

## ► Twenty-four hour registration – only pay for what you consume ...

The principle of twenty-four hour registration

### The meter registers

A heat cost allocator measures constantly, but if the radiator is not in use, the meter naturally must not register heat consumption for which you later have to pay.

The meter must therefore be capable of distinguishing between the heat coming from the central heating system and the heat which the radiator receives from the room, e.g. from sunshine or a wood-burning stove. It must also ensure that heat from such sources is not registered as consumption.

**Brunata Futura+** ensures that you only pay for the heat coming from the central heating system. This is due to Brunata's patented twenty-four hour registration, which is described below.

### Twenty-four hour registration

When a radiator is NOT in use, the room temperature will eventually become higher than the radiator temperature due to sun light, wood-burning stoves, electric lights, computers, etc.

When this happens, the radiator will slowly absorb heat from the room. After approx. twelve hours, the radiator will typically begin to emit this heat again due to the twenty-four hour rhythm (day and night temperatures).

Because the radiator is not in use, the heat received from the room and the heat emitted by the radiator are registered in a special register for exactly twenty-four hours.

After twenty-four hours, the difference between the heat received by the radiator from the room and the heat emitted by the radiator to the room is calculated. If the heat received equals the heat emitted, the radiator has not been in use and the meter will not register any consumption for the last twenty-four hours. See figure 2.

The twenty-four hour register then returns to zero and the meter starts a new twenty-four hour period, when it again measures the heat received and emitted by the radiator.

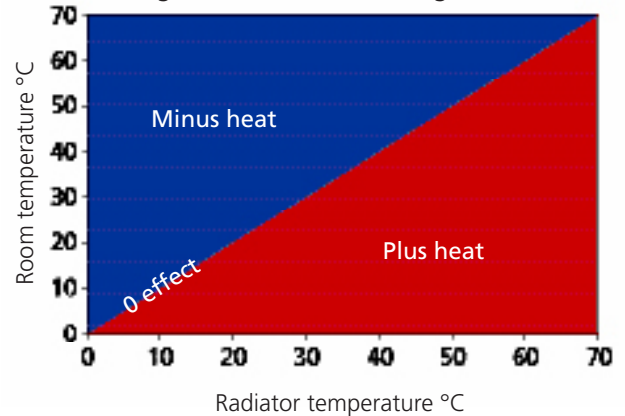
The oval in figure 2 shows the radiator temperature cycle over twenty-four hours. After approx. twelve hours, the radiator begins to return the heat it has received to the room from which it came.

### Radiator in use

If more heat is emitted than received, the radiator has been in use and the meter will register the emitted heat as consumption. This consumption is accumulated in a consumption register and shown on the display.

The meter continues to register the emitted heat as consumption as long as the radiator temperature is higher than the room temperature.

Figure 1: Brunata meter registration



- Minus heat: The radiator receives heat from the room as long as the room temperature is higher than the radiator temperature.
- Plus heat: The radiator emits heat to the room while the radiator temperature is higher than the room temperature.

Figure 2: Radiator not in use

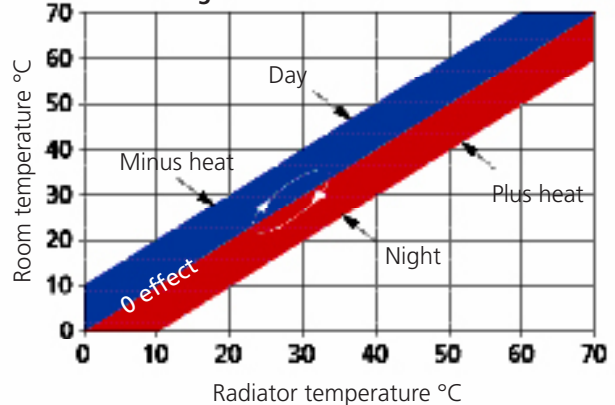
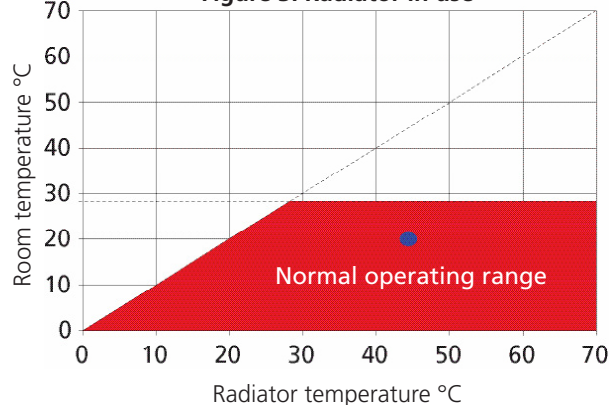


Figure 3: Radiator in use



## Manipulation of meters in use

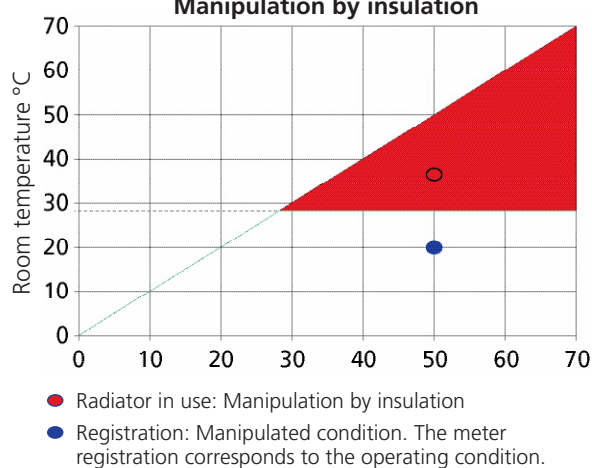
Manipulation of the meter is ONLY possible when the radiator is in use. Manipulation of the twenty-four hour register when the radiator/radiator valve is closed is not possible. Manipulation is fraud, but can occur in different ways, e.g. by thermal insulation of the meter or by heating the meter to a high temperature with a lamp.

If manipulation occurs, the meter will always register consumption equal to or higher than the actual consumption, using a so-called substitute temperature. This is done by various calculations based on the radiator and room sensor temperature measurements.

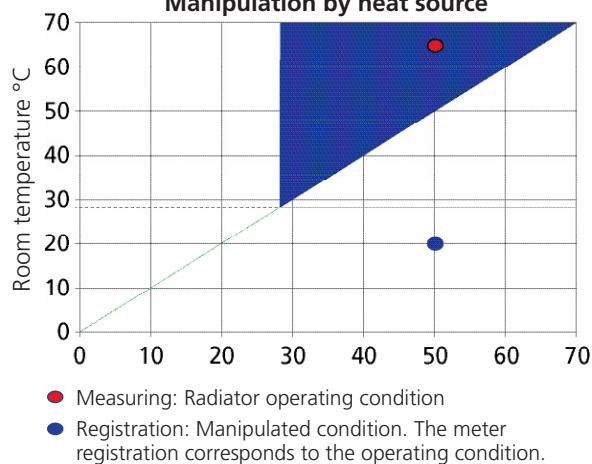
The units registered in connection with manipulation are saved in two separate registers.

One register saves data related to manipulation by insulation (figure 4) and the other data related to manipulation by heating (figure 5). In this way, it is possible to see how often manipulation has occurred and how many units have been achieved by manipulation.

**Figure 4: Radiator in use  
Manipulation by insulation**



**Figure 5: Radiator in use  
Manipulation by heat source**



*Brunata is a 100 % Danish owned company. We have more than 90 years of experience within developing and producing heat cost allocators, heating accounts and meter services. Brunata a/s has implemented a quality system in accordance with EN ISO 9001 and 14001. Please contact us for further information.*