SONOS DRIP

Determining Reliance of Ingress Protection

UC SANTA BARBARA engineering

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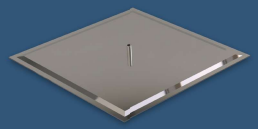
Background

Sonos DRIP is a revolutionary testing chamber that performs IPX1-5 tests giving Sonos confidence in the water resistance of their products before sending them out for official certification. By integrating three unique test fixtures into one robust machine, the Sonos DRIP combines the functionality of multiple machines into one for a fraction of the cost.

IP Systems

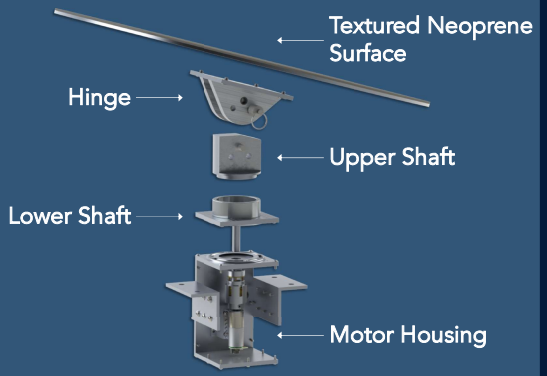


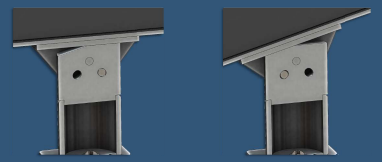
IPX1/2: 16"x16" shower head dripping water at 1mm/min.

IPX3/4: L-bracket with angled nozzles designed to spray water at ±60° and ±180° at 2.64 gpm. Slider allows fixture to be adjusted to the height of various products.

IPX5: Pressurized jet that can be angled to directly hit any sized product at 4.12 gpm.

Rotary Table





Detents in the upper shaft allow the table to be positioned at 0° and 15°.

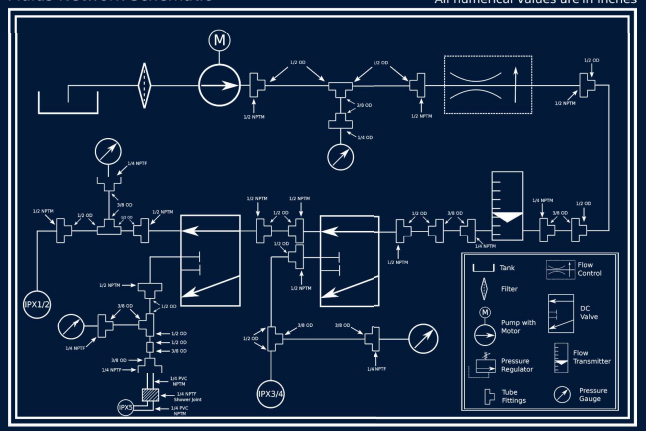
IP Standards

In industry, the widely accepted standards for judging a product's level of water resistance are known as Ingress Protection, or IP, standards. The following are the standards met by this test chamber:

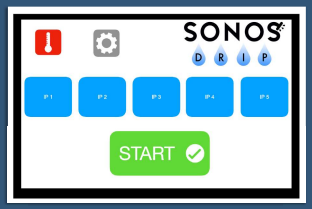
- IPX1: Light vertical drip while product rotates
- IPX2: Light vertical drip with product tilt at 15°
- IPX3: Spray from oscillating tube ±60° from vertical
- IPX4: Spray from oscillating tube ±180° from vertical
- IPX5: Water jet hose nozzle from a distance of ~3m

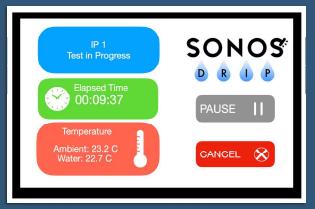
Fluids Network Schematic

*All numerical values are in inches



Graphical User Interface (GUI)





GUI allows the system to be controlled and monitored from LCD while in use. Features include test selection, pause/resume, elapsed time and temperature monitoring.