Raincube V0.4

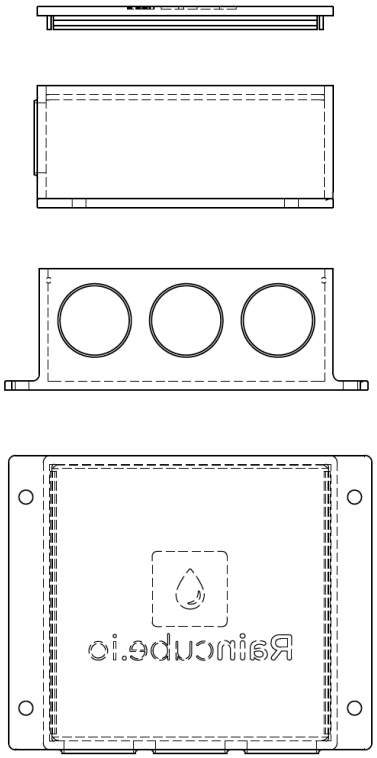
CONTROLLER ENCLOSURE DESIGN ELEMENTS

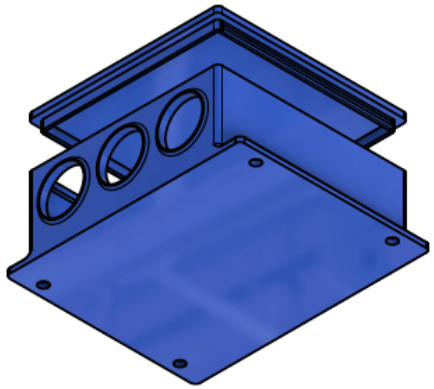
3D PRINTED COMPONENT BOX

Ideal External Dimensions
4.50 x 4.50 x 2.50 inches / 114.30 x 114.30 x 63.50 mm

Ideal Internal Dimensions
4.38 x 4.38 x 2.38 inches / 111.30 x 111.30 x 60.50 mm

Required Cable Entries
3 x Diameter 0.886 inches / 22.500 mm

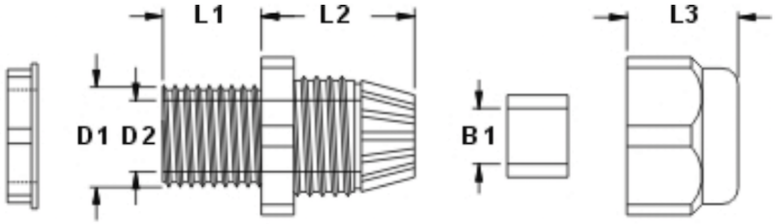




PG16 WEATHER-RESISTANT CABLE GLAND

Must have a minimum of three cable connectors to attach, secure, and weatherproof to the highest possible level, all incoming and outgoing sources of power and data. The following specifications relate to the PG6 cable gland that's readily available from a variety of manufacturers and distributors. All quantities are provided in millimeters.

	D1	D2	B1	L1	L2	L3
PG16	22.50	17.20	15.00	9.80	26.20	19.50



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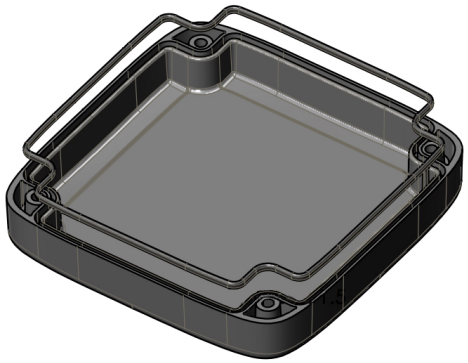
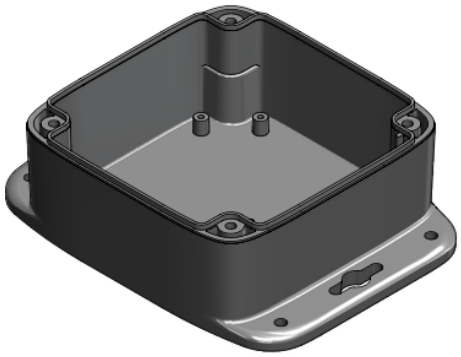
CONTROLLER ENCLOSURE DESIGN ELEMENTS

IP RATING INTERNAL REQUIREMENTS

IP (Ingress Protection) ratings are used to define levels of sealing effectiveness of electrical enclosures against intrusion from foreign bodies like dust and water. Therefore, the Raincube Controller Box needs to have an acceptable IP rating to enhanced the durability of the electronic components inside the enclosure and to avoid external damages due to any resulting electrical hazards. The addition of an internal rubber gasket in either side of the enclosure should be a simple way to improve the overall degree of protection provided to all internal components.





TEMPERATURE CONSIDERATIONS

The overall design of the Raincube controller box should take into consideration all the challenges associated with an outdoor installation. The system will be mounted either inside a conventional irrigation valve box or a stationary outdoor location. Thus, the enclosure needs to account for a series of internal and external factors that could attempt against the stability of the system.

More specifically, the microcontroller board includes a solid-state relay system that provides a series of enhancements over the more conventional electromechanical relays. However, one of the major considerations when using an SSR is properly managing the heat that is generated when switching currents higher than 5A. Thermal management becomes a critical aspect of our design due to a fluctuating contact dissipation rate. Likewise, we need compensate for external temperatures by creating sufficient space for air flow between the parts and electrical components. Finally, we should explore other radical designs that allow for the case to efficiently dissipate heat without incorporating other systems or moving parts.