PL15
Powder Loader Instructions

Preliminary Issue

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⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

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What is a PL15 Powder Loader?

The PL15 is a filtered vacuum material receiver that provides a filtered receiving vessel for material conveyed to it through vacuum power. The source of vacuum is usually a vacuum pump, located elsewhere, and connected to the PL15 through a vacuum line, connected to the PL15's lid. The PL15 is controlled by a separate control system, detailed elsewhere, that is connected to the PL15 via the junction box on the PL15's mounting flange. The control system provides vacuum control for the PL15 as well as other functions like ratio valve control, duration of blowdown, etc.

The PL15 is equipped with dual cartridge filters that provide a separation method for the conveying air and material. The filters allow conveyed material to be collected in the PL15's 15 inch diameter receiving hopper, while the vacuum air is allowed to pass through the filters, back towards the vacuum pump. A dust collector is usually located between the PL15 and the vacuum pump, to trap any potential carry-over material fines and prevent their return to the vacuum pump, where they could cause damage.

A filter-cleaning "blowdown" system is included in the PL15 to keep the dual cartridges clean of collected powder that could rapidly blind them, preventing further conveying. The blowdown consists of repeated blasts of compressed air, directed down through the filters from the PL15's lid. These blasts are directed through venturi, air amplification devices that create a shock wave effect in the filters to maximize the effectiveness of each blast for maximum filter cleaning efficiency. The blowdown system is connected to a compressed air accumulator tank on the side of the PL15's filter body that allows a build of compressed air to be released for filter cleaning, providing maximum air volume for maximum cleaning efficiency.

The filter cartridges of the PL15 are mounted to a filter plate, oriented and sandwiched between the PL15 lid and filter chamber. This filter plate allows both filters to be removed as a unit for a convenient cleaning/replacement procedure. The cartridges may also be removed individually from the filter plate.

The lower, loader portion of the PL15 consists of a 1 cu ft capacity conical vacuum chamber equipped with the material inlet tube, material discharge valve, mounting flange and Universal Terminal Box (UTB) for all electrical connections. A number of options are available for the PL15's vacuum chamber to enhance its suitability to each application, including a choice of discharge valve configurations, incoming material valves, volume fill sensing devices, wear resistant plates, etc.

Typical Applications:

The PL15 was designed to provide effective transfer of typical PVC powder and most PVC blends. Its effective filtration and filter cleaning features make it suitable for other materials as well.

Installation

Typical installations place th PL15's discharge valve down into the top of the hopper to be filled, by utilizing the loader's mounting flange, located above the discharge valve, as the interfacing surface with the hopper the loader will fill. A gasket (supplied) should be installed between the mounting flange of the loader and the receiving hopper to assure a dust-free seal. An appropriately sized hole in the destination hopper is required for this mounting. The loader, once inserted into this mounting hole, may be either bolted into place with 1/4-20 bolts through the supplied bolt holes (recommended) around the perimeter of the loader's mounting flange, or it may be secured with hold-down clips, tightened against the mounting flange.

Bin Vent Filters

Since the PL15 utilizes a high powered compressed air blowback function to clean its cartridge filters, the receiving hopper should be vented in a controlled manner to allow the release of this compressed air from the system. This vent should be filtered to prevent material dust from escaping along with this air. Two methods of receiving hopper venting are available from Conair and either method is highly encouraged to be included in your installation, to prevent undesirable dusting from blowback.

1. The Sock Filter (Conair Part Number 101-788-01) may be fitted to the top surface of the receiving hopper as close as possible to the PL15. This filter allows compressed air to escape, yet filters out material dust and keeps it inside the filter. In addition, since the sock filter is oriented up, collected material dust is allowed to fall, by gravity, back down into the receiving hopper after the blowback cycle is complete. (Heavy accumulations of dust inside the sock may require an occasional shake, to loosen trapped powder, to encourage it to fall from the sock, back into the hopper). The Sock Filter requires a 4" diameter hole to be provided in the receiving hopper lid, along with four bolt holes. Once installed, the filter media maybe easily cleaned or replaced by loosening the hose clamp that secures the filter to the mouting ring.
2. The Riser with Sock Filter (Conair Part Number 101-790-01) provides a sock filter, connected directly to a "Riser" weldment, to which the PL15 is installed. This 8" tall stainless steel riser does not require additional holes to be provided on the receiving hopper lid, but actually utilizes the same hole as the PL15 would typically use, saving space. Note that the Riser adds 8" to the height of the PL15 installation.

One of these devices may be included along with your PL15 purchase and should be included in your installation to assure trouble free, filtered bin venting of compressed air.

How it Works:

The PL15's demand level switch (either a reed switch integrated into the discharge flapper of the PL15 or a separate switch that monitors the material level in the receiving hopper below the PL15) will trigger the control system, indicating the need for more material in the receiving hopper below the PL15.

When the control system responds and allows conveying at the PL15, signals are received from the control, through the PL15's terminal box to open the vacuum sequencing valve in the lid of the PL15, allowing vacuum to enter the PL15, pass through the cartridge filters and provide a negative pressure in the vacuum chamber. This negative pressure simultaneously pulls the discharge flapper fully closed and begins to place a negative pressure on the material conveying line, connected to the material source.

Vacuum draws material into the material conveying line, along with a mixture of air, provided by the feed tube at the material pick-up point. Conveyed material enters the PL15's vacuum chamber and is directed along a filter guard that traverses the diameter of the hopper. This filter guard provides initial routing of the conveyed material away from the filter area. The conveyed material bounces off the inside wall of the material hopper, opposite the material inlet. An optional wear plate may be provided in this area to retard abrasion of the receiving hopper's inner wall.

Material collects in the vacuum hopper as it is conveyed, while the conveying air is exhausted through the PL15's dual filter cartridges in the chamber above the vacuum hopper. The filters retain the material and material dust in the vacuum chamber, yet allows conveying air to pass through the filter media, through the vacuum sequencing valve in the lid of the PL15 and back towards the vacuum source (dust collector and vacuum pump).

Once load time has elapsed, the control system discontinues the vacuum-on signal to the PL15, which allows the vacuum sequencing valve to spring shut, stopping the flow of vacuum air to the PL15. Immediately following termination of the loading function, the control system provides a "vacuum-off' signal that allows enough time for the PL15 to dump its load of conveyed material before another cycle starts and simultaneously operates the optional powered discharge valve, if the PL15 is so equipped. This vacuum off signal also provides the time duration to allow the blowback function of the PL15 to operate. Using the vacuum-off signal from the control system, a small, adjustable timer on the PL15 provides electrical pulses that open a compressed air solenoid valve located above the accumulator which releases pulsed blasts of compressed air down into the filter cartridges, to blow off collected dust.

At the conclusion of the blowback function, determined by the duration of the vacuum-off signal, the system is ready to begin to load again, based upon the presence of a demand signal from the demand level switch.

Adjusting the Filter Cleaning Blowback:

Three settings adjust overall blowback parameters of the PL15:

1. Blowback Sequence Duration
2. Blowback Cycle Adjustments
3. Blowback Compressed Air Pressure Adjustment

These three adjustments should be made in concert with one another to optimize the filter cleaning function and to match the needs of your material and process.

Blowback Sequence Duration is triggered by the 'vacuum-off' signal from the loading control system. This signal may be called "unload", "positive discharge", "dump time"or even "pause" and is normally used to control sequences that occur when the PL15 is not loading, like the operation of a discharge valve. This adjustment may be found inside of Conair Selectronic 4+ or 5 control boxes and may be adjusted with a small, flat-bladed screwdriver. On Conair Selectronic 6 controls (with a digital readout window), this setting may be found in Security Level "C", and identified as "SET OFF SECS". With other controls systems, it may be present within the control software and adjusted through programming or loading control set-up adjustments.

For the blowback function, this setting adjusts the overall time dedicated to the blowdown function and it may be adjusted higher or lower to allow more or less time for filter cleaning. The duration of the blowback pulses and

Blowback Cycle Adjustments (the amount of time between blowback pulses) is adjusted separately, right on the solenoid that triggers the blowdown pulses. This solenoid is located near the top of the side-mounted accumulator tank and is coupled to the lid of the PL15 via flex hose. The blowdown solenoid is equipped with a special cable connector that contains a micro-timer module. When viewing this connector you can clearly see two small timer adjustments labeled "on" and "off". Each timer adjustment is a multi-turn potentiometer, providing a wide range of time settings. The "on" time relates to the duration of the blowback blast. Since 99% of the effectiveness of the blowdown function is achieved with the initial burst of compressed air energy, this setting does not need to be set any higher than minimum and is usually set accordingly at the factory. It may be rotated with a very small flat bladed screwdriver to assure that it is set to the far counter-clockwise setting, or minimum.

The timer's "off" time setting relates to the pause between the blasts of compressed air and this setting assures that the accumulator tank on the side of the PL15 has enough time to 'recharge' with accumulated compressed air, so that the next blast is effective at cleaning the filters. This setting should be made according to your particular needs. If the material you are conveying is heavily filled with very fine particles, these particles may tend to adhere tightly to the filter material and require maximum air blast power to shake them loose, so the pause (off) time should be set higher. But if the material you are conveying has fewer fines and you want to minimize the amount of air sent through the filters and minimize the 'dusting' that can take place around the loader as a result, this setting could be reduced. It should be adjusted in concert with the "unload" setting, mentioned above, to fine tune the blowback to your specific needs. Maximum pause (off time) is 50 seconds, but

typical settings are 3 to 5 seconds. It may be adjusted by turning the timer screw all the way counter-clockwise, then clockwise turning it several rotations to achieve the desired setting. Once again, the factory setting may suite your needs already. A small indicator light on the timer module will signal when the blasts will take place, so trial settings may be made without material and even without compressed air connected to the PL15.

Blowback Compressed Air Pressure Adjustment allows you to fine-tune the actual impact of the blowback function by adjusting the maximum air pressure that feeds the blowback accumulator. A compressed air regulator is fitted between the PL15's main air intake manifold and the accumulator that allows air pressure to be adjusted separately for blowback (take care not to confuse this regulator with air regulating devices that may have been installed before the PL15's inlet air supply). The blowback air pressure regulator may be used to increase or decrease air so that the high impact blasts of compressed air suitably clean the filters of the PL15, yet do not unduly allow dust-laden compressed air to seep out through openings of the receiving hopper below the PL15 or back through the incoming material line of the PL15, causing housekeeping issues.

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:

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, serial 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 loading control 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.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

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.