Supercal 739

Compact Thermal Energy Meter

Your benefits

- Available in various models:
  - Singlejet flow sensor
  - Coaxial multijet flow sensor with G2" thread
  - Coaxial multijet flow sensor with M77x1,5 thread
  - Coaxial multijet flow sensor with M62x2 thread
- Available sizes for the singlejet flow sensor:
  - q_p 0.6 m³/h: 110 mm
  - q_p 1.5 m³/h: 110 mm or 130 mm
  - q_p 2.5 m³/h: 110 mm or 130 mm
- Detachable calculator:
  Flexible mounting possible (compact/split)
- LCD display with high contrast, large and clear design:
  Easy to operate and read the data
- Non-volatile memory EEPROM:
  Keeps stored data even in case of power failure

Applications

- High-end device for building management
- All applications in local and district heating and cooling or building automation
- Consumption measurement of heat or/and cooling energy for individual billing

Properties

- Nominal diameter DN 15 or DN 20
- Max. operating pressure PN 16 bar
- Supply via 6+1 or 12+1-year battery or M-Bus with back-up battery
- Protection class of calculator IP65
- Threaded fittings
- Temperature sensor Pt 1'000 (2-wires), Ø 5.0, Ø 5.2 or Ø 6 mm with 1.5 m cable
- LCD-resolution 8 digits, calculator can be rotated by 360°
- Display operating data including self-monitoring with error display
- 18 month register (heat- or/and cooling energy and volume)
- Default calculator configuration: Heat meter MID (cooling as order option)
- Optical interface for readout and configuration
- Standard EN 1434 class 3
- CE Conformity according European Measuring Instruments Directive (MID)

Options

- Ø 5.0 mm or Ø 5.2 mm or Ø 6 mm temperature sensors
- Execution on-site reading (supply via 6+1-year or 12+1-year battery)
- Execution with M-Bus Interface (supply via M-Bus with 6+1-year backup battery)
- Execution with one of the following radio communication options (supply via 6+1-year or 12+1-year battery):
  - Wireless M-Bus
  - LoRaWAN
  - Bidirectional radio SONTEX interface
- Execution with two pulse outputs (supply via 6+1-year or 12+1-year battery)
  - Either heat or cooling energy and volume or
  - Heat energy and cooling energy
- Two additional pulse inputs

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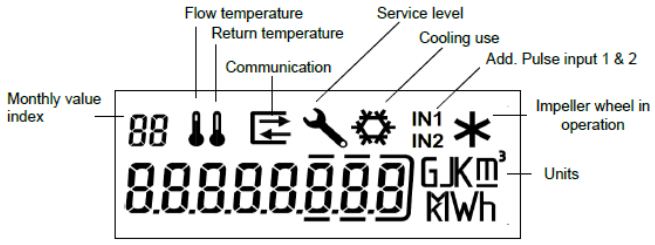
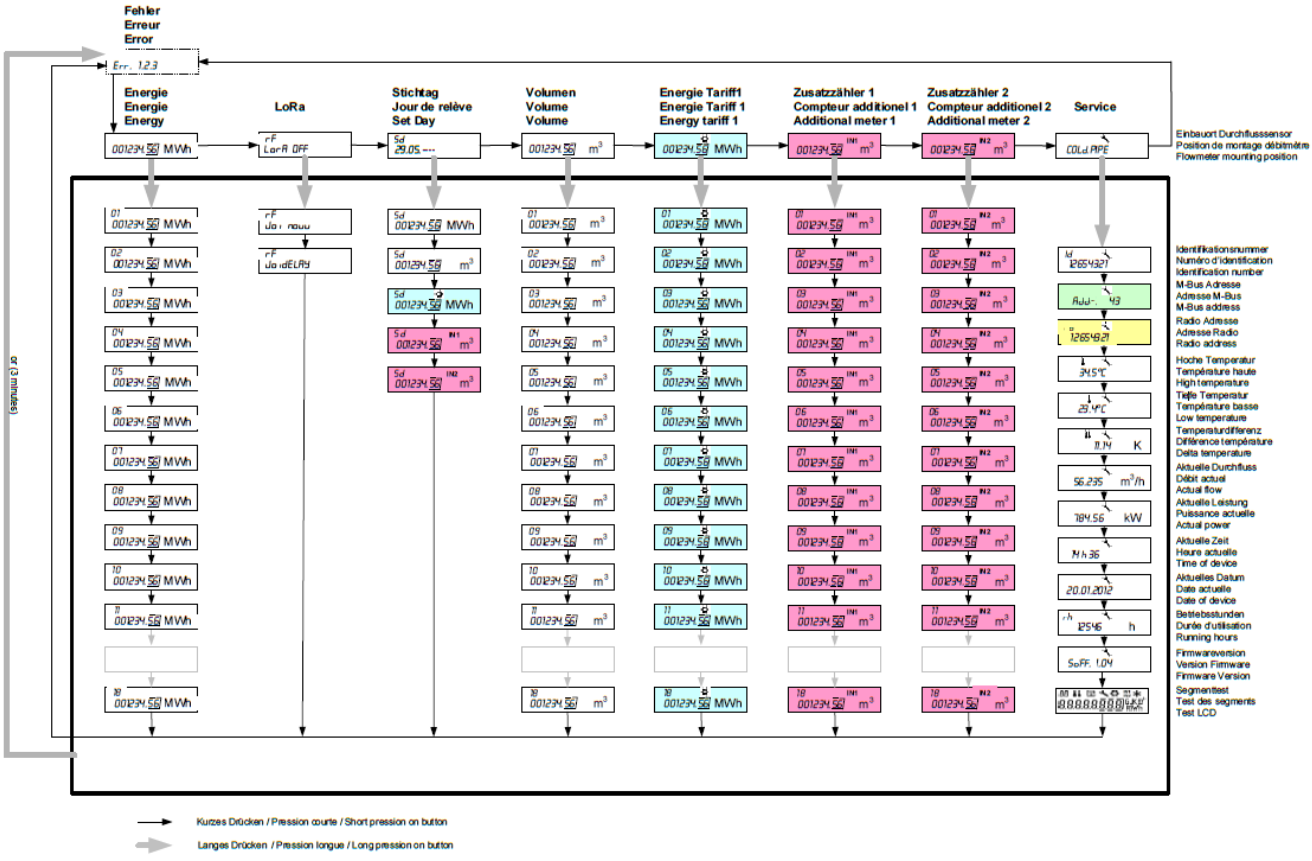
Multi-function display

The LCD display of the Supercal 739 has a large, clear design and high contrast. It can be rotated by 360°.



Display sequences



Error messages:

Err 1 Flow higher than 1.2 x qs or faulty flow sensor.

Err 2 Measured temperature out of range or faulty temperature sensor.

Informations

Measuring principle

The medium flowing through the system drives the impeller wheel and the rotational speed is scanned electronically using a magnet (singlejet) or inductive (coaxial multijet) principle detection. The temperature difference in the supply and return line is measured with a pair of platinum temperature sensors (Pt 1'000, 2-wires).

Energy calculation

The flow sensor records the flow. The thermal energy consumption, respec- tively the heat- and cooling energy are calculated by means of the temperature difference between hot (supply) and cold (return) pipe, the recorded volume, and the heat coefficient. The latter takes into consideration the density, the viscosity and the specific heat of the liquid (water) used. All these are dynamically adapted in function of the temperature.

Cooling energy

The cooling energy in combined heat- and cooling applications is stored in another memory than the heat energy and will be cumulated only if the two following conditions are fulfilled:

- Temperature difference (Δt) > -0.5 K
- Supply temperature < 18 °C

The cooling energy has the same physical unit as the heat energy. The cooling power and the temperature difference are in this case displayed with a minus sign (-). If required it is possible to order the Supercal 739 with another threshold than18 °C.

Non-volatile memory

The device parameters, as well as the cumulative values for energy (heat or/and cooling) and volume, monthly values, set day values, values of the pulse input counters 1 and 2, operating hours and error type are stored in a non-volatile memory (EEPROM), where they are saved even in case of a power failure (e.g. changing batteries). Once an hour and in the event of battery failure, the cumulative values are updated in the EEPROM.

Monthly values

At the end of each month, the monthly values are stored.
Depending on the configuration, a total of 18 monthly values of heat or/and cooling energy, volume and of the additional pulse inputs 1 and 2 are memorized in the calculator.

Pulse inputs

As an option the Supercal 739 offers the possibility to integrate two additional pulse inputs such as from a hot water and a cold water meter.

Communication options

Several communication interfaces are available. The configuration of the selected communication option of the Supercal 739 can be carried out with the free software Prog7x9 from Sontex.

Installation

Pipeline	horizontal	
	vertical	
Meter head: (for horizontal installation)	upwards	
	to the side	

The Supercal 739 should not be installed on the side where the continuous operating temperature of the liquid exceeds 90 °C or is below 5 °C. See below length of straight section fitted up- or downstream of each flow meter (acc. EN1434):

Singlejet flow sensor:
U3 / D0 for: L=110 mm and L=130 mm

Coaxial multijet flow sensors:
U0 / D0 for: L=110 mm and L=130 mm

Technical Data

Temperature sensors	
Sensor element	Pt 1'000
Connection diagram	2-wire
Diameter	Ø 5.0, Ø 5.2, Ø 6.0 mm
Cables length	1.5 m (fix)

Measurement	
Approved temperature range θ	0 to 110 °C
Approved for long term operating temperature θq	5 to 90 °C
Differential range Δθ	3 to 75 K
Response limit	0.5 K
Temperature resolution t (display)	0.1 °C
Temperature resolution Δt (display)	0.01 K
Temperature-measurement cycle at nominal flow	10 seconds

Calculator general	
Environment class	C
Mechanics	M1
Electronics	E1
Battery protection class	III
Cable connection between flow sensor and calculator	0.6 m, fix
Integrator protection index	IP65
Operating temperature	5 to 55 °C
Operating temperature with radio option	5 to 40 °C
Storage and transport temperature	-10 to 60 °C

Display & Display units	
LCD with 8-digits	e.g 99'999'999 kWh; 999'999,99 m^3
Energy	kWh, MWh, GJ
Volume	m^3
Additional pulse inputs	Volume or without unit (pulses)
Temperature	°C
Δ Temperature	K

Power supply	
Lithium Metal Battery (≤1 g) 3 VDC	6+1 (1 battery) or 12+1-year (2 batteries)

M-Bus (power and communication over M-Bus)	
Protocol	Wired M-Bus according EN 13757
M-Bus standard load	2 standard loads (3 mA)
Standard baud rate	2400 Baud
Standard data set	Fabrication nr., energy (heat or/and cooling), volume, flow, power, temperatures (supply, return, difference), operating time, date and time, yearly key date values (energy and volume), software version, hardware version

Pulse outputs	
Open drain (MOS Transistor)	1 Hz, 500 ms Vcc_{max}: 35 V DC; Icc_{max}: 25 mA

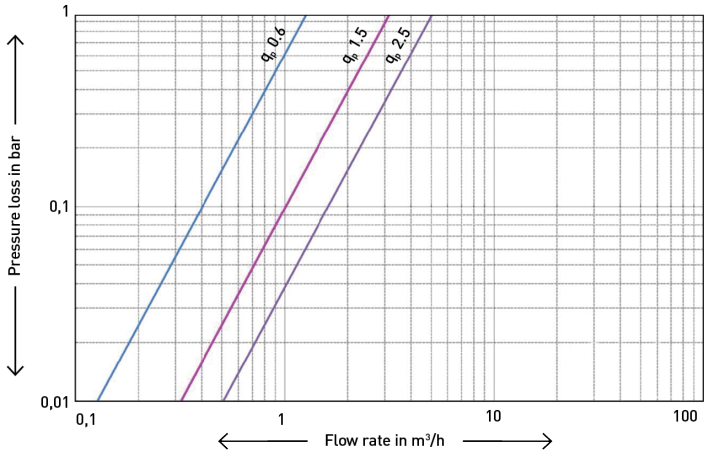
Pulse inputs (e.g. for a water meter with dry contact output)	
Internal power supply	2.3 VDC
R (internal pull-up)	2 MΩ
Pulse factor	0 to 999.999 m^3/Imp or without unit

Singlejet Flow Sensor

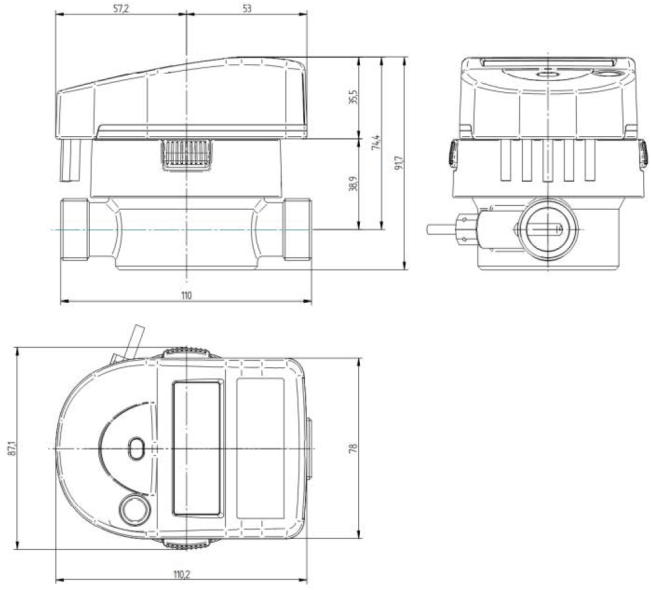
q_p	Threaded connection		Mounting length	Mat.	PN	Maximum flow rate q_s	Minimum flow rate q_i	Low flow threshold value (50°C)	Threaded hole for T-Sensor	Total meter weight	Kvs value (20°C)	Pressure loss at q_p
m^3/h	G" (EN ISO 228-1)	DN	mm		bar	m^3/h	l/h h / v[1)]	l/h		kg	m^3/h	bar
0.6	3/4"	(15)	110	Br	16	1.2	12 / 24	3	Yes	0.8	1.3	0.22
1.5	3/4"	(15)	110	Br	16	3.0	30 / 60	3	Yes	0.9	3.2	0.22
1.5	1"	(20)	130	Br	16	3.0	30 / 60	3	Yes	1.0	3.2	0.22
2.5	1"	(20)	130	Br	16	5.0	50 / 150	8	Yes	1.1	5.1	0.24

1) h / v: Horizontal mounting / vertical mounting; Br: brass; 16 bar = 1.6 MPa

Typical Head Loss Curve



Dimension Diagram



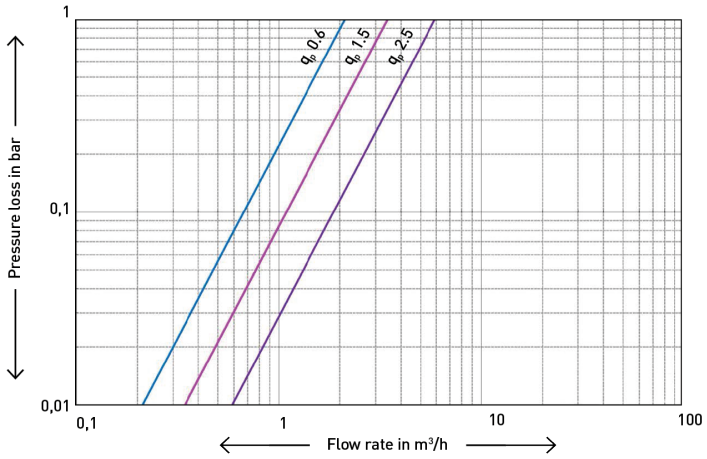
Calculator	110.2 mm x 87.1 mm
Height total	91.7 mm
Height from pipe centre line (with calculator)	74.4 mm
Height from pipe centre line (without calculator)	38.9 mm

Coaxial Multijet Flow Sensor with G2" connection

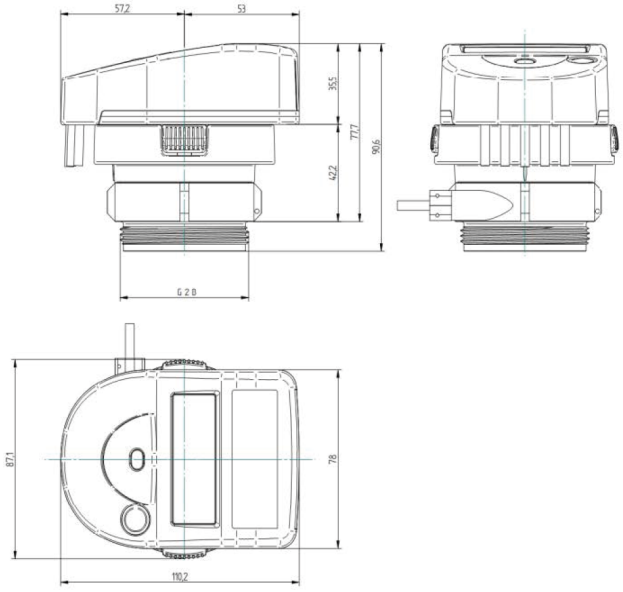
q_p	Threaded connection EAS[1)]		Mounting length	Mat.	PN	Maximum flow rate q_s	Minimum flow rate q_i	Low flow threshold value (50°C)	Threaded hole for T-Sensor	Total meter weight	Kvs value (20°C)	Pressure loss at q_p
m^3/h	G" (EN ISO 228-1)	DN	mm		bar	m^3/h	l/h	l/h		kg	m^3/h	bar
0.6	3/4"	(15)	110	Br	16	1.2	12	8	Yes	0.6	1.7	0.08
1.5	3/4"	(15)	110	Br	16	3.0	15	10	Yes	0.6	3.4	0.19
1.5	1"	(20)	130	Br	16	3.0	15	10	Yes	0.6	3.4	0.19
2.5	1"	(20)	130	Br	16	5.0	25	17	Yes	0.7	5.9	0.18

1) EAS: Base; Br: brass; 16 bar = 1.6 MPa

Typical Head Loss Curve



Dimension Diagram



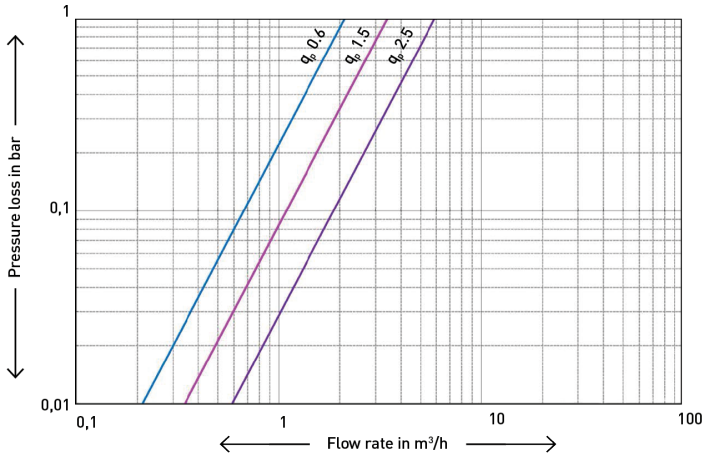
Calculator	110.2 mm x 87.1 mm
Height total	90.6 mm
Height from pipe centre line (with calculator)	77.7 mm
Height from pipe centre line (without calculator)	42.2 mm

Coaxial Multijet Flow Sensor with M77 x 1.5 connection

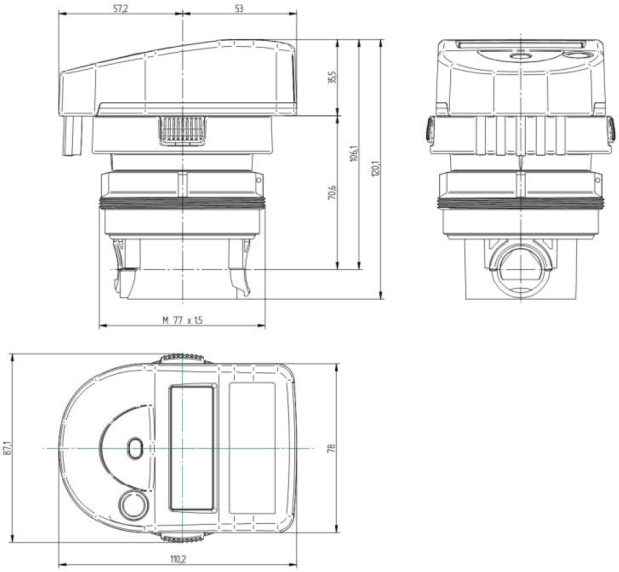
q_p	Threaded connection EAS[1]		Mounting length	Mat.	PN	Maximum flow rate q_s	Minimum flow rate q_i	Low flow threshold value (50°C)	Threaded hole for T-Sensor	Total meter weight	Kvs value (20°C)	Pressure loss at q_p
m^3/h	G" (EN ISO 228-1)	DN	mm		bar	m^3/h	l/h	l/h		kg	m^3/h	bar
0.6	3/4"	(15)	110	Br	16	1.2	12	8	Yes	0.8	1.7	0.08
1.5	3/4"	(15)	110	Br	16	3.0	15	10	Yes	0.8	3.4	0.19
1.5	1"	(20)	130	Br	16	3.0	15	10	Yes	0.8	3.4	0.19
2.5	1"	(20)	130	Br	16	5.0	25	17	Yes	0.8	5.9	0.23

1) EAS: Base; Br: brass; 16 bar = 1.6 MPa

Typical Head Loss Curve



Dimension Diagram



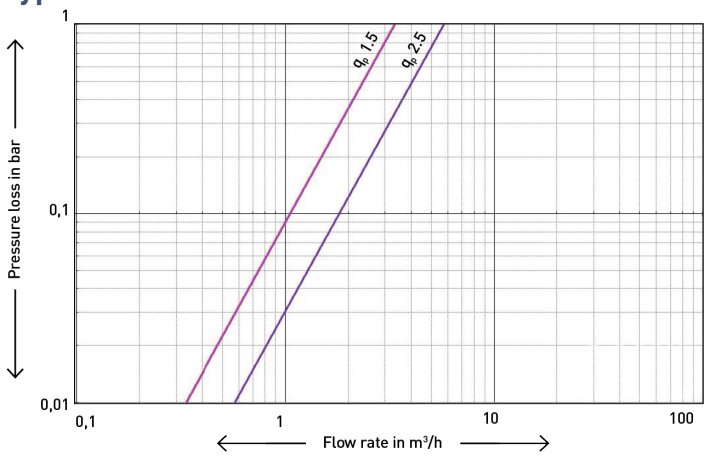
Calculator	110.2 mm x 87.1 mm
Height total	120.1 mm
Height from pipe centre line (with calculator)	106.1 mm
Height from pipe centre line (without calculator)	70.6 mm

Coaxial Multijet Flow Sensor with M62 x 2 connection

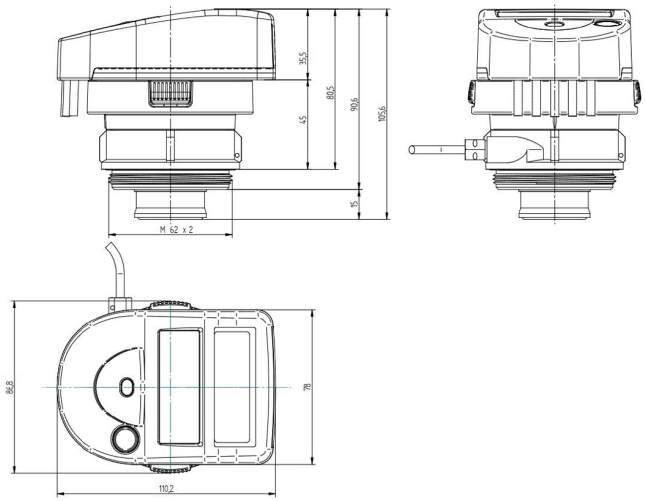
q_p	Threaded connection EAS[1]		Mounting length	Mat.	PN	Maximum flow rate q_s	Minimum flow rate q_i	Low flow threshold value (50°C)	Threaded hole for T-Sensor	Total meter weight	Kvs value (20°C)	Pressure loss at q_p
m^3/h	G" (EN ISO 228-1)	DN	mm		bar	m^3/h	l/h	l/h		kg	m^3/h	bar
1.5	3/4"	(15)	110	Br	16	3.0	30	10	Yes	0.7	3.4	0.20
1.5	1"	(20)	130	Br	16	3.0	30	10	Yes	0.7	3.4	0.20
2.5	1"	(20)	130	Br	16	5.0	50	15	Yes	0.7	5.7	0.19

1) EAS: Base; Br: brass; 16 bar = 1.6 MPa

Typical Head Loss Curve



Dimension Diagram



Calculator	110.2 mm x 86.8 mm
Height total	105.6 mm
Height from pipe centre line (with calculator)	90.6 mm
Height from pipe centre line (without calculator)	45 mm