Central Vacuum Receivers
DuraLoad (DL), Filterless (FL), K-Loader
It’s a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this User Guide and all manuals, engineering prints and parts lists together for documentation of your equipment.

Date:

Manual Number: UGC046-0316

Serial Number(s):

Model Number(s):

DISCLAIMER: Conair shall not be liable for errors contained in this User Guide or for incidental, consequential damages in connection with the furnishing, performance or use of this information. Conair makes no warranty of any kind with regard to this information, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose.
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Purpose of the User Guide

This User Guide describes Conair Central Vacuum Loaders and explains step-by-step how to install and operate this equipment.

Before installing this product, please take a few moments to read the User Guide and review the diagrams and safety information in the instruction packet. You also should review manuals covering associated equipment in your system. This review won’t take long, and it could save you valuable installation and operating time later.

How the Guide is Organized

Symbols have been used to help organize the User Guide and call your attention to important information regarding safe installation and operation.

⚠ Symbols within triangles warn of conditions that could be hazardous to users or could damage equipment. Read and take precautions before proceeding.

1 Numbers indicate tasks or steps to be performed by the user.

◆ A diamond indicates the equipment’s response to an action performed by the user.

☐ An open box marks items in a checklist.

● A circle marks items in a list.

❖ Indicates a tip. A tip is used to provide you with a suggestion that will help you with the maintenance and the operation of this equipment.

📚 Indicates a note. A note is used to provide additional information about the steps you are following throughout the manual.

Your Responsibility as a User

You must be familiar with all safety procedures concerning installation, operation, and maintenance of this equipment. Responsible safety procedures include:

- Thorough view of this User Guide, paying particular attention to hazard warnings, appendices, and related diagrams.
- Thorough review of the equipment itself, with careful attention to voltage sources, intended use and warning labels.
- Thorough review of instruction manuals for associated equipment.
- Step-by-step adherence to instructions outlined in this User Guide.
ATTENTION: Read This So No One Gets Hurt

We design equipment with the user’s safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

⚠️ **WARNING:** Improper installation, operation, or servicing may result in equipment damage or personal injury.

⚠️ This equipment should be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

Other Manuals

This instruction manual covers the installation, operation, and maintenance of the Conair equipment listed on the cover.

Because Conair equipment may be shipped as part of an installation involving other types of equipment, or dissimilar units are sometimes connected to perform specific functions, you should familiarize yourself with the manuals’ covering the other equipment before proceeding with installation. By cross referencing the manuals, you may save valuable installation time and avoid improper operation.

Keep this and all manuals, prints, and parts lists together for documentation of your equipment. It is a good idea to record the model and serial number of the equipment on the manual to make sure it is specific to the one being installed.
Description

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What Are Central Vacuum Receivers

Central vacuum receivers are hoppers that receive plastics conveyed from a source and deposit that plastic in an end-use or storage point. Conveyance is accomplished by vacuum power created by a remotely located vacuum pump. Conair central vacuum receivers are manufactured in a variety of styles to match specific applications (see Figure 1). Most styles are available in several sizes, matched to an appropriately sized vacuum pump, to match throughput and conveying distance requirements.

Figure 1. Different Types of Receivers.

Loaders with Central Vacuum Pumps

Central vacuum receivers used in multiple loader installations and sharing a common or “central” vacuum pump, can be operated with either a central control like the FLX-128 or ELS.

These controls both allow one, central pump, to power several receivers, one at a time, in a controlled sequence, so that full vacuum power is delivered to each station when it is loading. Vacuum receivers within one system can vary in size and function (i.e. ratio loading of regrinds, powder loading, color loading, etc.) and each receiver can be filled with a different material, or all can be filled with the same material.
What Are Central Vacuum Receivers (continued)

Figure 2. Central Vacuum Receivers with a Central Control.
What Are Central Vacuum Receivers

Receivers with Dedicated Vacuum Pumps

Another application variation for Central Vacuum Receivers is with “dedicated vacuum pumps” working with only one or two receivers. These systems, known as “PowerFill”, operate with remote vacuum pumps that are self-contained with controls, dust collector, and the pump itself. As shown in Figure 3, “PowerFill” systems use the same operating principles as a central vacuum system, but are much simpler in installation because they are self-contained.

“PowerFill” System.

“PowerFill” pump packages are described in detail in their own instruction manual.
How the Vacuum Receiver System Works

System Operation

The Vacuum Receiver “calls” for material with a “demand” level switch located on the receiver. This can be an integrated switch, within the dump valve; a rotating paddle switch, extending from the mounting flange of the receiver; or a solid state, capacitive sensor.

The receivers in a central vacuum system are connected to the central pump with vacuum line tubing and each receiver is connected to that tubing “header” with a “T”. Vacuum power is isolated to each loader with “Vacuum Sequencing Valves” installed either in the lid of the receiver itself, or on the vacuum tubing between the vacuum header and the receiver’s vacuum inlet tube.

The details of the tubing installation and connection are covered later in this manual. Details of the electrical installation are covered in other manuals, specific to the type of control system used.

Mounting a Vacuum Receiver

Although vacuum receivers used in a central vacuum system may be any of several configurations, they all operate in the same basic manner. Material is drawn into the hopper as air is evacuated by the central vacuum pump which is connected to all receivers in the system. Each vacuum receiver is isolated from all others, while it is loading, by a vacuum sequencing valve in the vacuum tubing line (see Figure 2). Each receiver will mount on, or over, a processing machine hopper, storage bin, silo, or other receiving location and each will require electrical connection to the central control provided with the system. Each loading station will also require a compressed air connection.

Types of Receiver Mountings

Two basic types of receiver mountings may be included in a central vacuum system:

- Direct Feed Mounting (see Figure 4) - Where the receiver is mounted directly on the processing machine throat with a sealed gasket (such receivers have no discharge valve); and

- Open Vessel Mounting (see Figure 5), - Where the receiver is mounted on top of a receiving point, such as a processing machine hopper, surge bin, silo, floor stand, or other structure.

(Continued)
How the Vacuum Receiver System Works (continued)

Figure 4. “K” Loaders.

Figure 5. DuraLoad Loader.
Specifications: DuraLoad (DL) Series

Hopper Loading

Direct Feed

DL Series Vacuum Receivers

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>DL8</th>
<th>DL12</th>
<th>DL15</th>
<th>DL20</th>
<th>DL25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver diameter inches (mm)</td>
<td>8 (203)</td>
<td>12 (305)</td>
<td>15 (381)</td>
<td>20 (508)</td>
<td>25 (635)</td>
</tr>
<tr>
<td>Receiver volume R³ (liters)</td>
<td>0.14 (4.0)</td>
<td>0.5 (14.2)</td>
<td>1.0 (28.3)</td>
<td>1.8 (51)</td>
<td>3.0 (85.0)</td>
</tr>
<tr>
<td>Material/Vacuum line size range inches (mm)*</td>
<td>1.5-2 (38-51)</td>
<td>1.5-2.5 (38-64)</td>
<td>1.5-2.5 (38-64)</td>
<td>2.25-3 (57-76)</td>
<td>2.5-4 (64-102)</td>
</tr>
<tr>
<td>Receiver maximum temperature rating °F (°C)</td>
<td>180 (82)</td>
<td>180 (82)</td>
<td>180 (82)</td>
<td>180 (82)</td>
<td>180 (82)</td>
</tr>
<tr>
<td>with high-heat option °F (°C)</td>
<td>350 (177)</td>
<td>350 (177)</td>
<td>350 (177)</td>
<td>350 (177)</td>
<td>350 (177)</td>
</tr>
<tr>
<td>Filter type</td>
<td>20 mesh stainless steel disc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available voltages (outputs)</td>
<td>120 VAC, 24 VAC and 24 VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressed air requirements</td>
<td>Intermittent duty: 1ft³/min. @ 80 psi (28.3 liters/min. @ 5.51 bars) NPT fitting: 3/8 in.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hopper Loading Configuration

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>DL8</th>
<th>DL12</th>
<th>DL15</th>
<th>DL20</th>
<th>DL25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions in. (mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Height above mounting plate</td>
<td>12.19 (310)</td>
<td>17.375 (441)</td>
<td>20.8 (528)</td>
<td>26.19 (665)</td>
<td>33.75 (857)</td>
</tr>
<tr>
<td>B - Depth below mounting plate</td>
<td>5.5 (140)</td>
<td>8.375 (213)</td>
<td>8.375 (213)</td>
<td>9.5 (241)</td>
<td>9.5 (241)</td>
</tr>
<tr>
<td>with positive discharge</td>
<td>NA</td>
<td>16.0 (406)</td>
<td>16.0 (406)</td>
<td>16.0 (406)</td>
<td>16.0 (406)</td>
</tr>
<tr>
<td>C - Height to center of material inlet</td>
<td>6.19 (157)</td>
<td>9.5 (241)</td>
<td>12.34 (313)</td>
<td>15.9 (404)</td>
<td>21.25 (540)</td>
</tr>
<tr>
<td>D - Height to center of vacuum outlet</td>
<td>10 (254)</td>
<td>14.4 (366)</td>
<td>17.5 (445)</td>
<td>22.625 (575)</td>
<td>29.19 (741)</td>
</tr>
<tr>
<td>Mounting details</td>
<td>See FIG. 1</td>
<td>See FIG. 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installed weight lb (kg)</td>
<td>22 (10)</td>
<td>41 (19)</td>
<td>49 (22)</td>
<td>69 (31)</td>
<td>99 (45)</td>
</tr>
<tr>
<td>Shipping weight lb (kg)</td>
<td>35 (16)</td>
<td>50 (23)</td>
<td>70 (32)</td>
<td>130 (59)</td>
<td>225 (102)</td>
</tr>
</tbody>
</table>
### Specifications: DuraLoad (DL) Series (continued)

#### Direct Feed Configuration (glass hopper)

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>DL8</th>
<th>15 lb</th>
<th>25 lb</th>
<th>4 lb</th>
<th>15 lb</th>
<th>25 lb</th>
<th>4 lb</th>
<th>15 lb</th>
<th>25 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewing chamber model</td>
<td>4 lb</td>
<td>15 (6.8)</td>
<td>25 (11.3)</td>
<td>4 (1.81)</td>
<td>15 (6.8)</td>
<td>25 (11.3)</td>
<td>4 (1.81)</td>
<td>15 (6.8)</td>
<td>25 (11.3)</td>
</tr>
<tr>
<td>Viewing chamber capacity lb (kg)†</td>
<td>4 (1.81)</td>
<td>15 (6.8)</td>
<td>25 (11.3)</td>
<td>4 (1.81)</td>
<td>15 (6.8)</td>
<td>25 (11.3)</td>
<td>4 (1.81)</td>
<td>15 (6.8)</td>
<td>25 (11.3)</td>
</tr>
<tr>
<td>with isolator valve†</td>
<td>3 (1.36)</td>
<td>11 (4.98)</td>
<td>21 (9.52)</td>
<td>3 (1.36)</td>
<td>11 (4.98)</td>
<td>21 (9.52)</td>
<td>3 (1.36)</td>
<td>11 (4.98)</td>
<td>21 (9.52)</td>
</tr>
</tbody>
</table>

### Dimensions inches (mm)

<table>
<thead>
<tr>
<th>Specification</th>
<th>DL8</th>
<th>15 lb</th>
<th>25 lb</th>
<th>4 lb</th>
<th>15 lb</th>
<th>25 lb</th>
<th>4 lb</th>
<th>15 lb</th>
<th>25 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Height above mounting plate</td>
<td>24.0 (609)</td>
<td>29.5 (749)</td>
<td>41.5 (1054)</td>
<td>29.25 (742)</td>
<td>35.0 (889)</td>
<td>47.0 (1193)</td>
<td>32.5 (825)</td>
<td>37.75 (968)</td>
<td>49.75 (1263)</td>
</tr>
<tr>
<td>B - Height to center of material inlet</td>
<td>17.75 (450)</td>
<td>23.25 (590)</td>
<td>35.25 (895)</td>
<td>21.25 (539)</td>
<td>27 (685)</td>
<td>39 (990)</td>
<td>23.75 (603)</td>
<td>30.5 (774)</td>
<td>42.5 (1079)</td>
</tr>
<tr>
<td>C - Height to center of vacuum outlet</td>
<td>22.75 (577)</td>
<td>27.25 (692)</td>
<td>39.25 (996)</td>
<td>26.5 (673)</td>
<td>32.5 (819)</td>
<td>44.25 (1123)</td>
<td>29.25 (742)</td>
<td>35.0 (880)</td>
<td>47.0 (1193)</td>
</tr>
<tr>
<td>Add for isolator valve</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.25 (57)</td>
<td>2.25 (57)</td>
<td>2.25 (57)</td>
<td>2.25 (57)</td>
<td>2.25 (57)</td>
<td>2.25 (57)</td>
</tr>
</tbody>
</table>

### Mounting details

- See FIG. 3

### Installed weight lb (kg)

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>DL8</th>
<th>15 lb</th>
<th>25 lb</th>
<th>4 lb</th>
<th>15 lb</th>
<th>25 lb</th>
<th>4 lb</th>
<th>15 lb</th>
<th>25 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL8</td>
<td>49 (22)</td>
<td>51 (23)</td>
<td>80 (36)</td>
<td>68 (31)</td>
<td>70 (32)</td>
<td>99 (45)</td>
<td>76 (34)</td>
<td>78 (35)</td>
<td>107 (49)</td>
</tr>
<tr>
<td>DL12</td>
<td>77 (35)</td>
<td>79 (36)</td>
<td>108 (49)</td>
<td>96 (44)</td>
<td>98 (44)</td>
<td>127 (58)</td>
<td>104 (47)</td>
<td>106 (48)</td>
<td>135 (61)</td>
</tr>
</tbody>
</table>

### Shipping weight lb (kg)

- See FIG. 3

### Specifications: Filterless (FL) Series

#### Hopper Loading

**GRAVITY DISCHARGE**

**POSITIVE DISCHARGE**

**Direct Feed**

### SPECIFICATION NOTES

* Outside diameter
† At 35 lbs. per cu. ft.

Specifications may change without notice. Check with a Conair representative for the most current information.
Specifications: Filterless (FL) Series (continued)

FL Series Vacuum Receivers

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>FL10</th>
<th>FL15</th>
<th>FL20</th>
<th>FL24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver diameter inches (mm)</td>
<td>10 (254)</td>
<td>15 (381)</td>
<td>20 (508)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>Receiver volume ft³ (liters)</td>
<td>0.28 (7.9)</td>
<td>1 (28.3)</td>
<td>2.3 (65.1)</td>
<td>4 (113.3)</td>
</tr>
<tr>
<td>Material/Vacuum line size range inches (mm)*</td>
<td>1.5-2 (38-51)</td>
<td>1.5-2.5 (38-64)</td>
<td>2.25-3 (57-76)</td>
<td>2.5-4 (64-102)</td>
</tr>
<tr>
<td>Receiver maximum temperature rating °F (°C)</td>
<td>180 (82)</td>
<td>180 (82)</td>
<td>180 (82)</td>
<td>180 (82)</td>
</tr>
<tr>
<td>with high-heat option °F (°C)</td>
<td>350 (177)</td>
<td>350 (177)</td>
<td>350 (177)</td>
<td>350 (177)</td>
</tr>
<tr>
<td>Available voltages (outputs)</td>
<td>120 VAC, 24 VAC and 24 VDC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressed air requirements</td>
<td>Intermitent duty: 1 ft³/min. @ 80 psi (28.3 liters/min. @ 5.51 bars)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressed air NPT fitting</td>
<td>3/8 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hopper Loading Configuration

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>FL10</th>
<th>FL15</th>
<th>FL20</th>
<th>FL24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions in. (mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Height above mounting plate</td>
<td>20.5 (521)</td>
<td>32.75 (832)</td>
<td>45.25 (1150)</td>
<td>57.0 (1450)</td>
</tr>
<tr>
<td>B - Depth below mounting plate</td>
<td>8.375 (213)</td>
<td>8.375 (213)</td>
<td>9.5 (241)</td>
<td>9.5 (241)</td>
</tr>
<tr>
<td>with positive discharge</td>
<td>16.0 (406)</td>
<td>16.0 (406)</td>
<td>16.0 (406)</td>
<td>16.0 (406)</td>
</tr>
<tr>
<td>C - Height to center of material inlet</td>
<td>10.5 (267)</td>
<td>21.25 (540)</td>
<td>28.5 (724)</td>
<td>37.0 (940)</td>
</tr>
<tr>
<td>D - Height to center of vacuum outlet</td>
<td>19.25 (489)</td>
<td>30.5 (775)</td>
<td>42.5 (1080)</td>
<td>52.5 (1334)</td>
</tr>
<tr>
<td>Mounting details</td>
<td>See FIG. 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installed weight lb (kg)</td>
<td>40 (18)</td>
<td>58 (26)</td>
<td>92 (42)</td>
<td>126 (57)</td>
</tr>
<tr>
<td>Shipping weight lb (kg)</td>
<td>120 (54)</td>
<td>170 (77)</td>
<td>200 (91)</td>
<td>260 (118)</td>
</tr>
</tbody>
</table>

Direct Feed Configuration (glass hopper)

<table>
<thead>
<tr>
<th>Receiver model</th>
<th>FL10</th>
<th>FL15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewing chamber model</td>
<td>4 lb</td>
<td>15 lb</td>
</tr>
<tr>
<td>Viewing chamber capacity lb (kg)†</td>
<td>4 (1.81)</td>
<td>15 (6.8)</td>
</tr>
<tr>
<td>with isolator valve†</td>
<td>3 (1.36)</td>
<td>11 (4.98)</td>
</tr>
<tr>
<td>Dimensions inches (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Height above mounting plate</td>
<td>32.3 (820.4)</td>
<td>37.8 (960.1)</td>
</tr>
<tr>
<td>B - Height to center of material inlet</td>
<td>20.9 (530.9)</td>
<td>28.3 (718.8)</td>
</tr>
<tr>
<td>C - Height to center of vacuum outlet</td>
<td>29.7 (754.4)</td>
<td>37.1 (942.3)</td>
</tr>
<tr>
<td>Add for isolator valve</td>
<td>2.25 (57)</td>
<td></td>
</tr>
<tr>
<td>Mounting details</td>
<td>See FIG. 2</td>
<td></td>
</tr>
<tr>
<td>Installed weight lb (kg)</td>
<td>40 (18)</td>
<td>55 (25)</td>
</tr>
<tr>
<td>Shipping weight lb (kg)</td>
<td>68 (31)</td>
<td>83 (38)</td>
</tr>
</tbody>
</table>

SPECIFICATION NOTES

* Outside diameter
† At 35 lbs. per cu. ft.
Specifications may change without notice. Check with a Conair representative for the most current information.
# Specifications: K Loaders (K2 and K2CR Models)

## MODELS

<table>
<thead>
<tr>
<th>VIEWING CHAMBER SELECTION</th>
<th>K2</th>
<th>K2CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiver volume ft³ (liters)</td>
<td>0.28 (7.9)</td>
<td>1 (28.3)</td>
</tr>
<tr>
<td></td>
<td>2.3 (65.1)</td>
<td>4 (113.3)</td>
</tr>
<tr>
<td>Material/vacuum line size OD in (mm)</td>
<td>1.5 - 2 (38.1 - 50.8)</td>
<td></td>
</tr>
<tr>
<td>Dimensions in. (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Height with viewing chamber</td>
<td>19 (482.6)</td>
<td>25 (635.0)</td>
</tr>
<tr>
<td>B - Height to center of material inlet with straight inlet</td>
<td>23.5 (596.9)</td>
<td>29.5 (749.3)</td>
</tr>
<tr>
<td>B - Height to center of material inlet with 45 inlet</td>
<td>25.5 (647.7)</td>
<td>31.5 (800.1)</td>
</tr>
<tr>
<td>B - Height to center of material inlet with 90 inlet</td>
<td>25.5 (647.7)</td>
<td>31.5 (800.1)</td>
</tr>
<tr>
<td>C - Height to center of vacuum outlet</td>
<td>16.5 (419.1)</td>
<td>22.5 (571.5)</td>
</tr>
<tr>
<td>D - Hopper diameter</td>
<td>7.5 (190.5)</td>
<td>7.5 (190.5)</td>
</tr>
<tr>
<td>Weight lb (kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installed</td>
<td>10.5 (4.8)</td>
<td>14 (6.4)</td>
</tr>
<tr>
<td>Shipping</td>
<td>14 (6.4)</td>
<td>21 (9.5)</td>
</tr>
<tr>
<td>Filter type</td>
<td></td>
<td>20 mesh stainless steel screen cylinder</td>
</tr>
<tr>
<td>Compressed air requirement†</td>
<td>80-120 psi (5.5-8.3 bars)</td>
<td></td>
</tr>
<tr>
<td>Standard construction material*</td>
<td>carbon steel</td>
<td>carbon steel</td>
</tr>
</tbody>
</table>

## SPECIFICATION NOTES

* Stainless steel construction is available as an option on the K2 model.
† Compressed air requirement is needed only if the K-Loader is equipped with an optional sequencing valve.
Specifications may change without notice. Check with a Conair representative for the most current information.

Note: If using an optional isolator valve with the K2 model add 5.5 inches (139.7 mm) to total height or measurement B in the line drawing above.
Installation

Installing the Central Vacuum Receiver ....................... 3-2
Installing the Central Vacuum Receiver

Mounting Direct Feed Receivers
(Loader That Have No Discharge Valves)

Conair Central Vacuum Receivers (see Figure 6) and similar models of direct feed receivers (no discharge valve), are designed to mount directly to the throat of a processing machine without an intermediate surge hopper. The receiver acts as both a vacuum loading device and a supply hopper for loaded material.

Since direct feed receivers, like all vacuum receivers, rely on an air-tight chamber to create the negative pressure required to draw material, a seal is required between the receiver and material inlet of the processing machine. Care must be taken to install the receiver with the gasket provided and to follow these guidelines.

DuraLoad Vacuum Receiver Installation Guidelines

1. Install the receiver without slide gates, magnets, or other intermediate devices that may affect the vacuum seal, unless these devices have been properly designed for use with a throatless receiver and have airtight closures.

2. The compact design of the K Loader should be retained by mounting all peripheral devices such as vacuum sequencing valves or material line valves away from the receiver unless these devices are included within the receiver design. Only the material and vacuum flex hoses should be connected to miniature vacuum receivers.

Figure 6. “K” Loaders.
**Installing the Central Vacuum Receiver** (continued)

3. Do not plumb directly to the receiver with hard pipe. Flex hose should be used for the final connection to the receiver.

An adapter plate may be required to fit the receiver to the inlet of your machine. If so, be sure to provide proper gasket material between the adapter plate and the machine, and use the included gasket between the receiver and the plate. Figure 7 provides the dimensions of standard throatless receivers from Conair. Check to be sure that your specific model of receiver conforms to these dimensions.

---

**Figure 7. Direct Feed Loader Base Plate Dimensions.**

**Mounting Open Vessel, Central Vacuum Hopper Loaders**
(Loading with a Discharge Valve)

Vacuum Receivers with discharge valves (see Figures 9 and 10) may be mounted on, or over, a variety of receiving hoppers, bins, etc. The receiver will create its own, airtight chamber for loading when the discharge valve is closed.

Make sure that the receiver you are installing is the proper one for the installation. For example, if it is to be mounted over a high temperature receiving hopper (i.e. a drying hopper with a high heat dryer, crystallizer, etc.), then a special, high heat receiver is usually provided.
Installing the Central Vacuum Receiver (continued)

Figure 8. Pellet Loader.

Figure 9. FilterLess (FL) Loader.
Installing the Central Vacuum Receiver (continued)

**NOTE:** The modular design of Conair pellet receivers (see Figure 8) allows the discharge valve assembly of the receiver to be a variety of styles as required. A selection of valves is available including those listed below.

- **Gravity (see Figure 8):** This model includes a discharge “flapper” that opens freely from the weight of the material, after the receiver has finished its vacuum cycle. It includes an integrated level switch that is triggered from the position of the discharge flapper.

- **Positive Discharge:** This is a powered open/powered close discharge valve that operates by a pneumatic cylinder upon signals from the control, and usually includes a rotating level switch for level detection. FilterLess (FL) loaders, as shown in Figure 8, are always equipped with Positive Discharge Valves.

- **Viewing Chamber with Sensor:** This throat adapter has no actual discharge valve since it is designed to bolt air-tight to the throat of a processing machine. It includes a see-through chamber that acts as a receiving hopper for the loaded material. A sensor is included for level detection (see “Mounting Direct Feed Loaders” for more information).

**Mounting a Receiver with a Discharge Valve**

The mounting surface must be strong enough to support the weight of the hopper receiver when it is filled with material. Reinforce mounting surfaces (i.e. hopper lids) if any sag is noticed when placing the receiver on the surface. Consider processing machine vibration, retraction of the injection unit (injection machines), etc. when planning installation.

Cut a hole in the cover of the receiving hopper, unless one is provided in a hopper shipped from Conair. Use the diagram (see Figure 10) and table as a guide for the proper size hole.

![Figure 10. Mounting Dimensions for Loaders with a Discharge Valve.](Continued)
Installing the Central Vacuum Receiver (continued)

Table 1. Loader Specifications.

<table>
<thead>
<tr>
<th>Loader Diameter</th>
<th>Dim. “A” in. (mm)</th>
<th>Dim. “B” in. (mm)</th>
<th>Dim. “C” in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DuraLoad Loaders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.00 (203.2)</td>
<td>8.25 (209.6)</td>
<td>6.50 (165.1)</td>
<td>4 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>12.00 (304.2)</td>
<td>14.00 (355.6)</td>
<td>12.13 (308.0)</td>
<td>6 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>15.00 (381.0)</td>
<td>14.00 (355.6)</td>
<td>12.13 (308.0)</td>
<td>6 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>20.00 (508.0)</td>
<td>14.00 (355.6)</td>
<td>12.13 (308.0)</td>
<td>6 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>25.00 (635.0)</td>
<td>23.50 (596.9)</td>
<td>12.13 (308.0)</td>
<td>8 Holes: 22.00 (558.8) D Circle</td>
</tr>
<tr>
<td>FilterLess (FL) Loaders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.00 (254.0)</td>
<td>14.00 (355.6)</td>
<td>12.13 (308.0)</td>
<td>6 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>15.00 (381.0)</td>
<td>14.00 (355.6)</td>
<td>12.13 (308.0)</td>
<td>6 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>20.00 (508.0)</td>
<td>14.00 (355.6)</td>
<td>12.13 (308.0)</td>
<td>6 Holes: 13.00 (330.2) D Circle</td>
</tr>
<tr>
<td>24.00 (609.6)</td>
<td>23.50 (596.9)</td>
<td>12.13 (308.0)</td>
<td>8 Holes: 22.00 (558.8) D Circle</td>
</tr>
</tbody>
</table>

The under-flange components of most receivers should fit easily within the large hole (“B”) sized by the chart, but orientation should be carefully considered before deciding where to drill the flange hold down bolt holes.

“Open Vessel” Loader Mounting Guidelines

1 Examine the discharge angle of the valve beneath the flange of the receiver. Check to be sure that the dump valve will not hit any portion of the receiving hopper when it is fully open.

2 The receiver should be oriented on the receiving bin so that any external level switch (i.e. the rotating switch of a FilterLess (FL) loader) does not touch the sides of the receiving hopper or other obstruction. Receivers with discharge valves directly beneath the loader flange must also be allowed to swing fully open, without hitting the sides or the receiving hopper.

3 The receiver’s material inlet should be positioned facing the material line feeding the station. Avoid short bends or kinks in the flexible tubing connections. This is especially important for ratio vacuum loaders where two material lines must enter a ratio valve from the same side of the receiver (see Figure 11).

Figure 11. Common Material Line Installation (Overhead Tubing).
Installing the Central Vacuum Receiver System (continued)

4 The lid of the vacuum receiver may be rotated to position the vacuum tube inlet so that a smooth connection can be made to the system’s common vacuum line. Again, avoid any sharp bends or kinks to assure full vacuum power.

5 The lights on the electrical enclosure of the receiver should be positioned for optimum visibility.

6 Any receiver manufactured by Conair is designed to work in an upright position, with the mounting flange horizontal. Do not attempt to mount the receiver on an inclined surface. Doing so will affect the operation of the receiver.

The Discharge Valve Protective Guard
Central vacuum receivers designed to be mounted elevated above the receiving hopper will include a protective guard beneath the mounting flange to protect the under flange components from damage while being installed, or in the event the receiver is removed from its receiving hopper, for service, cleaning, etc..

![Figure 12. Discharge Valve Protective Guard.](image)

If this guard interferes with the receiving hopper in any way, it may be removed without affecting the receiver’s operation. Care should be taken, however, that the loader is treated gently if it is ever removed, to prevent damage to the level switch, discharge valve, etc..

Vacuum Tubing Installation

Typical installations utilize ceiling supports to run vacuum lines overhead from the central dust collector(s) to the receivers in the system (see Figure 13). An alternate method is to place vacuum lines in a utility trench beneath the floor of your plant (see Figure 14).

Whichever method is used, vacuum lines must be secured against the motion created by any surging of the pump’s vacuum and the sequencing valves used at each receiver. This will prevent vacuum connections from working loose and a loss of vacuum power. “Tees” are used at the individual loading stations to connect the main vacuum header to each of the receivers in the system.
Installing the Central Vacuum Receiver (continued)

Figure 13. Overhead Vacuum Tubing Installation.

Figure 14. Trench Vacuum Tubing Installation.
Installing the Central Vacuum Receiver (continued)

Vacuum Header to Receiver Connections

The configuration in Figure 15 is recommended for all vacuum line installations. This “up and over” orientation, from “T” connections to the receiver lid, will prevent any dust or fines, which may be in the vacuum line, from contaminating other loading stations sharing the same line. This is especially important when receivers are conveying different materials or colors.

Heavy wall, flexible hose is normally supplied with your installation for connecting the vacuum line. Suitable clamps are provided to fasten the tubing in place. Make sure to slip clamps over each end before sliding the flexible hose over rigid tubing. Fasten each clamp securely to prevent leaks.

The flexible hose should be long enough to allow for any movement of the process hopper and receiver and allow removal of the vacuum receiver lid for maintenance.

The receivers in your installation will include a vacuum sequencing valve to isolate each receiver from all others in the system when it is being filled. Open Vessel vacuum receivers usually use a compressed air operated, “popper valve”, in the hopper lid, for both vacuum sequencing and filter cleaning.

![Diagram of Vacuum Connection](image)

Figure 15. Vacuum Connection.

Some other types of loading equipment will use a remotely mounted vacuum sequencing valve on the vacuum line (see Figure 15). These valves should be positioned on the “T”, as shown, and flexible hose is then run to the receiver’s vacuum tube inlet. Clamp in place. Be sure the remote vacuum sequencing valve is positioned for correct air flow (if a particular direction is specified on the valve).

**Note:** Do not confuse “vacuum sequencing valves” with “common material line valves” and where each should be installed (sequencing valves on the vacuum inlet and line valves are installed on material inlet). These two valves can be identical in appearance (see Figure 16). Check your system design to be sure that you are installing each valve in its correct location.
Installing the Central Vacuum Receiver (continued)

Figure 16. Correct Use of Valves.

Hex hose should also be used for vacuum lines in and out of the central dust collector(s) (see separate dust collector instructions) and is also recommended for the connection between the dust collector(s) and the vacuum pump(s) to permit pump maintenance. The use of flex hose at all vacuum line terminations (receivers, pumps, dust collectors) allows for quick and easy changeovers in the event of the need for service.

Material Line Installation

Short Distance Conveying

Short distance, “beside the press” loading is set-up by connecting and clamping flex-hose to a feed tube, and to the material inlet of a receiver, and placing the feed tube in a material container (see Figure 17). This procedure is all that is required for drawing material from a gaylord or any source located near the hopper loader.

Figure 17. Short Distance Material Conveying Set-up.

If the receiver is equipped with a “ratio mixing valve” (see Figure 18) or any other type of dual material inlets, the above procedure is duplicated for the second material (usually regrind).
Installing the Central Vacuum Receiver (continued)

Figure 18. Ratio Mixing Valve.

Such short distance conveying may also bring materials from the bottom of a grinder bin or surge bin, through a horizontal feed tube. The flex-hose material line is simply clamped between the horizontal feed tube and the receiver’s material inlet tube.

**Longer Material Lines**

If the material must travel more than 20 to 30 feet (6.1 to 9.1 meters), or up to several hundred feet, then rigid material tubing, sized to the vacuum pump and hopper loader size, must be used. Use the following guidelines for installing rigid tubing.

**Guidelines for the Installation of Rigid Material Lines**

1. All tubing must be cut with straight, 90° edges, to assure that it butts tightly against adjacent tubing, eliminating potential entrapment spots for material.

2. All tubing should be completely free of bum or sharp edges. After cutting each piece, thoroughly and carefully file the edges, inside and out, until smooth to the touch. Sharp edges can abrade material and create “angel hair”, or “skins”. Sharp edges can also cut the liners of couplings.

3. All tubing should be cleaned before installation by drawing a rag soaked with a non-flammable solvent through the tube. This will remove all material shavings and dirt.

(Continued)
Installing the Central Vacuum Receiver (continued)

4 All tubing should be firmly secured to prevent movement which could loosen couplings and cause vacuum or air leaks.

5 All couplings (see Figure 19) should be installed tightly, with grounding straps in place to ground static electricity caused by air or material flow in the tubing. When installing clamp-type couplings, make sure internal gasketing material is smooth and correctly positioned before tightening the bolts.

Figure 19. Couplings for Tubing.

6 When using “O”-ring couplings or adapters, push each end of tubing about half-way into the coupler, until they meet about in the middle of the coupler length. When tightening screws, do not over-tighten. Stop tightening when reasonable resistance is met and coupler will not rotate on tube. Over-tightening can cause the tubing to crimp and create a vacuum leak.

7 Joining two different tubing diameters together should always be done in accordance with the system’s design and Conair’s instructions. Only Conair-supplied, air-tight adapter couplings should be used. Improper connections can create high material velocities, causing excessive pipe and component wear, or may decrease velocity which will affect conveying rates.

Modular Tube Adapters

The vacuum and material inlet tubes on your vacuum loader are designed in a modular fashion to allow easy adaptation to a variety of sizes and to allow for replacement in the event of damage or material wear-through. Referring to Figure 19, note that each inlet tube is composed of three pieces referred to as “A”, “B”, and “C”. If replacement is needed, both the “B” and “C” pieces are available from Conair and may be screwed in and out of place as required. If they are difficult to remove, a strap wrench that applies friction around the perimeter of each component without crushing it, may be helpful. Avoid the use of pipe wrenches that could crush the thin walled tubing and/or create scuffs to the tubing exterior.

Note: “B” pieces are installed into the “C” pieces with Loctite® 222. Heat may be required to remove the “B” piece.
Installing the Central Vacuum Receiver (continued)

⚠️ CAUTION!
If you are making an adaptation to a different line size, be aware that adapting a loader to a different line size may result in undesirable loading characteristics like decreased throughput, excessive material velocity, plugged lines, etc. The modular adapters on your loader are part of a family of connectors that are grouped according to accepted material conveying parameters per each loader size. Consult Conair for acceptable guidelines.

Note that the “C” threaded tube stub comes in both aluminum and stainless steel material. If you have experienced wear-through with an aluminum stub, you may wish to substitute stainless, to slow down further wear. “B” adapter couplings are aluminum as standard (they are not exposed to material flow). It is common to replace the “B” and “C” components together.

When installing “B” couplings, be sure to include the “O”-ring on the threaded side, and tighten the coupling enough to slightly compress the “O”-ring against the “A” coupling, for a good vacuum seal.

![Diagram of Modular Tubing Adapters](image)

**Figure 20. Modular Tubing Adapters.**

**NOTE:** Your couple may vary from what is shown here.
Installing the Central Vacuum Receiver (continued)

Ratio Mixing Valves

Ratio mixing valves allow two materials to be loaded into one vacuum receiver (usually virgin and regrind), as a part of each vacuum loading cycle. Figure 14 shows a typical Ratio Valve Assembly.

Care should be taken to observe the correct orientation of virgin and regrind inlets (marked “V” for virgin and “R” for regrind, on the valve) so that operation coincides with the controls of your loading system.

Remoting the Ratio Valve

Normally, the ratio valve is fitted directly to the material inlet of the vacuum receiver and it is with this configuration that the ratio valve is supplied with your receiver. The valve may be remoted if desired by simply extending the compressed air and electrical connections to the desired length.

Ratio Valve Installation Guidelines

Wherever the valve is mounted, be sure to observe the following Cautions:

⚠️ CAUTION!

- Always mount the valve in a horizontal position, with the inlet tubes on a horizontal plane and the access door on top.

- screws are supplied on the “O”-ring outlet to secure the valve to hard tubing (usually the inlet tube of the loader). Do not over tighten these screws! Over-tightening could actually crimp the tubing causing an air leak.

- Always mount the valve in a location allowing access to the top cover plate for material cleanout and service.

- Flex hose is recommended for the material inlets to allow complete removal of the valve for service.

⚠️ CAUTION!

The ratio mixing valve creates a pinch point when connected to compressed air. Always disconnect power and compressed air before removing the service lid.
Installing the Central Vacuum Receiver (continued)

Material Line Installation for Common Material Line Systems

Common material line vacuum loading systems convey a single material from a central source to a number of loading stations, all using the same material. Figure 21 shows the components of a common material line tubing kit that will be included with your hardware. The following section details the proper installation of this hardware for optimum operation.

Figure 21. Common Material Line Components.

Common Material Line Valves

As shown in Figures 23 and 24, special material line valves are mounted ahead of each receiver’s material inlet tube. These isolate material flow to each receiver. As each receiver sequentially demands material from the common supply source, the valve for that station opens, allowing material flow only to that hopper. This pneumatically operated valve then closes after the station is filled.

Proper operation of the common material line system depends on the forming of a small “plug” of material in the plug area of the material line elbow at each receiver. This plug area is shown in Figure 22 with a system which runs its material tubing overhead. Figure 23 shows the plug area on a system running material tubing in a trench and rising up to the loading stations.

(Continued)
Installing the Central Vacuum Receiver (continued)

Figure 22. Common Material Line Installation (Overhead Tubing).

Figure 23. Common Material Line Installation (Tubing in a Trench).

Ratio Valves on Common Material Line Systems

On receivers equipped with ratio mixing valves (see “Ratio Mixing Valves” sub-section earlier in this section), the virgin side of the valve performs the same function as a common material line valve by staying closed when not operating. These systems do not require the use of an independent line valve.
Installing the Central Vacuum Receiver (continued)

Dual Common Material Lines

In systems utilizing common material lines on both virgin and regrind, duplicate the above common material line tubing installation scheme for the regrind side. In these dual common material line installations, special ratio valves are employed that are designed so both inlets of the valve are closed at the conclusion of each receiver’s loading cycle, to allow other receivers in the system to load virgin and regrind through the dual material headers.

Compressed Air Installation

All remote vacuum loading stations require connection to a compressed air source supplying at least 60 PSI (4.14 Bar) (maximum 90 PSI (6.21 Bar)) of air. A compressed air header is recommended, providing clean, filtered air to each loader and the dust collector(s).

Compressed Air Lubrication Guidelines

1. A small amount of lubrication is recommended for typical central vacuum receivers only if the installation is connected to an extremely dry, “instrument rated”, compressed air supply.

⚠️ IMPORTANT!

FLOW OF LUBRICANT MUST BE CAREFULLY CONTROLLED AND LIMITED TO LOADING DEVICES WHICH DO NOT INCLUDE COMPRESSED AIR FOR FILTER CLEANING.

2. Oil can collect and clog filters, causing dust to accumulate and affect conveying.

Quick disconnect fittings on the compressed air line at each loading station will allow for easy removal of the receiver for maintenance. A manifold is provided on each receiver for connection to your compressed air source.

Flow controls for air-operated discharge valves are factory preset and should not be further adjusted.

Electrical Installation

Your Conair receiver is equipped with a “Universal Terminal Box” (UTB) which extends the capabilities of your loading system through compatibility with a wide variety of options. Figure 24 shows the internal layout of the UTB with its PC board and input/output connection points. Options that were ordered with the original receiver will already be connected to the UTB and options that you may wish to add after initial purchase are easily connected according to the input/output labels included on the PC board.

(Continued)
Installing the Central Vacuum Receiver  (continued)

**CAUTION!**

Changes made to the loader should be made only after disconnecting power to the control.

**NOTE:** Your UTB may appear different than shown here. Refer to wiring diagrams for detail.

Figure 24. Universal Terminal Box.

**Connecting Options to the Universal Terminal Box**

Figure 25 details actual cable connections into the UTB through access ports that are clearly labeled on the outsides of the UTB. Input cables are connected to the left side and outputs are connected to the right. The holes are covered over by the label that identifies their function and the label may be cut with a knife to expose the hole. Take care not to cut any wires within the control as the holes are being cut in the label. Use proper strain relief connectors to hold the cables in place and terminate the cables into the appropriate terminal strip. Inputs may be terminated per the instructions listed on Conair Prints.

Input/output function by color code is shown on these prints. (Input configurations may vary per the control package being employed). Output may be connected according to the function descriptions listed on the PC board within the UTB.
Installing the Central Vacuum Receiver (continued)

**Note:** The UTB allows for the connection of any standard option to any Conair receiver, but the control being employed to operate that receiver must be equipped with the appropriate input/output capability for that receiver to operate properly. Check your instruction manual for control capability details, or contact Conair for clarification prior to attempting to install an optional function onto the receiver.

![Typical Input Connection](image)

![Typical Output Connection](image)

Figure 25. Typical Input/Output Connection.

**Preventing Damage from Static Electricity**

1. Because the control system used with your receivers is a sophisticated, microprocessor controlled device, static electricity could cause damage to the control circuitry. For this reason, the cables used to carry signals from the control to the receivers in your system should never be run along with material or vacuum tubing (a source of static electricity).

2. If close proximity to any potential static producing source is unavoidable, the use of shielded cable is required at the time of installation.

(Continued)
Installing the Central Vacuum Receiver (continued)

If hard wiring is required as a part of your installation, wiring from your control system to the loading stations should be provided with strict adherence to common wiring practices with special attention given to:

**Electrical Installation Guidelines**

1. Protection of the wire from hot surfaces or hazardous areas.
2. Fastening the cable to stationary objects or structural supports with non-conductive fasteners.
3. Providing solid, insulated, and protected splices.
4. All connections should be double-checked with a volt/ohm meter (VOM) for short circuits, continuity, and loss of electrical level due to cable length.

**SPECIAL LOADERS**

**Special Loaders**

The instructions in this manual refer to standard Conair central vacuum receivers which operate with standard Conair control systems. These standard receivers are designed to convey pellets or powders and regrinds from a storage source to a receiving point (i.e. the processing machine, surge bin, etc.).

Some, or all of the receivers in your installation may vary from the standard design and include features to perform special tasks not described in this manual. In such cases, Conair usually documents the special designs and functions with engineering prints that are included with this manual, or the loading equipment itself.

⚠️ **IMPORTANT**

Always refer to the engineering prints accompanying this manual or shipped with the equipment for the specifics of your receiver(s) which may differ from those in the manual.
Section 4

Operation

Operating Central Vacuum Receivers ....................... 4-2
Setting Load Timers - (Time Fill Loading) ................. 4-10
Demand Signals of Central Vacuum Loaders ............. 4-10
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Vacuum Sequencing Valves .................................. 4-13
Stand-Alone Vacuum Sequencing Valves .................. 4-14
Operational Options ........................................... 4-16
Operating Central Vacuum Receivers

Central vacuum receivers operate in two distinct fashions:

- With other receivers as part of a central system
- As stand alone units with dedicated pumps (PowerFill type).

The operation of either type of system is similar. Loading system operation should be understood to achieve optimum performance and to prevent misapplication or misunderstanding of the receiver’s operation.

Separate manuals for your particular system controls detail operation more specifically, but here is a general outline of typical operation.

Operation of Receivers in a Central Vacuum System

Multiple receivers using the same (central) vacuum pump, operate as follows (refer to Figures 2 and 3 in Section 2 - "Description").

1. The need for material is sensed at the receiver through a “demand” level sensing device and this device sends a signal to the control system, which starts the pump.

2. When the-pump is energized by the control, a signal is also sent to the receiver, opening the vacuum sequencing valve of the receiver (in the receiver lid, or connected to the incoming vacuum line).

3. Material is drawn into the receiver by vacuum from the pump and that vacuum power is isolated to just that loader by the vacuum sequencing valve.

4. Ratio models open and close the two sides of the ratio mixing valve independently, as the vacuum draws in material. The control functions of the ratio valve are provided by the control system.

5. At the conclusion of the load time (or when a “Volume Fill” sensor is covered by the material conveyed into the loader), the vacuum cycle for that receiver is complete and the vacuum sequencing valve closes. The closing action of the sequencing valve allows the receiver to immediately dump its load of material (if it is fitted with a “gravity” discharge valve on its base).

6. The control system is capable of receiving simultaneous “demand” signals from other receivers in the system and at the conclusion of one receiver’s vacuum cycle, the control system will send the load signal to the next receiver calling for material. The control will correspondingly open the next receiver’s vacuum sequencing valve and the cycle will repeat.

7. Once all receivers in the system that have a demand signal have been filled, the pump will turn off for an adjustable period of time, and then continue to remain on “stand-by” until another demand signal is received by any station.

8. Vacuum receivers which include a pneumatically powered positive discharge valve (i.e. FilterLess [FL] loaders), will unload when the pump turns off or while other receivers in the system are being loaded.
Starting to Load Material

Once all material and vacuum line connections have been made, all wiring has been checked, proper pump rotation has been verified and there is material available for each receiver, you may start your system to balance and fine tune material conveying performance for each station.

Optimum entry of material into the conveying air stream and correct setting of each load time adjustment will result in efficient conveying performance. Horizontal and vertical conveying distances, material flow characteristics, the number of bends in the conveying lines and air tight installation of vacuum and material conveying tubing can all affect conveying efficiency.

• For vertical pick up of material, Conair provides a vertical feed tube with air holes, which can be covered or uncovered with the flexible tubing connected to it, to adjust the air-to-material ratio. Horizontal feed devices, such as bin tubes and distribution boxes control material flow by moving a slip tube in and out, controlling the amount of material allowed to enter the air stream.

**Note:** Fast, short duration loading cycles that flood material into the conveying line does not result in moving more material. Optimum material flow can be obtained with longer loading cycles moving less material; and this smoother flow is less likely to form material plugs and create line “surging”.

• You can fine tune the loading time for each station later, but first just make sure that material flows smoothly to the receiver, regardless of whether or not, the hopper is completely filled during one cycle.

• To start, program all loading stations to zero or “Off”, then turn on the first receiver, set load time to about 30 seconds and turn on the control. The first receiver’s vacuum sequencing valve will open, the vacuum pump will start, and material should start flowing.

Material flow should be steady, not erratic. Watch for surging at the beginning of the load cycle, which will be noticed in the flexible sections of the material line as a plug of material, then no material; another plug of material, etc. This indicates that there is too much material feeding into the air stream. Correct this with the feed tube adjustments explained in the “**Adjusting the Air-to-Material Ratio**” section.

Once the first station is adjusted for material flow, turn it to zero or “Off” and move on the next station. For single receiver systems (like PowerFills), there may be only one station. For multiple receiver systems, set approximate load times for each receiver, turn on each station, and adjust each feed tube for optimum flow as with the first loader.

Starting to Load Ratio Loaders

Loading stations equipped with ratio valves require feed tube adjustments for each of the two material inlets. Each material pick-up device may be adjusted according to the directions in the “**Various Types of Feed Devices**” section.
Set the loading controls to a 45 second overall load time for the particular ratio loading station being started (this adjustment may be fine tuned later). Set the “regrind percentage” at your desired level (0 to 100%) as determined by your processing parameters (or set the percentage to 30% to perform these material adjustments). Start the receiver. Note that the ratio valve cycles back and forth between the virgin (left) and regrind (right) material inlets. Adjust each material feed tube as vacuum draws on each material source.

Figure 26. Receiver with Ratio Mixing Valve.

Special consideration must be given to the operation of ratio loaders.

**Ratio Loading Guidelines**

1. The distances involved in ratio loading are usually different for the regrind and the virgin. The amount of time it takes to move the material is affected by the distance the material has to travel. Different air-to-material feed tube adjustments may be required to compensate for the different distances involved. Load time and ratio percentage adjustments may need to be modified because of distance.

2. The ratio valve provides “cycle” adjustments to allow mixing of the two materials in the loader, as they are loaded; virgin, regrind, virgin, regrind, etc.. The number and frequency of these cycles may need to be modified based on the parameters detailed in #1 above.

3. The regrind to be drawn into the ratio valve usually has a radically different bulk density, consistency, and most importantly, flow characteristics, compared to the virgin material. It usually does not flow as readily as virgin material.

**Note:** The ratio valve is designed to provide selectable loading times of virgin and regrind materials. The ratio valve has no capability of confirming that material is actually flowing through it, nor the rate at which the material is flowing. The User is responsible for making air-to-material adjustments of each feed tube, load time adjustments (covered later in this manual and in the specific control manual), and cycle adjustments of the valve to compensate for the irregularities of the two different material flow rates.
Operating Central Vacuum Receivers (continued)

4 Some Conair control systems are equipped with a “Ratio Cycles” or “Layers” adjustment that allows the number of the virgin/regrind cycles occurring with each load to be modified. Fewer cycles may be more appropriate to help make ratio loading more accurate. Too many cycles may not allow material to flow smoothly.

Correct Vacuum Pressure

If surging (momentary blockage of material conveying lines) is occurring, it can also be detected on the vacuum pressure gauge of positive displacement pumps.

Vacuum Setting on Positive Displacement Pumps:

8.0 to 11.5 in. (203.2 to 292.1 mm) Hg of Mercury in Operation (Vacuum Relief set to 12 in. [304.8 mm] of Mercury).

Optimum vacuum loading will be indicated by a steady vacuum gauge reading. If there are material blockages, the vacuum gauge will read very high and may cause the following malfunctions:

- On positive displacement style pumps (pump assemblies with separate motors and vacuum/blower units), the vacuum limit of the pump can be exceeded by a material or vacuum line blockage, which opens a safety relief valve to relieve the vacuum pressure within the pump. The relief valve, factory set to open at 12 in. (304.8 mm) of Mercury, will take in make-up air to prevent the pump from damage. The inrush of air into this valve is audible.

Various Types of Feed Devices

Vertical Feed Tubes

Smooth material flow is controlled by opening or closing off the air holes at the top of feed tube, either with the flexible conveying tubing connected to the feed tube, or with strong tape. Always place the feed tube away from any plastic liner in the shipping container.

Figure 27. Vertical Feed Tube.
Operating Central Vacuum Receivers (continued)

Horizontal Feed Tubes

Horizontal feed tubes allow conveying of material from the bottom of storage bins, silos, etc. Any number of receivers can draw material from one source to multiple locations by use of a “distribution box” which holds a number of horizontal feed tubes. Each tube is independently adjustable for each receiver’s conveying distance.

There are several types of horizontal feed tubes:

- Granulator bin tubes;
- Modular distribution boxes;
- Single compartment distribution boxes; and
- Dry air conveying distribution boxes.

Granulator Pick-up Tubes (BIN NBES)

Horizontal bin tubes, as shown in Figure 28, have an air orifice over the adjustable material outlet tube. Air-to-material adjustments are made by moving the material tube (with flexible conveying hose attached), in and out, to regulate the amount of material allowed to enter the conveying line.

A common arrangement for bin tube installations (i.e. in a granulator bin or other flat-bottomed container) includes a deflector which directs material to the bin tube’s inlet.

![Granulator Bin Tube](image)

Figure 28. Granulator Bin Tube.

Distribution Boxes (Air Box, Pick-up Box; Etc.) Modular Style

Air-to-material adjustments are made on the back of the box, opposite the material outlet tube(s). The position of this air inlet tube regulates the amount of material allowed to be drawn into the telescoping pick-up tube by vacuum (see Figure 29).

The material tubes on the front of a modular style box may be plumbed directly to rigid pipe, since they do not require movement for operation or adjustment. Flex hose is recommended however, to allow easy removal for service.
Operating Central Vacuum Receivers (continued)

Modular Distribution Boxes Utilizing Dry Air for Material Conveying

“Dry Air Conveying” systems will be equipped with a dry air supply line plumbed to the back of the distribution box. These systems provide that each load of material drawn from the distribution box and conveyed to a receiver is done so with dry air. Adjustment of the air tube on the back of the box must be made by moving both the tube and the dry air flex hose without disturbing the closed loop, dry air connection (see Figure 30).

A screen is included at the back of the distribution box to prevent material from being pulled into the dry air line when the loading system is off.

Figure 30. Dry Air Conveying Distribution Box with Purge Valve.
Operating Central Vacuum Receivers (continued)

Distribution Boxes - Single Compartment Style

Certain styles of distribution boxes are equipped with a single air inlet filter on the back of the box and air-to-material adjustments are made by adjusting the material outlet tubes on the front of the box (see Figure 31). On these models, it is necessary for all material connections to be provided with flex hose so that the tubes may be moved in and out for adjustment.

![Figure 31. Single Compartment Distribution Box.](image)

Adjusting the Air-to-Material Ratio

Before adjusting the material flow, familiarize yourself with the various types of feeding devices which are provided with your system or receiver (see Various types of Feed Devices section).

If material surges, first shut off the material flow by pushing the adjustable portion of a horizontal feed tube all the way in, allowing material lines to clear and providing a 100% air flow. If using vertical feed tubes, simply lift the tube out of the material supply while the receiver runs.

For horizontal feed tubes, loosen the locking screw and pull the feed adjustment out slowly, during several load cycles, observing the flow. Continue until mild surging occurs, then push in the tube just enough to stop the surging. This is the optimum position. Lock the tube in place. If you expect the material or conveying distance to change, you may want to mark the tube for this material and distance, for future reference.

If you are using a vertical feed tube, loosen the clamp on the flexible tubing and slide it down to shut off all air holes before loading. Slowly slide the flex tubing up, exposing air holes, while loading, until a smooth conveying ratio is achieved. Re-fasten the clamp.

Common Material Line Feed Adjustments

If you are adjusting a common material line conveying system, where several loaders are fed from one source through one material line, the feed tube setting must be acceptable for all receivers in the system. To optimize this type of system, fine tune the air-to-material ratio for the loader farthest from the material source. The other loaders will usually perform well on that setting.
Operating Central Vacuum Receivers (continued)

Adjusting Material Flow Time

The flow of material from the source to the receiver is dependent upon many variables that must be taken into consideration when adjusting pneumatic conveying parameters. Some of these variables include:

- Bulk density of the material;
- Length of the material lines;
- Air-to-material adjustments on each material pick-up tube;
- Differences in bulk density of materials used in each receiver of the system;
- The number of regrind mixing cycles used on ratio loaders;
- Flow characteristics of regrind vs. the virgin; and
- The number of common material line diverter “Y”s.
Setting Load Timers - (Time Fill Loading)

“Time Fill” loading is based on time, and the objective is to provide a full hopper of material by correctly setting the appropriate amount of vacuum “On” time on the control. Observe the flow of material in the flexible material hose and adjust load time through the course of several cycles to allow the hopper loader’s chamber to just fill with material before the control times out.

An easy method for determining optimum load time for positive displacement pump systems is to observe the vacuum gauge on the pump. The vacuum reading will rise to maximum when the loader is full of material, so the best setting will be achieved when the receiver just fills before the load timer times out.

Setting Alarm Timers - (Volume Fill Loading)

On loaders equipped with fill sensors, the sensor automatically terminates loading as soon as it is covered with material. With volume fill sensor operation, the timers that control vacuum on time act as “alarm” timers, providing a maximum on time if the fill sensor is not satisfied. The optimum alarm time setting will be the normal fill time of the receiver, plus 5 seconds. The 5 seconds will prevent the alarm system of the receiver control from nuisance tripping in the event of normal material flow abnormalities.

Demand Signals of Central Vacuum Loaders

The vacuum pump of the loading system is activated by a demand level switch at each hopper loader station. This switch signals the control system when no material is present at the switch and loading is required. This signal is referred to as a valve position (demand).
The Magnetic Reed Switch

The magnetic reed switch is the standard level switch for pellet receivers equipped with “gravity discharge valves” (a counter-weighted, flapper style, discharge valve). The reed switch reacts electrically to a magnet that moves with the discharge valve. When the material discharge valve of the receiver is at rest, it is closed. When the hopper or receiving bin below the receiver becomes filled with material, the final load of material keeps the discharge valve from closing, and prevents the magnetic reed switch from providing a “Demand” signal.

![Diagram of discharge valve with magnetic reed switch]

Figure 32. Discharge Valve with Magnetic Reed Switch.

The reed switch requires no adjustment for normal operation.

Rotating Paddle Demand Switches

FilterLess (FL) and DuraLoad (DL) loaders, or any receiver equipped with a “Positive Discharge Dump Valve” use a rotating paddle switch (see Figure 33) to sense the need for material loading. This motor driven paddle is equipped with a clutch and a mechanical limit switch that allows an electrical signal to be created when the paddle can move freely, indicating the absence of material, creating a “Demand”. When material stops the paddle from rotating, the switch is tripped, indicating no need for material.

On many receivers equipped with rotating paddle switches, assembly of the paddle portion of the switch is required before putting the receiver in operation. A simple mating shaft coupling held in place with a cotter pin completes the installation.
Rotating Paddle Demand Switches (continued)

Figure 33. Rotating Demand Paddle Switch.

Solid State Demand Sensors

A demand sensor may be moved up and down in its holder by loosening the knurled thumb nuts that hold the sensor in place. When adjusting the demand sensor of a “K” loader or other direct feed style receiver, use the following guidelines.

1 The level of material in the sight glass may be adjusted by moving the sensor up or down in its holder. If you are conveying moisture sensitive material or otherwise wish to minimize the material level at your machine throat, the level may be kept quite low by moving the sensor down on the glass. If larger shot sizes are required, you may need to move the sensor up to have more material available for the processing machine’s consumption.

2 Be sure that the sensor is repositioned firmly against the viewing chamber. This is best accomplished by first rotating the inner thumb nut until the sensor gently pushes against the glass, and then locking the sensor in its desired position by tightening the outer thumb nut.

3 The sensor cannot be placed in the maximum high or low position. Because the sensor is designed to sense a change in density of objects near the sensor face, placing the sensor close to the metal frame of the sight glass assembly will allow the sensor to give a false reading. Always double check to be sure the sensor is accurately reading the presence or absence of material (only) when repositioning it on the viewing chamber.
Solid State Demand Sensors (continued)

The capacitive level sensor generates an adjustable capacitive field that, when interrupted by the presence of material, creates an electrical signal. The sensor may be placed directly in the material receiving hopper, in contact with material up to 180°F (82.2°C) (standard solid state sensors may not be placed in direct contact with material over 180°F), or it may be adjusted to “see” through sight glasses, when mounted externally. When material is present at the face of the sensor, loading is stopped. When the capacitive field of the sensor is not interrupted by material, a demand signal is sent to the loading control.

Sensors require initial adjustment to sense your particular material before loading can begin. A small hole on the back of the sensor contains an adjustment screw that determines the sensitivity level of the sensor. Many models are equipped with indicator lights that indicate either the presence or absence of material (depending upon sensor model).

Figure 34. Capacitance Sensor.

Note: Sensors are capable of sensing material dust and, as a result, should be readjusted after a period of operation to assure that the sensor reacts only to the presence of a solid “quantity” of material and “ignores” dust.

Vacuum Sequencing Valves

Receivers operating within a central vacuum loading system use a vacuum sequencing valve to direct full vacuum power to the loader demanding material. This valve is operated by the sequencing loading system control.

Sequencing Valves (Popper Valves)

Standard pellet and FilterLess (FL) loaders include a vacuum sequencing valve in their lids. These also provide a “popping” action to clean fines from the lid mounted filter screen after each loading cycle. When the receiver is full, or turned off, the valve shifts to close off the vacuum inlet and open the lid vent (see Figure 35). Opening this vent causes atmospheric air to rush into the receiver and “pop” the screen filter, blowing the dust back into the receiver hopper allowing the hopper’s discharge valve to open, discharging the material.

When the receiver signals for material loading, the valve shifts to close the vent and open the vacuum line, drawing material into the hopper.
Stand-Alone Vacuum Sequencing Valves

Small receivers (and some other receiver models) utilize external vacuum sequencing valves in place of the “popper” valves detailed above. External models incorporate a plunger action to allow the passage of material fines that pass through the loader’s screen and are usually installed on the central vacuum tubing manifold and connected to the loader with a section of flex hose (see “Vacuum Header to Loader Connections” in Section 2). These valves (see Figure 36) will receive their operating signal from the vacuum control system through a cable connected to the loader terminal box but usually require an independent compressed air connection.

Note: Do not confuse “vacuum sequencing” valves with “common material line” valves and where each should be installed (sequencing valves on the vacuum inlet and line valves are installed on material inlet (see Figure 16 in Section 3 - Installation). These two valves can be identical in appearance. Check your system design to be sure that you are installing each valve in its correct location.
Stand-Alone Vacuum Sequencing Valves

(continued)

Discharging Material from the Loader

Gravity Discharge Valve

Once the receiver stops filling with material and vacuum power is shut off to that station, the receiver’s hopper is vented to atmosphere and its discharge valve opens, allowing loaded material to flow out of the hopper. On standard pellet receivers, the “counter-weighted pan” is opened by the weight of the loaded material.

After emptying, the discharge valve closes and the receiver is again ready to receive material. If the receiving hopper is full and all material cannot flow from the vacuum receiver, the material holds the discharge valve open, preventing re-loading, until the material inventory has dropped sufficiently to allow valve closing.

Positive Discharge Valve

For certain applications, a more positive hopper loader discharge is provided by a pneumatically operated, “Positive Discharge” valve. This valve is opened by an “unload” signal from the receiver control, which operates the pneumatic cylinder to drive the discharge valve open and closed.

**Note:** Receivers with a positive discharge valve must be mounted carefully, so that there is sufficient room in the receiving hopper or bin for the valve to open fully without striking the hopper walls. Usually a low material level sensing device is provided in the receiving hopper that assures clearance over the inventory of material for full valve opening.

The positive discharge valve is ideal for loading material into drying systems where a high volume of positive air flow from the dryer might prevent gravity discharge.

These valves are standard on Conair FilterLess (FL) and DuraLoad (DL) loaders (see Figure 8).

Receivers without Discharge Valves

Receivers directly mounted onto processing machine throats (i.e. Conair K-Loaders or direct feed loaders) require no conventional discharge valve to operate. A sealed, air-tight mounting to the processing machine allows vacuum to draw material into the receiver. The demand signal for the vacuum system is created by a capacitive level sensor that “sees” material movement through a sight glass at the base of the receiver.
Operational Options

Receiving Hopper Venting

In some loading applications, it is common for the vacuum receiver to unload slowly (or not at all) due to the air-tightness or pressurized condition of the receiving hopper beneath it.

As material is dumped from the receiver (see Figure 37), it requires displacement of the air from the receiving hopper to make room for the incoming material, and the air must be vented away or looped back to the receiver. Most often, there is enough ventilation of the receiving hopper to allow the small amount of displaced air to dissipate to atmosphere (for this reason, a hole plug is usually installed in the breather port of the loader flange). If there is not sufficient air leakage, or the vessel is actually pressurized, then receiving hopper venting must be installed, which will direct displaced air to open atmosphere or direct it back to the receiver for “closed loop” venting.

Figure 37. Hopper Vent Options.

Loading systems that work above “pressurized” vessels (like drying hoppers working with high CFM dryers) require venting to allow an equalization of the pressure in the vacuum receiver with that of the receiving hopper below, when the receiver dumps. This type of system also requires equalization without the use of ambient air to prevent dry air loss from the pressurized hopper below the loader.

Referring to Figure 37, which explains hopper venting, note that a hole plug is most often supplied with each hopper receiver. The hole plug may be removed and replaced with a variety of optional breathers, shown in Figures 39 and 40.
Operational Options (continued)

Figure 38. Receiving Hopper Vent Options.

**Hole Plug:** For No Hopper Venting.

**Filtered Hopper Vent:** For venting of displaced air from the loader dump action. Air may be laden with material dust which will be vented to the atmosphere along with the displaced air. This filter requires periodic cleaning/replacement.

**Open (Louvered) Hopper Vent:** For venting of displaced air from the receiver dump action. Air is filtered to prevent introduction of material dust to the atmosphere. This filter requires periodic cleaning/replacement.
The “louvered” or “open” vent allow full venting of the receiving hopper to atmosphere and air vented by this fashion may include material dust or fines (depending upon the nature of your material, how much airborne dust it generates, how much loading is being performed, etc.).

The “filtered” vent traps all fines and dust, yet allow the hopper to vent displaced air to atmosphere efficiently. Depending upon the amount of fines in your material, this vent will require periodic cleaning to assure optimum performance. The filter element may be vacuumed from the inside, or blown through with compressed air to clean it.
Operational Options (continued)

“Dry air conveying” systems require special receiving hopper venting that will allow the receiver to dump without the use of ambient air (which could reduce the effectiveness of conveying with dry air).

Figure 38 details the closed loop venting kit that directs displaced air from the receiving hopper back into the vacuum receiver’s vacuum sequencing lid. This equalization allows the loader to dump freely, even when dry air is being employed as a conveying medium, or when the receiving hopper is pressurized with a high CFM air flow.

Loaders with Volume Fill Sensors

Filling receivers with material is often controlled by a timer with the system’s controls. Receivers equipped with “fill sensors” (see Figure 40) within the hopper loader’s body, interrupt this timed sequence by signaling the control that the hopper is full. A fill sensor may also alert the control system if insufficient loading does not permit the hopper to fill. See the appropriate control manual for more details on timing functions of receivers with volume fill sensors.

Figure 40. Loader with Volume Fill Sensor.

Fill sensors, standard on Conair’s FilterLess (FL) loaders, prevent material overfill, which can create carry-over problems at the dust collector.

Fill sensors require initial calibration with the material(s) being loaded. A small screwdriver slot on the back of the sensor will allow sensitivity to be adjusted with your material. Many models are equipped with indicator lights that indicate either the presence or absence of material (depending upon sensor model).

Sensors are prone to be sensitive to material dust and as a result should be readjusted after an initial period of operation to assure that the sensor reacts only to the presence of a solid “quantity” of material and “ignores” dust.
Operational Options (continued)

Bolt-in Wear Plates

Your vacuum receiver may have to be equipped with a special abrasive wear prevention plate, installed opposite the material entry point. This plate provides a long life abrasion resistant surface for the plastic material being conveyed to impinge upon, preventing wear-through of the vacuum chamber. If your receiver is not equipped with one of these plates, you may install it yourself.

The plate requires match-drilling holes in the vacuum chamber that allows the plate to be bolted into the receiver according to Figure 41. The plate kit includes all hardware for initial installation or replacement.

Figure 41. Bolt-in Wear Plates.
Operational Options (continued)

To install a bolt-in wear plate, first position the plate on the straight section of the receiver interior, opposite of the material entry port, with the point or crown of the plate slipped firmly up into the filter guard. Mark through the holes of the plate onto the interior of the receiver and drill the four marked holes with clearances for the included hardware. While installing the plate with the hardware, include a dab of silicone sealer on each bolt to prevent vacuum loss around each bolt. (Care should be taken to assure that the sealer is placed around the bolt shank and not the head where it could contaminate conveyed material). Tighten the lock nuts firmly on the outside of the receiver.

To replace a wear plate, remove the lock nuts from the outside of the loader and replace the plate and associated hardware according to the installation instructions above.

Changing Discharge Valves

The modular discharge valves of Conair receivers may be changed to provide suitable operation with different applications. Modular discharge valve kits may be ordered based upon the receiver model (diameter).

The following instructions detail changing from a gravity discharge to alternate discharge models.

To remove a gravity discharge valve (*see Figure 10 in Section 2 - “Installation”*):

1. Remove the discharge seal of the receiver by releasing the hose clamp that secures it to the receiver throat.
2. Remove the level switch wires from the terminal box.
3. Remove the existing discharge valve assembly from the discharge mounting flange by unbolting the hex head bolts that secure the valve to the receiver and slipping the valve off of the receiver throat.
4. Install the new discharge valve or viewing chamber assembly employing the gasket that is included with the new kit.

To Install a Positive Discharge Valve:

1. The new valve assembly will interface with the receiver in a similar fashion to the valve that has been removed. Once bolted in position, re-install the discharge valve seal with the original hose clamp and line it up to the new discharge flapper according to instructions contained in *Section 5 - “Maintenance”*.
2. Connect the pneumatic line of the positive discharge valve to the compressed air manifold of the receiver. A plugged port on the manifold is provided. Remove the plug and plumb in the compressed air line from the valve assembly using thread tape (sparingly).
3. Connect the electrical line of the solenoid into the terminal box of the receiver. A special hole is provided, labeled “DISCH”. Use a cord grip and connect the cable into terminal strip numbered T-7 “AIR DIS”. Use the parameters detailed in *Section 2 - “Connecting Options to the Universal Terminal Box”*.

(Continued)
Operational Options (continued)

4 If a rotating level switch assembly is included in your installation, the electrical cable accompanying the level switch must be connected to the universal terminal box according to the wiring diagram detailed on Conair Print #107-454-02. The cable will enter the box through the hole labeled “VLV POS” and be connected to both AC power at T-11 “BIND” to operate the motor of the switch) as well as, the set of input terminals marked “T-2”.

To Install a Glass Viewing Chamber:

1 Bolt the chamber assembly to the bottom mounting flange of the receiver with the included gasket.

2 Install the sensor cable of the viewing chamber into the universal terminal box of the receiver by inserting the cable into the “VLV POS” according to print #107-454-02. This print details the specific color and function coding required for most loader controls).

3 Install the receiver on the processing machine according to the installation instructions in Section 3 - “Mounting Direct Feed Loaders”.
Maintenance

Maintenance of a Central Vacuum Receiver System .................................................. 5-2
Maintenance of the Receiver ................................................................. 5-2
Maintenance of the System Dust Collector ......................................................... 5-4
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Preventative Maintenance Checklist ................................................. 5-8
Maintenance of a Central Vacuum Loader System

Maintenance of a central vacuum loader system is divided into four sections:

- Receivers;
- System dust collector;
- Remote/central vacuum pump; and
- Compressed air devices.

Be sure to examine any other manuals included with your system that may describe the maintenance of specific pieces of equipment in more detail.

Maintenance of the Receiver

⚠️ CAUTION: The receiver, when connected to the central vacuum system, has the potential for providing several pinch points when disassembled, including, but not limited to:

- Vacuum sequencing valve;
- Discharge valve;
- Ratio valve;
- Common material line valve; and
- Any vacuum chamber opening.

It is recommended that the receiver be removed from service for checking the components detailed in this section.

Maintenance of a central vacuum receiver is separated into the following categories.

Screen Filter

The screen mesh that filters material from the conveying air must be cleaned with any material change. But it is advisable to periodically check the screen for material build-up or material wear-through that could greatly affect loader performance. Vacuum cleaning or compressed air blow-off are usually all that is required for cleaning.

Wear safety glasses to guard against air-borne material particles if compressed air cleaning is employed.

On receivers with disc-style filters, the screen also provides the air-tight sealing between the receiver body and lid that allows the receiver to draw in material to it, so the perimeter seal of the screen should be closely examined to be sure it is pliable and intact. On “K” style loaders with filter baskets, the seal is positioned around the top edge of the hopper and it should be examined for pliability and integrity.
Maintenance of the Receiver (continued)

On “K” style loaders, be sure to check the condition of the filter basket. The filter basket of the “K” style loader is removed and replaced by rotating it against the loader lid. It should not be bent or distorted, since it must provide an intersection seal with the vacuum hopper cone. The basket should be reformed into its cylindrical shape before re-installing it into the receiver lid.

Some receiver applications employ disc style, cloth filters, designed to trap 100% of both material and fines in the receiver itself. On these filters, thorough vacuum cleaning is required and closer inspection to assure that no holes have developed as a result of material wear-through or abuse from handling.

Discharge Valve

On receivers with gravity style discharge valves, the discharge flapper must make good contact with the silicone rubber ring that surrounds the outlet of the receiver body. The rubber ring is equipped with a “knife-edge” that provides a flexible contact surface for optimum sealing. The knife-edge must be positioned with the beveled edge facing outward, away from the discharge flapper (see Figure 42) so that the flapper and seal contact each other with a very narrow edge of silicone rubber. This narrow line of contact forces trapped pellets out of the contact area and the seal will flex easily.

The discharge valve should be examined to be sure that its own weight readily closes the valve and that all components are in line. If necessary, the rubber seal may be repositioned for better contact by loosening the hose clamp that holds the seal in place. If any material obstructs the free motion of the discharge valve, clean off the valve thoroughly. If the valve sticks in any position, replace components as required.

![Figure 42. Gravity/Positive Discharge Valve Seal.](image_url)

On positive discharge valves (see Figure 8, page ??), the valve and seal contact are the same as gravity models, but the dump valve closes and opens with air pressure and not by gravity. Maintenance should include identical examination of the sealing area, plus examination of the air cylinder linkage to the discharge flapper weldment. Be sure that all pivot components are correctly fitted and not loose or binding. Replace worn items immediately and be sure to Loctite all screw fittings.
Maintenance of the Receiver (continued)

Vacuum Sequencing Valves

The three-way vacuum sequencing valves built into the lids of remote vacuum receivers ("popper" valves) are equipped with two sealing plungers that sequentially open and close to vacuum and ambient air to allow the receiver to load and dump respectively. The sealing surfaces of this valve should be examined to ensure that the valve closes off to vacuum when at rest, and closes off the ambient air inlet when the receiver calls for vacuum. Close examination of the seals that provide the airtight closures (and their replacement, if required) should be part of regular maintenance checks.

“K” Loaders use external vacuum sequencing valves that may be checked the same as ratio mixing valves and common material line valves (see below).

Ratio and Common Line Valves

These valves open and close material lines to allow specific materials to flow upon demand while stopping the flow of others. The design of the valve isolates wear to just the sealing ring that provides the sealing of each material valve. Examine the seal for material abrasion or trapped material. Clean out any trapped material and replace the seal if required, being sure to tightly reinstall a hose clamp to secure the seal to the inlet stub.

Examination of the lid seal and clamps is also recommended to be sure that the valve seals properly under vacuum.

Maintenance of the System Dust Collector

⚠️ CAUTION: Dust collectors, when connected to the central vacuum system, have the potential for providing pinch points at any vacuum chamber opening when disassembled, so it is recommended that the collector be removed from service before checking the components listed on the next page.

Maintenance of a dust collector is separated into the categories that follow in this section.

Draining of Collected Dust

Most dust collector models have a collection bucket at the base that accumulates the dust trapped by the cartridge filters above it. This bucket is easily removed by releasing the clamps around its perimeter and may be dumped, wiped out, and replaced.

🔍 Note: Some sophisticated dust collectors have no collection buckets, but employ dump valves or dust return systems on their base that incorporate more moving parts. These dust collectors are supplied with a separate instruction manual (and/or engineering prints) to detail their operation and maintenance.
Maintenance of the System Dust Collector  (continued)

Cleaning of the Cartridge Filter(s)

Each dust collector is equipped with one or more cartridge style paper filters that perform the work of filtering the conveying vacuum air to remove dust particles carried over from the screen filters in the receivers of the system. These cartridges must be removed periodically and thoroughly cleaned to keep the system in operating order.

The actual frequency of cleaning varies greatly with each system, based upon the material being conveyed, the types of screens in the receivers, the amount of regrind or fine material being conveyed, etc. Establish a schedule for your system that prevents the filters from becoming hopelessly clogged with material dust and be sure to follow the procedure detailed below.

Dust Collector Maintenance Procedure:

1. Turn off or remove the dust collector from the system to prevent the escape of material fines from an unfiltered dust collector from escaping back to the vacuum pump.

2. Remove the cartridge filter(s) by releasing the hand knob located in the center of the filter cartridge and slipping the filter off of its threaded mounting shaft.

3. Use a vacuum cleaner to carefully clean all of the collected dust off of the surface of the filter and out from between the filter leaves. An alternative technique is to use compressed air to blow the dust off of the filter by directing the flow of air from the inside out. Directing the air on the outside of the filter could actually compact the collected fines deeper into the filter leaves.

CAUTION: Be sure to wear safety glasses to guard against air-borne material particles if compressed air cleaning is employed. Be sure that the compressed air being employed is completely dry and will not add moisture to the filter media. If moisture is added, the collected fines will probably solidify into clumps that will be very difficult to remove. If moisture is accidently introduced, set the filter aside and allow it to thoroughly air dry before vacuuming at a later time, or replace it with a new cartridge.

Note: Never bang the filter on a hard surface to clean it or release stubborn clumps of material. The shock of this procedure could distort the sealing surface of the filter, preventing a good seal when it is re-installed, or could fracture the filter media itself, allowing dust to escape through to the vacuum pump.

4. Carefully inspect the filter for any tears, holes, or breaks of any kind in the filter media (paper). Never attempt to repair the filter. Replace immediately if any aberration is found. Further inspect the sealing surface of the filter (the mounting base) to be sure it is not distorted in any way, but is completely flat and will mate properly with the mounting base within the dust collector when it is reinstalled.

(Continued)
Maintenance of the System Dust Collector (continued)

5. Reinstall the cartridge into the dust collector by slipping it carefully over the threaded mounting spindle, seating it properly against the mounting base within the dust collector and screwing the hand knob on tightly. Be sure to use a rubber washer under the hand knob to prevent dust carry-over to the pump protection filter. Test the fit of the cartridge by hand to be sure that it cannot move when reinstalled and is firm in its position.

Maintenance of the Remote/Central Vacuum Pump

CAUTION: Vacuum pumps, when connected to the central vacuum system, have the potential for starting automatically and providing pinch points. It is recommended that the pump be removed from service for checking the components listed below.

Service of the Pump Protection Filter

Positive displacement pumps are equipped with small “pump protection filters” to prevent accidental damage to the pump in the event maintenance of the system dust collector has been performed incorrectly or too infrequently to properly trap all carryover dust. This filter may be serviced/maintained the same as the system dust collector filters described above by releasing the filter from its housing which is incorporated into the inlet of the vacuum pump. Follow all of the steps outlined above for cleaning, inspection and reinstallation.

Changing of the Pump Oil

Positive displacement pumps must be checked periodically for the condition of the lubrication oil and changing of that oil if required. A separate set of instructions, provided the original pump manufacturer, is included with the pump assembly (or this instruction packet) that details the proper procedure, amounts and specifications for the oil used in these pumps. Pipe fittings are provided for checking, draining and refilling the pump.

Belt Adjustment/Replacement

Multiple drive belts link the positive displacement pump with the three-phase motor and the belts require periodic checking for tightness and wear. In normal operation the belts should be tight enough to resist more than 1.0 in. (25.4 mm) of deflection in the center of the belt span with firm finger pressure. If more than 1.0 in. of deflection is possible, the belt should be tightened (see procedure, below). If the belts become frayed or separated from use, they should be replaced promptly and tightened to the above tension spec. Once replaced, the belts will lose their tension very rapidly during the first 20 hours of operation. After this initial operating period, they should be checked and retightened.

Note: Belt dressing should never be used on Conair vacuum pump assemblies.
Belt Tension Adjustment Procedure

1. Disconnect power to the pump assembly.
2. Remove the belt guard.
3. Check the tension of the belts. Each belt should deflect no more than 1.0 in. (25.4 mm) in the center with firm finger pressure. If tightening is required, proceed.
4. Loosen all four motor hold down bolts (do not remove bolts).
5. Rotate the motor tension adjustment bolt to slide the motor away from the pump assembly and tighten the belts.
6. Snug the motor hold down bolts and recheck the belt tension. If the tension is OK, proceed. If tension is incorrect, repeat steps 4 through 6.
7. Once the tension is correct, tighten down the motor hold down bolts, replace the belt guard, and check the tightness of all bolts.
8. Test the pump before restoring the system to full operation and listen for rattling, belt squealing, or any other tell-tale signs of improper adjustment or reassembly.
Preventative Maintenance Checklist

Routine maintenance will ensure optimum operation and performance of the Central Vacuum Receiver and control. We recommend the following maintenance schedule and tasks.

- **Daily**
  - Clean the filter
    If you are running a dusty material or regrind you may need to check and clean the filter screen more often. If the material flow is erratic or sluggish, check the filter. The screen filter should be cleaned whenever you change materials.

- **Weekly, or as needed.**
  - Drain the compressed air filter trap (if equipped).
    Depending on your compressed air system, you may see moisture or oil in the compressed filter trap. Open the petcock on the bottom of the trap to drain. If you see oil, Conair recommends installing a coalescing type filter ahead of the standard moisture removing filter.

- **Every six months**
  - Inspect all wiring connections.
    Power and cable connections between the loading control and Receiver may become loose or wires may become worn. Tighten any loose connections and replace any wire or cable that has become worn or damaged.
  - Inspect the Installation.
    Check installed mounting hardware to make sure that the installation is secure.
Troubleshooting

Before Beginning ........................................ 6-2
A Few Words of Caution................................. 6-2
Conveying Problems ...................................... 6-3
Before Beginning

You can avoid most problems by following the recommended installation, operation and maintenance procedures outlined in this User Guide. If you have a problem, this section will help you determine the cause and tell you how to fix it.

Before you begin troubleshooting:

- Find any wiring, parts, and assembly diagrams that were shipped with your equipment. These are the best reference for correcting a problem. The diagrams will note any custom features or options not covered in this User Guide.
- Verify that you have all instructional materials related to the puller. Additional details about troubleshooting and repairing specific components are found in these materials.
- Check that you have manual for other equipment connected in the system. Troubleshooting may require investigating other equipment attached to, or connected with the puller.

A Few Words of Caution

⚠️ **WARNING: Improper installation, operation or servicing may result in equipment damage or personal injury.**

This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed and adjusted by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

⚠️ **WARNING: Electrical hazard**

Before performing maintenance or repairs on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up.
## Conveying Problems

**WARNING:** Disconnect power and air sources. Always disconnect the pump from the loading control, main power source, compressed air source and before servicing. This prevents the pump from starting during servicing, which could cause personal injury from flying debris or moving parts.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low reading on vacuum pump gauge.</td>
<td>Air leaks in system.</td>
<td>Check the lines and ells for wear or holes, loose and leaking couplings.</td>
</tr>
<tr>
<td>Low/no material flow.</td>
<td></td>
<td>Check pump. Relief valve should not relieve air below 12 in. (304.8 mm) Hg reading.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check valving:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Dust collector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Ratio valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Common material valves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Sequence valve (located on receiver lid), seals, air cylinder, solenoid valve, and air pressure.</td>
</tr>
<tr>
<td>Feed tube adjustment</td>
<td></td>
<td>Adjust tube – add more material.</td>
</tr>
<tr>
<td>Conveying system is out of material</td>
<td></td>
<td>Add material supply</td>
</tr>
<tr>
<td>Hose clamps loose.</td>
<td></td>
<td>Tighten or install hose clamps – both material and vacuum lines.</td>
</tr>
<tr>
<td>Sequencing valve in receiver lid not sealing to atmospheric vent.</td>
<td></td>
<td>Check alignment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for worn silicon ring seals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solenoid may be defective.</td>
</tr>
<tr>
<td>Material Line is blocked</td>
<td></td>
<td>Air pressure to solenoid valve too low.</td>
</tr>
<tr>
<td>Run out or empty material supply source.</td>
<td></td>
<td>Air cylinder may be defective.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check material line, clear obstruction as needed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restore material supply.</td>
</tr>
</tbody>
</table>
## Conveying Problems

**WARNING:** Disconnect power and air sources. Always disconnect the pump from the loading control, main power source, compressed air source and before servicing. This prevents the pump from starting during servicing, which could cause personal injury from flying debris or moving parts.

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</tr>
</thead>
<tbody>
<tr>
<td>High reading on vacuum pump gauge.</td>
<td>Adjustment opened too far.</td>
<td>Readjust to give smooth flow and steady vacuum gauge reading.</td>
</tr>
<tr>
<td>No material flow.</td>
<td>Material line blockage.</td>
<td>Clear obstruction.</td>
</tr>
<tr>
<td></td>
<td>Vacuum sequencing valve, mate-</td>
<td>Check for: 1. Proper control signal to sole-</td>
</tr>
<tr>
<td></td>
<td>rial line valve, or dust collector valve not opening.</td>
<td>2. Defective solenoid 3. Air line pressure 60+ PSI (4.14+ bar)</td>
</tr>
<tr>
<td></td>
<td>Vent tube on material pick-up</td>
<td>4. Defective air cylinder 5. Air line leaks – clear obstruction.</td>
</tr>
<tr>
<td></td>
<td>tube blocked.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If compression couplings are used, a stainless steel gasket protector should be used. Otherwise, if tube ends are not butted, rubber gasket can be sucked into the joint.
We’re Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

![Conair Service Hotline](image)

**NOTE:** Normal operating hours are 8:00 am - 5:00 pm EST. After hours emergency service is available at the same phone number.

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call...

If you do have a problem, please complete the following checklist before calling Conair:

- Make sure you have all model, control type from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- Make sure power is supplied to the equipment.
- Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- Check the troubleshooting guide of this manual for a solution.
- Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Department for a nominal fee. Most manuals can be downloaded free of charge from the product section of the Conair website.

www.conairgroup.com
**Equipment Guarantee**

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair’s guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

**Performance Warranty**

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair’s Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

**Warranty Limitations**

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.