

A photograph of a greenhouse interior, showing rows of vibrant green lettuce plants in the foreground. The background shows the structural framework of the greenhouse, including metal beams and glass panels. The image is framed by a diagonal purple and white border.

CONTROLLED ENVIRONMENT AGRICULTURE

**Container Farms,
Controllers, Sensors And
Greenhouse Automation**

THE FUTURE OF CONTROLLED ENVIRONMENT AGRICULTURE IS HERE

Axalyn is a range of Controlled Environment Agriculture technologies for plant factories, Container farms and Greenhouses. Axalyn aims to augment urban farmers with hyper-local production of nutrition-dense crops. This will help democratize farming and solve for the nutrition predicament of serving 2bn additional population by the year 2050.





CONTROLLED ENVIRONMENT AGRICULTURE (CEA)

- In a CEA system, plants are grown throughout the year by controlling the key parameters of air temperature, relative humidity, VPD, evapotranspiration, carbon dioxide concentrations and light availability.
- CEA ensures higher food production vis-a-vis efforts required and enables cultivation even in areas with degraded soil. CEA provides fresh, & healthy food locally & consistently
- Vertical farming is an environmentally suitable solution to increase productivity per area as stacked layers of planting can be configured to suit the scale of the grow operation.
- Viable in non-farmland areas, such as industrial parks and unoccupied storefronts in commercial centers and increases the pace of yield growth
- It helps you to scale the production to meet the needs of supply and demand provides cost-effective solutions for high-value crops



Our Mission

Emerge as a pioneering smart sustainable farming company that leverages cutting edge green technologies and lean methodologies, to make every available space



Productivity

CEA increases a farm's production efficiency by shortening the growth cycle and increasing plant density



Flavor

Plants are automatically provided accurate input variables of nutrients and fertilizer dosage at predetermined intervals in the container



Freshness

By placing container farms closer to the consumers who will consume the produce which is grown locally



Availability

CEA eliminates the impacts of climate, location, and seasonality, allowing you to have any produce you choose at any time of year and in any area



Traceability

Traceability ensures that the steps can be traced backwards and forwards at any point in the supply chain. This enables quick corrective actions when a food quality issue is discovered



Water Conservation

CEA can save 70 to 90 percent more water than soil due to its efficiency. Water circulates throughout the system, allowing plants to absorb more of the water they require for active metabolism

COMPLETE CONTROL OVER GROW ENVIRONMENT



CONTROLLED ENVIRONMENT

CEA is to provide protection and maintain optimal growing conditions throughout the growth stages of the plant



VERTICAL FARMING

Vertical farming is an environmentally favorable solution to increase productivity per area



ARTIFICIAL LIGHTING

Artificial lighting benefits are high resource use efficiency, high annual productivity per unit land area





COMMUNITY

- Addresses the food security conundrum
- Creates jobs in the local communities
- Contributes to the local economy
- Decreases food miles in Farm-To-Fork chain
- Eliminates food waste
- Improves food safety
- Water conservation with over 90% savings

CONSUMERS

- Meets aspirations of health conscious consumers
- Cholesterol free high fiber produce addresses lifestyle diseases
- Live enzymes in fresh food have higher concentrations of essential nutrients
- Essential nutrients like potassium, folate and Vitamins A, C, D & B12 build immunity
- Free of fertilizer and pesticide traces
- Free of contaminants as long distance food transport is avoided



GROWERS

- Labour Cost Savings up to 30%
- Lesser capital requirement by about 70% for a given capacity
- Delivers higher food quality by controlling growing conditions
- 60% Energy Cost Savings
- Enables farming in confined spaces
- Makes efficient use of land resources
- 50% Faster Growth
- Enables produce devoid of seasonality



CONTAINER FARMS

The Fully Controlled Plant Factory, re-engineered shipping containers, are modular and portable vertical production environments for growing a wide range of greens, across any weather conditions. The Axalyn Plant Factory enables growers to achieve constant production of vegetables all year around. The Plant Factory utilizes artificial control of light, temperature, moisture and carbon dioxide concentrations to enable quality and consistency.

Plant Factory is an ideal option to implement Smart Controlled Environment Agriculture techniques. The microclimate management inside the container is done automatically through sensors and controllers to provide a customized optimum growing environment for a variety of plants.

Plant Factory ensures higher food production vis-a-vis efforts required and it makes production possible even in areas where it is difficult or not possible. The important factors that play a key role in the success of a plant factory are Crop selection, Lighting selection, and design.

Plant Factory is becoming more viable because of advancements in sensor technologies, LED lighting, climate control systems, analytics, machine learning, etc. The concept of growing food with indoor hydroponic gardening is localization, sustainability, and reduction of the carbon footprint



FEATURES

- Hyperlocal Farming at any place, every climate
- Round the year efficient production
- Full Thermal Shielding Container
- Automated Climate Control
- Automated Humidity Control
- Automated LED Grow Lights
- Available in 80, 160 & 320-square-foot space
- Configurable as Hydroponic or Aeroponic setup
- Sterile cleanroom type operation
- Highest quality and tastiest produce
- Savings of 95% on water resources
- Clean produce - no pesticides or fungicides
- Protection from outside elements for predictability
- Sustainable Farming - Renewable Energy Sources
- Customize taste, color, texture and turgidity

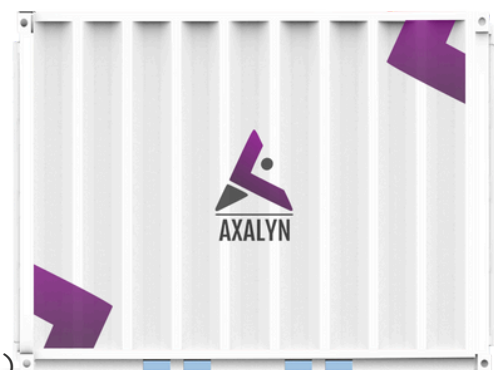
MONITORED PARAMETERS

- Air Temperature
- VPD
- Barometric Pressure
- CO2 Level
- Solar Radiation
- Nutrient Level
- Inlet Flow
- PAR
- Relative Humidity
- Evapotranspiration
- Sea Level Pressure
- Dew Point
- Heat Index
- Turbidity
- Outlet Flow
- PPFD

Container Farm Pico CF-80

SPECIFICATIONS

Volume	: 15500 Ltrs
Net Weight	: 1500kg
Refrigerant	: R134a
Shelves	: 5
Plant Capacity	: 1200 Nos
Temperature Range	: 180-280 C
External Dimensions (ft)	: 10(W) x 8(D) X 8(H)
Internal Dimensions (ft)	: 9'5"(W) X 7'8"(D) X 7'9"(H)
Area	: 80 sft



Container Farm Nano CF-160



SPECIFICATIONS

Volume	: 31000 Ltrs
Net Weight	: 2500kg
Refrigerant	: R134a
Shelves	: 5
Plant Capacity	: 2200 Nos
Temperature Range	: 180-280 C
External Dimensions (ft):	20(W) x 8(D) X 8(H)
Internal Dimensions (ft)	: 19'5"(W) X 7'8"(D) X 7'9"(H)
Area	: 160 sft



Container Farm Micro CF-320



SPECIFICATIONS

Volume	: 62000 Ltrs
Net Weight	: 4500kg
Refrigerant	: R134a
Shelves	: 5
Plant Capacity	: 6000 Nos
Temperature Range	: 180-280 C
External Dimensions (ft)	: 40(W) x 8(D) X 8(H)
Internal Dimensions (ft)	: 39'6"(W) X 7'8"(D) X 7'9"(H)
Area	: 320 sft



CONTROLLED ENVIRONMENT AGRICULTURE - AUTOMATION SYSTEMS

The Controlled Environment Agriculture automates all the parameters of the grow operation by maintaining optimal conditions for better crop growth and bountiful yields. The Plant Factory Controller monitors and controls Air Temperature, Barometric Pressure, Relative Humidity, Solar Radiation, Water and Nutrient Flows as part of the irrigation and nutrient management system. It also monitors some derived parameters like Evapotranspiration, Dew Point, Sea Level Pressure, Heat Index, CO2 Level, Nutrient Level, Turbidity, PAR (Photosynthetically Active Radiation) and PPFD (Photosynthetic Photon Flux Density).



CONTROLLERS & SENSORS



PLANT FACTORY CONTROLLER

Plant Factory Controller automates all the parameters of the Controlled Environment by maintaining the optimal growing conditions inside the Plant Factory.



IRRIGATION CONTROLLER

The Irrigation Controller manages the hydroponic irrigation system by controlling the water pumps and solenoid valves, that are part of the Semi Controlled Plant factory nutrient system



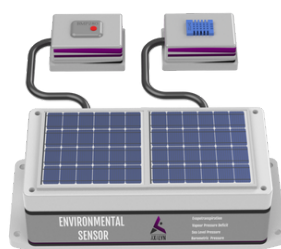
DOSING CONTROLLER

The Dosing Controller automatically measures the pH, EC, DO and nutrient temperatures in the nutrient sampler box. The built-in algorithm will then correct the parameters as per the desired setpoints.



CLIMATE CONTROLLER

The Climate Controller provides a stress-free cultivation environment for crops by preventing sudden changes in the micro-climate of the Semi Controlled Plant factory



ENVIRONMENTAL SENSOR

The Environment Sensor constantly monitors Air Temperature, Relative Humidity, VPD, Evapotranspiration, Barometric Pressure, Sea Level Pressure, CO2 Level, Dew Point, Solar Radiation and Heat Index



AQUA SENSOR

Keep your greenhouse operations optimised with Aqua Sensor, the advanced solution designed to streamline nutrient tank level maintenance and monitor inlet and outlet flows effortlessly.

DOSING CONTROLLER (DCZ01)

The Dosing Controller automatically measures the pH, EC, DO and nutrient temperatures in the nutrient sampler box. The built-in algorithm will then correct the parameters as per the desired setpoints. The controller also sends all the measured parameters to the cloud platform, so that the farmer can monitor the farm operations any-time, any- where using the mobile app and dashboards.



MEASURED PARAMETERS

- PH
- EC
- DP (Dissolved Oxygen)
- Nutrient Temperature

SPECIFICATIONS

Display

3.2" HMI TFT

EC Measurement

Units

EC, CF, or TDS
(500/640/700)

Water Level Monitor

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PH Measurement

Range

1-14

Peristaltic Pump Flow Rate

400-600 ml/min

Sunlight Detection

Wavelength Band

315nm to 400nm

Dosing Channel

PH Up, PH Down,
Nutrient A, B, C

Dissolved Oxygen Response

Up to 98% within 90 seconds

Relay Out

Sampler Pump,
Heater, DO Pump,
Nutrient Pump

Power Source

230V AC, 5A, 60
Watts

Nutrient Temperature Range

-55 °C to +125 °C

Doser modes

Auto, Schedule, Manual

IRRIGATION CONTROLLER (ICZ01)

The Irrigation Controller manages the irrigation system by controlling the water pumps and solenoid valves, that are part of the plant factory nutrient system. Irrigation control in a plant factory needs careful attention when compared to soil-based systems, due to the smaller root zone volume, greater water-holding capacity, and a higher dissolved oxygen concentration in the nutrient solution. The controller can support up to 2 zones with each zone having a dedicated nutrient tank.



MEASURED PARAMETERS

- Nutrient/ Water Level
- Inlet Flow Rate
- Outlet Flow Rate
- Solar Radiation

SPECIFICATIONS

Display

3.2" HMI TFT

Water Flow Rate

10-200 Liter/min

Power Source

230V AC, 5A

Solenoid Valve

1 to 2 Inch 2/2 Way
220V AC Diaphragm
Valve 2W-250-25

Water Pressure Resistance

2Mpa 2Mpa

Power Consumption

60 Watts

UVA (Radiation)

315nm to 400nm

Relay Switching Voltage (VAC)

230V@30A

Operating

Temperature Range

0°C to 55°C (32°F to 125°F)

Water Level

Operating Range

25cm ~ 4.5m

Relay Operating

Voltage (VDC)

5V@30A

Usage conditions

Avoid Direct Sunlight

CLIMATE CONTROLLER (CCZ01)

The Climate Controller provides a stress-free cultivation environment for crops by preventing sudden changes in the micro-climate of the greenhouse. The Climate Controller can interface with Weather Monitors to receive weather forecasts of the plant factories outdoor climate to manage the plant factory indoor climate by controlling the fan & pad system and fogging/heating system.



MEASURED PARAMETERS

- Air Temperature
- Relative Humidity
- VPD
- Evapotranspiration
- Barometric Pressure
- Sea Level Pressure
- CO2 Level
- Dew Point
- Solar Radiation
- Heat Index

SPECIFICATIONS

Display

3.2" HMI TFT

Air Pressure

0-40KPA VPD
0.45kPa - 1.25kPa

Barometric Pressure

15kPA CO2 250-1000ppm

Relative Humidity

5-90% RH ±2%RH

Solar Radiation

400-1100 nm

Heat Index

-2 to 50 °C

Sunlight Detection Wavelength Band

390 to 400nm

Rain Precipitation

0 -200 mm/h

Dew Point

10-34 °C

Relay Switching Voltage

230V@30A

Relay Operating Voltage

5V@30A

Power Source

230V AC, 5A ,60 Watts

PLANT FACTORY CONTROLLER (MCZ01)

The Multi Controller automates all the parameters of the grow operation by maintaining the optimal growing conditions inside the hydroponic Plant Factory, Container Farm, and Indoor Farm environments for better crop growth and bountiful yields. The Plant Factory Controller monitors and controls Air Temperature, Barometric Pressure, Relative Humidity, Solar Radiation, Water, and Nutrient Flows as part of the irrigation and nutrient management system.



MEASURED PARAMETERS

- ▶ Nutrient/ Water Level
- ▶ Inlet Flow Rate
- ▶ Outlet Flow Rate
- ▶ Solar Radiation

SPECIFICATIONS

Display
3.2" HMI TFT

Air Pressure
0-50 °C ±2°C

Relative Humidity
5-90% RH ±2%RH

Evapotranspiration
0.1-1000 mm day

Heat Index
2 to 50 °C

Water Flow Rate (Inlet & Outlet)
10-200 Liter/min

600-900 PPFD
For flowering, fruiting/
budding stage of plants

Power Source
230V AC, 5A, 60 Watts

Relay Switching Voltage
230V@30A

control modes
Auto, Schedule, Manual

Relay Out
Sampler Pump, Heater, DO
Pump, Nutrient Pump

Power Source
230V AC, 5A, 60
Watts

ENVIRONMENTAL SENSOR (ESZ01)

The Environment Sensor Node constantly monitors Air Temperature, Relative Humidity, VPD, Evapotranspiration, Barometric Pressure, Sea Level Pressure, CO2 Level, Dew Point, Solar Radiation and Heat Index. The Environment sensor then wirelessly transmits the data to the climate controller within the plant factory.



MEASURED PARAMETERS

- Air Temperature
- Relative Humidity
- VPD
- Evapotranspiration
- Barometric & ▸ Sea Level Pressure
- CO2 Level
- Dew Point
- Solar Radiation
- Heat Index

SPECIFICATIONS

Display

0.96 Cm OLED Module

Evapotranspiration

0.1-1000 mm day

Sea Level Pressure

1-100hpa

Evapotranspiration

0.1-1000 mm day

CO2 Level

250-1000ppm

Dew Point

10-34 °C

Solar Radiation

400-1100 nm

Sunlight Detection

Wavelength Band

390 to 400 nm

Relay Switching Voltage (VAC)

230V@30A

control modes

Auto, Schedule, Manual

Power Source

230V AC, 5A ,60 Watts

Usage Conditions

Avoid Direct Sunlight

AQUA SENSOR (ASZ01)

Keep your greenhouse operations optimised with Aqua Sensor, the advanced solution designed to streamline nutrient tank level maintenance and monitor inlet and outlet flows effortlessly. Engineered to perfection, Aqua Sensor ensures precise control and management, paving the way for enhanced crop growth and yield.



MEASURED PARAMETERS

- Water Level
- Inlet Flow
- Outlet Flow

SPECIFICATIONS

Display

0.96 Cm OLED
Module

Air Pressure

0-50 °C $\pm 2^{\circ}\text{C}$

Relative Humidity

5-90% RH $\pm 2\%RH$

Air Pressure

0-40KPA

VPD

0.45kPa - 1.25kPa

Operating Temperature Range

0°C to 55°C (32°F
to 125°F)

Usage Conditions

Avoid Direct Sunlight

Relay Switching

Voltage (VAC): 230V@30A

Relay Operating Voltage (VDC)

5V@30A

Control modes

Auto, Schedule, Manual

Usage Conditions

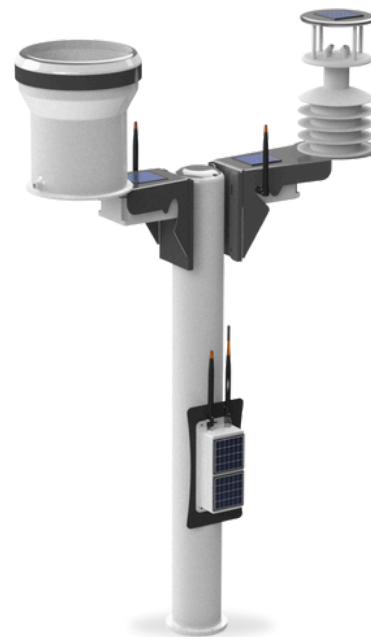
Avoid Direct Sunlight

Power Source

230V AC, 5A, 60 Watts

WEATHER STATION (WSZ01)

Weather Station revolutionizes the way farmers monitor and manage their crops by providing a comprehensive weather sensor system designed to optimize agricultural practices. With its advanced set of sensors and seamless integration with IoT technology, Weather Minder offers real-time weather data insights, enabling farmers to make informed decisions and maximize yields. Let's explore the enhanced features of this cutting-edge solution



MEASURED PARAMETERS

- Soil moisture
- Soil Temperature
- Relative Humidity
- Wind Speed
- Atmosphere Temperature
- Wind Direction
- Solar Radiation
- Atmospheric/Barometric Pressure

SPECIFICATIONS

Number of Nutrient Channels

1 Channel (Single)

Sensors Included

Soil Minder(Sensor)
Weather Minder (Sensor)

Control up with solenoid valves

Solenoids for Zones

Irrigation Modes

Schedule Mode

IoT Connectivity

Available (WiFi/Cellular/LoRa)

Compatibility

Suitable for up to 5 acres of land

Fertigation Capability

Supports precise nutrient delivery

DIY Kit

Includes components, tools, and assembly instructions for DIY installation

Control and Monitoring

Remote control and real-time monitoring

Weather Integration

Real-time weather data integration

Soil Health Monitoring

Continuous soil health assessment

Power Supply

External power source (plug-in)

OUTDOOR SENSOR (OSZ01)

The Outdoor Sensor Node constantly monitors Air Temperature, Relative Humidity, VPD, Evapotranspiration, Barometric Pressure, Sea Level Pressure, CO2 Level, Dew Point, Solar Radiation and Heat Index. The Environment sensor then wirelessly transmits the data to the climate controller within the plant factory.



MEASURED PARAMETERS

- Soil moisture
- Soil Temperature
- Relative Humidity
- Wind Speed
- Atmosphere Temperature
- Wind Direction
- Solar Radiation
- Atmospheric/Barometric Pressure

SPECIFICATIONS

Number of Nutrient Channels

1 Channel (Single)

Sensors Included

Soil Minder(Sensor)
Weather Minder (Sensor)

Control up with solenoid valves

Solenoids for Zones

Irrigation Modes

Schedule Mode

IoT Connectivity

Available (WiFi/Cellular/LoRa)

Compatibility

Suitable for up to 5 acres of land

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Supports precise nutrient delivery

DIY Kit

Includes components, tools, and assembly instructions for DIY installation

Control and Monitoring

Remote control and real-time monitoring

Weather Integration

Real-time weather data integration

Soil Health Monitoring

Continuous soil health assessment

Power Supply

External power source (plug-in)



Thank You

GET IN TOUCH



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