**Technical Parameter of the layer** **assembly and Explanation each:**

|  |  |  |
| --- | --- | --- |
| **SN** | **Parameters** | **Values** |
| 1 | Input power supply | 220 V/ single phase |
| 2 | Machine load | 5 KW |
| 3 | Speed range | 5-80 pcs per min |
| 4 | Sanitary pad Size (Lx W) | 280x 160 |
| 5 | Main Motor to drive rollers | 1.5 HP |
| 6 | Gear ratio | 75:30:90(Three gear reduction) |
| 7 | Horn Buster with ultrasonic generator | 9-inch length/ 15 KW |
| 8 | Sealing and embossing roller | 220 V/ single phase |
| 9 | Cutting roller | 1 pc |
| 10 | Hard MS Roller (anvil for cutting roller) | 1 pc |
| 11 | Rubber roller | 2 pcs |
| 12 | MS Roller | 2 pcs |
| 13 | PLC (Delta) | 1 pc |
| 14 | Display for interference | 4-inch delta |
| 15 | Servo motor to driver feeding conveyor belt |  |
| 16 | Servo motor drive | 1 pc |
| 17 | UVC Chamber for pad Sterilization | 8 UVC light |

**Detailed explanation of each component:**

1. Input Power Supply

Requirement: 220V power supply

Type: Single-phase (although the machine supports both single and three-phase)

Configuration: Single-phase power supply was selected during procurement, aligning with local availability and consumption planning.

2. Machine Load

Total Load: 5 kW

Included Components:

Compression system

Ultrasonic sealing system

Cutting rollers

Servo motor for feeding fluffy absorbent core

Ultrasonic generator (powers horn and booster)

3. Speed Range

Adjustable Range: 5 to 80 pads per minute (variable via control interface)

Current Operating Speed: 12 pads per minute (limited by the output of fluffy absorbent core production unit)

4. Sanitary Pad Size Compatibility

Supported Lengths: 260 mm, 280 mm, 300 mm, 320 mm

Adjustment Method: Interchangeable sealing and cutting dies based on desired pad size

Current Configuration: 280 mm pads (classified as “Large” per Nepal Standards)

5. Main Drive Motor

Motor Rating: 1.5 HP

Drive System: Gear reduction box

Gear Ratio: 75:30:90 (three-stage reduction)

Purpose: To generate adequate torque and speed for the layer assembly roller unit

6. Ultrasonic Sealing System

Components: Horn and booster with ultrasonic generator

Functionality:

Converts electrical frequency to high-frequency mechanical vibrations

Produces localized heat and vibration at sealing point

Allows clean, precise sealing of multiple layers using ultrasonic energy

7. Sealing with Embossing Die and Cutter Die

*Die Material:* Hardened steel for long-term durability

*Embossing Die Function:* Adds surface patterns to the pad (typically central area)

Enhances liquid flow and aesthetics

*Sealing Die Function:* Fuses layers using ultrasonic heat and pressure

Cutter Die Function: Cuts the final sealed pad into individual units of defined shape and size

8. Compression Rollers

Quantity: 3

*Material:* Industrial-grade rubber

*Purpose:* Compresses each layer during feeding and assembly

Placed alternatively between sealing and cutting units for stability

Ensures tight bonding before and after sealing

9. User Interface Display Panel

*Purpose:*

Operator interface for machine settings

Speed control and batch size adjustment

Layer alignment and system diagnostics

Integrated Controllers:

PLC (Programmable Logic Controller)

Servo motor driver

VFD (Variable Frequency Drive) controller

10. UVC Sterilization Chamber

*Placement:* Final stage of the assembly line

*Functionality:*

Exposes completed pads to UVC light

Reduces surface microbial load

Enhances hygienic quality by preventing microbial growth on the top layer