

# POP-UP SPILL AND FLOOD BARRIERS

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NO POWER, NO PEOPLE, NO EXTERNAL SENSORS ARE NEEDED.  
AUTOMATIC PROTECTION TO GIVE YOU PEACE OF MIND



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## 1. MAINTENANCE

The DENIOS Pop-Up Barrier is factory adjusted and lubricated and requires no further adjustment or lubrication. Should the barrier become damaged and require repair, please contact DENIOS, Inc. for further instructions.

## 2. INSPECTION AND CLEANING

The DENIOS Pop-Up Barrier should be inspected every month. Please see our Periodic Inspection Checklist under point 8.0

### 2.1 SEALS

Inspect the seals on each side for damage, tears, etc. If the seals are damaged, they should be replaced. Contact DENIOS for replacement parts.

### 2.2 SUMP

Inspect the sump and remove any dirt and debris that may have accumulated. Carefully raise the barrier manually to expose the sump. To raise the barrier manually follow these steps:

- Lift it from back side (side away from the opening).
- When the barrier reaches approximately 30 degrees from horizontal, it will close by itself.

**NOTE: Do not lift the barrier by its ends when raising manually! Injury to hands could occur! Always keep hands clear of seal area when raising barrier manually or liquid testing.**

With barrier in vertical position, clean sump of dirt and debris. To lower the barrier manually follow these steps:

- Lower the barrier back to its closed position by pushing it down from outside the door opening. Keep hands away from top of barrier during lowering as injury could occur from pinching between barrier and sump.

The barrier is now back in service.

## IMPORTANT

**Read carefully before commissioning. Keep safe for later reference. Technical changes reserved.**

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### 3. TESTING

The DENIOS Pop-Up Barrier should be tested for correct operation after initial installation and **every 3 months** thereafter. As the barrier operates totally mechanically, testing is a relatively simple process:

- Insure that the barrier sump has been cleaned of construction debris. (See cleaning instructions above).
- With barrier resting in the sump, flush with the floor, fill the sump with water. The amount of water required to raise the barrier varies with the height and width of the barrier. It will take more than 20 gallons to activate a 12-foot barrier.
- The barrier should rise as it is displaced by the liquid to approximately 30 degrees from the horizontal, at which point the mechanical assist should take over and raise the barrier to vertical. When testing, always be sure that personnel are clear of the barrier and that the seal areas on both sides are clear of personnel as the barrier rises suddenly when the mechanism takes over.
- If the barrier rises to the complete vertical (closed) position before the sump is completely filled with liquid, the test was successful.
- Resetting the barrier – remove the liquid from the sump using a pump or other means. Reset the barrier following the instructions in 2. Inspection and Cleaning above
- The barrier is now back in service.
- Alternatively, the barrier can be activated by inserting a pry bar in the small notch located on the right side (see pictures below).



- Please note that during this test the barrier is not expected to completely seal at the very top. The pressure of a larger volume of fluid beyond what is collected in the sump will help achieve a tight seal of the entire height of the barrier.

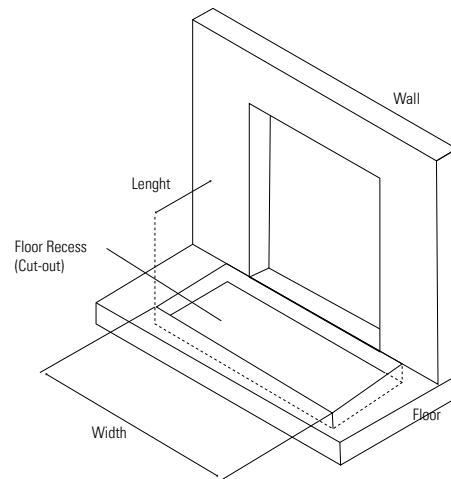
### 4. INSTALLATION

Please read these instructions thoroughly before beginning installation.

#### WHEN UNCRATING, LEAVE THE SUPPORT ARMS BOLTED TO THE BARRIER



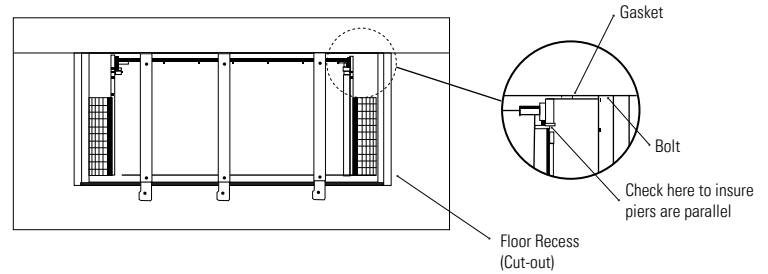
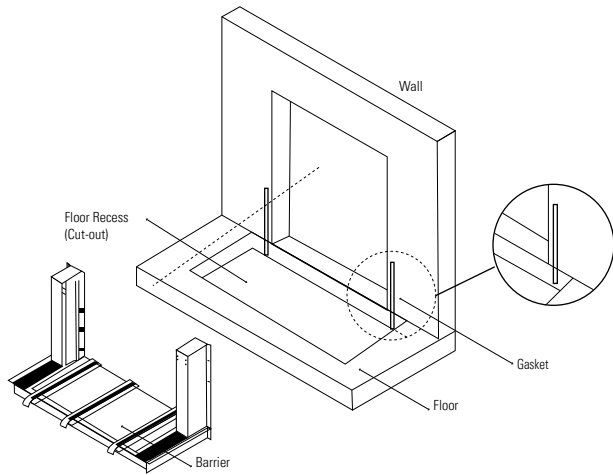
The DENIOS Pop-Up Barriers are installed at floor level. Therefore, it is necessary to cut-out and remove a portion of the floor to install the barrier. The exact dimensions of the floor cut-out are provided in the installation drawing provided with the barrier as well as in the specification provided with the quotation. The depth of the pit should match the drawing and should be uniform over the entire recessed area.



The installation pit must be of a solid surface on all 5 sides. i.e., If the excavation goes below the poured floor, then a concrete surface must be poured and tied in with the existing floor. The concrete should be designed to handle the maximum barrier load of 13,500 PSI.

Gravel pits, packed sand pits and the like are not acceptable and will void the warranty. Rough block or brick walls or wall seams where the barrier piers will be attached should be smoothed with grout or mortar prior to installation.

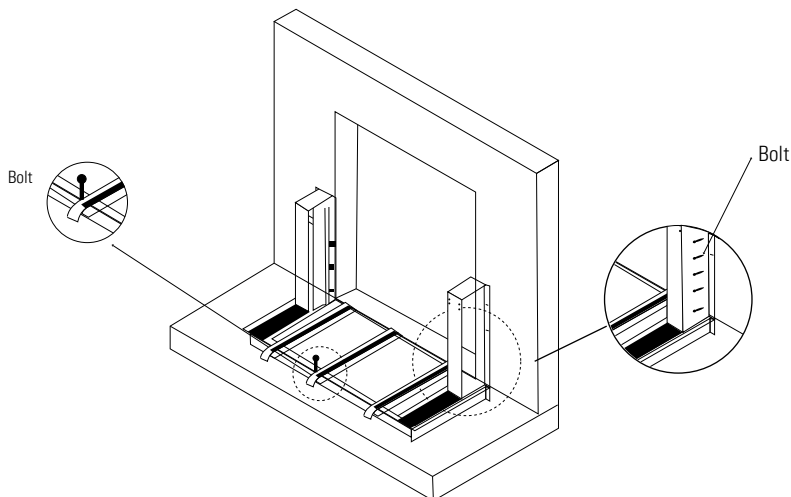
Two loose gasket strips are supplied with the barrier. They are shipped under the removable grate at one end of the barrier along with concrete anchors to fasten the barrier to the wall. To secure an absolute liquid-tight connection between the wall and the two vertical piers of the barrier, as the barrier is positioned in the cut-out, it is necessary to place these two strips of gasket material between each of the two piers and the wall (see graphic below). These strips should extend into the pit, so that they will be secured below floor level when mortar is later poured.



The barrier is now positioned into the floor cut-out with the piers and gasket strips against the walls. The unit is delivered with a number of support angles. These angles extend beyond the cut-out on both sides and support the barrier in the cut-out recess at floor level. They also help prevent the barrier from twisting or being out of plumb in the recess. The angles should remain attached to the barrier until the mortar is set.

Check to assure that the top of the barrier sump pan is at the desired level or height. The support angles can assist with any adjustments necessary to bring the barrier to the correct height or level. For rough or uneven floor surfaces, use small wooden wedges as necessary under the support angles to shim the supports into the correct position.

After the barrier is in position, it is ready to be fastened to the wall (see graphic below). Before fastening, recheck the position of the gasket strips between the piers and wall. To assure a liquid-tight seal, and to prevent movement (upwards) of the barrier as the mortar is poured, it is necessary to bolt the unit to the wall on either side of the opening. Both piers are provided with four bolt holes. When fastening the piers to the walls, make sure that the two piers remain in the same plane, parallel with each other. This will assure that the barrier is not in a bind and will close properly. A supply of bolts and anchors is provided with the unit. They are shipped under one of the removable grates at the end of the barrier. Depending upon the actual makeup of the wall, it may be necessary to substitute other styles of fasteners.



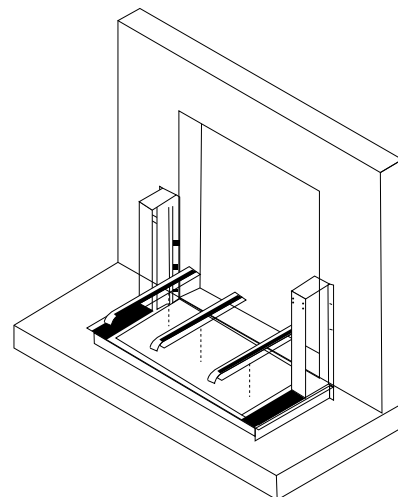
Parallelism should only be checked on the piers themselves, not on the cover plates (see graphic below). For barriers supplied with 3 or more support angles, the center supports should be fastened to the floor. This will prevent any twisting of the barrier when the grout is being applied.

Next the grout is poured into the recess beneath the barrier. Before beginning the pour, it is recommended to shroud the barrier in plastic sheeting to protect it from splashing grout during the pour.

A uniform, free-flowing machine grout should be used (see section 4.1 for grout recommendations) to completely fill the open areas beneath and surrounding the unit. In order to assure complete filling beneath the barrier's sump pan, for best results, pour grout in stages, pouring from front to back. Start with a manageable section. Pour additional grout as needed, working your way across the front until the entire area is filled and reaches the desired level on all sides.

The grout should be allowed to set. Generally this will be approximately 24 hours, but is variable depending upon the grout manufacturer's specifications as well as the ambient temperature and humidity. Once the mortar is set, the support brackets may be unscrewed from the floor and removed from the barrier itself (see graphic below). At this point the barrier is ready to be placed into service.

The barrier should be cleaned and any excess mortar removed. The barrier itself is easily raised by hand to check function and clean the sump of any debris. After inspection, the barrier can be pushed down to its horizontal / stored position.



The barrier's closing mechanism is pre-set at the factory and requires no adjustment during installation.

## 4.1 GROUT RECOMMENDATION

The two types of grouts that are available are epoxy and cementitious. The primary specification for either grout is a final compressive strength of 13,500 PSI.

All other specifications are to be evaluated and discussed between the contractor and the grout manufacturer based on the project's requirements.

Whichever grout is selected the installation of the barrier should be performed by a contractor that has experience working with the selected grout. Installation should follow the grout manufacturer's instructions and the industry's best practices and procedures. The contractor should reach out to the grout manufacturer if they have any questions about the grout and its application. The contractor will need to ensure that the grout completely fills the space between the barrier and the concrete pit both along the bottom and sides without creating any voids or air pockets. Any failure with the grout installation will void the warranty with the barrier assembly.

### 1. EPOXY GROUT –

**Epoxy grout is the preferred grout.**

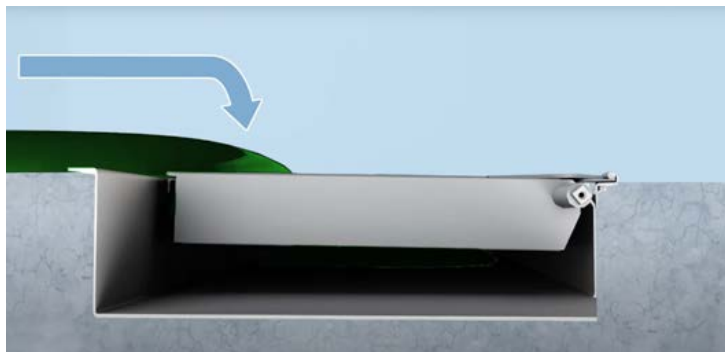
ADVANTAGES	DISADVANTAGES
Rapid set and cure times	Low flowability
Early high strength applications	Max. temperature exposure after cure is 140F
Resistant to oils and chemicals	Rapid set up creates a small working installation window.
Higher bond strength to steel and concrete	Higher material cost
Broader temperature range for installation	-
Good for thin pours	-
Packaged components for easy mixing	-

### 2. NON-SHRINK CEMENTITIOUS – Non-shrink cementitious grout can be used but consideration should be given to the environment in which the barrier is located.

ADVANTAGES	DISADVANTAGES
Lower material cost	Very susceptible to variations in mixing
Higher temperature exposure (approx. 400F)	Longer cure times to reach required strength
High flowability	Smaller temperature range for installation
Easier cleanup	-
Longer working time	-

## 4.2 OPERATION

When a flow of liquid reaches the barrier, it is collected into the sump that houses the barrier wall. As the volume of liquid increases, it displaces the wall from its horizontal position. The built-in mechanisms then bring the barrier to its full locked and upright position, containing or holding back the impending liquid, whether that liquid is trying to escape a spill zone or is encroaching from outside. With no external power assistance whatsoever, the completely self-contained DENIOS Pop-up Barrier senses the flow of liquid and closes completely on its own. The DENIOS Pop-up Barrier can be reset and reused after the event.



## 5. REPLACEMENT PARTS

Each DENIOS Pop-up barrier model has a corresponding barrier assembly, threshold plate assembly, gasket pier wall and gasket short base (SB). Please use the following table as a reference when ordering replacement parts.

MODEL		THRESHOLD PLATE ASSY	VERTICAL GASKET (WALL)	HORIZONTAL GASKET
R11-0312	R14-0312	H74-0011-001	G74-0016-001	G74-0016-004
R11-0318	R14-0318	H74-0011-001	G74-0016-001	G74-0016-005
R11-0324	R14-0324	H74-0011-001	G74-0016-001	G74-0016-006
R11-0412	R14-0412	H74-0011-006	G74-0016-001	G74-0016-005
R11-0418	R14-0418	H74-0011-006	G74-0016-001	G74-0016-006
R11-0424	R14-0424	H74-0011-006	G74-0016-002	G74-0016-007
R11-0612	R14-0612	H74-0011-002	G74-0016-001	G74-0016-007
R11-0618	R14-0618	H74-0011-002	G74-0016-001	G74-0016-008
R11-0624	R14-0624	H74-0011-002	G74-0016-002	G74-0016-009
R11-0812	R14-0812	H74-0011-003	G74-0016-001	G74-0016-009
R11-0818	R14-0818	H74-0011-003	G74-0016-002	G74-0016-000
R11-0824	R14-0824	H74-0011-003	G74-0016-002	G74-0016-001
R11-1012	R14-1012	H74-0011-004	G74-0016-001	G74-0016-001
R11-1018	R14-1018	H74-0011-004	G74-0016-002	G74-0016-002
R11-1024	R14-1024	H74-0011-004	G74-0016-002	G74-0016-003
R11-1212	R14-1212	H74-0011-005	G74-0016-001	G74-0016-003
R11-1218	R14-1218	H74-0011-005	G74-0016-002	G74-0016-004
R11-1224	R14-1224	H74-0011-005	G74-0016-002	G74-0016-005
	R14-1412	H74-0011-008	G74-0016-002	G74-0016-005
	R14-1418	H74-0011-008	G74-0016-002	G74-0016-006
	R14-1424	H74-0011-008	G74-0016-002	G74-0016-007
	R14-1612	H74-0011-007	G74-0016-002	G74-0016-007
	R14-1618	H74-0011-007	G74-0016-002	G74-0016-008

### 5.1 THRESHOLD PLATE REPLACEMENT INSTALLATION

Wear gloves during this process. For safety reasons place weight on the barrier: use a 5-gallon bucket full of water or have someone stand on it.

On either end of the barrier on the inside of the pier is a clamping assembly. The clamping assembly compresses the vertical aspect of the gasket on both ends. The lower end has a saddle shape retainer for the end pins of the threshold plate. By removing the acorn nuts that hold the clamping assembly, the gasket becomes free and the threshold end pins as well. It is only necessary to remove one side. The threshold plate can be pulled free out of the saddle shape retainer on the other end.

Place the new threshold plate in position, threading the one end pin into the still fixed clamping assembly. Sliding the free end of the threshold plate into position replace the clamping assembly that was removed while being careful to put the vertical gasket back where it was. This will be easy as the gasket will still have a groove in it from being compressed by the clamping assembly.



## 6. FM FLOOD ABATEMENT EQUIPMENT SYSTEM ACCEPTANCE CHECKLIST

Pursuant to FM Approvals Standard 2510, this document MUST be completed to maintain the FM Label Certification on the flood barrier listed below. A copy of this form must be returned to DENIOS, and the original must be kept on file by the property owner for FM Global review when requested.

☐

1st Notice

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Final Notice

### Required Action:

At time of installation, the installer, the owner of the property, and/or the owner's representative, is responsible for completing and returning this form.

Property Owner Name: \_\_\_\_\_ Company Name: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Physical Address: \_\_\_\_\_

Flood Barrier Serial Number: \_\_\_\_\_

## SYSTEM ACCEPTANCE CHECKLIST (REQUIRED)

DATE	INITIALS	INSPECTION
		Wall/Mounting Surface; acceptable per design.
		Anchors; per installation drawings and data sheets.
		Gasket/sealants; placed/applied per installation drawings and product instructions.
		Barrier water tested per product instructions.
		Grout; per installation drawings and product instructions.
		Seals; all seals contact the proper sealing surface-no light visible, No damaged seals.
		Finishes; finishes on surfaces and components are undamaged.

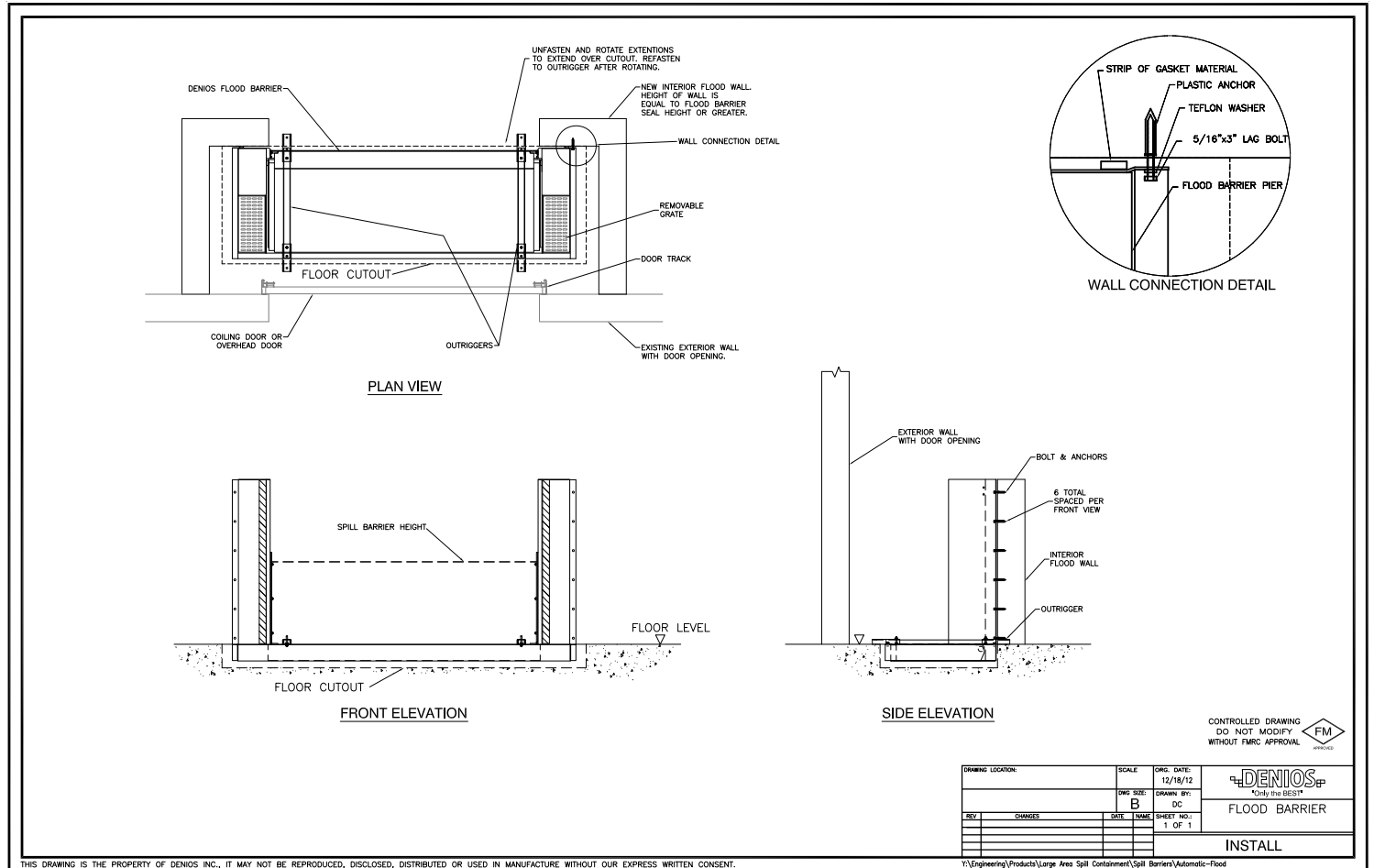
By initializing, dating, and signing this form you are stating that the installation has been inspected and meets the requirements of all installation drawings and instructions, and the workmanship of the installation is acceptable.

Owner/Installer/Inspector Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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## 7. POP-UP FLOOD BARRIER INSTALLATION DRAWING

This installation drawing shows the reverse mount needed for a Pop-Up flood barrier application.



See more information: [WWW.DENIOS-US.COM/SPILL-BARRIERS](http://WWW.DENIOS-US.COM/SPILL-BARRIERS)

## 8. PERIODIC INSPECTION CHECKLIST

Year:		Serial number:		
	MONTHLY INSPECTIONS			QUARTERLY TESTING
	Visual Inspection of Seals for Damage	Visual Inspection and Cleaning of Sump Area	Visual Inspection of Barrier Structure for Damage	Wet or Dry Test for Proper Closing
	Date + Initials	Date + Initials	Date + Initials	Date + Initials
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				



## 9. DIMENSIONS AND SPECIFICATIONS

ITEM NUMBER	LIQUID RETENTION HEIGHT	NOMINAL WIDTH OF DOOR	OPENING SPAN	SEALED WIDTH	ESTIMATED WEIGHT
Rxx-0312	12 in	3 ft	36 in	40 in	335 lbs
Rxx-0412	12 in	4 ft	48 in	52 in	385 lbs
Rxx-0612	12 in	6 ft	72 in	76 in	485 lbs
Rxx-0812	12 in	8 ft	96 in	100 in	585 lbs
Rxx-1012	12 in	10 ft	120 in	124 in	685 lbs
Rxx-1212	12 in	12 ft	144 in	148 in	785 lbs
Rxx-1412	12 in	14 ft	168 in	172 in	1010 lbs
Rxx-1612	12 in	16 ft	192 in	196 in	1120 lbs

ITEM NUMBER	LIQUID RETENTION HEIGHT	NOMINAL WIDTH OF DOOR	OPENING SPAN	SEALED WIDTH	ESTIMATED WEIGHT
Rxx-0318	18 in	3 ft	36 in	40 in	405 lbs
Rxx-0418	18 in	4 ft	48 in	52 in	475 lbs
Rxx-0618	18 in	6 ft	72 in	76 in	540 lbs
Rxx-0818	18 in	8 ft	96 in	100 in	830 lbs
Rxx-1018	18 in	10 ft	120 in	124 in	970 lbs
Rxx-1218	18 in	12 ft	144 in	148 in	1110 lbs
Rxx-1418	18 in	14 ft	168 in	172 in	1250 lbs
Rxx-1618	18 in	16 ft	192 in	196 in	1600 lbs

ITEM NUMBER	LIQUID RETENTION HEIGHT	NOMINAL WIDTH OF DOOR	OPENING SPAN	SEALED WIDTH	ESTIMATED WEIGHT
Rxx-0324	24 in	3 ft	36 in	40 in	455 lbs
Rxx-0424	24 in	4 ft	48 in	52 in	625 lbs
Rxx-0624	24 in	6 ft	72 in	76 in	800 lbs
Rxx-0824	24 in	8 ft	96 in	100 in	970 lbs
Rxx-1024	24 in	10 ft	120 in	124 in	1140 lbs
Rxx-1224	24 in	12 ft	144 in	148 in	1315 lbs
Rxx-1424	24 in	14 ft	168 in	172 in	1485 lbs