

# Supercal 539

## Compact thermal energy meter



### Application

Electronic, battery-powered compact thermal energy meter for recording heat consumption in autonomous heating systems.

The Supercal 539 compact thermal energy meter is used to measure heat energy. The main area of application is a central heating system that distributes heat to individuals, who are then invoiced for the heat used.

Areas of application:

- Multi-family buildings
- Offices and administration buildings

### Functions

- Recording heat consumption by means of measuring the flow and temperature difference
- Displaying 15 monthly energy values
- Displaying consumption data
- Displaying the most important operating data
- Self-monitoring with error display

### Type overview

- Standard version
  - With bi-directional radio communication
  - With M-bus as per EN1434
  - With pulse output (open collector - 1 Hz 500 ms)
- All versions have an optical interface according to EN 60870-5

### Special versions

The following versions are available at extra cost:

- Energy units: MWh, GJ
- Mounting in supply flow

### Main feature

- Easy to operate and read
- Non-volatile EEPROM memory
- 15 monthly energy values
- The Supercal 539 is suitable for all communication environments: Radio, M-bus (as per EN 1434) and optical interface
- The Supercal 539 fits into all cabinets, thanks to its compact design
- Many years of reliable operation thanks to new contact flow sensor
- The new energy-saving technology of the permanently connected Pt10'000 $\Omega$  measuring unit, along with the long-life battery ensure reliable power supply for the complete duration of the valid calibration period.
- As only the impeller wheel works in the wet area, any currents caused by impurities in the water are largely excluded.
- The sensor mounting point is integrated into the flow sensor

- The Supercal 539 includes the functions necessary for self-monitoring, as well as for monitoring operating status
- Can be installed in supply or return flow

## Design

The compact thermal energy meter consists of a single jet flow sensor with magnetic sensor, an integrator and two temperature sensors. The inlet fitting includes a filter which traps any larger impurities.

## Flow sensor

The flow sensor complies with state-of-the-art technology. Thanks to the high quality standard, many years of operating reliability are guaranteed. The flow sensor operates in the dry, and the impeller wheel is equipped with a special hard metal bearing. As only the impeller wheel works in the wet area, problems that might be caused by impurities in the water are largely excluded. The sensor mounting point is integrated into the flow sensor.

## Integrator

The integrator is equipped with a 7-digit LCD display and can be rotated through 350°.

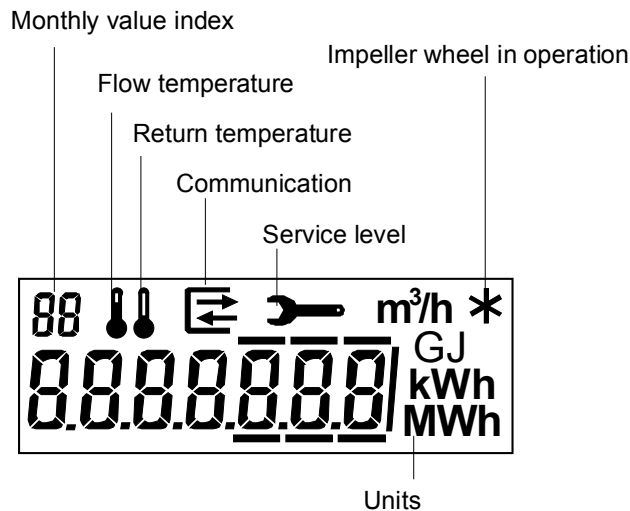
## Temperature sensor

The new energy-saving technology of the permanently connected Pt10'000Ω measuring unit, along with the long-life battery ensure reliable power supply for the complete duration of the valid calibration period.

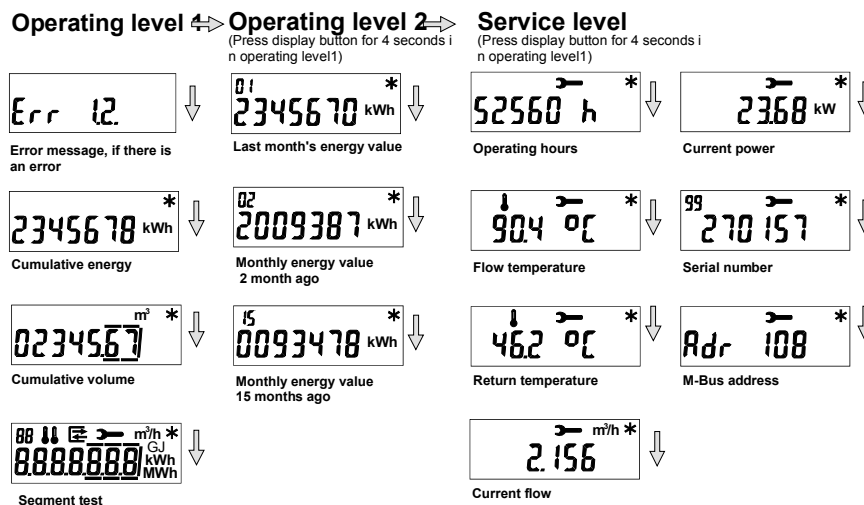
For normal metering operations without communication, a battery life of up to 8 years can be guaranteed. The return flow sensor is built into the sensor mounting position in the flow sensor as standard. The supply flow sensor is mounted externally.

## Display

The LCD display on the Supercal 539 has a large, clear design making it easier to read.



Values displayed that are relevant for invoicing, such as cumulative energy and volume, as well as error codes are displayed on the first display level. If the display button is pressed for longer than 4 seconds, the Supercal 539 switches to the second level, where the 15 monthly energy values are displayed. If the display button is then pressed again for at least 4 seconds, the Supercal 539 switches to service operating mode.



## Error messages

Error code	Description	Remedial action
Err 1	Water meter faulty	Return to manufacturer
Err 2	Temperature sensor faulty	Return to manufacturer
Err 3	Electronics faulty	Return to manufacturer

## Technique

### Measuring principle

The medium flowing through the system drives the impeller wheel and the rotational speed is scanned electronically using a magnet. The temperature difference in the supply and return flows is measured with a pair of platinum temperature sensors (Pt 10'000).

### Energy calculation

The flow sensor records the flow and the pair of temperature sensors records every minute the supply and return flow temperatures. Using a microprocessor, the integrator calculates the temperature difference and then calculates the thermal energy consumed using the average flow and the heat coefficient.

### Non-volatile memory

The device parameters, as well as the cumulative values for energy and volume, operating hours and error type are stored in a non-volatile memory (EEPROM), and this information is not lost in the event of a power failure (e.g. changing batteries). Once a day and in the event of battery failure, the cumulative values are updated in the EEPROM.

### Monthly energy values

On the 1<sup>st</sup> of the month, the thermal energy value is stored. A total of 15 months' energy values are stored in the integrator.

# Technical data

<b>Flow metering</b>	Nominal flow $q_p$	0.6 m <sup>3</sup> /h	1.0 m <sup>3</sup> /h	1.5 m <sup>3</sup> /h	1.5 m <sup>3</sup> /h	2.5 m <sup>3</sup> /h
	Maximum flow $q_s$	1.2 m <sup>3</sup> /h	2.0 m <sup>3</sup> /h	3.0 m <sup>3</sup> /h	3.0 m <sup>3</sup> /h	5.0 m <sup>3</sup> /h
	Minimum flow $q_i$					
	Horizontal mounting	12 l/h	10 l/h	15 l/h	15 l/h	25 l/h
	Vertical mounting	24 l/h	20 l/h	30 l/h	30 l/h	50 l/h
	Starting point	< 3 l/h	< 3 l/h	< 5 l/h	< 5 l/h	< 8 l/h
	Nominal pressure	16 bar	16 bar	16 bar	16 bar	16 bar
	Pressure loss at $q_p$ $\Delta p$	0.10 bar	0.23 bar	0.23 bar	0.23 bar	0.23 bar
	Metrological class	EN 1434 Class 3				
	<b>Mounting</b>	Nominal width DN	15 mm	15 mm	15 mm	20 mm
Connecting thread		G 3/4 B	G 3/4 B	G 3/4 B	G 1 B	G 1 B
Mounting length		110 mm	110 mm	110 mm	130 mm	130 mm
Long-term operating temp.		90°C				
Short-term operating temp.		110°C				
<b>Temperature measurement</b>	Temperature sensors	Pt10'000Ω				
	Integrator sensor	0 - 110°C				
	Temp. difference range $\Delta t$	3 - 75K				
	Minimum starting value	0.5K				

**Power supply** Lithium battery, 3.6 V

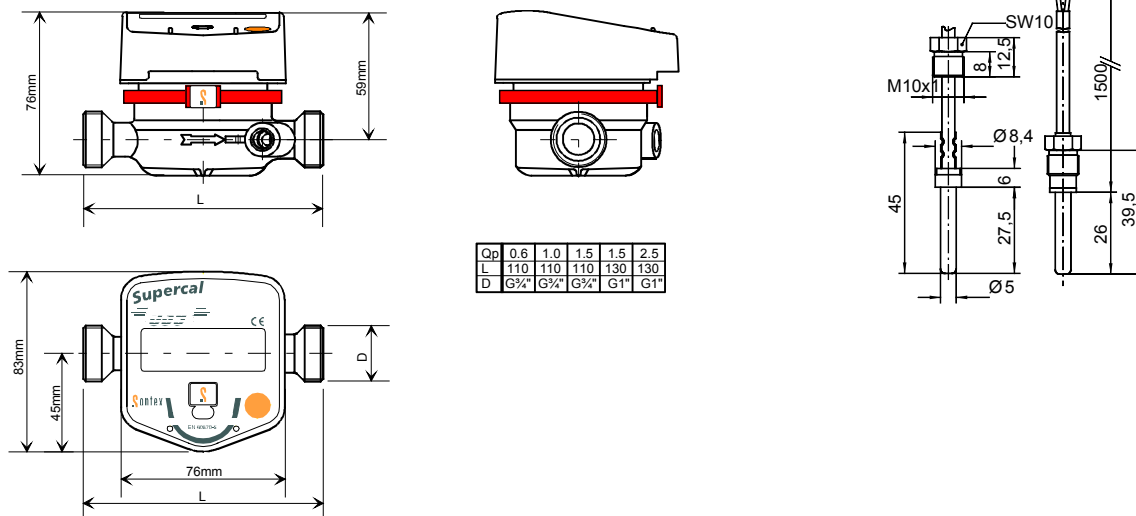
<b>Thermal energy meter</b>	Environmental class	A
	Battery protection class	III
	Housing protection class	IP54 as per DIN VDE 0470, Part 1
	<b>Permissible temperatures</b>	
	Transport and storage	-10 - 60°C (dry)
	Operation	5 - 55°C <sup>1)</sup>
	Data memory	non-volatile
	Display	LCD, 7-digit
	Weight	0.8 kg

<sup>1)</sup> The average annual permissible temperature with the radio option is 40°C

- Installation instructions**
- Local regulations regarding the use of thermal energy meters must be observed
  - The pipework must be flushed through before installing the meter
  - Both temperature sensors and all screw pipe joints must be fitted with seals
  - It is recommended to fit the thermal energy meter between two shut-off valves
  - The information given on the identification plate must be observed

- Operating instructions**
- Basically, the battery must be replaced in the event of re-certification or repair

## Dimension diagram



We reserve the right to make technical modifications  
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