

WARCO CHEMAG™ SERIES GH FILTERS

High Performance Pleated & Bag Type Filtration Systems INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS

Thank you for your purchase of a WARCO Series GH Filtration System. With proper installation and maintenance you can expect many years of trouble free operations. Failure to follow the recommended procedures may result in early and severe damage to your WARCO Filter System, and may also invalidate the warranty.

SAFETY NOTE: Plant operations and maintenance personnel should follow proper safety guidelines (e.g. OSHA) when servicing this equipment. Safety glasses and hand protection should be the minimum safety protection. Safety goggles are recommended during filter change-out of elements or media due to overhead suspension and risk of chemical spray or splash.

1) SYSTEM MONITORING

The WARCO Series–GH high performance bag filtration systems are sold with or without centrifugal magnetic drive or mechanical seal type pumps. If using a pump special attention should be given to the recommended operating pressures for these pumps to prevent pump damage resulting from dead-heading, dry-running or cavitation. Constant monitoring with flow meters or a power monitors will indicate critical minimum flow setting (i.e., bath turnover rate) for filter change-outs. Air leaks in the suction line will lead to pump cavitation, which is normally indicated by erratic pressure readings on the filter gauge (s). Please refer to pump's operation and service guide for complete pump installation, start-up and maintenance.

Pump Protection: Do not operate the pump in a closed discharge (dead–head) condition for extended time periods (< 1 minute). If using a centrifugal pump that is not a self-priming type, a flooded suction will be required to maintain proper prime for the system to function properly.

2) INSTALLATION

WARCO Filter Chambers are shipped completely assembled and ready for installation. Please note filter media is sold separately. It is recommended that the system be located as close as possible to the process tank. Also, the nominal pipe diameter of the pump suction port must be adhered to when sizing the suction and discharge line to ensure proper flow velocities.

Do not decrease the pipe size of the suction or the discharge pump connections. It is recommended to use schedule-80 slip joint glued fittings for plumbing the unit (s) to and from the process tank. Sharp 90° degree fittings (elbows or tees) should be mounted a minimum of 10 pipe diameters from the pump inlet to prevent turbulence and excessive wear of the pump components.

WARCO filter systems are free standing and stable when placed on flat level surface. We strongly suggest installing ball valves in front and after the filtration system. By closing off inlet and outlet valves when system is shut down, this will prevent back siphoning and flooding. Also installing a drain line will help out when changing out filter media.

The use of suction strainer (s) is recommended when large solid particulate matter is present and could enter the pump. Oversized strainers are recommended to prevent an excessive flow restriction. The

strainer should be mounted a minimum of 10-20 pipe diameters from the pump inlet. The screen size should be 20-50 mesh. A regular maintenance schedule should be implemented to prevent flow restriction of the pump. Installing additional pressure gauges on the inlet and discharge side of the strainer (s) this will allow for monitoring a pressure drop for proper maintenance.

3) PRELIMINARY OPERATION

Please take a moment to record all the model, serial, and product code numbers. This information will come in handy for future references and filter media replacement. Care should also be taken to protect the pump components against unnecessary wear and physical abuse. Review parts list and maintain an emergency inventory of pump replacement items to assure that unit is returned to service with the least delay.

Prior to start up, open the chamber (s) lid cover assembly to inspect the internals; see if the filter media is installed correctly inside the perforated support basket. Also check to make sure the correct matching retaining seal ring BAG ↑, or CART ↑ is installed, and the arrow is pointing upward, and all rubber gaskets are in place. When the chamber's lid is shut, and bolted hand tight, all of the internal components will squeeze together to form a positive seal. This positive seal will prevent incoming solution to bypass the filter media.

To prevent dry-running of the pump on start-up, pour 1 or 2 gallons of solution inside the chamber to fill the pump casing. Close top lid, and tighten the knobs evenly by hand, no tools are not necessary.

Inspect all pipes, hose fittings and band clamps to ensure that they are secured, to prevent possible leaks. Throttling a discharge valve to the maximum recommended pump pressure can perform pressure testing the complete system, further inspection of all pipes and fittings should then be made.

Pump Protection: Do not operate the pump in a dead-head condition for extended time periods (<1 minute).

The minimum recommended operating pressure is necessary to prevent pump operating at run-out, which is subsequent pump damage due to cavitation. Inducing backpressure may be required on systems with low head pressure by throttling a discharge valve or installing an orifice.

4) ELECTRICAL

All single-phase units are factory wired for 120-volt operation.

For three-phase operation, the installation of external fused disconnect switch and motor starter (supplied by others) should be installed near each unit. Rotation for the system's pump motor must be correct. Refer to pump's manual for details. View the motor from the fan end, and bump start the pump motor to verify correction rotation. The motor fan blades should rotate counter clockwise. A qualified licensed electrician should do all wiring and connections.

For added pump and media protection consider LINEMAN™ pump power monitors that can be programmed for safe minimum and maximum operating conditions.

5) INSTALLING FILTER MEDIA

The filter media can be either a bag, or pleated cartridge type. Please note filter media is sold separately. If using a bag style media, you will need the matching round top retaining ring for proper sealing. This ring is marked with the word **BAG** ↑stencil on the side of it. If you're using pleated style cartridges, you will need the corresponding retaining ring with the word **CART** ↑engraved on the side of it. Please contact the factory if you do not have the correct sealing ring (s). The incoming contaminated process solution will enter the top of chamber and flow out thru the bottom. The filter chamber design features a flow path from inside to outside of the media. Both the bag or cartridge style media are single open-end (S.O.E) design, which retains solid materials inside the media itself. Therefore the filter media needs to be installed with the opening at the top of chamber facing upward. Also the top round retaining ring has a stencil arrow ↑on it. This arrow needs to be installed pointing upward ↑towards the lid cover.

NOTE: Process solutions that are sensitive to entrained air require venting of the chamber prior to restarting.

6) OPERATION WITH ABSOLUTE RATED PLEATED ELEMENTS

Open all inlet/outlet valves and energize the pump motor. As the filter chamber media removes contaminants from the process tank, the pressure drop across the unit will slowly rise. This can be observed by having a pressure gauge guard assembly installed on the chamber's lid cover. In normal operation typically it is desirable to change the filter media when it reaches 7 PSI above the initial pressure drop depending upon the type of media. Do not exceed 10 PSIG differential pressures across media. A drop in flow will reflect a rise in pressure if a centrifugal pump is being used. When the flow drops below an acceptable point, the filter media should be changed.

7) GRANULAR CARBON READY BAGS

Activated carbon is an effective method of removing organic impurities from plating baths and other chemical solutions. Carbon Ready Bags are equipped with an internal PP sleeve to prevent short circuit of the carbon column for longer resonance time. Proper carbon treatment requires a low flow rate/contact time to properly activate with the process solution by means of adsorption of the impurities. The quality of solution purification is controllable by the contact time between the solution and the carbon. The flow through the carbon should be adjusted to 1 to 3 GPM flow rate for each pound of carbon that is being used. A flow meter installed on the carbon chamber piping will facilitate flow adjustment for establishing the desire flow rate thru the chamber.

TO REPLACE FILTER MEDIA (Cartridges or Bag Elements)

Shut down the pump. Close all inlet and outlet valves. Open drain valve to relieve pressure and drain chamber.

SAFETY NOTE: Do not attempt to open the chamber top cover until pressure has been relieved through a vent or drain valve after pump is shut down.

After system and filter pressure have been relieved, loosen lid Tee handle cover hold down bolts. Lift lid cover straight up from the shell. Please note the chamber features a tilt lid design. This allows the lid to remain upright in place while servicing the unit.

- a. Remove round retaining seal ring, and lift either the spent cartridge or bag element straight up and out of chamber.
- b. Review section on Installing Filter Media (see page 2). Insert new media, retaining ring, close lid and hand tighten all Tee handle swing bolts- no tools are necessary.
- c. WARCO offers you a variety of CHEMTREX™ filter media with various micron ratings from 0.5 to 125 microns for fine-tuning your process requirements.

8) GASKET INSPECTION

Depending upon the operating conditions (e.g. temperature, pressure, chemistry, etc.) and frequency of filter element change-outs, the square chamber lid gasket should be inspected and changed on an annual basis to avoid costly leakage or spills. Special care should be taken to thoroughly clean and rinse the gasket seat before installation to avoid potential leak pathways from the bridging effect of solid particle.

9) PUMP OPERATION

Refer to the pump Installation, Operation & Maintenance (IOM) manual for complete pump guidelines.

10) MOTOR OPERATION

Refer to the motor Installation, Operation & Maintenance (IOM) manual for complete motor guidelines.



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