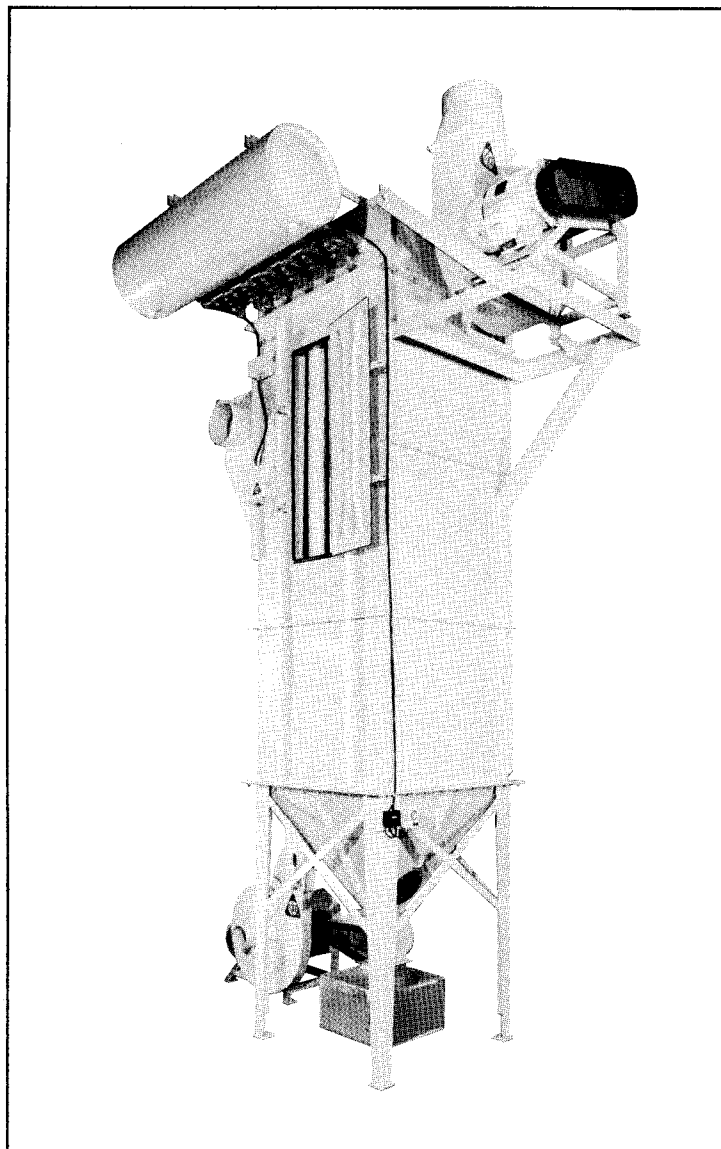




# Filter Manual

## MODEL PNEU-JET

Assembly • Safety Instructions • Controls • Operation • Service & Maintenance



# 1. INTRODUCTION

When you purchased your Kice Pneu-Jet Filter, you bought an air-cleaning device which has proven its reliability based on hundreds of installations and years of proven reliability and operation.

We're proud of our products and the people at Kice Industries who build them. At Kice, we start in our own foundry and follow the construction standards and manufacturing techniques, which have proven superior over the last 50 years.

The results of our development work and input from the users has resulted in the present design of the Kice Pneu-Jet Blast Filter.

This owner's manual is intended as a guide for proper installation, operation and maintenance to keep your Kice Filter operating safely and efficiently on the job. Service and spare parts information is also included for your benefit.

Sincerely,

Thomas F. Kice,  
President  
Kice Industries, Inc.

## WARRANTY

The Company warrants the equipment manufactured by the Company to be free of defects in material and workmanship for a period of one (1) year from the date of shipment. Kice agrees to repair or replace, at its option, any parts found defective in the opinion of the company. Kice is not liable for any costs in connection with the removal, shipment or reinstallation of said parts. This warranty does not apply to abrasion, corrosion, erosion abuse or misuse of the product. Assistance by Kice in system layout or selecting equipment does not imply Kice's responsibility.

Buyer agrees to look to the warranty, if any, of the manufacturer or supplier of equipment manufactured by others and supplied by Kice for any alleged defects in such equipment and for any damages of injuries caused thereby or as a result thereof. Where work is made to measurements or specifications furnished by the Buyer, Kice does not assume any responsibility for the accuracy of Buyer's specifications. Kice will not assume responsibility for alteration or repairs unless the same are made with the written consent and approval of Kice.

## ***PURCHASER SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ELECTRICAL MANUFACTURER RECOMMENDATIONS, UNDERWRITER'S CODE AND ALL SAFETY PRECAUTIONS.***

Kice extends no other warranty for any of its products other than the above express warranty and there are no other warranties, express or implied, including warranties of merchantability, fitness for a particular purpose or otherwise which extend beyond the above limited express warranty. Kice and its dealers shall not in any event be liable for consequential or incidental damages. The terms and conditions stated herein provide Buyer's sole and exclusive remedy. Any actions for breach of this agreement or warranty must be commenced within one year after the cause of action has occurred.

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## IMPORTANT:

Write down the **MODEL** and **SERIAL NUMBER** of the Kice Filter, along with the same information for the auxiliary equipment. (Airlock valves, fans, gearmotors, motors, sheave sizes, type and any special modifications to standard).

For additional information, application assistance or special service, you should contact the factory. We'll need to know the **MODEL** and **SERIAL NUMBER** of your Kice Filter. For ready reference, please record this information and the date of delivery or installation on the lines below. See the General information section for the location of model and serial number.

Model \_\_\_\_\_

Serial Number \_\_\_\_\_

Date of delivery or installation..... / /

## **2. GENERAL INFORMATION:**

### **TO THE NEW OWNER**

The purpose of this manual is to assist owners and operators in maintaining and operating the Kice Industrial Pneu-Jet Filter. Please read it carefully; information and instructions furnished can help you achieve years of dependable performance.

Separate manuals are included for auxiliary equipment that makes up a system such as discharge airlock valves, cyclones and fans. They contain additional information that may not be repeated in this manual. You are urged to read all manuals before attempting any operation or repair of the equipment in the system. If these manuals are not included in your owner's packet, contact our customer service department.

### **USING THIS MANUAL**

General operation, adjustment and maintenance guidelines are outlined for owners and operators of Kice Industrial Pneu-Jet Filters. Operating conditions vary considerably and cannot be addressed individually. Through experience, however, operators should find no difficulty in developing good operating safety and monitoring skills.

The term "**disconnect and lock-out**" as used in this manual means that power to the equipment has been disconnected through the use of a "**Pad Lockable Manual, Power Cut-Off, or Power Lockout Switch**".

Directions used in this manual, for example **RIGHT** or **LEFT**, **CLOCKWISE** or **COUNTERCLOCKWISE**, refer to directions when facing the door of the filter, under the reverse jet cleaning mechanism. The metal identification plate, containing the model, serial number and date is attached to the housing next to the filter door.

Photographs and illustrations were current at the time of printing, but subsequent production changes may cause your Kice Pneu-Jet Blast Filter to vary slightly in detail. Kice Industries, Inc. reserves the right to redesign and change the equipment as deemed necessary, without notification. If a change has been made to your Kice Pneu-Jet Blast Filter which is not reflected in this owner's manual, or the illustrated parts list, write or call Kice Industries Inc. for current information and parts.

### **MODEL AND SERIAL NUMBER**

The model of the filter, serial number and date of manufacture can be found stamped on the metal identification plate, located on the housing next to the access door.

### **KICE PNEU-JET FILTER PARTS AND SERVICE**

Use original Kice Pneu-Jet Filter replacement parts only. These parts are available from Kice Industries, Inc. To obtain prompt,

efficient service, always provide the following information when ordering parts:

1. Correct part description and number, as given in the Illustrated Parts List section of this manual.
2. Correct model number.
3. Correct serial number.

For assistance in service or ordering parts, contact the customer service department:

**Kice Industries, Inc.,**  
**5500 North Mill Heights Drive**  
**Wichita, KS 67219-2658**  
Phone 316-744-7151, Fax 316-744-7355.

**IMPORTANT:** Any unauthorized modification, alteration, or use of non-approved attachments or drive units voids the warranty and releases Kice Industries, Inc., from any liability arising from subsequent use of this equipment. Each type of Pneu-Jet Filter is designed to be used in a specific type of system. Using the Kice Pneu-Jet Filter for a purpose other than what it was designed, could result in personal injury, as well as product or property damage.

Purchased items such as speed reducers, motors, and positive pressure pumps are covered by the manufacturer's warranty. If there is a problem, with purchased items, check with the local service representative.

Kice equipment is designed and built to provide years of operation. As with any equipment, the following rules are essential to trouble-free operation:

- ◆ **Proper Installation**
- ◆ **Regular Maintenance**
- ◆ **Correct Operation within Original Design Parameters**
- ◆ **Proper application within a Process**

Failure to install, maintain or operate Kice equipment can result in a variety of problems, including but not limited to; poor equipment performance, decreased equipment life, equipment failure or dangerous operating conditions.

Kice Industries product line includes a variety of equipment, all of which can be custom made to suit your application. Your Kice equipment was chosen based on your specification of process, product and your application requirements for capacity, operating conditions, operating parameters, etc. It is essential that your Kice equipment is installed, maintained and operated under the conditions originally designed and specified. Should your process needs change, please consult with Kice Industries prior to utilizing our equipment under different conditions.

### **3. SAFETY PRECAUTIONS:**



Fig #1

This safety alert symbol is used to call your attention to an important safety message on equipment, safety decals and in manuals, to warn you of possible danger to your personal safety.

When you see this symbol (Fig #1), be alert. Your personal safety or the safety of other persons is involved. Follow the instructions in the safety message.

#### **HAZARD LEVELS**

The following definition for identifying hazard levels are:

**DANGER (RED)** - Danger is used to indicate the presence of a hazard that **WILL** cause **SEVERE** personal injury, death, or substantial property damage if the warning is ignored.

**WARNING (ORANGE)** - Warning is used to indicate the presence of a hazard that **CAN** cause **SEVERE** personal injury, death, or substantial property damage if the warning is ignored.

**CAUTION (YELLOW)** - Caution is used to indicate the presence of a hazard which **WILL** or **CAN** cause **MINOR** personal injury or property damage if the warning is ignored.

**NOTICE (BLUE)** - Blue is used to indicate installation, operation, or maintenance information that is important but not hazard-related. Hazard warnings should never be included under the Notice signal word.



**WARNING:** All owners and operators should read this manual or be instructed on safe operating and maintenance procedures before attempting to uncrate, install, operate, adjust, or service this equipment.

#### **SAFETY DECALS**

Safety decals on the equipment should not be removed, covered over, painted, or otherwise become illegible. If this occurs, the decals should be replaced immediately. Contact our customer service department for replacements.

1. Do not attempt to install, connect power to, operate or service your new filter without proper instruction and until you have been thoroughly trained in its use by your employer.
2. Do not attempt to work on, clean, service the filter, open, or remove any protective cover, guard, grate or maintenance panel until the **POWER** has been turned off and **LOCKED OUT**.
3. Do not manually override or electrically by-pass any protective device.
4. Do not connect power to or operate the filter unless all moving parts are covered and all covers, guards, grates, and maintenance panels are in place and securely fastened.
5. Do not abuse, overload, mistreat or misuse the filter or attempt to operate the equipment if it is in need of service, lubrication, maintenance or repair.
6. Never place any part of your body in or near rotating members or moving parts of the filter.
7. The filter may have factory supplied drive guards for rotating components. Moving parts must be completely enclosed before connecting power and before operation.
8. The filter is equipped with maintenance panel, and access doors in the housing. The entrance into the housing is a confined space, and proper measure for entry and exit must be observed.
9. Many filter systems are installed and programmed to start automatically or operate from remote control locations. Keep clear of all moving parts on industrial equipment at all times.
10. Industrial filters must be equipped with a properly functioning Protective Interlocking Electrical Control Switch (PCS), a Pad Lockable Manual Power Lockout Switch and with the other basic safety equipment listed above. On/Off, Interlock and Padlock functions of the PCS must be tested and logged daily by supervisory personnel.
11. It is the owner and employer's responsibility to adequately train the employee-operator in the proper and safe use of the equipment. Written safety programs and formal instructions are essential. All new employees must be made aware of company policies and operating rules, especially the established safety and health procedures. Refresher training of experienced employees in the potential hazards of the job is important. Up to date training records must be maintained at the job site.
12. Special attention must be devoted to outside contractors engaged to enter and perform work on equipment or in the work place. Special care must be exercised to insure all such personnel are fully informed of the potential hazards and follow plant rules - with special emphasis on explosion proof electrical tools, and cutting or welding in unsafe environments.

13. Keep the work place clean and free of dirt and dust at all times. Do not attempt to work on slippery or unsafe ladders or work platforms when maintenance inspecting or repair work is being performed on the filter.
14. Do not climb on ladders or work on platforms unless the maximum load rating is posted. Do not exceed maximum load ratings when installing or servicing the filter or components and accessories.
15. Never allow any kind of metal or other foreign objects to enter a filter while in operation.
16. All filter inlet and discharge fittings must be completely connected to the piping system to prevent human access when the machine is running, and remain enclosed until **POWER IS TURNED OFF AND LOCKED OUT**. Keep away from the moving parts of the filter and auxiliary equipment during operation.
17. Operate safely at all times. Use personnel protective equipment when and where appropriate, such as hard hats, helmets, gloves, ear plugs, fall arrest, and eye protection devices. Keep personal protective equipment in good repair and convenient to the operator.
18. Drive components must be inspected and adjusted after transportation, and periodically as required by operating conditions. Check the chain drives of the airlock valves, and the V-Belt drives of the fans and Air Power Unit, appropriate to job conditions.
19. High voltage and rotating parts can cause serious or fatal injury. Only qualified, trained, and experienced personnel must perform installation, operation and maintenance of electrical machinery. Make sure that the motor and the frame of each piece of equipment is effectively grounded in accordance with OSHA safety and health standards, the National Electric Code and local codes.
20. Never stand under any kind of hoist or lifting mechanism, whether or not it is loaded or in operation. Never stand under or near equipment or a component when it is being lifted.
21. Qualified personnel must carefully inspect all lifting devices before each use. Never use a lifting device to transport equipment. Never use a lifting device that is damaged, deteriorated or in any way in need of repair.
22. All protective covers, guards, grates, maintenance panels, switches and warning decals must be kept in place and in good repair. Any equipment with damaged, malfunctioning, defective, or missing protective devices must be taken out of service until protective device can be repaired or replaced.
23. Any device powered by air or hydraulic pressure must be equipped with a properly functioning Pad lockable Manual Pressure Lockout and Internal Pressure Relief Valve (PRV).
24. Any filter which is used in the processing of hazardous materials or in hazardous environments requires an evaluation and determination, by the user and operator, of proper and adequate monitoring equipment, dust control, explosion relief venting, and electrical equipment enclosures. Do not use your equipment in hazardous environments unless it has been properly equipped for the hazard.
25. It is ultimately the operator's responsibility to implement the above listed precautions and insure proper use of the equipment, and proper maintenance and lubrication. Keep these instructions and list of warnings with your machine at all times.
26. It cannot be assumed that every acceptable safety procedure is contained herein or that abnormal or unusual circumstances may not warrant or require future or additional procedures.

**WORK SAFELY AT ALL TIMES!**

## **4. GENERAL RECEIVING, HANDLING & INSTALLATION**

### **RECEIVING AND INSPECTION**

Kice Industries Inc., has prepared your new filter for shipment in accordance with the Uniform Freight Classification. It is thoroughly inspected at the factory and, barring damage in transit, should be in perfect condition upon arrival.

The filter and accessories should be inspected on receipt for any shipping damage. If dampers or shutters are provided, check these accessories for free operation of all moving parts.

When a carrier signs the Kice Industries Inc., bill of lading, the *carrier accepts the responsibility* for any subsequent shortages or damage, evident or concealed, and *the purchaser must make any claim against the carrier*. Evident shortage or *damage should be noted on the carrier's delivery document* before signature of acceptance. Inspection by the carrier of damage evident or concealed must be requested. After inspection, issue a purchase order for necessary parts or arrange for return of the equipment to Kice Industries Inc., factory for repair.

### **HANDLING AND STORAGE**

Kice filters are shipped in many different configurations. Some units are completely assembled and skidded when size permits. These units may be handled and moved using good rigging techniques, being careful to avoid concentrated stresses that will distort any of the parts. Items or parts of the filter that are shipped knocked down will be clearly labeled for reassembly.

If the filter is not to be installed promptly, store it in a clean, dry location to prevent rust and corrosion of steel components. If outdoor storage is necessary, protection should be provided. Cover the components to prevent the accumulation of dirt and moisture in the housing. Cover motors with waterproof material. Refer to the motor maintenance information for further storage instructions.

**Caution:** Use proper equipment when lifting or moving the filter. Make sure all persons and obstructions are clear from path and installation area.


### **INSTALLATION**

1. Move the filter to the installation area using proper equipment, tool truck or fork lift.

2. Check all mounting surfaces of bin or hopper flange and filter housing flange. They should be free of any foreign materials.
3. Place two beads of caulking on the flange, on each side of the bolt holes and around each hole, of the bin or hopper, and mount the filter housing.

**NOTE:** Kice Industries, Inc. will **always** supply internal safety grating in the housing if it is mounted on an existing storage bin, to prevent personnel, bags, and cages from dropping to the bottom of the storage bin.

4. If an airlock valve is required, it should be mounted to the hopper discharge flange.
5. Tighten all mounting fasteners securely. To insure proper operation, the Filter must be adequately supported and properly installed. All ductwork or stacks should be independently supported as excess weight may distort the filter housing and cause contact between moving parts. When installing outside, care must be taken to guy wire the unit to take the wind loading. Consult Kice Industries Inc., for proper location and adjustment.
6. Connect the bag cleaning air supply to the assembled filter, using the tubing and the air power unit furnished by Kice with the unit.

 **WARNING: High voltage and rotating parts can cause serious or fatal injury. Only qualified personnel must perform installation, operation and maintenance of electrical machinery. Make sure that any motor and the frame of each filter is effectively grounded in accordance with OSHA standards, the National Electric Code and local Codes.**

7. The filter controller can be mounted in any convenient location. Orientation of the controller does not effect its performance.

Electrical conduit and junction tees (one at each Pneu-Jet solenoid valve) are furnished with each filter.

The electrical manifold is prewired from the solenoids to a junction box. A local electrician must run a conduit from the control box to the junction box on the filter. Wiring from the controller to the solenoids should be #18 gauge. One wire from each

solenoid is connected to the corresponding terminal on the terminal strip. The second wire for each solenoid is connected to the common/neutral lead. For ease in assembly, a white wire should be used for the common/neutral lead. Wires of any other color, other than white or green, can be used for the hot lines. Numbering each end may be helpful. The sequence programmer is not dependent on the successful firing of the Pneu-Jet Blast valve to advance to the next valve in sequence. If, for any reason, a Pneu-Jet Blast does not fire, the programmer will continue to time out the "off" time and activate the next valve in sequence.

8. Some systems will have a fan and airlock valve to be connected. The fan must rotate in the direction of rotation marked on the housing.
9. Test run the filter. If any unusual noises occur, disconnect and lockout the power. Check the fan, airlock valve or the screw conveyor if these items are furnished.
10. Reassemble any doors or covers removed during installation.

### SLAB-MOUNTED UNITS

A correctly designed and level concrete foundation provides the best means of installing a filter outside. The slab should be extended to support accessory equipment such as a floor-mounted fan. The mass of the base must maintain the fan/driver alignment, absorb normal vibration, and resist lateral loads. The overall dimensions of the concrete base should extend at least six to twelve inches beyond the outline of the filter base and other equipment. The weight of the slab in the area where high speed rotating equipment is located should be two to three times the weight of the rotating assembly, including the motor. The foundation requires firmly anchored fasteners such as anchor bolts, and guy wiring the tall housing for wind load support.

### Installing Bags and Cages

1. Slip the filter bag over the wire cage retainer. The bottom of the bag should be in contact with the bottom of the retainer. Filter media seam should be located 180 degrees from the gap in the retainer sleeve.
2. Tuck the overextended portion of the filter media inside the retainer sleeve. (Figure 2).

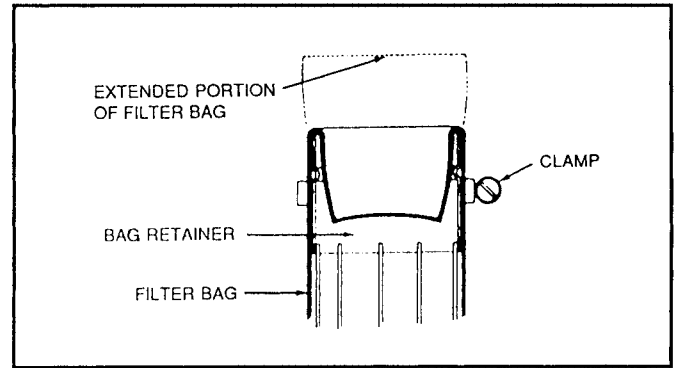


Figure 2

3. Place the clamp over the bag and locate the clamp approximately in the middle of the retainer sleeve. The clamp head should not be placed over the seam or over the gap in the retainer sleeve.
4. Slip the retainer-bag-clamp assembly over a collar in the tube sheet. (Figure 3).

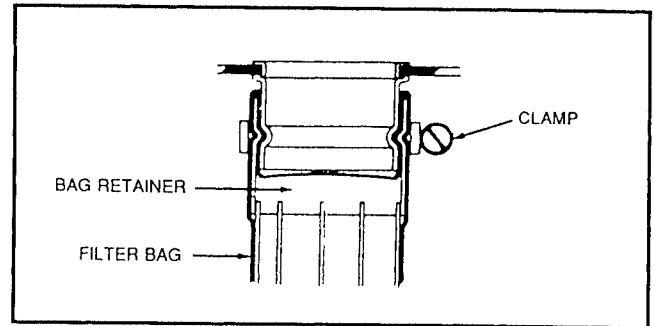


Figure 3

5. The clamp is then tightened with a screwdriver, or a nut runner with a  $\frac{5}{16}$ " socket. A ratchet with an extension will help facilitate the installation. It is very important to tighten the clamp very firmly so as to prevent the assembly from leaking or slipping off the tube collar.
6. Shake the bag and cage assembly by hand, and again tighten the clamp.

### IMPORTANT

- (A) Matching grooves in the retainer sleeve and collar in the tube sheet have to mate to prevent assembly from slipping off.
- (B) Check the filter bag for proper length. The filter bag should be only 2" longer than the bag retainer cage.

## 5. FILTER OPERATION & STARTUP PROCEDURE

Early day filters were simply dust chambers with cloth bags that had to be cleaned manually by shaking or rapping the bags to remove the dust. Mechanical shakers were devised to do the same thing, but compressed air jets provided a more positive cleaning effect. It is necessary to operate the cleaning jets at approximately 100 psig of pressure in order to induce the supplementary air volume (through the Venturi) needed to provide adequate bag cleaning. This type cleaning of the filter bags is only as good as the compressed air source. In a great many facilities, the compressed air carries droplets of moisture and lubricating oil.

In contrast, the Pneu-Jet method uses direct jets of oil-free, medium pressure air to clean the bags. Operating in the 8-13 psig range, this air can be supplied by a positive displacement rotary blower that eliminates the oil problem. The moisture problem is greatly reduced, since the air is used as fast as the pump produces it and the temperature stays above the condensation point. The oil-free air is piped to the air tank, which is connected through the Kice Pneu-Jet valves between the air tank and the manifold lines above the filter bags. The manifold line is mounted in the clean air chamber, with a vertical drop into the center of each bag. The air tank fills and holds compressed air at a pressure of 8-12 psig. An electric signal is sent to activate a solenoid valve to open the Pneu-Jet valve, which suddenly discharges the tank of positive pressure air through the manifold into the top of each bag. This sudden flow of air causes the dust particles collected externally on the filter media to be dislodged and fall into the hopper. After an adjustable amount of time, the controller cycles to the next Pneu-Jet Blast valve and manifold, in sequence, and activates the solenoid, which release air to clean the next row of filter bags.

A. A Kice Pneu-Jet filter control circuit is shown on schematic (drawing # 1-4256M). The Pneu-Jet valves (Figure # 4) are mounted between the air tank and the cleaning manifolds. These valves are an exclusive Kice design, which allow fast, high-energy release used for cleaning the filter media. The Pneu-Jet valves are two-way normally closed, diaphragm type valves, with spring and differential pressure causing the diaphragm to be sealed when air pressure is above the diaphragm. When the air above the diaphragm is exhausted to atmosphere, this causes the diaphragm to lift to the open position. The air in the tank is then discharged into the cleaning manifold,

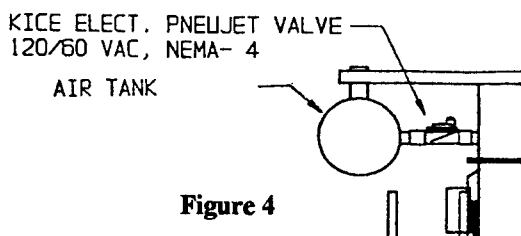


Figure 4

and in turn into each filter bag in a fraction of a second. With air pressures equalized above and below the diaphragm, the Pneu-Jet Blast valve will return to the closed position with the aid of spring pressure.

B. The chamber above the diaphragm of the Pneu-Jet Blast valve is connected to a two-way, normally closed solenoid operated valve. The Pneu-Jet Blast valve is internally piloted, which equalizes the pressure on the diaphragm thus keeping it in the closed position. The solenoid mounted on the two-way, normally closed valve is wired to the terminal block of the electric controller. An electric signal (120 Vac) actuates the solenoid, causing the actuator valve to open and exhaust the air/pressure above the Pneu-Jet Blast diaphragm to atmosphere. The diaphragm moves to the open position, allowing the air in the pressure tank (8-13 psig) to discharge into the manifold above one row of bags.

The air rushes down the manifold above a row of filter bags with discharge lines from the manifold down into each bag. The medium pressure system provides all of the air required to clean the filter bags. This creates a shock effect that dislodges dust and other foreign material that is caked on the outside of the filter bag. (See fig 5).

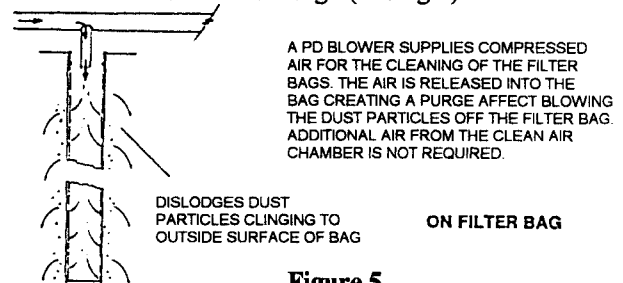


Figure 5

C. The sequence programmers used are electronic, 100% solid state mounted in a dust tight, moisture proof, or explosion proof enclosure.

### DESCRIPTION OF OPERATING LOGIC:

Input power is applied to control at all times. For "On Demand" cleaning, closure of isolated control contacts (pressure switch) initiates the "Off" time. At the end of the Off time, the control energizes solenoid no. 1 to provide a cleaning pulse; it then transfers to the next compartment initiating the off time again. This cycle continues until the control contacts open. The control remembers the last output activated and will activate the next one in line when the control contacts close. For "continuous" cleaning the pressure switch terminals should be shorted together a program wire allows for field selection of number of outputs.

The part numbers of the programmers used are:

8. kicepneujetfilter.10-19-00

Starting 8-26-93 - to Present

Model #	Number of Positions	Filter Model
DNC T2010 A10	3 to 10	R, S & C Series
DNC T2020 A10	11 to 20	All "M" Series
DNC T2032 A10	17 to 32	M 168 & 336

The Model DNC T2010, T2020 & T2032 programmer operates on 115v, 50/60hz, 1ph power, with an output rating of 3 amps at 115 Vac. Each controller has a pair of contacts for customer's pressure switch input, for on demand cleaning. For "On Demand" cleaning, closure of isolated control contacts (pressure switch) initiates the "Off" time. At the end of the off time the control energizes solenoid no. 1 to provide a cleaning pulse; it then transfers to the next compartment initiating the off time again. This cycle continues until the control contacts close.

These contacts are shipped, shorted out, for "continuous" cleaning. Each controller has two potentiometers to adjust the "on" time and the "off" time. The "on" time range is 50 milliseconds to 500 milliseconds. The "off" time range is 1.5 to 30, or 8.5 to 180 seconds. Each output has an LED (light emitting diode) indicator to let the operator know at the control box that an output signal is being generated.

With power applied to terminals L1 & L2 at all times the timer number 1 output "on" time will activate followed by an independently timed "off" period. Each time sequence is infinitely adjustable within the stated time range. Following the number 1 "on" and "off" time, the number 2 "on" and "off" time will be activated. This sequence of events continues to the last selected output then returns to the number 1 output. This sequence repeats as long as power is applied.

This control may be stopped at any point in its sequence, either on or off, by a simple switch closure, such as a simple light switch. Upon closing of the switch the controller will restart at position number 1 after the normal adjusted time period.

A program wire allows for field selection of the number of outputs required. The program wire is inserted in a small numbered socket to reduce the number of output positions. Remove this jumper by pulling lightly until it retracts from the socket position corresponding to the number of outputs desired (each hole closer to the fixed end reduces the output quantity by one).

1980 - to - 8-26-93

Model #	Number of Positions	Filter Model
7937-8037	4 to 10	R, S & C Series
7940-8037	4 to 20	All "M" Series
7943-8037	8 to 32	M 168 & 336

The Model 7937, 7940 & 7943 programmer operates on 115v, 50/60hz, 1ph power, with an output rating of 1-3 amps at 115 Vac. Each controller has two potentiometers to adjust the "on" time and the "off" time. The "on" time range is 30 milliseconds to 1.2 seconds. The "off" time range is 1 to 60, or 1.5 to 30 seconds. Each output has an LED (light emitting diode) indicator to let the operator know at the control box that an output signal is being generated.

With power applied to terminals H & N at all times, the timer number 1 output "on" time will activate followed by an independently timed "off" period. Each time sequence is infinitely adjustable within the stated time range. Following the number 1 "on" and "off" time, the number 2 "on" and "off" time will be activated. This sequence of events continues to the last selected output, then returns to the number 1 output. This sequence repeats as long as power is applied.

This control may be stopped at any point in its sequence, either on or off, by a simple switch closure such as a differential pressure switch. Upon closing of the switch, the controller will restart at position it was at shutdown, after the normal adjusted time period.

To select the proper program, a gold jumper on the component side of the control is provided for selecting the number of outputs. It is inserted in a small socket. To reduce the number of output positions, remove this jumper by pulling lightly until it retracts from the socket position corresponding to the number of outputs desired (each hole closer to the fixed end reduces the output quantity by one).

**Start-Up Procedure**

1. Check the Air Power Unit for correct rotation and speed to provide air and (8-12 psig) in the filter tank, gear motors driving airlocks and screw conveyors (if furnished) for proper oil level. For proper oil specifications, refer to manufacturer's recommendations.
2. Check screw conveyors, and airlocks for proper directions of rotation.

3. Controls should be wired in accordance with schematic diagram. Square and round models are normally prewired, fully assembled and tested at the factory. Check all wiring connections to assure proper sequence. The air tank pressure gauge (0-30psig range) should work in the area of 6-12 psig.
4. Set the adjustable "off" time adjustment at the minimum time by rotating the adjusting screw CCW with a small screwdriver. Allow the sequence programmer to operate for 5 to 10 minutes to assure mechanism has not been damaged in shipment and to allow a short run-in time for the electronics.
5. Set the adjustable "off" time adjustment at a longer time span by rotating the adjusting screw CCW until you cannot turn the screw any further. With the "off" time adjustment in this setting, set the relief valve at 15 psig. This provides pressure relief safety for the air tank.
6. Bring the adjustable "off" time adjustment to the desired time by turning the screw CCW until the Sequence Programmer fires a Pneu-Jet Blast valve.
7. If a Pneu-Jet Blast valve does not fire on start up, first check the output LED to confirm the power is being sent to the solenoid on the Pneu-Jet Blast solenoid.
8. After the filter is placed into operation, a good practice to follow on shutdown is as follows:
  - A. Shut off the suction fan only.
  - B. Allow the reverse air cleaning, airlock and screw conveyor to operate for at least 15 minutes. (a longer period of time is desired if the operation will allow.)
  - C. Then shut down the remainder of the system.

## **6. FILTER MAINTENANCE & SERVICE**

### **Daily**

1. Check and note pressure differential across the filter.
2. Check the electronic controls to ensure that all valves are operating.

### **Monthly**

1. Check the oil in the gearmotors driving airlock valves and screw conveyors.
2. Check the fan bearings.

## **7. TROUBLE SHOOTING - COMMON FILTER PROBLEMS:**

**CAUTION - SENSITIVE CIRCUITRY:** Testing and trouble shooting this circuit board with a grounded test instrument or applying any external voltage to pressure switch terminals will cause serious damage to circuit board components. Failure to comply will void any warranty.

<b>Problem</b>	<b>Probable Cause/Suggested Remedies</b>
<b>A. Filter discharging dust from clean air chamber</b>	<ol style="list-style-type: none"> <li>1. Check for holes in the filter media.</li> <li>2. Check for loose bag clamps.</li> <li>3. Check filter bag installation (ref. Installation section).</li> </ol>
<b>B. Pressure drop starts to increase.</b>	<ol style="list-style-type: none"> <li>1. Should one 3" Pneu-Jet Blast valve not fire for an extended period of time, a row of filter bags could become masked with dust. (See E- Pneu-Jet Blast Valve Misfires).</li> <li>2. After a long period of time, the dust may build-to the point that the filter media needs to be removed for cleaning. (This condition may be corrected by running the cleaning cycle without the dusty air flowing through the filter media section.)</li> <li>3. If the air input has been increased to the filter, the air-to-cloth ratio may exceed the recommended ratio.</li> </ol>

<b>Problem</b>	<b>Probable Cause/Suggested Remedies</b>
<b>C. Inlet air volume insufficient</b>	<ol style="list-style-type: none"> <li>1. Check the fan direction of rotation.</li> <li>2. Check the fan speed. (Belts may be slipping or pulleys may be reversed.)</li> <li>3. Check for high-pressure differential (See (B)-Pressure drop starts to increase).</li> <li>4. Check for leaks in the ductwork.</li> <li>5. Check for clogged or partially clogged ducts.</li> <li>6. Check for closed or partially closed damper in the dust system.</li> </ol>
<b>D. Product does not discharge</b>	<ol style="list-style-type: none"> <li>1. Check the direction of rotation of the airlock and screw conveyor.</li> <li>2. Check for clogged or partially clogged gravity spouts.</li> <li>3. Check for bridging in the hopper.</li> </ol>
<b>E. Pressure Relief Valve on the tank pops off - Pneu-Jet Blast valve fails to fire</b>	<ol style="list-style-type: none"> <li>1. Check power to the controller.</li> <li>2. Check LED output indicators.</li> <li>3. Check for power at the solenoid, or a faulty solenoid.</li> <li>4. Check operator assembly of the 2-way solenoid valve to see if it is broken. If the valve is faulty, replace the valve or diaphragm.</li> </ol>
<b>F. Air Pressure in the Air Tank will not build</b>	<ol style="list-style-type: none"> <li>1. Check the airline from the Air Power Unit to the tank.</li> <li>2. Check the inlet filter on the APU, clogged restricting flow into the air pump.</li> <li>3. Leaks <ol style="list-style-type: none"> <li>a. Check Pneu-Jet Blast valves on the tank for leaks.</li> <li>b. Check to see if any of the Pneu-Jet Blast valves are stuck open and bleeding tank air straight to the filter. This is usually caused by the electric operated 2 way pilot exhaust valve being stuck open. Check by manually plugging the exhaust port.</li> <li>c. Check the air piping for leaks.</li> <li>d. Check couplings for leaks between the air tank and the Pneu-Jet Blast valves.</li> </ol> </li> <li>4. Check APU is it running, is the motor energized.</li> </ol>
<b>G. Cleaning pressure varies</b>	<ol style="list-style-type: none"> <li>1. Check "off" time potentiometer</li> <li>2. Check "on" time potentiometer</li> <li>3. Check for skipping sequence/Pneu-Jet Blast valve not firing.</li> </ol>
<b>H. SEQUENCE CONTROLLER TROUBLESHOOTING</b>	<ol style="list-style-type: none"> <li>1. Check incoming power</li> <li>2. Observe RED power light <ol style="list-style-type: none"> <li>a. If no power light, check fuses</li> <li>b. Fuses OK, replace timer board</li> </ol> </li> <li>3. Before replacing blown fuse, disconnect power and check <u>output</u> circuits for short circuits and correct if necessary.</li> <li>4. Replace Fuse</li> <li>5. While watching output lights for proper function apply power</li> <li>6. Cycle starts at #1 and continues to last output selected then restarts.</li> <li>7. If fuse blows, observe at which output light the malfunction occurred and recheck that output circuit for shorted condition</li> <li>8. If an output stays energized with power off, replace the valve <ol style="list-style-type: none"> <li>a. If a valve stays energized, replace the timer board</li> <li>b. If a valve does not operate when it's output light is on, replace the wiring or the solenoid valve.</li> </ol> </li> </ol>

**SOME THINGS NOT TO DO!!!**



**Warning: Disconnect Power before Touching any component part!**



1. **DO NOT** mount controls in high vibration areas without shock mounts.
2. **DO NOT** mount controls in areas of high dust or corrosive atmospheres without a protective enclosure.
3. **DO NOT** use a converter or inverter for the power source.
4. **DO NOT** mount the control in a high transient voltage area without an isolation transformer.
5. **DO NOT** leave the control box door open.
6. **DO NOT** allow a local repair shop to repair controls. For service call on DNC model controllers, call National Controls Corp. 1-800-323-2593, in IL call 1-312-932-6900.

**REPLACEMENT PARTS:**

It is recommended that only Kice Manufactured Supplied replacement parts be used. Kice filter parts are Built to be fully compatible with the original filter, using Specific alloys and tolerances. These parts carry a Standard Kice warranty.

When ordering replacement parts, specify the part name, Kice Serial Number, Filter model, Filter size, series (M, S, or R), and number of filter bags.

Most of this information is on the metal nameplate attached to the filter housing next to the door.

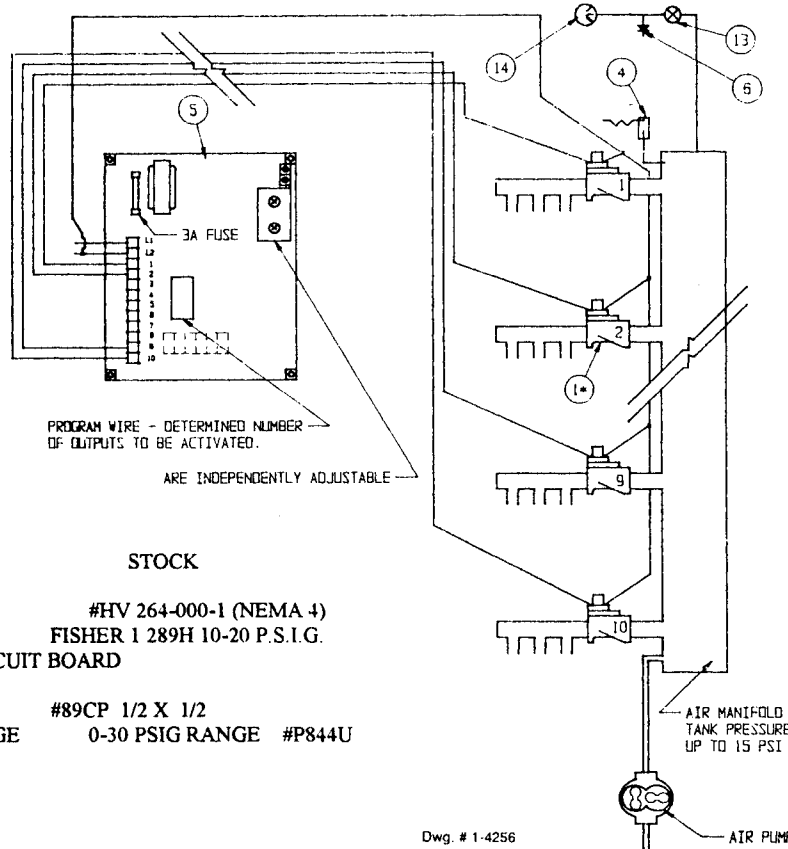
When ordering solenoids for ASCO solenoid operators or valves, order the number stamped on the solenoid. Also specify voltage and frequency.

When ordering replacement cards for the solid-state electronic controller, order by part # (see page 15), or by specifying the total number of outputs on the card you are replacing.

**PNEU-JET FILTER ELECTRIC CONTROL CIRCUIT**

**SEQUENCE:**

- 1) No. 1 ON THEN No. 2 AND SO ON TO LAST SELECTED OUTPUT THEN BACK TO No. 1 AND CONTINUING, EACH OUTPUT IDENTICAL
- 2) ON TIMERS AND OFF TIMERS ARE INDEPENDENTLY ADJUSTABLE



NO.	DESCRIPTION	STOCK
1	3" PNEUJET VALVE	#HV 264-000-1 (NEMA 4)
4	TANK RELIEF VALVE	FISHER 1 289H 10-20 P.S.I.G.
5	ELECTRIC CONTROL CIRCUIT BOARD	
6	BLEED ORIFICE	
13	PALM BUTTON VALVE	#89CP 1/2 X 1/2
14	AIR TANK PRESSURE GAGE	0-30 PSIG RANGE #P844U

Dwg. # 1-4256

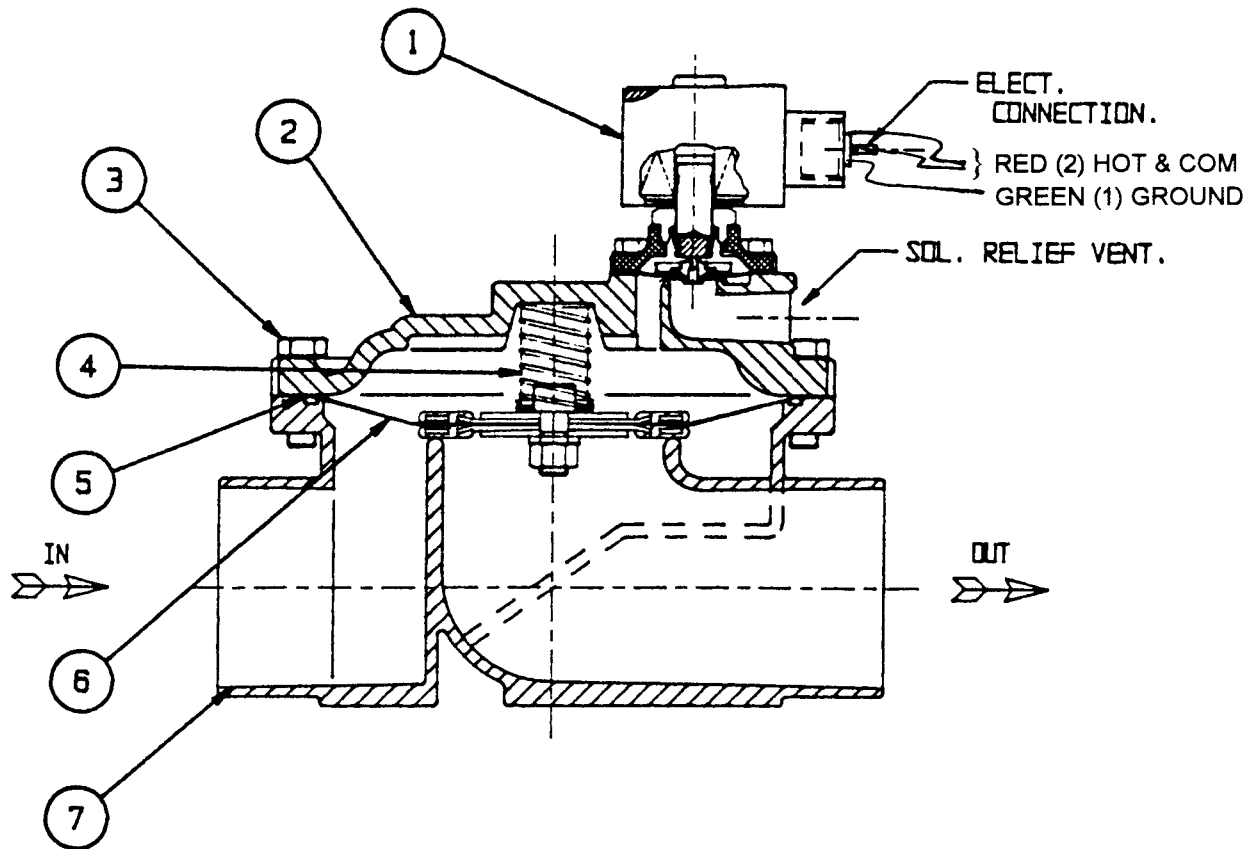
# 8. ILLUSTRATED PARTS LIST

## ASCO/KICE 3" PneuJet Blast Valve with Solenoid

Oct. 1979 to the Present

PN HV-264-000-1, & EFHV-264-000-1

Ref. Dwg # 1-4210 M

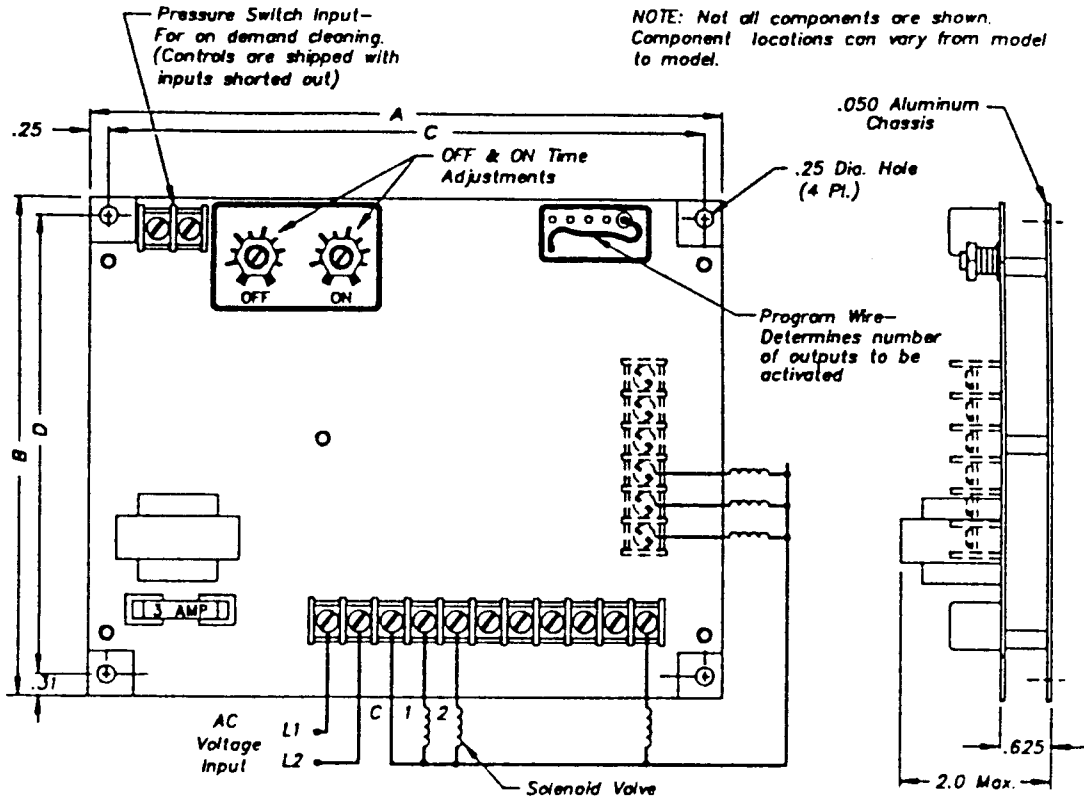


- Electric Solenoid Valve NEMA 4 (Green) Kit #224-845-120
- Electric Solenoid Valve NEMA 7&9 (Black) Kit #224-845-119
- ◆ PneuJet Body Repair Kit #K 234-169

ITEM	NAME	QTY.	ITEM	NAME	QTY
•1.	Electric Operator Assembly (NEMA -4 Green)	1	◆4.	Spring	1
	(NEMA - 7 & ( Black)		◆5.	Gasket, Body	1
			◆6.	Diaphragm Assembly	1
2.	Bonnet	1	7.	Body	1
3.	Screws (SEMS)	8			

# Electronic Controller Schematic

Starting 8-26-94 to Present



Model	Off Time Sec.	Max. No. of Outputs	Size of NEMA 4 Enclosure required	Programmable No. of Outputs
DNC-T2010-A10	1.5 - 30	10	10" x 8" x 4"	3 - 10
DNC-T2020-A10	1.5 - 30	20	12" x 10" x 5"	11 - 20
DNC-T2032-A10	1.5 - 30	32	14" x 12" x 6"	17 - 32

### Specifications:

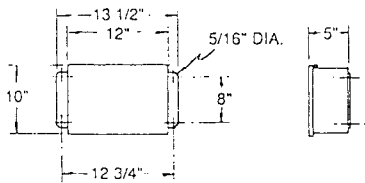
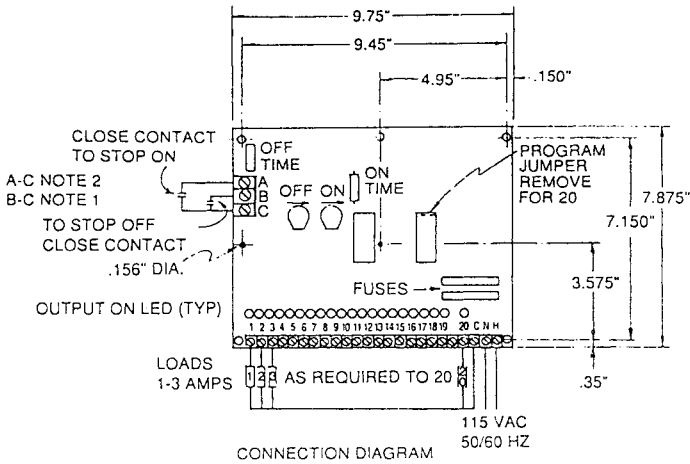
Time Delay:		Input:	
On Time	Adjustable from 50 to 500 Milliseconds	Operating voltage	105 to 135 Volts AC, 50/60 Hz, 1ph Optional: 220volts AC, 50/60 Hz, 1ph
Off Time	Adjustable from 1.5 to 30 Seconds		
Output:		Protection	
Type	Solid State Switch rated at 200 VA max. per output. Position of program wire determines number of outputs	Transient voltage	30 Joule Varistor
		Short Circuit Protection	3 amp fuse
Environmental:			
Operating Temperature:		(-40° to 150° F) (-40° to 66° C)	

# CONTROLLER USED FROM 1980 TO AUG. 1993



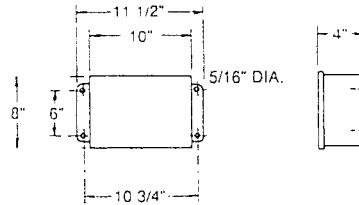
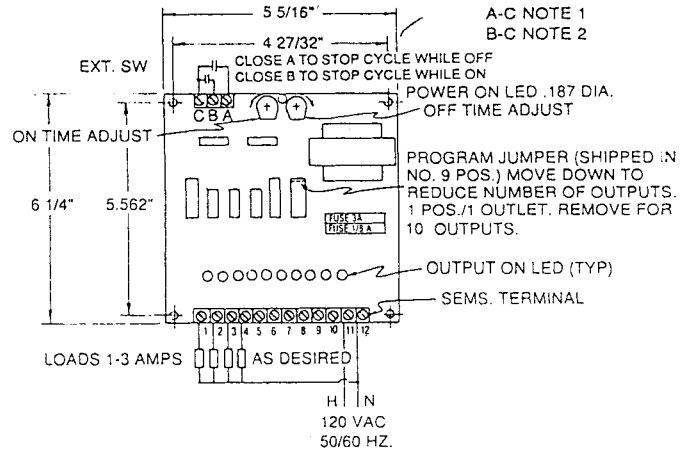
## CHECKING CIRCUIT BOARD FOR CONTINUITY MAY DAMAGE THE COMPONENTS.

### SEQUENCE PROGRAMMER #7940-2-6



NEMA 4 & 12 MOUNTING

### SEQUENCE PROGRAMMER #7937-2-6

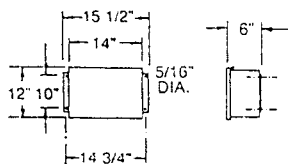
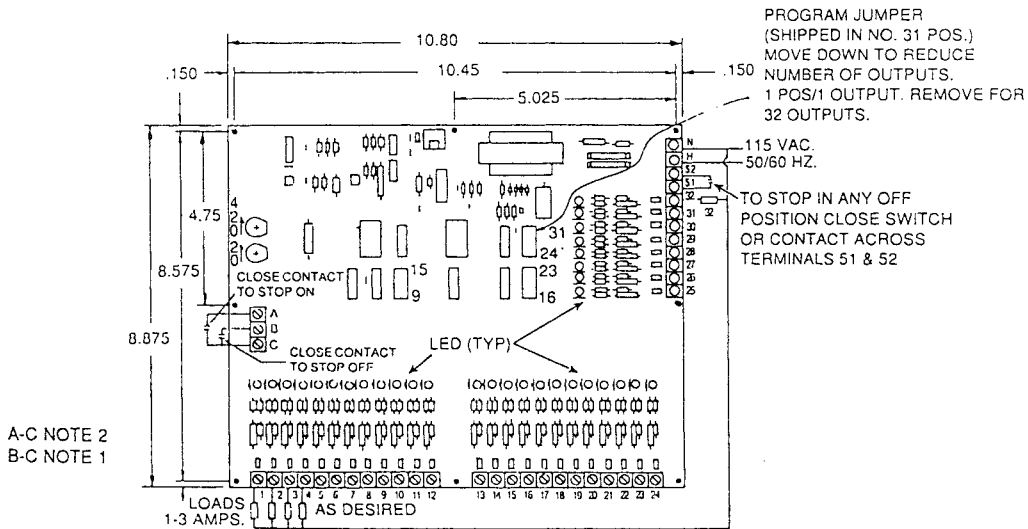


NEMA 4 & 12 MOUNTING

**NOTE:**

- 1) AT PRESSURE SWITCH CLOSURE, SEQUENCE WILL STOP IN THE OFF CONDITION AFTER ANY ON TIME, AND WILL RESUME AT THAT POINT.
- 2) AT PRESSURE SWITCH CLOSURE, SEQUENCE WILL STOP IN THE ON CONDITION AFTER ANY OFF TIME, AND WILL RESUME AT THAT POINT.

### SEQUENCE PROGRAMMER #7943-2-6

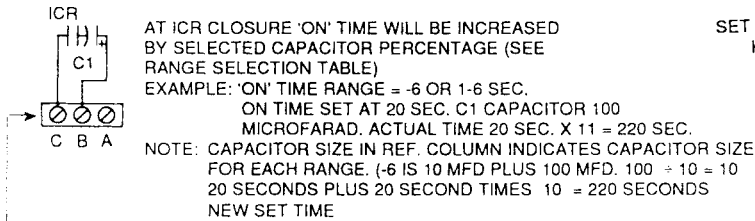


NEMA 4 & 12 MOUNTING

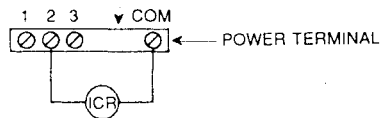
**SEQUENCE:**

- 1) NO. 1 ON THEN NO. 2 AND SO ON TO LAST SELECTED OUTPUT, THEN BACK TO NO. 1 AND CONTINUING EACH OUTPUT IDENTICAL.
  - 2) ON AND OFF TIME ARE INDEPENDENTLY ADJUSTABLE.
- ON TIME RANGE - 30 MILLISECONDS TO 1.2 SECONDS
  - OFF TIME RANGE - 1 - 60 SECONDS

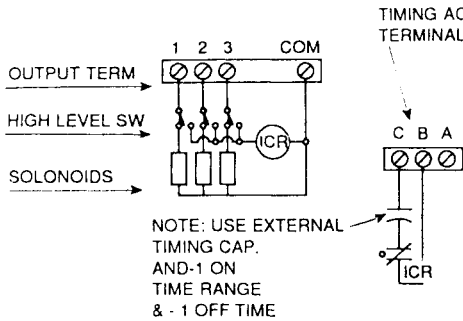
# ELECTRICAL CONTROL APPLICATION DATA



TIMER DELAYS AT POINT #2 FOR 220 SECONDS



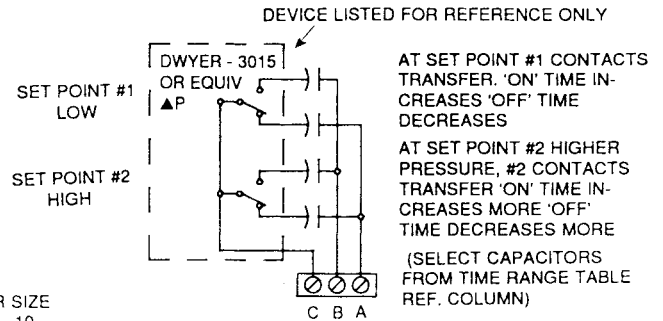
## DELAY FOR LONGER TIME AT ANY POINT



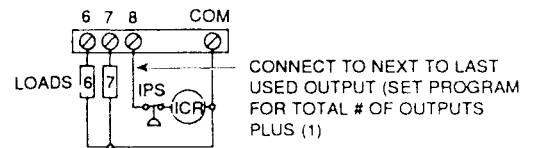
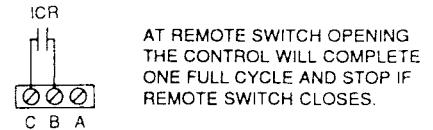
## KEEP FULL SEQUENCE

TIMING ACCESS TERMINAL

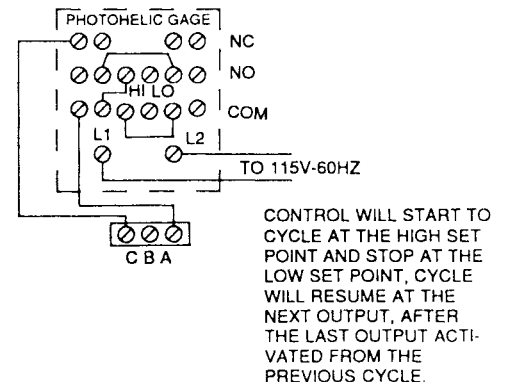
IF HIGH LEVEL SWITCH CALLS FOR MATERIAL AT ITS RESPECTIVE POINT, TIMER WILL TIME OUT FOR REQUIRED (ADJUSTMENT) FILL PERIOD.  
 IF ZONE FILLS OR IS FULL AS INDICATED BY LEVEL SWITCH, TIMER WILL RAPID ADVANCE TO NEXT POINT AND SCAN TO FIND A ZONE REQUIRING MATERIAL



## AUTOMATIC TIMING ADJUSTMENT



## INTERMITTENT FULL CYCLE



## CYCLE ON DEMAND

DWG. #2 - 2374



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