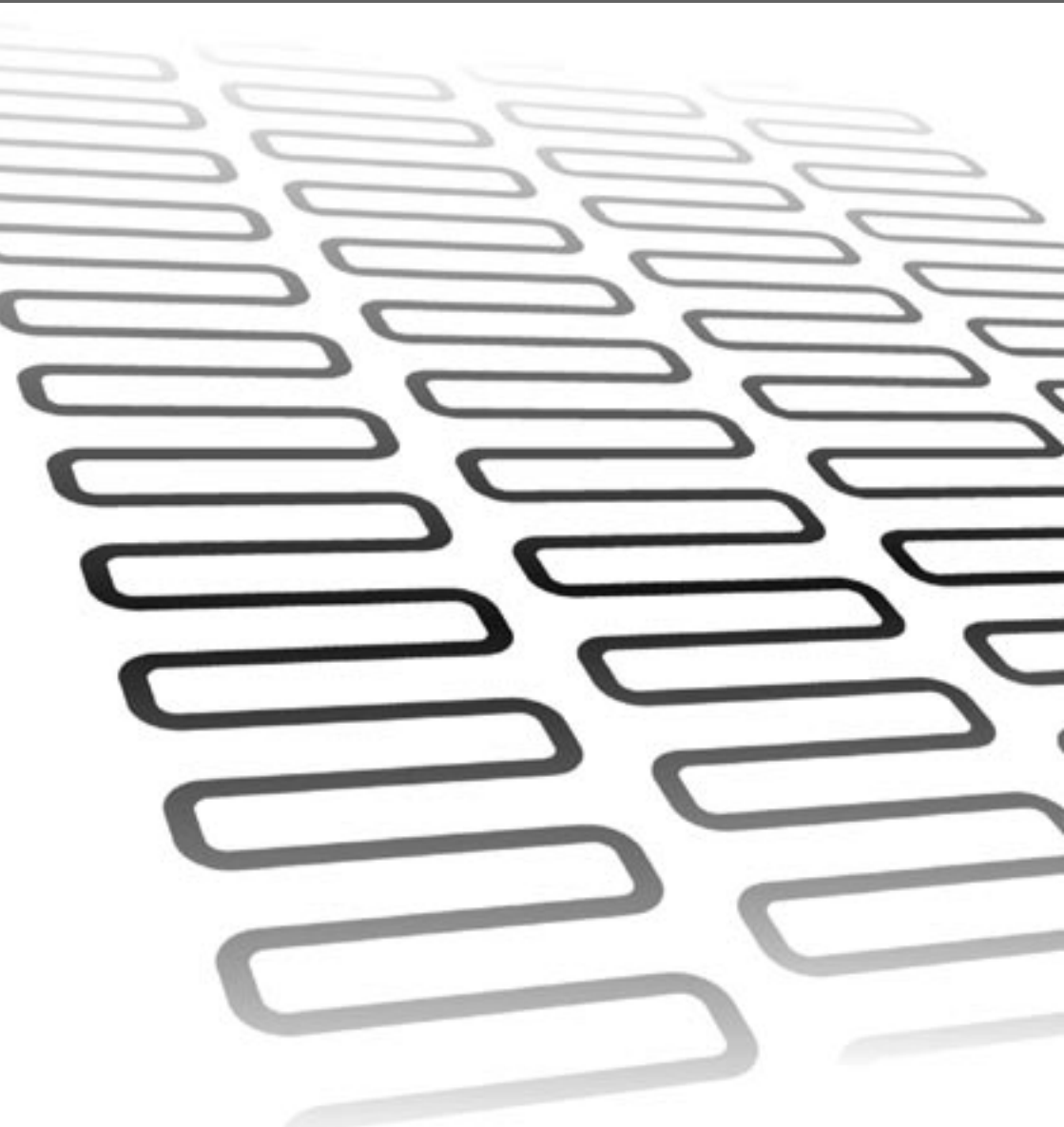




# In-concrete Installation

## Instructions



# Cable Specifications

(Rating: Normal 30 watts/Lm, 150w/sqm @ 230 V AC)

1. PVC Jacket (Florescent Orange) OD 6.0 – 6.5mm. Stable up to 105 Deg C. Markings every 2 Lin m, ¼, ½ and ¾.
2. Isolator cover.
3. Stranded Copper Earth Screen. (1mm Sq)
4. PVC Secondary Insulation. Stable up to 105 Deg C.
5. PTFE (Poly Fluoro Ethylene) Helically Wrapped Primary Insulation. Stable up to 260 C.
6. Multi Stranded Conductor.
7. IEC60800, Second Edition 1992-04 and IEC61423-1 First Edition 1995-06: Test Report no 99257.47 GID.

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## Important Note: The following instructions MUST be read prior to commencing installation.

- A representative of The Heating Company, or a licensed electrician must carry out installations.
- Do NOT cut or shortened the heating cable, or place the cold tail termination under strain.
- Installed drawings or photos, of each zone installed, including sensor conduit, and the termination join MUST be created and available for future reference.
- Ensure that all cable lengths are “securely” fastened at the appropriate spacing.
- All Hotwire floor-heating installations shall be controlled using an electronic thermostat and floor-sensing probe.
- Hotwire cable can be used in wet areas.
- The maximum loading = 30-Watts per linear metre.
- The cable operating temperature should not exceed 90°C.
- The cable must be kept clear of any thermal insulation and upper floor surfaces with a minimum clearance of 25 mm.

## Calculating cable spacing

- Cable spacing distance is measured from the centre of one cable loop to the centre of the next.
- Cable spacing is typically determined by the available floor area and the element length, spacing varying from 100mm to 300mm.
- Cable spacing calculations can be achieved by using the cable length.

## Loading Specifications

- We recommend a design loading of 50w/m<sup>2</sup>. See heating cable chart below.
- Hotwire heating cables are designed for a maximum operation of 14 hours in any 24-hour period at a maximum of 170w/m<sup>2</sup>.
- If the above design limitations are exceeded a floor sensor must be used in conjunction with a 50°C temperature limiter and electronic controller.

### Cable Length:

$$\text{Cable spacing (mm)} = \frac{\text{heated floor area (m}^2\text{)} \times 1000}{\text{Cable/s length (m)}}$$

### Design Loading:

$$\text{Cable spacing (mm)} = \frac{\text{Cable (W/m)} \times 1000}{\text{Design loading (W/M}^2\text{)}}$$

## Testing and Handling

All cables are quality checked prior to leaving the factory. However the follow tests should be carried out –

1. Check that the ohmic values = the specified values on the reel label, (within -5 % to +10%) before, during and after the concrete pour.
2. During the concrete pour, a 500V insulation test should be used to monitor the cable insulation and a continuity check, to ensure there are no open circuits.
3. All steps to protect the cable must be taken.
4. Avoid twisting, tangles, kinks or undue mechanical stress on the cable.
5. Avoid stress on the joint terminations by pulling or stretching the cables.

## Installation

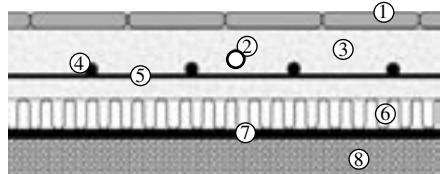
- The connection of heating cables must be carried out by an electrical trades person and in accordance with Clause 4.22 of AS 3000 and any other relevant regulation.
- Ensure that the cable loading is suitable and the correct design loading for the area to be heated.
- The heating cable, including the cold tail terminations, must be embedded within concrete.
- Cables must never be allowed to cross or touch.
- Cable must never be shortened. The 3 m cold tails may be shortened if required.
- Cable must not be bent past a radius of 37mm.
- Avoid laying cables where all permanent structures are to be installed above the finished floor, or where the floor is likely to be penetrated by nails, water pipes or similar fixings.
- Cables should be covered as soon as possible with concrete, to avoid unnecessary damage.
- Cables must be no closer than 100 mm from walls and or fixed fittings.

- Cables need to be attached to structural reinforcement or a separate layer reinforcing mesh, using clips or tie wires.
- Fixing spacing must not be greater than 600 mm.
- Cable must not float closer than 30 mm below the concrete surface.
- Steel rods, of 6 mm diameter should be used where cables are run between the reinforcing mesh. They need to be able to support the weight of a person.

## Installations on top of existing concrete floors

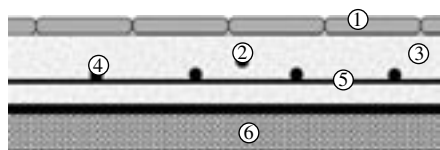
- Place netting or light gauge reinforcement mesh covering the desired heating area.
- Ensure the area is free from sharp objects.
- We recommend the cable ties be no greater than spacing of 400 mm.
- The heating cable should have a minimum finished floor cover 25 mm.

### Concrete Slab Floor Construction



1. Floor coverings
2. Sensor
3. Concrete Slab
4. Hotwire heating Cable
5. Mesh
6. Insulation
7. Vapour barrier
8. Ground

### Screed or Topping Floor Construction



1. Floor coverings
2. Sensor
3. Screed or concrete
4. Hotwire heating cable
5. Hotwire heating cable
6. Existing floor

## Floor Coverings

- Most floor coverings can be used.
- Do not use bitumen backed carpets.
- Parquet or cork overlays must be laid on a dry floor. See "Initial Operation".

## Insulation

- A resistance R factor of  $1.7\text{m}^2/\text{°C}/\text{w}$  for heated floors.
- High density polystyrene or fibre glass insulation materials should be used. (NZS 4218P, BRANZ 292, 344)
- Perimeter 1 metre width insulation should be fitted.

## Connection and Wiring

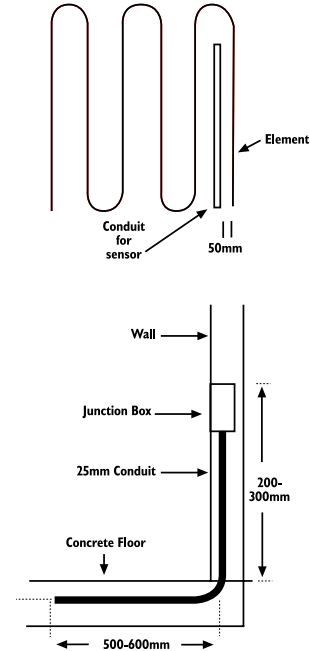
- All power connections must be permanent i.e., no plug/socket connections.
- All cables must be earthed in accordance with local wiring regulations.
- Ensure that the correct size contactor is used. Loads can sometimes be shared on a contactor. For zones with a capacity of 2.2 Klw or larger require a slave contactor.
- Flush boxes for element and sensor connections should be fitted at 200 – 300 mm above the floor level.
- A Residual Current Device or HRC fuse must protect each heating circuit.
- A surge diverter must be connected between the earth and the phase or phases supplying the floor heating, to protect against lightning strike. Failure to do so will negate your warranty.

## Thermostat Controls and Options

- A Din rail mounted designed to be mounted in the switchboard or heating sub-board.
- A room flush mounted thermostat, with a probe slab sensor/temperature limiter.
- The optimum floor temperature for comfort should be no greater than  $26^{\circ}\text{C}$ .
- The length of 25mm conduit, for the sensor probe to be fitted, with a gentle 300 mm bend at the floor end, running 600mm

towards the middle of the room. The probe should be fitted between the heating cable. Each zone must have accessibiity to the conduit for each zone, to allow for future possible replacement.

## Floor Sensing Probe



## Damage to cable

- If the outer insulation is cut, punctured or damaged in any way. Repeat the above testing procedure and check the resistance between the cable screen and the surrounding concrete is correct.
- Carefully inspected the damaged area and if the tests register as correct, insulation tape may be used to cover the damaged area.
- Any damaged area should be, noted and marked, on your installation design layout.
- Do not proceed with the installation without totally repairing the damaged cable.

## Initial Operation

- The heating should not be turned on until the concrete has naturally cured. Approximatley 5 - 6 weeks.
- Do not instal sensitive floor coverings, such as, parquetry or cork until the intial use of the heating has removed all remaining moisture.

## Important

- The client should be made aware that coverings or objects of high thermal resistance are NOT placed directly on the floor. Also that all large items are adequately vented underneath.

## Agriculture

- The Hotire heating cable is suitable to be laid in the ground for growing enhancement.
- Normal loading = 100w/m<sup>2</sup>.
- The cable must be installed at a depth to avoid cable damage.
- Heating warning notices should be put in place.
- The ground area should be void of all sharp objects that may damage the cable.

Item	Area M <sup>2</sup>	Norm Watts 230 V, 20.°C	Length Meters	Total Ohms 20.°C	Ohms/M 40.°C	Amps 230V
1	2	300	10	175.07	17.52	1.3
2	3	450	15	117.55	8.03	1.96
3	4	600	20	88.16	4.52	2.61
4	5	750	25	70.53	2.83	3.26
5	6	900	30	58.77	1.79	3.91
6	8	1200	40	44.08	1.11	5.22
7	10	1500	50	35.26	0.715	6.52
8	12	1800	60	29.39	0.503	7.83
9	14	2100	70	25.19	0.369	9.13
10	17	2550	85	20.74	0.25	11.09
11	20	3000	100	17.63	0.181	13.04
12	23	3450	115	15.33	0.144	15
13	27	4050	135	13.06	0.104	17.61
14	31	4650	155	11.38	0.079	20.22
15	36	5400	180	9.8	0.059	23.48
16	41	6150	205	8.4	0.044	26.74

## Warranty

- The Hotwire heating cable carries a 10-year manufactures warranty.
- The warranty is only valid, if the heating cables are installed as per our installation instructions.
- All warranty claims are required to be made in writing with a description of fault and explanation of cause.
- The Heating Company obligation under our warranty will be to repair or replace faulty cables, without responsibility to other third parties or materials.
- The warranty does not cover incorrect design or installation.
- If The Heating Company is required to inspect or repair any defects that are caused by another party, all work will be fully chargeable.
- The Heating Company reserve the right to have any claim of fault, independently inspected to determine responsibility of fault. The final onus of fault will be at The Heating Companies discretion.

## Construction Details

