

Ruwac USA Industrial Vacuums

DS2 Series

Installation, Operation, Maintenance & Service

Model No.

Serial No.

Filter No.

Start-Up Date

• PORTABLE

• SILO VACUUMS

• REGEN VACUUMS



Version: 2.2

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I. --- Warranty

RUWAC warrants that new equipment which are complete units and are sold and/or manufactured by RUWAC, Inc. will be free from defects in material and workmanship for a period of 18 months from date of shipment or 12 months from date of start-up, whichever come first. RUWAC warrants that replacement parts sold hereunder will be free from defects in material or workmanship for a period of 120-days after the date of shipment. RUWAC machines that have been completely re-built at the factory will carry a 180-day warranty from date of shipment. All field repairs preformed by authorized RUWAC service personnel are covered by a 120-day parts only warranty.

RUWAC, Inc. will not assume any responsibility under the terms of this limited warranty on equipment, which has not been paid in full. This warranty does not apply to any equipment that has been disassembled, repaired, or otherwise altered by any person without the written authorization of RUWAC'S service department, nor does it apply to any product that has been subjected to failure sure to corrosive or abrasive attack, misused, damaged, or improperly installed, nor does it apply to motors, controls, and components not manufactured by RUWAC, Inc. Motors, controls, and other Sub vendor's components therefor are warranted only to the extent of the manufacture's warranty. All warranty work on such products must be authorized by RUWAC, Inc. and must be performed in an authorized shop as designated by the manufacturer. RUWAC sole liability and buyer's sole and exclusive remedy hereunder is the replacement or repair at RUWAC'S option of products not complying with this warranty. Such repair or replacement shall be F.O.B. RUWAC'S factory, and RUWAC reserves the right to invoice all expenses incurred when repairs are made in the field at the request of the customer, except as specifically set forth herein, RUWAC makes no warranty express or implied, with respect to the products and/or service supplied hereunder, this warranty is in lieu of and excludes all other warranties, including without limitation, any warranty of merchantability, fitness for a particular purpose, or conformance to purchaser's specifications.

II. --- Safety

CAUTION: Standard Ruwac DS2 series machines are not to be used for the removal of liquids or any volatile, viscous, flammable or explosive media. If you are unsure about your application requirements consult your Ruwac representative.

CAUTION: Standard Ruwac DS2 series machines are designed for continuous use, provided the vacuum is not held under constant stress. If you are unsure about your application requirements consult your Ruwac representative.

CAUTION: The components in this machine can be very heavy. Always follow safe lifting procedures.

CAUTION: A dust mask should be worn when working with fine materials.

CAUTION: Machines equipped with a reverse pulse module must always be supplied adequately when the machine is on. The module is controlled by an electrical sequential timer (requires a 110 volt power supply) or differential pressure switch. The module itself requires a source of compressed air of 90 PSI at 2 - 4 CFM (depending on module). This device prevents the accumulation of material on the filter and therefore prevents the machine from being held under excessive stresses due to material blockage.

CAUTION: Machines equipped with a motorized shaker must be supplied with a three phase, 230 - 460 volt (depending on motor) power supply when ever the machine is on. The motorized shaker is controlled by an electrical sequential timer (requires a 110 volt power supply), a differential pressure switch or a manual switch. Manual switch models should be actuated before and after every use while the vacuum is off. This device prevents the accumulation of material on the filter and therefore prevents the machine from being held under excessive stresses due to material blockage.

CAUTION: Check motor direction. Vacuum can be produced while operating in both directions. A backwards rotation will produce 40% less while heating the bearings, however. The motor should always run clockwise.

CAUTION: Vacuums are not design for working in classified explosion atmospheres in accordance to OSHA / NFPA regulations.

DS2 SERIES INSTRUCTIONS:
GROUNDING INSTRUCTIONS

This appliance must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electrical current to reduce the risk of electric shock. This appliance is equipped with a cord having an equipment-grounding conductor and grounding plug. The plug must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Danger: Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the of the cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal. Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the appliance is properly grounded. Do not modify the plug provided with the appliance—if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This appliance is for use on a circuit having a nominal rating more than 120V and is factory equipped with a specific electrical cord and plug to permit connection to a proper electrical circuit. Make sure that the appliance is connected to an outlet having the same configuration as the plug. No adaptor should be used with this appliance. If the appliance must be reconnected for use on a different type of electrical circuit, the reconnection should be made by qualified service personnel; and after the reconnection, the appliance should comply with all local codes and ordinances.

Grounding Check

ABOUT RUWAC’S DS2 UNITS AND GROUND:

- All DS2 units are constructed of carbon impregnated fiberglass housings which dissipate static charge
- Metal components are electrically grounded through a series of internal ground wires. Grounding can be confirmed using a standard multimeter



Check for continuity between the plug and handle bar, dustpan lever, and starter box if applicable.

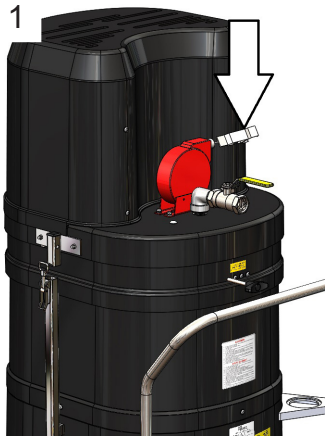


Also check for continuity between the plug and inlet, all four casters, and frame hardware if applicable.

Note: If continuity is not found across any of these points, consult the parts manual to check that all ground wires are in place. For further assistance, contact Ruwac.

**DS2 SERIES STANDARD INSTRUCTIONS:
AV SERIES START-UP OPERATION**

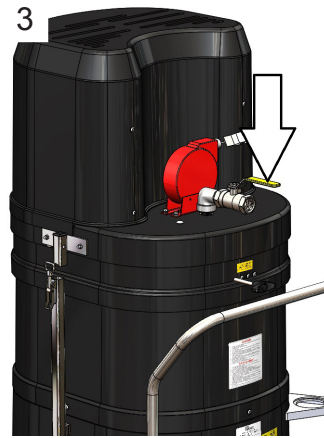
NOTE: AV2000 Vacuums run at 100 PSI and 100 CFM, to be used with a 1" NPT unrestricted air line.



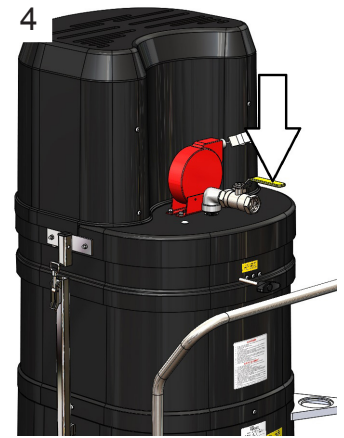
If included, affix the retractable grounding cable to an adequately grounded object



Attach a full port air supply connection. A 1" unrestricted air line is required for optimal performance



To turn on the machine, open the ball valve by turning the lever towards you



To turn off the machine, close the ball valve by turning the lever away from you

DS2 SERIES INSTRUCTIONS: STANDARD FILTER INSPECTION

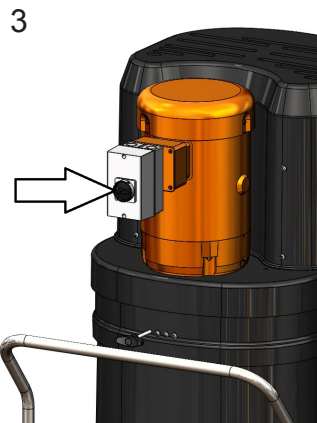
WARNING: Always wear a dust mask when performing filter inspections or service.



Pull up on the dustpan lever to release the dustpan. Check that the dustpan is empty, then replace it.



Connect the machine to proper power source, as indicated by the serial tag.



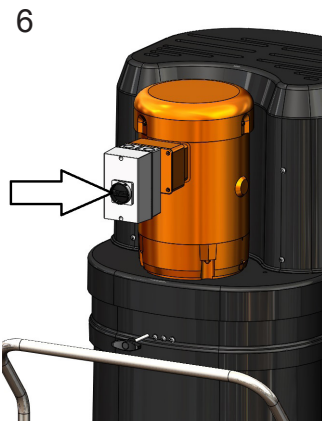
Quickly turn the motor on then off to confirm the motor direction.



Use the filter shaker to clean the filter before and after each use.



Empty the dustpan by releasing the rear lever.



Turn on the motor before removing the dustpan. This will ensure excess material sticks to the filter.



Remove dustpan and empty contents. Dustpan should be emptied after every use.

DS2 SERIES INSTRUCTIONS: STANDARD FILTER INSPECTION

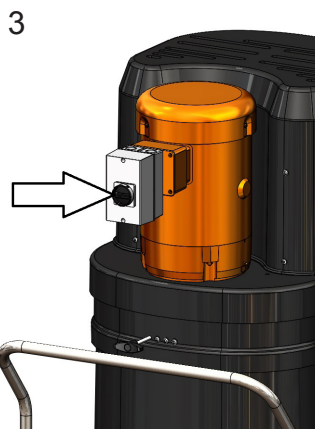
CAUTION: Refer to OSHA / NFPA guidelines regarding handling of your material prior to servicing filter. Always follow proper safety procedures when working with hazardous materials.



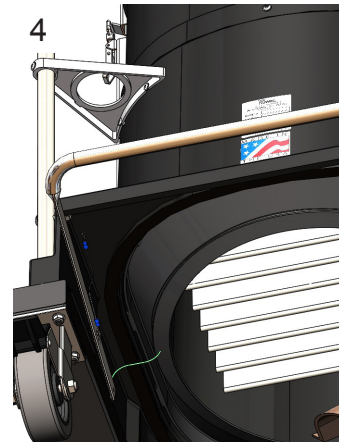
Use the shaker bar to clean the filter while the machine is off.



Remove the dustpan.



Turn the machine on to trap excess material against the filter.



Look underneath the base to inspect the filter. Check the inlet for wear.

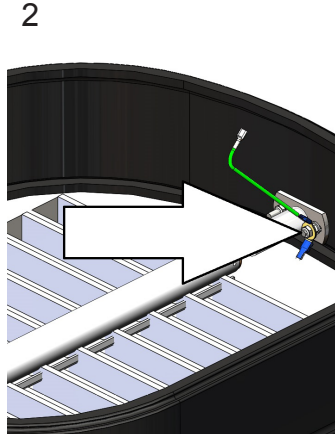
Note: Using an object to dislodge material may tear the filter. Consult your RUWAC representative if material blockage is excessive. Do not use high pressure compressed air or water to clean off filter, as material may become permanently lodged into filter membrane.

DS2 SERIES INSTRUCTIONS: STANDARD FILTER REPLACEMENT INSTRUCTIONS

CAUTION: Motor deck will be heavy and will require a crane to remove. Always wear a dust mask when performing filter inspections or service.



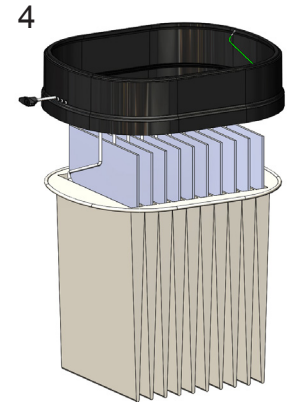
Remove the motordeck using a hoist.



Disconnect the filter ring grounds.



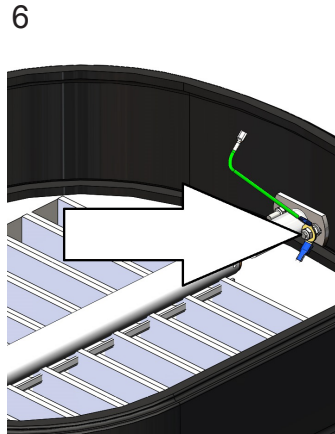
Lift the filter ring and remove the filter from cage.



Replace the filter over the cage. Be sure to place the filter inserts into the pleats.



Place the filter ring back onto the base. Be sure that the filter is seated properly.



Reconnect the ground wires.



Replace the motordeck and clamp it together.

NOTE: The presence of material above the filter or in the exhaust is often the result of a misaligned seal or damaged filter. Consult your RUWAC representative if either is the case.

DS2 SERIES INSTRUCTIONS: HEPA MAINTENANCE

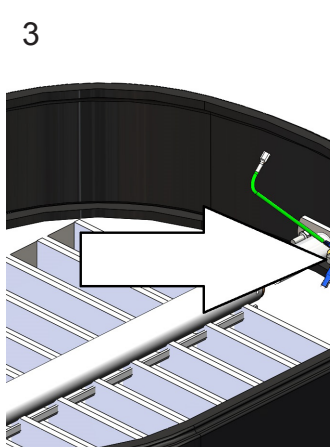
CAUTION: Motor deck will be heavy and will require a crane to remove.



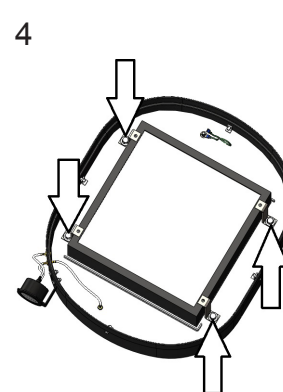
To ensure optimal performance, replace the filter at 8" W.C.



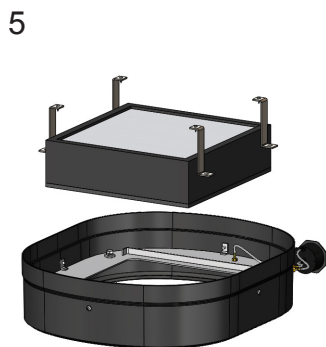
Release the clamps and remove the motordeck using a hoist



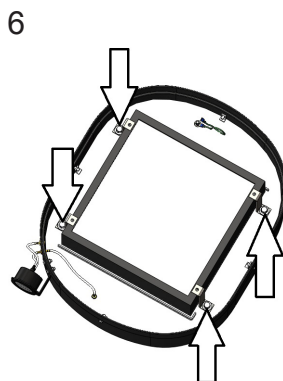
Disconnect the ground wires.



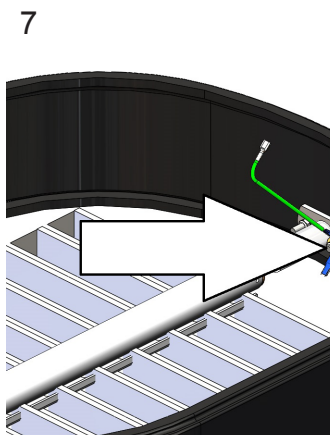
Locate and loosen the bracket hardware.



Remove and replace the filter.



Secure the bracket hardware.



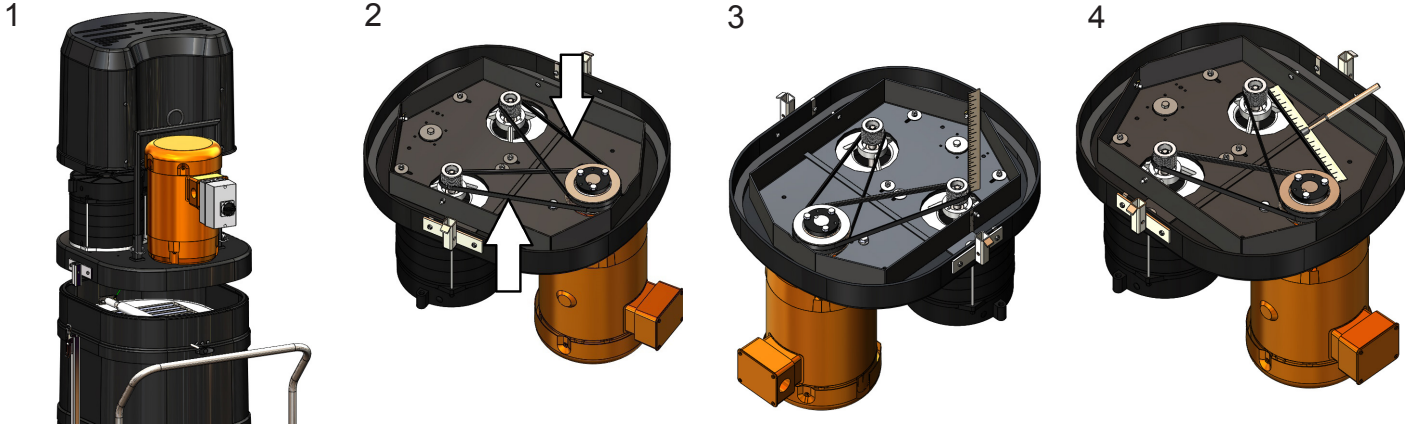
Reconnect all ground wires.



Replace motordeck and fasten the clamps.

DS2 SERIES INSTRUCTIONS: BELT INSPECTION

CAUTION: The motor deck of this unit can be very heavy. Do not attempt to lift it manually. Follow safe lifting procedures.



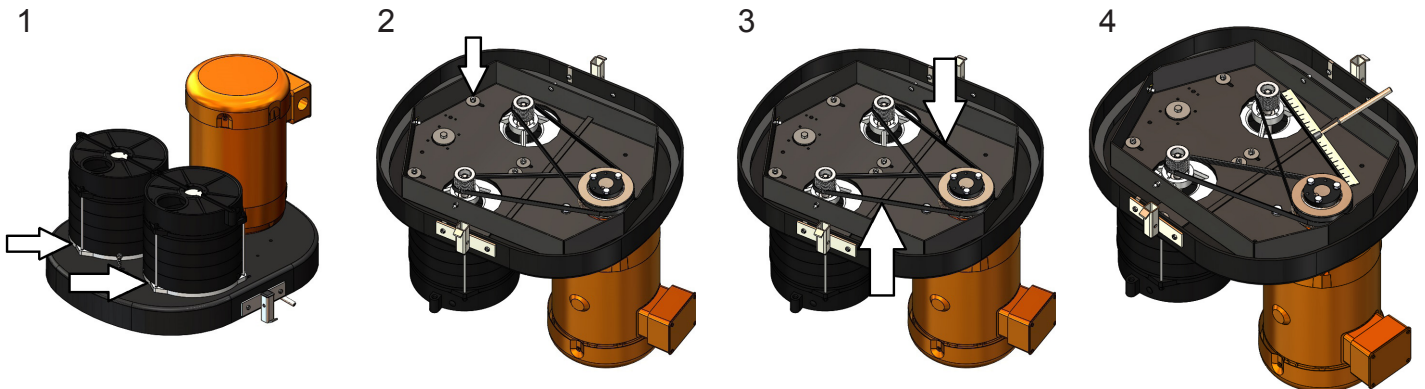
Remove the silencer hood, and lift the motordeck using a hoist.

Inspect belts for any glazing, cracking, or shedding. Any of these will require a belt replacement. (See below)

Check that the sheaves are properly aligned. (See pg. 11)

Check the belt tension. (See pg. 10)

BELT REPLACEMENT



Cut and remove silicone from around the turbines.

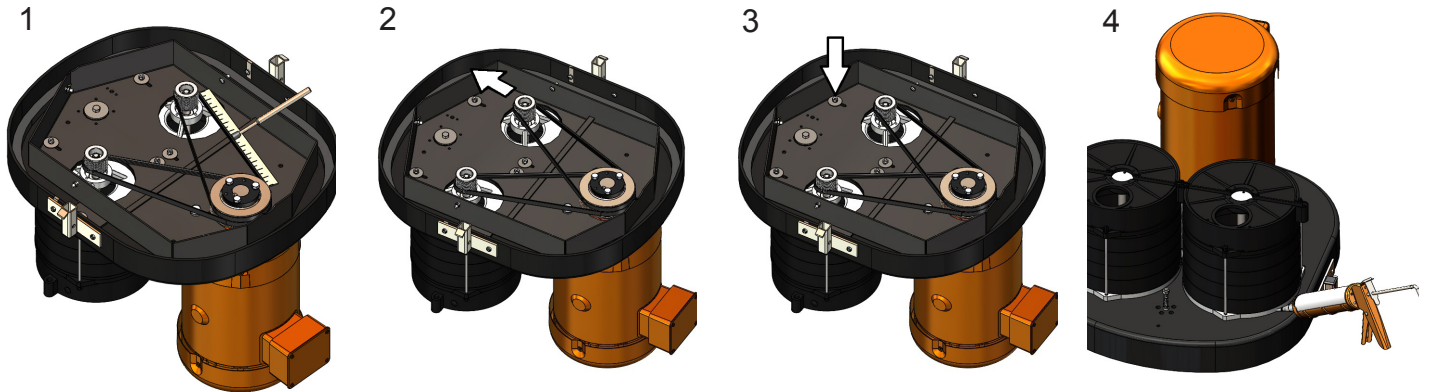
Loosen turbine hardware (3 per turbine), then slide inward to slacken the belt.

Remove and replace belts as necessary.

Tension the belt. (See pg. 10)

DS2 SERIES INSTRUCTIONS: BELT TENSIONING

NOTE: Complete the previous operations to prepare the motor deck for service of the motor, turbine or belt. Replace any defective components and secure the motor with bolts before proceeding.



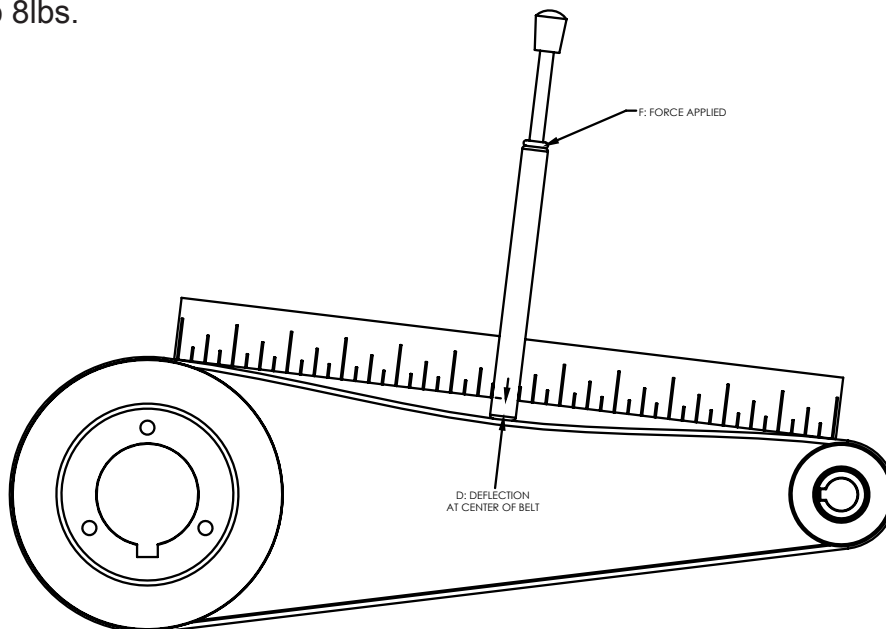
Measure belt tension by using a straight edge and tension gauge as shown. Refer to the diagram below for proper tension specifications.

To tighten belt, slide the turbine outward.

Secure the turbine when belt is tensioned properly.

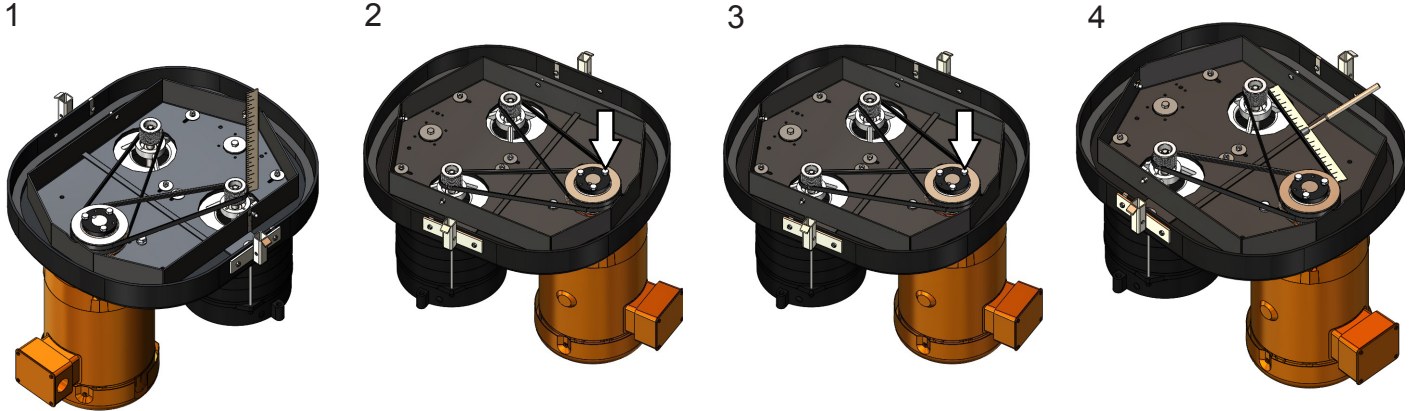
Reseal the turbines with silicone.

New 6-groove belts should be set to 6lbs at $\frac{3}{16}$ " of deflection. New 10-groove belts should be set to 9lbs at $\frac{3}{16}$ " of deflection. Allow new belts to stretch by running in for several hours. After run-in period, 6-groove belts should be between 4lbs to 5lbs, and 10-groove belts should be between 7lbs to 8lbs.



DS2 SERIES INSTRUCTIONS: PULLY ALIGNMENT

CAUTION: Motor deck will be heavy and will require a crane to remove. Before any maintenance service is done, follow standard lock out and tag out procedures as well.



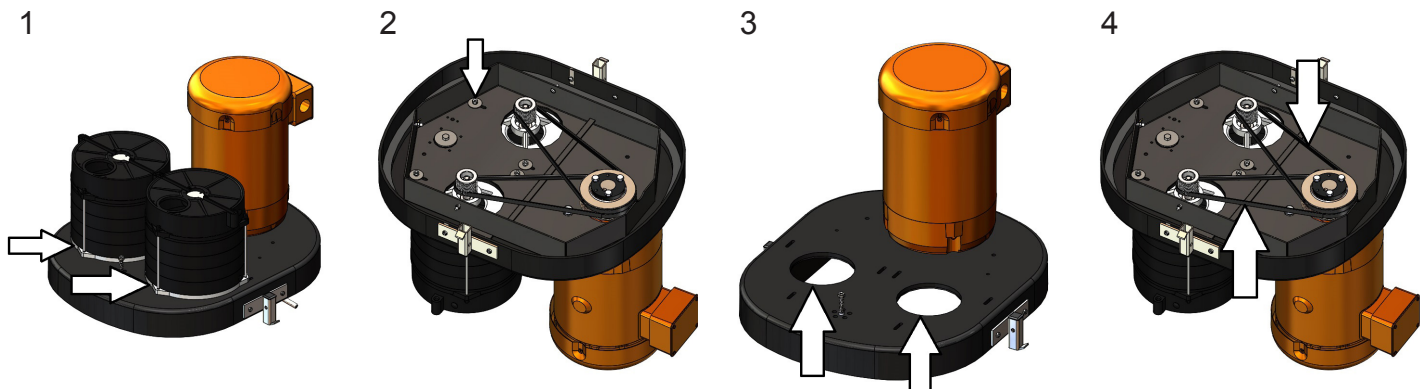
1
Measure height of first groove on each sheave to check alignment.

2
Loosen motor sheave hardware and adjust as necessary.

3
Once the motor sheave is at proper height, tighten the bolts to 15 ft-lbs.

4
Check that the belts are tensioned properly (See pg. 10)

TURBINE REPLACEMENT



1
Cut and remove silicone seal around the turbines.

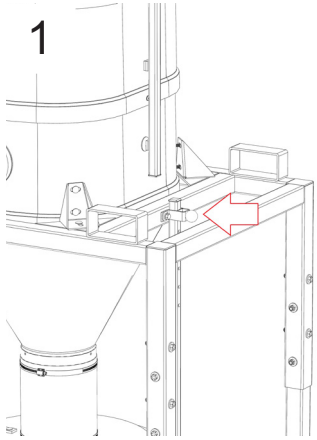
2
Remove the hardware to release the turbine.

3
Remove any excess silicone from the motor deck.

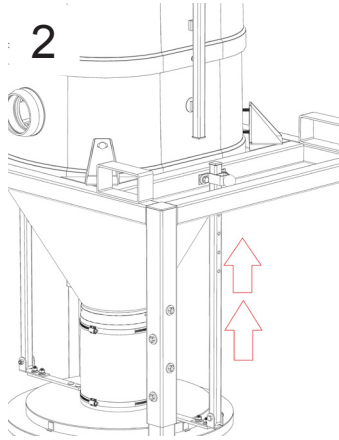
4
Install turbine and belt. Adjust the belt (See pg. 10)

DS2 SERIES SILO VACUUM INSTRUCTIONS: SILO DRUM RELEASE & EMPTYING

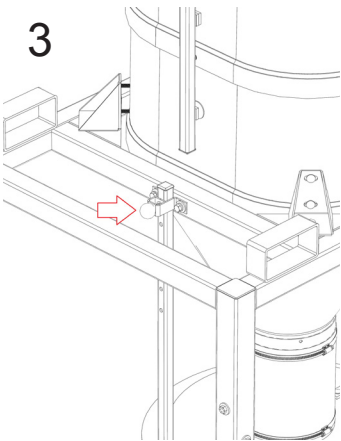
The Silo System drum is comprised of two locking pins located on each side of the bars attached to the drum lid of the silo. Each locking pin has a black ball handle for release, and each can be inserted into the designated guide to securely position the lid in the upward (open) and downward (closed) positions. When the drum lid is fixed in the upward position, it allows for the removal and emptying of the drum caddy from underneath the silo system.



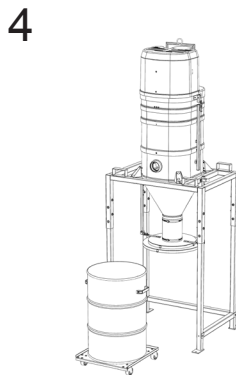
1
Standing on either side of the machine, grab the ball pin lock and pull it out of the guide.



2
Once ball pin is released, pull up on the guide bar until it locks in the upward position, making sure the ball pin clicks into its designated hole.



3
Repeat the process for the other side.



4
Once both pins and lid are locked in the up position, remove the drum by rolling the caddy unit from under the silo.



Note: To reattach, place drum underneath silo, release the locking pins on each side, and allow the lid to lower onto the drum.

**DS2 SERIES REGEN INSTRUCTIONS:
SAFETY & MAINTENANCE**

CAUTION: Before servicing your Regen, ensure that the turbine is moving in the direction of the arrow. If it is not, do NOT proceed, as you will run the risk of burning out the motor.

Regenerative vacuum producers can become very hot under high vacuum loads. Since the temperatures can reach 320 degrees Fahrenheit it is important not to touch the blower surfaces during operation. Before performing any service on the blower, it should be disconnected from power and allowed to cool.

Regenerative vacuum producers **MUST** be equipped with a safety relief valve to protect the motor from over-load. This valve should be set at the factory with the correct operating voltage and current load. Regenerative vacuum producers have very tight internal tolerances and cannot digest solids or liquids. If the blower makes **ANY** unusual noise it **MUST** be shut down **IMMEDIATELY** to prevent catastrophic damage.

Please take the time to read and understand this manual before placing the blower into service. Improper use of the blower can cause catastrophic failure and / or serious injury or death. All service should be performed by a trained service technician. Please insure that the blower is properly sized for the application and that the correct electrical service is available to run the blower. Never run the blower without a safety filter and the proper safety relief valve installed and calibrated.

As part of general maintenance, it is important to check the following periodically:

1. Inspect the vacuum relief valve and insure that it is functioning properly. The valve should open when the inlet is blocked. The amperage of the motor should be monitored to insure that the current is below full load when the inlet is blocked.
2. Periodically remove any excessive dust build up from the surface of the blower. This dust can be an insulator and prevent heat dissipation from the blower, resulting in overheating.
3. Carefully listen to the blower for any unusual noise from the housing or the motor. The blower should operate free of any vibration or internal noise.
4. Inspect and replace if necessary, the safety filter protecting the blower.

The Vacuum Producer:

1. Is designed for the continuous movement of clean, dry, non-flammable air.
2. It is not be located in a area that is classified as "hazardous"
3. Should not be started more than 6 times per hour, evenly spaced.

The performance of the vacuum producer can be affected by the following:

1. The altitude where the blower is located.
2. The ambient temperature.
3. The operating frequency if a frequency drive is used.
4. Overall inlet resistance.

Special Note:

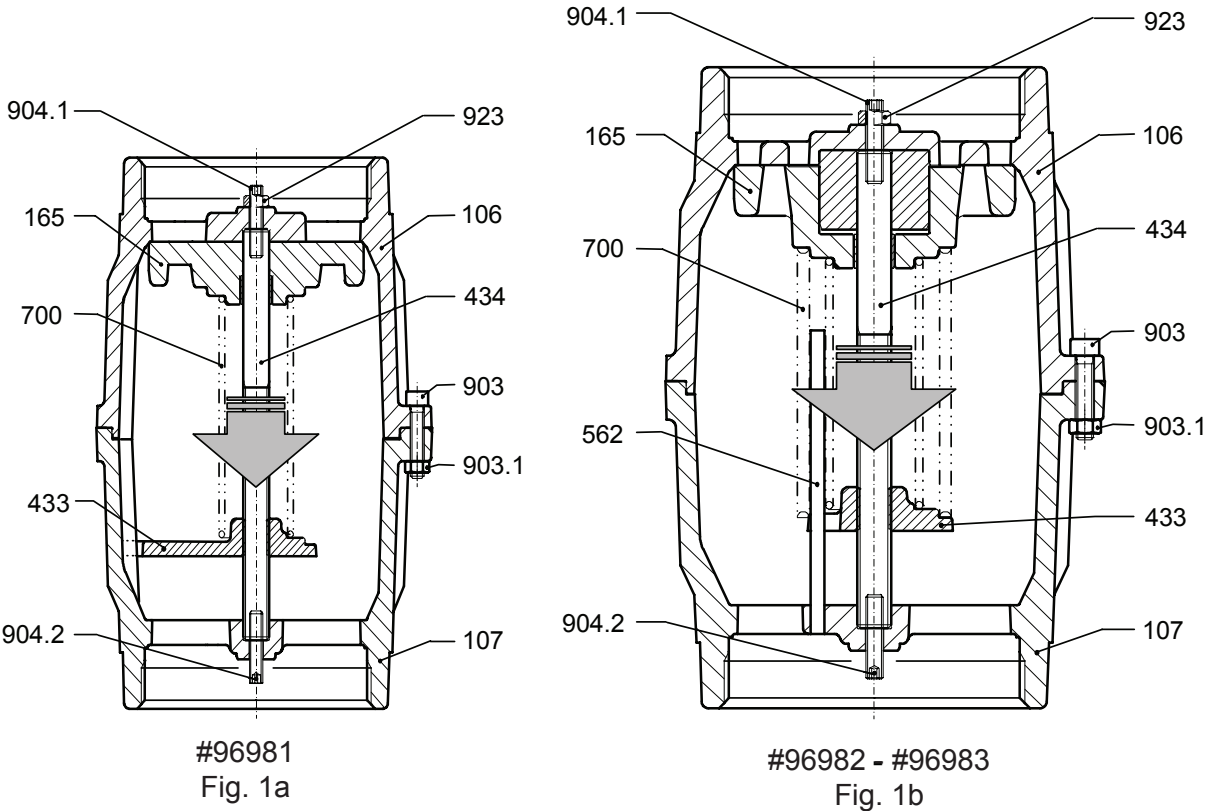
The above factors may require the vacuum relief valve to be adjusted to the specific conditions (See pages 23 & 24 for further instructions)



DS2 SERIES REGEN INSTRUCTIONS:
RELIEF VALVE ADJUSTMENT

WARNING When using the vacuum in another location, always verify motor rotation before placing the vacuum into service.

CAUTION: The electrical service at the installation site must supply the voltage stamped on the machine's serial tag. Most motors have multiple voltage capabilities that may appear on the motor tag but do not apply to the specific machine. Operating at an incorrect voltage may damage the machine. See the Ruwac serial tag for proper machine voltage.



ITEM	Description
106	Housing
107	Cover
165	Shutter
433	Spring guide disc
434	Shutter guide
562	Dowel pin
700	Spring
903	Screw
903.1	Nut
904.1	Upper grub screw
904.2	Lower grub screw
923	Nut

DS2 SERIES REGEN INSTRUCTIONS: RELIEF VALVE ADJUSTMENT

1. CHOICE OF SPRING

The valve is supplied with 2 different springs; each spring is to be used within a specific pressure-vacuum operating range. For the #96982 and #96983 there is the possibility to use both springs working in parallel. Referring to the SELECTION DIAGRAM, check that the valve is correctly sized and depending where the operating point (area A, B,...H) is located, choose one or two springs according to SPRING SELECTION CHART.

The valve is supplied with spring # installed. If spring needs to be replaced or a supplementary spring is needed to be added (for #96982 / #96983), proceed to point # 2 otherwise, adjust valve as per point #3.

2. INSTRUCTIONS FOR SPRING REPLACEMENT (OR MOUNTING ADDITIONAL SPRING FOR #96982 / #96983)

- Remove the two plastic caps on valve.
- Ensure stop-nut 923 is locked on the upper housing 106.
- Unscrew screw 903 from nut 903.1.
- Remove cover 107 from housing 106.
- Unscrew spring guide disc 433 taking it out from shutter guide 434.
- Remove spring 700 (only in case of replacement).
- Install the appropriate spring into shutter 165.
- Compress spring and screw spring guide disc 433 on shutter guide 434 for at least 20 full thread terms.
- Check that both ends of the spring are properly positioned within their seats.
- Install the cover 107 on the housing 106 inserting:
 - for #96981: the sliding guide on the slot in spring guide disc 433.
 - for #96982 and #96983: dowel pin 562 on the slot in spring guide disc 433.
- Tighten screw 903 on nut 903.1.

3. VALVE SETTING

A) Setting-up at allowed vacuum level

- Remove the two plastic caps on valve, if any.
- Position valve on the suction by-pass and connect a vacuum gauge as close as possible to the exhauster inlet (Fig. 2).
- Unscrew nut 923.
- Relieve spring tension by backing off upper grub screw 904.1 with the fit key.
- Turn on exhauster. Induce highest attainable vacuum by throttling air intake upstream relief valve (normally reducing throttle to fully-closed).
- Adjust upper grub screw 904.1 until maximum allowable vacuum level is reached.
- Tighten nut 923 keeping blocked upper grub screw 904.1.
- Open suction line.

Double-check vacuum gauge to ensure no additional losses are induced by pipes or filters installed upstream relief valve.

B) Setting-up at allowed pressure level

- Remove the two plastic caps on valve, if any.
- Remove nut 923 from upper grub screw 904.1 and place it on to the lower grub screw 904.2.
Do not tighten.
- Position valve on the discharge by-pass and connect a pressure gauge as close as possible to the blower outlet (Fig. 3).
- Relieve spring tension by backing on lower grub screw 904.2 with the fit key.
- Turn on blower. Induce highest attainable pressure by throttling air discharge downstream of the valve (normally reducing throttle to fully-closed).
- Unscrew lower grub screw 904.2 until maximum allowable pressure level is reached.
- Tighten nut 923 keeping blocked lower grub screw 904.2.
- Open discharge line.

Double-check pressure gauge to ensure no additional losses are induced by pipes or filters installed downstream the valve

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Insufficient Vacuum Pressure	- Motor in wrong direction	- Check motor direction and ensure it is moving clockwise.
	- Dustpan improperly seated	- Remove dustpan, inspect seal, replace dustpan.
	- Filter clogged or improperly seated	- Follow filter inspection procedure (Section IV.)
	- Clogged hose	- Remove hose and re-inspect vacuum pressure, if vacuum pressure returns to normal snake hose.
	- Unit is improperly sealed	- Block the inlet with a flat and rigid material to place the unit under vacuum pressure then inspect for air leaks.
Air Leaks	- Worn or poorly seated seals, Retainers improperly installed	- Block the inlet with a flat and rigid material to place the unit under vacuum pressure then remove retainers and turn the unit off. Inspect the seals for completeness, then reseal and secure components again under vacuum pressure.
Material In Exhaust / On Top Side of Filter	- Poor filter seal or torn filter	- Follow filter inspection procedure (Section IV.)
Unusual or High Pitched Noises	- Motor bearings, turbine bearing	- Follow relevant motor bushing inspection procedure (Section IV.) Check motor bearings for noise by hand.
	- Worn or poorly seated seals, Retainers improperly installed	- Block the inlet with a flat and rigid material to place the unit under vacuum pressure then remove retainers and turn the unit off. Inspect the seals for damage, then reseal and secure components again under vacuum pressure.
	- Belt worn, cracked, damaged, stretched, loose	- Follow belt / turbine / motor inspection in previous pages
Vacuum Motor Shuts Down Prematurely	- Confirm the amperage setting on motor overload	

ACCEPTANCE: The terms and conditions of sale set forth herein apply to any order accepted or acknowledged by RUWAC, Inc. Buyer's acceptance of RUWAC'S proposal or delivery of all or any part of the goods covered hereunder constitutes acceptance of the terms and conditions of sale contained herein, and RUWAC hereby rejects any additions to or modification to these terms and conditions. Any representations, promises, warranties, or statements by RUWAC or its agents that differ in anyway from these terms and conditions shall be given no force or effect. No contract is final until accepted in writing by RUWAC at its corporate office in Holyoke, Massachusetts.

PRICES: Prices quoted orally expire the same day they are made unless accepted in writing on that day or confirmed by written communication by RUWAC. Written price quotations are guaranteed for thirty (30) days after the date issued, but may be terminated by written notice within that period. After thirty (30) days, any written price quotations are subject to adjustment to reflect prices in effect at the time of shipment, including any changes in packing, storage, or shipping charges. This order or proposal includes only the equipment specified herein, and does not include freight or installation of RUWAC equipment. All prices are F.O.B. RUWAC'S plant in Holyoke, Massachusetts and are exclusive of all taxes, levies, and duties that may be assessed in connection with the sale or delivery of goods, and Buyer shall be responsible for all such taxes, levies, and duties. In the event RUWAC pays any such tax, levy, or duty, Buyer shall promptly reimburse RUWAC therefor. Any packaging requirements other than RUWAC'S standard packaging and commercial container will be invoiced as an extra charge.

PAYMENT: Payment is due in full thirty (30) days after the date of invoice. All invoices paid after the due date will be assessed a late payment charge of one and half percent (1.5%) per month or any portion thereof, or the maximum amount allowed by applicable law, whichever is less. Buyer shall be responsible for all costs of collection, including reasonable legal fees. Sales on the foregoing terms are subject to the approval of RUWAC'S credit department and may be changed at any time at RUWAC'S sole discretion. If RUWAC has reasonable grounds with respect to Buyer's ability or willingness to make timely payments for the goods. RUWAC may at any time suspend performance, decline to ship, or require advance payment in cash or other adequate assurance satisfactory to RUWAC.

SHIPMENTS AND DELIVERY: RUWAC shall use its reasonable efforts to meet all shipment or delivery dates recited in RUWAC'S proposal or in Buyer's order but any such dates are estimated only and are not guaranteed. RUWAC shall have no liability to Buyer for damages or penalties, direct or indirect, for any delay in shipment or delivery, whether such delay is minor or substantial, nor shall Buyer have the right to declare a breach of contract because of any such delay. In any event, delivery schedules are based upon the effective date of the order and are subject to prompt receipt by RUWAC of all necessary down payments, information and instructions from Buyer, including any required approval of drawings. RUWAC shall have the right to make partial shipments, and invoiced covering the same shall be payment terms hereof. RUWAC will attempt to ship in accordance with Buyer's instructions, but RUWAC will make the final selection of a method of shipment and a carrier unless Buyer clearly and conspicuously specifies that shipment must be by a particular method of carrier. RUWAC is not responsible for damage or loss in transit, and all such claims must be by Buyer directly against the carrier.

CHANGE ORDERS: RUWAC shall not be obligated to make any changes in or additions to the scope of the work which are initiated by Buyer or result from circumstances beyond RUWAC'S control unless there is an equitable adjustment in price and or delivery.

CANCELLATION, SUSPENSION OR DELAY: In the event Buyer requests or causes a cancellation, suspension or delay in any RUWAC'S work under this proposal or order based thereon, Buyer shall indemnify and pay to RUWAC all appropriate charges, including but not limited to any costs, expenses, and commitments incurred by RUWAC up to the date of receipt of notice of such cancellation, suspension or delay, plus RUWAC'S overhead and reasonable profit. If shipment is delayed on account of Buyer, the purchase price shall be due and payable as if delivery had been made. Additionally, all charges related to storage, disposition and/or resumption of work, at RUWAC'S plant or elsewhere, shall be for Buyer's sole account and Buyer thereto shall assume all risks incidental.

CLAIMS: NOTICE OF DEFECTS: Buyer shall give written notice of rejection of any shipment or portion thereof within thirty (30) days after the date of shipment specifying the reasons therefor. Failure to give such notice shall be deemed a waiver of any right of rejection and any claim with respect thereto (except as to claims under the warranty) and shall be deemed an acceptance of such shipment. Buyer shall set aside and hold rejected goods without further processing until RUWAC has an opportunity to inspect and advise of the disposition, if any, to be made of such goods. In no event shall any rejected goods be returned reworked, or scrapped by Buyer without the express written authorization of RUWAC.

INSPECTION OF EQUIPMENT: RUWAC shall have the right to inspect, after prior notices, the equipment supplied by it when in operation. If Buyer requires, RUWAC shall execute an appropriate secrecy agreement.

CONFIDENTIALITY: All proposals, drawings, diagrams, specification, pricing, and other materials relating to the goods included are the property and confidential information of RUWAC. Buyer shall not disclose such material or information without the written approval of RUWAC.

BACK CHARGE: RUWAC will pay claims for expenses of Buyer relating to labor and/or material supplied by Buyer only if (a) RUWAC is advise in writing before such expenses are incurred (2) RUWAC gives Buyer its prior written consent to the supply of such labor and/or material by buyer.

LIMITED WARRANTY: RUWAC warrants that new equipment which are complete units and are sold and/or manufactured by RUWAC, Inc. will be free from defects in material and workmanship for a period of 18 months from date of shipment or 12 months from date of start-up, whichever comes first. RUWAC warrants that replacement parts sold hereunder will be free from defects in material and workmanship for a period of 120-days after the date of shipment. RUWAC machines that have been completely re-built at the factory will carry a 180-day warranty from date of shipment. All field repairs by authorized RUWAC service personnel are covered by a 120-day parts only warranty. RUWAC, Inc. will not assume any responsibility under the terms of this limited warranty on equipment, which have not been paid for in full. This warranty does not apply to any equipment that has been disassembled, repaired, or otherwise altered by any person without the written authorization of RUWAC'S service department, nor does it apply to any product that has been subject to failure due to corrosive or abrasive attack, misused, damaged, or improperly installed, nor does it apply to motors, controls, and components not manufactured by RUWAC, Inc. Motors, controls, and other Sub vendor's components therefor are warranted only to the extent of the manufacturer's warranty. All warranty work on such products must be authorized by RUWAC, Inc. and must be performed in an authorized shop as designated by the manufacturer. RUWAC sole liability and buyer's sole and exclusive remedy hereunder is the replacement or repair at RUWAC'S option of products not complying with this warranty. Such repair or replacement shall be F.O.B. RUWAC'S factory, and RUWAC reserves the right to invoice all expenses incurred when repairs are made in the field at the request of the customer, except as specifically set forth herein, RUWAC makes no warranty express or implied, with respect to the products and/or service supplied hereunder, this warranty is in lieu of and excludes all other warranties, including without limitation, any warranty of merchantability, fitness for a particular purpose, or conformance to purchaser's specifications.

LIMITATION OF LIABILITY: RUWAC'S responsibility with respect to the goods and RUWAC'S obligations related thereto should in no event exceed the purchase price of the goods. RUWAC shall not be liable to Buyer for any special incidental, indirect, or punitive damages for any reason whatsoever, including, but without limitation damages in the form of (a) loss of profits, revenues, or anticipated savings resulting from the failure of the equipment to meet specifications or warranties (b) damages suffered by Buyer as a result of loss of production facilities or equipment (c) cost of replacement equipment (d) damages suffered by customers of the Buyer (e) any fines or penalties assessed for failure to comply with any law or government regulations.

REPAIR OF GOODS EXPOSED TO HAZARDOUS, TOXIC, OR INFECTIOUS MATERIAL: Buyer shall ensure that any goods submitted by Buyer or any of its customers to RUWAC for repairs or other service have been decontaminated and cleaned (including sterilization, if appropriate) of any hazardous, toxic or infectious materials, including without limitation any materials listed by the Environmental Protection Agency, OSHA, or any applicable state law as deserving or requiring special treatment. Upon RUWAC'S request, Buyer or its customer shall certify in writing that such goods contain no such hazardous, toxic, or infectious materials, and that such decontamination has taken place in accordance with accepted parties and in accordance with all applicable laws and regulations. If special safety equipment is required to protect RUWAC'S service personnel from any such hazardous, toxic, or infectious materials during field service work or otherwise. Buyer shall ensure that such safety equipment is provided and that the personnel are properly instructed. The provision of this paragraph shall apply to all work to be performed by RUWAC'S service personnel at any time, whether or not covered by warranty. Buyer shall defend and indemnify RUWAC for any and all losses, liabilities, expenses, and damages (including attorneys' fees) arising out of any failure of buyer or its customer to comply fully with the terms of this paragraph.

BUYER SUPPLIED DATA: Buyer acknowledges that RUWAC has relied upon all specifications and other data supplied by Buyer to RUWAC in the selection and design of the equipment and the preparation of this proposal. In the event the site operating conditions differ from those represented by Buyer and relied upon by RUWAC, any warranties or performance guarantees contained herein affected by such conditions shall be null and void, unless otherwise mutually agreed upon in writing.

VI. _____ Terms & Conditions

REMEDIES OF SELLER: In addition to any other remedies of RUWAC provided hereby or by law, in the event Buyer becomes bankrupt, insolvent, assigns assets for the benefit of creditors or its financial condition has substantially deteriorated, RUWAC may, at its sole option, declare a breach of contract, stop all work hereunder or demand payments in advance as security for its performance hereunder.

FACTIONS: GOVERNING LAW: Any dispute, controversy, or claim against RUWAC with respect to the goods or any of RUWAC'S obligations related thereto must be commenced within one year from the date of shipment. All contract between Buyer and RUWAC shall be governed by and construed in accordance with the laws of the state of Massachusetts except that body of laws controlling conflict of laws.

BONDS: In addition to the price specified herein, Buyer shall pay the cost of any bonds, which Buyer requires RUWAC to obtain.

ENTIRE AGREEMENT: These terms and conditions, together with the provisions of the proposal constitute the entire agreement between the parties pertaining to the goods, and they supersede any prior or contemporaneous agreements, representations, or understandings between the parties. No waiver or modification of these terms and conditions is binding unless such waiver or modification is set out in writing signed by an authorized manager or officer of RUWAC. RUWAC'S failure to strictly enforce any right on one occasion does not constitute a waiver of that or any on any other occasion.