

Soil Plant Atmosphere Research Facility Controlled  
Environment Sunlit Plant Growth Chambers  
Day-Lit Plant Growth Chambers  
A TOOL FOR PLANT RESEARCH AND MODELING



# Environment Sunlight Plant Growth Chambers

## Product Overview/Applications

The SPAR units are located outdoors on a concrete pad. Each unit has the capability for controlling air temperatures, and atmospheric composition especially CO<sub>2</sub> concentration at predetermined set points for studies of plant growth in natural solar radiation regimes. The bottom third of each SPAR unit consists of a steel bin to contain rooting medium. The upper two thirds is an airtight Plexiglas chamber

A door in the bottom of the aerial portion of each chamber is hinged for access to the soil surface and the aboveground portions of the plants. Ducts on the northern face connect to the cooling system. Conditioned air is introduced at the top of the Plexiglas chamber, flows down through the plant canopy, and is returned to ducts just above the soil surface. A steel soil lysimeter contains the rooting medium

The SPAR units provide a natural solar radiation environment (94% transmissive to photosynthetically active radiation) and have capabilities for controlling both the aerial and soil environment across a wide range of environmental set points. Controlled factors in each chamber include atmospheric carbon dioxide concentration ([CO<sub>2</sub>]), dry-bulb air temperature, and dew point temperature. The environmental control system can be programmed to provide continuously

### Airflow

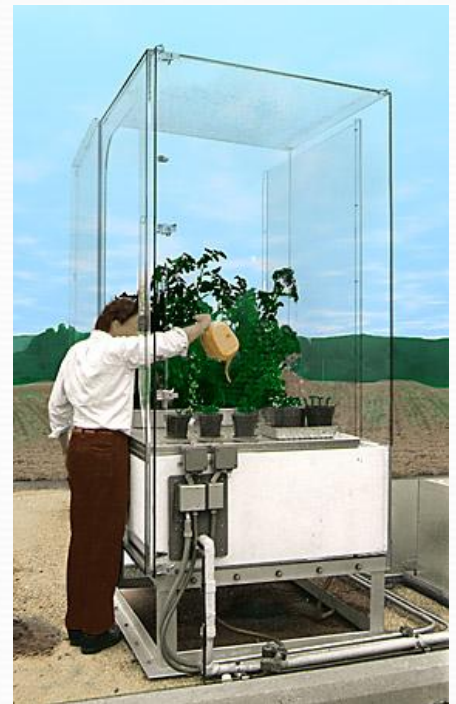
The airflow design directs air downward along the center aisle way. Air is then redirected returning upward between the plants and through the lamp canopies. Filtered and adjustable fresh air intake enables researchers to exchange air to the chamber in a controlled manner.

### Refrigeration

Cooling for the GR series is provided by a self-contained water-cooled condensing unit with hot gas bypass for continuous compressor operation. An electronic modulating valve provides tight temperature control while ensuring quiet operation. Pressure transducers are included for monitoring the status of the refrigeration system. Alternative refrigeration methods are available depending on site-specific and/or user defined requirements. Consult the factory for heat rejection information and other refrigeration options.

### Experiment Protection

User programmable “set and forget” alarms track the chamber’s operation versus user-defined set points. This allows for exceptionally accurate monitoring without the need for adjustment every time the set point is redefined. Backup “high/ low” alarms provide a further level of protection while visual and audible notification is provided when any alarm is activated. Contacts for connection to a building management system are also included.



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## Performance Data

	Temperature Range (°C)	Interior Capacity	Growth Area	Growth Height	Exterior Dimensions (WxDxH)
SPMGR48	5°C to + 35°C or as per customer requirement	320 ft <sup>3</sup>	48 ft <sup>2</sup>	80"	116" x 116" x 102.25"
	5°C to + 35°C or as per customer requirement	9130 L	4.5 m <sup>2</sup>	2030 mm	2950 x 2950 x 2600 (mm)
SPMGR64	5°C to + 35°C or as per customer requirement	420 ft <sup>3</sup>	64 ft <sup>2</sup>	80"	139" x 116" x 102.25"
	5°C to + 35°C or as per customer requirement	11900 L	5.9 m <sup>2</sup>	2030 mm	3530 x 2950 x 2600 (mm)
SPMGR96	5°C to + 35°C or as per customer requirement	640ft <sup>3</sup>	96ft <sup>2</sup>	80"	116" x 208" x 102.25"
	5°C to + 35°C or as per customer requirement	(17900L)	(8.9m <sup>2</sup> )	2030 mm	2950 x 5285 x 2600 (mm)
SPMGR128	5°C to + 35°C or as per customer requirement	850ft <sup>3</sup>	128ft <sup>2</sup>	80"	139" x 208" x 102.25"
	5°C to + 35°C or as per customer requirement	(23960L)	(11.9m <sup>2</sup> )	2030 mm	3530 x 5285 x 2600 (mm) SP
SPMGR144	5°C to + 35°C or as per customer requirement	960ft <sup>3</sup>	144ft <sup>2</sup>	80"	116" x 300" x 102.25"
	5°C to + 35°C or as per customer requirement	(26800L)	(13.4m <sup>2</sup> )	2030 mm	2950 x 7620 x 2600 (mm)(mm)
SPMGR192	5°C to + 35°C or as per customer requirement	1280ft <sup>3</sup>	192ft <sup>2</sup>	80"	139" x 300" x 102.25"
	5°C to + 35°C or as per customer requirement	(36000L)	(17.9m <sup>2</sup> )	2030 mm	3530 x 7620 x 2600 (mm)(mm)