# CE-2VP Coffee Conveying System

## Operation & Maintenance Manual


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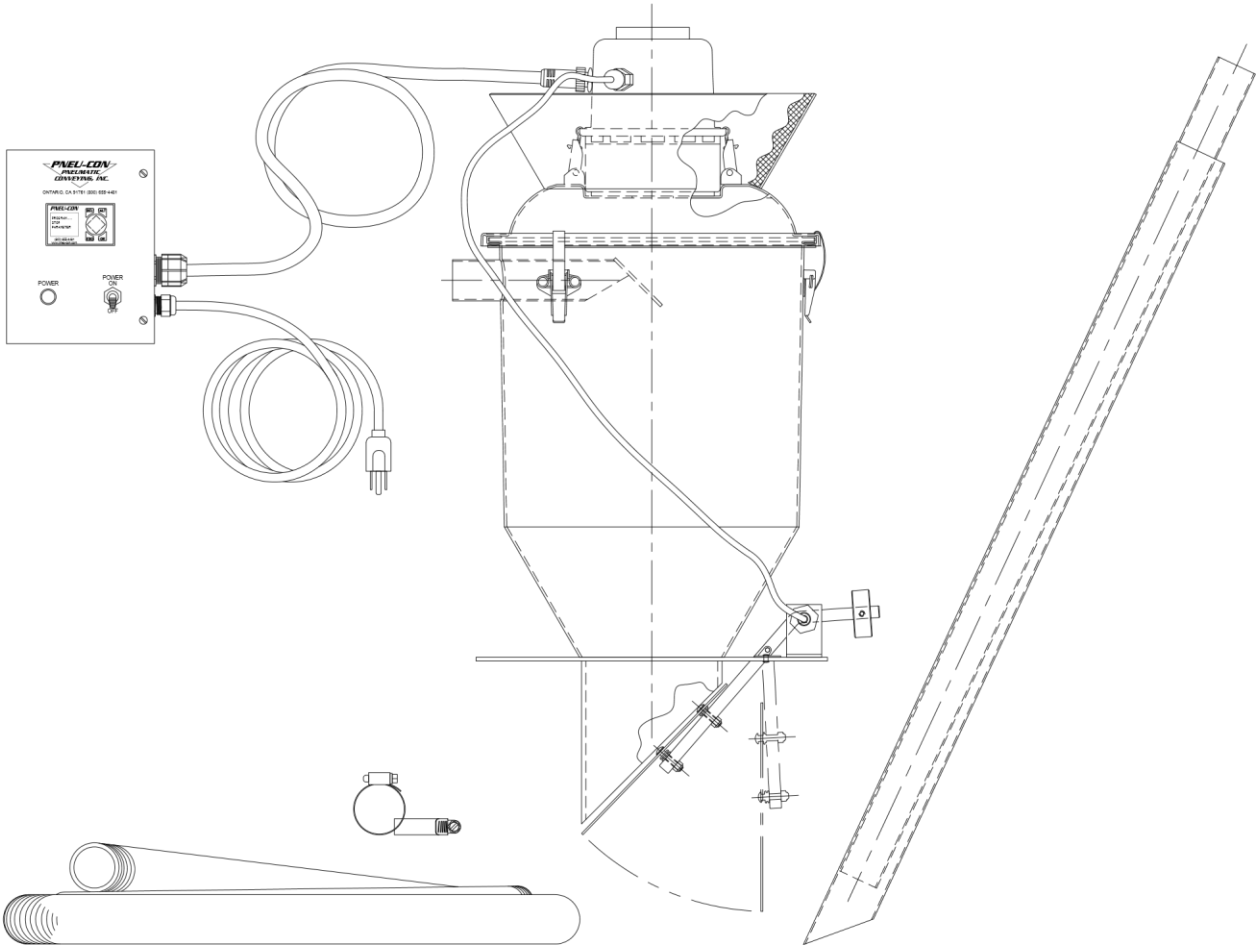
PNEUMATIC CONVEYING Whisper® Loader™



# Contents

## Safety Precautions

**B E F O R E Y O U B E G I N**

- Check All Packaging and Materials Upon Receipt of Equipment
- Read All Instructions PRIOR to Operating this Equipment
- Call our Factory for Support or Start-up Assistance
- Review this Manual periodically to maintain full product awareness

This Operation & Maintenance Manual (OMM) includes safety precautions, installation steps, maintenance procedures and supporting engineering drawings to assist both production supervisors and facility maintenance engineers. Please take the necessary time to read, and fully understand, this document in its entirety prior to operating the equipment, ensuring all personnel assigned to operate and maintain this equipment are well prepared. Periodically revisit this OMM to refresh & enforce the user's knowledge base for this equipment and its intended use.

*This Manual uses the following words and/or symbols to indicate various ALERT levels.*

**DANGER** means that you are very likely to be killed or injured if you do not take the needed steps to avoid the hazard. This is the highest level of warning.

**WARNING** is for a situation where you could be killed or injured if you do not avoid the hazard.

**CAUTION** means you could receive moderate or minor injuries, or equipment could be damaged if you do not avoid the hazard.

The Control Panel and/or other system components may have the following Warning Labels affixed.

**WARNING**

Material Handling and Processing machines could cause **DEATH, SHOCK,** or **INJURY.**

**LOCK OUT** and **TAG OUT** machine **POWER** before installing loader.

Follow safety steps in machine manual during installation process or whenever adjusting loader.

**WARNING**

**COMPRESSED AIR** could cause **DEATH, BLINDNESS** or **INJURY.**

Avoid contact. Compressed air can enter through skin pores, causing injury or death.

Do not direct compressed- air jet stream at any person.

Wear safety eyewear wherever a Compressed-air source is in use.

**CAUTION** Do Not –under any circumstances – plug this unit into an extension cord. Only connect power cord plug directly into a properly grounded receptacle suitable for the intended use. Doing otherwise could result in personal injury or moderate to severe equipment damage voiding warranty.

**DANGER** Whisper® Loader™ units powered by electric motors are to be installed such that contact with foam, liquid (including water) or other foreign substances does not occur. Do no allow these types of substances to enter the fan system, motor housing or electrical components. When operating a Whisper® Loader™ in potentially hazardous areas – environments containing dry chemicals or other volatile materials – an explosion-proof motor with special exhaust fitting must be implemented. Failure to adhere to this precaution could lead to electrical shock resulting in a flash fire (volatile substance exposure), equipment or property damage or even personal injury or death. When in doubt – ask.

## Un-Packing

*Whisper® Loader™ Systems are packaged in either a single carton or, depending on carrier regulations multiple cartons. Additionally, system accessories may require palletization.*

**CAUTION** Check carton contents carefully ensuring that every component has been accounted for. A complete package consists of a Loader, Control Panel, Pick-Up Lance, Flex Hose & Clamps and a copy of this Manual. A common accessory may be a Transition Hopper or Portable Feed-Bin Hopper.

The Loader will be encapsulated between foam-filled poly bags, in a clam-shell fashion within the shipping carton. Take care not to damage packing materials, please see notes below. Some models will have the Control Panel attached directly to the Loader's Mounting Flange, while most others will have a Remote Panel individually packed and placed at top of carton directly above Loader. For added protection the Control Panel is wrapped in a padded "*Jiffy*" envelope.

The length of Flex Hose will be coiled and located at bottom of carton, along with Hose Clamps. Placed vertically in one corner will be the Pick-Up Lance. **PLVP** (*Proportioning)* model Loader have two Lances each occupying a corner (**PLVP** Flex Hose is double-length and may be packed separately).

Upon removal from carton place Loader on stable horizontal surface (with clearance for Dump Valve/Flap) or temporarily lay on its side in one half of clam-shell packaging until ready to mount onto machine or hopper.

**CAUTION** Do Not allow unit to rest on Flapper Plate as damage may result.

Notes:

1) It is recommended that all packing materials be retained for at least the duration of the warranty period, typically one year, in case the unit should need service or repairs beyond the user's capacity or expertise. See Returns section at the back of this manual for details on obtaining a Return Material Authorization (RMA) number.

2) If upon unpacking equipment, damage is observed immediately notify the carrier to file a damage claim. Most carrier claim policies allow a fifteen-day window for such claims; therefore, time is of the essence. Also contact our factory of the facts, and to procure any replacement items if in dire need.

3) If not yet recorded, it is recommended that the unit's serial number be retained for product warranty and traceability of the manufacturing details. Please write the unit's serial number(s) in space provided at the back of this manual as these numbers are important should any repairs or warranty be required. Typically the Loader's serial number is located on mounting flange near the pivot arm; the Controller (mounted inside enclosure) serial number can be found on left side of module. Also, these numbers are recorded on the accompanying shipping documents and invoice.

## System Description

*Whisper® Loader™* packages are self-contained material-loading systems powered by an integral motor/fan (vacuum-air source) integral to the Loader's Cover Assembly. The self-contained *Whisper® Loader™* is designed to automatically convey material from a local source (typically located within 10 feet) up-and-over to a machine material hopper, extruder, 'Day' bin or similar type of receiving vessel for efficient and economical operation with minimal maintenance and downtime. Each *Whisper® Loader™* is shipped complete and ready-torun with minimal set-up time; after physically mounting unit, plug power cord into a local grounded 120VAC/Ø1/60Hz/20Amp receptacle. Optional 240VAC/Ø1/60Hz voltage is available for most Loaders (having larger motor) – 240VAC NOT available on the smaller models with '1250' type motor.

**CAUTION** Do Not –under any circumstances – plug this unit into an extension cord. Only plug its power cord directly into a local receptacle suitable for the intended use. Doing otherwise could affect performance and may result in moderate to severe equipment damage, voiding warranty.

Standard packages include: Vacuum-Loader, Aluminum Pick-up Lance (sized to match line size of the Loader's inlet), 10-ft length of clear PVC Flexible Hose (sized to match inlet) & pair of Hose Clamps and the Loader Control Panel. The *Whisper® Loader™* is designed to automatically and efficiently maintain material levels in a receiving vessel, drawing material from the source – at timed rate – set at the Control Panel. As an option the *Whisper® Loader™* can be supplied with a *Vibra-Pulse™* filter-cleaning system to automatically clean the filter, either during (ON-LINE), or following (OFF-LINE) each conveying cycle.

*Whisper® Loader™* operates on a batch principle. The duration of the conveying (run-time) and dump cycle (dump-time) is determined by the controller settings. The Control Panel features a programmable 12 I/O PLC Logic Relay Control Module with adjustable timer functions to control all timer-related Loader or Auxiliaryequipment functions. Under special circumstances or to maintain proper material conveying rates at distances greater than 10 feet, adjustments to the factory settings may be necessary. For further details on Controller features and settings refer to the Control Panel section.

The *Whisper® Loader™* conveying-cycle frequency is "on demand" and will continue to cycle (convey material) whenever the level in the receiving vessel falls below the point of the Loader's Dump Valve Flap, thus allowing it to close. Once the Dump Valve swings open the Proximity Switch no longer senses the presence of the Valve's Arm, in-turn signaling Controller to stop Convey Cycle. Refer to Sequence of Operation section for complete operating details.

Numerous *Whisper® Loader™* options are available beyond the Standard base model; Filtration media (determined by the material being conveyed), receiver working capacities, Proportional Conveying (from two material sources), Loader-construction (food-grade or other industrial requirements). The Standard *Whisper® Loader™* PLC Control Panel can be configured for various functions, including auxiliary equipment controls. Additional OEM Controller models and types are available to suit your specific requirements.

**Obsolescence:**

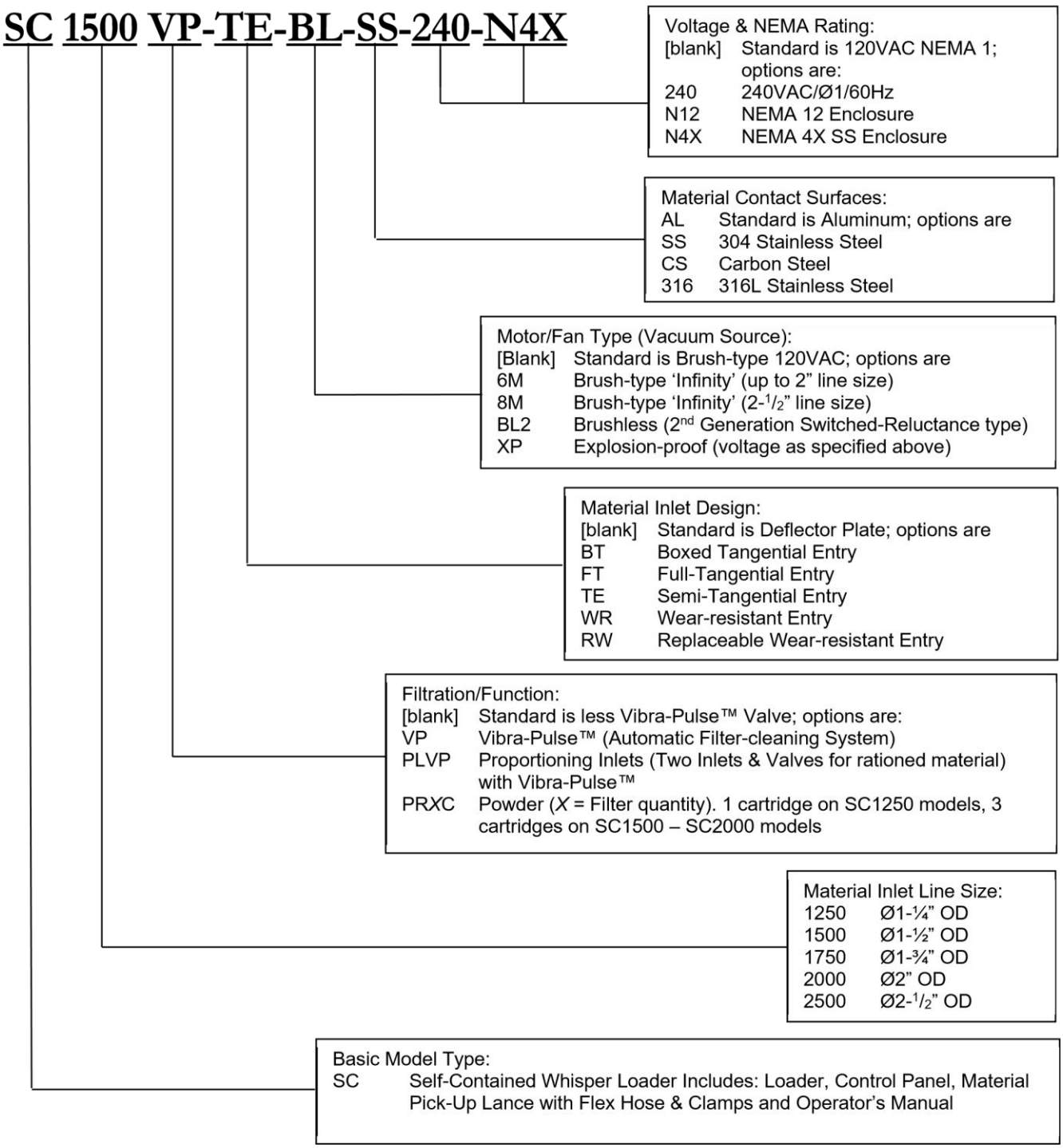
Notes: 1) As of August 2006, due to ever-changing technologies and product-resource depletion, the '070' model PCB-based (printed circuit board) controller has been phased-out and replaced with an advanced Logic Relay PLC in a Pneu-Vue™ Panel.

2) Beginning October 2018, we no longer offer the '**BL**' motor option; depending upon your application, a '**6M**' or '**8M**' brush-type version will be selected.

Contact the Sales Department for further details, price and availability, to obtain information on ordering PLC or Motor options, or Retrofit Kits.

## Model Number Definition

The Model Number example below represents a typical *Whisper® Loader™* System and an array of options.


SC 1500 VP-TE-BL-SS-240-N4X
Voltage & NEMA Rating:
[blank] Standard is 120VAC NEMA 1; options are:
240 240VAC/Ø1/60Hz
N12 NEMA 12 Enclosure
N4X NEMA 4X SS Enclosure
Material Contact Surfaces:
AL Standard is Aluminum; options are
SS 304 Stainless Steel
CS Carbon Steel
316 316L Stainless Steel
Motor/Fan Type (Vacuum Source):
[Blank] Standard is Brush-type 120VAC; options are
6M Brush-type 'Infinity' (up to 2" line size)
8M Brush-type 'Infinity' (2-1/2" line size)
BL2 Brushless (2nd Generation Switched-Reluctance type)
XP Explosion-proof (voltage as specified above)
Material Inlet Design:
[blank] Standard is Deflector Plate; options are
BT Boxed Tangential Entry
FT Full-Tangential Entry
TE Semi-Tangential Entry
WR Wear-resistant Entry
RW Replaceable Wear-resistant Entry
Filtration/Function:
[blank] Standard is less Vibra-Pulse™ Valve; options are:
VP Vibra-Pulse™ (Automatic Filter-cleaning System)
PLVP Proportioning Inlets (Two Inlets & Valves for rationed material) with Vibra-Pulse™
PRXC Powder (X = Filter quantity). 1 cartridge on SC1250 models, 3 cartridges on SC1500 – SC2000 models
Material Inlet Line Size:
1250 Ø1-¼" OD
1500 Ø1-½" OD
1750 Ø1-¾" OD
2000 Ø2" OD
2500 Ø2-1/2" OD
Basic Model Type:
SC Self-Contained Whisper Loader Includes: Loader, Control Panel, Material Pick-Up Lance with Flex Hose & Clamps and Operator's Manual

**Component, Model & Option Descriptions**

## FEATURES and BENEFITS

- Stand-alone Self-contained design Vacuum-Conveying System
- Spun & Welded Aluminum Body Construction – Standard
- Energy Efficient Solid State Controls operating on a Batch Principle
- Automatic Conveying for a wide range of materials and conditions
- Consistent loading of Machines, Hoppers or Day-Bins
- Take-apart design for Easy Cleaning & Maintenance

## BASIC COMPONENTS

The complete *Whisper® Loader™* Conveying System comprises the following major items (See Figure 1-1):

- ❑ Receiving Hopper Body with Inlet, Mounting Flange and Dump Valve Flapper Assembly with Proximity Switch (material level sensor)
- ❑ Integrated Motor/Turbine, Brush-type standard (Brushless type option available)
- ❑ Material Pick-up Lance and PVC Flex Hose

(quantity doubled for PLVP models)

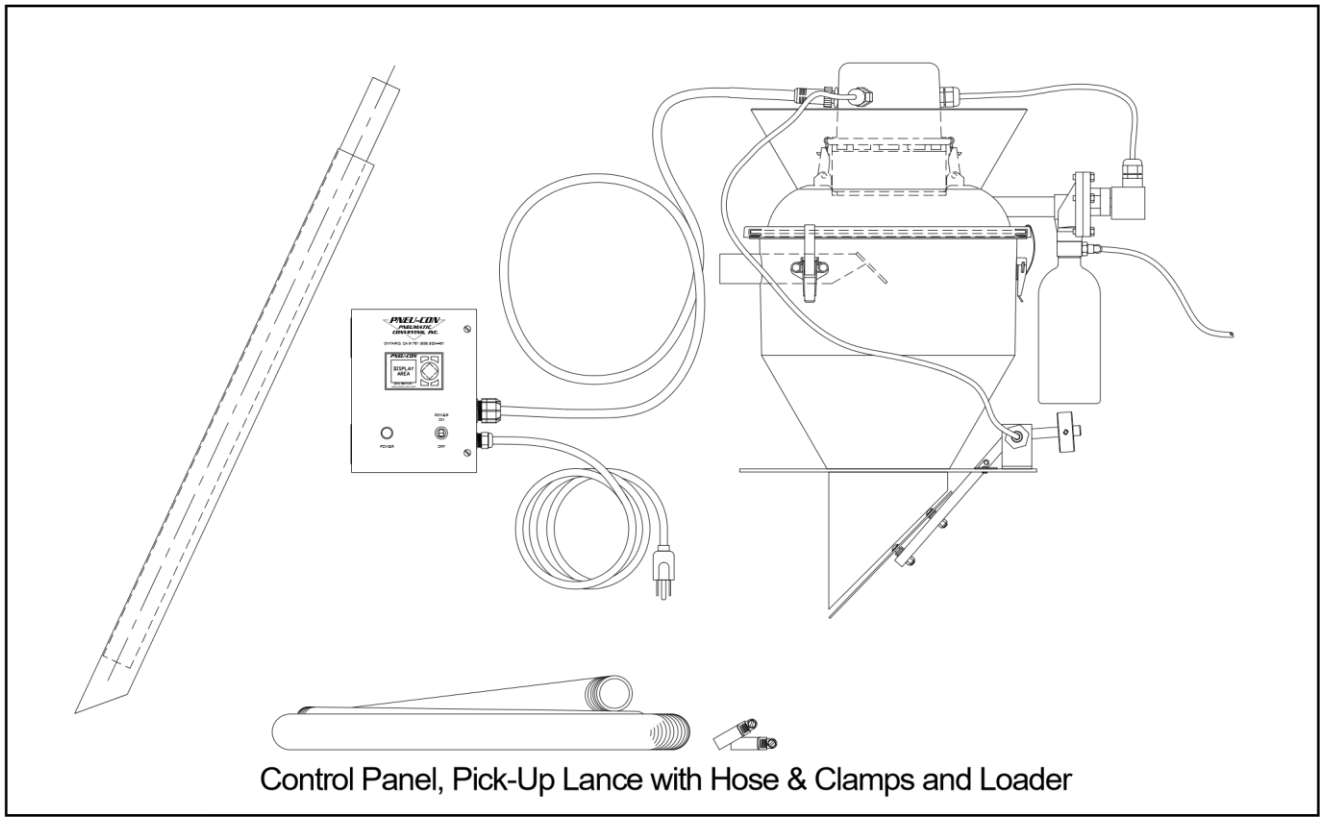



Figure 1-1 **Major Components**
(Model SC1500VP Whisper®Loader™ shown)

- Nylon or Polyester-Felt media Flat-disc Membrane Filter (*Vibra-Pulse*™ filter-cleaning system optional) and Gasket (seals Cover to Body)

- Control Panel housed in NEMA 1 Enclosure with ON/OFF Switch, Indicator Light, Control Cord and Power Cord

## RECEIVING HOPPER

Constructed of spun aluminum, the Receiving Hopper Body includes a Discharge chute with Dump Valve and Mounting Flange. For material introduction an inlet (from Ø1-¼" up to Ø2-½" OD Tube Stub) is located on the side of the Loader's body. Proportioning (**PL**) models have two inlets (located side-by-side) permitting conveying of multiple material sources. As an option Loaders can be fitted with an Interblend® Static-blender a well as an optional material sensor providing high-level fill control at the **Virgin/Product 1** Inlet.

*Whisper® Loaders™* with Powder (**PR**) model designation require taller bodies to allow for 6" to 12" tall Filter Cartridge(s) as standard (18" or 24" tall optional), additional Body height as required to accommodate required material-receiving capacity below extent of filter cartridge. **PR1C** models have a single filter, while the **PR3C/PR4C** models are supplied with three or four cartridges, refer to **PR** section for further details.

## TANGENTIAL-ENTRY (TE) INLET OPTIONS

The Tangential Entry series includes: Full (**FT**), Semi (**TE**), and Boxed (**BT**) Tangential Entries. The **FT** is a Full (flush to outside of Loader body) tangential-entry Inlet; the Semi tangential-entry **TE** Inlet is offset approximately ¾-distance from the center to the outside of the body; the **BT** Inlet is a Full tangential-entry rectangular-design (boxed transition to Body) with round connection stub. Each Tangential Entry provides a degree of added protection for conveying delicate and fragile materials.

## WEAR-RESIST (WR) INLET OPTION

The Wear-Resistant (**WR**) Inlet is designed to protect the conveyed product from damaging the Loader's inlet and/or protection of the conveyed material itself, as it is introduced into the Loader. The terminus of the Inlet is capped (providing an area where product is retained within the Inlet) to cushion subsequent material impact; the opening along bottom allows material to more-gently fall into the Loader's receiver body. Also a special Replaceable **(RW)** version, sleeved and/or flange-mount design, can be incorporated into the **WR** Inlet.

## VIBRA-PULSE™ (VP) OPTION

The *Vibra-Pulse™* (**VP**) option to the Basic *Whisper® Loader™* is where the Loader's Cover Assembly is fitted with an automatic filter cleaning system:

Hardware: The **VP** System includes Loader Lid Assembly with integral Air Blast Pipes, Diaphragm Valve & Control Solenoid with Signal Cord, Air-Pulse Bottle and Air-supply Tubing (except 1250VP and PVLP models which only have a Pulse Valve connected).

Function: At the end of each conveying cycle, the **VP** System will automatically clean the Filter(s) with a precision pulse of compressed air effectively loosening small particles and debris from the Filter's media.

## PROPORTIONING-LOADER (PLVP) OPTION

The Proportioning-Loader **PLVP** *Whisper® Loader™* is designed to automatically and efficiently convey material from two individual sources. **PLVP** Loaders are available with the *Vibra-Pulse*™ (**VP**) system. The **Virgin/Product 1** source conveying line is connected to the Left-hand Inlet, **Regrind/Product 2** source connects to the Right-hand Inlet.

Hardware: **PLVP** *Whisper® Loaders™* are supplied with VP system (as shown above) two Pick-up Lances, a total of 20-ft of Flex Hose and (4) Hose Clamps (to accommodate both hose pieces). As an option the **PLVP** can be fitted with Interblend® (**IB**) Static-blender where the Loader's Receiver Body is divided into two compartments providing a rough mix of the ingredients prior to being discharged. The **IB** also reduces product layering within Loader.

Function: While the Loader is in the RUN mode, the Control signals **Ingredient 1** Valve to open drawing material from the **Virgin/Product 1** source for the allotted amount of time. At the elapse of T1 timer **Virgin/Product 1** Inlet Valve closes and **Regrind/Product 2** Inlet Valve opens to draw from **Regrind/Product 2** material source for duration of T2 timer. Total RUN time is culmination of both T1 & T2 timer functions. Simple Control Panel adjustments allow fine-tuning each timer.

## POWDER (PR) OPTION

Powder (**PR**) model series *Whisper® Loaders™* are designed to convey powders or other materials which produce a dusty byproduct. All **PR** Loaders are equipped with the **VP** System for automated filter cleaning. Series SC1250PR1C models are a single-cartridge design with Ø8" ID X 16" side-wall Body (material Inlet located just below Filter) and single-cartridge Ø9" 1C Tubesheet/Filter Assembly. Series SC1500PR3C with Ø13" ID x 12" side-wall Body (Inlet on cone section) and SC1750PR3C thru SC2000PR3C with Ø13" ID x 18" Body (Inlet on side-wall below Filter); these models are with three-cartridge Ø14" 3C Tubesheet/Filter Assembly. Optionally taller bodies allow for more receiver capacity and/or taller filters, also optional construction materials and finishes are available to suit various application requirements. A **PR4C** with Ø2-½" Inlet and **8M** Motor is available.

## MOTOR/TURBINE

**DANGER** The Whisper® Loader™ is powered by an electric motor which must be installed & operated in an environment where contact with foam, liquid (including water) or other foreign substances does not occur. Do not allow foreign substances to enter the fan system, motor housing or other electrical components. Failure to adhere to this precaution could lead to electrical shock resulting in flash fire (volatile substance exposure), equipment or property damage or personal injury or death. When operating Whisper® Loaders™ in a potentially hazardous area or near volatile materials – an explosion-proof motor with special exhaust fittings must be utilized.

**WARNING** Failure to replace motor brushes in a timely manner may lead to irreparable motor damage, requiring motor replacement.

The Standard 120VAC/60Hz/Ø1 Brush-type Motor coupled to a 2-Stage Turbine Fan. The Turbine section produces two types of air movement: 1) Vacuum-conveying air which, after entering the Loader Body, is drawn up through the membrane Filter; and 2) Cooling/Discharge air. The Motor's cooling air is drawn through the

openings in the top of the motor cover and discharged at the bottom periphery of the motor cover. Do not block air flow in and around the motor as damage may result. Typical life expectancy of the motor's brushes is approximately 400 operating hours. A SERVICE appears on the PLC Controller display alerting operator when brushes are to be replaced; refer to the Maintenance section for details on replacing Brushes.

## 6M / 8M Option

As an option, based on the application where used, we offer an extended-life (1500-plus hours) brush-type 'Infinity' Motor, identified with either the **6M** or **8M** designation. Consult Sales Department.

## 240-Volt Option

*Whisper® Loaders™* equipped with 240-Volt (**240**) Motors are designed for operation with 240VAC electrical mains supply source. **WARNING!** If the *Whisper® Loaders™* you purchased is equipped with 240VAC Motor and Controls **DO NOT** PLUG Control Panel cord into a power source other than 240VAC/60Hz/Ø1 or compatible voltage (such as 220VAC/50Hz/Ø1).

## Brushless Motor (BL) Option

The *Brushless* (**BL**) is a 2nd Generation Switched-reluctance technology Motor with integral 2-Stage Fan system control, as well as optional Variable Speed Control (VS). The **BL** motor design requires a unique Loader-Cover with mounting tabs and cannot be incorporated onto an existing Brush-type Motor Cover Assembly.

Note: The **BL** motor option is being phased out as it is no longer available from the manufacturer. Retrofit Kits are available to convert the **BL** to a **6M** or **8M** motor.

## Explosion-Proof Motor (XP) Option

The *Explosion-Proof Motor* (**XP**) option to the *Whisper® Loaders™* is required when hazardous conditions are present thus reducing the chance of accidental flash fires related to volatile materials or environment. The Loader is available with other options including NEMA 7/9 Control Solenoids.

*Whisper® Loaders™* equipped with Explosion-Proof (**XP**) Motors are designed for operation in hazardous environments; therefore, it is imperative that all electrical connections are made utilizing suitably rated components for such. Proper grounding reduces/eliminates ignition sources caused by build up of static electricity that could discharge possibly igniting explosive or flammable vapors or volatile materials. Loader function & operation is the same as with Standard Motor-powered *Whisper® Loaders™*.

## N2 Option

An optional feature for special environment/atmospheric concerns is to fit the *Whisper® Loaders™* with an inert-gas (nitrogen) purge system where the Motor/Cover incorporates a special **N2** exhaust and recovery system; also a closed-loop recover system is available.

## PROXIMITY SWITCH

The frequency of material brought into the *Whisper® Loader™* is primarily controlled by the material level in the receiving hopper; when the vacuum is off the Dump Valve Flap is allowed to open. The Proximity Switch senses

the Flapper's Pivot arm unless the Flap is held open by material in the receiving receiver. The convey cycle is on hold until the material level in the receiving receiver drops down low enough to permit the Dump Valve Flap to close restarting the cycle.

# FILTRATION

Proper filtration is crucial to the performance of your *Whisper® Loader™* and provides protection to the Motor/Turbine assembly. Filters are installed between the *Whisper® Loader's™* removable Lid Assembly and the Body's upper flange. *Whisper® Loaders™* have either of the following filter types installed: Nylon or PolyFelt media **DI-AC** (Diaphragm-Action) Flat Disc; or Pleated Filter Cartridge type (12" tall is standard, other lengths & media optional dependant on application). Most Pellet Loader applications use a Nylon media (Standard & PLVP models) while dusty-material applications require the Polyester/Felt (VP models) DI-AC Filter. The 'Powder' (**PR** model) *Whisper® Loader™* is fitted with one or three Cartridge-type Filter(s) for powder-based materials.

## Polyester/Felt media DI-AC

The **Poly-Felt** Filter DI-AC is a 16-oz Woven Off-White Polyester-Felt blend media calendared (heat-set) on one side with filtration effectiveness of 5 micron. The **Poly-Felt** Filter is engineered for use in dusty/nuisance applications where the conveyed material is dusty or expels dust-like byproducts.

Note: Although the **Poly-Felt** filter captures much smaller particulate matter, it does however, exhibit slightly lower airflow characteristics than the **Nylon** media filter.

## Nylon media DI-AC

The **Nylon** media **DI-AC** Filter is a 1.12-oz Woven White monofilament media exhibiting excellent airflow characteristics and filtration for particles as small as 55 micron.

## Pleated Polyester media Cartridge

The Pleated Filters are Ø5-½" x 6" or 12" long (Standard lengths) Closed-end Cartridges with a Spunbond 225 Thread-count Non-woven White Polyester Pleated media exhibiting excellent air-flow and filtration for particles as small as 2-microns. Standard available cartridge lengths provide filter area of either 5.5-ft² @6" tall, or 11-ft² @12" tall. Each Cartridge has a Galvanized Steel Closed-End Bottom Cap & Open-ended Top Cap with two Mounting Studs and is supplied with a Mounting Gasket.

Options to our Standard media include but are not limited to: PTFE (Teflon) film-laminated media, Hightemperature rated media, as well as Stainless-steel End Caps for Dairy/Food-grade applications. Various Cartridge lengths are available to suit special cloth-to-air ratio applications (providing up to 22-ft² filter area per cartridge).

The Filter may be adequately cleaned with a vacuum cleaner, blast of air, or (in extreme cases) washed with a mild detergent and warm water. Please refer to the Filter Maintenance section of this Manual for further details.

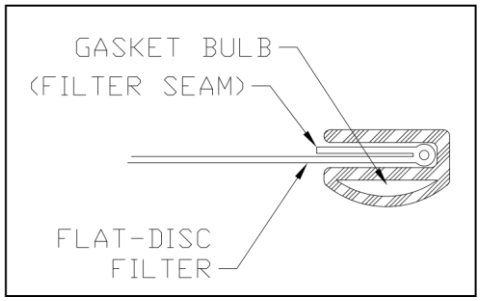
**DO NOT SUBSTITUTE FILTER MEDIA WITHOUT DISCUSSING YOUR APPLICATION**

**WITH A CUSTOMER-SERVICE REPRESENTATIVE**

# GASKETS

## Filters & Tubesheets

**PLVP**, **VP** and **Standard** models utilize Flat disc-type Filters. Proper Membrane-type Filter installation incorporates a Gasket (e-shaped cross-section) placed around the periphery of Filter to make an airtight seal between the Loader Body & Cover Assembly.




When re-installing a DI-AC (Flat-Disc type) Filter ensure the Filter's periphery is first installed in the slot of the Gasket with seam-side facing up/smooth-side down (away from the motor). Gasket orientation: flat-side up/curved-side down (see diagram).

**PR** model loaders have cylindrical Pleated Filter Cartridge(s) installed. Each Cartridge is first mounted onto the Tubesheet using the Filter-mount Gasket & hardware provided. The Body-to-Lid Gasket (e-shaped crosssection) is then installed on the perimeter of the Tubesheet prior to placing Assembly into the Loader's Body.

When re-installing Cartridge-type Filters, mounted on a Tubesheet, the Tubesheet Gasket is installed with the flat-side up (towards the Motor – away from Loader Body).

Loader body size determines Cartridge quantity and is defined by the model number's suffix being either **PR1C** for a single-cartridge or **PR3C/PR4C** for multiple-cartridge units.

## Motor

A Motor-mount Gasket is affixed to top surface of Loader Cover, the Motor attaches to top of Cover and is sealed at base with Gasket (ensuring proper channeling of the Vacuum-conveying/Motor-cooling Air up into the Loader Lid/Motor Assemblies).

**Pneu-Vue™ CONTROL PANEL**

The Standard Pneu-Vue™ Control Panel enclosure (Fig. 2-1) has a hinged door with cut out for keypad access and carries a NEMA 1-rating configured for 120VAC/Ø1/60Hz operation; other voltages available. Features include a combination ON/OFF Circuit-Breaker Switch, Power-Indicator Light, Control Cord and Power Cord. Depending upon your particular Loader's functions, the Panel may have a different arrangement of Door-mounted controls and indicator lights than shown.

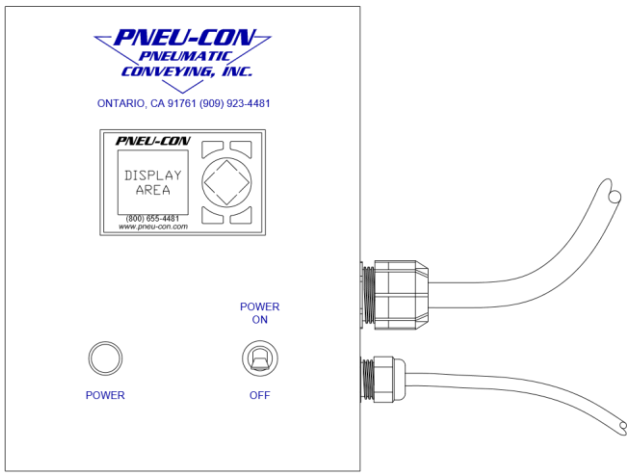



Figure 2-1 **Control Panel Enclosure**

Control Panels on SC1250 & SC1250VP *Whisper® Loaders™* are mounted directly to the Loader's mounting flange. Control Panels on SC1250PLVP, SC1250PR1C & all other models shall be remotemounted with connection to Loader by a Control Cord, refer to Model-specific drawings (provided with this manual) for applicable Panel configuration and wiring diagrams.

**CAUTION** Use of an extension cord is not allowed. Use caution when plugging unit into receptacle – know your electrical source beforehand.

# PLC CONTROLLER

## Factory Settings

Settings may be adjusted in the field to suit material conveying and/or operating conditions not covered in this manual: Consult factory prior to making any changes.

## Quick-Start

Keypad Terminal: Initial Screen at Power-On will display System, Stop/Run or other Loader-function status. See Figure 2-2 for PLC Module's Keypad layout.

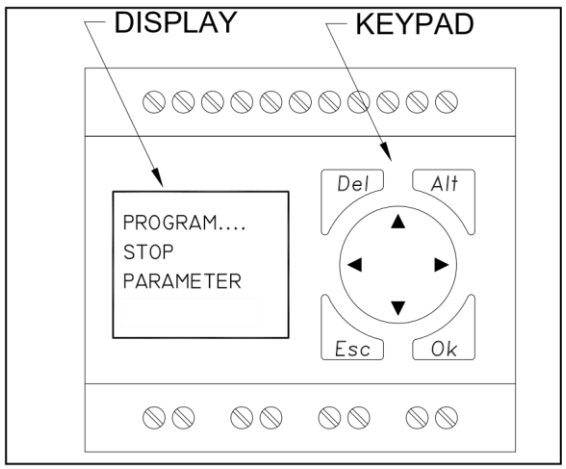



Figure 2-2 **Module Keypad Layout**

Pressing "Ok" brings up the Menu Selection Screen. Press the Center Pad "DOWN" Arrow until "Parameter" function is flashing. Press "Ok" to access the Timerfunctions Screen.

Press UP or DOWN Arrow until desired Timer is selected then press "Ok" for next screen. From here set time desired by pressing "Ok" while first-digit is flashing. Press Right Arrow (Center Pad) until the next digit to be changed flashes, and then UP or DOWN arrow until desired value is displayed. Repeat until entire time value is entered. Press "Ok" to save and then "Esc" to return to the previous menu. Press UP or DOWN arrow to access another Timer or "Esc" to save and return to previous menu.

Press "Esc" once again to return to the RUN Screen.

Timer Descriptions & Functionality

**PR**, **VP** & **Standard** (Basic) *Whisper® Loader™* Models:

T1: Run Time (Filling Duration)

T2: (Not used)

T3: Dump Time (Discharge Duration)

T4: Pulse-Off Time (Duration between Pulses) for PR & VP (not used on Standard model) **PLVP** *Whisper® Loader™* Models:

T1: Proportioning Time (Filling Duration), Virgin/Product 1 Material

T2: Proportioning Time (Filling Duration), Regrind/Product 2 Material

T3: Dump Time (Discharge Duration) T4: Pulse-Off Time (Duration between Pulses) Optional Set-up:

**DANGER!** Prior to performing ANY control panel terminal adjustments, service or repairs LOCK OUT and TAG OUT electrical power & de-energize compressed-air sources.

Factory settings for On-Line or Off-Line Pulse Jumper at PLC Control Module are as follows: **PLVP** & **VP** Model *Whisper® Loaders™* are set for On-Line Pulse and **PR** models are set for Off-Line Pulse. For factory default jumper settings see Figure 2-3 below.

**CAUTION** Refer to Wiring Diagram provided in your Whisper® Loader™ Operating Manual as the applicable Input Contacts may vary from that shown below. The Wiring Diagram supplied with the Loader will identify the actual jumper location & related input terminal & wire numbers. The On-Line setting pulses filters during the Conveying or Run Cycle; the **Jumper** is placed from Terminal L1 (with wire #4) to Terminal I-4 (with wire #11) on the PLC Controller.

The Off-Line setting pulses filters during the Dump Cycle; the **Jumper** is placed from Terminal L1 (with wire #4) over Terminal I-3 (with wire #9).

Note: Typically there may not be any wires physically located at either terminal I-3 or I-4 other **Jumper** wire; terminal wires depicted are for illustration purposes only. Please refer to wiring diagram provided with your order for actual configuration.

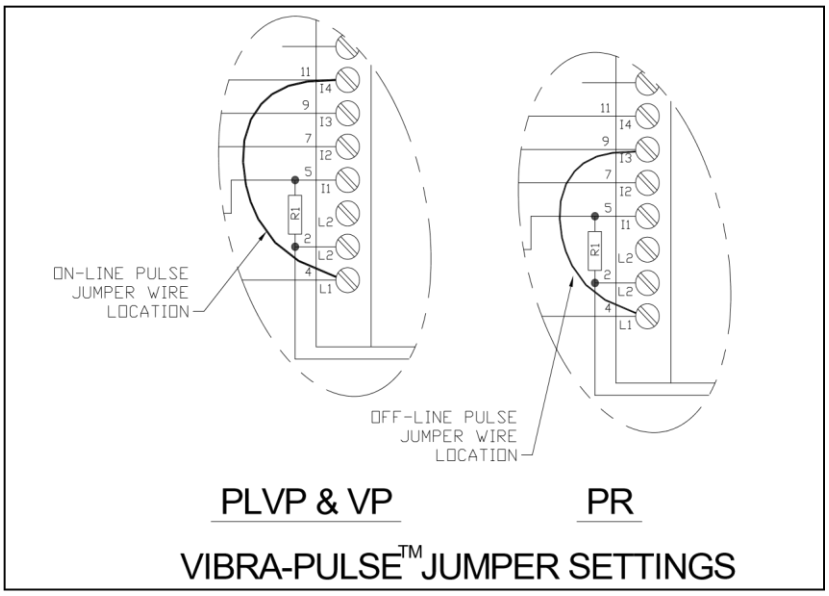



Figure 2-3 **Jumper Settings**

## CIRCUIT-BREAKER

To protect the Control Panel circuitry an ON/OFF Switch incorporates a Circuit Breaker providing overload protection. Upon an overload condition the circuit-breaker trips putting the Switch's Baton in *neutral* position. Flipping the switch to the OFF position, and then back to the ON position will reset the breaker.

## SERVICE INDICATOR

This section refers to *Whisper® Loaders™* with Brush-type Motor. We recommend replacing the motor brushes after 400 hours of operation to prevent detrimental damage to the Motor. The Control Panel's internal timer device records accumulated hours of operation; at the 400-hour mark the **SERVICE** will activate a message on the display screen – the Brushes must be changed. Once replaced the **SERVICE** message must be cleared (timer reset) by depressing the **UP** button on the PLC Keypad (see Figure 2-1 or 2-2).

**Note**: Failure to replace brushes in a timely manner will eventually damage the commutator requiring a complete Motor/Turbine replacement. Please refer to Maintenance section for details on changing Brushes and other motor-related maintenance issues.

## MATERIAL PICK-UP

A Pick-Up Lance with Flex Hose & Hose Clamps is included, as standard, with each *Whisper® Loader™* system. On **PL** model Loaders, two Pick-Up Lances plus an additional length of Flex Hose (20-ft total) & two additional Clamps (4 total) are supplied to accommodate both source-material Inlets.

## PICK-UP LANCE

The Pick-up Lance is the material pick-up device which draws air down the crescent-shaped opening between the Outer Tube & Inner Probe and then into source bin (DO NOT block the air-inlet area or allow top-end of Outer Tube to be inserted below material level). The Lance will capture material and convey it up through the Inner Probe; material then travels through the Flex Hose with final destination at the Loader Inlet (Probe & Hose

diameters sized to match Loader Inlet). Pick-Up Lance options include; material of construction, adjustable take-apart sanitary designs, and Bag Guard protective End-pieces.

## HOSE

10-foot long PVC Flex Hose (inner diameter sized matches Loader's Inlet) with Integral Copper Ground Wire (to reduce/eliminate static built up). A pair of Stainless steel Worm-drive Hose Clamps is provided as standard. One end of the Flex Hose is attached to the Pick-up Lance's Inner Probe, the other end attached to the Loader's Inlet. Refer to Installation section for important information.

On **PLVP** models there will be two 10-ft lengths, or single 20-ft piece, of Flex Hose, and four Hose Clamps, as Standard provisions.

## SERIAL NUMBER

Please write the Loader and Controller serial numbers in the spaces provided at the back of this manual and/or in other equipment records associated with this unit – store manual in a safe place for future reference. We recommend an extra back-up copy be made and appropriately stored.

## Installation

Instructions for installing and setting up a *Whisper® Loader™* Vacuum-Conveying System: *Whisper® Loaders™* should not be connected to extension cords as this may cause the circuit-breaker to trip due to voltage drop. Desired mounting surface (i.e. extruder, molding machine feed-screw inlet, hopper or day-bin) must be horizontal, flat (warp-free) and free from debris. Ensure surface is mechanically sound and able to rigidly support the *Whisper® Loader™*; bolt in place at the Mounting Flange. For your convenience a Flange mounting-template drawing is included. We offer an array of Hopper Covers to provide a custom fit on your material hoppers and other containers.

The receiving hopper should be vented to prevent pressurization. When properly mounted the Discharge Flapper (Dump Valve) MUST be slightly open with an approximate gap of ¼" at the lower-most point (when system is not in vacuum mode). The counterweight on the Dump Valve pivot arm is factory adjusted and should require no further adjustment. Care should be taken to ensure the Dump Valve mechanism is working properly and able to swing freely to a full-open (flap vertical) position. Remedy any mechanical interference prior to placing *Whisper® Loader™* into service.

For Proximity Switch sensitivity adjustments and/or mounting instructions refer to applicable attachment(s) included with this manual.

On PLVP, PR & VP Model *Whisper® Loaders™* equipped with the *Vibra-Pulse™* (**VP**) system it is necessary to connect a dedicated, filtered, compressed-air supply line (see table for sizes) to the air INLET fitting on the **VP** Pulse Valve Body near Solenoid.

| Loader Model | Line Size | Pressure Required |
|---|---|---|
| SC1250PLVP & VP Models (without Pulse Bottles) | 3/8" | 60-80psi |
| All other PLVP/PR & VP Model series (with Pulse Bottles) | 1/4" | 40-60psi |

Next, make the material-conveying line connections by attaching one end of the provided Flex Hose to the Loader's Material Inlet and the other end to the Pick-up Lance's inner probe; secure using Hose Clamps provided. To reduce or eliminate static build-up within the conveying line and/or conveyed material attach the Flex Hose's integral Ground Wire to the Probe & Loader. Expose a short length of the wire at each hose-end, tuck inside of hose prior to connection. Routing of the Flex Hose should be as direct and straight as possible. Avoid tight-radius bends or kinking Flex Hose as this will impede flow resulting in sluggish system performance.

Now place the Pick-Up Lance into material source. Do not allow material level to be higher than the upper end of the Outer Tube as material will enter causing poor flow – even blockage.

For installations where the conveying distance is greater than 10 feet, longer hose lengths or rigid metallic tubing may be required. We recommend Aluminum tubing for its light-weight characteristics, ease of handling and inherent corrosion-resistant qualities. When conveying abrasive materials it may be necessary to utilize either carbon steel or stainless steel bends in the conveying line run.

Metallic tube bends/sweeps should have a centerline radius (twelve time tube outside diameter) on the materialconveying line. Material-conveying lines to be configured having predominately horizontal or vertical straight runs with a minimum number of bends to prevent "plugging" of the material. Please contact our Parts

Department for assistance in selecting proper Bends, Sweeps and Couplings. Certain materials being conveyed may require conveying lines of either carbon steel for its ruggedness, or stainless steel to meet food-grade and/or clean room requirements. Compression-type Couplings with 3-Bolt or 4-Bolt Clamps are best suited for metallictube connections, please refer to Compression-Coupling section for additional information. Periodic inspection of the conveying line hose & tube, its condition and routing should be incorporated into the system's regular maintenance program.

## Sequence of Operation

Following is sequence of operation for Self-contained Vacuum *Whisper® Loaders™*:

1. Flip Control Panel Power Switch to the **ON** position, the **POWER** indicator light illuminates. If the Receiving Hopper is empty, the Dump Valve is allowed to close initiating signal to convey material, the motor/turbine runs for the programmed amount of time (T1); display will read RUN during the materialconveying cycle.

1.1 **PL** *Whisper® Loaders™* have two ratio-controlled (proportioning) Material Inlets to draw from either of two sources: Virgin/Product 1 or Regrind/Product 2 material. Virgin/Product 1 proportioning valve will open to allow material to be conveyed (the display will read Product 1). After conveying the Virgin/Product 1 for prescribed time (T1), the Valve will close and then the Regrind/Product 2 Inlet valve will open allowing its' material to be conveyed (the display will read Product 2 during this time). Once the total conveying time (T2) is achieved, the Loader will idle as described in Step 2.

2. The Loader will idle for the programmed **DUMP** time (T3 - Off delay), allowing all material in the Loader to discharge into the receiving hopper.

3. For Loaders equipped with Vibra-Pulse™ **VP** option **(VP, PR** & **PLVP** models) the Controller will start timer T4 (Duration between Pulses) signaling the **VP** Solenoid to open and pulse the Poppet Valve producing blasts of air directed at the Filter(s) to dislodge particles. The pulsing can be set for On-Line (**VP** & **PLVP**) for uninterrupted operation or Off-Line (**PR**) between conveying cycles when motor is stopped (T1 "Run/Proportioning Time" timer(s) will be off).

4. If the Dump Valve is held open, by material in the receiving hopper, the Loader remains idle until material level drops low enough to allow the Dump Valve to close. The Proximity Switch senses the return of the pivot arm which in-turn signals the Control Panel.

5. After the signal from Proximity Switch the T1 (RUN-Time) timer starts thus developing a vacuum and restarts sequence steps 1 thru 4. The Controller automatically cycles the Loader Motor **ON** and **OFF** to maintain level in the receiving hopper.

**NOTE**: Material density, moisture content and flow characteristics (as well as environmental factors) play a part in the system's overall conveying efficiency. Therefore, it may be necessary to adjust factory-default settings mentioned in this manual. Keep records (on the note page contained herein or in your plant maintenance records) of changes in case you need to restore factory-default settings. It is advised that changes being considered are reviewed with Customer Service prior to implementation.

### Maintenance

**DANGER!** Prior to performing any service or repairs LOCK OUT and TAG OUT electrical power and deenergize compressed-air source.

## MOTOR

Brush-type Vacuum Motors generally last a long time when properly maintained. Check Brushes regularly, replace at the accumulated operating time of 400 hours – the Control Panel indicator reminds the user of this important milestone. Replace worn or damaged Brushes immediately.

The optional Switched-Reluctance Brushless-type Motor of course does not need Brush service. Proper break-in of new brushes required prior to applying full-load electrical current.

## Motor Replacement

1. **Disconnect Power Cord from receptacle**.

2. Remove electrical quick-disconnect Cords (Proximity Switch and Control) from the Motor Cover. These are threaded-body QD connectors. Rotate knurled Ring counter-clockwise to disconnect then unplug cord from receptacle.

3. Depress lock button to disengage each Latch holding the Motor-Cover onto the Motor.

4. Lift off Motor Cover to gain access to the Motor.

**CAUTION!** Exercise CAUTION performing steps 4a thru 4c. Rotate Motor Cover while lifting, avoid pulling on or otherwise damaging lead-wires, as they are permanently attached to the motor and are somewhat delicate. If these wires do get damaged beyond SAFE use, the entire motor needs to be replaced.

   a. Disconnect the wire-nuts connecting the Motor lead-wires to Control-Cord Receptacle (Connector for the large yellow-jacketed Cord).

   b. Disconnect Motor ground wire.

   c. Remove Motor (lead-wires intact).

5. Install NEW Motor and reconnect all wires, reversing steps above. Check condition of Motor-mount Gasket attached to Loader Cover, if necessary replace.

6. Replace the Motor Cover, making sure the lead-wires are not damaged.

7. Secure both Motor-Cover Latches (ensuring that a “click” is heard) locking them in place.

8. Reconnect the Proximity Switch and Control QD (yellow-jacketed) Cords.

9. Plug Loader’s Power Cord into receptacle.

10. Press the UP button on the PLC board to reset the SERVICE Alarm (Loader must be connected to power source and Power switch turned ON to reset).

Your *Whisper® Loader™* is ready to be put back into service.

## Motor Brush Replacement

1. **Disconnect Power Cord from receptacle**.

2. Remove electrical quick-disconnect Cords (Proximity Switch and Control) from the Motor Cover. These are threaded-body QD connectors. Rotate knurled Ring counter-clockwise to disconnect then unplug Cord from Receptacle.

3. Depress lock button to disengage each Latch holding the Motor-Cover onto the Motor.

**CAUTION!** Exercise CAUTION when performing step 4. Rotate Motor Cover while lifting, avoid pulling on or otherwise damaging lead-wires, as they are permanently attached to the motor and are somewhat delicate. If these wires do get damaged beyond SAFE use, the entire motor needs to be replaced.

4. Lift off Motor Cover and set aside – leaving lead-wires attached – to gain access to Motor.

5. Carefully spread snap-on "Ears" of the plastic Fan Cover and remove to expose Motor Brushes.

6. Remove Brush-retaining Screws.

7. Place small-blade standard screwdriver between outer plastic Brush Housing and wire Slide Clips. Carefully pry outward with screwdriver – just enough to push Slide Clips closer to the Brush and slide it out from its locked position.

8. Insert NEW Brushes. Both Brush mechanisms must be replaced as a set.

9. Return Slide Clips to their locked positions to secure Brushes. Replace Brush-retaining Screws and plastic snap-on Fan Cover.

**WARNING!** DIRECT APPLICATION OF FULL-RATED VOLTAGE TO UNSEATED BRUSHES WILL CAUSE ARCING & PITTING OF THE COMMUTATOR – REDUCING MOTOR LIFE.

10. To achieve optimum motor performance, new brushes should be seated on the commutator BEFORE applying full-rated voltages to obtain maximum brush life and maintain peak motor performance. Following Brush-set change apply 50% to 75% of rated voltage for thirty minutes to seat Brush faces. Full motor performance achieved following thirty to forty-five minutes of operating at the full-rated voltage. Do not block motor air flow when running. Alternately, if reduced voltage source not available connect two like-rated motors in series, run for allotted time will to achieve above results.

11. Replace the Motor Cover, making sure to not damage lead-wires.

12. Secure both Motor-Cover Latches locking them in place (a "click" sound is heard).

13. Reconnect the Proximity Switch and Control Cords (yellow-jacket QD cords).

14. Plug Loader Power Cord into receptacle.

15. Press the UP button on the PLC board to reset the SERVICE Alarm. Press the UP button on the PLC board to reset the SERVICE Alarm (Loader must be connected to power source and Power switch turned ON to reset).

Your *Whisper® Loader™* is ready to be put back into service.

# FILTER MAINTENANCE

Filters are crucial to the *Whisper® Loader's™* performance AND provide protection to the Vacuum Motor/Fan Assembly. Check filters DAILY. Filters are cleanable, whether Flat-disc type or cylindrical Cartridge type. However, you MUST exercise care and follow the procedures outlined below. Should filter(s) require morefrequent manual cleaning please review your specific operating conditions with PCI Customer Service to achieve a reduction-in-maintenance solution.

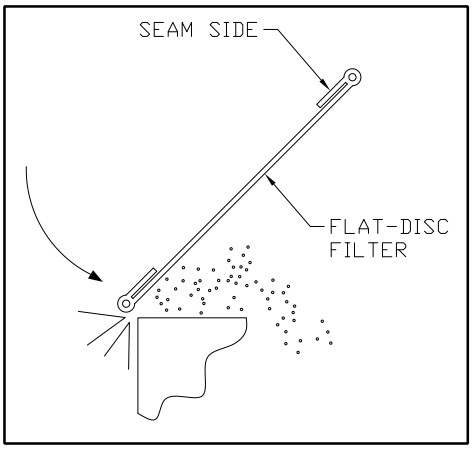
**CAUTION** DO NOT use excessively-high air or water pressure. DO NOT use stiff-bristle brushes or similar devices. DO NOT otherwise scratch specially-treated filter surfaces. DO NOT use oils, solvents, harsh detergents or other abrasive cleaning agents & solvents. DO NOT apply direct (perpendicular to the pleated surface) air or water pressure on the dust side of the filter. **NEVER** point compressed-air nozzles directly at anyone!

DO wear appropriate protective clothing for the contaminant you are cleaning and ensure any residue generated is properly contained and discarded per local environmental regulations.

## Flat Filters

CLEANING: DRY METHOD

Should DI-AC (Nylon and Polyester-Felt) Flat-Disc Filters require cleaning, even beyond the capabilities of the Loader's *Vibra-Pulse*™ system, remove and clean as follows:




1. Unlatch Loader Cover, remove filter from *Whisper® Loader™*.
2. While holding filter at the perimeter Ring lightly tap (smooth side) against a firm surface to dislodge majority of larger particles.
3. Thoroughly vacuum; first from smooth side then seam side, take care so as not to embed particles further into media.
4. Repeat from smooth side to seam side until all visible debris has been removed.

CLEANING: WET METHOD

Additionally Nylon DI-AC filters can be cleaned using a mild detergent and air-dried.

1. Place filter in a 2%-3% (approximately 4 oz per gallon of water) solution of mild dish soap such as Ivory®, Joy® or Palmolive®. Allow to soak for about ten minutes.
2. With seam side facing you, wash filter. DO NOT scrub excessively as damage may result.
3. Remove from solution and rinse thoroughly, from the seam side straight through, under low-pressure stream of water. Rinse smooth side, and again from seam side until all soap residual is removed.
4. Allow filter to air dry completely, normally 24-48 hour period @ 70° F or lower. DO NOT dry filter inside of the Loader. DO NOT apply direct heat as damage will result.

## Cartridge Filters

PTFE-Coated Cartridge

**WARNING!** If your *Whisper® Loader™* is fitted with special PTFE-coated Filter(s) use extreme caution during handling and cleaning of the cartridge(s). You are cleaning filter media surface-coated with a PTFE membrane (approximate thickness of 1 to 1-½ mills or about 1/8 the thickness of plumber's tape) laminated onto a nonwoven, spun-bond substrate. DAILY Filter Inspection is required. Clean periodically as dictated by service load, replace when damaged or worn as surface abrasions and damage adversely affect filter performance. **DO NOT SCRUB**.

CLEANING: DRY METHOD

*Vibra-Pulse*™ pre-clean Cartridge(s) Off-line (Vacuum Motor off) for approximately ten minutes with the Loader's **VP** system frequency setting at 15-second intervals at 100-milliseconds. The **VP** Valve shall remain connected to 60psig compressed-air source.

Should Pleated Cartridge Filters require further cleaning beyond that accomplished by the *Vibra-Pulse*™ system, remove and clean as follows:

1. Carefully lift out Tubesheet/Cartridge assembly from *Whisper® Loader™*.

2. Loosen the Cartridge mounting hardware and remove Filter(s) from Tubesheet.

3. The Tubesheet material-contact surface can be cleaned as required at this time. Dry thoroughly.

4. While holding filter at the Upper (open) End Cap lightly tap (Bottom End Cap) against a firm surface to dislodge majority of larger particles, rotating as you work completely around filter.

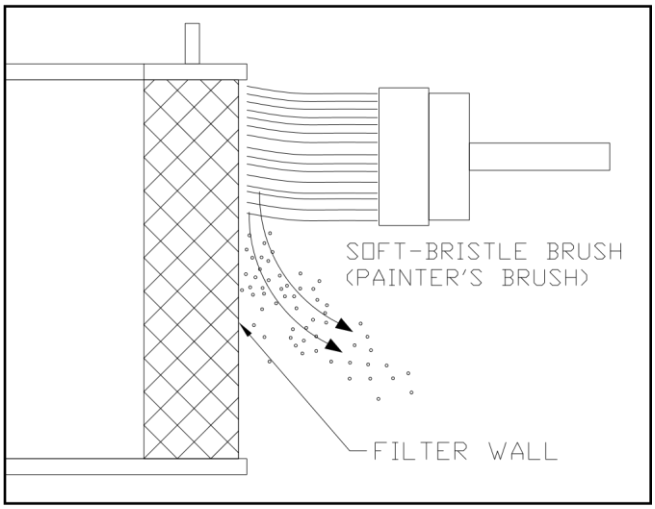
5. Lightly brush excess debris lodged within pleats in a sweeping motion as required starting from each end and working towards middle of filter, taking care as to not force debris into pleat crevices. Turn filter over end-for-end and repeat.

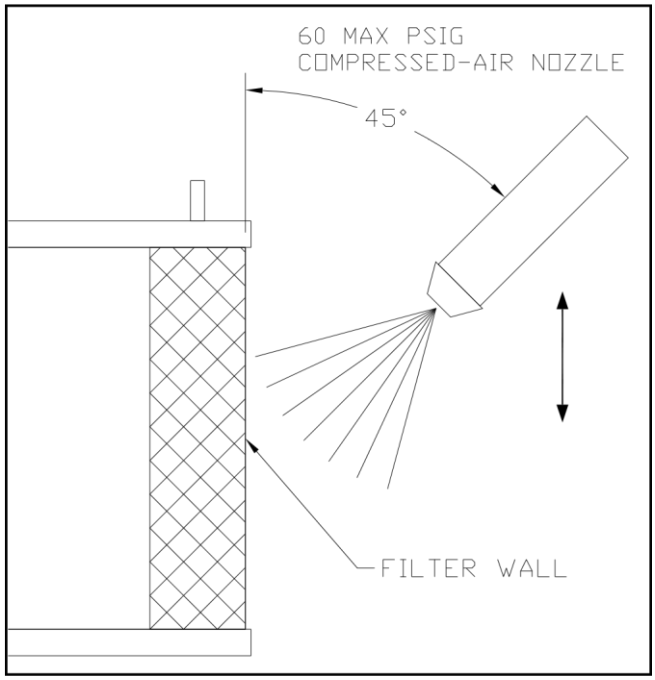
6. And/or vacuum, from dust side, using a soft-bristle brush so as not to embed particles further into media.

7. Vacuum inside at closed End Cap to remove accumulated debris – if any.

8. Apply a jet from compressed-air nozzle/wand held away from surface at 45° to filter's surface. DO NOT allow air device to scrape filter surface as damage may result. The air device opening must be Ø3/8" or larger to prevent filter damage. Move nozzle along the full length of filter in a steady up & down motion.

9. Using same technique in step 8, sweep inside of cartridge.




10. Repeat steps 8 & 9 again to provide a clean sweep of both inside & outer surfaces.

11. As an option, a vacuum nozzle can be used to clean the pleats as described in steps 8 & 9.

CLEANING: WET METHOD

Additionally Cartridge Filters can be cleaned using a mild detergent and air-dried.

1. Pre-clean and brush Cartridge as described in Dry-Method above to remove excess dust particles.

2. Place filter in a container with 2%-3% (approximately 4 oz per gallon of water) solution of mild dish soap such as Ivory®, Joy® or Palmolive®. Allow to soak for ten minutes.

3. Remove from solution and flush with stream of clean low-pressure water. Hold hose end/nozzle away from and at 45° to filter surface. Water stream must not exceed 70 psig. **DO NOT SCRUB**.
4. Rinse thoroughly, from the inside straight through to outside, under low-pressure stream of water. Rinse until all soap residual has been removed.
5. Allow filter to air dry completely, normally 24-48 hour period @ 70° F or lower. DO NOT dry filter inside of the Loader. DO NOT apply direct heat as damage will result.

## Troubleshooting

The following situations may occur when installing or operating the *Whisper® Loader™*, please attempt to remedy the problem you have encountered prior to contacting us for service. Exercise applicable safety precautions while working on electrical devices or compressed-air equipment.

**DANGER!** Prior to performing any service or repairs **LOCK OUT** and **TAG OUT** electrical power.

| Problem | Probable Cause | Solution |
|---|---|---|
| Material is not being conveyed | 1. Filter blinded or plugged<br>2. Conveying Line clogged<br>3. Dump Valve not Sealing | 1. Remove and Clean<br>2. Clear line<br>3. Check for bent Flapper or foreign-object obstruction |
| No Virgin Material being conveyed (PLVP Models) | 1. Virgin Line Valve remains closed<br>2. Control Knob is not turned to the full clockwise position | 1. Check Valve's Air Cylinder and Solenoid<br>2. Turn Control Knob CCW |
| No Regrind Material being conveyed (PLVP Models) | 1. Regrind Line Valve remains closed<br>2. Control Knob is not turned to the full counterclockwise position | 1. Check Valve's Air Cylinder and Solenoid<br>2. Turn Control Knob CW |
| Motor has high-pitched runaway sound during conveying cycle | 1. Loader Receiving Hopper Body full | 1. Shorten Motor **ON** time |
| Motor continues to cycle after receiving hopper is full | 1. Proximity Switch being activated | 1. Check that Dump Valve Pivot Arm is NOT sensed by Proximity<br>Switch, make necessary adjustments<br>2. Faulty Proximity Switch |
| Motor does not run | 1. No 120 Volt supply<br>2. Breaker tripped<br>3. Motor Brushes improperly installed or worn out | 1. Remedy as required<br>2. Reset Breaker<br>3. Re-install Brushes, perform brush-seating procedure or replace Brushes |
| Power light does not operate | 1. No 120 volt supply available<br>2. Tripped circuit breaker | 1. Check for power at outlet<br>2. Reset or check Breaker |

| | | |
|---|---|---|
| Circuit-Breaker Switch fault | 1. Pinched or chaffed wires<br>2. Incorrectly sized Breaker | 1. Check under Motor Cover and inside Enclosure for pinched of damaged wires<br>2. Install correctly sized Breaker |
| Filter (Flat Disc or Cartridge type) quickly becomes clogged or dirty | 1. No air supply available (keeping VibraPulse™ from performing)<br>2. Air pressure too low (keeping VibraPulse™ from working correctly)<br>3. Pulse cycle setting too low, not enough pulses during OFF time<br>4. Pulse time duration set longer that Dump time<br>5. Jumper (Off-line or On-line) not placed correctly or missing. | 1. Check for broken or loose airline fittings<br>2. Increase air supply pressure – **Do Not exceed 100psi**<br>3. Decrease cycle lengths for more pulses during OFF time<br>4. Decrease Pulse time<br>5. Check that Jumper wire present and connected properly (see Fig. 2-3) |

## Spare Parts

To ensure minimum down time during routine maintenance We recommend that a spare parts kit (see tables below) be kept in stock. A typical Spare Parts Kit (**SPK**) contains essential consumable items such as Filters, Gaskets and Motor Brushes (for Standard Brush-type Motor only).

Also, many of the Loader's parts beyond those included in the **SPK** may be kept on hand as well. All Loader parts can be ordered individually, see applicable *Whisper® Loader™* assembly drawing for specific part numbers. For pricing and availability contact PCI Parts Department.

# STANDARD KITS
# Loaders with PLC Controller & Brush-type Motor

SC1250PLVP, SC1500PLVP, SC1750PLVP & SC2000PLVP model **SPK** contain the following items:

2 pc Flat-Disc Filters, Polyester-Felt; Ø9" (SC1250), Ø14" (SC1500 – SC2000)

1 pc Cover Gasket, White Buna Rubber; Ø9" (SC1250), Ø14" (SC1500 – SC2000)

2 set Motor Brushes, 120VAC Motor Standard; SC1250/SC1500 or SC1750/SC2000

SC1250PR1C, SC1500PR3C, SC1750PR3C & SC2000PR3C model **SPK** contain the following items:

A/R pc Cartridge Filter(s), 12" tall (Standard); 1 pc (SC1250), 3 pc (SC1500 – SC2000)

1 pc Cover Gasket, White Buna Rubber; Ø9" (SC1250), Ø14" (SC1500 – SC2000) 2 set Motor Brushes, 120VAC Motor (Standard); SC1250/SC1500 or SC1750/SC2000 SC1250, SC1500, SC1750 & SC2000 model **SPK** contain the following items:

2 pc Flat-Disc Filters, DI-AC (Standard); Ø9" (SC1250), Ø14" (SC1500 – SC2000)

1 pc Cover Gasket, White Buna Rubber; Ø9" (SC1250), Ø14" (SC1500 – SC2000) 2 set Motor Brushes, 120VAC Motor (Standard); SC1250/SC1500 or SC1750/SC2000

SC1250VP, SC1500VP, SC1750VP & SC2000VP model **SPK** contain the following items:

2 pc Flat-Disc Filters, Poly-Felt Standard; Ø9" (SC1250), Ø14" (SC1500 – SC2000)

1 pc Cover Gasket, White Buna Rubber; Ø9" (SC1250), Ø14" (SC1500 – SC2000)

2 set Motor Brushes, 120VAC Motor Standard; SC1250/SC1500 or SC1750/SC2000 Note: *Whisper® Loader™* models with the **BL** Motor option do not include Brush Sets.