KICE INDUSTRIES, INC.

Skilled Air for Industry

Venturi-Jet Filter

Operators Manual

Special execution, intended for use in potentially explosive atmosphere (zone 22) in conformity with category 3 of group II, according to the European ATEX Directive 2014/34/EU. The equipment has the following marking:

II 3D c

1. Introduction

When you purchased your new Kice Venturi-Jet filter, you bought an air cleaning device that has proven its reliability based on hundreds of installations and years of dependable service.

We are proud of our products and the people at Kice Industries who craft them. At Kice, we use high manufacturing standards and processes to produce superior quality products, which have been a trademark of our organization for over 60 years.

The results of our development work, driven by input from our customers, has resulted in the present design of the Kice Venturi-Jet 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,

Drew Kice
President
Kice Industries, Inc.

Warranty

The Company (Kice Industries, Inc.) warrants the equipment manufactured by the Company to be free of defects in material and workmanship for a period of one year from the date of shipment. Company agrees to repair or replace, at its option, any parts found to be defective in the opinion of the Company. Company 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, or erosion.

Purchaser agrees to look to the warranty, if any, of the manufacturer or supplier of equipment manufactured by others and supplied to the Company for any alleged defects in such equipment and for any damages or injuries caused thereby or as a result thereof.

PURCHASER SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ELECTRICAL COMPONENT MANUFACTURER'S RECOMMENDATIONS, UNDERWRITERS CODE AND ALL SAFETY PRECAUTIONS.

The only warranty extended under this agreement is 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 extends beyond the face hereof. The Company and its dealers shall not in any event be liable for consequential or incidental damages and this agreement provides purchaser'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.

Table of Contents

2. Important Kice Venturi-Jet Filter Information

Important Kice Venturi-Jet filter Information

Write down the MODEL and SERIAL NUMBER of the Kice Venturi-Jet filter, along with the same information for the auxiliary equipment. (Airlock valves, fans, speed reducers, motors, and sheaves size, type and any special modifications to standard).

For additional information, application assistance or special service, please contact us by phone at 316-744-7151 or email at sales@kice.com. We'll need to know the MODEL and SERIAL NUMBER of your Kice Venturi-Jet 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 ____/_____/_____

Additional Notes:

_____

_____

_____

_____

3. General Information

To The Owner

The purpose of this manual is to assist owners and operators in maintaining and operating the Kice Venturi-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 make up an air system, such as airlock valves, cyclones and fans. They contain additional information that may not be repeated in this manual. Please contact the Kice Customer Service Department if additional manuals are needed.

Using This Manual

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

The terms **“disconnect and lockout”** or **“lockout/tagout”** as used in this manual means that power to the Kice Venturi-Jet filter has been disconnected through the use of a padlockable, manual power cutoff or power lockout switch pursuant to 29CFR1910.147.

Directions used in this manual, for example **RIGHT** or **LEFT, CLOCKWISE** or **COUNTERCLOCKWISE**, refer to directions when facing the door of the filter located under the reverse jet cleaning mechanism.

Photographs and illustrations were current at the time of printing but subsequent production changes may cause your Kice Venturi-Jet filter to vary slightly in detail. Kice Industries, Inc. reserves the right to redesign and change the filter as deemed necessary, without notification. If a change has been made to your Kice Venturi-Jet filter that is not reflected in this owner’s manual or the illustrated Parts Lists, 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 (see Figure 1) located on the housing, next to the access door (see Figure 2).

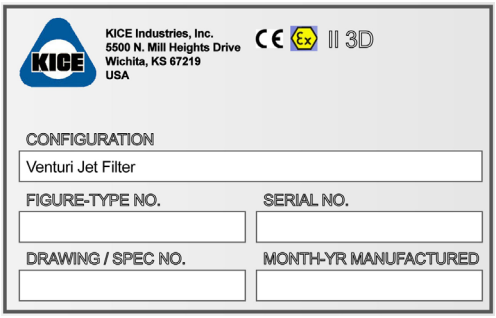


Figure 1

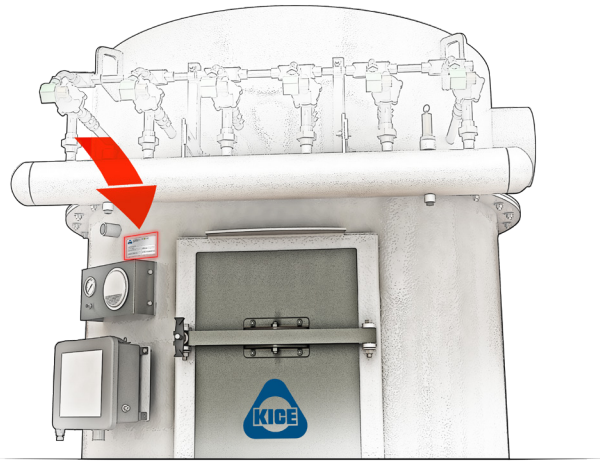


Figure 2

Kice Venturi-Jet Filter Parts and Service

Use original Kice Venturi-Jet filter replacement parts only. These parts are available from Kice Industries, Inc. only. To obtain prompt, efficient service always provide the following information when ordering parts:

1. Correct part description and number as shown in the Filter Maintenance and Service section of this manual.
2. Correct model number.
3. Correct serial number.

For service or assistance ordering parts, contact the Customer Service Department or Quick Ship Department.

Kice Industries, Inc.
5500 Mill Heights Drive
Wichita, Kansas 67219-2358
Toll Free: (877) 289-5423
Main 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 Kice Venturi-Jet filter is configured to be used in a specific type of system, handling particular types of material. Using a Kice Venturi-Jet filter for any purpose other than that for which it was designed could result in personal injury as well as product or property damage.

General Information Continued

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

- Proper installation.
- Regular maintenance.
- Correct operation within original design parameters.
- Proper application within a process.

Failure to properly 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.

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

The Kice Industries product line includes a variety of equipment, all of which can be custom-made to suit your application. Your Kice equipment was chose 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 be installed, maintained and operated under the conditions for which it was originally designed and specified. Should your process needs change, please consult with Kice Industries prior to utilizing the equipment under different conditions.

Explosion Vents

Many fine dusts collected by filters are combustible. Most dusts can catch fire if three components are present: fuel, ignition source and oxygen. Dust is the fuel, a spark or flame may provide the ignition source, and air provides the oxygen. The deflagration index (Kst) and the maximum deflagration pressure (Pmax) of a particular dust will determine the violence of the fire and the amount of destructive force that has to be vented from the filter. This information, provided by the operator, will be used to calculate the number of explosion vents required for Kice Filters.

The National Fire Protection Association (NFPA) provided comprehensive guidelines and standards for dealing with explosive dusts and fires. The following publications provide valuable information on fire and explosion protection and can be helpful to insure your facility is properly equipped.

- NFPA 652 – Standard on the Fundamentals of Combustible Dust
- NFPA 61 - Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
- NFPA 68 - Standard on Explosion Protection by Deflagration Venting
- NFPA 69 - Standard on Explosion Prevention Systems
- NFPA 77 - Recommended Practice on Static Electricity
- NFPA 654 - Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 664 - Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

This is not a comprehensive list of standards for all applications. These and other standards and guidelines from the NFPA that may be applicable for your facility can be ordered or viewed at http://www.nfpa.org.

4. Safety Precautions

Safety Symbols

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, be alert. Your personal safety or the safety of others may be affected. Follow the instructions in the safety message.

Hazard Levels

The following definitions are used to identify hazard levels:

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 that **WILL** or **CAN** cause **MINOR** personal injury or property damage if the warning is ignored.

Safety Decals

The Kice Venturi-Jet filter decals should not be removed, covered, painted or otherwise become illegible. If this occurs they should be replaced immediately. Contact Kice Industries, Inc. Customer Service Department for replacements.

The following safety decals will be located on the Kice Venturi-Jet filter. Look for them!

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

SAFETY PRECAUTIONS

WORK SAFELY AT ALL TIMES

- All energy sources associated with the Kice Venturi-Jet filter must be locked and tagged out in compliance with 29CFR1910.147, local enforcement authorities, OSHA, and facility safety practices, before removing any protective cover, guard, grate or maintenance gate.
- Do not attempt to install, connect power, operate or service a Kice Venturi-Jet filter without proper instruction and until you have been thoroughly trained in its use by your employer.
- It is the owner's and employer's responsibility to adequately train each operator in the proper and safe use of Kice Venturi-Jet filters. Written safety programs and formal instruction are essential. All new employees must be made aware of company policies, standard operating procedures (SOPs) and established health and safety procedures. Experienced employees should receive refresher training for potential hazards and up to date training records should be maintained at the job site.
- Assume at all times that power is "on". Treat all conditions as live. This practice ensures a cautious approach that may prevent an accident or injury.
- Before applying power to any equipment, make certain that all personnel are clear of the machine.
- Operate safely at all times. Use personal protective equipment when and where appropriate, such as hard hats, helmets, gloves, earplugs, dust masks and eye protection devices. Especially when working inside the filter. Keep personal protective equipment in good repair and convenient to the operator.
- If it becomes necessary to climb into the Kice Venturi-Jet filter for service or repair work, adequate securing devices and fall arresters must be worn by personnel.
- The Kice Venturi-Jet filter is fully encapsulated if properly connected during installation and should only be operated after all pipes and hoses, including upstream and downstream components, have been completely connected to the piping system. This will prevent human access while the machine is running.
- The Kice Venturi-Jet filter may also have factory supplied guards for rotating components. Do not connect power to or operate the Kice Venturi-Jet filter unless all moving parts are completely enclosed and all guards, grates and maintenance panels are in place and securely fastened.
- All protective covers, guards, grates, maintenance panels, switches and warning decals must be kept in place and in good repair. Any equipment with a damaged malfunctioning, defective, or missing protective device must be taken out of service until the protective device can be repaired or replaced.
- Do not abuse, overload, mistreat or misuse the Kice Venturi-Jet filter or attempt to operate the Kice Venturi-Jet filter if it is in need of service, lubrication, maintenance or repair.
- The Kice Venturi-Jet filter may be installed and programmed to start automatically or be controlled from a remote location. Keep clear of all moving parts on industrial equipment and on the Kice Venturi-Jet filter at all times, until the POWER IS TURNED OFF AND LOCKED OUT.
- Do not attempt to work on, clean or service the Kice Venturi-Jet filter, open or remove any protective cover, guard, grate, connection or maintenance panel until the POWER IS TURNED OFF AND LOCKED OUT. A main disconnect device must be installed to achieve this.
- The compressed air supply must be disconnected from the system before service and repair work is carried out. The switch-off devices for the compressed air supply, as with the electrical supply, are the responsibility of the distributing company (operator) of the overall system.
- During installation, the motor and frame of each piece of equipment including the Kice Venturi-Jet filter, must be effectively and separately grounded in accordance with OSHA safety and health standards, the National Electrical Code, local codes and DIN EN 60204-1 or DIN EN 60439-1 as required for the classified area.
- High voltage and rotating parts can cause series or fatal injury. Only qualified, trained, and experienced personnel should perform installation, operation, and maintenance of electrical machinery. Make sure the Kice Venturi-Jet filter is grounded in accordance with OSHA, National Electric Code, and all other applicable regulatory bodies, including local codes and EN ISO 60204-1 as required for the classified area.

Safety Precautions Continued

- If a Kice Venturi-Jet filter is equipped with a maintenance panel incorporating any Protective Interlocking Limit Switch (PLS), the PLS must be interlocked with all electrical controls so that all motors or powered devices on the unit will be de-energized if any protected cover, guard, grate, or maintenance panel is open or removed. Never attempt to manually override or electrically bypass the PLS safety device. Interlock function of the PLS must be tested and logged daily by supervisory personnel.
- Kice Venturi-Jet filters must be equipped with a properly functioning Protective Interlocking Electrical Control Switch (PCS), a Pad-lockable Manual Power Lockout Switch, along with the other basic safety equipment listed above. On-Off, interlock and padlock functions of the PCS must be tested and logged periodically by supervisory personnel.
- Any device powered by air or hydraulic pressure must be equipped with a properly functioning Padlockable Manual Pressure Lockout and Internal Pressure Relief Valve (PLV) capable of safely relieving motive pressure between the isolation valve and device.
- Any Kice Venturi-Jet filters used in the processing of combustible materials or in hazardous environments require evaluation by the owner and regulatory bodies to determine appropriate Kice Venturi-Jet filters monitoring equipment, dust control, explosion protection and electrical equipment enclosures. Do not use a Kice Venturi-Jet filter in hazardous environments unless properly equipped for the hazard.
- Operate safely at all times. Use personal protective equipment (PPE) such as hard hats, helmets, gloves, earplugs, protective eyewear, etcetera when and where appropriate. Keep PPE in good repair and accessible to affected personnel.
- Keep the workplace clean and free of dirt and dust at all times. Do not attempt to work on slippery or unsafe surfaces, ladders or work platforms when maintenance or repair work is being performed on an Kice Venturi-Jet filter.
- The Operator must ensure that all piping and connections are laid away from access routes, ladders and steps.
- Adequate and proper lighting must be provided at the equipment location.
- Do not use a ladder or work platform unless it is in good repair and rated for the load required to complete required Kice Venturi-Jet filter service.
- Never stand under any kind of hoists or lifting mechanisms whether or not it is loaded or in operation. Never stand under or near an Kice Venturi-Jet filter or component when it is being lifted.
- All Kice Venturi-Jet filter lifting devices must be inspected by qualified personnel before each use. Do not use a lifting device to transport a Kice Venturi-Jet filter. Never use a lifting device that is damaged, deteriorated or in need of repair.
- The unit must be lifted by a means with sufficient lifting capacity.
- The operator must ensure that adequate lighting conditions are provided at the location of equipment operation.
- Never allow any kind of metal or other foreign objects to enter a Kice Venturi-Jet filter while in operation, unless the system is specifically designed as a wire or metal reclaim system. Examined raw materials should be used through the machine to ensure proper and consistent operation. A material separator should be installed on the raw gas inlet.
- Special attention must be devoted to outside contractors engaged to enter and perform work on a Kice Venturi-Jet filter or in the workplace. Special care must be exercised to ensure all such personnel are fully informed of potential hazards and plant safety procedures. Special emphasis should be placed on the use of explosion proof electrical, cutting, or welding tools where required.
- Free outlet of product must be guaranteed at all times. Otherwise, blockage and severe damage may result, or a dangerous situation may occur.
- Airflow to the filter must be switched off long enough (approximately 30 minutes) for dust to settle in the raw gas or dirty air chamber before the service entrance is opened. This is to prevent zone entrainment and mitigate the risk of a potential event outside the system.
- Drive components must be inspected and adjusted after transportation and periodically as required by operating conditions. Check sprocket, sheave and coupling alignment and spacing, drive belt tension, setscrews, keys, fasteners, bearings, shafts, and motors as appropriate to job conditions.
- It is ultimately the operator's responsibility to apply the above listed precautions and ensure proper Kice Venturi-Jet filter use, maintenance and lubrication. Keep these instructions and list of warnings with your machine at all times.
- It cannot be assumed that every acceptable safety procedure is contained herein or that abnormal or unusual circumstances may not warrant or require additional procedures.

WORK SAFELY AT ALL TIMES

5. Delivery Inspection and Installation Preparation

The Kice Venturi-Jet filter has been inspected at Kice and should be in excellent condition upon delivery. A thorough customer inspection of the Kice Venturi-Jet filter should be completed upon receipt to verify its condition.

The Kice Venturi-Jet filter and accessories should be inspected upon receipt for any shipping damage. Check for free operation of all moving parts before signing off on the receiver.

NOTICE: Delivery inspection should be completed before signing carrier's release.

When a carrier signs the Kice Industries, Inc. bill of lading, the carrier accepts responsibility for any subsequent shortages or damage, evident or concealed. Therefore any resulting claim must be made against the carrier by the purchaser. Evident shortage or damage should be noted on the carrier's delivery document before signature of acceptance. Inspection by the carrier for damage, evident or concealed, must be requested.

Complete a visual inspection paying particular attention to guards, overall external condition, protrusions (i.e. mating flanges, attachment points, valves, etc.) and safety decals while the Kice Venturi-Jet filter is still secured to freight platform.

Slab Mounted Units

A qualified engineer should design the foundation and/or footings for the filter. 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 filter housing for wind load support. Hardware for anchoring the filter structure is generally not supplied with the filter and should be procured by the installer.

NOTICE: The following instruction are intended to assist the installer with the assembly and erection of their Kice Venturi-Jet filter but should not be considered a step-by-step instruction due to variations in the supplied product and site location. These variations could be due to application, customer specifications, orientations, etc. Any questions arising before or during installation should be directed to your Kice sales representative for clarification and recommendations.

6. Storage

Kice Venturi-Jet 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 reassemble. 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 any openings to prevent the accumulation of dirt and moisture inside the housing. Cover motors with waterproof material. Refer to the motor maintenance information for further storage instructions.

7. Installation

WARNING: Use appropriate equipment when lifting or moving the Kice Venturi-Jet filter. Make sure all persons and obstructions are clear from the path and installation area. When installing the equipment, make sure the moving parts inside the equipment are not accessible. This also fulfills EN ISO 13857-1 where required.

Installation

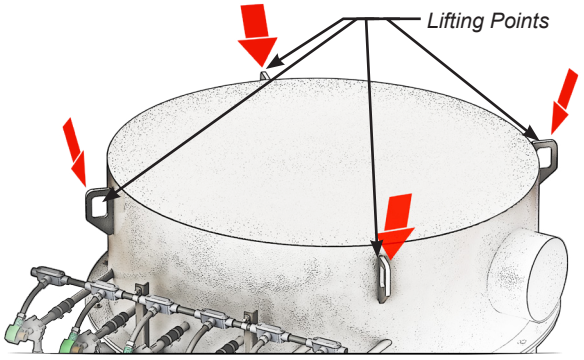


Figure 3

1. Move the Kice Venturi-Jet filter to the installation area using proper equipment. Lift only by lugs indicated (see Figure 3).
2. Check the mating surfaces of the bin or filter hopper flange and the filter housing flange. They should be free of any foreign materials.
3. Place two beads of caulking on the flange of the bin or hopper (on each side of the bolt holes and around each hole) and mount the filter housing.
4. If an airlock valve is required, it should be mounted to the hopper discharge flange or sight glass assembly. Additional support may be required.
5. Tighten all fasteners securely. To insure proper operation, the filter must be adequately supported and properly installed. All duct work or stacks should be independently supported as excess weight may distort the filter housing and cause contact between moving parts. When installing outdoors, care must be taken to guy wire the unit in order to handle the wind loading. Contact Kice Industries, Inc., for the proper location and adjustment.
6. Anchor the base of the ladder to the concrete pad. Use shims as required to ensure the base of the ladder is flush with the pad. Depending on the span of the ladder there may be support bracing that will attach the ladder to the filter housing or structure. Make sure all of the support braces are connected and secure before using the ladder.

CAUTION: Ladder is not safe to use until all components and braces are properly installed.

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

7. Connect the high pressure air supply to the filter air tank, utilizing the pressure regulator, filter and valve(s), if required.
8. The Kice Venturi-Jet filter controller is normally mounted adjacent to the Kice Venturi-Jet filter housing access door. However, it can be mounted in any convenient location. Orientation of the controller does not affect its performance.
9. Electrical conduit and junction tees (one at each Kice Venturi-Jet solenoid valve) are furnished with each filter. On filters with one air tank, the electrical manifold is pre-wired from the solenoids directly to the control box. On filters with two or more air tanks, each tank has an electrical manifold that is pre-wired from the solenoids to a junction box. Each air tank has its own junction box. A local electrician must run a conduit from the control box to each junction box on the filter. Wiring from the controller to the junction box terminals 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 color other than white or green can be used for the hot lines (numbering each end may be helpful).

NOTICE: Reference Figure 14 in the Operating Logic section for example wiring diagram.

10. The sequence controller is not dependent on the successful firing of the Kice Venturi-Jet blast valve to advance to the next valve in sequence. If, for any reason, a Kice Venturi-Jet blast valve does not fire, the controller will continue to time out the “off” time and activate the next valve in sequence.
11. Some systems will have a fan and airlock valve to be connected. Verify that the fan and airlock rotation direction is correct as marked.
12. Test run the filter. If any unusual noises occur, disconnect and lock out the power. Check the fan, airlock valve and screw conveyor, if furnished.
13. Reassemble any doors or covers removed during installation.

Installing / Replacing Bags and Cages - Accessing Dirty Air Chamber

1. Locate proper cleaning platform (see Figure 5.1 and 5.2).
2. Remove any filter bags that may interfere with the position of the cleaning platform inside the chamber.
3. Place cleaning platform inside the filter access door as shown (see Figure 6.1 and 6.2). For door mount platform, make sure the tabs on both sides of the cleaning platform are on the outside of the door frame. Check to make sure the cleaning platform is level and secure. The platform should not rest against or interfere with any filter bags inside the chamber.

NOTICE: A hook is located on the bottom of the tube sheet that may be used to provide additional balance and stability when accessing the dirty air chamber (see Figure 4).

WARNING: The hook on the bottom of the tube sheet is not intended to be a tie off point for a fall arrest system.

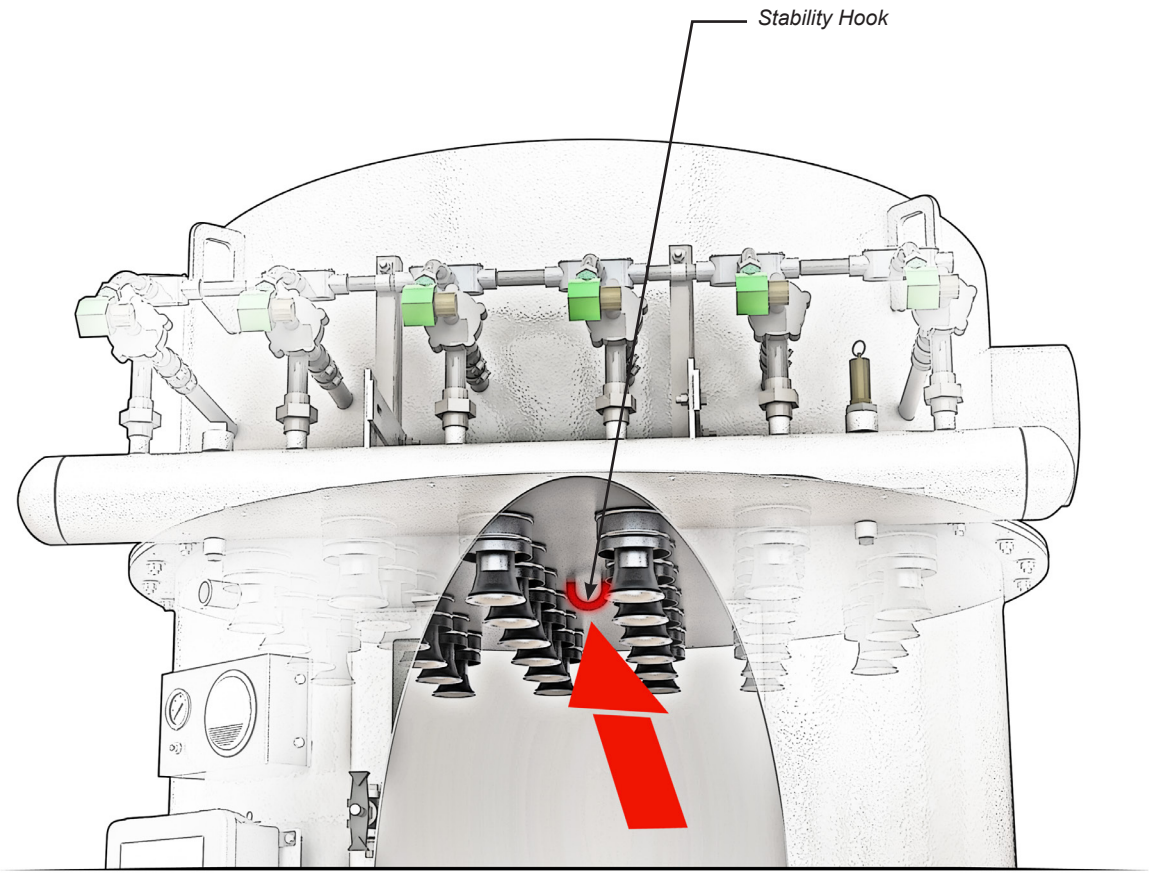


FIGURE 4

NOTICE: Kice Industries, Inc., will always supply internal safety grating in the bottom of the filter housing if it is to be mounted onto a storage bin, to prevent personnel, bags and cages from dropping into the storage bin.

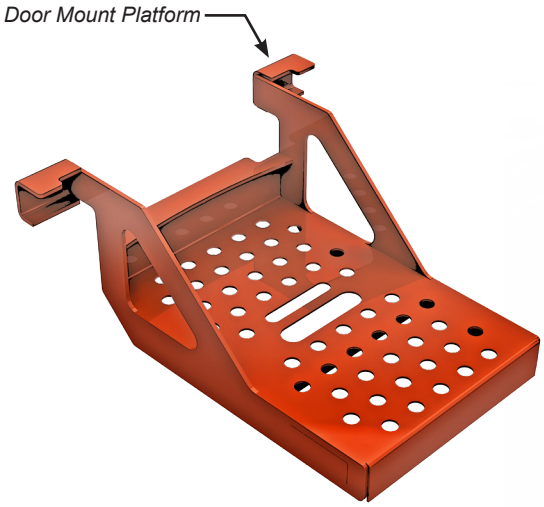


Figure 5.1

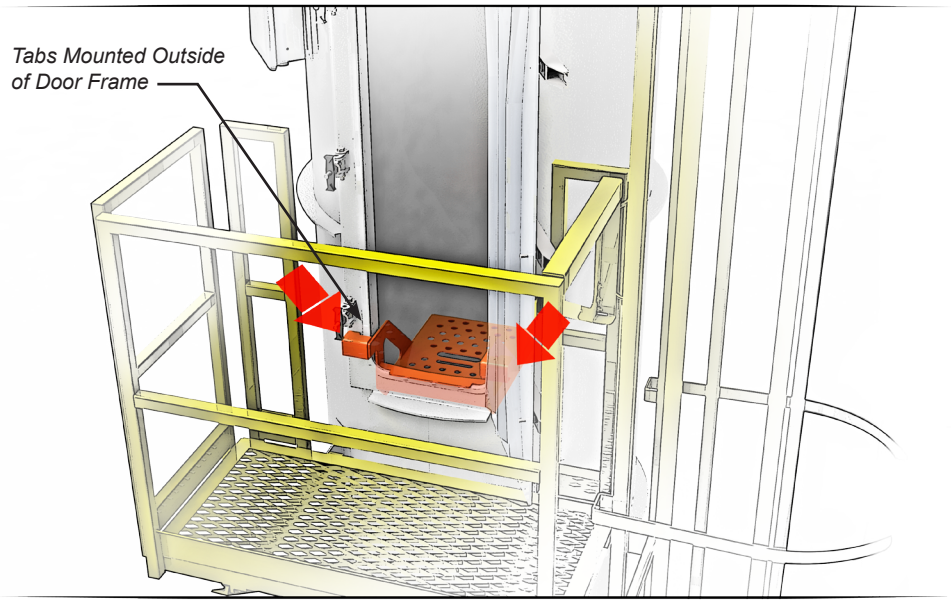


Figure 6.1

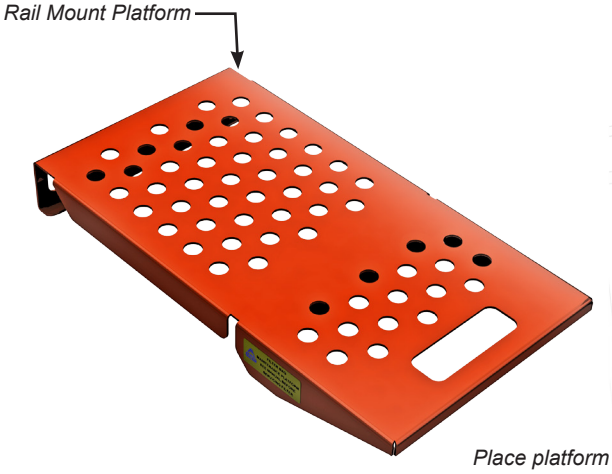


Figure 5.2

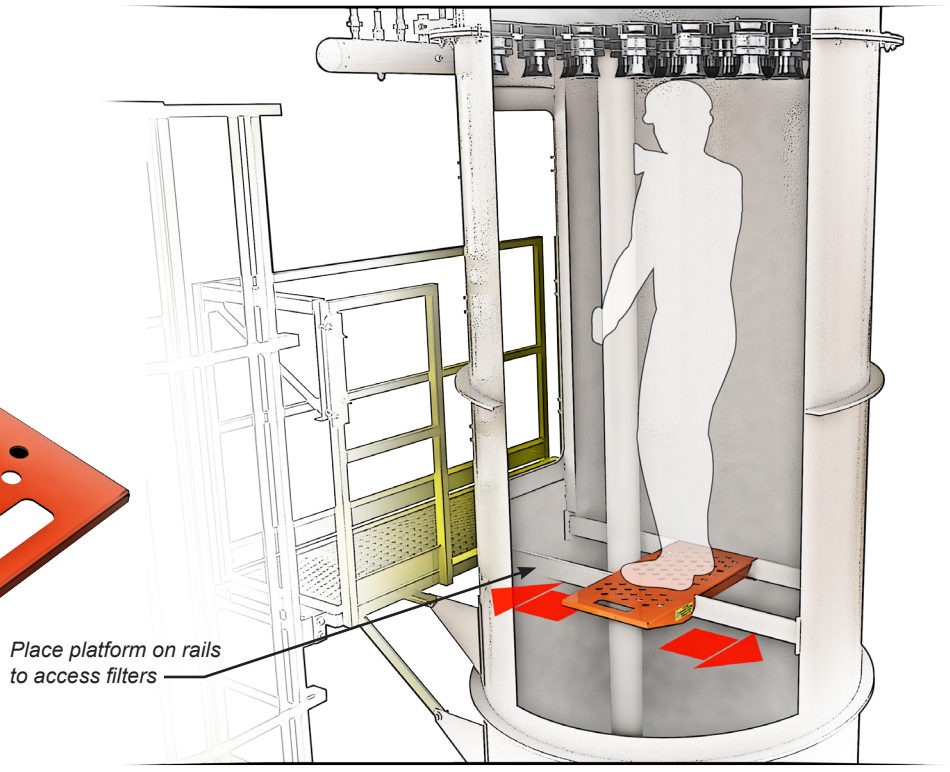


Figure 6.2

NOTICE: Two platforms may be used in conjunction when using rail mount system.

Installing / Replacing Bags and Cages - Bottom Load

1. Slip the filter bag over the wire cage retainer until the bottom of the bag is in contact with the bottom of the retainer. The filter media seam should be located 180 degrees from the gap in the retainer sleeve (see Figure 7).

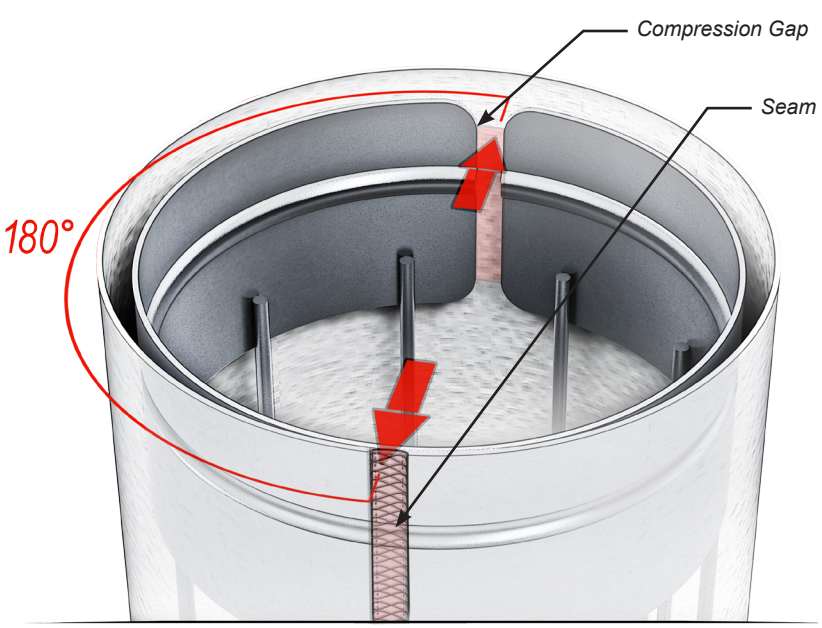
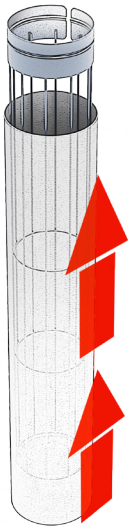


FIGURE 7



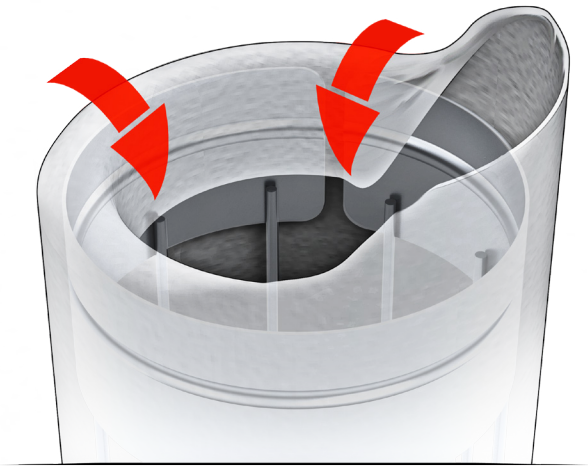


FIGURE 8

2. Check the filter bag for proper length. The filter bag should be only 2” longer than the bag retainer cage.

3. Tuck the overextended portion of the filter media inside the retainer sleeve (see Figure 8).

4. 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 (see Figure 9).

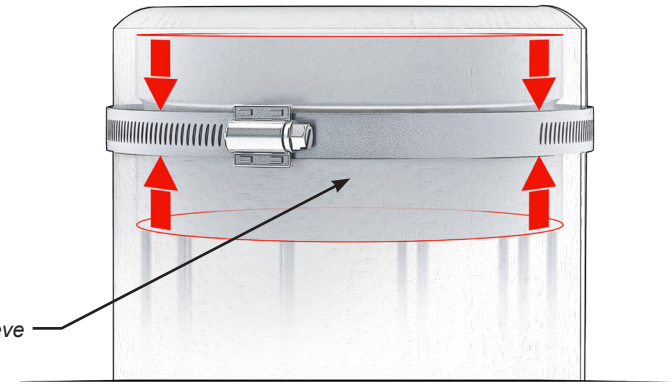


FIGURE 9

5. Slip the retainer/bag/clamp assembly over a collar in the tube sheet (see Figure 10).

6. Match the groove in the retainer sleeve with the groove in the tube sheet collar to prevent the assembly from slipping off (see Figure 11).

7. Tighten the clamp with either a screwdriver, a nut runner with a 5/16” socket, or a ratchet with an extension (which 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.

8. Shake the bag and cage assembly by hand and retighten the clamp.

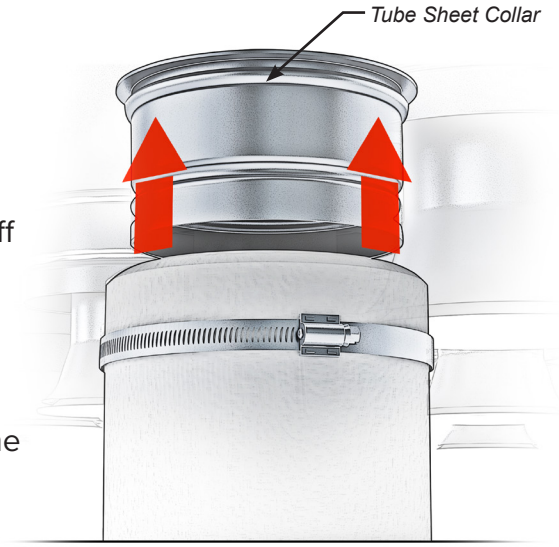


Figure 10

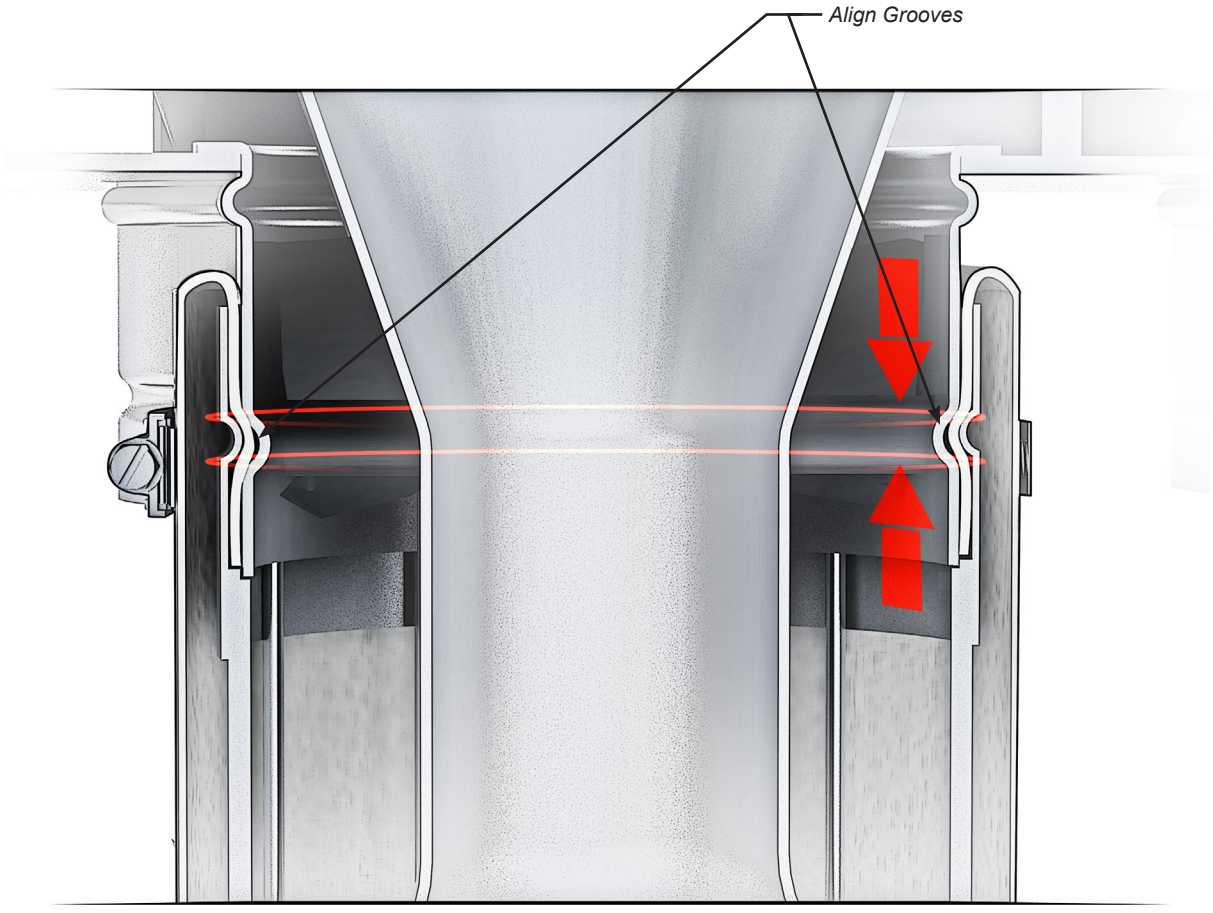


Figure 11

8. Filter Operation & Start-Up 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 a venturi) needed to provide adequate bag cleaning. The compressed air needs to be clean, dry, and oil free.

The compressed air is piped to the air tank mounted on the side of the filter, next to the clean air chamber. The Kice Venturi-Jet blast valves are located between the air tank and the manifold lines that run inside the clean air chamber above the filter bags. Each bag has a venturi mounted to the tube sheet above the open end of the bag. The air tank is filled with compressed air to a pressure of 80-100 psig, at which time an electric signal is sent to activate a solenoid on one of the Kice Venturi-Jet blast valves. The valve opens and quickly discharges the tank of pressurized air through the manifold and into the venturis located above each of the filter bags in that row. This pulse 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 Kice Venturi-Jet blast valve in sequence and activates its solenoid, which releases air to clean the next row of filter bags.

The complete Kice Venturi-Jet filter control circuit is shown on the schematic located on page 21. The Kice Venturi-Jet blast valves (see Figure 12) are mounted between the air tank and the cleaning manifolds. The Kice Venturi-Jet blast valve is a 2 way, normally closed, diaphragm type valve utilizing a spring and air pressure above the diaphragm to cause the diaphragm to seal. When the pressurized air above the diaphragm is exhausted to the atmosphere through the solenoid valve, the diaphragm lifts to the open position. The air in the tank is then discharged into the cleaning manifold in a fraction of a second (the pulse duration is adjustable by the “on-time” setting in the control panel). When the solenoid valve closes the pressure equalizes, allowing the diaphragm to close. As this high pressure jet of air is fired through an orifice in the manifold and into the venturi located above the filter bag, the jet of high-pressure air induces additional air from the clean air chamber to flow into the bag. This creates a shock effect that dislodges dust and other foreign material that is caked on the outside of the filter bag (see Figure 13).

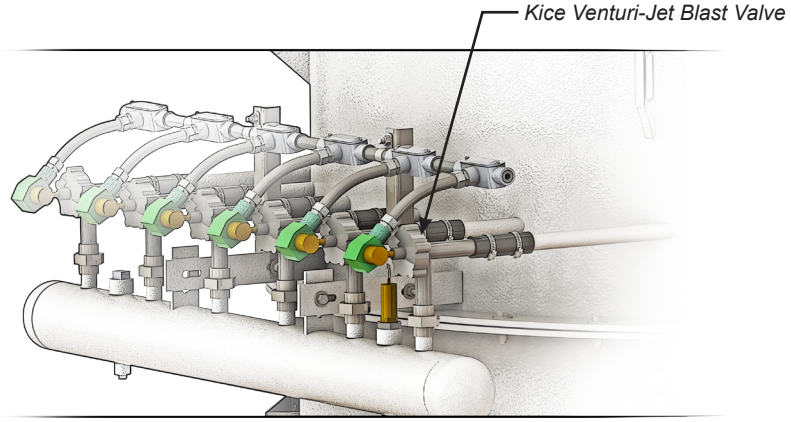


Figure 12

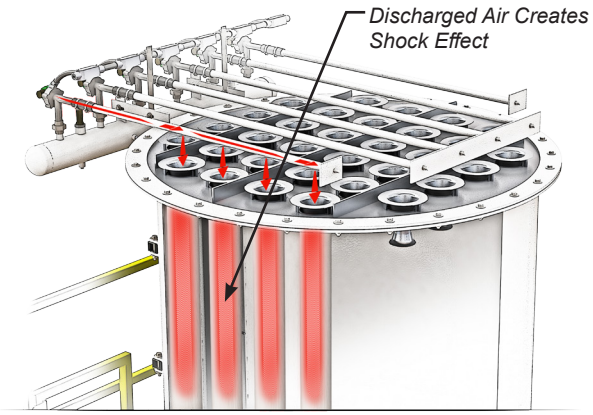


Figure 13

Operating Logic

The controller is an electronic, 100% solid-state board mounted in either a NEMA 4 or an explosion proof enclosure.

The controller can function in two modes:

Continuous Mode: The pressure switch terminals are shorted. Upon application of input voltage, the controller activates output #1 after the preset off time. It will continue to activate outputs sequentially until input voltage is removed.

On Demand Mode: The pressure switch terminals are connected to an isolated set of contacts of a differential pressure switch. The controller will activate the outputs sequentially whenever the pressure switch contacts are closed. When the pressure switch contacts open, the output sequencing stops. Reclosing of the contacts will cause the controller to resume activating the outputs.

A jumper wire allows the user to select the maximum number of outputs to be activated.

NOTICE: Controller is shipped with a jumper across the pressure switch terminals.

The Part Number of the Controllers Used Are:

Dwyer Instruments Timer Controller
2009 to Present:

Model #	Number of Channels	Filter Models
DCT1022DC	22	VM & VR Series
DCT1010	10	VS Series
DCT510ADC	10	VR & VS Series
DCT610	10	VR Series
DCT622	22	VR132

Reference the Dwyer Electronic Controller Schematic (Figure 14) on page 21 for more detail.

The DCT610 and DCT622 both operate on 85 to 270 VAC/50 or 60 Hz. The DCT600 Timer Controllers are mainly used for on-demand, pulse-jet type dust controllers or continuous pneumatic conveying systems.

The DCT1010 and DCT1022DC operates on 24 VDC. The DCT100DC Dust Collector Timer Controller series is mainly used for continuous cleaning or timer-controlled on-demand cleaning.

The DCT510ADC operates on 10 to 35 VDC. The DCT500ADC Low Cost Timer Controller is designed for continuous cleaning methods or on-demand pulse-jet cleaning systems.

Dwyer Instruments Timer Controller Schematic

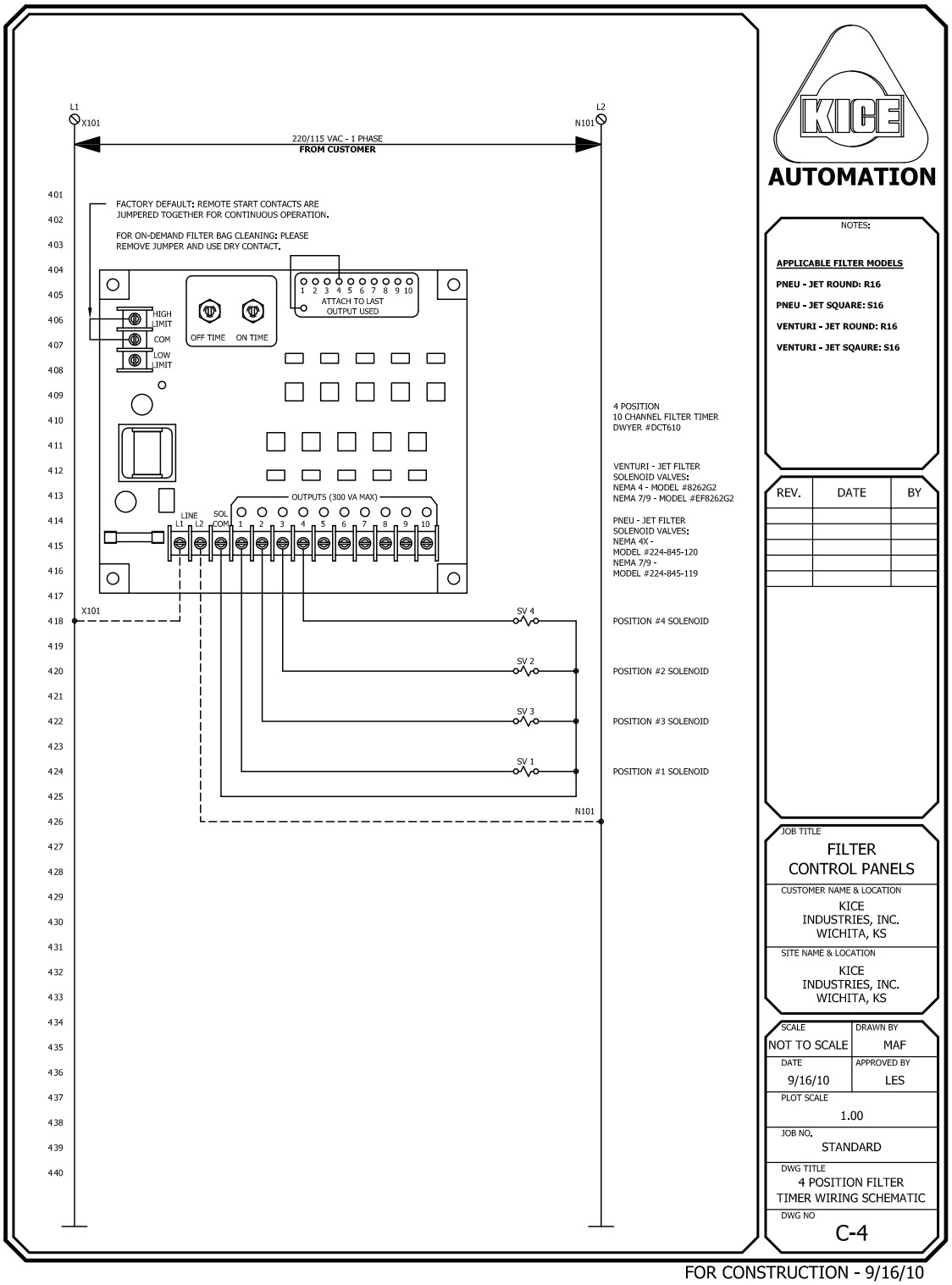


Figure 14

Model	Off Time Sec.	Max. No. Of Outputs	Programmable No. of Outputs
DCT1022DC	1 - 225	22	6 - 22
DCT510ADC	1 - 180	10	4 - 10
DCT610	1 - 180	10	4 - 32
DCT622	1 - 180	22	4 - 32

Specifications:

Time Delay:		Input:	
On Time	Adjustable from 50 to 500 Milliseconds *DCT1022DC: Adjustable from 10 to 600 Milliseconds	Operating Voltage	120 +-10% VAC, 50/60 Hz
Off Time	Adjustable from 1 to 180 Seconds *DCT1022DC: Adjustable from 1 to 225 Seconds	Optional Voltage	220 +-10% VAC, 50/60 Hz

Output:		Protection:	
Type	10-30 VDC power	Solenoid Fault Light	Notifies operator when solenoid valve fails to activate properly

Environmental:	
Operating Temperature:	-40°F to 140°F (-40°C to 60°C)

Ametek Electronic Controller

1994 to 2008:

Model #	Number of Positions	Filter Models
DNC-T2010-A10	3 to 10	VR, VS & VC Series
DNC-T2020-A10	11 to 20	All "VM" Series
DNC-T2032-A10	17 to 32	VM 168 & 336

Reference the Ametek NCC Electronic Controller Schematic (see Figure 15) on page 24 for more detail.

The Model DNC-T2010-A10, DNC-T2020-A10 and DNC-T2032-A10 controllers operate on 120 VAC, 50/60 Hz, and single-phase power. The "on" time is adjustable from 50 milliseconds to 500 milliseconds and the "off" time is adjustable from 1.5 seconds 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 continuously to terminals L1 and L2, the 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.

The controller may be stopped at any point in its sequence by the opening of a simple switch (such as a differential pressure switch). Upon closure of the switch, the controller will resume activating the outputs from where it left off.

A program wire allows for field selection of the number of outputs required. The loose end of the program wire can be moved from one numbered position to another to change the number of outputs activated. Remove this jumper by pulling it off the numbered pin to which it is currently connected and move it to the numbered pin corresponding to the number of outputs desired (each pin closer to the fixed end of the program wire reduces the output quantity by one).

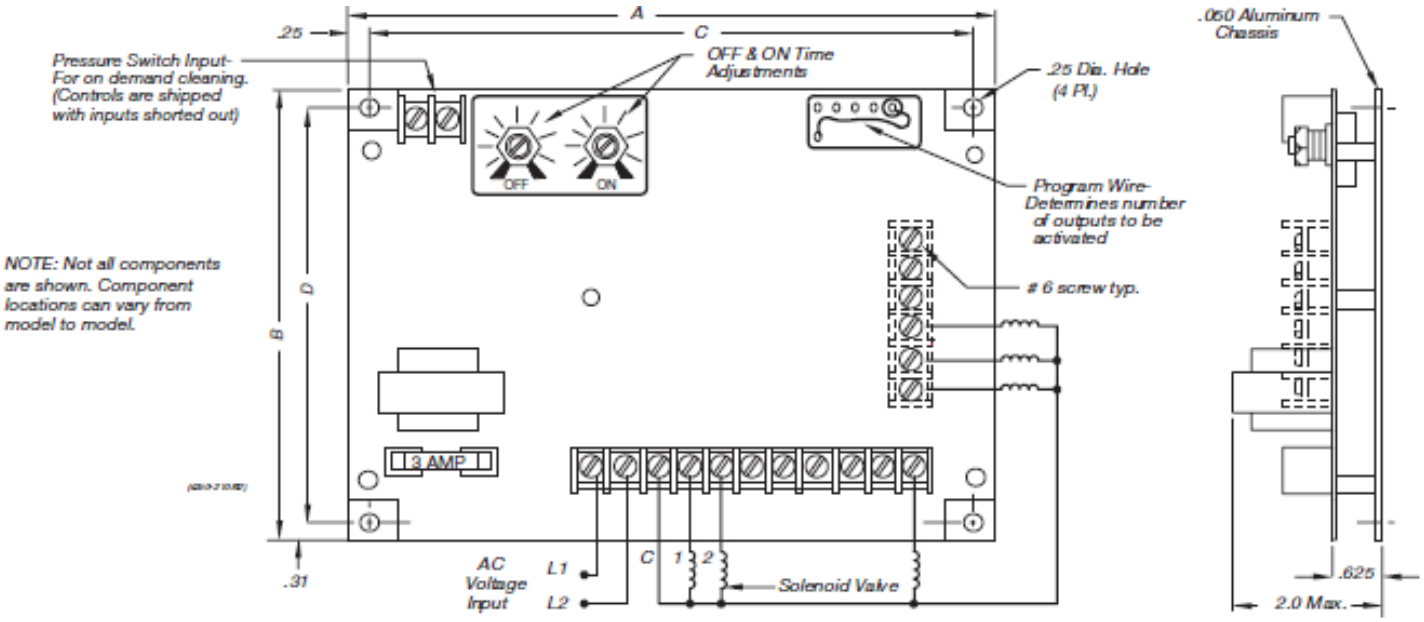


FIGURE 15

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	120 +-10% VAC, 50/60 Hz
Off Time	Adjustable from 1.5 to 30 Seconds	Optional Voltage	220 +-10% VAC, 50/60 Hz

Output:		Protection:	
Type	Solid State Switch rated at 200 VA max. per output (position of program wire determines number of outputs)	Transient voltage Short Circuit Protection	30 Joule Varistor 3 amp fuse

Environmental:	
Operating Temperature:	-40 degrees to 150 degrees F (-40 degrees to 66 degrees C)

Start-Up Procedure

1. Check plant air pressure in the filter air tank.
2. Check screw conveyors and airlocks (if furnished) for proper directions of rotation.
3. Controls should be wired in accordance with schematic diagram. Square and round model filters are normally pre-wired, fully assembled and tested at the factory. Check all wiring connections to assure proper bag cleaning sequence. The air tank pressure gauge should have a working range of 0-160 psig.
4. Set the controller “off” time adjustment to the minimum time by rotating the dial counterclockwise. Allow the sequence controller to operate for 5 to 10 minutes to assure the mechanism has not been damaged in shipment and to allow a short run-in time for the electronics.
5. Set the controller “off” time adjustment to a longer time span by rotating the dial clockwise until you cannot turn the dial any further. With the “off” time adjustment at this setting, check to insure that the relief valve relieves at no more than 125 psig. This provides pressure relief safety for the air tank.
6. Set the controller “off” time adjustment to the desired time by turning the dial to the desired setting.
7. If a venturi-jet blast valve does not fire on start-up, first check the output LED to confirm that power is being sent to the solenoid on the venturi-jet blast valve.

Shut-Down Procedure

After the filter is placed into operation, a good practice to follow on shutdown is as follows:

1. Shut off the suction fan only.
2. Allow the reverse air cleaning, airlock and screw conveyor to operate for at least 15 minutes (a longer period of time is desirable if the operation will allow).
3. Then shut down the remainder of the system.

9. Filter Maintenance and Service

WARNING: Depressurize the valve and bleed air from the air tank before making repairs. To do so, it is only necessary to activate the solenoid on the pilot valve or remove one pilot valve from one blast valve.

Daily Filter Inspection

1. Check and note pressure differential across the filter bags. It is recommended that filter bags be replaced when they can no longer be cleaned to 6.0" *WC* differential pressure.
2. Check the electronic controls to make sure all valves are operating.

General Valve Maintenance

Cleaning: Periodic cleaning of all valves is desirable. The time between cleaning will vary, depending upon the condition of the plant air supply. In general, sluggish valve operation or excessive leakage or noise will indicate that cleaning is required.

Preventative Maintenance: Periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

Causes of Improper Operation:

1. Incorrect Pressure: Check valve pressure. Pressure to valve must be within 5-125 psig.
2. Excessive leakage: Disassemble valves and clean all parts. Replace parts that are worn or damaged with a complete Spare Parts Kit (#96-875).
3. Failure to Open or Close:
   a. If the blast valve stays open, the bleed hole in the diaphragm may be clogged. If the blast valve stays closed, the diaphragm may be torn. Disassemble the valve and clean or replace the diaphragm assembly.
   b. Failure of the solenoid operated pilot valve can also cause the blast valve to stay closed or open. Inspect the solenoid operated pilot valve for proper operation.

Kice Venturi-Jet Blast Valve

Description: The Kice Venturi-Jet blast valve is a 2 way, NC, diaphragm type air valve designed for remote pilot operation. This valve has an angle type aluminum body with a 1/8" NPT connection in the bonnet.

NOTICE: Reference ASCO Valves installation and maintenance instructions in **Appendix A**.

Kice Solenoid Operated Pilot Valve

Description: The Kice solenoid operated pilot valve is a 2 way, NC, direct-acting solenoid valve designed as a pilot for a larger diaphragm valve for remote pilot operation. This valve has a rugged brass body with a general purpose (green) or explosion proof (black) solenoid enclosure.

NOTICE: Reference ASCO Valves installation and maintenance instructions in **Appendix B**.

Solenoid

Description: The Kice pilot valve is operated by an ASCO Red-Hat II epoxy encapsulated solenoid. The green solenoid with lead wires and ½" conduit connection is designed to meet Enclosure Types 4 and 4X – Watertight. The black solenoid (designated by catalog number prefix "EF") is designed to meet Enclosure Types 7 and 9 – Explosion proof.

Types 4 and 4X (Green) - #8262G2
Types 7 and 9 (Black) - #EF8262G2

NOTICE: Reference ASCO Valves installation and maintenance instructions in **Appendix C**.

10. Troubleshooting - Common Filter Problems

CAUTION (SENSITIVE CIRCUITRY): Testing and troubleshooting the 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.

WARNING: Disconnect power before touching any component part!

A. Filter Discharging Dust from Clean Air Chamber

Probable Cause/Suggested Remedies:

1. Check for holes in the filter media.
2. Check for loose bag clamps.
3. Check filter bag installation (see Installation).

B. Pressure Drop Starts to Increase

Probable Cause/Suggested Remedies:

1. Should one venturi-jet blast valve not fire for an extended period of time, a row of filter bags could become masked with dust (see “E” - venturi-jet blast valve fails to fire).
2. After a long period of time, the dust may buildup 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.)
3. If the air volume has been increased to the filter, the air-to-cloth ratio may exceed the recommended ratio.

C. Inlet Air Volume Insufficient

Probable Cause/Suggested Remedies:

1. Check the fan direction of rotation.
2. Check the fan speed (drive belts may be slipping or sheaves may be reversed).
3. Check for high pressure differential (see “B” - Pressure drop starts to increase).
4. Check for leaks in the ductwork.
5. Check for plugged or partially plugged ductwork.
6. Check for closed or partially closed damper.

D. Product Does Not Discharge

Probable Cause/Suggested Remedies:

1. Check the direction of rotation of the airlock and screw conveyor (if furnished).
2. Check for plugged or partially plugged gravity spouting.
3. Check for bridging in the filter hopper.

E. Pressure Holds Constant in Air Tank - Venturi-Jet Blast Valve Fails to Fire

Probable Cause/Suggested Remedies:

1. Check power to the controller.
2. Check LED output indicators.
3. Check for power at the solenoid or for a faulty solenoid.
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.)

F. Cleaning Pressure Varies

Probable Cause/Suggested Remedies:

1. Check “off” time potentiometer.
2. Check “on” time potentiometer.
3. Check for skipping in bag cleaning sequence (venturi-jet blast valve not firing).

G. Pressure in Air Tank will Not Build

Probable Cause/Suggested Remedies:

1. Check the compressed air line filter and regulator.
2. Check the compressed air line solenoid valve.
3. Check the compressed air line manually operated maintenance valve.
4. Check the venturi-jet blast valves for leaks.
5. Check to see if any of the venturi-jet blast valves are stuck open and bleeding air straight into the filter. (This is usually caused by the solenoid operated 2 way pilot valve being stuck open).
6. Check the air piping for leaks.
7. Check connections for leaks between the air tank and the venturi-jet blast valves.
8. Check plant air supply.

H. Sequence Controller Troubleshooting

Probable Cause/Suggested Remedies:

1. Check input power.
2. Observe RED power light:
   a. If power light is not on, check fuse.
   b. If fuse is OK, replace timer board.
3. Before replacing blown fuse, disconnect power and check output circuits only for short circuit. Correct, if necessary.
4. Replace fuse.
5. Apply power while watching output lights for proper function.
6. Make sure cycle starts at output #1, continues to last output selected, and then restarts.

7. If fuse blows, observe at which output light the malfunction occurs and recheck that output circuit for shorted condition.
8. If a valve stays open after it is de-energized, replace the valve.
   a. If a valve stays energized, replace the timer board.
   b. If a valve does not operate when its output light is on, replace the wiring or the solenoid valve.

WARNING: Disconnect power before touching any component part!

Some Things *NOT TO DO*

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 the controller. For service info call Kice.

Replacement Parts

It is recommended that only Kice 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, the Kice filter serial number, the filter model, and the filter size, series (VM, VS, or VR) and number of filter bags. Most of this information is on the metal nameplate attached to the filter housing next to the access door.

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

When ordering a replacement solid-state electronic controller, refer to the Filter Maintenance and Service section, or by specifying the total number of outputs on the controller you are replacing.

Contact Kice Industries for explosion vent replacement and information.

I&M No. V 5162 R6

INSTALLATION AND MAINTENANCE INSTRUCTIONS

REMOTE PILOT OPERATED 2-WAY VALVES

BULLETIN **8353**

Kit No. 96-875

DESCRIPTION

Bulletin 8353 is a 2-way diaphragm type air valve designed for remote pilot operation. Valves have an angle type aluminum body with a 1/8 N.P.T. connection in the valve bonnet for connection to the ASCO remote pilot valve. Valves are designed for multi-unit installations with separately mounted ASCO pilot valves.

OPERATION

When remote pilot valve opens, pressure above the diaphragm is released allowing main line pressure to act against the underside of the diaphragm, opening the main valve orifice. When pilot valve closes, main line pressure bleeds to the top of the diaphragm and closes the main orifice.

INSTALLATION

Check valve bonnet for correct catalog number, pressure and service.

POSITIONING

Valve may be mounted in any position.

PIPING/TUBING

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening pipe, do not use valve as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point. The remote ASCO pilot valve should be mounted as close as possible to the main valve. For correct ASCO pilot valve, consult factory. For proper operation of valve, a specific pilot valve must be utilized. Connecting tubing lengths of ten feet or less have little effect on the pulse response. Installations with over ten feet of tubing must be tested under actual operating conditions. Tubing with 1/4 O.D. is recommended for all installations.

CAUTION: To avoid damage to the valve body, DO NOT OVER-TIGHTEN PIPE CONNECTIONS. If teflon tape, paste, spray or similar lubricant is used, use extra care due to reduced friction.

IMPORTANT: For the protection of the valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required, depending on the service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

MAINTENANCE

WARNING: Depressurize valve and bleed air from header before making repairs. It is necessary only to remove the tubing from the remote pilot valve.

CLEANING

A periodic cleaning of all valves is desirable. The time between cleaning will vary, depending upon media and service conditions. In general, sluggish valve operation or excessive leakage or noise will indicate that cleaning is required.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on media and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within 5-125 psi.
2. **Excessive Leakage:** Disassemble valve and clean all parts. Replace parts that are worn or damaged with a complete Spare Parts Kit for best results.
3. **Failure to Open or Close:**
   - A. If diaphragm valve stays open, bleed hole may be clogged. If diaphragm valve stays closed, diaphragm may be torn. Disassemble valve and clean or replace diaphragm assembly.
   - **B.** Failure of the remote pilot solenoid valve can also cause the diaphragm valve to stay closed or open. Inspect remote pilot solenoid valve for proper opening and closing.

VALVE DISASSEMBLY AND REASSEMBLY (Refer to Figures 1 & 2)

Depressurize valve and bleed air from headers before making repairs. Remove tubing connection from remote pilot valve. Proceed in the following manner:

1. Remove bonnet screws, valve bonnet, diaphragm spring and diaphragm assembly. If the valve you are disassembling contains a square cut gasket or a step spacer as shown in the sectioned view, Figure 2, the square cut gasket or step spacer need not be replaced unless damaged. If a replacement is required, order by the numbers indicated in Figure 2.
2. Diaphragm assembly is now accessible for cleaning or replacement. Replace diaphragm assembly if worn or damaged.
3. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
4. Replace diaphragm assembly, (for ease of assembly, the tab may be located in any position) diaphragm spring, valve bonnet and bonnet screws. Torque bonnet screws in a crisscross manner to 10 - 11 foot-pounds.
5. Replace tubing connection from remote pilot valve.
6. After maintenance, operate the valve a few times to be sure of proper opening and closing.

SPARE PARTS KITS

Spare Parts Kits are available for ASCO valves.
Parts marked with an asterisk (*) are supplied in Spare Parts Kit.

ORDERING INFORMATION FOR SPARE PARTS KITS

When Ordering Spare Parts Kits,
Specify Valve Catalog Number and Serial Number.
Order Kit No. 96-875

For Square Cut Gasket, Order
Part No. 88-224-228A

For Step Spacer, Order
Part No. 93-834-1

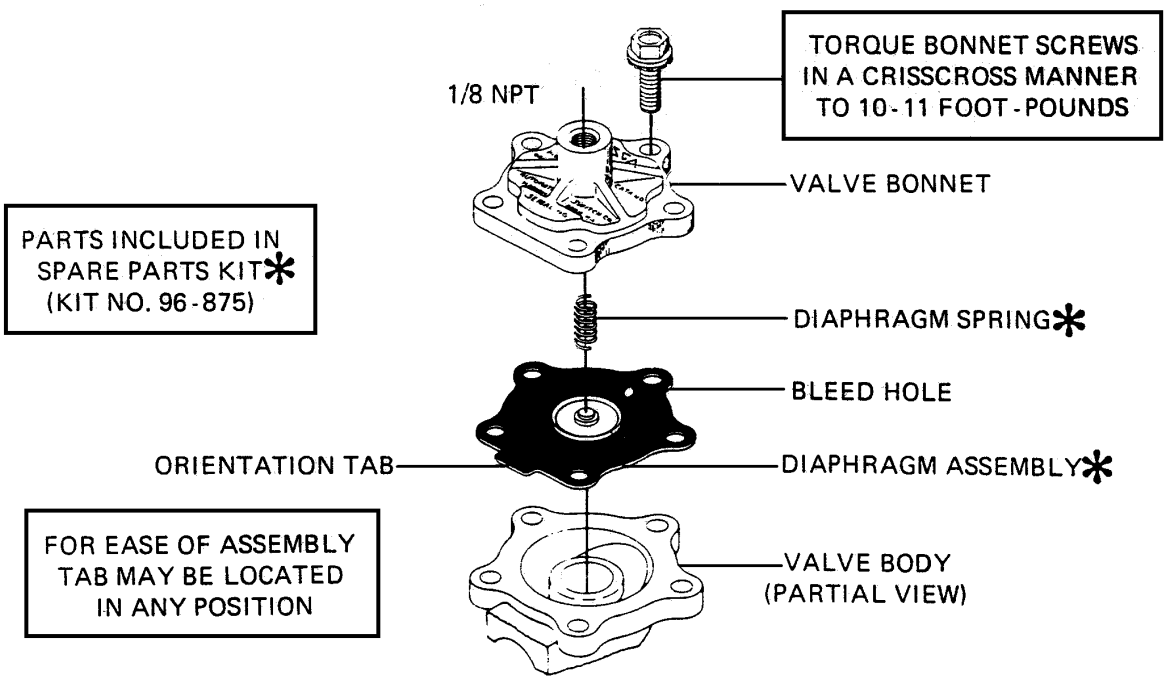


Figure 1. Bulletin 8353

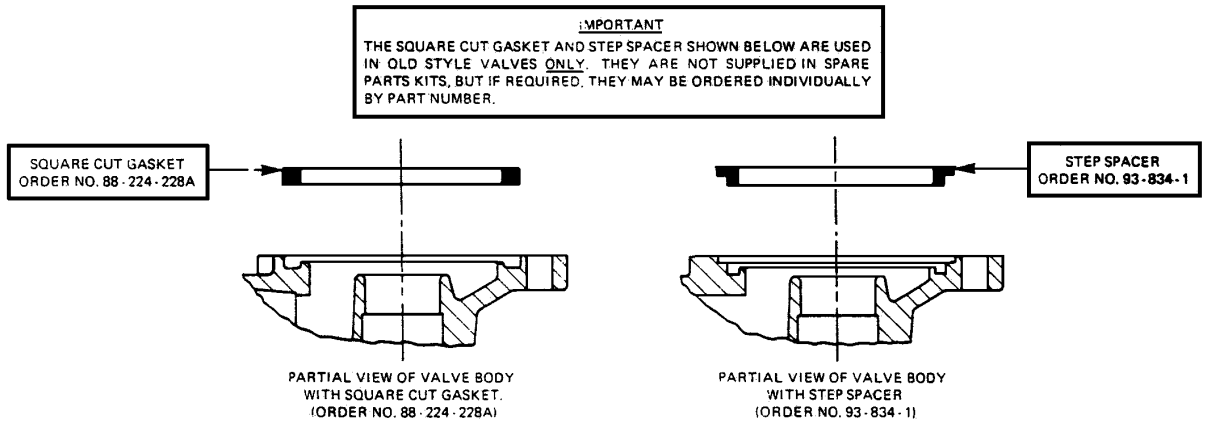


Figure 2. Bulletin 8353
Partial Views Showing Square Cut Gasket and Step Spacer used in Older Style Valves.

I&M No. V 9575 R5 - Sec. 1

Installation & Maintenance Instructions

2-WAY DIRECT-ACTING SOLENOID VALVES
REVISION "H" & "R"
NORMALLY OPEN OR NORMALLY CLOSED OPERATION
BRASS OR STAINLESS STEEL CONSTRUCTION - 1/8 , 1/4 , OR 3/8 PIPE THREADS

SERIES
8262
8263

(Section 1 of 2)

IMPORTANT: See separate solenoid installation and maintenance instructions for information on: Wiring, Solenoid Temperature, Causes of Improper Operation, and Coil or Solenoid Replacement.

DESCRIPTION

Series 8262 and 8263 valves are 2-way direct-acting general service solenoid valves. Valves bodies are of rugged brass or stainless steel. Series 8262 or 8263 valves may be provided with a watertight/ explosionproof solenoid enclosure.

Notice: Brass valves are not certified as lead-free under the Safe Water Drinking Act SWDA 1417 and are not intended for use on drinking water systems. They are intended for control of water in industrial applications. Consult ASCO for valves rated for use in potable water applications.

OPERATION

Normally Open: Valve is open when solenoid is de-energized; closed when energized.

Normally Closed: Valve is closed when solenoid is de-energized; open when energized.

IMPORTANT: No minimum operating pressure required.

Manual Operation (Valves with Suffix MS)

Manual operator allows manual operation when desired or during an electrical power outage. To engage manual operator, rotate stem on the side of the body clockwise until it hits a stop, approximately 90º from its original position. Do NOT rotate beyond stops. Do NOT apply excessive force beyond stops. Valve will now be in the same position as when the solenoid is energized. To disengage,rotate stem counterclockwise until it hits a stop, approximately 90º from its original position. Do NOT rotate beyond stops. Do NOT apply excessive force beyond stops.

MS option is not available on normally closed valves that have a pressure rating greater than 750 PSI. MS option is not available on normally open valves.

⚠ **CAUTION: Do NOT rotate beyond 90 stops. Do NOT apply excessive force beyond stops. Rotating beyond the 90 result in equipment damage.**

⚠ **CAUTION: For valve to operate electrically, manual operator stem must be fully rotated counterclockwise.**

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

Note: Inlet port will either be marked "1" or "IN". Outlet port will be marked "2" or "OUT". (see Figure 1)

Future Service Considerations.

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous,noncombustible fluid after disassembly and reassembly.

Temperature Limitations

For maximum valve ambient and fluid temperatures, refer to the following tables. Use catalog number, coil prefix, suffix,and watt rating on nameplate to identify the maximum ambient and fluid temperatures.

NOTE: The following Temperature Limitations Tables do not apply to Magnetic Latch Valves: Catalog Numbers 8262A610 to 8262A627; 8263A615 to 8263A618, and 8263A624 to 8263A627. See separate Instruction Manual.

Max. Ambient Temperature Limitations for AC and DC Coil Valves, Catalog Numbers 8262H/R & 8263H/R

Prefix ①	Coil Class	Watt Ratings			Max Ambient Temperature			
		AC		DC	Normally Closed		Normally Open	
		60Hz	50Hz		°C	°F	°C	°F
EF,EV	FT	6.1, 10.1	8.1, 10.1	-	52	125	52	125
EF,EV	FB	9.1, 17.1	11.1, 17.1	-			-	-
	FT	6.1, 10.1	8.1, 10.1	-	55	131	55	131
	FB	9.1, 17.1	11.1, 17.1	-			-	-
	HT	-	-	10.6, 11.6	40 ②	104 ②	55	131
	HB	-	-	22.6, 18.6				
EF,EV	HT	-	-	10.6, 11.6				
EF,EV	HB	-	-	22.6, 18.6				
	HT	6.1, 10.1	8.1, 10.1	-	60	140	60	140
	HB	9.1, 17.1	11.1, 17.1	-			55	131
EF,EV	HT	6.1, 10.1	8.1, 10.1	-			60	140
EF,EV	HB	9.1, 17.1	11.1, 17.1	-			-	-
	-	2	2	2			60	140

Max. Ambient Temperature Limitations for AC and DC Coil Valves, Catalog Numbers 8262H/R & 8263H/R

Valve Elastomer/ Suffix	Coil Class	Watt Ratings			Max. Fluid Temp.	
		AC		DC		
		60Hz	50Hz		°C	°F
UR/None④	FT, FB, HT, HB⑤	6.1, 10.1, 9.1, 17.1, 2	8.1, 10.1, 11.1, 17.1, 2	10.6, 11.6, 18.6, 22.6, 2	60	140
NBR/ None④					82 ⑤	180 ⑤
CR/J						
Lt-Nitrile/A					75	167
EPDM/E					99 ⑤	210 ⑤
FKM/V & PTFE/T	FT	6.1, 10.1	8.1, 10.1	-	99 ③	210 ③
	FB		11.1, 17.1	-		
	HT with EF/EV Prefix	6.1, 10.1	8.1, 10.1	10.6, 11.6		
	HB with EF/EV Prefix	9.1, 17.1	11.1, 17.1	18.6, 22.6		
	HT	6.1, 10.1	8.1, 10.1	10.6, 11.6	121 ③⑤	250 ③⑤
	HB⑤	9.1, 17.1	11.1, 17.1	18.6, 22.6		
	-	2	2	2		

① = EF, EV data applies to Explosionproof coils only.

② = DC Normally closed solenoid valves can be operated at maximum ambient temperature of 55° C / 131° F with reduced pressure ratings. See page 5 of 5, Section 2 of 2 for maximum operating pressure differential.

③ = Solenoid coils with prefix EF & EV are limited to a maximum fluid temperature of 99°C/ 210°F

④ = Urethane (UR) elastomer applies to catalog numbers 8262H079, 089, 096 099, 106, 107, 154, 155, 159, 161, 167, 168, 173, 175, 176, 180, 181, 198, 199, 200, 214 and 8262R107, 181, 155, 161, 168, 169.

⑤ = Normally open 8262H & 8263H valves fitted with HB 17.1 watt AC coils have a maximum fluid temperature of 75°C (167°F)

Positioning

These valves are designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub-assembly area.

Mounting

Two (2) M5 threaded holes are provided in the valve body for mounting. (See Figure 1)

Optional mounting bracket can be obtained with valve as Suffix MB or separately as a kit.

Piping

Connect piping or tubing to valve according to markings on valve body. Inlet port will either be marked "1" or "IN". Outlet port will be marked "2" or "OUT". Wipe the pipe threads clean of cutting oils. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

IMPORTANT: To protect the solenoid valve, install a strainer or filter suitable for the service involved, in the inlet side as close to the valve as possible. Clean periodically depending on service conditions. See ASCO Series 8600 and 8601 for strainers.

MAINTENANCE

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.

NOTE: It is not necessary to remove the valve from the pipeline for repairs.

Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- Periodic exercise of the valve should be considered if ambient or fluid conditions are such that corrosion, elastomer degradation, fluid contamination build up, or other conditions that could impede solenoid valve shifting are possible. The actual frequency of exercise necessary will depend on specific operating conditions. A successful operating history is the best indication of a proper interval between exercise cycles.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any worn or damaged parts.

Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve (see Maintenance) and clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Disassembly (see Figures 2, 3 & 4)

1. Disassemble valve using exploded views for identification of parts.
2. Remove solenoid, see separate instructions.
3. Unscrew solenoid base sub-assembly with wrench. Remove core assembly, core spring, and solenoid base gasket from valve body.
4. For normally open construction (Figure 4) remove spring,and disc holder assembly.
5. All parts are now accessible to clean or replace. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Reassembly

1. Use exploded views for identification, orientation and placement of parts.
2. Lubricate all gaskets with DOW CORNING® 200 Compound lubricant or an equivalent high-grade silicone oil.
3. For normally open construction (Figure 4), install disc holder assembly and disc holder spring.
4. Replace solenoid base gasket, core assembly with core spring and solenoid base sub-assembly. Note: For core assemblies with internal type core springs, install wide end of core spring in core assembly first, closed end of core spring protrudes from top of core assembly. (see Figure 2)
5. Torque solenoid base sub-assembly to 175±25 in-lbs [19,8±2,8 Nm].
6. Install solenoid. See separate solenoid instructions. Then make electrical hookup to solenoid.

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a nonhazardous, noncombustible fluid.

7. Restore line pressure and electrical power supply to valve.
8. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic *click* signifies the solenoid is operating.

ORDERING INFORMATION FOR ASCO REBUILD KITS

Parts marked with an asterisk (*) in the exploded views in Figure 2 & 3 are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the quantity of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

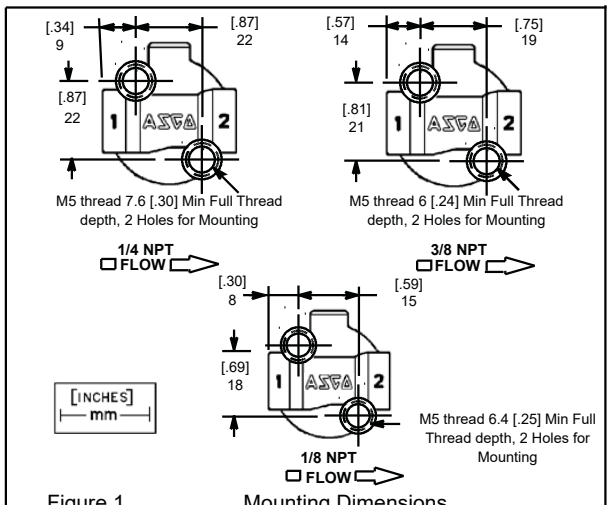
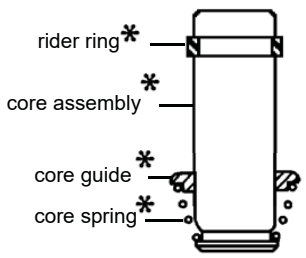
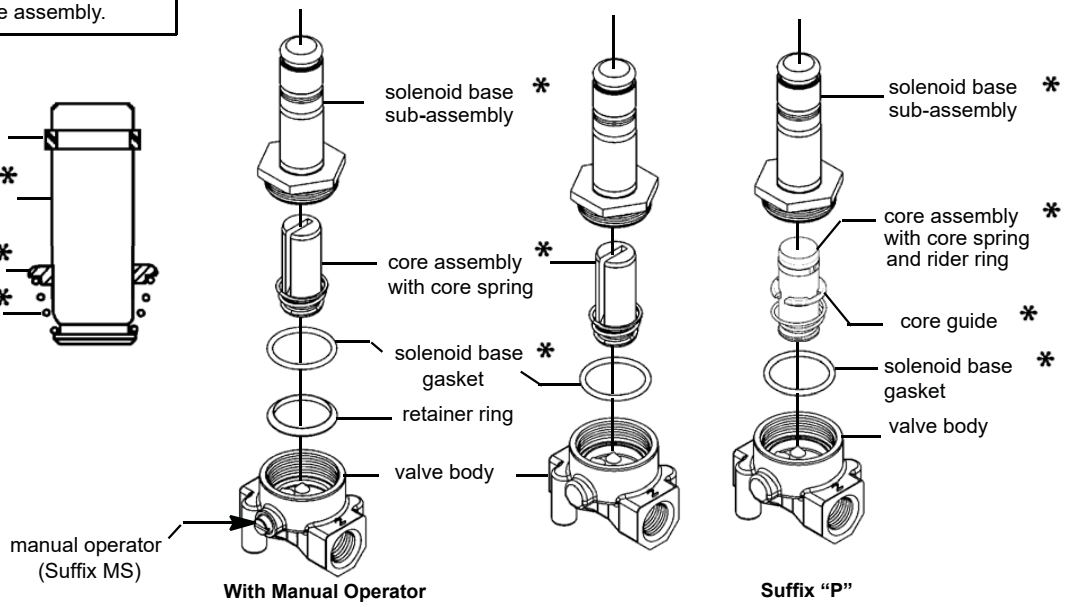


Figure 1 Mounting Dimensions

Torque Chart		
Part Name	Torque value Inch-Pounds	Torque value Newton-Meters
solenoid base sub-assembly	175 ± 25	19,8 ± 2,8

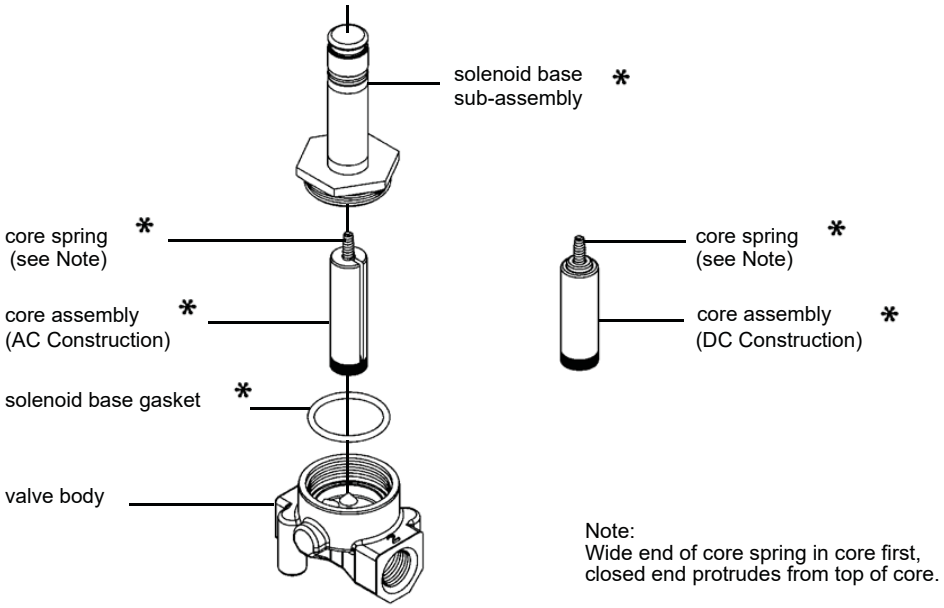
Partial cutaway view showing positioning of rider ring, core guide, and core spring on core assembly.





External Spring Construction

* Indicates Parts Supplied in ASCO Rebuild Kits.



Internal Spring Construction

Figure 2. Normally Closed Construction

Disassembly and Reassembly of Manual Operator (Refer to Figure 3)

1. Position core assembly with core spring attached into base of manual operator body.
2. Ensure retaining ring is properly located in valve body.
3. Replace solenoid base gasket and solenoid base sub-assembly into valve body. Torque solenoid base sub-assembly to 175 ± 25 in-lbs [19,8 ± 2,8 Nm].
4. Check manual operator for proper operation. Turn stem clockwise and counterclockwise; stem should turn freely without binding.

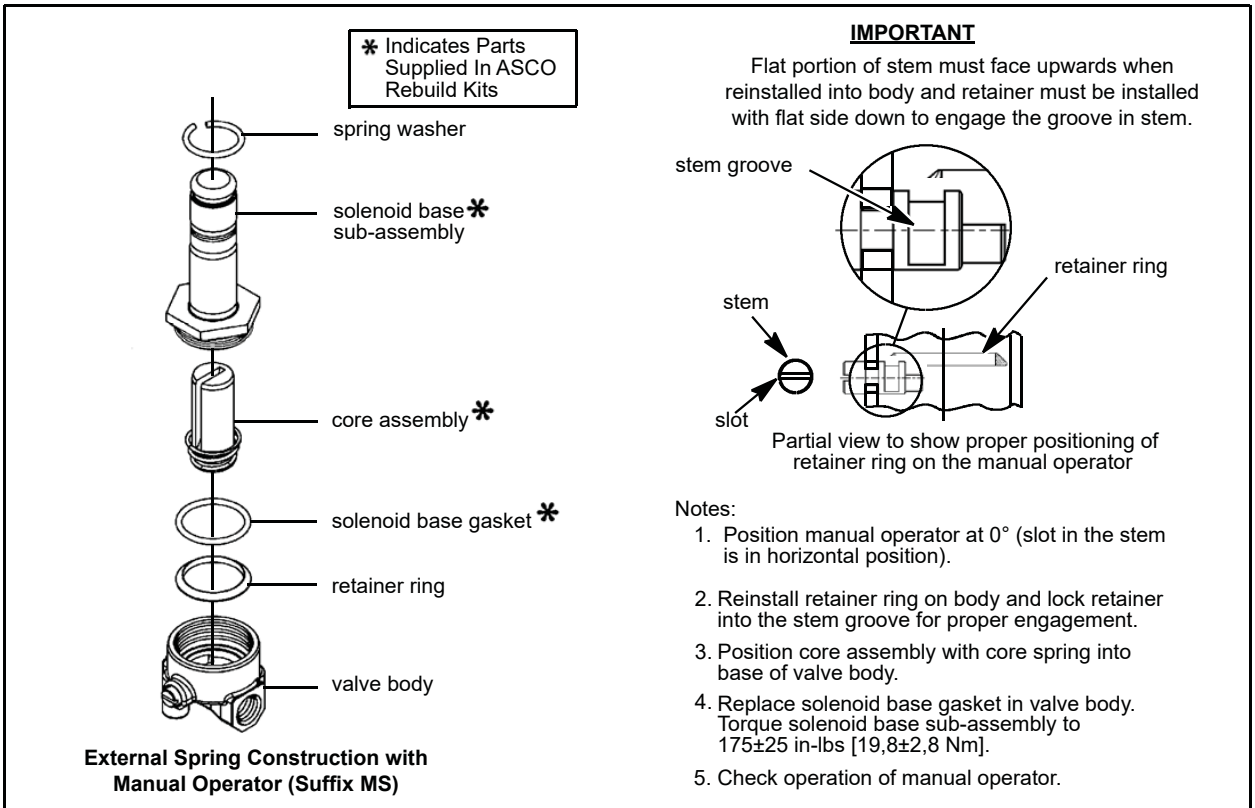
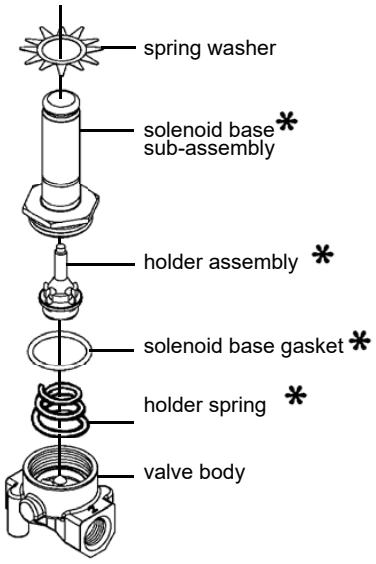
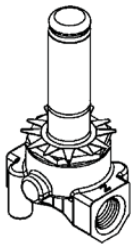


Figure 3. manual operator



Torque Chart		
Part Name	Torque value inch-pounds	Torque value Newton-Meters
solenoid base sub-assembly	175 ± 25	19,8 ± 2,8



* Indicates Parts Supplied In ASCO Rebuild Kits

Figure 4. Series 8262 & 8263, normally open constructions

I&M V_6583_R12

Installation&Maintenance Instructions

ASCO Red-Hat II™

OPEN-FRAME, GENERAL PURPOSE, WATERTIGHT/EXPLOSIONPROOF SOLENOIDS
OPTIONAL FEATURE FOR OPEN FRAME (GENERAL PURPOSE) CONSTRUCTION ONLY

SERIES
8016G/H

— SERVICE NOTICE —

ASCO™ solenoid valves with design change letter "G" or "H" in the catalog number (ex. 8210G1) have an epoxy encapsulated ASCO Red Hat II® solenoid. This solenoid replaces some of the solenoids with metal enclosures and open-frame constructions. Follow these installation and maintenance instructions if your valve or operator uses this solenoid.

DESCRIPTION

Catalog numbers 8016G/H1 and 8016G/H2 are epoxy encapsulated pull-type solenoids. The green solenoid with lead wires and 1/2 conduit connection is designed to meet Enclosure Type 1-General Purpose, Type 2-Dripproof, Types 3 and 3S-Raintight, and Types 4 and 4X-Watertight. The black solenoid on catalog numbers prefixed "EF" is designed to meet Enclosure Types 3 and 3S-Raintight, Types 4 and 4X-Watertight, Types 6 and 6P-Submersible, Type 7, Explosionproof Class I, Division1 Groups A, B, C, & D and Type 9, -Dust-Ignitionproof Class II, Division1 Groups E, F & G. The Class II, Groups F & G Dust Locations designation is not applicable for solenoids or solenoid valves used for steam service or when a class "H" solenoid is used. See *Temperature Limitations* section for solenoid identification and nameplate/retainer for service. When installed just as a solenoid and not attached to an ASCO valve, the core has a 0.250-28 UNF-2B tapped hole, 0.38 minimum full thread.

Series 8016G/H are also available in:

- **Open-Frame Construction:** The green solenoid may be supplied with 1/4″ spade, screw or DIN terminals. (Refer to Figure 4)
  - **DIN Plug Connector Kit No. K236034:** Use this kit only for solenoids with DIN terminals. The DIN plug connector kit provides a two pole with grounding contact DIN Type 43650 construction (See Figure 6).
- **Panel Mounted Construction:** These solenoids are specifically designed to be panel mounted by the customer through a panel having a .062 to .093 maximum wall thickness. (Refer to Figure 3 and section on *Installation of Panel Mounted Solenoid*).
- **Junction Box:** This junction box construction meets Enclosure Types 2, 3, 3S, 4, and 4X. Only solenoids with 1/4″ spade or screw terminals may have a junction box. The junction box provides a 1/2″ conduit connection, grounding and spade or screw terminal connections within the junction box (See Figure 5).

OPERATION

When the solenoid is energized, the core is drawn into the solenoid base sub-assembly.

IMPORTANT: When the solenoid is de-energized, the initial return force for the core, whether developed by spring, pressure, or weight, must exert a minimum force to overcome residual magnetism created by the solenoid. Minimum return force for AC construction is 0.69lbs (3.1N) and 0.31 lbs (1.38N) for DC.

INSTALLATION

Check nameplate for correct catalog number, service, and wattage. Check front of solenoid for voltage and frequency.

⚠ WARNING: Electrical hazard from the accessibility of live parts. To prevent the possibility of death, serious injury or property damage, install the open - frame solenoid in an enclosure.

FOR BLACK ENCLOSURE TYPES 7 AND 9 ONLY

⚠ CAUTION: To prevent fire or explosion, do not install solenoid and/or valve where ignition temperature of hazardous atmosphere is less than 165°C. On valves used for steam service or when a class "H" solenoid is used, do not install in hazardous atmosphere where ignition temperature is less than 180°C. See nameplate/retainer for service.

NOTE: These solenoids have an internal non-resetable thermal fuse to limit solenoid temperature in the event that extraordinary conditions occur which could cause excessive temperatures. These conditions include high input voltage, a jammed core, excessive ambient temperature or a shorted solenoid, etc. This unique feature is a standard feature only in solenoids with black explosionproof/dust-ignitionproof enclosures (Types 7 & 9).

⚠CAUTION: To protect the solenoid valve or operator, install a strainer or filter, suitable for the service involved in the inlet side as close to the valve or operator as possible. Clean periodically depending on service conditions. See ASCO Series 8600 and 8601 for strainers.

Temperature Limitations

For maximum valve ambient temperatures, refer to chart. The temperature limitations listed, only indicate maximum application temperatures for field wiring rated at 90°C. Check catalog number prefix and watt rating on nameplate to determine maximum ambient temperature. See valve installation and maintenance instructions for maximum fluid temperature.

NOTE: For steam service, refer to *Wiring* section, *Junction Box* for temperature rating of supply wires.

Temperature Limitations For Series 8016G Solenoids for use on Valves Rated at 6.1, 8.1, 9.1, 10.6 or 11.1 Watts

Watt Rating	Catalog Number Coil Prefix	Class of Insulation	Maximum § Ambient Temp.
6.1, 8.1, 9.1 & 11.1	None, FB, KF, KP, SC, SD, SF & SP	F	125°F (52°C)
6.1, 8.1, 9.1 & 11.1	HB, HT, KB, KH, SS, ST & SU	H	140°F (60°C)
10.6**	None, KF, SF, SC, HT, KH, ST & SU	F & H	104°F (40°C)
7.1 @ 60Hz (8.1 @ 50Hz)		F & H	175°F (79°C)*
10.6**		F & H	140°F (60°C)

§ Minimum ambient temperature -40°F (-40°C).
* When used with watertight aluminum junction boxers (screw or spade) max. ambient and fluid temperature will be reduced to 157°F (69.4°C)
** 10.6 Watt solenoids rated for 104°F are 8030, 8260, 8316, 8321, 8320, 8360 & 8344 valves while those rated for 140°F are 8040 valves

Temperature Limitations for Series 8003H, 8007H and 8202H solenoids

Prefix ①	Coil Class	Watt Ratings AC 60 Hz	Watt Ratings AC 50 Hz	Watt Ratings DC	Maximum Ambient Temperature °C	Maximum Ambient Temperature °F
EF	FT	6.1	8.1	-	52	125
EF	FB	9.1	11.1	-		
	FT	6.1	8.1	-	55	131
	FB	9.1	11.1	-		
	HT	-	-	10.6	40 ②	104②
	HB	-	-	18.6		
EF	HT	-	-	10.6		
EF	HB	-	-	18.6		
	HT	6.1	8.1	-	60 ③	140 ③
	HB	9.1	11.1	-		
EF	HT	6.1	8.1	-		
EF	HB	9.1	11.1	-		

①= EF data applies to Explosionproof coils only.
②= Some DC solenoid valves can be operated at maximum ambient temperature of 55°C / 131°F with reduced pressure ratings. See valve I&M for maximum operating pressure differential ratings.
③= Steam Service Valves have a maximum ambient temperature of 55° C/ 131°F.

Positioning

This solenoid is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub-assembly area.

Wiring

Wiring must comply with local codes and the National Electrical Code. All solenoids supplied with lead wires are provided with a grounding wire which is green or green with yellow stripes and a 1/2″ conduit connection. To facilitate wiring, the solenoid may be rotated 360°. For explosionproof solenoid version, the conduit lead wires are factory sealed for use in hazardous locations.

Additional Wiring Instructions For Optional Features:

- **Open-Frame solenoid with 1/4″ spade terminals.**

For solenoids supplied with screw terminal connections use #12-18 AWG stranded copper wire rated at 90°C or greater. Torque terminal block screws to 10±2 in-lbs [1,0±1,2 Nm]. A tapped hole is provided in the solenoid for grounding, use a #10-32 machine screw. Torque grounding screw to 15-20 in-lbs [1,7-2,3 Nm]. On solenoids with screw terminals, the socket head screw holding the terminal block to the solenoid is the grounding screw. Torque the screw to 15-20 in-lbs [1,7-2,3 Nm] with a 5/32″ hex key wrench.

- **Junction Box**

The junction box is used with spade or screw terminal solenoids only and is provided with a grounding screw and a 1/2″ conduit connection. Connect #12-18 AWG standard copper wire only to the screw terminals. Within the junction box use field wire that is rated 90°C or greater for connections. For steam service use 105°C rated wire up to 50 psi or use 125°C rated wire above 50 psi. After electrical hookup, replace cover gasket, cover, and screws. Tighten screws evenly in a crisscross manner.

- **DIN Plug Connector Kit No. K236034**

1. The open-frame solenoid is provided with DIN terminals to accommodate the plug connector kit.
2. Remove center screw from plug connector. Using a small screwdriver, pry terminal block from connector cover.
3. Use #12-18 AWG stranded copper wire rated at 90°C or greater for connections. Strip wire leads back approximately 1/4″ for installation in socket terminals. The use of wire-end sleeves is also recommended for these socket terminals. Maximum length of wire-end sleeves to be approximately 1/4″. Tinning of the ends of the lead wires is not recommended.
4. Thread wire through gland nut, gland gasket, washer and connector cover.

NOTE: Connector housing may be rotated in 90° increments from position shown for alternate positioning of cable entry.

5. Check DIN connector terminal block for electrical markings. Then make electrical hookup to terminal block according to markings on it. Snap terminal block into connector cover and install center screw.
6. Position connector gasket on solenoid and install plug connector. Torque center screw to 5±1 in-lbs [0,6±1,1 Nm].

NOTE: Alternating current (AC) and direct current (DC) solenoids are built differently and cannot be converted from one to the other by changing the coil.

Installation of Solenoid

Solenoids may be assembled as a complete unit. Tightening is accomplished by means of a hex flange at the base of the solenoid.

Installation of Panel Mounted Solenoid (See Figure 3)

Disassemble solenoid following instruction under *Solenoid Replacement* then proceed.

3/4" Valve Bonnet Construction

1. Install retainer (convex side to solenoid) in 1.312 diameter mounting hole in customer panel.
2. Position spring washer over plugnut/core tube sub-assembly.
3. Install plugnut/core tube sub-assembly through retainer in customer panel then replace solenoid, nameplate and red cap.

15/16" Valve Bonnet Construction

1. Install solenoid base sub-assembly through 0.69 diameter mounting hole in customer panel.
2. Position spring washer on opposite side of panel over solenoid base sub-assembly then replace.

Solenoid Temperature

Standard solenoids are designed for continuous duty service. When the solenoid is energized for a long period, the solenoid becomes hot and can be touched by hand only for an instant. This is a safe operating temperature.

MAINTENANCE

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, turnoff electrical power, depressurize solenoid operator and/or valve, and vent fluid to a safe area before servicing.

Cleaning

All solenoid operators and valves should be cleaned periodically.
The time between cleaning will vary depending on medium and service conditions. In general, if the voltage to the solenoid is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the solenoid operator or valve as free from dirt and foreign material as possible.
- Periodic exercise of the valve should be considered if ambient or fluid conditions are such that corrosion, elastomer degradation, fluid contamination build up, or other conditions that could impede solenoid valve shifting are possible. The actual frequency of exercise necessary will depend on specific operating conditions. A successful operating history is the best indication of a proper interval between exercise cycles.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any worn or damaged parts.

Causes of Improper Operation

- **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic *click* signifies that the solenoid is operating. Absence of the *click* indicates loss of power supply. Check for loose or blown fuses, open-circuited or grounded solenoid, broken leadwires or splice connections.
- **Burned-Out Solenoid:** Check for open-circuited solenoid. Replace if necessary. Check supply voltage; it must be the same as specified on nameplate/retainer and marked on the solenoid. Check ambient temperature and check that the core is not jammed.
- **Low Voltage:** Check voltage across the solenoid leads. Voltage must be at least 85% of rated voltage.

Solenoid Replacement

1. On solenoids with lead wires disconnect conduit, coil leads, and grounding wire.

NOTE: Any optional parts attached to the old solenoid must be reinstalled on the new solenoid.

2. Disassemble solenoids with optional features as follows:
   - **Spade or Screw Terminals**

     Remove terminal connections, grounding screw, grounding wire, and terminal block (screw terminal type only).

NOTE: For screw terminals, the socket head screw holding the terminal block serves as a grounding screw.

   - **Junction Box**

     Remove conduit and socket head screw (use 5/32″ hex key wrench) from center of junction box. Disconnect junction box from solenoid.

   - **DIN Plug Connector**

     Remove center screw from DIN plug connector. Disconnect DIN plug connector from adapter. Remove socket head screw (use 5/32″ hex key wrench), DIN terminal adapter, and gasket from solenoid.
3. Snap off red cap from top of solenoid base sub-assembly.
4. Push down on solenoid. Then using a suitable screwdriver, insert blade in slot provided between solenoid and nameplate/retainer. Pry up slightly and push to remove. Then remove solenoid from solenoid base sub-assembly.
5. Reassemble using exploded views for parts identification and placement.

Disassembly and Reassembly of Solenoids

1. Remove solenoid, see *Solenoid Replacement*.
2. Remove spring washer from solenoid base sub-assembly.
3. Unscrew solenoid base sub-assembly.

NOTE: Some solenoid constructions have a plugnut/core tube sub-assembly, bonnet gasket and bonnet in place of the solenoid base sub-assembly. To remove bonnet use special wrench adapter supplied in ASCO Rebuild Kit. For wrench adapter only, order ASCO Wrench Kit No. K218948.

4. The core is now accessible for cleaning or replacement.
5. If the solenoid is part of a valve, refer to basic valve installation and maintenance instructions for further disassembly.
6. Reassemble using exploded views for identification and placement of parts.

ORDERING INFORMATION FOR ASCO SOLENOIDS

When Ordering Solenoids for ASCO Solenoid Operators or Valves, order the number stamped on the solenoid. Also specify voltage and frequency.

Torque Chart

Part Name	Torque Value in Inch-Pounds	Torque Value in Newton-Meters
solenoid base sub-assembly	175 ± 25	19,8± 2,8
valve bonnet (3/4" bonnet construction)	90 ± 10	10,2 ± 1,1
bonnet screw (3/8" or 1/2" NPT pipe size)	25	2,8
bonnet screw (3/4" NPT pipe size)	40	4,5

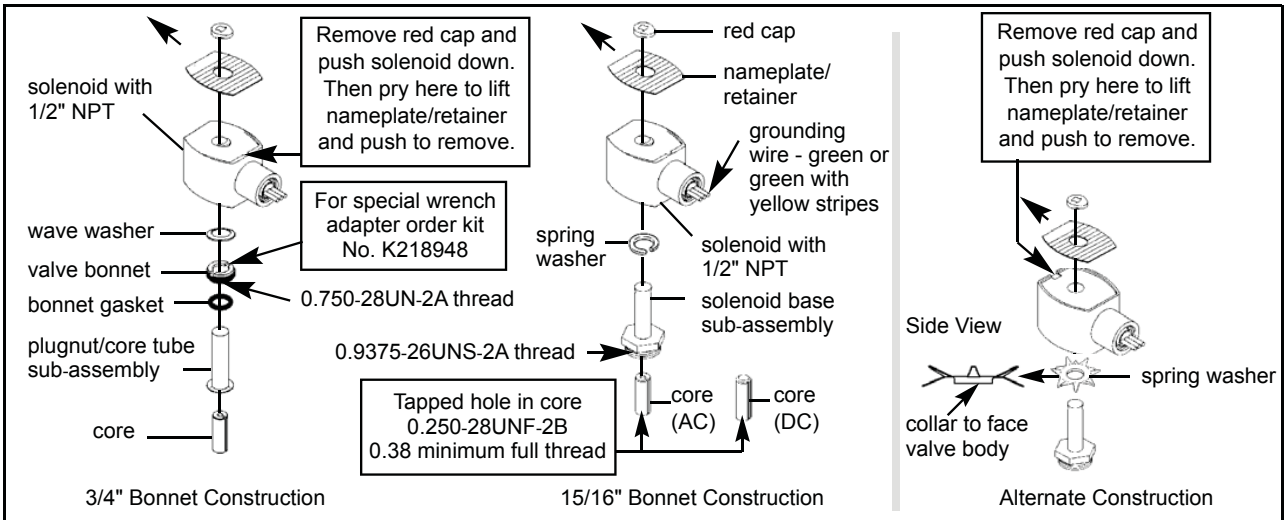


Figure 1. Series 8016G/H solenoids

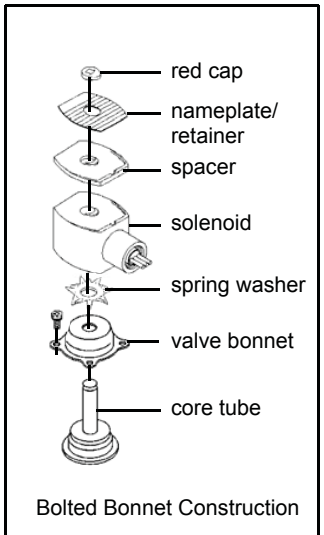


Figure 2. Series 8016G/H solenoids

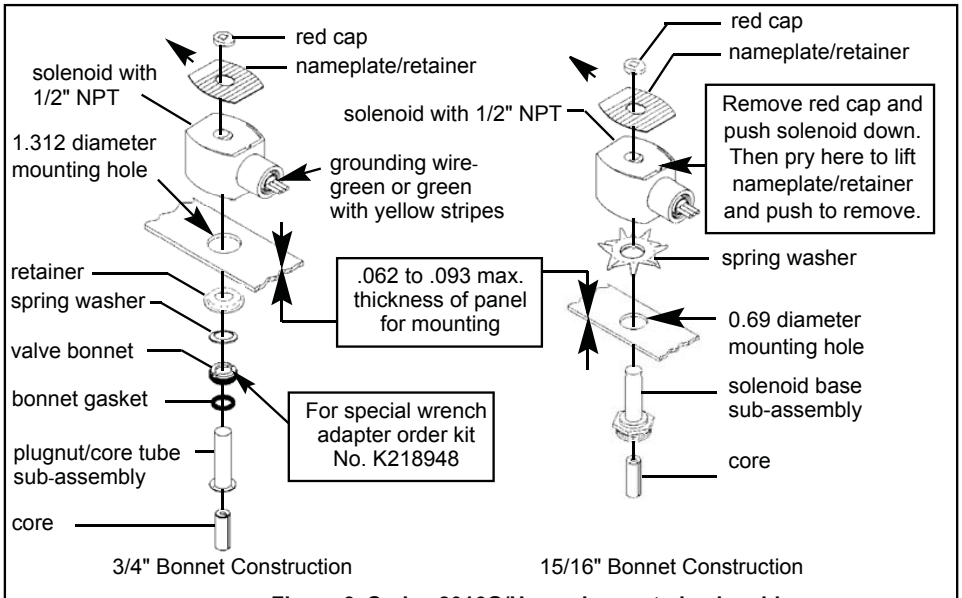


Figure 3. Series 8016G/H panel mounted solenoids

Torque Chart

Part Name	Torque Value in Inch-Pounds	Torque Value in Newton-Meters
terminal block screws	10 ± 2	1,1 ± 0,2
socket head screw	15 - 20	1,7 - 2,3
center screw	5±1	0,6 ± 0,1

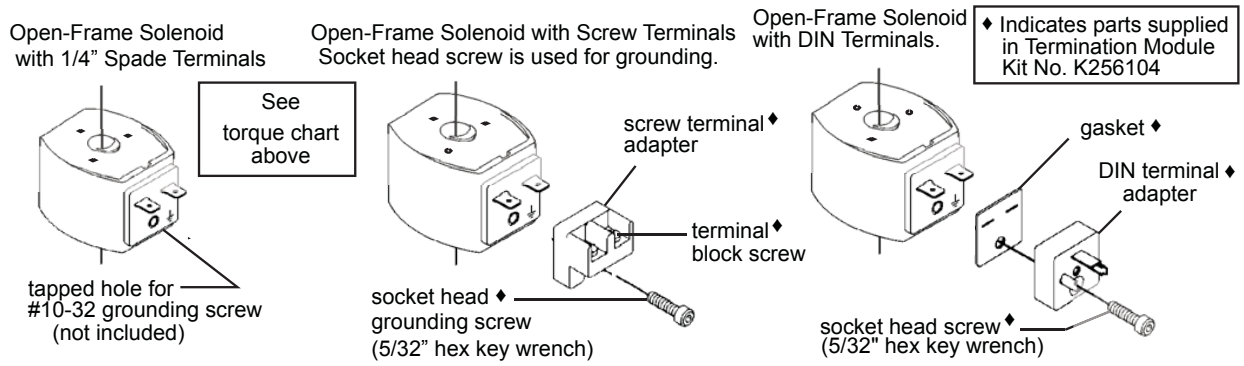


Figure 4. Open-frame solenoids

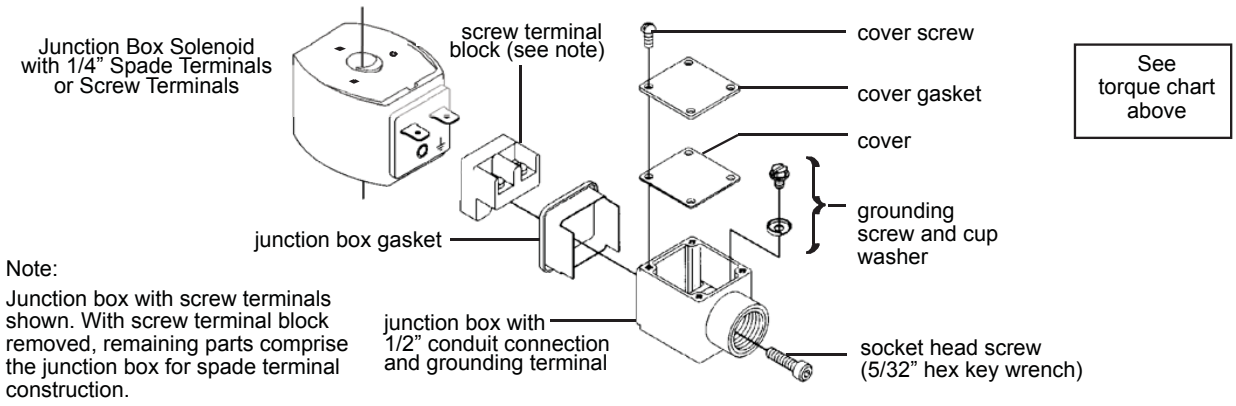


Figure 5. Junction box (optional feature)

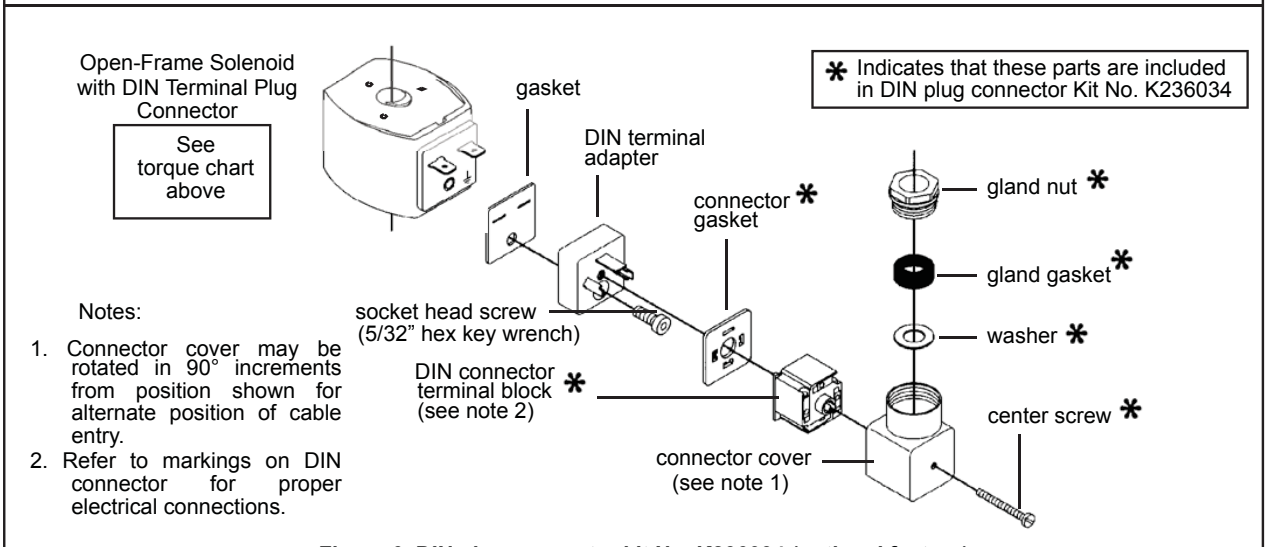


Figure 6. DIN plug connector kit No. K236034 (optional feature)

14. Special CE and ATEX Information

The following has been prepared in reference to EU directives 2014/34/EC and 2006/42/EC, so that Kice Filters applied in locations under this directive may meet the requirements specified. See the following section, “Ignition Source Analysis” for a more comprehensive assessment of non-electrical category requirements.

CATEGORIES AND BASIC REQUIREMENTS

Below is a summary of relation between categories and gas/dust zones.

ATEX Category	Designed for Gas Zone	Designed for Dust Zone
1	0	20
2	1	21
3	2	22

Dimensioning of the protective system for the overall plant must be done under consideration of EN 13849-1. All necessary signs and warnings must be appropriately mounted or installed.

In the raw gas inlet, as well as in the clean gas outlet, the distributing company of the overall system (operator) must incorporate certified protective systems into the overall system to limit the ATEX zones. This includes the airlock discharging the filter hopper.

ELECTRICAL REQUIREMENTS

Construction of the control system must be done under consideration of EN ISO 13849-1.

Electrical equipment on the machine, including peripheral components, electro-magnetic compatibility (presumed EMC) can be assumed. EMC also includes resistance to electrostatic discharges.

Electrical components must be installed and maintained by EMC skilled specialists, in accordance with the instructions of the component manufacturers.

The electrical system must be set up and inspected per DIN EN 60204-1 or DIN EN 60439-1 by specialized personnel to ensure there are no hazards caused by improper installations.

If a control cabinet is supplied, the entire electrical system of the machine must be installed according to EN 60204-1 by specialized personnel. The control cabinet can only be opened with a key.

The condition of electrical cables and wiring must be routinely checked, and any damages must be repaired immediately.

The operator or manufacturer of the facility must install an Emergency Stop circuit near the equipment, which is capable of turning off the machine immediately and securely under consideration of EN 13850.

The safety circuit “EMERGENCY STOP button ➔ safety relay ➔ safe shut down of the drive motor (e.g. by means of motor protection switch)” must at least have performance level PL r=b according to EN ISO 13849-1.

PRECONDITIONS FOR INSTALLATION

The set up location must be horizontal and stable as the filter will be bolted to the floor when installed.

The set up location must also be vibration-free. If there is danger of vibrations transferring between adjoining plant components, suitable compensators are installed on air inlet and outlet.

The fan or the components of the fan must not be dropped during transport – not only because of the risk of personal injury but also due to the risk of sparks being produced.

Welding is not permitted in zones 0, 1 or 2. Bolted connections must be used instead.

The operating temperature range is between -40 C and 82 C (-40 F and 180 F, T6).

Only explosion-protected, non-sparking tools must be used when dismantling or assembling the filter.

MAINTENANCE & INSTALLATION

The filters have attachment points where equipment necessary for lifting the individual components (e.g. ropes) can be attached. These points are located in a way to ensure that the components are suspended vertically.

During on-site installation, an external grounding wire must be connected to the fans.

If heavy machine components (e.g. heavy parts of the housing) must be dismantled to carry out service and maintenance activities, suitable lifting equipment must be used.

When installing parts inside the filter housing, hardware (nuts and bolts) must be secured with a low to medium strength thread locking compound such as Loctite®.

All painted surfaces must be cleaned by a means of vacuuming and/or with an antistatic cloth to mitigate the risk of static discharge.

MARKINGS

Per DIN EN 13463-1, the nameplate shall be fixed permanently to the filter and indicate: Name and address of the manufacturer, date of construction, designation or type of filter, serial or identification number, technical file number, the CE mark and classification markings (CE Ex II 3D).

15. Torque Values For Maintenance and Installation

Recommended U.S. BOLT TORQUE* *Coarse thread only*							
		SAE Grade 5	SAE Grade 5	SAE Grade 8	SAE Grade 8	Socket head cap screw	Socket head cap screw
Bolt Dia.	Thread Size	lb – ft	N – m	lb – ft	N – m	lb – ft	N – m
1/4	20	8.4	11	12	16	11	15
5/16	18	17	24	25	33	23	31
3/8	16	31	42	44	59	41	55
7/16	14	49	67	70	95	65	59
1/2	13	74	100	110	140	100	140
9/16	12	100	140	150	210	140	200
5/8	11	140	190	210	290	200	270
3/4	10	240	330	380	510	350	480
7/8	9	390	520	610	820	570	770
1	8	570	780	910	1100	850	1200
1-1/8	7	790	1100	1300	1700		
1-1/4	7	1100	1500	1800	2500		
1-3/8	6	1500	2000	2400	3200		
1-1/2	6	1900	2600	3200	4300		
1-5/8	5.5	2400	3300	4300	5900		
1-3/4	5	3000	4100	5000	6800		
2	4.5	4500	6100	7500	10000		

*Values above are approximations; consult with the manufacturer for torque data.
Significant variation may exist within the same grade and size between manufacturers.

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