

| Item No. | Item | Technical Specification |
|----------|--|--|
| 1. | <u>Poly House (Fan-Pad) 576 sq. Mtr</u> | <p><u>Commissioning of Poly-house Fan-Pad, Supply Installation and civil Work include</u></p> <p>Corridors – Maximum 2m all sides for area calculation. Shape – Aero dynamitic Structure – Hot Dip Galvanized structure. Galvanization of the structural members of BIS standards and should not be less than 300 GSM. Stability of Structure – Structure should with stand to minimum wind velocity of 150 km/hr. Structure :-All columns will be of size 76 of 2.0 mm thickness sand side corridor member of size 60 mm of 2 mm thickness, roof purlins of size 48 mm of 2mm thickness, Trusses of size 42 & 33mm of 2 mm thickness. Gutter thickness is 2 mm.(ThicknessTolerance+or-10%). The structural design should be sound enough to withstand 100km/hr of wind speed. And minimum load of 20kg/m². Multi-layered Polythene film Fixed properties- 200 micron thick, UV stabilized, UV blocking IR Reflective Cooling, diffused, Anti dust, Anti drip. Optional property-,Anti sulphur for the crops where sulphur consumption is high. Automated Humidity and temperature control inside the poly house</p> <p>Profile</p> <ul style="list-style-type: none"> • Made of GI • Galvanization: 200 to 250 gr per running meter • Higher grade: >300 gr per running meter <p>Gutter</p> <ul style="list-style-type: none"> • Slope: 1-1.5% • Maximum length: 40 m |

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- Material: GI drainage sheet, 2.0 mm thickness
- Support: Single piece, supported by gutter purlins on arch
- Width: 500 mm
- Minimum galvanization: 120 GSM
- Features: Leak-proof, ensures uniform slope to prevent stagnant water and maximize gutter life
- Orientation: North-South

Drainage Water Pipe

- PVC pipe: 90/110 mm OD
- Pressure rating: 4 kg/cm²

Zigzag Spring Insert

- Material: High carbon steel wire for repeated action
- Diameter: 2.3 mm (or PVC plastic coating)
- GI spring: Placed over a 2-inch strip of new poly film overlapping the main plastic in profile (25% overlapping)

Shade Net (On top underneath polythene)

- Shade net inside the greenhouse (50%) with nylon support cables, pulleys, side support with clamps, plastic clamps, etc.
- Manual system operation

40 Mesh Insect Net

- 40 mesh insect net installed outside the cooling pad
- Prevents insect entry through the cooling pad

Exhaust Fans

- 50" exhaust fans with a hot-dip galvanized body
- 1.5 HP motor, 3-phase, belt drive with louvers (one per 8m bay)
- Height determined based on plant height in the greenhouse
- Fan blades and frame made of non-corrosive materials (aluminum/stainless steel)
- Maximum fan-to-pad distance: 40 m
- Airflow rate: 75 cubic meters/minute/sq. m of pad
- Water flow rate: 9 liters/minute/linear meter pad
- Uniform water distribution on the pad to be maintained

Cooling Pad (BIS Specifications)

- Cellulose cooling pad: 1.8 m width, 0.1 m thickness
- Hot-dip galvanized water-collecting gutter
- Profiles for fixing pads
- PVC water distribution system with pump (complete setup)

Civil Work

- Brick wall construction in CM 1:4



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- 0.3 m thick, 0.9 m height above ground, and 0.45 m below ground (32 m long for the cooling pad side)
- 0.15 m thick, 0.2 m height above ground, and 0.2 m below ground on three sides
- Fully plastered on both sides

Electrical Control Panel

- Consists of MCB, relay, switches, RYB indicator, panel, voltmeter
- MS body duly painted
- Designed for fan and pad control
- All electrical gadgets and appliances must meet BIS standards

Multi layered plastic water tank 500 lits. X 1 no., for cooling pad Climate Control System

Fan Pad System:- Numbers of fan depends upon size of Fan-fad house and it should be capable of exhausting air volume in one minutes.

Exhaust Fans – 50" however it depends upon size of fan-pad house with louvers, 1.5 HP – 3 phase ISI standard electric motor.

Cellulose cooling pads of 1.8 meter with 100 mm / 150 mm thickness covering the area properly, PVC water distribution system, screen / disc filter, valve and pumps etc.

Control panel with manual operation, temp and humidity sensors.

The necessary digital controller with sensory device & accessories of standard quality as per requirement should be provided to operate the fan & pad system for controlling temperature & humidity inside the Green house.

Fogging System:- In consist of four way anti leak fogger 28 lph flow rate (working pressure should be mentioned at which we will be able to get required particle size, fogger spacing along the lateral and lateral spacing) and particle size 80-100 micron, 16 mm lateral class-3, PVC pipe 6 kg / cm², valves, filter, pump, panel with volt meter, MCB, relay, temp and humidity sensor etc. complete application rate 3 mm/hr.

Gutter Slope

- Slope must be between 1.0% to 1.5% towards the gutter side.
- If the gutter length exceeds 40 m, the slope should be provided on both sides to prevent damage and leakage.

Gable Side Slope

- Slope should be between 0% to 1.0%.

Foundations

- Telescopic type foundation.
- Column size: 45 cm × 45 cm × 90 cm depth.
- Concrete mix: CC 1:2:4 ratio, properly compacted over a 10 cm layer of 1:8:16.
- Two holdfasts in a perpendicular direction, 20 cm apart,

starting 20 cm from the base.

Orientation

- Polyhouse gutters should preferably be installed in a North-South direction.
- All vents should preferably face East, with the last vent on the eastern side facing West.

Drip System

1. Main & Sub-main Line: PVC 63mm x 4 kg/cm² - more than 36m
2. 16mm LLDPE Lateral Line CL-2: more than 60m
3. In-line 16mm, 1.3 to 2.4 LPH @ 20-40cm CL2: more than 750m
4. Ball Valve 63mm (Moulded Seal, Plain): 2 Nos.
5. Sub-main Flush Valve 40mm: 2 Nos.

Fogging System

1. Main & Sub-main Line: PVC 63mm x 4 kg/cm² - more than 36m
2. 16mm LLDPE Lateral Line: more than 200m
3. 4-way Fogger Assembly with HPLPD: more than 50 Nos.
4. Ball Valve 50mm (Teflon Seal, Plain): 2 Nos.
5. Sub-main Flush Valve 40mm: 2 Nos.
6. GI Wire 2mm Thick: more than 200m

Filtration Unit

1. Disc Filter 25 m³/hr: 1 No.
2. Sand Filter/Hydrocyclone 10 m³/hr: 1 No.
3. Manifold GI+GMV/HDPE: 1 No.
4. Venture Assembly Complete: 1 No.
5. Air Release Valve Assembly 1": 1 No.

Technical Specification :-

The contractor shall supply, install, integrate, and commission a complete Advanced Tier Technology & Automation System for the greenhouse, meeting all requirements listed in this section. All components shall be new, of proven design, and compliant with relevant industry standards.

A. Power Management & Automation

Electrical Control Panel - Auto & Manual Switches, minimum 10+2 configuration.

Equipment Safeguard System - Protection against overloads, voltage fluctuations, and electrical faults.

Power Monitoring System - Real-time monitoring of power usage.

Integration with Solar/DG/Backup System - Seamless switching and operation with alternative power sources.

B. Climate Management & Automation

Climate management based on Time Interval- Programmable scheduling for ventilation/heating.

Temperature and Humidity Sensors - Accurate monitoring with digital Output

VPD, Rain, and Lux Sensors - For precise climate control decisions.

CO2 Sensor-For enriched CO2 control in the greenhouse.

Automated Curtain Movement Control - Fully motorized operation linked to climate parameters.

C. Nutrient Management & Automation

Nutrient/Fertigation management with integrated monitoring:

-EC, TDS, and pH Sensors

- Temperature Sensors

- Dissolved Oxygen Sensor (for DWC systems)

D. Irrigation Management & Automation

Irrigation management based on Time Interval - Fully programmable.

Irrigation management based on Vapour Pressure Deficit (VPD) - Sensor- driven precision irrigation.

Multi Zone Irrigation Management - Minimum 3 irrigation zones included.

Auto Tank Level Management - Automated refilling and level control.

Water & Nutrient Usage Measurement - Integrated flow meters with digital logging.

E. Remote Management & Analytics

Remote Monitoring Software - Accessible via secure web and mobile applications.

Analytical Reports with 1-year History - Downloadable and exportable in common formats.

Agronomy Support through Centralised App - Expert advisory integration.

F. AI-Based Features

Off-line Data Tracking - Operates during Wi-Fi connectivity issues with data sync when restored.

Smart Irrigation Memory System - Restores last known schedule/settings after power outages.

Chat with Data - AI bot interface for querying IoT data.

Economy Mode - Optimised operation for solar/DG/backup power.

Proactive Alerts through Predictive Analysis - Early warnings for system anomalies

AI-Driven Automation Control - Past trend-based decision making.

Off-grid Setup | Without Internet | Data Secure - Local control and secure data storage (mandatory)

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| Compliance Table | |
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| Contractor shall complete the following table and include it in their Technical proposal | |
| Spec No. | Additional Feature Description |
| A1 | Electronic Control Panel (10+2) |
| A2 | Equipment Safeguard System |
| A3 | Power Monitoring System |
| A4 | Integration with Solar / DG / Backup |
| B5 | Climate Management – Time Interval |
| B6 | Temperature & Humidity Sensors |
| B7 | VPD Rain and Lux Sensors |
| B8 | CO Sensor |
| B9 | Automated Curtain Movement Control |
| C10 | Nutrient/Fertigation – EC, TDS, pH, Sensors |
| C10b | Nutrient/Fertigation – Temperature Sensors |
| C10c | Nutrient/Fertigation – Dissolved Oxygen Sensor |
| D11 | Irrigation – Time Interval |
| D12 | Irrigation – VPD Based |
| D13 | Multi-Zone Irrigation (3 min) |
| D14 | Auto Tank Level Management |
| D15 | Water & Nutrient Usage Measurement |
| E16 | Remote Monitoring Software |
| E17 | Analytical Report (1 Year) |
| E18 | Agronomy Support App |
| F19 | Smart Irrigation Memory |
| F20 | Offline Data Tracking |
| F21 | Chat with Data |
| F22 | Economy Mode |
| F23 | Proactive Alert System |
| F24 | AI-Driven Automation Control |
| F25 | Off-Grid Setup / Without Internet / Data Secure |

Delivery & Integration:-

All features must be integrated into a single automation system with unified control and commissioning must be completed 8 weeks from award date. Training for operating personnel must be provided.

Warranty & Support:-

Minimum 3 year warranty for all hardware components, covering defects in materials and workmanship. Minimum 3 year software support, including updates, security patches, and feature upgrades.

Vendor shall provide remote troubleshooting and technical assistance during the warranty period.

On-site service response must be within 48 business hours of fault reporting.

All replacement parts and labour during the warranty period shall be provided at no additional cost.

Free training for operation and maintenance of 1 year.