

USER GUIDE

Vacuum Loaders GSL Series

MODELS:

> **GSL-12**

> **GSL-19**

Patent # 8,753,432 and 8,070,844



GSL-12



Remote
pendant control



Optional
machine mount
assembly



GSL-19

In the space provided below you should record the model and serial number(s) of your equipment and the date the equipment was received.

In the event you would need aftermarket assistance our parts and service department uses this information, along with the manual number, to provide help for the specific equipment installed.

Please keep this instruction manual, any relevant addendums, engineering prints and parts lists together for accurate documentation of your equipment.

User Manual: GSL-UG 17 June 2019
Serial Number(s):
Model Numbers:

NOTES

DISCLAIMER: NOVATEC, Inc., shall not be liable for errors in this instruction manual. Information can change without notice. Novatec makes no warranty of any kind concerning the information contained herein, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose.

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1.0 PRINCIPLE OF OPERATION

A Load Cycle begins with a compressed air blowback pulse to clear any isolated material particles or dust buildup that may remain on the flapper discharge valve. This action ensures a tight vacuum seal for each Load Cycle.

The loader then activates our powerful, maintenance free, brushless motor to create a vacuum, which draws material into a chamber. After the load time setting has expired, the vacuum motor is turned off and the negative pressure in the chamber is relieved. Material in the chamber then falls through the bottom, past the flapper while compressed air is pulsed through the filter to dislodge any contaminants or fines that may have accumulated. This cycle is repeated as many times as necessary, until the unit is shut off by the rise of the conveyed material in the area below the loader which trips the level switch, removing the 'demand' signal.

Machine mounted units do not have a flapper valve or demand switch, but instead utilize a clear sight tube, which mounts directly to the machine throat, with a sensor to control loader operation based upon the level of material within the sight tube. The sensor may be either a capacitance style, with sensitivity adjustment, or a pair of photoelectric sensors, an emitter and a receiver.

The bottom flange of a Machine Mount unit is normally supplied undrilled to allow the customer to drill the appropriate mounting pattern for a particular process machine.

2.0 UNPACKING AND INSPECTION

NOVATEC Vacuum loaders are shipped complete, with all controls for automatic operation. The only utilities required are a 115 volt power supply and clean, dry compressed air at approximately 80 PSI.

After receipt of the unit, completely inspect it for damage. All units are packaged securely at the factory. Please report any damage to your carrier promptly.

3.0 SPECIFICATIONS

NOVATEC GSL Series vacuum loaders are completely automatic self-cleaning vacuum loaders designed to convey virgin pellets and regrind materials from storage containers to drying hoppers or directly to process machines.

Each unit is shipped complete with all controls for immediate operation, and include a hardware package. The hardware package includes 15 feet of flexible vacuum hose, hose clamps and a material pick up lance, plus a 12' extension cable for remote mounting the standard Control Pendant.

The GSL is designed for mounting on drying hoppers. The GSL can be modified for use as a machine mount unit on processing machines by adding a machine mount assembly with an 8, 12, or 16 lb. capacity site glass with a height adjustable photo-eye demand switch.

OPTIONS:

2" Inlet: (in lieu of 1.5")

Extended Wear Package: Recommended when loading abrasive materials - contact factory

Alternate Glass Size: 12 lb glass (adds 4" to height) or 16 lb glass (adds 7" to height)

Retro-fit Kit to convert GSLs into machine mount models: Kit includes glass, twist-lock plug and photo-eye

Alternate Mounting Flange (7" x 7" with 3.5" opening) removes 1.5" from height

ACCESSORIES:

Replacement Plug-N-Play Control Pendant with 12 ft cable: (one included with each GSL)

Replacement 12 ft cable

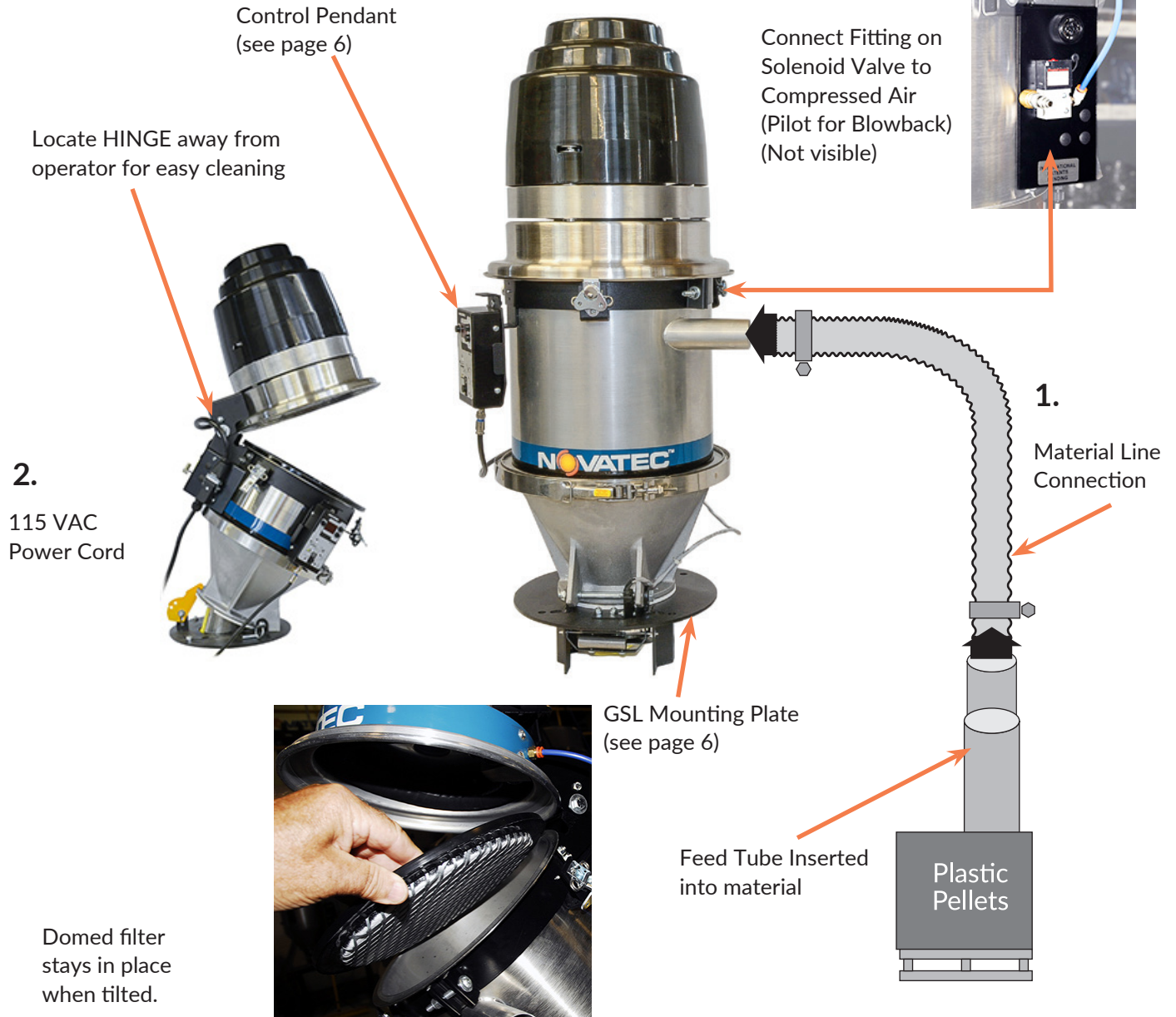
External Proportioning Valve: (Includes coupler, wand, hose and clamps.) 1.5" and 2.0" O.D.

Level Switch, Capacitance, 30mm dia., 2m cable

Capacitance Level Switch in lieu of Photo-eye Sensor (for machine mount models)

4.0 INSTALLATION

4.1 GSL



1. Install flexible hose, secured with hose clamps at both ends, from feed tube to material inlet tube of loader. A Proportioning Valve, if included (see separate instructions) is installed on the material inlet tube with a compression style coupling.

2. Plug power cord into 115 VAC power source. Note amperage listing on loader for correct voltage and capacity.

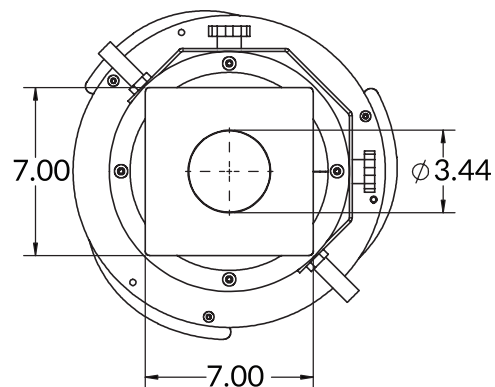
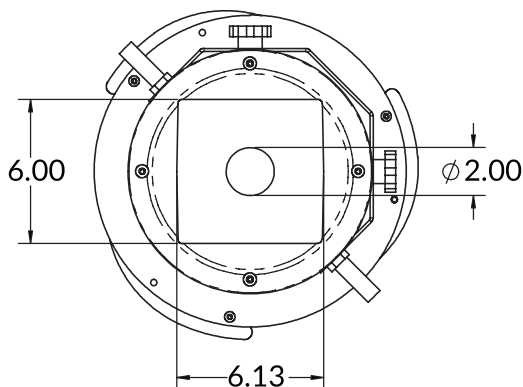
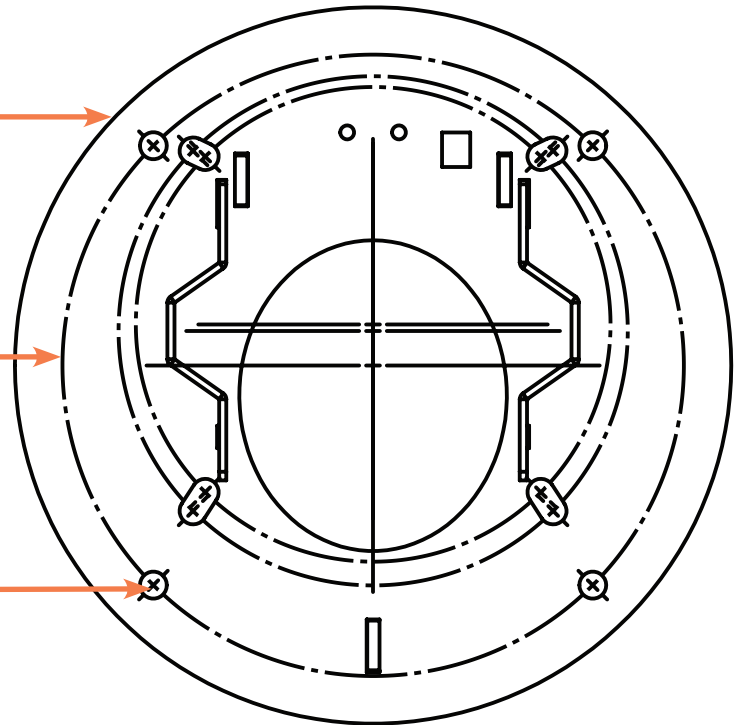
3. Install flexible compressed air line to the solenoid valve fitting (below lid hinge). Source should provide clean, dry compressed air supply 80 -100 psi. Use only full-flow quick disconnect fitting for best blowback performance. **CAUTION:** Use a second wrench to hold the fitting on the GSL securely while tightening the hose fitting. **DO NOT** apply direct pressure, or damage the GSL fitting or an air leak could result. A compressed air filter (sold separately) is recommended for protection of pneumatic components.

4.1 GSL Mounting Flange Patterns -
NOVATEC Compatible

10.38" O.D.

9.00" Dia. Bolt Hole Circle

.3125" Dia. Typ. (4 places)



Alternate Mounting Flange (7" x 7" with
3.5" opening) removes 1.5" from height

- New or existing NOVATEC hoppers will allow mounting the GSL directly. Hoppers with large openings for 5" dump throat models will use the VL-12 to VL-38 adaptor, included with the GSL unit. You may bolt the loader base plate on the receiving hopper securely, and then install the GSL cast cone with the front hinge pin and rear flange locking tab.

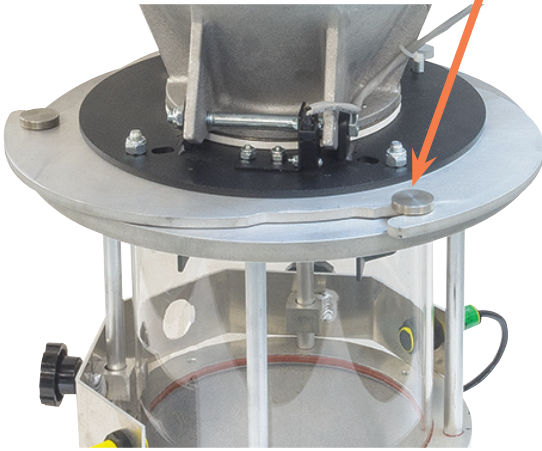
CAUTION: FASTEN GSL FLANGE TO RIGID MOUNTING SURFACE BEFORE OPERATING OR TILTING THE HOPPER BODY. USE ONLY LOCKING, CAPTIVE FASTENERS.

- For mounting to non-NOVATEC hoppers, note your model of GSL and prepare the hopper to be loaded with the appropriate cut-out and bolt pattern according to the diagrams above. These have been designed to allow for direct mount into several non-NOVATEC mounting patterns.
- Secure fasteners should be employed, fastened permanently to the hopper lid to prevent possible dropping into the hopper/material.

4.2 GSL MACHINE MOUNT MODELS

The upper part of the machine mount model still tilts for ease of access to clean/replace filters.

Upper and lower parts of machine mount model are connected together with a plate that slides into place.




A detent pin locks the plate in place.



GSL-19 with adjustable with optional machine mount assembly and Photo Eye Level Sensor installed.

5.0 OPERATION OVERVIEW

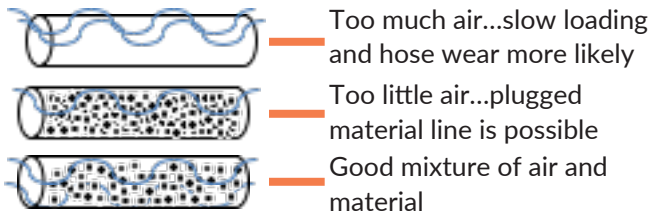
3. Vacuum motor should fill loader until 5 seconds before pellets stop moving through the convey hose and no more.

2. Press button  to turn on loader and adjust load time with + buttons.

Rotate to change air inlet opening



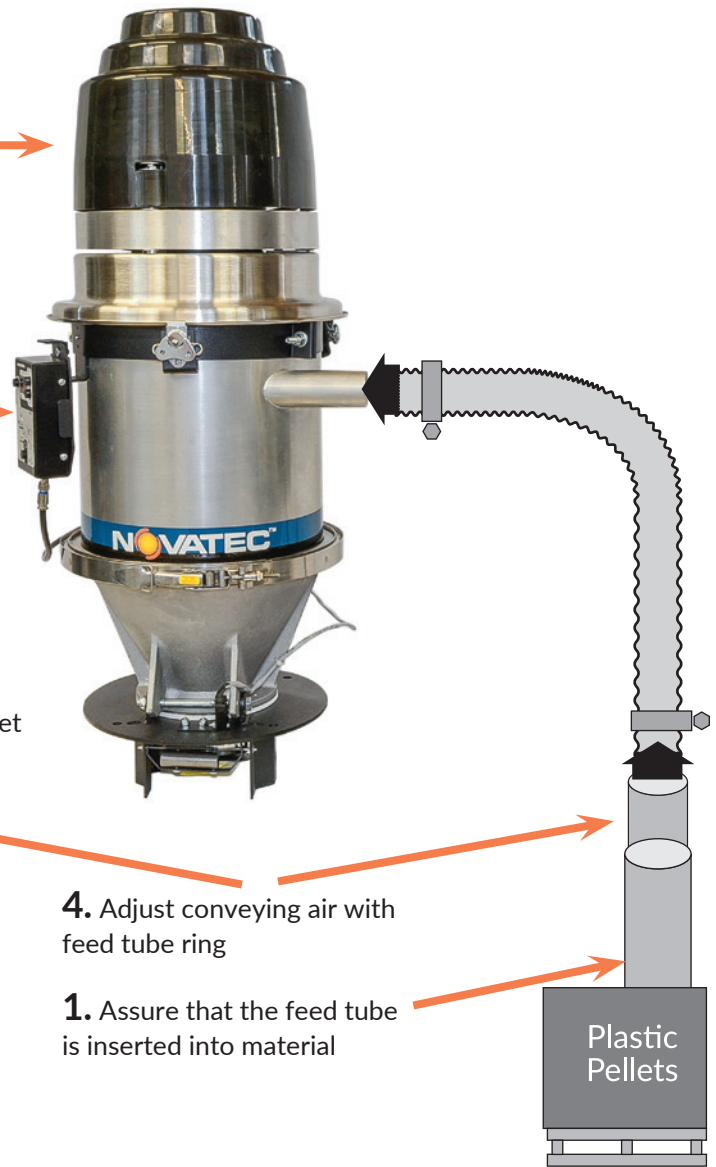
Air inlet



4. Adjust conveying air with feed tube ring

1. Assure that the feed tube is inserted into material

Plastic Pellets



1. The feed tube joins air with material and it should be plunged (and kept) in the material supply, but allow upper section of feed tube to remain above material level.

2. Adjust load time. See next page for detailed instructions on control settings and options.

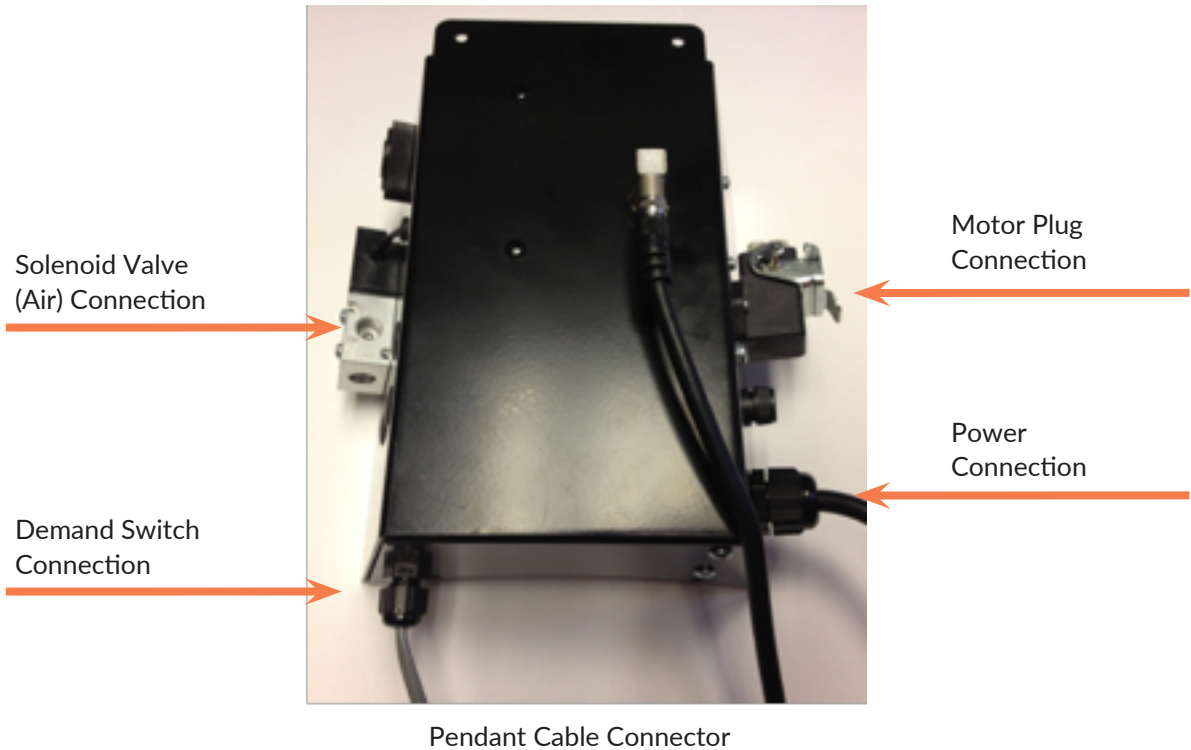
3. To allow optimum loading and longest filter life, adjust load time to fill the loader without over filling. To identify optimal load time, operate the motor until material stops moving and note the corresponding fill

time. This means the loader is OVER FILLED. Subtract 5 seconds from the over-filled time to limit premature filter blinding.

4. Rotate the feed tube ring for the best air to material mixture. The best mixture of air and material will allow material to flow efficiently, with the right proportion of conveying air, without clogging and without rapid hose wear. Be sure material flows into loader consistently from start to finish, without surging or floating at the pickup or loader inlet.


6.0 ADJUSTING THE LOADER CONTROL

Control Box



Remote Pendant

* The "Power" button enables or disables loading.
Power is only disconnected by unplugging the power cord.

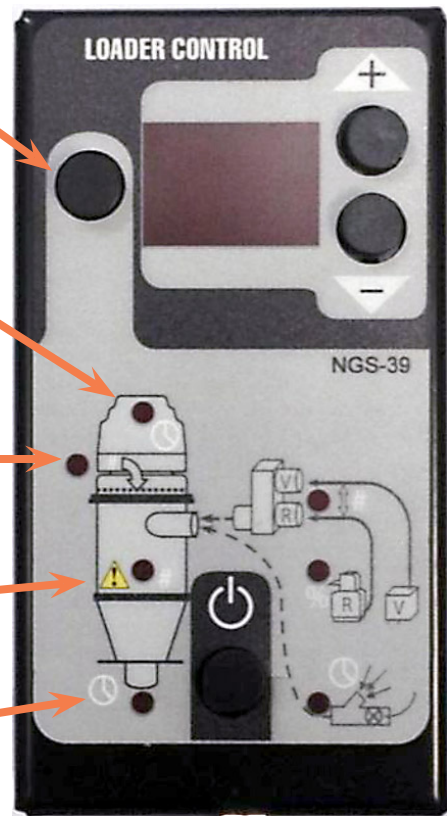
POWER* 
Press for On or Off
Display shows "ON"
Force Alarm Reset

SELECT FUNCTION BUTTON

- Button selects functions for viewing and/or changing.
- Selected function lights up, below.
- Silences Alarm (does not reset alarm)

STANDARD FUNCTIONS

- **MOTOR ON:** Seconds per load
Default = 15s (suggested Max = 20s)
Do not exceed 30s / Do not overfill
Damage may result
- **BLOWBACK FILTER CLEAN:** "XY"
X=loads between clean cycles
Y=air charge (Y*0.4s)
See Blowback Function description (p. 12)
- **ALARM:** 'No Load' cycles to create alarm
"0" = Alarm disabled.
See Alarm Function description (p.12)
- **DUMP TIME:** Seconds or minutes (M)
(Forced pause between Load Cycles)



VIEW and CHANGE SETTINGS

- Selected setting appears in window
- Increase (+) or decrease (-) values
- Display defaults to show "ON"
- Display shows "AL" for alarm condition

OPTIONAL FUNCTIONS

PROPORTIONING: Requires optional Valve.

- **LAYERS:** # of alternating VIR/REG cycles per load.
'A' = Automatic control calculated Layers.

TOTAL CONVEY TIME per Load

$$\text{Regrind} = (\text{Motor On} - \text{Purge}) * \text{REG} \%$$

$$\text{Virgin} = (\text{Motor On} - \text{Purge} - \text{Regrind})$$

NOTE: Divide these times by LAYERS value for individual layer cycles times.

REGRIND: % of Convey Time for regrind

- **PURGE:** Uses specified time to empty the material line. Inserted as final interval of total MOTOR ON time (does not extend MOTOR ON time). Requires optional Valve.

6.1 Loading Control System Terminology

Loading and Purging

“FILL” TIME:

Although this term may not appear on all controls, it is helpful to use for understanding the vacuum-on time of an individual receiver. The total vacuum-on time of a loader (the length of time the vacuum motor is “ON”) can be referred to as FILL time. All functions that happen while the vacuum motor is “ON” (regrind proportioning, pocket conveying, purging, etc.) is all part of the FILL time.

“LOAD” TIME:

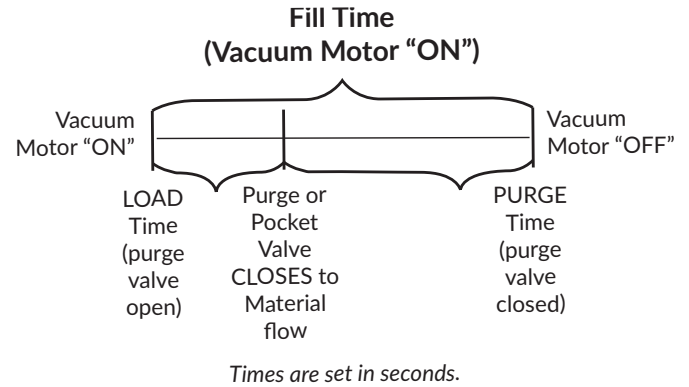
The vacuum time that a loader uses to introduce material into a material conveying line is LOAD time. The term may be thought of as ‘loading the material line’. This term is important to understand when purging conveying lines, to distinguish between the time the purge valve is opened (LOAD time) compared to the time it is closed (PURGE time). On loaders that have no purge valves, LOAD time equals FILL time. On systems with purge valves, LOAD time is just the first part of the FILL time. Purge time is the conclusion of FILL time.

“PURGE” TIME:

The vacuum time that a pocket or purge valve is closed to material flow, but vacuum air continues to flow thru the conveying line to clean out the material conveying line is referred to as PURGE time.

MATERIAL LOAD TIME = FILL TIME - PURGE TIME

Because the functions are identical, the term PURGE time is used for purging systems and pocket conveying systems for cleaning out the conveying line after loading.

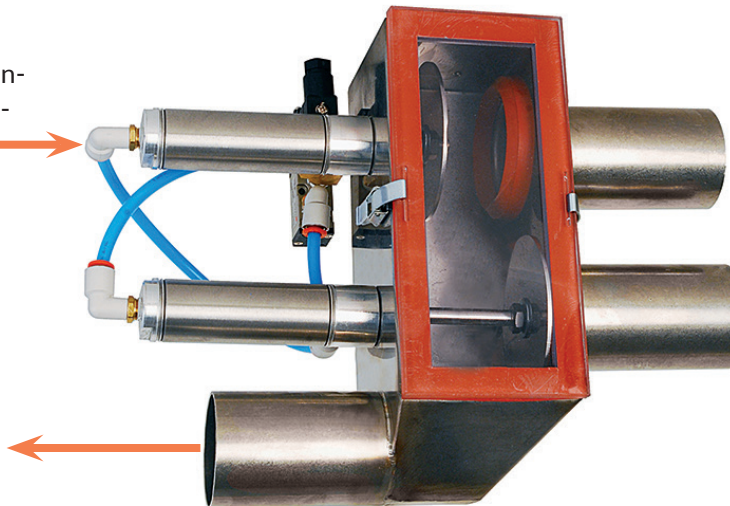


6.2 Proportioning Valve Use

External Proportioning Valve

Solenoid: Connection to control and connection to compressed air supply.

Material Outlet, connected to receiver Inlet



Material #1 inlet, typically Virgin


Material #2 inlet, typically Regrind

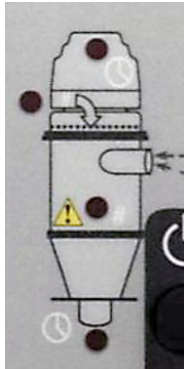
7.0 INITIAL STARTUP

Press the Power Button on the Control Pendant until 'ON' appears on the display to enable loading.

IF a material demand exists, the loader will begin loading.

NO LOAD ALARM FUNCTION

The NO LOAD ALARM is enabled through the control pendant by entering a display value >0 when the No Load Alarm LED is illuminated (see photo). 



NO LOAD ALARM occurs when the counter reaches the user selected Alarm Set Point value.

- The Loader continues load attempts after the 'Alarm' Output is energized.
- If 10 cycles pass without the alarm counter being cleared, the Loader will shut down and flash "OF" on the pendant control.

CLEARING AN ALARM CONDITION:

- Pressing the 'Select Button' will silence the 'alarm' output. The alarm counter will continue.
- The alarm clears when the hopper is full.
- After Alarm Shutdown, press the power button to clear the alarm and restart operation.

BLOWBACK FUNCTION

Blowback, when enabled for filter cleaning, pulses before and after any load cycle designated for blowback by the control settings.

Blowback also pulses briefly at the beginning of each load cycle, just as the motor begins operating. This blowback pulse is intended to clear any material residue from the discharge flapper and ensure a clean vacuum seal for optimal loading.

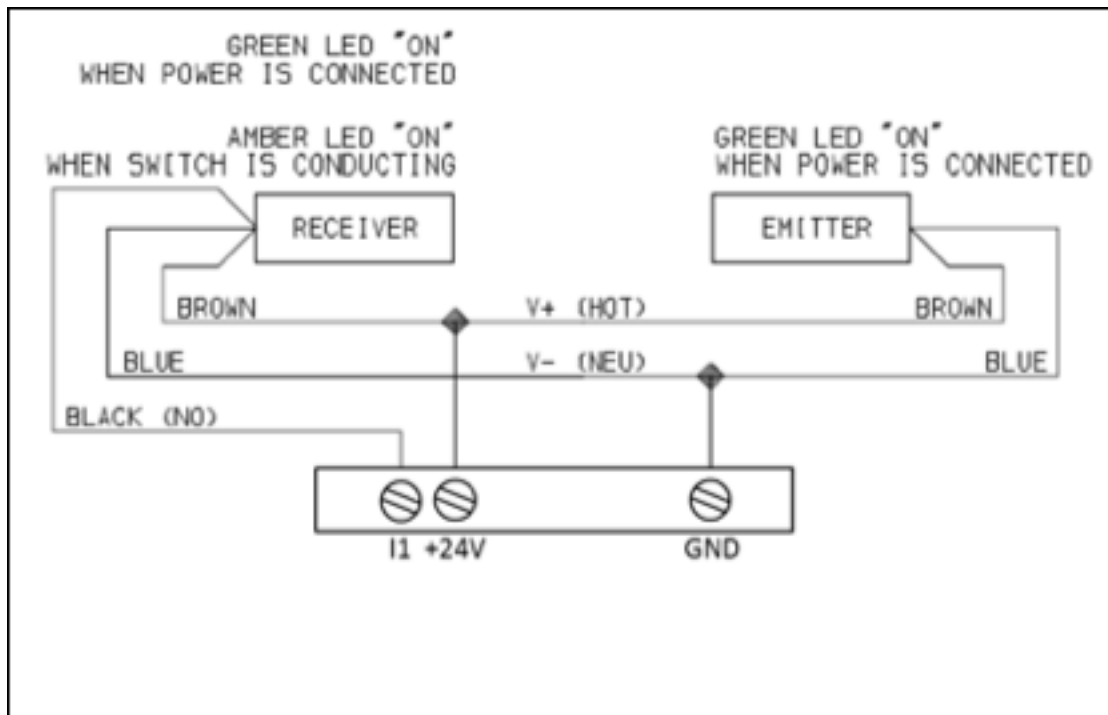
8.0 ELECTRICAL CONNECTIONS FOR LOADER OPTIONS

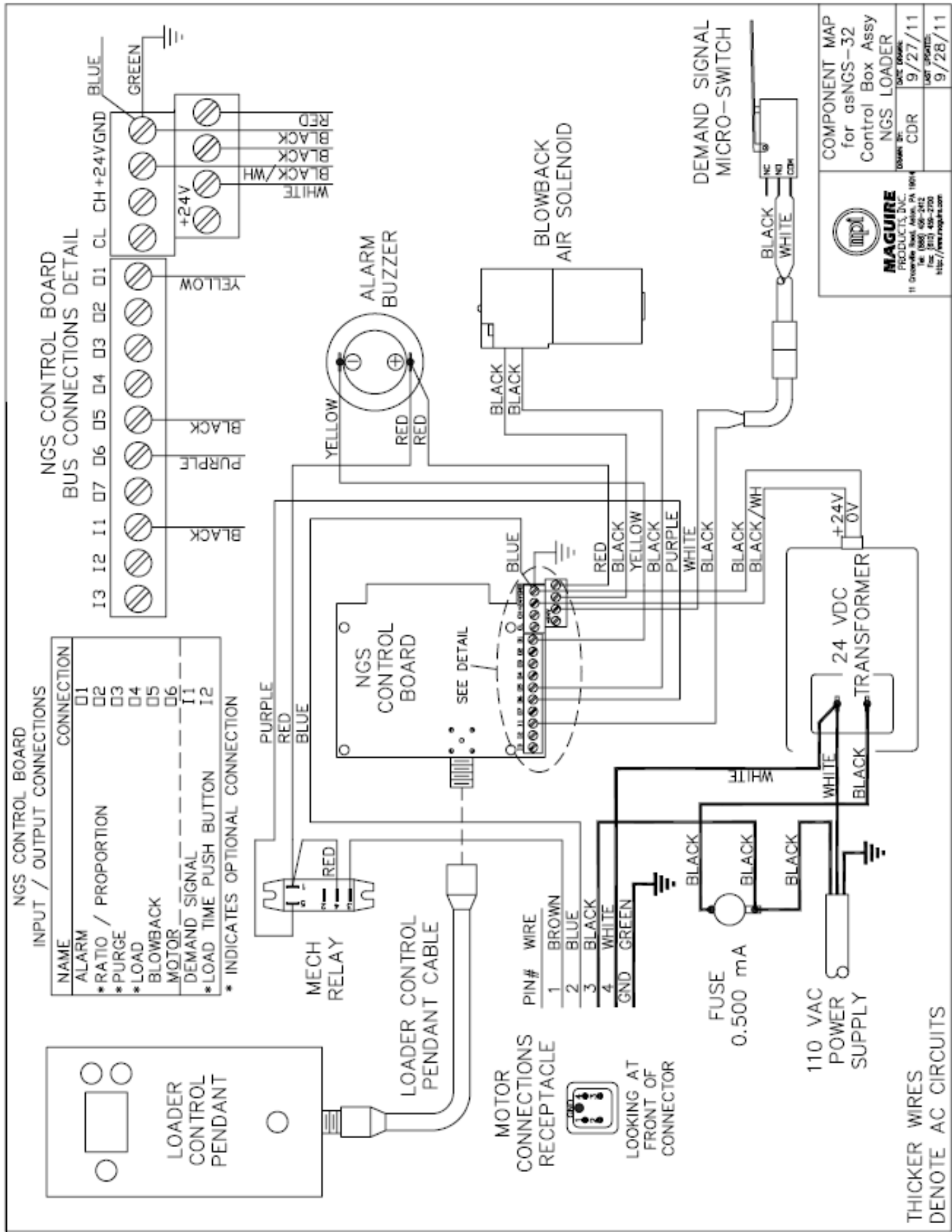
Proportioning Valve

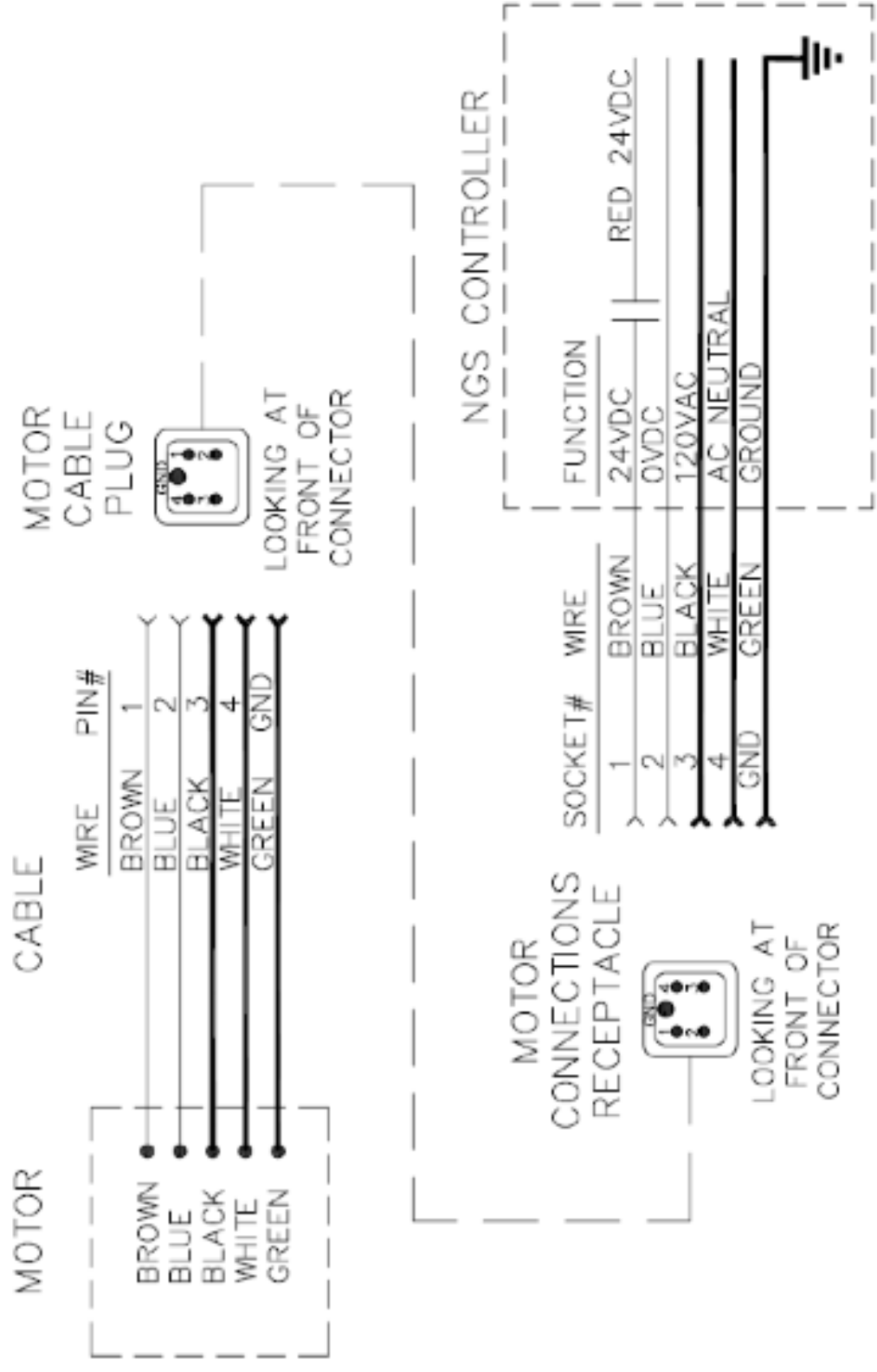
-Purge Valve

-Output to Auxiliary Alarm Device

1. Remove the loader control enclosure, and carefully tip the enclosure out without straining wires connected to the control.
2. Locate the correct terminals for the device you are connecting, as shown in the diagrams that follow, and connect the wires carefully. Use care as some terminals accommodate multiple wires.
3. Route the cable out of the control box, through one of the slots in the side. Tightly install a tie wrap (not included) onto the cable, inside the control enclosure to prevent the cable from being pulled out of the box.
4. Tip control box back into place and tighten top screw.







THICKER WIRES DENOTE AC CIRCUITS

9.0 TROUBLESHOOTING

Most loader problems are a result of a dirty filter, air leaks or improper adjustments. These items should be checked before assuming equipment failure.

Problem

Motor will not run
 Inadequate or no vacuum
 Inadequate or no material flow
 Motor runs but proportioning solenoid not operating

Investigate

A, B, C, H, and L
 D, E, F, G, J
 D, E, F, and G, I, K
 L

CHECK

CONDITIONS

SOLUTION

A. Power Supply	No voltage or voltage incorrect voltage at outlet	Check incoming power supply
B. Stop/Start Switch	No voltage through switch	Replace switch
C. Vacuum motor	No voltage at motor	See A,B, & L
D. Filter	Filter dirty	Replace filter (Also see G & J)
E. Air Ducts	Obstructed	Remove obstruction
F. Leaks in system	Air leaking into system	Replace gaskets & repair leaks as necessary
G. Blowback air pressure incorrect	Low pressure	Increase pressure (not to exceed 125 psi)
H. Limit switch	No voltage through switch	Replace switch
I. Load Time	Chamber not filling sufficiently Chamber over-filling	Increase load time Decrease load time
J. Pulse rate	Insufficient to clean filter	Increase rate
K. Dump time	Insufficient to allow complete emptying of chamber	Increase time
L. Pulse solenoid	Correct voltage at solenoid	Replace solenoid

10.0 WARRANTY

NOVATEC, INC. - EFFECTIVE DATE 1 APRIL 2019

NOVATEC, INC. offers COMPREHENSIVE PRODUCT WARRANTIES on all of our plastics auxiliary equipment. We warrant each NOVATEC manufactured product to be free from defects in materials and workmanship, under normal use and service for the periods listed under "Warranty Periods". The obligation of Novatec, under this warranty, is limited to repairing or furnishing, without charge, a similar part to replace any part which fails under normal use due to a material or workmanship defect, within its respective warranty period. It is the purchaser's responsibility to provide Novatec with immediate written notice of any such suspected defect. Warranted replacement parts are billed and shipped freight pre-paid. The purchaser must return the suspect defective part, freight prepaid and with identifying documentation to receive full credit for the part returned. Novatec shall not be held liable for damages or delay caused by defects. No allowance will be made for repairs or alterations without the written consent or approval of Novatec.

The provisions in equipment specifications are descriptive, unless expressly stated as warranties. The liability of Novatec to the purchaser, except as to title, arising out of the supplying of the said equipment, or

its use, whether based upon warranty, contract or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided. All such liability shall terminate upon the expiration of said warranty periods. Novatec shall not in any event be held liable for any special, indirect or consequential damages. Commodities not manufactured by Novatec are warranted and guaranteed to Novatec by the original manufacturer and then only to the extent that Novatec is able to enforce such warranty or guaranty. Novatec, Inc. has not authorized anyone to make any warranty or representation other than the warranty contained here. Non-payment of invoice beyond 90 days will invalidate the warranty. A renewed warranty can be purchased directly from Novatec.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any issues in connection with our equipment.

Warranty Periods:

Note: All warranty periods commence with the shipment of the equipment to the customer.

5-YEAR (Except 1-Year on Non-Novatec Buy-Out Items)

Resin Drying to Include:

NovaWheel™ Dryers *
Dual Bed Dryers
NovaDrier *
NDM-5 Membrane Dryer
Gas-Fired Process Heaters
Gas-Fired Regeneration Heaters
Drying Hoppers
Central Drying Hopper Assemblies
Heater/Blower Units and Hot-Air Dryer
Silo Dehumidifiers
NovaVac Dryers *
Nitrodry Nitrogen Dryers
DryTemp Plus

Central System Controls to Include:

FlexTouch™ Series Controls
FlexXpand™ Series Controls
OptiFlex™ Series Controls
PLC Communications Modules
Greenboard Communications Modules
LOGO! Mini PLC
MCS-600 Series Controls – (Distributed I/O)
MCS-400 Series Controls
CL Silo Manager

Moisture Measurement Equipment to Include:

MoistureMaster®

PET Resin Crystallizers

Resin Blending and Feeding to Include:

WSB Blenders, MaxiBatch & Feeders *
Gaylord Sweeper Systems

Downstream Extrusion Equipment to Include:

C and NC Bessemer Series Cutters
NPS Bessemer Series Pullers
NPC Mini Puller/Cutter
All NS Series Servo Saws
Rx SmartMed Extrusion Products
All Cooling and Vacuum Tanks Manufactured by Novatec

Resin Conveying and Systems Components to Include:

GSL Series Vacuum Loaders
GlassVu Loaders, Receivers and Hoppers
VL/VLP Series Loaders
VRH, VR, VR-FL, VRP & VRM Series Receivers
Compressed Air Loaders
AL-B Barrel Loader
Cyclone Dust Collectors
Conveying System Accessories
Surge Bins
Valves and Accessories
Electronic Metal Separators
Quick Select Manifolds
Tilt Tables
Filter Dust Collectors
Drawer Magnets
Velocity Control Valves

3-YEAR

Resin Conveying System Components to Include:

** VPDB Vacuum Positive Displacement Pumps
** SVP Vacuum Pumps
** MVP Vacuum Pumps
** Railcar Unloading Systems

****5-Year Extended Warranty** - When a MachineSense® data plan is activated for products with **, Novatec automatically extends the warranty to 5 years. The data plan must be activated within 60 days after product shipment, and remain active through the warranty period to maintain extended warranty eligibility. The first 6-months of data plan usage is free from Novatec.

1-YEAR

Infrared Dryers
UltraVac Vacuum Pumps
Vacuum Regenerative Blower Pumps
Custom Equipment of any kind unless otherwise specified

Exclusions:

Routine maintenance/replacement parts are excluded from the warranty. These include, but are not limited to: hoses, desiccant, filters, filter elements, wiper seals, gaskets, dew point sensors, infrared lamps, motors, internal solenoids, fuses and motor brushes. Use with abrasive materials will void the warranty of any standard product. Wear resistant options may be available to extend usable service life with abrasive materials. Novatec reserves the right to limit the warranty if the customer installs replacement parts that do not meet the specifications of the original parts supplied by Novatec.

***Specific Exclusions:**

1. NovaDrier™ and NITROdry™ warranty is void if coalescing filters are not replaced on a 6-month or yearly basis (per instruction manual) and/or membrane has been exposed to ozone.
2. NovaVac Dryer -The ability of the canisters to hold vacuum will be compromised if the vacuum seal edge is damaged from mishandling. We do not warranty canisters damaged from improper handling. We do, however, warranty the seals.
3. LOAD CELLS on our WSB's are covered by Novatec standard warranty as long as they have not been damaged from improper handling.
4. Desiccant Wheel Warranty will be void if the wheel has been exposed to plasticizer, dust or other contaminants as a result of negligence on the part of the processor.
5. DryTemp+ - We assume no responsibility from equipment failures resulting from untreated or improperly treated water.

This warranty shall not apply to equipment:

1. Repaired or altered without written approval of NOVATEC unless such repair or alteration was, in our judgment, not responsible for the failure
2. Which has been subject to misuse, negligence, accident or incorrect wiring by others
3. Warranty is void if processing rates exceed manufacturer-recommended levels or if damage is caused by ineffective power isolation and/or power spikes/sags or incorrect installation.

NOTE: All conditions and content of this warranty are subject to changes without notice.

Drying > Conveying > Blending > Downstream



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