

ELECTRIC INFRARED HEATERS



SUPERIOR
RADIANT PRODUCTS



SERIES mWAVE™



WARNING

The manufacturer's instructions, the layout drawing, national and local codes and ordinances, and all applicable standards which apply to electrical wiring comprise the basic information needed to complete the installation. These criteria must be thoroughly understood before proceeding.

Only personnel who have been trained and understand all applicable codes should undertake the installation. Manufacturer representatives are Factory Certified in the service and application of this equipment and can be called on for helpful suggestions about installation.

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Introduction

Superior Radiant Products is a leader in the infrared heating industry, built on more than 30 years of engineering excellence and commitment to the contractors, architects, and building owners who depend on its products every day. That commitment to quality extends from commercial and industrial applications to the residential and light commercial market through the mWave Series.

The mWave electric infrared heater is the direct result of listening to architects, designers, and installers who needed a high-performance radiant heater sized for residential and light commercial applications — ceiling heights of 8 to 14 feet, single-phase power, and installations where aesthetics, quiet operation, and simple controls matter as much as heat output.

Unlike forced-air systems that heat air, the mWave heats people and surfaces directly through radiant infrared energy. This means no drafts, no duct noise, no recirculated dust, and no waiting for air temperature to stabilize. Heat is perceived within seconds of the heater energizing — making the mWave ideal for spaces that are occupied intermittently or that lose heat quickly through open doors or high glazing.

This Application Design Guide is intended to give architects, mechanical engineers, electrical designers, and electrical contractors the complete information needed to specify, size, and layout a mWave installation with confidence. It covers product description, sizing methodology, worked examples, electrical requirements, and controls.

Applicable Codes and Standards

Installation of this heater shall be in accordance with local codes, or in the absence of local codes, the National Electrical Code, NFPA 70, or the Canadian Electrical Code, Part 1, C22.1.

The mWave heater is designed and manufactured for residential and light commercial heating applications for indoor and outdoor use, according to the Standard for Fixed and Location-Dedicated Electric Room Heaters, UL 2021, and the Canadian Standard for Electric Air Heaters, CSA C22.2 No. 46.

NOTE: Consult your authority having jurisdiction (AHJ) for any additional local requirements before specifying or installing this product.

Product Description

The mWave is a high-efficiency electric radiant infrared heater — a stationary, ceiling and wall mounted heating solution designed for indoor and outdoor residential and light commercial environments where targeted, comfortable heat delivery is required without ductwork, combustion, or fan noise.

The heater generates heat through a particular carbon filament element housed within a quartz tube filled with inert gases. This element emits medium-wave infrared energy directed downward by a precision-shaped reflector assembly toward the occupied zone — the floor area and people within the heater's field of coverage. 90% of the electrical input is converted to radiant energy directed at the floor, with 10% released as convective heat in the upper air volume.

The mWave is available in four output ratings — 1.5 kW, 2.5 kW, 3.6 kW, and 5.0 kW — covering installation heights from 8 feet to 14 feet. The heater operates on standard single-phase residential supply voltage and mounts from the ceiling in either horizontal or angled orientations. Its slim, low-profile housing is designed to fit architecturally into finished residential and commercial spaces.

Heaters are available with either integrated SMART controls or equipped with a junction box to be controlled externally. SMART models have incorporated Wi-Fi connectivity and remote-control operation and provide multiple output levels and an adjustable timer to optimize occupant comfort, energy use, and heating element life.

The heater design provides installation flexibility, allowing walls, ceiling, or chain-suspended mounting using manufacturer-supplied hardware.

Technical Specifications

Model No.	Power (W)	Voltage (V~)	Amps (A)	LAMP qty	Dimensions (L x W x H) inches	Weight (lbs)
Integrated controls						
MW15M12V	1500	120	12.5	1	37.8 x 8.15 x 3.8	12.5
MW25M20V	2500	208	12	1		
MW25M24V	2500	240	10.4	1		
MW36M20V	3600	208	17.3	2	66.5 x 8.15 x 3.8	20.1
MW36M24V	3600	240	15	2		
MW50M20V	5000	208	24	2		
MW50M24V	5000	240	20.8	2		
Without integrated controls						
MW25M20	2500	208	12	1	33.7 x 8.15 x 3.8	10.7
MW25M24	2500	240	10.4	1		
MW36M20	3600	208	17.3	2	62.2 x 8.15 x 3.8	18.3
MW36M24	3600	240	15	2		
MW50M20	5000	208	24	2		
MW50M24	5000	240	20.8	2		



NOTE: Confirm model-specific electrical ratings on the product nameplate. Amperage shown is at rated output. Circuit sizing must use 125% of rated amperage per NEC/CEC continuous-load rules.

Key features & customer benefits

Instant Comfort — Fast Response. Radiant heat is perceived within seconds of the heater energizing. The mWave delivers immediate comfort — making it highly effective for intermittently occupied spaces such as garages, workshops, and covered patios where long warm-up times are unacceptable.

Design-Friendly Profile. The heater's slim ceiling-mount form factor and neutral finish integrate into finished residential and light commercial interiors without the visual intrusion. Architects and interior designers can mount units parallel to ceiling planes or at angles to direct heat toward seating areas or entry zones.

Zone Control — Heat Only What You Use. mWave heaters with integrated SMART controls can be independently controlled or models without integrated controls will use a standard thermostat or occupancy sensor through a relay. Multi-heater installations can be divided into zones, allowing occupants to heat only the rooms or areas in use.

Simple Installation — Single-Phase Power. The mWave operates on standard single-phase electrical supply (120V or 240V depending on model). There is no three-phase requirement, and no factory-trained commissioning. Qualified electricians familiar with residential wiring can complete a typical installation in a fraction of the time required for a gas heating system retrofit.

Built-In Smart Controls — Remote & Wi-Fi App (SMART Models). SMART model mWave heaters (V-suffix) include a factory-integrated Wi-Fi module and a handheld remote controller as standard equipment. No additional smart controller, hub, or external panel is required. The included remote provides five power levels (33% to 100%) and a 0–9 hour countdown timer from anywhere in the space. The Tuya platform app (TuyaSmart or Smart Life, available for iOS and Android) enables full control from any location — turn the heater on before arriving, set a schedule, or monitor operation remotely. Both the remote and the app work interchangeably with the same heater.

Typical applications

Use this table to match the building type and heating need to the appropriate mWave model and strategy.

Application	Typical Install Height	Recommended Model	Key Selling Points
Residential garage	8–10 ft	1.5–2.5 kW	Spot heat at workbench or parking area; fast warm-up; no combustion in sealed garage
Covered patio / outdoor living area	8–10 ft	2.5–3.6 kW	Radiant output not displaced by wind; extends outdoor season; no ductwork required
Workshop / hobby room / studio	9–12 ft	2.5–3.6 kW	Task-area spot heat; occupancy-sensor controlled; no dust recirculation
Retail boutique / showroom / salon	10–12 ft	3.6–5.0 kW	Silent operation; no ductwork visible; zone control by display area or treatment room
Place of worship / assembly hall	12–14 ft	5.0 kW	High-ceiling coverage; quiet operation during services; fast warm-up for intermittent use
Restaurant patio / hospitality space	8–10 ft	2.5–3.6 kW	Effective in open or semi-open environments; no flame risk near seating

Design parameters

Radiant Intensity: The rate of radiant heat delivered to the floor, expressed in Btu/h·ft² (W/m²). This value represents the thermal energy received by surfaces within the heater's coverage zone.

Coverage Area: The floor area beneath the heater in which the radiant intensity meets or exceeds the minimum threshold of 10 Btu/h·ft² (30 W/m²).

Installation Height: The vertical distance between the heater and the finished floor surface. This dimension directly affects radiant intensity and coverage performance.

Average Radiant Intensity: Radiant intensity is not uniform across the coverage area. It is highest directly beneath the heater and decreases with horizontal distance.

Dependence on Installation Height: Radiant intensity varies with mounting height. Higher installation heights produce lower-intensity coverage, while lower mounting heights produce higher-intensity coverage.

Heater Staging: These heaters may operate in multiple power levels. The radiant intensity delivered at a given installation height depends on the active operating stage, with lower power level producing reduced radiant output in proportion to input power.

Peak Radiant Intensity: The maximum radiant intensity at any single point within the coverage area, occurring directly beneath the centre of the heater at floor level. It is always higher than the average intensity for the same installation height and output stage.

Heat Load: The rate of heat energy required to maintain a defined indoor design temperature under worst-case outdoor conditions, expressed in Btu/h·ft² (W/m²) of floor area. The heat load is the primary input to heater selection and quantity calculations. It is determined by building construction, insulation levels, infiltration rate, and design outdoor temperature, and should be calculated using the SRP Heat Calculator (srpheat.com) for final design.

Occupied Zone: The portion of the floor area where people are regularly present and for which radiant comfort is the design objective. In space heating applications, the occupied zone is typically the full conditioned floor area. Heater layout should concentrate coverage on the occupied zone rather than on the total floor area of the building.

Radiant Efficiency: The fraction of total electrical input power that is converted to and emitted as infrared radiation directed toward the floor, expressed as a percentage. The mWave achieves a radiant efficiency of 90%, as tested in accordance with AHRI Standard 1330.

Spot Heating: A heating strategy in which one or more heaters are sized and positioned to provide radiant comfort to a specific, defined occupancy zone — such as a workbench, seating area, or entry zone — without conditioning the surrounding space. Spot heating relies on radiant intensity at the point of occupancy rather than raising the ambient air temperature of the building.

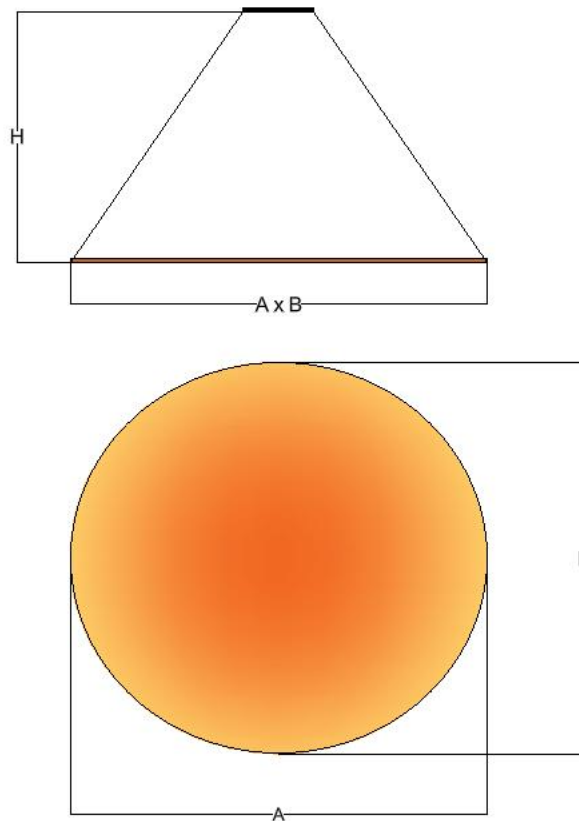
Space Heating: A heating strategy in which heaters are distributed across the full floor area of a conditioned space to maintain a uniform minimum radiant intensity and ambient air temperature throughout. Space heating requires calculating total floor area, applying an overlap factor to achieve the design heat load, and laying out heaters for even coverage with deliberate perimeter reinforcement.

Recommended installation heights

The following table shows the recommended installation height ranges for each mWave model.

Model	8	9	10	11	12	13	14
	Installation height (ft)						
1.5 kW	8						
2.5 kW	8 - 10						
3.6 kW		9 - 13					
5.0 kW			10 - 14				

Model	2.4	2.7	3.0	3.4	3.7	4.0	4.3
	Installation height (m)						
1.5 kW	2.4						
2.5 kW	2.4 – 3.0						
3.6 kW		2.7 – 4.0					
5.0 kW			3.0 – 4.3				



Installation heights and coverage ranges



Note: Heaters may be installed at heights higher than these recommendations. Refer to the layout to ensure the heat is not directed outside the intended heating space.

Coverage area and distance between heaters

By knowing the installation height, you can estimate the spacing required between the heaters to maintain an adequate comfort zone in the space (maintain adequate radiant intensity pattern).

Coverage Area - A (ft) x B (ft)

	Installation height (ft)						
Model	8	9	10	11	12	13	14
1.5 kW	15 x 13						
2.5 kW	17 x 16	18 x 16	18 x 17				
3.6 kW		19 x 18	20 x 19	21 x 20	22 x 21	22 x 22	
5.0 kW			24 x 22	25 x 23	25 x 24	26 x 25	27 x 26

	Installation height (m)						
Model	2.4	2.7	3.0	3.4	3.7	4.0	4.3
1.5 kW	4.5 x 4						
2.5 kW	5 x 5	5.5 x 5	5.5 x 5				
3.6 kW		6 x 5.5	6 x 6	6.5 x 6	6.5 x 6	6.5 x 6.5	
5.0 kW			7.5 x 6.5	7.5 x 7	7.5 x 7	7.5 x 7.5	8 x 8

Heater selection procedure (Spot heating)

Use this procedure when the goal is to provide radiant comfort in a specific, defined area — a seating group, workbench, patio dining area, or entry zone — without conditioning the full space.

Step 1 — Define the Target Zone

Identify the specific area requiring radiant comfort. Record its dimensions (length × width) and calculate the zone floor area. Note that the goal is occupant comfort within the zone, not air temperature in the surrounding space.

Step 2 — Identify Installation Height

Record the clear height from the finished floor to the lowest obstruction directly above the target zone. Use this to determine the compatible model from the installation height table.

Step 3 — Select Heater Model and Stage

Choose the model whose single-unit coverage area at the installation height is equal to or slightly larger than the target zone area. For small zones or low ceilings, a smaller model is preferable to avoid excessive peak intensity directly below the heater.

Step 4 — Calculate Unit Count

Divide the total target zone area by the single-heater coverage area and round up. For spot heating, the result is typically one unit per discrete occupancy location.

Step 5 — Consider Aiming Angle

If the heater cannot be mounted directly above the target zone, or if the zone is offset toward a wall, consider angling the heater toward the occupancy area.

Step 6 — Control Strategy

For spot heating, wire to an occupancy sensor or thermostat to enable automatic on/off when the zone is unoccupied. This is the primary energy-efficiency lever in spot heating — unlike space heating, there is no overlap factor to optimize; control strategy drives the energy outcome.

Example — Covered Patio Dining Area (9 ft Ceiling)

Step	Description	Result
Target Zone	Covered patio dining area, 10 ft × 12 ft. Partially open to outdoors; moderate wind exposure. Shoulder-season outdoor use (ambient ~40°F / 4°C).	Zone area: 120 ft ²
Installation Height	Ceiling of covered structure: 9 ft.	9 ft
Select Model	At 9 ft, the 2.5 kW model is appropriate. Single-heater coverage at 9 ft exceeds the 120 ft ² zone area.	2.5 kW
Unit Count	120 ft ² zone, 16 ft × 18 ft coverage → 1 heater.	1 heater
Aiming Angle	Mount at tilted angle toward the open edge of the patio to concentrate heat on occupants near the exposure.	1 × 2.5 kW or 3.6 kW
Controls	Wire to a wall switch with timer for guest-activated control. No thermostat needed for patio application.	Timer switch

Electrical service & circuit sizing

Each mWave heater requires a dedicated single-phase branch circuit. Per the National Electrical Code (NEC) and Canadian Electrical Code (CEC), heaters are treated as continuous loads. Branch circuit overcurrent protection and conductor ampacity must be rated at a minimum of 125% of the heater's rated amperage.



CAUTION: The 25% multiplier above applies to the total connected load treated as continuous. If the panel also serves other continuous loads (lighting, ventilation, etc.), those must be included in the panel sizing calculation. Coordinate with the project electrical engineer of record.

Controls

1. SMART model – Single heater

The mWave SMART models (model numbers with a 'V' suffix, e.g. MW25M24V) include factory-integrated Wi-Fi and a handheld remote controller as standard equipment. These models offer three control methods that can be used independently or together:

Control Method	Description	Best For
Handheld Remote Control	Included with SMART models. IR remote with ON/OFF, power level (L1–L5), and timer (0–9 hours). Range: up to 5 m, must point at receiver.	Day-to-day operation; garages, patios, workshops
Tuya Wi-Fi App (TuyaSmart / Smart Life)	Smartphone app control over 2.4 GHz Wi-Fi. Full power level and timer control from anywhere. iOS and Android compatible.	Remote operation; scheduling; multi-heater management from one app



NOTE: Models (without the V suffix) do not include Wi-Fi or a remote controller. They are controlled by a hardwired line-voltage thermostat or switch only. Specify SMART (V) models to enable remote and app control.

2. Model without integrated controls – Single heater

For single-heater installations, the mWave connects directly to a standard line-voltage thermostat rated for the heater's supply voltage and amperage. No external relays or control panels are required.

Application	Recommended Control	Notes
Residential garage (1–2 heaters)	Line-voltage thermostat, 240V rated	Mount on interior wall, 5 ft above floor. Not on exterior wall or near door.
Sunroom / workshop (1–2 heaters)	Programmable line-voltage thermostat	Enables setback during unoccupied periods. Fastest energy-savings lever.
Covered patio / outdoor area	Manual wall switch with 30-min countdown timer	No thermostat needed. Guest-activated.
Entryway / mudroom	Occupancy sensor (line-voltage capable)	Automatic on/off based on presence. Eliminates wasted energy.

3. Multi-Heater Zone Wiring

When multiple heaters serve the same area, they can be wired in parallel to a single thermostat, provided the thermostat contact rating is not exceeded. As a general rule:

- Limit each thermostat to a maximum load of 30A at the supply voltage (confirm against the thermostat's rated ampacity).
- For zones exceeding the thermostat contact rating, use a relay or contactor rated for the total heater load, controlled by the thermostat's low-current signal.
- Separate heaters serving different rooms or areas into independent zones, each with its own thermostat or sensor.
- Do not mix heaters serving permanently occupied spaces (space heating) with heaters serving intermittently used areas (spot heating) on the same thermostat — they require different control strategies.

4. Smart Thermostat Compatibility

The mWave is compatible with most 240V line-voltage smart thermostats, and equivalent brands designed for electric baseboard and radiant heater circuits. These thermostats provide:

- Remote setpoint adjustment via smartphone app
- Scheduling and occupancy-based setback
- Energy monitoring and usage reporting
- Integration with smart home platforms (Google Home, Amazon Alexa, Apple HomeKit — confirm per thermostat model)



CAUTION — Never use a low-voltage (24V) smart thermostat designed for forced-air HVAC systems with the mWave heater. The mWave requires a line-voltage (120V or 240V) thermostat rated for electric resistance heating. Using a low-voltage thermostat will damage both the thermostat and the heater circuit.

5. Thermostat Placement

- Mount the thermostat on an interior wall at 5 ft (1.5 m) above the finished floor.
- Never mount within the direct radiant field of a mWave heater — the heater will short-cycle as the thermostat reads falsely elevated temperatures.
- Do not mount on exterior walls, near doors, or in the path of cold drafts — the thermostat will call for heat excessively.
- In garages with direct overhead doors, mount the thermostat on the interior side wall, away from the door opening.

6. Setback Strategy by Application

Application	Recommended Strategy	Rationale
Residential garage — active use	Full output, thermostat-controlled at 55°F (13°C)	Maintain working temperature when occupied
Residential garage — unoccupied (nights)	Set back to 40°F (4°C) or off (mild climates)	Short recovery time at occupancy start; radiant comfort in minutes
Sunroom — occupied	Thermostat at comfort setpoint (68–72°F)	Supplement main HVAC; zone independently
Covered patio — variable occupancy	Timer switch or occupancy sensor — full off when unoccupied	No air mass to protect; radiant comfort recovered in seconds on entry
Workshop / studio — scheduled use	Programmable thermostat with pre-heat schedule	Pre-heat 20 min before scheduled use; full setback between sessions

Why mWave — Value Compared to Alternatives

mWave vs. Electric Baseboard Heaters

	Electric Baseboard Heater	mWave Electric Radiant
Heating method	Convective — heats air, which rises and stratifies	Radiant — heats people and surfaces directly
Draft sensitivity	Heated air displaced by open doors or windows	Radiant output unaffected by air movement
Noise	Silent	Silent
Wall space used	Requires perimeter wall clearance; limits furniture placement	Ceiling-mounted; no wall clearance required
Ceiling height range	Best for low ceilings (8–9 ft); inefficient above 10 ft	Designed for 8 – 14 ft ceiling heights
Control	Line-voltage thermostat per baseboard	Line-voltage thermostat per heater or zone
Best for	Bedrooms, standard residential rooms with low ceilings	Garages, sunrooms, studios, high-ceiling spaces

mWave vs. Ductless Mini-Split (Heat Pump)

	Ductless Mini-Split	mWave Electric Radiant
Heating method	Convective — delivers warm air via fan-coil	Radiant — heats people and surfaces directly
Draft sensitivity	Heated air displaced by open doors; comfort lost at threshold	Radiant output not displaced by air movement
Noise	Low-level fan noise; compressor noise outdoors	Silent
Installed cost	High — indoor head, outdoor compressor, refrigerant lines, electrical	Low — single circuit per heater; no outdoor equipment
Cold-climate performance	Heating capacity drops at extremely low temperatures (below -15°C)	Full rated output at all ambient temperatures
Best for	Whole-room conditioning where both heating and cooling are needed	Supplement heating, spot heat, or spaces where cooling is not required

The Case for Using Both Ductless Mini-Split (Heat Pump) and mWave

A ductless mini-split heat pump is an excellent primary heating system for residential spaces -- it delivers seasonal heating efficiently at a low cost per BTU, and doubles as a cooling system in summer. In most homes, it handles the bulk of the heating load well.

Where mini-splits fall short is in delivering the immediate, localized comfort that occupants feel on a cold day when sitting still. A mini-split heats the air, and that warm air rises -- so the system must raise the temperature of the entire air volume before occupants at floor level feel it. In cold weather, or in rooms with high ceilings and large glazed surfaces, this can mean a room that is technically at setpoint but still feels drafty and cold at seating level.

A single well-positioned 2.5 kW mWave over the seating area solves this directly. Radiant energy from the heater reaches occupants and surfaces instantly -- warming people the way sunlight does, independent of air temperature. The result is a more natural and comfortable thermal environment: the mini-split manages the ambient air efficiently, while the mWave delivers the perceived warmth at the level where people actually sit.

NOTE: In a heated space with a mini-split as the primary system, a single 2.5 kW mWave SMART model positioned above the primary seating group gives occupants on-demand radiant comfort during the coldest weather -- controlled independently by remote or app, without affecting the mini-split thermostat setting or adding significant electrical load to the home.

Disclaimer

The information in this document is provided for educational and information purposes only.

Thermal comfort represents that condition of mind which expresses satisfaction with the surrounding thermal environment and is assessed by subjective evaluation. Thermal comfort is affected by heat conduction, convection, radiation, evaporative heat loss, and relative air motion.

The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents.

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