

Supercal 739

Compact thermal energy meter



Single Jet



Coaxial Multi- Jet meter with thread G2"



Coaxial Multi- Jet meter with thread M77 x 1.5



Coaxial Multi- Jet meter with thread M62 x 2

Application

The Supercal 739 is an autonomous compact thermal energy meter consisting of a flow meter, a detachable calculator with a wide range of communications options and a pair of temperature sensors. It's used in home automation, local and district heating/cooling systems to measure the consumption of heating or/and cooling energy for individual billing.

The Supercal 739 is available in various models, measures the temperature within the range of 0°C to 110°C and meets the requirements of the European Measuring Instruments Directive (MID) 2014/32/EU and the standard EN 1434 class 3.

Features

- Configured as a heat meter MID with temperature sensors Ø 5, Ø 5.2 or Ø 6 mm with 1.5m cable.
- Optical interface for readout and 6+1 years battery
- Easy to operate and read
- Non-volatile EEPROM memory, that keeps stored data even in case of power failure
- 18 monthly energy values for heat energy and volume
- Self-monitoring and error display

Models

The Supercal 739 is available in the following model:

- Mechanical flow meter for flows qp 0.6 m³/h, qp 1.5 m³/h, qp 2.5 m³/h with
 - Single jet flow sensor
 - Coaxial multi jet flow sensor with G2" or M77x1,5 thread
 - Coaxial multi jet flow sensor with M62x2 thread for flows qp1.5 and qp2.5 m³/h

Sizes

The Supercal 739 single jet is available in the following sizes:

- qp 0.6 m³/h, L= 110 mm
- qp 1.5 m³/h, L= 110 mm or 130 mm
- qp 2.5 m³/h, L= 110 mm or 130 mm

Options

The Supercal 739 can be ordered with following options:

- Ø 5,2 mm or Ø 6 mm temperature sensors
- 12+1 years battery
- One of the following communications options:
 - Self-powered M-Bus
 - LoRaWAN technology
 - Bidirectional Radio SONTEX interface.
 - Wireless M-Bus.
 - Two pulse outputs either heating or cooling energy consumption and volume, or heating and cooling energy consumption
 - Two additional pulse inputs

Functions

- Measure and record energy consumption and volume of the flow in heating or cooling applications
- Optionally measure and record a second "energy consumption", for heating/cooling applications
- If two additional inputs were configured then records the provided values. The configuration can be done either through the optical interface, or via M-Bus or by radio SONTEX
- Display of consumption data depending on configuration:
 - 18 monthly energy heat, volume and, if configured, energy Tariff 1 (cooling energy)
 - 18 monthly values of additional pulse input 1 and 2 respectively
 - Set day values
- Display operating data including self-monitoring with error display

Temperature sensors

The pair of temperature sensors Pt 1'000 is connected to the calculator and is an integral part of the heat meter. The temperature sensor with no frame marking on the label is fitted close to the flow meter or directly into it. The temperature sensor cable marked with a black frame mark on the label is mounted in the "opposite" pipe (in the other side of the heat exchanging circuit) of the one with the Supercal 739.

The temperature sensors mustn't be changed or modified.

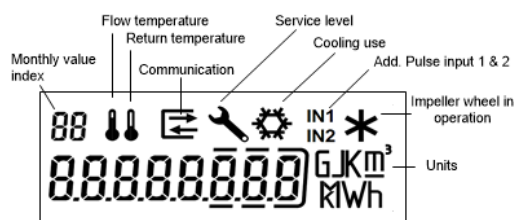
Calculator

The calculator is equipped with a large 8-digits display and can be rotated by 360°. The calculator can be separated from the flow sensor and be installed separately. A cable of 0,6 meter connects the calculator to the flow sensor.

The housing has a protection index of IP65 against dust and humidity.

Display

The LCD display of the Supercal 739 has a large, clear design and high contrast, making it easy to read the data



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

Measuring principle

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

Energy calculation

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

Cooling energy

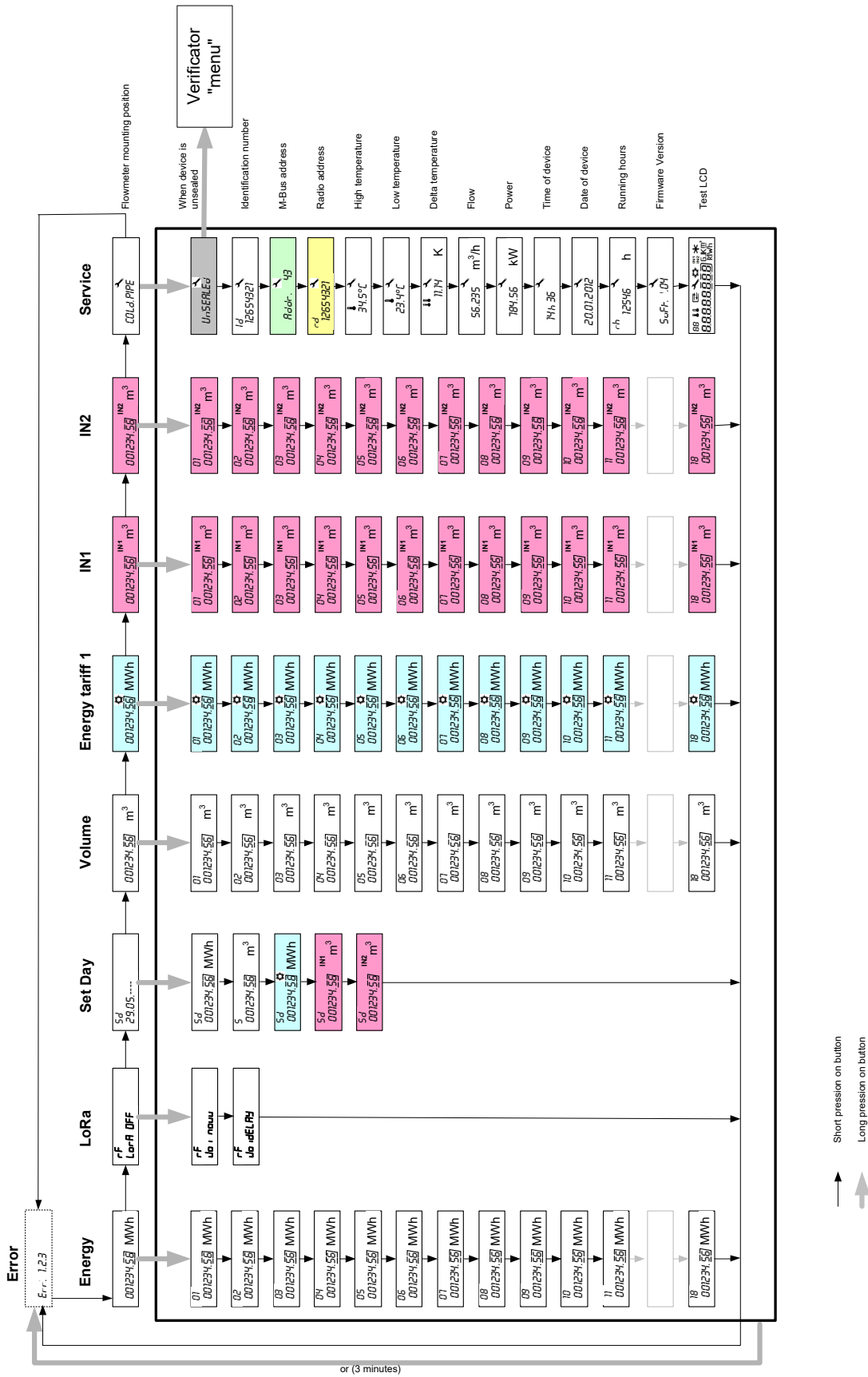
The cooling energy in combined heat/cooling applications is stored in another memory than the heat energy and will be cumulated only if the two following conditions are fulfilled:

Temperature difference(Δt) < -0.5K

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 than the 18°C.

Display sequences



Non-volatile memory

The device parameters, as well as the cumulative values for energy and volume, cooling energy, 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 energy, volume, cooling energy and of the additional pulses 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.

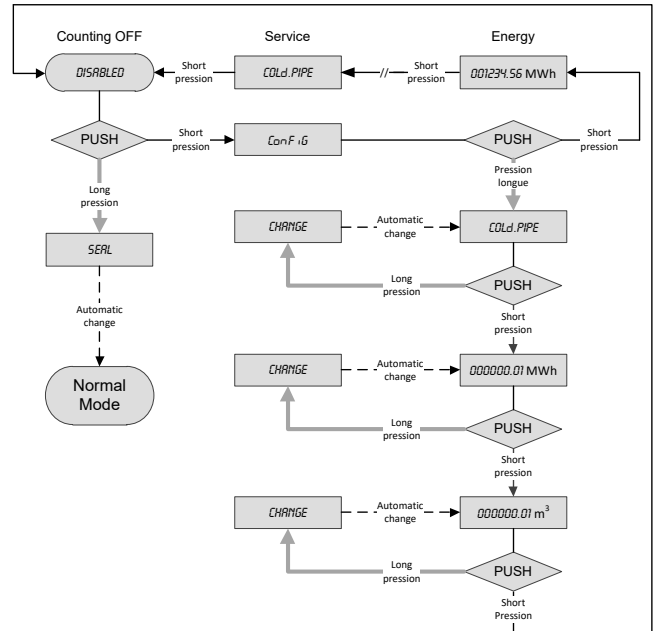
Communication options

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.

Configuration

The heat meter is delivered ex works in the "storage" mode, it means it does not count and the display shows "Disabled". The storage mode is active as long as the meter is not sealed "Seal". Optionally, the "Config" menu can be ordered in addition. The transition from "storage" mode to "Config" menu is made with a short press on the orange navigation button. Another short press gives access to the whole sequence of the "Normal" mode. In the "Config" menu, a long press on the button will change the below settings:

- Flow meter mounting position in the installation. Hot (HOT PIPE) or cold side (COLD PIPE).
- Energy unit (0.1kWh, 1 kWh, 0.001MWh, 0.01MWh, 0.001GJ and 0.01GJ).
- Volume unit (0.01 m³ and 0.001m³)



Technical Data

Temperature sensors	<ul style="list-style-type: none"> ■ Temperature sensors 2 wires ■ Diameter ■ Cables lenght 	Pt1000 ø 5, ø 5.2 , ø 6 mm 1.5 m
Measurement	<ul style="list-style-type: none"> ■ Approved temperature range ■ Approved for long term operating temperature range ■ Differential range ■ Response limit ■ Temperature resolution (display) ■ Temperature resolution ΔT (display) ■ Temperature measurement cycle at nominal flow 	0° ...110°C 5°... 90°C 3...75 K 0.5 K 0.1°C 0.01 K 20 seconds
Calculator	<ul style="list-style-type: none"> ■ Environment class ■ Mechanics ■ Electronics ■ Battery protection class ■ Protection class ■ Cable length between flow sensor and calculator ■ Operating temperature (electronic circuits) ■ Operating temperature (version with radio) ■ Storage and transport temperature 	C M1 E1 III IP65 0.6 m 5...55°C 5...40°C -10...60°C (dry environment)
Display & Display units	<ul style="list-style-type: none"> ■ 8-digits LCD ■ Energy ■ Volume ■ Additional pulse inputs ■ Temperature ■ Δ Temperature 	kWh, MWh, GJ m ³ Volume or pulses °C K
Power supply	<ul style="list-style-type: none"> ■ 3 VDC Lithium Battery 	6+ 1 or 12+ 1 years
Radio communication	<p>Sontex Radio</p> <ul style="list-style-type: none"> ■ Frequency ■ Communication ■ Protocol ■ Encryption ■ Transmission power ■ Transmission interval <p>wM-Bus</p> <ul style="list-style-type: none"> ■ Frequency ■ Communication ■ Protocol ■ Encryption ■ Transmission power ■ Transmission interval <p>LoRaWAN®</p> <ul style="list-style-type: none"> ■ Frequency ■ Communication ■ Protocol ■ Encryption ■ Transmission power ■ Transmission interval ■ Uplink / Downlink 	<p>433.82 MHz bidirectional Radian 0 AES 128 10 mW (10 dBm) on request</p> <p>868.95 MHz unidirectional wM-Bus EN13757-4 AES 128 25 mW (14 dBm) Standard 120 sec. (Mode T1, C1 encryption mode 5, 7), 24/24 or 12/24 (Walk-by), 7/7</p> <p>EU868 bidirectional class A according EN60870-5 AES 128 25 mW (14 dBm) from 1h to 4h depending on the network data coded according to EN60870-5 (M-Bus)</p>
Pulse output	<ul style="list-style-type: none"> ■ Open drain (MOS Transistor) Vccmax : 35 VDC ; Iccmax : 25 mA 	1 Hz, 500 ms
Pulse input with a dry contact	<ul style="list-style-type: none"> ■ Power supply internal ■ Rpull UP internal ■ Pulse factor 	2.3 VDC 2 MΩ 0...999.999 m ³ /pulse or without unit
Powered by M-Bus line	<ul style="list-style-type: none"> ■ 1 device = 2M-Bus charges 	max 2 x 1.5 mA
Metrological class		EN 1434 class 3
Examination type	<ul style="list-style-type: none"> ■ Heating ■ Cooling 	CH-MI004-13018 DE-16-M-PTB-0083

Single jet flow meter

Qp	Threaded connection		Mounting length	Mat	PN	Maximal flow qs	Minimal flow qi	Low flow threshold value (50°C)	Threaded hole for sensor	Total Meter Weight	Kvs value (20°C)	Pressure loss at qp
	G"	DN										
	(EN ISO 228-1)						* (h / v)					
0.6	3/4"	(15)	110	Brass	16	1.2	12 / 24	3	yes	0.8	1.3	0.22
1.5	3/4"	(15)	110	Brass	16	3.0	30 / 60	3	yes	0.9	3.2	0.22
1.5	1"	(20)	130	Brass	16	3.0	30 / 60	3	yes	1.0	3.2	0.22
2.5	1"	(20)	130	Brass	16	5.0	50 / 100	3	yes	1.1	5.1	0.24

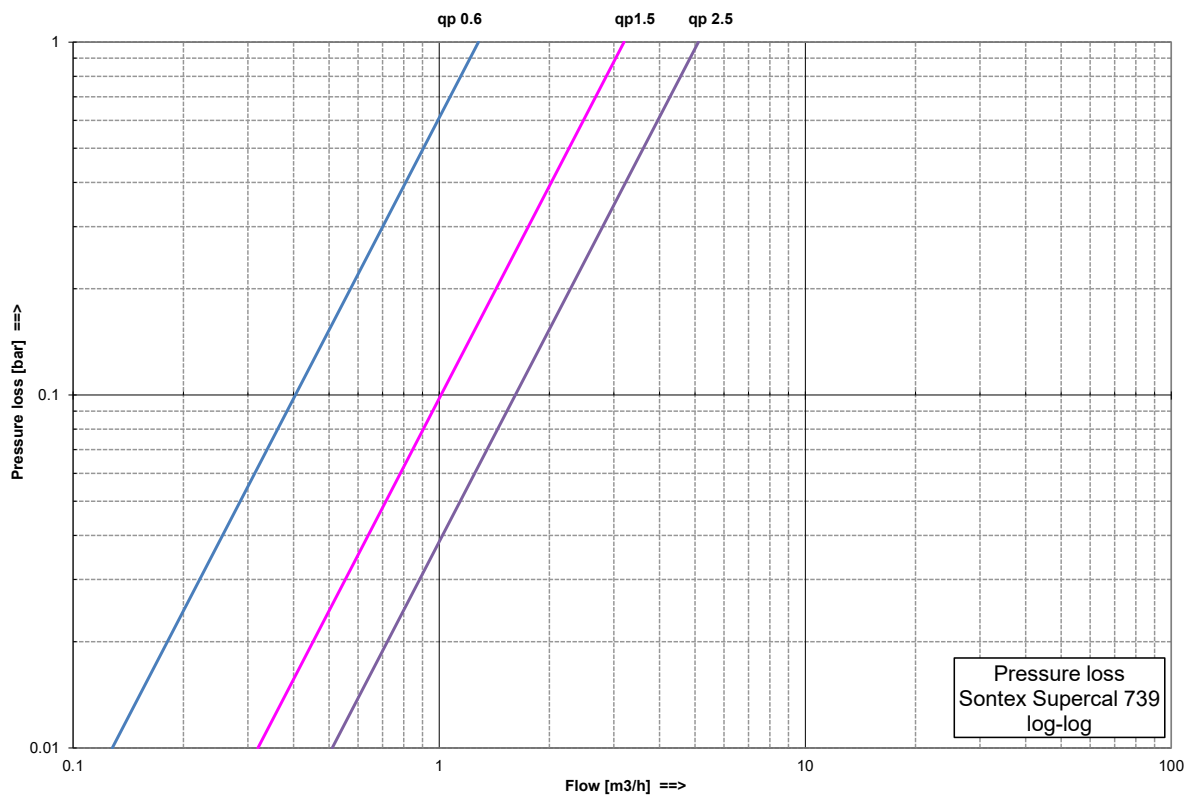
*(h/v): horizontal / vertical mounting 16 bar = 1.6 MPa

Mounting

The Supercal 739 should not be mounted on the side where the continuous operating temperature of the liquid exceeds 90°C or is below 5°C.

Length of straight section fitted upstream/downstream of each flow meter (EN1434): U3 / D0 for: L=110mm and L=130mm

Pressure loss curve



Coaxial multi jet meter with G2" connection

Qp	Threaded connection *EAS		Mounting length *EAS mm	Mat	PN	Maximal flow qs m³/h	Minimal flow qi l/h	Low flow threshold value (50°C) l/h	Threaded hole for sensor	Total Meter Weight Kg	Kvs value (20°C) m³/h	Pressure loss at qp bar
	G"	DN										
m³/h	G"	DN	mm		bar	m³/h	l/h	l/h		Kg	m³/h	bar
	(EN ISO 228-1)											
0.6	3/4"	(15)	110	Brass	16	1.2	12	8	yes	0.6	1.7	0.08
1.5	3/4"	(15)	110	Brass	16	3.0	15	10	yes	0.6	3.4	0.19
1.5	1"	(20)	130	Brass	16	3.0	15	10	yes	0.6	3.4	0.19
2.5	1"	(20)	130	Brass	16	5.0	25	17	yes	0.7	5.9	0.18

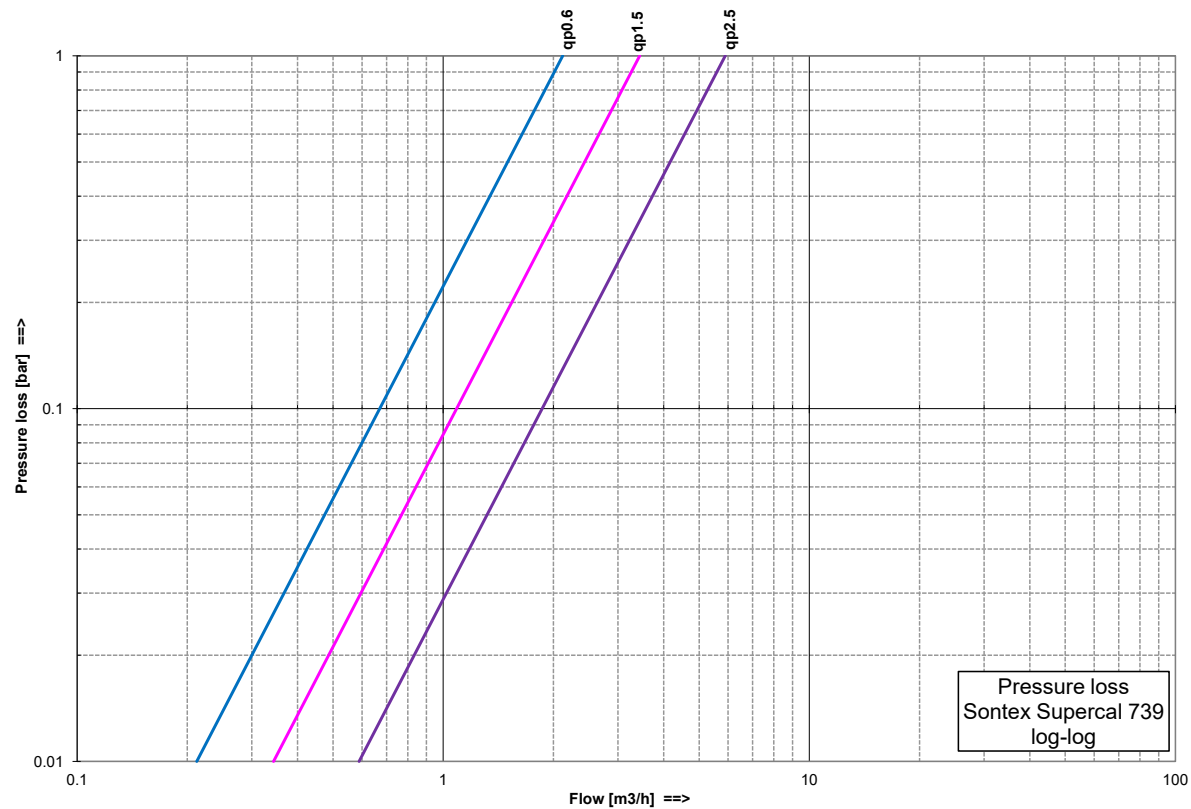
*EAS = base 16 bar = 1.6 MPa

Mounting

The Supercal 739 should not be mounted on the side where the continuous operating temperature of the liquid exceeds 90°C or is below 5°C.

Length of straight section fitted upstream/downstream of each flow meter (EN1434): U0 / D0 for: L=110mm and L=130mm

Pressure loss curve



Coaxial multi jet meter with M77 x 1.5 connection

Qp	Threaded connection *EAS		Mounting length *EAS	Mat	PN	Maximal flow qs	Minimal flow qi	Low flow threshold value (50°C)	Threaded hole for sensor	Total Meter Weight	Kvs value (20°C)	Pressure loss at qp
	G"	DN										
m ³ /h	G"	DN	mm		bar	m ³ /h	l/h	l/h		Kg	m ³ /h	bar
	(EN ISO 228-1)											
0.6	3/4"	(15)	110	Brass	16	1,2	12	8	yes	0.8	1.7	0.08
1.5	3/4"	(15)	110	Brass	16	3,0	15	10	yes	0.8	3.4	0.19
1.5	1"	(20)	130	Brass	16	3,0	15	10	yes	0.8	3.4	0.19
2.5	1"	(20)	130	Brass	16	5,0	25	17	yes	0.9	5.2	0.23

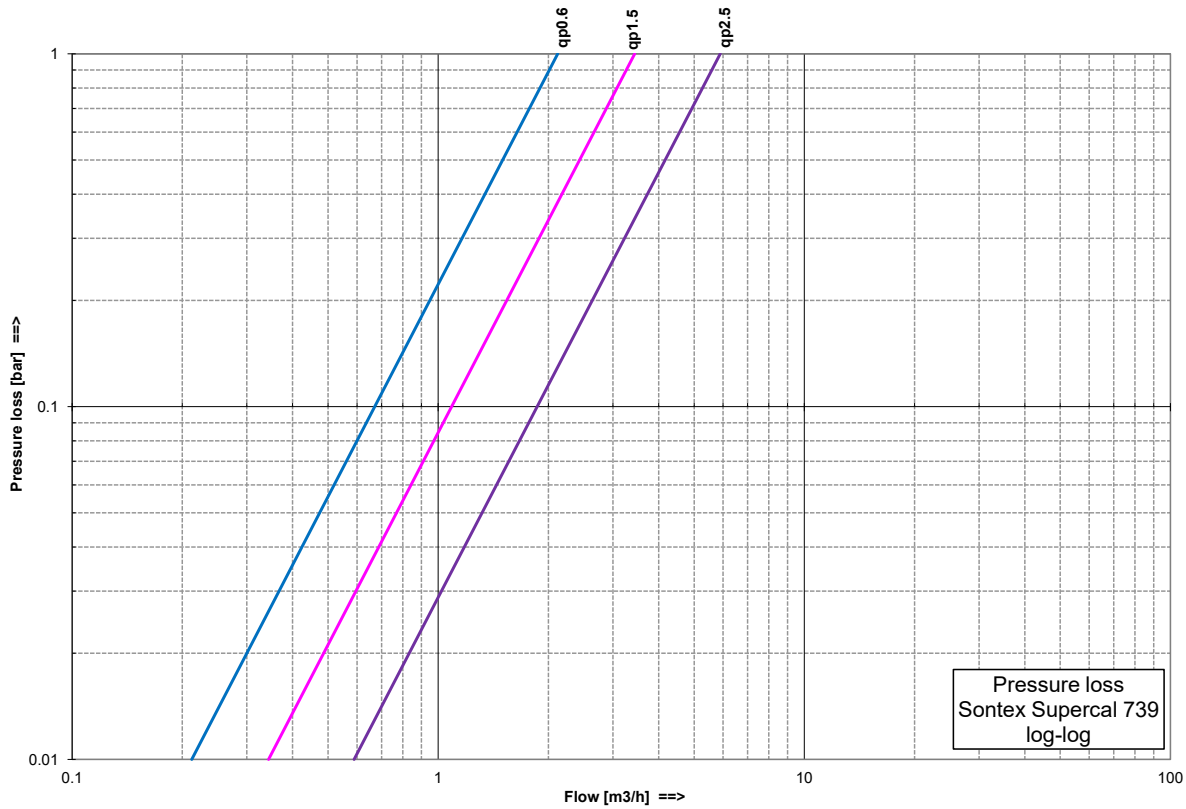
*EAS = base 16 bar = 1.6 MPa

Mounting

The Supercal 739 should not be mounted on the side where the continuous operating temperature of the liquid exceeds 90°C or is below 5°C.

Length of straight section fitted upstream/downstream of each flow meter (EN1434): U0 / D0 for: L=110mm and L=130mm

Pressure loss curve



Coaxial multi jet meter with M62 x 2 connection

Qp	Threaded connection *EAS		Mounting length *EAS	Mat	PN	Maximal flow qs	Minimal flow qi	Low flow threshold value (50°C)	Threaded hole for sensor	Total Meter Weight	Kvs value (20°C)	Pressure loss at qp
	G"	DN										
m ³ /h	G"	DN	mm		bar	m ³ /h	l/h	l/h		Kg	m ³ /h	bar
	(EN ISO 228-1)											
1.5	3/4"	(15)	110	Brass	16	3.0	30	10	yes	0.7	3.4	0.20
1.5	1"	(15)	130	Brass	16	3.0	30	10	yes	0.7	3.4	0.20
2.5	1"	(20)	130	Brass	16	3.0	50	15	yes	0.7	5.7	0.19

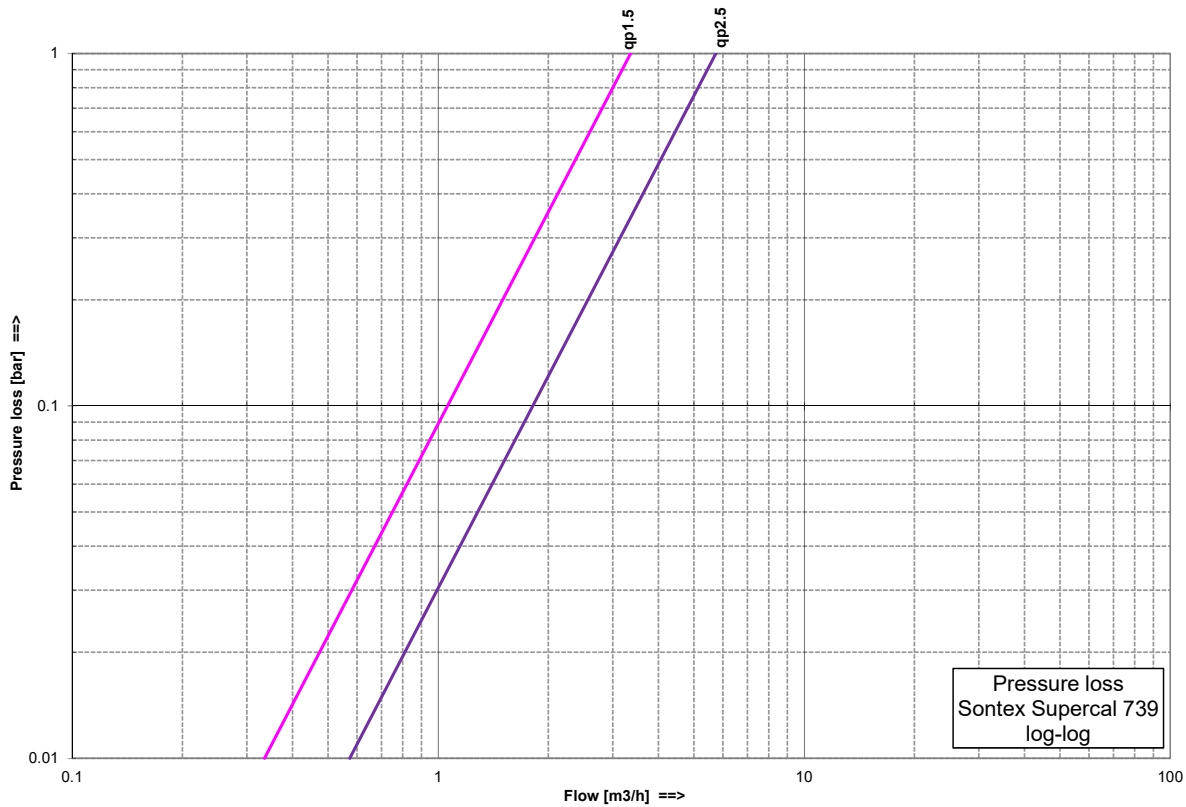
*EAS = base 16 bar = 1.6 MPa

Mounting

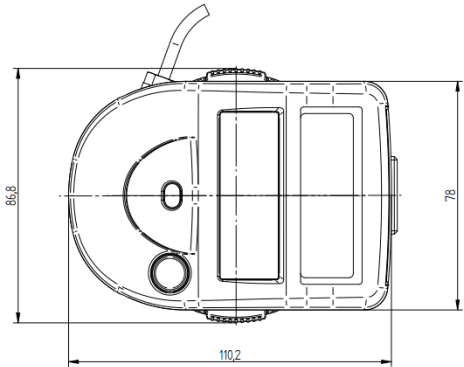
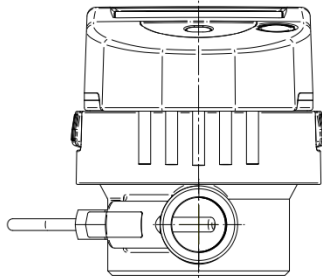
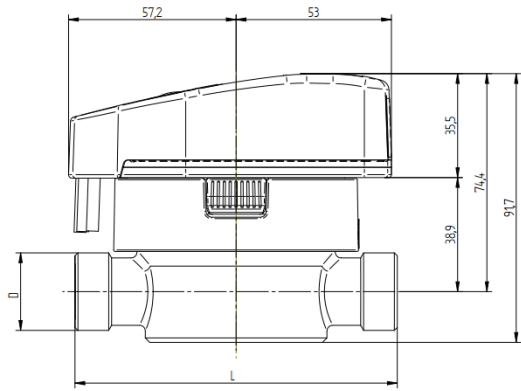
The Supercal 739 should not be mounted on the side where the continuous operating temperature of the liquid exceeds 90°C or is below 5°C.

Length of straight section fitted upstream/downstream of each flow meter (EN1434): U0 / D0 for: L=110mm and L=130mm

Pressure loss curve

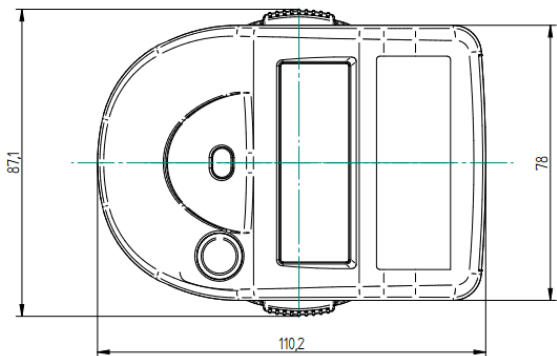
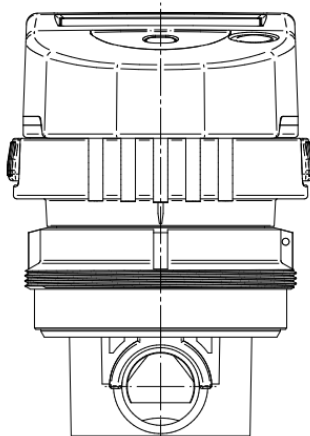
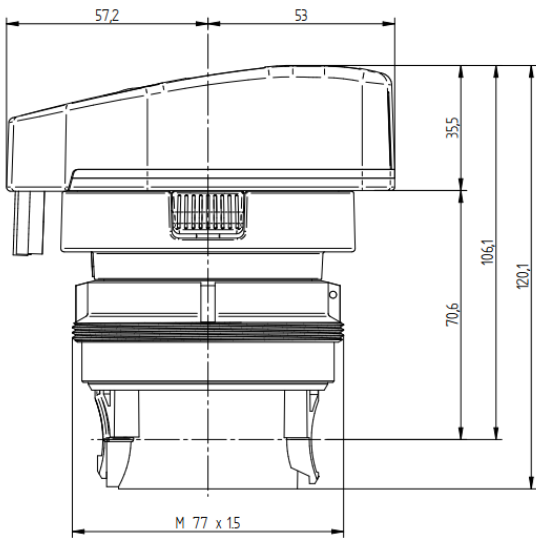


Dimension single jet mechanical thermal energy meter

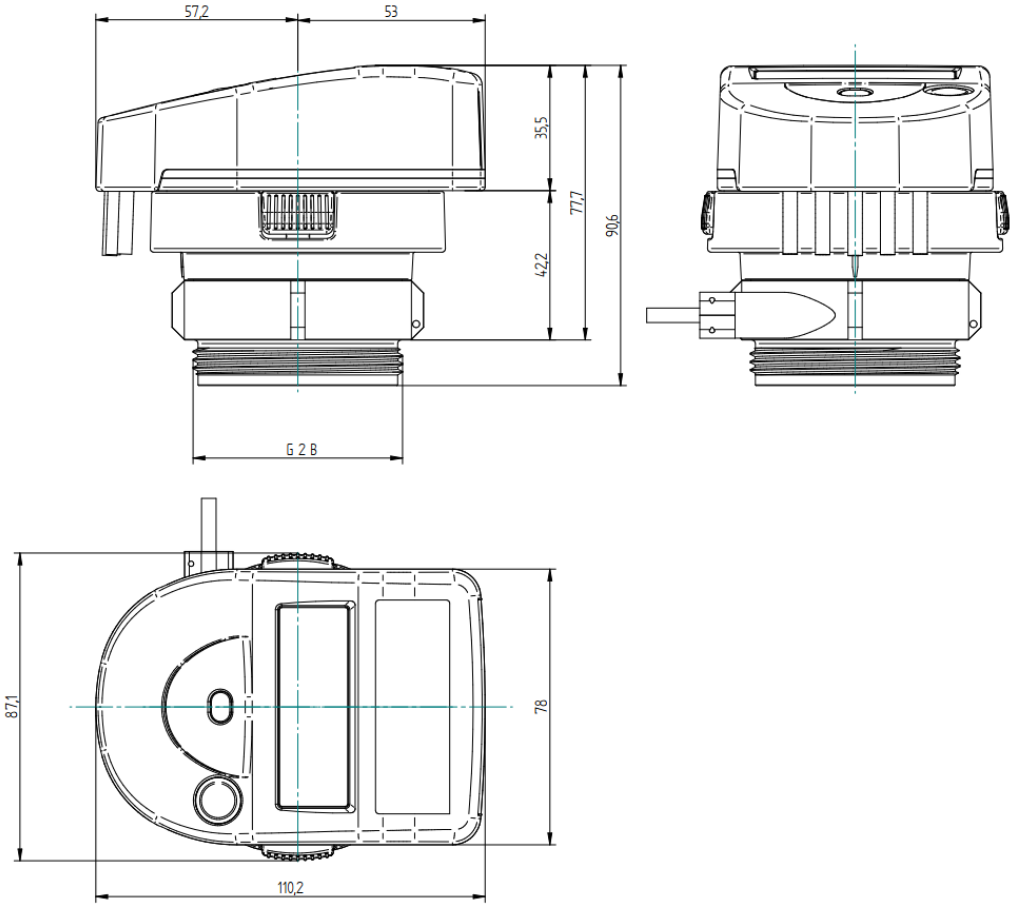


Nominal flow	qp	m ³ /h	0.6	1.5	1.5	2.5
Nominal diameter	DN	mm	15	15	20	20
Connection thread	D	G"	3/8	3/8	1	1
Flowmeter length	L	mm	110	110	130	130

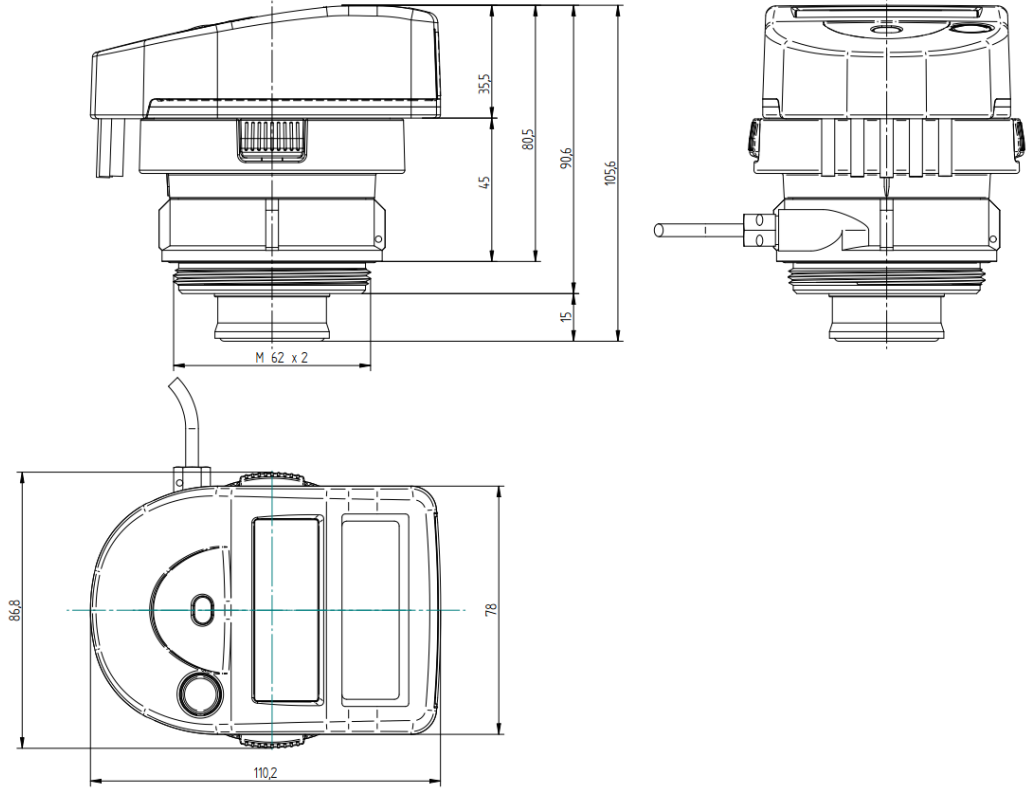
Dimension measuring capsule with M77 x 1.5 connection



Dimension measuring capsule with G2" connection



Dimension measuring capsule with M62 x 2 connection



CE Conformity

according to Directive MID 2014/32/EU
according to RED 2014/53/EU

UKCA Conformity

Technical Support

For technical support, please contact your local Sontex agent or Sontex SA directly.

Sontex Hotline

support@sontex.ch, +41 32 488 30 04

Specifications are subject to change without notice.