Colo Science
Laboratory & Scientific Equipment

COLO.SCIENCE · TECHNICAL SPECIFICATION

RAKAPOSHI-WR

Walk-in Plant Growth Room · 11.5 or 17.3 m² lit growing area · 4 or 6 LED racks · 18–35 °C · 50–90 % RH

RAKAPOSHI-WR is a walk-in plant growth room for research groups that have outgrown reach-in chambers. Researchers work inside the room among stainless steel racks, each shelf lit by its own dimmable LED panel. Temperature, humidity and light run together in one day and night program from a 10" touch screen at the door, and a smartphone app shows the room status from anywhere. The Basic version comes in two room sizes with 16 or 24 lit shelves; options cover the number of shelves, eight light spectra up to 1600 µmol/m²·s, temperature down to −10 °C, low humidity, CO_2 control, video monitoring, smart access lock and independent data loggers. COLO.Science delivers the room as a project — site check, installation, commissioning and training.

WALK-IN ROOM | 16 OR 24 LIT SHELVES | 11.5 · 17.3 M² | 18–35 °C | 50–90 % RH | LED, COLOUR OPTIONS | DAY / NIGHT PROGRAMS | SMARTPHONE APP

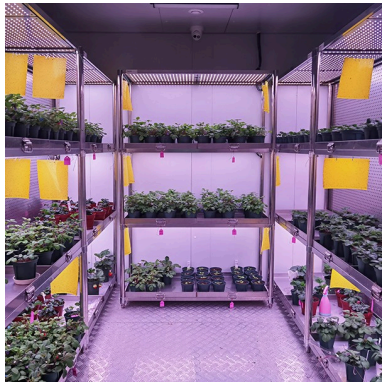
HEATING & COOLING 18 … 35 °C

Document type: **Technical Specification Sheet**
Product series: **RAKAPOSHI Plant Growth Rooms**
Models · SKU: **RAKAPOSHI-WR12 · PRO8331** | **RAKAPOSHI-WR17 · PRO8332**
Format: **A4 landscape · CORE-TECHSPEC 1.2**

WR12 PRODUCT PAGE | WR17 PRODUCT PAGE | TESTING — OVERVIEW | TESTING CATALOGUE | REQUEST QUOTE



RAKAPOSHI-WR · insulated door with window, control panel with 10" touch screen



Inside the room · stainless steel racks, LED panel above each shelf

SERIES
RAKAPOSHI-WR

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Technical data sheet · Informational document · Controlled electronic document
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RAKAPOSHI-WR · technical specification

Walk-in plant growth room with programmable temperature, humidity, light, fresh air and CO_2 on stainless steel racks · Basic version and options

PHOTOPERIOD PROGRAMS | LIGHT ON EVERY SHELF | VERTICAL LAMINAR AIR FLOW | REMOTE APP — Growth-room capacity with chamber-level control

Product Overview

Application profile

Plant research institutes and universities: large numbers of model plants and crops under one defined climate.

Breeding and seed programs: seedlings, young plants and generation cycles independent of the season.

Photobiology and stress studies: light quality, intensity, temperature and humidity experiments at room scale.

Tissue culture and plantlet hardening: many trays on multi-tier racks with uniform light.

Algae and aquatic organisms: flasks and culture vessels on lit shelves, CO_2 control as an option.

Key features · Basic version

Controller: 10" touch screen at the door, PID control of temperature, humidity, light and fresh air in time-segment programs.

Sensor: Vaisala HMP60 temperature and humidity probe.

Climate: compressor refrigeration with heat recovery and variable-frequency control; cooling, heating, humidifying and dehumidifying units in the ceiling cavity.

Remote access: smartphone app for status and settings.

Construction: polyurethane insulated panels; air-flow walls, racks and shelves in stainless steel AISI 304.

Why RAKAPOSHI-WR

Room capacity, chamber control: 16 or 24 lit shelves as standard, climate and light programmed like a reach-in chamber.

Even climate on every shelf: mesh air-flow walls on both sides and a return-air filter strip on top; the climate units sit in the ceiling cavity, so the floor stays free.

Light per shelf: dimmable LED panel above every shelf, from white to eighteen-band research spectra.

One supplier for the project: COLO.Science plans the site, installs, commissions and services the room.

Core technical summary · Basic version

Parameter	RAKAPOSHI-WR12	RAKAPOSHI-WR17
Racks × lit shelves	4 × 4 · 11.52 m²	6 × 4 · 17.28 m²
Temperature	18–35 °C, lights on and off · fluctuation ≤0.5 °C	
Humidity	50–90 % RH, lights on and off · fluctuation ≤3 % RH	
Light	White LED, 350 µmol/m²·s at 10 cm, dimmable 0–100 %	
Exterior W × D × H	2310 × 2910 × 3000 mm	2310 × 4200 × 3000 mm

GROWING AREA	TEMPERATURE	HUMIDITY	LIGHT
11.52 · 17.28 m²	18–35 °C · options to −10 °C	50–90 % RH · option from 40 %	350 µmol/m²·s · up to 1600, 8 spectra

Basic version = standard configuration. Options, lighting, supply and site requirements are confirmed in the COLO.Science quotation.

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Technical Parameters · Basic version

Models · SKU	RAKAPOSHI-WR12 · PRO8331 RAKAPOSHI-WR17 · PRO8332	**Lighting**	LED panel above each shelf; full-spectrum white 400–700 nm
Racks and shelves	WR12: 4 racks × 4 shelves · WR17: 6 racks × 4 shelves; rack height 200 cm	**Light intensity**	350 µmol/m²·s at 10 cm from the panel, dimmable 0–100 %
Lit growing area · height	WR12: 11.52 m² · WR17: 17.28 m² · growth height 43 cm	**Light control**	Programmed in time segments together with the climate; gradual sunrise and sunset
Temperature range	18–35 °C with lights on and off	**Controller**	10" touch screen, PID control of temperature, humidity, light, fresh air and CO_2 (option)
Temperature fluctuation · resolution	≤0.5 °C · 0.1 °C	**Remote access**	Smartphone app for status and settings
Humidity range	50–90 % RH with lights on and off	**Communication · internet**	Confirmed in the quotation — see site requirements, page 7
Humidity fluctuation · precision	≤3 % RH · 1 % RH	**Sensor**	Vaisala HMP60 temperature and humidity probe
Air circulation	Vertical laminar flow: mesh air-flow walls on both sides, return-air filter strip on top	**Climate units**	Cooling, heating, humidifying and dehumidifying in the ceiling cavity
Refrigeration	Compressor with heat recovery, variable-frequency control, heat-pump heating	**Fresh air**	Controlled fresh-air exchange
Construction	Polyurethane insulated panels; insulated door with observation window	**Racks, shelves, air walls**	Stainless steel AISI 304, modular
Exterior W × D × H	WR12: 2310 × 2910 × 3000 mm WR17: 2310 × 4200 × 3000 mm	**Installation**	Delivered in modules, installed and commissioned on site by COLO.Science

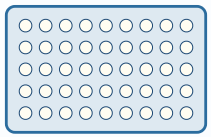
Basic Version and Options

Function	Basic version	Option at order
Temperature	18–35 °C, lights on and off	Low-temperature module 5–35 °C or −10–35 °C
Humidity	50–90 % RH	Low-humidity module 40–90 % RH (30–90 % RH on request)
Light	White, 350 µmol/m²·s at 10 cm	White up to 1600 µmol/m²·s · single colour · 3, 4, 7 or 18 colours — page 4
Shelves per rack	4 lit shelves, 43 cm growth height	2, 3 or 5 lit shelves — page 5
Atmosphere	Controlled fresh-air exchange	CO_2 control module, ambient to 2000 ppm (5000 ppm on request)
Observation	Door with observation window	Video monitoring with one or two cameras
Access control	Mechanical door handle with lock	Smart lock: RFID card, fingerprint or Wi-Fi / app, with access log
Records	Controller display and app	Independent data loggers for temperature, humidity, light (PAR/DLI) and CO_2 · handheld spectrometer light meter

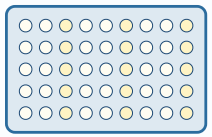
Design and specifications may change without prior notice. The final configuration is stated in the COLO.Science quotation.

WR12 PRODUCT PAGE | WR17 PRODUCT PAGE | TESTING — OVERVIEW | TESTING CATALOGUE | REQUEST QUOTE

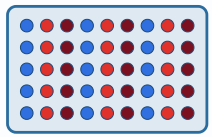
Lighting Configurations



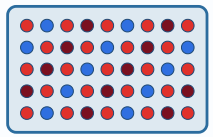
White · standard
Full spectrum, 350 µmol/m²·s
standard configuration



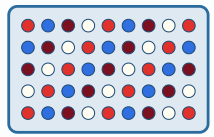
White · other intensity
300 · 700 · 1000 · 1200 · 1600
option at order



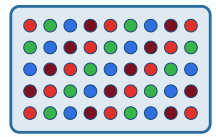
Single colour
Blue 450 · red 660 · far-red 735 nm
option · one colour per panel



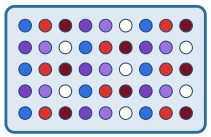
Three colours B·R·FR
450 · 660 · 735 nm
option



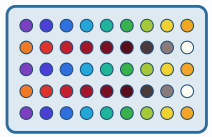
Four colours R·B·FR·W
660 · 450 · 735 nm + white
option



Four colours R·G·B·FR
450 · 525 · 660 · 735 nm
option



Seven colours with UV
B · R · FR · UV-A · UV-B · UV-C · white
option



Eighteen colours
18 wavelengths, 365–950 nm
option · research spectrum

Schematic view of one shelf panel from below; dot colours show the LED colours in the panel. The Basic version has full-spectrum white panels on all shelves. Another configuration is chosen at order; in multi-colour panels each colour is dimmed separately from 0 to 100 % and follows the time-segment program. Intensity per colour is stated in the quotation.

Lighting configuration	Spectrum and intensity	In the room
White · standard	Full-spectrum white 400–700 nm, 350 µmol/m²·s at 10 cm, dimmable 0–100 %	**Standard**
White · other intensity	Full-spectrum white, 0–300, 0–700, 0–1000, 0–1200 or 0–1600 µmol/m²·s	**Option**
Single colour	Blue 450 nm, red 660 nm or far-red 735 nm (each ±5 nm)	**Option**
Three colours B·R·FR	450 / 660 / 735 nm, each colour dimmed separately	**Option**
Four colours R·B·FR·W	660 / 450 / 735 nm plus white 400–700 nm, each channel dimmed separately	**Option**
Four colours R·G·B·FR	450 / 525 / 660 / 735 nm, each channel dimmed separately	**Option**
Seven colours with UV	450 / 660 / 735 nm, UV-A, UV-B, UV-C and white	**Option**
Eighteen colours	18 bands from 365–375 nm to 940–950 nm (UV-A, visible, far-red, near infrared), each regulated separately	**Option**

Choosing the light

General growth, seedlings, Arabidopsis: standard white 350 µmol/m²·s.

Light-demanding crops: white 1000–1600 µmol/m²·s, usually with 2 or 3 shelves.

Photomorphogenesis, flowering, shade response: three or four colours with far-red 735 nm.

UV and stress research: seven colours with UV-A, UV-B and UV-C.

Spectral research: eighteen bands, each regulated separately.

Tall-plant configuration · ceiling LED lamps





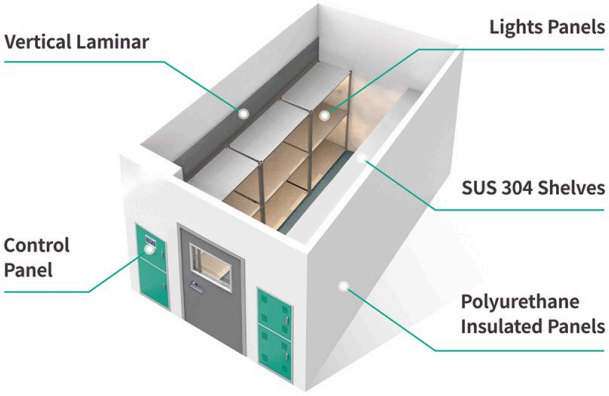
Lamp	Power	Φ × H	Weight
CL-80	80 W	290 × 175 mm	2.25 kg
CL-130	130 W	340 × 194 mm	3.2 kg
CL-170	170 W	400 × 206 mm	4.1 kg

For tall plants and climbers: racks are left out and full-spectrum lamps hang from the ceiling · IP65 · 108–305 V AC · beam 120° (60° option) · 25,000 h · CE.

Light on the shelf can be checked with the LUMA-SM1 handheld spectrometer light meter (PRO8344): spectrum, illuminance and colour data, 380–780 nm.

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Construction, Climate System and Shelf Options



Room construction · polyurethane insulated panels, vertical laminar air-flow wall, SUS 304 shelves with LED panels, control panel at the door

Shelves per rack

Shelves per rack	Growth height	RAKAPOSHI-WR12	RAKAPOSHI-WR17	Status
2 shelves	95 cm	5.76 m²	8.64 m²	Option
3 shelves	60 cm	8.64 m²	12.96 m²	Option
4 shelves	43 cm	11.52 m²	17.28 m²	Standard
5 shelves	32 cm	14.40 m²	21.60 m²	Option

Fewer shelves give more height for taller plants; more shelves give more area for seedlings and trays.

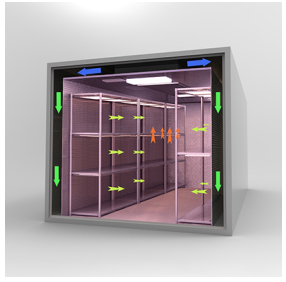
Climate system

Uniformity by design: mesh air-flow walls on both sides, return-air filter strip along the top.

Space: cooling, heating, humidifying and dehumidifying units in the ceiling cavity — the whole floor is for racks and aisle.

Energy: heat-recovery refrigeration with variable-frequency control and heat-pump heating, without electric heaters or a separate dehumidifier; water cooling where the site allows.

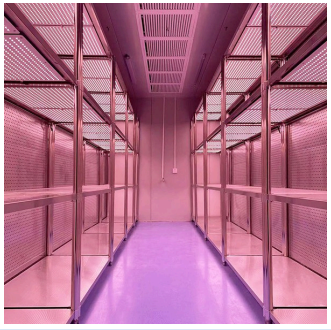
Options: low-temperature module to −10 °C, low-humidity module, CO_2 control, one or two cameras, smart access lock (card, fingerprint, Wi-Fi), independent data loggers.



Air flow · supply through the side walls, return on top



10" touch screen · status, temperature, humidity, light, fresh air, graph, alarm



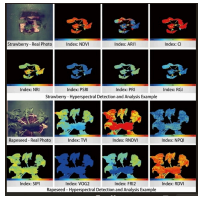
Room before loading · stainless steel racks with LED panels on both sides of the aisle

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Options Catalogue

Option	What it gives	Status
CLIMATE		
Low-temperature module 5–35 °C	Cool-season crops and night temperatures below 18 °C	Option
Low-temperature module −10–35 °C	Operation near 0 °C, cold and frost-stress tests, with defrosting	Option
Low-humidity module 40–90 % RH	Drier conditions; 30–90 % RH on request	Option
Water-cooled refrigeration with heat recovery	Less heat released into the building; uses site cooling water	On request
Second refrigeration circuit	Redundancy for long, uninterrupted experiments	On request
LIGHTING		
White 700 · 1000 · 1200 · 1600 µmol/m²·s	Light-demanding crops and high-light studies	Option
Coloured spectra	Single colour, 3, 4, 7 (with UV) or 18 colours — page 4	Option
Separate light programs per rack or shelf	Different light treatments in one room	On request
Tall-plant configuration	No racks; 80, 130 or 170 W full-spectrum lamps hung from the ceiling — page 4	On request
LUMA-SM1 spectrometer light meter · PRO8344	Checks spectrum and illuminance on each shelf	Option
ATMOSPHERE		
CO_2 control module	Ambient to 2000 ppm; 5000 ppm on request	Option
CO_2 / O_2 safety alarm with gas shut-off	Personnel safety when CO_2 is used; installed by COLO	COLO
Filtered and conditioned fresh air	Defined fresh-air rate, pre-treated before entering the room	On request
MONITORING AND DATA		
Video monitoring	One or two cameras, view in the app	Option
Independent data loggers	Temperature, humidity, light (PAR/DLI) and CO_2 for records and audits	COLO
Remote alarms and building connection	SMS / e-mail alarms; Modbus / RS485 link to building management	On request
UPS for controller and alarms	Keeps control and alarms running during short power cuts	COLO

Option	What it gives	Status
ACCESS AND SAFETY		
Smart access lock	RFID card, fingerprint or Wi-Fi / app, with access log	COLO
Inside door release and alarm button	Safe exit and call for help from inside the room	On request
RACKS AND CONSTRUCTION		
2, 3 or 5 shelves per rack	Growth height 95 / 60 / 32 cm — page 5	Option
Hydroponic racks	Nutrient-solution circulation, filtration per level, adjustable water level	Option
Corrosion-resistant finish, IP-rated sockets, anti-slip floor	Humid or saline environments, wet working	On request
Other room sizes and layouts	Adapted to the available space and door positions	On request
RESEARCH UPGRADES		
Rail-type phenotyping on the racks	Automatic scanning and imaging of plants on schedule	On request
Hyperspectral imaging and analysis	400–1000 nm, vegetation indices (NDVI, PRI, PSRI …), PDF report	On request
Chlorophyll fluorescence imaging	Photosynthetic efficiency and stress, non-destructive	On request
Portable phenotyping imager	RGB morphology and optional thermal imaging, in the room or field	On request
COLO.SCIENCE SERVICES		
Site check, layout, installation, commissioning, training	Included in the Basic version	Included
IQ / OQ qualification and climate mapping	Documented performance with calibrated loggers	COLO
Service contract and extended warranty	Preventive maintenance, priority service in Slovenia	COLO
Removal of an existing room	Dismantling and disposal before installation	On request

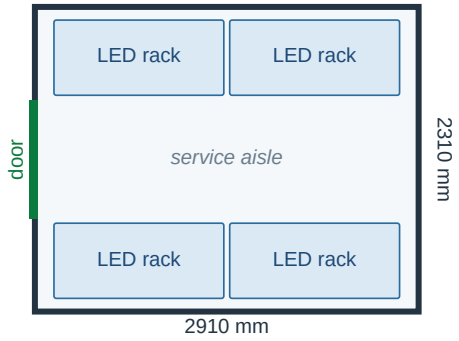


Hyperspectral analysis · vegetation index maps of strawberry and rapeseed

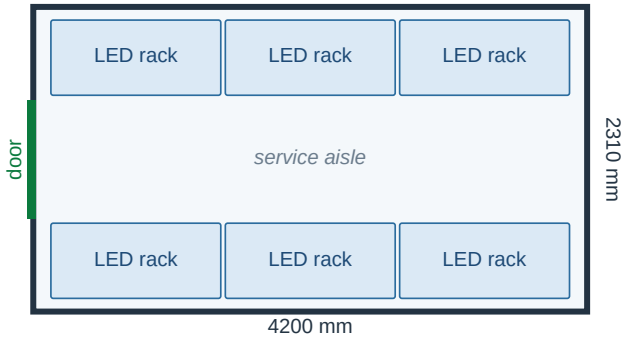
Option — available from the series, price in the quotation · **On request** — designed for the project after the site check · **COLO** — supplied, installed or performed by COLO.Science · **Included** — part of the Basic version.

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Room Layout, Site Requirements and Ordering



RAKAPOSHI-WR12 · 4 racks along the long walls, central aisle · 2310 × 2910 mm



RAKAPOSHI-WR17 · 6 racks along the long walls, central aisle · 2310 × 4200 mm

Schematic top view, indicative only. Door side, rack arrangement and room size can be adapted to the site; the layout drawing is part of the quotation.

Site requirements

Site requirement	Confirmed in the quotation
Power supply	Voltage, phases, frequency, installed and typical power
Main fuse / circuit breaker	Rating of the supply line and protection at the room's control panel
Cooling	Air- or water-cooled; position of the condensing unit; cooling water flow and temperature
Water and drain	Water quality for humidification (deionised), supply and drain connection
Communication · internet	Network connection for the app (LAN or Wi-Fi), interfaces to building systems
Gas supply	CO_2 cylinder or line, pressure regulator, O_2 / CO_2 safety alarm
Room	Clear height above 3000 mm, floor load, access for modules, ambient temperature

Ordering information

Item	SKU	Basic version
RAKAPOSHI-WR12	PRO8331	4 × 4 shelves · 11.52 m² · white LED · 18–35 °C · 50–90 % RH
RAKAPOSHI-WR17	PRO8332	6 × 4 shelves · 17.28 m² · white LED · 18–35 °C · 50–90 % RH
Options	at order	pages 3–6 · other room sizes on request

SUPPLIER AND SUPPORT

COLO Lab Experts · Polje ob Sotli 4, SI-3255, Slovenia

Site check, layout, installation, commissioning, training and service by COLO.Science · sales@colo.si · +386 70 713 437 · colo.si

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