Electronic radio enabled heat cost allocator
Measuring consumption to protect the environment

Resource conservation – environmental protection

Protecting our environment has never been as important as it is today. It is essential to rediscover long established but sustainable energy sources and to utilise them using the latest technologies, to combine energy sources, to tap new and forward-thinking resources and, last but not least, to save energy.

Saving energy is however only possible, if its consumption can be accurately measured, reliably recorded and be individually accounted for. The energy consumption readings are in turn only trustworthy if the measuring instruments are working accurately and reliably in the long term.

Minol has been developing and producing measuring instruments for the metering of water and heat for several decades. This is the foundation for Minol’s energy accounting, a system well established for over 50 years.

Minol’s proven and comprehensive range of products includes consumption meters and measuring instruments for any type of application - water meters for all application areas, heat meters in any capacity rating, as well as electronic heat cost allocators with the latest radio transmitter technology.
Accurate measurements – flexible and versatile

A new metering instrument has been added to Minol's extensive product range - the new electronic heat cost allocator Minometer® M 6.

The Minometer® M 6 is capable of meeting any requirements at the highest technical level. The Minometer® M 6 offers a wide range of applications as well as a convenient data collection and transmission technology to fully meet not only the stringent demands of the residential industry but also the ever increasing comfort requirements of the tenants.

With its extraordinarily wide operation temperature range of 35°C to 130°C, the Minometer® M 6 is perfectly suited for heating equipment of any design temperature (in particular low temperature equipment).

The Minometer® M 6 can operate in conjunction with single pipe heating systems or with today's more common two-pipe systems.

A radio enabled version of the Minometer® M 6 is also available. Together with its wide range of applications, the intelligent and convenient data transmission capabilities make the Minometer® M 6 an “all-rounder” in the area of individual heat consumption metering.
Double measurement – reliable data collection

The Minometer® M 6 operates under the **double-sensor measuring principle**, using very precise sensors to detect even the smallest changes in temperature of the radiator and the room on a continuous basis. The data obtained in this way are then used to reliably determine the consumption rate.

The logged ambient and heating element temperatures undergo a series of plausibility checks to differentiate between the heat from the heater and that from an external source, even during the heat-up phase. This method ensures that any external heat is excluded from the measurements in a reliable way.

A **remote sensor version** of the Minometer® M 6 is available for heating elements with difficult or obstructed access.
Convincing performance features

- Electronic heat cost allocator with double-sensor measuring mode
- Measuring range from 35°C to 130°C mean design temperature
- Storage of the last two billing periods as well as the final readings of the last 18 months
- Reliable discerning of heat from external sources through internal plausibility checks
- Back plate is compatible with the evaporative heat cost allocator Minotherm® and the electronic heat cost allocator Minometer® M 5

- Consumption data reading via radio transmitter is possible
- Compact version, alternative remote sensor version
- Clearly legible, 5-digit multifunctional display
- Guaranteed power supply for 10 years plus reserve
- Infrared interface for automatic data visualisation via handheld computer, display-based retrieval and programming capability
- Freely selectable readout date
- High resolution consumption data
- Continuous internal self-checks
- Any manipulation attempt is registered electronically
- Unit scale
- Starting date on first installation is freely assignable
- Increased protection against thermal, electrical and magnetic interferences
Exact accounting – reproducible at any time

The clearly legible 5-digit multifunctional display provides an up-to-date reading of the current consumption. By activating the LC display through the optical interface integrated in the front face of the instrument, the user is able to obtain not just the current value, but also further relevant consumption and instrument data on two consecutive readout loops.

After the initial display test, the first readout loop shows, in sequence, the meter reading on the billing day, the corresponding date and the scale and sensor variants. Minol is therefore able to offer an accurate readout of all the values on a particular due date at any individually set point in time.

The second readout loop enables the user to obtain the values from 18 consecutive months. This a very attractive advantage which eliminates the need for costly journeys for intermediate readings in case of a user change. The values stored in the instrument also enable an accurate consumption assessment in a subsequent account settlement.

Service personnel can use the infrared interface to obtain a readout of the consumption data from two years back.
Punctual start – reliable readouts

By request, all Minometer® M 6 can be programmed to begin the heat metering on a fixed starting date, so that all instruments begin operating simultaneously, regardless of their actual installation date. This can be especially interesting in the case of large real estates that are built in various construction phases, which are finalised at different times and need to be ready for service at a fixed date.

A 3 Volt Lithium long-life battery supplies the Minometer® M 6 with electrical energy and guarantees its reliable operation throughout the whole of its operating life of 10 years, plus reserve.

The standard instrument provides the consumption readout via an integrated infrared interface through a handheld computer. A direct plausibility check of the data takes place in the handheld to guarantee the correct capture of the consumption data. Manual reading errors can be eliminated.

The consumption data and instrument parameters are sent by the handheld computer via a GSM mobile transmitter directly to the Minol accounting centre, where they are already available for billing only a few seconds after being sent. This is where Minol prepares every day a great number of individual heating bills in a very short time - for over 1.3 Million customers every year - also for you.
Highest comfort – absolute freedom

No appointments – no holidays – no disturbance of privacy. All this is possible with the radio-enabled version of the Minometer® M 6. No reading personnel need to make a visit any more.

And this is how the Minometer® M 6 radio works. Several times a day the Minometer® M 6 radio sends the actual consumption readout, historical consumption data and various instrument parameters to a data collector, where they are reliably allocated and securely stored.

The data are sent in the European ISM band at a frequency of 868 MHz. The individual radio signals from the Minometer® M 6 radio to the Minomat® data collector are only a few milliseconds long and are transmitted during a very short period of time. This excludes any interference and ensures a secure transmission of data.

The information is sent with multiple coding to assure the highest data security.
A network of data collectors – this is how it works

The Minol network of data collectors operates under the master-slave principle. Each measuring device sends its consumption readings and instrument data in 5 minute intervals to „its“ Minomat® S data collector for storing and management. In large buildings the Minomat® S data collector transmits the collected information to the Minomat® M, which, in turn, stores the received consumption and instrument data and keeps them ready for the central reading.

The instrument data are maintained in the Minomat® S as a backup, ensuring that the data are captured by at least one Minomat® S and sent to the Minomat® M. In this way, all the instrument data always flow together in the Minomat® M.

A GSM modem can be used to collect the entire real estate consumption records from the Minomat® M and make them available in seconds to the Minol computing centre for the billing operations.

In larger real estates interposed Minomat® S data collectors are used as repeaters to increase the transmission distances.
Systematic upgrading

Comfortable – compatible

Your real estate is still fitted with evaporative heat cost allocators or previous-generation electronic heat cost allocators and you are thinking of changing over to the latest generation of instruments?

No problem. The old Minotherm® evaporative heat cost allocators, of which there are still millions in operation, can be easily exchanged by the new Minometer® M 6 radio.

The service personnel take a reading of the old heat cost allocators, make a note of the readouts for subsequent billing and disassemble the old instruments. The Aluminium back plate mounted on the radiator remains where it is.

The new Minometer® M 6 radio fits on all the Minotherm® back plates and can therefore be mounted on them without any problems. It then only needs to be security sealed. And ready.
Electronic heat cost allocator Minometer® M 6 and Minometer® M 6 radio

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Measuring method</td>
<td>Two-sensor measurement with integrated logic for external heat source discrimination</td>
</tr>
<tr>
<td>Temperature range</td>
<td>35°C to 130°C</td>
</tr>
<tr>
<td>Display</td>
<td>LCD, 5 digits</td>
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<tr>
<td>Display functions</td>
<td>actual consumption, retrieval of supplementary data possible</td>
</tr>
<tr>
<td>Energy supply</td>
<td>Lithium battery</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>10 years plus reserve</td>
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<tr>
<td>Scale</td>
<td>Unit scale</td>
</tr>
<tr>
<td>Functional test</td>
<td>continuous internal auto calibration</td>
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<tr>
<td>Compliance</td>
<td>HKVO A 01.02.1997, CE mark</td>
</tr>
<tr>
<td>Storage of consumption readings</td>
<td>Last year and last two years, 18 monthly readouts</td>
</tr>
<tr>
<td>Interfaces</td>
<td>IR, all data retrievable, Radio transmitter</td>
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Features of the radio transmitter module of the Minometer® M 6 radio

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<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Transmitter frequency</td>
<td>868 MHz</td>
</tr>
<tr>
<td>Radiated transmitter power</td>
<td>+5dBm</td>
</tr>
<tr>
<td>Signal range in buildings</td>
<td>approx. 40 m</td>
</tr>
<tr>
<td>Data transfer rate</td>
<td>19.2 kBaud</td>
</tr>
<tr>
<td>Modulation process</td>
<td>FSK</td>
</tr>
<tr>
<td>Transmission frequency</td>
<td>several times a day</td>
</tr>
<tr>
<td>Interface</td>
<td>IR, radio</td>
</tr>
<tr>
<td>Compliance</td>
<td>CE</td>
</tr>
<tr>
<td>Coding of transmission protocols</td>
<td>yes</td>
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<tr>
<td>Error recognition</td>
<td>CRC checksums</td>
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