

Netsudo Plant Growth

Optimize controlled environment research with Netsudo's high-precision plant growth chamber, engineered to deliver uniform light intensity and stable temperature conditions essential for consistent plant development. Designed for flexibility across various growth cycles, it offers accurate temperature control (typically from 10°C to 50°C) and programmable photoperiod lighting to simulate natural day/night conditions. With a reflective stainless-steel interior, adjustable shelving, and consistent airflow, it ensures optimal photosynthetic response and reproducibility. Ideal for botanical research, seed germination, and agricultural testing, this chamber supports reliable, repeatable plant growth studies.

Regulatory Compliances:

- FDA 21 CFR Part 11
- GMP Compliance
- IEC 60068
- IEC 61010
- ICH Q1A
- ISO 9001



Functional Overview of Netsudo Plant Growth Chamber.

Capacity :

Available in various Sizes from 90L to 1000L with wide shelf spaces.

Parameter Uniformity:

uniform airflow of $\leq 0.5\text{m/s}$ does the job.

Temperature:

precise control from 10°C to 50°C (lights-ON)
 2°C to 50°C (lights-OFF)
By timed-VCRS with HGBS

Integrated Alarm Protection

Heavy duty Front locking castor wheels and adjustable bolts

Access:

Door with lock and validation port.

Intuitive HMI Dashboard

with Clear Visualization Touch Screen HMI 4.5" to 10" Driven through PLC with Data

Build:

Interior Build - Stainless Steel SS-304 Exterior Build- Powder Coated SS-304 or MS (Optional)

Humidity Control

40 to 95%rh Accuracy - 1%rh achieved through Netsudo Hybridhumid™ system

Light

LED /Incandescent/ Fluorescent cool white lamps giving upto $700 (\mu\text{mole}/\text{m}^2/\text{s})$

Control & Monitoring

Intelligent Control with Integrated Monitoring for Plant Growth Chambers

Reliability:

Most reliable as all necessary compliances ICH, IEC, FDA, GMP are successfully met

Versatility on the Move

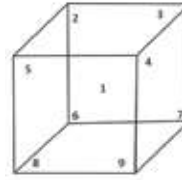
Heavy-Duty Locking Wheels with Adjustable Bolts



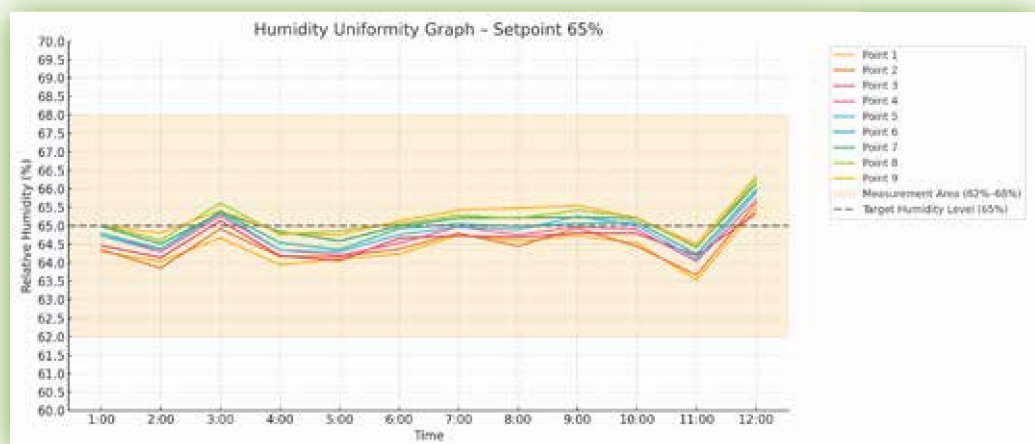
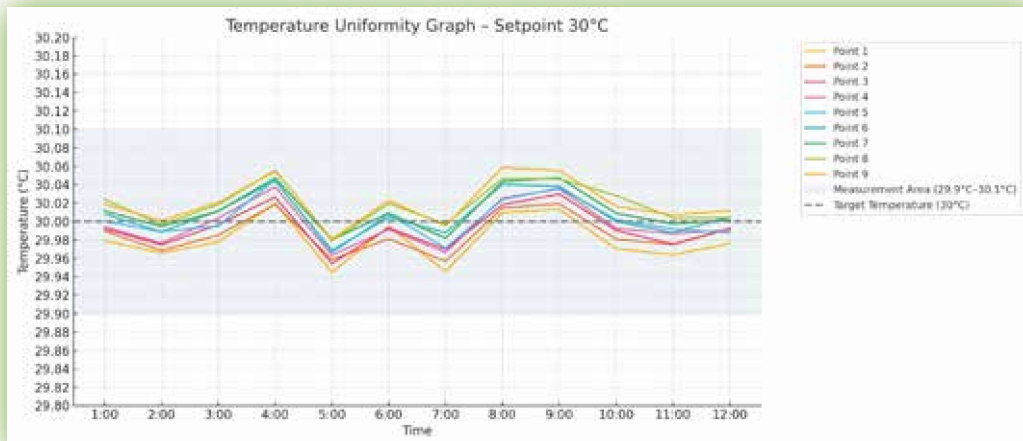
Technical Specifications:

	Model	Units	NCPG09	NCPG20	NCPG40	NCPG75	NCPG100
Performance	Light Type	-	LED / Incandescent / Fluorescent cool white lamps				
	Light Intensity	(μmole/ m²/s)	upto 700 (μmole/m²/s)				
	Light Control	-	Dimmable between 10% to 100%				
	Temp Control Range	°C	10°C to 50°C (light-ON) & 2°C to 50°C (light-OFF)				
	Temp Accuracy, Uniformity	°C	±0.1°C, ±1°C				
	Humidity Control Range	%RH	+40% to 95%				
	Humidity Accuracy, Uniformity	%RH	±1%, ±3% RH of set humidity				
Control System	Programming	-	24 programmable profiles, each capable of executing 24-hours cycles				
	User Access	-	Single to multi-level authentication for critical parameters				
	Audit Trail Support	-	authorised/unauthorised logins, parameter changes				
	Event Logs	-	Time-stamped logs for door opening, power failure, setpoint changes				
	Data Logs	-	Continuous parameter logging (Temperature, Humidity & Light) with graphical trends; export via USB				
	Safety Features	-	Alarms for Unauthorised door Open, parameter under or over shoot, configurable alarm threshold				
	Construction	User Interface	-	Touch-Screen HMI 4.5"	Touch-Screen HMI 7"		Touch-Screen HMI 10"
Interior		-	Stainless Steel ISO 5-Grade				
Exterior		-	Powder Coated SS-304				
Door		-	Well Insulated with toughened glass viewing window				
Wheel		-	Front Locking Castors				
Leveller		-	Adjustable levelling bolts				
Shelf Count (Standard)		No.	2	3	4	5	6
Heater		-	Sheathed U-shaped Nichrome heater				
Refrigeration Sysem		-	VCRS - Electrostatic-coated refrigeration coils				
Cooler		-	Air Cooled				
Refrigerant		-	R-134a				
Humidifier		-	Netsudo HybridHumid™				
Temperature Senson/count		-	PT - 100 / 4				
Humidity Sensor/ Count		-	Capacitive Humidity Sensor that exceeds ICH / FDA requirements / 4				
Capacity		L	90	200	400	750	1000
Dimensions	Shelf Wise Maximum Load	No.	12	19	25	30	35
	Shelf wise growth area	mm x mm	400x300	550x350	650x450	750x600	750x750
	Overall growth Height without shelf (standard)	mm	400	750	11050	1350	1470
	Inside Dimension	mm	450x400x500	600x400x850	700x500x1150	800x650x1450	800x800x1570
	Outside Dimension	mm	630x1015x1027	780x1015x1377	880x1115x1677	980x1265x1977	980x1415x2097
	Equipment Weight	kg	180	210	320	400	460
	Shipping Weight	kg	220	280	420	550	640
Electrical Rating	Power Supply	Ac/Hz	230/50				
	Power Rating	-	4	5	7	16	17
	Inside Chamber Socket	-	Optional				
Communication	Ethernet Port	-	Yes				
	USb Port	-	Yes				
	Printer Port	-	Optional				
	Rs 485 Modbus	-	Yes				

Temperature Humidity Uniformity Graphs



The chamber features a high-accuracy PT100 temperature sensor, offering excellent stability and precise measurements over extended periods. Humidity is monitored using a capacitive sensor combined with a wet cloth wick system, providing consistent and reliable readings, especially under high-humidity conditions.



Refrigerant GWP

By minimizing greenhouse gas emissions, these refrigerants offer an eco-friendly alternative to traditional options. They help meet international environmental standards, support energy-efficient performance.

Documentation

- Netsudo Chamber Documentation
 - Netsudo Factory Acceptance Test (FAT) Report
 - Netsudo Sensor Calibration Report
- Along with DQ, OQ, PQ, IQ.

Safety Devices:

- Over-temperature protection (OTP)
- Circuit breakers (ELCB)
- Emergency stop button
- Independent temperature limit controller
- Sensor fault detection
- Visual and audible alarm system
- Fire-resistant insulation materials

Add-ons:

- CO₂ Supply and control. The CO₂ range spans from 0% to 20%, with precision control of $\pm 0.1\%$, measured using an infrared CO₂ sensor. In terms of 'ppm' it ranges from 350 (ambient) to 1200 for enhancing significant growth in plants.
- Condensate Recirculator
- H₂O₂ Decontamination



“Unwavering Accuracy. Uncompromising Results.”

Installation requirement

Model No.	Installation Space (mm)	Handling cum movement Space (in)
NCPG09	630 x 1015 x 1027	32.7 x 47.8 x 48.3
NCPG20	780 x 1015 x 1377	38.6 x 47.8 x 62.1
NCPG40	880 x 1115 x 1677	42.5 x 51.8 x 73.9
NCPG75	980 x 1265 x 1977	46.5 x 57.7 x 85.7
NCPG100	980 x 1415 x 2097	46.5 x 63.6 x 90.4

Catalogue No.:

Model No.	Description
NCPG09	Plant Chamber with internal cabinet Capacity of 90 liters
NCPG20	Plant Chamber with internal cabinet Capacity of 200 liters
NCPG40	Plant Chamber with internal cabinet Capacity of 400 liters
NCPG75	Plant Chamber with internal cabinet Capacity of 750 liters
NCPG100	Plant Chamber with internal cabinet Capacity of 1000 liters