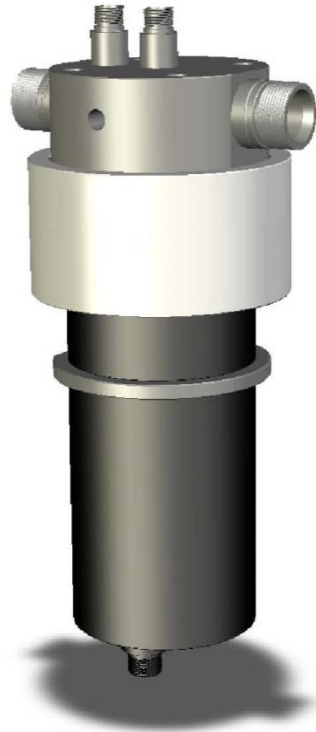


LTFH

Reusable Filter Housing



Instruction Manual



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INTRODUCTION:

The following symbols and warning labels appear on the unit and in the instruction manual. The table below provides an explanation of each.



DESCRIPTION	PICTORAL DESCRIPTION
<p>CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.</p>	
<p>CAUTION: HOT SURFACE. DO NOT TOUCH Filter chamber surface may be hot. Allow unit to cool before servicing.</p>	

Table 1: LTFH Warning Labels

The Process Technology LTFH filter chamber is a *reusable* filter chamber that is rated for operating temperatures up to 180°C (356°F). The LTFH accepts the standard 70mm SOE (Single Open End) filter cartridges with #222 o-rings made by most manufacturers. Models are also available for 83mm SOE cartridge filters.

Please note these units are not designed for negative pressure applications.

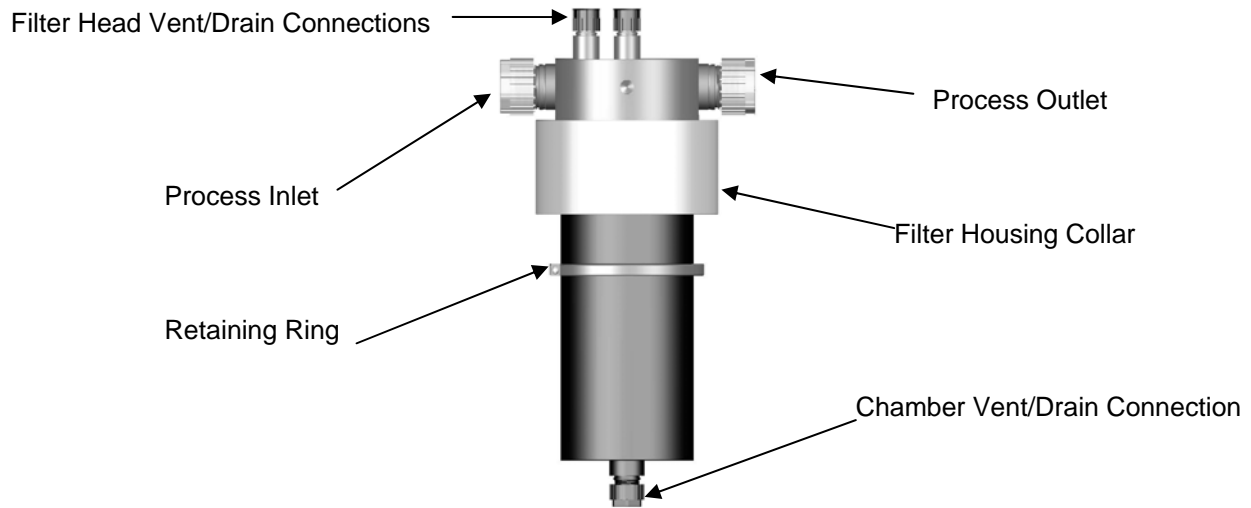


Figure 1: LTFH Filter Housing

SYSTEM SPECIFICATIONS:

Product	LTFH series high temperature cartridge filter chamber	
Dimensions:	Diameter	Height
70mm x 10" SOE filter	164 mm (6.45 inches)	432 mm (17 inches)
70mm x 20" SOE filter	164 mm (6.45 inches)	686 mm (27 inches)
83mm x 10" SOE filter	193 mm (7.6 inches)	432 mm (17 inches)
	* Refer to facilities print for overall width, which will vary based upon plumbing connections	
Weight:	8.2kg (18 lbs.); (LTFH-70 only)	
Internal volume:	1.72 liters (0.45 gallons); (LTFH-70 only)	
Wetted surfaces:		
Chamber	Virgin PTFE fluoropolymer	
o-ring	PFA encapsulated viton	
Maximum operating temperature:	Up to 180°C, depending upon operating conditions	
Maximum pressure rating:		
At 25°C	Maximum 680 kPa (6.8 bar, 100 psi) *	
At 180°C	Maximum 275 kPa (2.8 bar, 40 psi) *	
Available Mounting Brackets	PVC, Rated for liquid temperatures up to 130°C (266°F)	
Available High Temperature Mounting Brackets	PVDF, Rated for liquid temperatures up to 180°C (356°F)	

Table 2: LTFH Specifications

*** The pressure rating listed above is for the vessel only. The pressure rating of the entire system will be reduced by the pressure rating of the fittings and tubing used.**

MODEL NUMBER:

Provided below is an example of a typical model number along with an explanation of each section. This key will help you understand your model number.

Model number examples:

LTFH-70-10 XVT-R

① ② ③ ④ ⑤ ⑥ ⑦

- ① **Product Series.** The beginning of each model number will designate the product line. In this case, the LTFH high temperature fluoropolymer filter housing.
- ② **Filter Cartridge Size.** The standard LTFH is designed for a 70mm SOE (Single open end) cartridge filter (cartridge filter not included). A different model will provide a chamber designed for an 83mm SOE cartridge filter.

Model Number	Cartridge Filter Size
-70-	70mm (2.8-inch) diameter
-83-	83mm (3.3-inch) diameter

Table 3: Cartridge Filter Sizes

- ③ **Filter Cartridge Length.** The standard LTFH is designed for a 254mm (10-inch) long cartridge filter. A different model will provide a chamber designed for a 508mm (20-inch) cartridge filter.

Model Number	Cartridge Filter Size
-10-	250mm (10-inch) long cartridge filter
-20-	508mm (20-inch) long cartridge filter

Table 4: Cartridge Filter Lengths

- ④ **Inlet/Outlet Plumbing Connections.** This character or designation specifies the size and type of the inlet and outlet plumbing connections. Please refer to table 5 for a complete list of available plumbing connections.
- ⑤ **Chamber Vent/Drain Plumbing Connection.** This character or designation specifies the size and type of the chamber vent/drain connections. This connection will act as a vent or a drain, depending upon the orientation of this unit in service. Please refer to table 5 for a complete list of available plumbing connections.

MODEL NUMBER (Continued):

- ⑥ **Filter Head Vent/Drain Plumbing Connections.** This character or designation specifies the size and type of the filter head vent/drain connections. These two connections will act as a vent or a drain, depending upon the orientation of this unit in service. Please refer to table 5 for a complete list of available plumbing connections.

Model Number	Available Connection Types for the following positions:			Connection Type	Plumbing Connection Size: mm(inches)
	Plumbing Inlet/Outlet	Chamber Vent/Drain	Filter Head Vent/Drain		
O		X	X	None	N/A
A	X	X	X	Male flared tube fitting	13mm (1/2 inch)
B	X	X		Male flared tube fitting	19mm (3/4 inch)
C	X			Male flared tube fitting	25mm (1 inch)
S	X	X	X	Male flared tube fitting	9mm (3/8 inch)
T	X	X	X	Male Super 300 type Pillar tube fitting	9mm (3/8 inch)
V	X	X	X	Male Super 300 type Pillar tube fitting	13mm (1/2 inch)
W	X	X		Male Super 300 type Pillar tube fitting	19mm (3/4 inch)
X	X			Male Super 300 type Pillar tube fitting	25mm (1 inch)
Y		X	X	Male Super 300 type Pillar tube fitting	6mm (1/4 inch)
Z		X	X	Male flared tube fitting	6mm (1/4 inch)

Table 5: Plumbing Connection Types and Sizes

MODEL NUMBER (Continued):

- ⑦ **Options.** There are several options available with the Process Technology Series LTFH inline filter chamber. More than one option may be included in an individual unit. Please refer to the table 6 for a brief listing of the available options.

Model Number	Description
(Blank)	No option
-R	Outlet fitting rotated 90° to the right of the inlet fitting
-L	Outlet fitting rotated 90° to the left of the inlet fitting
-MB	Include PCV mounting brackets
-SB	Include high temperature (PVDF) mounting brackets
-T	Design for universal installation (both upright and inverted)
-##	Special construction design. Consult factory for details

Table 6: Options List

FACILITY REQUIREMENTS:

Before installing the LTFH inline filter chamber confirm the facility requirements listed below.

Space Requirements:

The LTFH inline filter chambers are designed for installation within the tool near the process tank. Allow adequate space in the tool for mounting the LTFH. In addition, provide at least 50mm (2-inches) of clearance space to allow for the separation of the filter head and chamber body for routine cartridge filter replacements. The LTFH filter chamber includes a retaining clip, which minimizes the space required during filter replacement (see figure below).

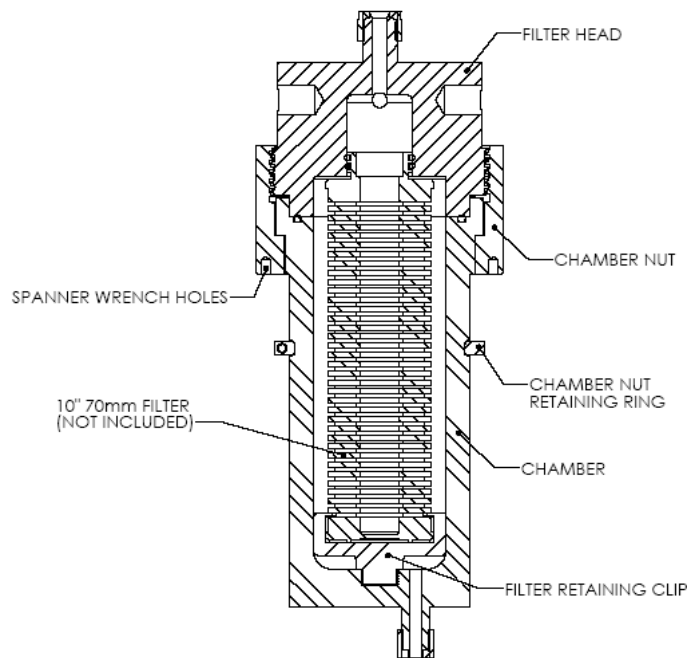


Figure 2: LTFH Cross Section

The LTFH will also need adequate space to loosen and tighten the retaining nut with the use of the LTFH spanner wrench and a customer-supplied torque wrench. Please insure enough space for a minimum 90° rotation of the torque wrench.

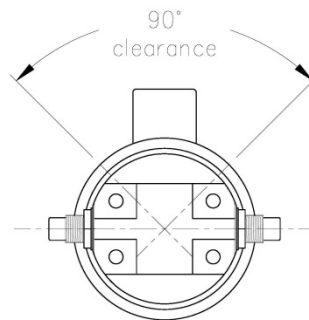


Figure 3: LTFH space requirements, minimum torque wrench rotation

FACILITY REQUIREMENTS (Continued):

Plumbing Requirements:

The LTFH plumbing connections include fluid inlet and outlet connections, as well as bleed/vent connection(s) on the top, and a drain connection(s) on the bottom. The standard LTFH must be installed as shown in figure 4. If the LTFH includes the “-T” option, it can be installed in the upright position, as shown in figure 4.

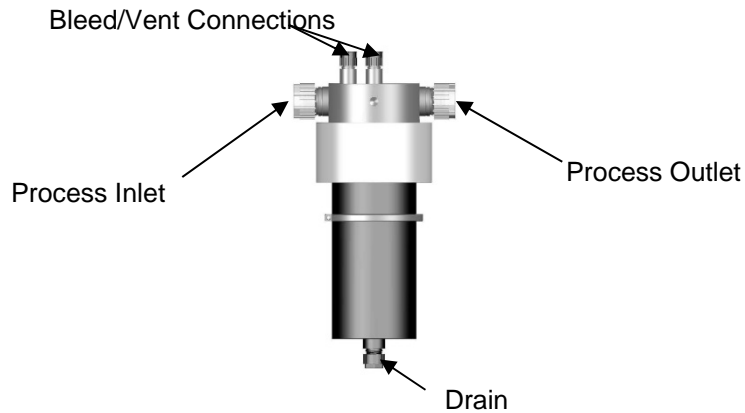


Figure 4: LTFH Plumbing Orientation/Connections

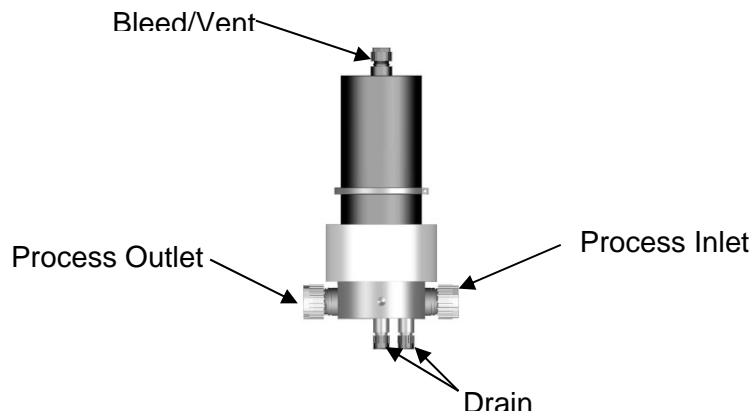


Figure 5: Alternate LTFH Plumbing Orientation/Connections

The LTFH will require service shutoff valves for the fluid inlet and outlet connection, which are needed for replacement of the cartridge filter. In addition, the plumbing that will be connected to the chamber vent/drain fitting should be able to allow the chamber to move away from the unit far enough to facilitate cartridge replacement.

Installation:

Inspection:

Visually inspect the unit itself for damage. If there is evidence of damage, notify Process Technology and the freight carrier immediately.

Verify that all accessories are included with the LTFH unit. If any are missing, contact Process Technology immediately:

- **Spanner Wrench:** The spanner wrench is shipped with the LTFH unit. It is needed to loosen the retaining nut for cartridge filter replacement. The spanner wrench includes stainless steel pins which are designed to engage the filter retaining nut.

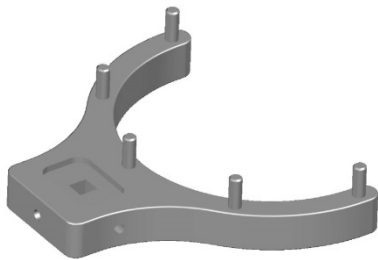


Figure 6: 70mm Spanner Wrench

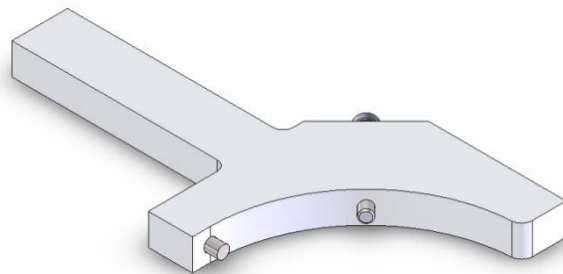


Figure 7: 83mm Spanner Wrench

Note: For models with an 83mm chamber, the spanner wrench holes are oriented radially rather than vertically. When receiving your LTFH unit, please verify that the appropriate spanner wrench is included for your chamber type. If the appropriate spanner wrench is not included, please consult the factory for assistance.

- **Retaining Clip:** The retaining clip is used to hold the cartridge filter in the chamber body. This clip also provides the advantages of a minimal clearance dimension needed for cartridge filter replacement. This retaining clip is installed inside the chamber body.

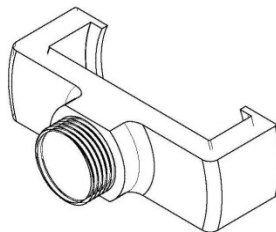


Figure 8: Retaining Clip

- **Removal Rod:** This rod measures 18mm (0.75-inch) diameter x 150mm (6-inches) long. It is a PCV rod which can be used to support the filter head during cartridge filter removal/replacement. There are two recess holes in the filter head to allow the insertion of this removal rod.

Mounting:

Note: Due to the weight of this unit, Process Technology recommends that the LTFH be mounted securely to a stable structure.

This procedure should be performed only by qualified technicians. Wear suitable protective gloves, clothing and eye protection when installing or servicing this product.

Filter Housing Orientation:

Mount the Process Technology Fluoropolymer Filter Housing in a vertical orientation. The LTFH filter chamber is designed for upright or inverted installation.

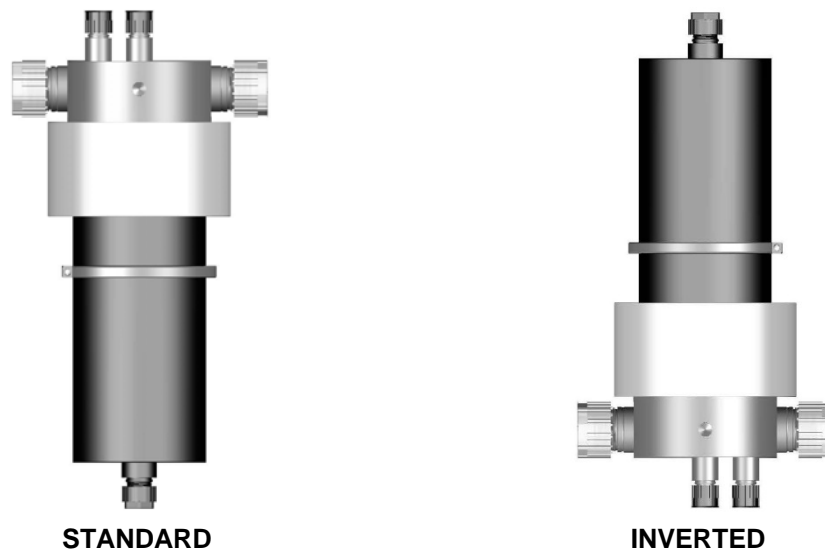


Figure 9: LTFH Installation Orientation

Installation (Continued):

The LTFH filter chamber must be mounted securely to a stable structure. The standard mounting connections are the four (4) mounting holes (1/2-13 machine thread) located on the filter head of the LTFH.

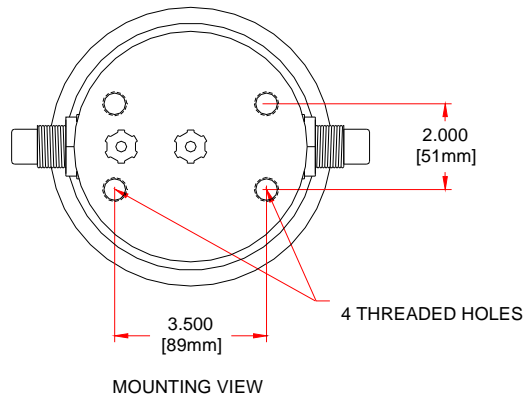


Figure 10: Filter Chamber Mounting Holes

Optional mounting brackets are available from the factory, and are sold as a separate item from the LTFH filter chamber. The optional mounting brackets are available in either PVC (for process fluid temperatures up to 130°C) and PVDF (for process fluid temperatures up to 180°C).

Process Fluid Connections:

The various fluid connections on the LTFH Filter Housing are made from machined PTFE. When connecting your plumbing to these fittings, be careful not to cross-thread the fittings or to strip the threads. If damaged, the unit must be returned to PROCESS TECHNOLOGY for repair.

The fluid inlet/outlet plumbing must include service shutoff valves, which are necessary for cartridge filter replacement. In addition, the plumbing connected to the chamber vent/drain must be able to allow the chamber body to move away from the unit to allow cartridge filter replacement.

1. Connect the source fluid plumbing to the “Inlet” fitting of the LTFH.
2. Connect the outlet fluid plumbing to the “Outlet” fitting of the LTFH.
3. Connect the “Drain” fitting(s) to a non-pressurized chemical drain.
4. Connect the bleed / vent fitting(s) to plumbing which route to the process bath.
5. Check all plumbing connections for leaks. Tighten/repair connections as needed to insure there are no leaks at the system’s maximum rated pressure.

Installation (Continued):

Flared Compression Process Fluid Inlet and Outlet Connections:

The standard process fluid connections consist of inlet and outlet ports with two fittings on the same horizontal centerline. Please note that the procedure specified below should only be performed once, when the tubing is first connected to the fittings. Once properly tightened, the fittings will not need to be re-tightened in the future.

- 1) Remove the protective plastic caps from the flared fittings on the Inlet and Outlet piping of the heater assembly.
- 2) Connect properly flared tubing to the flared fitting on the heater chamber assembly.
- 3) Tighten the fitting nuts until fitting nut contacts the flared tubing. Tighten an additional $\frac{1}{4}$ turn. Then tighten fitting nut to the maximum required torque value. See **Table 7** for proper values.
- 4) Repeat this procedure for each of the flared tube fittings on the filter chamber, including the bleed and drain fittings.
- 5) Check for leaks at the fittings.
- 6) Circulate hot fluid through the filter chamber at the operating temperature of the system, allowing the filter chamber to reach operating temperature.
- 7) Cool down the filter chamber to ambient. Re-tighten the fitting nut to the minimum torque value. See Table 7 for proper value.

Fitting Size	Torque Value	
	Minimum value (cold)	Maximum value (cold)
13mm ($\frac{1}{2}$ -inch) flared	1.24 N-m (11 in-lbs).	1.8 N-m (16 in-lbs).
19mm ($\frac{3}{4}$ -inch) flared	1.58 N-m (14 in-lbs).	3.2 N-m (28 in-lbs).
25mm (1-inch) flared	3.39 N-m (30 in-lbs).	5.1 N-m (45 in-lbs).

Table 7: Torque values for flared tube fittings



Do NOT tighten fitting nuts at elevated temperatures. Irreparable damage to the plumbing connections will result.

Installation (Continued):

Super 300 Type Pillar™ Process Fluid Inlet and Outlet Connections:

Super 300 Type Pillar™ process fluid connections are available for the LTFH filter housings. Super 300 Type Pillar Fittings use a “gauge ring” which is used to determine the proper tightness of the fitting connections.

- 1) Remove the protective plastic caps from the fittings on the Inlet and Outlet piping of the heater assembly.
- 2) Install appropriately sized Super 300 Type Pillar “gauge ring”

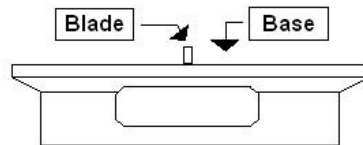


Figure 11: Gauge ring for Super 300 type Pillar fittings

- 3) Tighten the Pillar fitting nut until the bosses on the union nut makes contact with the gauge ring and pulls the blade. A clicking (crunching) sound will be heard at this point. Continue tightening the union nut until the bosses make full contact with the gauge ring.

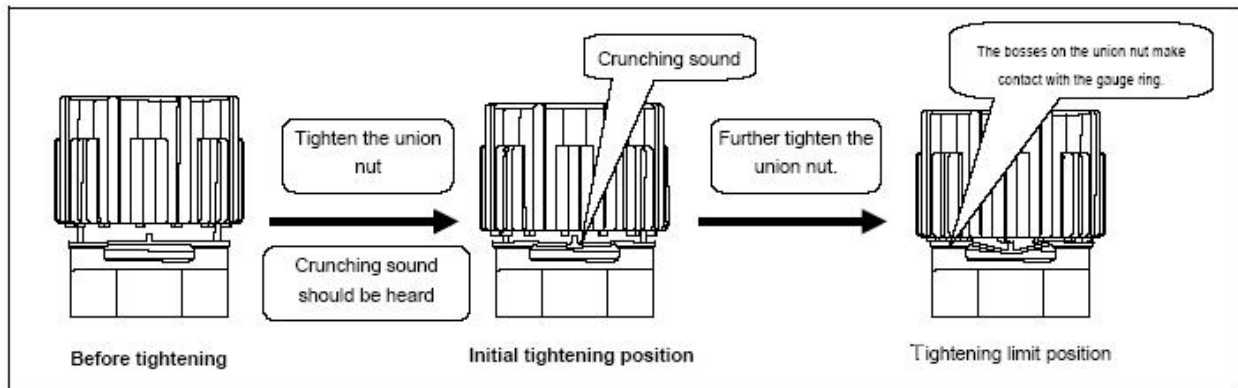


Figure 12: Super 300 type Pillar fittings tightening procedure

Installation (Continued):

Filter Cartridge Installation/ Replacement:

Note: Wear suitable protective gloves, clothing and eye protection when installing or servicing this product. This procedure should only be performed by qualified technicians.

For the initial installation of the first cartridge filter, you may skip step 1.

- 1) Close the service valves on the inlet and outlet of the unit. Open the drain valve(s) and vent valve(s) to allow the unit to drain fully.
- 2) Insert the removal rod into one of the two recess holes in the filter head.
- 3) Using the supplied spanner wrench completely loosen the filter housing collar. The collar will slide down the chamber body as far down as the retaining ring.

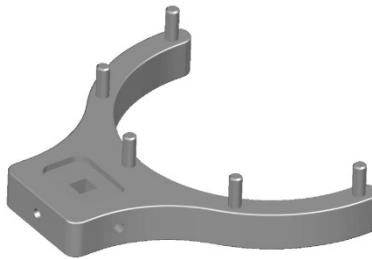


Figure 13: LTFH Spanner Wrench (70mm)

- 4) Separate the Filter Chamber Body from the filter head. Retain the O-ring for re-use.
- 5) Remove the LTFH retaining clip (with the cartridge filter attached if this is a replacement procedure) from the bottom of the chamber body by un-threading it from the Chamber Body.

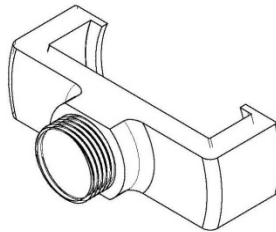


Figure 14: Retaining Clip

Filter Cartridge Installation (Continued):

- 6) Attach Retaining Clip to a new cartridge filter by sliding the clip to engage the ends to the slots in the cartridge filter.
- 70mm cartridges, insert the clip tabs into the last slots at the end of the cartridge.
 - 83mm cartridges, insert the clip tabs into the 2nd to last slots at the end of the cartridge.

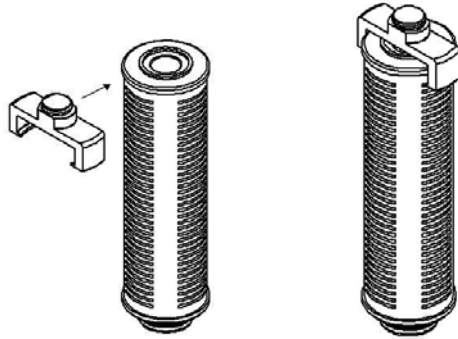


Figure 15: Retaining Clip Mounting:

- 7) Insert cartridge filter and Retaining Clip assembly into Chamber Body. Thread Retaining Clip into bottom of Chamber Body until hand tightened (1.7 N-m (15 in-lbs) maximum).
- 8) Re-assemble the filter housing. Spin the filter housing collar onto the filter head until resistance is felt.
- 9) Use the spanner wrench to tighten the retaining collar. (1/4 turn required)

Torque Value	
Minimum value (cold)	Maximum value (cold)
28.25 N-m (250 in-lbs).	33.9 N-m (300 in-lbs).



Use extreme care when tightening the retaining collar. DO NOT Over-tighten the retaining collar. Over-tightening can permanently damage Fluoropolymer surfaces, resulting in deformation of the spanner wrench holes in the retaining collar.

Start up:

Note: Wear suitable protective gloves, clothing and eye protection when installing or servicing this product.

- 1) Slowly fill the LTFH Filter Housing with solution until all air is vented from the chamber. Close air bleed / vent valve and apply full pressure.
- 2) Check all connections for leaks. If leaks are present, check connections for proper tightening or possible cross-threading.

Spare Parts:

Please contact PROCESS TECHNOLOGY for pricing and availability.

Process Technology Part #	Quantity	Description
PCN 9106	1	Removal Rod
PCN 7042	1	Retaining Clip for 70mm cartridge filter
PCN 6430	1	Retaining Clip for 83mm cartridge filter
PCN 04-7125	1	O-ring for 70mm chamber
PCN 9873	1	O-ring for 83mm chamber
PCN 6648	1	Spanner wrench, 70mm
PCN 6500	1	Spanner wrench, 83mm

Table 8: Spare Parts

WARRANTY:

All PROCESS TECHNOLOGY equipment, heaters and controls have been carefully inspected before shipping and are warranted to be free from defects in workmanship and materials for a period of one year from date of purchase on a pro-rated basis. At its option, PROCESS TECHNOLOGY will repair or replace any defects that are exhibited under proper and normal use. PROCESS TECHNOLOGY disclaims any responsibility for misuse, misapplication, negligence or improper installation of equipment, tempering or other operating conditions that are beyond its control (such as excessively high or low purge gas supply pressure). PROCESS TECHNOLOGY makes no warranty or representation regarding the fitness for use or the application of its products by the customer.

All products and components not manufactured by PROCESS TECHNOLOGY will carry the original manufacturer's warranty, copies of which are available upon request. PROCESS TECHNOLOGY makes no warranty or representation, expressed or implied, with respect to the products not manufactured by PROCESS TECHNOLOGY.

Products must be installed and maintained in accordance with PROCESS TECHNOLOGY instructions.

PROCESS TECHNOLOGY is not liable for labor costs incurred in removal, reinstallation, or unauthorized repair of the product or for damage of any type including incidental or consequential damage.

PROCESS TECHNOLOGY neither assumes nor authorizes any representative of PROCESS TECHNOLOGY or any other person to assume for it any other liabilities in connection with the sale of the products. This warranty may not be verbally changed or modified by any representative of PROCESS TECHNOLOGY.

Shipping Damages:

Claims against freight carriers for damage in transit must be filed by the customer at the time of delivery or as soon as possible.

Returns:

No product shall be returned to PROCESS TECHNOLOGY without first obtaining a return material authorization (RMA) number from a PROCESS TECHNOLOGY representative. All returns must be freight prepaid. Freight collect or shipments without authorization will be refused.

Information:

PROCESS TECHNOLOGY will endeavor to furnish such advice as it may be able to supply with reference to the use by buyer of any material purchased, but PROCESS TECHNOLOGY makes no guarantees and assumes no obligation or liability for advice given verbally or in print or the results obtained. Buyer assumes all risk and liability that may result from the use of any material, whether used by itself or in combination with other products. No suggestion for product use shall be construed as a recommendation for its use in infringement on any existing patent.

Conflict Between Documents:

Acceptance of this offer is expressly conditioned upon agreement to all terms and conditions contained herein. In the event of a conflict between the terms and conditions of purchaser's purchase order, and PROCESS TECHNOLOGY's terms and conditions, proposal or offer, the latter shall govern.