

Der Unitank-Guide

The Unitank from the American company Ss Brewtech is an absolute all-round fermentation tank. I have been using it for a little over a year now and due to the many requests I have received, I have summarized my procedure in a guide.

The Unitank from Ss Brewtech is now very common in the hobby brewery scene all over the world. I also have a 14 GAL version and meanwhile I get a lot of inquiries about which accessories are needed, how to do this and that and so I thought - why not write a comprehensive guide about it.

I would like to mention that I only describe and present my procedures. **You should always follow the manufacturer's instructions and know what you are doing in any case.**

In this guide, of course, manufacturers/brands are also mentioned. I use this equipment and it has proven itself for me. I don't get paid for naming the brands.

I would like to deal with the following topics:

1. **Specification**
2. **Accessories**
3. **Temperature control**
4. **Passivation**
5. **Carbonization**
6. **Dry hopping**
7. **Draining trub/ harvesting yeast**
8. **Filtering**
9. **Transfer in keg or bottle**
10. **Cleaning / CIP**
11. **Advantages over non-pressure resistant fermentation tanks**

At the beginning I would like to give you some specific details about the Unitank.

- *Dimensions (mm rounded up)*

Size	Batch size	Height (ground to PRV/manometer)	Width (Carbstone to Blow off)
7 GAL	19l	89 cm	49 cm
14 GAL	38l	107 cm	49 cm
Half BBL	64l	111 cm	49 cm
1 BBL	117l	130 cm	72 cm

- *Pressure*

All Unitanks are designed for an operating pressure of 15 PSI (approx. 1 bar). The maximum pressure (short-term) should not exceed 30 PSI (approx. 2 bar). It is tested for up to 60 PSI, which is about 4 bar. However, it is essential to follow the manufacturer's specifications.

Accessories

Not to be underestimated is the amount of accessories that you will have to deal with if you decide to buy a Unitank. Of course, it always depends on how you want to use it and where it is installed.

Here is my list for necessary accessories:

- Tempcontrol from Ss Brewtech "FTSs2" – Heating & Chilling
- hose ½" ID
- 1,5" TC to ½" Hose connector
- TC Gaskets 15mm ID and 38mm ID (Best to buy in stock)
- Hose connector with 1/2" AG (male NPT) for Blow off tube

My list for recommended accessories:

- Casters
- Reducer TC 3" to 1,5" (Spunding valve instead of PRV)
- Spunding valve TC 1,5", Working pressure 15-30 PSI
- TC to e.g. ¾" AG to connect your CO2 bottle directly to the Blow (Filling / tapping / carbonating)
- Hose and/or Fittings for Carbstone
- Hose clamps
- Spare O-rings for Racking Arm (10 x 1,2 mm)
- Leg extensions
- 1,5" TC Sight glass
- Diaphragma Valve
- TC mounting for FTSs

My list for CIP accessories:

- Pump e.g. Novax 20b
- CIP Sprayball - Micro Spray Ball 3" TC
- 1,5" TC to 1" hose connector
- 1" ID hose

My list for Dryhopping - Accessories:

By means of a Hop Dropper you can plug oxygen deficiency:

- 3" Butterfly Valve
- 3" Sight glass
- 3" TC clamp

My list for Filter - Accessories:

Is the beer to be filtered during filling into KEG or bottle:

- Hop Strainer with 1.5" TC
- 2x 1,5" TC clamp
- 2x 1,5" TC Gasket

Temperature control

If you invest in a Unitank, it is convenient to buy the FTSS2 to control the fermentation temperature. This is a small temperature controller and a heating element which is attached to the cone of the Unitank.

What is missing now is a cooling source. Now it depends on how you want to accomplish this. Which variant you choose depends on your budget.

If you want to cool actively, you can simply put the Unitank in a refrigerator, which is controlled by an Inkbird for example.

Another possibility is to control it with an external cooling source. A cheap method would be e.g. an expansion tank with ice water. The pump and hoses to lead the liquid through the cooling coil of the Unitank are included in the FTSS2.

There is also the possibility to connect an aquarium cooler.

The ideal solution is a Glycolchiller. This solution is quite expensive, but the cooling capacity is hard to beat. If you use a Glycolchiller from Ss Brewtech you have a plug and play solution, without much tinkering and can also perform a cold crash.

I myself use the Glycolchiller from The Grainfather. This one can be connected to the FTSS with an adapter. You can get it at maltmiller.uk by mail, because it is not offered in the shop. The Chiller from The Grainfather is a little bit cheaper.

Passivation

It is very important to passivate the Unitank before the first use. This will create a protective layer that prevents or greatly slows down corrosion. This procedure should be repeated once a year.

This is a treatment with trisodium phosphate or another highly effective fat solvent. During the first passivation you will also get rid of all oil and production residues in the Unitank.

You can also use 4% citric acid at 40-60°C.

Either fill the Unitank completely with the solution or use your CIP equipment. It is important that you take enough time for this and treat all parts again with the solution.

Carbonation

A big advantage of the Unitank is its compressive strength and the possibility to produce already carbonated beer. To achieve this there are several possibilities:

1. carbonate naturally

With this method I let the beer ferment almost completely. Shortly before the end of fermentation I close the blow off. This prevents the CO₂ from escaping, it remains in the tank and passes into the beer - it carbonates.

You can also ferment under pressure right from the start. I don't do this because it is not necessary and I don't want to stress the yeast unnecessarily.

In any case you need an adjustable spunding valve for this variant. This is available from Ss Brewtech or you can order one in China, which you can attach to the blow off arm with a T-piece.

The problem with this is that the supplied PRV releases pressure at 1.2 bar. If you want to carbonate bottom-fermented beer, let's say at 10°C with 5g/l CO₂, this is just possible. If you also want to carbonate top-fermented beers you have to replace the PRV with one that only releases at 2 bar pressure.

The spunding valve from Ss Brewtech is also adjustable up to 2 bar. So you can let a Pale Ale carbonate naturally at 18°C.

Instead of the 2 bar PRV you can also install a 3" butterfly valve under the supplied PRV and then close it while carbonating. This way no pressure can escape through the PRV and the regulation is exclusively done by the spunding valve. However, **I may not recommend this variant to you, since there is practically no safety mechanism any more.**

Because: a spunding valve is not a pressure relief valve!

1. Force carbonation using the Carbstone

You can also just let the beer ferment. After fermentation you close the Blow off and apply CO₂ to the beer via the Carbstone. I recommend you to cool the beer far down before. On the one hand you need less CO₂ and it binds faster in the beer, on the other hand the required pressure is lower at cooler temperatures and you can work with the included PRV. The Carbstone distributes the incoming CO₂ extremely fine, so it binds faster in the beer.

This variant is also suitable if you have not exactly reached the planned carbonation and still have to carbonate a little bit.

With Carbstone you have to take into account the wetting pressure. This is the pressure needed to make the gas flow through the stone. It is about 0.2 bar (3 PSI).

Example: Your Pale Ale is fermented. You close the blow off and cool the beer down to 5°C. Your desired carbonation is 5g/l CO₂. Now connect the CO₂ bottle to the Carbstone and pressurize the Unitank with 1,1 bar.

- 0.9 bar bunging pressure + 0.2 bar wetting pressure = 1.1 bar

2. Force Carbonation using the Blow off

You can also do the same procedure using the Blow off Arm. You press the CO₂ from above onto the beer and it takes a little longer until it binds in the beer. Again, I recommend to cool the beer beforehand.

For the most part you can leave the CO₂ bottle connected to the pressure reducer in variants 2 and 3. Then you don't need a spunding valve, because the desired saturation is reached exactly. If you want to speed up the process and apply a little more pressure, you will need a spunding valve in case of over-carbonization.

Dryhopping

Again, there are several possibilities.

Of course you can let the beer ferment, not carbonate it, and then put the lid on and throw in hops. But the Unitank is a piece of professionalism in the hobby area, so that there are also possibilities to optimize Dry hopping. During this step you can quickly add oxygen to the beer.

To avoid or reduce this you can use a sluice (Hop Dropper). The simplest construction is a 3" butterfly valve and a 3" sight glass or tri clamp pipe. With this you can add the hop dropper under pressure.

My approach to beers I want to dryhop:

- Shortly before reaching the final gravity I close the blow off
- The beer ferments and carbonates naturally on
- I cool to 16.5°C and close the butterfly valve under the PRV
- Remove the PRV, install the 3" sight glass in its place, fill in stopper hops
- Fix the PRV on it
- Open the butterfly valve only slightly, so that CO₂ from the tank reaches the hop sluice
- Then open the PRV slightly to allow the CO₂/oxygen mixture to escape upwards in the airlock
- Rinse for about 1 minute
- Then close PRV and open butterfly valve - the hops fall in

By draining CO₂ through the sluice to flush the hops, you will of course lack some of the desired spunding pressure. You can simply add the difference back after plugging via the blow off or carbonize a little higher.

I then dryhop for about 2-3 days and then do a cold crash for 2 days. In between I always drain some hops. Afterwards the beer can be bottled.

You can also realize a kind of Hop Gun here. You use a Hop Strainer/Inline Filter. In its filter basket you put the dryhop addition. Here I can recommend you from practical experience cone hops, since this does not clog the filter so much. Afterwards you pump the wort in a circle through the strainer. 6-8 hours of circulation are sufficient to reach the desired aroma saturation. It is important that you rinse the Hop Gun thoroughly with CO₂ to minimize the oxygen input.

Draining trub/ harvesting yeast

Harvesting yeast is super easy with the Unitank. Basically you only have to open the lower valve and hold a container underneath where you want to store the yeast. It makes sense to put a sight glass in front of the lower valve to see when the yeast is completely drained. If the yeast gets clogged and does not drain even when the valve is open, you can pressurize the Unitank. Afterwards open the valve carefully.

In this case, or if you plan to harvest under pressure, a diaphragm valve is a good choice. To do this, place the sight glass in front of the butterfly valve and the diaphragm valve in front of it. You open the butterfly valve completely when the diaphragm valve is closed and you can see in the sight glass what is coming out. Then slowly open the diaphragm valve and you can harvest the yeast very smoothly.

After dry hopping you have to drain the hops at regular intervals. The trub collects in the cone and slips after each draining. Depending on how many hops have been used, you have

to drain between 1 and 3 litres of trub. If you use a sight glass here as well, you can easily observe when there is no or only little trub left in the cone.

It is important that you cool down the beer as much as possible. In this way you reduce the surface tension (cold crash) and the hops can sink down well.

Draining is necessary to transfer clear beer without hop particles at the upper tap into the keg or bottle.

The leg extensions have helped me a lot in this step. On the one hand you can attach the sight glass vertically to the cone, on the other hand you simply have more space for a vessel and can work better.

Filtering

If you want to filter e.g. after dry hopping, I can recommend a Hop Strainer (also Inline Filter) with 100 - 150 mesh. A real all-round talent. For example, if I only dry hopped a little (1-2g/l), I let off some trub and the filter catches the rest.

It is also important that you flood the strainer with CO₂ before. I do this with a T-piece connected in front of it and a ball valve with a nozzle to which I connect the CO₂ bottle.

Transfer in Keg or bottle

When transferring under pressure into the keg, you apply the same pressure to the keg as to the Unitank.

You connect the CO₂ bottle via the blow off on the Unitank and set the same pressure on its pressure reducer.

Then connect the outlet of the Unitank with the beer side of the keg. On the CO₂ side of the keg you need a spunding valve, which is closed at first. Now open the butterfly valve on the Unitank and the beer side of the keg. Now open the spunding valve on the keg so much that some pressure releases from the keg and the beer flows smoothly.

For the transfer into bottles under pressure you need a counter pressure filler or a Beergun. The handling is the same as when you fill into bottles from the keg. Your CO₂ input side at the Unitank is the blow off.

Cleaning

There is the Low Budget (but what is low budget talking about the Unitank) and the CIP variant. But first to the cleaners. For good cleaning results I recommend PBW, EnzyBrew or other alkaline pre-cleaners. It is important to use hot water (60°C) to get good results. Afterwards you should use StarSan (foams very much) or better SaniClean.

1. Low Budget

First you rinse the Unitank roughly with water and drain everything that is still in the cone. Then take out the cooling coil, close all valves and fill in a water/enzyme brew mixture (as hot as possible) up to the hop resin mark. Then turn on a whirlpool with a paddle or similar and let it stand for 20 minutes. Put the cooling coil back in and let it stand for another 10 minutes. Afterwards drain everything and you should only have to rework a little by hand. Now spray the inside with StarSan. Afterwards, you should disassemble, clean and disinfect all TriClamp parts separately.

2. CIP

Also here you first rinse everything roughly with water. Then fill in approx. 15-20 litres of water/EnzyBrew mixture with closed valves. Now connect the lower and if necessary the upper butterfly valve with a pump. The outlet of the pump is connected to the CIP ball. The pump should have enough power to turn the CIP ball properly. Make sure that the used hoses and fittings are heat and cleaner resistant. Open the lower drain valves and turn on the pump. Then let it circulate for 20-30 minutes. After that everything should be spick and span. Then repeat with StarSan. However, StarSan foams a lot, so SaniClean is better suited for this. Afterwards, disassemble, clean and disinfect all TriClamp parts separately.

Advantages over non-pressure resistant fermentation tanks

The question that frequently arises: What is the advantage of the Unitank compared to other fermentation tanks, for example? The big plus is the compressive strength. You can carbonate your beer and store it without problems after harvesting the yeast. The already carbonated beer can be bottled directly from the Unitank by closed transfer. The oxygen input is minimized. In principle, it is also possible to tap directly from the Unitank.

Furthermore you only have Tri Clamp connections. So there is no more "fiddling" with threads, O-rings and Teflon tape. All parts are removable and easy to clean.

Because of the Tri Clamp connections the part is also very flexible and different versions for hop locks, filters and filling are conceivable and easy to implement.

The price, the amount of required accessories and the cleaning effort speak against it.

Here you have to weigh up. But if you want to design your fermentation process in a completely professional way, there is no way around a pressure tank like the Unitank.