

# Product: Model X-90 High-Density Polymer Enclosure

## 1. General Overview

This document specifies the materials, dimensions, and tolerances required for the manufacture of the **Model X-90 Enclosure**, a protective casing intended for the Series 3 control board. The enclosure must provide reliable ingress protection (`IP65`) and maintain structural integrity under standard operating conditions ( $0^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ ).

## 2. Material Specifications

Component	Material	Specification	Notes	Main Body
(Housing)	Polycarbonate (PC)	<code>UL94-V0</code>	Rated, <code>UV</code> -Stabilized	Color: RAL 7035 (Light Grey)

**Gasket (Seal)** Silicone Rubber

`Shore Hardness A 50`  $\pm 5$  Must meet `IP65`

rating standards

**Fasteners** Stainless Steel

`ASTM A240, Type 304` Required for lid attachment (See Section 4)

## 3. Dimensional Tolerances

All dimensions refer to the primary engineering drawing **DRW-X90-001 Rev B**.

- **Overall Dimensions:**  $150.00 \text{ mm} \times 100.00 \text{ mm} \times 45.00 \text{ mm}$  (Length  $\times$  Width  $\times$  Height).
- **Tolerance:**  $\pm 0.30 \text{ mm}$  on all overall dimensions.
- **Wall Thickness:**  $2.50 \text{ mm}$  nominal.
- **Tolerance:**  $+0.20 \text{ mm} / -0.05 \text{ mm}$ .
- **Mounting Holes (Internal):** M3 threaded inserts required in four corner posts.
- **Position Tolerance:**  $\pm 0.10 \text{ mm}$  relative to the center axis.
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## 4. Processing and Finishing

### 4.1. Molding

The Main Body (Housing) shall be manufactured via **Injection Molding**. The mold must incorporate adequate draft angles ( $\geq 1.5^\circ$ ) to prevent part damage during ejection. Minimal flash is acceptable, limited to  $\leq 0.10 \text{ mm}$  at the parting line.

### 4.2. Surface Finish

The external surface finish shall be **\$\text{MT-11010}\$ (Medium Texture)** to minimize visible scratches. The interior surface may have a standard **\$\text{SPI A-3}\$** finish.

### 4.3. Post-Molding Requirements

1. **Threaded Inserts:** Four (4) brass heat-set inserts ( $M3 \times 5 \text{ mm}$  length) must be installed into the lid attachment posts.
2. **Gasket Channel:** The channel designed for the Silicone Gasket must be clean and free of debris to ensure a proper seal.

## 5. Quality Assurance and Inspection

- **Critical Dimensions:** Dimensional verification must be performed on the first article (FAIR) and for every 500 units thereafter.
- **Leak Test:** A sample of 5% of each batch must undergo a water ingress test to confirm the **IP65** rating is met.
- **Visual Inspection:** All finished units must be visually inspected for warpage, sinks, voids, or color inconsistencies.

SIMONE, VOGAS, OR COLOR MECHANISTICS.

