

EasyClean™ Filter Assembly

Customer Product Manual
Part 237 371A

OBSOLETE



Nordson Corporation welcomes requests for information, comments and inquiries about its products.

Address all correspondence to

Nordson Corporation
555 Jackson Street
Amherst, OH 44001

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EasyClean Filter Assembly

1. Safety

This section contains general safety instructions for using your Nordson equipment. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies. Refer to the National Fire Protection Association (NFPA) standard 33 and to federal, state, regulatory agency, and local codes for rules and regulations covering installation and operation of spray systems.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.



WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.

Safety Symbols (contd.)



WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.



WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.



WARNING: Hot! Risk of burns. Wear heat-protective clothing, safety goggles with side shields and/or heat-protective gloves depending on the symbol shown.



WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.



WARNING: Injection. Do not point this device at yourself or other personnel. Failure to observe this warning may result in serious injury or death.

Safety Symbols (contd.)

CAUTION: Failure to observe may result in equipment damage.



CAUTION: Hot surface. Failure to observe may result in burns.

Qualified Personnel

“Qualified personnel” is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating this equipment to see that its personnel meet these requirements.

Intended Use

WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

Nordson Corporation cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine Nordson replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your Nordson equipment
- allowing unqualified personnel to perform any task

Installation

Read the installation section of all system component manuals before installing your Nordson equipment. A thorough understanding of system components and their requirements will help you to install this equipment safely and efficiently.



WARNING: Failure to follow these safety procedures can result in personal injury or death.

- Allow only qualified personnel to install Nordson equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical, pneumatic, gas, and hydraulic connections to local code.
- Install locking, manual, shutoff valves in the air supply lines to the system. This allows you to relieve air pressure and lock out the pneumatic system before undertaking maintenance and repairs.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Ground all electrically conductive equipment. Ungrounded conductive equipment can store a static charge which could ignite a fire or cause an explosion if a hot spark is discharged.
- Route electrical wiring, electrostatic cables, and air hoses and tubing along a protected path. Make sure they will not be damaged. Do not bend electrostatic cables around a radius of less than 6 in. (152 mm).
- Install safety interlocks and approved, fast-acting fire detection systems. These shut down the spray system and any flammable liquid supply if a ventilation or electrical problem occurs, a fire is detected, or other emergency situation develops.

Installation (contd.)

- Make sure the spray area floor is conductive to ground and that the operator's platform is grounded.
- Use only designated lifting points or lugs to lift and move heavy equipment. Always balance and block loads when lifting to prevent shifting. Lifting devices must be inspected, certified, and rated for a greater weight than the equipment being lifted.
- Do not use unapproved fluid hoses. Solvents may cause them to deteriorate rapidly which may allow flammable or pressurized material to escape.
- Protect components from damage, wear, and harsh environmental conditions.
- Allow ample room for maintenance, material supply container drop-off and loading, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments to their judgement or reaction times, should operate this equipment.

Read all component manuals before operating this equipment.

A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks, locked-out electrical disconnects, or pneumatic valves.

Operation (contd.)

- Know where *EMERGENCY STOP* buttons, shutoff valves, and fire extinguishers are located. Make sure they work. If a component malfunctions, shut down and lock out the equipment immediately.
- Before operating, make sure all conductive equipment, objects being sprayed, and fluid containers are connected to a true earth ground.
- Never operate equipment with a known malfunction or leak.
- Never point handguns or applicator nozzles at yourself or other persons.
- Never touch exposed electrical connections on equipment while the power is ON.
- Do not operate the equipment at pressures higher than the rated maximum working pressure of any component in the system.
- Shut off moving equipment before taking measurements or inspecting workpieces.
- Know the pinch points, temperatures, pressures, and material composition for all equipment that you are working with. Recognize potential hazards associated with these and exercise appropriate caution.
- Wear shoes with conductive soles, such as leather, or use grounding straps to maintain a connection to ground when working with or around electrostatic equipment.
- Do not wear or carry metallic objects (jewelry or tools) while working with or around electrostatic equipment. Ungrounded metal can store a static charge and cause harmful shocks.
- Maintain skin-to-metal contact between your hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If wearing gloves, cut away the palm or fingers.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments to powder spray guns.
- If you notice electrical arcing in a spray area, shut down the system immediately. An arc can cause a fire or explosion.
- Keep parts of the body or loose clothing away from rotating parts. Remove personal jewelry and cover or tie back long hair.

Operation (contd.)

- Wear National Institute of Occupational Safety and Health (NIOSH) approved respirators while operating spray equipment and when performing maintenance and cleaning tasks.
- Wear eye protection when operating spray equipment.
- Wear gloves and protective clothing to protect your skin from materials.
- Keep paint pumps, pressure pots, and containers of flammable coating materials or solvents far enough away from spray booths to prevent their inclusion in a booth fire.
- Do not smoke in the spray area. A lit cigarette could ignite a fire or cause an explosion.
- Treat all high-pressure fittings and hoses as if they could leak. High-pressure compressed air can be injected under the skin and cause serious injury or death.
- Do not use materials that will corrode the equipment.
- Do not attempt to operate electrical equipment if standing water is present.
- Wash exposed skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove coating materials from your skin.

Less Obvious Dangers

Operators should also be aware of less-obvious dangers in the workplace that often cannot be completely eliminated:

- exposed surfaces on the equipment which may be hot or have sharp edges and cannot be practically safeguarded
- electrical equipment which may remain energized after the equipment has been shut off
- vapors and materials which may cause allergic reactions or other health problems
- automatic hydraulic, pneumatic equipment, or mechanical parts that may move without warning
- unguarded, moving mechanical assemblies

Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power. Close and lock out hydraulic and pneumatic shutoff valves and relieve pressures.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with Nordson equipment are permitted to service this equipment.

- Always wear appropriate protective clothing and use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.
- Relieve air and fluid pressures before servicing equipment. Follow the specific instructions in this manual.
- Use only genuine Nordson replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.



WARNING: Note the flash point of the cleaning solvent used. Only use controlled methods and equipment, such as temperature-controlled or explosion-protected heaters, to heat cleaning solvent. Observe explosion-prevention regulations and follow applicable safety instructions.

- Refer to the MSDS before using solvents to clean this equipment. The MSDS will provide use, storage, and disposal information about the solvent. Read this information carefully and follow instructions.

Maintenance and Repair (contd.)

- Never use an open flame to clean the unit or components of the unit.
- Do not store flammable materials in the spray area or room. Keep paint pumps, pressure pots, and containers of flammable coating materials or solvents far enough away from spray booths to prevent their inclusion in a booth fire. If a fire or explosion occurs, flammable materials in the area will increase the chances and the extent of personal injuries and property damage.
- Make sure that the room where you are working is sufficiently ventilated. Avoid breathing vapors over prolonged periods of time.
- Check interlock systems periodically to ensure their effectiveness.



WARNING: Operating faulty or electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program.

- Check all ground connections periodically with a megohm meter. Resistance to ground must not exceed one megohm. If sparks or arcing occur, shut down the system immediately.
- Connect all disconnected equipment ground cables and wires after servicing the equipment. Ground all conductive equipment.



WARNING: Service lines connected to panel disconnect switches will still be energized unless power is shut off at another disconnect ahead of the panel. Make sure the power is off before servicing. Wait 5 minutes for capacitors to discharge after shutting off the electrical power.

- Turn off the electrostatic power supply and ground the gun electrode before adjusting or cleaning the nozzles, fluid tips, or air caps.
- If a “power on” test is required, perform the test carefully and then shut off and lock out power as soon as the test is over.
- Never troubleshoot the power supply without first disconnecting all external power supplies and discharging the high-voltage capacitors with an insulated screwdriver.
- Ground electrodes and electrostatic cable ends before touching them.

Maintenance and Repair (contd.)

- Do not attempt to service electrical equipment if there is standing water present. Do not service electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Keep high-voltage connection points clean and insulated with dielectric grease or oil.
- Do not attempt to service a moving piece of equipment. Shut off the equipment and lock out power. Secure equipment to prevent uncontrolled movement.

Material and Solvent Precautions



WARNING: Hot! Risk of burns. Wear heat-protective clothing, eye protection with side shields and/or heat-protective gloves.



Heated materials may cause severe burns on contact. Remember that some materials, even solid materials, may retain heat for some time. If you are burned by a heated material, immediately cool the affected skin with lots of cool, clean water. Do not try to remove hot, melted material from the skin. Seek immediate medical attention.

High-pressure fluids, unless they are safely contained, are extremely hazardous. A jet of high-pressure fluid can act like a knife or needle, penetrate skin and muscle, and inject itself into your body. Injected fluids can cause toxic poisoning.

Do not treat an injection injury as minor. Seek medical care immediately. Inform the medical staff at the hospital that you have an injection injury and identify the fluid that was injected. If possible, give the doctor copies of the MSDS for the injected fluid and for any additives, such as solvents, that are in the injected fluid.

Also, Nordson recommends that you carry a National Safety Equipment Manufacturers Association (NSEMA) wallet card to give to emergency medical staff in the event of an injection injury. These cards are supplied with the equipment. Additional cards are available free from Nordson Corporation.

**Material and Solvent
Precautions** (contd.)

WARNING: Injection hazard. Do not go near a known leak in a hose or fitting, and stay clear of all spray nozzles or orifices. Do not point an applicator at yourself or other personnel. The high-pressure fluid stream can penetrate skin and inject fluid into the body causing serious injury or death.

To prevent an injection injury, take some basic safety precautions when operating your equipment.

- Always handle spray applicators carefully. Do not point a pressurized gun at yourself or other personnel.
- Never place hands, fingers, or other parts of your body directly over a spray nozzle or in front of a leak in a high-pressure system.
- Never “back-flush” the nozzles. Blocking a nozzle causes the high-pressure fluid to reverse direction and can lead to an injection injury.
- Always relieve system pressure before servicing equipment. Trigger all applicators and bleed off system pressure.

Halogenated hydrocarbon solvents can cause an explosion when used with aluminum components in a pressurized fluid pumping system (pumps, heaters, filters, valves, spray guns, and tanks). The explosion could cause serious bodily injury, death, or substantial property damage. No available stabilizers will prevent this violent reaction from happening.



WARNING: Never use halogenated hydrocarbon solvents to clean aluminum parts or to flush any system. Cleaning agents, coatings and paints, or adhesives may contain halogenated hydrocarbon solvents. Obtain and read the MSDS for each material and solvent being used.

- Use nonhalogenated solvents.
- Contact your solvent supplier to determine whether your existing materials and solvents contain halogenated hydrocarbons or to obtain a suitable, nonhalogenated hydrocarbon solvent for cleaning and flushing your system.

**Material and Solvent
Precautions** (contd.)

- Refer to Table 1. Check the labels on your solvent containers. Halogenated hydrocarbon solvents can be recognized if any of the following elements are listed in the name of the product or as an ingredient:

<u>Element</u>	<u>Symbol</u>	<u>Prefix</u>
Flourine	F	“Flouro-”
Chlorine	Cl	“Chloro-”
Bromine	Br	“Bromo-”
Iodine	I	“Iodo-”

If you are now using halogenated hydrocarbon solvents in pressurized systems with aluminum components, perform the following steps:

- Pump the system empty, shut off the pumps, and relieve the system pressure.
- Disassemble and inspect the system components. Replace any damaged or corroded parts.
- Thoroughly clean all noncorroded parts with nonhalogenated hydrocarbon.
- Contact your coatings, solvent, or adhesive supplier for a nonhalogenated solvent to thoroughly flush the entire system before operating it.
- If you must continue to use halogenated hydrocarbon solvents, consult your Nordson representative about compatible Nordson components.

**Material and Solvent
Precautions** (contd.)

Table 1 Solvents Containing Halogenated Fluids

Chlorinated Solvents	Iodinated Solvents	Brominated Solvents	Fluorocarbon Solvents
Carbon Tetrachloride	Ethyl Iodide	Ethylene Dibromide	Dichlorofluoromethane
Chloroform	Methyl Iodide	Methyl Bromide	Trichlorofluoromethane
Ethylene Dichloride	N-butyl Iodide	Methylene Chlorobromide	Freon
Methylene Chloride	Propyl Iodide		
1-1-1 Trichloroethane			
Monochlorobenzene			
Orthodichlorobenzene			
Perchloroethylene			
Trichloroethylene			

Disposal

Dispose of equipment and materials used in operation and cleaning according to your local regulations.

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2. Description

The EasyClean filter assembly is intended for use as a primary fluid filter plumbed to the outlet of a single fluid pump. It acts as a supplemental filter and does not replace existing filters installed on downstream application devices (guns).

Introduction

This manual provides general information about the Nordson EasyClean filter assembly and how to integrate it into your material coating operation. If you require additional information, contact your Nordson Corporation representative.

The EasyClean Filter Assembly

See [Figure 1](#), which shows the EasyClean filter assembly as it is configured on its panel. The EasyClean filter assembly can be divided into four main sections:

- fluid inlet components
- filter components
- fluid outlet components and check valves
- orifice block with restrictor

The Fluid Outlet Components and Check Valves

See [Figure 1](#). In normal operating conditions, fluid flows through your fluid supply plumbing and into the fluid inlet where its pressure is measured by the filter inlet gauge (9). Fluid passes through the filter inlet valve (10) and into the filter housing.

The Filter Components

Fluid flows from the outside of the filter element (7) to the inside of the element. Because of this unique element design, contaminants accumulate on the outside of the filter screen, away from the fluid flowing to downstream components. When the filter becomes blinded (clogged), the operator can rotate the filter tee handle (11) 3–4 revolutions to wipe the filter clean without stopping production. The contaminants settle at the bottom of the filter bowl (8). When the filter bowl valve (6) is opened, the operator can perform a backflush to drain contaminants out of the filter into a waste container.

The Fluid Outlet Components and Check Valves

Fluid flows out of the filter through a series of check valves (12) and into the filter outlet valve. The check valves prevent fluid from flowing back into areas that it is not supposed to. The filter outlet valve (2) diverts flow from down stream components to the drain. The filter outlet is also equipped with a drain that is used when air is purged from the system. By observing the amount of pressure drop between the filter inlet gauge (9) and outlet gauge (1), the operator can determine if the filter is clogged with contaminants.

The Orifice Block with Restrictor

The orifice block (4) and restrictor (5) are installed in the filter assembly to regulate fluid flow. During normal operation (when the filter inlet valve (10) is in its normal position), fluid does not flow toward the orifice block. During backflush operations (when the filter inlet valve is turned 90 degrees), fluid flows through the orifice block and restrictor. Because of the restrictor and orifice design, only a portion of the fluid flows through the restrictor and the majority of the fluid flows to the filter outlet. During a bypass of the filter assembly (when the filter element (7) is changed), the orifice block valve (3) is closed (rotated 90 degrees) so that no fluid is able to pass through the orifice block and restrictor.

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The EasyClean Filter Assembly
(contd.)

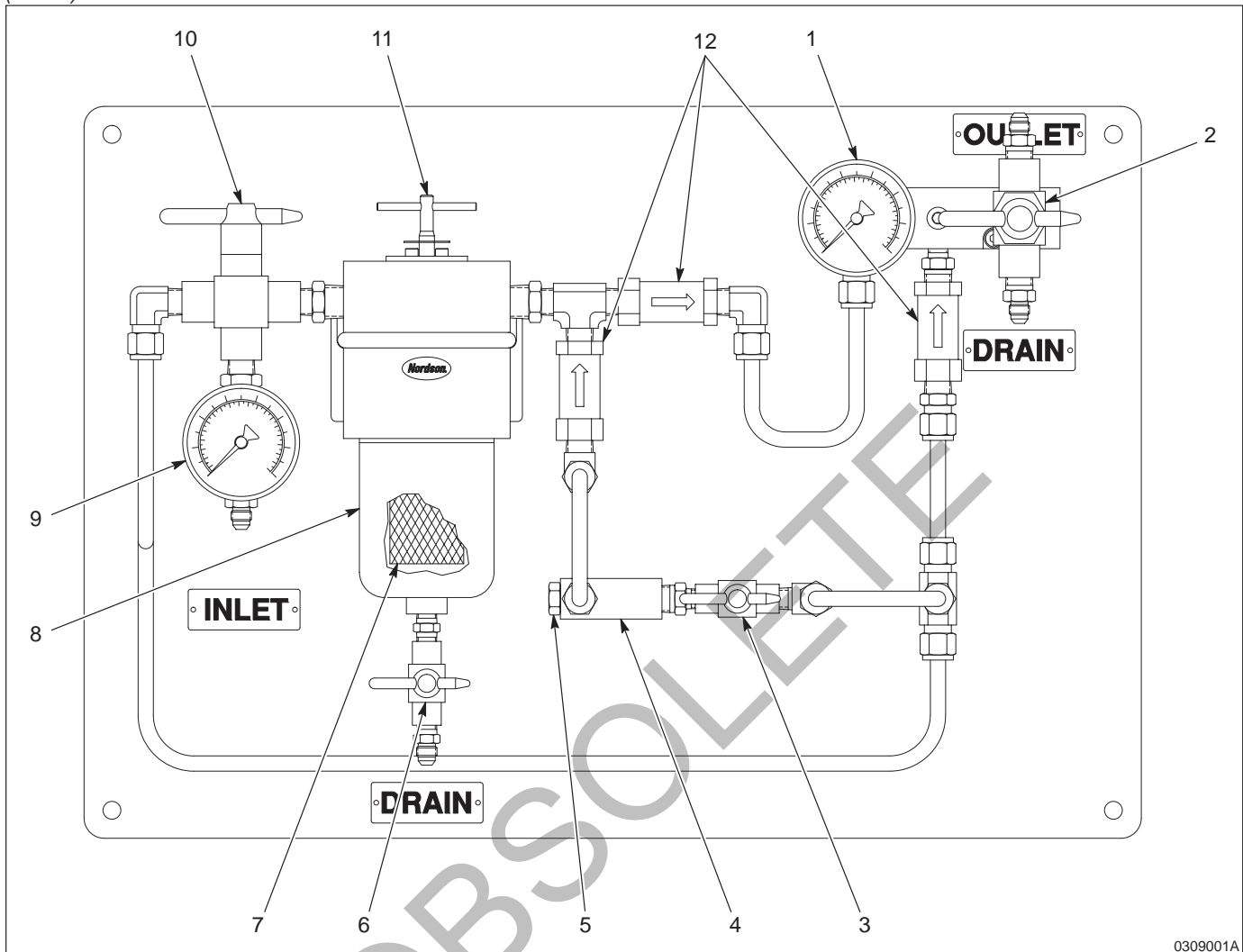


Fig. 1 EasyClean filter assembly components

- | | | |
|------------------------|----------------------|------------------------|
| 1. Filter outlet gauge | 5. Restrictor | 9. Filter inlet gauge |
| 2. Filter outlet valve | 6. Filter bowl valve | 10. Filter inlet valve |
| 3. Orifice block valve | 7. Filter element | 11. Filter tee handle |
| 4. Orifice block | 8. Filter bowl | 12. Check valves |

Specifications

Following are the specifications for the EasyClean filter assembly:

Maximum Operating Pressure:	103 bar (1500 psi)
Maximum Operating Temperature:	149 °C (300 °F)—filter housing and element 66 °C (150 °F)—ball valves
Maximum Flow Rate:	0.19 liters/second (3 GPM)
Panel Weight:	20 kg (45 lb) (approximate)
Panel Size (width x height x depth):	12.5 x 40.6 x 22.9 cm (26.0 x 16.0 x 9.0 in.)
Minimum Bowl Clearance:	20 cm (8 in.)
Fluid Connectors (inlet, outlet, outlet drain, and filter bowl drain):	1/2-20 JIC
Wetted Components:	300 series stainless steel
Filter Screen:	125 microns nominal, 0.005-inch spacing

3. Installation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

This section contains general installation procedures for the EasyClean filter assembly.

Mounting Requirements

When mounting the EasyClean filter assembly, consider the following requirements. The mounting structure must

- be strong enough to support the 20.4-kg (45-lb) filter assembly securely, not allowing any movement of the panel
- allow a minimum of 20.3 centimeters (8 inches) of clearance below the filter bowl (for filter screen service access and clearance for the drain lines)
- permit you to mount the filter assembly in relatively close proximity to the pump and/or any type of header coming off the main supply line

Mounting the EasyClean Filter

NOTE: Material flows through the fluid lines from left to right. Nordson Corporation suggests that you install the filter assembly panel in the line in the same direction of flow, if possible.

Follow these procedures to mount the EasyClean filter assembly:

1. Choose a mounting structure and location based on the requirements listed in *Mounting Requirements*.
2. Secure the filter assembly to the support structure with a minimum of four $\frac{3}{8}$ -inch bolts.
3. Connect soft plumbing between the filter drain and outlet drain to a waste container(s) to minimize post-maintenance cleanup.
4. Change the inlet and outlet fittings ($\frac{1}{2}$ -20 JIC) to the proper size Swagelok fittings to match your line size. This will allow you to hard plumb the EasyClean panel into the system.

Prior to Startup

Prior to integrating the filter assembly into production, perform the following procedures:

- flush the filter assembly with solvent and introduce coating material
- purge air from the filter assembly

Flushing the Filter Assembly with Solvent and Introducing Coating Material

Prior to first-time startup, you must flush the entire filter assembly with a compatible solvent. This will make sure that any contamination introduced into the filter assembly during manufacturing, assembly, or installation has been purged and will not be introduced to any downstream components. While following these steps, observe the material going into the waste container and make sure that all of the solvent has been purged and only coating material is exiting the drains.

Flushing with Solvent

Follow these procedures to flush your EasyClean filter assembly with solvent:

1. Connect a compatible solvent supply to the inlet connector. The solvent supply should be under low pressure (1.4–6.9 bar (20–100 psi)) and have a shut off valve, referred to as the solvent valve in the Table 2.
2. Be sure to connect drain lines to a suitable waste container before beginning the flushing procedure.
3. Install a plug in the outlet port.
4. Place the valves in the positions designated in Table 2. Table 2 shows the steps to follow for flushing and the required position of the valves for each step. See Figure 1 for valve locations.

Table 2 Flushing the EasyClean Filter Assembly with Solvent

Step	Inlet Valve (item #10)	Outlet Valve (item #2)	Orifice Block Valve (item #3)	Filter Bowl Valve (item #6)	Solvent Valve
1	Bypass	Drain	On	Off	Off
2	Bypass	Drain	On	Off	On
3	Bypass	Drain	On	Off	Off
4	Normal	Outlet	On	On	On
5	Normal	Outlet	On	Off	On
6	Normal	Drain	On	Off	On
7	Normal	Drain	On	Off	Off
8	Bypass	Outlet	On	On	On
9	Bypass	Outlet	On	Off	Off

5. When all of the solvent had been purged, coating material can be introduced into the system.

Introducing Coating Material

The following steps and valve positions should be followed to introduce the coating material and make sure that the solvent has been purged from the filter assembly.

Follow these procedures to introduce coating material into your EasyClean filter assembly after completing a solvent flush:

1. Disconnect the solvent supply.
2. Connect the coating supply to the filter assembly inlet.
3. Set the pressure on the pump at 1.4–6.9 bar (20–100 psi).
4. Make sure that the outlet port is still plugged and that the drain ports are still connected to a suitable waste container.
5. Place the valves in the positions designated in Table 3. Table 3 shows the steps to follow for flushing and the required position of the valves for each step. [See Figure 1](#) for valve locations.

Table 3 Introducing coating Material into the EasyClean Filter Assembly

Step	Inlet Valve (item #10)	Outlet Valve (item #2)	Orifice Block Valve (item #3)	Filter Bowl Valve (item #6)	Coating Pump
1	Bypass	Drain	On	Off	Off
2	Bypass	Drain	On	Off	On
3	Bypass	Drain	On	Off	Off
4	Normal	Outlet	On	On	On
5	Normal	Outlet	On	On	Off
6	Normal	Drain	On	Off	On
7	Normal	Drain	On	Off	Off
8	Bypass	Outlet	On	On	On
9	Bypass	Outlet	On	On	Off
10	Normal	Outlet	On	Off	Off

6. Connect the outlet port to the downstream part of the system.
7. Set the filter inlet valve to the normal position.
8. Set the filter outlet valve to the outlet position.
9. Turn the coating pump on and set the desired pressure.

Purging Air from the Filter Assembly

During initial installation or after maintenance procedures, purge the filter assembly of any air that may have been introduced into the fluid path.

NOTE: To purge air from the system, you will have to briefly shut down production.

1. Verify that the outlet drain is soft-plumbed to a waste bucket and not to an open fitting.
2. Turn the filter outlet valve 90 degrees. This action changes the direction of fluid flow to the drain.
3. When all air has been adequately purged from the system, return the filter outlet valve to its normal operating position (with the handle pointed at the outlet connector) and begin/resume production.

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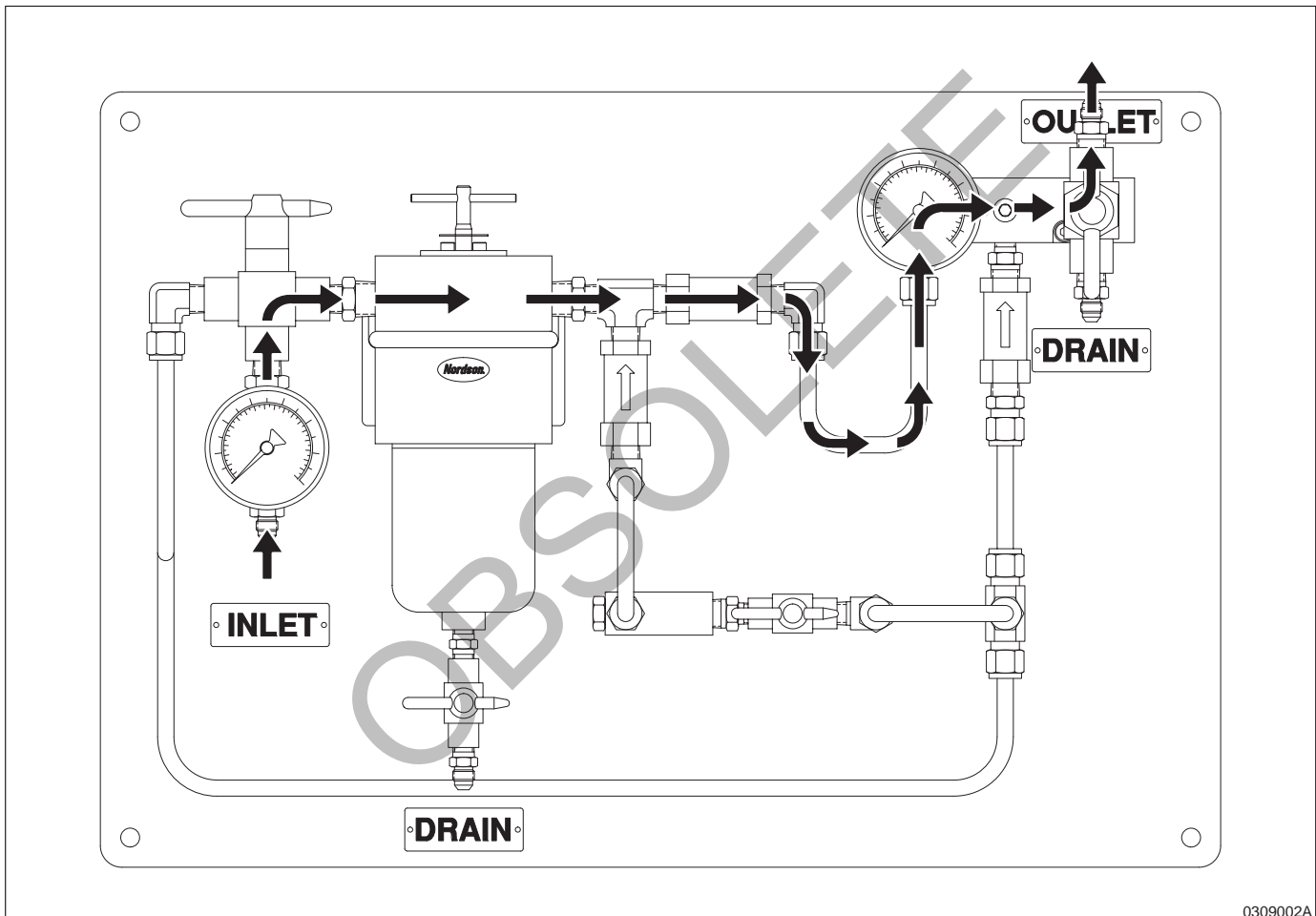
4. Operation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

The EasyClean filter assembly is equipped with two liquid-filled gauges, one on either side of the filter. By virtue of their placement, these gauges identify any excessive pressure drop at the filter outlet gauge due to blinding (blocking) of the filter element. You can quickly identify the need for filter maintenance and remedy the blockage within seconds, eliminating costly down time.

See Figure 2, which illustrates the path of fluid flow and normal valve positions during normal operation of the EasyClean filter assembly.



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Fig. 2 Fluid flow and valve positions during normal operation

4. Operation (contd.)

Table 4 lists the various valve positions during normal operation of the EasyClean filter. Filtered fluid flows to the downstream components when the valves are in their normal positions.

Table 4 Valve Positions during Normal Operation

Valve	Position during Normal Operation
filter inlet valve (3-way ball)	handle pointed at filter
filter outlet valve (3-way ball)	handle pointed at outlet connector
filter bowl valve (2-way ball)	handle pointed perpendicular to drain outlet
orifice block valve (2-way ball)	handle pointed horizontal in direction of fluid path, parallel to fluid lines

Cleaning the Filter

Inside the filter housing, fluid is routed from the outside of the filter screen to the inside of the filter screen, allowing contamination larger than 0.005 inches to be captured against the filter screen. As this contamination builds up, the inlet pressure remains the same but the outlet pressure decreases. Checking the fluid pressure indicated on the inlet and outlet pressure gauges can help you to note when the filter is contaminated.

After your filter assembly has been installed and in operation for some time, you will be able to determine what is an acceptable outlet pressure level. When the outlet pressure has dropped to an unacceptable level, you must clean the filter. There are two filter cleaning functions, both of which you can perform while continuing normal operation:

- scraping the filter screen
- backflushing the filter assembly

Scraping the Filter Screen

NOTE: Depending on your application, you may have to scrape the filter screen every day to maintain maximum production.

When the filter is blinded (clogged) and the filter outlet pressure has dropped to an unacceptable level, scrape the filter screen. To do so, rotate the tee handle on the top of the filter housing clockwise for 3 or 4 revolutions. The contaminants on the filter screen will settle at the bottom of the filter bowl.

Backflushing the Filter Assembly

When scraping the filter no longer returns the outlet pressure to normal, backflush the filter screen. The filter assembly has a bypass loop that maintains the fluid supply to downstream components, even during backflushing. The check valves, ball valves, and restrictor block in the assembly prevent both exposure to extremely high pressure and starvation of the system and ensure the proper flow path during backflushing.

See Figure 3, which shows the fluid flow and valve positions during backflushing operations. A portion of the bypassed fluid is routed to the outlet of the filter housing, allowing the incoming fluid to flow backwards through the filter element and out through the bowl drain when the filter bowl valve is opened. This action uses the fluid pressure to force any contamination away from the filter screen and flushes the contamination that has accumulated in the bottom of the filter bowl to a waste container.

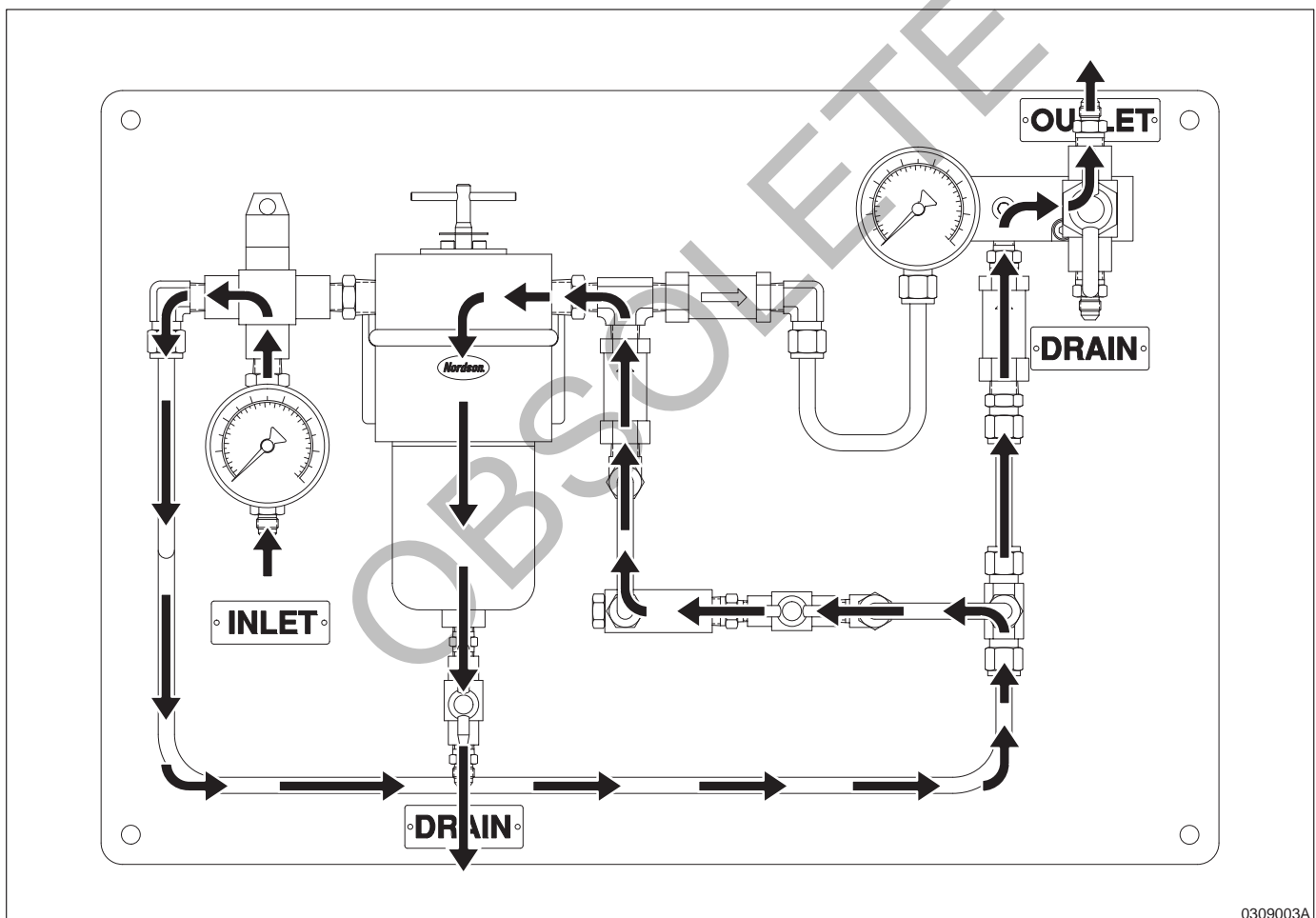


Fig. 3 Fluid flow and valve positions during backflushing

Backflushing the Filter Assembly (contd.)

To backflush the filter assembly,

1. Verify that the orifice valve is in its normal position. The orifice block and restrictor make sure that only a portion of the fluid is routed to the filter housing.
2. Remove and inspect the restrictor to make sure that there is not blockage of the orifice or damage to the O-ring.
3. Reinstall the restrictor.
4. Turn the handle of the filter inlet valve 90 degrees. This reroutes the material flow around the filter to the outlet, continuing to satisfy the downstream flow requirements.
5. Verify that the filter outlet drain is soft-plumbed to a waste container.



WARNING: Do not open the filter bowl valve during normal operation or when the filter inlet valve handle is in its normal position (pointing toward the filter housing). Failure to observe this precaution will allow fluid at full pressure to be discharged from the filter housing. This may result in starving downstream system components, equipment damage, or personal injury.

6. Open the filter bowl valve, so that the handle is pointed toward the drain outlet connector.
7. When the contaminants have been flushed from the filter bowl, close the filter bowl valve.
8. Rotate the filter inlet valve 90 degrees back to its normal position.
9. Filtered fluid is now being supplied to the downstream system components.
10. After backflushing, check the orifice and restrictor for contamination. For more information, refer to the *Cleaning and Replacing the Orifice and Restrictor* procedures in the *Repair* section of this manual.

NOTE: During backflushing, the orifice block valve should be open as shown on the assembly drawing. If the orifice block should require maintenance, this ball valve can be opened allowing the orifice block to be serviced while maintaining filtered fluid to the downstream system components.

5. Maintenance



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

NOTE: Any time maintenance procedures are performed, you must purge the system of air before returning the filter assembly to normal operation. Refer to the *Purging Air from the System* procedures in the *Installation* section of this manual.

To perform routine maintenance procedures on the EasyClean filter assembly, you must bypass the filter assembly to direct the fluid flow around the filter rather than through it. See Figure 4, which shows the fluid flow and valve positions during bypass operations.

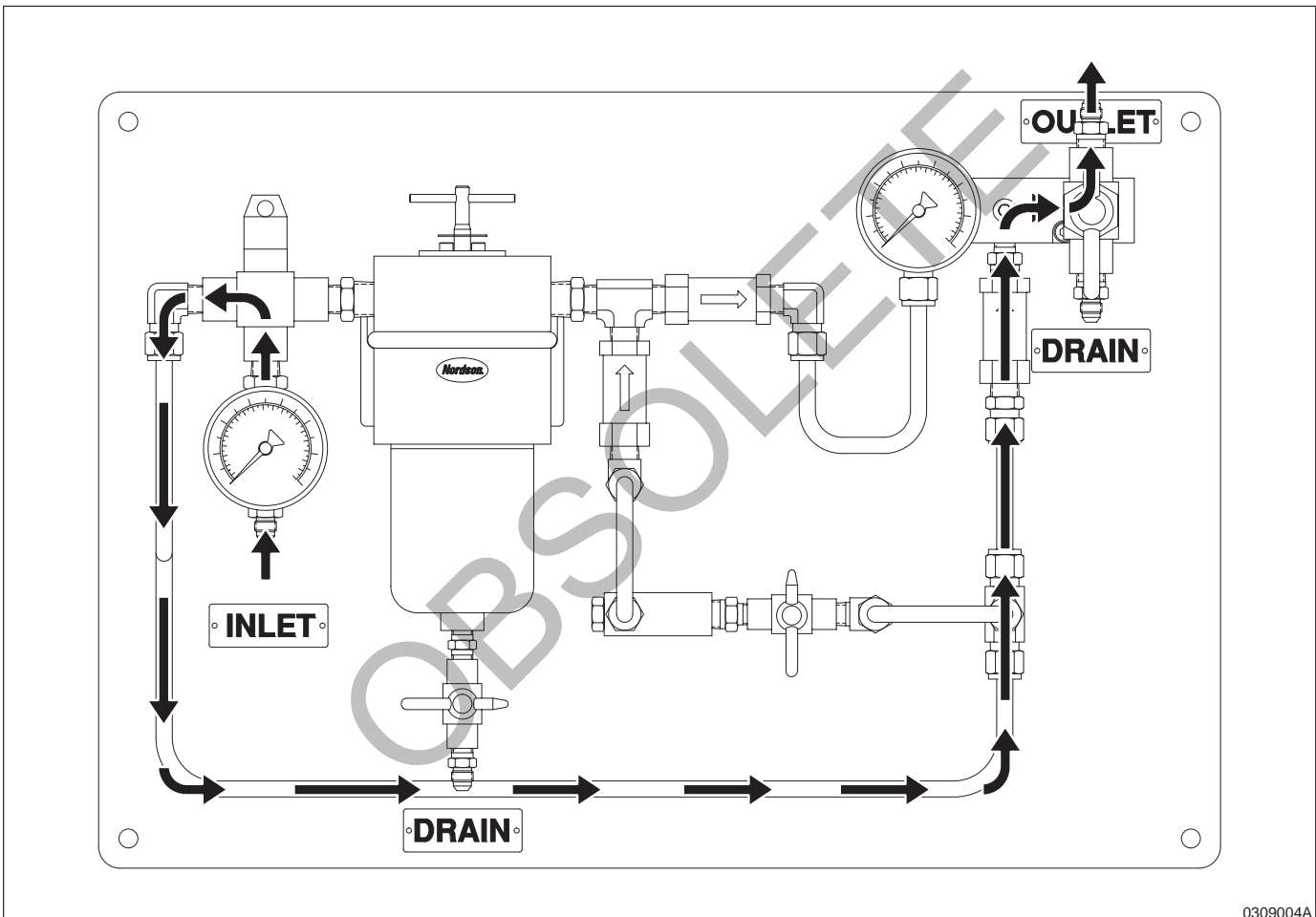


Fig. 4 Fluid flow and valve positions during bypass

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Removing the Filter Element

When scraping the filter and backflushing no longer remedy the blinding or clogging of the filter, remove the filter element for inspection and cleaning. When you remove the filter element, you will have to bypass the filter housing. This will send a stream of non-filtered fluid to downstream components. The individual filters installed at the downstream application devices should provide sufficient filtration for the duration of this procedure.

Follow these procedures to remove the filter bowl and element from the filter assembly:

1. Remove and relieve all inlet fluid and pressure.
 2. Rotate the handle of the filter inlet valve 90 degrees.
 3. Rotate the orifice block valve 90 degrees to the closed position.
 4. See Figure 5. Relieve the pressure in the filter housing (7) by slowly opening the filter bowl valve (6).
 5. Using a 1-inch wrench, grasp the flats (5) on the bottom of the filter bowl (2). Carefully turn the filter bowl counterclockwise to remove it from the filter head (1).
 6. Follow these steps to remove the filter element (3):
 - a. Remove the cotter pin (4) at the bottom of the filter element.
- NOTE:** The filter element has a left hand thread.
- b. Rotate the filter element by hand in a clockwise direction to remove it from the filter head (1).
 7. Thoroughly clean any exposed areas of the filter housing (7) with solvent and a soft, clean cloth.
 8. Inspect and clean the filter screen on the filter element (3). If the filter screen shows signs of wear, replace the filter element.
 9. Reinstall the filter element (3) to hand-tightness only. Keep in mind the left hand threads.
 10. Clean the filter bowl (2) compatible solvent and clean, lint-free wipes.
 11. Reinstall the filter bowl (2) on the filter head (1).

Removing the Filter Element
(contd.)

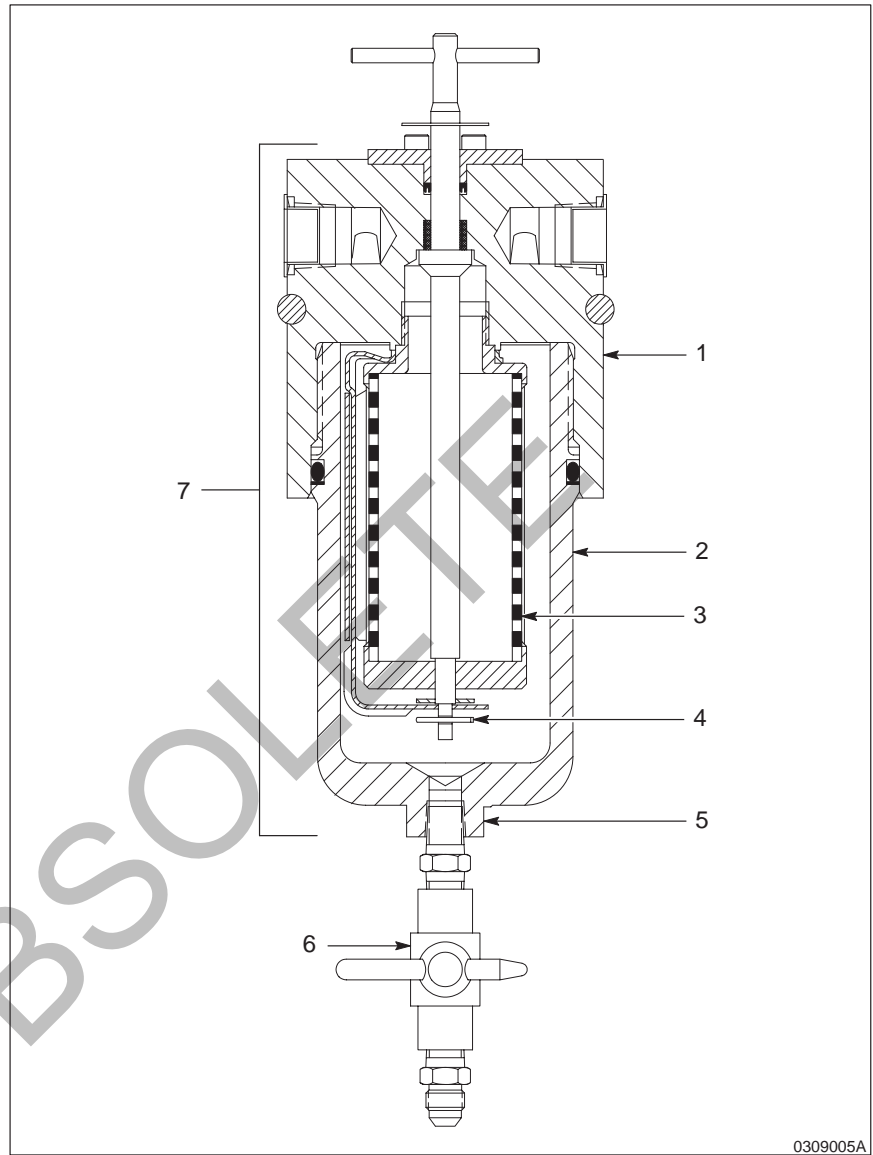


Fig. 5 Removing the filter element from the EasyClean filter assembly

- | | |
|-------------------|----------------------|
| 1. Filter head | 5. Flats |
| 2. Filter bowl | 6. Filter bowl valve |
| 3. Filter element | 7. Filter housing |
| 4. Cotter pin | |

Removing the Filter Element
(contd.)

12. Return the system to normal operating mode by rotating the inlet ball valve to the run position (pointing at the filter).
13. Return the orifice block valve to its normal operating position (in line with the fluid flow).
14. Purge any air from the system. Refer to the *Purging Air from the System* procedures in the *Installation* section of this manual.

6. Troubleshooting



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

This section contains troubleshooting procedures. These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.

Problem	Possible Cause	Corrective Action
<p>1. Outlet filter gauge pressure decreased to unacceptable level; inlet filter gauge pressure normal</p>	<p>Contamination built up on outside of filter screen</p> <p>Filter screen dirty</p>	<p>Rotate the filter tee handle clockwise 3 or 4 revolutions. If the pressure does not return to acceptable levels, proceed to next possible cause</p> <p>Backflush the filter screen. Refer to the <i>Backflushing the Filter Assembly</i> procedures in the <i>Operation</i> section of this manual.</p>

7. Repair



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

If any ball valves, fittings, gauges, or tubing on the EasyClean filter assembly should need to be replaced, use standard procedures. Periodically, you will need to clean and replace the restrictor, orifice, and the check valves. How often is dependent upon your operation and the coating material used.

Cleaning and Replacing the Orifice and Restrictor



WARNING: Remove all fluid pressure from the EasyClean filter assembly before performing this procedure. Failure to observe this warning could result in equipment damage, personal injury, or death.

When you need to clean the orifice and restrictor:

- a. Unscrew the restrictor from the orifice block using an 1¹/₁₆-inch wrench.
- b. Check the restrictor for wear. Replace the restrictor, if worn.
- c. Replace the O-rings and orifice.
- d. Install the restrictor with new orifice and O-rings into the orifice block.

8. Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (–) is used when the part number applies to all parts in the illustration.

The six-digit number in the Part column is the Nordson Corporation part number. A series of dashes in this column (– – – – –) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

Item	Part	Description	Quantity	Note
–	000 000	Assembly	1	
1	000 000	• Subassembly	2	A
2	000 000	• • Part	1	

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

Using the Illustrated Parts List
(contd.)

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

**EasyClean Filter Assembly
Parts**

See Figures 6 and 7, as necessary.

Item	Part	Description	Quantity	Note
—	241 677	Filter assembly, EasyClean	1	
1	241 678	• Filter, EasyClean, stainless steel	1	
2	241 682	• Manifold, stainless steel, 1/4 NPT	1	
3	179 366	• Accessory group, M I, M4, 0.010	1	B
4	248 534	• Block, orifice	1	
5	169 623	• Holder, restrictor, mini-insert	1	B
6	115 799	• Valve, check, stainless steel	3	
7	115 135	• Gauge, hydraulic pressure, with seal	2	
8	241 699	• Valve, 3-way, 3/8 NPT, 90 degrees, stainless steel	2	
9	241 768	• Valve, 2-way, 1/4 NPT, stainless steel	2	
10	971 716	• Tee, union, stainless steel, 3/8	1	
11	971 211	• Connector, male, stainless steel, 3/8 x 3/8	2	C
12	971 210	• Connector, male, stainless steel, 3/8 x 1/4	1	C
13	971 511	• Connector, male, elbow, stainless steel, 3/8 x 3/8	3	
14	971 510	• Connector, male, elbow, stainless steel, 3/8 x 1/4	1	
15	973 617	• Nipple, hex, 1/2 x 3/8, stainless steel	1	C
<p>B: See Figure 8 and refer to the <i>Orifice Accessory Group</i> parts list later in this section. C: Use pipe/thread/hydraulic sealant, part 900 481, when assembling this part.</p>				
<i>Continued on next page</i>				

EasyClean Filter Assembly
Parts (contd.)

Item	Part	Description	Quantity	Note
16	973 971	• Nipple, hex, $\frac{3}{8}$ x $\frac{1}{4}$ x 1.4, stainless steel	4	C
17	973 059	• Nipple, hex, $\frac{3}{8}$ x $\frac{3}{8}$ x 1.45, stainless steel	1	C
18	973 029	• Nipple, hex, $\frac{1}{4}$ x $\frac{1}{4}$ x 1.45, stainless steel	1	C
19	973 266	• Tee, pipe, hydraulic, $\frac{3}{8}$, stainless steel	1	
20	972 099	• Connector, male, $\frac{1}{2}$ -20 x $\frac{3}{8}$ NPT, stainless steel	3	C
21	972 029	• Connector, male, $\frac{1}{2}$ -20 x $\frac{1}{4}$ NPT, stainless steel	1	C
22	973 609	• Bushing, pipe, hydraulic, $\frac{1}{2}$ x $\frac{3}{8}$, stainless steel	1	C
23	703 191	• Plug, pipe, socket flush, $\frac{1}{4}$, stainless steel	4	C
24	972 926	• Tee, pipe, male, $\frac{3}{8}$ NPT, stainless steel	1	C
25	981 485	• Screw, socket, $\frac{5}{16}$ -18 x 1.500, bl	2	
26	241 694	• Tubing, stainless steel, 0.375, cv/man	1	
27	241 695	• Tubing, stainless steel, 0.375, 3wbv/tee	1	
28	241 696	• Tubing, stainless steel, 0.375, tee/cv	1	
29	241 697	• Tubing, stainless steel, 0.375, tee/bv	1	
30	241 698	• Tubing, stainless steel, 0.375, circ/cv	1	
NS	241 679	• Bracket, mounting , EasyClean filter	1	A
NS	981 326	• Screw, hex, $\frac{5}{16}$ -18 x 0.50 cap, zinc	2	A
NS	983 050	• Washer, flat, 0.344 x 0.625 x 0.063, zinc	2	A
NS	900 481	• Adhesive, pipe/thread/hydraulic sealant (PSNC)	AR	

NOTE A: These parts are used to mount the EasyClean filter to the back panel.
NOTE C: Use pipe/thread/hydraulic sealant, part 900 481, when assembling this part.
AR: As Required
NS: Not Shown

EasyClean Filter Assembly
Parts (contd.)

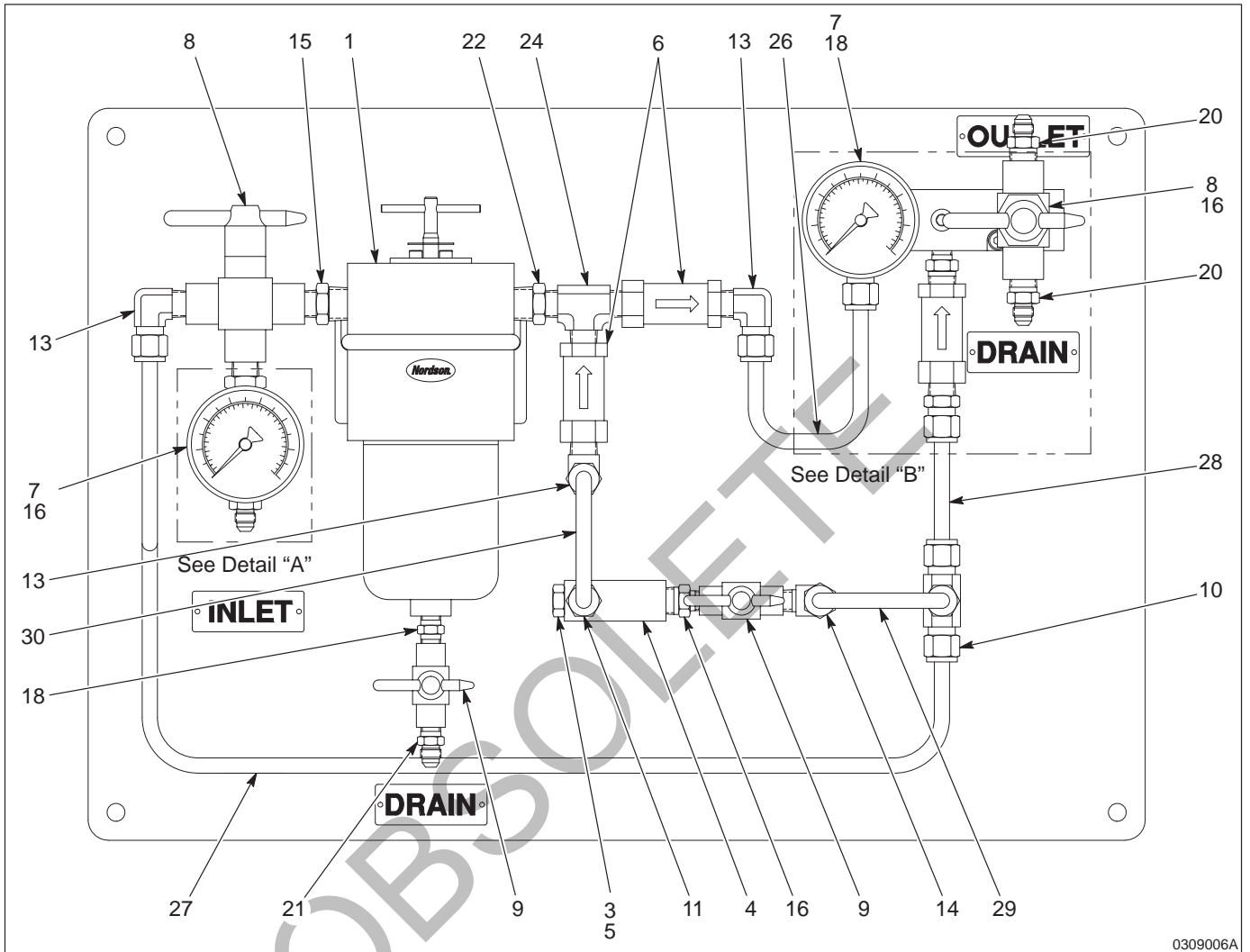


Fig. 6 EasyClean filter assembly components

EasyClean Filter Assembly
Parts (contd.)

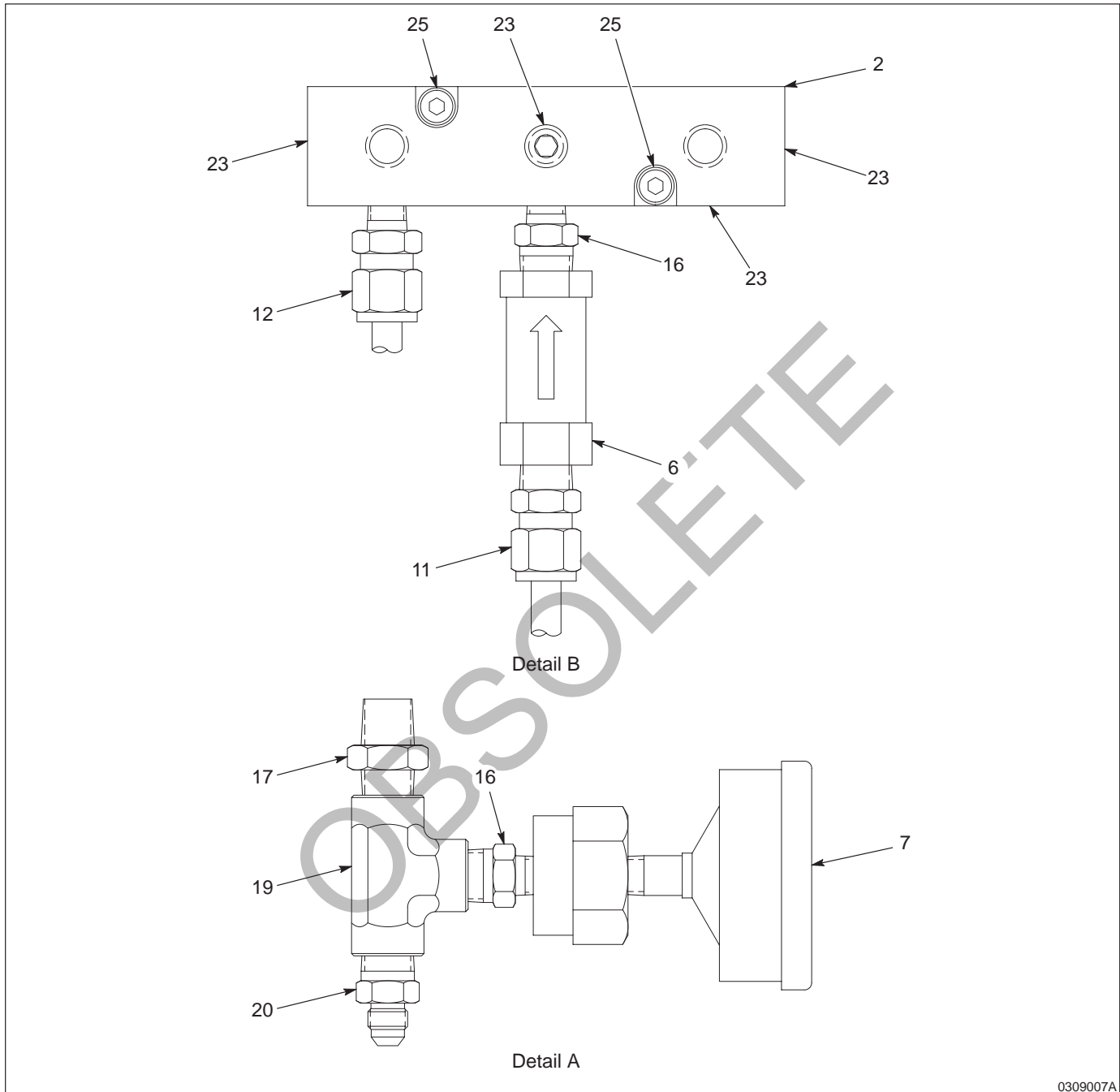


Fig. 7 EasyClean filter assembly components

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Recommended Spare Parts

See Figures 6 and 7, as necessary. The following parts list details the recommended spare parts for the EasyClean filter assembly.

Part	Description	Note
247 816	Kit, shaft seal, EasyClean	1
247 817	Kit, O-ring, bowl, EasyClean	1
247 819	Kit, element, EasyClean filter	1
179 366	Accessory group, M1, M4, 0.010	1

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Orifice Accessory Group

See Figure 8.

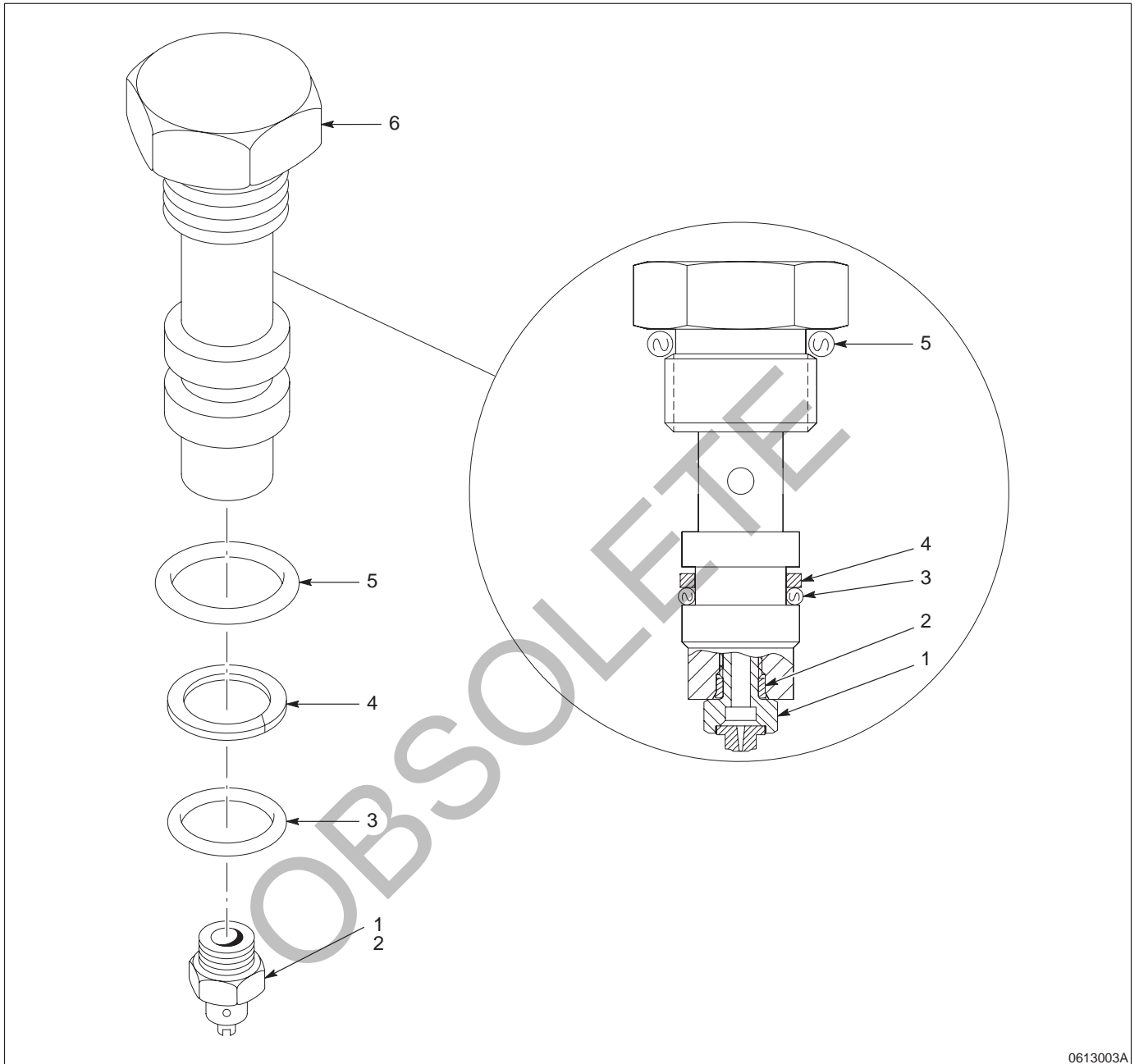
Item	Part	Description	Quantity	Note
—	179 366	Accessory group, MI, M4, 0.010 in., 0.05 GPM	1	A
1	122 318	• Restrictor, MI, M4, 0.010, orifice	1	
2	121 709	• • Seal, ring, M4	1	
3	940 113	• O-ring, Viton, blk, 0.313 x 0.438	1	
4	954 028	• Back-up ring, single, $\frac{5}{16} \times \frac{7}{16}$	1	
5	945 046	• O-ring, Viton, blk, $\frac{5}{16}$ tube	1	
6	169 623	Holder, restrictor, mini-insert	1	B

NOTE A: The flow rate (GPM) is based on H2O @ 500 psi.

B: The restrictor holder is not included with this kit. It is shown only for clarity of parts.

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Orifice Accessory Group (contd.)



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Fig. 8 Orifice accessory group parts

Orifice Cleaning Parts

Item	Part	Description	Quantity	Note
NS	094 000	Broach, nozzle, 0.003	1	A
NS	901 905	Brush, nozzle	1	A

NOTE A: Order this part to clean the restrictor, part 122 318.
 NS: Not Shown

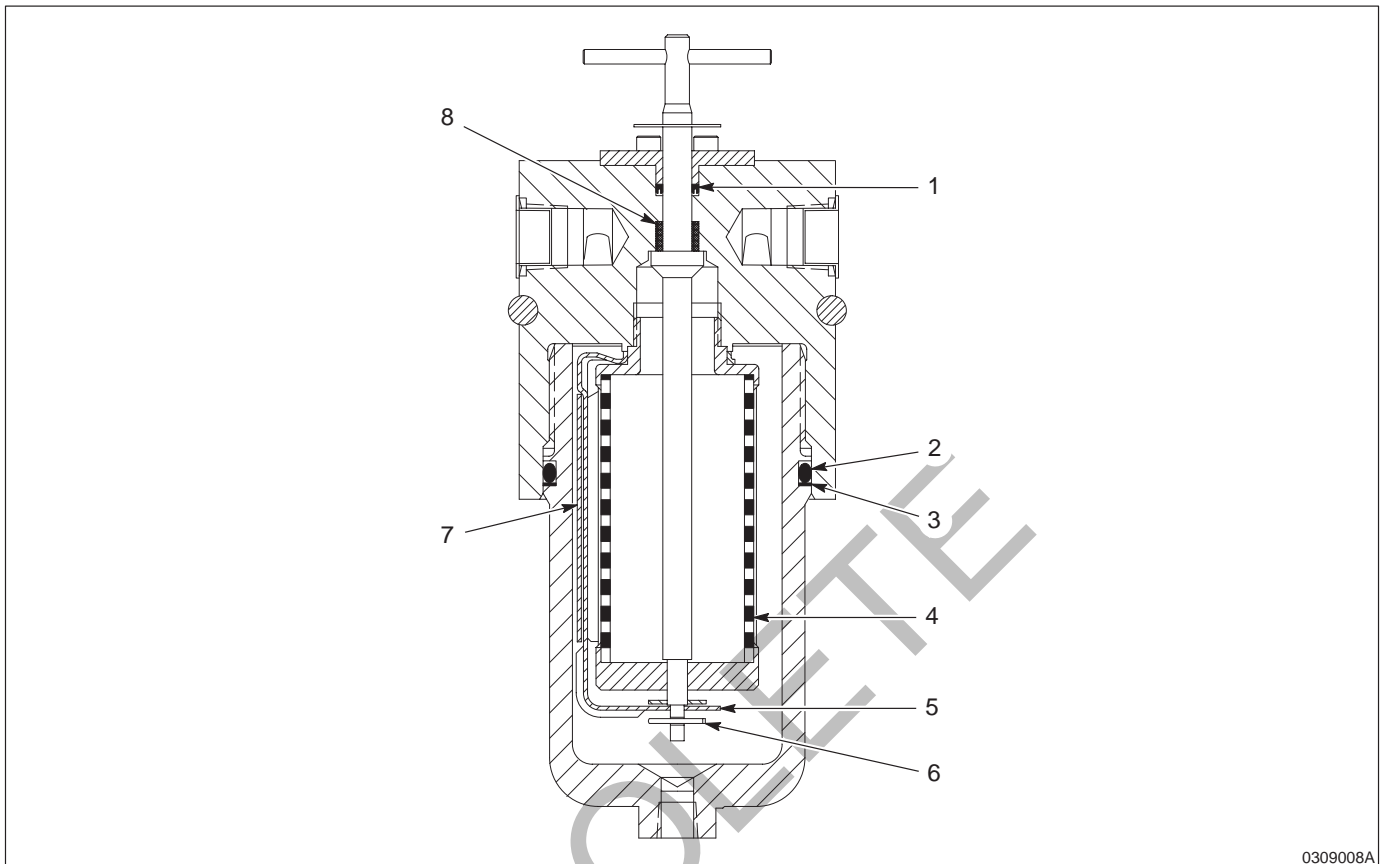
EasyClean Filter Element Kit

See Figure 9. Order this kit when you need to replace the filter element and related parts.

Item	Part	Description	Quantity	Note
—	247 819	Kit, element, EasyClean filter	1	
2	943 381	• O-ring, hot paint, 3.125 x 3.500 x 0.188	1	A
3	954 338	• Back-up ring, single, 3.125	1	A
4	-----	• Element assembly	1	
5	-----	• Washer	1	
6	-----	• Cotter pin	1	
7	-----	• Cleaning knife assembly	1	

NOTE A: If you wish to order the O-ring and back-up ring only, order the EasyClean Bowl O-Ring Kit, part 247 817

Orifice Accessory Group (contd.)



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Fig. 9 EasyClean filter replacement parts

EasyClean Bowl O-Ring Kit

See Figure 9. Order this kit when you need to replace the O-ring and back-up ring on the filter bowl.

Item	Part	Description	Quantity	Note
—	247 817	Kit, O-ring, bowl, EasyClean	1	
2	943 381	• O-ring, hot paint, 3.125 x 3.500 x 0.188	1	
3	954 338	• Back-up ring, single, 3.125	1	

EasyClean Shaft Seal Kit

See Figure 9. Order this kit when you need to replace the rotary seal and related parts.

Item	Part	Description	Quantity	Note
—	247 816	Kit, shaft seal, EasyClean	1	
1	-----	• Rotary seal	1	
8	-----	• Sleeve bushing	1	

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