



OPERATOR'S MANUAL

Dustless Discharge Cyclone

English

WALINGA®
TOUGH TO BEAT IN THE LONG RUN

00-146400-0 B
2025-01-13

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Table of Contents

Contact Information [00-146401-0] - - - - -	<i>i</i>
Table of Contents [00-146401-0] - - - - -	<i>ii</i>
Literature Information [00-146401-0] - - - - -	<i>v</i>
Identification of Machine [00-146401-0] - - - - -	1-1
<i>Serial Numbers</i> - - - - -	1-2
Introduction [00-146402-0] - - - - -	2-1
<i>Statement of Importance</i> - - - - -	2-2
<i>Intended Use</i> - - - - -	2-2
<i>Directional References</i> - - - - -	2-3
<i>Filtered Pneumatic Discharge Systems</i> - - - - -	2-4
Machine Configuration [00-146403-0] - - - - -	3-1
<i>Model Sizes</i> - - - - -	3-2
<i>Model Variations</i> - - - - -	3-2
Safety [00-146404-0] - - - - -	4-1
<i>Safety Alert Symbol</i> - - - - -	4-2
<i>Signal Words</i> - - - - -	4-2
<i>General Safety</i> - - - - -	4-3
<i>Pre-Operation Safety</i> - - - - -	4-4
<i>Installation Safety</i> - - - - -	4-5
<i>Operational Safety</i> - - - - -	4-6
<i>Storage Safety</i> - - - - -	4-7
<i>Maintenance Safety</i> - - - - -	4-7
<i>Electrical Safety</i> - - - - -	4-8
<i>Safety Around Storage Structures</i> - - - - -	4-8
<i>Machine Safety Signs</i> - - - - -	4-10
<i>Safety Training Sign-Off Form</i> - - - - -	4-18

Machine Life-Cycle Procedures [00-146405-0]	5-1
<i>Reception, Installation and Initial Set-Up</i>	5-2
<i>Storage</i>	5-24
<i>End of Life</i>	5-25
Operation [00-146406-0]	6-1
<i>Machine Features and Components</i>	6-2
<i>Controls and Displays</i>	6-4
<i>Operation</i>	6-8
<i>Pre-Operation Machine Preparation</i>	6-8
<i>Operation of the Machine</i>	6-9
<i>Stopping the Machine</i>	6-11
<i>Clearing Blockages</i>	6-12
<i>Operating Tips and Hints</i>	6-12
<i>Troubleshooting</i>	6-13
Maintenance and Adjustments [00-146407-0]	7-1
<i>Maintenance Schedule</i>	7-2
<i>Maintenance Safety</i>	7-3
<i>Maintenance Procedures</i>	7-3
<i>Maintenance Materials</i>	7-37
<i>Adjustments</i>	7-38
Specifications [00-146408-0]	8-1
<i>Technical Data</i>	8-2
<i>Bolt Torques</i>	8-3
<i>Standards and Regulations</i>	8-5
Warranty [00-142209-0]	9-1
<i>The Warranty</i>	9-2
<i>Warranty Period</i>	9-2
<i>Limitations and Exclusions of the Walinga Warranty</i>	9-2

<i>Warranty Claim Procedure</i>	9-2
<i>Required Warranty Claim Information</i>	9-3
<i>Warranty Conditions</i>	9-3
<i>Warranty Claim Rejection</i>	9-4
<i>Not Covered Under Warranty</i>	9-4
Accessories and Attachments [00-146410-0]	10-1
Parts List [00-146411-0]	11-1
<i>Model References</i>	11-2
<i>Purge Installation Components</i>	11-3
<i>Miscellaneous Components — Upper</i>	11-4
<i>Miscellaneous Components — Lower</i>	11-5

This manual contains important information regarding the safety, operation and maintenance of your Dustless Discharge Cyclone.

Some illustrations and diagrams may show safety shields, guards, or covers removed for clarity. **DO NOT** operate the machine without these guards in place.

Identification of Machine

The identification of machine section outlines the applicable models included in this manual. It identifies the location of the machine serial number and serialized components and provides space for recording these numbers.

Introduction

The introduction section outlines the importance of this document and provides details for the interpretation and understanding of information presented in this manual.

Configuration

The configuration section gives an overview of the various configurations available for the specified model and identification between the different configurations.

Safety

The safety section lists important safety precautions and procedures as well as providing the meaning, location and visual representation of all safety signs and labels on the machine. Read and understand all precautions before operating, maintaining or transporting the machine.

Machine Life-Cycle Procedures

The machine life-cycle procedures section provides information on the reception, assembly and initial set-up, storage, and end of life procedures.

Operation

The operation section gives general information on the operating principles including starting, operating functions, and stopping the machine, as well as clearing any blockages. This section also provides troubleshooting information for fault diagnosis and solutions to issues that may be encountered.

Maintenance and Adjustments

The maintenance and adjustments section provides the recommended maintenance schedule and task instructions for both calendar and operation hour intervals, maintenance should be performed at the first occurrence of these two intervals.

Specifications

The specifications section details technical data of the particular model to achieve a high standard of operational performance and outlines relevant standards and regulations.

Warranty

The warranty section outlines the terms and limitations of the warranty coverage.

Accessories and Attachments

The accessories and attachments section lists available attachments for the machine.

Parts List

The parts list section provides information for the identification of replacement assemblies, subassemblies and parts.

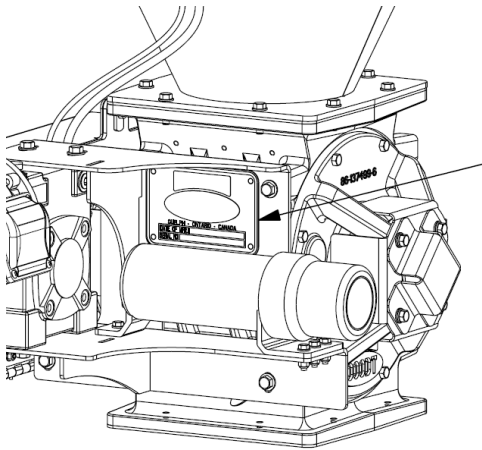


Identification of Machine

DUSTLESS DISCHARGE CYCLONE

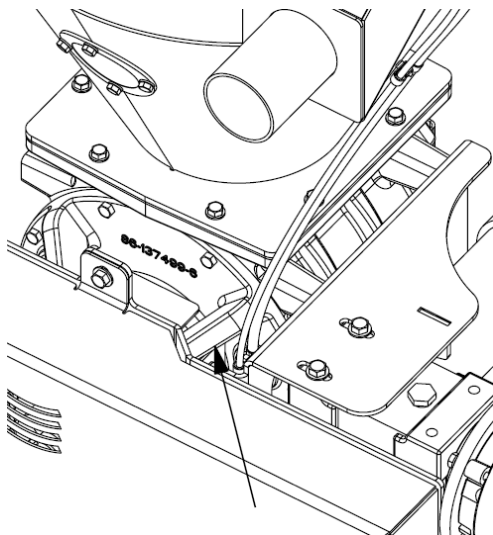
SERIAL NUMBERS

Be prepared to provide the serial number of the Dustless Discharge Cyclone (DDC) and airlock to your Walinga dealer or representative when ordering parts or requesting service or other information. For easy reference, record the required serial numbers as follows:



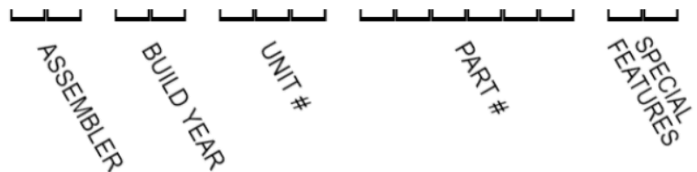
Dustless Discharge Cyclone Serial Number

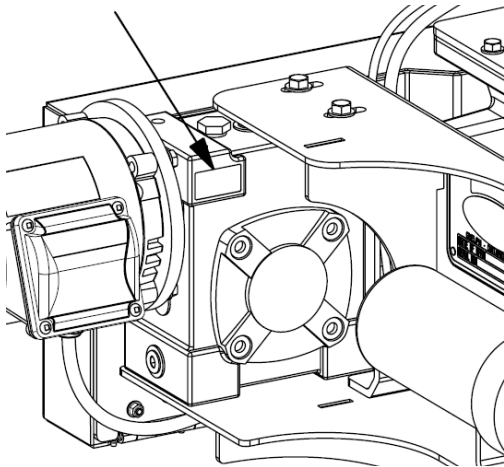
Located on the right side of the housing, below the sequential timer.



Airlock Serial Number

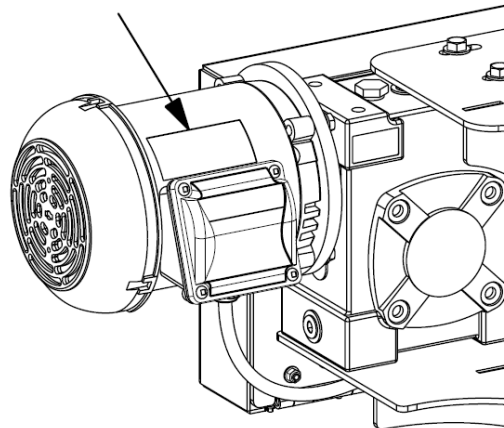
Located on the rib of the end plate of the airlock.





Gearbox Serial Number

Located on the upper corner of the gearbox housing, closest to the C-flange.



Electric Motor Serial Number

Located on the nameplate of the motor, usually positioned above the conduit box.



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Introduction

DUSTLESS DISCHARGE CYCLONE

STATEMENT OF IMPORTANCE

Congratulations on your choice of a Walinga Dustless Discharge Cyclone (DDC) to complement your operation. This equipment has been designed, engineered and manufactured to meet the needs of the discriminating buyer for the efficient pneumatic loading of bulk commodity storage structures.

Your safety and the performance of your DDC are the top priorities. This operator's manual has been created for the express purpose of keeping you safe and providing education for the efficient use of your DDC.

Safe, efficient and trouble-free operation of your DDC requires that you and any individuals operating or maintaining the machine, read and understand all sections of this operator's manual. An operator who has not familiarized themselves with the contents of this manual constitutes an untrained operator. Untrained operators are not qualified to operate the machine.

Keep this manual available for frequent reference and for provision to new operators or owners.

Your machine's appearance or structural design may differ from illustrations shown in the manual. Continuous design improvements for optimized field performance are on-going and may have been made to your machine since the publication of the manual. Specifications, descriptions and all other information in the manual are subject to change and/or correction without notice. Contact your local dealer or Walinga representative for the most current revision of your machine's manual or if you have any questions.

INTENDED USE

The Walinga DDC has been designed for use in agricultural and bulk commodity operations for the filtered pneumatic loading of a bulk commodity storage structure. Use of the machine in any other manner is considered as contrary to the intended use. Compliance with and strict adherence to the methods of operation, maintenance, and repair, as specified by Walinga in this manual, also constitute essential elements of the intended use.

The DDC must be operated, maintained and serviced only by persons who are familiar with its particular characteristics and have been acquainted with the relevant safety procedures in this manual. Any individual who has not familiarized themselves with the content of this manual is considered untrained. Untrained persons are considered unqualified to operate, maintain or service a DDC. It is the responsibility of the owner and/or operator to train new operators and ensure they have read and understood this manual.

Accident prevention regulations, and all other generally recognized regulations on safety and occupational health and safety must be observed at all times.

Any unauthorized modifications carried out to the DDC may relieve Walinga of liability for any resulting damage or injury and is considered contrary to the intended use.

DIRECTIONAL REFERENCES

The following directions will be used as a standard throughout the manual:

TOP	The upper face of the filter access door
BOTTOM	The outlet of the airlock
FRONT	The face opposite to the purge assembly
REAR	The face where the purge valves are mounted
LEFT	The non-driven end of the airlock
RIGHT	The driven end of the airlock

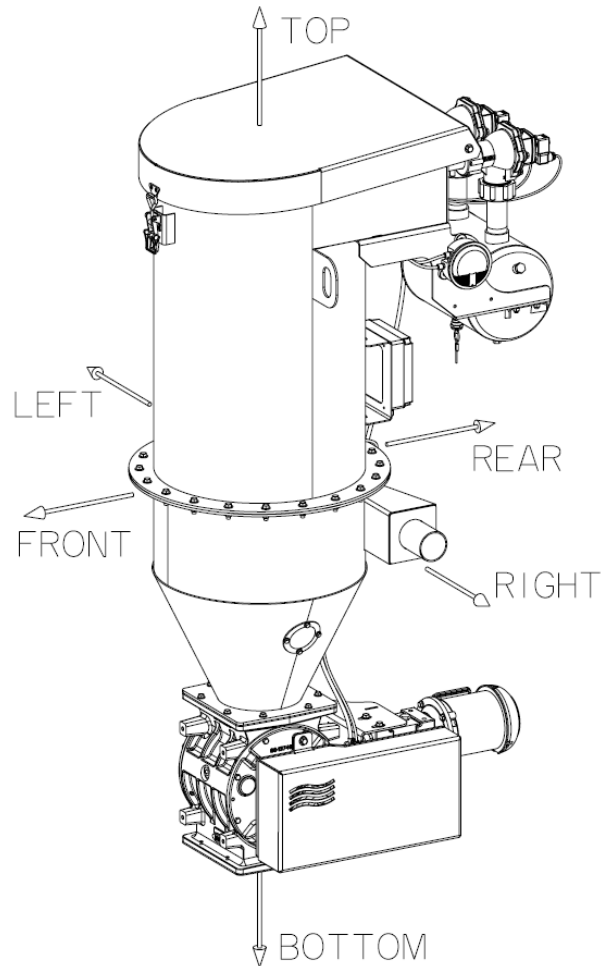


Figure 2-1: Directional references

FILTERED PNEUMATIC DISCHARGE SYSTEMS

Filtered pneumatic discharge systems facilitate the unloading of bulk commodities via a pneumatic conveying system into a bulk commodity storage structure while preventing the release of particulate and dust-laden air into the surrounding environment. As a bulk commodity is transferred under pressure through a pneumatic conveying system, as it reaches the discharge point of the system, significant amounts of dust, particulates, and/or product may be released to the environment if the discharge is not properly controlled and filtered. To prevent catastrophic failure of the storage structure due to over-pressurization, a pressure protection device, such as a Dustless Bin Vent and thief hatch, must be installed. A simplified representation of the function of a Walinga DDC can be seen in **Figure 2-2**.

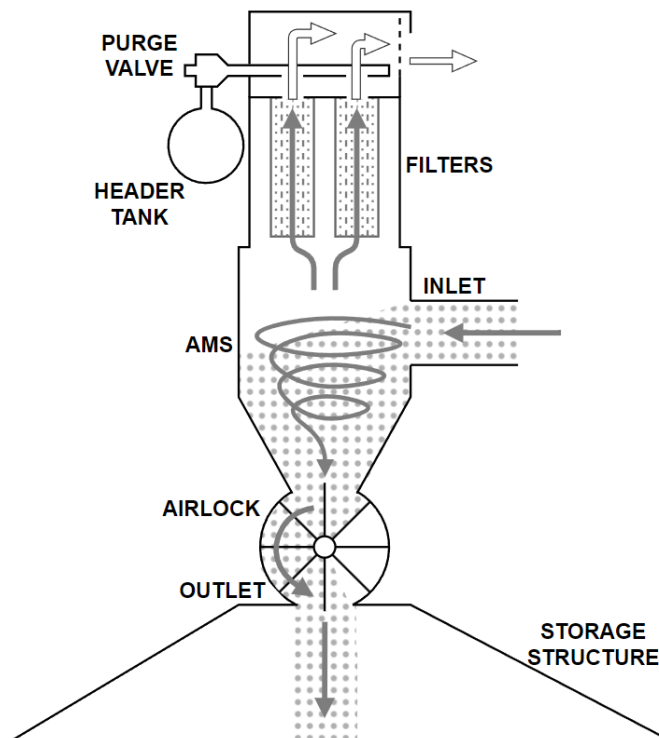


Figure 2-2: Simplified filtered discharge cyclone

The discharge point of the pneumatic conveying system is connected to the inlet of the DDC air material separator (AMS). As the pressurized air and bulk commodity enter the AMS, cyclonic action separates the product from the pressurized air, allowing the product to fall downwards towards the airlock, and the pressurized, dust-laden air to rise towards the filters. The air passes through the filters where the dust and particulates are captured. The clean air is then exhausted from the DDC through the vented housing below the filter access door. The airlock at the base of the AMS acts as a seal between the pressurized air from the pneumatic conveying system and the atmospheric pressure of the bulk commodity storage structure. As the airlock rotor turns, the upward facing rotor pocket fills with the falling product. As the rotor pocket rotates, the product is moved to the bottom of the airlock where it is released into the bulk commodity storage structure.

As dust and particulates accumulate on the surface of the filters, it must be removed to continue efficient and effective release of air through the vented clean air plenum to promote cyclonic action within the AMS. Therefore, a self-cleaning feature is incorporated into the design of the Walinga DDC. The system is equipped with a purge valve assembly to improve the function of the system and extend the filter life. The function of this assembly can be seen in **Figure 2-3**.

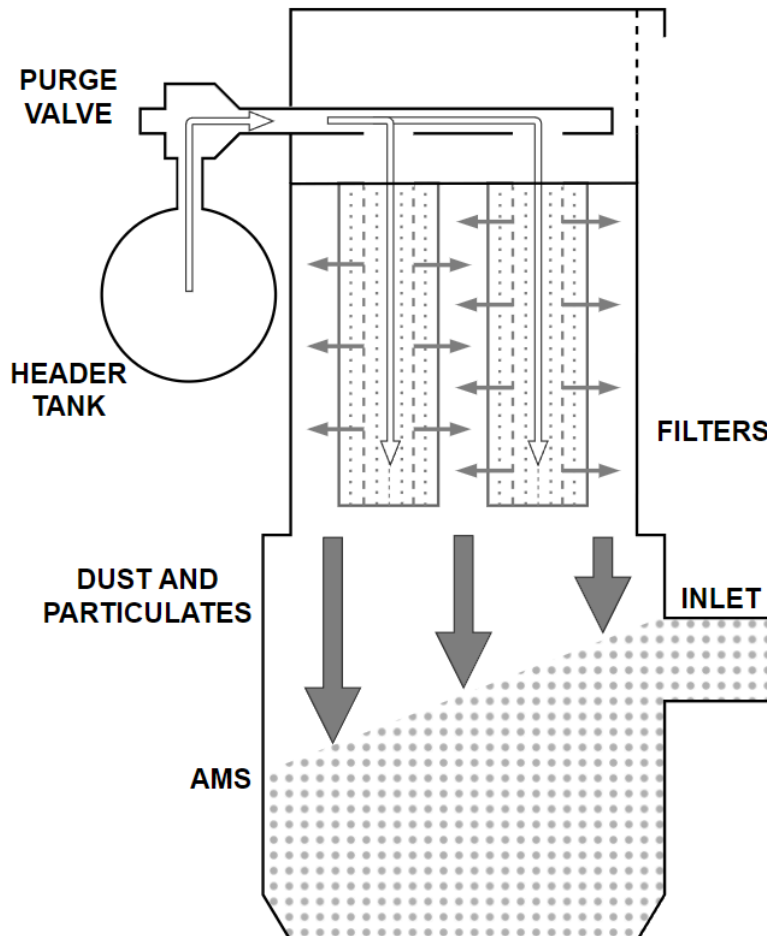


Figure 2-3: Simplified purge function

A sequential timer is used to control the operation of the purge valves, controlling both the length of time for which the purge valves are active and the period of time between the active purges. The timer also ensures that only certain filters are purged at a time to ensure at least half of the filters are functional and capable of continuing to vent pressurized air from the AMS. As the purge valves are activated, a jet of pressurized air is released through the valves from the pressurized header tank. This air is directed into the center and along the axis of the specific filters, opposite to the normal direction of airflow through the filters. This pressurized, reversed jet of air forcefully releases the dust and particulates trapped and accumulated on the surface of the filters. The released dust and particulates then fall into the AMS and return to the volume of the bulk commodity and are discharged through the airlock.



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Machine Configuration

DUSTLESS DISCHARGE CYCLONE

MODEL SIZES

The DDC is available in two sizes. The model size may be identified as follows:

Table 3-1: Model size references

	3" Model	5" Model
Inlet Diameter	3 in (7.62 cm)	5 in (12.7 cm)
Airlock Model	1008 DT	1210 DT
Number of Filters	4	7
Number of Purge Valves	2	3

MODEL VARIATIONS

HSLA Construction

The standard DDC housing is constructed using high-strength low-alloy steel for a robust and durable design.

Stainless Steel Construction

For applications in which the DDC will be installed in a corrosive environment, the housing may be constructed using stainless steel.



Safety

DUSTLESS DISCHARGE CYCLONE

SAFETY ALERT SYMBOL



This safety alert symbol means: **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

The safety alert symbol identifies important safety messages on the Walinga DDC and in the operator's manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Safety is one of the top priorities and should always be taken into consideration because:

- Accidents disable and kill
- Accidents cost
- Accidents can be avoided

SIGNAL WORDS

Take note of the signal words **DANGER**, **WARNING**, and **CAUTION** when used with a safety message, as well as the use of the words **IMPORTANT** and **NOTE**. The appropriate signal word for each message has been selected using the following guidelines:

DANGER	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded. The associated color is red.
WARNING	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices. The associated color is orange.
CAUTION	Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The associated color is yellow.
IMPORTANT	Indicates a potentially hazardous situation that, if not avoided, may result in damage to the machine. It may also be used to alert against unsafe practices. The associated color is blue or white.
NOTE	Indicates supplementary information that the operator must be aware of for the safe or proper use of the machine. The associated color is blue or white.

GENERAL SAFETY

You are responsible for the **safe** operation and maintenance of your DDC. **You** must ensure that you and anyone else who will operate, maintain, or work around your DDC is familiar with the operating and maintenance procedures and safety information contained in this manual. This manual will provide information for safety practices that must be adhered to while operating a DDC. Remember, **you** are the key to safety. Good safety practices not only protect you, but also the people around you. Make good safety practices a working part of your safety program. Be certain that **everyone** operating the DDC is familiar with the recommended procedures and follows all safety precautions. Remember, most accidents can be prevented; do not risk injury or death.

DDC owners must provide operating instructions to operators or employees before initially allowing them to operate the equipment, and must review this information at least annually thereafter. The most important safety feature of a DDC is a **safe** operator. It is the operator's responsibility to read and understand all aspects of this manual and to follow all safety and operational instructions. An individual who has not read, understood, and been trained to follow all operation and safety procedures is considered an untrained operator and is unqualified and unauthorized to operate a DDC. Untrained operators expose themselves and bystanders to potential serious injury or death.

Before servicing, adjusting, or repairing a DDC, place all controls in neutral, disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, relieve the air pressure from the system, and wait for all moving parts to stop.

In case of emergency, keep a first-aid kit and fire extinguisher readily available and stored in a highly visible place. Be familiar with the use of each of these tools. Also keep the phone number for the emergency medical center for your area readily available.

Use appropriate personal protective equipment including, but not limited to: a hard hat, protective shoes with slip-resistant soles, protective glasses or goggles, heavy gloves, wet weather gear, and hearing protection.

Ensure all electrical equipment is properly grounded. All electrical connections made to the DDC must be in compliance and accordance with the National Electric Code (NFPA 70). During installation, identify and avoid overhead obstructions and power lines. Be aware that electrocution can occur without direct contact.

In order to provide a better view or visualization, certain diagrams in this manual may show an assembly or machine feature with a safety shield or guard removed. This is for illustrative purposes only. Equipment must never be operated in this condition. Keep all guards and shields in place. If it is necessary to remove a shield or guard for maintenance or adjustment, the shield or guard must be replaced prior to use.

Replace any safety sign or instructional sign that has been damaged or become illegible. The location and a reproduction of the safety signs located on the DDC are outlined later in this section. In addition to the design and configuration of this implement, including safety signs and safety equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation and maintenance of the machine. Refer to the safety messages and operational instructions in each of the appropriate sections of any auxiliary equipment and machine manuals. Pay careful attention to the safety signs affixed to any auxiliary equipment and the machine.

Never use alcoholic beverages, narcotics, or other intoxicants which could hinder alertness or coordination while operating a DDC. Consult your doctor about operating this machine while taking prescription medications.

Under no circumstances should young children be allowed to work with this equipment. Do not allow children or any other individuals to climb on or play around the DDC at any time. This equipment is dangerous to children and individuals unfamiliar with its operation. The operator must be a responsible, properly trained, and physically able person trained in the DDC's operation. Do not allow any individuals to operate or assemble this machine until they have read and understood the safety precautions and operational procedures in this manual.

Never exceed the limits of a piece of machinery. If its ability to perform a task, or to do so safely, is in question, do **not** attempt it. Do not modify the equipment in any way. Unauthorized modification may result in serious injury or death and may impair the function, safety or life of the equipment, as well as void the warranty.

PRE-OPERATION SAFETY

- Safety is a primary concern in the design and manufacturing of Walinga products. However, these efforts can be negated by a single careless act of an operator or bystander.
- It is the responsibility of the operator to read and understand all safety and operational instructions contained within the operator's manual and the manuals of any auxiliary equipment. Working with unfamiliar equipment can lead to careless injuries. Ensure you and any individual who will be working with or around the DDC understands the information provided in the operator's manuals and is instructed in the safe and proper use of the machine.
- Become familiar with the controls of the DDC and know how to stop the DDC and any other auxiliary equipment quickly in the event of an emergency.
- Properly train all new personnel and review instructions frequently with existing workers. Ensure only a properly trained and physically able individual will operate the machine. Any individual who has not read and understood all operating and safety procedures is not qualified to operate the machine.

- Ensure all necessary personal protective equipment including a hard hat, safety glasses or goggles, safety shoes, gloves, wet weather gear, and hearing protection are in good condition. Do not allow loose long hair, loose fitting clothing, or jewelry to be around the equipment. Prolonged exposure to loud noise may cause permanent hearing loss. Dust collection equipment can often produce enough noise to cause permanent, partial hearing loss. It is recommended that hearing protection is always used if the noise levels at the operator's position exceeds 80 dB. Noise over 85 dB on a long-term basis can cause severe hearing loss. Noise over 90 dB in close proximity to the operator over a long-term basis may cause permanent, total hearing loss. Hearing loss from loud noise is cumulative over a lifetime without the hope of natural recovery.
- Ensure the machine is properly anchored, adjusted and in good operating condition. Check the machine over for any loose bolts, worn parts, cracks, leaks, etc., and make any necessary repairs. Always follow the maintenance instructions.
- Ensure that all safety shielding and guarding and safety signs are properly installed and secured, and are in good condition.

INSTALLATION SAFETY

- Ensure there is a minimum of one additional individual available for assistance with elevating, moving, or connecting other equipment.
- For any required electrical connections, ensure that sufficient amperage at the proper voltage and frequency is available before connecting power. Have a licensed electrician provide power to the unit. Always follow ANSI/NFPA 70 standard and all local codes and regulations when providing electrical power.
- Identify and avoid overhead obstructions and power lines. Be aware that electrocution can occur without direct contact.
- Use caution when installing the DDC in the presence of combustible materials to prevent injury or damage due to fire and/or explosion.
- Ensure the installation method, location and operation of the DDC meets all required national and local codes and regulations for fire and/or explosion properties of combustible materials.
- Ensure the foundation or support framing on which the DDC will be installed and anchoring devices are capable of supporting the load of the DDC. The loading must incorporate, as applicable, dead, live, wind, seismic, and any other applicable loads, such as snow or ice buildup in outdoor installations. Be aware that the weight of the DDC will increase as material accumulates on the filters. Reinforce the storage structure as required to support the DDC.
- Be aware that the Walinga DDC is not equipped with fire extinguishing protection systems, and not all models are equipped with explosion protection systems. It is the responsibility of the owner/operator to ensure these systems are adequately incorporated into the storage structure.

- The DDC is not capable of venting pressure from the storage structure. Ensure the storage structure is equipped with a mechanism to vent internal pressure; failure to do so could result in the failure of the storage structure, resulting in serious injury or death.
- Use only lifting devices of sufficient capacity to lift and install the DDC.
- While lifting the DDC, clevis connectors should be used on each lifting eye. Failure to use proper lifting equipment or each lifting eye can result in warping, damage, and potential failure of the equipment. Do not use hooks to lift the DDC.
- Do not stand under or near any hoists, lifting mechanism or the DDC while being lifted.
- If the DDC is to be installed in a classified hazardous atmosphere, the DDC must be equipped with an enclosure rated for the specific application.
- Comply with all local and national regulations regarding working at heights as applicable. Use appropriate safety equipment, including but not limited to a helmet, harness, high visibility vest, eye protection and appropriate footwear. Use extreme caution while installing the DDC around fall hazards such as the edge of the storage structure and the opening into the structure of the DDC support frame. Use an appropriate fall arrest system as required by local or national regulations.
- An external power disconnect device and compressed air shut-off and pressure relief valve must be installed by the owner/operator.
- Ensure all components of the DDC, including filters are effectively grounded.

OPERATIONAL SAFETY

- Read and understand the operator's manual and all safety signs before use.
- Do not operate when any guards are damaged or removed. Install and secure all guards before operating.
- Operate only in daylight or with sufficient artificial lighting.
- Keep hands, feet, clothing, hair, and jewelry away from all moving and/or rotating parts.
- Do not allow any individuals to climb on the DDC at any time.
- Clear the area of all bystanders, especially small children, before operation.
- Ensure the DDC is mounted securely to the storage structure.
- Wear appropriate personal protective equipment while operating.
- Do not operate the DDC if there are any leaks in the air system.
- Do not operate the DDC if there are any damaged or worn components.
- Do not operate the DDC if any power sources have been locked-out. Determine the reason for the lock-out before removal or beginning operation.
- In the event of a blockage in the airlock, follow all procedures outlined for clearing obstructions. Never reach into the airlock while in operation to clear an obstruction.

STORAGE SAFETY

- Store the DDC on a firm, level surface in a dry area away from human activity. If the DDC must be stored outdoors, provide covering to protect the DDC from rust and corrosion.
- Ensure all openings of the DDC are sufficiently covered to protect from accumulation of dust, debris and moisture within the housing.
- Do not permit children to play on or around the stored machine.

MAINTENANCE SAFETY

- Read, understand and follow all operating, maintenance and safety information in the operator's manual.
- Clear the area of bystanders, especially small children, when carrying out any maintenance or repairs or making any adjustments.
- Follow good shop practices:
 - Keep the service area clean and dry.
 - Ensure electrical outlets and tools are properly grounded.
 - Use adequate lightning for the job at hand.
- Ensure a fire extinguisher and first aid kit are readily available and in good condition.
- Establish a formal Lock-Out Tag-Out program for your operation and train all operators and service personnel before allowing them to work with or around the DDC. Provide tags at the work site and a sign-up sheet to record tag-out details. Do not perform any service or maintenance work unless the electrical and compressed air sources are turned off and locked out. Safety lockout devices are available through your Walinga dealer parts department.
- Place all controls in neutral, disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, relieve the air pressure from the system, and wait for all moving parts to stop.
- Use required personal protective equipment previously outlined.
- Use only tools, jacks and hoists of sufficient capacity for the job.
- Keep hands, feet, hair, clothing, and jewelry away from all moving and/or rotating parts.
- Never attempt to locate a leak in the air system using the hands or any other part of the body. High pressure air is capable of penetrating the skin and injecting air into the bloodstream, leading to stroke or death.
- Ensure all guards are in place and properly secured when maintenance work is complete.

ELECTRICAL SAFETY

- For any required electrical connections, ensure that sufficient amperage at the proper voltage and frequency is available before connecting power. Have a licensed electrician provide power to the machine. Always follow ANSI/NFPA 70 standard, the National Electric Code, and all other local codes and regulations when providing electrical power.
- Ground all electrical equipment and ensure the power source is properly grounded.
- To prevent the buildup of static electricity, the filters must also be grounded. When measuring the continuity between the filter and the DDC housing, the resistance must be less than 10 Ω .
- Ensure all electrical switches on the equipment are in the OFF position before connecting the equipment to power.
- Turn the equipment OFF, shut-down and lock-out all power supplies, and wait 30 seconds for all internal capacitors to discharge before opening any electrical enclosure, servicing, or adjusting.
- Inspect all electrical connections to ensure none are loose or damaged. Replace any damaged electrical plugs, cords, switches or components immediately.

SAFETY AROUND STORAGE STRUCTURES

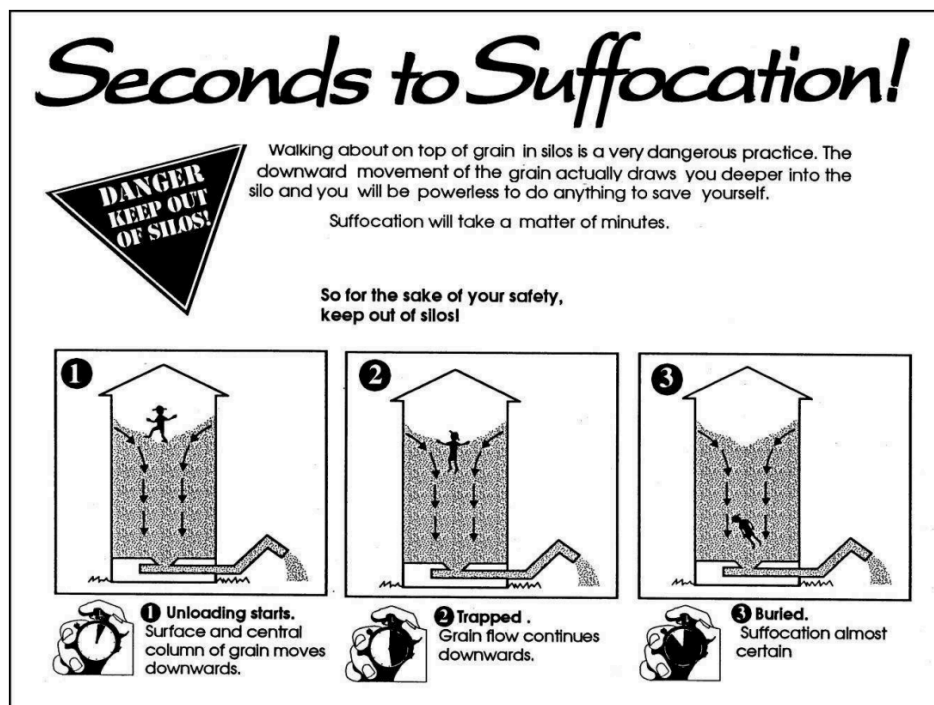
DDC operators and all other personnel in the vicinity or assisting with operation must strictly adhere to the procedures outlined below before entering a storage structure. For additional details regarding these procedures, reference Occupational Safety and Health Administration standards, or your local regulations.

Entering a bin, silo, tank, or other type of storage structure is hazardous. You can suffocate and die from the materials stored within these structures. There may also be explosive, harmful or poisonous gas or dust in the air.

The following safety procedures are adapted from the Occupational Safety and Health Administration 1910.272 standard relating to grain handling facilities:

- The machine operator(s) and all assisting personnel must be aware of the actions they will take in the event of an emergency.
- The machine operator(s) and all assisting personnel must be trained in the general procedures and safety practices for entering and working in bins, silos, tanks, or other storage structures, as well as the safety procedures for handling special tasks concerning entering and working within such structures.
- The atmosphere within a bin, silo, tank, pit, basement, or storage structure must be tested for the presence of combustible gasses, dusts, vapors, and toxic agents.

- Ventilation must be provided until any unsafe conditions are eliminated or as long as there is still a possibility of recurrence of the unsafe conditions within the bin, silo, tank, pit, basement, or storage structure while occupied by personnel.
- Any individual entering the bin, silo, tank, pit, basement, or storage structure must wear an appropriate respirator and protective clothing as long as there is the possibility of any unsafe atmospheric conditions.
- When entering bins, silos, tanks, or storage structures from the top, personnel must wear a body harness with a lifeline or use a boatswain's (bosun's) chair.
- An observer equipped to provide assistance and trained in rescue procedures, including notification methods, must be stationed outside the bin, silo, tank, or storage structure being entered. Visual, voice or signal line communications must be constantly maintained between the observer and the individual in the bin, silo, tank or storage structure.
- Equipment for rescue operations that is specifically suited to the bin, silo, tank, or storage structure being entered must be provided and readily accessible.
- Do not enter bins, silos, tanks, or storage structures under a bridging condition, or where a buildup of materials could fall and bury you. Do not walk or stand on grain or other materials where the depth is greater than waist height.
- Allow sufficient time, approximately 30 minutes, for the dust to settle within the storage structure before entry is made, or the entrance is opened. Failure to do so may result in zone entrainment leading to potential risk of fire or explosion.



MACHINE SAFETY SIGNS

The safety signs affixed to the DDC provide important information regarding your safety and the safe operation of the machine. Familiarize yourself with all safety signs before operation.

- Safety signs must be clean and legible at all times.
- Replace any safety signs that are missing, damaged, or have become illegible.
- Any replaced parts that previously displayed a safety sign, must display the current safety sign.
- Safety signs are available at no cost from your representative, dealer, or directly from Walinga.

If a safety sign has become damaged, illegible or a new safety sign must be installed on a replacement component, proceed as follows:

1. Ensure the installation area is clean and dry.
2. Ensure the temperature of the DDC is above 50 °F (10 °C).
3. Locate the correct position of the safety sign before removing the backing paper.
4. Remove the smallest portion of the split backing paper.
5. Align the safety sign over the correct position and carefully press the small portion with the exposed adhesive backing in place.
6. Slowly peel back the remaining paper and carefully smooth the remaining portions of the safety sign in place.
7. Small air pockets can be pierced with a pin and smoothed out using the backing paper.

Safety signs affixed to a DDC are standardized as follows:

- Danger safety signs are red in color.
- Warning safety signs are orange in color.
- Caution safety signs are yellow in color.
- Informational safety signs are white or blue in color.
- Each safety sign is printed with its respective Walinga part number located in the bottom right corner. Reference this number on the safety sign, or identified in the following reproductions, to obtain replacement safety signs.

The safety signs affixed to a DDC are as follows:

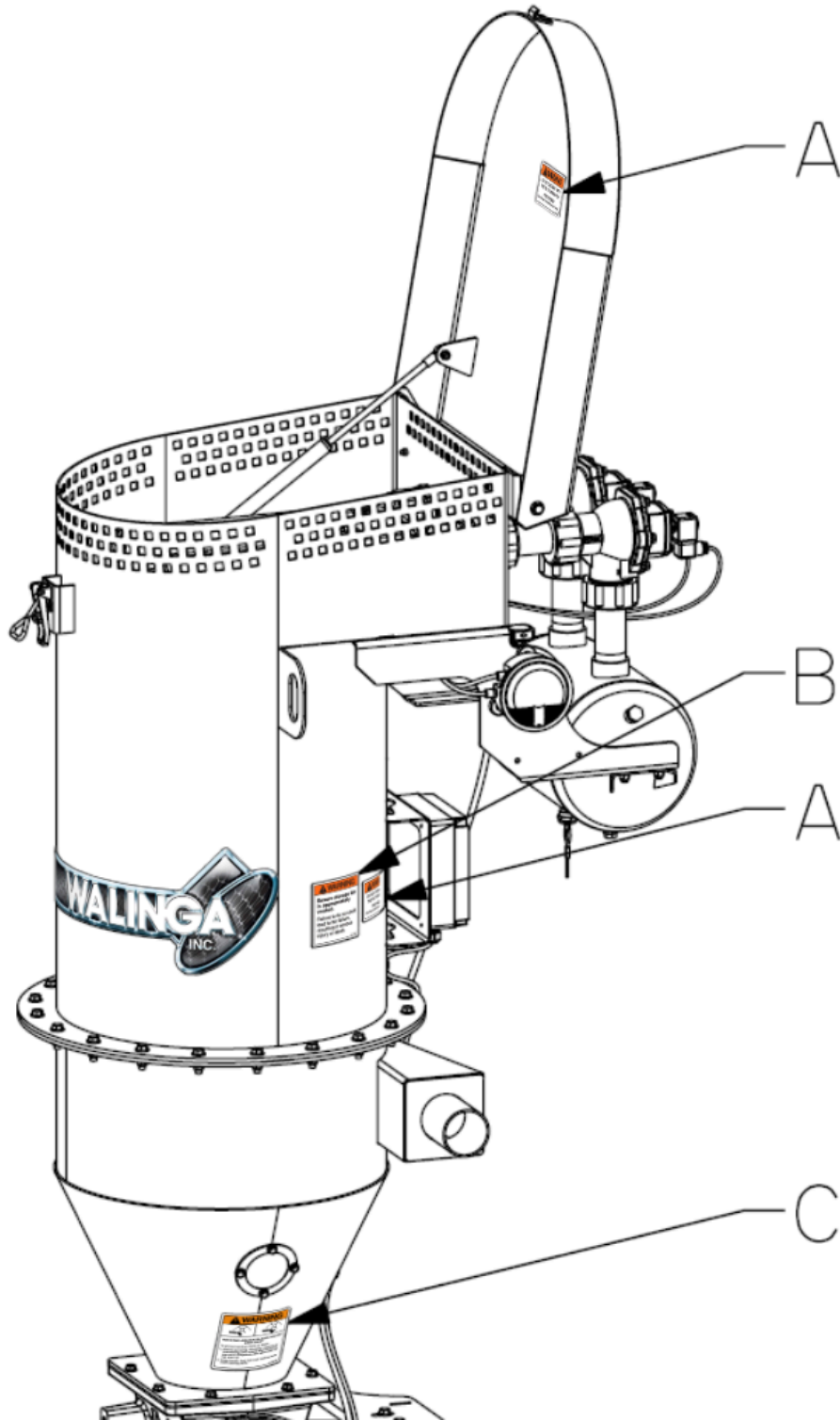


Figure 4-1: Right side of DDC housing safety signs

Figure 4-1 A

Part Number: 53-105036-6

Location: the inner surface of the filter access door and the right side of the housing beside the sequential timer.



Figure 4-1 B

Part Number: 53-127098-6

Location: the right side of the housing beside the sequential timer.



Figure 4-1 C

Part Number: 53-18289-6

Location: the right side of the AMS.



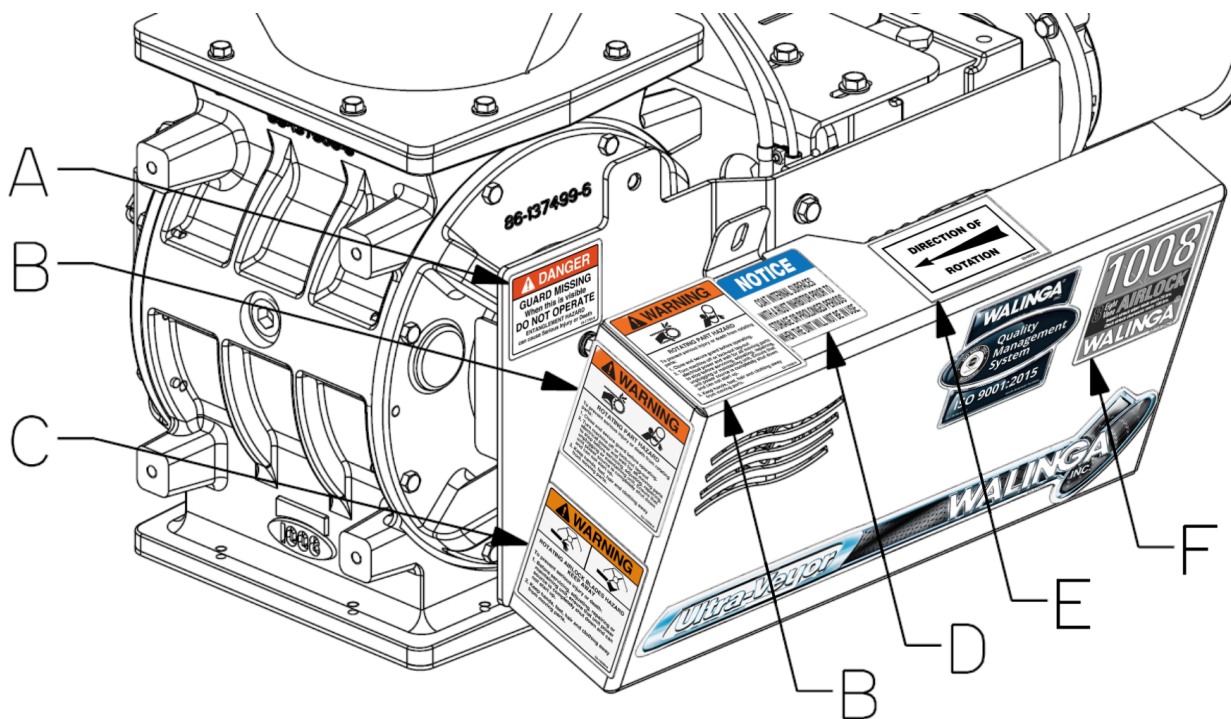


Figure 4-2: Airlock drive guard safety signs

Figure 4-2 A

Part Number: 53-17704-6

Location: the inner surface of the airlock drive guard, only visible when the drive guard cover is opened.



Figure 4-2 B

Part Number: 53-18288-6

Location: the front and top surfaces of the airlock drive guard cover.



Figure 4-2 C

Part Number: 53-18289-6

Location: the front surface of the airlock drive guard cover.



Figure 4-2 D

Part Number: 53-137850-6

Location: the top surface of the airlock drive guard cover.

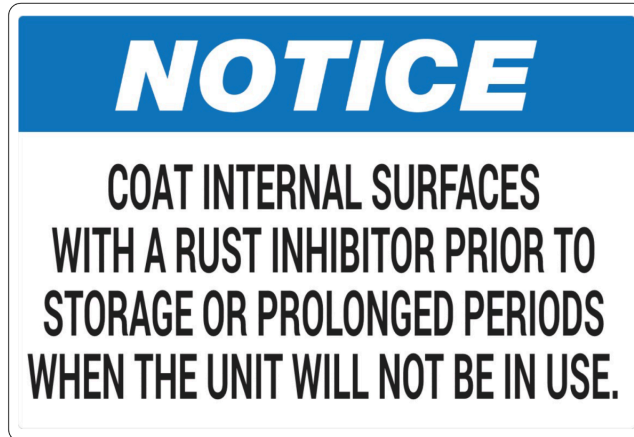


Figure 4-2 E

Part Number: 53-04733-6

Location: the top surface of the airlock drive guard cover.

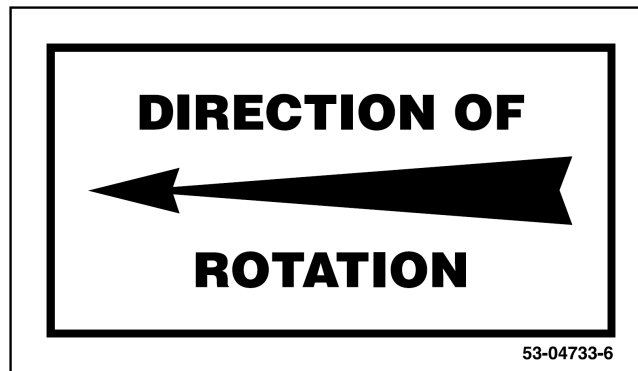
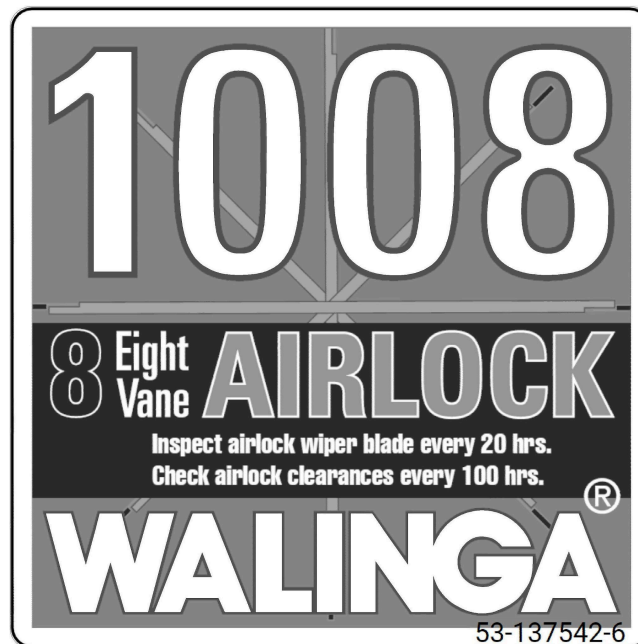


Figure 4-2 F

Part Number: 53-137542-6
or
53-120496-6

Location: the right surface of the airlock drive guard cover.



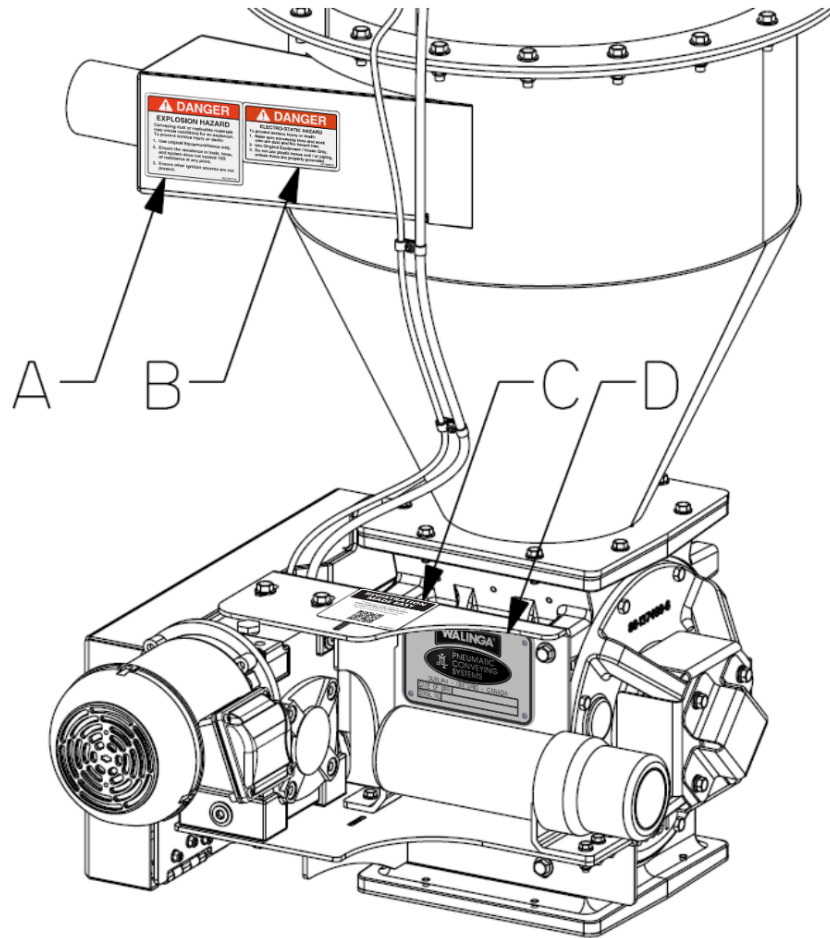


Figure 4-3: Rear of DDC safety signs

Figure 4-3 A

Part Number: 53-119771-6

Location: the rear surface of the AMS inlet.



Figure 4-3 B

Part Number: 53-18290-6

Location: the rear surface of the AMS inlet.



Figure 4-3 C

Part Number: 53-102592-6

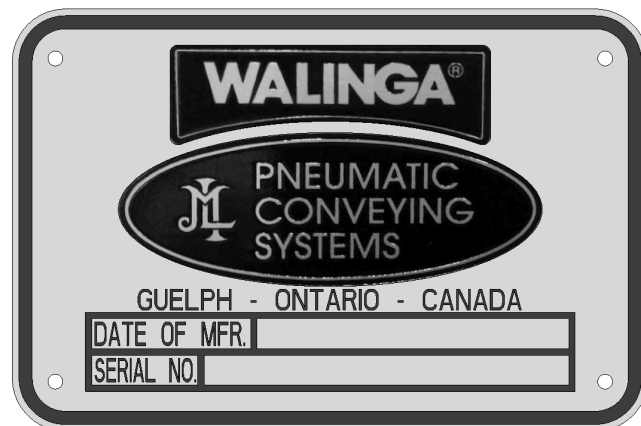
Location: the top surface of the gearbox mounting frame.



Figure 4-3 D

Part Number: 53-94818-6

Location: the rear surface of the gearbox mounting frame.





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Machine Life-Cycle Procedures

DUSTLESS DISCHARGE CYCLONE

RECEPTION, INSTALLATION AND INITIAL SET-UP

Reception

Upon initial reception of the DDC, proceed as follows:

- Inspect the condition of the DDC, ensure no components have been damaged. Any damaged components must be repaired or replaced.
- Check to ensure all fasteners are tightened to the required torque.
- Inspect the interior surfaces of the DDC housing, filters, and airlock to ensure there are no signs of moisture or excessive levels of dust or debris.
- Check to ensure any loose components have been received.

Installation

To install the DDC, proceed as follows:

1. Ensure the area is clear of any bystanders and individuals not involved in the assembly and installation of the DDC, especially small children.
2. Ensure the dust hazard analysis as required by NFPA 652 has been completed and the incorporation of the equipment complies with all relevant standards and regulations.
3. Ensure the storage structure foundation or support frame has been reinforced as required and is capable of supporting the full load of the installed DDC.
4. Create an opening in the storage structure to allow for the mounting of the DDC. Reference **Figure 5-1** and **Figure 5-2** for the reference dimensions of the DDC mounting surface. All dimensions shown are in inches.

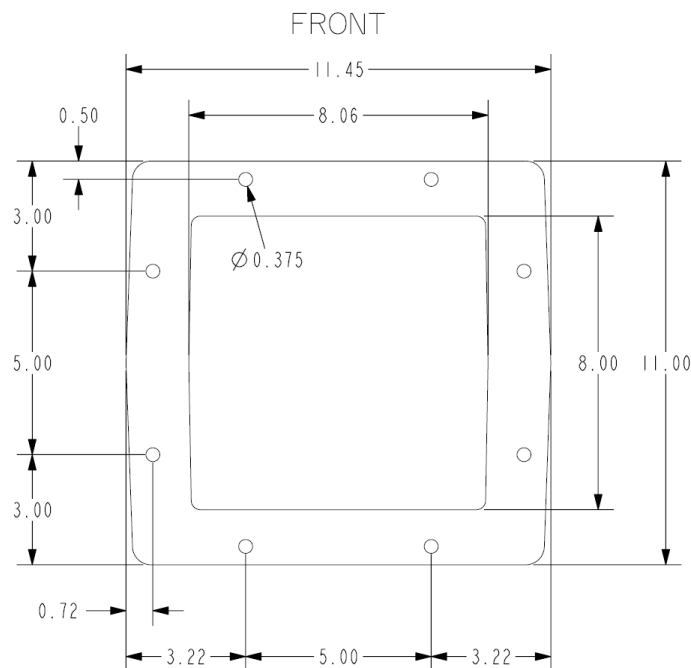


Figure 5-1: 3" model dimensions

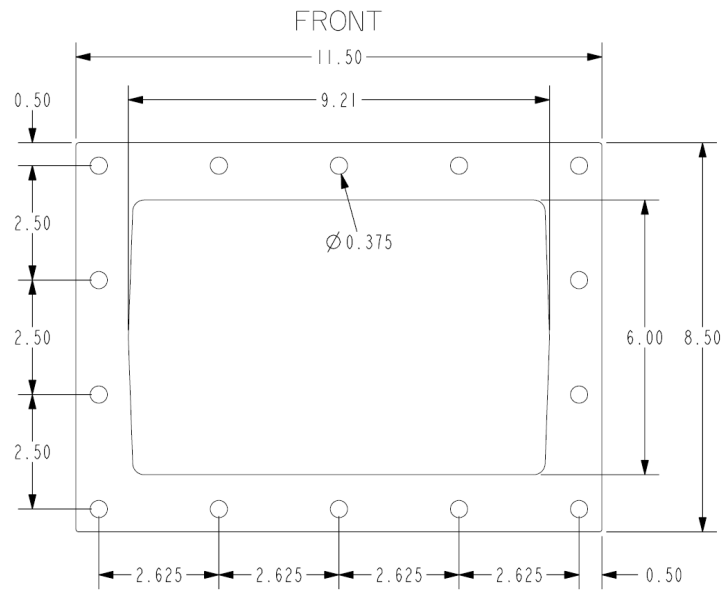


Figure 5-2: 5" model dimensions

5. Use extreme caution while working around the DDC mounting opening in the storage structure and use all required safety equipment for working at heights to mitigate fall hazards.
6. Lock-out all electrical power sources and compressed air supplies. Relieve any pressure from the compressed air supply.
7. Remove the airlock outlet shipping plate and any other shipping covers or protectors from the DDC. Installation and operation with these covers in place can result in significant damage to the machine and serious injury. The airlock protector plate may be retained after removal for use during storage if desired.

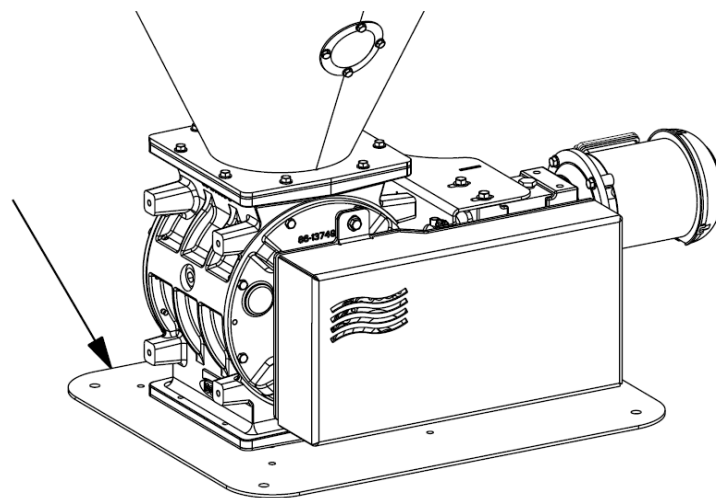


Figure 5-3: Airlock shipping protector plate

8. The DDC must be installed such that the outlet of the airlock is level in all directions. Note that the filter access door is angled to assist in preventing water/snow accumulation. Make any required modifications to the mounting frame to allow for the correct positioning of the DDC.

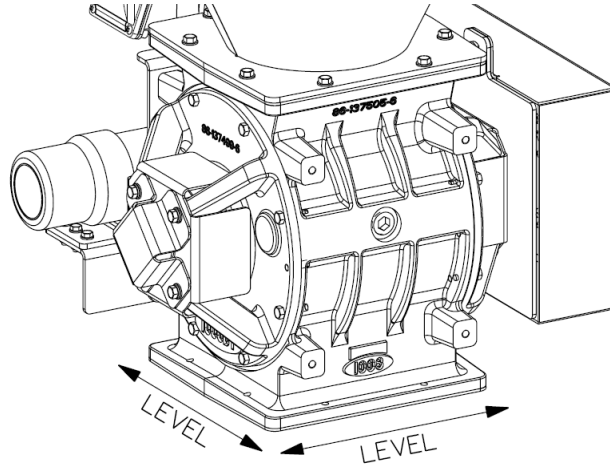


Figure 5-4: DDC level mounting requirement

9. Ensure the mounting frame positioning allows the AMS inlet to be aligned with the discharge point of the pneumatic conveying system.

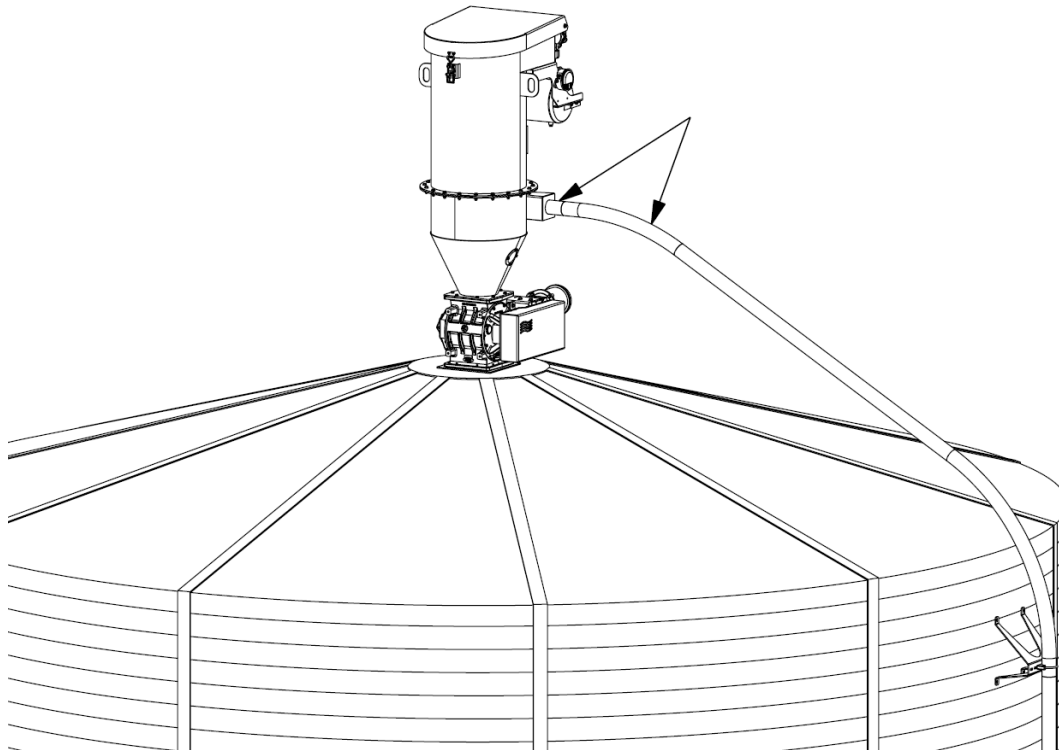


Figure 5-5: AMS inlet alignment

10. Install a clevis on each lifting eye of the DDC, equipped with a lifting sling and spreader bar as required.

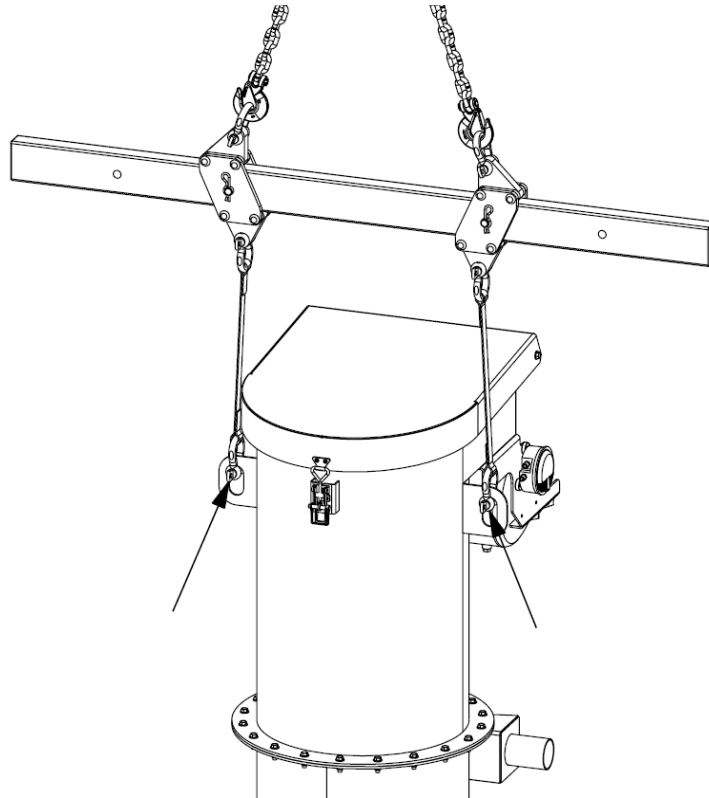


Figure 5-6: Lifting clevis installation

11. Identify and avoid all overhead obstructions and powerlines, be aware that electrocution can occur without direct contact.
12. Position a mounting gasket on the storage structure mounting frame.

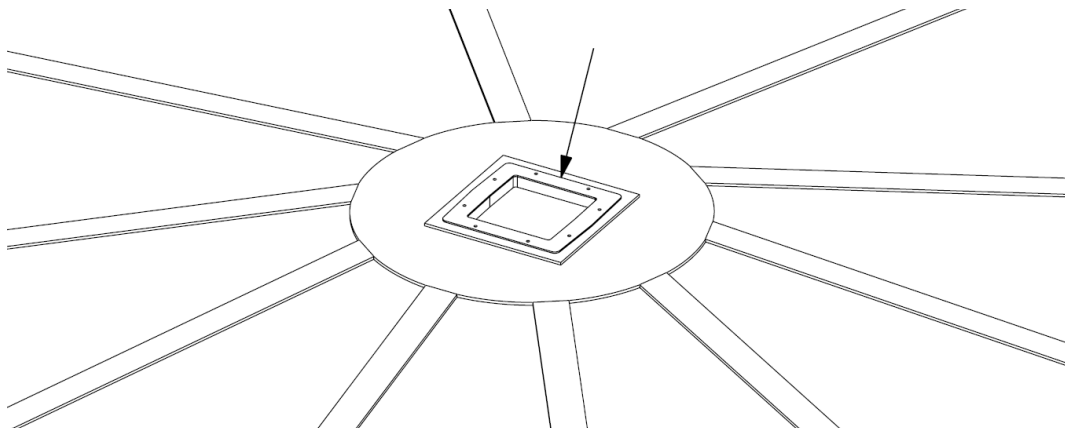


Figure 5-7: Mounting gasket positioning

13. Lift the DDC into position, aligning the airlock with the holes of the mounting frame. Drift pins may be used to assist with alignment.

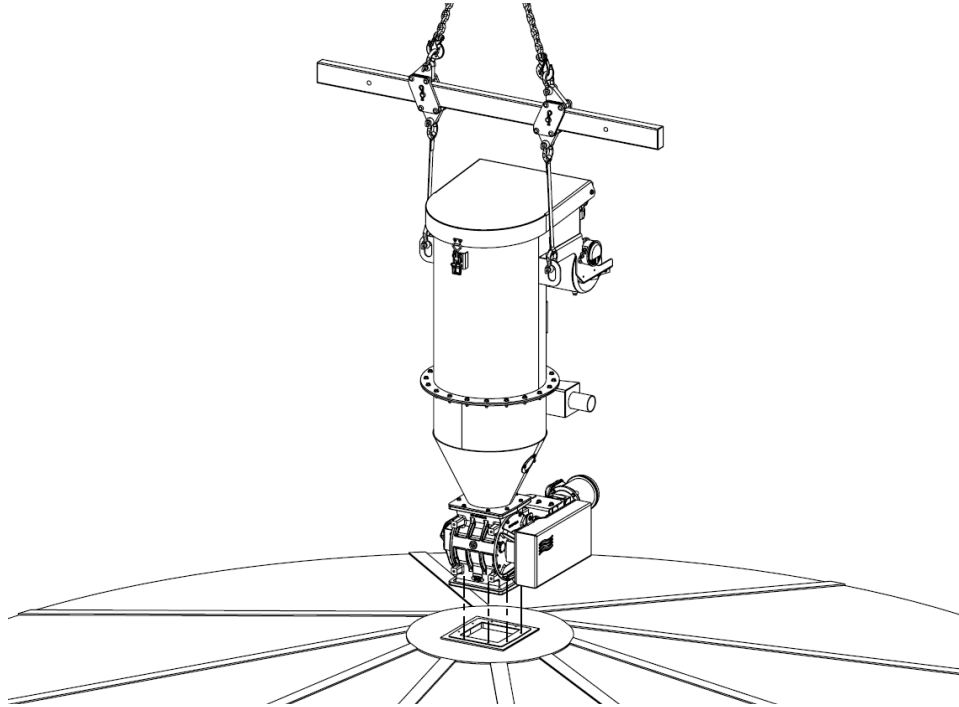


Figure 5-8: Mounting hole alignment

14. Install and tighten all mounting fasteners to the required torque.

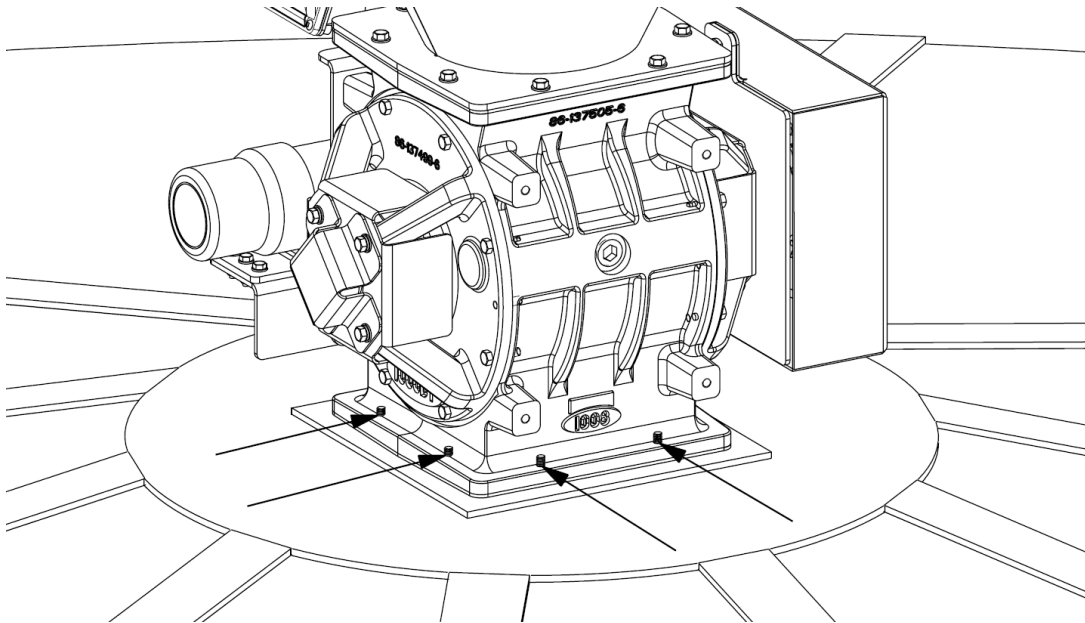


Figure 5-9: DDC mounting fasteners

15. Install any additional supports to ensure the DDC is stabilized. It is the responsibility of the owner and/or operator to ensure the mounting structure, frame, and/or supports are sufficient and installed to stabilize and support the DDC under all loading conditions.
16. Ensure the filters are properly grounded by measuring the electrical continuity between the filters and the DDC housing. The resistance must be less than 10 Ω .

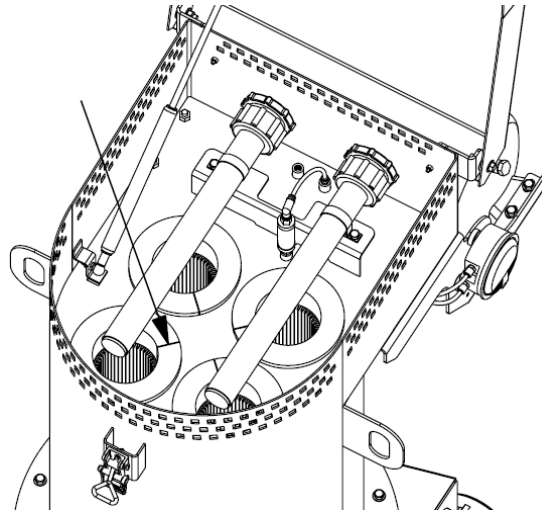


Figure 5-10: Filter grounding strip

17. Connect the discharge point of the pneumatic conveying system to the AMS inlet of the DDC using a compression coupling. Do not overtighten the compression coupling as it may result in warping of the inlet or conveying system lines, resulting in leaks and poor system performance.

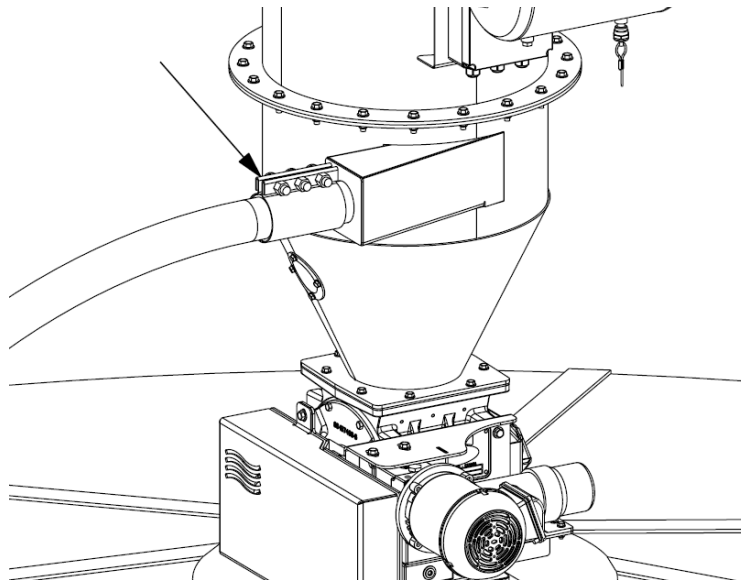


Figure 5-11: AMS inlet connection

Initial Set-Up

To allow for safe and efficient operation, upon complete assembly of the DDC onto the storage structure, the supplied air and electrical sources must be properly connected.

To establish the air supply to the DDC, proceed as follows:

1. Ensure the area is clear of any bystanders and individuals not involved in the assembly and installation of the DDC, especially small children.
2. Ensure the compressed air supply is not above 75 psi (517 kPa). Excessive pressure can cause damage to the DDC components.
3. Ensure the pressure regulator is set to 65 psi (448 kPa).

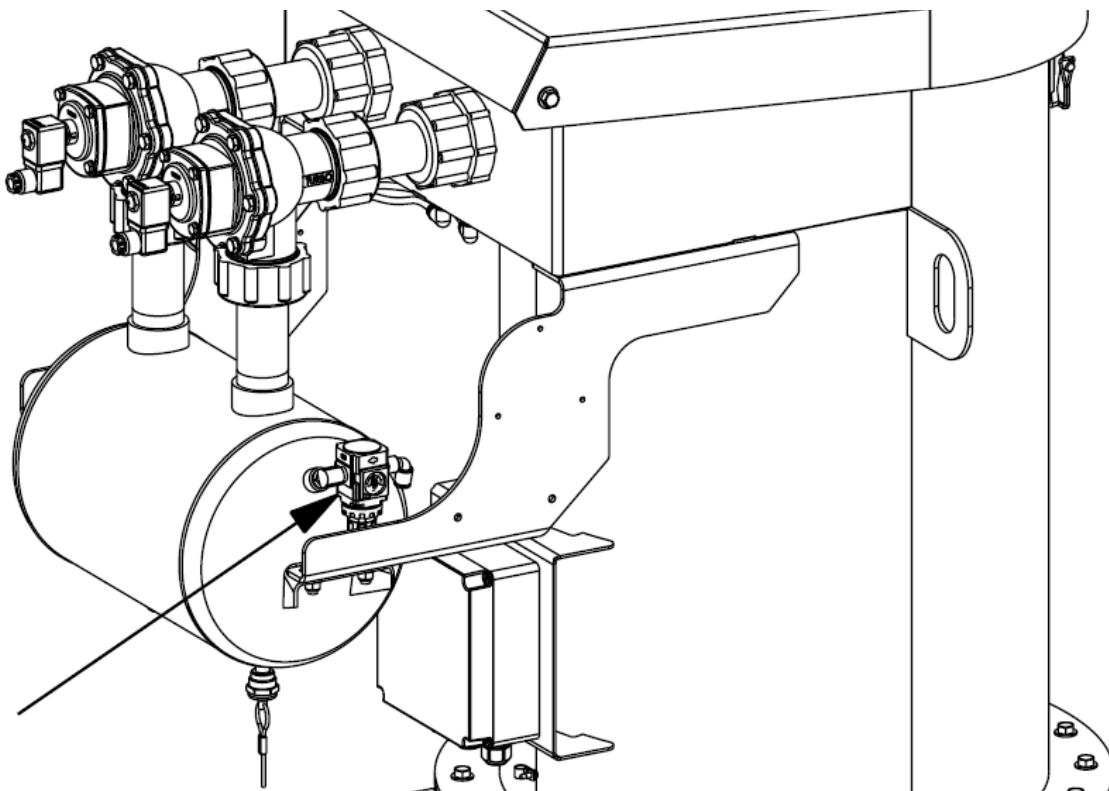


Figure 5-12: Header tank pressure regulator

4. Ensure the compressed air supply is free of oil and moisture. Any contamination in the air supply can result in ineffective cleaning of the filters and potential failure of the purge valves or other components.
5. Install an air filter, and a lock-out shut-off pressure relief valve along the air supply line to the DDC. Note that these components are to be supplied by the owner/operator.
6. Safely purge the compressed air supply line to clear the line of any dust, dirt or debris before connecting to the DDC.

7. Connect the compressed air supply line to the pressure regulator mounted to the header tank.

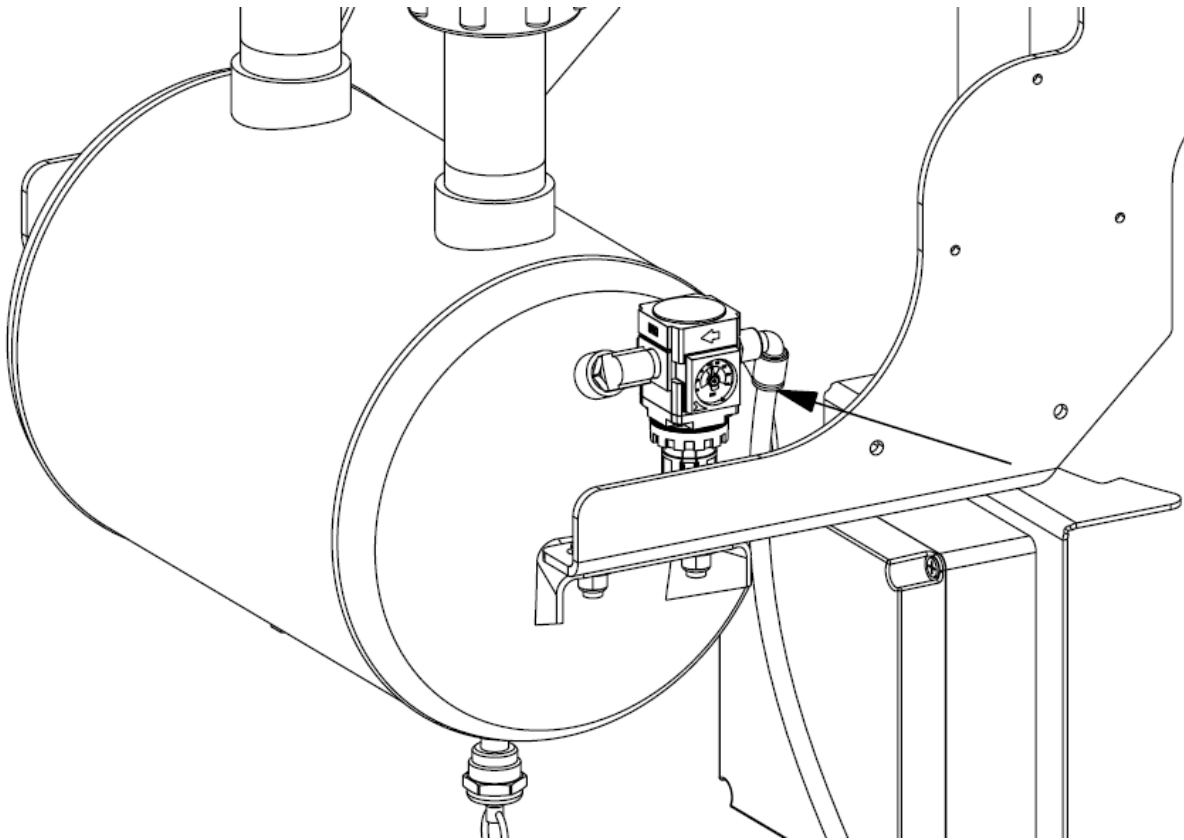


Figure 5-13: Compressed air supply connection fitting

To establish the electrical power supply to the DDC and configure the sequential timer, proceed as follows:

1. Ensure the area is clear of any bystanders and individuals not involved in the assembly and installation of the DDC, especially small children.
2. Turn the power off and lock-out all power supplies before attempting any electrical installation.
3. Ensure all electrical switches are in the OFF position.
4. Ensure all electrical installation, service and maintenance is performed by a licensed electrician in accordance with ANSI/NFPA 70 standard, the National Electric Code, and all other local codes and regulations.

5. Remove the cover of the sequential timer enclosure.

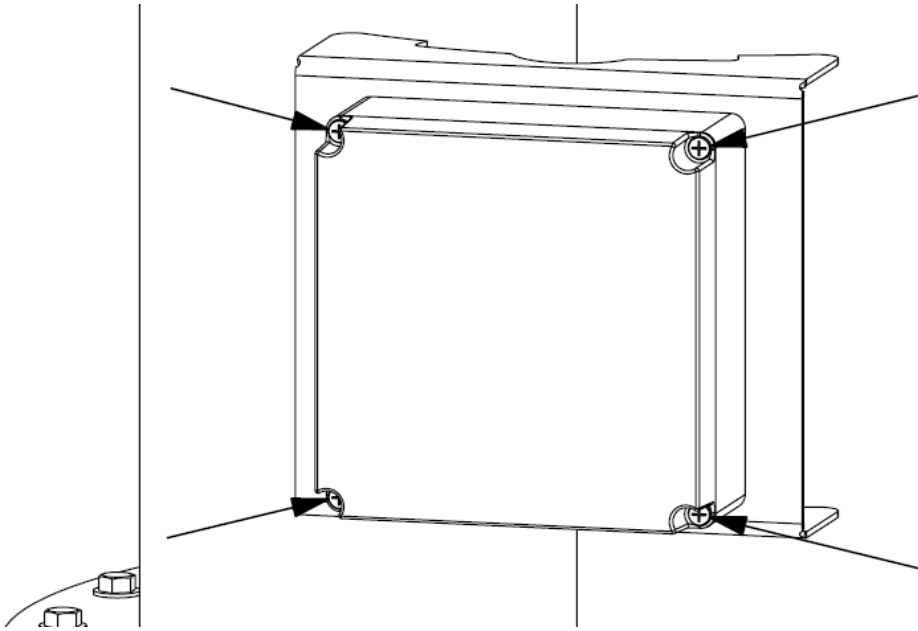


Figure 5-14: Sequential timer cover removal

6. Remove the display plate to gain access to the terminal board of the sequential timer.

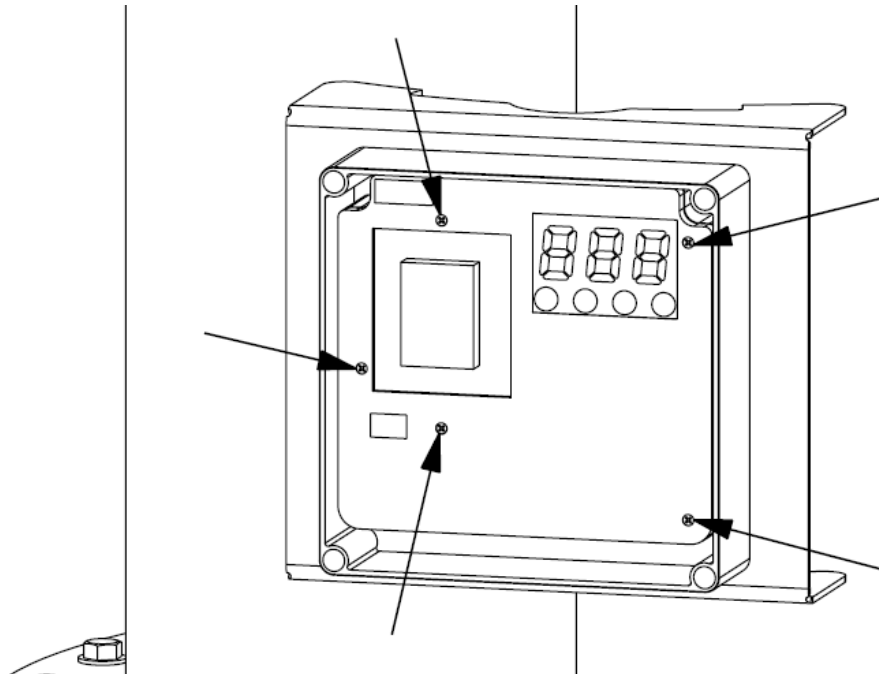


Figure 5-15: Terminal board access

- Position the input power jumpers for **JP1** and **JP4** in the 115 VAC position, which is all the way to the right.

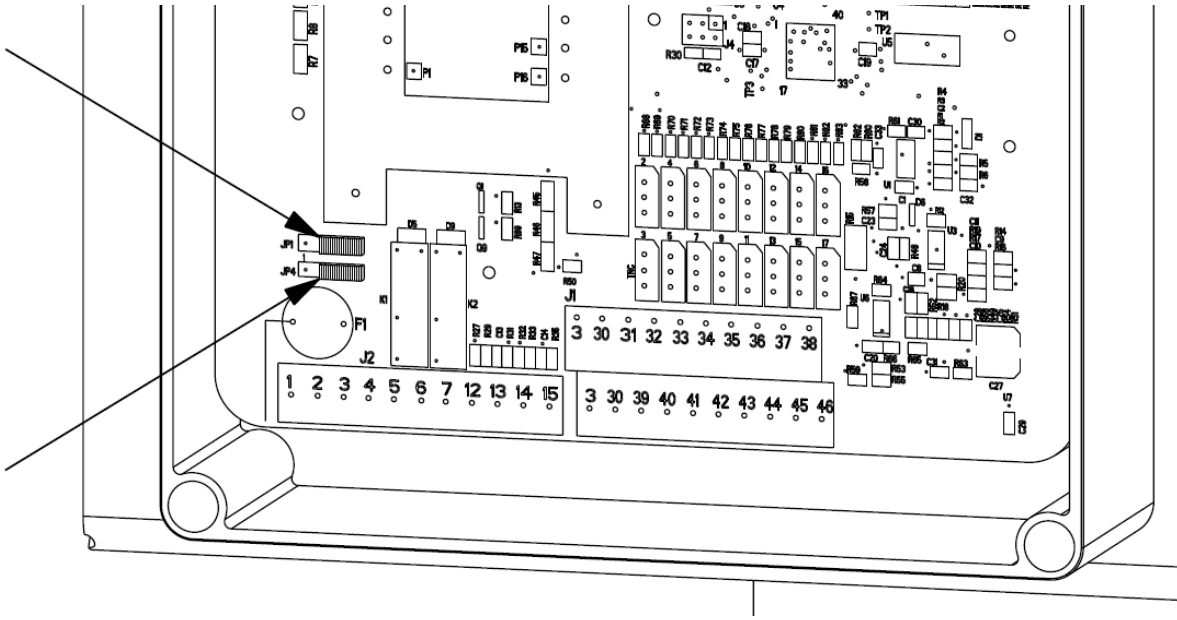


Figure 5-16: Input power jumpers

- Position the output jumpers for **JP2** and **JP6** in the DC position, which is all the way to the right.

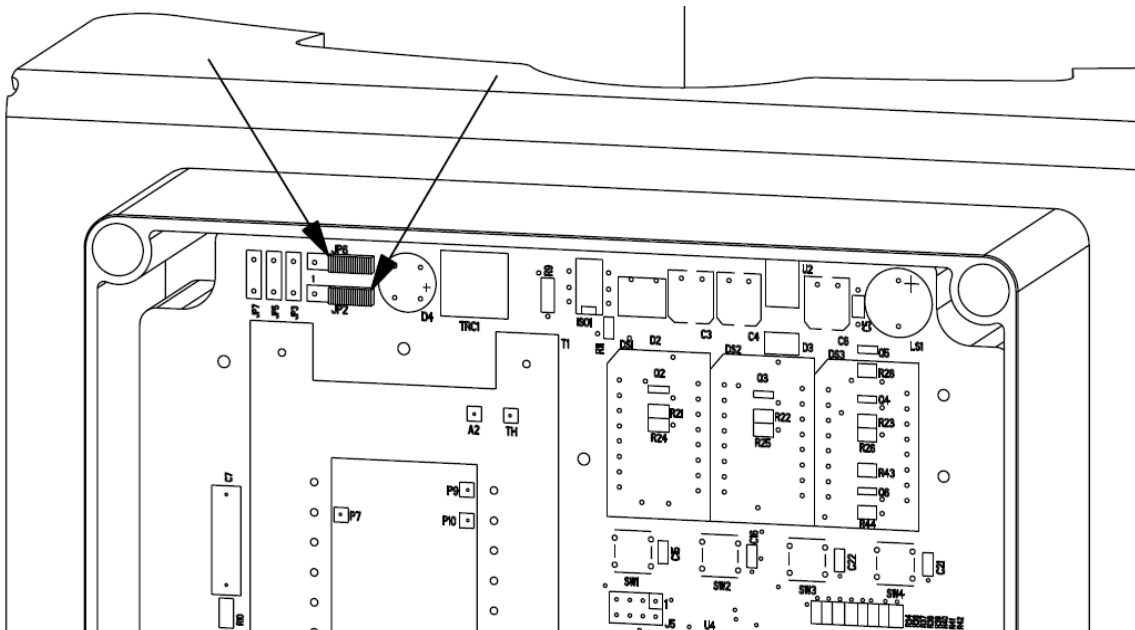


Figure 5-17: Output current jumpers

- Position the output voltage jumper on the **JP3** terminal for 24 VDC.

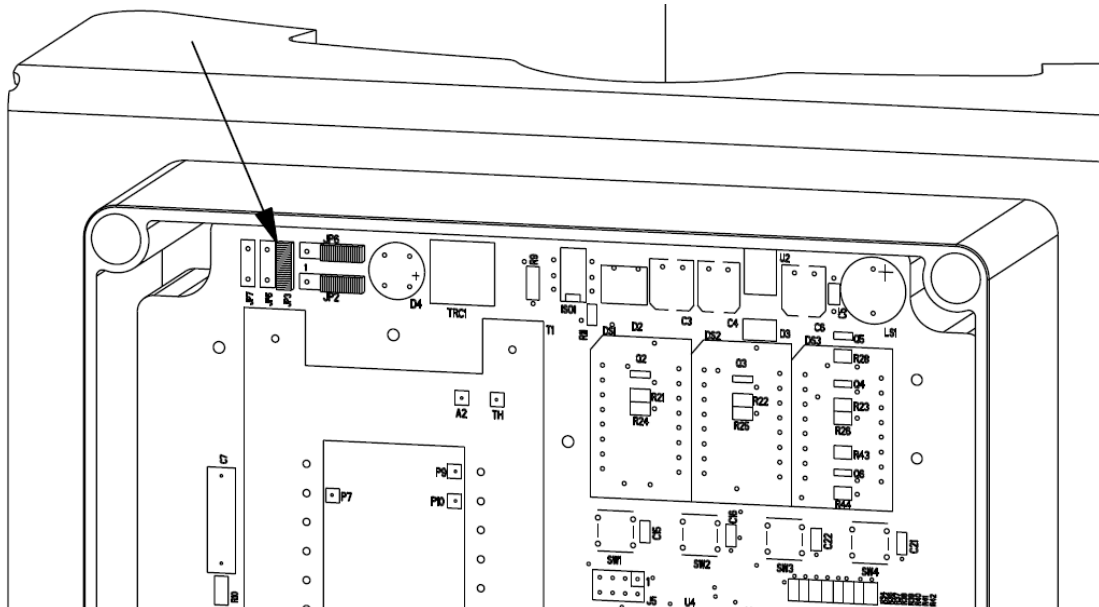


Figure 5-18: Output voltage jumper

- Install cable glands into the sequential timer enclosure. One gland is required for the power supply wires, and one gland for each purge valve to ensure the enclosure remains well sealed against moisture and contaminants.

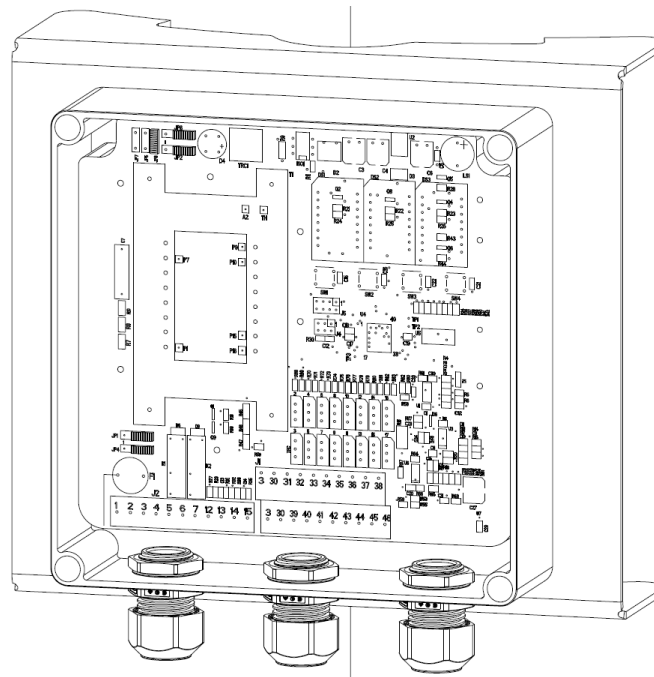


Figure 5-19: Cable gland installation

11. Prepare a three-wire cable with a minimum wire cross-sectional area of 0.75 mm^2 (18 AWG), as recommended per the manufacturer or as required to comply with local regulations, for each of the purge valves. Connect one cable to the PG9 connector of each purge valve. Route the cables along the housing of the DDC, using the wire clamps to keep them organized and secured.

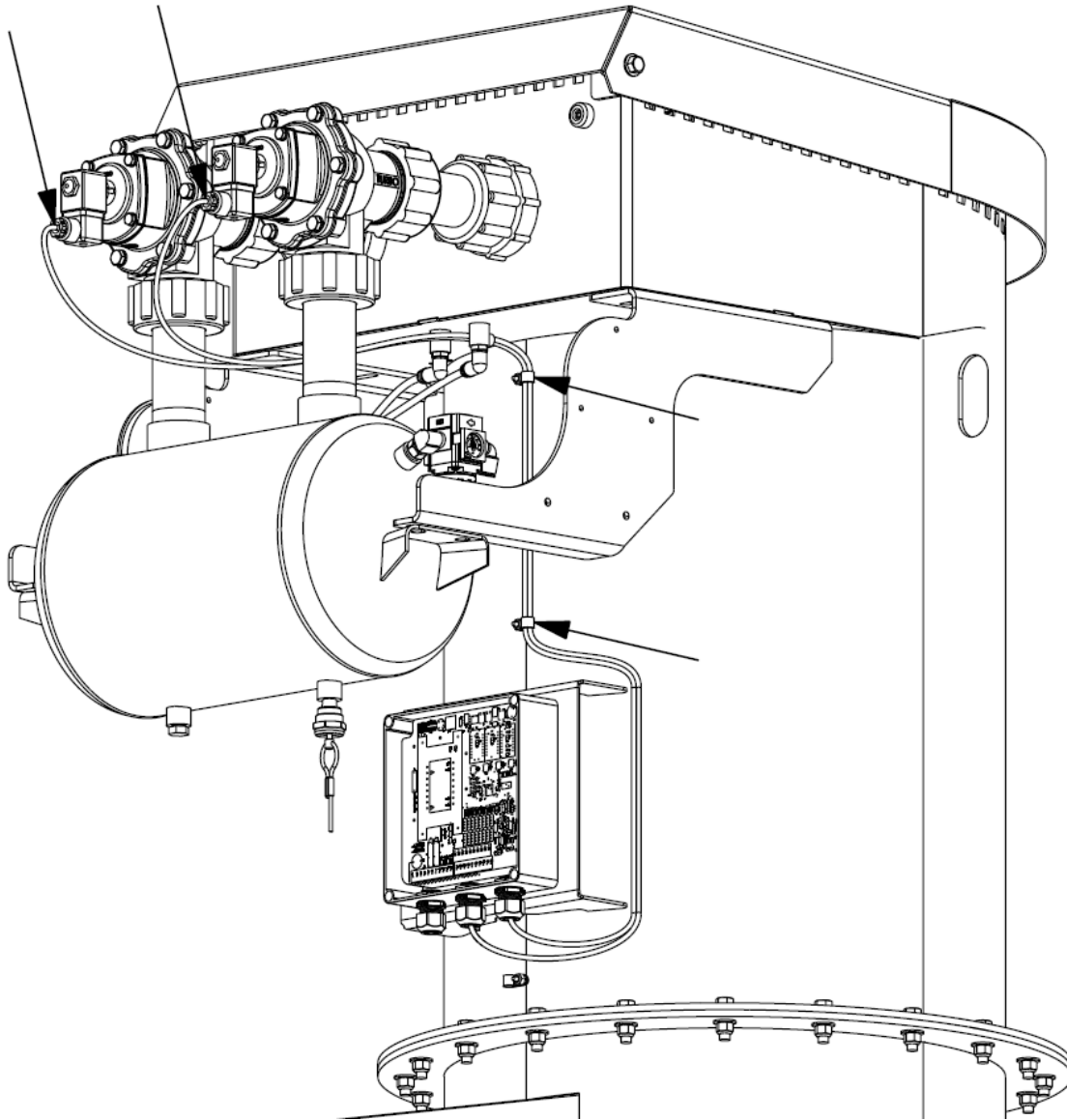


Figure 5-20: Purge valve cable connection

12. Connect the valve cables to the sequential timer. Ensure there is a sufficient length of wire to prevent a traction from acting on the terminals. Wire colors have been referenced for clarity; follow all local regulations as applicable.

a. Connect the ground wire (WHITE) for all valves to Terminal 3.

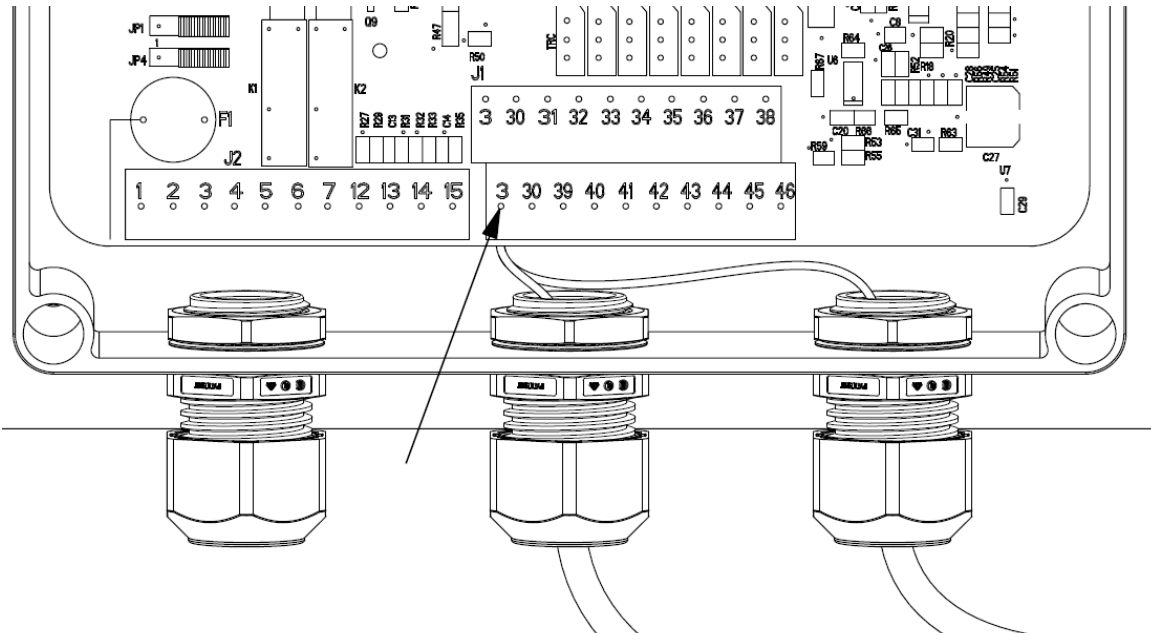


Figure 5-21: Valve ground connection

b. Connect the common wire (BLACK) for all valves to Terminal 30.

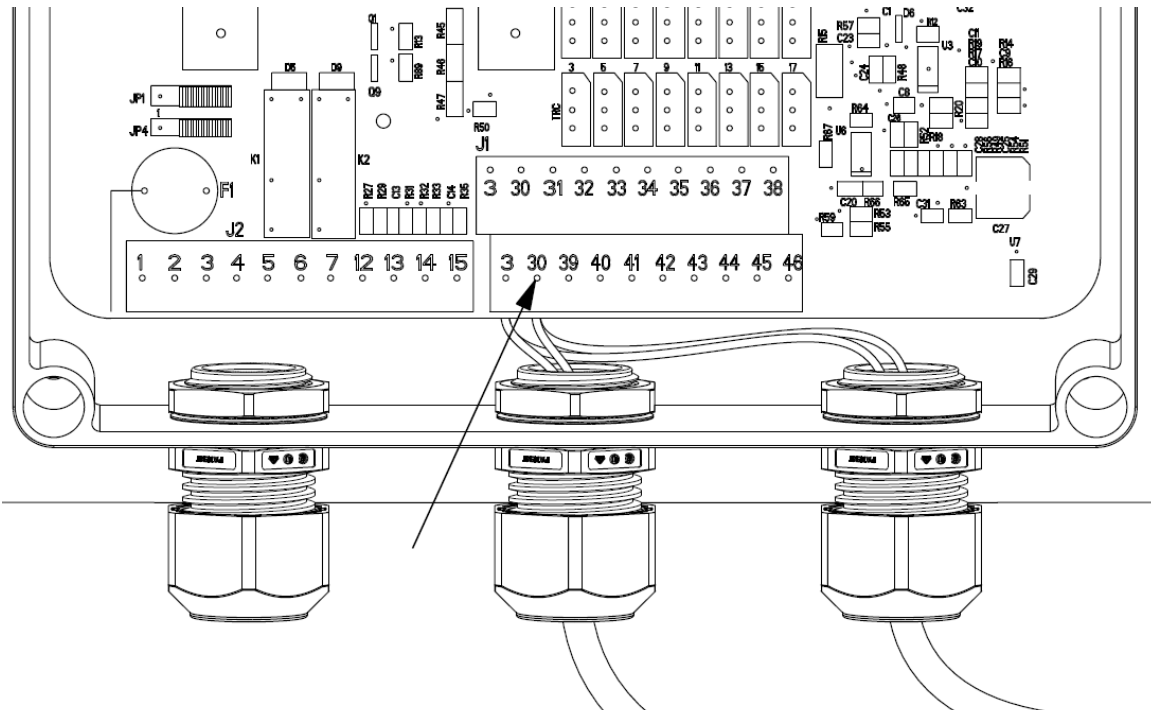


Figure 5-22: Valve common connection

c. Connect the power wire (RED) for the first valve to Terminal 39.

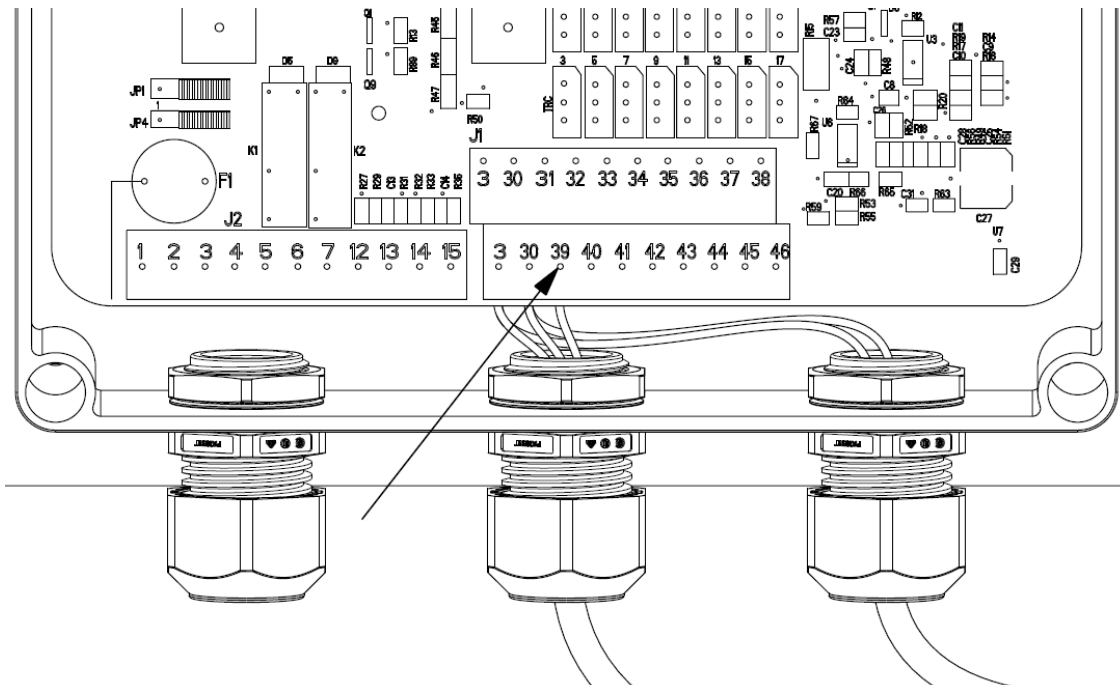


Figure 5-23: First valve power connection

d. Connect the power wire (RED) for the second valve to Terminal 40.

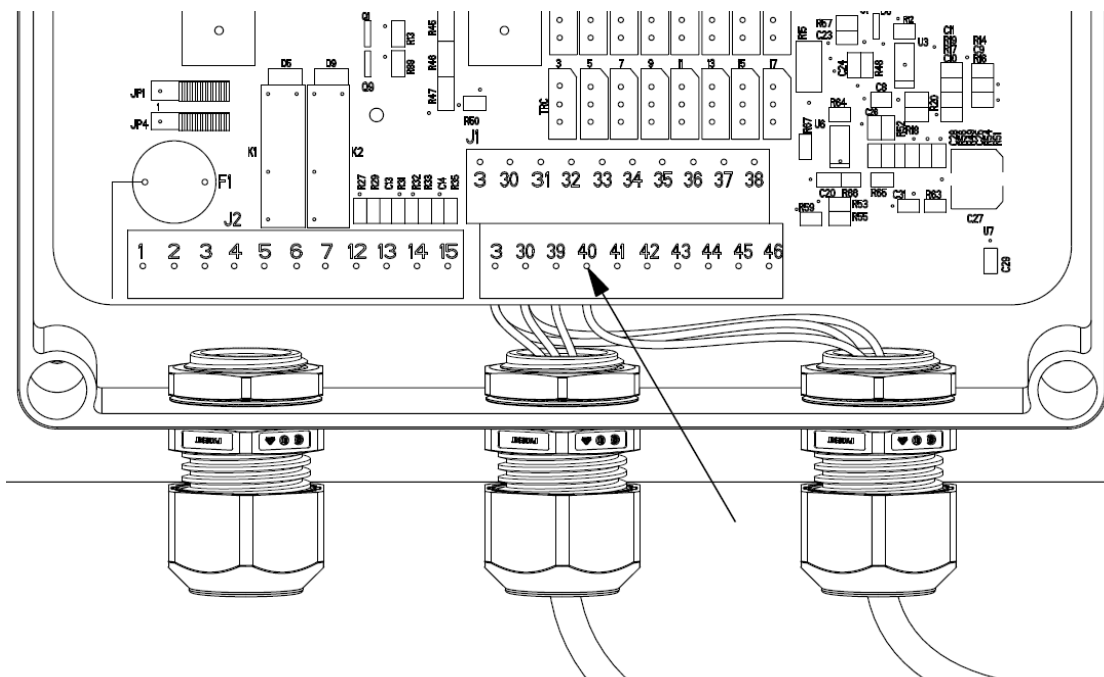


Figure 5-24: Second valve power connection

- e. If equipped, connect the power wire (RED) of the third valve to Terminal 41.

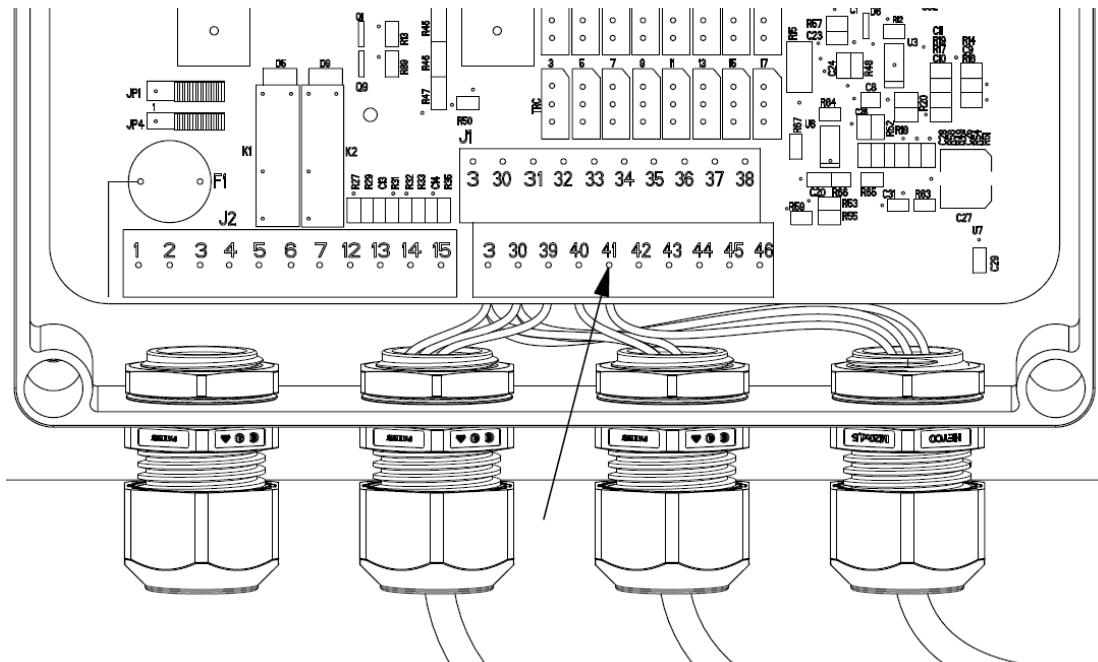


Figure 5-25: Third valve power connection

13. Ensure the electrical power supply meets the requirements of the sequential timer:
115 VAC 50-60 Hz \pm 10%
14. Install a disconnect switch along the electrical power supply line to the DDC. The electrical supply to the sequential timer must be protected by a differential switch 230 VAC ~ 30mA and a bipolar magneto thermic switch 230 VAC ~ 10A, as recommended per the manufacturer or as required to comply with local regulations. These components are to be supplied by the owner/operator.
15. Connect the electrical power supply to the sequential timer with reference to **Table 5-1** for the required terminal connections. The power supply wires must have a minimum cross-sectional area of 0.75 mm² (18 AWG). The ground wire must be colored GREEN or YELLOW and must be the first to be connected. Ensure there is a sufficient length of wire to prevent a traction from acting on the terminals.

Table 5-1: Sequential timer power supply terminal connections

Terminal	Description	Wire Color
1	Live	BLACK
2	Neutral	WHITE
3	Earth Ground (GND)	GREEN

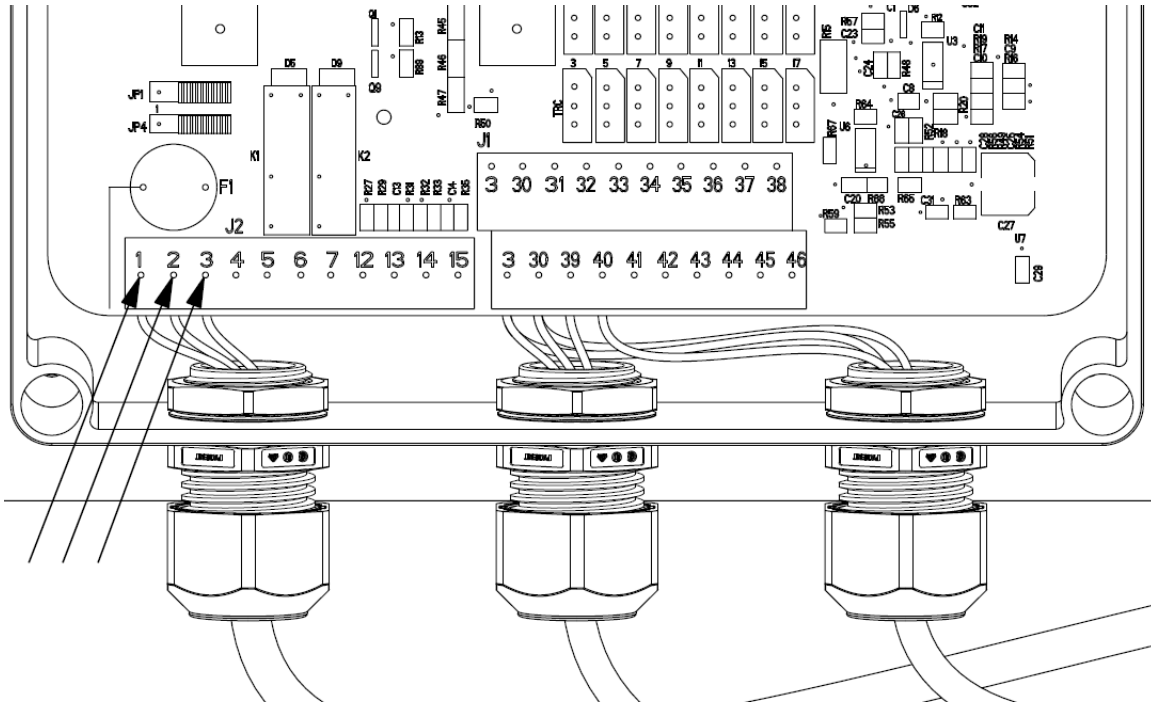


Figure 5-26: Power supply terminal connections

16. Reinstall the sequential timer display plate.
17. Engage power to the sequential timer.
18. Press **OK** to clear any codes or errors displayed.

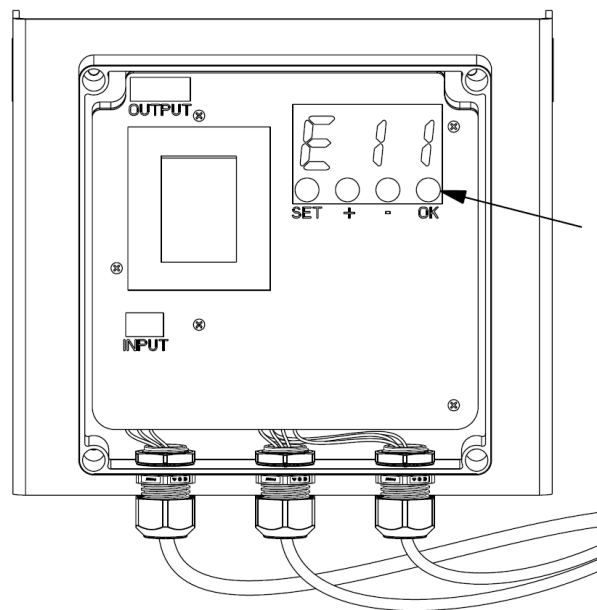


Figure 5-27: Error code clearance

19. Ensure the sequential timer parameter functions are correctly configured as follows:
 - a. Press **SET** to access the programming mode. The letter **F** should flash on the display.

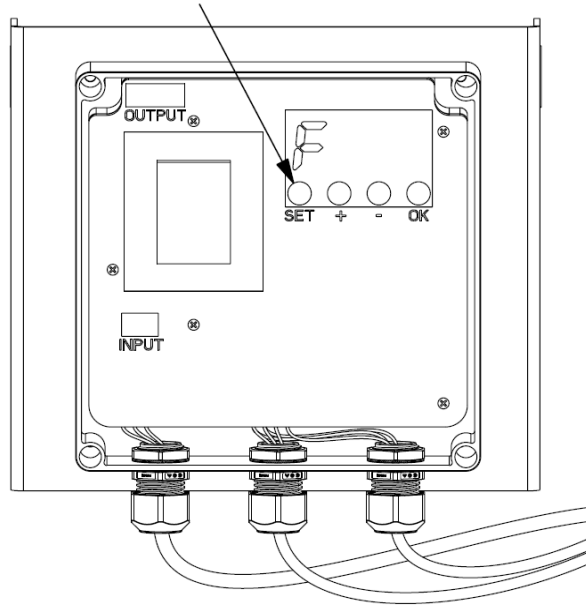


Figure 5-28: Programming mode access

- b. Press **+** and **-** to scroll through the list of functions.

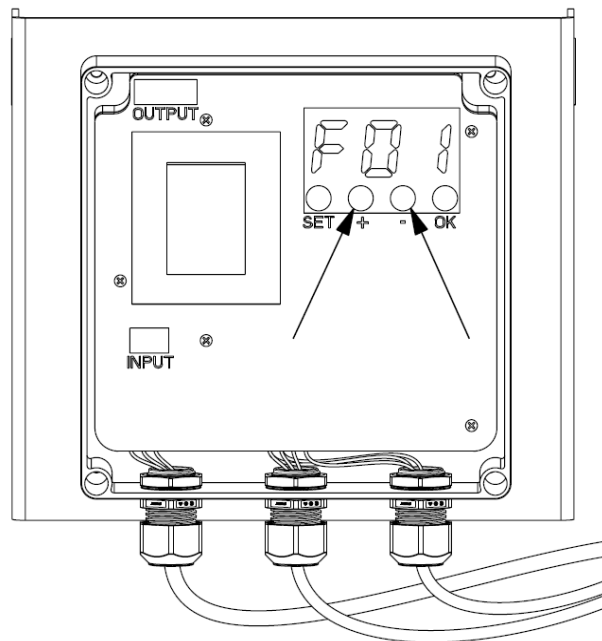


Figure 5-29: Menu navigation

- c. Press **OK** to select the displayed function.

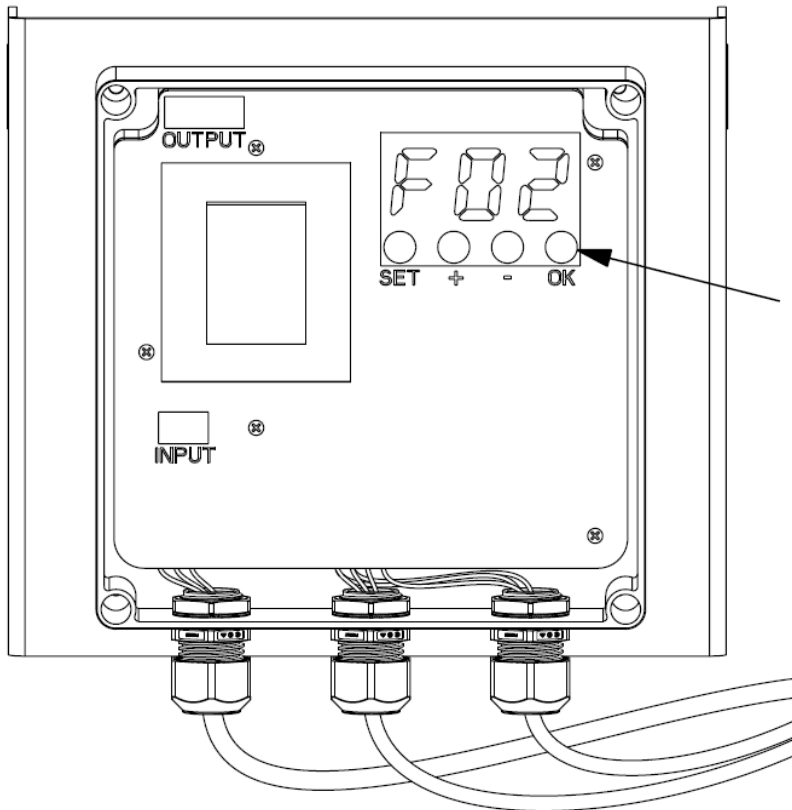


Figure 5-30: Function parameter access

- d. The value of the function will be displayed on the screen. Increase or decrease the value of the parameter using the + and - buttons with reference to **Table 5-2** below.

Table 5-2: Sequential timer function parameters

Function	Description	Value
F02	Solenoid valve activation time	0.2
F03	Washing pause between solenoid valves	30
F04	Number of connected outputs	2 (3" unit) 3 (5" unit)
F05	Output voltage setting, must agree with jumpers	d24

- e. Press **OK** to confirm the value and return to the function list.
 - f. Repeat **Step b** through **Step e** to confirm all required functions.
 - g. Press and hold **SET** and **OK** until — — — is displayed.
 - h. Press -, press **OK**, and press +.
 - i. Use + and - to navigate to F65 and press **OK**.
 - j. Set the parameter to 0.
 - k. Press **OK**.
 - l. Once all functions have been properly adjusted, press **SET** to exit the programming mode.
20. Reinstall the sequential timer enclosure cover.
 21. Prepare the electric motor power supply. The power supply must meet the following requirements:
575 VAC ±10%, 60Hz ±5%, 3-Phase
 22. It is the responsibility of the owner/operator to supply a sufficient method of overcurrent protection, a power disconnect switch, and a motor starter.
 23. Connect the power supply to the electric motor. Ensure the motor is properly grounded.

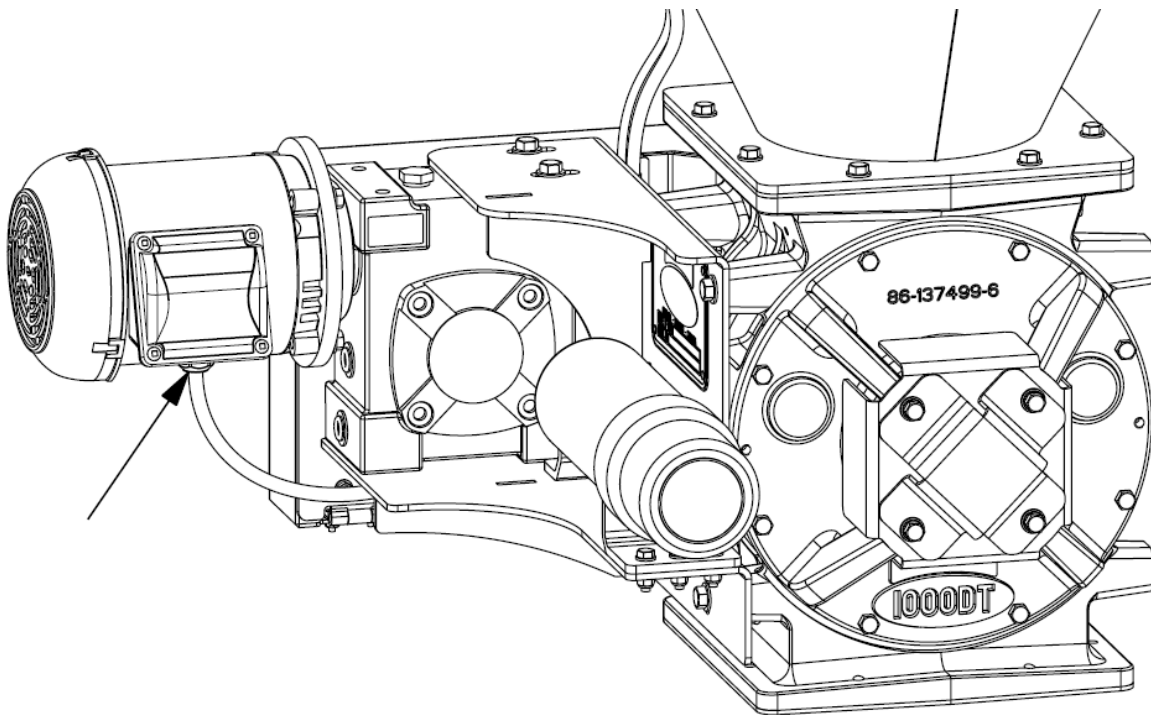


Figure 5-31: Motor power supply connection to conduit box

24. Ensure the motor turns in the correct direction. The airlock must rotate in a counter-clockwise direction when viewed from the driven end of the airlock. Operating the airlock in the reverse direction for extended periods will result in damage and potential catastrophic failure of the airlock and its components. If the rotation is in the wrong direction, switch Line 1 and Line 2 of the 3-phase input lines to the motor.

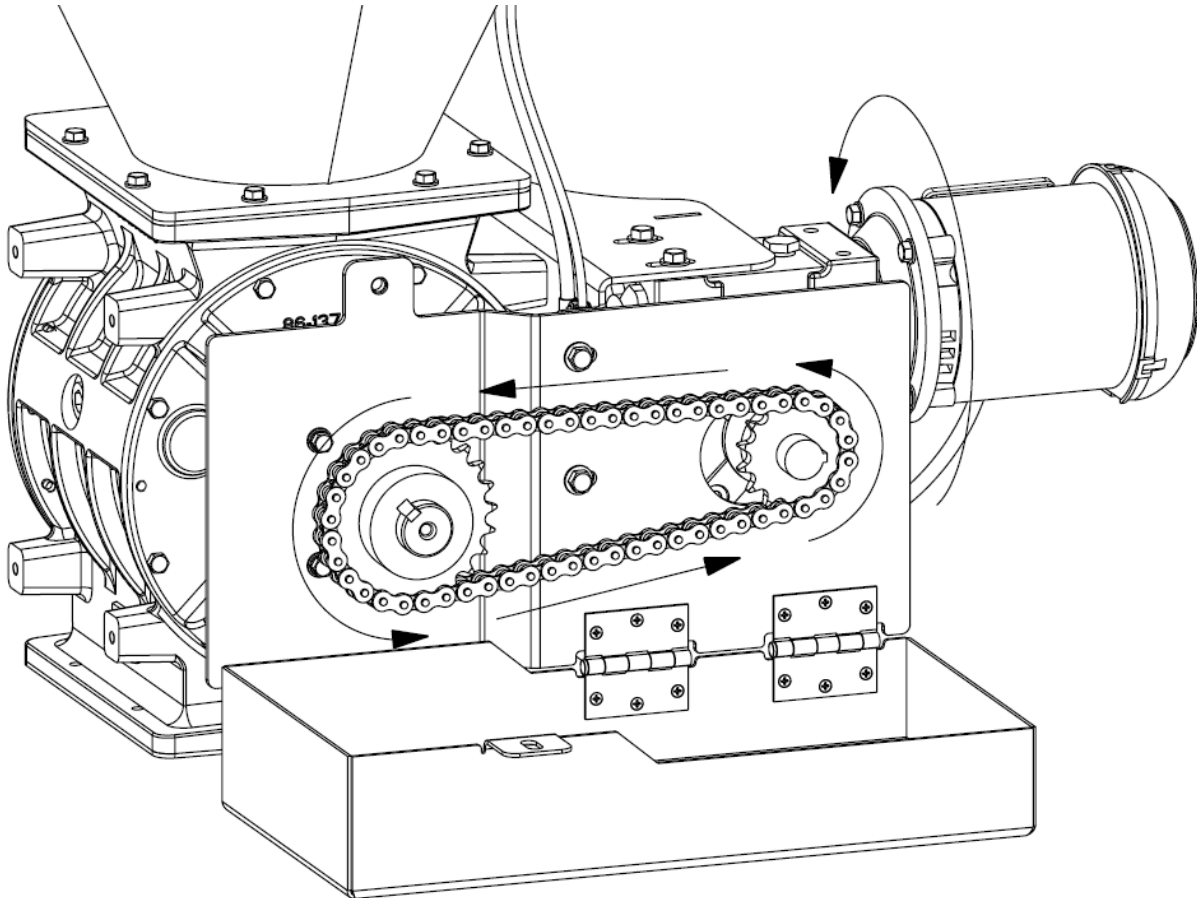


Figure 5-32: Airlock forward rotation direction

25. Proceed to the pre-operation procedures as detailed in **Section 6: Operation**.

Break-In Inspections

There are no operational restrictions on the DDC when used for the first time, however, during the initial break-in period, the following features should be inspected more frequently than the recommended maintenance schedule. With reference to **Section 7: Maintenance and Adjustments**, inspect the DDC as follows:

After operating the DDC for 30 minutes:

1. Clear the area of all bystanders, especially small children.
2. Read the differential pressure gauge to ensure the filters are clean and purging correctly. The gauge should read less than 6 in WC (1.5 kPa).
3. Ensure the header tank maintains a pressure of 65 psi (448 kPa).
4. Monitor the exhausted air for any signs of dust or particulates.
5. Listen to the airlock for any excessive noise produced by the bearings or rotors.
6. Inspect the AMS inlet and airlock inlet and outlet for any air leaks.
7. Measure the electric motor current and ensure it corresponds to the nameplate rating.
8. Place all controls in neutral, disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, and relieve the air pressure from the system.
9. Check the temperature of the airlock bearings, rotor casing and surrounding areas to look for any signs of overheating or hotspots.
10. Inspect the motor for any unusual heating of bearings or windings.
11. Re-torque all fasteners and hardware to the required specifications.
12. Inspect all air lines and fittings to ensure none are pinched, rubbing, crimped, leaking, or damaged. Re-align or replace any damaged lines or fittings as required.
13. Inspect all electrical connections, components, and wires to ensure none are loose, exposed, or damaged. Tighten any loose connections and replace any damaged wires or components
14. Open the filter access door and inspect the clean air plenum for any signs of dust or particulates. Ensure the filters are correctly mounted, fully seated, and show no signs of damage. Replace any damaged filters.
15. Check to ensure the airlock turns freely.
16. Ensure all guards and accesses are closed and secured before resuming operation.

After operating the DDC for 5 hours:

1. Clear the area of all bystanders, especially small children.
2. Read the differential pressure gauge to ensure the filters are clean and purging correctly. The gauge should read less than 6 in WC (1.5 kPa).
3. Ensure the header tank maintains a pressure of 65 psi (448 kPa).
4. Monitor the exhausted air for any signs of dust or particulates.
5. Listen to the airlock for any excessive noise produced by the bearings or rotors.
6. Inspect the AMS inlet and airlock inlet and outlet for any air leaks.
7. Place all controls in neutral, disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, and relieve the air pressure from the system.
8. Check the temperature of the airlock bearings, rotor casing and surrounding areas to look for any signs of overheating or hotspots.
9. Inspect the motor for any unusual heating of bearings or windings.
10. Re-torque all fasteners and hardware to the required specifications.
11. Inspect all air lines and fittings to ensure none are pinched, rubbing, crimped, leaking, or damaged. Re-align or replace any damaged lines or fittings as required.
12. Inspect all electrical connections, components, and wires to ensure none are loose, exposed, or damaged. Tighten any loose connections and replace any damaged wires or components.
13. Open the filter access door and inspect the clean air plenum for any signs of dust or particulates. Ensure the filters are correctly mounted, fully seated, and show no signs of damage. Replace any damaged filters.
14. Check to ensure the airlock turns freely.
15. Ensure all guards and accesses are closed before resuming normal operation.
16. Proceed with normal operation, following the recommended maintenance schedule.

STORAGE

To prevent unnecessary down-time when preparing the machine for use after storage, it is important to carefully follow the storage preparation procedures.

To prepare the DDC for storage, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Drain any accumulated moisture from the header tank through the use of the drain valve.
3. Place all controls in neutral, disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, and relieve the air pressure from the system.
4. Thoroughly inspect the DDC for any damaged or worn components; repair or replace any components as required before storage with reference to **Section 7: Maintenance and Adjustments** to prevent down-time after storage.
5. Inspect all the air lines, fittings, and valves. Tighten any loose fittings and replace any damaged components. Replace any hose that has been cut, nicked, or abraded.
6. Inspect all electrical connections, components, and wires to ensure none are loose, exposed, or damaged. Tighten any loose connections and replace any damaged wires or components.
7. Thoroughly clean the DDC and filters:
 - a. Refer to **Section 7: Maintenance and Adjustments** to clean the filters.
 - b. With the filters removed, wash the interior surfaces of the DDC housing and airlock using a combination of water, scrapers and solvent as required. Ensure any solvent used is approved for use in the application of the product stored within the storage structure, especially within food-grade applications.
 - c. Wash the airlock thoroughly using a water hose or pressure washer to remove all dirt, dust, debris, and residue. The internal surfaces of the airlock may also be cleaned through flushing. To flush the internal surfaces, proceed as follows:
 - i. Run the airlock at a high idle speed with the airlock rotating.
 - ii. Direct water through the inlet of the AMS to enter the inlet of the airlock for several minutes, allowing time for the water to wash out the inner AMS surfaces, airlock casing interior, the rotating airlock blades, and the airlock inlet and outlet surfaces.
 - iii. Stop the water flow into the inlet and continue to run the airlock for several minutes to allow all interior surfaces to completely dry.
 - iv. When discharging materials with oily characteristics or high moisture content, including milled feeds, the airlock may need to be flushed on a more regular basis to remove residue build-up. Oily residues may require flushing and soaking with a suitable solvent to dissolve the build-up. Any non-food-grade solvents must be cleaned from the machine using hot

- water and/or detergent flushing. Ensure that any solvent used is acceptable for the intended market of the conveyed product.
- d. Be sure to wash all accumulated dirt, dust, debris and residue from the surfaces of the DDC. Rinse any remaining solvent from the DDC.
 - e. Ensure the filters are completely dried before reinstalling within the DDC.
8. Coat the internal surfaces of the airlock with a rust inhibitor/anti-corrosive oil.
 9. Touch up all paint nicks and scratches to prevent rusting.
 10. If the DDC must be removed from the storage structure, refer to the above sub-section, *Installation*, and follow the outlined lifting procedures to remove the DDC from its mounting position.
 - a. Identify a storage location for the DDC that has a firm, level surface in a dry area away from human activity. If the DDC must be stored outdoors, install a covering over the DDC to protect it from rust and corrosion.
 - b. Cover all openings, especially the airlock outlet, to protect the DDC from accumulation of dust, debris and moisture within the housing. The airlock shipping plate, reference **Figure 5-1**, may be installed as protection.

After storage, refer to **Section 7: Maintenance and Adjustments** to ensure all necessary maintenance tasks are completed. Once the required maintenance tasks have been completed, proceed to the standard pre-operation checks as outlined in **Section 6: Operation** and resume normal operation.

END OF LIFE

Upon completion of the functional life of the DDC, special care must be taken in disposal. Electronic components can release toxic elements harmful to both humans and the environment with improper disposal. Refer to your local regulations for disposal of electronic waste.

Upon completion of the functional life of the airlock, Walinga offers a rebuilding program as cost-effective means of keeping your airlock in optimal operating condition. Contact your Walinga dealer or representative to submit your airlock and join the rebuild program. All rebuilt and refurbished airlocks are tested to ensure ideal operation and inspected for proper tolerances and clearances to meet all requirements. Rebuilt and refurbished airlock feature:

- A re-machined casing to correct out-of-round wear or damage
- Re-machined end plates to correct any damage and properly aligned with the casing
- New hard coating treatments to required components
- Replacement of seals, O-rings, and bearings as required
- Replacement of rotor shafts and blades as required
- New rotor blade tips
- Repainted outer surfaces



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Operation

DUSTLESS DISCHARGE CYCLONE

MACHINE FEATURES AND COMPONENTS

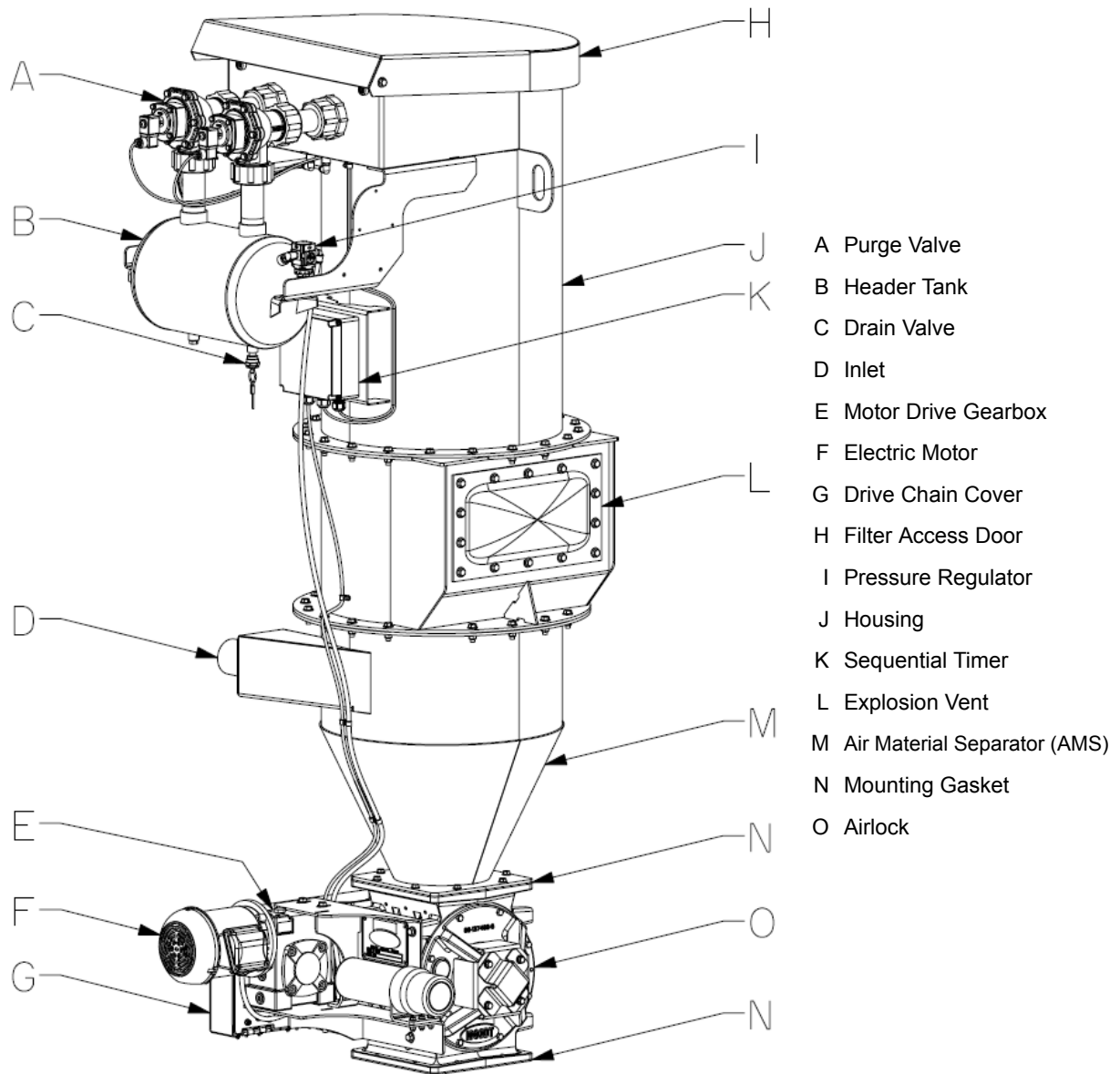


Figure 6-1: Exterior DDC components

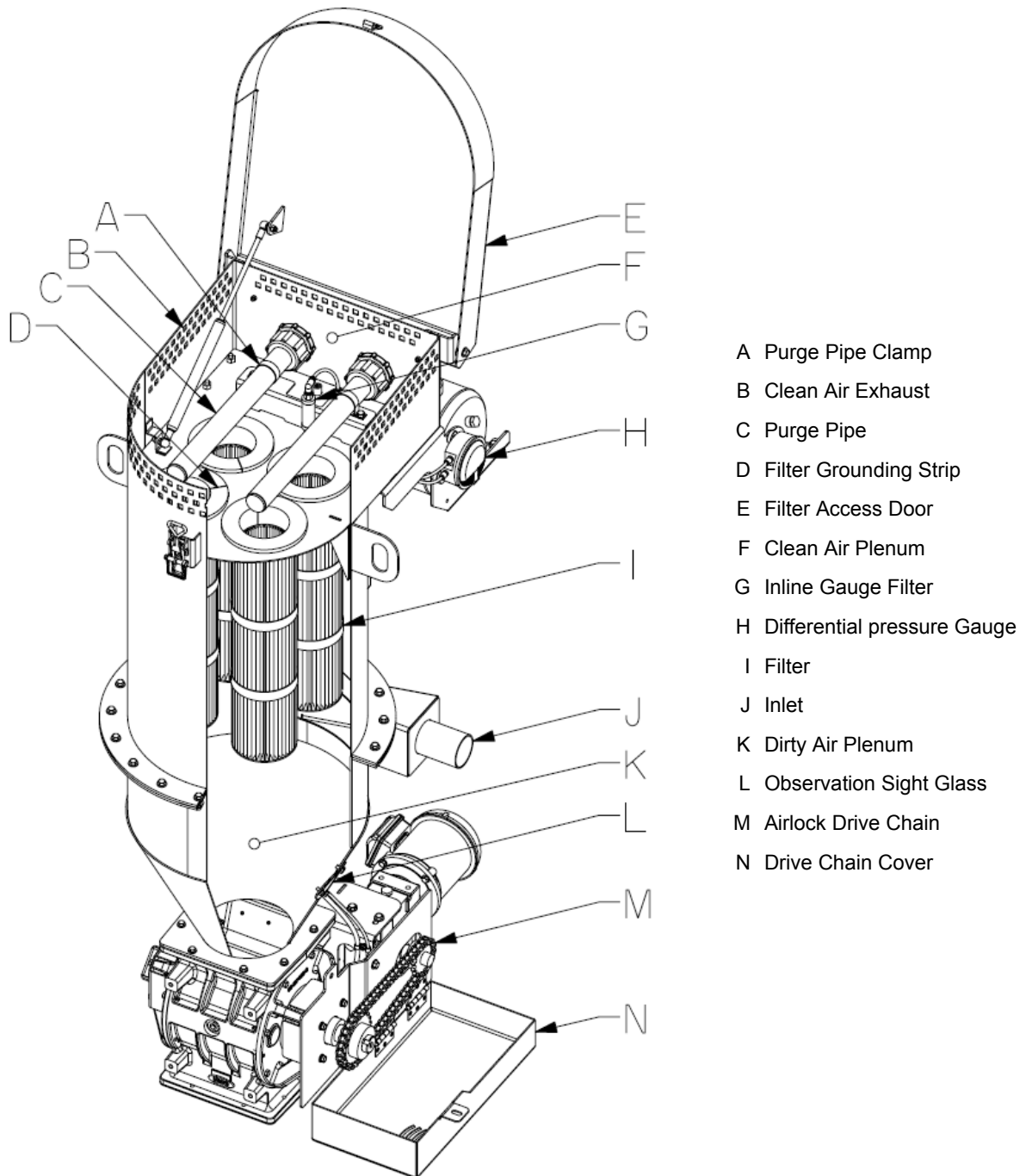


Figure 6-2: Interior DDC features and components

CONTROLS AND DISPLAYS

Function: Displays the difference in pressure on either side of the filter (within the clean air plenum and dirty air plenum) to indicate the cleanliness and function of the filters.

Range: The gauge is capable of measuring from 0 in WC (0 kPa) to 15 in WC (3.7 kPa). Immediately after an active purge cycle, the pressure differential will spike. After stabilization, under normal operating conditions, the pressure differential should be below 6 in WC (1.5 kPa).

Location: The gauge is mounted on the right side of the DDC on the header tank mounting bracket.

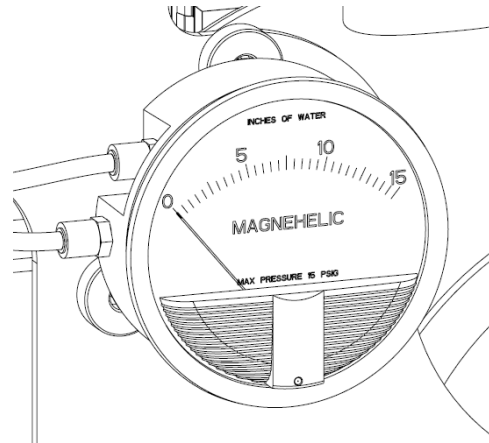


Figure 6-3: Differential pressure gauge

Function: Controls the activation of the purge valves, including pulse time, pause time, and valve activation order, and displays any errors that may occur in relation to the timer.

Range: The pulse time may be set between 0.05 to 5.00 seconds. The pause time may be set between 1 to 999 seconds. Refer to the auxiliary equipment's operator's manual for applicable error codes.

Location: The sequential timer is mounted on the rear of the DDC housing.

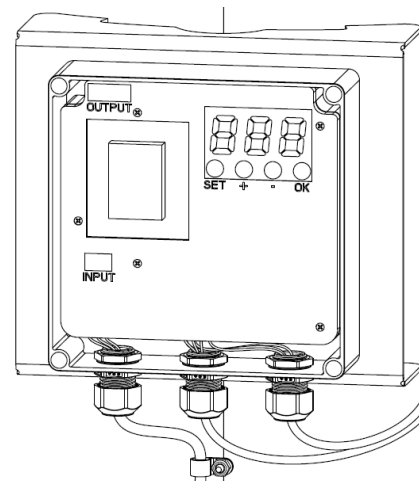


Figure 6-4: Sequential timer

Function: Displays the pressure within the header tank and limits the header tank pressure.

Range: The pressure gauge is capable of reading from 0 psi (0 kPa) to 140 psi (965 kPa). The pressure of the header tank must be limited to 65 psi (448 kPa).

Location: The pressure regulator is mounted on the left side of the header tank.

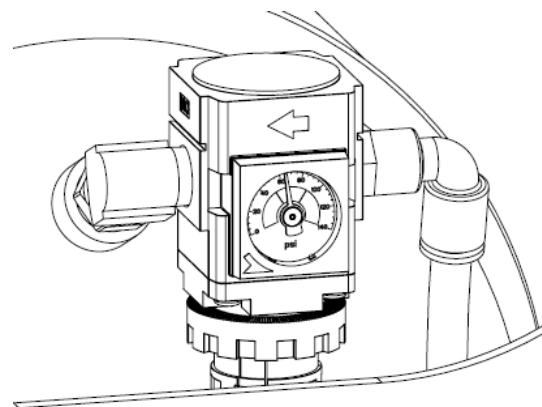


Figure 6-5: Pressure regulator

Function: Provides a means to isolate the compressed air supply from the DDC and relieve any residual pressure from the DDC system. The valve must be able to be locked-out.

Range: In the open position, the valve allows the compressed air supply to pass through to the pressure regulator of the DDC. In the exhausting position, the compressed air supply to the DDC is blocked and any air pressure within the DDC is relieved and exhausted through the valve.

Location: The valve must be located along the supply line between the compressed air supply and the pressure regulator of the DDC.

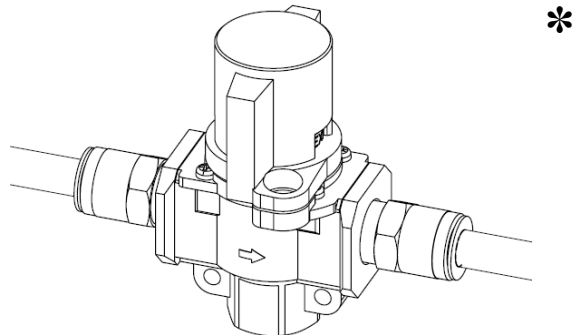


Figure 6-6: Shut-off pressure relief valve

Function: Provides a means to disconnect the electrical power source from the sequential timer. The switch must be able to be locked-out.

Range: The two-position switch should be in the *ON* position while the DDC is in operation and in the *OFF* while the DDC is not in use or during maintenance and adjustments.

Location: The switch must be located along the electrical power cable between the electrical power source and the sequential timer.

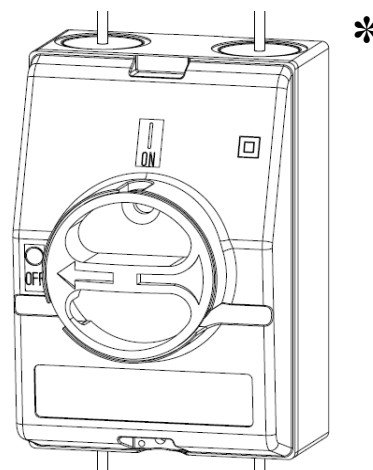


Figure 6-7: Sequential timer disconnect switch

Function: Monitors the incoming and outgoing current of the electrical system. If the difference in current exceeds the rated difference, the switch will open, de-energizing the sequential timer and preventing electrocution due to a current leak.

Range: The rated current difference of the switch must be 30 mA and it must accept an input voltage of 230 VAC.

Location: The switch must be located along the electrical power cable between the electrical power source and the sequential timer.

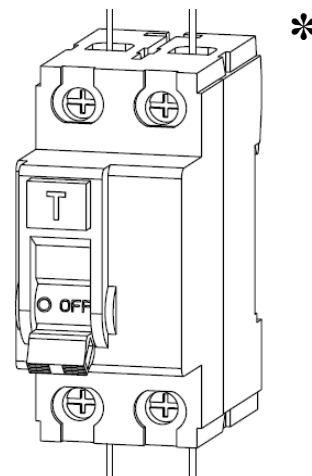


Figure 6-8: Differential switch

Function: In the event of a short-circuit within the sequential timer, the magnetic contact of the switch will open, preventing the passage of current to the sequential timer. In the event of an overload within the sequential timer, the thermal contact of the switch will open, preventing the passage of current to the sequential timer.

Range: The switch must be rated for an input voltage of 230 VAC and have a tripping current of 10 A.

Location: The switch must be located along the electrical power cable between the electrical power source and the sequential timer.

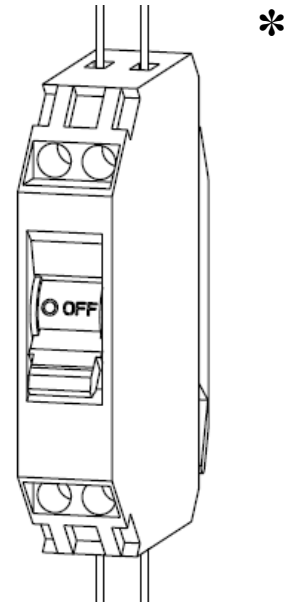


Figure 6-9: Bipolar magneto thermic switch

Function: Provides a means to disconnect the electrical power source from the electric motor. The switch must be able to be locked-out.

Range: The two-position switch should be in the *ON* position while the DDC is in operation and in the *OFF* while the DDC is not in use or during maintenance and adjustments.

Location: The switch must be located along the electrical power cable between the electrical power source and the electric motor.

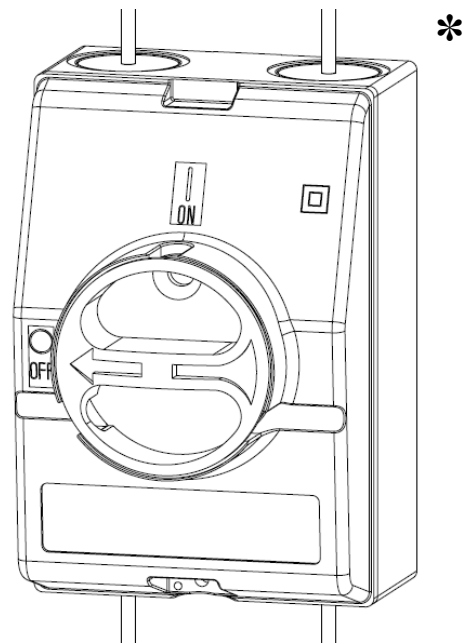


Figure 6-10: Motor disconnect switch

Function: Provides a means to start and stop the electric motor of the airlock to start and stop the rotation of the airlock. More advanced models may also provide the ability to adjust the electrical output and therefore control the rotational speed of the airlock.

Range: The starter should be in the *ON* position while the DDC is in operation and in the *OFF* position while the DDC is not in use or during maintenance and adjustments.

Location: The starter must be located along the electrical power cable between the electrical power source and the electric motor.

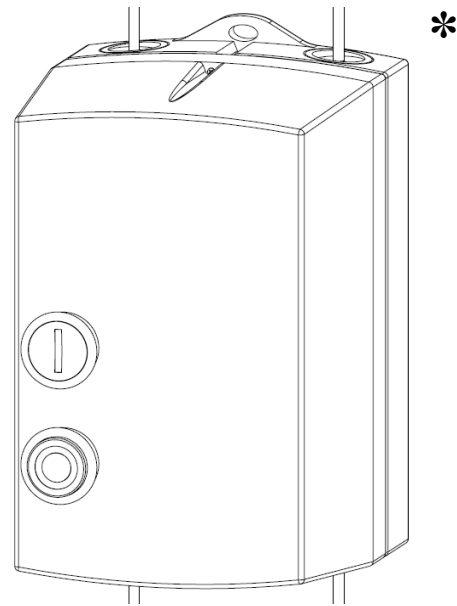


Figure 6-11: Motor starter

Function: In the event of a short circuit or any other overcurrent failure within the electric motor circuit, the overcurrent switch will open its contact, preventing the passage of current to the electric motor.

Range: The device must be appropriately rated for the electric motor used in the DDC model. Refer to the nameplate of the motor for the Full Load Amperage (FLA).

Location: The device must be located along the electrical power cable between the electrical power source and the electric motor.

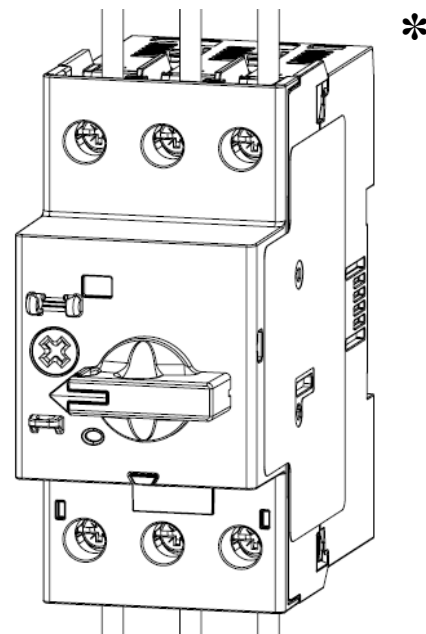


Figure 6-12: Motor overcurrent switch

* The shut-off pressure relief valve, sequential timer disconnect switch, differential switch, bipolar magneto thermic switch, motor disconnect switch, motor starter, and motor overcurrent switch are to be supplied by the owner/operator. The models shown are for reference only. Ensure compliance with all local regulations.

OPERATION

Pre-Operation Machine Preparation

For personal safety and to ensure the DDC is in good mechanical condition, the following checks must be performed before operation of the system:

1. Clear the area of bystanders, especially small children.
2. Ensure the DDC has been properly serviced, maintained, and lubricated as per the described methods and schedule as outlined in **Section 7: Maintenance and Adjustments**.
3. Ensure all storage coverings and protectors that would hinder or prohibit normal function of the system have been removed. Serious damage to the machine, storage structure, and/or personal injury to operator or bystanders may result from attempting to operate the system with restrictions in place.
4. Empty any accumulated moisture from the header tank through the use of the drain valve.

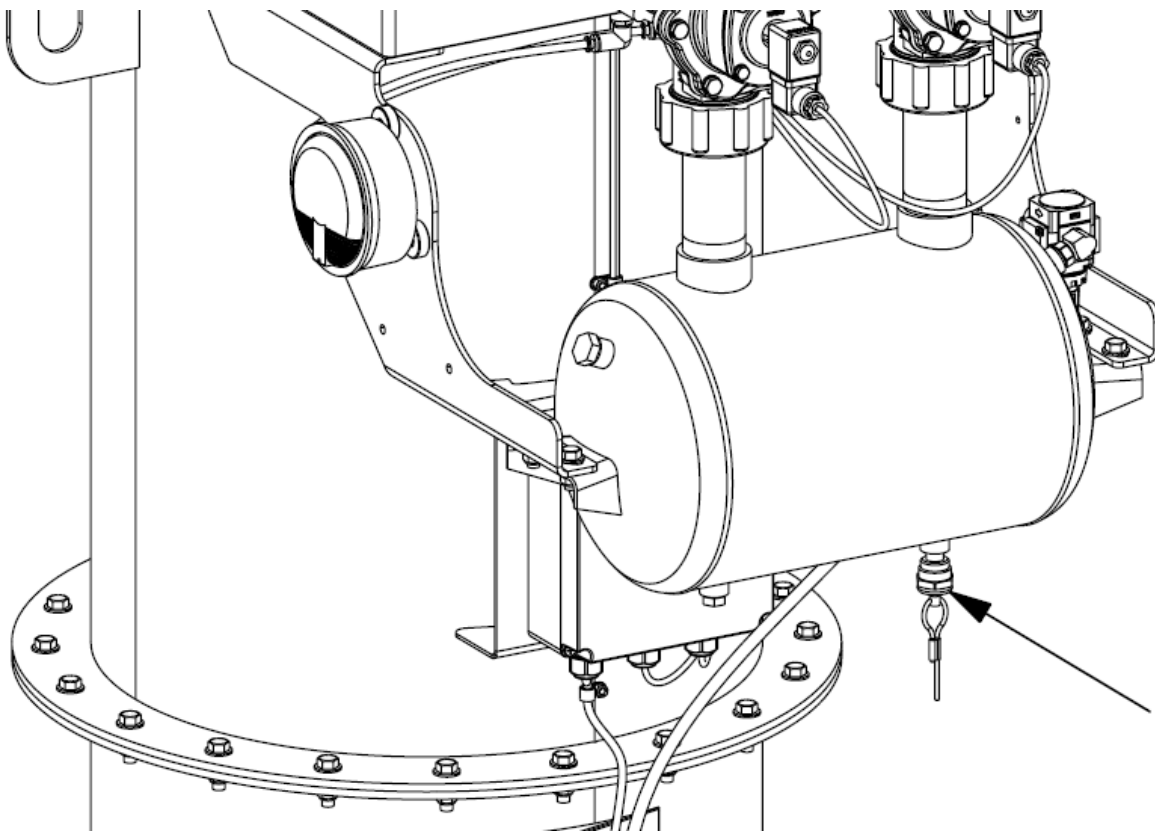


Figure 6-10: Header tank drain valve

5. Ensure the exhaust area is clear of any debris or obstructions.

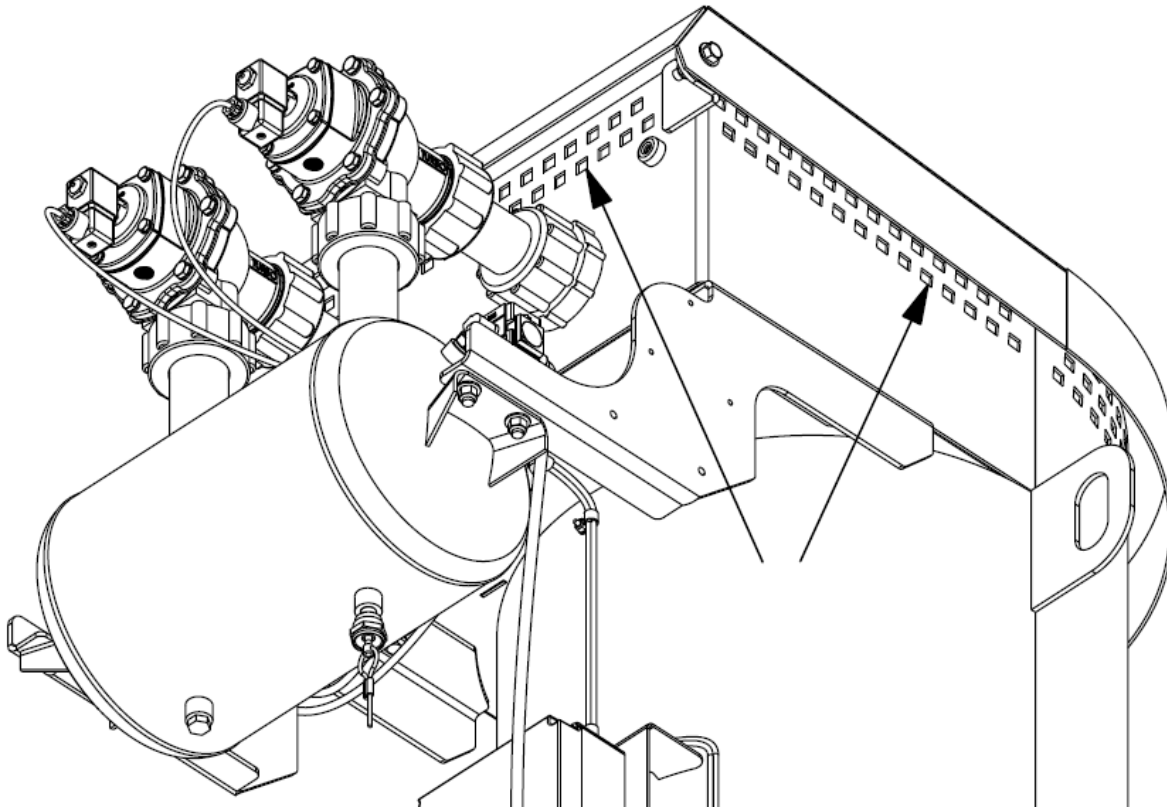


Figure 6-11: Exhaust area

6. Close and secure all guards, shields and access points.

Operation of the Machine

To operate the DDC, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Ensure all guards, shields and access points are closed and secured.
3. Ensure the electrical disconnect switches, compressed air shut-off valve, and any other devices or supplies have not been locked-out. If any are locked-out, identify the cause and retrieve the tag before engaging power.
4. Ensure the differential switch, bipolar magneto thermic switch, and motor overcurrent switch are not in the tripped position. If any are tripped, refer to the auxiliary equipment's operator's manual(s) to properly reset the switch(es).
5. Turn the power supply on and engage power to the airlock motor.

6. Ensure the airlock is rotating in the correct direction and at the required speed.

Table 6-1: Recommended airlock operational speeds

	3" Model 1008DT Airlock	5" Model 1210DT Airlock
Rotation	Counter-clockwise	Counter-clockwise
Maximum Speed	30 rpm	35 rpm

7. Allow the airlock to operate for approximately 30 seconds or until any residual product that may be within the airlock or DDC has been discharged.
8. Engage power to the sequential timer.
9. Turn the compressed air supply on and move the compressed air shut-off valve to the open position.
10. Ensure the header tank pressure is at 65 psi (448 kPa), adjusting the pressure regulator as required.
11. Refer to any auxiliary equipment's operator's manuals to begin conveyance of product into the DDC and storage structure.
12. Monitor the movement of product within the AMS using the sight glass. During operation, product will be seen flowing past this window, however product should never appear stationary against the sight glass. If product begins to build up against the sight glass, increase the airlock speed or refer to the auxiliary equipment's operator's manual to adjust the ratio of product to air being conveyed into the DDC. Ensure the discharge pressure of the auxiliary equipment does not exceed 15 psi (103 kPa).
13. Monitor the performance of the system by listening for the activation of the purge valves and reading the differential pressure gauge. A pressure differential greater than 6 in WC (1.5 kPa) indicates the filters must be cleaned or replaced, or may indicate the purge valves are not operating correctly.
14. For continuous-duty applications and to reduce unnecessary power consumption, a differential pressure switch may be installed to activate the purge cycle only when the filters reach a predetermined level of dust accumulation to prevent premature wear and damage to the filters due to an over-activation of the purge cycle. Reference **Section 7: Maintenance and Adjustments** and **Section 10: Accessories and Attachments** for differential pressure switch installations.

Stopping the Machine

To stop the DDC, proceed as follows:

1. Ensure any auxiliary conveying equipment has been shut-down and no product is being conveyed into the DDC.
2. Allow the DDC to continue to operate for approximately 10 minutes after product conveyance has stopped to allow the filters to be completely cleared of dust and particulates.
3. Stop the compressed air supply and move the shut-off valve to the exhaust position.
4. Move the sequential timer disconnect switch to the *OFF* position.
5. Allow the airlock to continue to operate for approximately 30 seconds or until all product has been discharged from the DDC and into the storage structure.
6. Disengage power to the electric motor by placing the motor starter in the *OFF* position and moving the motor power disconnect switch to the *OFF* position.
7. Turn off the power supply.
8. Refer to **Section 7: Maintenance and Adjustments** and perform any required maintenance.
9. Reference **Section 5: Machine Life-Cycle Procedures** to prepare the DDC for storage as required.

In emergency situations, for example, if the safety of a person is threatened, it may be necessary to immediately shut-down the DDC. To avoid potential damage to the DDC and auxiliary equipment, the following should only be used in an emergency situation. Familiarize yourself with the emergency shut-down procedures of the auxiliary conveying equipment.

To shut-down the DDC in an emergency:

1. Use the emergency shut-down procedures as detailed in the auxiliary equipment's operator's manual to shut-down the conveying system.
2. Move the compressed air shut-off valve to the exhaust position.
3. Move the sequential timer power supply disconnect switch to the *OFF* position.
4. Move the electric motor power supply disconnect switch to the *OFF* position.

Clearing Blockages

To clear a blockage from the airlock, proceed as follows:

1. Refer to the auxiliary equipment's operator's manual to stop the conveyance of product into the DDC.
2. **DO NOT** open any access door or reach into the airlock to clear an obstruction while power is engaged to the DDC.
3. If the airlock motor is equipped with a reversible speed controller:
 - a. Change the rotational direction of the airlock briefly then return to the correct direction. **DO NOT** change the direction of rotation by reversing the wiring on 3-phase electric motors, as this may cause impact damage.
 - b. Repeat this alternation of directions several times to dislodge and clear the obstruction.
4. If the airlock is not equipped with a reversible speed controller, or if the obstruction does not clear after performing **Step 3**:
 - a. Follow the procedures in the above section, *Stopping the Machine*, and shut down the DDC.
 - b. Ensure the power supply is turned off and the sequential timer and motor disconnect switches are both in the *OFF* position.
 - c. Gain access to the airlock through the inlet or outlet as required.
 - d. Manually remove the obstruction from the airlock.
5. Inspect the interior of the airlock for any signs of damage. Reference **Section 7: Maintenance and Adjustments** to repair or replace any components as necessary.

OPERATING TIPS AND HINTS

To achieve the best performance from your DDC keep the following in mind:

- Always follow the recommended schedule and perform the required maintenance as detailed in **Section 7: Maintenance and Adjustments**, to maximize the life of your filters and DDC.
- Consult your Walinga dealer or representative to adjust the purge valve activation and pause durations; too short or too long of a valve activation time can damage or shorten the life of the filters, too long between valve activations can result in poor performance of the DDC.
- Ensure the filters and DDC remain properly grounded to prevent static accumulation.
- Listen to the DDC during operation to ensure the purge valves are activating as expected and monitor the differential pressure gauge to ensure the filters remain clean.
- Monitor the exhaust of the DDC to look for any signs of dust or particulates, as this is an indication of a failure within the system.
- To achieve maximum capacity, the airlock should be operated as slowly as possible to allow each rotor pocket to completely fill. Do not operate the airlock faster than the recommended speeds.

TROUBLESHOOTING

Reference **Table 6-2** for assistance with some of the most common issues, causes and solutions that you may face during the operation of your DDC. If you encounter a problem that is difficult to solve, even after having referenced the following table, please contact your Walinga dealer or representative. Before you call, please have your Operator's Manual and your DDC's serial number ready and available.

For detailed procedures and diagrams for the proposed solutions, reference **Section 5: Machine Life-Cycle Procedures**, **Section 6: Operation** and **Section 7: Maintenance and Adjustments**.

Table 6-2: Troubleshooting for DDC

ISSUE	CAUSE	SOLUTION	
Dust is released from DDC	Filters installed incorrectly	Inspect filters to ensure they are fully seated, reference the proper filter installation procedures.	
	Damage to filters	Inspect the filters for any signs of damage such as deformation of the end caps, damage to the mounting flanges, or holes within the filter media. Replace any damaged filters.	
	Insufficient sealing of DDC		Inspect the joints of the dirty air plenum for any damage or potential leaks. Repair any damaged welds or replace any worn or damaged components.
			Inspect the mounting gaskets for signs of wear or damage. Replace any worn or damaged gaskets.
			Inspect the AMS inlet for any signs of damage due to an over-tightened compression coupling. Repair or replace as required.
			Inspect the compression coupling to ensure it is sufficiently tightened and there are no signs of wear or damage to the inner gasket. Tighten, repair or replace the coupling as required.

ISSUE	CAUSE	SOLUTION
Insufficient airflow	Exhaust area restricted	Inspect the exhaust area for any accumulated debris or obstructions and remove.
		Inspect the exhaust area for any damage and repair or replace as required.
	Filters not permitting adequate flow	Inspect the filters for accumulation of dust and particulates. Clean the filters or replace any worn filters as required.
Slow transfer of product	Defective airlock	Check that the tip clearance matches the specifications. Adjust or replace tips as required
	Incorrect airlock speed	Adjust the speed of the airlock to be within the recommended range
		Inspect the drive chain to ensure it is properly tensioned and aligned.
Incorrect product to air ratio	Refer to the auxiliary equipment's operator's manual to adjust the ratio of air to product being conveyed into the DDC.	
Noisy airlock	Tips hitting casing	A light grinding noise is normal for some time after adjustment of the airlock tip clearances. The noise will disappear after the tips seat fully on the casing. If the noise is excessive or does not decrease, re-adjust the tips where applicable.
	Incorrect direction of rotation	The airlock operates continuously in one direction only. Check that the drive chain and airlock rotor shaft rotate in a counter-clockwise direction when viewed from the right side of the DDC. Continuous operation in the reverse direction will cause excessive wear and may damage the rotor tips, tip wiper, casing and bearings. For units equipped with an electric motor, switch Line 1 and Line 2 of the 3-phase input lines to reverse the rotation direction.
	Bearing failure	Refer to the airlock operator's manual to replace the bearing(s). Check the clearances between the rotor blades and end plates after replacing the bearing(s).

ISSUE	CAUSE	SOLUTION
Air loss through airlock	Excessive clearance between blade tips and casing	Adjust the tips to decrease the clearance to the required specifications. Excessive clearance causes operating problems including erratic flow. Prolonged operation with excessive clearances will cause uneven casing wear, resulting in lower performance even after tip adjustment.
Airlock rotor blade tip or wiper tip breakage	Prolonged operation in reverse direction	The airlock must rotate in a counter-clockwise direction when viewed from the right side of the DDC. Change the rotational direction and repair or replace the tips or wiper as required.
	Wiper fouling blade tips	Re-adjust the clearance of the wiper blade on the rotor blade tips.
Airlock stalls	Obstruction in airlock preventing blade rotation	Refer to the section, <i>Clearing Blockages</i> , to remove the obstruction from the airlock. Inspect the airlock for any signs of damage and repair or replace components as required.
	Improper motor grounding	Ensure all grounds of the motor are secured and properly connected. Add a grounding strap if required.
	Poor electrical connection to motor	Ensure the power supply meets the required voltage and frequency.
		Ensure all electrical connections are tightened and secure.
	Prolonged operation in reverse direction	The airlock must operate in a counter-clockwise direction when viewed from the right side of the DDC. Operation in the reverse direction for extended periods may cause damage to the rotor blades and tips and may cause jamming. Inspect and repair or replace as required.
	Insufficient rotor or tip clearance with casing or end plates	Check the tips and rotor clearances and adjust to the correct specifications as required.
	Chain drive out of alignment or improperly tensioned	Check the alignment and tensioning of the chain drive. Ensure the airlock, gearbox, and motor shafts are all aligned. Adjust as required.
Faulty gearbox or motor	Replace gearbox or motor as required.	

ISSUE	CAUSE	SOLUTION
High pressure differential	Insufficient compressed air supply	Ensure the pressure of the header tank is 65 psi (448 kPa). Ensure the compressed air supply is sufficient to supply the header tank.
		Inspect shut-off valve, pressure regulator and any other pneumatic components for wear or damage. Repair or replace as required.
		Ensure the air supply is clean and dry. Moist or oily air will damage/decrease the life of the filters.
		Ensure the air lines are not kinked or damaged. Straighten, repair or replace any lines as required.
		Ensure the sequential timer activation time and purge frequency are appropriately set and configured to the operation. Consult your Walinga representative before adjusting the purge cycle timing.
	Purge valves are not energized	Ensure no electrical protection devices have been tripped and that all disconnect switches are in the <i>ON</i> position.
		Use a voltmeter to check the activation signal from the sequential timer.
		Ensure the electrical connections are tight and there are no signs of damage or wear on the wires. Repair or replace as required.
	Purge valves are leaking compressed air	Inspect the purge valves for any debris, signs of wear or damage. Clean, repair or replace the valve(s) as required.
		Inspect the purge valve couplings and pipes for any signs or wear or damage. Repair or replace as required.
		Inspect the purge valve to ensure it is not stuck in the open position. If the valve is de-energized and open, replace the valve. If the valve is continuously energized and open, replace the sequential timer.
	Purge pipe not aligned	Ensure the purge pipe is properly aligned with the filter openings. Readjust the positioning of the purge pipe as required.

ISSUE	CAUSE	SOLUTION
Purge cycle is not activating	Insufficient input power	Ensure the power supply meets the requirements of the sequential timer: 115 VAC 50-60 Hz ±10%.
		Ensure the differential switch and bipolar magneto thermic switch are not in the open position.
		Ensure the input power jumpers, JP1 and JP4, are in the 115 VAC position.
		Check to ensure all electrical connections are tight.
		Check the condition of the sequential timer fuse. Replace as required.
	Insufficient output power	Check to ensure the purge valves connected to proper terminals of the sequential timer.
		Ensure the output power jumpers, JP2 and JP6, are in the DC position. Ensure the output voltage jumper, JP3, is in the 24V position.
		Check to ensure all electrical connections are tight.
	Optional differential pressure switch does not activate purge cycle	Ensure the high pressure port of the differential pressure gauge/switch is connected to the clean air plenum. Ensure the low pressure port is connected to the dirty air plenum.
		Ensure the outputs of the differential pressure switch are connected to the proper terminals of the sequential timer.
		Check the condition of the differential pressure switch fuse. Replace as required.
		Check the output of the differential pressure switch. Repair or replace the switch as required.
		Ensure the ports of the switch are clean of any dirt or debris.



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Maintenance and Adjustments

DUSTLESS DISCHARGE CYCLONE

MAINTENANCE SAFETY

Unsafe workshop and servicing practices increase the risk of injury around machinery. Review the following safety guidelines for important information regarding safety involved with maintenance operations.

- Read, understand and follow all operating, maintenance and safety information in the operator's manual.
- Clear the area of bystanders, especially small children, when carrying out any maintenance or repairs or making any adjustments.
- Place all controls in neutral, disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, relieve the air pressure from the system, and wait for all moving parts to stop.
- Follow good shop practices:
 - a. Keep the service area clean and dry.
 - b. Ensure electrical outlets and tools are properly grounded.
 - c. Use adequate lighting for the job at hand.
- Use only tools, jacks and hoists of sufficient capacity for the job.
- Relieve pressure from the air system before servicing or disconnecting any components.
- Ensure all guards and access points are in place and properly secured when maintenance work is complete.

MAINTENANCE PROCEDURES

Header Tank Moisture Drainage

To extend the life of the system components and prevent corrosion or sealing issues due to moisture in the air system, any accumulated moisture must be removed from the header tank.

To drain the header tank, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Pull on the cable attached to the tip of the drain valve. Keep hands clear of the exhaust area of the valve to avoid injury from the pressurized air and any discharged debris. High pressure air is capable of penetrating the skin and injecting air into the bloodstream, leading to stroke or death.

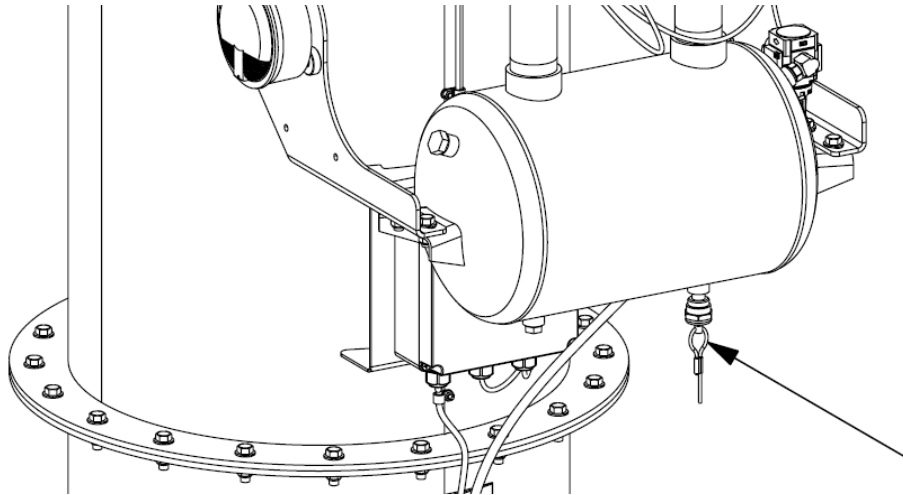


Figure 7-1: Header tank drain valve

3. Continue pulling on the cable and allow any accumulated moisture and contaminants to drain through the valve.
4. Release the cable to allow the drain valve to seal.

Inspection of Purge Cycle Function

To ensure sufficient airflow through the system to maintain the exhausting capacities of the DDC, the purge cycle must activate properly to remove accumulated dust and particulates from the filter surfaces.

To ensure the purge cycle is functioning properly, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. During normal operation of the DDC, monitor the function of the purge cycle. While operating with the standard settings, the purge cycle will activate the purge valves once for 0.2 seconds every 30 seconds. The activation may be observed as follows:
 - a. During the activation of the purge valves, and immediately afterwards, the differential pressure gauge will increase sharply. Monitor the differential pressure gauge to watch for this spike.
 - b. The purge valves will produce an audible release of air when activated. Listen for the audible activation signal during operation.
3. Ensure the differential pressure stabilizes below 6 in WC (1.5 kPa) during normal operation. If the differential pressure is greater than 6 in WC (1.5 kPa), the filters must be cleaned or replaced. Refer to the following section, *Inspection of Filters*, to replace the filters.

Drive Chain Tension and Sprocket Alignment

Rotational power is transmitted to the airlock from an electric motor using a chain drive system. To obtain efficient transmission of power and optimal chain life, the chain must be properly tensioned and the sprockets must be aligned. Chains that are too tight will stretch and wear quickly or overload the bearings. Chains that are too loose will not transmit power evenly and will wear quickly. Misaligned sprockets will rapidly wear and cause premature wear of the chain.

To check and adjust the chain tension and sprocket alignment, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Place all controls in neutral, disconnect and lock-out all electrical power sources, disconnect the compressed air source, relieve the air pressure from the system, and wait for all moving parts to stop.
3. Remove the bolt securing the chain drive cover and open the guard.

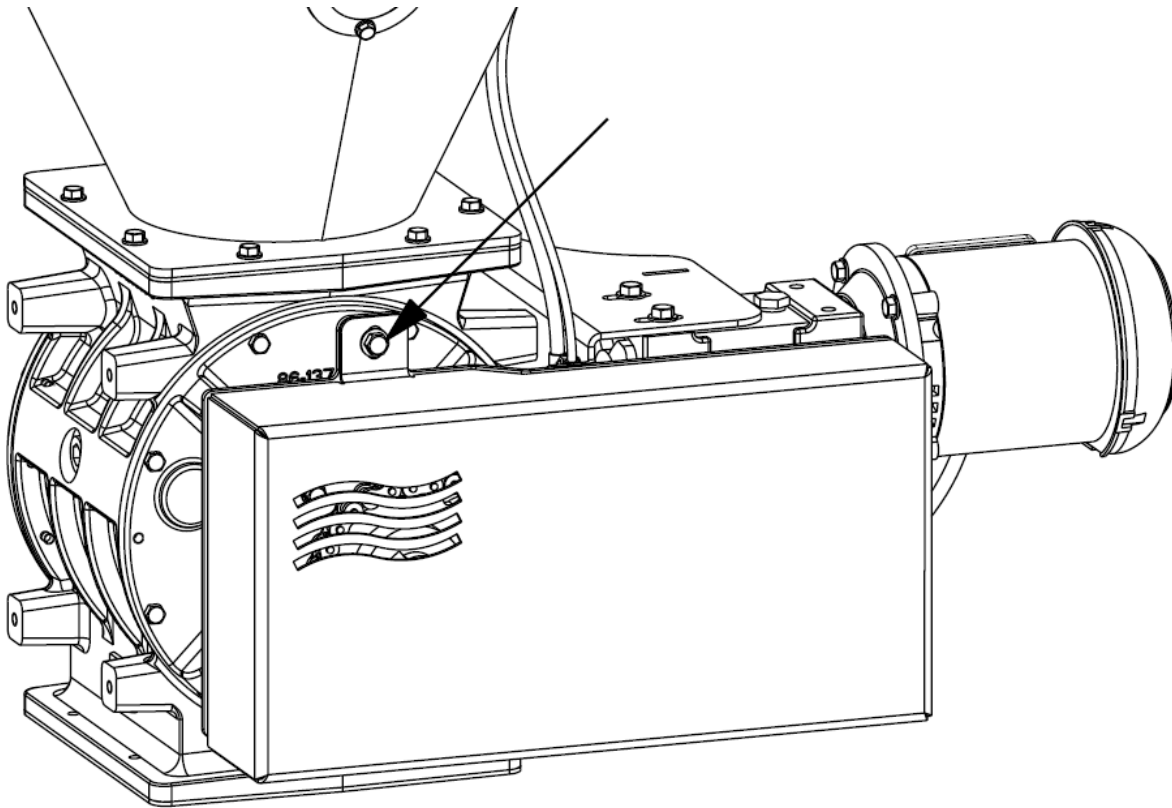


Figure 7-2: Chain guard fasteners

4. Apply an upward force to the center of the slack side of the chain between the two sprockets and measure the displacement. The chain should extend 0.25 in (6.4 mm).

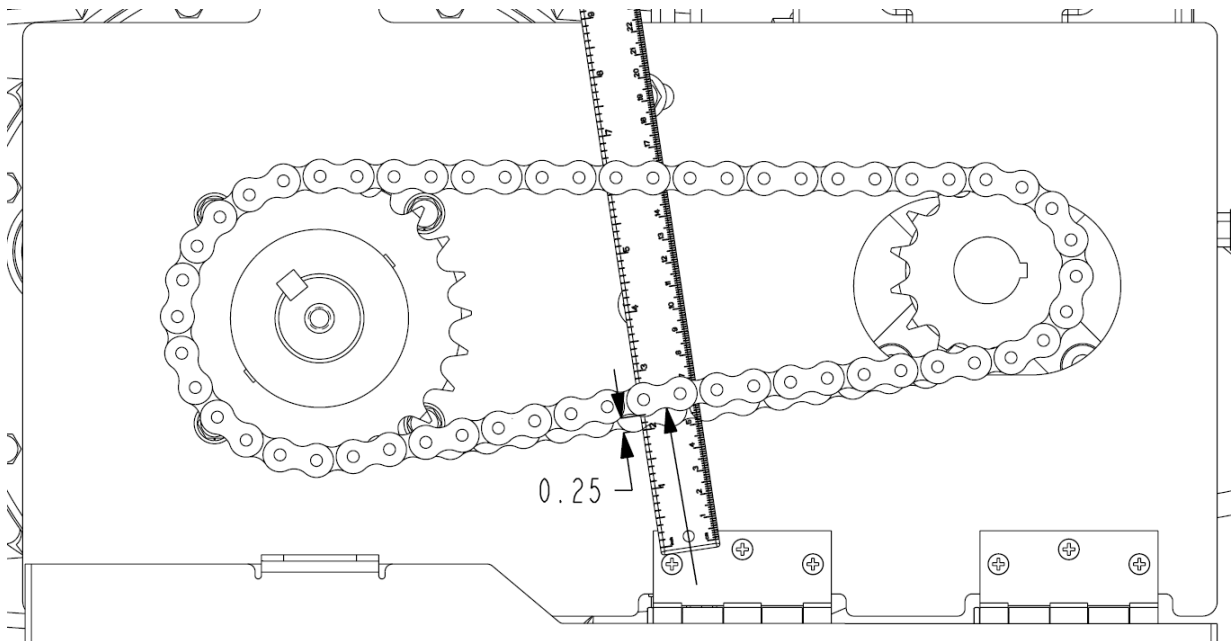


Figure 7-3: Upward chain displacement

5. Apply a downward force to the center of the slack side of the chain between the two sprockets and measure the displacement. The chain should extend 0.25 in (6.4 mm).

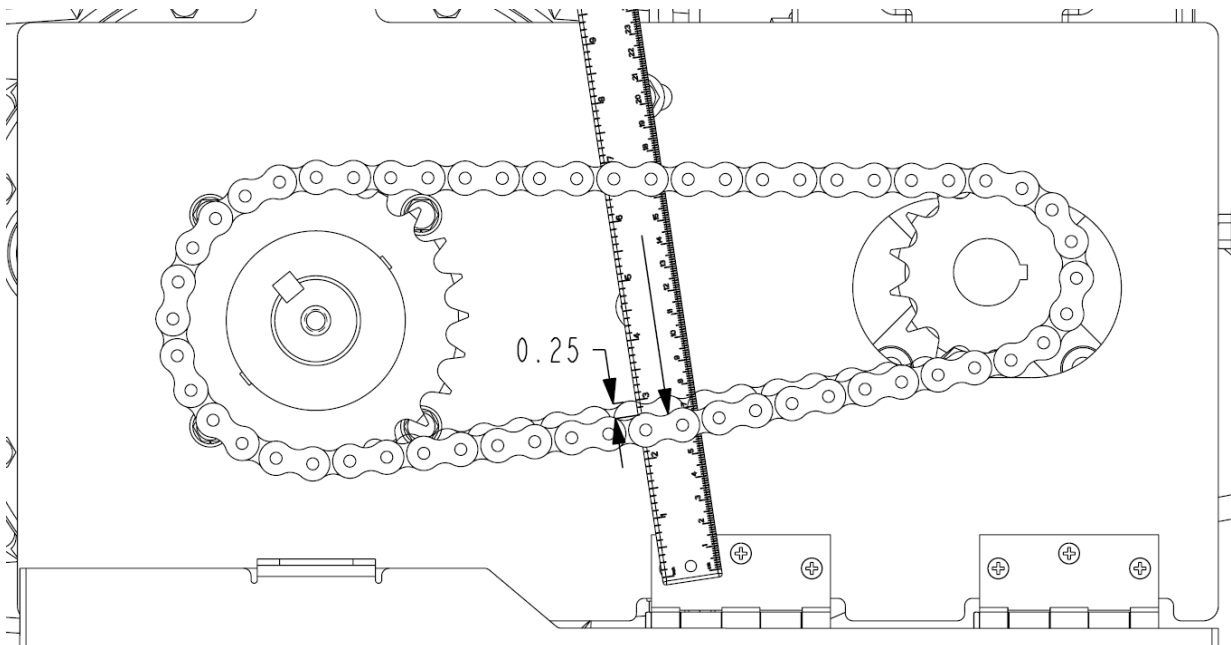


Figure 7-4: Downward chain displacement

6. To adjust the chain tension, proceed as follows:
 - a. Loosen the gearbox mounting bolts.

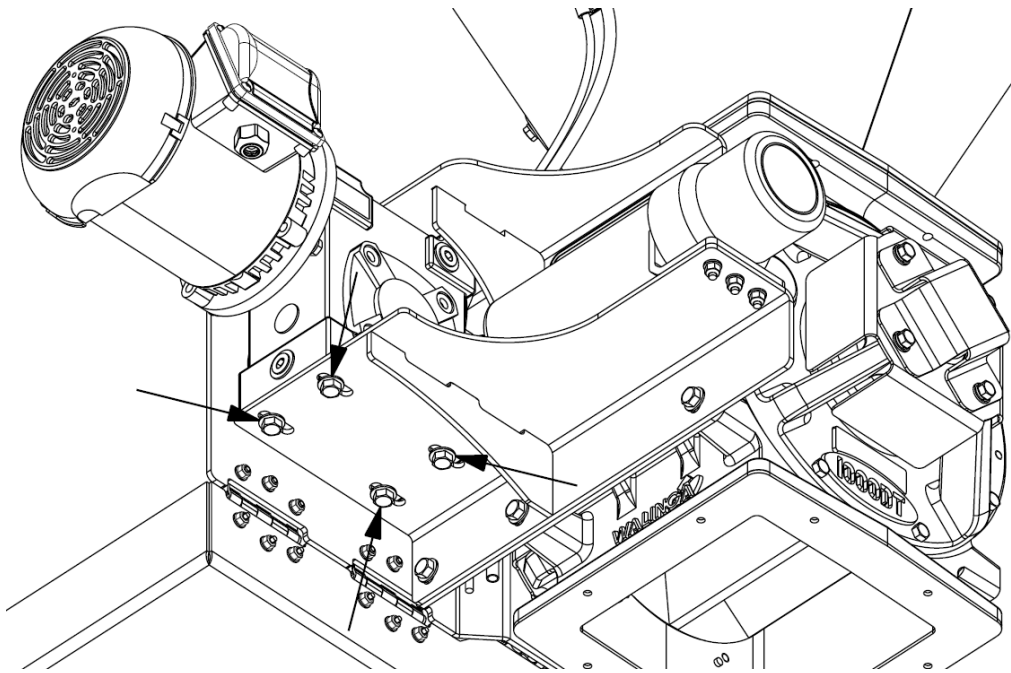


Figure 7-5: Gearbox mounting bolts

- b. Reposition the gearbox along the mounting slots to achieve the correct chain tension.

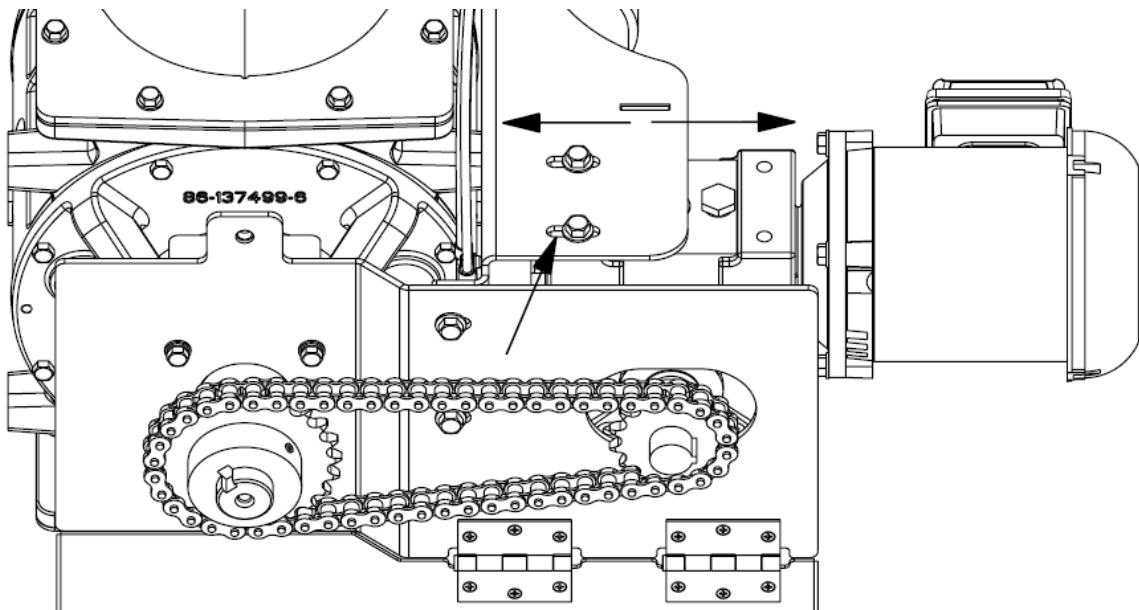


Figure 7-6: Gearbox positioning adjustment

- c. Tighten the gearbox mounting bolts.
 - d. Check the tension and ensure the chain extends 0.25 in (6.4 mm).
7. Check the alignment of the sprockets by laying a straight edge across the faces of the two sprockets. If there is a gap of more than 1/16 in (1.6 mm) between the straight edge and the sprocket, the sprockets must be realigned.

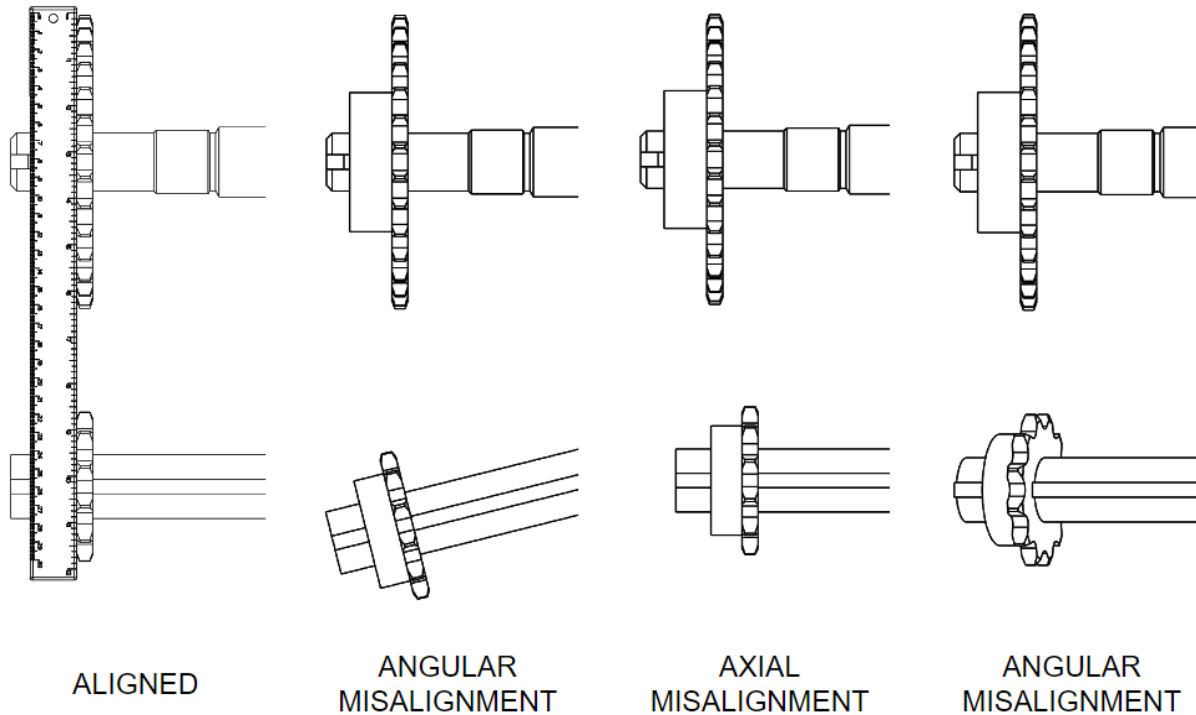


Figure 7-7: Sprocket misalignment references

8. To realign the sprockets, proceed as follows:
- a. Loosen the gearbox mounting bolts.
 - b. Reposition the gearbox along the mounting slots to align the sprockets.
 - c. Tighten the gearbox mounting bolts.

- d. Ensure the sprocket set screws are tightened to the required torque and the sprockets are mounted concentrically with the shafts.

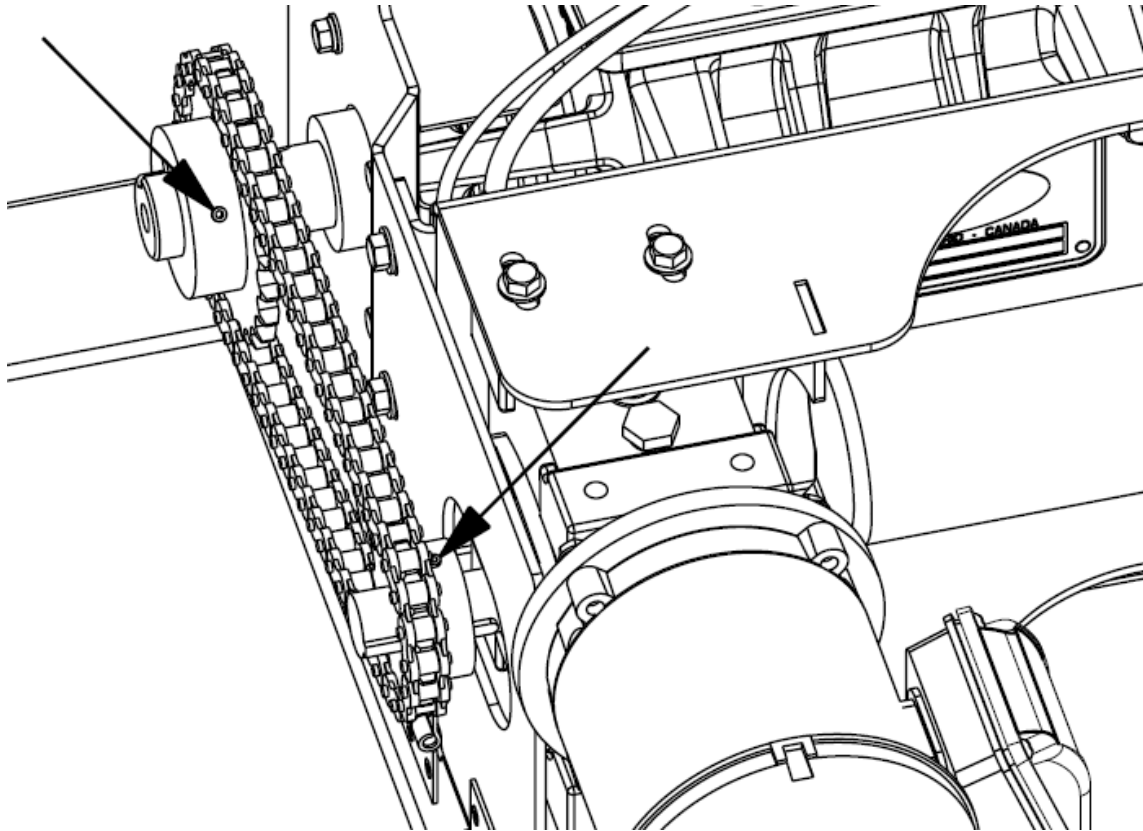


Figure 7-8: Sprocket set screws

- e. Check the sprocket alignment and chain tension.
 - f. Make any adjustments as needed to ensure the sprockets are properly aligned and the chain is properly tensioned.
9. Close the drive chain cover and secure in place with the required fasteners.

Gearbox Oil Level

To obtain efficient transmission of power, the gearbox must remain properly lubricated.

To check and adjust the oil level of the gearbox, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Place all controls in neutral, disconnect and lock-out all electrical power sources, disconnect the compressed air source, relieve the air pressure from the system, and wait for all moving parts to stop.
3. Examine the oil level sight glass on the front side of the gearbox. The oil level must clearly appear in the center of the sight glass when not in operation.

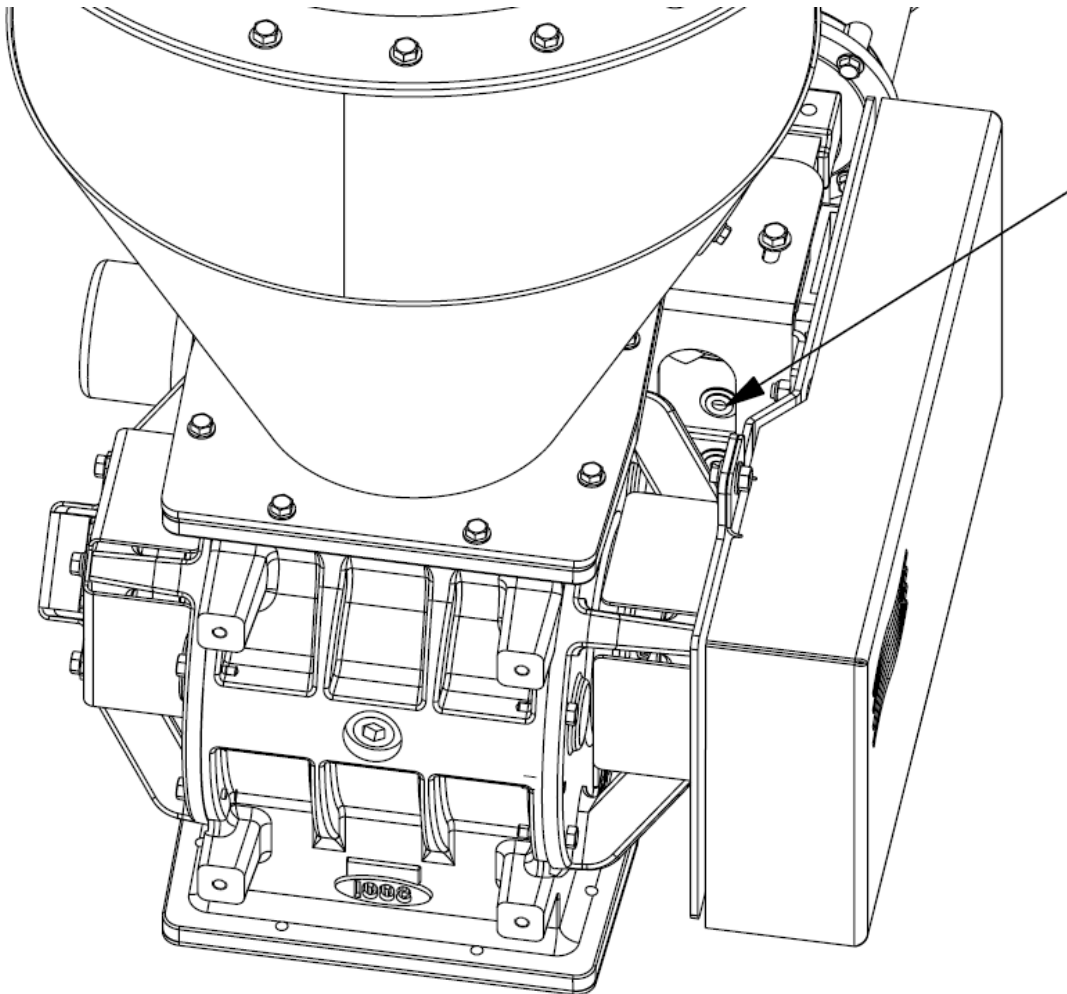


Figure 7-9: Gearbox oil level sight glass

4. To add additional oil, remove the fill plug from the top of the gearbox and add Walinga blower oil (part number 98-13813-6) until the oil reaches the center of the sight glass. Do not mix different types of oils. If it is necessary to remove the gearbox to access the fill plug, refer to *Changing of Gearbox Oil*, to remove the gearbox.

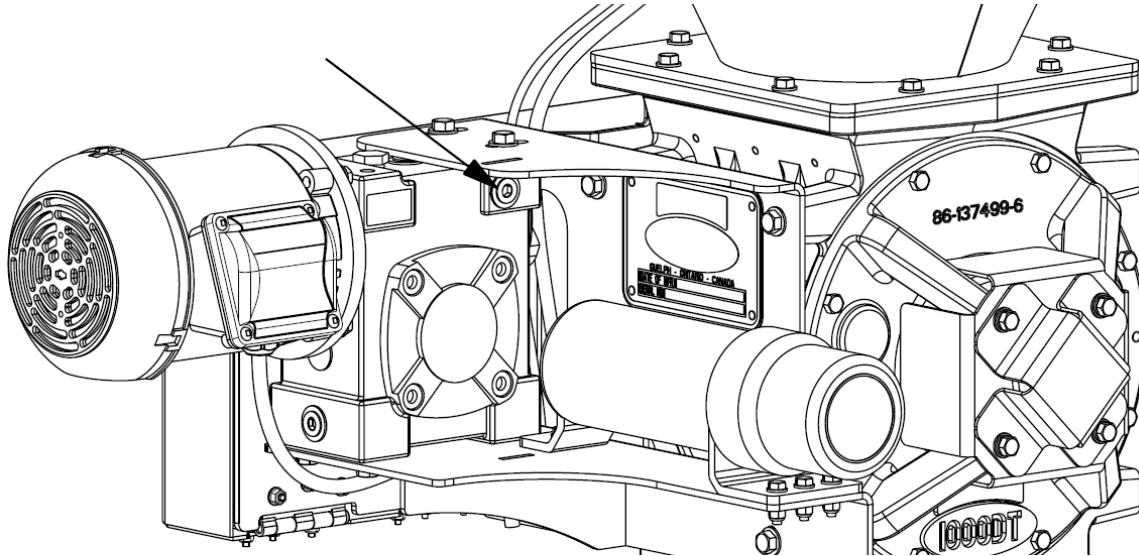


Figure 7-10: Gearbox oil fill plug

5. Install and tighten the fill plug.
6. Check the condition of the breather; clean if necessary.

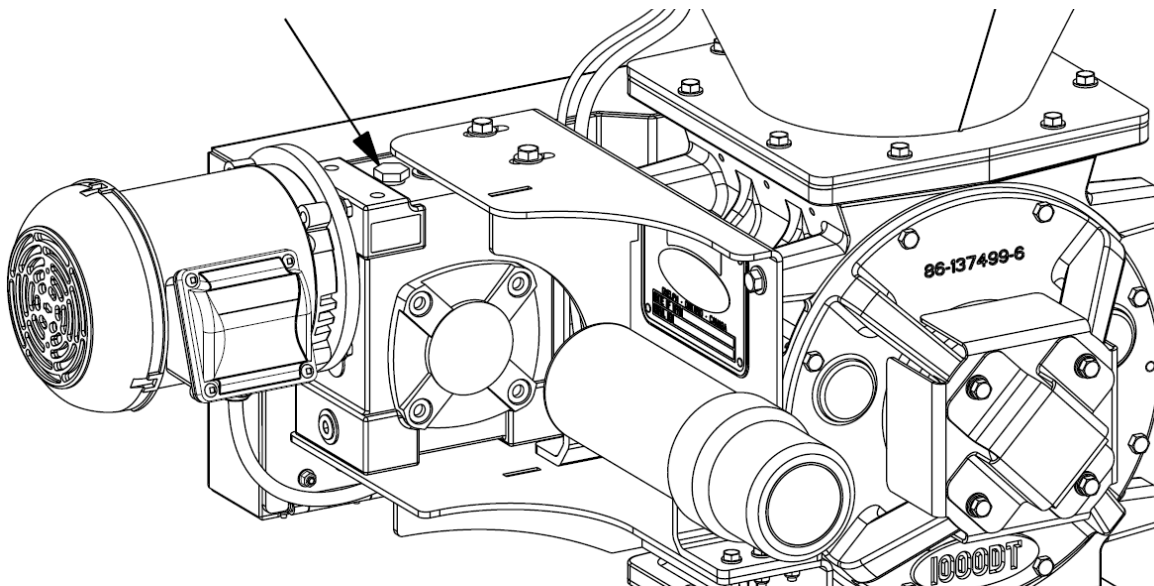


Figure 7-11: Gearbox breather

Inspection of Filters

To ensure sufficient airflow through the system to maintain the exhausting capacities of the DDC, the filters must remain sufficiently clean. During normal operation, a differential pressure greater than 6 in WC (1.5 kPa), indicates the filters must be cleaned or replaced.

To remove the filters, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Place all controls in neutral, disconnect and lock-out all electrical power sources, disconnect the compressed air source, and relieve the air pressure from the system.
3. Disengage the door latch and open the filter access door. Ensure the door is fully opened and secured to prevent it from unintentionally closing.

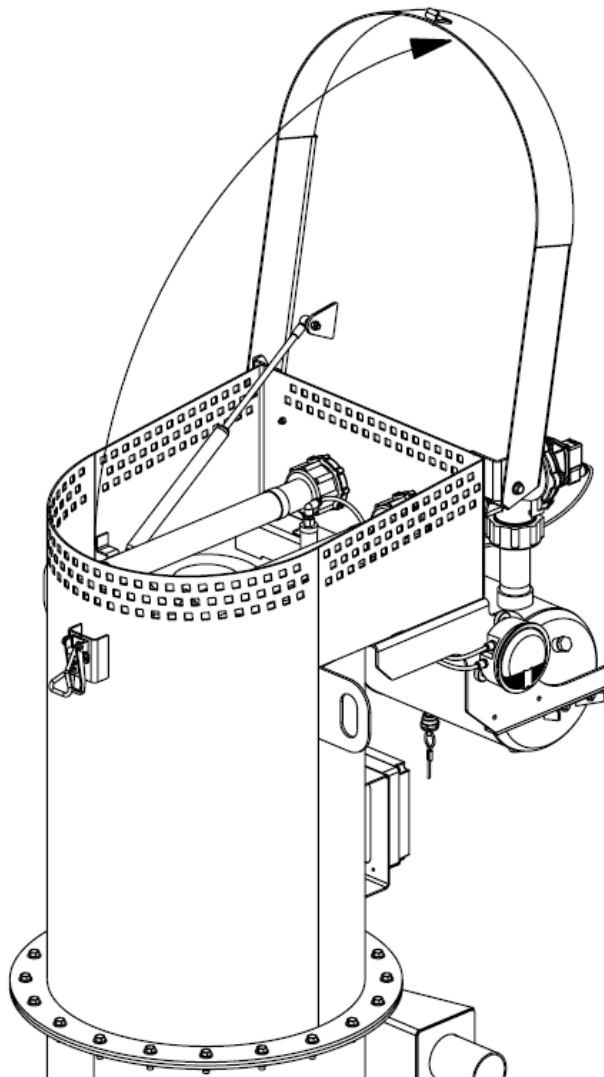


Figure 7-12: Full opening of filter access door

4. Loosen and remove the fasteners securing the purge pipe clamps.

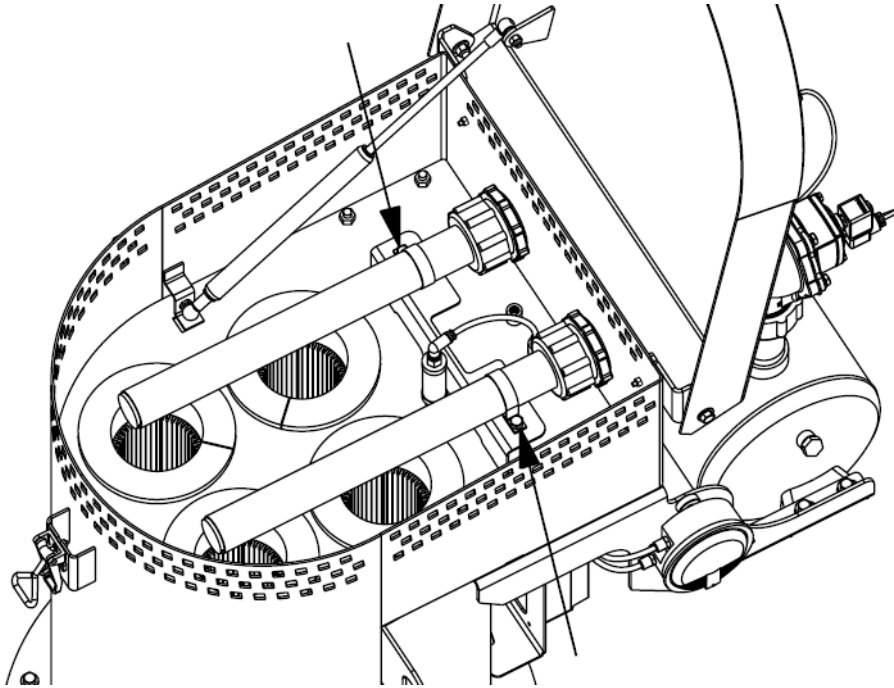


Figure 7-13: Purge pipe clamps

5. Loosen and remove the purge pipe and compression nut from the bulkhead fitting.

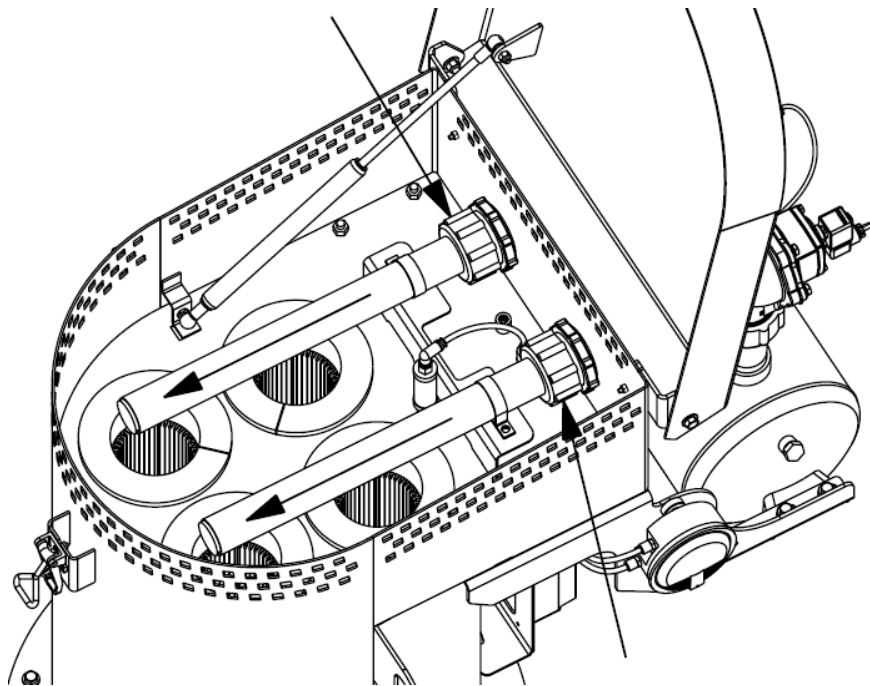


Figure 7-14: Purge pipe removal

6. Carefully unseat the filter from the filter plate, ensuring the filter surface is not damaged or deformed while removing the filter through the mounting hole.

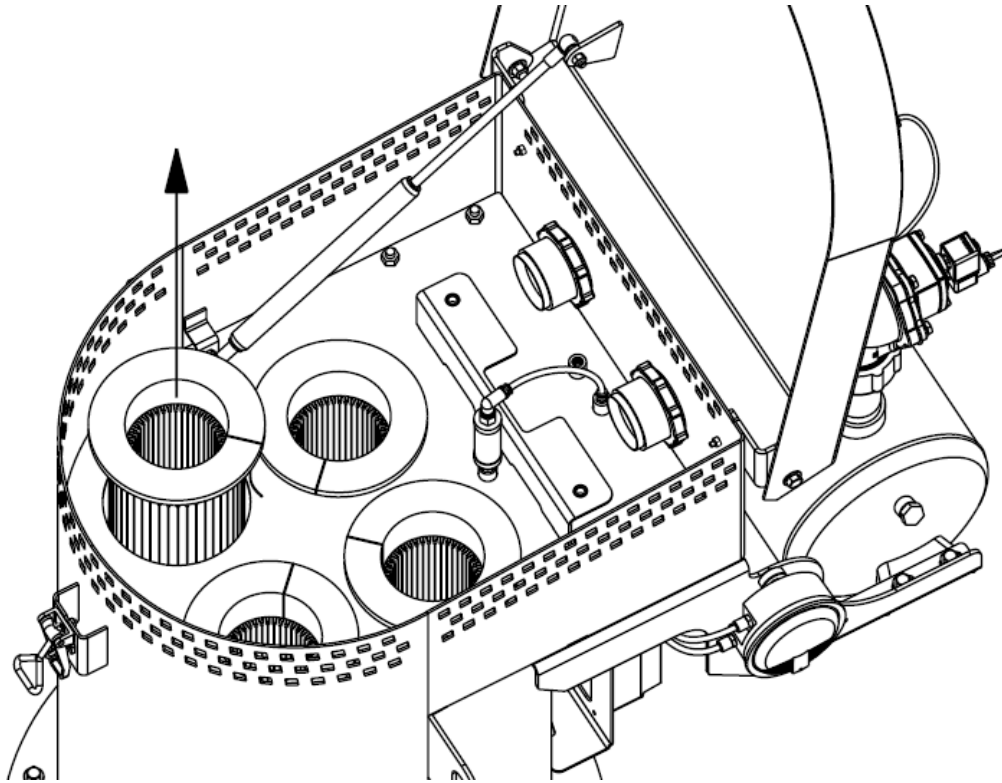


Figure 7-15: Filter removal

7. Repeat **Step 6** to remove all filters.
8. Inspect the condition of the filters. If the filter is not damaged and it is not necessary to immediately replace it, the filter may be cleaned and reinstalled. If the filter shows any signs of damage, wear or degradation, it must be replaced.

To clean a filter, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Using compressed air at a maximum of 100 psi (690 kPa), blow any loose dust off of the surface of the filter, blowing from the inside of the filter towards the outside to prevent forcing dust into the filter pores.
3. Fill a clean container with warm water, at a temperature of 125 to 150 °F (52 - 66 °C), and a low sudsing, mild-washing solution. Submerge the filter in the container and allow the filter to soak for approximately 10 minutes. If necessary, the water may be gently agitated by submerging a compressed air line into the container. Use care to ensure direct contact with the water and exposed skin is not made. Water at this temperature can burn or scald.

4. Remove the filter from the container and rinse the inside and outside surfaces with a water hose, at a maximum of 40 psi (276 kPa). The outside surface must be rinsed with the water stream at a 45° angle from vertical and parallel to the pleats.

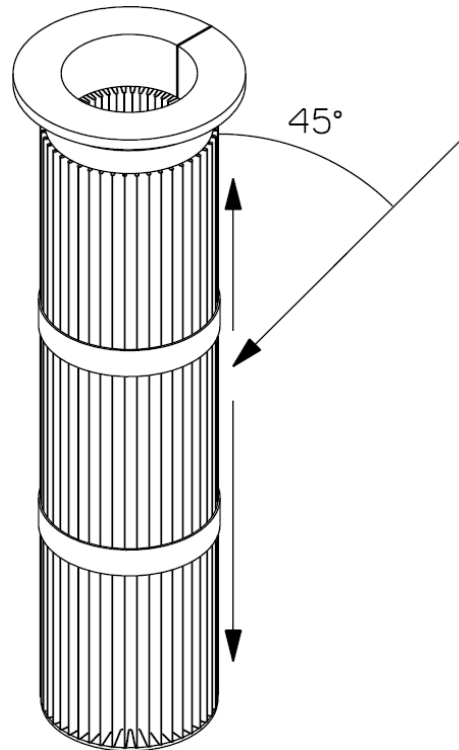


Figure 7-16: Water stream positioning

5. Using compressed air at a maximum of 50 psi (345 kPa), blow any excess water from the surface of the filter.
6. Allow the filters to dry for 24 to 48 hours, or until completely dry. Ensure the filters are protected against exposure to dust while drying.
7. Ensure the filters are completely dry before reinstalling and resuming operation; operating the DDC with wet or damp filters will result in poor performance and potential failure of the filter.

To install new or cleaned filters, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Ensure the electrical power source and air supply are disconnected and locked-out, and that the pressure has been relieved from the air system.
3. Ensure the filter access door is opened and secured.

4. Ensure the filter grounding strip is positioned in a manner such that it will be in simultaneous contact with the filter and the filter plate when the filter is fully seated.

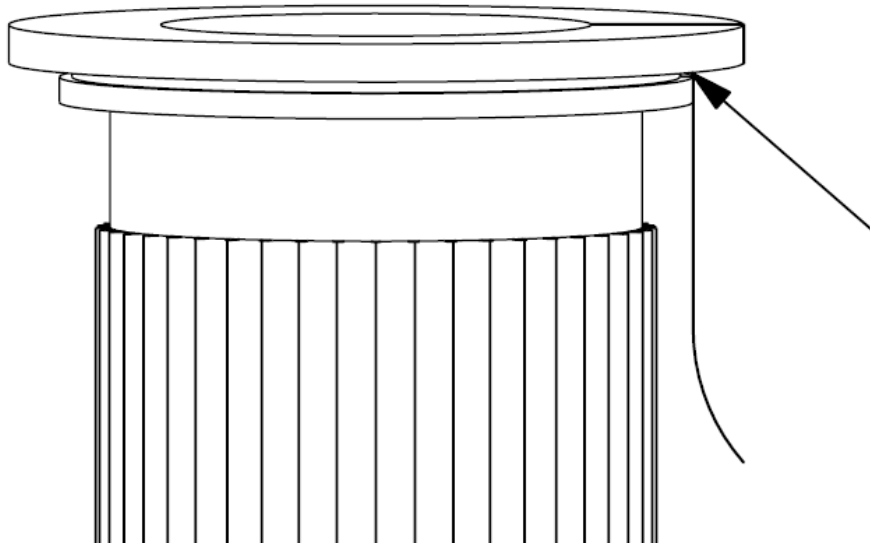


Figure 7-17: Grounding strip positioning

5. Insert the closed end of the filter through the filter plate.

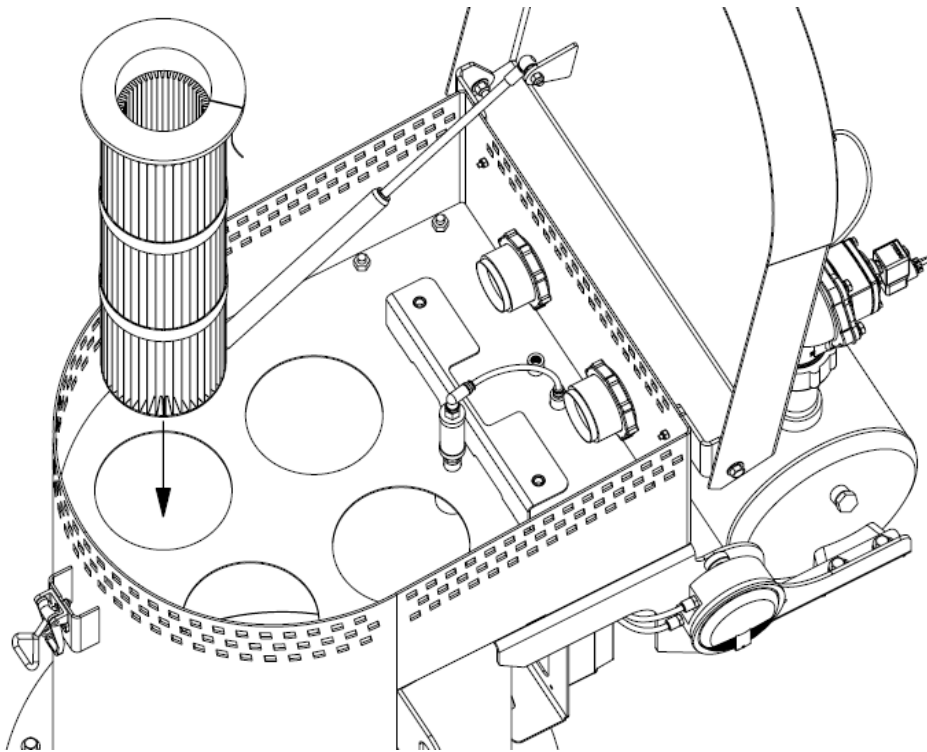


Figure 7-18: Filter insertion

6. Fully seat the filter into the filter plate, ensuring the top flange is level and in complete contact with the filter plate.

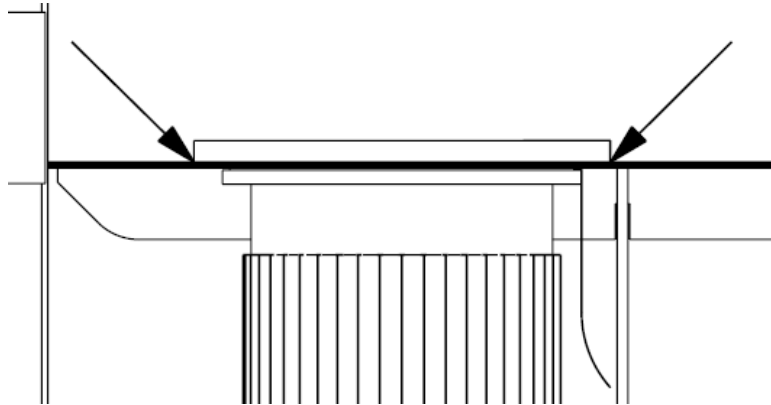


Figure 7-19: Seating of filter on filter plate

7. Repeat **Step 4** to **Step 6** to install all filters.
8. To ensure the filter grounding strip has been properly positioned to ground the filters, use an ohmmeter or multimeter set to measure resistance. Place one probe on the filter plate and the second probe on the filter grounding strip on the top surface of the filter flange. The measured resistance must be less than 10Ω for the filter to be adequately grounded. If necessary, readjust the grounding strip until the resistance is at an acceptable level.
9. Reinstall the purge pipes by tightening the compression nut onto the bulkhead fittings.

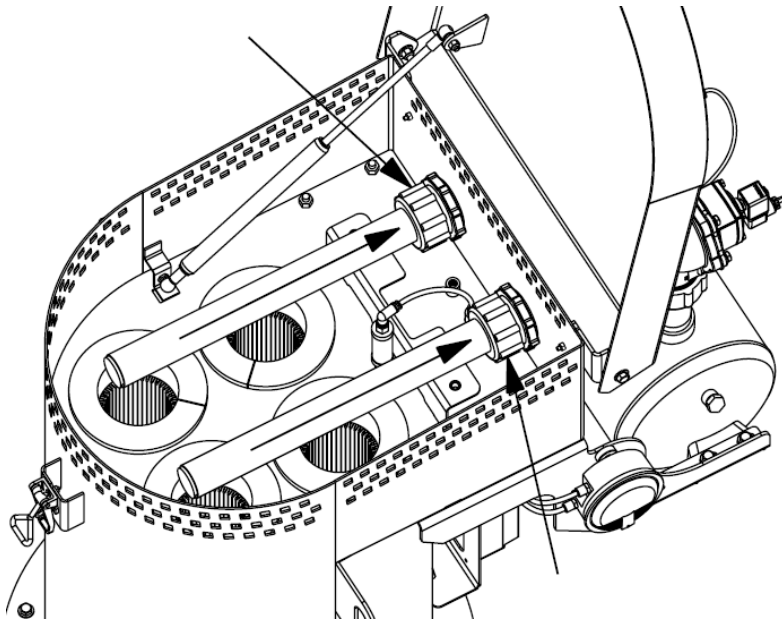


Figure 7-20: Installation of purge pipes

10. Rotate the purge pipe as necessary to ensure the purge pipe holes are pointed downwards and aligned with the openings of the filters.

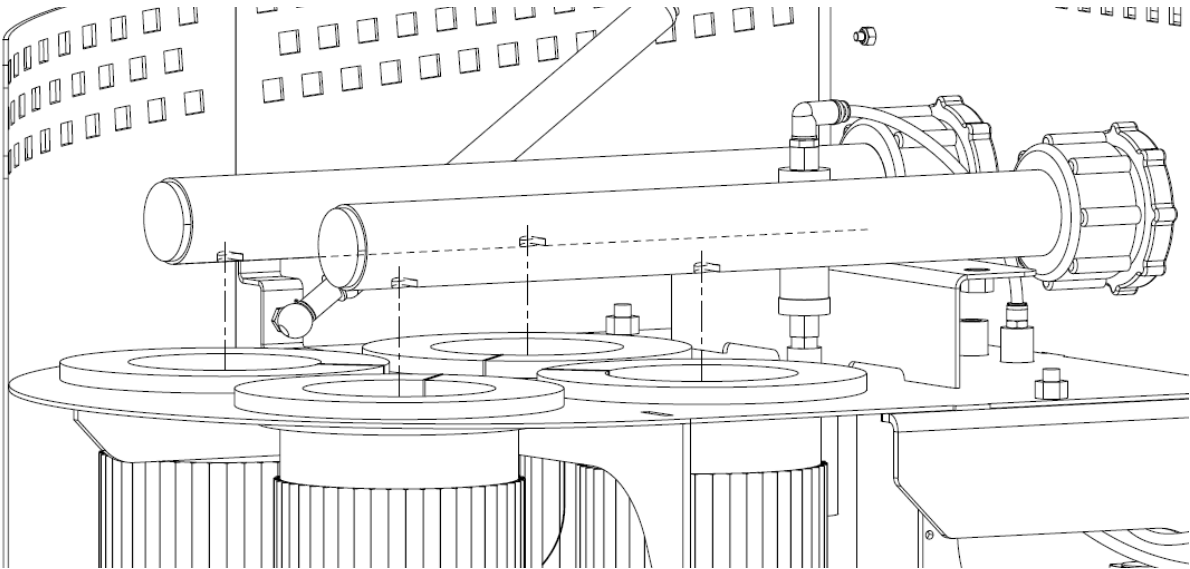


Figure 7-21: Purge pipe alignment

11. Secure the purge pipes in place by installing and tightening the fasteners of the clamps.

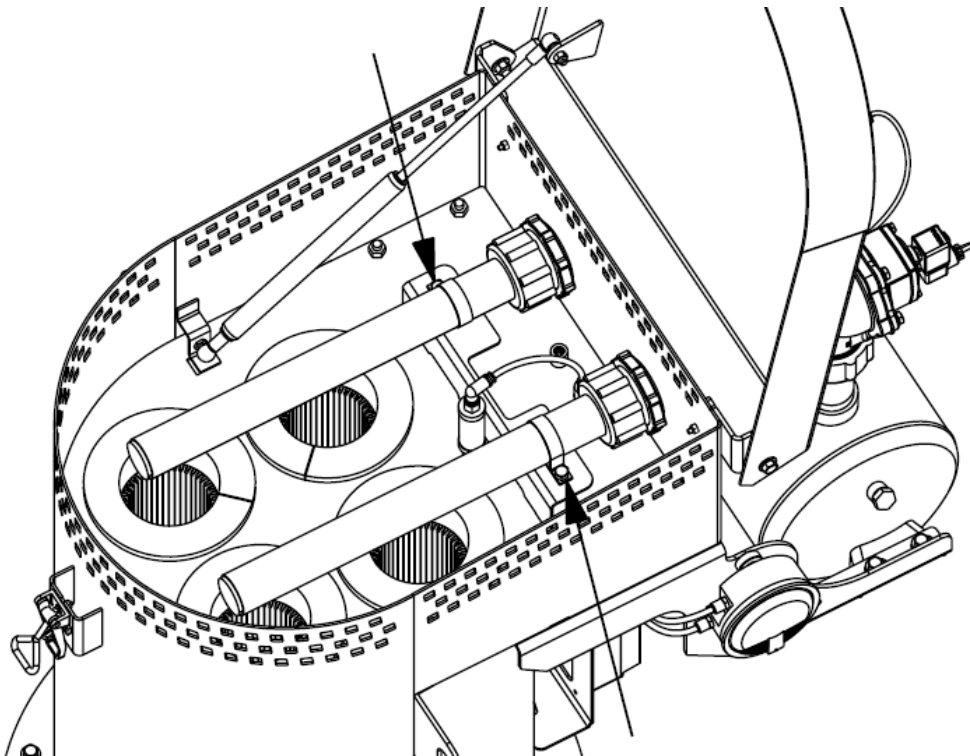


Figure 7-22: Purge pipe clamp installation

12. Close the filter access door and secure it in place using the latch and latch retaining pin.

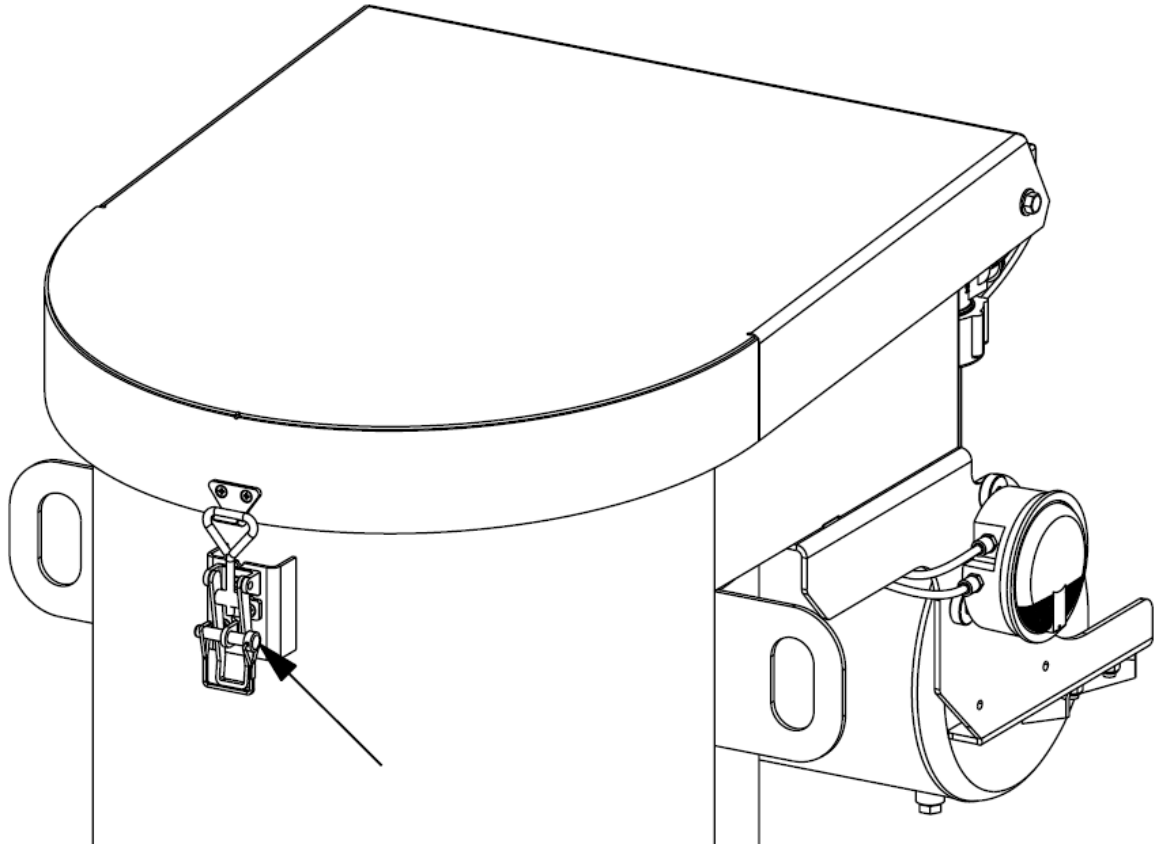


Figure 7-23: Access door securement

Inspection of Differential Pressure Gauge Filter

To ensure accurate function of the differential pressure gauge, the sampled air from the dirty air plenum must be cleaned of any dust or debris before entering the differential pressure gauge. Accumulated dust and debris must be cleared from the filter for continued proper function.

1. Clear the area of bystanders, especially small children.
2. Place all controls in neutral, disconnect and lock-out all electrical power sources, disconnect the compressed air source, and relieve the air pressure from the system.
3. Disengage the door latch and open the filter access door. Ensure the door is fully opened and secured to prevent it from unintentionally closing.

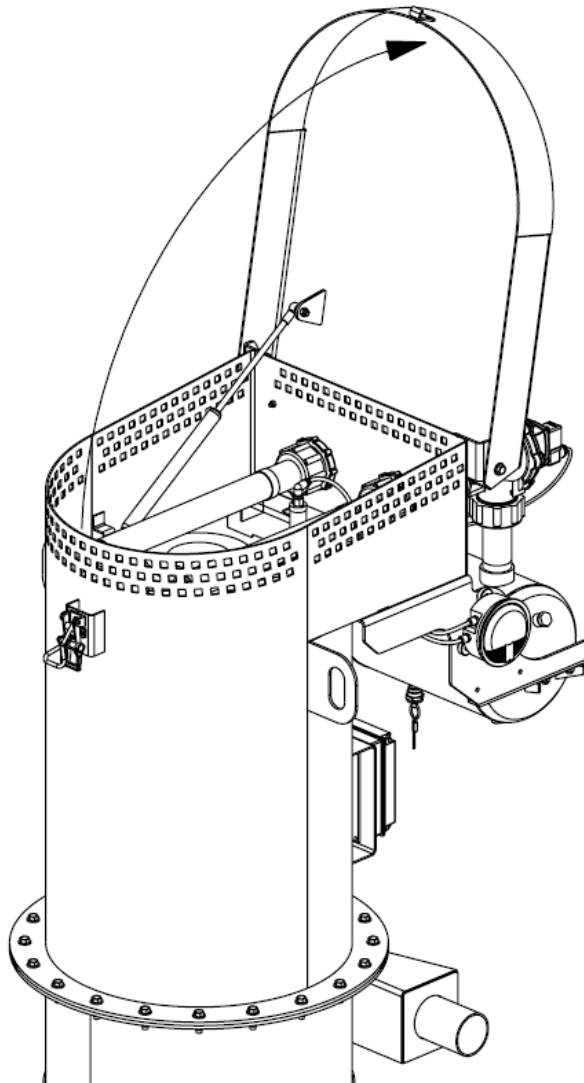


Figure 7-24: Full opening of access door

4. Disconnect the differential pressure gauge airline from the push-in fitting.

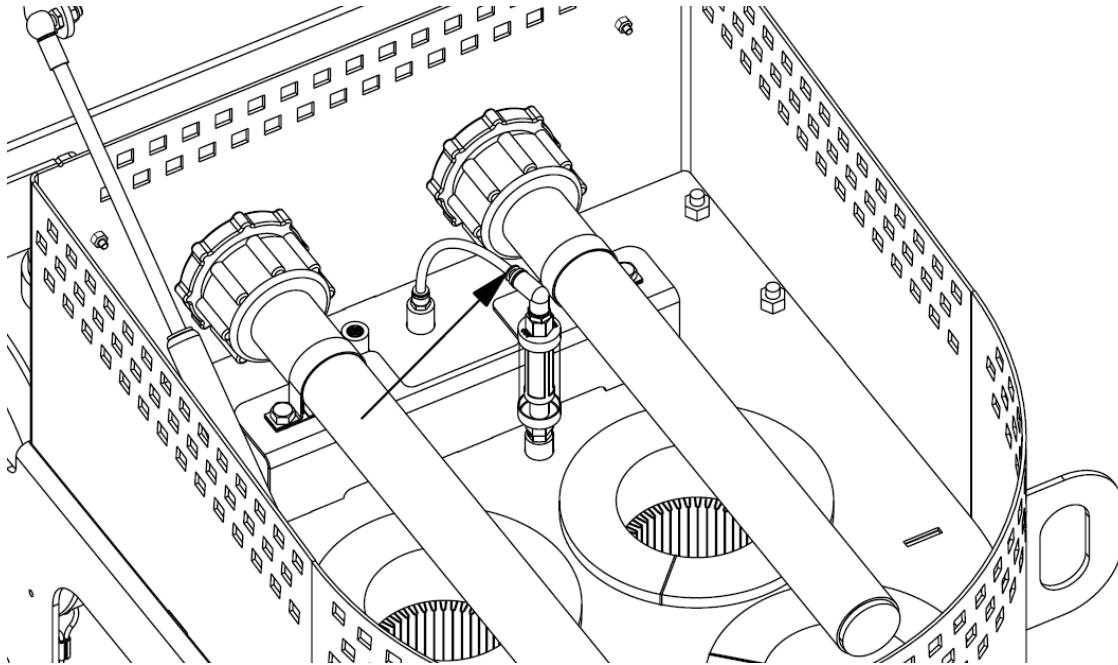


Figure 7-25: Disconnection of airline

5. Loosen and remove the filter from the mounting adapter and coupling.

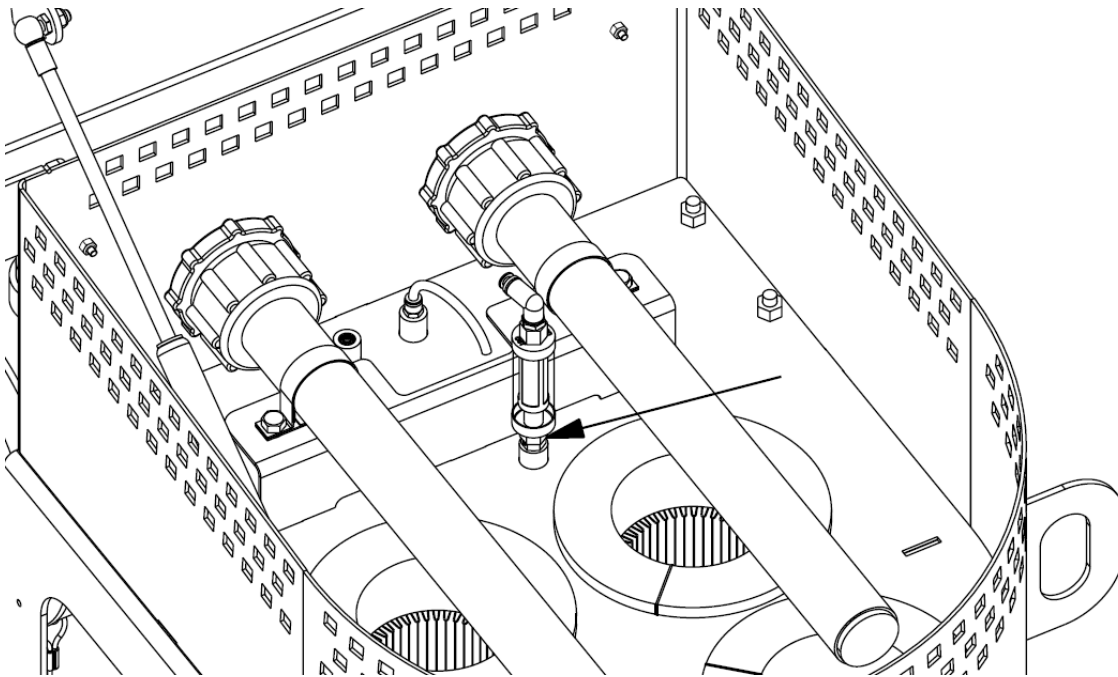


Figure 7-26: Removal of filter

6. Remove the push-in fitting from the filter.
7. Remove the ends of the filter to access the filter element and seals.

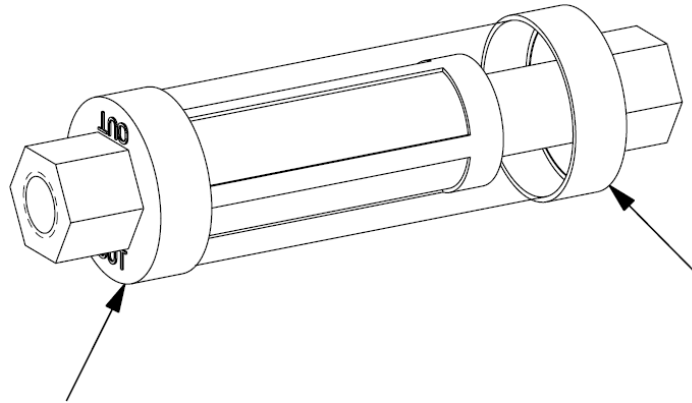


Figure 7-27: Filter element access

8. Clean the interior surfaces of the glass body and filter end caps.
9. Clean or replace the filter element and seals as required.
10. Apply Loctite 242 to the threads of the filter ends and reinstall the filter ends to the filter body. Tighten both filter ends to 13 in-lbs (1.5 Nm), ensuring there is no play between the filter ends and the glass, and the seals are properly seated.
11. Install and the end labeled *IN* onto the coupling and adapter on the filter mounting plate.

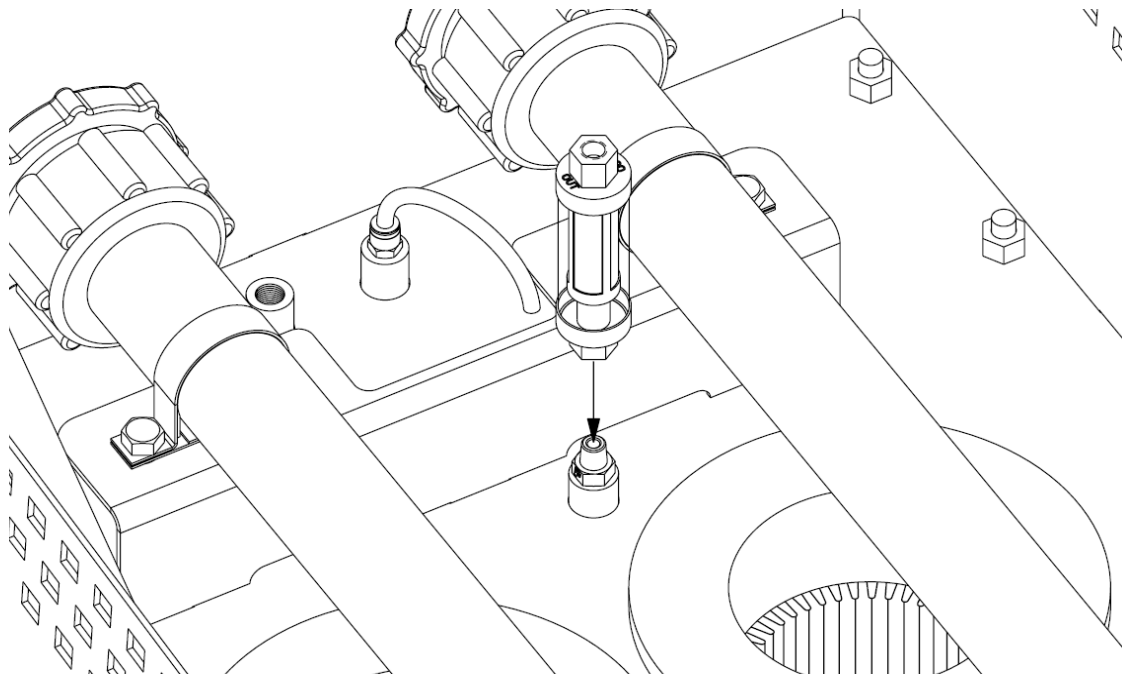


Figure 7-28: Installation of filter to mounting plate coupling

12. Install and tighten the push-in fitting into the filter end labeled *OUT*. Insert the differential pressure gauge airline into the push-in fitting.

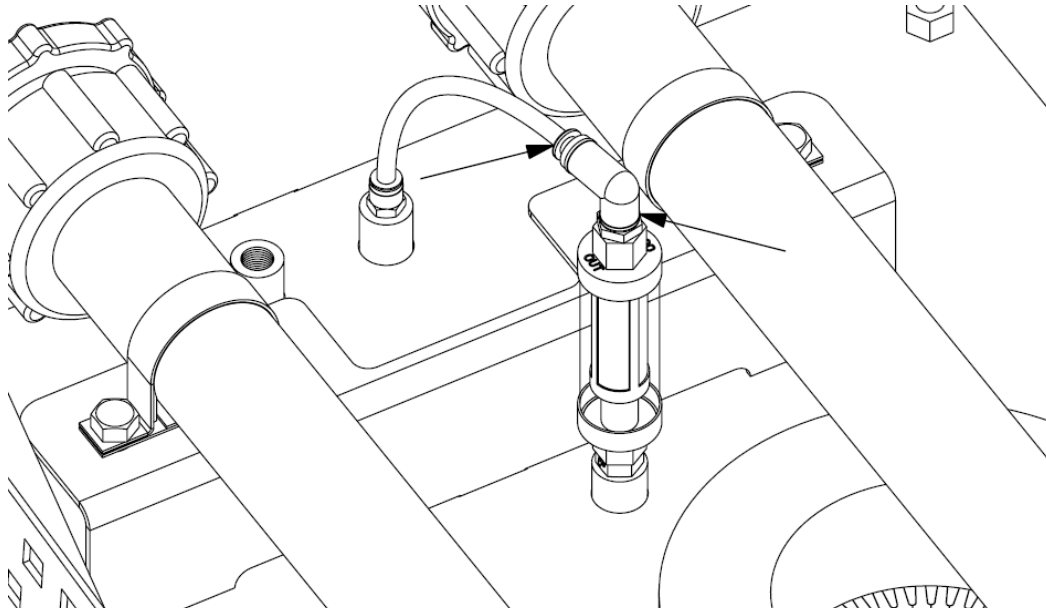


Figure 7-29: Installation of push-in fitting and airline connection

13. Close the filter access door and secure it in place using the latch and retaining pin.

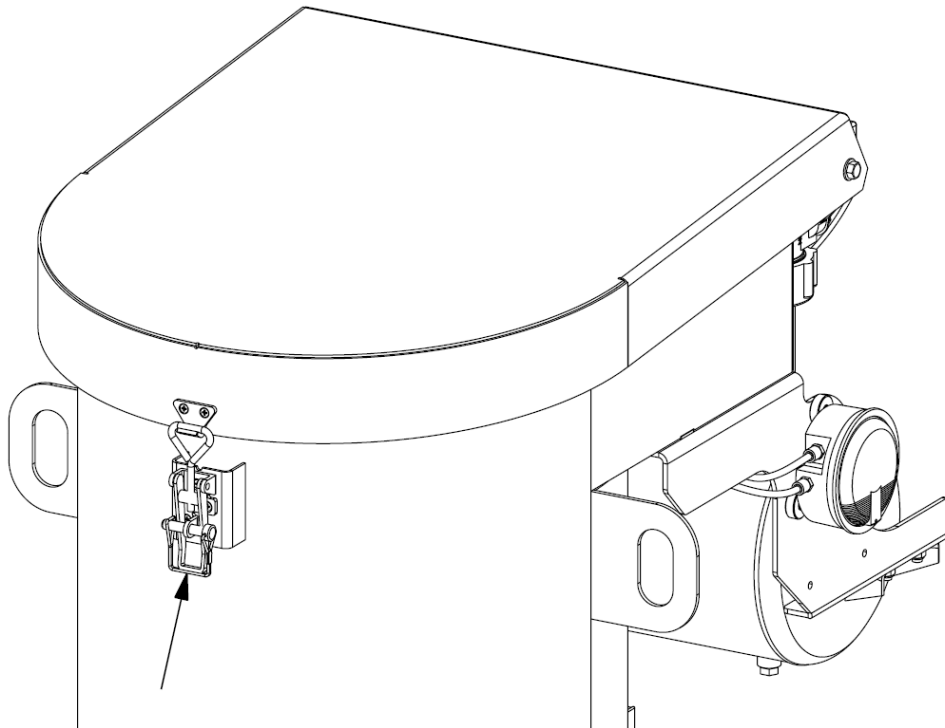


Figure 7-30: Securement of access door

Inspection of Air System

Safe and efficient operation of a DDC relies on a well sealed and high performance air system. Use extreme caution when working with high pressure air systems. High pressure air is capable of penetrating the skin and injecting air under the skin and into the bloodstream, leading to serious injury, stroke or death. **NEVER** attempt to locate a leak using your hand or any other part of your body.

When inspecting the air system, pay particular attention to the following:

- Always shut-off the compressed air supply, lock-out the shut-off valve and ensure the pressure is relieved before performing any maintenance.
- Inspect all couplings, fittings and joints to ensure there are no leaks and the components are in good condition. Clean any accumulated dirt or debris and replace any components that show signs of wear or damage.
- Inspect the AMS inlet to ensure there is no damage to the structure due to over-tightening of the compression coupling, and ensure the compression coupling gasket is in good condition and the coupling is sufficiently tightened. Tighten as required and replace any coupling that shows signs of wear or damage.
- Inspect the air lines for signs of wear damage, and to ensure no lines are kinked. Straighten any kinked lines and repair or replace any lines that show signs of wear or damage.
- Inspect the condition of the mounting gasket(s) and ensure all fasteners are tightened to the correct torque to maintain a good seal at all points of the dirty air plenum. Replace any gasket(s) that shows signs of wear or damage.
- Ensure the differential pressure gauge functions properly. Calibrate or replace inaccurate gauges.
- Ensure the pressure regulator is functioning properly and maintains the pressure within the header tank below 65 psi (448 kPa).
- Ensure the air pressure produced by the conveying system entering the AMS does not exceed 15 psi (103 kPa).
- Ensure the exhaust hood is clear of any debris or obstructions.
- Check the condition of any air supply filters and clean or replace as required.
- For units equipped with an explosion vent, check to ensure the fasteners are properly tightened and the vent shows no signs of wear or damage. Replace as required.

Inspection of Electrical System

Proper function of the DDC relies on the good working condition of the electrical system and components.

When inspecting the electrical system, pay particular attention to the following:

- Always turn off the power supply and ensure the electrical disconnect switch is in the *OFF* position, and wait for 30 seconds to allow for the internal capacitors to discharge before performing any maintenance or opening any electrical enclosure.
- Inspect all electrical wiring, cables, connectors and components, looking for any signs of physical wear, damage, abrasions, or loose connections. Replace any worn or damaged components as required.
- Test the operation of all electrical switches to ensure the proper function is performed as the switch is toggled.
- Open and inspect the interior of the sequential timer enclosure and electric motor conduit box. Ensure there are no loose connections or signs of water within the enclosure. Clean any accumulated dirt or debris and lubricate the connections with dielectric grease.
- To prevent static buildup, electrical discharge or sparks due to the flow of granular materials, it is crucial that the DDC remains properly grounded with complete electrical continuity. Use an ohmmeter, or multimeter set to measure resistance, to measure the electrical continuity of the system; perfect continuity will return a reading of 0 Ω , although a reading slightly above zero is acceptable. If the reading is above 10 Ω , or the ohmmeter indicates infinite resistance, the electrical continuity of the system is broken. Ensure there are no non-metal components installed between system components. Adjust the positioning of the filter grounding strip, repair, or replace any damaged components as required.
- Clean any dirt, dust or oil from the electric motor to permit proper heat dissipation and prevent insulation breakdown. Apply a fresh coat of insulating varnish to motor surfaces as required.
- Measure the insulation resistance of the motor in accordance with IEEE Standard 43 to ensure there are no indications of moisture within the motor. The recommended minimum insulation resistance in megohms at 104°F (40°C) is equal to the rated motor potential in kilovolts plus one megohm (e.g., a motor rated at 575 V \Rightarrow 0.575 kV, would require a limit of 0.575 + 1, resulting in a 1.575 megohm minimum insulation resistance). If the minimum resistance is not met, the motor must be dried.

Changing of Gearbox Oil

The lubricating oil of the gearbox must be routinely changed to prevent accumulation of contaminants or debris in the oil to maintain smooth transmission of power.

To change the gearbox oil, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Run the system at normal operating speeds until the gearbox is warm. Warm oil removes more contaminants than cold, stagnant oil.
3. Follow normal operating procedures to shut down the system according to **Section 6: Operation, Stopping the Machine**.
4. Place all controls in neutral, disconnect and lock-out all electrical power sources, disconnect the compressed air source, relieve the air pressure from the system, and wait for all moving parts to stop.
5. Allow some time for the gearbox to cool to a safe temperature to handle. Do not contact hot oil as it can cause serious injury.
6. To remove the gearbox from the DDC, proceed as follows:
 - a. Remove the fasteners in the C-flange and remove the electric motor.

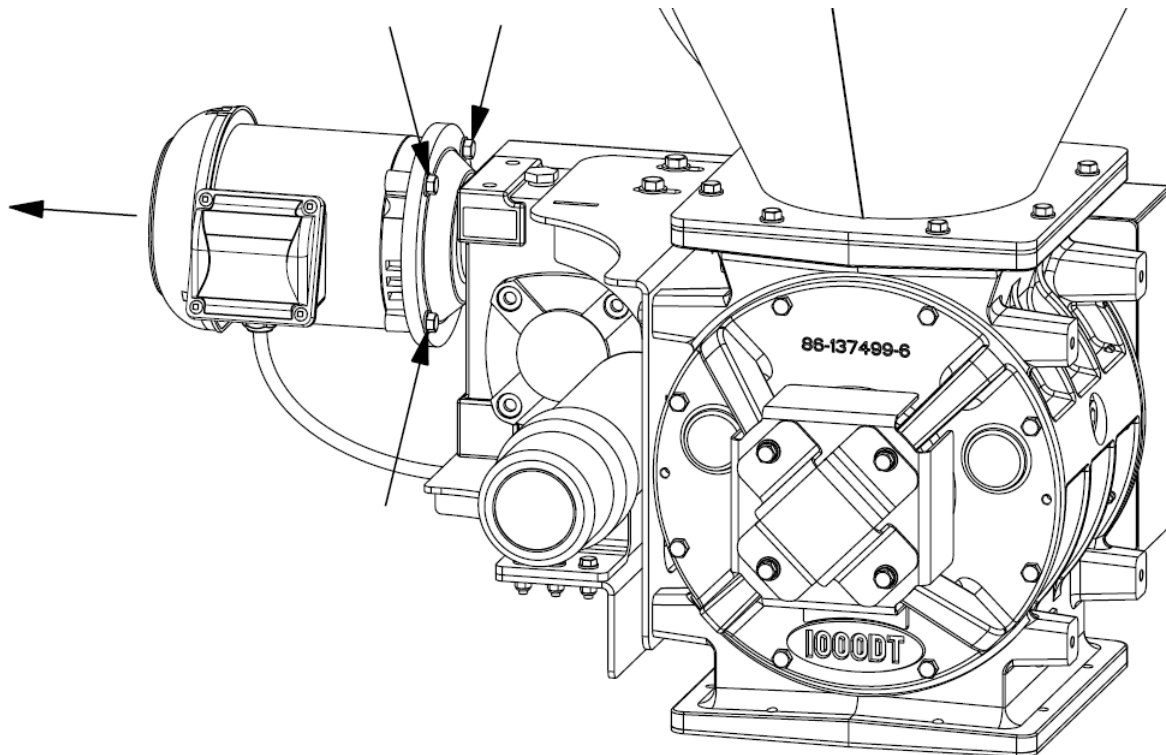


Figure 7-31: Electric motor removal

- b. Remove the fasteners securing the drive chain cover and open the guard.

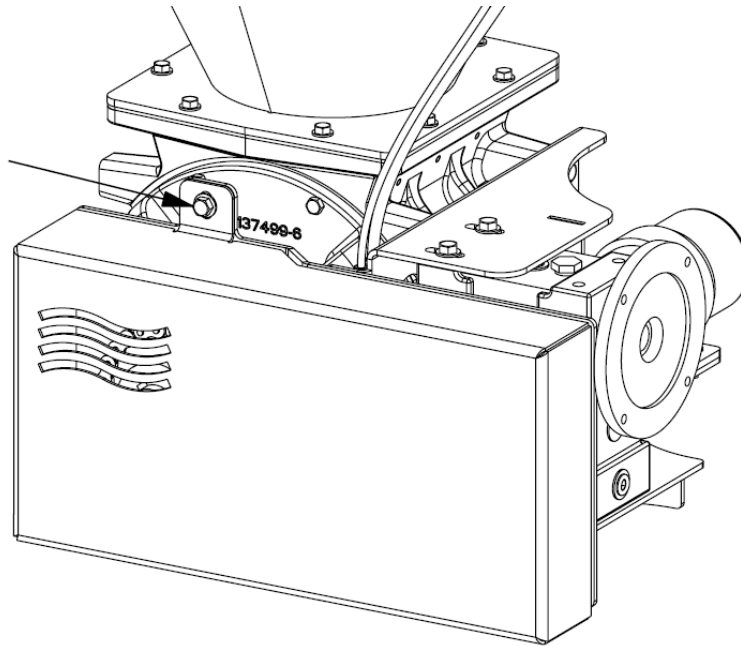


Figure 7-32: Drive chain cover fasteners

- c. Locate the connecting link in the drive chain and rotate the drive chain to position the connecting link on the slack side between the two sprockets.

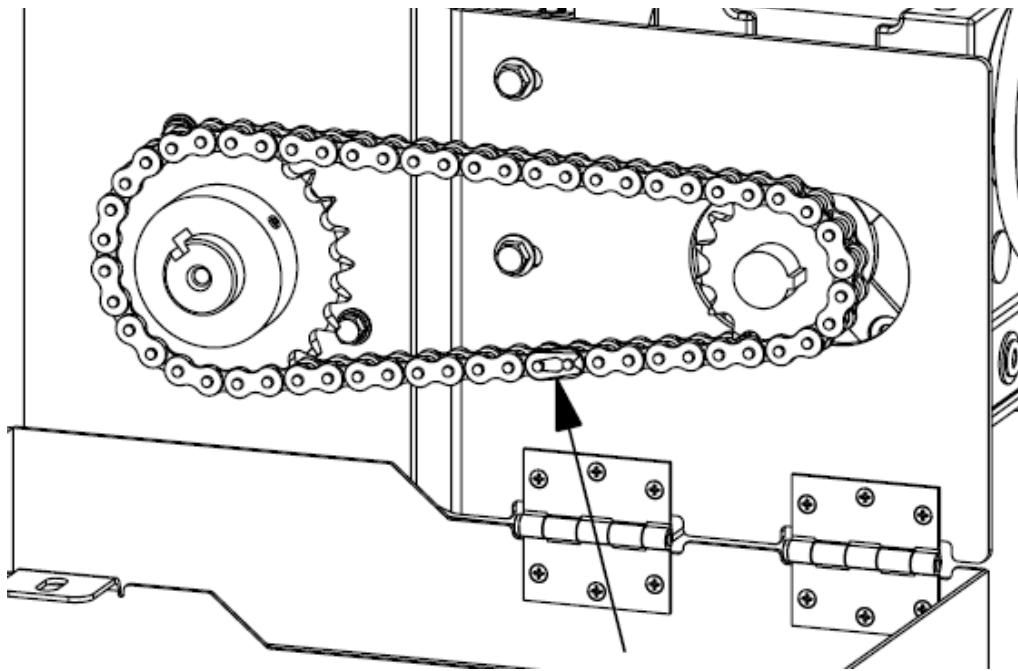


Figure 7-33: Positioning of connecting link

- d. Secure the chain in place through the use of a chain vise or block and tackle assembly to prevent movement during the removal of the connecting link.
- e. Remove the spring clip from the connecting link.

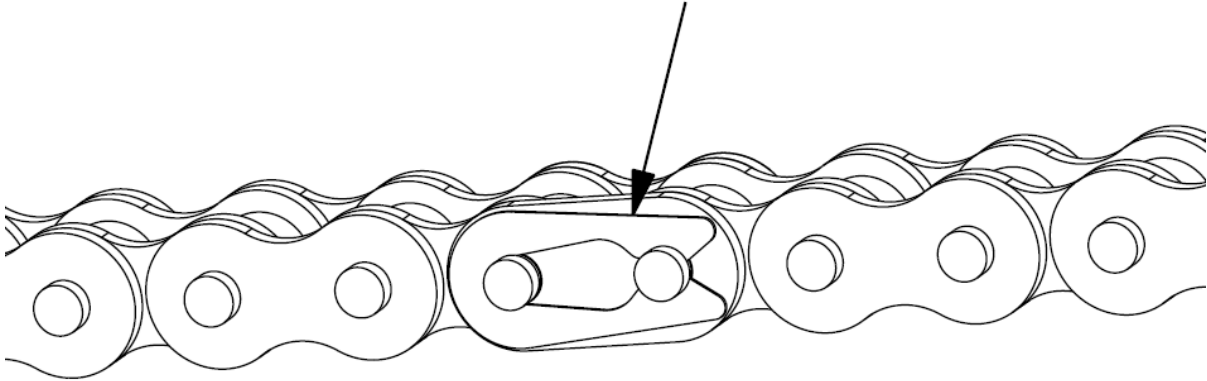


Figure 7-34: Connecting link spring clip

- f. Remove the outer plate from the connecting link.

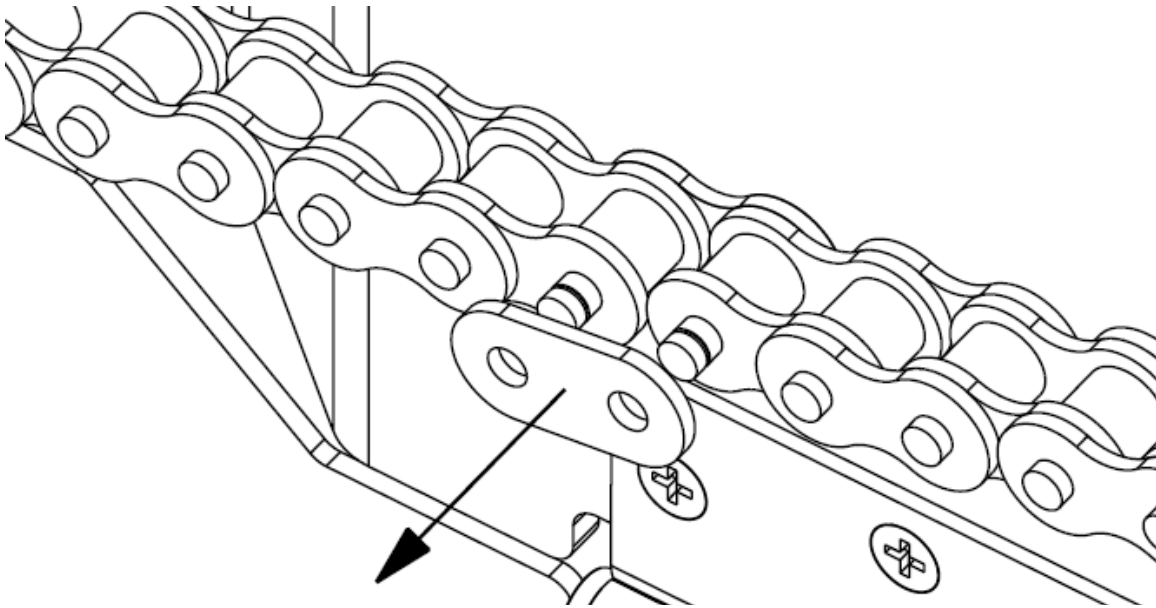


Figure 7-35: Connecting link outer plate

- g. Use a chain punch to alternately strike the pins of the connecting link to evenly disengage the connecting link pins from the bushings of the chain ends.

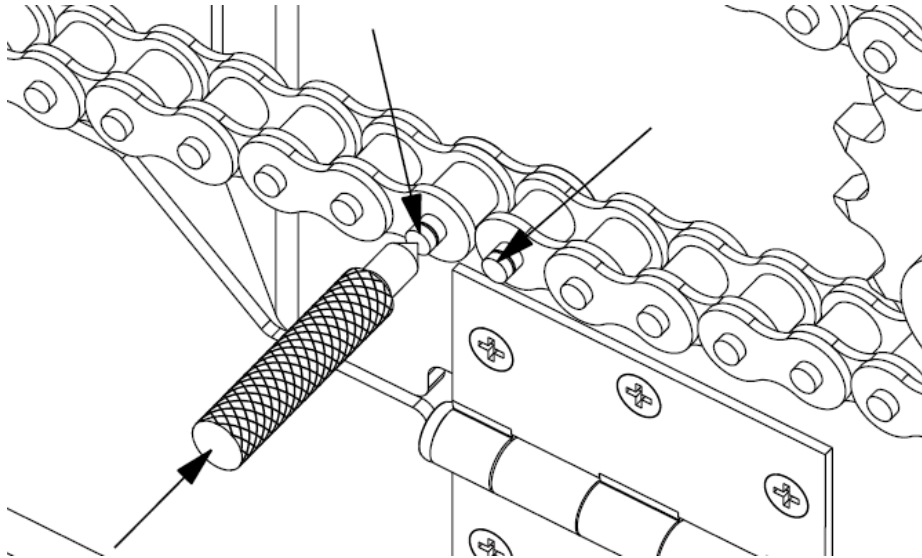


Figure 7-36: Disengagement of connecting link pins

- h. Release all clamping devices used to secure the chain and remove the drive chain from the sprockets. Place the chain in an area where it will not be exposed to dirt or debris.
- i. Loosen the set screws of the gearbox sprocket.

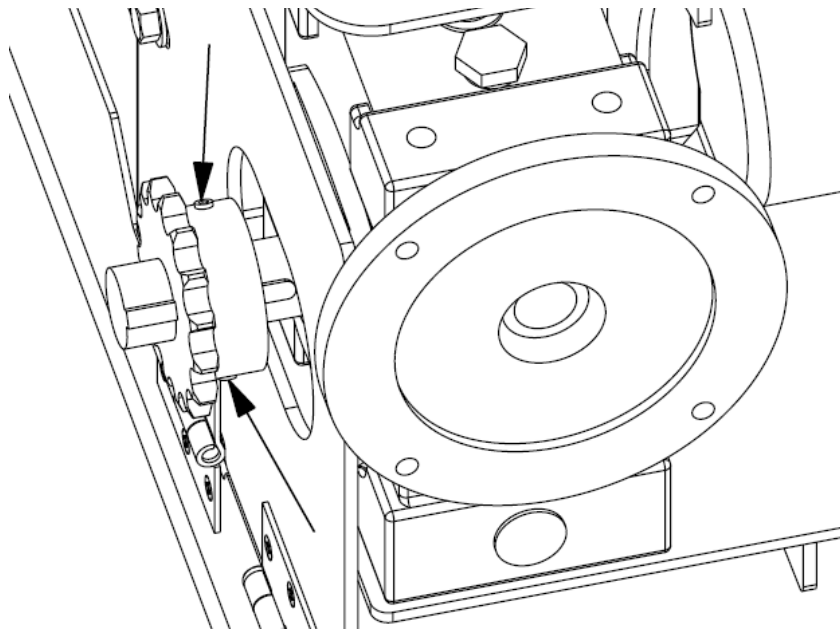


Figure 7-37: Sprocket set screws

- j. Remove the sprocket from the gearbox output shaft.

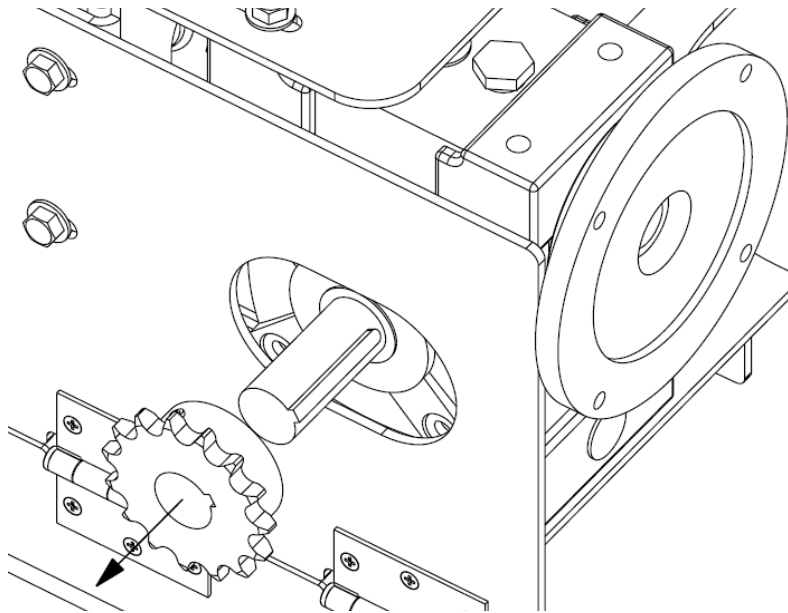


Figure 7-38: Removal of sprocket

- k. Remove the mounting fasteners of the gearbox and remove the gearbox from the DDC mounting frame.

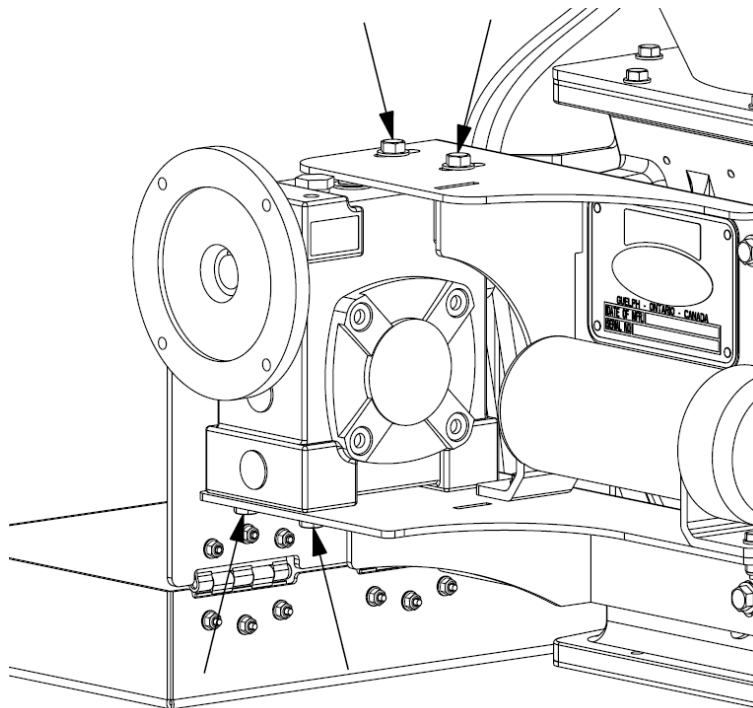


Figure 7-39: Gearbox mounting fasteners

7. Place the gearbox in a manner such that the drain plug is accessible and place a pan or other suitable receptacle under the gearbox drain plug.

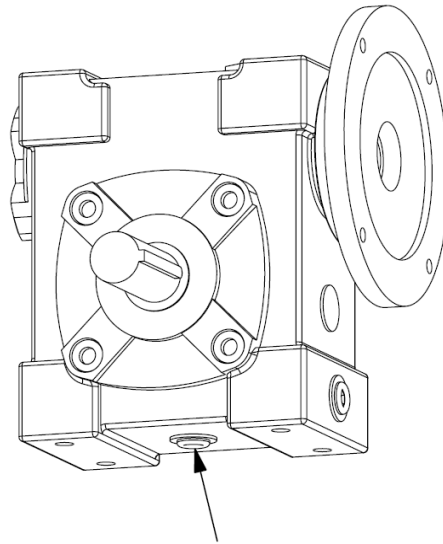


Figure 7-40: Gearbox drain plug

8. Remove the drain plug and allow the oil to drain into the pan.
9. Remove the fill plug to allow air to enter the gearbox to improve the oil drainage.

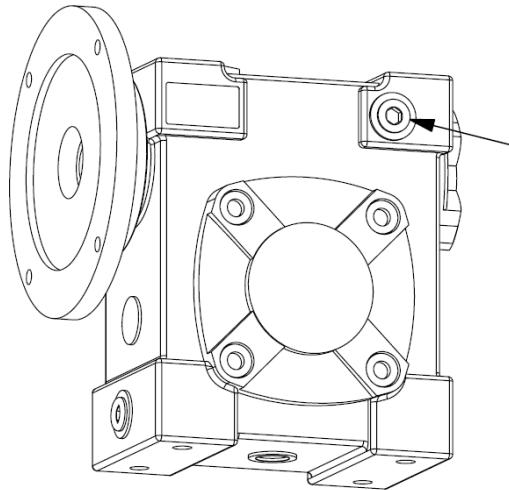


Figure 7-41: Fill plug removal

10. Allow the oil to drain completely.
11. If the oil appears especially dirty, it may be beneficial to flush the interior of the gearbox to remove any remaining contaminants. To flush the gearbox, pour clean oil into the fill hole and allow it to pass through the gearbox and drain into the pan, picking up any remaining contaminants as it passes through.

12. Check the condition of the breather and clean as required.

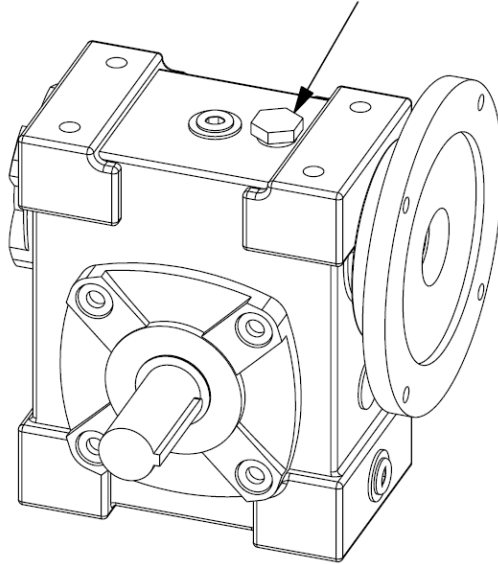


Figure 7-42: Gearbox breather

13. Once completely drained, install and tighten the drain plug.
14. Fill the gearbox with Walinga blower oil (part number 98-13813-6) until the oil reaches the center of the sight glass. Do not mix different types of oils.

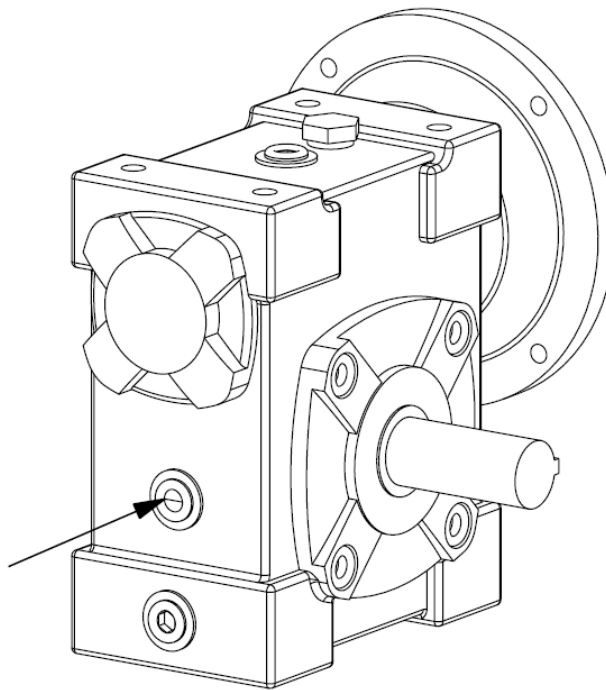


Figure 7-43: Sight glass oil level

15. Install and tighten the and fill plug.
16. To reinstall the gearbox, proceed as follows:
 - a. Position the gearbox on the DDC mounting frame and secure in place by loosely installing the gearbox mounting fasteners.
 - b. Apply anti-seize to the inner surface of the sprocket and place the sprocket onto the gearbox output shaft.
 - c. Refer to the section *Drive Chain Tension and Sprocket Alignment* to align the shafts and sprockets of the gearbox and airlock.
 - d. Once properly aligned, tighten the set screws to secure the sprocket in place.
 - e. Clean and lubricate the drive chain. Ensure the chain end bushings are clear of any debris.
 - f. Position the drive chain on the sprockets such that the two ends of the chain are separated by one sprocket tooth. Rotate the sprockets as required to ensure the chain is properly engaged on both sprockets.

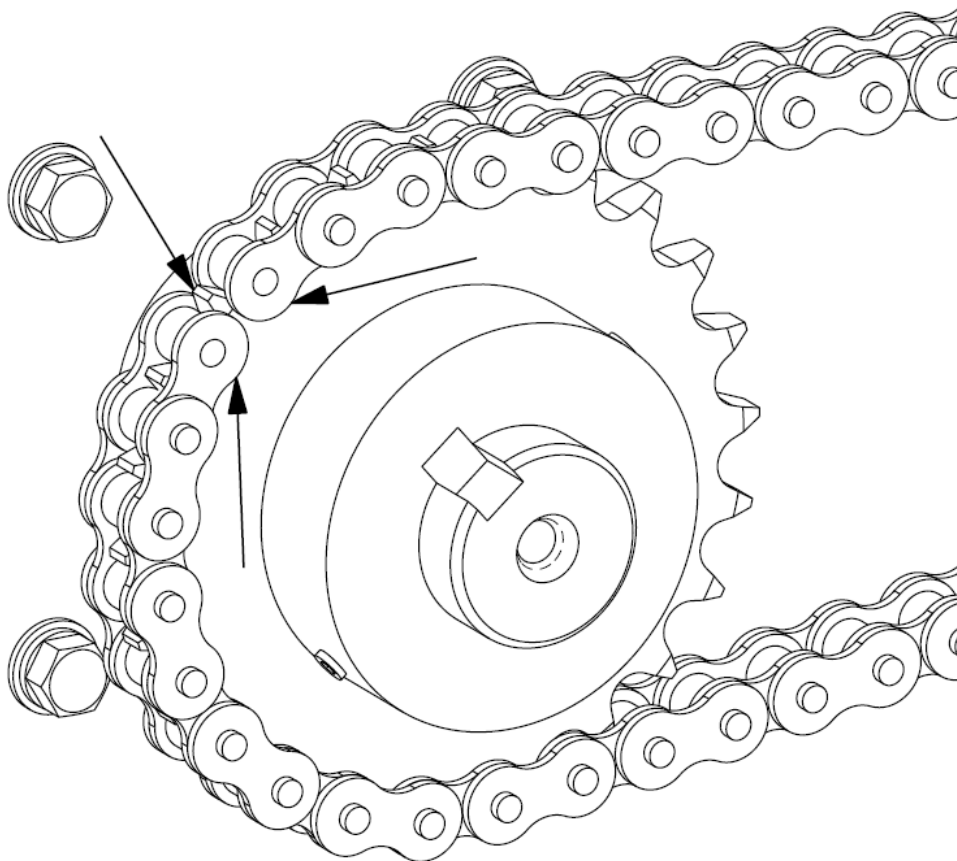


Figure 7-44: Chain end positioning

- g. Insert the pins of a new connecting link through the bushings of the two chain ends.

NOTE: Do not reuse a previously removed connecting link. Damage to the pins of the connecting link occurs during the removal process. Using a link with damaged pins can cause premature wear and failure of the drive chain.

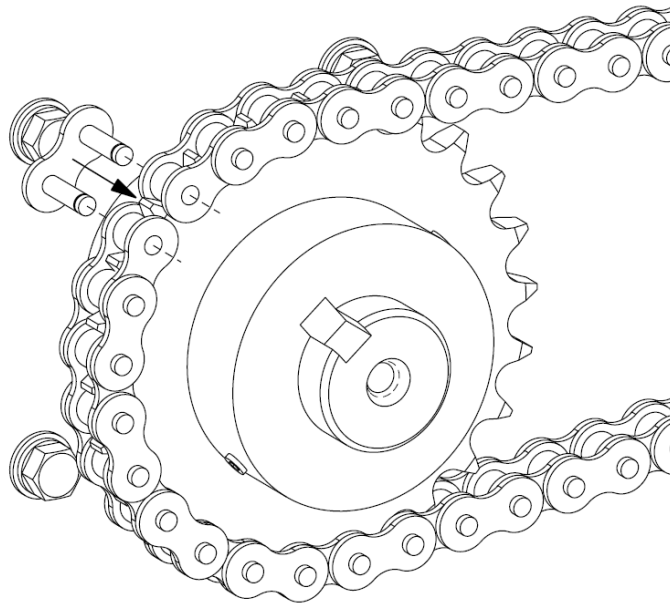


Figure 7-45: Connecting link pin insertion

- h. Slide the outer plate over the pins and flush against the chain end inner plates.

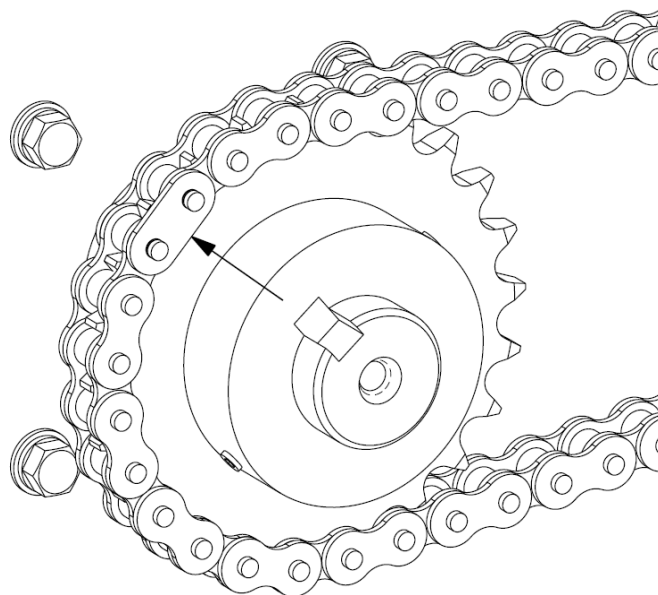


Figure 7-46: Connecting link outer plate installation

- i. Secure the outer plate in place by installing the spring clip.

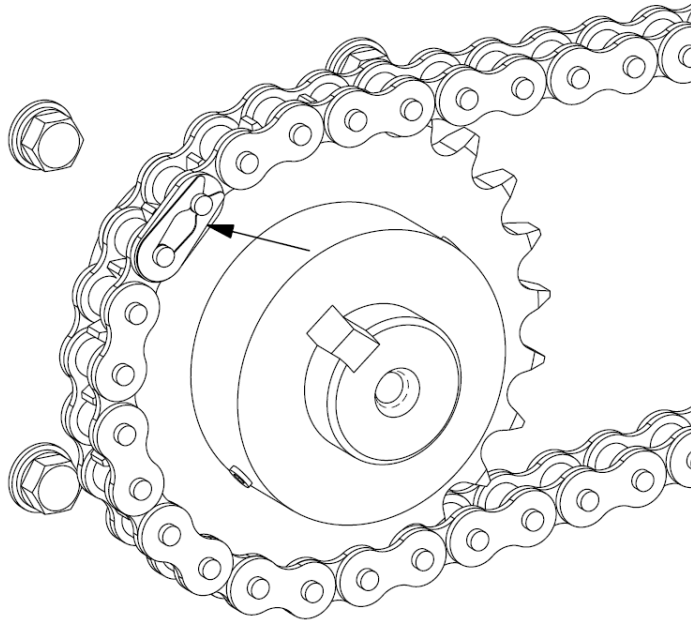


Figure 7-47: Connecting link spring clip installation

- j. Use a mallet to tap the exposed ends of the connecting link pins to ensure the outer plate and spring clip of the connecting link have a snug fit to the chain ends, allowing free and smooth movement of the chain.

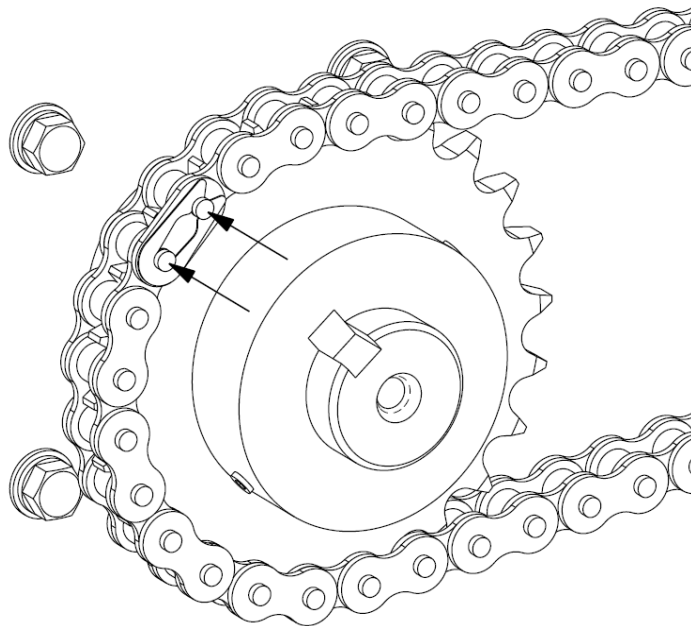


Figure 7-48: Connecting link adjustment

- k. Ensure there is sufficient clearance between the drive chain and the drive chain guard and cover.

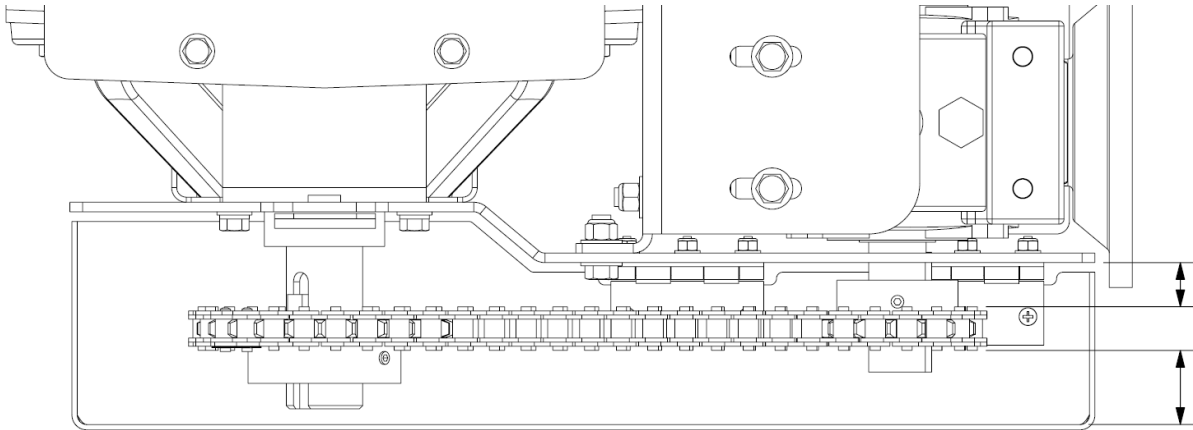


Figure 7-49: Drive chain clearance

- l. Apply anti-seize to the motor shaft and reinstall the electric motor to the gearbox by aligning the motor shaft key with the gearbox keyway. Secure the motor to the C-flange of the gearbox with the required fasteners.

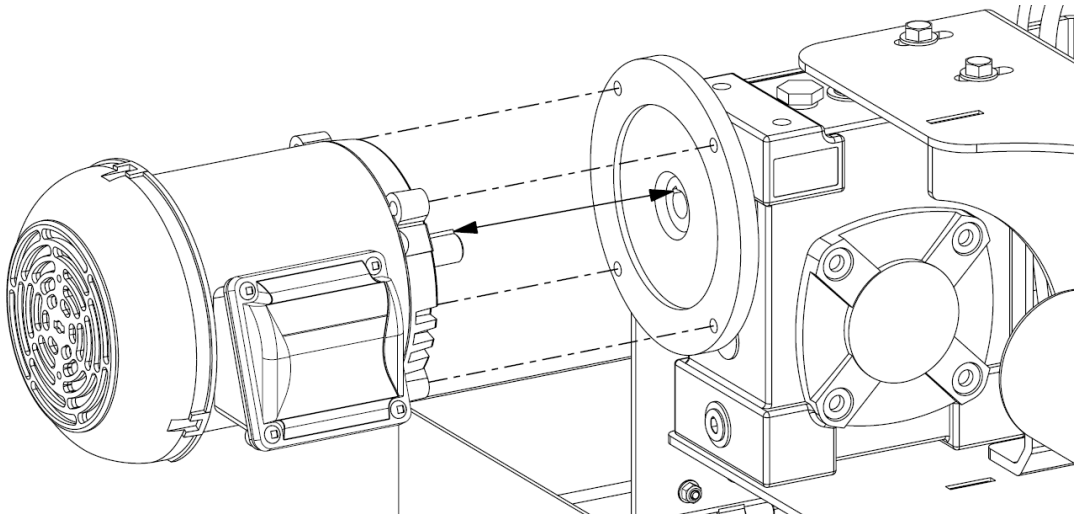


Figure 7-50: Motor and gearbox alignment

- m. Refer to the section *Drive Chain Tension and Sprocket Alignment* to ensure the drive chain is properly tensioned and the sprockets are aligned.
 - n. Ensure the gearbox mounting fasteners have been tightened to achieve the correct chain tension and the sprocket set screws are tightened.
 - o. Close and secure the drive chain cover in place with the required fasteners.
17. Ensure all guards are installed and secured.

MAINTENANCE MATERIALS

Dielectric Grease

Use a silicone-based dielectric grease to seal and protect electrical connections from corrosion (Walinga part number 37-19361-6).

Lubricating Oil

Use Walinga blower oil to lubricate the gearbox (Walinga part number 98-13813-6).

Lubricating Grease

Use an SAE multi-purpose high temperature grease with extreme pressure characteristics. An SAE multi-purpose lithium based grease is also acceptable. Walinga airlocks are manufactured using Unirex EP 2 (Walinga part number 98-01959-6).

Thread Sealant

Use a high performance thread sealant for pneumatic fittings. Fittings are installed using Permatex High Performance Thread Sealant (Walinga part number 92-03141-6).

Rust Inhibitor

Use a water soluble rust inhibitor to prevent corrosion of the airlock during storage, such as Rust Prevent Syn 3-X (Walinga part number 85-61652-6).

Anti-Seize Lubricant

Use a copper-base lubricant to prevent seizing of moving or rotating components, such as Torque Master Anti-Seize (Waling part number 98-13491-6).

Lubricant Storage

A DDC can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store lubricants in an area protected from dust, moisture and other contaminants.

ADJUSTMENTS

Purge Cycle Timing Adjustments

The purge valve activation time and pause time may be fine tuned and adjusted to meet the demands of each unique DDC installation. Incorrect adjustment of the purge cycle timing can result in failure of the components or system, or severe shortening of the life-span of the components. Always consult your local Walinga dealer or representative before making adjustments to the timing of the purge cycle.

To adjust the purge cycle timing, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Shut off the compressed air supply, switch the pressure relief shut-off valve to the exhaust position and ensure the pressure is relieved from the DDC system.
3. To adjust the purge cycle timing, the electrical power supply to the sequential timer must remain engaged. Use caution to ensure no contact is made with any exposed electrical connections or components.
4. Refer to **Section 5: Machine Life-Cycle Procedures** *Initial Set-Up* for detailed procedures to adjust the parameters of the sequential timer. It is important to keep the following in mind:
 - a. **F02** controls the purge valve activation time. The standard setting for the activation time is 0.20 seconds. The sequential timer allows this parameter to be set between 0.05 to 5.00 seconds.
NOTE: Setting the activation time too low will result in the filters not being entirely cleaned during purging, leading to a potential blockage of the filter, preventing the DBV from properly venting, and leading to a potential structural failure of the storage structure. Setting the activation time too high can cause damage to the filter media, leading to the potential creation of holes in the media, allowing dust to pass through the filter and be exhausted through the clean air plenum.
 - b. **F03** controls the pause time. The standard setting for the pause time is 30 seconds. The sequential timer allows this parameter to be set between 1 to 999 seconds. Use **+** and **-** to adjust the value.
NOTE: Setting the pause time too low can cause damage to the filter media due to over-activation of the purge valves, decreasing the filter life-span and causing potential failure of the filters. Setting the pause time too high can result in an excess of dust/particulate accumulation on the filters resulting in a blockage, preventing the DBV from properly venting, and leading to a potential structural failure of the storage structure.
5. Ensure all guards and covers are installed and secured and resume normal operation of the DDC, carefully monitoring the differential pressure gauge and performance of the DDC to ensure the adjustments made to the activation time and/or pause time are appropriate for the unique application.

Differential Pressure Switch

For continuous-duty applications in which the DDC must remain operational for extended periods of time, a differential pressure switch should be installed in the system. The differential pressure switch will send an activation signal to the sequential timer when the dust/particulates covering the filters cause the differential pressure between the clean and dirty air plenums to reach a set value. This controlled activation ensures the filters are only purged when required, preventing early wear and extending the filter life in continuous-duty applications. Walinga offers a kit including a general industrial (GI) low differential pressure switch and a kit including an explosion-proof (EP) differential pressure switch.

To install a differential pressure switch, proceed as follows:

1. Clear the area of bystanders, especially small children.
2. Disconnect and lock-out all electrical power sources, wait 30 seconds for internal capacitors to discharge before opening electrical enclosures, disconnect the compressed air source, and relieve the air pressure from the system.
3. Ensure all required components, as detailed in **Table 7-1**, are ready and available.

Table 7-1: Differential pressure switch kit components

Item	Description	Walinga Part Number	Quantity
A	MOUNTING PLATE	11-144479-4	1
B	SWITCH JUNCTION BOX ENCLOSURE	82-17453-6	1
C	RUBBER GROMMET	79-90073-6	2
D	PUSH-IN FITTING, 4T-2MP	81-18107-6	2
E	GI DIFFERENTIAL PRESSURE SWITCH	82-144611-6	1
F	EP DIFFERENTIAL PRESSURE SWITCH	82-144612-6	1
G	PUSH-IN TEE, 4T-4T-4T	81-18582-6	2
H	1/4" AIR TUBE	73-03867-6	40 in (1 m)
I	15 AMP FUSE ATC	82-04696-6	1
J	IN-LINE FUSE HOLDER, 694207	82-16381-6	1

4. Secure the mounting plate [**Item A**] to the header tank mounting bracket on the right side of the DDC, using the provided mounting holes and tightening all fasteners to the required torque.

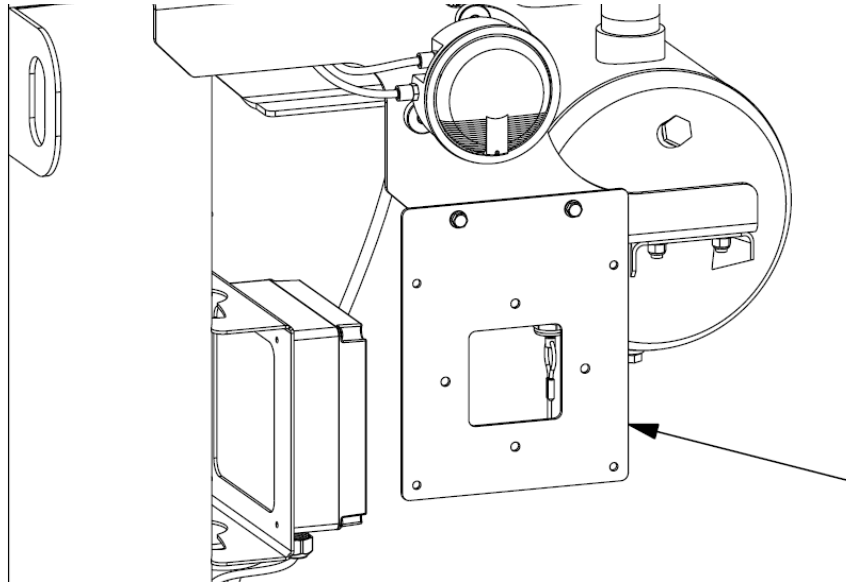


Figure 7-51: Mounting plate installation

5. **GI Only:** Secure the switch enclosure [**Item B**] to the mounting plate, tightening all fasteners to the required torque.

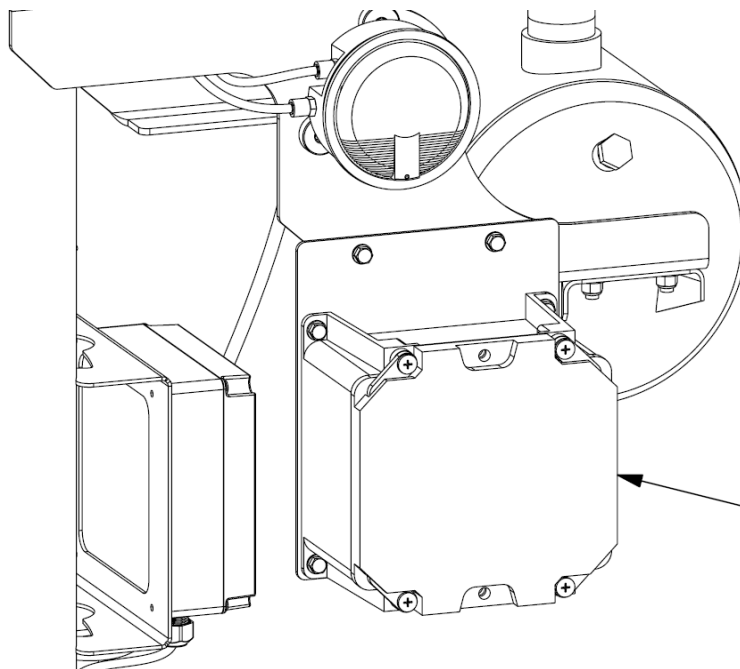


Figure 7-52: Enclosure mounting

6. **GI Only:** Install glands [Item C] into the front face of the enclosure to permit the air and electrical connections to the switch while providing protection from exposure to moisture and dirt.

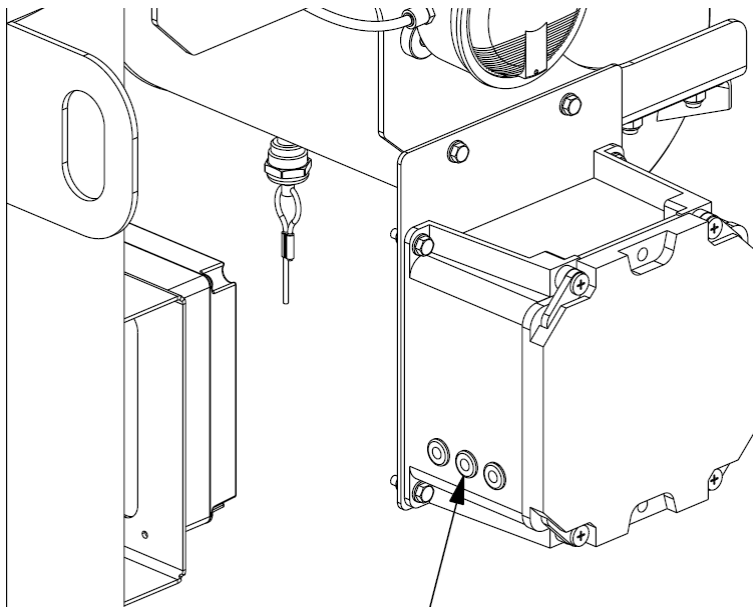
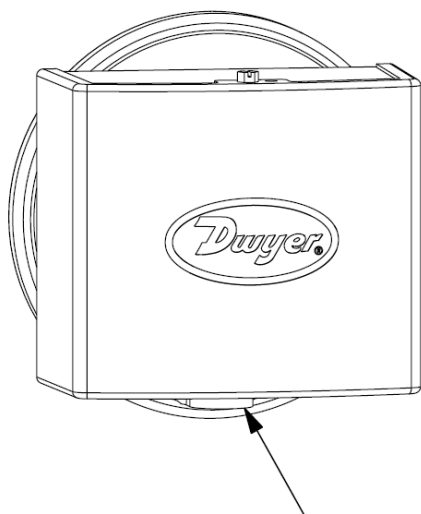
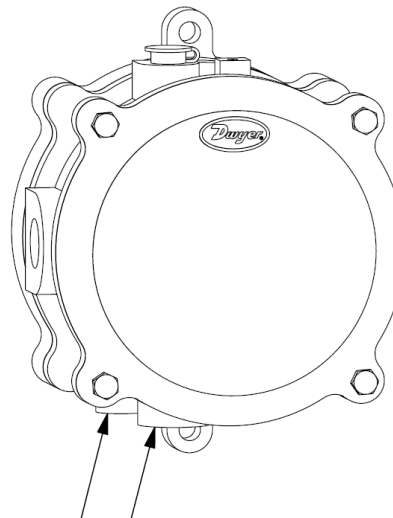


Figure 7-53: Enclosure gland positioning

7. Calibrate the differential pressure switch as follows:
- Position the switch such that the diaphragm is in the vertical plane and the pressure ports point downwards. The switch **must** be calibrated in the orientation that it will be mounted during operation.



GI Model



EP Model

Figure 7-54: Calibration orientation

- b. Assemble a "T" assembly with three tubing leads as short as possible, with the entire assembly offering minimum flow restriction.

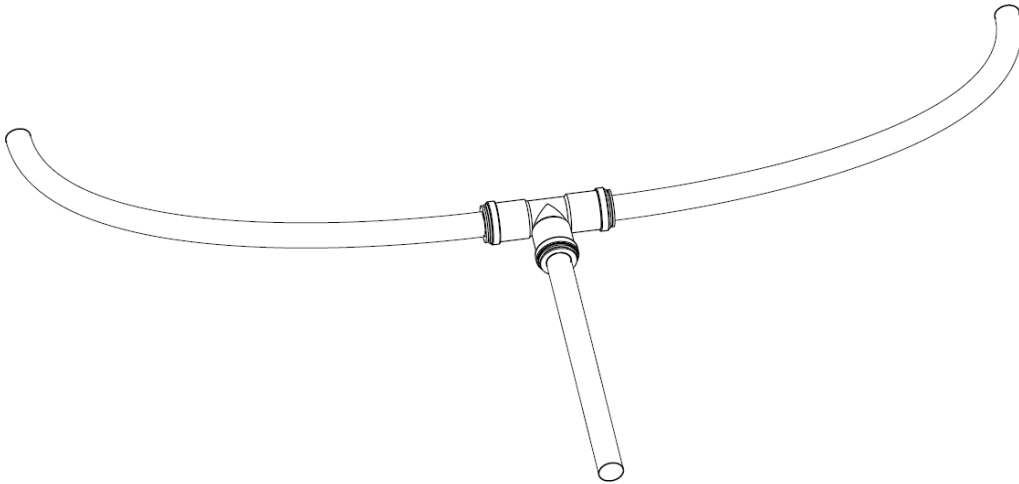


Figure 7-55: Calibration "T" assembly

- c. Connect the first lead to the high pressure port of the pressure differential switch.

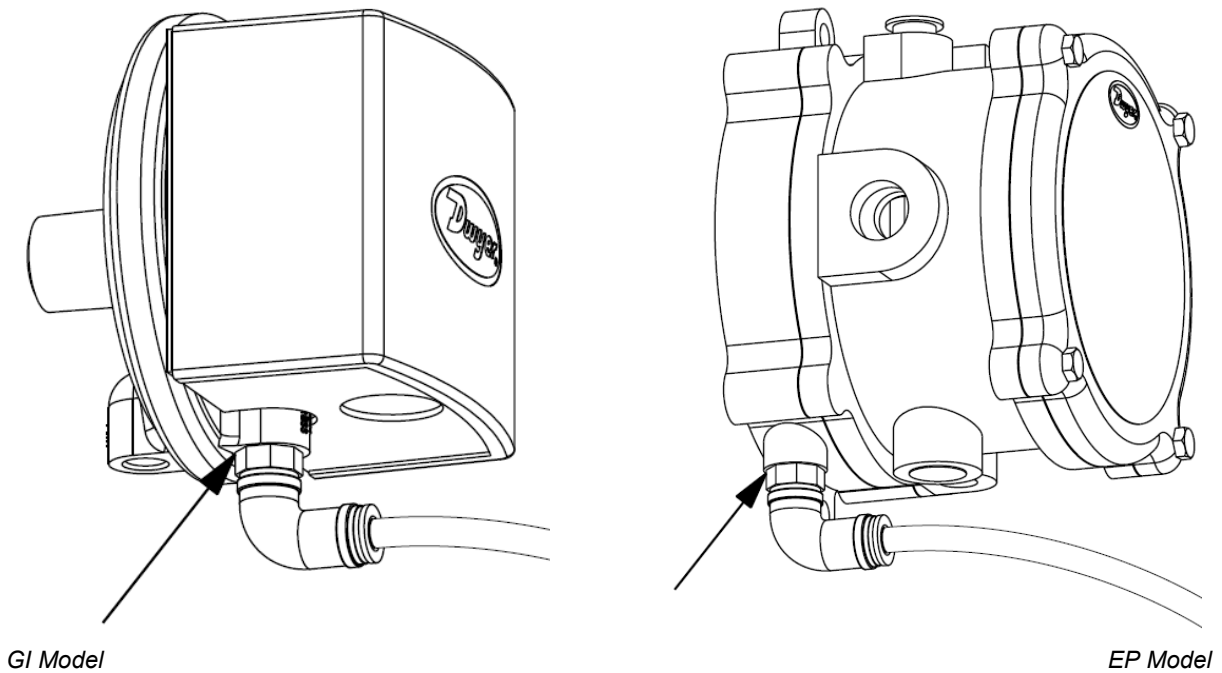


Figure 7-56: High pressure port connection

- d. Connect the second lead to a manometer of known accuracy and appropriate range.

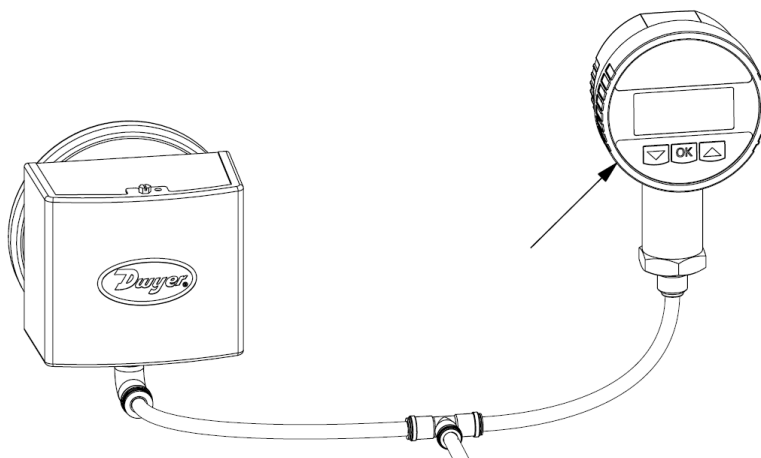
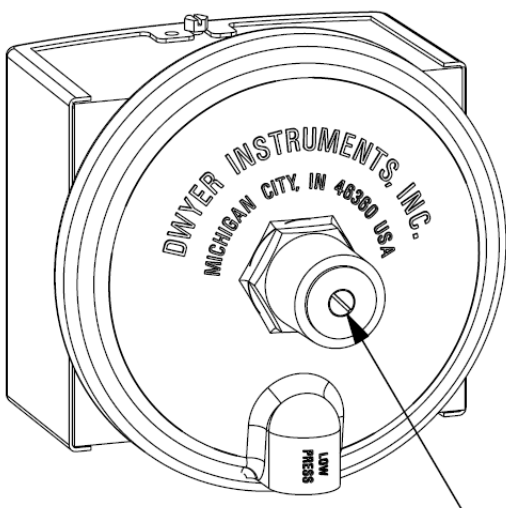
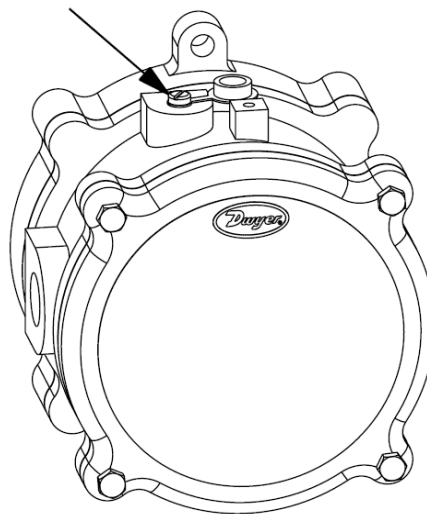


Figure 7-57: Manometer connection

- e. Slowly apply pressure to the third lead, approaching the desired setpoint slowly. **NOTE:** the manometer and pressure differential switch will have different response characteristics due to the difference in internal volumes, tubing lengths, fluid drainage, etc.
- f. Adjust the setpoint of the differential switch by rotating the adjustment screw. Rotate the screw clockwise to increase the setpoint and counter-clockwise to decrease the setpoint. The setpoint should be set to 10 in WC (2.5 kPa).



GI Model



EP Model

Figure 7-58: Adjustment screw

8. Install the fittings [Item D] into the high and low pressure ports.

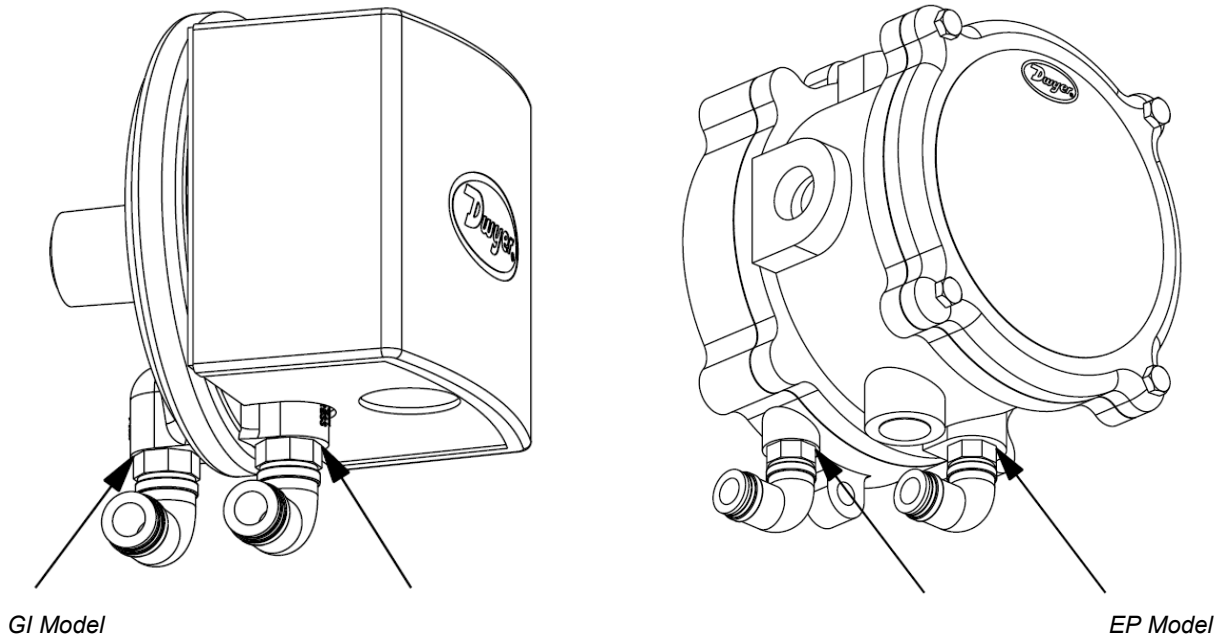


Figure 7-59: Pressure port fittings

9. Mount the differential pressure switch [Item E or Item F]. The switch must be oriented such that the diaphragm is in the vertical plane and the pressure ports are pointing downwards and must be in the same position in which it was calibrated.

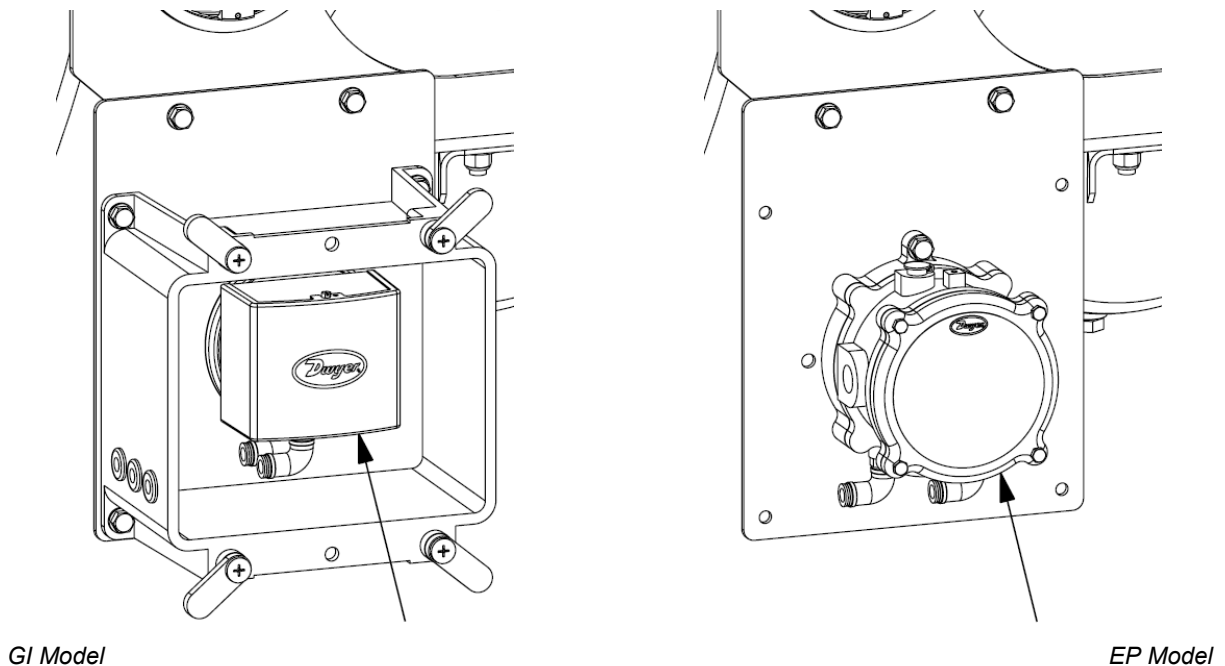


Figure 7-60: Mounting orientation

10. Install a tee [Item G] in the air line connected to the low pressure port of the differential pressure gauge and connect a line [Item H] to the low pressure port of the differential pressure switch.

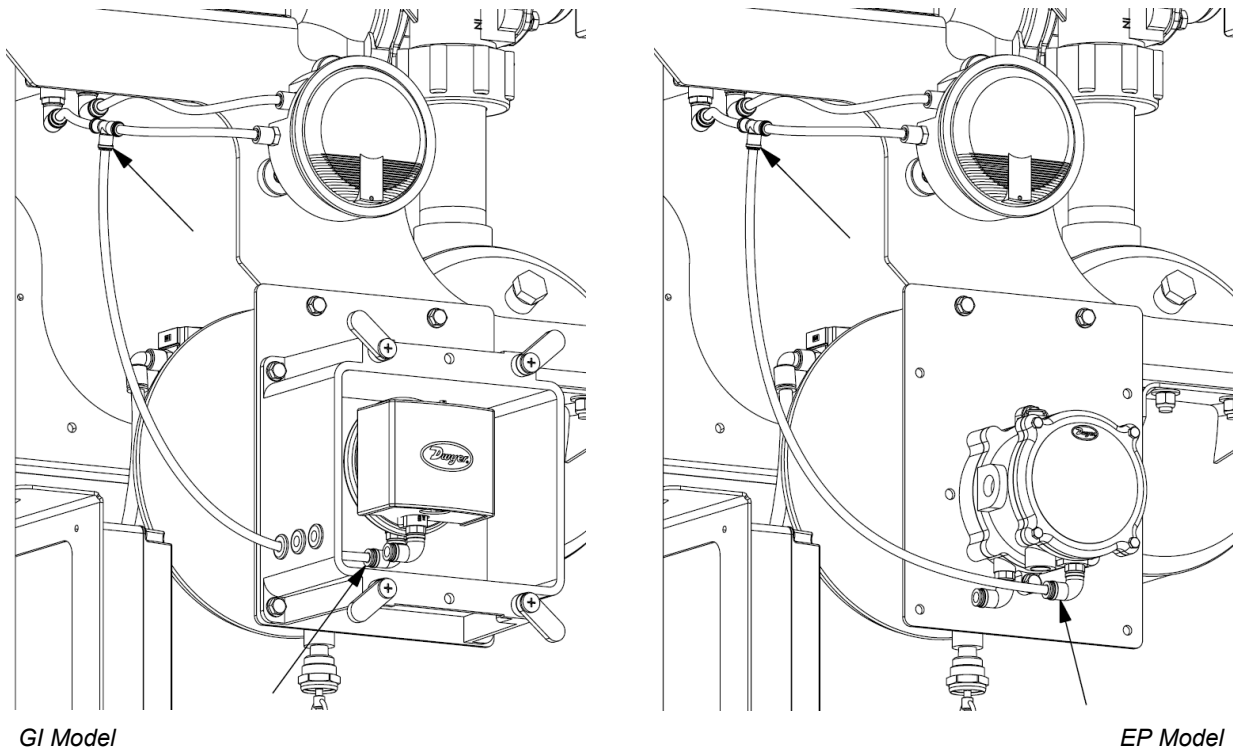
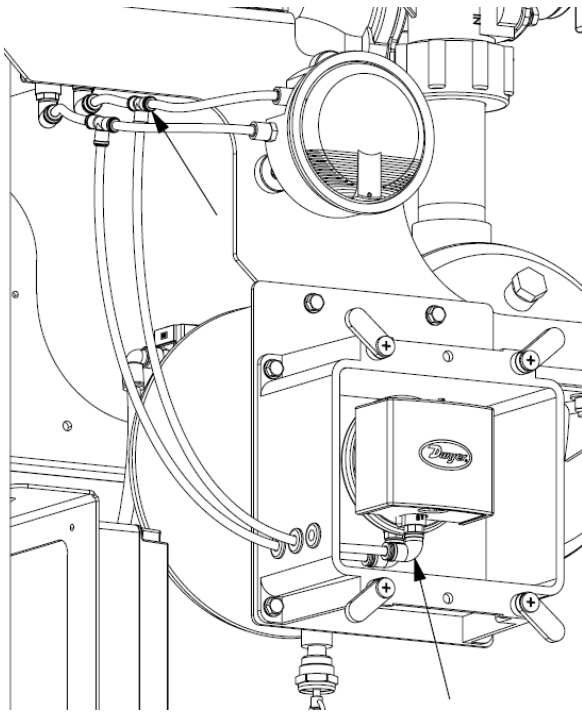
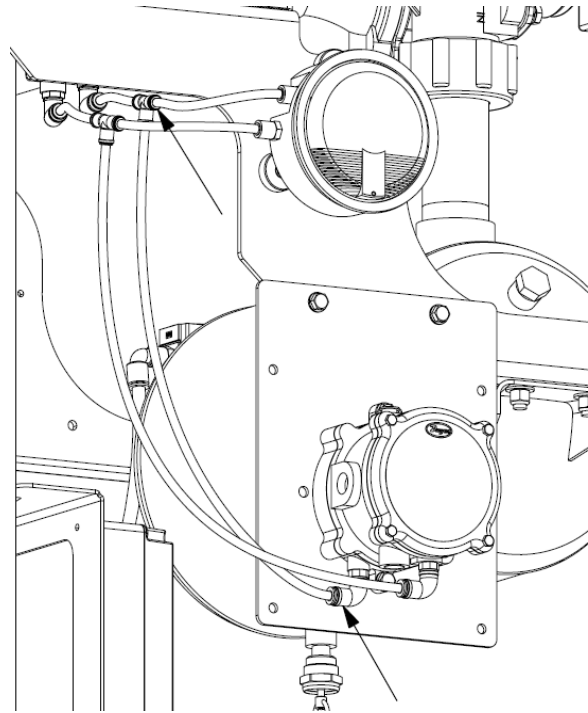


Figure 7-61: Low pressure connection

11. Install a tee [Item G] in the air line connected to the high pressure port of the differential pressure gauge and connect a line [Item H] to the high pressure port of the differential pressure switch.



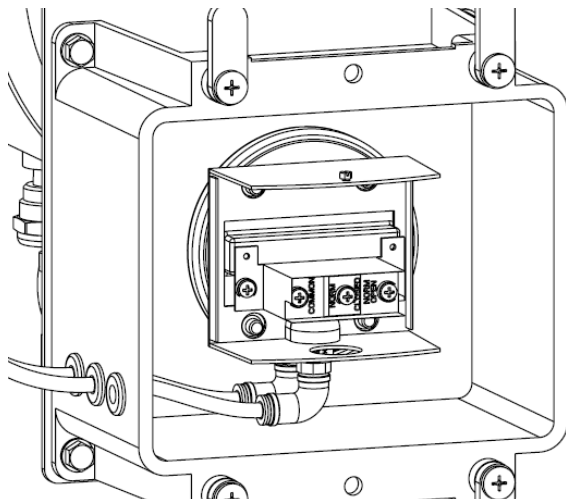
GI Model



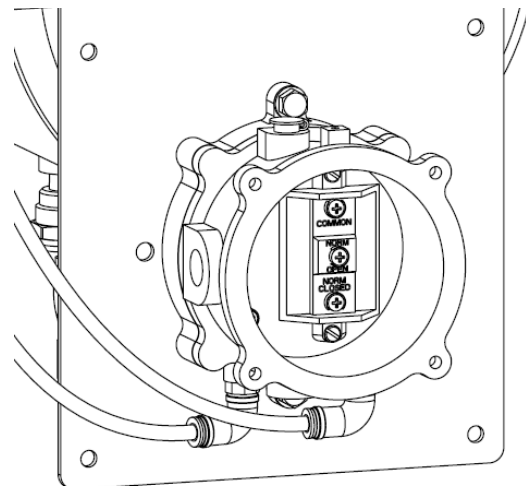
EP Model

Figure 7-62: High pressure connection

12. Loosen the mounting screws and remove the cover of the differential pressure switch.



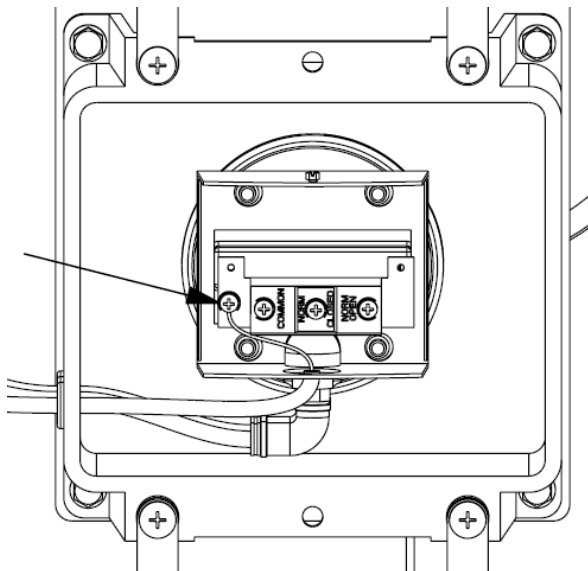
GI Model



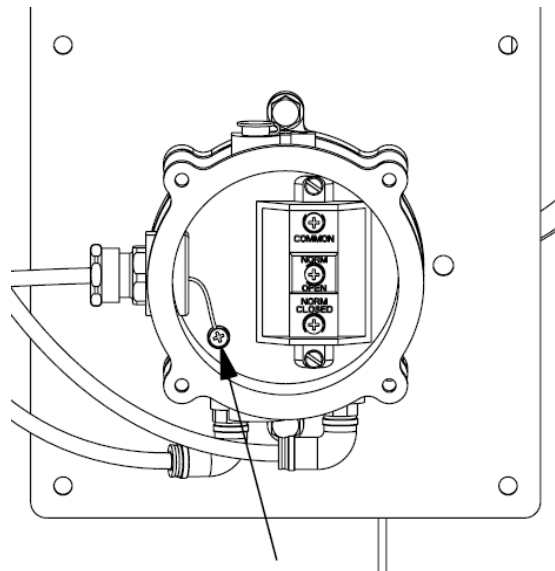
EP Model

Figure 7-63: Differential pressure switch cover removal

13. Prepare a cable connection to the 120 VAC 60 Hz power supply. Connect the ground line to the ground stud within the differential pressure switch.



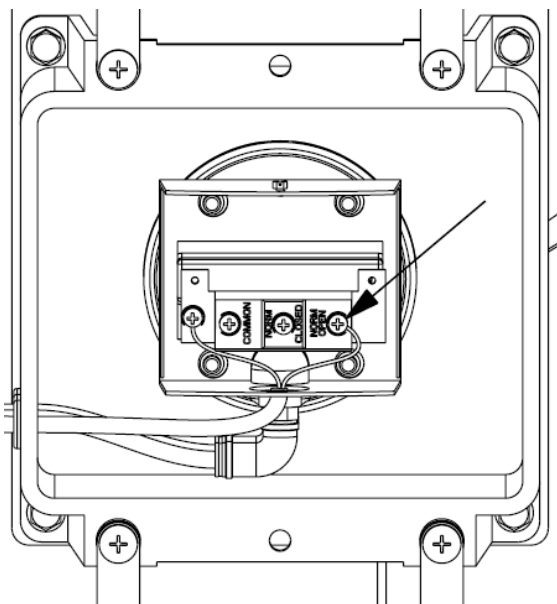
GI Model



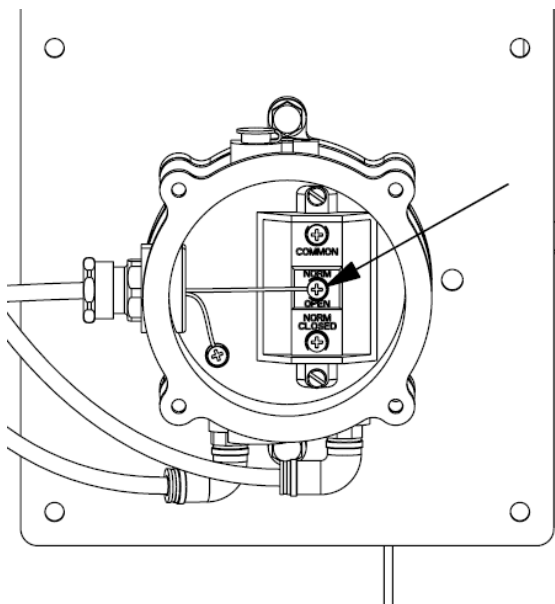
EP Model

Figure 7-64: Ground line connection

14. Install a 15 Amp fuse [Item I and Item J] along the live power supply line and connect the line to the Normally Open terminal contact of the differential pressure switch.



GI Model



EP Model

Figure 7-65: Power supply connection

15. Remove the cover and display plate of the sequential timer.

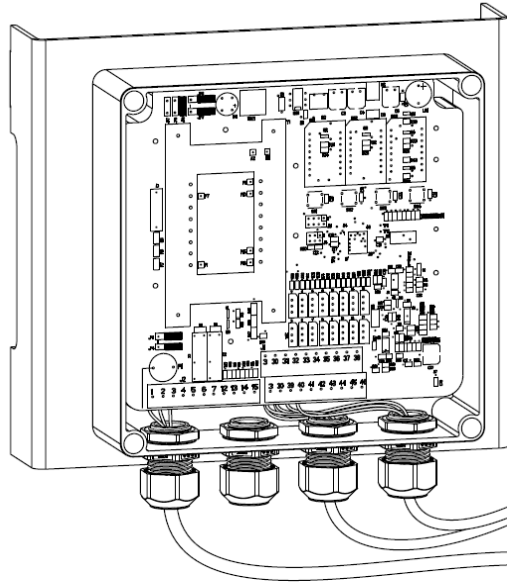


Figure 7-66: Sequential timer access

16. Connect the Common terminal contact of the differential pressure switch to terminal 15 of the sequential timer.

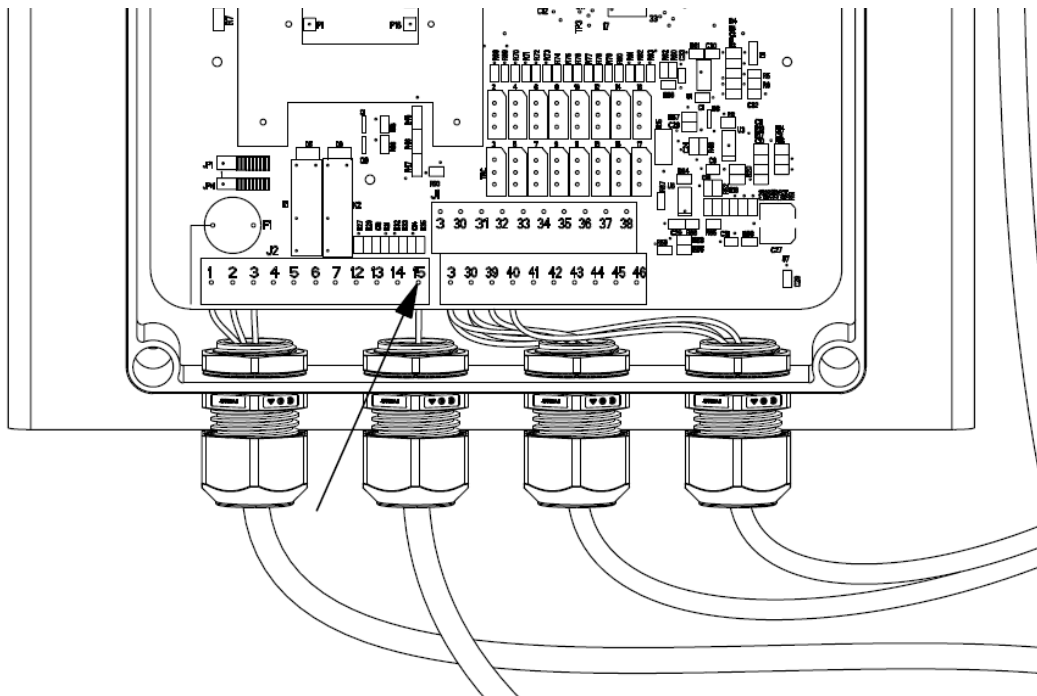


Figure 7-67: Sequential timer connection

17. Reinstall the display plate and cover of the sequential timer.
18. Reinstall the cover of the differential pressure switch.
19. **GI Only:** Install the cover of the differential pressure switch enclosure.

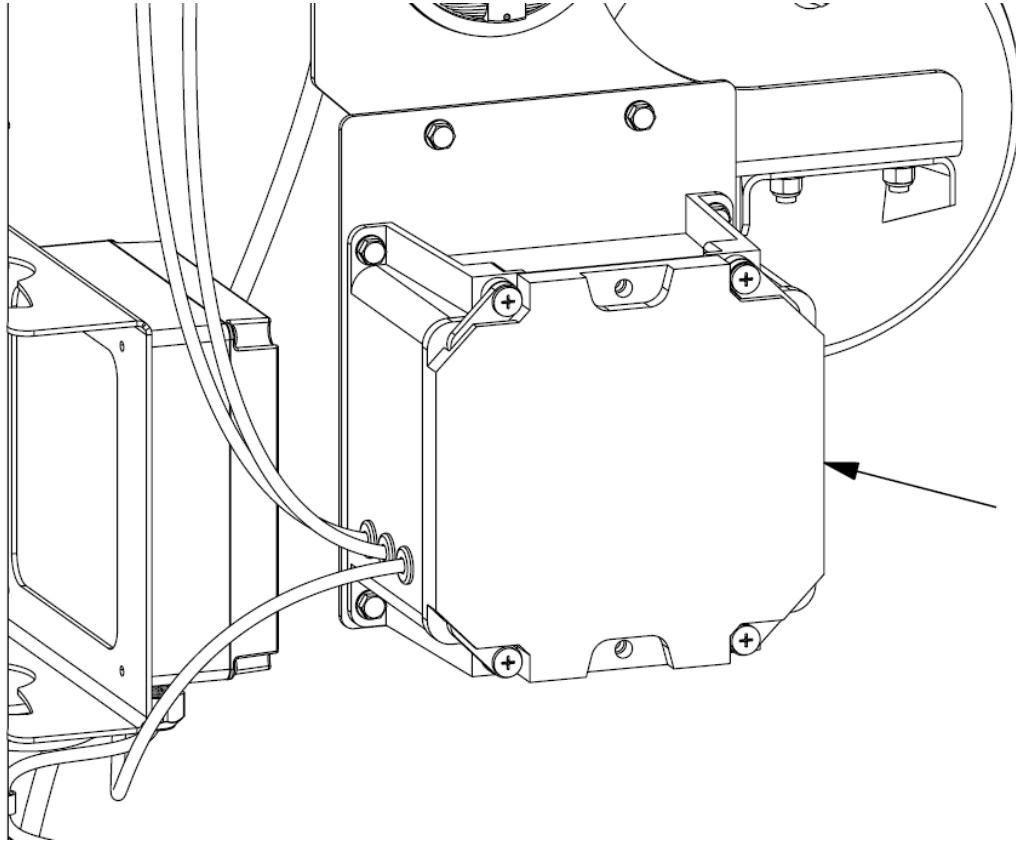


Figure 7-68: Enclosure cover installation

20. Engage power to the differential pressure switch, the sequential timer, and the electric motor and resume the supply of compressed air to the system.
21. Resume normal operation, monitoring the system to ensure the purge cycle is activated when the set pressure differential is reached.



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Specifications

DUSTLESS DISCHARGE CYCLONE

TECHNICAL DATA

		3" Model			5" Model		
Weight		590 lbs (268 kg)			955 lbs (434 kg)		
Dimensions	Height	74 in (188.0 cm)			115 in (292.1 cm)		
	Width	30 in (76.2 cm)			48 in (121.9 cm)		
	Depth	43 in (109.2 cm)			52 in (132.1 cm)		
Airlock	Model	1008DT			1210DT		
	Capacity	0.28 cu ft/rev (8 L/rev)			0.55 cu ft/rev (16 L/rev)		
	Max Speed	30 rpm			35 rpm		
Filter	No. Filters	4			7		
	No. Valves	2			3		
	Total Area	59.1 ft ² (5.5 m ²)			103.4 ft ² (9.6 m ²)		
	Type	Spunbond polyester			Spunbond polyester		
	Efficiency	0.5 micron 98.91%	1 micron 99.35%	>2 micron 100%	0.5 micron 98.91%	1 micron 99.35%	>2 micron 100%
Sequential Timer	Voltage	115 VAC			115 VAC		
	Frequency	50 - 60 Hz			50 - 60 Hz		
	Max Load Consumption	28 W			28 W		
Electric Motor	Voltage	575 VAC			575 VAC		
	Frequency	60 Hz			60 Hz		
	Phase	3-Phase			3-Phase		
	Power	0.75 HP (0.55 kW)			1.5 HP (1.1kW)		
	Speed	1750 rpm			1750 rpm		
	Full Load Amperage	0.9 A			1.9 A		
Operating Temperature		20 - 131°F (-6.7 - 55°C)			20 - 131°F (-6.7 - 55°C)		
Maximum System Pressure		15 psi (103 kPa)			15 psi (103 kPa)		

BOLT TORQUES

The torque values for imperial and metric bolts and cap screws are given below in **Table 8-1** and **Table 8-2** respectively. Unless otherwise noted, tighten all bolts to the torques specified in the tables below. Check the tightness of bolts periodically. Replace any damaged or lost hardware with the same strength bolt.

Torque values indicated in the following tables are valid for non-greased or non-oiled threads and heads. Unless otherwise specified, do not grease or oil bolts or cap screws. When using locking elements, increase the listed torque values by 5%. Reference **Figure 8-1** and **Figure 8-2** for proper identification of grades.

Table 8-1: Imperial torque specifications

Bolt Diameter "A" [in]	Bolt Torque					
	SAE 2		SAE 5		SAE 8	
	[Nm]	[lb-ft]	[Nm]	[lb-ft]	[Nm]	[lb-ft]
1/4	8	6	12	9	17	12
5/16	13	10	25	19	36	27
3/8	27	20	45	33	63	45
7/16	41	30	72	53	100	75
1/2	61	45	110	80	155	115
9/16	95	60	155	115	220	165
5/8	128	95	215	160	305	220
3/4	225	165	390	290	540	400
7/8	230	170	570	420	880	650
1	345	225	850	630	1320	970

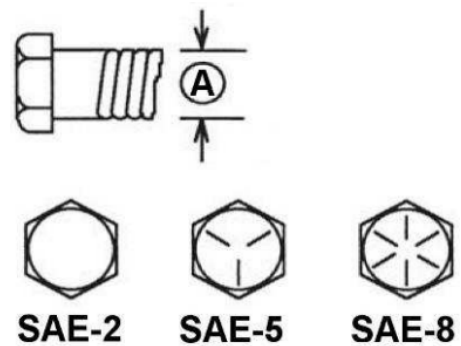


Figure 8-1: Imperial bolts

Table 8-2: Metric torque specifications

Bolt Diameter "A"	Bolt Torque			
	8.8		10.9	
	[Nm]	[lb-ft]	[Nm]	[lb-ft]
M3	.5	.4	1.8	1.3
M4	3	2.2	4.5	3.3
M5	6	4	9	7
M6	10	7	15	11
M8	25	18	35	26
M10	50	37	70	52
M12	90	66	125	92
M14	140	103	200	148
M16	225	166	310	229
M20	435	321	610	450
M24	750	553	1050	774
M30	1495	1103	2100	1550
M36	2600	1917	3675	2710

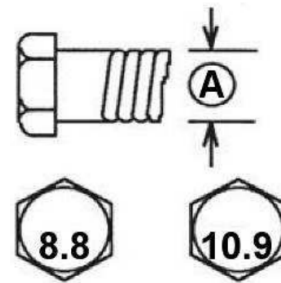


Figure 8-2: Metric bolts

STANDARDS AND REGULATIONS

Walinga follows the general safety standards specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA) with consideration of standards outlined by the National Fire Prevention Agency (NFPA), International Organization for Standardization (ISO), Occupational Health and Safety Standards (OH&S), and American National Standards Institute (ANSI). Be aware that there may be additional local or federal laws and regulations that require compliance based on operational location that are the responsibility of the owner and/or operator. For your convenience, the standards referenced in this manual and pertinent to DDCs are listed below.

IEEE 45	Recommended Practice for Electrical Installations on Shipboard
ISO 4254-1	Agricultural Machinery - Safety - Part 1: General Requirements
NFPA 68	Standard on Explosion Protection by Deflagration Venting
NFPA 69	Standard on Explosion Prevention Systems
NFPA 70	National Electric Code
NFPA 91	Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids
NFPA 652	Standard on the Fundamentals of Combustible Dust
NFPA 654	Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
OSHA 1910.272	Grain Handling Facilities



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Warranty

PNEUMATIC CONVEYING SYSTEMS

Walinga Inc. is committed to providing a quality product that will meet or exceed expectations for many years to come. The warranty terms and warranty claim process have been designed to ensure that each warranty claim will be resolved in an orderly, fair and timely manner.

THE WARRANTY

Walinga Inc. (“Walinga”) warrants that all new pneumatic products sold by Walinga will be free from defects in material and workmanship (the “Walinga Warranty”).

WARRANTY PERIOD

The warranty period for the Walinga Warranty shall expire on the date that is the earlier of: two (2) years after the date of delivery to the original customer or upon the expiration of five hundred (500) hours of operation; whichever date comes first.

LIMITATIONS AND EXCLUSIONS OF THE WALINGA WARRANTY

- The Walinga Warranty applies to material and workmanship only.
- With respect to any component parts that are supplied or manufactured by others, the warranty coverage on such component parts will be strictly limited to the warranties of the manufacturers of such component parts.
- The Walinga Warranty shall only be for the benefit of the original purchaser of the pneumatic products.
- A Walinga Warranty may be transferable by the original purchaser to a third party for the balance of the warranty period then remaining, provided that Walinga consents in writing to such a transfer of warranty.
- The Walinga Warranty is conditional upon proper storage, installation, use, maintenance, operation, and compliance with any applicable recommendations of Walinga.

WARRANTY CLAIM PROCEDURE

Should any difficulties with a unit within its warranty period be encountered, please contact a local Walinga dealer or sales representative, the local Walinga Service Department or Walinga’s Warranty Department to submit a warranty claim application. To speak with a Walinga Warranty Coordinator, contact:

Canada and
International 1-888-WALINGA (ext 273)
 +1-519-824-8520 (ext 273)
 warranty.canada@walinga.com

USA 1-800-466-1197 (ext 8)
 warranty.usa@walinga.com

Australia 07-4634-7344
 mail@customvac.com.au

REQUIRED WARRANTY CLAIM INFORMATION

The following information must be provided to Walinga for proper consideration and processing of a warranty application:

- Customer name and contact information, including email if available
- The equipment serial number and/or Vehicle Identification Number (VIN), if applicable
- Date of claimed failure
- Equipment hours of operation
- Details, description and photos (upon request) of the claimed failure and the corrective repairs attempted

WARRANTY CONDITIONS

- Equipment must be registered within thirty (30) days of being received by the buyer. It will be within the sole and unfettered discretion of Walinga as to whether it will honor its warranty on non-registered equipment.
- The buyer is responsible for promptly notifying Walinga of any defect to the equipment and making the equipment available to Walinga or its authorized facility for evaluation or repair.
- Prior to making any repairs or parts replacements, a warranty application and any estimated associated costs must be approved with the issuance of a claim number by an authorized Walinga representative. Undertaking any work prior to receiving warranty authorization may result in a partial or complete loss of warranty coverage.
- At Walinga's discretion, warranty repairs may be authorized to be completed at a repair facility convenient to the buyer. In such situations, the estimated labor time must be approved by Walinga prior to undertaking any work. Labour hours will be reimbursed at the facility's posted hourly labor rate.
- At Walinga's request, parts in question must be returned to the nearest Walinga service facility for evaluation. In such situations, a Returned Goods Authorization (RGA) number will be provided to the buyer. The returning shipment must be clearly labeled with the assigned RGA number and include a copy of the RGA form. Unless otherwise arranged, these parts are to be returned to Walinga within thirty (30) days to ensure timely processing of the warranty claim. Failure to return such parts may result in partial or complete loss of warranty coverage.
- Replacement parts provided under warranty are covered for the remainder of the original equipment warranty period.
- Walinga reserves the right to use new, remanufactured or refurbished components when performing warranty repairs and replacements.
- Walinga is entitled to a reasonable amount of time and a reasonable number of attempts to assess the claim, diagnose the problem, and perform any necessary repairs.
- The warranty offered on used or refurbished equipment is limited to that specified on the purchase contract. Where a warranty period has not been stipulated on the purchase contract, and where such equipment is "used", then such equipment is considered to be sold "as is, where is" without the Walinga Warranty. Where such equipment is refurbished, the Walinga Warranty shall apply.

WARRANTY CLAIM REJECTION

Without limitation, Walinga reserves the right to reject a warranty claim for any one or more of the following reasons:

- The warranty claim information provided is insufficient.
- The product evaluation does not substantiate the claim.
- The unit has been operated above and beyond its capacity or not maintained or serviced properly, resulting in damages incurred to major components.
- The unit was equipped with a factory installed hour meter which has been disconnected, altered or inoperative for an extended period of time; with the result being that the equipment's operating hours cannot be verified.
- It is apparent that the operator's manuals have not been followed.
- The equipment is not registered.

NOT COVERED UNDER WARRANTY

Without limitation, the Walinga Warranty does not cover:

- Damage or deterioration due to lack of reasonable care or maintenance.
- Damage caused or affected by unapproved modifications to the equipment.
- Damage caused by negligence or misuse of the equipment.
- Damage caused by using the equipment for purposes for which it was not designed or intended.

Walinga's liability under this warranty, whether in contract or tort, is limited to the repair, replacement or adjustment of defective materials and workmanship. In no event will Walinga be responsible for any direct, indirect, loss of time, incidental or consequential expenses including, but not limited to equipment rental expenses, towing, downtime, inconvenience, or any losses resulting from the inability to use the equipment. Further, Walinga shall not be liable for any damages or inconvenience caused by any delay in the supply of any equipment or component parts thereof.

The selling dealer/salesperson makes no warranty of its own and has no authority to make any representation or promise on behalf of Walinga, or to modify the terms or limitations of the Walinga Warranty in any way.

Punitive, exemplary or multiple damages may not be recovered unless applicable law prohibits their disclaimer.

Warranty related claims may not be brought forward as a class representative, a private attorney general, a member of a class of claimants or in any other representative capacity.

The Walinga Warranty and all questions regarding its enforceability and interpretation are governed by the law of the country, state or province in which the Walinga equipment was purchased. The laws of some jurisdictions limit or do not allow the disclaimer of consequential damages. If the laws of such a jurisdiction apply to any claim against Walinga, the limitations and disclaimers contained here shall be to the greatest extent permitted by law.



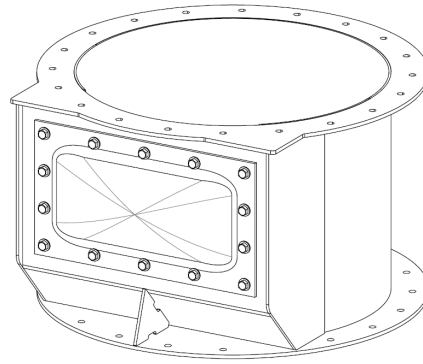
Accessories and Attachments

DUSTLESS DISCHARGE CYCLONE

A variety of accessories are available for your DDC model to improve your operational experience. Below are some of the available accessories and a general description of their function. Please contact your Walinga dealer or representative for accessories compatible with your specific DDC, availability and ordering, or if you have any questions.

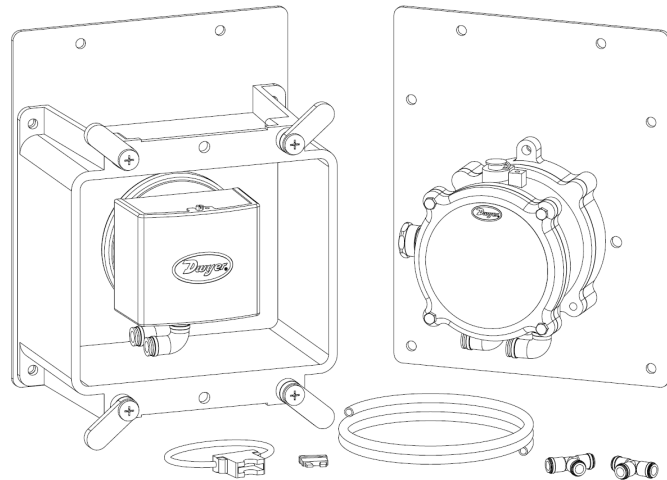
EXPLOSION VENT

To accommodate explosion relief requirements, a bolt-on explosion relief panel is available which can be installed above the AMS and below the filter housing.



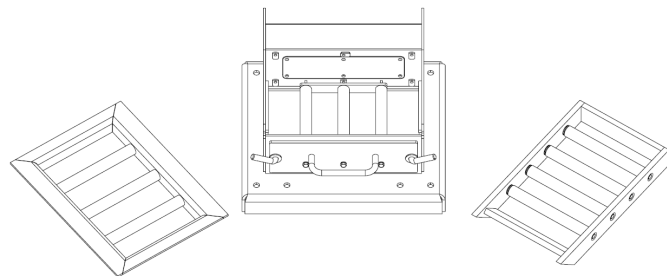
DIFFERENTIAL PRESSURE SWITCH

To allow for the use of the DDC in continuous-duty applications, a differential pressure switch kit is available to activate the purge cycle only when required to extend the life of the filters. To accommodate various installation or application requirements, a general industrial low differential pressure switch kit and an explosion-proof differential pressure switch kit are available.



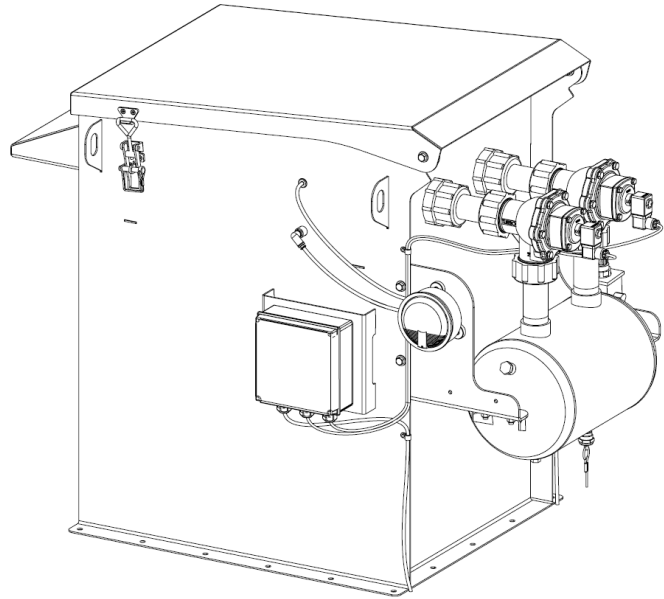
MAGNETIC INLET COVERS

In operations where conveyed products may be contaminated with metallic debris, magnetic airlock inlet covers are available to remove contaminants from the product.



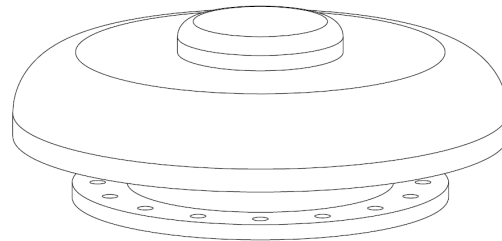
DUSTLESS BIN VENT

To allow for pressure to be vented from the storage structure while controlling the emission of dust and particulates, a Walinga Dustless Bin Vent may be installed on the storage structure.



THIEF HATCH

To ensure pressure can be safely vented from the storage structure, a thief hatch must be installed on the storage structure. Ensure the thief hatch or other pressure protection device is properly sized and of sufficient capacity for your application.





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Parts List

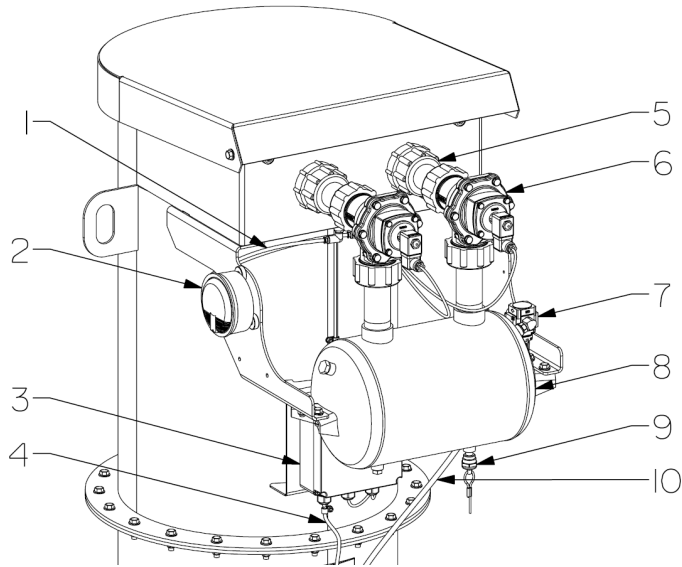
DUSTLESS DISCHARGE CYCLONE

MODEL REFERENCES*Table 11-1: Top-level model assemblies*

Reference Code	Assembly Number	Description
A	11-138699-5	3" model
B	11-139465-5	5" model

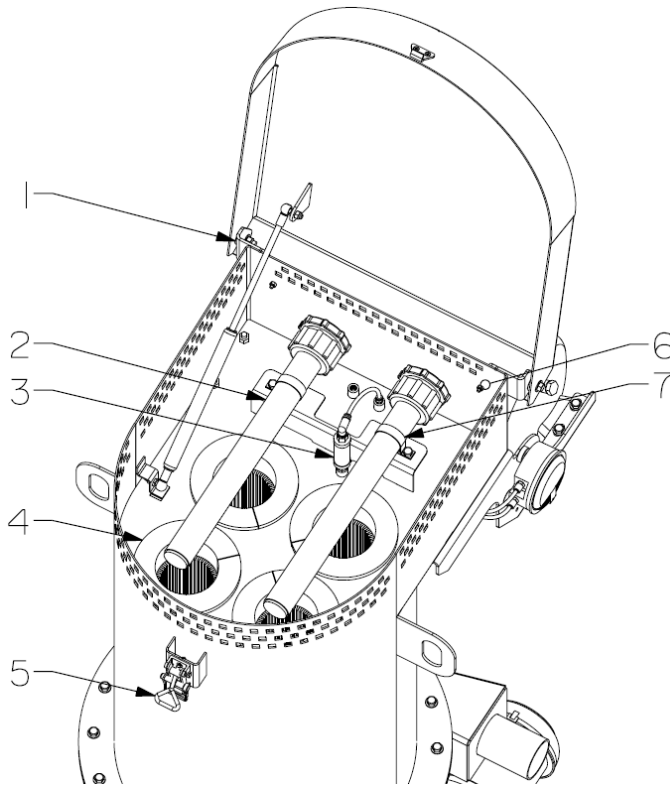
For information regarding replacement components not found listed in the following sections, contact your local Walinga dealer or representative and provide your DDC's serial number.

PURGE INSTALLATION COMPONENTS



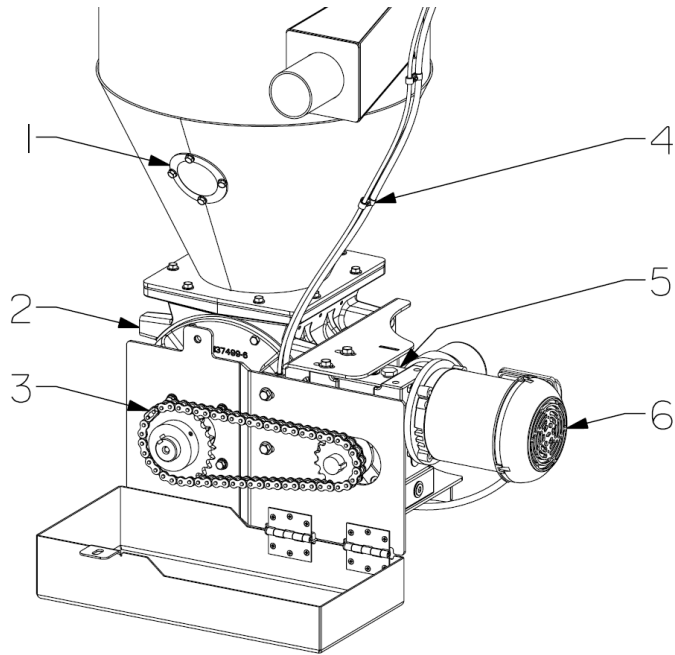
Model	Ref.	Description	Part Number
A	—	PURGE ASSEMBLY, 3"	11-138746-5
B	—	PURGE ASSEMBLY, 5"	11-139463-5
A, B	1	AIR TUBE, 1/4"	73-03867-6
	2	DIFFERENTIAL PRESSURE GAUGE	27-15285-6
	3	SEQUENTIAL TIMER, DS-ACDC12-PC	82-115445-6
	4	CABLE, 3 WIRE, 18 GA	82-108456-6
	5	BULKHEAD FITTING, 1-1/2"	39-139255-6
	6	PURGE VALVE, 1-1/2", DP40, 24VDC	39-145402-6
	7	PRESSURE REGULATOR, 1/4", 80-2008	79-145681-6
A	8	HEADER TANK, 2 PORT, 7-11/16	11-115376-6
B	8	HEADER TANK, 3 PORT, 8-9/16	11-127136-6
A, B	9	DRAIN VALVE, 1111-60	79-00979-6
	10	AIR TUBE, 3/8"	73-03871-6

MISCELLANEOUS COMPONENTS — UPPER



Model	Ref.	Description	Part Number
A, B	1	UHMW SPACER, 3/8"	94-36939-6
A	2	PURGE PIPE, 3", 2 FILTER	11-139256-5
B	2	PURGE PIPE, 5", 2 FILTER	11-139455-5
	2	PURGE PIPE, 5", 3 FILTER	11-139456-5
A, B	3	INLINE FILTER	20-121830-6
	4	FILTER, SPUNBOND, 6" X 24", 45 PLEATS	11-139468-6
	5	DRAW LATCH, ADJUSTABLE, 772-0128	28-8097-6
	6	RUBBER BUMPER	20-05314-6
	7	PURGE PIPE CLAMP, 2", 900R-32	82-16389-6

MISCELLANEOUS COMPONENTS — LOWER



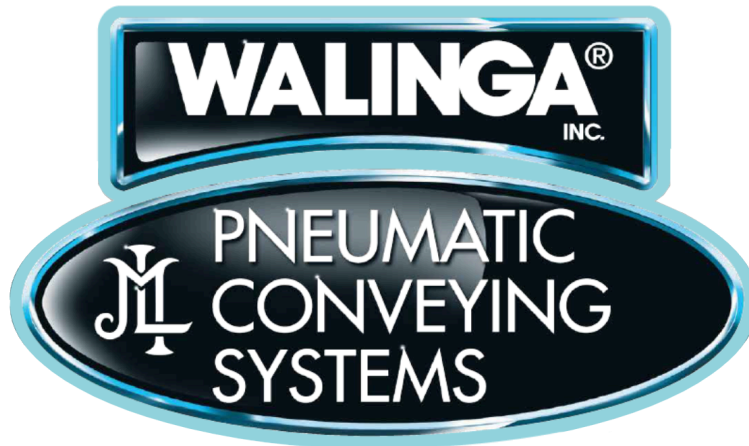
Model	Ref.	Description	Part Number
A	1	AMS SIGHT GLASS RETAINING RING	11-28763-4
		SIGHT GLASS, LEXAN	11-39020-4
	2	AIRLOCK, 1008DT, OB, SOLID TIP	30-137490-5
	3	CONNECTING LINK, 50WP	97-17157-6
	4	CABLE CLAMP, 3/8", 903NB	82-00276-6
	5	GEARBOX, 60:1, CC70-60L56C	11-18048-6
	6	MOTOR, 3/4HP, 1750RPM, 575V, 3PH, 56C	11-80719-6
B	1	CLEAN-OUT ACCESS DOOR	11-115918-5
	2	AIRLOCK, 1210DT, FXR, FLEX TIP	30-97030-5
	3	CONNECTING LINK, 50WP	97-17157-6
	4	CABLE CLAMP, 3/8", 903NB	82-00276-6
	5	GEARBOX, 50:1, CC80-50L143C	11-115910-6
	6	MOTOR, 1.5HP, 1750RPM, 575V, 3PH, 145TC, TEFC	11-86748-6



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