

Urodynamics Without Borders Guide

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Contents

1	Manufacturing Guide	3
1.1	Components List	3
1.2	Ordering PCBs	4
1.3	Fabricating Supporting Structures	5
1.3.1	3D Printing	5
1.3.2	Workshop Manufacturing	5
1.3.3	Uroflowmetry Base Plates	6
1.3.4	Pressure Configuration Clamp Design	7
1.3.5	Infusion Pump Clamp Design	8
1.4	Sub-System Assembly	9
1.4.1	Uroflowmetry	9

1 Manufacturing Guide

This section will provide the required equipment lists, ordering requirements, fabrication, and soldering information to manufacture the full Urodynamics system.

1.1 Components List

here

1.2 Ordering PCBs

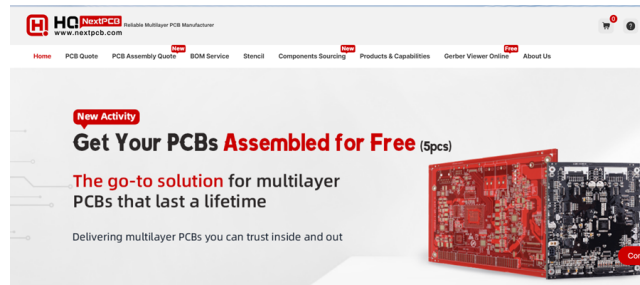


Figure 1: PCB Manufacturer

1.3 Fabricating Supporting Structures

The sections below provide drawings with labelled dimensions and tables with the corresponding measurements. Measure the procured components and apply the dimensions to the drawings to identify suitable supporting structures for your components.

1.3.1 3D Printing

If you have access to a 3D printer, then check (XX APENDIX x) to see the measurements used to create the STL files for the components. If your component parts have the same measurements, then use the supplied files. If component measurements vary then use the drawings to design your own, at the time of writing Autodesk provide a free version of Autodesk that can be used to design the parts and export to STL files for printing. Aim to use a stiff setting filament to optimise the transmission of load for loadcell measurement.

1.3.2 Workshop Manufacturing

Use the drawings and relative measurements in each section to form the design for each part. Aim to use lightweight and stiff materials, this will ensure that the load transmission for measurement via loadcells is optimised.

1.3.3 Uroflowmetry Base Plates

The drawings below outline base plates fit for purpose, two are required. The large flat bottom provides a large stable base in contact with the floor as well as a large pad to place the fluid container on. The design centres the loadcell in the middle of the plate so that the weight of the container and fluid are over the centre of the plate. This reduces the likelihood of the container falling over if knocked.

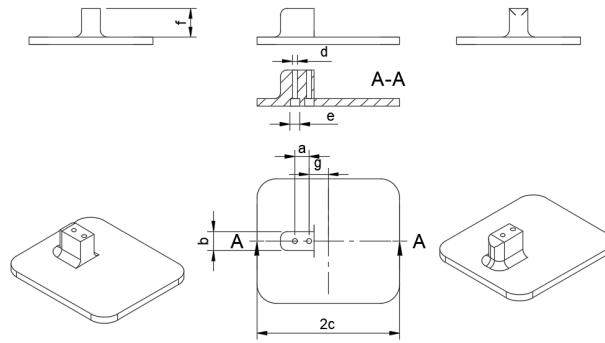


Figure 2: Uroflowmetry Base Plate Drawings

- a) The distance between the centre points of the two tapped holes at each end of the loadcell
- b) The width of the loadcell + > 2mm
- c) Length of the loadcell
- d) The bolt diameter used by the loadcell + > 1mm
- e) The diameter of the head of the bolt + > 2mm
- f) The height of the loadcell
- g) Distance between the centre of the loadcell and the centre point of the loadcell hole nearer to the loadcell mid-point

1.3.4 Pressure Configuration Clamp Design

The drawings below outline the pressure configuration clamp, two are required. Two of these can be fixed together on a stand to provide a clamp for the pressure sensor syringes. The four bolt and nut holes allow the two parts to be clamped together around the upright support. The internal nut holes and through bolt holes allow a single bolt and nut to act as grub screws to fix the two syringes in place and fix the clamp to the upright support. The single nut and bolt hole at the end of the part clamps the two parts together so that the syringe grub screws do not splay the parts.

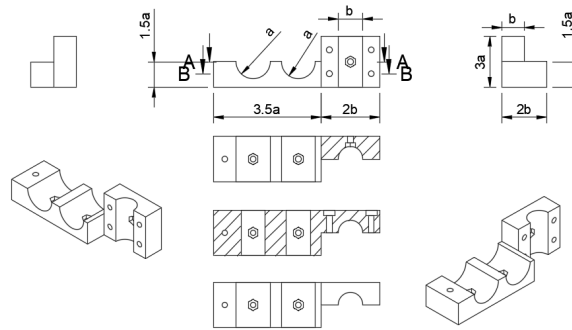


Figure 3: Pressure Syringe Clamp Drawings

- a) The diameter of the pressure syringe + > 4mm
- b) The diameter of the upright stand/trolley + > 4mm
- Nb) Select bolts that are greater than the larger of 3a and 3b
- Nb) Create holes to accommodate the chosen bolts
- Nb) Create hexagonal holes to accommodate the corresponding nuts, a tight fit makes it easier to move the bolts without the nuts dropping out

1.3.5 Infusion Pump Clamp Design

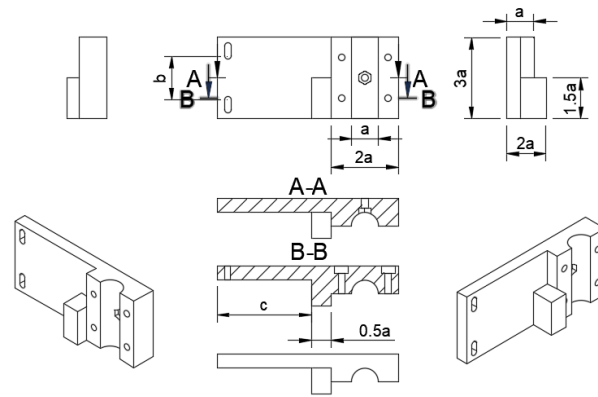
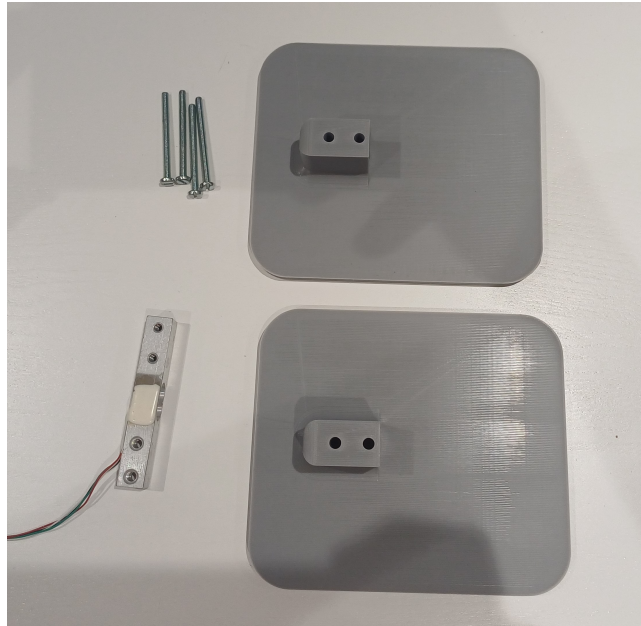


Figure 4: Infusion Pump Clamp Drawings

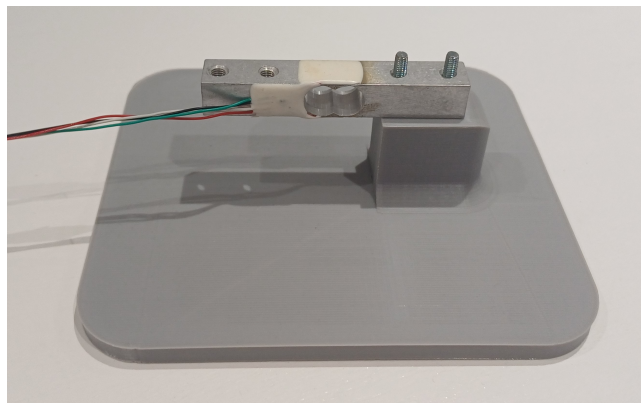
1.4 Sub-System Assembly

1.4.1 Uroflowmetry

1. 3D print or manufacture the supporting parts using the STL files



2. Connect the 2m 4 core wire to the 4 wires attached to the loadcell (Note the order of the wires attached)
3. Solder the male 4 pin DIN connector to the other end of the
4. Screw the loadcell into the first baseplate



5. Screw the second base plate onto the loadcell

