Installation & Operation Manual
4NCF / 4NBF Series

WARNING!

To minimize the risk of serious injury and property damage:

- Do not exceed maximum operating pressure & temperature
- Do not open vessel until pressure has been relieved
- Read & follow instructions & safety information in this manual

Contents

Note: Keep this IOM in a protected pouch & permanently retain on or adjacent to filter vessel.

I. GENERAL WARNINGS

WARNING! USE PROTECTIVE CLOTHING. Operator should wear protective clothing including protective gloves and face shield. If handling hot liquids, the operator should wear heat resistant clothing made from materials such as Nomex® to avoid possible burning or scalding. Refer to the material safety data sheets (MSDS) for specific handling instructions.

WARNING! Operating vessel with damaged or worn parts could cause serious injury and/or damage. Inspect vessel interior and all components for wear, corrosion or damage. Replace all damaged components.

WARNING! Do not exceed the operating limits of this vessel and gasket. Property damage, serious injury or death can result if limits are exceeded. The maximum vessel operating pressure and temperature is stamped on the nameplate / label.

WARNING! The maximum operation temperature of this vessel may be limited by the closure seal o-ring material. The maximum operating temperature may be lower than the maximum design temperature stamped on the vessel nameplate. The maximum operating temperature can be increased up to the maximum design temperature by substituting an appropriate alternate o-ring gasket material.

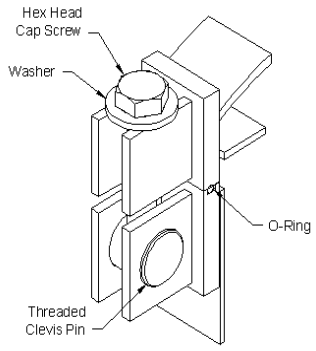
In all cases**,** it is extremely important to match the temperature and chemical compatibility of the seal with actual conditions. Reference table 1 on page 3 for general guidelines.

II. FILTER INSTALLATION & START-UP

Start-up Procedure

1. Clean and inspect closure o-ring and o-ring groove. Lubricate o-ring with suitable lubricant that is compatible with the seal material & the application.
2. The use of a thread lubricant such as Loctite® Nickel Anti-Seize Lubricant is recommended on all bolt threads to reduce friction & eliminate thread galling.
3. Close cover onto vessel. Do not slam the cover against the vessel. Damage to the seal or sealing surfaces may occur. Swing bolts forward to engage cover **(see figure 1)**. Hand tighten bolts.
4. Tighten nuts in an alternate crisscross pattern. Do not apply excessive torque to the nuts as permanent distortion to the filter may occur. Maximum torque applied to the bolting should not exceed the values found in table 2 on page 3 of this document.
5. Close drains and open vent port.
6. Open inlet valve and allow vessel to fill slowly, taking care to not allow process fluid to spray from the vent.
7. When air is expelled from vent and liquid begins to bleed from vent, close the vent plug.
8. Open outlet valves.

Figure 1



III. FILTER SHUTDOWN

WARNING! Do not service this vessel while inlet or outlet valves are open or while unit contains pressure. Do not, at any time, loosen closure bolts before draining. Failure to open drain and vent will result in pressurized liquid being trapped in vessel. Pressurized liquid will spray out when the bolts are loosened which could cause death, serious injury or property damage.

WARNING! USE PROTECTIVE CLOTHING! Operator should wear protective clothing including protective gloves and face shield. If handling hot liquids, the operator should wear heat resistant clothing made from materials such as Nomex® to avoid possible burning or scalding. Refer to the material safety data sheets (MSDS) for specific handling instructions.

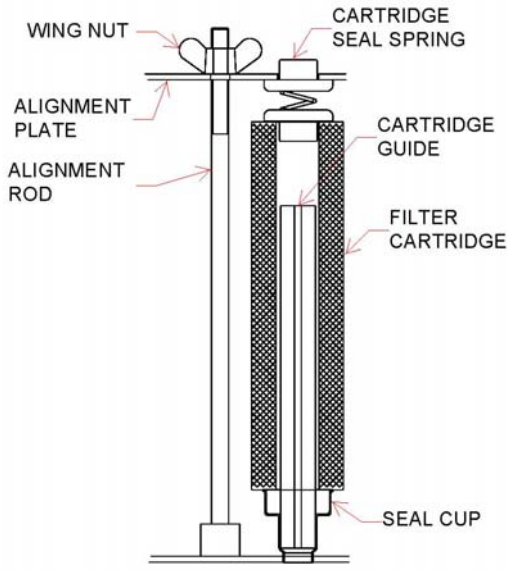
Shutdown Procedure

1. Before opening vessel, turn off pump and lock it out.
2. Close inlet & outlet valves. Inlet or pressure side should always be closed first.
3. Open vent valve. Make sure the valve is piped such that escaping fluids do not cause personal injury or property damage.
4. Check pressure gauge(s) to ensure the vessel's internal pressure is zero. Note: A DIFFERENTIAL pressure gauge connected between the inlet and outlet WILL NOT show internal pressure. Differential pressure gauges are usually marked "PSID" on the gauge face.
5. Open bottom drain. Gravity will move fluid through drain. After vessel has drained, close drain valve.
6. Loosen cover eye nuts, hex nuts or hex bolts as supplied & swing nuts and bolts away from cover **(see figure 1)**.
7. Swing cover away from vessel taking care not to damage the cover and sealing surface.

IV. MEDIA REPLACEMENT – MULTI-CARTRIDGE FILTERS

1. Follow shutdown procedure in Section III.
2. If using DOE (double-open end) cartridges, loosen & remove the alignment plate wing nut(s), remove the alignment plate, and remove the cartridge top seat w/ spring assemblies. Carefully place these aside (on clean surface) for re-assembly **(see fig. 2)**.
3. Remove the spent cartridges and dispose per local regulations / policies. If cartridge guides are inadvertently removed with the cartridges, place the guides back into the bottom seats in the vessel.
4. If using DOE (double-open end) cartridges, place the new cartridges over the guides and onto the bottom seats. Replace the top seat w/ spring assemblies (one per cartridge), the alignment plate, and tighten the wing nut onto each threaded alignment rod. Tighten all wing nuts in a crisscross pattern until evenly secured. Compression of the plate should be 1/2 inch to 3/4 inch to acquire proper seal.
5. If using SOE (single-open end) / 222 fin or flat cartridges, lubricate the cartridge o-rings with a compatible lubricant (or water) and insert the cartridge into the bottom seat until fully seated. The use of the cartridge guides is optional for SOE / 222 style cartridges. Install the alignment plate & tighten wing nuts in crisscross pattern until evenly secured. Compression of the plate is negligible and use of the top seat w/ spring assemblies is not required for SOE / 222 style cartridges.
6. Refer to Section II (Startup Procedure).

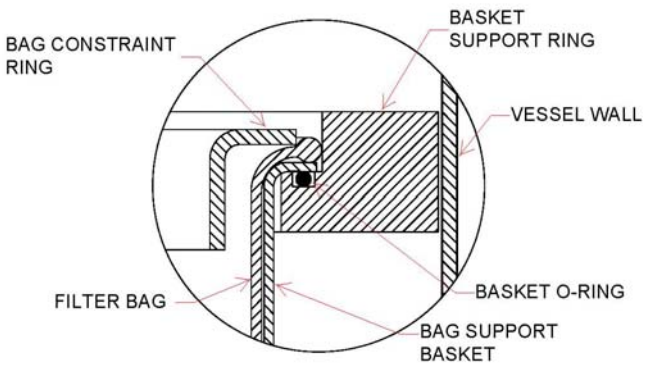
Figure 2



V. MEDIA REPLACEMENT – BAG FILTERS

1. Follow shutdown procedure in Section III.
2. Remove the bag retaining ring(s), carefully placing aside (on clean surface) for re-assembly. Remove the spent bag(s) from the vessel and dispose per local regulations / policies. If the bag support basket is inadvertently removed with the bag, separate the bag from the basket and re-install the basket into the vessel.
3. Insert a new bag bottom first into the support basket inside the vessel and push the bag down until the bag ring is seated against the basket rim. For best results, ensure the bag is fully extended to the bottom of the basket. Replace the bag retaining ring.
4. For single-bag vessels, the bag retaining ring w/ hoop combination sits directly on top of the internal support ring. The top of the hoop should extend slightly above the body flange face resulting in contact with the underside of the cover. The cover will exert a load onto the bag thus keeping the bag from dislodging. The positive pressure of the liquid flow will create the necessary seal on the bag. Slight reshaping of the hoop may be necessary so that it extends above the body flange face.
5. For multi-bag vessels, each bag has a separate retaining ring that is secured by twisting the device until the rod ends are secured under the constraint clips. This will prevent the bags from dislodging. The positive pressure of the liquid flow will create the necessary seal on the bag.
6. Refer to Section II (Startup Procedure).

Figure 3



VI. SEAL COMPATIBILITY & BOLT TORQUE VALUES

Notice: Standard vessels are designed to use gaskets made of self-energizing material such as Buna-N, EPR, or Viton®. Since the torque requirement to seal a vessel with these seals is minimal, it is normally not necessary to use extensions or cheater bars when torqueing bolts & nuts. Standard vessels are not designed to use gaskets made of non-energizing material or rope type gaskets. These types may require tightening torque beyond that which the vessel is designed for causing damage to vessel. Reference table 2 below for maximum torque values.

READ BEFORE OPERATING

Warning! The maximum operation temperature of this vessel may be limited by the closure seal (o-ring or gasket) material. The maximum operating temperature may be lower than the maximum design temperature stamped on the vessel nameplate. The maximum operating temperature can be increased up to the maximum design temperature by substituting an appropriate alternate gasket material.

In all cases, it is extremely important to match the temperature and chemical compatibility of the seal with actual conditions. Reference table 1 below for general guidelines.

Table 1 - Properties of Gasket Materials

		RESISTANCE TO SOLVENTS								
	Max. Oper. Temp. °F.	**Resistance to Acids**	**Resistance to Alkalis**	**Resistance to Petroleum Oils**	**Resistance to Water Swelling**	**Resistance to Animal and Vegetable Oils**	**Lacquers and Thinners**	**Aliphatic Hydro-carbons, Gasoline, etc.**	**Aromatic Hydro-carbons, Benzene, etc.**	**Oxygenated Ketones, etc.**
Nitrile (Buna N)	**250**	Poor	Poor	Excellent	Excellent	Excellent	Poor	Excellent	Fair	Good
Neoprene	**250**	Good	Good	Good	Good	Good	Poor	Good	Fair	Poor
Butyl	**250**	Excellent	Excellent	Poor	Excellent	Excellent	Excellent	Poor	Poor	Good
Ethylene Propylene (EPR)	**300**	Excellent	Excellent	Poor	Good	Good	Good	Poor	Poor	Good
Fluorocarbon **(Viton®)**	**400**	Excellent	Poor	Excellent	Excellent	Excellent	Poor	Excellent	Excellent	Poor
PTFE (Teflon®)	**500**	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Silicone	**500**	Good	Good	Poor	Excellent	Excellent	Poor	Poor	Poor	Excellent

Note: This table shows the general characteristics of various gasket materials. Consult the Parker Catalog CAT-500-XX USA materials selection chart or ask a Wessels Application Engineer for assistance with your specific application.

Table 2 – Maximum Cover Bolt Torque Values

Nominal Bolt Diameter	Stainless Steel Bolt – Max Torque ft-lb
M12 (1/2)	25
M16 (5/8)	38
M20 (3/4)1	50

Questions? Call a Wessels Application Engineer for assistance at (317) 898-9800