MADE IN TAIWAN

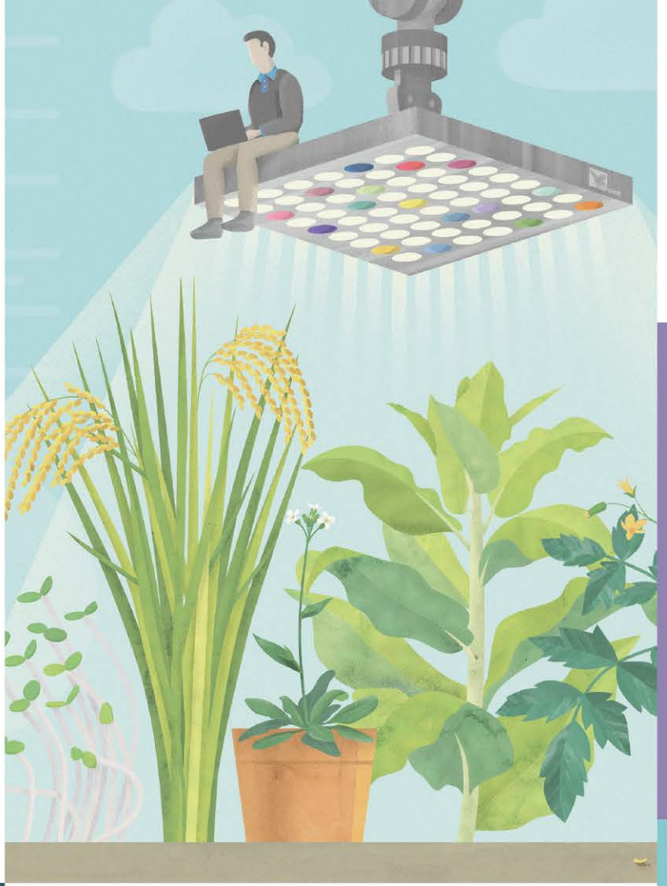
Management System ISO 9001:2015

TÜVRheinland CERTIFIED

www.tuv.com ID 9108853636

CE

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019



YOUR HIPOINT PARTNER

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HiPoint
TAIWAN HIPOINT CORPORATION

# PLANT GROWTH CHAMBER
# REACH IN GROWTH CHAMBER
# MULTI-COMPARTMENT CHAMBER
# HIGH LIGHT INTENSITY CHAMBER
# VERSATILE CHAMBER

# Taiwan HiPoint Corporation

## *More Effort, Better Solution!*

Taiwan **HiPoint**'s core purpose is to make a significant technical contribution to improving the health and safety of mankind. Our aim is to allow our customers to continuously improve their research with astonishing products that best support their daily life.

Our motto "More Effort, Better Solution" inspires us to unremittingly tend to perfection and to differentiate ourselves from others through continuous innovation. To this end, we continuously work in collaboration with the most prestigious institutes of the country.

The future is at the center of all our reflections and activities. We work in a sustainable world with our partners that inspires and drives us to improve every day. Everyone at Taiwan **HiPoint** is dedicated to meeting our customers' requirements beyond their expectations. We provide them a complete solution thanks to our large product range that can be totally remote controlled.

To ensure the highest quality standards, all our products are solely manufactured at our plant in Southern Taiwan. Our know-how in terms of environment control and 30 years of experience drive us to be the Taiwan Market leader, and currently worldwide market challenger. We intend to maintain this dynamic and in that regard, we work with the same passion and desire as we have since the foundation of Taiwan **HiPoint**.

**Kingco, C.C.**
CEO

SUSTAINABLE DEVELOPMENT GOALS

## **HiPoint** provides the settable $CO_2$ range precise from 0 to 5,000ppm.

Increases in $CO_2$ concentration cause global warming, rising sea-level and many other drastic ecological changes; these phenomena catch global attention. Countries are actively conducting research to slow down the increase of environmental $CO_2$ concentration. $CO_2$ levels in Europe have risen by 13.5% in the past 30 years.

Excessive $CO_2$ concentration also results in greenhouse effect; rising sea-level also reduces land area. Climate changes such as torrential rain and drought are associated with high atmospheric $CO_2$ concentrations. These changes can damage the ecosystem, natural resources and biodiversity.

$CO_2$ is the best fertilizer for plants.
Plants need $CO_2$ to conduct photosynthesis, and $CO_2$ makes plants grow strong and thrive.
**HiPoint** applies PID technology to provide precise $CO_2$ concentration to plants.

One tree can absorb about 5023g of $CO_2$ and produce about 3600g $O_2$ per day.
One hectare of forest can absorb about 1T $CO_2$ and produce about 7000g $O_2$ per day.

Response to UN SDGs

## SMALL SIZE

701

721

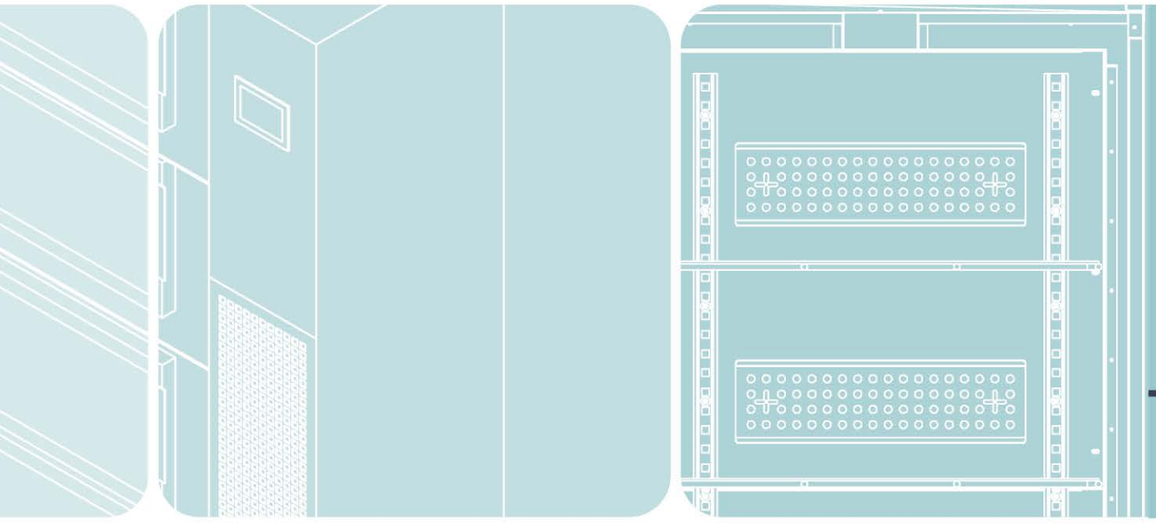
## MIDDLE SIZE

400

740

600

740-2D



## LARGE SIZE

1200

2300

1300

## MULTI COMPARTMENT

700

750

313

## HIGH LIGHT INTENSITY

230

130

650

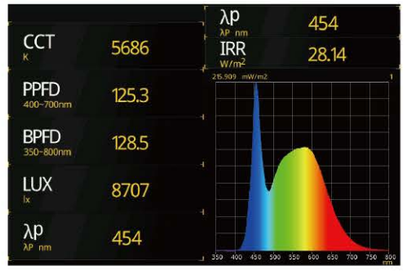
# Growth Light Type

Growth Light Type

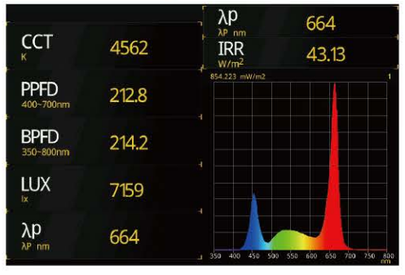
## Light Specifications

| Models | LED T8 | LED TRGB | LED Z190 | LED Z1N | LED Z1NS | LED Z4N | LED Z41N | LED Z4WN | LED Z9 | LED Z16 |
|---|---|---|---|---|---|---|---|---|---|---|
| Intensity ($\mu mols^{-1}m^{-2}$ @15cm) | 120<br>4 tubes | 200<br>4 tubes | 400 | 400 | 200 | 700 | 700 | 700 | 1300 | 500 |
| Control | Steps | Steps/<br>0%-100% | 0%-100% | 0%-100% | 0%-100% | 0%-100% | 0%-100% | 0%-100% | 0%-100% | 0%-100% |
| Size (cm) | 30/60/120 | 120 | 40 × 60 | 40 × 60 | 40 × 50 | 40 × 60 | 40 × 60 | 40 × 60 | 40 × 60 | 28 × 40 |

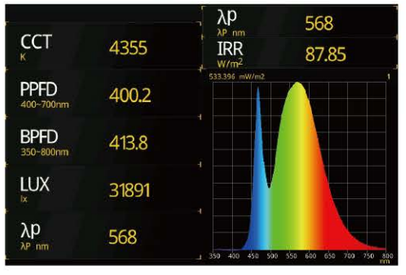
### LED T8



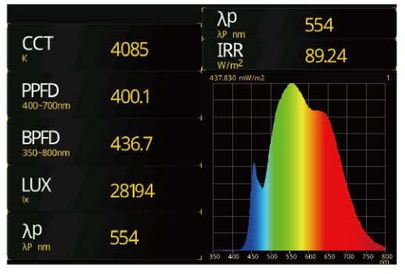

### LED TRGB



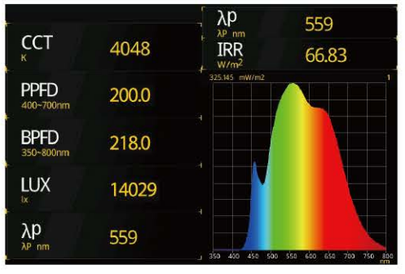

### LED Z190



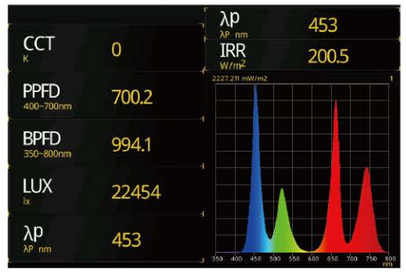

### LED Z1N



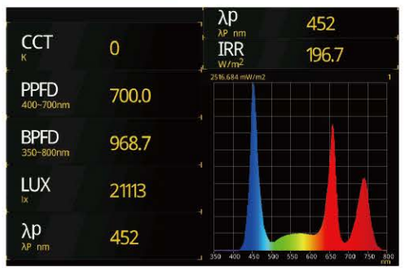

### LED Z1NS



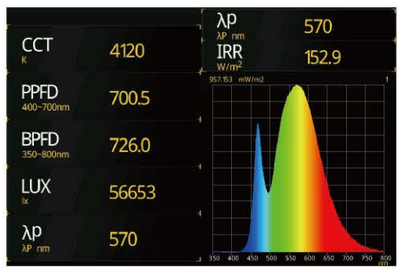

### LED Z4N



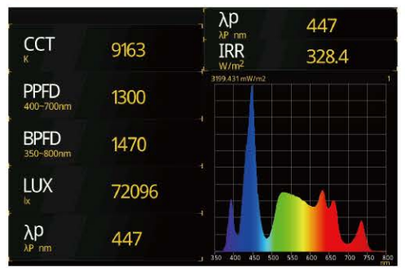

### LED Z41N



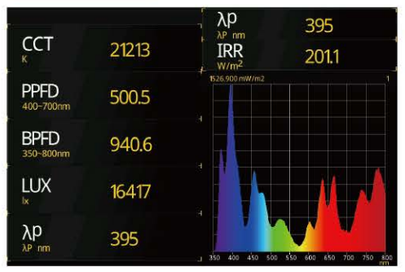

### LED Z4WN

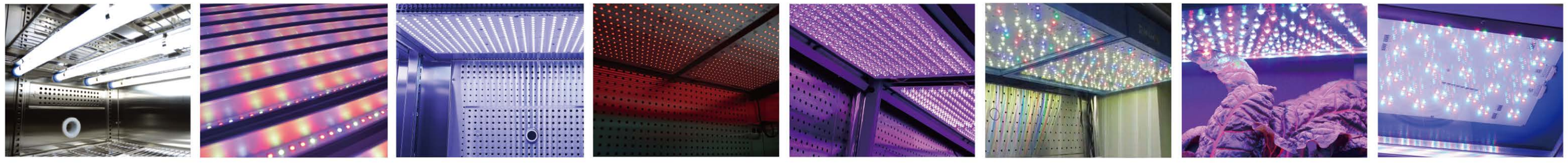



### LED Z9




### LED Z16



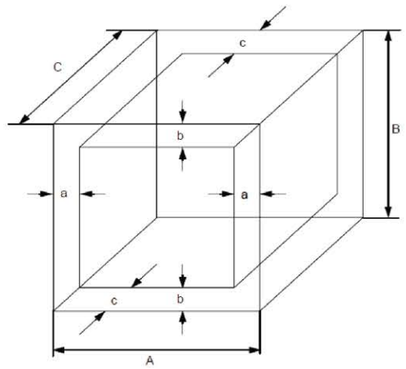



from left to right: T8 / TRGB / Z190 / Z4N-R / Z41N / Z9 / Customized / Z16

# Technical Data

## Area of Application

Our factory standard defines the measurement methods and general conditions to determine and verify technical DATA intended for publication.




A, B, C= internal dimensions (W, H, D)
a, b, c = wall clearances

a = 0.1*A
b = 0.1*B
c = 0.1*C

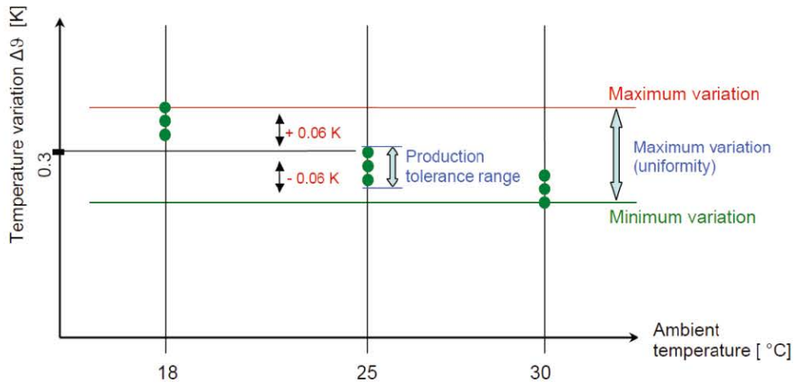
## Inner Efficient Working Volume

The working volume is the part of the inner chamber, in which compliance with the published technical DATA is guaranteed. It results from reducing the inner chamber diameter by at least 10% in all directions.

## Steady-State Condition

The steady-state condition is the operating state during which the values of all controlled parameters (temperature, humidity, $CO_2$ concentration) permanently do not vary by more than the maximum uniformity (variation) of all controlled parameters specified for the respective chamber at any point within the usable space.

This is the reason why Taiwan HiPoint Corporation always mentions the ***Inner Efficient Working Volume*** instead of the total volume concerning its chambers as the environment uniformity and stability DATA.




## Fresh Air Exchange

Temperature, humidity, $CO_2$ concentration uniformity, stability, and recovery times change, depend on the difference of conditions between the usable volume and ambient atmospheric conditions.

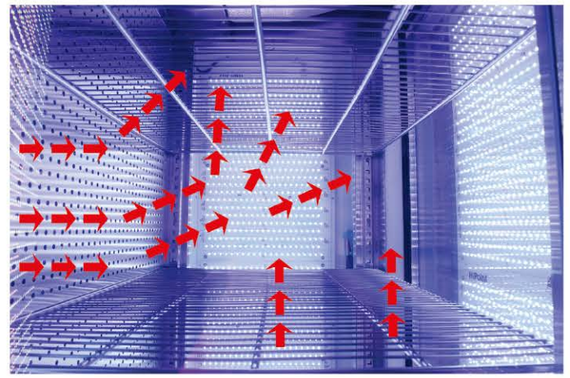


# Airflow

## Airflow Circulation

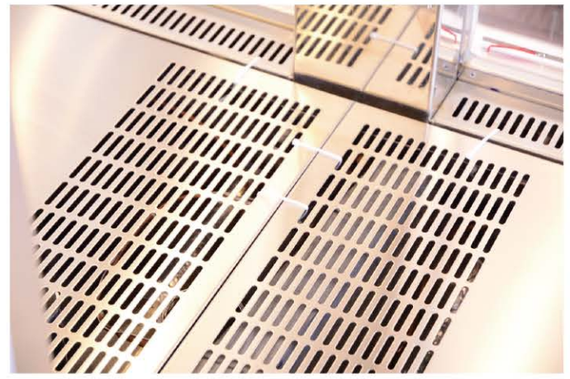
Horizontal Back to Front Airflow:

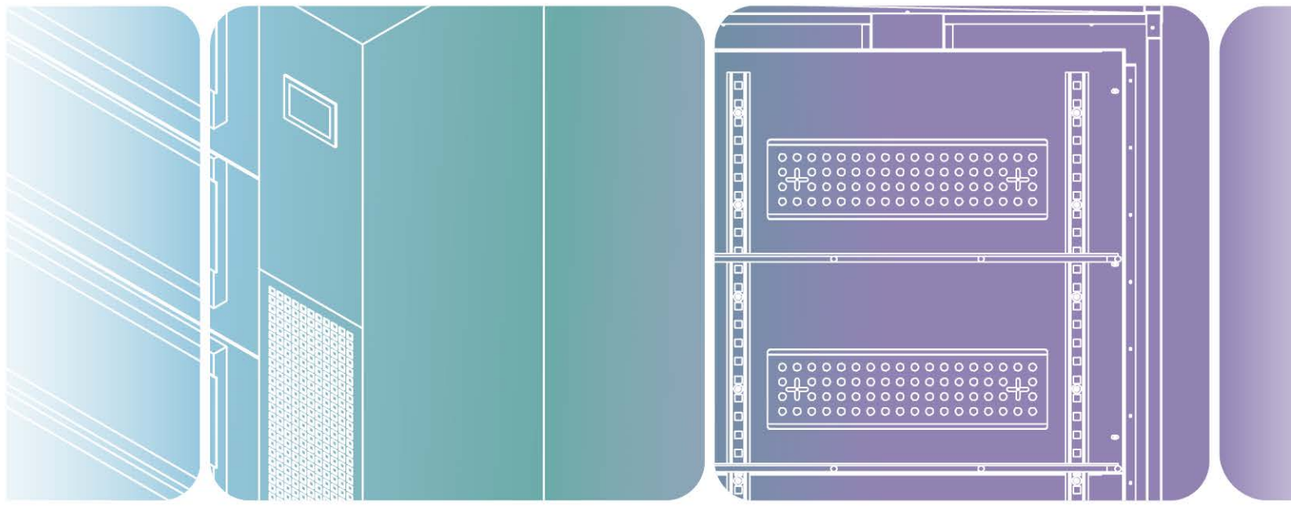
- This airflow is usually used for small plants such as Arabidopsis
- The nearest to the natural conditions' airflow
- The maximum available space
- Uniform temperature across the shelf



Vertical Upward Airflow:

- Ideal for tissue culture chambers to avoid condensation inside the petri dish
- Upward uniform laminar flow through the plants
- For small plants as Arabidopsis if each plant has an independent pot to let the air circulates between them
- For tall plants using a high-intensity light





# Specifications Overview

F = Temperature + Growth Light
FH = Temperature + Growth Light + Humidity Control
FHC = Temperature + Growth Light + Humidity + $CO_2$ control

| Type | Model No. | Capacity (L) | Temperature Control Range, Lights on (degrees) | Standard No. of Tier | Max. No. of Tier | Max. No. of the LED Panel |
|---|---|---|---|---|---|---|
| Lighting Downward Growth Chamber (Horizontal Lighting) | F-701 | 130 | 10-45 | 2 | 2 | 2 |
| | F-721 | 240 | | 2 | 2 | 2 |
| | F-400 | 370 | | 3 | 4 | 4 |
| | F-740 | 470 | | 3 | 4 | 4 |
| | F-600 | 580 | | 3 | 4 | 4 |
| | F-1200 | 800 | | 3 | 4 | 8 |
| | F-2300 | 1200 | | 4 | 4 | 8 |
| | F-1300 | 1400 | | 4 | 5 | 10 |
| High Illumination Growth Chamber (Vertical Lighting) | F-650 | 380 | 10-45 | 5 | 15 | 6 |
| | F-130 | 540 | | 5 | 15 | 6 |
| | F-230 | 1000 | | 5 | 15 | 12 |
| Multi-Compartment Growth Chamber | F-700 | 230 /compartment | 10-45 | 1 (1 tier per compartment) | 1 (1 tier per compartment) | 2 |
| | F-750 | 670 /compartment | | | | 6 |
| | MT-313 | 225 /compartment | | | | 6 |

# Application

| Model No. | Incubator | Plant Growth | Tissue Culture | Arabi-dopsis | Dros-ophila | Algae | Germi-nation | High Light | Multi Chamber |
|---|---|---|---|---|---|---|---|---|---|
| 701 | ● | ● | ● | ● | ● | ● | | | |
| 721 | ● | ● | ● | ● | ● | ● | | ● | |
| 400 | | | | | | | | | |
| 740 | ● | ● | ● | ● | ● | ● | | | |
| 600 | ● | ● | ● | ● | ● | ● | ● | ● | |
| 740-2D | | | | | | | | | |
| 1200 | ● | ● | ● | ● | ● | ● | ● | ● | |
| 2300 | ● | ● | ● | ● | ● | ● | ● | ● | |
| 1300 | | ● | | | | | | ● | |
| 700 | | ● | | ● | | | | ● | ● |
| 750 | | ● | | ● | | | | ● | ● |
| 313 | | ● | | ● | | | | ● | ● |
| 130 | | ● | | | | | | ● | |
| 230 | | ● | | ● | | | | ● | |
| 650 | | ● | | | | | | ● | |

The applications for each chamber type is our recommendations and can be discussed directly for customization.

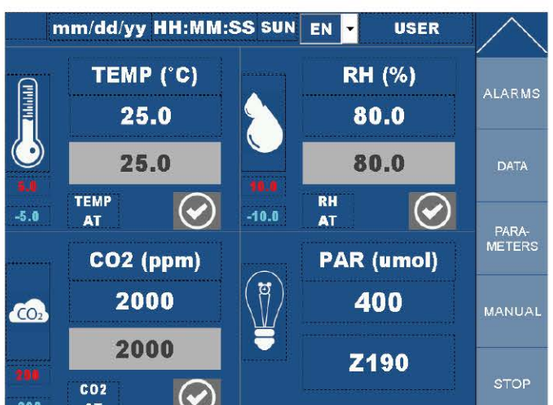
# Programming

## Human Machine Interface

Temperature, humidity, $CO_2$, multi-wavelength independently adjustable lighting, irrigation system, EC, pH level controlled easily with a color 4.3" or 7" large tactile interface for the intuitive programming.

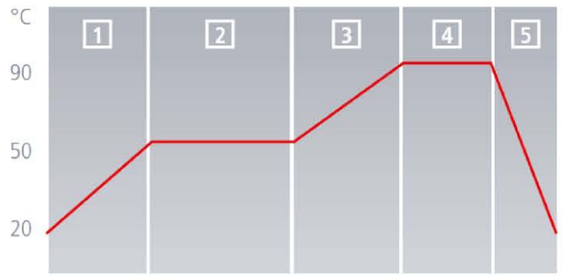
## Programming

50 programs (24 steps each) for the step or ramp process. Select 8 programs to combine as a schedule, each program independently repeatable, the whole schedule repeatable too The programs can be set to run once or repeat indefinitely. It is possible to add sensors and adjust the offset calibration through the touch-screen controller.



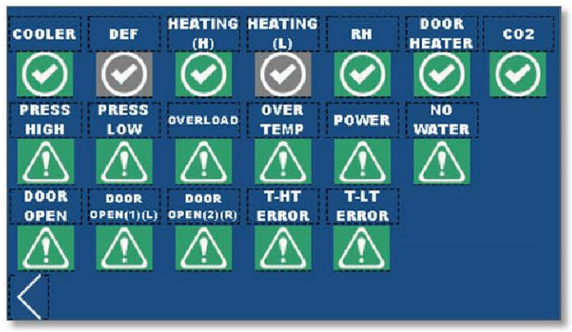

## Ramp Programming

Essential for the exact simulation of environmental conditions in research.
User-friendly ramp programming. Thanks to the "Celsius" standard software, an unlimited amount of different set values of temperature, humidity, $CO_2$, and lights can be combined on-time ramps.




## On-board Diagnostics

On-board diagnostics, door open, high/low pressure, and chamber off and power failure event logging to improve troubleshooting abilities. The most recent 1000 alarms appear clearly on the display and can be retrieved through any connected computer or Internet-connected PC.

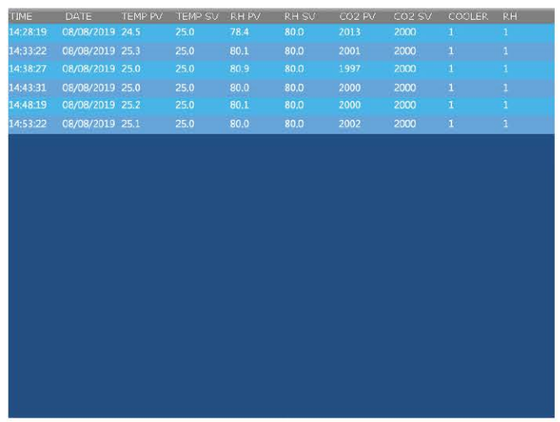





# Safety

## Datalog

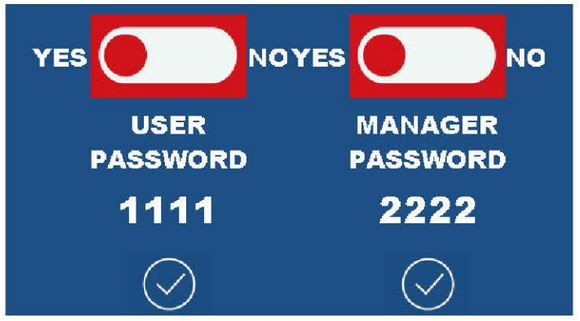
Up to 60,000 records, all processes are automatically logged every five minutes. Logging time is adjustable on request. Output parameter that is being controlled and monitored value displayed and can be exported to a USB key for analysis (Excel file).
Direct connection with a computer (PC) for monitoring and control, or connection via the Internet to control the unit is optional.



| TIME | DATE | TEMP PV | TEMP SV | RH PV | RH SV | CO2 PV | CO2 SV | COOLER | RH |
|---|---|---|---|---|---|---|---|---|---|
| 14:28:19 | 08/08/2019 | 24.5 | 25.0 | 78.4 | 80.0 | 2013 | 2000 | 1 | 1 |
| 14:33:22 | 08/08/2019 | 25.3 | 25.0 | 80.1 | 80.0 | 2001 | 2000 | 1 | 1 |
| 14:38:27 | 08/08/2019 | 25.0 | 25.0 | 80.9 | 80.0 | 1997 | 2000 | 1 | 1 |
| 14:43:31 | 08/08/2019 | 25.0 | 25.0 | 80.0 | 80.0 | 2000 | 2000 | 1 | 1 |
| 14:48:19 | 08/08/2019 | 25.2 | 25.0 | 80.1 | 80.0 | 2000 | 2000 | 1 | 1 |
| 14:53:22 | 08/08/2019 | 25.1 | 25.0 | 80.0 | 80.0 | 2002 | 2000 | 1 | 1 |

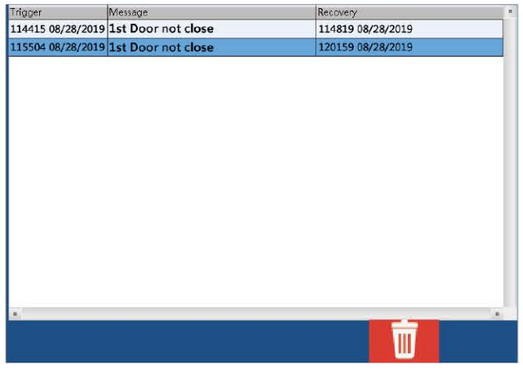
## Safety

To protect your experiments from unintended changes, access to User, Manager, and Service Engineer levels is protected by four digitals changeable passwords. The password function can be deactivated by Service Engineer level users in case of safe use. Power On/Off is protected by key lock to avoid unintended power off action.




## Alarms

Audible and color-coded alarms are displayed on the touchscreen to alert about the deviation of conditions within the chamber. Three levels of protection: Primary tracking alarm, secondary and tertiary levels of limit alarms for visual and audible (buzzer) signal for high and low temperature, humidity, $CO_2$ values.



| Trigger | Message | Recovery |
|---|---|---|
| 114415 08/28/2019 | 1st Door not close | 114819 08/28/2019 |
| 115504 08/28/2019 | 1st Door not close | 120159 08/28/2019 |

# F / FH / FC / FHC-701

# 701 Series

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 4.3" HMI

**Single door** Open left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

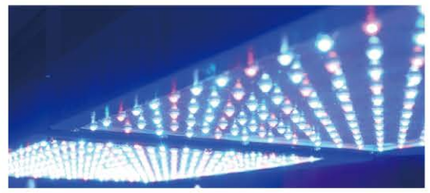
**Communication** USB, Ethernet LAN

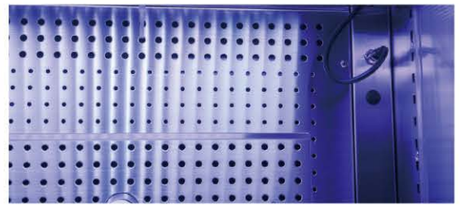
| | | | |
|---|---|---|---|
| Structure | Volume | L | 130 |
| | Interior dimension | mm | W500 x D470 x H550 |
| | Exterior dimensions | mm | W600 x D860 x H1160 |
| | Footprint | $m^2$ | 0.5 |
| | Max. number of tiers | tiers | 2 |
| | Max. load per tray | kgs | 25 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4 |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.23 / tier |
| | Growth height | cm | 1 tier: 53 / 2 tiers: 25 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |





# F / FH / FC / FHC-721

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 4.3" HMI

**Single door** Open left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

**Communication** USB Ethernet LAN

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.39 / tier |
| | Growth height | cm | 1 tier: 60 / 2 tiers: 29 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |

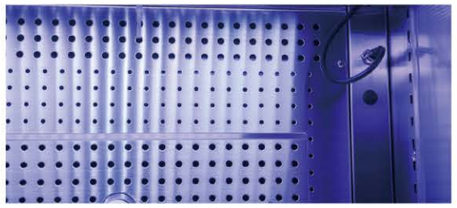
# 721 Series

HiPoint

| | | | |
|---|---|---|---|
| Structure | Volume | L | 240 |
| | Interior dimension | mm | W700 x D570 x H620 |
| | Exterior dimensions | mm | W800 x D930 x H1360 |
| | Footprint | $m^2$ | 0.7 |
| | Max. number of tiers | tiers | 2 |
| | Max. load per tray | kgs | 25 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |



# F / FH / FC / FHC-400

# 400 Series

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 4.3" HMI

**Single door** Open right outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

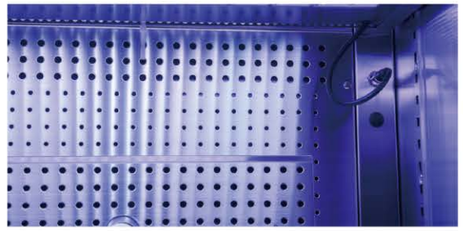
**Communication** USB, Ethernet (LAN)

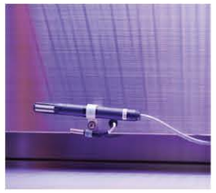
| | | | |
|---|---|---|---|
| Structure | Volume | L | 370 |
| | Interior dimension | mm | W550 x D520 x H1300 |
| | Exterior dimensions | mm | W650 x D860 x H1950 |
| | Footprint | $m^2$ | 0.55 |
| | Max. number of tiers | tiers | 4 |
| | Max. load per tray | kgs | 25 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | 7" HMI |
| | Antimicrobial interior | VNC remote control |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 5 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 60 - 90 |
| | Humidity control range (light on) | % | 60 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z1NS |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.24 / tier |
| | Growth height | cm | 3 tiers: 41 / 4 tiers: 30 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |





# F / FH / FC / FHC-740

# 740 Series

HiPoint

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 4.3" HMI

**Single door** Open left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

**Communication** USB, Ethernet LAN

| | | | |
|---|---|---|---|
| Structure | Volume | L | 470 |
| | Interior dimension | mm | W700 x D590 x H1145 |
| | Exterior dimensions | mm | W900 x D950 x H1950 |
| | Footprint | $m^2$ | 0.85 |
| | Max. number of tiers | tiers | 4 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Side to side |
| | Growth area | $m^2$ | 0.39 / tier |
| | Growth height | cm | 3 tiers: 36 / 4 tiers: 26 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 0 |

# F / FH / FC / FHC-600

# 600 Series

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 4.3" HMI

**Single door** Open left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

**Communication** USB, Ethernet

| | | | |
|---|---|---|---|
| Structure | Volume | L | 580 |
| | Interior dimension | mm | W770 x D600 x H1265 |
| | Exterior dimensions | mm | W900 x D1040 x H1950 |
| | Footprint | $m^2$ | 0.9 |
| | Max. number of tiers | tiers | 4 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 55 - 95 |
| | Humidity control range (light on) | % | 55 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Side to side |
| | Growth area | $m^2$ | 0.39 / tier |
| | Growth height | cm | 3 tiers: 40 / 4 tiers: 30 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |

# F / FH / FC / FHC-740-2D

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 4.3" HMI

**Single door** Open left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

**Communication** USB, Ethernet LAN

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Side to side |
| | Growth area | $m^2$ | 0.4 / tier |
| | Growth height | cm | 2 tiers: 49 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 0 |

# 740-2D Series

HiPoint

| | | | |
|---|---|---|---|
| Structure | Volume | L | 480 |
| | Interior dimension | mm | W720 x D590 x H1150 |
| | Exterior dimensions | mm | W940 x D800 x H1980 |
| | Footprint | $m^2$ | 0.75 |
| | Max. number of tiers | tiers | 2 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |

# F / FH / FC / FHC-1200

# 1200 Series

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Single door** Open right outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

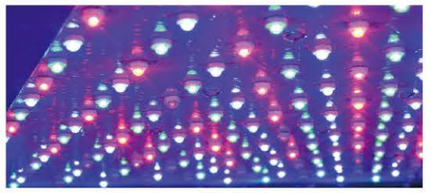
**Communication** USB, Ethernet LAN

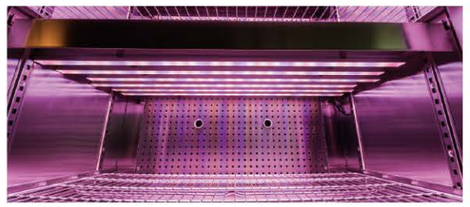
| | | | |
|---|---|---|---|
| Structure | Volume | L | 800 |
| | Interior dimension | mm | W950 x D690 x H1220 |
| | Exterior dimensions | mm | W1070 x D900 x H1950 |
| | Footprint | $m^2$ | 0.96 |
| | Max. number of tiers | tiers | 3 |
| | Max. load per tray | kgs | 35 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | Low humidity | VNC remote control |
| | Antimicrobial interior | Water-jacket LED system |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.6 / tier |
| | Growth height | cm | 2 tiers: 59 / 3 tiers: 38 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 0 |





# F / FH / FC / FHC-2300

# 2300 Series

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Double door** Open right and left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 6 caster wheels with leveling feet

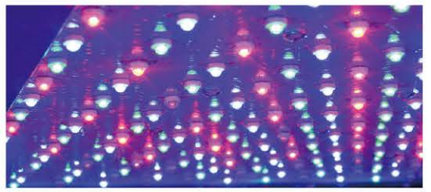
**Communication** USB, Ethernet LAN

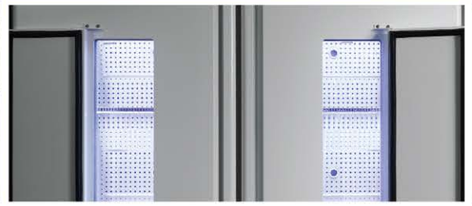
| | | | |
|---|---|---|---|
| Structure | Volume | L | 1200 |
| | Interior dimension | mm | W1600 x D650 x H1200 |
| | Exterior dimensions | mm | W1700 x D910 x H2070 |
| | Footprint | $m^2$ | 1.5 |
| | Max. number of tiers (2 trays per tier) | tiers | 4 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN / Z9 |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.9 / tier |
| | Growth height | cm | 3 tiers: 38 / 4 tiers: 28 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |





# F / FH / FC / FHC-1300

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Double door** Open right and left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 6 caster wheels with leveling feet

**Communication** USB, Ethernet LAN

| | | | |
|---|---|---|---|
| **Further Data** | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN / Z9 |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.8 / tier |
| | Growth height | cm | 3 tiers: 46 / 4 tiers: 34 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |

# 1300 Series

| | | | |
|---|---|---|---|
| **Structure** | Volume | L | 1400 |
| | Interior dimension | mm | W1410 x D690 x H1450 |
| | Exterior dimensions | mm | W2050 x D925 x H2075 |
| | Footprint | $m^2$ | 1.9 |
| | Max. number of tiers (2 trays per tier) | tiers | 4 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| **Safety Device** | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| **Accessories & Options** | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | 7" HMI | VNC remote control |
| | Antimicrobial interior | |

# F / FH / FC / FHC-700

# 700 Series

HiPoint

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Single door** Open left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 4 caster wheels with leveling feet

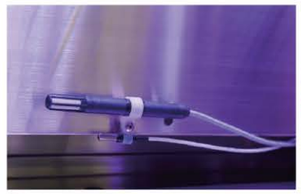
**Communication** USB, Ethernet LAN

| | | | |
|---|---|---|---|
| **Structure** | Volume | L | 230 / compartment |
| | Interior dimension | mm | W700 x D515 x H650 |
| | Exterior dimensions | mm | W1250 x D920 x H2020 |
| | Footprint | $m^2$ | 1.15 |
| | Max. number of tiers | tiers | 2 / compartment |
| | Max. load per tray | kgs | 35 |

| | | |
|---|---|---|
| **Safety Device** | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| **Accessories & Options** | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | Low humidity | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| **Further Data** | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN / Z9 / Z16 |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.29 / tier |
| | Growth height | cm | 1 tier: 65 / 2 tiers: 30 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |



# F / FH / FC / FHC-750

# 750 Series

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Double door** Open right and left outside, safety anti-condensation tempered glass observation window with tight cover

**Installation** 6 caster wheels with leveling feet

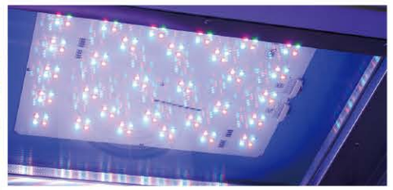
**Communication** USB, Ethernet LAN

| | | | |
|---|---|---|---|
| **Structure** | Volume | L | 700 / compartment |
| | Interior dimension | mm | W1350 x D740 x H700 |
| | Exterior dimensions | mm | W2100 x D1110 x H2030 |
| | Footprint | $m^2$ | 2.3 |
| | Max. number of tiers | tiers | 2 / compartment |
| | Max. load per tray | kgs | 50 |

| | | |
|---|---|---|
| **Safety Device** | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| **Accessories & Options** | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | Low humidity | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| **Further Data** | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN / Z9 / Z16 |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.88 / tier |
| | Growth height | cm | 1 tier: 70 / 2 tiers: 33 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 2 |



# MT / MTH / MTC / MTHC-313

# 313 Series

CE IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Single door** Open left outside, 1st fully insulated, 2nd safety anti-condensation tempered glass door

**Installation** 6 caster wheels with leveling feet

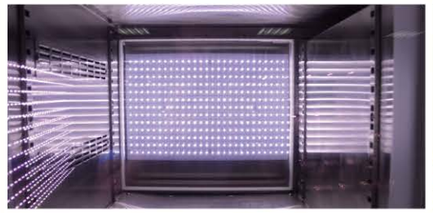
**Communication** USB, Ethernet LAN

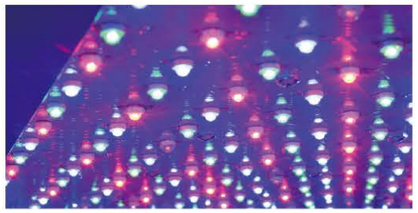
| | | | |
|---|---|---|---|
| **Structure** | Volume | L | 225 / compartment |
| | Interior dimension | mm | W750 x D600 x H500 / compartment |
| | Exterior dimensions | mm | W1660 x D940 x H1995 |
| | Footprint | $m^2$ | 1.56 |
| | Max. number of tiers | tiers | 1 / compartment |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| **Safety Device** | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| **Accessories & Options** | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| **Further Data** | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 60 - 90 |
| | Humidity control range (light on) | % | 60 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Horizontal |
| | Growth area | $m^2$ | 0.45 / tier |
| | Growth height | cm | 50 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 1 / compartment |





# F / FH / FC / FHC-230

# 230 Series

Internal Stainless Steel or White Coated

External Coated steel

Controller PID microprocessor control, multi program, LED touchscreen 7" HMI

Doors (front and back) Open right and left outside, 1st fully insulated, 2nd safety anti-condensation tempered glass door

Single door (right side) Open right outside, 1st fully insulated, 2nd safety anti-condensation tempered glass observation window

Single door (left side) Open left outside, 1st fully insulated, 2nd safety anti-condensation tempered glass observation window

Installation 6 caster wheels with leveling feet

Communication USB Ethernet LAN

CE

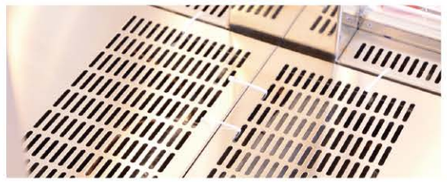
IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

| | | | |
|---|---|---|---|
| Structure | Volume | L | 1000 |
| | Interior dimension | mm | W1300 x D670 x H1170 |
| | Exterior dimensions | mm | W1600 x D1080 x H2050 |
| | Footprint | $m^2$ | 1.72 |
| | Max. number of tiers | tiers | 5 |
| | Max. load per tray | kgs | 40 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | Low humidity | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN / Z9 |
| | Forced air circulation | type | Vertical |
| | Growth area | $m^2$ | 0.67 / tier |
| | Growth height | cm | 5 tiers: 23 / 4 tiers: 29 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 0 |



# F / FH / FC / FHC-130

# 130 Series

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Single door (front and back)** Open right outside, 1st fully insulated, 2nd safety anti-condensation tempered glass door

**Single door (two side)** Open right outside, 1st fully insulated, 2nd safety anti-condensation tempered glass observation window

**Installation** 4 caster wheels with leveling feet

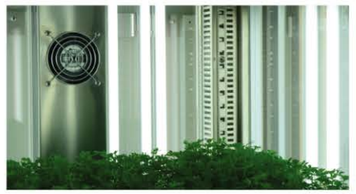
**Communication** USB, Ethernet LAN

| | | | |
|---|---|---|---|
| Structure | Volume | L | 540 |
| | Interior dimension | mm | W630 x D665 x H1300 |
| | Exterior dimensions | mm | W1030 x D1070 x H2050 |
| | Footprint | $m^2$ | 1.1 |
| | Max. number of tiers | tiers | 5 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | Low humidity | VNC remote control |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN / Z9 |
| | Forced air circulation | type | Vertical |
| | Growth area | $m^2$ | 0.33 / tier |
| | Growth height | cm | 5 tiers: 26 / 4 tiers: 32 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 0 |



# F / FH / FC / FHC-650

# 650 Series

IEC-61010
EN 61326-1:2021
EN 61010-1:2010+A1:2019

**Internal** Stainless Steel or White Coated

**External** Coated steel

**Controller** PID microprocessor control, multi program, LED touchscreen 7" HMI

**Doors (front)** Open right outside, 1st fully insulated, 2nd safety anti-condensation tempered glass door

**Single door (right side)** Open right outside, 1st fully insulated, 2nd safety anti-condensation tempered glass observation window

**Installation** 4 caster wheels with leveling feet

**Communication** USB, Ethernet

| | | | |
|---|---|---|---|
| Structure | Volume | L | 380 |
| | Interior dimension | mm | W610 x D500 x H1250 |
| | Exterior dimensions | mm | W880 x D935 x H2000 |
| | Footprint | $m^2$ | 0.8 |
| | Max. number of tiers | tiers | 5 |
| | Max. load per tray | kgs | 30 |

| | | |
|---|---|---|
| Safety Device | Password | Display / Control / Parameter passwords |
| | Temperature alarms (Primary) | Settable high/low tracking alarm following set point |
| | Temperature alarms (Secondary) | Settable high/low tracking temperature limit set point |
| | Temperature alarms (Tertiary) | Factory default mechanical high/low temperature protection |
| | Compressor safety | Delay start, over temperature, over pressure protection |
| | Electric safety | Over current protection |

| | | |
|---|---|---|
| Accessories & Options | Additional wire tray | Perforated stainless steel tray |
| | Reinforce wire tray | Inner socket |
| | Additional temperature sensor | Additional humidity sensor |
| | Additional $CO_2$ sensor | Additional access port |
| | Humidity monitoring | $CO_2$ monitoring |
| | $CO_2$ flask injection | $CO_2$ up to 5% |
| | $CO_2$ up to 20% | Low temperature |
| | Low humidity | VNC remote control |
| | Antimicrobial interior | |

| | | | |
|---|---|---|---|
| Further Data | Temperature control range (lights off) | °C | 0 - 60 |
| | Temperature control range (lights on) | °C | 10 - 45 |
| | Setting temperature accuracy | °C | 0.1 |
| | Humidity control range (light off) | % | 50 - 95 |
| | Humidity control range (light on) | % | 50 - 85 |
| | Setting humidity accuracy | % | 1 |
| | $CO_2$ control range | ppm | Ambient to 5000 |
| | Setting $CO_2$ accuracy | ppm | 1 |
| | Available light type | model | Z190 / Z4N / Z41N / Z4WN |
| | Forced air circulation | type | Back to front |
| | Growth area | $m^2$ | 0.28 / tier |
| | Growth height | cm | 5 tiers: 25/ 4 tiers: 31 |
| | Data logging | | 60,000 records |
| | Alarm record | Y/N | Yes |
| | USB Data export | Y/N | Yes |
| | Access port | unit | 0 |

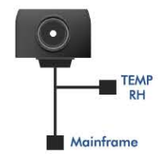
# HR-550

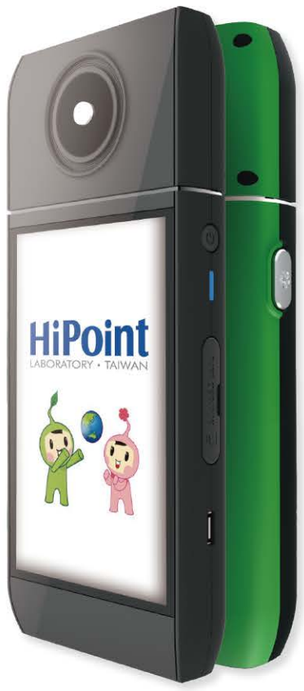
## Pioneer in the entire world

To understand the interaction between the various spectrum of plant growth photosynthesis, it combines the spectrum, luminous flux, DLI, DTI and various spectrum inter-ratio values.

The new HR-550 breaks through the traditional light quantum calculation to combine the photosynthesis plant physiological parameters of photosynthesis, solve the problem of optical signal and data analysis, and connect the light information with precise operation.

Test by NIST DIN JIS






| Measurable Parameter | | |
|---|---|---|
| | Lux | Illumination |
| | IRR | Spectral irradiance |
| | λpv | Crest value irradiance |
| | fc | Foot candle |
| | PPFD | Photosynthetic Photon Flux Density |
| | BPFD | Bio-photosynthetic Photon Flux Density |
| | PFD-R:B | Photon flux density: Red to blue light ratio |
| | PFD-R:IR | Photon flux density: Red to infrared light ratio |
| | PFD-X:Y | Photon flux density: Customized band ratio |
| | DLI | Daily Light Integral |
| | K | Relative color temperature |
| | λp nm | Crest value wavelength |
| | CIE 1931 | x , y chromaticity coordinate |
| | CIE 1976 | u′, v′ chromaticity coordinate |
| | LOGGING | Custom schedule measurement system |
| | CRI | Color rendering index |



# Plant Intelligence Spectrometer

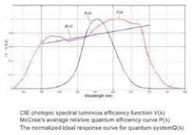
HiPoint

## Characteristic

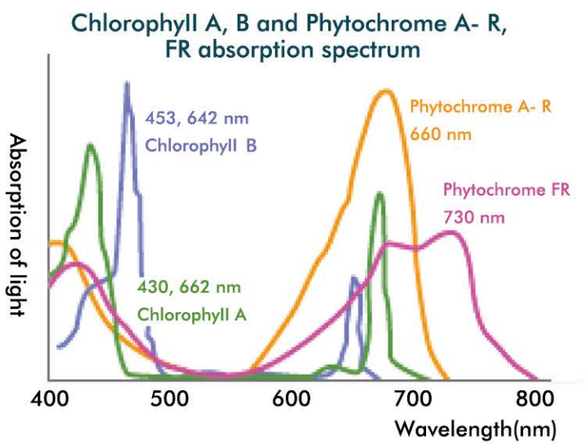
- Built-in 5 best spectral curve of photosynthesis
- Built-in temperature and humidity sensor
- Flexible spectrometer sensor, different measurement range adjustable (310~1050nm)
- Daily Light Integral calculation
- DTI cumulative temperature and humidity calculation
- Automatic horizontal adjustment function
- 8 languages are optional
- IP66 waterproof
- WIFI function for remote detection
- SD card recording
- Manual detection, automatic timing measurement function

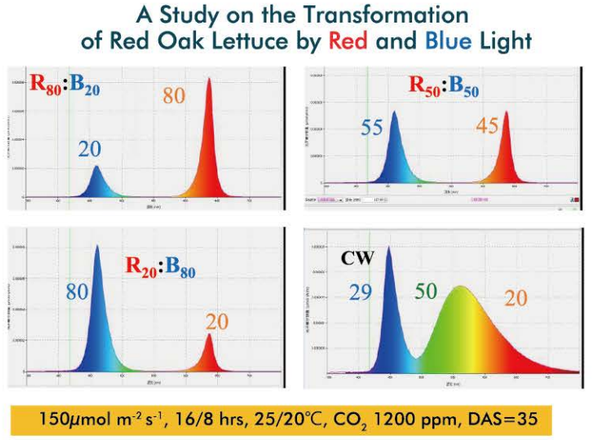
## Measurable Function

- Plant Physiological Effective Radiation Value Measurement - BPFD
- Accurately set the measurement arbitrarily of the wavelength interval
  SP 350 - 800 nm
  UV 310 - 500 nm (option)
  IR 700 - 1050 nm (option)



- Daily Light Integral (DLI)
- ratio of B:G,R:B,R:Fr, or a free set interval comparison
- Built-in reference spectrum surface new spectrum function
- Advanced platform (open ended), can expand different sensor, temperature and humidity sensor, UV sensor, infrared light sensor.



# PHENOTRON

# In vivo 3D multispectral image analyzer

HiPoint

## Spectrum Modeling

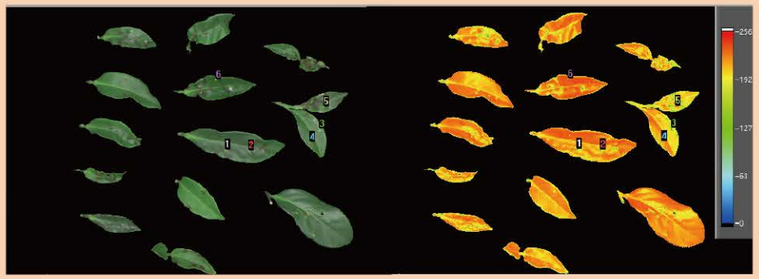
Establish a growth spectrum model and characteristic model of plant disease and pest for research and identification.

## Inspection & Quality Assurance

Use an inspection spectrum or related quality spectrum standards to inspect quality and classification.

### Plant growth stage model establish

### Tea leaves disease and pest model establish

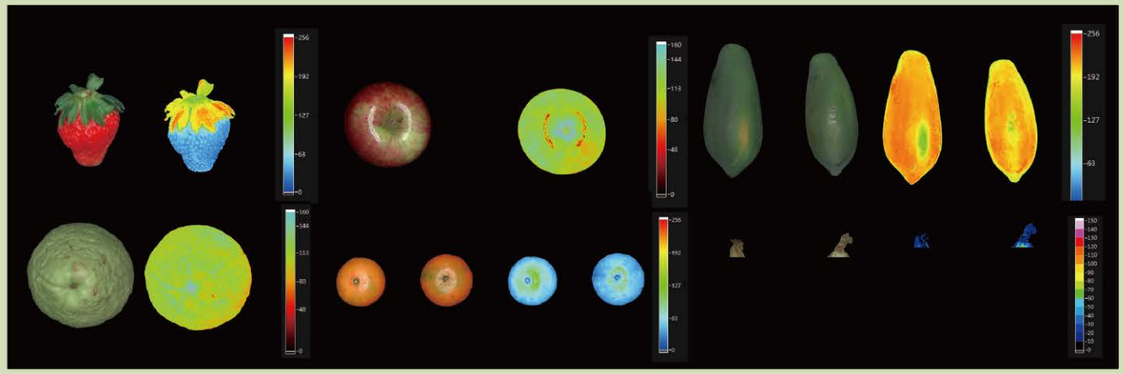
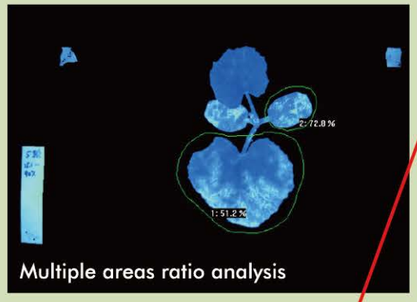
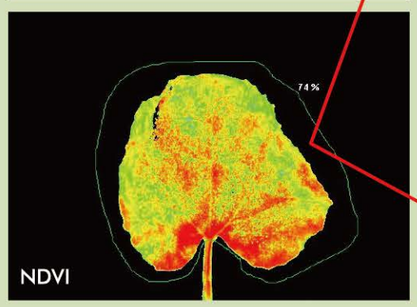
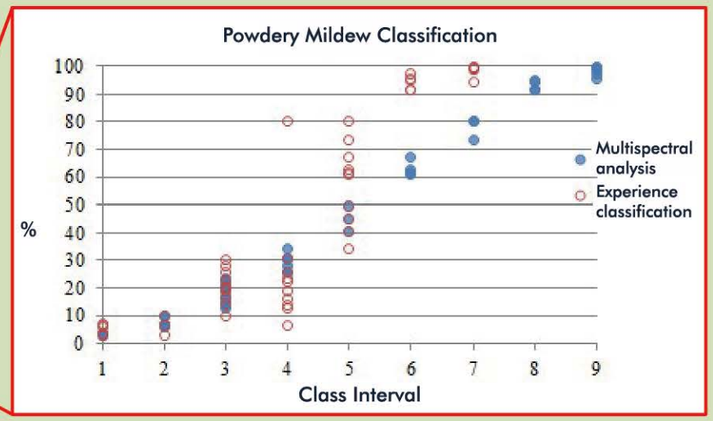


## Application

- Botanical composition analysis
- Plant disease research
- Seed health analysis
- Plant physiology research
- Plant stress experiment
- Phenotypic color record (RGB, Hue)
- Meat quality evaluation
- Vegetable and fruit quality inspection
- Single spectrum type image output
- High contradistinction single spectrum type image output
- Multispectral phenotyping analysis
- Vivo Image analyzer
- Area and dimension calculating
- Time-lapse photography analyzer

### Rice quality analysis

### Vegetable / fruit quality analysis



### Powdery mildew disease classification model establish