

Construction Method & Details

PDF Download: [Procedure for manufacturing a standard tubular test cell \(1\).pdf](#)

“ Procedure for manufacturing a standard tubular test cell.

Parts List

T33 Water Filter Cartridge Housing	51oXO1VpUYL._AC_SX522_.jpg	Example 1 Example 2
Waterproof cable gland M8*1.5.	Screenshot from 2022-06-29 21-32-23.png	Example
Optional Nylon Pneumatic Blanking Plug 4mm Hose Tube Push Fit Connector Air Line	Screenshot from 2022-06-29 21-32-30.png	
MPX5500DP PACKAGING SIP 6 pressure sensor.	Screenshot from 2022-06-29 21-32-35.png	

6*4mm polyurethane pneumatic hose	Screenshot from 2022-06-29 21-32-39.png
Various 1/4" BSP Thread Tee Type 3 Way Brass Pipe Fitting	Screenshot from 2022-06-29 21-32-45.png
Brass Hex Bushing Reducer Pipe Fitting 1/8" -> 1/4"	Screenshot from 2022-06-29 21-32-52.png
4mm Long Hose Barb x 1/4" Male BSP Thread Brass Barbed Pipe Fitting	Screenshot from 2022-06-29 21-32-57.png
0~30psi 0~2bar 40 Diameter Fuel Air Compressor Low Pressure Meter.	Screenshot from 2022-06-29 21-33-03.png
1/4" mini brass ball valve BSP male to female.	Screenshot from 2022-06-29 21-33-12.png
1/4" 8KG BSP Air Compressor Safety Release Valve Pressure Relief	Screenshot from 2022-06-29 21-33-29.png
DS18b20 Stainless steel package Waterproof (These will have to be adapted to improve waterproofing see below)	Screenshot from 2022-06-29 21-33-34.png
Heat shrink tube	Screenshot from 2022-06-29 21-33-39.png
4mm Banana Plugs Socket Connector	Screenshot from 2022-06-29 21-33-44.png
Thread sealant	Screenshot from 2022-06-29 21-33-52.png
Teflon tape	Screenshot from 2022-06-29 21-33-57.png
Epoxy resin.	

<p>Stainless steel tube 304L or 316L: Outer tube 16x2mm or 14x1mm ; 100mm length. Inner tube or rod ext diameter 10mm ; 110mm length. The goal is to get a 1 mm gap between outer and inner tube.</p>	<p>ZqyFDr5Sv2aNmcVR-download-3.jpeg</p>	
<p>T33 cell : Bottom, Stand and cap spacer The bottom and the tubes cap spacer have been designed for 16x2mm outer tube and 10mm inner tube. Ask for different dimensions.</p>	<p>Screenshot from 2022-06-29 21-43-42.png</p>	<p>ThingVerse STL</p>

Sealing of the DS18b20 temperature sensor:

The DS18b20 must be sealed with epoxy resin otherwise, the water will leak through the cable due to the pressure inside the cell chamber.

1- Remove the heat shrink tube protection.

[Screenshot from 2022-06-29 21-45-41.png](#)

2 - Protect the stainless tube with masking tape and pour the tube with epoxy resin.

[Screenshot from 2022-06-29 21-45-49.png](#)

3 - Once dry, remove the masking tape.

[Screenshot from 2022-06-29 21-45-57.png](#)

4 - In order to keep it clean replace the heat shrink tube.

[Screenshot from 2022-06-29 21-48-21.png](#)

5 - The DS18b20 is now ready to be used in a pressurized vessel.

[Screenshot from 2022-06-29 21-48-27.png](#)

T33 Bottom waterproofing:

“ In order to resist to the pressure and avoiding leaks, the bottom need to be filled with epoxy.

The printing wall thickness needs to be 5 walls in order to get a strong threaded part.

It needs only one 1st layer because it will be removed later. (But at least 1 layer for bed adhesion purpose). To improve bed adhesion, print with an additional skirt.

1 - Print the bottom.

This type of infill is not necessary. Any kind of infill will allow epoxy to flow and pour the part.

[Screenshot from 2022-06-29 21-50-18.png](#)

2 - Remove the bottom layer.

[Screenshot from 2022-06-29 21-51-12.png](#)

3 - Pour the cap with epoxy resin.

[Screenshot from 2022-06-30 17-11-29.png](#)

4 - Take care that the epoxy doesn't leak through the holes. In some cases, it will be useful to plug the orifices with silicone which can then be removed.

[Screenshot from 2022-06-30 17-05-26.png](#)

5 - Allow it to harden completely before attempting to use it.

[Screenshot from 2022-06-30 17-05-40.png](#)

6 - Install the different connections and fittings.

[Screenshot from 2022-06-30 17-05-49.png](#)

[Screenshot from 2022-06-30 17-05-59.png](#)

There's many way to connect each components, here is an example of the parts I used:

Screenshot from 2022-06-30 17-06-07.png	Screenshot from 2022-06-30 17-07-03.png	Screenshot from 2022-06-30 17-06-44.png
Screenshot from 2022-06-30 17-06-51.png		Screenshot from 2022-06-30 17-06-53.png

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