

Ruwac USA Industrial Vacuums

FA2000 Series

Installation, Operation, Maintenance & Service

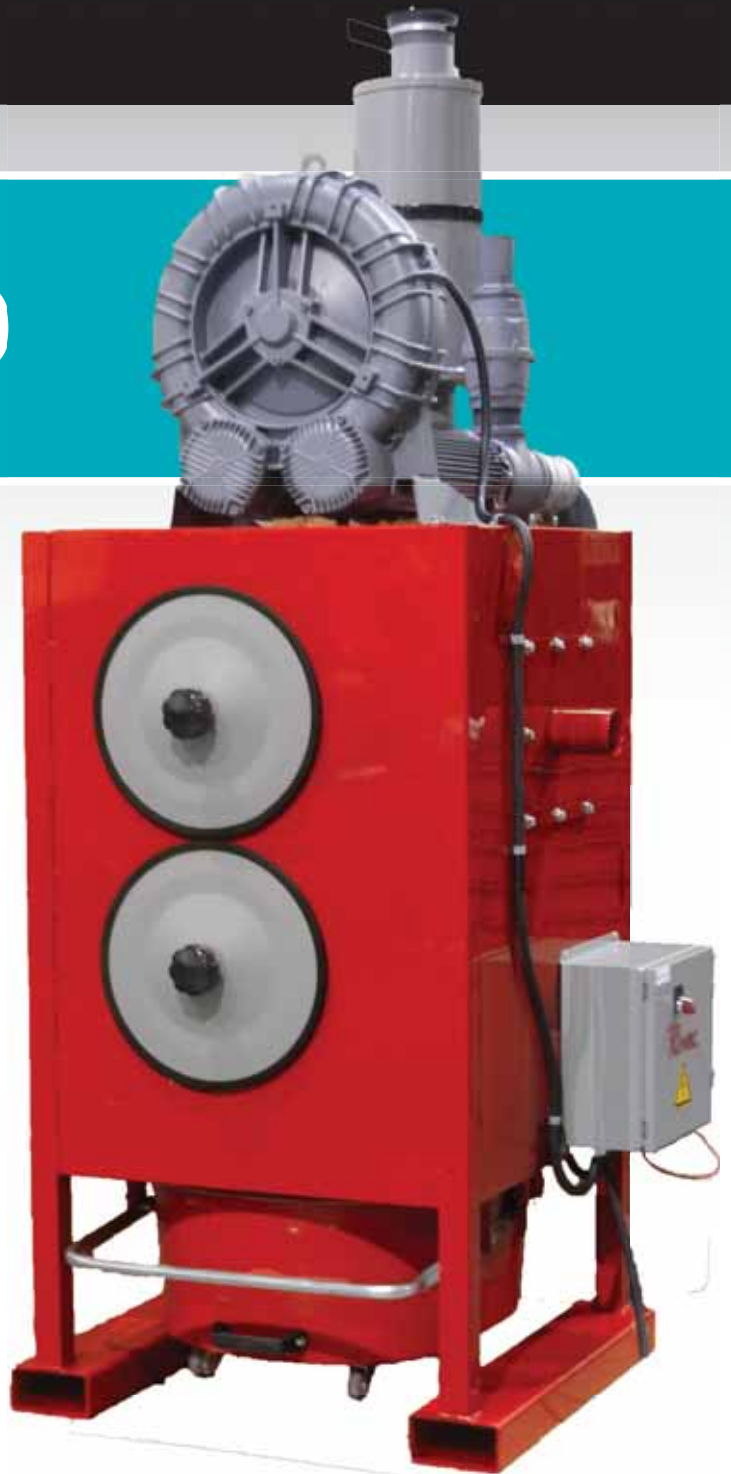
Model No.

Serial No.

Filter No.

Start-Up Date

STANDARD



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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: This machine is 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: This machine is 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: Machines equipped with a reverse pulse system must always be supplied adequately when the machine is on. The system itself requires a constant source of compressed air (70 - 80 psi). 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: The components in this machine can be very heavy. Always follow safe lifting procedures.

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

CAUTION: Disconnect the machine from the power source and air supply before performing inspection and / or maintenance.

CAUTION: Do not attempt to access the dustpan while the machine is on.

CAUTION: Make absolutely sure that there are no unsecured objects above the filter (after maintenance or inspection) before the machine is turned on. Catastrophic failure may occur if loose objects of any kind are drawn into the motor deck or turbine

**FA2000 SERIES INSTRUCTIONS:
SET-UP AND INSTALLATION**

SETTING UP AND INSTALLING YOUR FA2000 SERIES VACUUM

- Check to make sure that the dustpan is empty and free of debris.
- To ensure compliance with NFPA 70 standards, use qualified electrician in accordance with the National Electric Code and all local codes should perform all wiring and / or electrical adjustments when commencing start-up of your FA2000.
- Install the FA2000 unit on a flat surface and ensure that it is securely in place. Lag mounting feet to concrete pad if supplied with your system. (see Figure A)
- Ensure that there is a flexible connection from the motor to the filter to the tubing.
- Ensure all tubing is installed per Ruwac’s Tubing & Fittings instructions.
- Check that the ceramic filter lines are clear of debris. (see Figure B)
- Set up / adjust the reverse pulse filter system. (see pg. 7)



FIGURE A



FIGURE B

DUSTPAN REMOVAL & OPERATION



1 Pull up on the foot lever to release the dustpan.



2 Slide the dustpan out by its handle



3 To replace the dustpan, slide it fully underneath and step on the foot lever to lock it back into place.

MAINTENANCE NOTE:

It is required that you empty the FA2000’s dustpan on a regular basis to avoid filter clogging and potential mechanical failure,



**FA2000 SERIES INSTRUCTIONS:
START-UP**

WARNING: A qualified electrician in accordance with the National Electric Code and all local codes should perform all wiring and / or electrical adjustments when commencing start-up of your FA2000.



1 Pull up on the foot lever to release the dustpan. Empty if needed, and then replace.



2 Check the relief valve to ensure it is clear of any debris. (**Note:** Do not make adjustment to settings as they are set at the factory level.)



3 Connect the machine to an adequate supply of dry, clean, conditioned compressed air (constant 70 psi for Air Regulator, 80 psi for Relief Valve.)



4 Turn the reverse-pulse system on via the toggle switch on the left side of the reverse-pulse control box. The reverse-pulse should always be on when the machine is running.



5 Connect all of the machine to the proper (correct phase, voltage and amperage) power sources, as indicated on the machines serial tag.



6 Bump the motor by turning the machine on, and confirm that the motor direction is moving clockwise. If not, confirm that the machine is wired in accordance to the serial tag.

NOTE: Ruwac provides many custom controls for various specialized functions on these units. Consult the machine's packing list to confirm what is supplied. If additional info is needed, contact Ruwac.

FA2000 SERIES INSTRUCTIONS: CARTRIDGE FILTER INSPECTION

NOTE: Cartridge filters should be replaced when, in spite of the reverse pulse system, the Minihelic pressure gauge consistently registers above 5.5 H₂O". Always wear a dust mask when performing filter inspections or service.



1 Turn the machine off. Disconnect the power source and air supply. Allow any suspended material to settle before proceeding.



2 Turn the hand knobs on the filter covers counter-clockwise to release the filter covers.



3 Use both hands to pull the cartridge filters out of the filter housing.



4 Inspect the filters for damage and excessive material blockage. Also inspect both the front and back gasket points for signs of material leakage.



5 Insert the cartridge filter gasket side first when replacing.



6 Replace the filter covers.



7 Seal the filter covers tightly so they flush against the housing.



**FA2000 SERIES INSTRUCTIONS:
REVERSE PULSE ADJUSTMENT**

NOTE: The reverse pulse system was set to a differential pressure of 5.6" H₂O" at the factory. This is the recommended setting for normal operation.



1 Turn the vacuum system off and disconnect the power source.



2 Open the reverse-pulse control box.



3 Set the left dial on the reverse pulse circuit card to 8 seconds. Set the right dial on the reverse pulse circuit to 0.1.



4 Remove the pressure switch snap-on cover from the Dungs conduit enclosure by loosening it's retaining screw and pulling firmly on the bottom end.



5 Set the Dungs conduit to 14 mbar / 5.6" H₂O". (Note: 2.49 mbar = 1 H₂O".)



6 Replace the pressure switch snap-on cover.



7 Close the reverse-pulse control box.



8 Monitor the Minihelic pressure gauge while adjustment to achieve the desired setting. If the Minihelic pressure gauge stays at 6" - 7" H₂O" and pulsing does not directly improve the differential pressure, replace your filters.

WARNING: A qualified electrician in accordance with the National Electric Code and all local codes should perform all wiring and / or electrical adjustments.

FA2000 SERIES INSTRUCTIONS: VACUUM PRODUCER OVERVIEW

The regenerative blowers – exhausters have been designed and manufactured for use in an industrial environment, operated by qualified personnel and as a unit to be incorporated in a machine which conforms to the CE Machinery Directive.

The regenerative blowers – exhausters, like all machinery and equipment with live and moving parts -- can be a source of serious hazards unless properly used and protected.

The user is committed to ensure that:

All handling, assembly, installation, connection, maintenance and repair operations are undertaken by qualified personnel. As required by IEC standard 364, such people who by their background, training and experience as well as through their knowledge of statutory regulations, legislation, safety measures and operating conditions are able to carry out any necessary steps avoiding all possible risks to personal safety and equipment damage.

Such personnel shall have received all the instructions and information, including any local legislation, and will follow them during the performance of any operation.

It shall be forbidden for unqualified personnel to carry out any operations, even indirectly, on the machines and equipment.

During the installation, all the prescribed working conditions, including any possible local requirements, shall be observed.



The user must be aware that in operation:

- **The surface temperatures can reach 160 C°.**
- **The unit can not contain high internal pressures.**
- **There is small loss of the fluid handled.**
- **The level of noise may be unacceptable in certain applications.**



FA2000 SERIES INSTRUCTIONS: VACUUM PRODUCER CONDITIONS OF USE

The blowers-exhausters are designed for the continuous movement of air or non-explosive, non-hazardous and non-flammable gases in non-explosive environments.

Solid particles, however small, including dirt can cause serious damage; therefore it is essential that such substances should be removed from the gas using suitable filters upstream of the inlet. (Units, which do not have an adequate filter, ARE NOT COVERED BY UNDER WARRANTY.)

The maximum driving pressure must never be exceeded.

**UNDER NO CIRCUMSTANCES OPERATE THE UNIT WITH THE INLET OR OUTLET CLOSED.
IN PARTICULAR THIS APPLIES TO UNITS WITH HIGHER PRESSURES.**

Protect the units with an appropriate safety valve.

The performance characteristics are liable to variations due to the following factors:

- Differences of the suction or discharge pressures from the reference conditions.
- Operation in a system with both a low suction pressure and a high back pressure.
- Operation with a gas at a different temperature or of a different specific gravity from the reference data.
- Variations in the rotational velocity of the fan with respect to the reference value.

Both the gas inlet temperature and the ambient temperature must be in the range of -15 C° to $+40\text{ C}^{\circ}$. At the same time, ensure that the unit has good ambient ventilation, especially when subjected to severe operating conditions.

A unit subjected to frequent starting or to high ambient temperatures may be prone to overheating and in such cases further information should be requested. Similarly, where flammable gases may be present, information must be requested for alternative models certified for the explosion-proof environment.

Special Note:

The above factors may require the vacuum relief valve to be adjusted to the specific conditions (See pages 13 & 14 for further instructions)

BLOWER EXHAUST

It is important that the unit is installed in a well-ventilated environment where the temperature does not exceed 40 C° .

If outside, protect the unit from direct sunlight and avoid the possibility of water collecting in the external crevices especially when installed with the axis vertical.

**FA2000 SERIES INSTRUCTIONS:
VACUUM PRODUCER CONDITIONS OF USE****IMPORTANT**

Ingestion of foreign material, however small, can cause serious damage. Such material includes dust, sand, masonry debris, impurities in the tubes, cutting burrs or filings, welding or soldering slag and splatter, metal burrs and any residues from sealing and making the tube connections.

The unit can be mounted with the axis in any position. As supplied, the unit is balanced and will not transmit vibrations, however it is recommended that it is mounted on vibration dampening supports.

- To connect the accessories, remove the flanges from the unit and then seal and tighten.
- Do not over-tighten.
- Tube connections must be made with flexible couplings.
- Avoid using rigid couplings, which will induce stress and cause harmful vibrations.
- Remember to protect the inlet with suitable filters.
- If it is necessary to regulate the flow, install a bypass valve.
- Only remove the plugs on the ports when making the final connections.

- Select the tube size and the couplings to minimize the pressure drop, in particular
 - Do not use tubing of a smaller diameter than the ports of the unit
 - When installing units in parallel, size the manifold and main conduit accordingly
 - Utilize large radius bends and avoid using short radius elbows
 - Avoid using valves which have a reduced orifice relative to the general system
 - Use swing check valves (utilizing lightweight discs) which have the lowest pressure drop, rather than spring loaded check valves
 - For oxygenation select low loss diffusers (lowest pressure drop) and note that the pressure drop across plugs and porous membranes will increase over time due to progressive clogging.

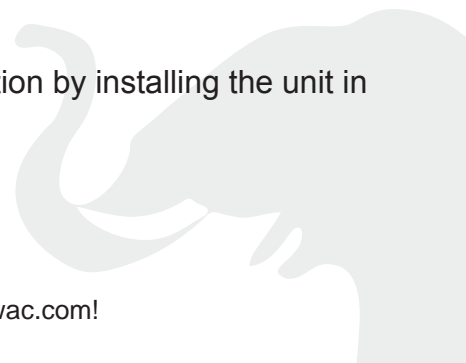
- A safety relief valve should be installed to avoid overloading the unit as a result of pressure variations.

- Make the electrical connections to the motor (AND CHECK THE DIRECTION OF ROTATION) before connecting the conduit.

- The blowers-exhausters are already supplied as standard with silencers in the suction and exhaust ports.

- For operation into free air either suction or discharge the free flow noise can be muffled with additional silencers In every situation avoid installing the unit on a structure which can transmit or amplify any noise (tanks, sheet metal, etc.)

- Further information should be requested regarding additional noise reduction by installing the unit in soundproof enclosures.



FA2000 SERIES INSTRUCTIONS: VACUUM PRODUCER CONDITIONS OF USE

ELECTRIC MOTOR

WARNING:

BEFORE UNDERTAKING ANY OPERATION ENSURE THAT THE UNIT IS DISCONNECTED FROM THE ELECTRICAL SUPPLY.

The electric motor has been selected for service in an ambient temperature between -15 C° and $+40\text{ C}^{\circ}$ at sea level. Consult factory on installation above or below sea level.

Ensure that the information on the nameplate is consistent with the supply voltage and frequency. Variations in the supply voltage up to $\pm 10\%$ are acceptable.

Outside the normal operating conditions the motor can not deliver full power and problems can arise with starting, especially for single-phase motors.

- Make the electrical connections referring to the wiring diagram in the terminal box, connecting an ground cable of adequate capacity to the ground terminal.
- The fuses are designed only for short circuit protection and not to safeguard the motor.
- Therefore, overload cutout (temperature or current) are essential to guard against the risk of over loads on the motor for example failure of one line in a three phase supply, an excessively high start up frequency, unacceptable variations in the supply voltage, stalled rotor, etc.
- Set the overload cutouts at the nominal current specified on the nameplate.
- The fuses should be rated for the peak currents especially in applications of direct starting.

CURRENT MEASUREMENT

The current drawn refers to normal operating conditions. Departures from the nominal operating conditions can result in variations of 5%.

There can be small differences in the measured value of each phase. These are tolerable up to a maximum deviation of 9%.

FA2000 SERIES INSTRUCTIONS: VACUUM PRODUCER CONDITIONS OF USE

COMMISSIONING

To commission the unit:

- Set the operating pressure or vacuum using a suitable gauge.
- Check the relieving pressure of the safety valve.
- Measure the current drawn by the motor and verify that it is within the limit stated on the nameplate.
- Adjust the overload cutouts accordingly.
- After one hour's operation, repeat the current measurements and verify that they are still within the stated limits.

OPERATING ADJUSTMENTS

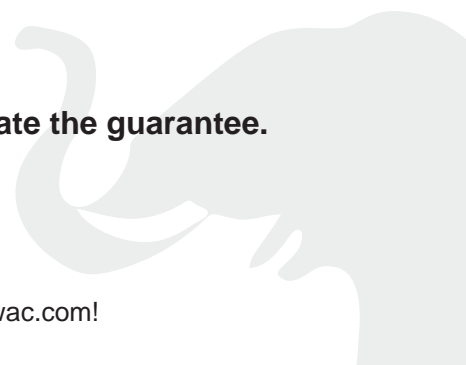
The blowers-exhausters will automatically generate the operating pressure required at the point of use. Since the power absorbed and the operating temperature are primarily a function of the operating pressure, it is possible that these can exceed the permitted operating conditions for the unit.

The driving pressure can be reduced by eliminating all possible obstructions and restrictions in the flow path. If it is still too high, the flow can be reduced by installing a bypass valve. Never choke the flow by throttling the suction or discharge.

MAINTENANCE

- After every 10 - 15 days of use, clean the cartridge filter if one is used.
- Replace the cartridge frequently in dusty environments. (A dirty filter will create a strong suction resistance and consequently a higher driving pressure, a higher operating temperature and an increase in the absorbed power).
- Check that the operating pressure does not change over time.
- Periodically remove any surface deposits which otherwise can cause the operating temperature to rise. To clean the internal components refer to the additional instructions for disassembly, cleaning and reassembly.
- It is important that a unit in service is subjected to periodic inspections by qualified personnel to insure against failures which, directly or indirectly, could cause damage. Departures from the normal operating conditions (e.g. a rise in the absorbed power, unusual operating noises, vibrations, etc.) are a sign of abnormal operation, which can lead to failure.
- In the event of any difficulties, please contact Ruwac, Inc.

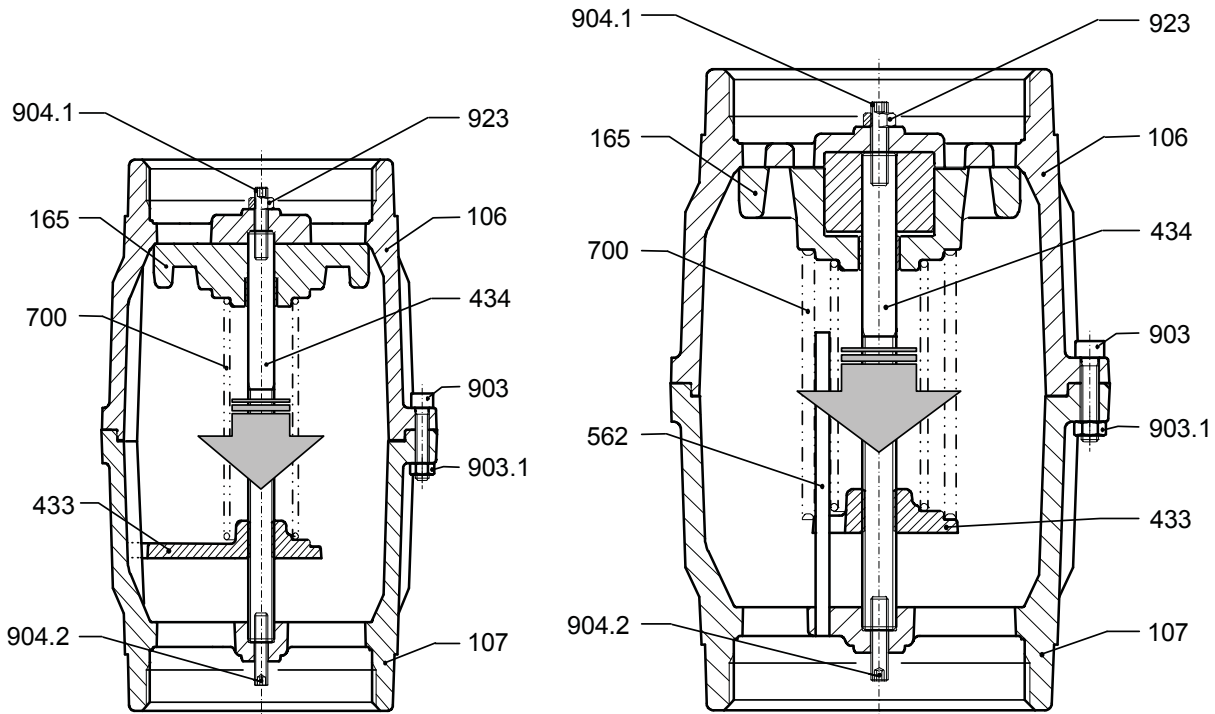
Please note that repairs undertaken by a third party will invalidate the guarantee.



**FA2000 SERIES 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.



#96981
Fig. 1a

#96982 - #96983
Fig. 1b

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

FA2000 SERIES 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 turns.
- 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

VI. _____ Troubleshooting

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Insufficient Vacuum Pressure	- Drum improperly seated	- Turn machine off, inspect drum lid seal, reposition drum if necessary
	- Filter clogged or improperly seated	- Follow filter inspection procedure, section IV. Make sure the reverse pulse system is turned on.
	- Unit is improperly sealed	- Block the inlet to place the unit under vacuum pressure then inspect for air leaks. CAUTION: Do not completely block the inlet of this machine for more that 5 minutes at a time.
Material In Exhaust	- Poor or torn filter seal	- Follow filter inspection procedure, section IV.
Unusual or High Pitched Noises	- Motor or blower bearing	- Contact your Ruwac sales representative

VII. _____ **Terms & Conditions**

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.



VII. Terms & Conditions

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.

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.