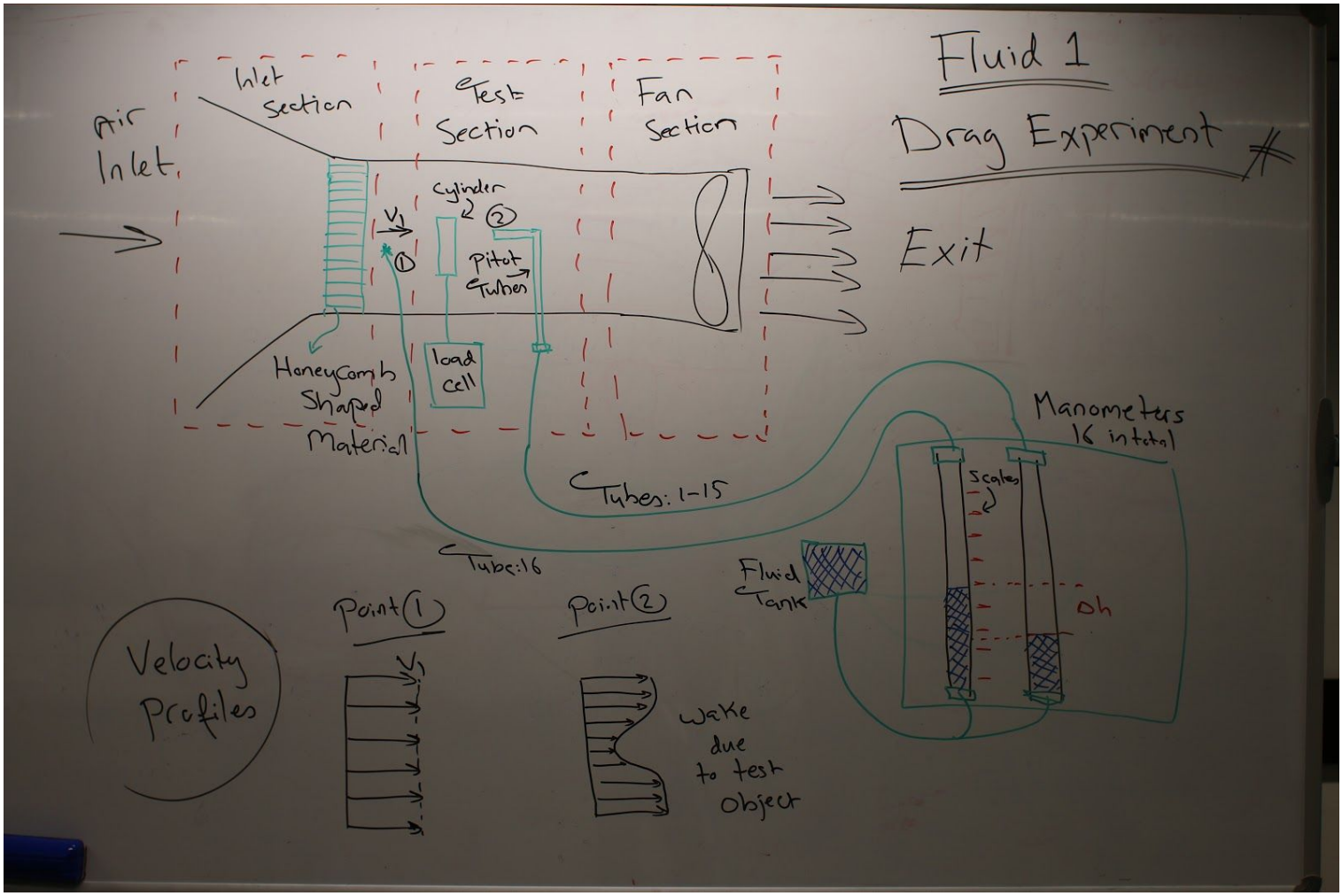
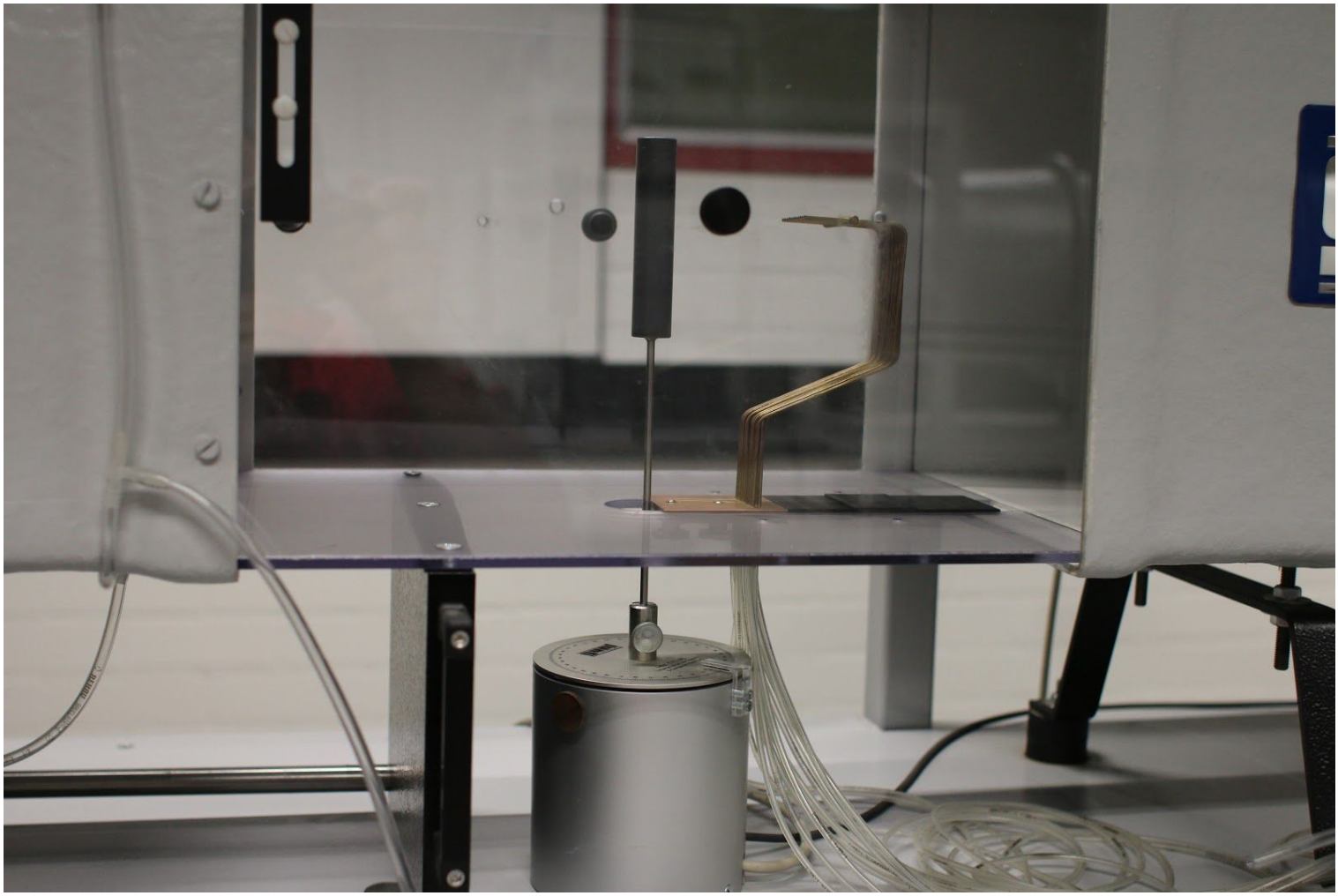
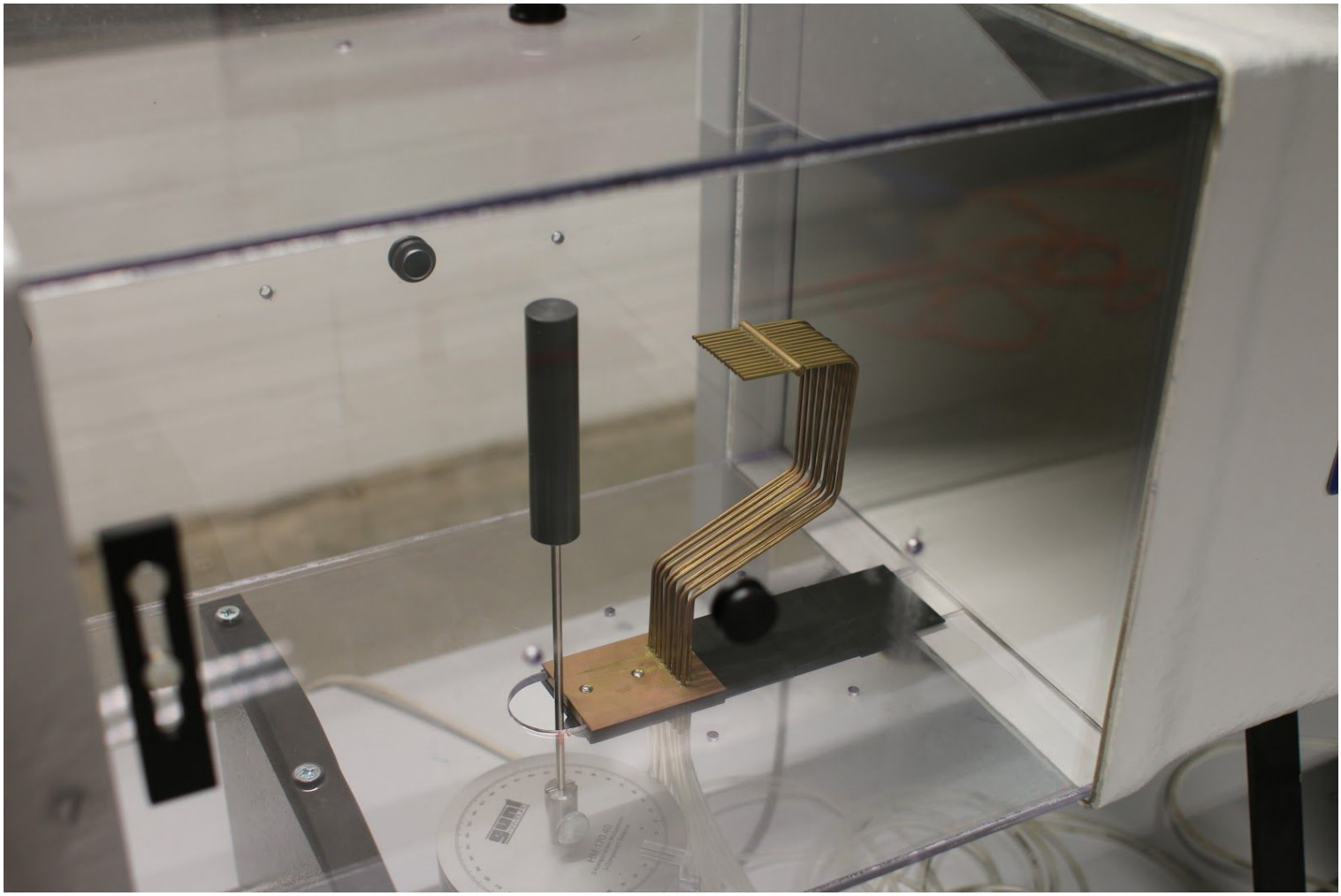
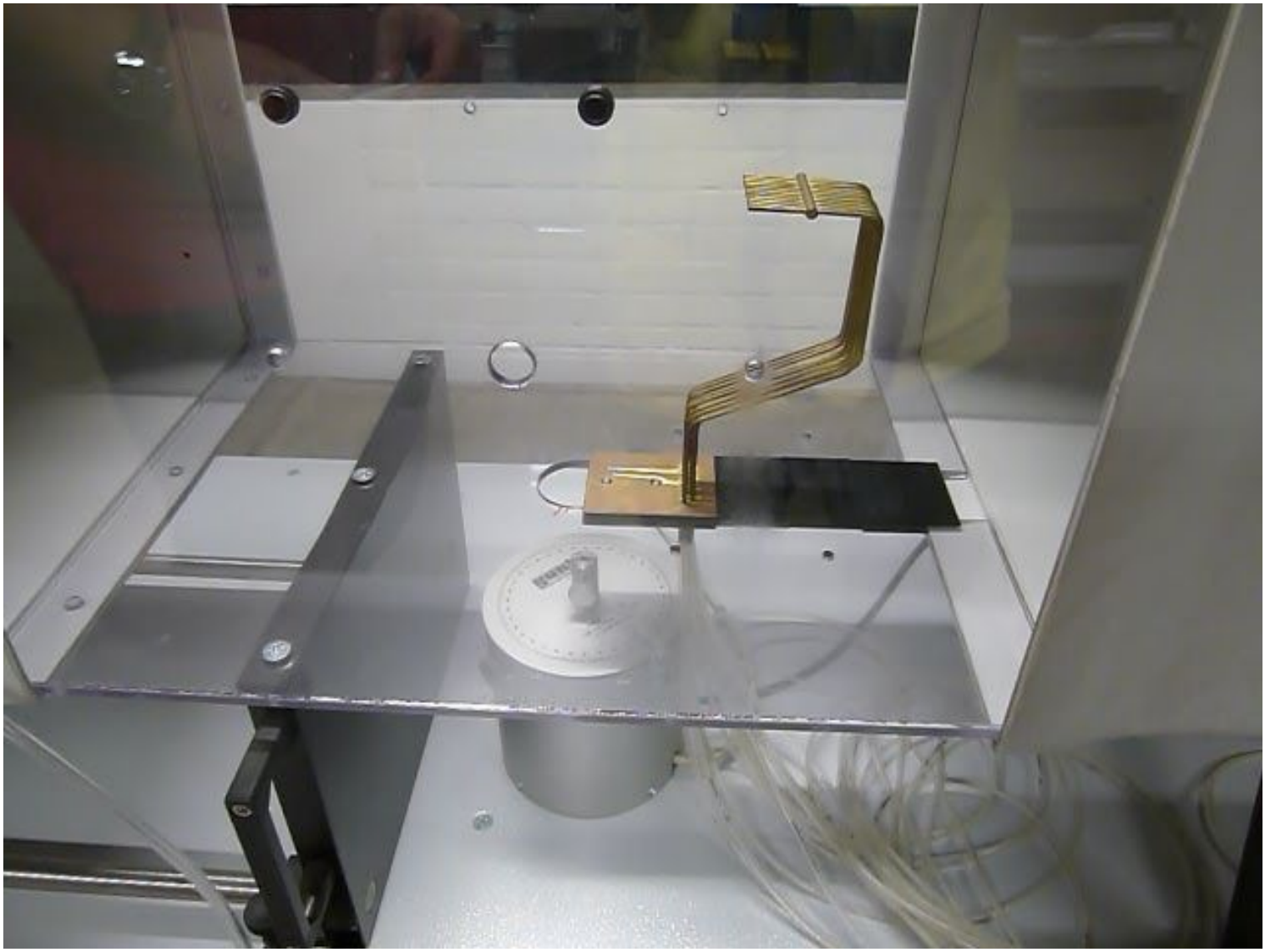
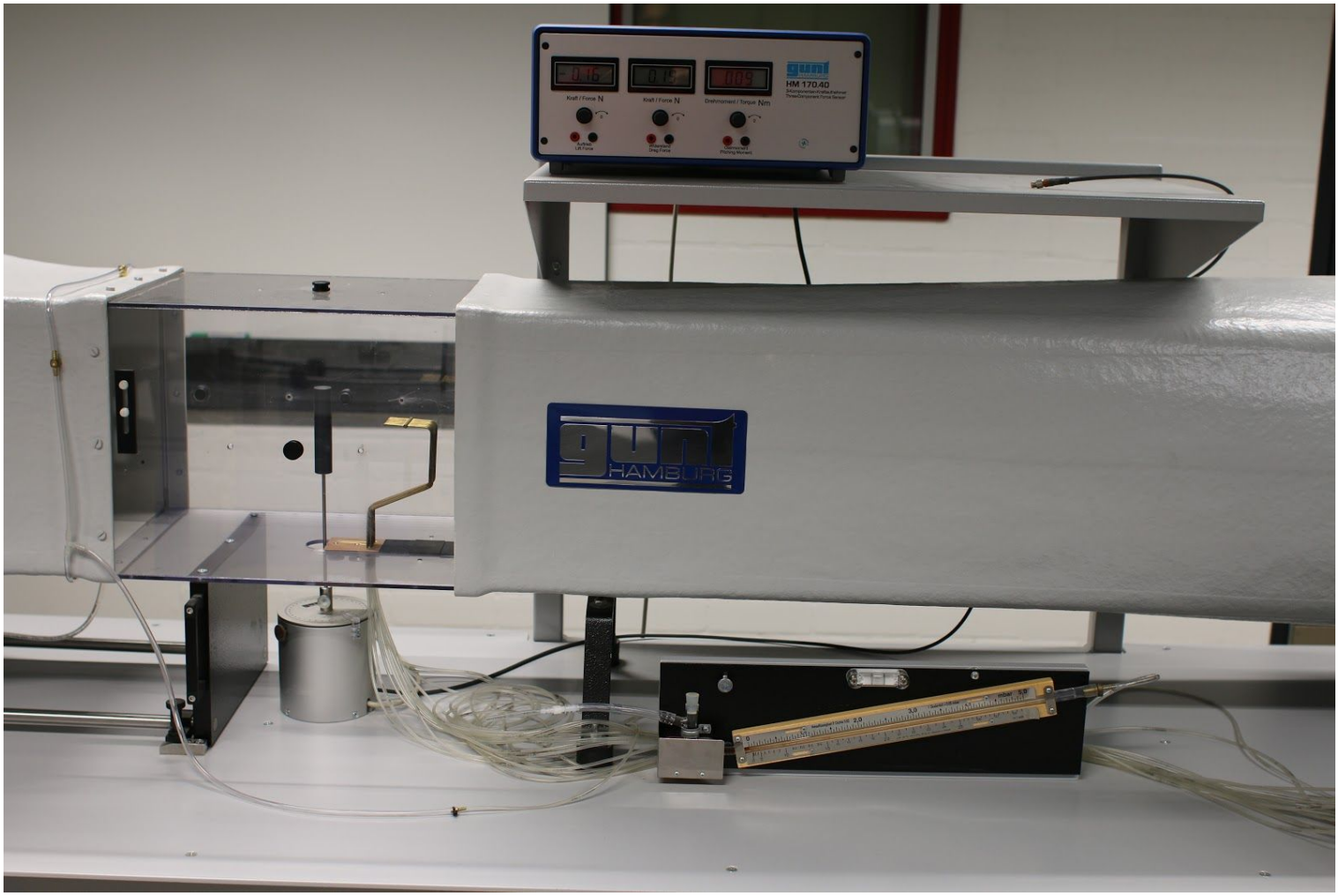

Fluid 1
Drag Experiment
Air Inlet
Inlet Section
Test Section
Fan Section
Exit
Cylinder
Pitot Tubes
load cell
Honeycomb Shaped Material
Tubes: 1-15
Tube: 16
Manometers 16 in total
Scales
Fluid Tank
Δh
Velocity Profiles
Point (1)
Point (2)
wake due to test object

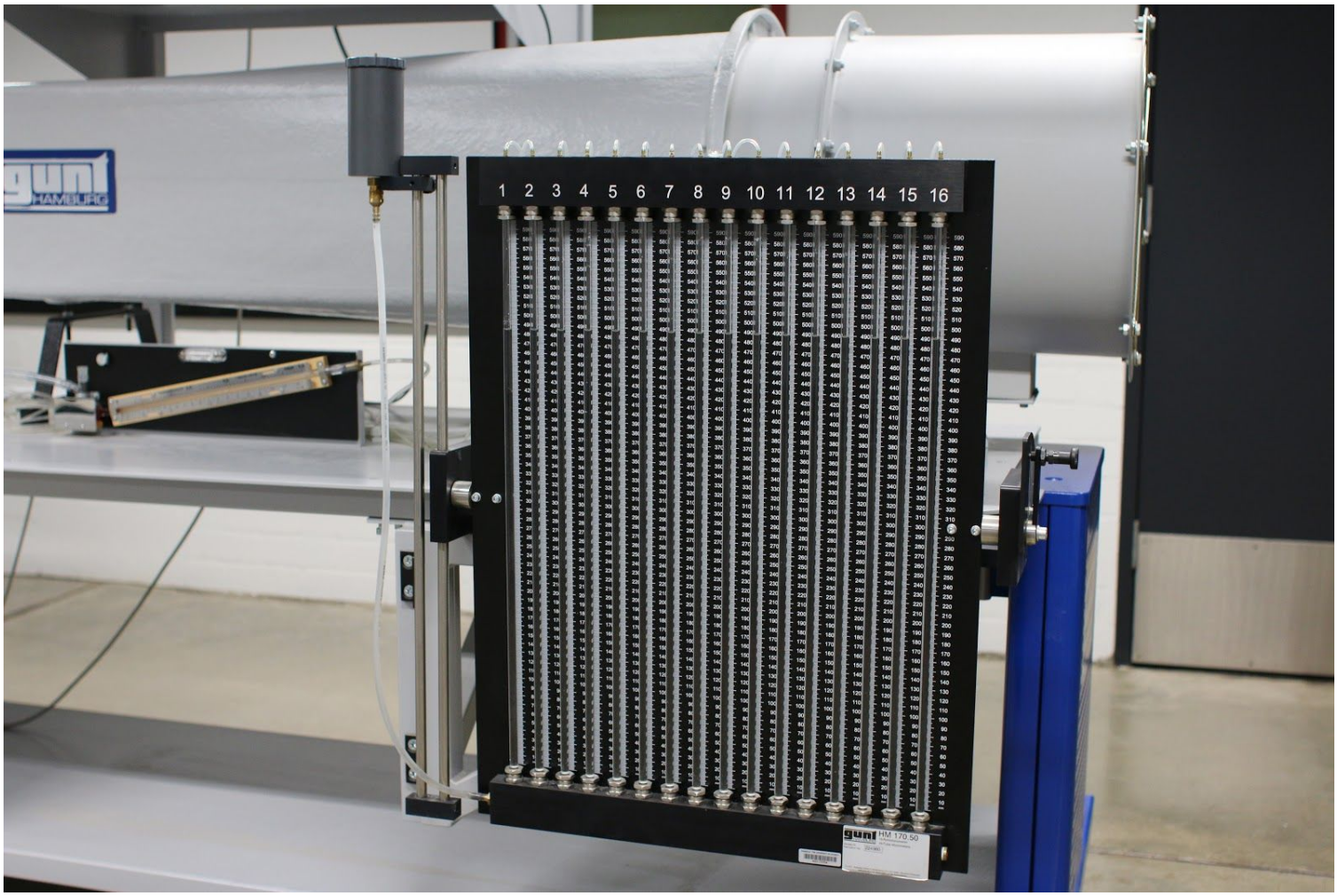

gunt
HAMBURG
gunt
HM 170
Göttinger Windkanal
Göttinger Wind Tunnel

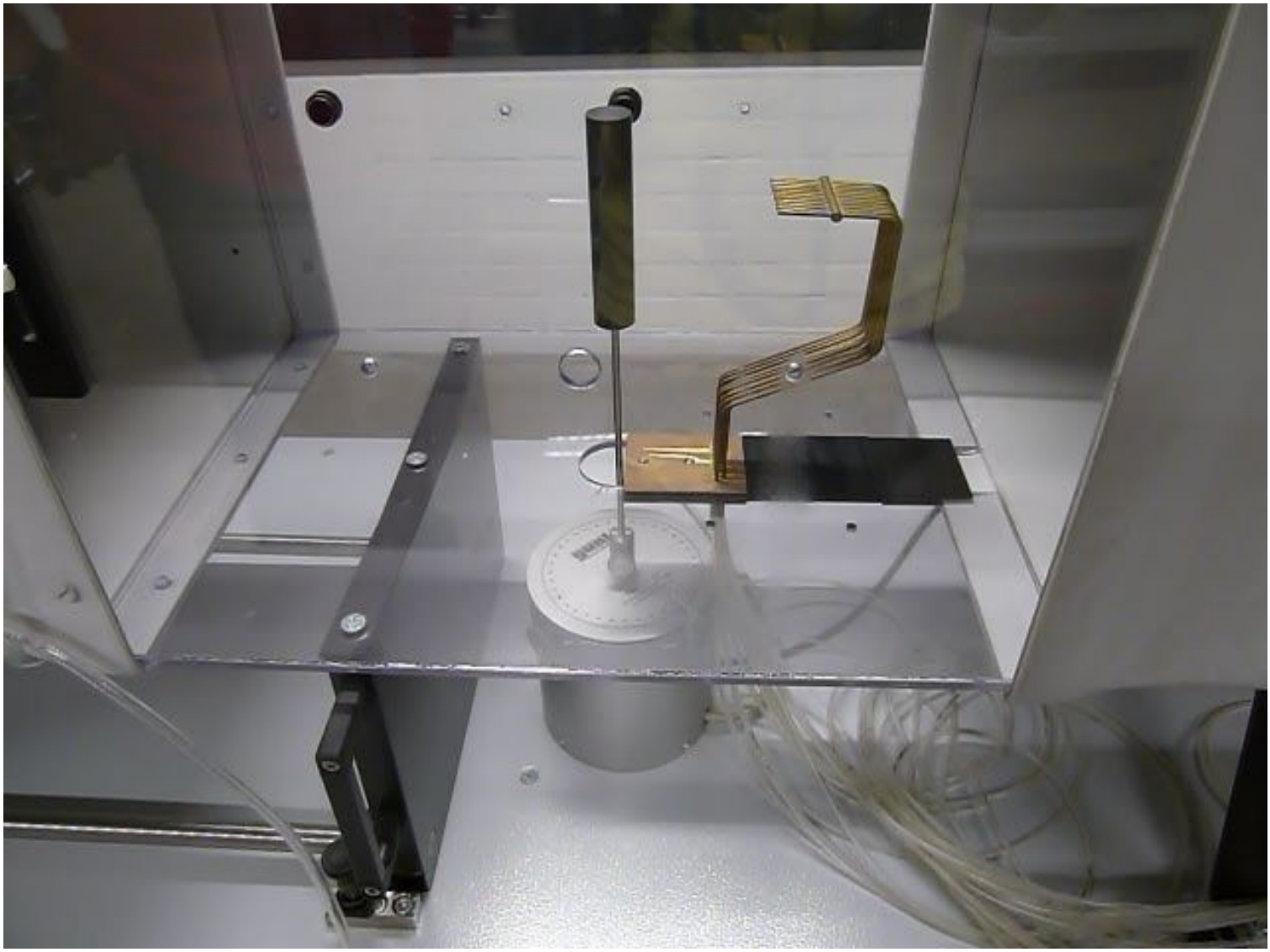







HM 170.40
gum
HAMBURG


gunt
HAMBURG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
gunt HM 170.50

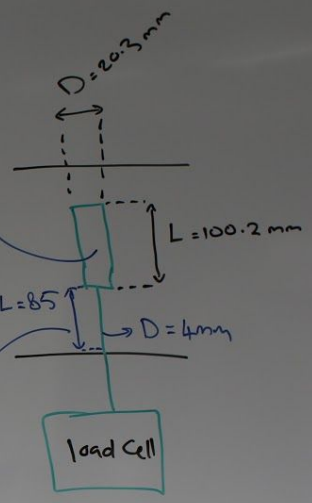


Experiment (1) Conditions

Test Object :- Cylinder

D = 20.3 mm

L = 100.2 mm



Rod attached to cylinder :-

D = 4 mm

L = 85 mm

Part in Tunnel only

V = 20 m/s

[redacted]

STEP ①

With No Test Object

Pitot Tubes measure Total pressure (Stagnation)

@ 15 locations – Tubes 1–15

Between ① & ② apply Bernoulli's equation :-

$$P_1 + \frac{1}{2}\rho V_1^2 + \rho g h_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho g h_2$$

$h_1 = h_2$; $V_2 = 0$; $h_2 = h_1$

$$\rightarrow V_1 = \sqrt{\frac{2(P_2 - P_1)}{\rho}}$$

$\rightarrow$ P_1 & P_2 can be found from height of fluid in Manometers

STEP ②

- Repeat measurement with test object
- Apply Conservation of Momentum to find drag force