



Thermo Scientific Barnstead Pretreatment System

Installation and Operation

50157886 • Revision A • October 2018

IMPORTANT Read this instruction manual. Failure to follow the instructions in this manual can result in damage to the unit, injury to operating personnel, and poor equipment performance.

CAUTION All internal adjustments and maintenance must be performed by qualified service personnel.

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Preface

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Read through the information given in these operating instructions on installing and operating the system before you begin installation and use of your water purification system. This is of particular importance, as we, the manufacturer, do not assume any liability for damage due to incorrect operation or use of the system other than the intended use.

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Legal Information

Note: Specifications, terms and pricing are subject to change. Not all products are available in all countries. consult your local sales representative for details.

Warranty

Thermo Fisher Scientific warrants the operational safety and functions of the Thermo Scientific Barnstead Pretreatment systems only under the condition that:

- The system is installed and operated as per the operation manual. Do not use this product for anything other than its intended use.
- The system is not modified.
- Only original spare parts and accessories that have been approved by Thermo Fisher Scientific are used (third-party spares without Thermo Fisher Scientific approval will void the limited warranty).
- Inspections and maintenance are performed at the specified intervals.
- An installation verification test is performed on commissioning the system for the first time and repeated after each preventative maintenance and repair activity. The warranty is valid from the date of delivery of the system to the customer.
- The above mentioned warranty conditions are subject to the general terms and conditions of sale, in effect at the time of purchase, which apply as well.

Explanatory Notes on the Operating Instructions



CAUTION: This symbol, in the context of a CAUTION, indicates a potentially hazardous situation which if not avoided could result in minor to moderate injury or damage to the equipment.



WARNING: This symbol, in the context of a WARNING, indicates potentially hazardous situations which, if not avoided, could result in serious injury or death.



DANGER: This symbol, in the context of a DANGER, indicates potentially hazardous situations which, if not avoided, could result in serious injury or death.



This symbol indicates a need to use gloves during the indicated procedures.



This symbol indicates a need to wear protective goggles gloves during the indicated procedures.



This symbol indicates a situation in which breathing protection must be used.

Note: Is used for application hints and useful information.



CAUTION: To avoid the risk of pinching, crushing, cutting, never perform maintenance on the system without its protective housing, or while it is in operation. Maintenance work on the system may only be performed by trained, authorized specialists.

This information is valid for the system that is received. For quick and correct service, include the following information on all inquiries and replacement parts orders which relate to your system:

- The serial number (located on the right side of the system on the nameplate)
- The catalog number

Safety Precautions

Observe these safety precautions for your own safety!



CAUTION: The Thermo Scientific Barnstead Pretreatment system is a modern water purification system intended solely for the treatment of potable water. The water it produces is not fit for drinking.

- Do not install or operate the system until you have carefully read through these operating instructions and the notes and notices contained therein.
- Lifting and carrying the Pretreatment system, e.g. to the installation location, can be carried out by one person. To do this, lift the system at the two corner points beneath the bottom plate.
- Always observe the applicable, pertinent codes and regulations valid at the installation location of the system and follow all applicable accident prevention regulations.
- If the system is not to be operated for an extended period, e.g., over extended weekend, or during a vacation period, close the feed-water inlet (close the feed-water tap)
- When installing the pretreatment system, always ensure that there is adequate space all around the system (refer to the table “Accessibility to Pretreatment system” in section **Technical Specifications**) to ensure that ease of use or easy replacement of materials (e.g., filter change, connection) is possible at all times.
- Visually inspect the system at regular intervals. Clean up any water or spills found around the system immediately.

Transport and Packaging



DANGER: Do not pull the plastic foil over your head. Risk of suffocation. Use the plastic foil only for packaging.

Pretreatment systems are carefully inspected and packed prior to shipping, but damage could still possibly occur during transport. Lifting and carrying the Thermo Scientific Barnstead Pretreatment system, e.g. to the installation location, can be carried out by one person.

Examination on Receipt

1. Ensure all components for complete system were ordered and received. This should include:
 - Pretreatment system - 50157886
 - 1 µm Prefilter - D502113
 - MPS Cartridge - D502114
 - Carbon Cartridge - D502115
 - Wall bracket (if wall mounting)
 - TU494X4 6 ft (1.8 m) of ¼ OD tubing
 - Feed-water Connection kit - 25.0071
2. Carefully unpack system and inspect system for damage.

Note: If the packaging shows signs of damage, inspect the system for damage.



Figure 1. Unpacking

Complaints

If there has been any damage occurred to the goods during transportation:

- Immediately contact your delivery transport agency.
- Save the complete packaging, including the cardboard box, for a possible inspection of them and/or return shipment of the system.

Packaging for Return Shipment

If possible, use the original box and packaging material. When these are no longer available, then:

- Protect the system from shock by packing it in bubble wrap and/or packaging foam and a strong cardboard box.

Note: The time limit for claims is 6 days from the time of receipt of the goods. The right to claim for damages ceases when this time has elapsed.

Note:

- Only a trained person should take the system out of operation.
- Prior to sending back an operated device, empty the water, dry the system and take out the cartridges.
- Pack the cartridges into a bubble wrap and/or packaging foam and put it into the package of the Pretreatment system.

Intended Use of the Device

The Thermo Scientific Barnstead Pretreatment system is laboratory systems used for the treatment of water.

The Thermo Scientific Barnstead Water systems are designed to be installed and used in the following application areas:

- Laboratories for cell biological and biotechnological work with the safety levels L1, L2 and L3.
- Medical and microbiological laboratories according to DIN EN 12128.
- Laboratories in the central area of clinics and hospitals.

The system must not be operated outside of the specifications as described in the operating manual. In particular, the system should not be used for production of drinking water and drugs manufacturing. The system must not be used as a medical device and outside of laboratories.

Note: Pretreatment system will operate with all Smart2Pure and Pacific series water purification systems.



Figure 2. Front view of Pretreatment system



Technical Specifications

Note: Check at regular intervals the quality of your feed-water.

Feed-water requirements	
Source	Potable tap water
Silt density index (SDI)	<5
Turbidity	<1 NTU
Conductivity (reference temperature +25°C)	1500 µS/cm (670 Ω·cm)
Chlorine	Max. 3 ppm
Iron content	Max. 0.5 ppm
pH range	4 - 11
Temperature	+2°C - +35°C
Pressure	2 - 6.9 bar / 29 - 100 PSI (at a pressure >6.9 bar / 100 PSI a pressure reducer must be installed upstream of the system.)
Feed-water supply	¾" NPT (adapts to ¼" NPT male or female)

Tubing Connections	
Inlet Tubing	Tube ¼" outer diameter
Outlet Tubing	Tube ¼" outer diameter

Accessibility to Pretreatment system	
Space to the Left & Right of Unit	15 cm / 6 inch
Space to the Front of the Unit	30 cm / 12 inch

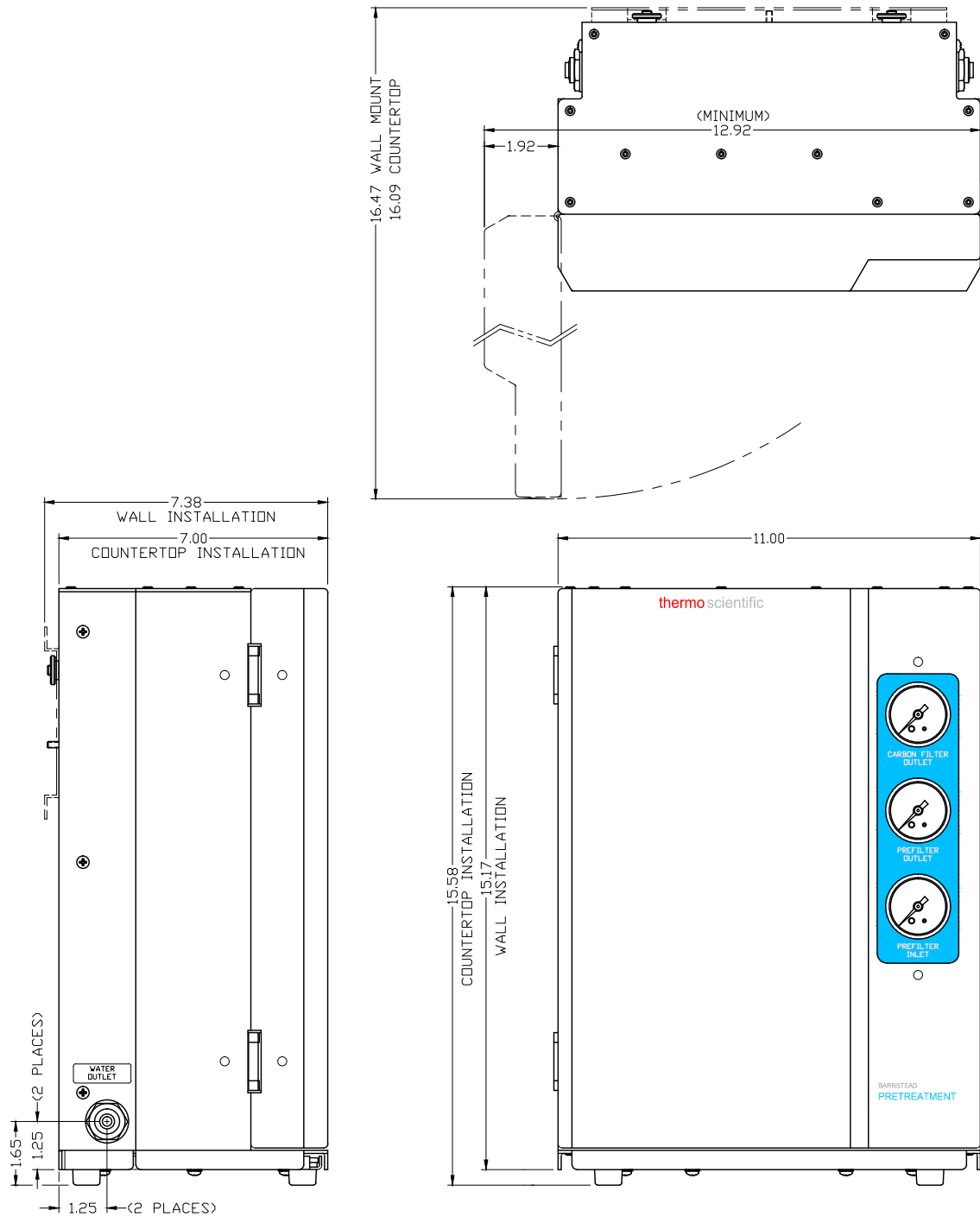


Figure 3. Dimensions of Pretreatment system

Dimensions and weight of Pretreatment system

Height / Height with Wall Bracket	15.58 inch / 15.17 inch
Width	11 inch
Depth / Depth with Wall Bracket	7.00 inch / 7.38 inch
Dry Weight	24.5 lbs (11.1 kg)
Wet Weight (during operation)	29 lbs (13.2 kg)

The Installation Area

Note: The operator is obliged to ensure, that the installation of the pretreatment system and its operation are carried out in compliance with all national and international guidelines, applicable and valid for the place of installation.

Note: If necessary, measures to protect the water have to be taken by installing appropriate components.

Take the following criteria into consideration when selecting the installation area:

- Feed-water pressure (potable tap water) not be less than 2 bar (29 PSI) and not greater than 6.9 bar (100 PSI).
- There must be a feed-water shut off valve installed ahead of the Smart2Pure Pro system.



CAUTION: The feed-water pressure to Pretreatment system must not be allowed to go above 6.9 bar. Install an additional pressure reducer when the feed-water pressure is higher.

- You must protect your system from frost. The temperature at the installation area must be between +2°C and +40°C.
- The surface on which the system is installed must be level and stable. It should not exceed a maximum of 2% deviation from evenness is recommended.
- A smooth wall is required when the system is to be wall mounted. The bench or wall surface must have an adequate load-carrying capacity (check the maximum capacity of load the wall can sustain and the stability of the wall). The dry and wet weight of the system is given under section **Technical Specifications**.
- A low pressure check valve is recommended in the feed-water line to prevent back flow of feed-water from the water system. Refer to local building codes.
- Easy access for operation and control of the system.

Installation

1. Requirements for installation:
 - Screws and fasteners for wall bracket (if wall mounting pretreatment)
 - Tap water supply with shut off valve and 3/4" NPT male adapter
2. Locate Pretreatment system within 6 feet of Water Purification system.

Wall Mounting Instructions for Pretreatment System

Note: Before you begin mounting the system on the wall, you must check that the strength of the wall to ensure it is suitable for supporting the system (refer to the table "Dimensions and weight of Pretreatment system" in the section **Technical Specifications**).

Note: The system does not include screws and fasteners for mounting, and requires minimum 4 fasteners (2 on top, 2 on bottom).

The countertop base can be removed before wall mounting. To remove the countertop base, remove the 4 screws from the bottom of unit.

1. Locate the wall bracket. Hold the wall bracket at the desired position on the wall and check for levelness. Mark four boreholes for fixing the wall bracket.

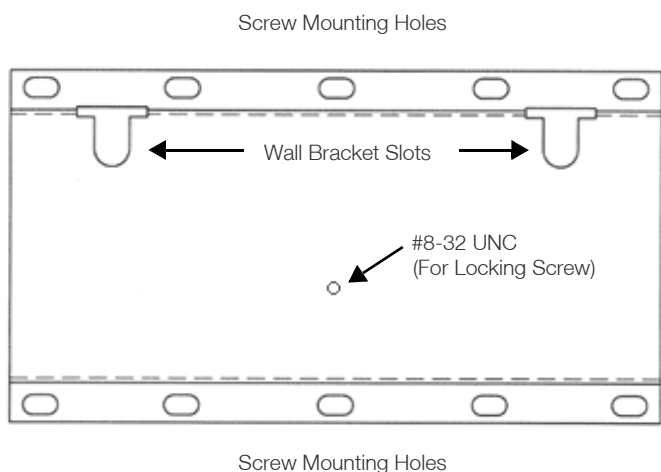


Figure 4. Wall mount bracket

2. Drill holes for fasteners, or drill screws directly into backing board and attach wall bracket securely to the wall.

3. Place Pretreatment system onto bracket by sliding the mounting pins into the wall bracket slots (refer **Figure 5**).
4. Lock Pretreatment system into place by opening front door and locating the locking screw hole. Fasten #8-32 locking screw from Pretreatment system to the wall bracket (refer **Figure 5**).

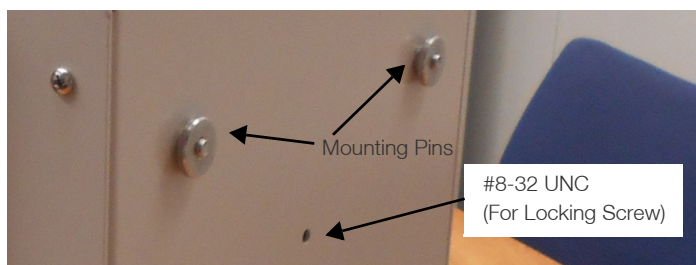
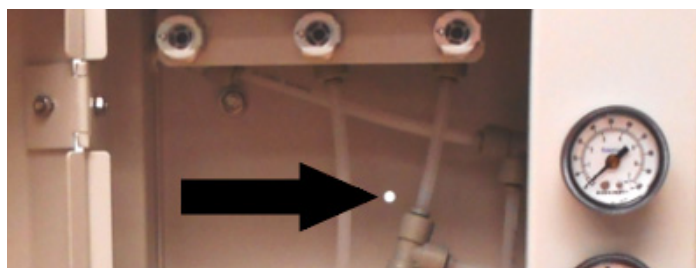


Figure 5. Locking wall mount

Connections of the Pretreatment System

Following connections are required for pretreatment system to work:

1. 1 micro Prefilter cartridge quick disconnects
2. MPS anti-scalent cartridge quick disconnects
3. Extruded carbon filter quick disconnects
4. Outlet connector for outer diameter 1/4" tube
5. Inlet connector for outer diameter 1/4" tube

Note: If you remove any of the cartridges, water flow will stop. In order to operate, all five connections above must be made, and feed-water must be turned ON.

Tubing Installation:

Note: Use tube cutter to ensure ends of tubing are flat and free of burrs (prickles).

1. Mark from end of tube the length of insertion (1.75 cm / 11/16 inch)
2. Wet the tube end and insert the tube straight into the fitting until it bottoms out on the interior shoulder and the insertion mark is no longer visible.

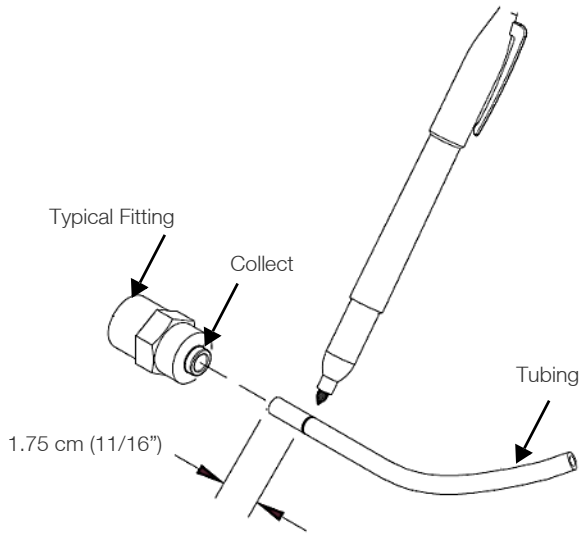


Figure 6. Inserting tube into fittings

Quick Disconnect Fittings:

These fittings are found on the Prefilter, MPS and Carbon cartridges. To insert the cartridges:

1. Press on metal thumb pad on unit to ensure fitting is open
1. Insert the male adapter into fitting and release your thumb. Push the connector until you hear a click. Gently pull the cartridge to ensure the connection is secure.
2. To remove cartridges, press on metal thumb pad to release fitting and pull cartridge out.

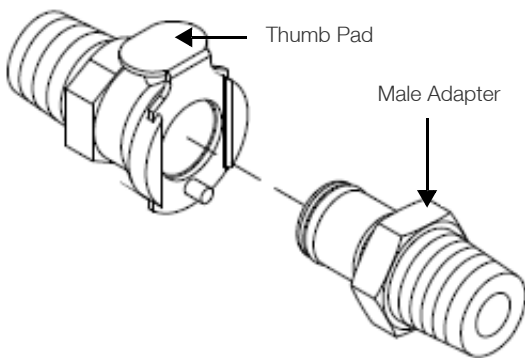


Figure 7. Quick disconnect fittings

Cartridge/Filter Installation:

1. Open the Front Door.
2. Install the Prefilter (D502113) by inserting into the upper right and lower right quick disconnects. Push firmly into place.

3. Install the MPS cartridge (D502114) by inserting into the upper middle and lower middle quick disconnects. Push firmly into place.
4. Install the Carbon filter (D502115) by inserting into the upper left and lower left quick disconnects. Push firmly into place.



Figure 8. Cartridge installation

Inlet / Outlet Connections:

1. **Outlet Connection:** Connect 1/4" outer diameter tubing to outlet connector on left side of Pretreatment system. Then connect to the water purification system (i.e. Smart2Pure Pro) as shown in the **Typical Installation** section.
2. **Inlet Connection:** Connect 1/4" outer diameter tubing to the inlet connector on right side of the Pretreatment system.
3. **Feed-Water Connection:** Using Feed-water fitting kit from Smart2Pure Pro installation kit, connect inlet tubing to the 3/4" NPT feed-water connection.

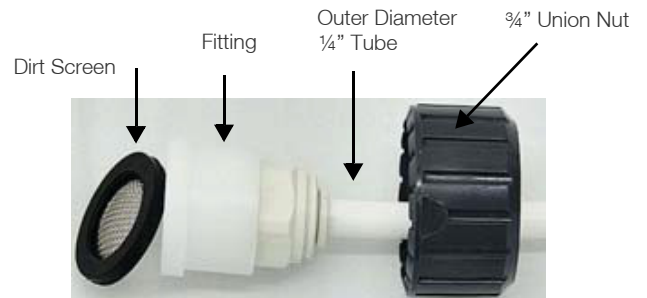


Figure 9. Feed-water fitting

Typical Installation

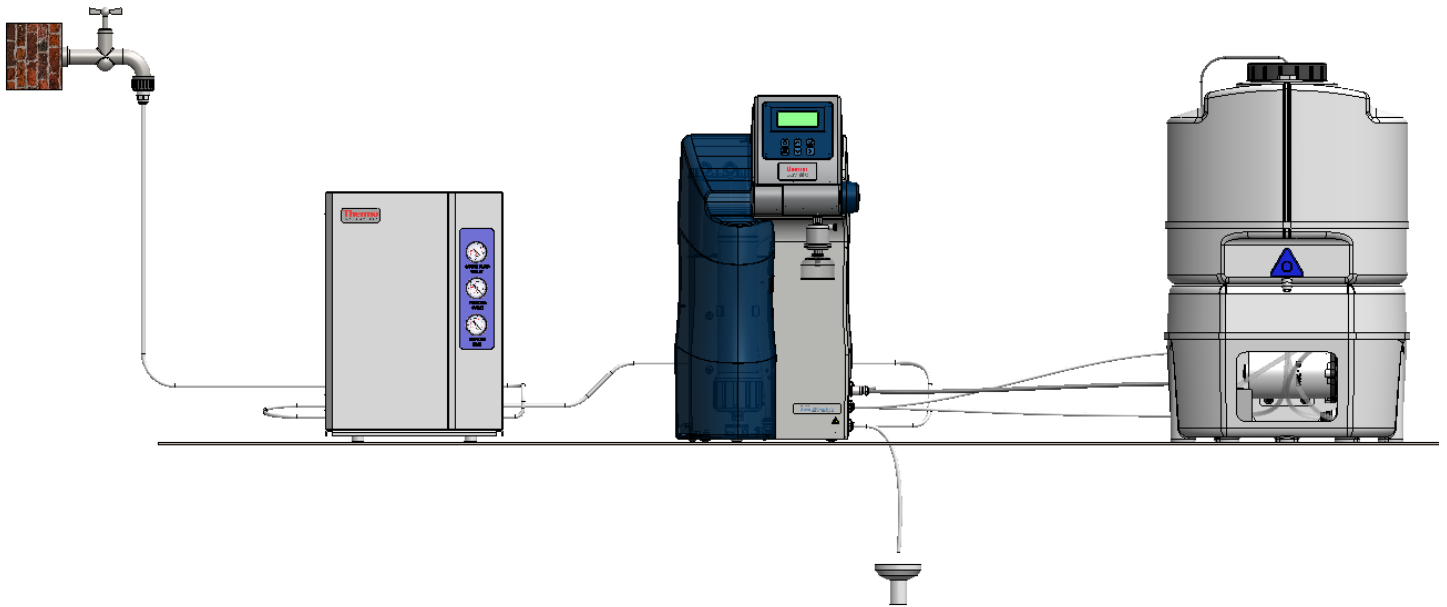


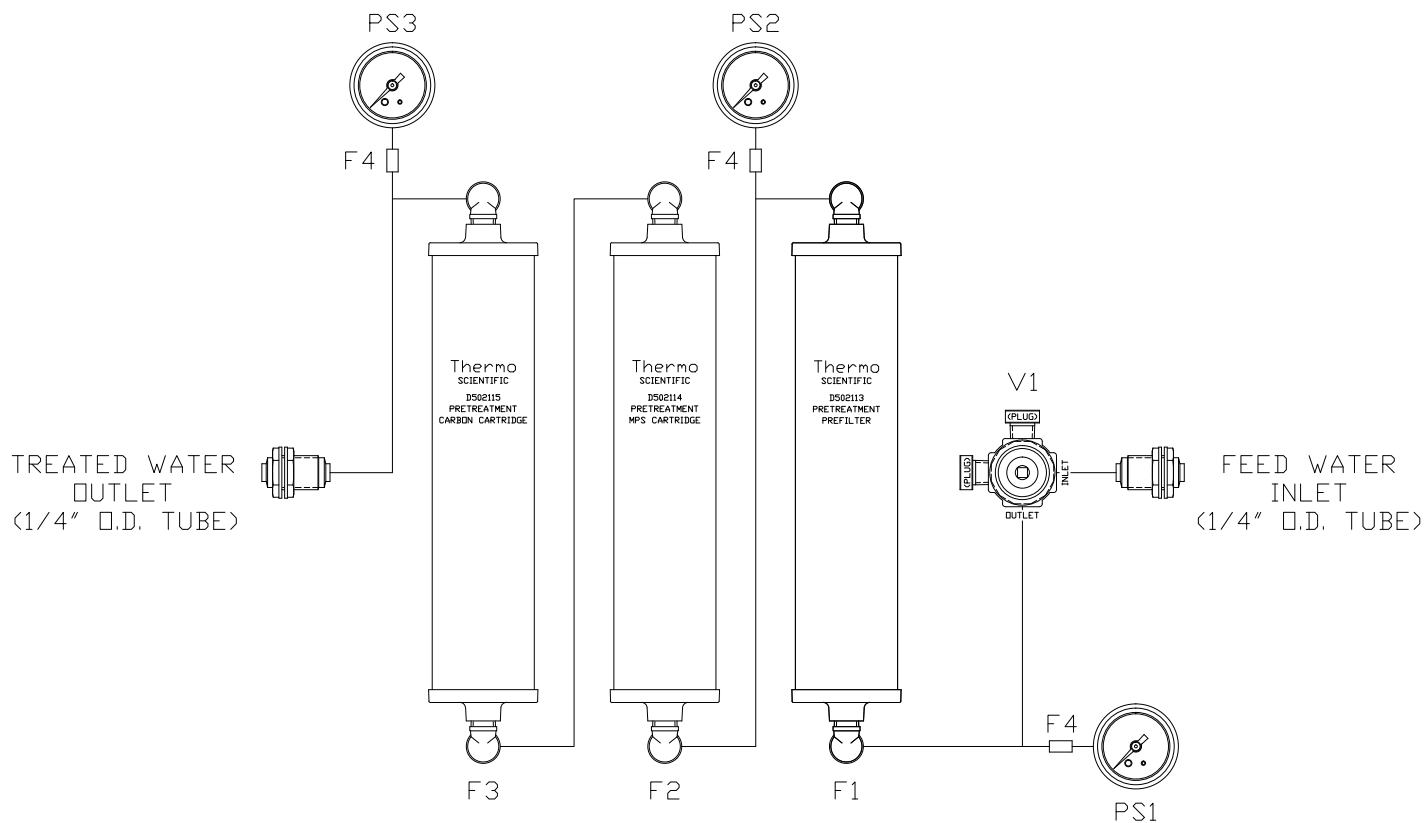
Figure 10. Bench setup

Corrective measures

- All tubing and cartridges must be checked for their correct position on the system and that no leakage or blockage after opening the feed-water supply.
- To avoid tripping, ensure that the tubing does not lay over the floor.

Flow Chart

Note: The following flow chart describes the Pretreatment system water flow path.



- | | | | |
|-----|------------------------------------|------|------------------------|
| F1: | Prefilter | PS1: | Prefilter Inlet Gauge |
| F2: | MPS Cartridge | PS2: | Prefilter Outlet Gauge |
| F3: | Carbon Filter | PS3: | Carbon Outlet Gauge |
| F4: | FLX31 Pressure Gauge Filter, 25 µm | V1: | Pressure Regulator |

How the Pretreatment System Functions

When the system is in operation, tap water with a maximum pressure of 6.9 bar flows into the system through the feed-water Inlet connection on the bottom of the right side panel.

The feed-water pressure is regulated to 30 psi via an internal pressure regulator. This regulated pressure can be seen on the Prefilter Inlet gauge.

The water then flows (upward) through the 1 μm Prefilter. The Prefilter is used to remove particulates from your feed-water which can damage/plug an RO Membrane downstream from the system. A Prefilter Outlet pressure gauge shows the pressure drop across the Prefilter by comparing the Prefilter Inlet and Prefilter Outlet gauge. A pressure drop of > 10 psi indicates a plugged Prefilter (which can reduce flow through the Pretreatment system) and replacement is necessary.

Next the water flows into the MPS Anti-Scalent cartridge. The MPS cartridge contains a slow dissolving anti-scalent material which is designed to prevent hard water scale buildup on down stream RO Membranes. Replace this cartridge when the anti-scalent material is half dissolved.

After the MPS cartridge, the water flows into the Extruded Carbon cartridge. The carbon cartridge removes chlorine from your feed-water, which can damage RO Membranes. Replace the carbon cartridge every 6 months. The Carbon Outlet pressure gauge displays the pressure after the carbon cartridge. Compare the Carbon Outlet gauge to the Prefilter Outlet gauge to determine the pressure drop across the carbon cartridge. Pressure drops of > 15 psi indicates the carbon cartridge is blocked and needs replacement.

The water exits the Pretreatment system via the Outlet connector on the bottom of the left side panel. Use a ¼" outer diameter tube to connect to an RO system, such as the Thermo Scientific Barnstead Smart2Pure or Pacific Series water systems.

Initial start up

Putting the system into operation



CAUTION: Check that all connections have been made as described in the **Installation** section.

- Verify if all connections are secure and correct.
- Turn the feed-water ON. Verify no leaks are present in the tubing, connectors, cartridges, etc. Turn the water purification system (i.e. Smart2Pure Pro) downstream of the Pretreatment system ON. Check for leaks once the downstream water purification system starts production.
- Verify that all pressure gauges are showing pressure readings.
- If no leaks or blockages are found, close the Pretreatment system's front door and allow operation to continue.

Operating Elements

1. Prefilter Inlet
 - Indicates water pressure after the regulator, before entering the Prefilter
2. Prefilter Outlet
 - Indicates water pressure after the Prefilter
3. Carbon Filter Outlet
 - Indicates water pressure after the carbon filter



Figure 11. Pretreatment system gauge

Maintenance

Regular servicing of the system ensures that the quality of the treated water will remain constant. To ensure that your system is serviced properly we recommend that you obtain a maintenance contract with Thermo Fisher Scientific or factory authorized service provider. You can then be certain that your system will have a high degree of operational reliability and dependability.

To ensure that your system functions without any errors it must be checked, maintained and serviced at regular intervals, as described in these operating instructions. The operating instructions must therefore be kept in an easily accessible location for anyone who is using or servicing the system.

Maintenance Intervals

Wear parts must be replaced in accordance with the following table. The intervals have been established for the user and depend on the actual, exact water quality and the volume of water that is used daily.

Material	Flow chart no.	Item No.	Interval	Other problems
Prefilter	F1	D502113	6 months	Or when pressure drop exceeds 10 psi as indicated by difference of Prefilter Inlet and Prefilter Outlet gauges
MPS Cartridge	F2	D502114	6 months	Or when material is half dissolved
Carbon Filter	F3	D502115	6 months	Or when pressure drop exceeds 15 psi as indicated by difference of Prefilter Outlet and Carbon Outlet gauges

Note: The lifetime of the wear parts is a direct function of the quality of the feed-water and the daily volume of water that is used.

Waste Disposal

Note: Before returning your Thermo Scientific Barnstead Pretreatment systems for waste disposal, contact your local waste disposal company for proper disposal of the system and its components. Only specially trained personal can take the system out of operation and dispose it properly.

When the packaging is no longer needed it can be disposed of as household waste. Systems are in conformity with EEC Guideline 2011/65/EC.

The system is not to be thrown away as household waste but must be properly disposed of. It can be returned to the manufacturer for safe disposal according to EEC Guideline 2011/65/EC. We therefore request our customers in Germany and other member States in the European Economic Area to contact our local service center or our headquarters.

weee.recycle@thermofisher.com

WEEE-Reg.-no.: DE 12471402

In countries outside of the European Economic Area, contact your local authorities or waste disposal company.

Troubleshooting

Note: Contact the service department if you cannot rectify these error.

Problem	Cause	Solution
Low Flow out of system	Plugged cartridge(s) Low feed-water pressure	Check Pressure gauges to determine if Prefilter or Carbon cartridge is plugged. Ensure feed-water is at least 2 bar
No Flow out of system	No feed-water flow	Verify feed-water is on, check for pressure on Prefilter Inlet Gauge
Leakage in the system	Tubing connector, Cartridge or tubing	Verify tubing is properly connected. Verify cartridges are installed properly and are not cracked. Replace broken tubing or connectors. Call Service
Gauges not working	Faulty gauge Blocked cartridge No feed-water	Replace faulty gauge Try bypassing cartridges using 3/8" tubing with CUX9 tubing connectors installed to check gauge Turn on feed-water, or remove blockage

Replacement Parts

Note: The use of spare parts, accessories or wear parts from other manufacturers will nullify the warranty for this unit.

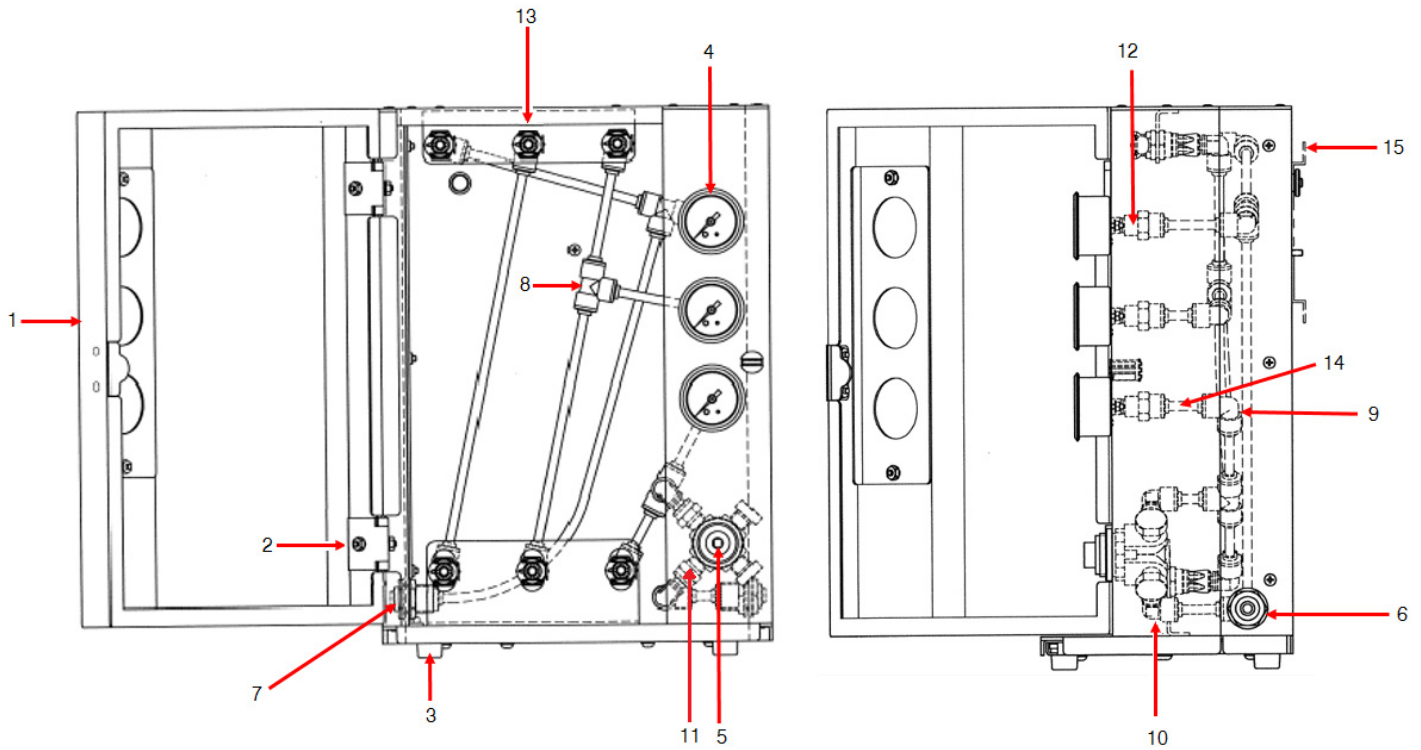


Figure 12. Replacement part list for Pretreatment system

Drawing ID	Part	Part Number
3	Feet	321191
4	Pressure Gauge	MEX196
5	Pressure Regulator	02280
6	Inlet Connector	PMX206
7	Outlet Connector	PMX206
8	TEE Union	PMX222
9	Elbow Union	212-00001
10	Elbow Stem	PMX235
11	Male Connector	212-00002
12	Female Connector	PMX236
13	Quick Disconnect Coupling	212-00003
14	25 Micron Tube Filter	FLX31

Drawing ID	Part	Part Number
15	Wall Bracket	700-00006

Not shown:

- TU494X4 6 feet (1.8 meters) of ¼ OD tubing)
- 25.0071 Feed Water Connection kit

Replacement: Consumables

Consumable	Item No.
Prefilter Cartridge	D502113
MPS Cartridge	D502114
Carbon Cartridge	D502115

Maintenance Record

Customer address:

Location:

System type:

Serial no.:

Manufacturing Year:

Date	Prefilter Replaced? Y/N	MPS Replaced? Y/N	Carbon Replaced? Y/N

The following points must be observed in order to ensure the quality of the system.

- 1x/Weekly, enter measured values.

WEEE Compliance

WEEE Compliance. This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. It is marked with the following symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on our compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at www.thermofisher.com under Services & Support.

Great Britain



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Deutschland



Conformità WEEE. Questo prodotto deve rispondere alla direttiva dell'Unione Europea 2012/19/EU in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE). È marcato col seguente simbolo. Thermo Fisher Scientific ha stipulato contratti con una o diverse società di riciclaggio/smaltimento in ognuno degli Stati Membri Europei. Questo prodotto verrà smaltito o riciclato tramite queste medesime. Ulteriori informazioni sulla conformità di Thermo Fisher Scientific con queste Direttive, l'elenco delle ditte di riciclaggio nel Vostro paese e informazioni sui prodotti Thermo Scientific che possono essere utili alla rilevazione di sostanze soggette alla Direttiva RoHS sono disponibili sul sito www.thermofisher.com in Servizi e Supporto.

Italia



Conformité WEEE. Ce produit doit être conforme à la directive euro-péenne (2012/19/EU) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est marqué par le symbole suivant. Thermo Fisher Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Fisher Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Fisher Scientific qui peuvent aider la détection des substances sujettes à la directive RoHS sont disponibles sur www.thermofisher.com sous Services et Assistance.

France



Cumplimiento de la directiva RAEE. Este producto está obligado a cumplir con la Directiva de la Unión Europea sobre residuos de aparatos eléctricos y electrónicos (RAEE) 2012/19/EU. Está marcado con el siguiente símbolo. Thermo Fisher Scientific ha contratado a una o varias empresas de reciclado/disposición de residuos en cada estado miembro de la UE, y este producto debe reciclarse o desecharse a través de dichas empresas. Para obtener más información sobre nuestro cumplimiento con estas directivas, las empresas de reciclaje de su país, así como información sobre los productos Thermo Scientific que pueden ayudarle a detectar sustancias sujetas a la directiva RoHS, visite www.thermofisher.com/WEEERoHS en la sección Servicios y Asistencia.

España



IF YOU NEED ASSISTANCE:

Thermo Fisher Scientific products are backed by a global technical support team ready to support your applications. We offer cold storage accessories, including remote alarms, temperature recorders, and validation services. Visit www.thermofisher.com or call:

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China	+800 810 5118, +400 650 5118	+8621 68654588
Japan	+81 3 5826 1616	+81 3 3816 3355
Australia	+61 39757 4300	1 300 735 292
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France	+33 2 2803 2180	+33 2 2803 2180
Germany	0800 1 536 376, +49 6184 90 6000	0800 1 536 376
Italy	+32 02 95059 552	+39 02 95059 552, 432 254 375
Netherlands	+31 76 579 55 55	+31 76 571 4440
Nordic/Baltic/CIS	+358 9 329 10200	+358 9 329 100
Russia	+7 812 703 4215	+7 812 703 4215
Spain/Portugal	+34 93 223 09 18	+34 93 223 09 18
Switzerland	+41 44 454 12 22	+41 44 454 12 12
UK/Ireland	+44 870 609 9203	+44 870 609 9203
New Zealand	+64 9 980 6700	+64 9 980 6700
Other Asian Countries	+852 2885 4613	+852 2885 4613
Countries not listed	+49 6184 90 6000	+49 6184 90 6000

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