

# ORION

## Tanks, pH Monitoring Systems & Sinks





## Tanks (Waste, Neutralization, Dilution):

Orion offers a wide range of chemical waste tanks, dilution traps, dilution tanks, solids interceptors and accessories. They are designed to facilitate the dilution and neutralization of corrosive liquid waste, thereby rendering the waste suitable for discharge into the sanitary sewer system. This protects the environment from contamination and downstream piping systems from chemical corrosion.

## pH Monitoring Systems:

In addition, Orion manufactures pH monitoring equipment that enables the owner to continuously measure and record the pH of the chemical waste discharge prior to it entering the sewer system. These monitoring systems are equipped with visual and audible alarms as well as data acquisition recording devices that can be used for permanently recording pH discharge levels.



## Sinks:

Orion's sinks are molded from durable virgin polyethylene. They are easy-to-install and are designed to provide years of tough service, even in intense chemical environments. Several models of ADA-compliant sinks are available.

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# ***PH, WHAT DOES IT MEAN?***

## ***The Importance of pH - Corrosion / Environmental Impact***

pH is a measure of the hydrogen ion, (H<sup>+</sup>), concentration in a liquid and classifies liquids as being acidic or caustic.

Liquid discharges that are either too acidic or too caustic may cause corrosion damage to downstream piping systems and may also adversely affect the environment, or create problematic conditions for waste water treatment plants.

It should be noted that acidic and caustic liquids can be equally harmful, hence they should be treated with equal attention.

Chemical effluent should be treated to ensure that the pH level is as close to 7 as possible, (or other values dictated by the local governing body).

## ***pH Scale***

pH values range from 0 - 14 and indicate the degree of acidity or alkalinity of a liquid. A liquid with a pH value below 7 is acidic and a liquid with a pH value above 7 is alkaline. A pH of 7 indicates that a liquid is neutral. The pH scale is logarithmic rather than linear. This means that for each change in a whole number on the pH scale the hydrogen ion concentration varies by a factor of 10.

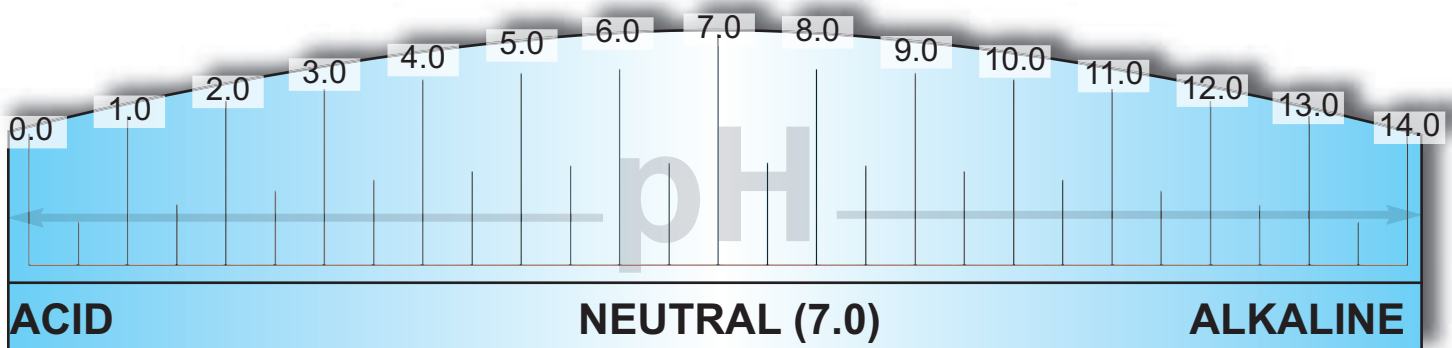
For example:

A liquid with a pH of 8 is 10 times more caustic than one with a pH of 7

A liquid with a pH of 6 is 10 times more acidic than one with a pH of 7

Liquids with pH's of 8 and 6 both have hydrogen ion concentrations 1000 times that of pH 7 and have the same corrosive ability

A liquid with a pH of 5 is 100 times more acidic than one with a pH of 7



## ***pH values of common liquids***

<u>Liquid</u>	<u>pH</u>	<u>Liquid</u>	<u>pH</u>	<u>Liquid</u>	<u>pH</u>
Apple juice	2.9 - 3.3	Lemons	2.2 - 2.4	Baking soda	8.0
Beer	4.0 - 5.0	Bleach	10.9 - 11.2	Detergent	9.5 - 10.0
Grapefruit juice	3.0 - 3.3	Lime juice	1.8 - 2.0	Milk	6.3 - 6.6
Soda	2.0 - 4.0	Vinegar	2.4 - 3.4	Wine	2.8 - 3.8

## Chemical Waste Discharge Guidelines

Generally effluent with a pH range of 5.5 - 8.5 can be disposed of without treatment, but local requirements may vary and must be adhered to. However, even mild caustics and acids within this range can cause severe damage to piping systems depending on the piping material. It is recommended therefore that the compatibility of individual piping materials are checked for suitability against the predicted pH discharge level and the individual chemicals being discharged to ensure compatibility. Many common products can cause severe damage over a period of time. The items listed on page 3 are some common liquids with varying pH levels, many of which would cause piping damage if not treated beforehand.



## Typical Chemical Waste Treatment Applications

### Laboratories:

Middle school  
High school  
Universities  
Medical research  
Pharmaceutical  
Biotechnology  
Pathology  
Forensic

### Decontamination waste holding:

Hospital decontamination areas  
Emergency ambulance stations  
Chemical manufacturing plants  
Fire departments  
Nuclear facilities

### Commercial / industrial

Chemical plants  
Battery charging facilities  
Linen cleaning facilities  
Photographic developing  
Printing shops

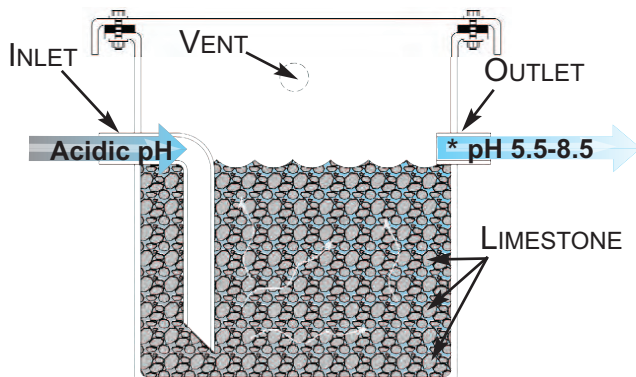
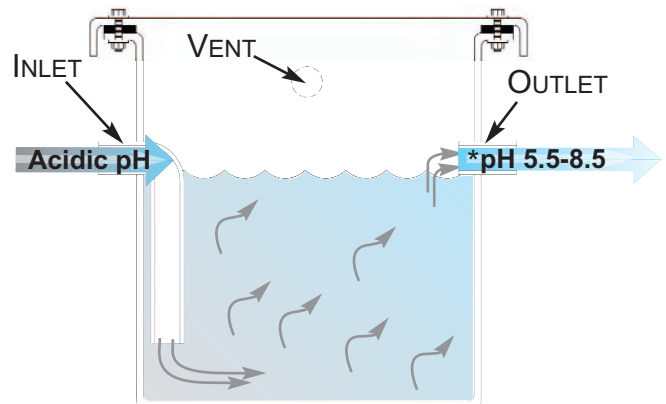
## Neutralization

Neutralization is a chemical reaction resulting from the physical mixing or extended contact of a base and an acid to form a neutral solution of water and salt. This neutral solution is suitable for discharge into sanitary sewer systems. Orion accomplishes neutralization by utilizing one of three methods:

1. Dilution
2. Limestone Chips, (calcium carbonate)
3. Chemical Dosing

### Dilution

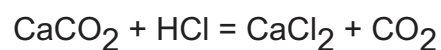
Dilution is the physical mixing of the chemical waste with water in order to stabilize the waste. Initial dilution can be as simple as flushing the chemical with water at the sink and discharging the mixture through a p-trap and the associated drainage piping. Alternatively, dilution can be accomplished via a large dilution trap, or dilution tank, located under the bench at each sink. In either case the waste piping should discharge into a central neutralization system for further treatment prior to discharge into the sewer system.



### Limestone Chip Neutralization

In the Orion standard system acidic waste is drained into an Orion tank filled with high purity limestone chips. After a designed dwell time in the tank of approximately 3 hours the chemical is neutralized and subsequently discharged by gravity flow into the sewer. The chemical reaction creates an off-gassing and therefore these tanks should be vented.

Chemical Reaction Example With Hydrochloric Acid:



The CO<sub>2</sub> is off-gassed through the venting system

\*Typical Applications - Check Local Governing Authority for specific pH discharge levels; where applicable.

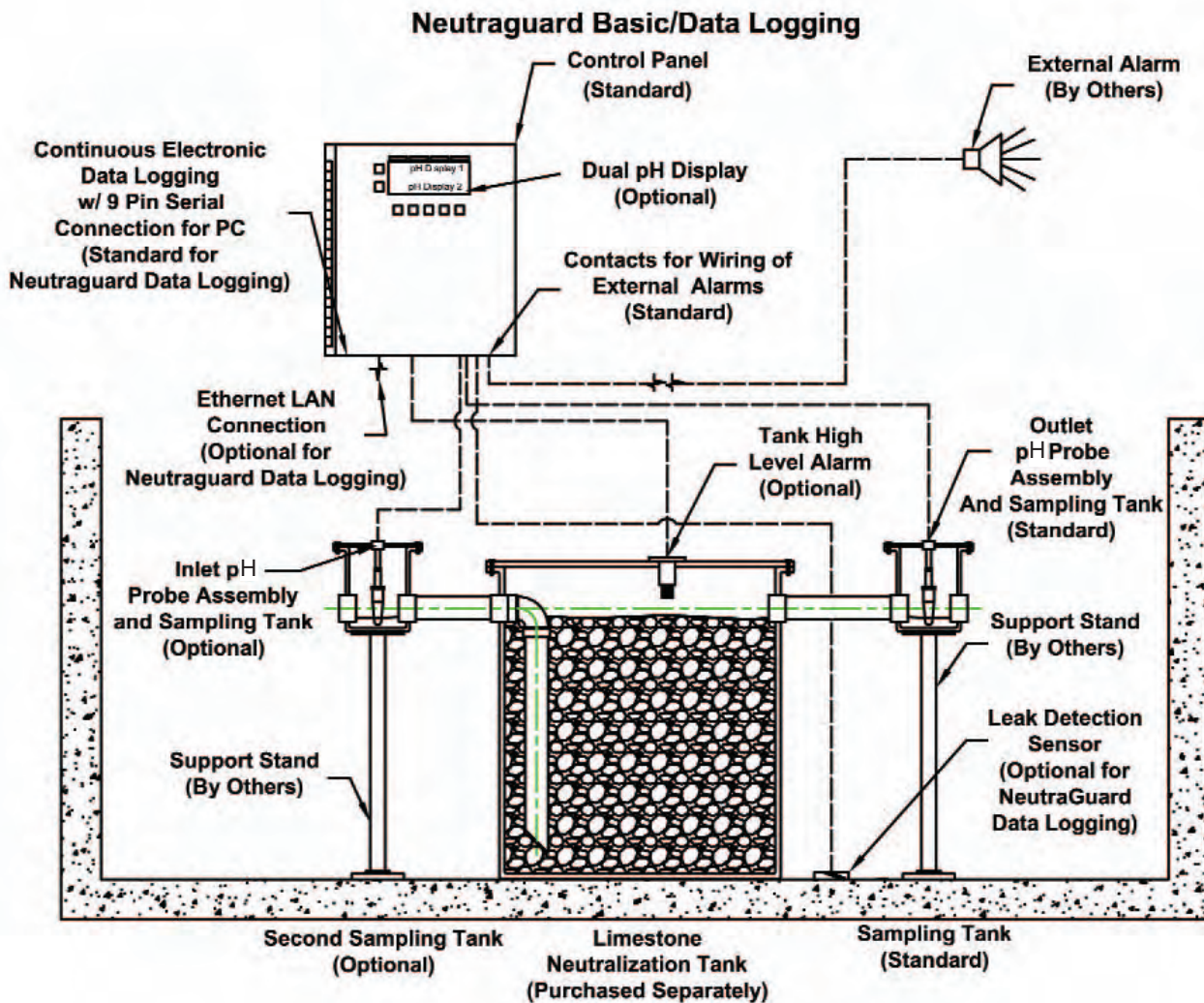
## Monitoring Systems

Many State and local authorities require that the pH level of chemical waste discharged into the sewer is monitored and quite frequently that the results are permanently recorded. Orion achieves these requirements through its NeutraGuard systems.

The basic NeutraGuard Monitor continuously monitors the pH level of the discharge and sounds an alarm when an upset condition exists.

In addition to pH monitoring, the NeutraGuard Data Logging version digitally captures the pH level of the discharge. This data can be either locally or remotely accessed.

Additional details on these systems are shown on page 26.



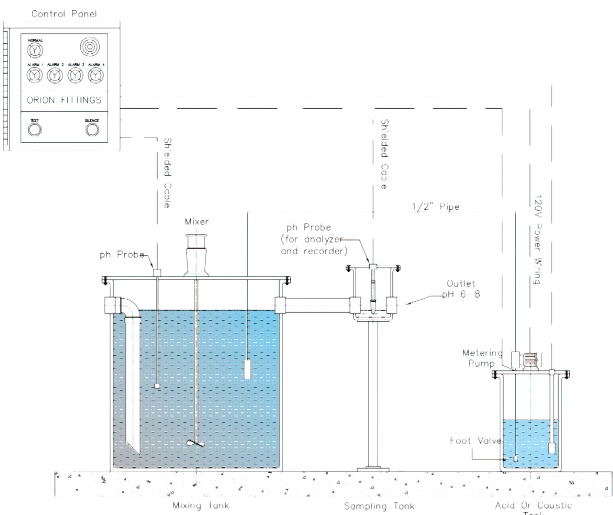
## Chemical Dosing Systems

Instead of using limestone chips for neutralization, chemicals can be injected into the waste stream to achieve the same result. Orion's Neutraguard Dosing System controls this process by introducing a solution of acid, or a solution of base, or both, into the chemical waste holding tank via metering pumps, controls and mixers. The resulting liquid mixture chemically reacts to form a salt and water composition, which is then discharged by gravity flow into the sewer.

When chemical waste streams are known to be always caustic, only acid dosing is required. Similarly, when chemical waste streams are known to be always acidic, only caustic dosing is required.

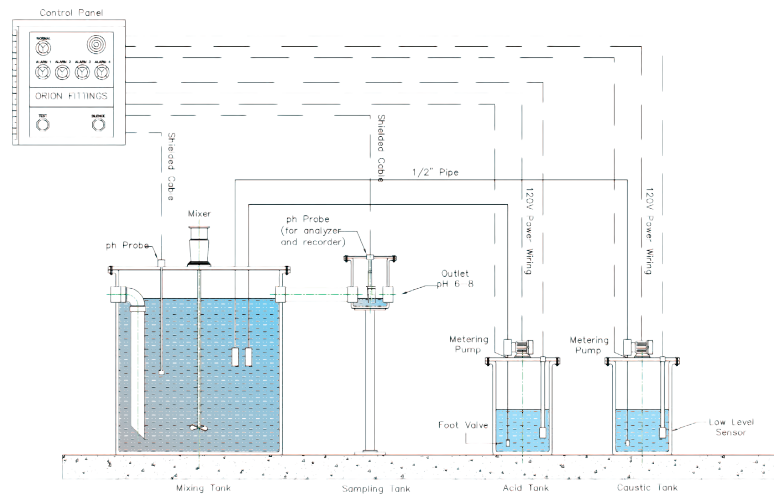
For systems that have unknown pH flows, the Neutraguard system will dose either acid or caustic as required.

These systems are depicted below.



**Acid or Caustic Dosing System**

**Combined Acid and Caustic Dosing System**



## General

Orion tanks are manufactured by rotationally molding virgin resins to uniform wall thicknesses and are stress and defect free. Tank shells are held in stock and each tank is completed to individual customer specifications with respect to:

- Inlet, outlet, vent size, location and style;
- Tank lid type;
- Access port type, size and location;
- FRP (fiberglass re-inforced), wrap for direct burial or plain tank.

A variety of tank configurations and styles are available, an overview of which is shown on page 9 for dilution tanks and page 16 for neutralization tanks.

## Tank Features

- Lightweight and easy to install
- Wide standard size range
- Custom sizes and configurations available
- Load bearing and non-load bearing tops available - plastic and plastic / metal combinations
- Direct buried tanks available with frp wrap
- Bolted, welded and combination tops available
- Manholes and easy access gamma ports available for inspection and limestone filling
- Fast delivery from factory
- Can handle most chemical waste requirements
- Minimum / easy maintenance
- High impact resistance
- High stress cracking resistance
- Cost effective
- Fiberglass reinforced (FRP), models available

## Materials of Construction

### Polyethylene

Orion tanks are manufactured as standard from high density polyethylene resin conforming to ASTM-D-1248. These are held in stock and can be used at temperatures up to 180°F in continuous service or 212°F intermittently. Tanks are black in color as standard, but may also be supplied in opaque or white in larger sizes. Tank lids can be bolted or welded. Maintenance access ports can be polyethylene threaded plugs, bolted manways, gamma cover with quick start thread, or a combination thereof. All fittings and penetrations are polyethylene and are located according to the engineer's specification.

### Polypropylene

Custom tanks can be manufactured from polypropylene resin conforming to ASTM-D-4101. These tanks can be used at temperatures up to 212°F in continuous service and in areas of high chemical concentration. Polypropylene tanks are translucent. Tank lids can be bolted or welded. Maintenance access ports can be polypropylene threaded plugs or bolted manways. All fittings and penetrations are polypropylene and are located according to the engineer's specification.

# DILUTION

## Dilution Tanks

In some low volume and low concentration chemical flow applications the dilution of the chemical waste may be enough to bring the liquid into an acceptable pH range. In this case mixing copious amounts of water, at approximately pH7, with relatively low concentrations and volumes of acid or base may be sufficient to render the pH of the resulting liquid mix acceptable for discharge into the sewer system. This dilution may occur in the sink traps, or more appropriately in under-bench dilution tanks. Orion manufactures a variety of tanks that are designed for this type of point of use dilution as shown below. To facilitate tank removal and maintenance, tanks should be properly supported to avoid over-stressing of connecting piping and tank welds.



### ***P trap***

Orion P traps can facilitate the initial dilution process, providing that both the chemical volumes and concentrations are very low. When higher concentrations and/or volumes are expected either a dilution tank or a combination of dilution tank and neutralization tank must be used to ensure complete chemical waste neutralization.



### ***Style 5 Dilution Tank - 5 Gallons***

The Orion style 5 tank is a bolted cover tank allowing for easy access and maintenance. When used without limestone chips the tank serves as a dilution basin. When used with limestone chips the tank serves as a point of use neutralization tank. These tanks must be vented.

The standard locations of the 2" inlet, outlet and vent connections are shown, but additional configurations can be produced to match a customer's requirements.



### ***Style 8 Dilution Tank/Trap - 1½ Gallons***

Orion style 8 tanks are specifically designed for under-bench use for low volumetric flow applications. They are a dual purpose trap and chemical waste dilution / neutralization tank. When used without limestone chips the tank serves as a dilution basin / trap. When used with limestone chips the tank serves as a point of use neutralization tank / trap

The tanks are compact in design allowing for easy fitting. A 1-1/2" female threaded connection is provided on the tank top to facilitate easy fitting to the sink drain tail piece. A 3" clean out is mounted on the tank top to facilitate inspection and maintenance. An additional 1 1/2" female threaded outlet is either side or top mounted for connection to discharge piping.

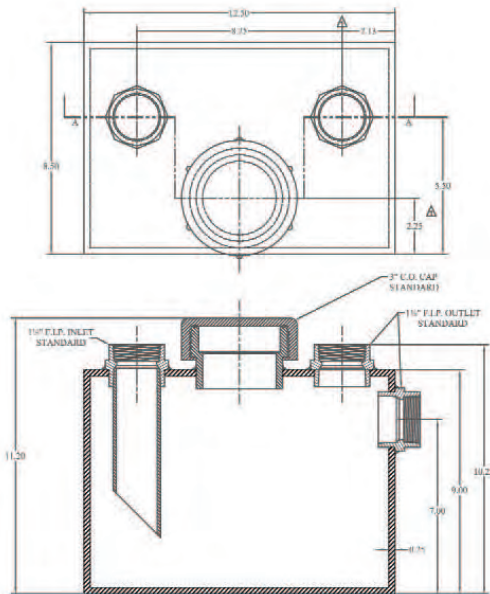


# DILUTION CONTINUED...

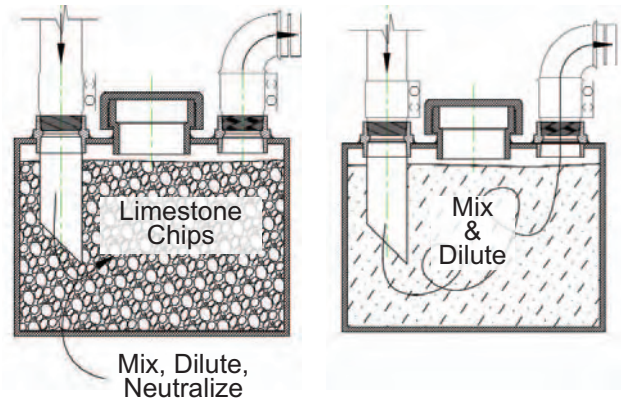
## Style 8 Dilution Tank/Trap Continued...

**Standard Style 8** - Top Inlet/Outlet/Clean out (as shown below).

**Optional Style 8** - Top Inlet & Clean out with Side Outlet



## Style 8 Operations

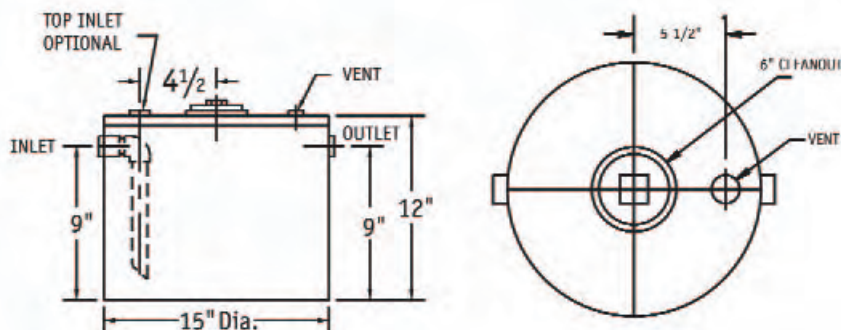


## Style 9 Dilution Tank - 5 gallons

Orion style 9 tanks are specifically designed for under-bench use where a larger capacity is required. When used without limestone chips the tank serves as a dilution basin. When used with limestone chips the tank serves as a point of use neutralization tank. These tanks must be vented.

The tanks are compact in design allowing for easy fitting. Standard connections are 2" female threaded inlet and outlet, 1-1/2 female threaded vent. A 6" cleanout is mounted on the tank top to facilitate inspection and maintenance.

The standard tank configuration is shown. These are held in stock. As with all Orion tanks additional configurations can be produced to match a customer's requirements.



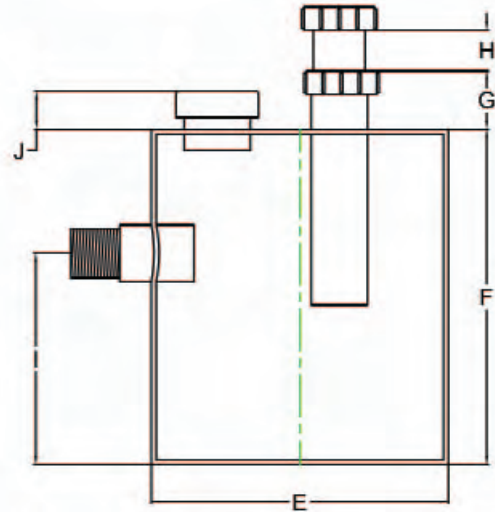
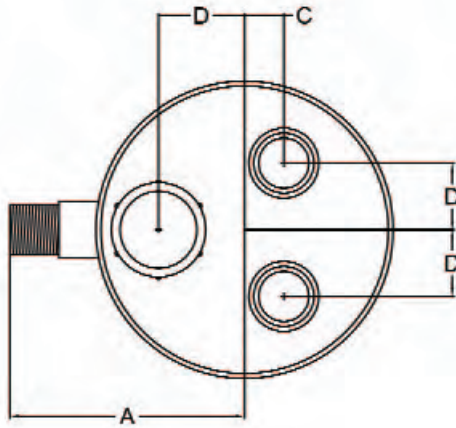
## Style 10 Dilution tank / Trap - 2 gallons

Orion style 10 tanks are specifically designed for under-bench use where a moderate flow is anticipated. When used without limestone chips the tank serves as a dilution basin / trap. When used with limestone chips the tank serves as a point of use neutralization tank. The tanks may be ordered as opaque allowing liquid levels to be visually ascertained.

The tanks are compact in design allowing for easy fitting. Standard connections are 1-1/2" female threaded inlet, 1-1/2" male threaded outlet. A 2" cleanout is mounted on the tank top to facilitate inspection and maintenance.

Single or dual inlets can be provided.

The standard tank configuration is shown. These tanks are held in stock. As with all Orion tanks, additional configurations can be produced to match a customer's requirements.



### Dimensional Table

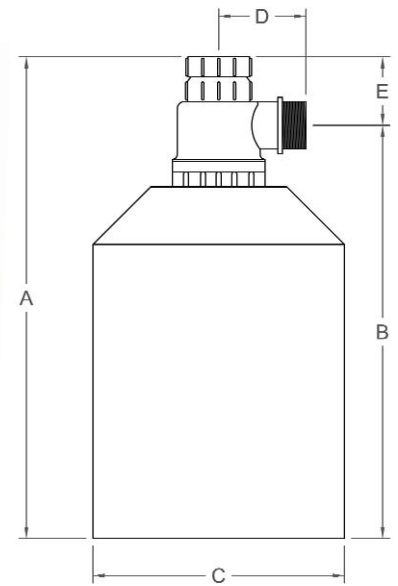
A	B	C	D	E	F	G	H	I	J	INLET	# of INLETS	OUTLET
7.31"	2.50"	1.19"	2.06"	9.00"	10.16"	1.91"	0" - 10"	6.78"	1.64"	1 1/2"	1	2"
7.31"	2.50"	1.19"	2.06"	9.00"	10.16"	1.91"	0" - 10"	6.78"	1.64"	1 1/2"	2	2"

# DILUTION CONTINUED...

## Style 11 Anti-Syphon Dilution Trap 1, 2 & 5 Gallons

Anti-syphon dilution traps are a pure dilution trap. They cannot be used with limestone chips for neutralization. They are available in 1, 2, and 5 gallon sizes for under-bench applications. The inlet and outlet locations are fixed as shown below.

Gallons	A In.	B In.	C In.	D In.	E Max.	E Min.
1	11.75"	9"	7.50"	2.88"	2.50"	7.50"
2	17.00"	14.25"	7.50"	2.88"	3.50"	13.50"
5	19.50"	17.00"	11.50"	2.88"	3.50"	13.50"



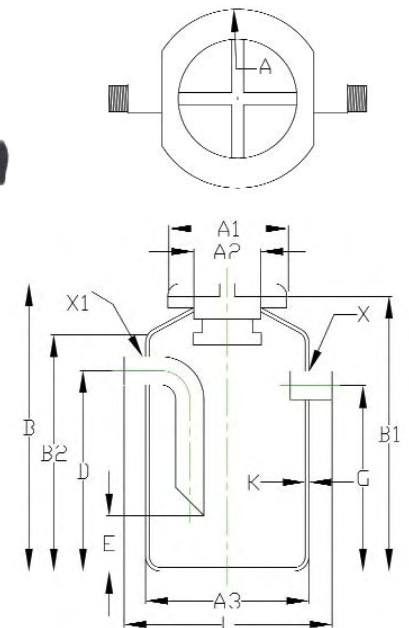
## Style 12 Dilution Trap - 6 Gallons

Orion style 12 tanks are specifically designed for under-bench use where large flows are anticipated.

When used without limestone chips the tanks serves as a dilution basin. When used with limestone chips the tank serves as a point of use neutralization tank. The tanks have a quick start thread cover for easy access and maintenance.

1½" and 2" inlets and outlets are stocked as standard.

The standard tank configuration is shown. These are held in stock. As with all Orion tanks additional configurations can be produced to match a customer's requirements.



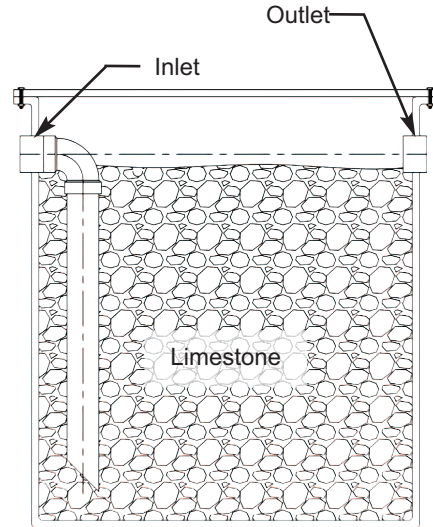
## Dimensional Table

A	A1	A2	A3	B	B1	B2	D	E	G	L	K	X - (MPT)	X1 - (MPT)
12"	8"	5.5"	11"	18.5"	17.75"	16"	13.5"	2"	12.5"	16"	.25"	1.5"	1.5"
12"	8"	5.5"	11"	18.5"	17.75"	16"	13.5"	2"	12.5"	16"	.25"	2"	2"

## Limestone Neutralization Tanks

When chemical waste flows cannot be neutralized by dilution alone, it is necessary to effect neutralization by some other means - either by introducing calcium carbonate into the liquid flow, or by dosing chemicals into the flow.

The most common and cost effective method of neutralization is the process where acidic chemical waste is brought into contact with calcium carbonate in the form of limestone chips. The calcium carbonate undergoes a chemical reaction with the waste flow which is then discharged into the sewer at acceptable pH levels. Water is added to the tanks to initiate the dilution process. A by-product of the chemical reaction is carbon dioxide gas, hence all limestone tanks should be vented. This method of neutralization is only effective with acidic flow. Caustic flows must be dosed with chemicals as in Orion's Neutraguard Dosing System.



## Limestone Specifications

The limestone supplied by Orion is certified as having a calcium carbonate content in excess of 90%. This high purity is essential to the successful neutralization of the acidic waste and to minimize sludge build up in the tank. The limestone chips should be 1" - 3" in size and be of irregular pattern to facilitate liquid percolation throughout the limestone bed. If the limestone chips are too small they may clog the tank and prevent both effective neutralization and proper liquid flow. If the chips are too large there may not be enough surface area to react effectively with the acidic waste. If the limestone purity is low, the particles inert to the chemical reaction will fall out and create a sludge within the tank. This may also prevent future chemical reaction and restrict liquid flow.

## Sizing: Neutralizing & Dilution Tanks

Number Of Lab Stations	Tank Size Gal	Limestone Lbs
2	5	50
4	15	150
8	30	250
16	55	500
25	100	1000
42	150	1700
55	180	2000
65	200	2500
80	275	3600
110	360	4500
150	500	6000
200	600	7500
350	1200	14500
700	2400	30000

Selecting the proper size tank is done by relating the number of sinks and drains that are being discharged into the system, to the capacity of the tank. According to ASPE tanks are to be sized to provide a "dwell time" of 2-1/2 to 3 hours. Based on this dwell time, ASPE has developed a sizing table which has been summarized as shown. Tanks should not be sized based on the number of sinks or drains alone. Certain types of waste may require particular needs and may not fall within the standard sink to tank ratio. Other factors which can affect the tank size are the amount of flow through the system piping. For commercial and industrial laboratories the number of lab stations in the table should be divided by two. A qualified engineer should make the final determination of tank size.

## Buried Tank Installation

Tanks must be fully supported on the base by either an appropriate concrete pad that allows no overhang or a compacted stone free sand bed.

When buried, tanks must be filled with water prior to backfilling. Tank tops are non-load bearing and should have a trap door or access cover over them supported by a foundation or by the ground. They cannot be supported by the top of the tank.

The backfill material shall be free of stones and foreign matter and shall be capable of passing a No. 10 screen. The depth of this backfill should be 6" to 8" thick around the tank and then normal backfill material may be used. Mechanical tamping is not recommended. For tanks with extensions, the above procedure should be followed up to, or slightly above, the water level. From that point on up to ground level it is recommended that a 4" thick concrete sleeve be poured around the tank in multiple lifts. If this is not feasible then the normal backfill procedure may be used, up to 36" height above water level, bearing in mind that backfilling will produce inward pressures on the empty portion of the tank. Care must be exercised during this operation to prevent inward buckling.

A concrete vault must be used or a 4" thick concrete sleeve poured around the tank in multiple lifts in areas with high water tables or poor soil conditions. If the tank is to be used as a pump-out holding tank, or similar type of operation, or the tank will be left empty, or partially full, then a vault is required.

Orion recommends that tanks that are going to be direct buried, should be fiberglass, (FRP), wrapped. These are Orion style 7 tanks.

Tanks may be placed in concrete vaults as illustrated. Once again, the vault base must be flat, uniform and free of sharp or irregular objects.

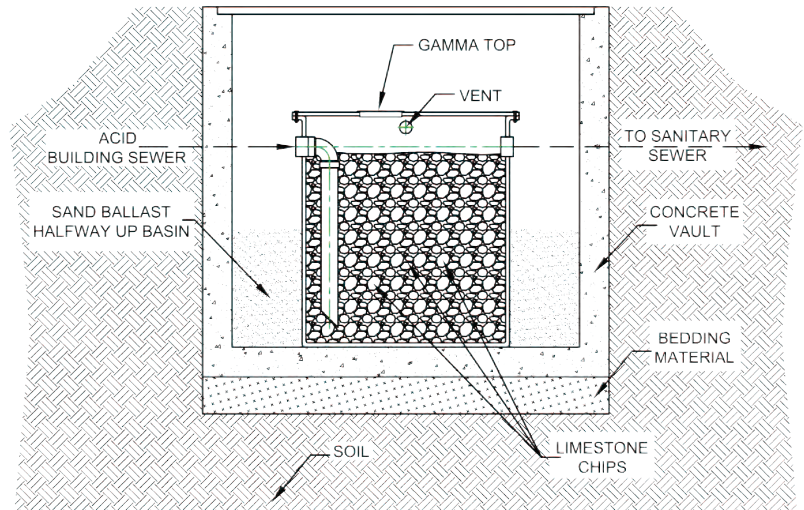
## Testing

Orion's neutralization tanks must not be pressure tested. Test tank by filling with water prior to use and inspect for any leaks.

## Maintenance of Tanks

The limestone chips supplied by Orion are 1-3" in size and have a calcium carbonate content certified to be in excess of 90%. Waste is added to the tank to help facilitate dilution. A maintenance schedule should be established to observe and maintain proper limestone levels in the tank. Limestone replacement should be performed at regular intervals. Typically, once every one to three months is sufficient. However, these intervals can be increased, or decreased, based upon application needs and performance. Factors affecting limestone replacement are related to waste flow, chemical composition as well as operating temperatures. Solids in the waste stream can plug the tank and should be avoided.

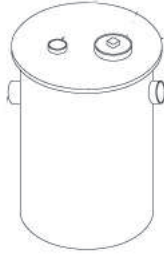
*Note: There are many variables that affect neutralization and dilution of chemicals discharged through a system. Professional assistance should be employed in analyzing the effluent and the necessary maintenance service.*



**Limestone Neutralization Tank**

## Style 4 (p17)

Orion Style 4 tanks are manufactured in 15 gallon to 2400 gallon sizes. The style 4 tank is complete with a welded circular top. The 15 and 30 gallon tanks have a 6" clean out installed in the top of the tank for access. Above 55 gallons a 16" gamma plus access port is installed.



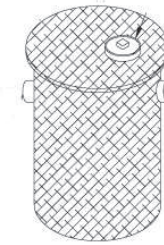
## Style 5 (p17)

Orion Style 5 tanks are manufactured in 5 gallon to 2400 gallon sizes. The style 5 tank is complete with a bolted circular top. This top lifts off for access to the tank.



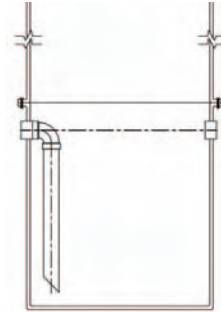
## Style 7 (p17)

Orion Style 7 tanks are manufactured in all tank sizes. These tanks are fiberglass reinforced for additional strength. Typically, Style 7 tanks have the same access as a style 4. A bolted top is also available.



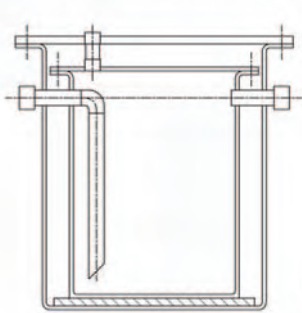
## Tank Extensions (p22)

Tank extensions can be fabricated for any size; Style 4, 5 & 7 tank.



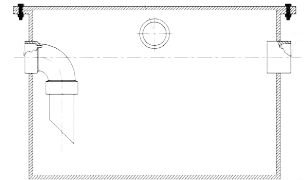
## Double Wall Tanks (p22)

Orion can fabricate a variety of double wall tanks. These are custom designed in conjunction with the engineer.



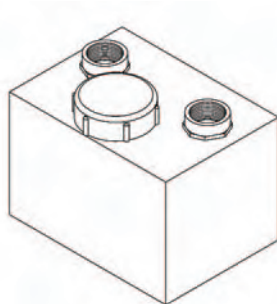
## Rectangular Tank (p24)

For constricted areas Orion provides a variety of rectangular tanks.



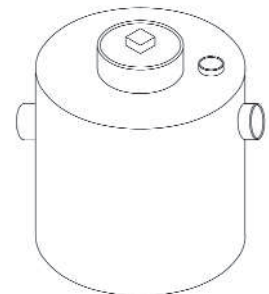
## Style 8 (p12-13)

Orion Style 8 tanks are designed for point of use applications. These tanks have a 1½ gallon capacity. Without limestone these tanks serve as a dilution tank or sink trap. A 3" cleanout is installed on the top of the tank to provide access. Other configurations are available.



## Style 9 (p13)

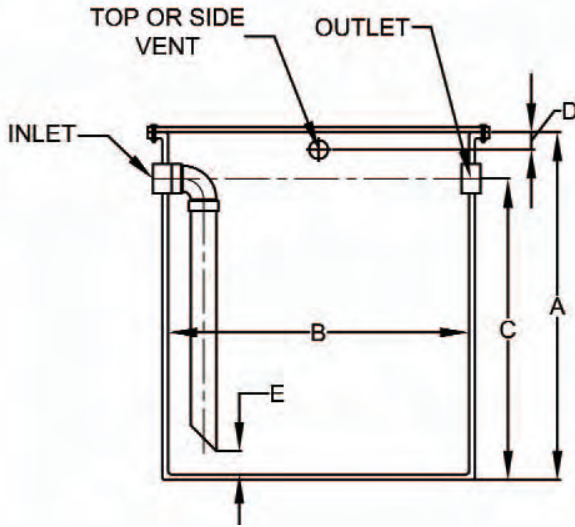
Orion Style 9 tanks are designed for use in applications that require a five gallon holding tank at point of use. The tank can serve as a neutralization tank when used with limestone chips. Without limestone it will serve as a dilution tank. The 6" cleanout installed in the center top of the tank provides access.



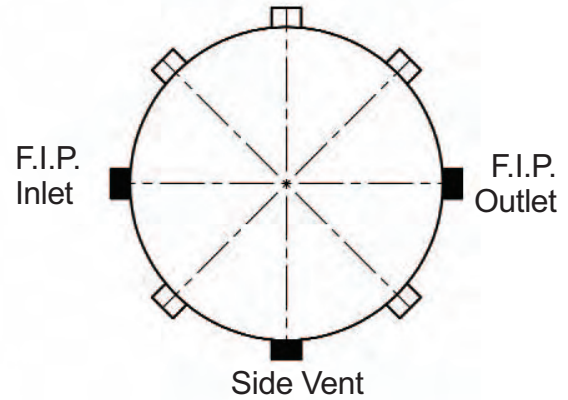
# NEUTRALIZATION TANKS

## STYLE 4, 5, & 7 STANDARD DIMENSIONS

### Standard Heights



### Standard Locations Inlet, Outlet & Vent



Gallons	Std. Inlet* & Outlet	Std.* Vent	A Ht.	B** Dia."	C Inlet Outlet	D Vent	E	Wgt.
Industry Standard Size Tanks								
5	2	2	16.25	11	12	3	3	9
15	3	2	15.5	17.25	10	3	3	12
30	3	2	30.5	17.25	25	3	3	18
55	3	2	33.5	22.5	27	3	3	37
100	4	3	49	24	42	3	3	50
150	4	3	48	30	40	3	3	70
180	4	3	42	36	34	3	3	75
200	4	3	53	36	45	3	3	86
275	4	3	48	42	40	3	3	100
360	4	3	48	48	40	3	3	172
500	4	3	60	52	52	3	4	207
600	4	3	84	48	76	3	4	248
1200	4	3	84	69	72	6	4	268
2400	6	4	126	78	114	6	4	663
***Actual Liquid Holding Capacity Sizes								
5W	2	2	16	13	11	3	3	11
15W	3	2	24	16	20	3	3	15
30W	3	2	24	22	20	3	3	20
55W	3	2	36	24	30	3	3	40
100W	4	3	48	31	38	3	3	55
150W	4	3	48	36	38	3	3	75
200W	4	3	48	42	38	3	3	90

\*All tanks standard furnished with FIP threaded adapters. All other additional fittings from price sheet All measurements in inches. Weight in pounds

\*\* Allow additional 5" for flange clearance on diameter of tank.

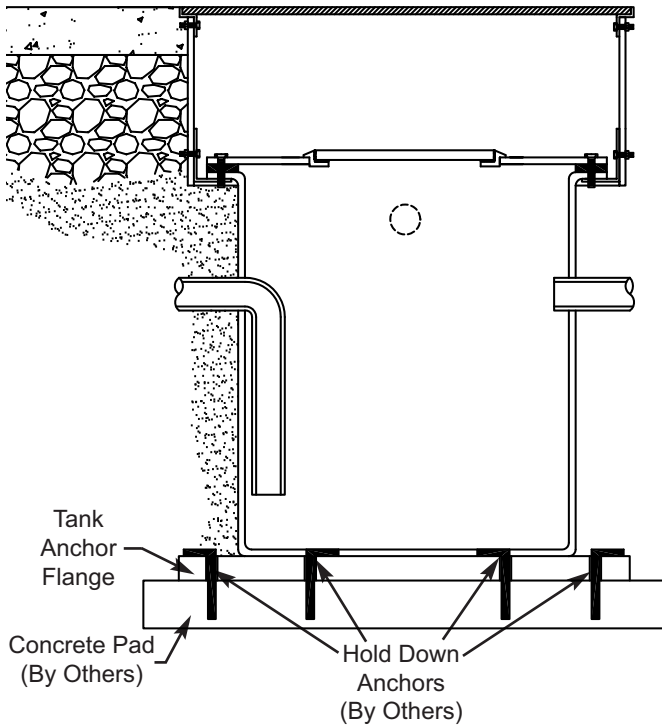
All tanks are supplied with above sized Inlet, Outlet, and Vent, at List Price. Tanks may be ordered with other variations on Inlets, Outlets and Vents as well as different locations and elevations of openings. For additional openings, or variations of fitting sizes, contact your Orion Representative for Pricing.

Note: All tanks are free standing and self supporting except 1200 and 2400, which require support braces or FRP.

Note: Tanks often ship dimensional weight. Consult freight carrier for details on dimensional weight.

\*\*\*Actual liquid holding tanks are sized so that with limestonefill, the tank still has the rated gallon capacity.

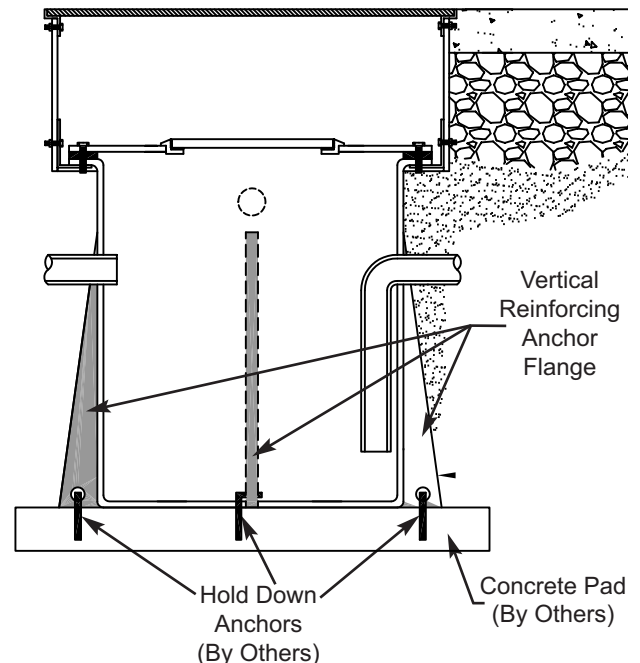
## Tank Anchor Flange - (TAF)



Tank Anchor Flanges are welded to the tank bottom and supplied with holes for hold down anchors (By Others) to attach to a concrete pad. Tank Anchor Flanges are recommended for securing the tank to the ground in partially full or high water table tank applications.

## Reinforcing Anchor Flange - (RAF)

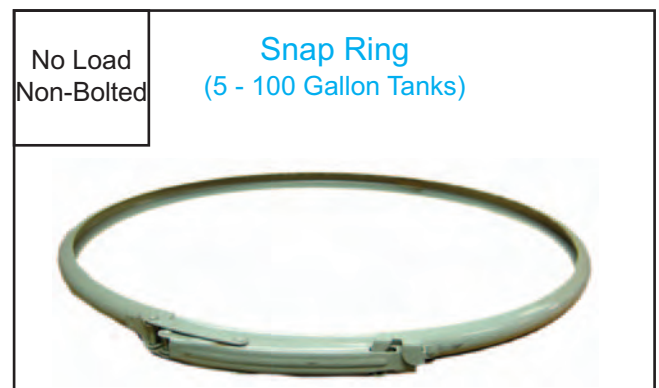
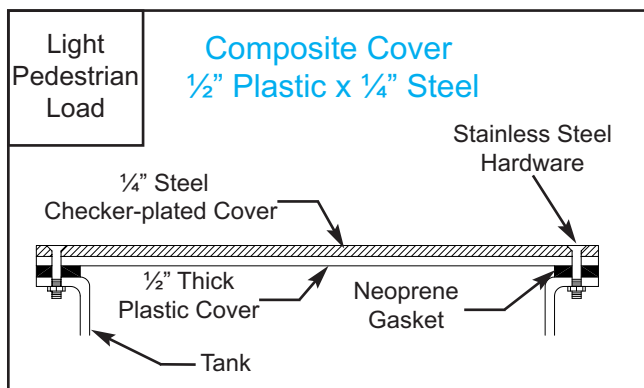
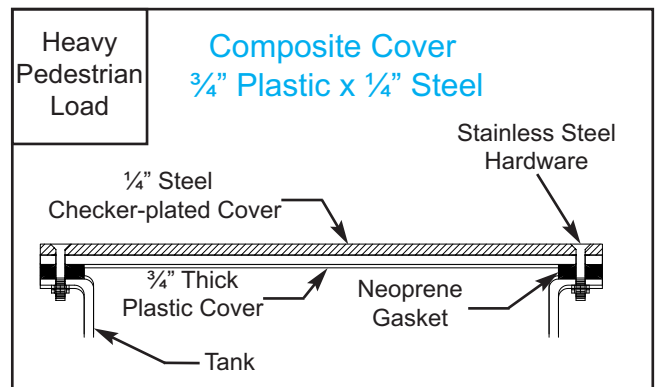
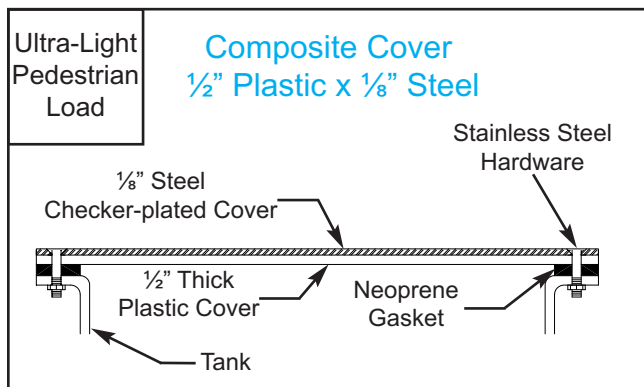
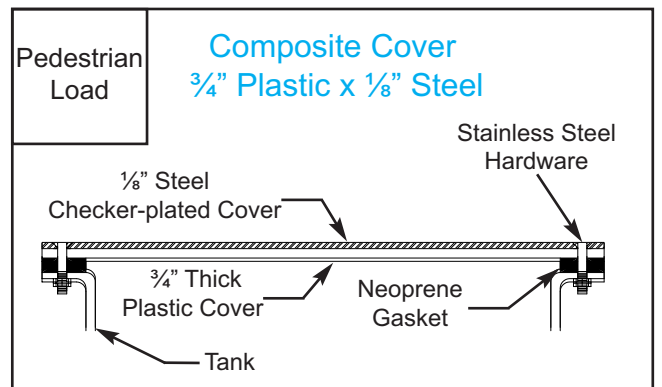
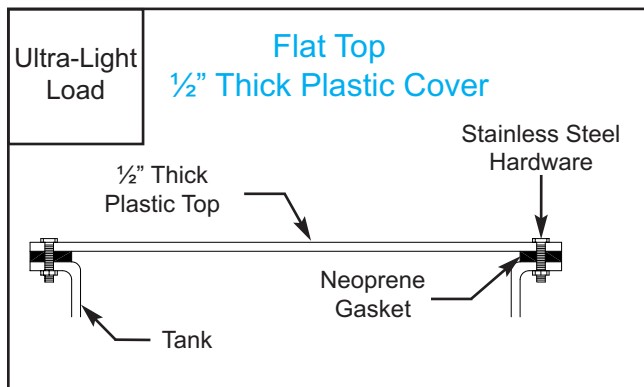
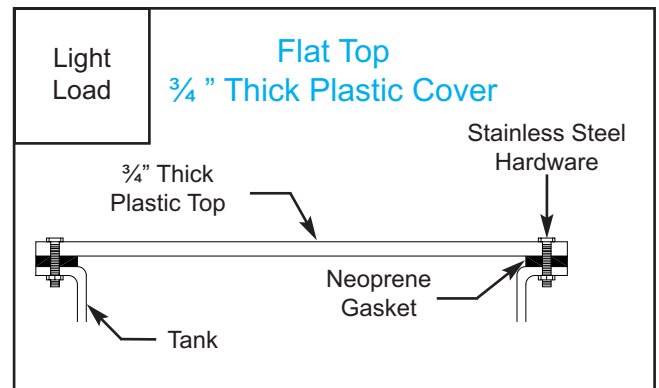
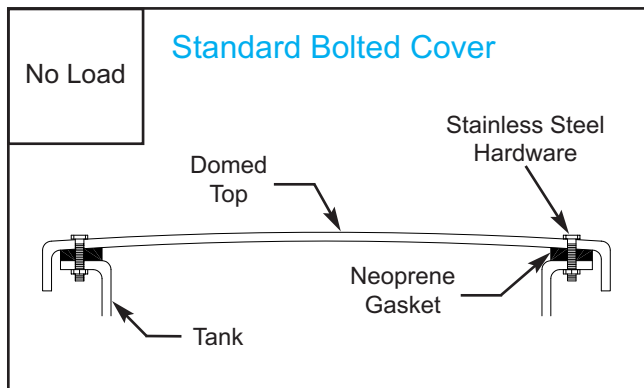
Reinforcing Anchor Flanges are vertical ribs welded to the outside of the tank included holes at the tanks bottom for hold down anchors (By Others) to attach the tank to a concrete pad. Reinforcing Anchor Flanges are typically used to structurally reinforce the tank for partially full tank applications..



# NEUTRALIZATION TANKS

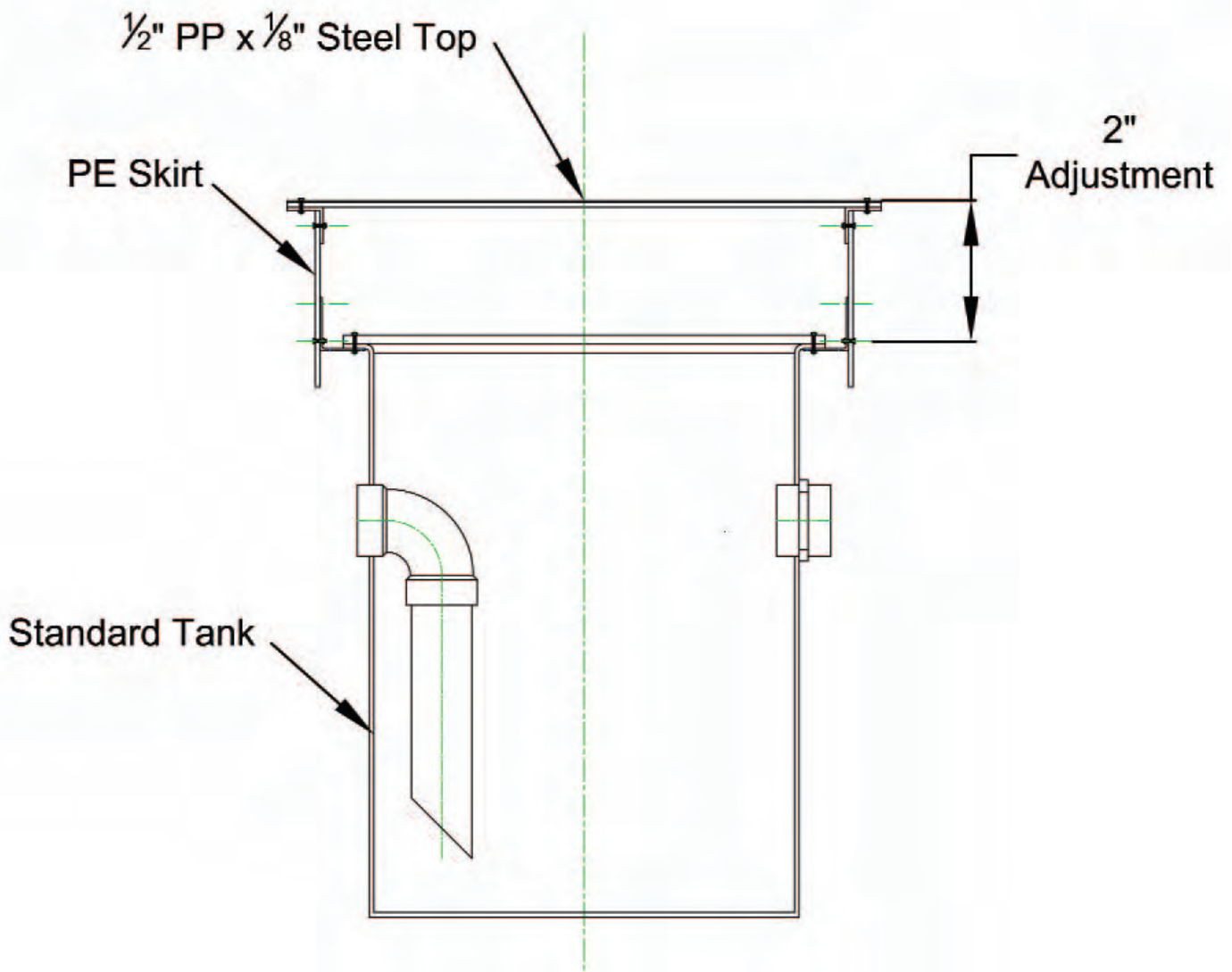
## STYLE 5 TANK COVER OPTIONS

### Bolted Cover Options



### Adjustable Height

Certain applications require job site adjustability for tank extensions. Orion's offers a range of adjustable height from 5-Gallon to 600-Gallons. They are assembled to our standard tanks and can be supplied with the same options as standard tanks.

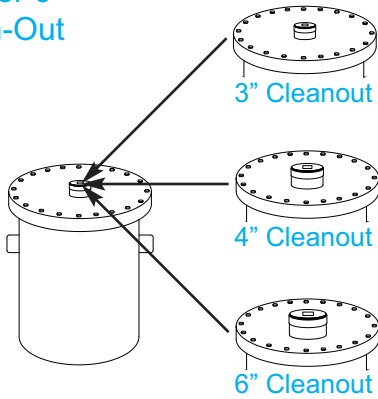


# NEUTRALIZATION TANKS

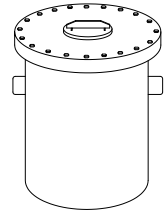
## INSPECTION PORTS & CONNECTION OPTIONS

### Inspection Ports

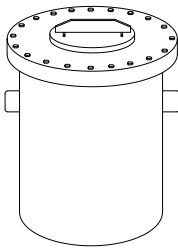
3", 4" or 6"  
Clean-Out



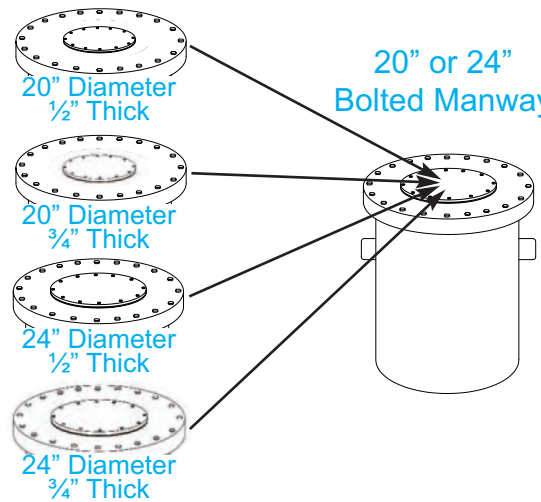
Gamma Top  
12" Easy Threaded Access



Gamma Plus  
16" Easy Threaded Access



20" or 24"  
Bolted Manway



### Connections

<p><b>Plain End</b></p>	<p>Connects to: Mechanical Joints Socket Ends</p> <p>Sizes: 1 1/2", 2", 3", 4", 6"</p>
-------------------------	--

<p>Connects to: Standard Male Pipe Thread</p> <p>Sizes: 1 1/2", 2", 3", 4", 6"</p>	<p><b>Female Thread</b></p>
--	-----------------------------

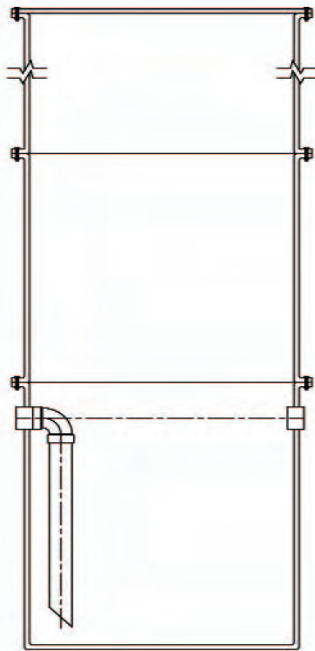
<p><b>Male Thread</b></p>	<p>Connects to: Standard Female Pipe Thread</p> <p>Sizes: 1 1/2", 2", 3", 4", 6"</p>
---------------------------	--

<p>Connects to: ANSI 150 lb Bolt Pattern</p> <p>Sizes: 1 1/2", 2", 3", 4", 6"</p>	<p><b>Flanged</b></p>
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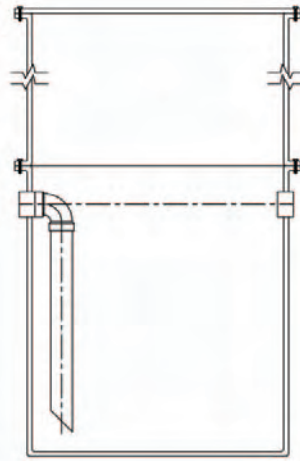
### Tank Extensions

Certain applications require tanks to be extended to the finished grade level. Orion's Style 4, 5, & 7 tank heights can typically be extended to a height that is three times the total height of the standard tank (two tank extensions). Orion offers both full diameter extensions and reduced diameter extensions made from our standard tanks. They can be supplied with the same options as standard tanks.

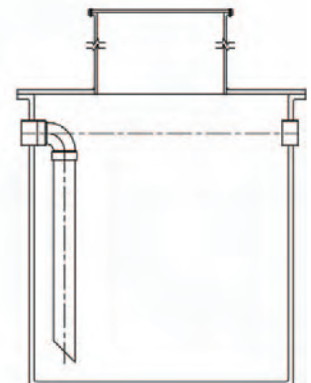
Tanks with extensions that are going to be direct buried should be placed in a vault or pipe sleeve.



Full Diameter  
Double Lift Extension



Full Diameter  
Single Lift Extension



Reduced Diameter  
Extension

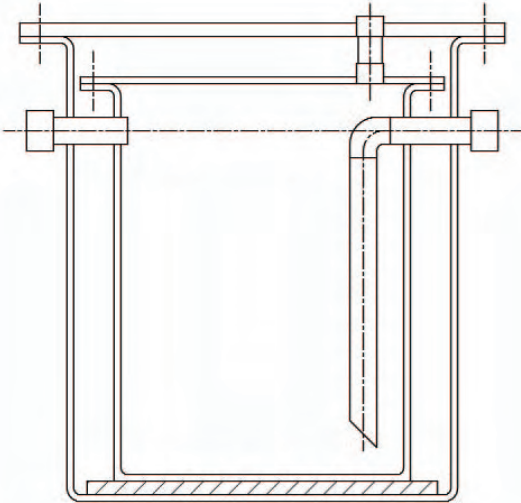
Gallons	Std. Tank Ht.	Extension Min / Max	Single Lift Ext. Total Height		Double Lift Ext. Total Height	
			Min	Max	Min	Max
5	16.25	4 / 14	20.25	30.25	24.25	44.25
15	15.5	4 / 14	19.5	29.5	23.5	43.5
30	30.5	4 / 28	34.5	58.5	38.5	86.5
55	33.5	4 / 31	37.5	64.5	41.5	95.5
100	49	4 / 47	53	96	57	143
150	48	4 / 46	52	94	56	140
180	42	4 / 40	46	82	50	122
200	53	4 / 51	57	104	61	144
275	48	4 / 46	52	94	56	140
360	48	4 / 46	52	94	56	140
500	60	4 / 58	64	118	68	144
600	84	4 / 58	88	142	92	144
1200	84	4 / 36	88	120	92	144

All Dimensions In Inches

# DOUBLE WALL TANKS & DECONTAMINATION TANKS

## Double Wall Tanks

Extreme applications may require a double wall tanks. Orion offers a variety of double wall tank options, with carrier tank sizes from 5-Gallons to 600-Gallons. They can be supplied with the same options as standard tanks.



### Tank Sizes In Gallons Carrier / Containment

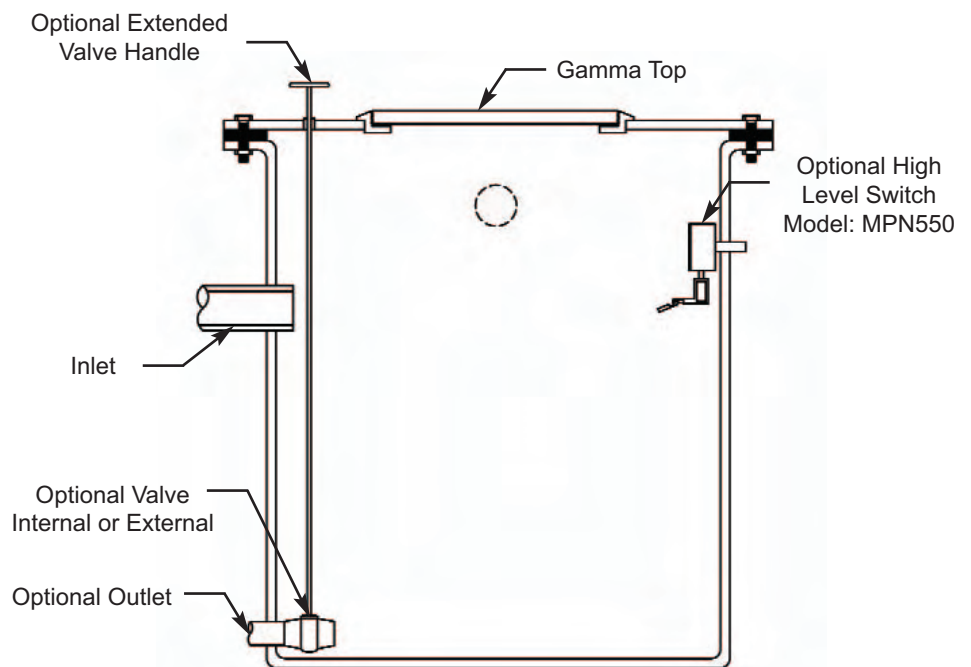
5 / 30
15 / 55
30 / 55
55 / 150
100 / 200
150 / 200

### Tank Sizes In Gallons Carrier / Containment

180 / 360
200 / 500
275 / 600
360 / 1200
500 / 1200
600 / 1200

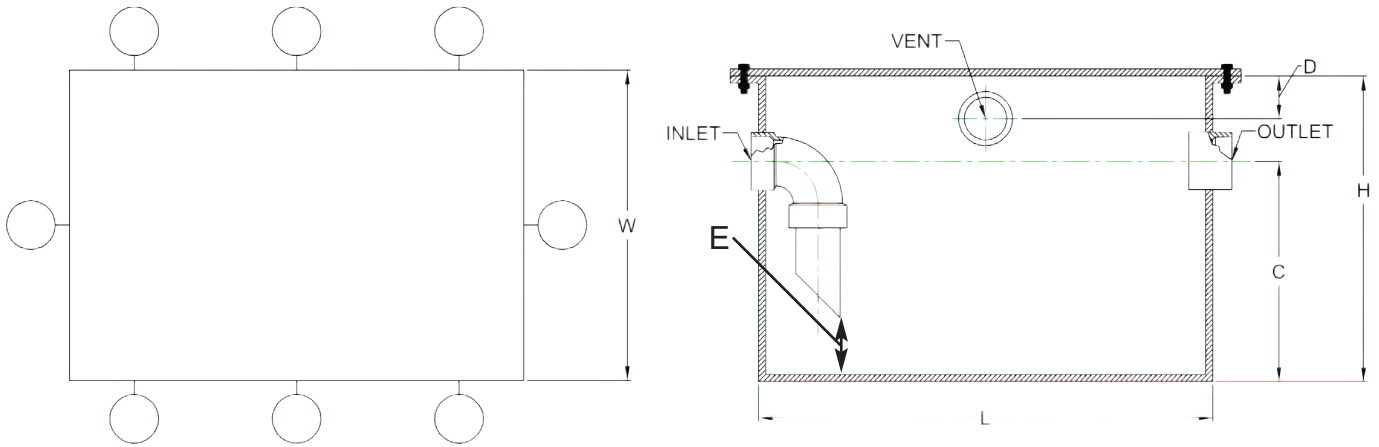
## Decontamination Tanks

Decontamination tanks are typically used in applications where there is a need to contain potentially hazardous waste that cannot be sufficiently neutralized or diluted by standard methods. Orion's decontamination tanks offer a safe and economical solution to contain hazardous waste until the waste can be removed and disposed of properly. Orion supplies a full range of decontamination tanks to meet your specified needs (150-Gallons to 1,200-Gallons). As an added option, our decontamination tanks can be equipped with a Single Station - High Level Alarm (Model MPN550); allowing the user to be automatically notified when removal of hazardous waste is required. This alarm has dry contacts to facilitate wiring the alarm into the central building management system.



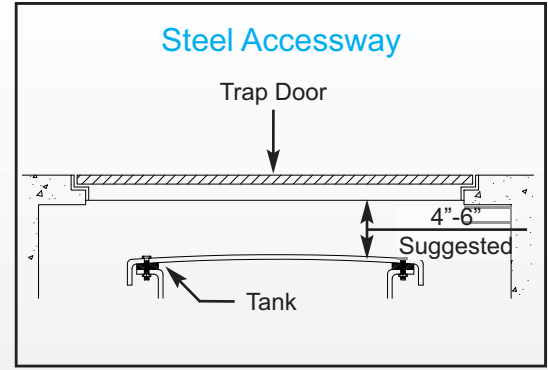
## Rectangular Tanks

Orion's rectangular tanks have the same cover options (Adjustable Extension - Not Available), connection options and access options as our standard tanks. Rectangular tanks are custom built to meet engineers' specifications; with a wide range of tank sizes (1 Gallon to 670 Gallon).



Part Number	Size	L	W	H	C	D	E
ORT0001	1 Gal.	6"	12"	6"	3"	1.5"	2"
ORT0002	2 Gal.	8"	8"	8"	5"	1.5"	2"
ORT0005	5 Gal.	10"	16"	8"	5"	1.5"	2"
ORT0015	15 Gal.	12"	24"	12"	7"	2"	4"
ORT0030	30 Gal.	12"	24"	24"	18"	2"	4"
ORT0055	55 Gal.	24"	30"	18"	12"	2"	4"
ORT0115	115 Gal.	30"	30"	30"	24"	2"	4"
ORT0150	150 Gal.	24"	48"	30"	24"	2"	4"
ORT0215	215 Gal.	36"	36"	42"	36"	2"	4"
ORT0265	265 Gal.	36"	72"	24"	18"	2"	4"
ORT0400	400 Gal.	36"	72"	36"	30"	2"	4"
ORT0540	540 Gal.	36"	72"	48"	42"	2"	4"
ORT0670	670 Gal.	36"	72"	60"	54"	2"	4"

# TRAP DOORS



### Suggested Trap Door Sizes For Orion Standard Tanks

Tank Size	Trap Door Size
5, 15, 30 galls	24"x24"
55, 100 galls	36"x36"
150, 180, 200 galls	48"x48"
275, 360, 500, 1200	60"x60"



### TYPE OR: 150 PSF Steel With Loose Cover

Model	Dimensions
OR-24	24"x24"
OR-36	36"x36"
OR-48	48"x48"



### TYPE K / TYPE Q: 150 PSF Hinged Cover

Model	Model	Dimensions
AL	Steel	
K1	Q1	24"x24"
K4	Q4	36"x36"
KD2	QD2	48"x48"
KD4	N/A	60"x60"

"D" represents a double door version



### TYPE J: 300 PSF Hinged Cover

Model	Model	Dimensions
AL	Steel	
J1AL	J1	24"x24"
J4AL	J4	36"x36"
JD2AL	JD2	48"x48"
JD4AL	JD4	60"x60"

"D" represents a double door version



### TYPE JH20: H-20 Wheel Loading

Model	Dimensions
Steel	
J1H20	24"x24"
J4H20	36"x36"
JD2H20	48"x48"
JD4H20	60"x60"

"D" represents a double door version

## **pH Monitoring**

Orion offers a variety of pH Neutraguard systems for a range of applications. Orion's Neutraguard systems are state-of-the-art, easily installed, user friendly and completely digital.

### **Control Panel and Display**

- All digital controls and displays
- Standard size control panel for all systems
- UL listed Control Panel and Components
- NEMA 4X Panel
- Polycarbonate Panel construction
- Impact and corrosion resistant
- Pre-installed cable penetrations & cable fasteners
- 5" Lower Profile than existing Monitor I unit
- LCD Can be backlit with separate on and off buttons



### **Standard Equipment**

- Factory calibrated electronically - No need to field calibrate for temperature or pH. Install and use.
- High & Low pH level alarms - Audible and Visual
- High & Low Tank level alarms - Audible and Visual

### **User Customizable**

- Easy Dry contact wiring for external level switch
- Easy calibration menu for pH
- Easy adjustment of pH High & low level settings
- Easy adjustment of data logging rate
- Easy dry contact wiring for remote external alarms - Audible and Visual
- Easy installation of an optional second pH monitor probe into the same control panel

### **Data Logging**

- All data logging is digital
- No need to change paper every 30 days
- 57,000 Standard data points giving 39 days of data at a 1 minute logging rate
- Data can be electronically retrieved by:
  - Laptop via local 9 pin serial port
  - Remote access through ethernet LAN connection. (Optional)
- Data viewing software supplied for easy download
  - Data is displayed as tabulated data or graphical display
  - Can be exported to excel
- Data logging is easily expandable by plug in 64mb SD-RAM memory, giving up to 123 years of data at a 1 minute logging rate.

## Standard Features

### NeutraGuard Monitor

Model # M02-0-01-000

- Continuous pH Monitoring
- All Digital Operations
- High/Low pH Alarm - Audio & Visual
- Contacts for Wiring of External Alarms or To Building Management System

## Optional Extras

- Second pH Probe Assembly and Display

- Tank High Level Alarms

### NeutraGuard Data Logging

Model # M01-1-01-001

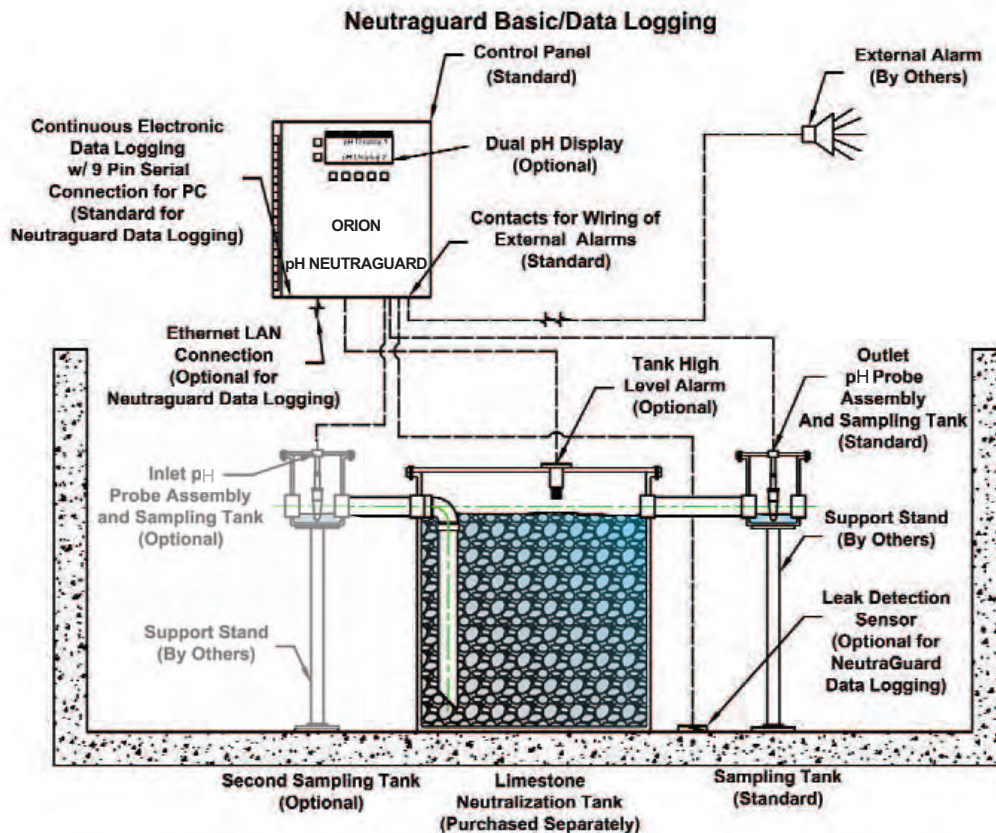
- Continuous pH Monitoring
- All Digital Operations
- High/Low pH Alarm - Audio & Visual
- Contacts for Wiring of External Alarms
- **Continuous Electronic Data Logging w/ 9 Pin Serial Connection for PC**

- Second pH Probe Assembly and Display

- Tank High Level Alarms

- **Ethernet LAN Connection**

- **Memory Expansion Modul**



## Standard Features

### NeutraGuard Dosing

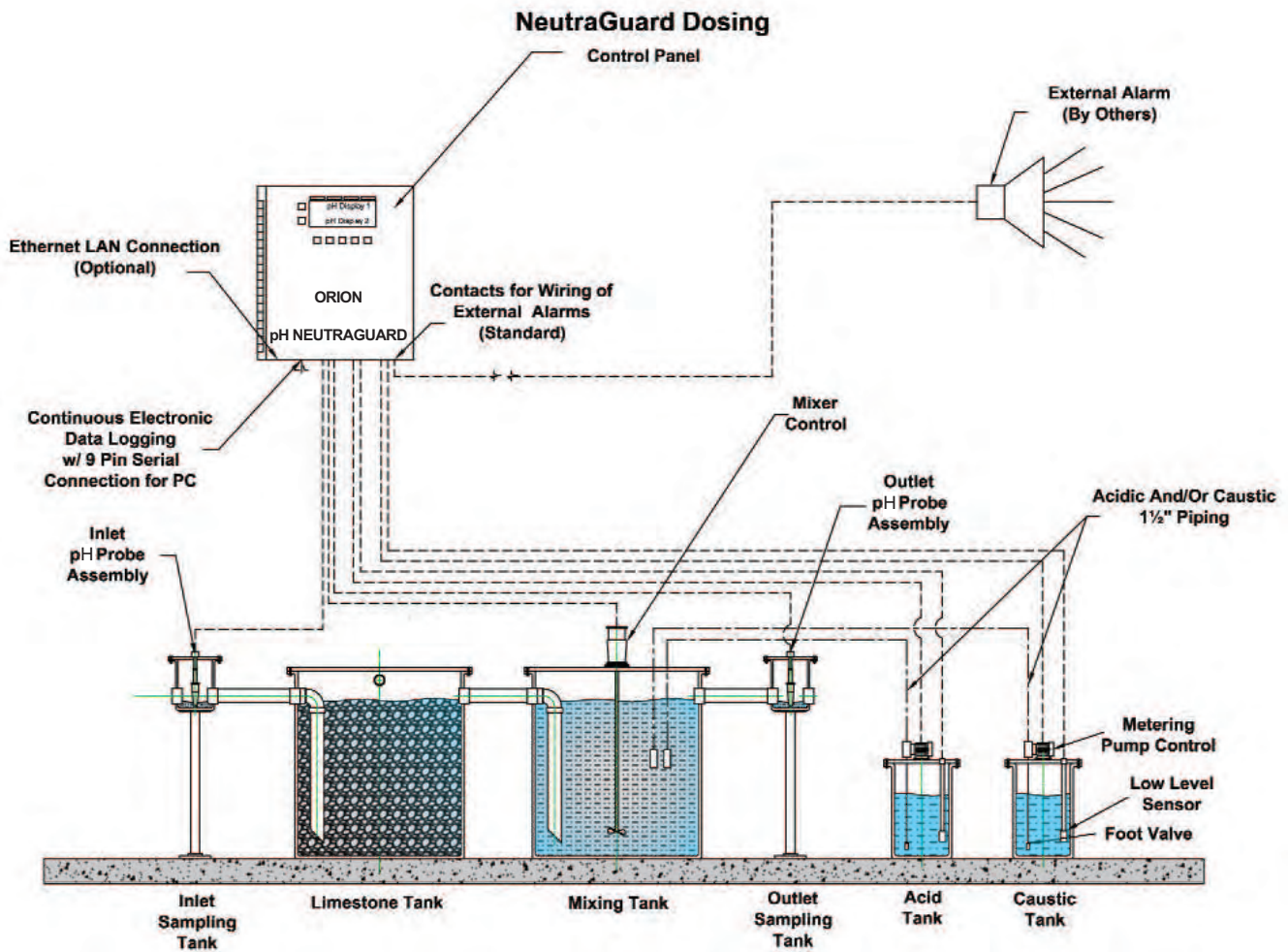
Model # S03-1-02-001

- Continuous pH Monitoring
- All Digital Operations
- High/Low pH Alarm - Audio & Visual
- Contacts for Wiring of External Alarms
- Continuous Electronic Data Logging w/ 9 Pin Serial Connection for PC
- **Chemical Dosing Pump Control**
- **Chemical Reagent Tank Level Alarms**
- **Second pH Probe Assembly and Readout**

## Optional Extras

- Ethernet LAN Connection

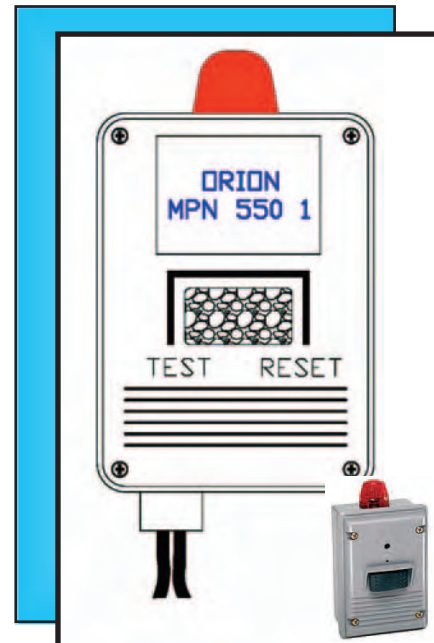
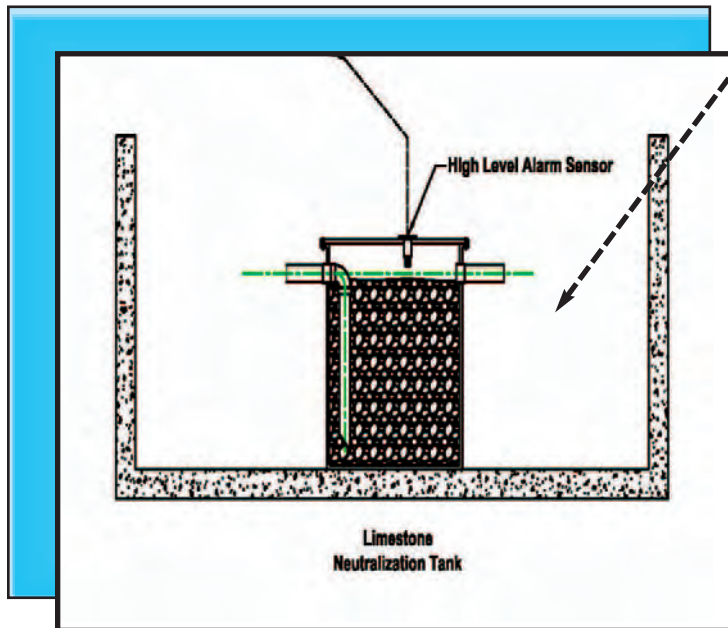
- Memory Expansion Modul



## High Level Alarm: Model # MPN 550

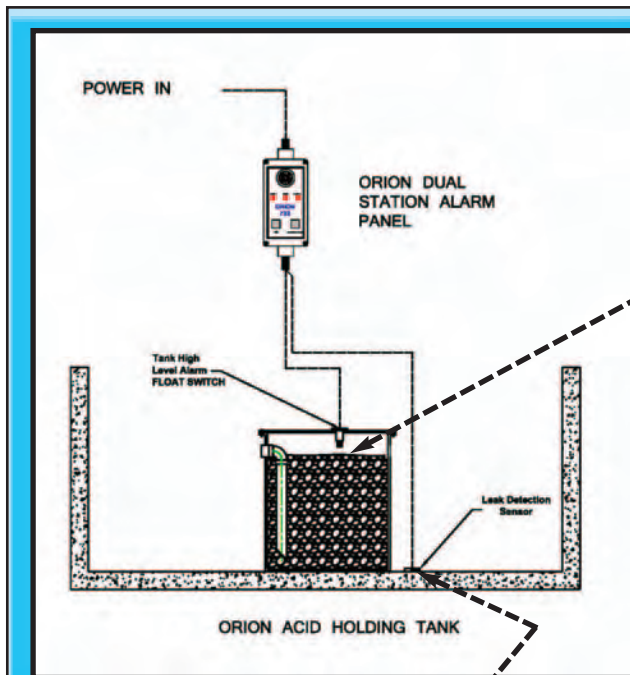
- **Automatic alarm reset, horn silence switch and alarm test switch**
- **Voltage:** 120 VAC; 7W max
- **Indicator:** Flashing light meets type 3R standards; 3 watt max
- **Audible alarm:** 82 dB @ 10ft, meets type 3R water tight standards
- **Enclosure:** Nema 4x indoor/outdoor; uv stabilized, weatherproof, thermoplastic 6.25”h x 4.5”w x 3.0”d
- **Test/silence switch.** certified to IP66 and IP68 standards
- **UL / CUL LISTED**
- **Float sensor:** normally open; LFP-VE-P2 solid polypropylene 0.71” diameter exposed float, 194F operating temperature, 0.5A
- **6Ft power cord**

High Level Alarm Sensor (LFP-VE-P2)



### High Level & Leak Detection Alarms: Model # 732

- **Supply Voltage:** 120 VAC +10%, -15%, 6.6 VA max
- **Indicators:** 3 solid state LED's
- **Audible alarm:** Field adjustable from 77 to 97 dB @ 2ft by rotating shutter
- **Enclosure:** Nema 3R polycarbonate; 6.25"H x 3.25"W x 3.5"D.
- **Sensor voltage / current:** 12VDC, .248 mA current.
- **Terminals:** size 6 panhead screws with captivated wire clamping plate
- **Operating Temperature:** -22F to 150F ambient
- **Sensitivity:** 0-26K ohm max specific resistance
- **UL LISTED**
- **Conduit connection:** Sensor - 3/4" NPT, PVC; Power - 1/2" NPT metal.
- **Float sensor:** normally open; LS3 solid polypropylene 1" diameter exposed float with 1/8" NPT connection
- **Flat leak detection sensor, LS10; HDPE**



High Level Alarm Sensor



Leak Detection Sensor





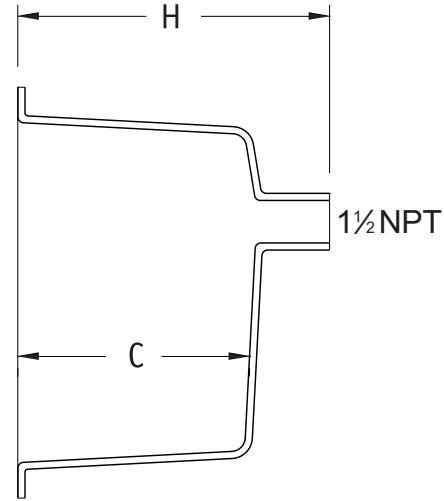
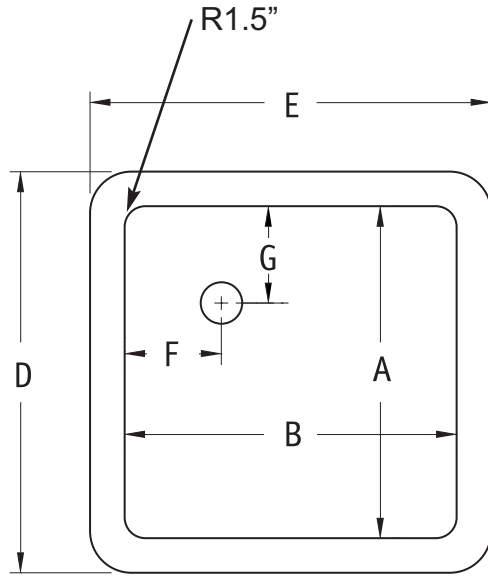
## Corrosion Resistant Laboratory Sinks

Orion sinks are molded from durable polyethylene. They are easy-to-install and are designed to provide years of tough service. Several models of ADA-compliant sinks are included in the line.

Laboratory sinks are designed for intense chemical environments and are produced from

virgin polyolefins with an integral 1½" national pipe thread outlet. The corner drain location allows for the maximum use of the sink bowl. An integral flange permits either flush above the counter mounting, using a stainless steel flush mounting rim, or traditional below the counter mounting.

Flush stainless steel or undercounter steel mounting rims are available for all sinks and are recommended by Orion for installation.



Style	A	B	C	D	E	F	G	H	Wt. oz.
ARLS-11	12	12	8	14.5	14.5	3.5	3.5	11	72
ARLS-12	16	8	7	18.5	10.5	4	4	9.25	75
ARLS-13	16	16	8	18.5	18.5	3.5	3.5	11	106
ARLS-14	18	12	8	20.75	14.75	3	3	10.25	106
ARLS-15	18	15	12	20.5	17.5	4	4	15	165
ARLS-16	21	18	10	23.5	20.5	3.5	3.5	12	165
ARLS-17	23	18	12	25.5	20.5	4	4	14.25	185
ARLS-18	25	15	10	27.5	17.5	4	4	13	168

Style	A	B	C	D	E	F	G	H	Wt. oz.
ARLS-13-ADA	16	16	6	18.5	18.5	3.5	3.5	11	98
ARLS-14-ADA	18	12	6	20.75	14.75	3	3	10.25	101
ARLS-15-ADA	18	15	6	20.25	17.5	4	4	15	158

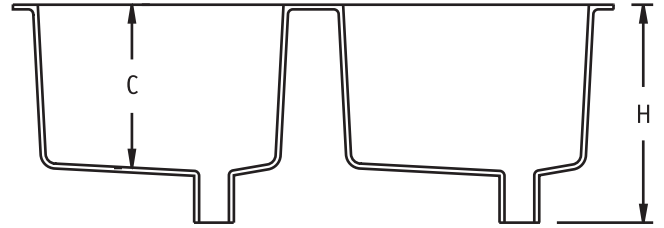
**Laboratory Sinks Compliant with the Americans with Disabilities Act (ADA)**

The ADA Laboratory sinks meet the standards set forth by the Americans with Disabilities Act. These ADA sinks have a depth of six (6) inches to allow proper clearance of wheel chairs, and have the sink outlet in the rear right-hand corner, so piping does not interfere with wheelchairs.

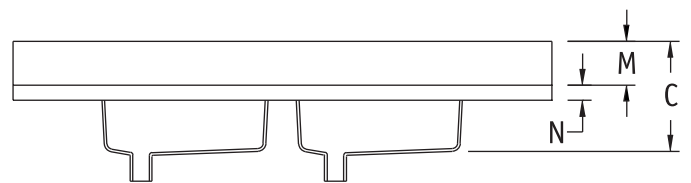
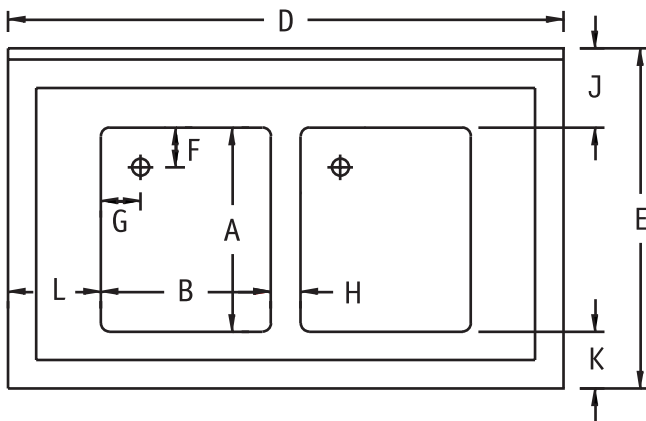
**Recommended Specification:**

Corrosion Resistant Lab Sink shall be manufactured from virgin High Density Polyethylene conforming to ASTM D 1248 with integral national pipe thread outlet. The waste assembly shall be located in the rear corner of the sink.

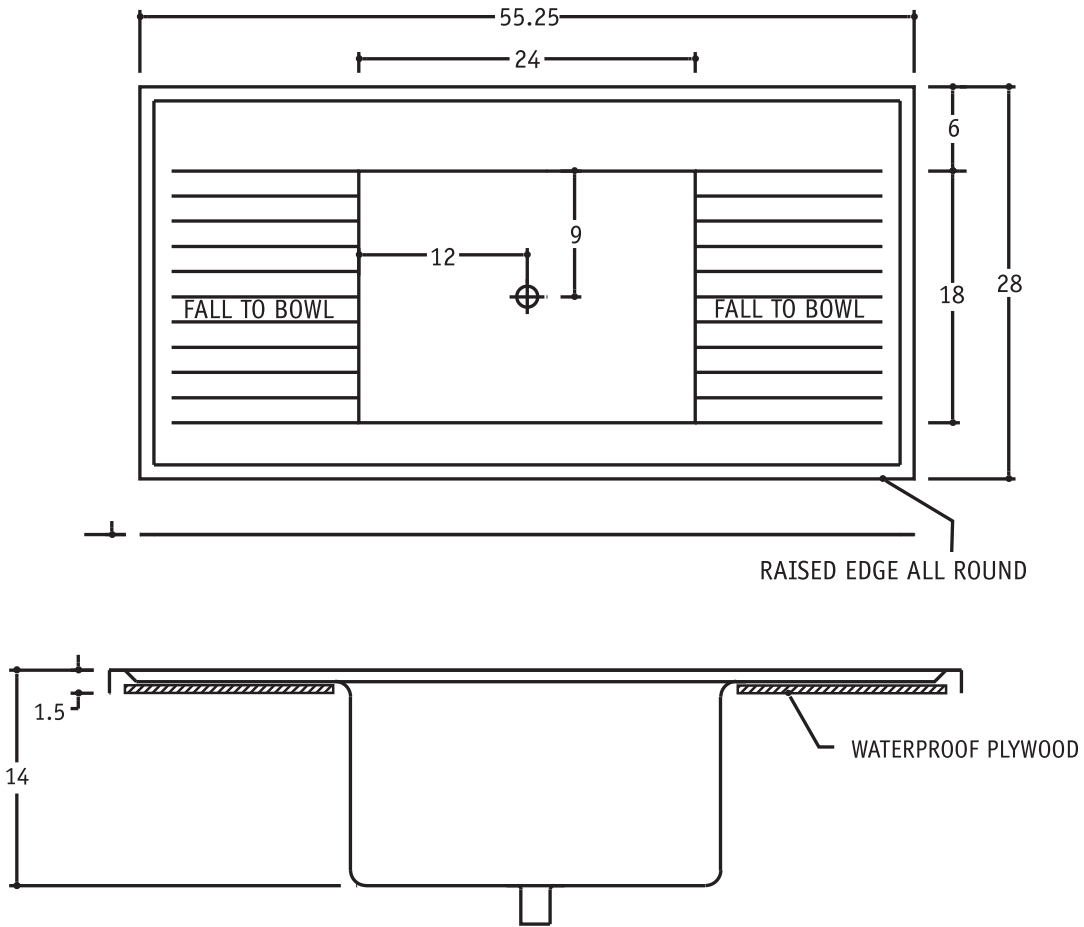
\*Note: Sinks often ship dimensional weight. Consult freight carrier for details on dimensional weight.



Style	A	B	C	D	E	F	G	H	I
ARLS-DB-1	12	12	8	30.25	14.5	3.5	3.5	11	3
ARLS-DB-2	15	18	10	41.25	17.5	3.5	3.5	13	3



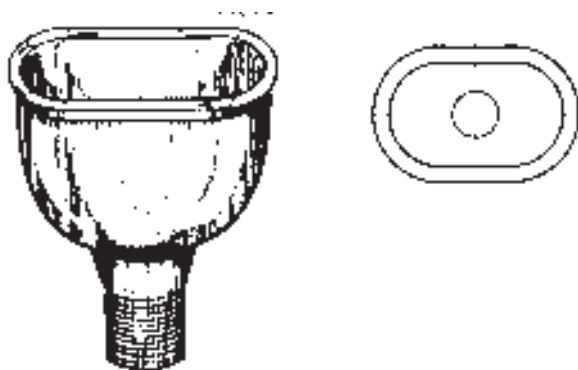
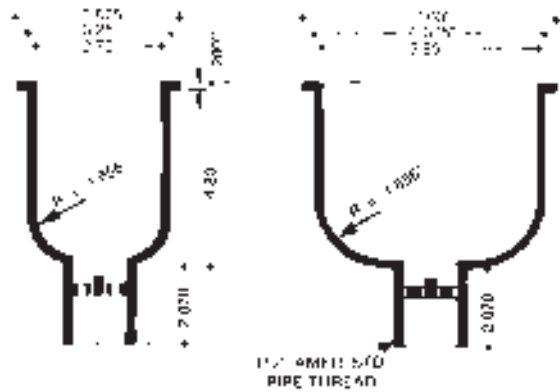
	A	B	C	D	E	F	G	H	J	K	L	M	N
ARLS-CDB18	15	10	49	30	3	2 <sup>11</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>8</sub>	7	5	8 <sup>3</sup> / <sub>16</sub>	4	1 <sup>3</sup> / <sub>8</sub>	



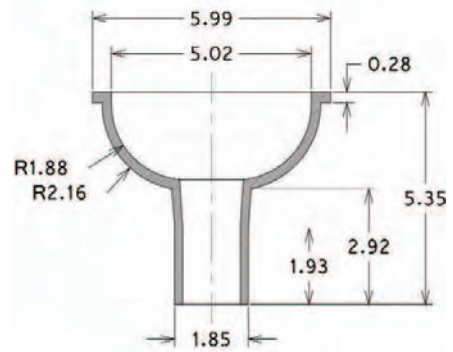
**CTU-1**

One piece molded sink (with integral molded 1½" threaded outlet) countertop unit with pitched ribbed drainboards. Rear deck allows for mounting water fixtures. Mounted on marine plywood base for ease of installation. Material is black polyethylene. Weight 49 lbs.

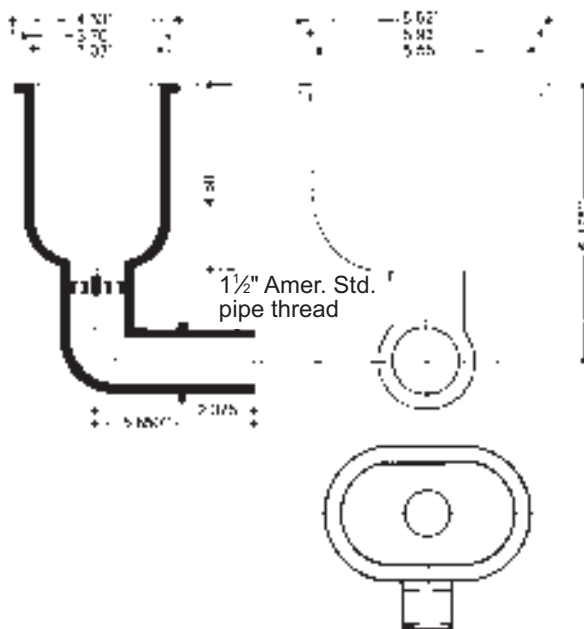
CS1



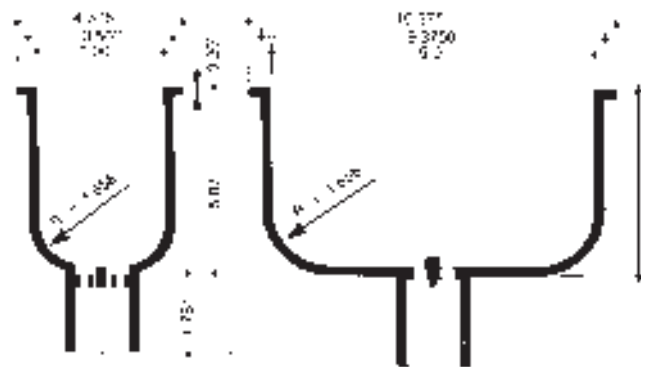
CS3



CS2



CS5



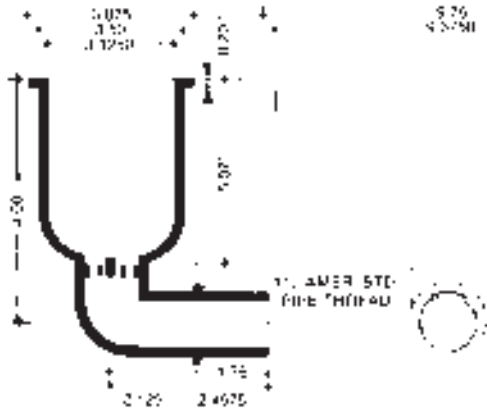
1 1/2" Amer. Std. pipe thread



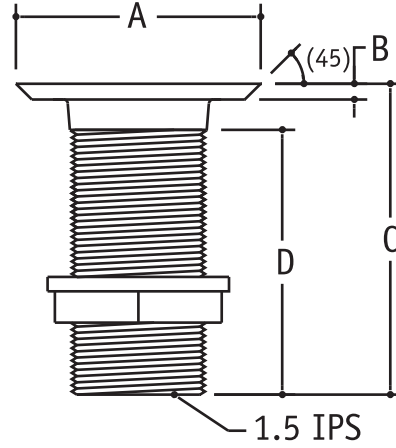
All diameters  $\pm 1/32$ "

All sinks supplied with stopper

### CS6

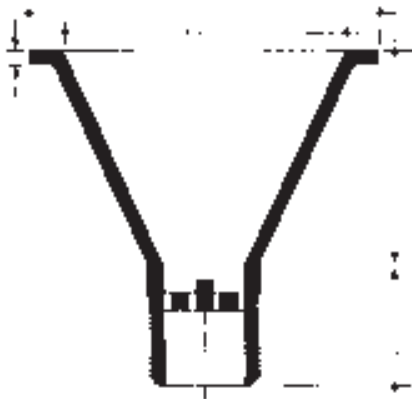


### Waste Assembly

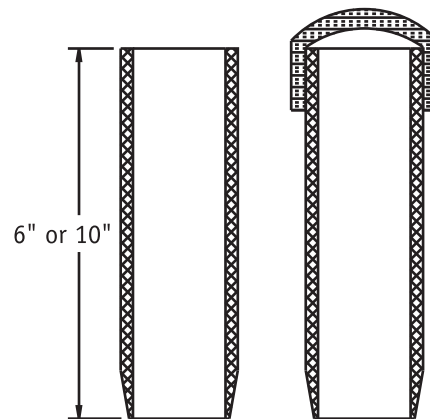


Model	A	B	C	D
WA-1	2.48	.23	4.24	3.62
WA-2	3.24	.20	4.21	3.60
WA-3	4.14	.20	4.28	2.90

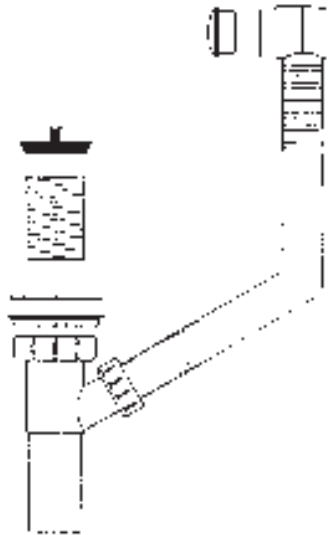
### CS7



### Standing Waste Assembly



## Sink Over-Flo

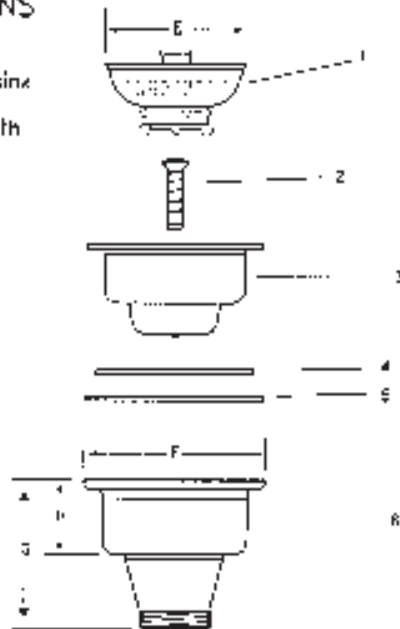


OVFASSY SINK OVER-FLO ASSEMBLY WITH 18" OF TUBING  
 (OVERFLO ASSEMBLY IS SOLD AS PART OF A SINK. ASSEMBLIES ARE NOT SOLD AS SEPARATE COMPONENTS. WHEN ORDERING, PLEASE SPECIFY SINK NUMBER + OVFASSY)  
 OF38555-150 ADDITIONAL FLEX TUBING BY INCH

## Basket Strainer

### INSTALLATION INSTRUCTIONS

- A Place strainer top (1) in sink opening with smaller dry fixing, washer (4) underneath as shown.
- B Position larger sponge washer (5) on plastic underbody (6) and secure to strainer body by hand tightening stainless steel pin (2).
- C Position strainer top (1) in strainer body.
- D Press down on black handle of strainer top to retain water in sink bowl and pull gently to release water for normal discharge.



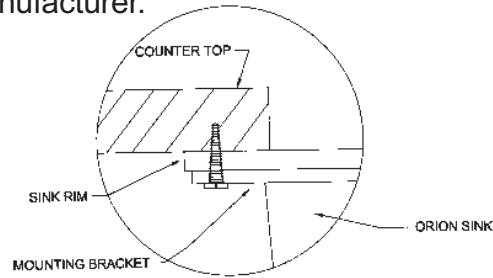
SYMBOL	E	F	G	H
BasketStrainer	3-1/8	4-1/2	3-1/4	1-3/4

## Under Counter Sink Mounting Procedure

1. Determine Cutout Size in Top: Measure the inside dimensions of sink bowl. Normal procedure is to subtract 1" from the cutout size. (18"x 15" sink size would then be 17"x 14") Be sure to check approved drawings as some plans may use other overhang dimensions.
2. Cut Opening in Top: After layout, check to be sure that you have left enough space to allow for sink installation. A minimum of two (2") inches from opening for the complete circumference is desired both above and below countertop.
3. Position Sink & Drill Holes: If possible, turn countertop over and lay sink in position upside down in cutout. Place FPJ Mounting Ring on sink rim so that it is tight to the underside of the sink lip. After checking position, drill holes through sink and countertop using the pre-drilled holes in rim as a guide.

Be sure to use all the pre-drilled holes in rim. Screws should be of type and style recommended by top material manufacturer for the sink load anticipated. Be sure to use anchors in top if recommended by top manufacturer. If it is not possible to turn countertop over, follow same procedure but with top in place.




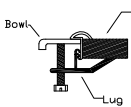



4. Mounting Sink: Place suitable caulking material [Hypalon caulk (by others) or as recommended by architect] on top of sink lip. Reposition sink and screw into place. Install top as recommended by top manufacturer.



**Under counter installation detail**

## Flush Rim Mounting Procedure

1. Order Flush Rims by sink number.
2. Use vertical leg of frame to mark cut out.
3. Cut hole in cabinet and/or top, try to have 2" minimum space from cut out edge to any obstacles underneath top.
4. Apply caulk to under inside surface of frame top flange.
5. Place frame, topside down on flat surface. Place sink upside down within the frame and push installation tabs over lip of sink.
6. Caulk under outside of flange, turn sink and frame upright and insert into cutout. Apply lugs to underside at 6"-8" intervals. Always place two lugs as close as possible to each corner.

IMPORTANT! READ THESE INSTRUCTIONS BEFORE CUTTING OPENING!	
1. IMPORTANT! FIRST CHECK FIT OF FRAME TO BOWL	4. SET BOWL (FRAME ATTACHED) INTO COUNTER TOP
 <p>Double check for correct size by placing the frame over the bowl to make sure it fits perfectly.</p>	 <p>Position frame and bowl into openings.</p>
2. DO NOT USE BOWL AS TEMPLATE—SCREE AROUND FRAME	5. ATTACH LUGS AND TIGHTEN
 <p>Position frame face up on counter top. Scribe the four corners using a straight edge and saw out the opening.</p> <p>Scribe against the hook, not top of rim.</p>	 <p>Attach lugs first to the four corners, as close as possible. Attach lugs two inches from the weld on sink frame.</p>
3. CAULK AND ATTACH INSTALLATION USING ZIP-IN TABS	6. HOW TO MEASURE SINK FRAMES
 <p>Caulk inside of flange before attaching bowl.</p>  <p>Zip-In Tabs. Punch in zip-in tabs to hold frame to bowl.</p>	 <p>Measure distance between hooks on leg of frame. This measurement can be no smaller than the distance over which the frame must slip for application.</p>
<p><b>CAUTION:</b> Measure frame to check size</p>	
<p><b>WARRANTY:</b> Manufacturer will replace any defective frame within one year from purchase. Liability extends to the replacement of this frame only. Any misapplication is not covered by this Warranty.</p>	<p><b>WARNING</b> Check frame to sink before cutting hole in counter top.</p>

**FREIGHT ALLOWANCE:** All orders are shipped F.O.B. Kansas City, Kansas with full freight allowed on shipments of \$4,000 net price, or more. The following items are always F.O.B. Kansas City, Kansas: all tanks, 8"-10"-12" pipe and fittings, double containment piping and tank accessories. For shipments to Alaska or Hawaii and for export freight allowances are as stated above, freight allowances good only for shipment to East, Gulf or West Coast Ports. All F.O.B. Kansas City, Kansas shipments will be shipped freight collect. When shipping to a job site freight will be third party billed.

**TERMS:**

A 2% cash discount is allowed if payment of invoice is mailed or delivered within 10 days of invoice date. All invoices are due net 30 days, with all Past Due accounts subject to a service charge of 1 per month. Minimum billing or credit is for \$50.00 net. Any order under minimum will carry a \$10.00 surcharge.

**ORDER ACCEPTANCE:**

No catalog, price list, literature or other material describing our products is to be construed as an offer to sell same. Orders are subject to acceptance by us at our facilities in Kansas City, Kansas. Your order, when shipped by us, shall be the complete contract between us, subject to, and incorporating therein, the terms and conditions herein set forth, and any provisions contained in your order that are inconsistent with our terms and conditions shall be inapplicable. Prices and discounts contained in any of our catalogs, price lists or other literature are subject to change without notice.

**WARRANTY:**

Our products are carefully inspected for manufacturing defects. However, it is not always possible to detect hidden defects. Our products are warranted only to the extent that we will replace them without charge if they are proved to have manufacturing defects within one year of the date of delivery to the site where they are to be used or installed and provided we have been given an opportunity to inspect any product alleged to be defective and the installation or use thereof. No warranty is included against any expense for removal, reinstallation or other consequential damages arising from any defect. The warranties set out above are the only warranties made and are expressly in lieu of all other warranties, expressed or implied, including the warranties of merchantability and fitness for a particular purpose.

**SHIPPING DATES OR DELAYS:**

Promises of shipping dates are estimates, and therefore cannot be guaranteed. Orion will not be liable for any delay in a delivery.

**TAXES:**

Any sales or manufacturers' taxes existing, or under future statutes, are to be paid by the buyer.

**RIGHTS GOVERNED BY LAW:**

Any agreement for the sale, delivery, or use of our products shall be construed and enforced in accordance with the laws of the State of Kansas. Any purchaser of our products expressly agrees that any legal action or proceeding arising out of or in connection with this transaction or our products shall be brought in the appropriate court in Kansas City, Kansas.

**RETURNED GOODS POLICY:**

1. Permission to return goods must be requested in writing. The request must identify original shipment of material by invoice number and date of invoice, and list all goods to be returned.
2. The following items are non-cancelable and non-returnable, and no credit will be issued upon their return.
  - Non-standard special order items or special welded items
  - All tanks, limestone and tank accessories
  - All standard line products
  - All PVDF Products
  - Expansion joints
  - 8"-10"-12" Pipe & Fittings
  - All fittings marked with (\*) on price sheets.
  - All pipe
3. Goods must be returned within one year after purchase in order to receive credit.
4. All goods must be returned "Prepaid." For any goods purchased on an FFA basis, outgoing freight charges will be deducted from total credit amount.
5. All goods returned must be in resaleable condition and are subject to our inspection.
6. All fittings purchased with coupling or coils must be returned with the correct quantity of coupling or coils. No credit will be issued on fittings returned without included coupling or coils. No individual coupling or coils may be returned.
7. A restocking charge of 25% will be charged against all returned goods, except Whiteline materials, for which the charge will be 35%.
8. All goods returned must have Orion's Return Authorization Number on boxes or cartons. If not, they will be refused.
9. All credit memos issued may be applied to current account balances only or to future purchases. No cash refunds will be issued.

# ORION



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