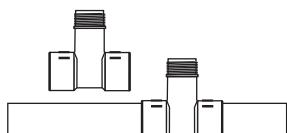


Please refer to Wiring, Installation, and Accessories sections for more information.

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 ³ 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 ³ 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)

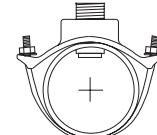
DN15	PPMT005	2192.73	579.32	13.68	51.78
DN20	PPMT007	1327.81	350.81	22.59	85.52
DN25	PPMT010	737.16	194.76	40.70	154.04
DN32	PPMT012	453.46	119.81	66.16	250.41
DN40	PPMT015	275.03	72.66	109.08	412.86
DN50	PPMT020	164.17	43.35	182.74	691.66

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

**# 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		

International Air Treatment Standards

ISO Quality Class	Solid Particle - Maximum Number			Water - Pressure			Oil (Including Vapor)
	0.1-0.5 Micron	0.1-1.0 Micron	0.1-5.0 Micron	°F	°C	Dew Point	
1	100	1	—	-100	-70	0.01	
2	100,000	1,000	10	-40	-40	0.1	
3	—	10,000	500	-4	-20	1	
4	—	—	1,000	37.4	3	5	
5	—	—	20,000	44.6	7	—	
6	—	—	—	50	10	—	

ISO 8573.1 Air Quality Classes

Maintaining air quality is so important that the International Standards Organization (ISO) developed 6 compressed air quality classes, as defined by ISO 8573.1. Testing methodology established at 100°F inlet temperature, 100°F ambient temperature, and 100 psig.



Refrigerated Air Dryers

HANKISON® SERIES

Fully automatic operation ensures maximum moisture removal. Easily installed units come preassembled with quality components for long service life. All units with max. air compressor HP over 25 include a coalescing filter and auto-drain. Nos. 3YA43 and 3YA44 include high-efficiency separators without air loss, Power On light, and 6-ft. power cord. Nos. 3YA48 to 1ZPT9 and 3YA45 to 3YA47 include On/Off switch, Power On light, dew point indicator, and 6-ft. power cord. Nos. 1ZPU3, 1ZPU2 to 1ZPU7 include EMM™ (Energy Management Monitor) and electric demand drain.

INGERSOLL RAND D SERIES

Permanently bonded freon plate heat exchanger enhances heat and moisture separation for maximum dew point

performance. Variable-speed fan further ensures continuous heat removal. Auto-drain included.

INGERSOLL RAND NONCYCLING

Patented stainless steel heat exchangers provide better energy efficiency and enhanced heat transfer with average pressure drops less than 3 psi. Corrosion-resistant. Include autodrain.

SPEEDAIRE® SERIES

Nos. 3YA49 and 3YA50 include an illuminated On/Off switch, high-efficiency separator, and no air loss float drain. Nos. 3YA51 to 3YA53 include an illuminated On/Off switch, high-efficiency separator and timed electric drain. Nos. 3YA54 to 2DAZ5 and 2DAZ6 to 2DBA1 are equipped with stainless steel heat exchanger, dew point temperature indicator, and timed electric drain.



No.
3YA53



No. 3YA44



No. 2HUF1



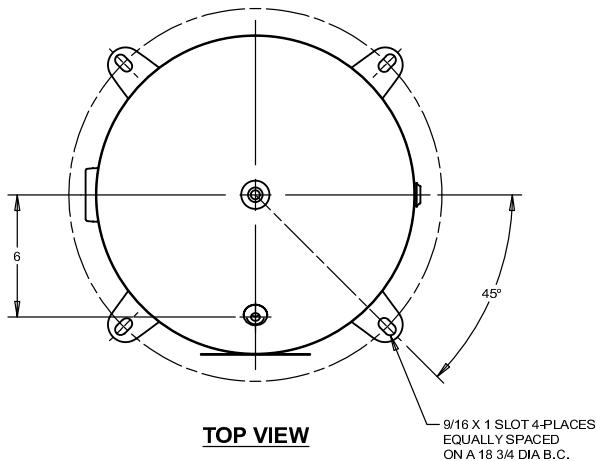
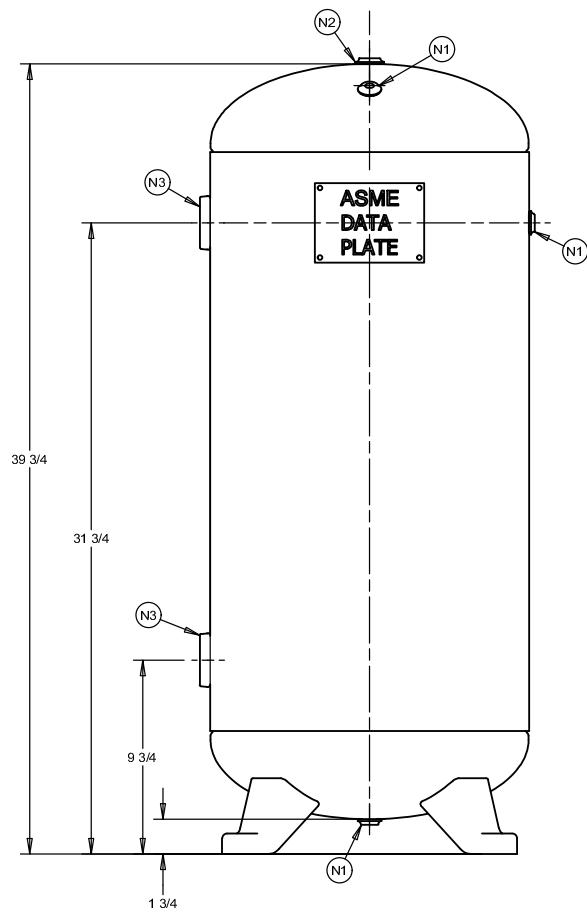
QTY:1

CFM Speedaire® Series	Max. Air Compressor HP	ISO Class*	Max. Pressure (psi)	Max. Inlet Temp. (°F)	Voltage	Amps AC	Phase	Inlet/ Outlet (in.)	H (in.)	W (in.)	D (in.)	Item No.	OPTIONAL MAINTENANCE KIT Item No.	
10	3	6	250	120	115	2.52	1	3/8 O.D.	15	13	13	3YA49 ✓	2DAY6	
PN200727	15	5	5	250	120	115	2.63	1	3/8 O.D.	15	13	13	3YA50 ✓	2DAY6
25	7.5	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA51 ✓	2DAY7	
35	10	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA52 ✓	2DAY7	
50	15	6	250	120	115	7.25	1	3/4 NPT	22	20	20	3YA53 ✓	2DAY7	
75	20	5	232	120	115	8.25	1	3/4 NPT	20 1/8	18 1/8	19 1/4	3YA54 ✓	2DAY8	
100	25	5	232	120	115	9.30	1	1NPT	20 1/8	13	28 1/8	2DAZ3 ✓	2DAY8	
125	30	5	232	120	115	9.60	1	1NPT	20 1/8	13	28 1/8	2DAZ4 ✓	2DAY8	
150	40	5	232	120	115	11.20	1	1NPT	20 1/8	13	28 1/8	2DAZ5 ✓	2DAY8	
200	50	6	232	120	460	2.40	3	1 1/2 NPT	30	16 1/8	35 7/16	2DAZ6 ✓	2DAY9	
250	60	6	232	120	460	2.60	3	1 1/2 NPT	30	16 1/8	35 7/16	2DAZ7 ✓	2DAY9	
300	75	6	232	120	460	3.70	3	1 1/2 NPT	29 1/8	19 1/8	37 7/16	2DAZ8 ✓	2DAZ1	
400	75	6	232	120	460	4.00	3	2 NPT	29 1/8	19 1/8	37 7/16	2DAZ9 ✓	2DAZ1	
500	100	6	232	120	460	6.10	3	2 NPT	29 1/8	23 1/4	41 1/8	2DBA1 ✓	2DAZ2	
Hankison® Series														
10	3	6	250	120	115	2.52	1	3/8 O.D.	15	13	13	3YA43 ✓	2DAX5	
15	5	5	250	120	115	2.63	1	3/8 O.D.	15	13	13	3YA44 ✓	2DAX5	
25	7.5	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA45 ✓	2DAX6	
35	10	6	250	120	115	6.00	1	3/4 NPT	22	15	16	3YA46 ✓	2DAX6	
50	15	6	250	120	115	7.25	1	3/4 NPT	22	20	20	3YA47 ✓	2DAX6	
75	20	5	232	120	115	8.25	1	3/4 NPT	20	19	21	3YA48 ✓	2DAX7	
100	25	5	250	120	115	10.20	1	1 NPT	38	29	20	1ZPT8 ✓	2DAX8	
125	30	5	250	120	115	15.20	1	1 NPT	38	29	20	1ZPT9 ✓	2DAX9	
200	50	5	232	120	460	7.50	3	1 1/2 NPT	39	34	32	1ZPU2 ✓	2DAY1	
250	60	4	232	120	460	10.40	3	1 1/2 NPT	39	34	32	1ZPU3 ✓	2DAY1	
300	75	5	232	120	460	10.40	3	1 1/2 NPT	46	35	32	1ZPU4 ✓	2DAY2	
400	75	5	232	120	460	10.40	3	2 NPT	46	35	32	1ZPU5 ✓	2DAY3	
500	100	5	232	120	460	11.40	3	2 1/2 NPT	58	32	42	1ZPU6 ✓	2DAY3	
600	125	5	232	120	460	7.1	3	2 1/2 NPT	58	32	42	2DAZ4 ✓	2DAY4	
750	150	5	232	120	460	22.10	3	2 1/2 NPT	58	32	42	1ZPU7 ✓	2DAY5	
Ingersoll Rand D Series														
7	3 to 5	6	203	140	115	2.8	1	3/8	16	12	16	2HUE7 ✓	—	
11	5	6	203	140	115	2.8	1	3/8	16	12	15	2HUE8 ✓	—	
15	5	6	203	140	115	2.8	1	3/8	16	12	15	36H108 ✓	—	
25	7.5	6	203	140	115	3.6	1	1/2 NPT	18	15 1/8	18	2HUF1 ✓	—	
32	10	6	203	140	115	6	1	1/2 NPT	18	15 1/8	18	2HUF2 ✓	—	
64	20	6	203	140	115	8	1	3/4 NPT	22 1/2	16 1/8	21 1/2	2HUF3 ✓	—	
85	25	6	203	140	115	9	1	3/4 NPT	22 1/2	16 1/8	21 1/2	2HUF4 ✓	—	
106	30	6	203	140	115	12.6	1	3/4	22 1/2	16 1/8	21 1/2	2HUF5 ✓	—	
176	40	6	174	140	230	8.3	1	1 1/2 NPT	38 1/2	20	25 1/2	2HUF6 ✓	—	
212	50	6	174	140	230	8.3	1	1 1/2 NPT	38 1/2	20	25 1/2	2HUF7 ✓	—	
Ingersoll Rand Noncycling														
250	50	4	300	120	460	6	3	1.5	40	28	33	4NMH4 ✓	—	
300	60	4	300	120	460	8	3	2	40	28	33	4NMH5 ✓	—	
400	75	4	300	120	460	12	3	2	40	28	33	4NMH6 ✓	—	
500	100	4	300	120	460	15	3	3	62	42	42	4NMH7 ✓	—	
700	125	4	300	120	460	15	3	3	62	42	42	4NMH8 ✓	—	
800	150	4	300	120	460	15	3	3	62	42	42	4NMH9 ✓	—	

* ISO Class dryer capacities established at 100°F inlet temp., 100°F ambient temp., and 100 psig.

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NOZZLE CHART	
NOZZLE ID	NPT SIZE
N1	1/4
N2	1/2
N3	1 1/2



PN200371

DESIGN INFORMATION	
SPECIFICATION	VALUE
DIAMETER O.D./I.D.	16 O.D.
MAWP	200 PSI AT 400°F
MDMT	-20°F AT 200 PSI
CAPACITY	APPROX 30 GALLONS
SHIPPING WEIGHT	84 LBS
CRN	L4032,5C

(BUILT IN ACCORDANCE WITH LATEST EDITION OF SECTION VIII DIV 1 ASME CODE)

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C16	ISSUED			
REV	DESCRIPTION	BY	DATE	
	QTY 1			TYPE ASME

TITLE		CUSTOMER STOCK		DRAWN BY	CHECKED BY	DRAWING NO	REV
VERTICAL AIR RECEIVER		KAT 9/1/2016		DMM 9/20/2016		A10040	C16
SIZE: B		SHEET 1 OF 1					