

NOBO*'Comfort you deserve'*

Made in Norway
Since 1947

INFORMATION KIT & SIZING CHART

'E' Series

Slimline Radiant Panel Heaters

Model E4E with manual electronic thermostat

Model E4EU with multi-programmable digital timer

FEATURES AND BENEFITS

- *Full Range of 6 Models in sizes from 500 WATT to 2000 WATT, all with or without timers*
- *Slim and stylish design*
- *Economical*
- *Safe*
- *Clean*
- *Efficient*
- *Healthy*
- *Completely silent*
- *Automatic safety cut out*
- *Accurate temperature control with electronic thermostat*
- *Blends unobtrusively into any decor*
- *Ideal for sufferers of asthma, hay fever and allergies*
- *Combined radiant and convection heat provides efficient, gentle and even warmth*
- *Manufactured in Norway since 1947*
- *Optional legs with castors available for portability*
- *Full 7 YEAR warranty covering all parts and labour plus a 10 YEAR warranty on the heating element*



**10 YEAR
ELEMENT WARRANTY
7 YEAR
PARTS & LABOUR**

WHY BUY NOBO SLIMLINE RADIANT PANEL HEATERS INSTEAD OF OTHER PANEL HEATERS?

- Attractive, modern, clean face
- Slimline – only 50mm thick
- Power point can be out of sight behind heater
- Cheap to run - independent running costs documented and available
- Large panel surface area equals greater radiant heat, and more comfort
- Safer, low surface temperature on the panel front
- No front grill and can be located close to or behind furniture

NOBO E4EU With Timer

- Fully programmable 24 hour/7 day digital timer.
- Power failure memory back up of 150 hours with continuously charging internal battery.



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www.nobo.com.au / www.nobo.co.nz

WHY DO NOBO SLIMLINE RADIANT PANEL HEATERS WORK SO WELL?

Nobo slimline radiant panel heaters work so well because they are actually a combination radiant and convection panel heater. The radiant component emits comfortable, "soft", and efficient long term heat, whilst the convection component provides an instant and quick start-up.

The clever and proven design of NOBO is what sets them apart from other panel heaters, and enables them to be used in circumstances and locations where convection panels are not as effective, efficient or practical.

For radiant heat it is necessary to have as much surface area as possible, hence the NOBO panel is approximately twice the length of convection panels with the same wattage output. The trade-off with NOBO is that they are much slimmer, better looking and modern, with a clean face and can be mounted behind low furniture (such as sofas). It is not essential to install them centrally within a room to be effective.

Radiant heat is regarded by all experts as the superior form of heat.

The convection component of NOBO is so gentle, you virtually have to be "on top of the heater" to feel it! Convecting from the top through the angled louvres allows the panel to be located behind low furniture without impeding its performance. This also means that underneath windows is an ideal location to provide an upward air "blanket".

Nobo slimline radiant panel heaters are ideally suited for rooms which require intermittent heating, quick warm up, and accurate temperature control.

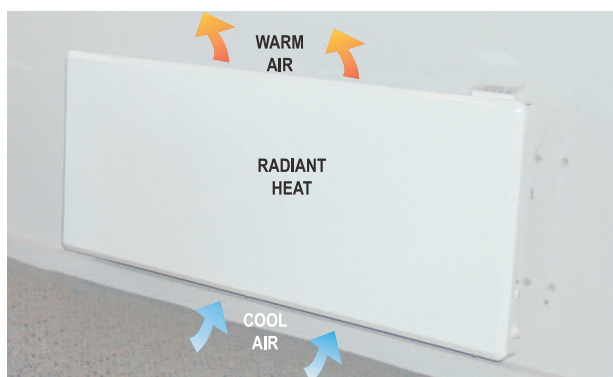
WHY ELECTRIC HEATING?

Electric heating offers levels of versatility, safety, reliability, cleanliness and comfort unmatched by other heating fuels. Combined with low installation costs and surprisingly economical running costs, NOBO slimline radiant panel heating offers exceptional value for money.

ROOM ZONING

The most efficient, economical and comfortable way to heat is on a room by room basis - only panel heating can provide independent zoning for every room or living area.

When choosing a heating system, most people put a lot of thought into how it will operate for today's needs, but little consideration is put into the long term use. As your family grows, the heating requirements for each room



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will change - both in terms of when heat is required and at what temperature.

Nobo slimline radiant panel heating is ideal for providing zoned heat to individual rooms and therefore accommodating any future changes. After all, shouldn't the heating system last the life-time of the house?

MIXED OR COMPLIMENTARY HEATING SYSTEMS

Nobo slimline radiant panel heating is often used to supplement or operate in conjunction with other heating methods or systems. Depending on the design of your house it may be desirable to mix different types of heating systems.

This may typically apply to an open living area with limited wall space. Why not install either a wood combustion heater, gas fire place or reverse cycle heating/air conditioning system, or even a basic gas ducted system for the living area only, complimented with NOBOS in each bedroom?

The result is an integrated, full zoned and flexible system.

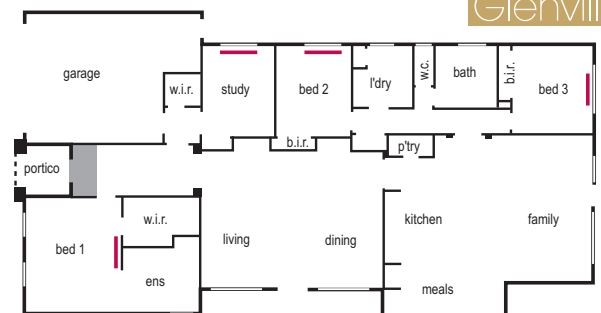
NOBO slimline radiant panel heating is also a very cost effective way to extend existing heating systems when refurbishing or extending.

Glenn Classique
by Glenvill
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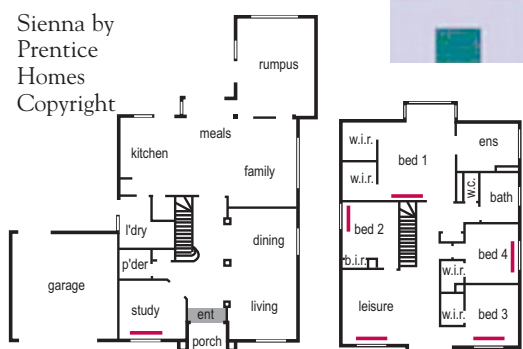
NOBO

Slimline Radiant Panel Heating
in study and bedrooms.



Reverse Cycle airconditioning
or basic Gas Ducted heating in
open living areas.

PRENTICE
HOMES



For a full list of approved NOBO dealers visit
www.nobo.com.au / www.nobo.co.nz

RADIANT HEAT OR CONVECTION HEAT - WHAT'S THE DIFFERENCE?

RADIANT HEAT

Just like the sun, radiant heat is multi-directional and works on the principle of warming surfaces and objects. All warm objects radiate heat to cooler objects or surfaces in the room, which then re-radiate the warmth. Surface temperatures rise above the air temperature, in turn warming the air as a secondary process. Objects have the ability to hold their heat for a period of time.

Radiant heat is universally regarded as a very efficient and healthy method of heating.

Its benefits include:

Efficiency: In a typical room, there are more surfaces and objects down low at people level. As these are warmed, the warmth is maintained at a lower level and for longer periods.

Healthy: Radiant heat does not create air movement, therefore dust and airborne particles are not distributed around the room.

Comfort: Without air movement, radiant heat assists your body to maintain your own body temperature. Typically 2 degrees celsius less is required with radiant heat as opposed to convection methods.

HEAT RISES - OR DOES IT?

Most people have heard the statement "heat rises". In reality, this is strictly not true! As explained above, it is actually hot air that rises. Think of the sun as producing radiant heat and the distance it "travels" to reach us here on earth - would we ever feel it if "heat rises"?

**DON'T BE FOOLED - ALL PANEL HEATERS ARE NOT THE SAME.
THERE IS ONLY ONE NOBO SLIMLINE RADIANT PANEL HEATER!**



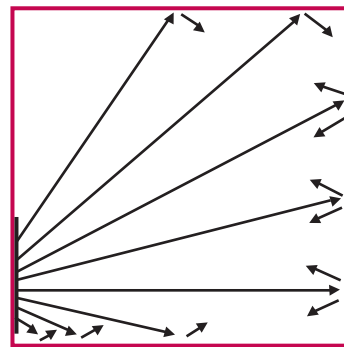
NOBO RADIANT PANEL

- ✓ Attractive, modern, clean face.
- ✓ Slimline - only 50mm thick.
- ✓ Power point can be behind heater.
- ✓ Can be installed behind low furniture.
- ✓ Safer low surface temperature.
- ✓ Economical radiant/convection combination.
- ✓ Independent running costs documented.
- ✓ Timer model available.

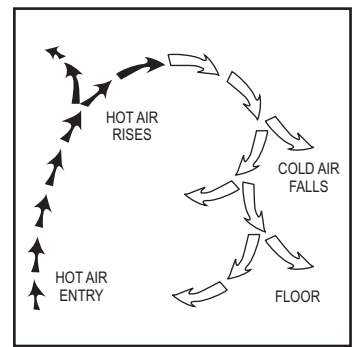
CONVECTION HEAT

Fan heaters and fan forced ducted heating systems are examples of convection heaters. Convection heat works by forcing warm air into a room. Warm air becomes lighter and rises to the ceiling, whilst denser, cooler air drops down lower at people level. The cold air must then be warmed again, requiring further energy input.

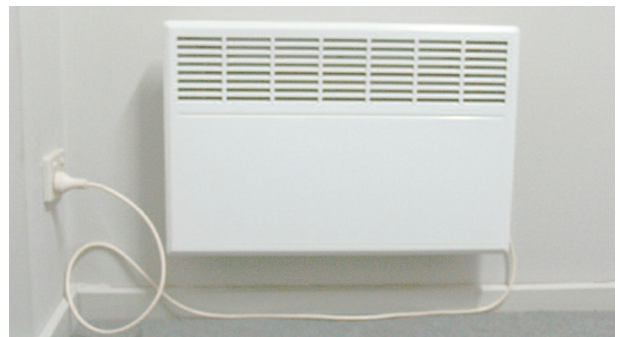
Typically there is a considerable temperature variation from floor to ceiling, the warmest air being high up near the ceiling.



Radiant Heating



Convective Heating



CONVECTION PANEL

- ✗ Obvious front grill.
- ✗ Thicker - 80mm or more.
- ✗ Power point must be adjacent.
- ✗ Must be clear of furniture.
- ✗ Hotter front grill.
- ✗ Higher running costs.
- ✗ Independent running costs not available.

SIZING CHART AND PANEL HEATER SELECTION

STANDARD BRICK VENEER CONSTRUCTION

Use the following chart to determine the correct heating wattage needed for a standard modern brick veneer construction built to Victorian minimum insulation standards, which includes:

- 2.5 rated ceiling insulation.
- 1.3 rated external wall insulation.
- Ceiling heights up to 3.0 metres.
- Thermostat temperature of 18-20 degrees celsius.
- Window drapes with insulation properties.

USE THIS SIZING TABLE TO DETERMINE THE WATTS REQUIRED FOR HEATING EACH ROOM OR AREA.

ROOM WIDTH X LENGTH	2.0 Metres	2.5 Metres	3.0 Metres	3.5 Metres	4.0 Metres	4.5 Metres	5.0 Metres	5.5 Metres	6.0 Metres	6.5 Metres	7.0 Metres	7.5 Metres	8.0 Metres
1.0 Metre	200	250	300	350	400	450	500	550	600	650	700	750	800
1.5	300	375	450	525	600	675	750	825	900	975	1050	1125	1200
2.0	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
2.5	500	625	750	875	1000	1125	1250	1375	1500	1625	1750	1875	2000
3.0	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400
3.5	700	875	1050	1225	1400	1575	1750	1925	2100	2275	2450	2625	2800
4.0	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
4.5	900	1125	1350	1575	1800	2025	2250	2475	2700	2925	3150	3375	3600
5.0	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750	4000
5.5	1100	1375	1650	1925	2200	2475	2750	3025	3300	3575	3850	4125	4400
6.0	1200	1500	1800	2100	2400	2700	3000	3300	3600	3900	4200	4500	4800
6.5	1300	1625	1950	2275	2600	2925	3250	3575	3900	4225	4550	4875	5200
7.0	1400	1750	2100	2450	2800	3150	3500	3850	4200	4550	4900	5250	5600
7.5	1500	1875	2250	2625	3000	3375	3750	4125	4500	4875	5250	5625	6000
8.0	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6400
8.5	1700	2125	2550	2975	3400	3825	4250	4675	5100	5525	5950	6375	6800
9.0	1800	2250	2700	3150	3600	4050	4500	4950	5400	5850	6300	6750	7200
9.5	1900	2375	2850	3325	3800	4275	4750	5225	5700	6175	6650	7125	7600
10.0	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000

IRREGULAR SHAPED ROOMS

Rooms which are irregular in shape can be sized by "squaring" them off to make 2 or more rectangles, and then from the chart above, add the required wattage for each rectangle together.

Example: "L" shaped room:

An "L" shaped room can be "squared off" to 2 rectangles.

One rectangle is 6.0 x 4.5 metres,
the second is 3.0 x 3.5 metres.

The total wattage needed is therefore
 $2700 + 1050 = 3750$ watts.

HALLWAYS & ENTRIES

Rooms which have another space, such as an entry or "hallway" without a door to isolate the room to be heated, must have both areas included in the calculations, otherwise heat will be lost into the hallway or entry.

Example:

A room 5.5 x 4.5 metres
with an adjoining Entry 3.5 x 1.0 metres.

The total wattage needed is therefore
 $2475 + 350 = 2825$ watts.

CALCULATING HEATING FOR BUILDINGS OTHER THAN BRICK VENEER

OR: OTHER FACTORS WHICH WILL EFFECT HEATING.

Buildings constructed of material other than brick veneer eg: solid brick, weatherboard, require more heat input. To calculate the extra heat required, the following "Correction Factors" must be applied. This is done by starting with the sizing chart for brick veneer above, taking that wattage required, and then adding the correction factor(s) from the following table.

Similarly, other factors such as poor insulation, large window areas, high ceilings, basements, etc. all require extra heat. The following correction factors must also be applied in these circumstances.

NOTE: From the following table, the correction factor must be added for every different factor which will impact on the heating needed. Therefore, in some circumstances, more than one correction factor may apply eg: A solid brick home, with high ceilings and large glass areas, required 3 of the correction factors added.

CORRECTION FACTORS

Extra 40%	Extra 20%	Less 20%
<ul style="list-style-type: none"> • Bathrooms or ensuites. • Solid brick. • No external wall insulation. • Weatherboard - none or little insulation. • Window area 35% to 45% of external wall area. 	<ul style="list-style-type: none"> • Ceiling height between 3.0 & 3.7 metres. • Living area with a void(s) to upper level. • Living area which includes stairway to upper level. • Window area 20% to 30% of external wall area. • South facing rooms. 	<ul style="list-style-type: none"> • Double glazed windows. • Insulation rated at 2.5 or more in both external and internal walls.

EXAMPLES:

- **“L” Shaped room with 42% window area of external walls:**
Brick veneer calculation
= 3750 watts + 40% correction factor = 3750 + 1500
= **5250 watts needed.**
- **Room + Entry, ceiling height 3.3 metres:**
Brick veneer calculation
= 2825 watts + 20% correction factor = 2825 + 565
= **3390 watts needed.**
- **“L” Shaped room with 42% window area of external wall + ceiling height 3.3 metres:**
Brick veneer calculation
= 3750 watts + 40% & 20% correction factors = 3750 + 1500 + 750
= **6000 watts needed.**

*When calculating more than one correction factor, add each of the extra % Correction Factors to the base room requirement only.

SELECTION OF PANEL HEATER SIZES.

Once the total wattage for heating an area is known, the NOBO models required can be selected from the sizes available providing they combine to the total wattage (or more). NB: If the heater selection cannot match exactly the wattage required, always choose heaters to total a slightly higher rather than lower wattage.

EXAMPLES:

- 5250 watts needed: the best selection would be 2 x 2000 watt + 1 x 1250 watt heater.
- 3390 watts needed: the best selection would be 1 x 2000 watt + 1 x 1500 watt heater.
- 6000 watts needed: the best selection would be 3 x 2000 watt heaters.

SIZE AND SELECT HEATERS FOR YOUR OWN HOME BELOW:

Room	Area LxW Metres	M2	Watts	Correction Factor(s)	Watts Needed	NOBO Model(s)	Quantity
	X						
	X						
	X						
	X						
	X						

WHAT “NOT” TO DO WITH NOBO PANEL HEATERS!

- Don't undersize the area being heated. The result will be inefficient operation and higher running costs.
- Don't install them upside down - follow the installation instructions and ensure the thermostat is on the bottom right corner.
- Don't install them high up on the wall or vertically.
- Don't have them operating all day. NOBO provides instant heat - only use them for the time periods required.
- Don't install them in a hallway outside 3 bedrooms expecting one panel to “take the chill off” all 3 bedrooms. It will not happen and the maximum running costs will result.
- Don't choose the panel size to fit a wall space - always calculate the heating output required and then select the panel(s) to heat the area properly.
- Don't install them adjacent to a door with a large air gap below it.

BENEFITS, APPLICATIONS & INSTALLATION OF NOBO

As well as the gentle, healthy and quiet heat, efficient operation and good looks, there are additional benefits for builders and renovators to install NOBO slimline radiant panel heating.

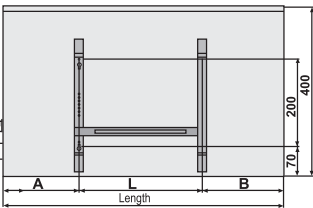
- Association with market leading European appliance.
- Manual or programmable systems available.

- Installation is at the end of the job - no damage worries, no equipment payments at early construction.
- Easy to install - any handyman can do it (power points must be fitted by a registered electrician).
- Maintenance free - no call backs.
- Complies with Australian Standards.

IDEAL BUILDING DESIGNS AND APPLICATIONS

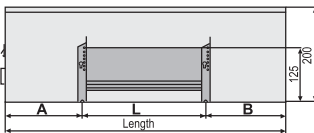
- Slab based constructions where convection systems require air registers to be ceiling mounted.
- Double or multi storey buildings where convection heat rises to upper levels (exasperated by slab based / ceiling mounted registers).
- Building designs where it is difficult to install ducting without extensive boxing.
- Buildings which are well insulated.
- Dwellings where time and temperature zoning is wanted.
- Dwellings where the entire house is not occupied at all times.
- Residents who feel unsafe with gas.
- House designs with an existing split system, combustion heater, or other form of heating already in the living area, and require heating in other rooms such as bedrooms, study etc.
- Houses in areas which only have LPG.
- Extensions which are difficult to install ducting, or the existing system cannot be extended.
- Residents who would like the benefits of radiant heat but cannot afford hydronic heating or other radiant systems.
- Residents who find the hydronic panels unattractive.

E4E
E4EU



Watt	Length mm	A mm	L mm	B mm	Weight approx. Kg
500	475	137.5	200	137.5	4.5
750	625	162.5	300	162.5	6.0
1000	775	187.5	400	187.5	7.0
1250	975	187.5	600	187.5	8.5
1500	1125	262.5	600	262.5	9.0
2000	1525	262.5	1000	262.5	12.0

E2E



Watt	Length mm	A mm	L mm	B mm	Weight approx. Kg
1250	1525	262.5	1000	262.5	9.8

INSTALLATION AND ELECTRICAL REQUIREMENTS

Wall Bracket: Installation is quick and simple by attaching the wall bracket supplied with each heater to the wall, then clipping the heater to the bracket. The bracket becomes its own template for fixing points and ensures that your NOBO will always be parallel to the floor. Instructions come with every heater.

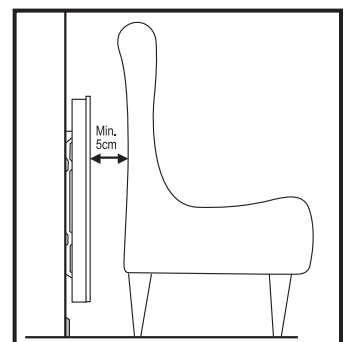
Plaster Walls: All four fixing points to go straight into plaster - it is not necessary to locate a wall stud. "Wall Mates" or toggles used correctly are all that is required.

Power Points: For a clean appearance, it is possible to install NOBO radiant panel heaters in front of a flush mounted power point. The design of the bracket has a plastic stay, enabling the heater to be unclipped and tilted forward for access to the power point if required.

Installation Location: Nobo Radiant panel heaters are unique because they can even be installed behind low furniture without a detrimental effect to their performance. Due to their radiant heat output, NOBO can be installed anywhere within a room. Directly under windows is an ideal location.

Electrical Requirements: The largest heater draws a maximum of 8.3 amps and simply plugs into a standard power point. When installing several NOBO slimline radiant panel heaters, with the intention of using them simultaneously, it is recommended to consult an electrician to ensure that the electrical circuits are not overloaded. The amperage for each heater is listed on the back of this brochure.

When building a new house, extending or renovating, it may be prudent to wire separate circuits if several heaters are being installed - consult with your registered electrician.



ECONOMICAL RUNNING COSTS.

Nobo slimline radiant panel heaters are 100% efficient as all the energy consumption is converted to heat, there are no fans or moving parts to consume power. A gas furnace, for example can lose as much as 30% of the heat it produces.

To maintain economical running costs, NOBO slimline radiant panel heaters are fitted with electronic thermostats for accurate temperature control. To further enhance efficiency, models with an inbuilt timer for automatic on/off operation are available.

NOBO slimline radiant panel heating has independent running costs issued by power utilities as the basis for calculations. Copies are available from your authorised dealer or from NOBO.

HOW TO CALCULATE RUNNING COSTS.

Before calculating running costs, it is important to first understand how NOBO slimline radiant panel heating works.

On initial start-up when the room is cold, the panel heater(s) will heat continuously until the desired comfort temperature is reached. Around 18-20°C should be adequate for radiant heat. Once the desired temperature is achieved, typically within 1/2 an hour (subject to correct sizing as per the sizing chart allowing for any "Correction factors"), the heater(s) will then start to "cycle" on the thermostat.

During operation, the ideal is for the heater(s) to operate on a 50% cycle ie: draw power for only 1/2 an hour in every hour. It has been proven independently by power utilities, that sized correctly, NOBO will achieve the desired 50% cycle.

EXAMPLE 1:

1 x 2000 watt NOBO panel heater: 1/2 hour start-up,
3.5 hours running cycling @ 50%, on a 14.5 cent tariff.
 $(2.0 \times .145 \times 0.5) + (2.0 \times .145 \times 0.5 \times 3.5) = \$0.14 + \$0.51$
= \$0.65 for 4 hours!

THE FOLLOWING INFORMATION IS REQUIRED TO CALCULATE RUNNING COSTS:

H: Heater panel(s) as calculated according to the sizing chart.

T: Electrical tariff per kilowatt hour.

C: Expected cycling of heater(s) after room temperature is reached.

O: Hours of operation.

IS: Initial start-up from cold in hours.

NB:

- To convert watts to kilowatts, divide by 1000 (1000 watts = 1.0 kilowatt).
- It is important in the above calculation to use the tariff charged in dollars ie: 14.5 cents per kilowatt = \$0.145.



CALCULATION FORMULA

INITIAL START-UP = H x T x IS
RUNNING COST = H x T x C x O

EXAMPLE 2:

1 x 2000 watt + 1 x 1500 watt NOBO panel heater:
1/2 hour start-up, 2 1/2 hours running cycling @ 50%, on a 14.5 cent tariff.
 $(3.5 \times .145 \times 0.5) + (3.5 \times .145 \times 0.5 \times 2.5) = \$0.25 + \$0.64$
= \$0.89 for 3 hours!

THE ABOVE CALCULATIONS SHOULD THEN BE REPEATED FOR:

- Each heater panel in use.
- Each different time period of use.
- Multiplied out to calculate running costs on a daily, weekly or monthly basis.

MAXIMUM RUNNING COSTS



With NOBO slimline radiant panel heating, the **absolute maximum** a panel can cost to run is *if it is not cycling at all, and then only to a maximum of it's rated output*. Therefore, in the first example above, the 2.0 kilowatt heater cannot possibly use more than the rated 2.0 kilowatts per hour, therefore the absolute maximum running costs = 29 cents per hour @ the 14.5 cents tariff.



'E' Series Slimline Radiant Panel Heaters

'Comfort you deserve'

Selecting your **NOBO**

MODEL	MODEL WITH TIMER	WATTS	AMPS	LENGTH (mm)	HEIGHT (mm)	THICKNESS (mm)	APPROX AREA HEATED (M ²)	APPROX RUNNING COST (Cents per hour)	SUGGESTED PLACEMENT
E4E05	E4EU05	500	2.08	475	400	50	5	3	Personal Space / Under Desk
E4E07	E4EU07	750	3.12	625	400	50	7.5	4.5	Small Ensuite
E4E10	E4EU10	1000	4.16	775	400	50	10	6	Bathroom / Bedroom 3 or 4
E4E12	E4EU12	1250	5.20	975	400	50	12	7.5	Bedroom 2 / Smaller Bedroom 1
E4E15	E4EU15	1500	6.25	1125	400	50	15	9	Average Bedroom 1
E4E20	E4EU20	2000	8.33	1525	400	50	20	12.5	Large Bedroom / Living Area
E2E12	Skirting Model No Timer	1250	5.20	1525	200	50	12	7.5	Bedroom 2 / Smaller Bedroom 1

AREA COVERED for each heater listed is only a guide and based on a building of modern brick veneer construction to Victorian minimum insulation standards. This includes ceiling height of up to 3.0 metres, ceiling insulation rated at 2.5, external wall insulation rated at 1.3 and average glass area with window coverings. Minimum insulation standards may vary from state to state and/or in areas with colder climatic conditions.

RUNNING COSTS are based on an average National supply tariff of 12.5 cents per kilowatt hour - as independently documented by several power utilities. Running costs will vary according to usage, heat loss factors and electrical tariff. These tariffs range from 6.5 cents to 18.5 cents per kW/hour depending on the area. Running costs are representative once the room has reached the desired comfort temperature of up to 20 degrees celsius, and on the basis that the heater is "cycling" on its thermostat for 50% of its operating time.

SAFETY

There are many features which make NOBO slimline radiant panel heating safe and practical for all applications.

- Low surface temperature - even though the front panel surface is warm to touch, it will not burn even young or frail skin.
- Safety cut out - if something is placed over the heater allowing the temperature to build-up, the safety cut-out will be activated.
- No gas emissions or smells.
- Maintenance free, no ducting to clean, no fire hazard.
- Can be installed in front of power points away from inquisitive fingers.
- Optional tamperproof control covers or lower surface temperature front covers are available.

INSTALLATION

Installation instructions are included with every NOBO panel. Please ensure that the installer reads and follows these instructions. Nobo slimline radiant heating panels are supplied with a separate wall mounting bracket and flex connection to a flat three pin plug. The wall frame allows the panel to be hinged forwards for cleaning.

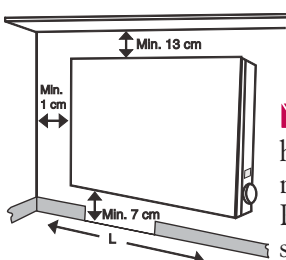
HEALTH, ALLERGIES AND ASTHMA

As many as 2 in 5 primary school children, and 2.2 million of Australia's population suffer with asthma, and this figure is continually rising to one of the highest developed in the world. This does not include those yet to be diagnosed, or suffering from allergies such as hay fever.

Airborne dust and particles contribute significantly to these conditions. Because NOBO emits radiant heat, with the convection component being so gentle, many asthmatics have chosen NOBO as their preferred heating choice.

Nobo's totally quiet operation means they are ideal for bedrooms.

Optional Legs with Castors



NOBO slimline radiant heating panels draw a maximum of only 8.33amps. Panels simply plug into a standard power point.

Nobo slimline radiant panel heaters are available from:

Web site: www.nobo.com.au / www.nobo.co.nz - includes full list of approved NOBO dealers

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