



21st Century  
**Heating** 

**CENTRAL HEATING WITHOUT PIPES**

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## 21st Century Heating Electric Central Heating Systems

### Data Sheet 3:01 - BSRIA Test – Detailing the parameters of the test and the findings:

Room type : Lounge	Room size: 4m x 4m	Ceiling height : 2.7m
Floor type : Solid, insulated	Wall type : Cavity wall insulated. U value = 0.6	U value = 0.6
No. Of o/s walls : 2 outside walls	Window area : 3.7m <sup>2</sup>	Room above : Heated room above at 18 o C
Air changes : 1 ½ per hour	Outside air temperature : -1o C	Surroundings : Normal suburban situation
Required room temp. 21 degrees C		

### Maximum Heatloss Calculation : 1775 watts.

At **BSRIA**, the test room is constructed using 100 mm Urethane insulation with steel finish materials in a fabricated sheet form (manufacturers stated U-value of 0.19 W/m<sup>2</sup>K). Around this is a second insulated chamber that can be kept at a constant temperature, to minimise heat transfer through its surfaces. The inner test room is airtight enough to prevent any significant flow from or to the buffer chamber outside. A fan coil unit is installed in the test rig to control the heat loss. **This is a static test scenario and in real circumstances a room would never usually have a constant heatloss.**

**Temperature** T-type thermocouples were used to monitor temperatures for measurement and control purposes in and around the facility. The accuracy of the thermocouples is  $\pm 0.5^{\circ}\text{C}$ . Signals generated by the thermocouples are converted in a multi-channel microprocessor based data acquisition system, by applying the appropriate relationship, into units of temperature ( $^{\circ}\text{C}$ ). Platinum resistance thermometers (1/10 DIN PRTs) were used to monitor space temperatures in the room. The accuracy of the PRTs is  $\pm 0.1^{\circ}\text{C}$ . The PRTs was connected to a multi-channel microprocessor based data acquisition system. Resistance signals generated by the PRT's were converted in the processor, by applying the appropriate relationship, into units of temperature ( $^{\circ}\text{C}$ ).

Data was transmitted directly to a personal computer, firstly to enable more comprehensive on-screen monitoring, and secondly for data analysis within a spreadsheet and graphical presentation software.

### **Electrical power**

The electrical power consumption of the heater being tested was measured using a Yokogawa kilowatt-hour meter. The electrical consumption (instantaneous in W and kWhrs) was logged at approximately 5-minute intervals for the duration of the tests.

### **Calibration**

All equipment significant to measurements is regularly serviced and maintained according to the manufacturers' instruction and is regularly calibrated in accordance with BSRIA's quality requirements. Operated by BSRIA's test engineers, a rigid system is in force, which records the calibration history of each instrument and prompts re-calibration prior to each work programme.