Float Switch Buoyancy Calculations

Note: When calculating buoyancy for liquids other than water, make adjustments in step 3.

5.5'' Float (Non Weighted)

1. Weight of the 5.5'' Float in air = **1.12 pounds**

2. Volume of the displaced liquid = **87.12 cubic inches**

    $4.189r^3$ Where r is float radius in inches
    $(4.189)\ (2.75)^3$ = **87.12 cubic inches**

3. The weight of the displaced volume of liquid = **3.138 pounds**

    Water = 62.248 pounds/cubic foot
    $62.248/12^3$ = pounds/cubic inch = 0.03602 pounds/cubic inch
    (0.03602 pounds/cubic inch) (87.12 cubic inches) = **3.138 pounds**

4. (Weight of the displaced volume of liquid) – (weight of the float) = **total net buoyancy**

    (3.138 pounds) – (1.12 pounds) = **2.018 pounds, total net buoyancy**

4.5'' Float (Non Weighted)

1. Weight of the 4.5'' Pipe Mount Float in air = **0.35 pounds**

2. Volume of the displaced liquid = **57.73 cubic inches**

3. The weight of the displaced volume of liquid = **2.08 pounds**

    Water = 62.248 pounds/cubic foot
    $62.248/12^3$ = pounds/cubic inch = 0.03602 pounds/cubic inch
    (0.03602 pounds/cubic inch) (57.73 cubic inches) = **2.08 pounds**

4. (Weight of the displaced volume of liquid) – (weight of the float) = **total net buoyancy**

    (2.08 pounds) – (0.35 pounds) = **1.73 pounds, total net buoyancy**

The above calculations compare the 5.5'' Stainless Steel Float Switch to the 4.5'' Float Switch. The larger 5.5'' float displaces over 40% more liquid and has over 15% more net buoyancy.

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