Scott Lenticular Filter Housing Operating Instructions

1. Introduction

The Scott lenticular filter housing is designed to be mounted upright, please make sure there is adequate overhead clearance for dome removal. A hoist or forklift is recommended for safe handling of the dome with 3 or 4 high housings. Any manual lifting of the dome should be done only with proper lifting techniques and by personnel approved for maximum lifting rates exceeding the dome weight.

- Maximum operating temperature: 284°F (140°C)
- Maximum operating pressure: 159 psi (10 bar) (LIQUID PRESSURE ONLY)
- All parts in contact with product are in 316L stainless steel.
- Standard gasket material is silicone.

## Housing Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Inlet/Outlet</th>
<th>Gauge port</th>
<th>Drain</th>
<th>Vent</th>
<th>Empty weight (lbs)</th>
<th>Approx. dome weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; 1-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>115</td>
<td>51</td>
</tr>
<tr>
<td>12&quot; 2-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>128</td>
<td>64</td>
</tr>
<tr>
<td>12&quot; 3-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>140</td>
<td>76</td>
</tr>
<tr>
<td>12&quot; 4-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>155</td>
<td>91</td>
</tr>
<tr>
<td>16” 1-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>168</td>
<td>68</td>
</tr>
<tr>
<td>16” 2-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>182</td>
<td>81</td>
</tr>
<tr>
<td>16” 3-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>198</td>
<td>95</td>
</tr>
<tr>
<td>16” 4-High</td>
<td>1 ½” TC</td>
<td>1 ½” TC</td>
<td>1” TC</td>
<td>¼” ball valve</td>
<td>210</td>
<td>110</td>
</tr>
</tbody>
</table>
2. Housing Installation

1. Housing inlet and outlet elbows are positioned on the bottom of the base unit with tri-clamp connections. The inlet connection is offset of center (short elbow). Outlet connection is in the center (long elbow).

2. Connect one sanitary pressure gauge, using gasket and tri-clamp, to the top of the dome (this will record the inlet pressure).

3. Connect the second sanitary pressure gauge and stainless steel “T” fitting to the outlet side of the filter using gaskets and clamps (this will record the outlet pressure).

4. Connect butterfly valves to inlet and outlet with gasket and tri-clamp.

5. The vent valve on top of dome should be open half way prior to operation.

6. The drain valve on the bottom of the housing should be closed.

**WARNING:** Absolute caution should be taken with pressurized vessels. Gas or liquid pressure above the pressure vessel’s rating should never be used. Regulators should always be used on gas supply if using gas.
3. **Filter Module Installation**

1. Select a center post and securely thread on the filter housing base. Place the stainless steel deflection plate on the center post (modules will sit on top of this plate). If using Pall backflush plates, place one end plate on top of deflection plate prior to placing down a filter module.

2. Load filter modules over the center post and install intermediate backflush plates (if using) between each module. After top module has been placed over the center post, place the final backflush end plate on top (if using).

Screw down locking nut assembly (cap, spring and closure spindle) on top of the center post to tighten, until the tightening nut seals with the cap o-ring and the spring is rigid (do not over tighten; this might damage locking nut assembly). Flat gaskets will seal once compression is complete.

3. Place the filter dome over the stack of modules and secure the dome with the ring bolts. Tighten to a complete seal. Now the unit is ready for filtration.

4. If you wish to use less than a full set of filter modules, a shorter center post can be used. Please contact Scott Laboratories for ordering of 1, 2, or 3 module center posts.
4. Sanitization Procedure

1. Open inlet, outlet, vent and drain valves.
2. Commence flow with water and partially close the vent and drain. Air should completely exit the vent and water should bubble out of both ports during sanitation.
3. Flush as necessary with sanitizing hot water (180°F for 20 min.), steam or solution. For the Pall SupraDisc II modules a citric and SO2 solution may be used. Common rates are pH at 2.0 with citric and 1,000ppm of SO2. (Consult your media vendor for compatibilities).
4. Rinse with cool water after sanitizing. Cool very slowly if steam was used.
5. Purge excess water.

**WARNING:** Absolute caution should be taken if gas pressure is used rather than gravity. Gas pressure above the pressure vessel’s rating should never be used. Regulators should always be used on gas supply if using gas.

5. Filtration Procedure

1. Close the valve on outlet side of the housing (discharge side).
2. Vent valve on top of the dome should be open. Slowly open inlet valve and allow liquid to fill the housing until all air is bled off from vent valve.
3. When liquid starts to exit the vent valve close the vent valve and slowly open the outlet valve to bring filter into operation.
4. Regulate flow to the desired level and pressure.
5. Check for leaks in connections and correct it if necessary.
6. Filtration should begin around 5-7 psi when pumping at an optimal speed.
7. Periodically bleed the vent valve to release gas (likely CO2)
8. Likely terminal differential pressure (dP) will be at 30 psi but **consider regeneration at 15-20 psi.**
9. Do not exceed a differential pressure of 50 psi.
6. Back Flush Procedure (backwards flow): for Pall SupraDisc II media only

Back flushing is very effective at removing larger surface caking on the filter media. Back flush support plates are highly recommended when back flushing. These will mechanically support the media during back flushing and prevent damage to the modules. Back flushing should be considered at a dP of 15-20 psi (well before terminal dP) or at the end of a filtration batch.

1. Back flush support plates need to be installed on the very bottom and top of the module stack (these will be the slim end plates), as well as in between each filter module (these will be the thicker intermediate plates). This should be installed PRIOR to filtration if backflush will be considered.

2. **If backflush is desired, this procedure should precede the Forward Flush procedure (see below).**

3. Adjust the housing for reverse flow by connecting the backflush fluid feed line to the housing outlet valve. Direct the back flush discharge line to drain.

4. Back flush the modules with clean, ambient temperature water at no more than half the operating flow rate. **Do not exceed 7 psi (0.5 bar).**

5. If desired increase the temperature to 120-140°F and flow for 10 minutes. If using ambient temperature water continue backflush cycle for 15-20 minutes.

6. If using hot water, stop flow & soak for 10 minutes, then restart reverse flow and backflush to drain for another 10 minutes.

7. Continue backflush until flush water becomes relatively clear. Commence Forward Flush Procedure (if desired).

8. Record the returned “clean” dP at the start up of your next filtration.

7. Regeneration Procedure (forwards flow):

A forward flow can provide the most effective means of reducing fouling in the depth of the filter media. Regeneration should be performed well before terminal dP.

1. Clear housing of product by drain or outlet valve.

2. Commence a forward flow of ambient water and slowly increase the temperature to 120-140°F.

3. Flow of water can be set to equal flow rate of the product.

4. Record pressure.

5. After 5-10 minutes of flow, hold in a soak phase for 10 minutes.

6. Recommence forward flow for another 5-10 minutes, then drain.

7. After regeneration, clear housing of water and recommence filtration.
** NOTE: ALL PRESSURE SHOULD ALWAYS BE RELEASED THROUGH DRAINS OR VENTS PRIOR TO REMOVING THE VESSEL LID. **

8. Storage of Filter Modules:

1. Store wet.
2. Use storage solution.
   a. 1,000 ppm SO$_2$ with citric to pH 2 or 30-40% ethanol solution.
3. Flush filter module with clean cold water, then sanitize filter module prior to use.