Zero Air Loss Condensate Drains
For Compressed Air and Gas

Bulletin 1300 - 160/USA
Zero Air Loss Condensate Drains by Finite®

What is a zero air loss condensate drain?

Finite’s zero air loss condensate drains are designed for economical removal of unwanted water, oil emulsions, and other liquids. These drains will only open when liquid is present and will not allow any compressed air to escape from the system.

Why are they needed?

- Condensate is always present in a compressed air system.
- If condensate is not removed from a compressed air system, it will adversely affect product quality and production efficiency and will eventually lead to costly downtime.

Where are condensate drains used?

<table>
<thead>
<tr>
<th>Compressor with Aftercooler</th>
<th>Receiver Tank</th>
<th>Filter</th>
<th>Air Dryer</th>
<th>Drip Leg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removes the condensate that is collected after the air cools in the aftercooler</td>
<td>Removes the condensate that is collected when the air cools inside of the receiver tank</td>
<td>Removes the condensate that is collected in the filter bowl</td>
<td>Removes the condensate that is collected in the air dryer</td>
<td>Point-of-use applications: removes the condensate from compressed air pipes in a plant</td>
</tr>
</tbody>
</table>

How does the Finite Zero Air Loss Condensate drain compare to other drains?

<table>
<thead>
<tr>
<th>Condensate Removal Method</th>
<th>Disadvantages of Other Drains</th>
<th>Advantages of Finite’s ZLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Drain (operators must manually open valves to discharge condensate)</td>
<td>• Requires constant attention • Always leads to excess air loss because air escapes when the valve is left open to drain the condensate</td>
<td>• Automatically drains condensate • When a minimum level of condensate is reached, the valve closes in time before compressed air can escape</td>
</tr>
<tr>
<td>Float Drain (uses a float connected to a drain valve that opens when enough condensate is present and closes when condensate has been removed)</td>
<td>• Float is susceptible to blockage from particulate contamination in condensate • Often sticks in open (leaks excess air) or closed position (no condensate is drained)</td>
<td>• Includes an integrated dirt screen between the level measurement and drain valve to protect the diaphragm valve • Particulate contamination is removed by the integrated dirt screen before fouling the moving parts</td>
</tr>
<tr>
<td>Solenoid Operated Drain Valves (uses a timer which allows user to open and close valve at specified intervals)</td>
<td>• The period for which the valve is open might not be long enough for adequate drainage of accumulated condensate • The valve will operate even if little or no condensate is present, resulting in air loss • Often requires a strainer to remove particulate contamination which can block the inlet and outlet ports</td>
<td>• Drain will remove condensate when liquid reaches the high level sensor • The drain will not operate until the liquid level reaches the high level sensor • Particulate contamination is removed by the integrated dirt screen before fouling the outlet port</td>
</tr>
</tbody>
</table>
How does this drain work?

1. This collection vessel stores condensate until it is drained away.

2. This electronic level controller continuously monitors the liquid level inside the drain.

3. This depicts the electric drain valve. As soon as the electronic level controller detects a buildup of liquid, the valve opens and condensate is drained. When a minimum liquid level is reached, the valve closes before compressed air can escape.

4. The diaphragm valve ensures that contaminants are flushed out and that the condensate is prevented from forming an emulsion that would need expensive condensate treatment.

5. If an error has occurred (i.e. if the condensate cannot be discharged), the electronic control board (5) of the condensate drain generates an alarm signal. This allows timely detection of a problem and helps avoid excessive costs associated with condensate carryover to downstream components.

6. Unique swivel inlet connection for easy adaptability on ZLD-013 and ZLD-023. This allows the condensate line to be connected from the top or the rear. The ZLD-006 has a fixed inlet port with dynamic seal which allows the filter bowl to be removed while the drain is attached (not shown).

7. An additional liquid inlet on the ZLD-023 allows for the connection of a balance or vent line. This provides new connections so that condensate can no longer back up into the feed lines.

The cost of compressed air when using a timed drain valve

The annual cost of compressed air was calculated using data from the U.S. Department of Energy and several compressed air consultants. The average annual energy cost to maintain a compressed air system is $0.23 per 1000 ft³. If a timed solenoid drain valve opens 3-4 times per hour, the cost of the wasted air will be $80 per valve, per year.

Finite’s Zero Loss Drains don’t waste any compressed air and have a payback of approximately 6 months - 1 year.

Easy installation and servicing!
# Dimension Drawings

<table>
<thead>
<tr>
<th>Model</th>
<th>ZLD-006</th>
<th>ZLD-013</th>
<th>ZLD-023</th>
<th>ZLD-100</th>
<th>ZLD-330</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions (in)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>4.33</td>
<td>3.97</td>
<td>4.80</td>
<td>5.39</td>
<td>7.75</td>
</tr>
<tr>
<td>A2</td>
<td>4.21</td>
<td>4.37</td>
<td>4.84</td>
<td>5.39</td>
<td>7.79</td>
</tr>
<tr>
<td>A3</td>
<td>0.47</td>
<td>0.47</td>
<td>0.47</td>
<td>0.47</td>
<td>0.47</td>
</tr>
<tr>
<td>A4</td>
<td>—</td>
<td>2.87</td>
<td>3.66</td>
<td>4.25</td>
<td>6.61</td>
</tr>
<tr>
<td>A5</td>
<td>—</td>
<td>—</td>
<td>1.94</td>
<td>1.94</td>
<td>1.94</td>
</tr>
<tr>
<td>B1</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
<td>2.63</td>
</tr>
<tr>
<td>B2</td>
<td>1.96</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>C1</td>
<td>5.74</td>
<td>5.47</td>
<td>6.45</td>
<td>6.45</td>
<td>6.45</td>
</tr>
<tr>
<td>C2</td>
<td>5.03</td>
<td>4.76</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>C3</td>
<td>4.17</td>
<td>4.21</td>
<td>4.88</td>
<td>4.88</td>
<td>4.88</td>
</tr>
<tr>
<td>C4</td>
<td>1.73</td>
<td>2.63</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Weight (lbs.)</strong></td>
<td>1.10</td>
<td>1.32</td>
<td>2.20</td>
<td>2.42</td>
<td>3.30</td>
</tr>
</tbody>
</table>

**NPT connections at condensate inlet**

| Top inlet | 3/8” | 1/2” |
| Vent      | Integrated in connection | 1/8” |
| Bottom vent | — | — | 1/2” |

**Connection at condensate outlet**

3/8” BSP or 0.3–0.4 in hose tail
# Technical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>ZLD-006</th>
<th>ZLD-013</th>
<th>ZLD-023</th>
<th>ZLD-100</th>
<th>ZLD-330</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow rate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressor aftercooler (SCFM)</td>
<td>—</td>
<td>141</td>
<td>247</td>
<td>1059</td>
<td>3531</td>
</tr>
<tr>
<td>Refrigeration dryer (SCFM)</td>
<td>—</td>
<td>282</td>
<td>494</td>
<td>2118</td>
<td>7062</td>
</tr>
<tr>
<td>Filter² (SCFM)</td>
<td>424</td>
<td>1410</td>
<td>2470</td>
<td>10590</td>
<td>35310</td>
</tr>
<tr>
<td>Nominal flow rate (ft³/h)</td>
<td>0.035</td>
<td>0.074</td>
<td>0.13</td>
<td>0.57</td>
<td>1.87</td>
</tr>
<tr>
<td><strong>Operating pressure range</strong></td>
<td></td>
<td></td>
<td></td>
<td>3-232 psig</td>
<td></td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td></td>
<td></td>
<td></td>
<td>35-140°F</td>
<td></td>
</tr>
<tr>
<td><strong>Supply voltage³ (selectable)</strong></td>
<td>115 V—60 Hz</td>
<td>50-60 Hz</td>
<td>24 Vac/50-60 Hz</td>
<td>(available on request)</td>
<td></td>
</tr>
<tr>
<td><strong>Potential-free contact⁴</strong></td>
<td>—</td>
<td></td>
<td></td>
<td>110 V DV, 250 V AV</td>
<td>1 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 W DC, 250 VA AC</td>
</tr>
<tr>
<td><strong>Power Consumption:</strong></td>
<td>Standby</td>
<td>Valve operation</td>
<td>1 VA</td>
<td>1.8 VA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6 VA</td>
<td>6.8 VA</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td></td>
<td></td>
<td></td>
<td>IP 65</td>
<td></td>
</tr>
</tbody>
</table>

1. at 14.5 psi and 68°F, operating pressure 100 psi, suction: compressor or 77°F at 60% relative humidity, compressed air outlet temperature at aftercooler 95°F; refrigeration dryer dewpoint 37.4°F.
2. Main condensate already drained from aftercooler or refrigeration dryer; only for residual oil or low condensate volumes arising from condensation.
3. Magnetic valve connector type B industrial standard (0.43 in) 2+PE.
4. Magnetic valve connector type C industrial standard (0.37 in) 3+PE.
Worldwide Filtration Manufacturing Locations

North America

**Compressed Air Treatment**

**Industrial Gas Filtration and Generation Division**
Lancaster, NY
716 686 6400
www.parker.com/igfg

Haverhill, MA
978 858 0505
www.parker.com/igfg

**Engine Filtration**

**Racor**
Modesto, CA
209 521 7860
www.parker.com/racor

Holly Springs, MS

662 252 2656
www.parker.com/racor

**Hydraulic Filtration**

**Hydraulic & Fuel Filtration**
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419 644 4311
www.parker.com/hydraulicfilter

Laval, QC Canada

450 629 9594
www.parkerfarr.com

**Velcon**
Colorado Springs, CO

719 531 5855
www.velcon.com

**Process Filtration**

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SciLog
Oxnard, CA
805 604 3400
www.parker.com/processfiltration

**Water Purification**

**Village Marine, Sea Recovery, Horizon Reverse Osmosis**
Carson, CA

310 637 3400
www.parker.com/watermakers

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