User Manual: Cabin 'Clean Water Filter' - Canada

The Cabin 'Clean Water Filter' or CWF is a variation of the BioSand Water Filter or BSF technology in use around the world for more than twenty-five years, (See www.manzwaterinfo.ca) and previously commercialized by Davnor Water Treatment Technologies Ltd. (now defunct). It is now commercialized by Davnor Water Filters Ltd. The unique design of the CWF results from critical evaluation of experience with the BSF technology from consumer, manufacturer, distributor and marketing perspectives, a focussed investigation of basic filter design, and independent performance evaluation studies. The depth of the filter media has been significantly decreased (to that used in original laboratory work in the University of Calgary) resulting in a shorter, light weight filter. The CWF is cleaned using surface agitation (similar to the BSF). Impaired filter performance resulting from media compaction (when moving filter) or attempting to filter water with excessively high concentration of suspended solids can be easily restored using the aggressive reverse flow feature.

The CWF can be used to remove particulate matter and pathogens from surface water (rivers, ponds and lakes), groundwater (wells and springs), captured rainwater and melted snow. Pathogen (parasite and bacterial) removal claims have been verified by independent laboratory testing.

While the water produced by the CWF is greatly improved and may be safe to drink, it is strongly recommended that filtered water be safely stored and dispensed and be disinfected using chlorine tablets or household bleach to provide treated water that is aesthetically pleasing and 100% safe to drink.

The CWF is designed to produce a maximum of 12 Litres per hour of filtered water.

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manzcabin@shaw.ca
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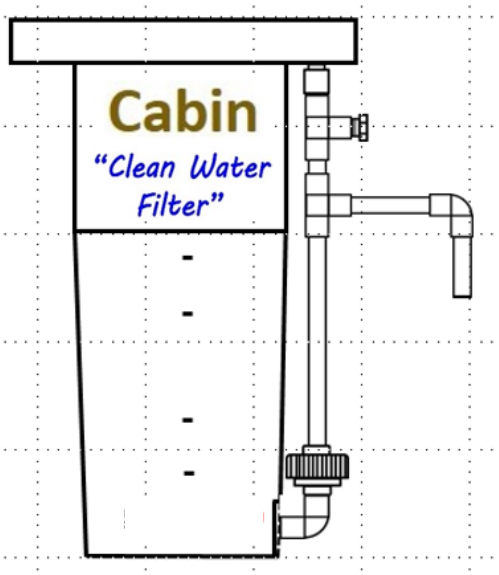
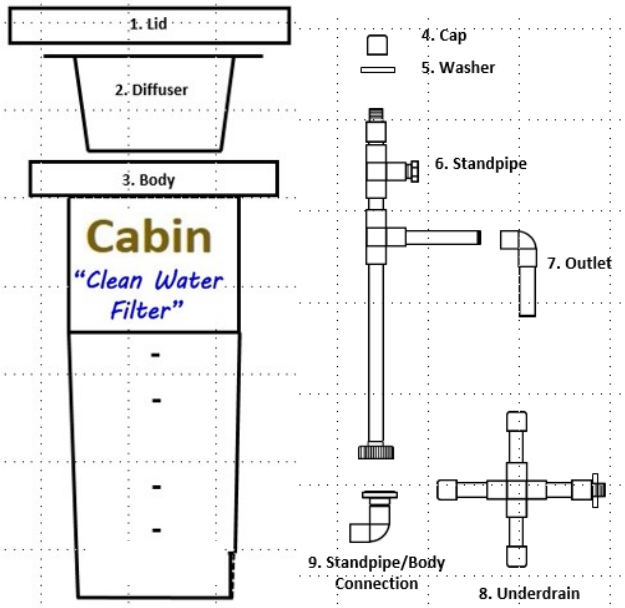
11. Filter Start-up After Extended Period of Not Being Used

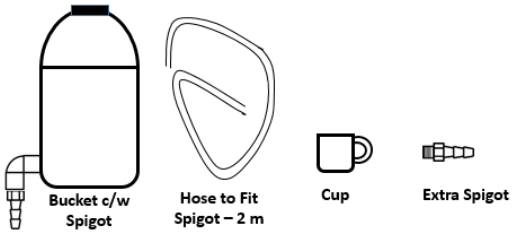
1. Assembly

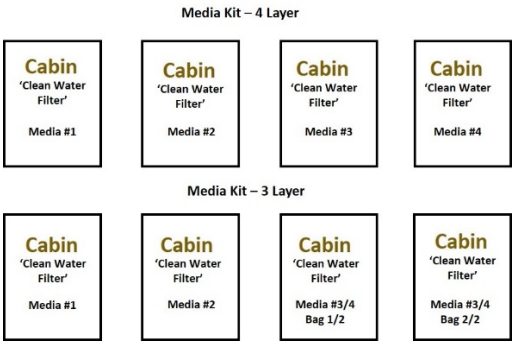


Assembled Filter



Filter Components





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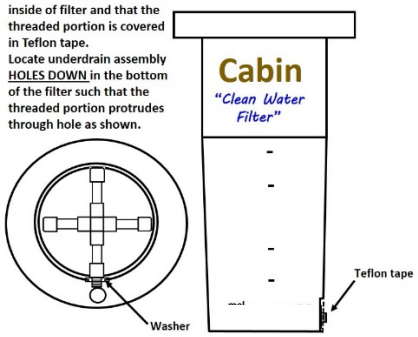
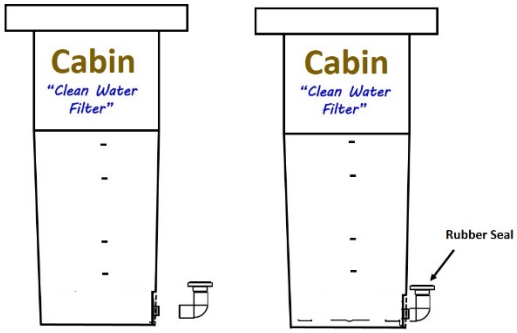
Insure that the washer is on inside of filter and that the threaded portion is covered in Teflon tape.
Locate underdrain assembly HOLES DOWN in the bottom of the filter such that the threaded portion protrudes through hole as shown.



Step 1

Attach lower leg of standpipe. Tape threaded portion with Teflon tape if necessary – hand tighten.

Insure the rubber seal is present and in position.



Step 2

Pass standpipe upper leg through hole on the top of the filter, Figure 1. (Insure that threaded portion has been covered with Teflon tape.)

Position standpipe as shown and loosely tighten the union, Figure 2.

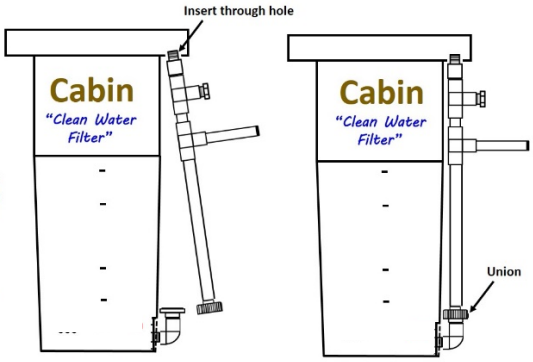


Figure 1.

Figure 2.

Step 3

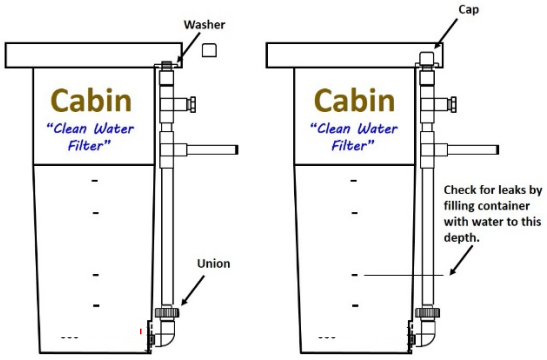
1. Place washer over threaded portion of standpipe and attach cap.

2. Hand tighten union.

3. Hand tighten cap. (May require further tightening as determined during commissioning.)

4. Add water to filter sufficient to fill it to second mark from bottom.

5. Check for leaks. Take corrective action as necessary.



Step 4

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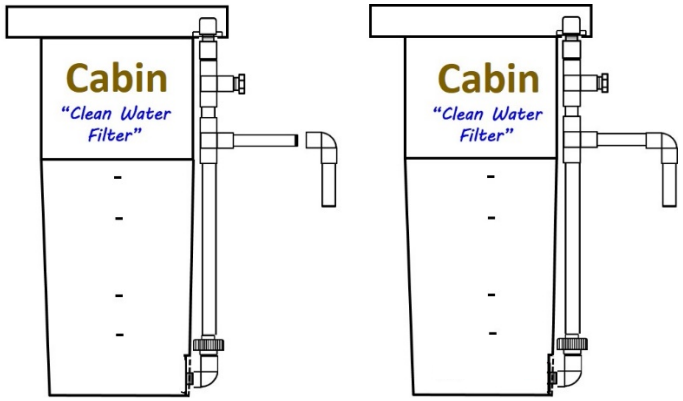
Attach standpipe outlet.

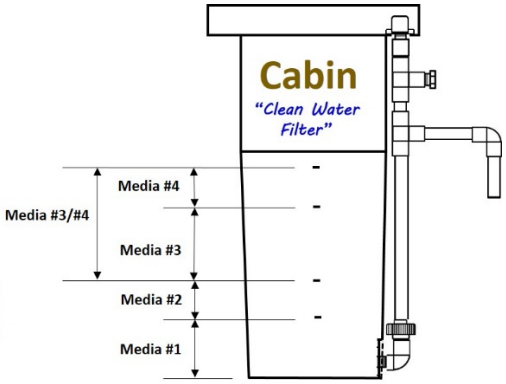


Step 5

Add media.

Media is added in the following order (see marks on filter container):

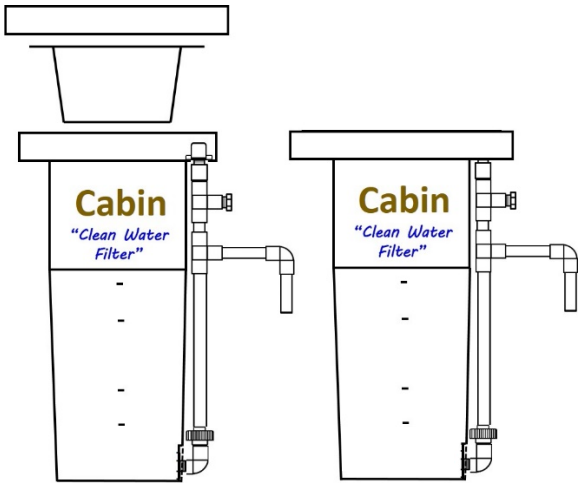
- **Media #1**
- **Media #2**
- **Media #3 (media #3/#4)**
- **Media #4 (media #3/#4)**



Step 6

1. Position diffuser.
2. Position lid.

Filter is now assembled and ready for commissioning.



Step 7

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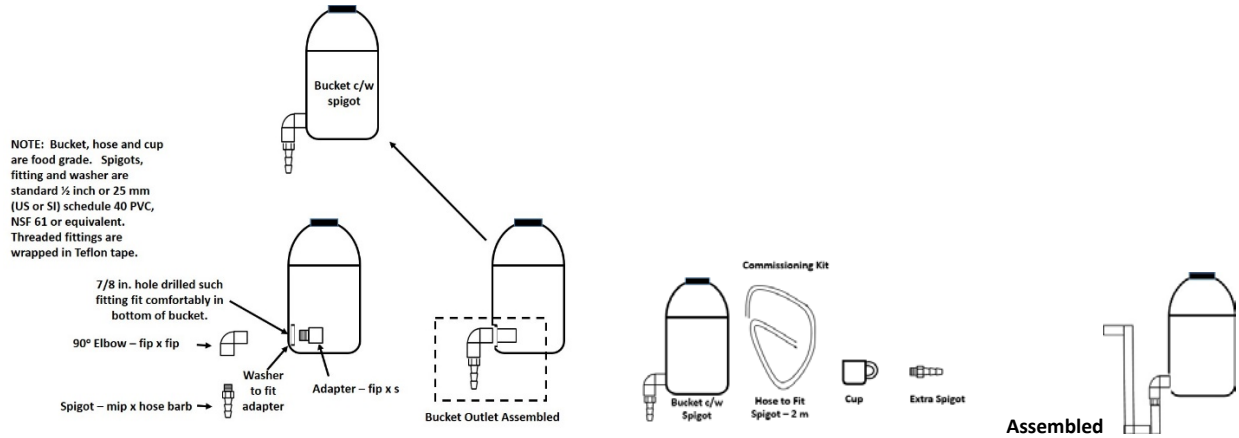
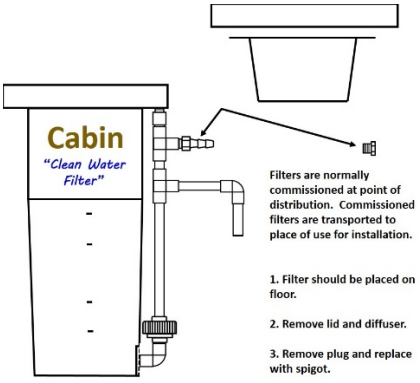
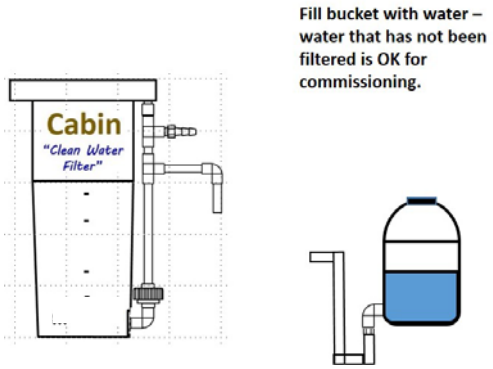
2. Commissioning

Commissioning is the process of preparing filters for use. Often filters are commissioned off-site and transported to place of use where they are re-commissioned. They can also be commissioned on-site as part of installation.





Step 1



Step 2

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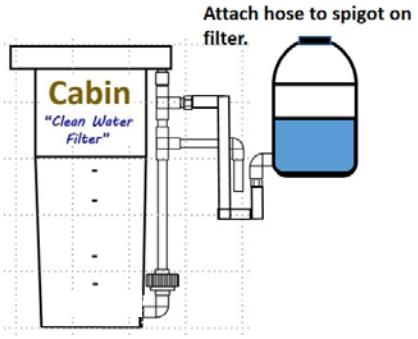
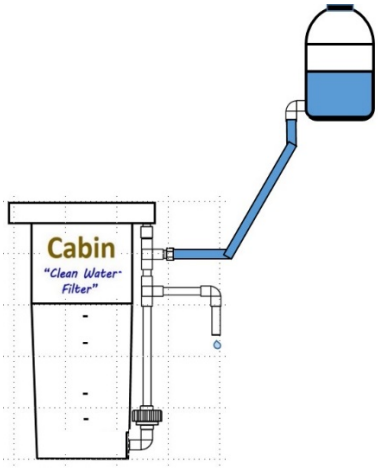


Step 3

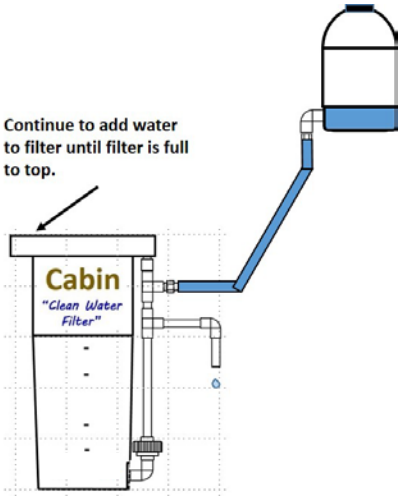


Raise bucket approximately 1.5 to 2 m above top of filter.

Water will flow through standpipe, into the underdrain and upward through the media. The media should behave like 'quick sand'. It should be possible to push your fist through filtering media down to separating media. (Do not disturb separating media.)

There will be some leakage from filter outlet.

Step 4



Step 5

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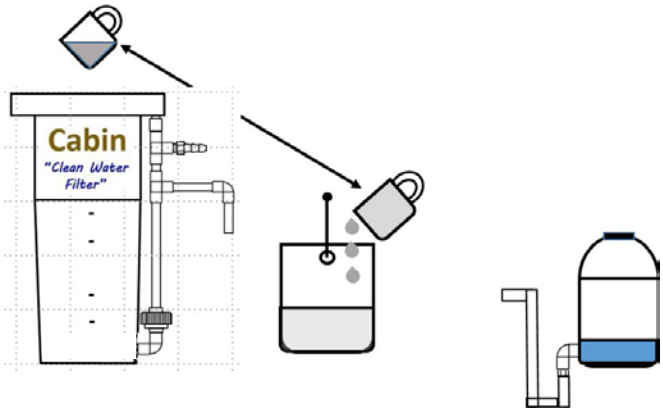
Wait a few seconds to let media settle. Hold finger over spigot or use spigot plug to prevent water from spilling on floor.

Use cup to scoop out 'dirty water'. Remove as much water as possible.

Dispose of dirty water.



Step 6

Steps 2 to 6 are repeated 4 times.

Step 7: Rinsing
At least two buckets of untreated water are poured into filter (diffuser in place) but NOT consumed. The filtered water is disposed of. After Step 7 the filter may be considered commissioned and ready for use.

The third bucket will produce consumable water.

Filtered water should be disinfected using chlorine (tablets or household bleach).

Filtered water should be stored in a closed container with provision for dispensing.

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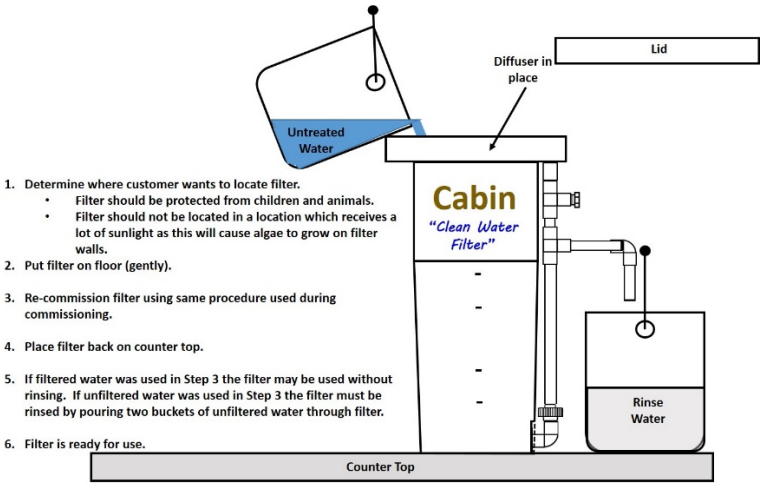
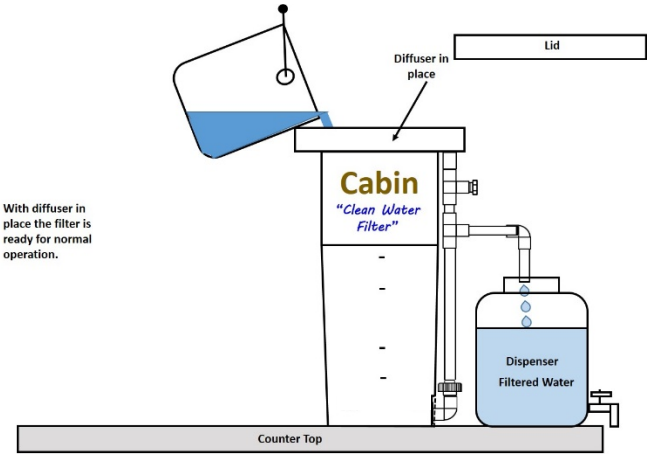
3. Installation

Installation consists of rinsing a commissioned filter prior to filter being placed into operation. If the filter has been moved after commissioning and there is reason to believe that the media has compacted the filter should be re-commissioned to restore filtration capacity as described later. Use of unfiltered water is OK.



1. Determine where customer wants to locate filter.
   - Filter should be protected from children and animals.
   - Filter should not be located in a location which receives a lot of sunlight as this will cause algae to grow on filter walls.
2. Put filter on floor (gently).
3. Re-commission filter using same procedure used during commissioning.
4. Place filter back on counter top.
5. If filtered water was used in Step 3 the filter may be used without rinsing. If unfiltered water was used in Step 3 the filter must be rinsed by pouring two buckets of unfiltered water through filter.
6. Filter is ready for use.



With diffuser in place the filter is ready for normal operation.

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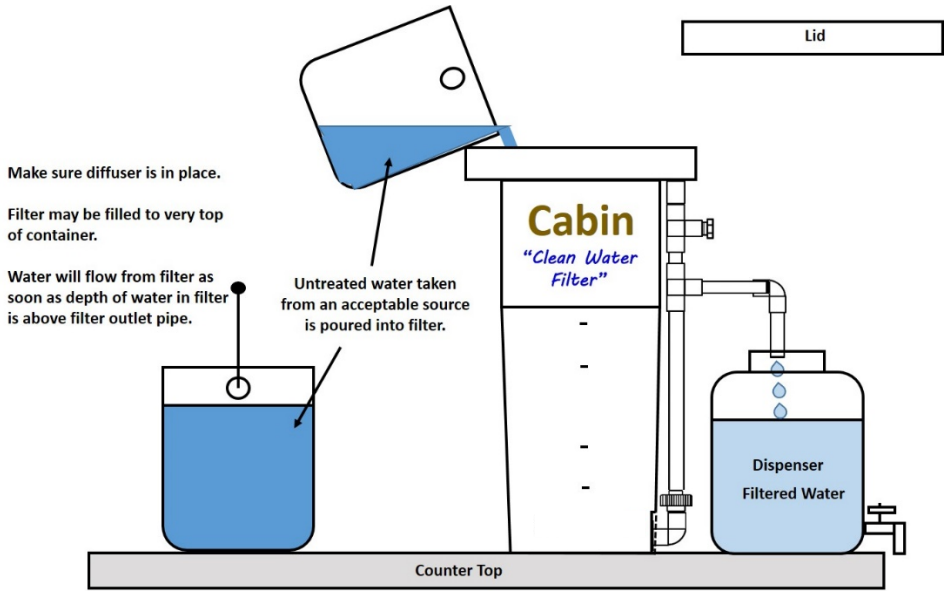
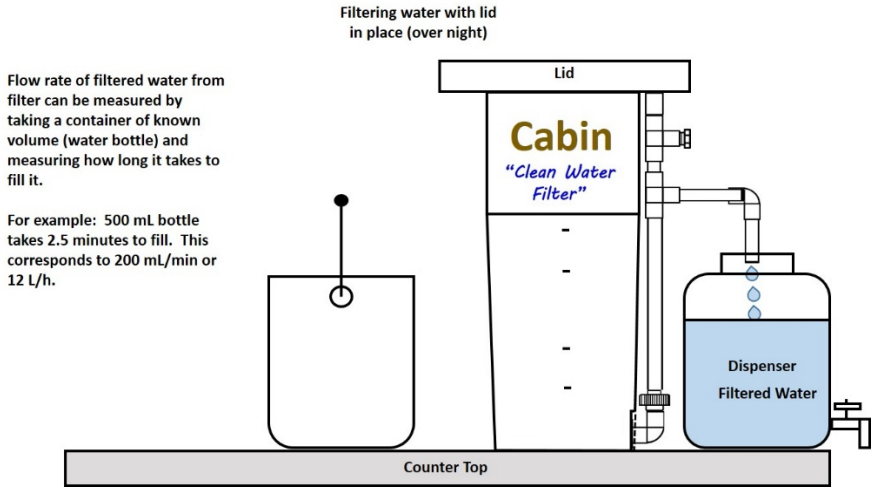
4. Operation





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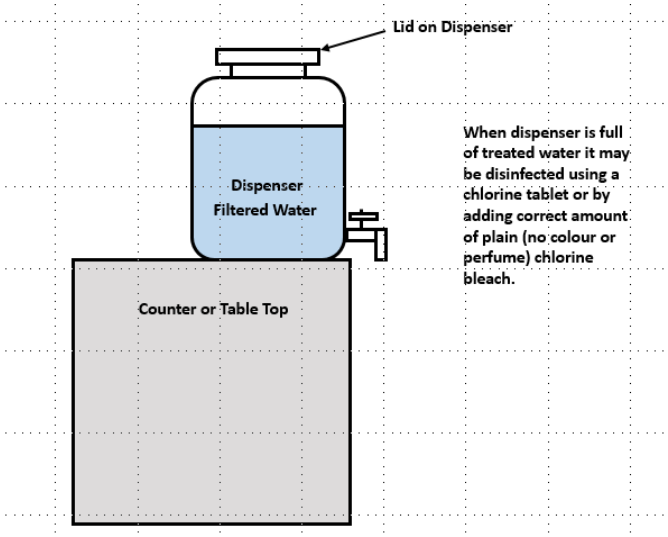

Other considerations:

1. Filter should be protected from children and animals.
2. Filter should not be located in a location which receives a lot of sunlight as this will cause algae to grow on filter walls.
3. Filter may be moved if done very gently. Rough handling of the filter will result in media compaction, flow reduction and need for re-commissioning.
4. Do not store food in diffuser.
5. Insure lid is on filter as much as possible to avoid problems with insects, rodents and dust.
6. Ideally, the filter should be used to treat 4 litres of water every day. Simple systems can be assembled to perform this function independently.
7. De-commission the filter if it might be subject to freezing temperatures. Very simple to re-commission.
8. If filter is damaged for any reason contact local technical support.

When treating water for removal of pathogens the recommended surface loading rate is 400 L/h/m^2. Filtered water production from the CWF is approximately 12 L/h or 200 mL/min.

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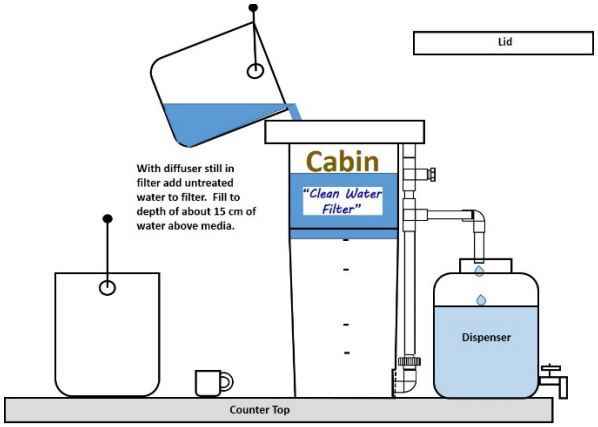
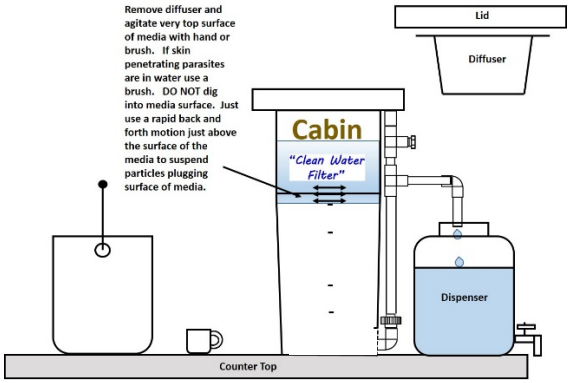
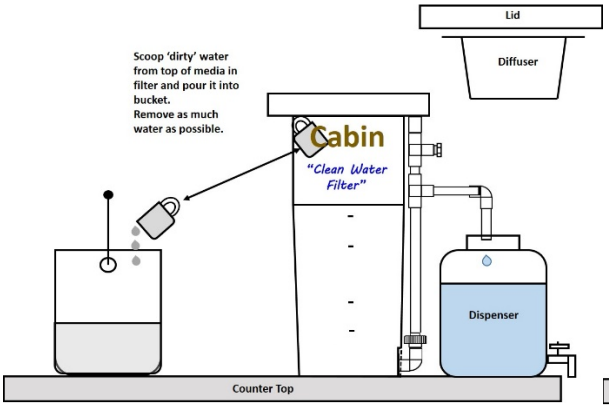
5. Cleaning



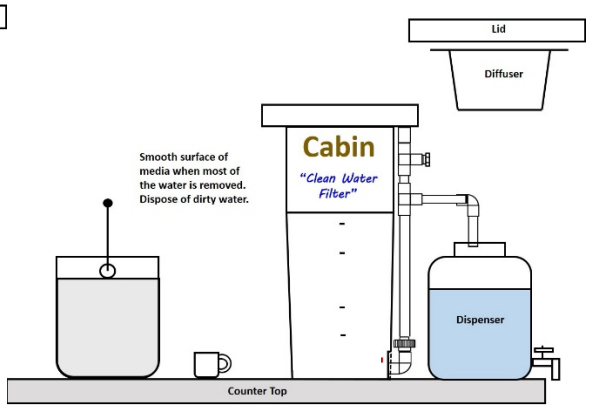
Step 1



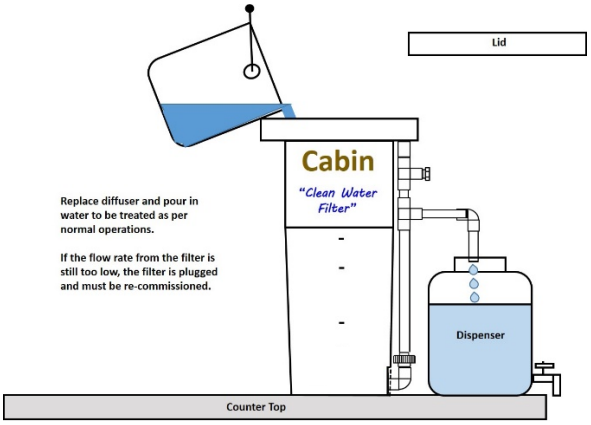
Step 2



Step 3



Step 4



Step 5

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6. Re-commissioning

Re-commissioning will be required if the filter is moved resulting in media compaction, if water with very high concentration of suspended solids is provided to the filter necessitating media flushing or if for some reason the flow through the filter media is obstructed by gas bubbles. Re-commissioning is performed using exactly the same method as commissioning. If filtered water is used the filter may be put into operation without rinsing.

7. Transporting or Moving Commissioned Filter

The filter may be transported or moved after commissioning and after used to filter water. The effect of transporting the filter will be compaction of the filter media resulting in very low production rate and disturbance of some fine material captured within the filter resulting in production of unacceptable turbidity of filtered water. Moving the filter may have identical effect. These problems can be overcome by re-commissioning the filter using filtered water and rinsing the filter until the produced water is acceptable. Note that the produced water, even with high turbidity, is not a health danger, particularly if properly disinfected.

8. De-commissioning and Re-commissioning

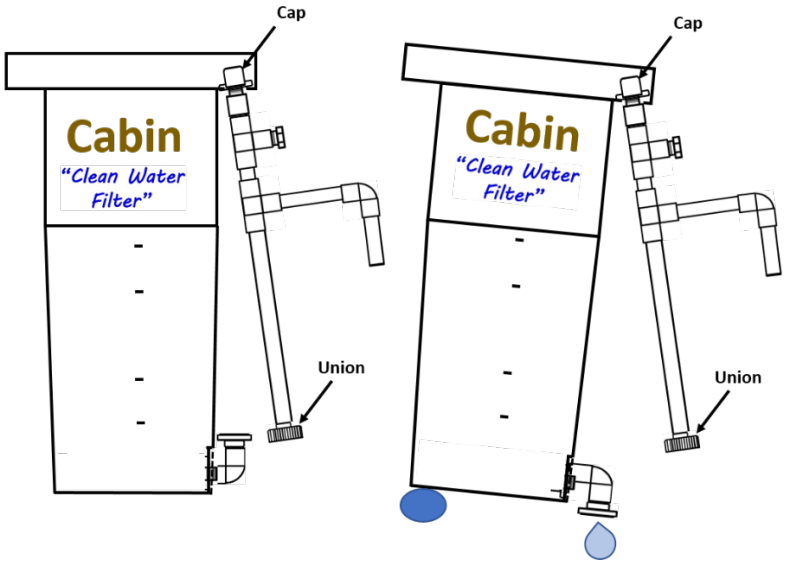
Clean filter

Loosen cap.

Undo union and tilt standpipe away from body.

Turn outlet downwards .

Tilt filter towards outlet to drain as much water as possible.



De-commissioning a filter may be desirable if the filter is subject to freezing or is not going to be used for several weeks, months or years.

Re-commissioning a filter consists of re-assembling the filter, performing a commissioning process with clean (preferably filtered) water, and rinsing the filter until the filtered water has acceptable turbidity (rinsing may not be necessary if filtered water is used). Note that the produced water, even with high turbidity, is not a health danger, particularly if properly disinfected.

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9. Winterizing (Canadian conditions)

Filters are winterized using the de-commissioning process. The media will freeze and any water left in the filter will freeze without damaging the filter. Winterized filters may be placed back into operation after thawing and using the commissioning process.

10. Disinfection of Filtered Water

It is strongly recommended that filtered water be disinfected using chlorine tablets (as per manufacturer's instructions) or using unscented and uncoloured liquid household bleach (2 drops per litre of 5% sodium hypochlorite). Chlorine taste and smell can be reduced by allowing the disinfected water to sit in the dispensing container overnight. Disinfection ensures that the filtered water meets World Health Organization drinking water guidelines and that the water container that holds and dispenses the filtered water remains hygiene.

11. Filter Start-up After Extended Period of Not Being Used

If the filter has not been used for three days or longer it is advisable to re-commission it to 'freshen it up'. This will improve the taste and odour of the water being produced.

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