

Supercal 739

Compact thermal energy meter



Instruction for use

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1. Product Description and Intended Use

The compact thermal energy meter *Supercal 739* is a precision measuring instrument approved for individual metering of heating systems and must be handled with care.

The *Supercal 739* is available in a heating or cooling or heating/cooling version and determines the thermal and/or cold energy exchanged by a heat-bearing fluid in a heat exchanger circuit.

The *Supercal 739* complies with the requirements of the European Directive MID 2014/32/EU modules B and D and of the standard EN 1434 class 3.

2. Symbols

Symbol	Significance
 WARNING	WARNING! Failure to observe these warnings may lead to death or serious injury.
 CAUTION	CAUTION! Failure to observe these warnings may lead to moderate injury
 NOTICE	NOTICE! Failure to observe these warnings may result in damage to property.
	INFORMATION Information that is important for a specific topic or goal, but not relevant to security.
	Disposal This symbol indicates that electrical and electronic equipment must be disposed separately. Do not dispose of the calculator with household waste.

3. Scope of delivery

One box contains 1 thermal energy meter, 1 pair of seals and their wire, 1 pair of gasket, 1 installation guide.

4. Target user and personnel qualification

The compact thermal energy meter may only be installed or replaced by qualified personnel for sanitary, heating and air-conditioning technology.

5. Safety precautions

document. Installation and maintenance must only be carried out by a trained and authorized specialist.

WARNING

Improper installation, pressure tests, modifications or incorrect operation can cause personal injury and damage to property.

WARNING

The calculator contains a lithium batterie, therefore:

- Do Not Open or Damage: The battery must not be charged, replaced, or short-circuited.
- Avoid Heat & Fire: Do not expose to temperatures above 70°C or throw into fire.

- Handle Leaks Safely: If the device is damaged and leaks electrolyte, avoid contact with skin/eyes and do not inhale fumes. Move to fresh air and seek medical advice if needed.

NOTICE

The thermal energy meter must be used within the conditions indicated on the thermal energy meter; the metrological seals have to stay intact.

NOTICE

Devices with activated radio are not permitted in air freight.

6. Technical data

Technical data of the *Supercal 739* are available on the datasheet at the following link:



7. Precautions of use

General precautions of use:

NOTICE

Safe operation of the equipment can only be guaranteed if the instruction for use have been read and the safety instructions contained therein have been observed.



- In the event of non compliancy to these instructions, the device may be destroy and Sontex declines all liability, warranty and guarantee for correct metrology. Sontex will not be liable in the event of any modification of the metrological data or of the measurement parameters if any of manufacturer's seals is damaged. The seals can only be applied by authorised people in conformity to national legislation related to legal metrology.
- To protect the system against all unauthorised manipulations, the thermal energy meter, the connection screws, the temperature sensors and the sensor pockets must all be sealed. It is important for the wire seal to be as short as possible so that it is slightly taut. This is the only way of preventing malicious interference.
- Outside installation and flooding are not allowed.
- The cable between the flow sensor and the calculator **cannot** be shortened or extended and must be handle with care (don't pull the cable on calculator or flow meter side).
- All cable must be installed with a minimum distance of 300 mm from heavy voltage and high frequency cables.
- Make sure that the thermal energy meter and the labels can be read easily.
- Generally, avoid an installation situation with an accumulation of heat above average. An above-average heat build-up affects substantially the lifetime of the electronic components.

Temperature sensors precautions of use:



- Only matched pairs are supplied and may not be separated, extended or shortened, since this affects the measuring accuracy.
- Asymmetrical mounting is also possible. In that case the temperature sensor having a cable marked with black frame will be fitted in the other side of the heat exchanging circuit in a sensor pocket.
- In case of use of sensor pockets, only use references that are listed in [Chapter 19.2](#).
- Temperature sensors must be inserted until they stall with the bottom of the sensor pocket and fixed afterwards in case of mounting in pocket.
- A factory seal will be applied to the temperature sensor mounted in flow meter. To mount the temperature sensor on the other side of the installation, the Sontex sticker seal (S written in black on a grey background) or wire seal supplied with the thermal energy meter must be used.
- For the *Supercal 739* with coaxial multi jet meter, the detector support fitted to the flow sensor can't be removed. A factory seal will be applied to the temperature sensor, mounted in the capsule with the threaded union G2". To mount the temperature sensor on the EAS base of the flow sensor with M77x1.5 connection the Sontex seal supplied with the thermal energy meter must be used (S written in black on a grey background).

Flow sensor precaution of use:



Depending on version and use (heat and/or cooling meter), the thermal energy meter must be fitted on the “cold” or “hot” pipe side of the installation in compliance with the indications showed on the LCD display.

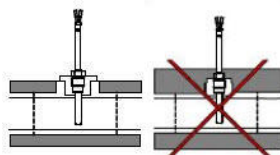
8. System requirements

General requirements:

- All thermal energy meters in the same installation must have the same mounting positions (either all horizontal or all vertical).
- The thermal energy meter should be installed only in leak-tested, rinsed and well-vented pipelines before commissioning.
- Operating conditions: temperatures +5°C to +55°C, relative humidity <95% (non condensing).
- The pipeline must be free of air pockets to ensure accurate measurements.

Temperatures sensor requirements:

- Install the temperature sensor with no frame marking on the label close to the flow meter or directly into it.
- For non-symmetrical integrated temperature sensor pair, restricted rated operating conditions: $q_i \leq 30 \text{ l/h}$ at $\Delta T_{\min} \geq 6 \text{ K}$.
- For cooling applications, insulation must be placed below the temperature sensor fixing screw. This also applies if the sensor is directly fixed in the flow meter:



Flow sensor requirements:

- **Install the flow sensor BEFORE any control valve to prevent interference.**
- Ensure stable pressure with no water hammer to avoid flow sensor damage.
- Install the flow sensor between two shut-off valves for maintenance access.
- Required straight pipe sections (EN1434):
 - Upstream (U3) / Downstream (D0) for $L = 110 \text{ mm}$ and $L = 130 \text{ mm}$.

Calculator requirements:

- Install the calculator away from refrigerating fluid pipes to avoid thermal influence.
- Ensure no condensation water can enter the calculator.
- If vibrations are present, mount the calculator separately on a wall.
- If the fluid temperature regularly reaches 90°C, install the calculator separately from the flow meter.

Radio transmission requirements (Radio Sontex, wM-Bus / OMS[®] or LoRaWAN[®]):

The radio quality must be checked on site. Interference may be caused by heat sources, electromagnetic fields, mobile radio or neighbouring transmitters.

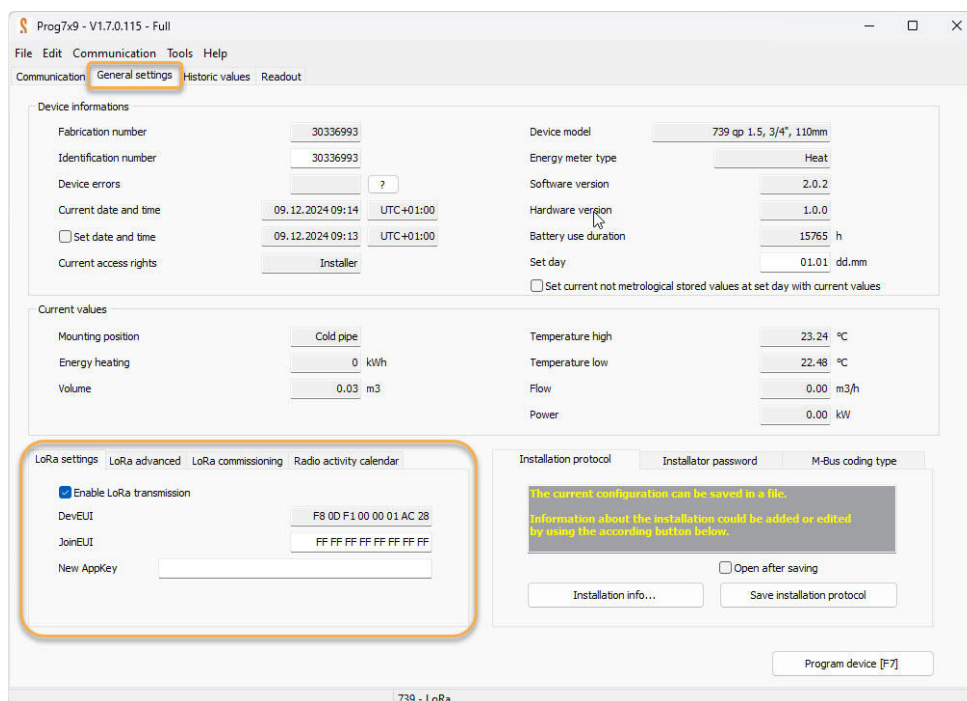
9. Communication interfaces and options

The communication interfaces are installed and preset in the factory. When ordering, you must specify the interface type: LoRaWAN[®], Wireless M-Bus, SONTEx Radio, powered remote M-Bus or pulse inputs/outputs.

The parameters can be set using the *Prog7x9* using the installer licence.

Make a device read out with *Prog7x9* by using the optical head. Make sure that the LED of the optical head is well positioned on the optical interface.

Go to General settings, the communication parameters can be set in down left menu:



9.1 LoRaWAN[®]

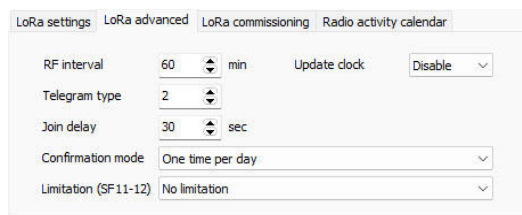


LoRaWAN[®] communication is enabled when the box “Enable LoRa transmission” is checked.

DevEUI: Device identification which is read from the LoRa module. Set in the factory and can't be modified.

JoinEUI: Network identification, which ensures the connection to the network.

New AppKey: You can set a new key for the device by entering it in this cell.



RF interval: Transmission intervals for the telegrams. 60 minutes is the default setting, the reduction of this time reduce the battery lifetime.

Telegram type: See “M-Bus frames 7X9 - LoRAWAN” on Sontex extranet to see the content of each telegram depending of this option (Telegram type 2 = Fport: 2; Telegram type 3 = Fport: 3...)

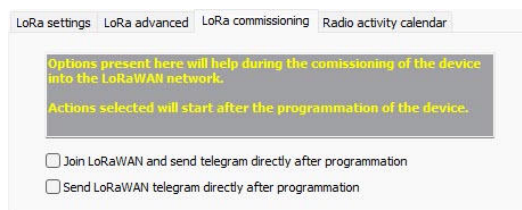
Join delay: In case the thermal energy meter is installed inside a close box, this timing let you close the door/cover before the LoRaWAN[®] join the network. Target is to check that communication is working properly with the door closed.

Confirmation mode: The confirmation of telegrams (acknowledge) by the network server can be activated or deactivated:

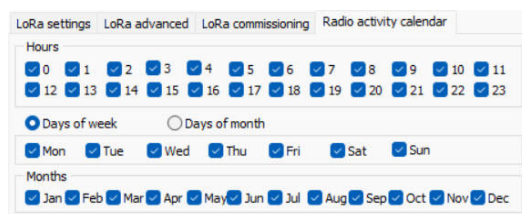
- Disabled
- Enabled for each transmission (not recommended)
- One time per day (midnight)

Limitation (SF11-12): When the LoRaWAN[®] network communication is not optimum and the spreading factor is at 11 or 12, the battery consumption is higher. 1; 2 or 3 telegram can be skip to reduce the battery consupction in SF11 or 12.

Update clock: Time can be update according to time of LoRaWAN[®] network if the option is enable.

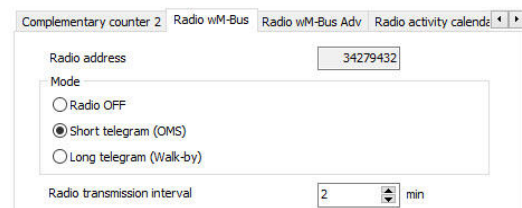


A first join to LoRaWAN[®] network can be done before sending the telegram or a telegram is send immediately without join to LoRaWAN[®] network.



Set the hours, days of the week or of the month, monthes on which telegram will be sent.

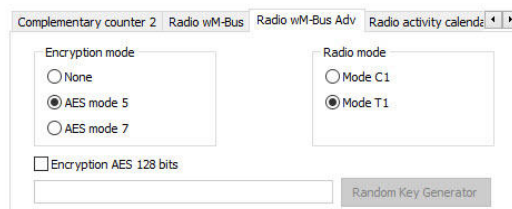
9.2 wM-Bus Radio



Radio address: Displayed on the right and can't be modified.

Mode: wM-Bus / OMS[®] is off when sent from factory, you can activate it during commissioning by selecting “Short telegram (OMS)” or “Long telegram (Walk-by)”.

Radio transmission interval: Transmission intervals for the telegrams. 2 minutes is the default setting, the reduction of this time reduce the battery lifetime.

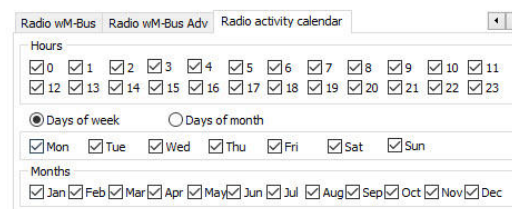


The screenshot shows the 'Radio wM-Bus' settings menu. It has tabs for 'Complementary counter 2', 'Radio wM-Bus', 'Radio wM-Bus Adv', and 'Radio activity calendar'. Under 'Radio wM-Bus', there are two sections: 'Encryption mode' with radio buttons for 'None', 'AES mode 5' (selected), and 'AES mode 7'; and 'Radio mode' with radio buttons for 'Mode C1' and 'Mode T1' (selected). There is a checkbox for 'Encryption AES 128 bits' which is unchecked, and a 'Random Key Generator' button.

Encryption mode: Can be set to None, AES mode 5 or AES mode 7

Radio mode: Can be set to Mode C1 or Mode T1

Encryption AES 128 bits: Encryption key can be enabled. You can also set a new key for the device by enter it or have a random one by pressing on “Random Key Generator”.

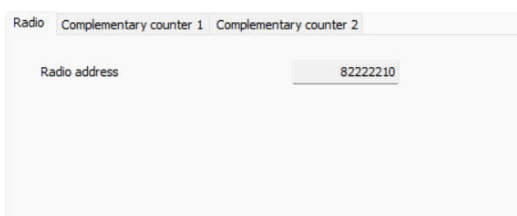


The screenshot shows the 'Radio wM-Bus Adv' settings menu. It has tabs for 'Radio wM-Bus', 'Radio wM-Bus Adv', and 'Radio activity calendar'. Under 'Radio wM-Bus Adv', there are three sections: 'Hours' with checkboxes for each hour from 0 to 23 (all checked); 'Days of week' with radio buttons for 'Days of week' (selected) and 'Days of month', and checkboxes for each day of the week (all checked); and 'Months' with checkboxes for each month from Jan to Dec (all checked).

Set the hours, days of the week or of the month, monthes on which telegram will be sent.

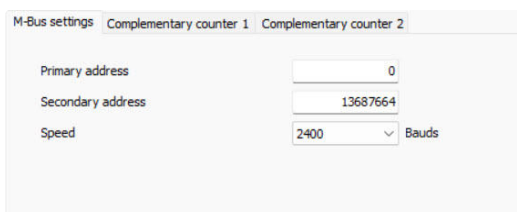
9.3 SONTEx Radio

SONTEX Radio has no parameters to be set. The *Prog7x9* can be used only to see the radio address in the “general setting” menu.



The screenshot shows the 'Radio' settings menu. It has tabs for 'Radio', 'Complementary counter 1', and 'Complementary counter 2'. Under 'Radio', there is a 'Radio address' field with the value '82222210'.

9.4 Powered remote M-Bus



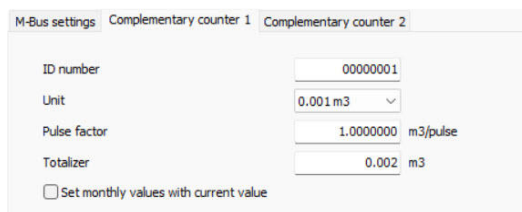
The screenshot shows the 'M-Bus settings' menu. It has tabs for 'M-Bus settings', 'Complementary counter 1', and 'Complementary counter 2'. Under 'M-Bus settings', there are three fields: 'Primary address' with the value '0', 'Secondary address' with the value '13687664', and 'Speed' with a dropdown menu showing '2400' and 'Bauds'.

By default, the primary address will be configured with the address 0 and the secondary address will correspond to the serial number of the device.

Default communication speed is 2400 Bauds and can be set to 300.

9.5 Pulse input function

The thermal energy meter offers the possibility of integrating up to two further pulse input from other meters, for instance a hot water and a cold water meter.



ID number: Serial number of the external device can be enter in this field.

Unit: Can be set to 0.001m^3 ; 0.01m^3 ; 0.1m^3 ; 1m^3 or without unit.

Pulse factor: By default, the pulse factor will be 1 Pulse/Unit for each pulse input.

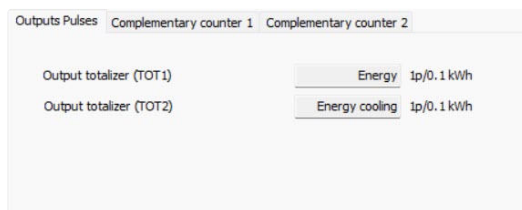
Totalizer: If the external device has already counted, the value can be entered in this cell.

By clicking on “Set monthly values with current value”, the 18 monthly values will be set with the value entered in the totalizer.

The meter data are aggregated separately in totalizers and can be shown on the display as IN1 and IN2; they can also be transferred via the communication interface which is installed in the calculator.

9.6 Pulse output function

If ordered, the thermal energy meter offers the possibility of integrating two open collectors pulse outputs which can represent hot energy, cold energy or volume.



For a heating or cooling application :

- Output S1 = Heating or cooling energy
- Output S2 = Volume

For a heating and cooling application:

- Output S1 = Heating energy
- Output S2 = Cooling energy

Whenever the smallest energy unit (hot or/and cold) or volume displayed on the screen is incremented, 1 pulse will be transmitted on the corresponding output cable S1/S2.

Example for energy:

Display 1234567,8 kWh ==> output pulse value for energy = 0,1 kWh / pulse (as display on the screen example)

Display 12345,678 MWh ==> output pulse value for energy = 0.001 MWh / pulse

Display 123456,78 GJ ==> output pulse value for energy = 0.01 GJ / pulse

Example for volume:

Display 12345,678 m³ ==> output pulse value for volume = 0.001 m³ / pulse

Display 123456,78 m³ ==> output pulse value for volume = 0.01 m³ / pulse

Outputs Pulses	Complementary counter	Complementary counter 2
ID number	00000014	
Unit	0.001 m ³	
Pulse factor	0.0010000	m ³ /pulse
Totalizer	0.151	m ³
☐ Set monthly values with current value		

ID number: Serial number of the external device can be enter in this field.

Unit: Can be set to 0.001m³; 0.01m³; 0.1m³; 1 m³ or without unit.

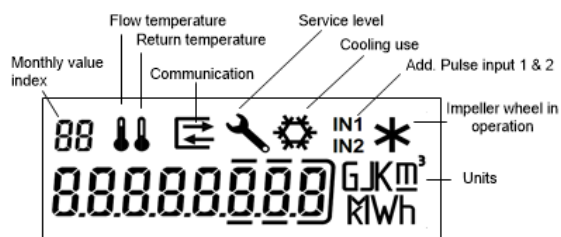
Pulse factor: By default, the pulse factor will be 1 Pulse/Unit for each pulse input.

Totalizer: If the external device has already count, the value can be entered in this cell.

By clicking on “Set monthly values with current value”, the 18 monthly values will be set with the value entered in the totalizer.

10. Functions overview

10.1 Display explanation



10.2 Display structure

To display general data on the calculator, several windows have been created in the form of menu/sub-menu functions. Depending on the chosen version of the thermal energy meter, some menus may be added.

The “Energy” window of the main menu is the basic display.

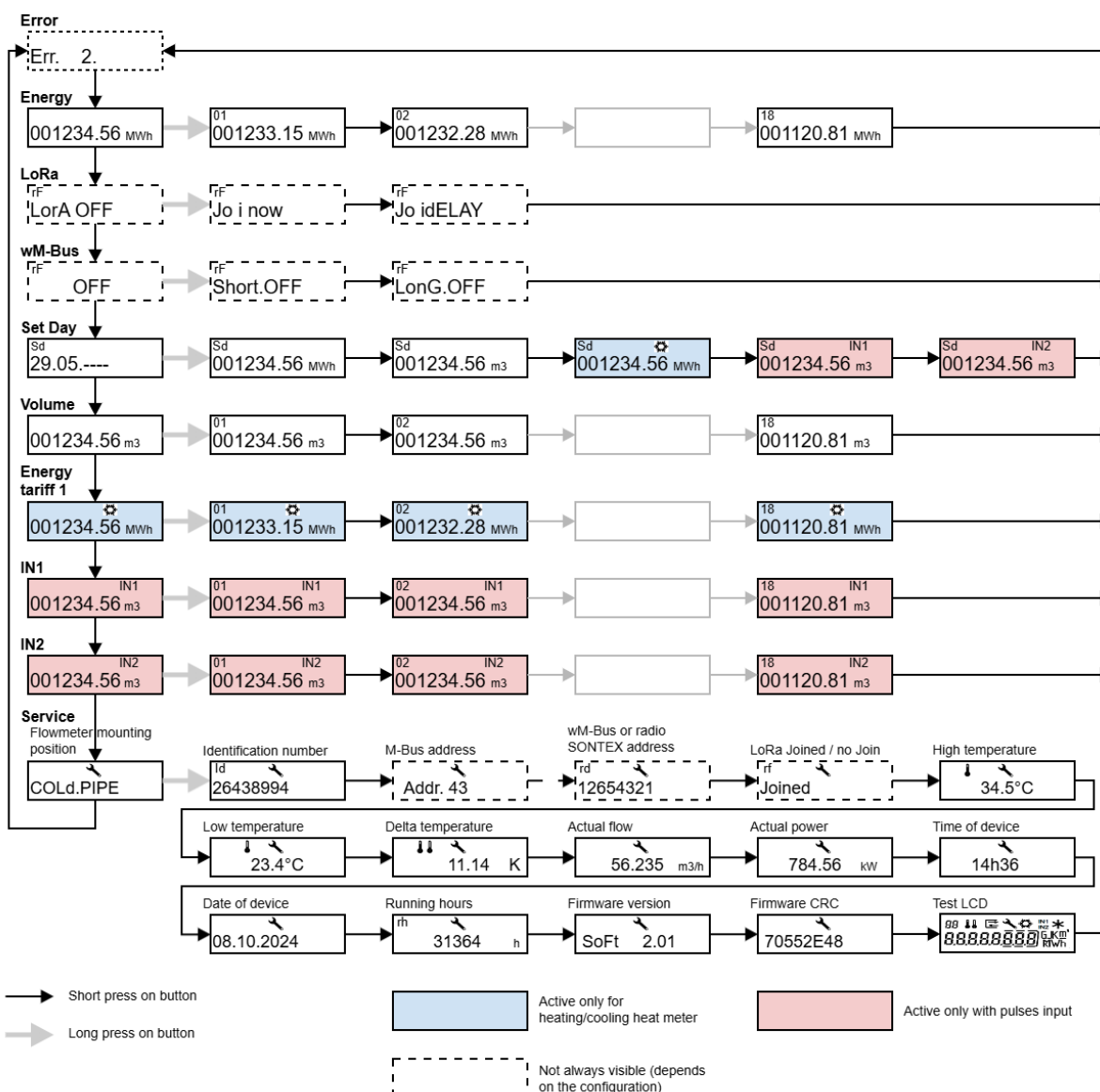
The navigation button enables the user to change from one menu to another and to access the different positions within a menu.

Short pressure on the navigation button permits transition from one menu to another or continuation to the next display while remaining in the same menu.

Long pressure (> 2 seconds) on the navigation button gives access to sub-menu within a menu or enables the “Energy” window to be displayed from within a menu.

After 3 minutes, the display automatically reverts to the basic “Energy” window.

10.3 Detailed display sequence



Energy: Display the cumulated energy in the main menu and the cumulated energy of the previous months in the sub-menu.

LoRa: During installation, this menu appears as long as the LoRaWAN join has not been done. See chapter [Chapter 12](#) for further details.

wM-Bus: During the installation, this menu appears as long as the wM-Bus communication has not been activate. See [Chapter 12](#) for further details.

Set day: Display the set day date. Display in the sub-menu the energy and volume set day if heating only. Display heating energy and volume and cooling volume if heating/cooling. If available Input 1 and 2 volume will also be display.

Volume: Display the cumulated volume in the main menu and the cumulated volume of the previous months in the sub-menu.

Energy tariff 1: Display the cooling cumulated energy if heating/cooling. Display in the sub-menu the cooling cumulated energy of the previous months.

IN1 and IN2: Display the cumulated volume of additional meter 1 and 2 if available, in the main menu and the cumulated volume of the previous monthes in the sub-menu.

11. Installation



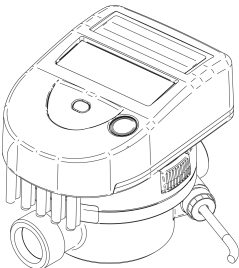
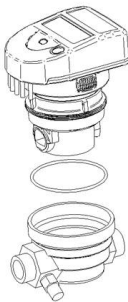
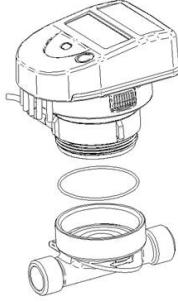
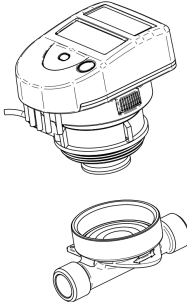
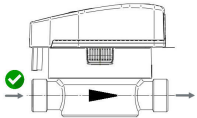
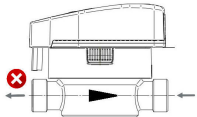
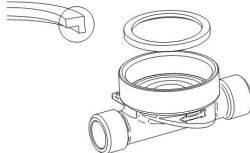
The prescriptions related in the standard EN1434-6 must be respected when the *Supercal 739* is installed.

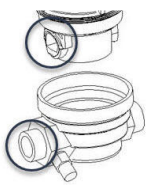
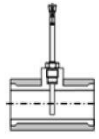
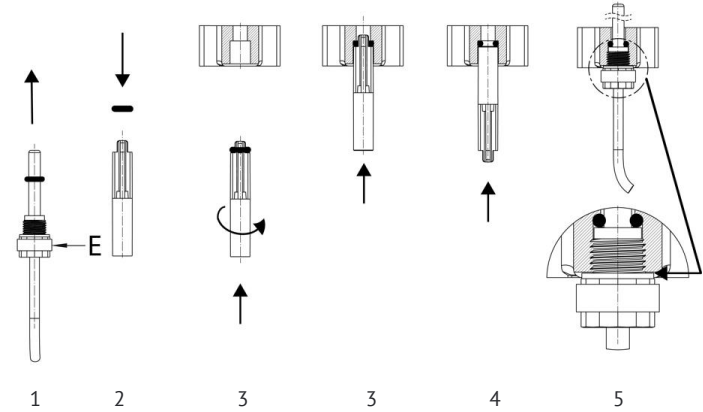
In the standard version, the calculator is parameterised by default for installation on the “cold” pipe side. Installation on the “hot” pipe side must be specified with the order.

The heat conveying liquid must be equivalent to water without any additives according to standard FW510 of the AGFW (German District Heating Association). If additives are added to the water, the user must ensure the compatibility of the materials used in the thermal energy meter which are in contact with these additives.

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

11.1 Installation Instruction (step by step)

Depending on version and use (heat and/or cooling meter), fit the thermal energy meter on the “cold” or “hot” pipe side of the installation in compliance with the chosen configuration. Press several time on the navigation button to see if the thermal energy meter is configured as “cold” or “hot” pipe.			
Flush out the installation pipes carefully in compliance with the DIN/EN standard specification.			
Close the shutoff valves before and behind the thermal energy meter.			
Open the drainage valve to reduce the pressure and discharge the water contained in the pipe between the two shutoff valves.			
Single jet meter: 	Coaxial multi jet meter with M77x1.5 connection (Allmess version): 	Coaxial multi jet meter with G2” connection (ISTA version): 	Coaxial multi jet meter with M62x2 connection (Techem version): 
Place a gasket on each side of the flow meter. Only use appropriate new gaskets.	Remove the blind cover or the old meter from the EAS base using an installation spanner. Be careful! Water may escape.		
Install the flow sensor on the pipe and ensure that the flow direction corresponds to the arrow on the flow sensor.  	Remove the o-ring / preformed gasket then clean the contact surfaces and the thread.		
	Remove the protection cap from the metering capsule		
	Place the new o-ring in the EAS base and check that it is correctly positioned.	Place the new profiled gasket in the EAS base and check that it is properly positioned. 	
Lubricate the external thread of the metering capsule with a fine silicone coating.			

Make sure that the gaskets are carefully positioned in relation to the water pipe and flow meter unions.	 Install the metering capsule in the base. For M77x1.5, ensure that the arrow on the base corresponds to the arrow underneath the metering capsule and that the blind hole is correctly positioned in the base.
Tighten the fixing nuts firmly by hand. Then tighten up to the mechanical end stop using a mounting tool.	Screw the metering capsule down firmly by hand then tighten as far as the mechanical end stop, using a mounting tool.
In case of direct mounting in a T tube, the temperature sensor is on the same level or deeper and perpendicular to the pipe axis:  Install the temperature sensor by following below steps: - Remove the O-ring from the temperature sensor. Be careful not to remove the rubber band (symbolized by the letter «E» on the drawing) from the nut as it may separate into two parts and fall on the floor. - Fit the O-ring on the mounting template pin. - Insert the O-ring by rotating it using the fitting template in the position provided for the ball valve. - Position the O-ring definitively with the other flat end of the fitting template. - Insert the temperature sensor with the two half-nuts in the thread M10x1 of the ball valve and screw down by hand as far as it will go (maximum tightening torque of 1 Nm). Note: The mounting template pin is not included in the delivery and can be ordered separately (Article number: 0460P348).  Turn the display into the desired position for reading.	

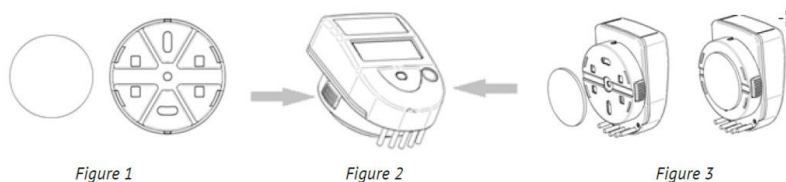
11.2 Wall mounting of the calculator

The calculator can be separated from the flow meter and fixed on the wall using the wall fixing component, together with a double-sided adhesive tab delivered with the thermal energy meter (Figure 1). If possible, install the wall fixing component above the flow meter.

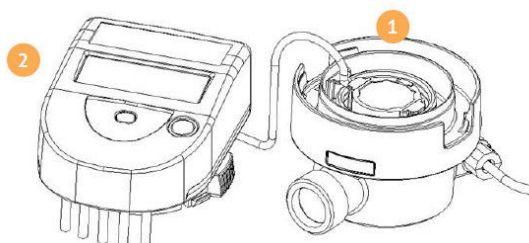
The wall fixing component can also be screwed on to the wall (screws are not supplied).

To separate the calculator from the flow meter press laterally with one hand on the two locking buttons, while pulling the calculator upwards (Figure 2).

Fix the calculator onto the wall fixing component taking care not to jam the cable which connects the calculator to the flow meter and stick the adhesive tab behind the wall component. Secure the assembly to the wall (Figure 3).



To remove the calculator from the wall support, it will be sufficient to press laterally on the two locking buttons while pulling the assembly towards you.



1 Rewind the connection cable at the position provided for this purpose on the flow meter.

2 Reinsert the calculator

11.3 Mounting of the calculator for a cooling application

Only the flow meter can be fully isolated. Separate the calculator from the flow meter and fix using the wall support aid.

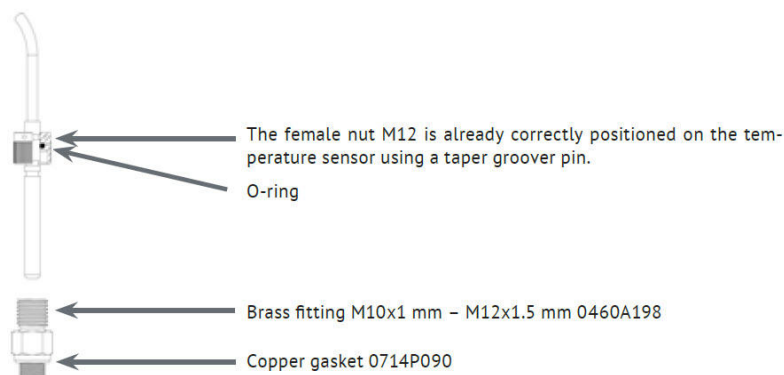
It is recommended to separate the calculator from the flow meter and installed at a sufficient distance from the flow meter if:

- The thermal energy meter has to be installed in a confined space.
- The thermal energy meter is in connection with mounting in condensing environments.
- To extend the battery life time.

The pipes are generally free from air before the installation is brought into service. Follow the insulation instructions for cooling installations. Final commissioning must be performed and documented.

11.4 Temperature sensor 6 mm, direct mounting with brass nut M10 x 1 mm - M12 x 1.5 mm

The brass fitting may be mounted in the EAS base of the coaxial multi jet meter M77x1.5 or in a ball valve.

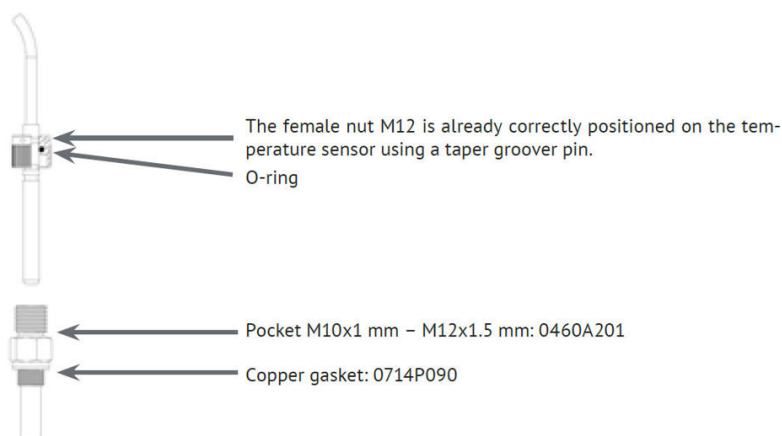


- Place the copper gasket (0714P090) on the brass fitting M10x1 mm side.

- Screw the brass fitting on the EAS base of the coaxial multi jet meter M77x1.5 or in the ball valve.
- Insert the temperature sensor into the brass fitting.
- Tighten by hand the M12 female nut until stumbled on the brass fitting (maximum tightening torque of 1-2 Nm).
- Check the watertightness of the temperature sensor placed under pressure.
- Seal the temperature sensor.

11.5 Temperature sensor 6 mm, indirect mounting in a pocket

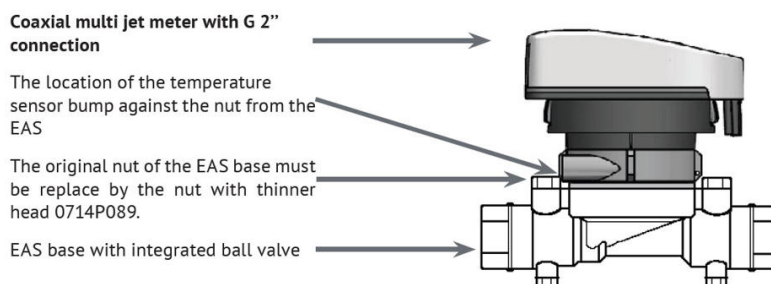
The brass fitting may be replaced by a pocket that can be mounted in the EAS base of the coaxial multi jet meter M77x1.5 or in a ball valve.



- Place the copper gasket (0714P090) on the pocket M10x1 mm side.
- Screw the pocket on the EAS base of the coaxial multi jet meter M77x1.5 or in the ball valve.
- Insert the temperature sensor into the pocket.
- Tighten by hand the M12 female nut until stumbled on the pocket (maximum tightening torque of 1-2 Nm).
- Check the watertightness of the temperature sensor placed under pressure.
- Seal the temperature sensor.

11.6 EAS base with integrated ball valves for coaxial multi jet meter with G 2" connection

To prevent that the counter mound on the nut of the ball valve, replace the original nut on the EAS base with a nut with thinner head.



11.7 Mounting cable for the pulse input function

The pulse inputs are built with SELV circuits (Safety Extra Low Voltage) and must be only connected with SELV circuits. The electrical characteristics are displayed on the datasheet.

11.8 Mounting cable for the pulse output function

The pulse outputs are built with SELV circuits (Safety Extra Low Voltage) and must be only connected with SELV circuits. The electrical characteristics are displayed on the datasheet.

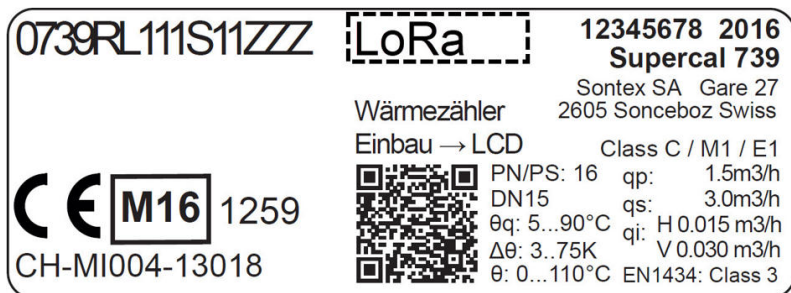
12. Commissioning

- Check the waterproofness of the thermal energy meter placed under pressure.
- Seal the flow meter / measuring capsule and the temperature sensors.

12.1 Supercal 739 manual activation

Since the instructions vary based on the radio type and device status, both pieces of information must be retrieved as follows:

Check the radio type: Check below label on the side of the calculator to know the radio communication.



Text on label	433 MHz	868 MHz	LoRa	No text
Communication type	Radio Sontex	wM-Bus / OMS [®]	LoRaWAN [®]	No radio communication

Check the device status:

- Remove the yellow label from the LCD (if any) and press several time on the orange button until you have made a loop.
- **Normal mode:** No "DISABLED" or "ConFIG" displayed.
- **Storage mode:** "DISABLED" displayed.
- **Storage & Config mode:** "DISABLED" and "ConFIG" displayed.

Depending on the thermal energy meter setting, go to [Chapter 12.1.1](#); [Chapter 12.1.2](#) or [Chapter 12.1.3](#).

12.1.1 Radio Sontex

Mode	Counting Status	Radio Status	Counting Activation: required actions
Normal	Activated	Activated	no action needed.
Storage	Off	Activated	Activate counting (see Chapter 12.1.4).
Storage & Config	Off	Activated	Activate counting (see Chapter 12.1.4).

12.1.2 wM-Bus / OMS[®]

Mode	Counting Status	Radio Status	Counting and Radio activation: Actions Required
Normal	Activated	Off	No action needed to activate counting. Short telegram: ■ Press several time the button until "OFF" is displayed. ■ Press and hold the button until "Short.OFF" is displayed. ■ Press and hold the button to activate the radio with short telegram.

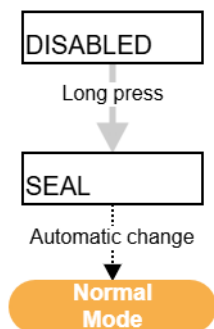
			Long telegram: - Press several time the button until "OFF" is displayed. - Press and hold the button until "Short.OFF" is displayed. - Press the button once, "LonG.OFF" is displayed. - Press and hold the button to activate the radio with long telegram.
Storage, Storage & Config	Off	Off	Activate counting and radio (see Chapter 12.1.4 to activate counting). Short telegram is auto-selected when the thermal energy meter is activated.
			Long telegram: - Press the button until "OFF" is displayed. - Press and hold the button until "Short.OFF" is displayed. - Press the button once, "LonG.OFF" is displayed. - Press and hold the button o activate the radio with long telegram. - Activate counting (see Chapter 12.1.4).

12.1.3 LoRaWAN[®]

Mode	Counting Status	Radio Status	Counting and Radio activation: Actions Required
Normal	Activated	Off	No action needed to activate counting.
			To activate the radio follow below steps: - Press several time on the button until "LORA OFF" is displayed. - Press and hold the button until "Jo i now" is displayed. - Press and hold the button.
			If the thermal energy meter is placed inside a box, follow below steps to activate the radio: - Press several time on the button until "LORA OFF" is displayed. - Press and hold the button until "Jo i now" is displayed. - Press the button once, "Jo idELAY" is displayed. - Press and hold the button to activate the radio. - Immediately close the door (the LoRaWAN[®] join occurs after 30s by default to check if the transmission quality is enough when the door is closed).
Storage, Storage & Config	Off	Off	Activate counting and radio (see Chapter 12.1.4).
			If the thermal energy meter is placed inside a box: - Press several time on the button until "LORA OFF" is displayed. - Press and hold the button until "Jo i now" is displayed. - Press the button once, "Jo idELAY" is displayed. - Press and hold the button to activate the radio. - Immediately close the door. (the LoRaWAN[®] join occurs after 30s by default to check if the transmission quality is enough when the door is closed). - Activate counting (see Chapter 12.1.4).

12.1.4 Activation of the thermal energy meter in Storage/Storage and Config mode

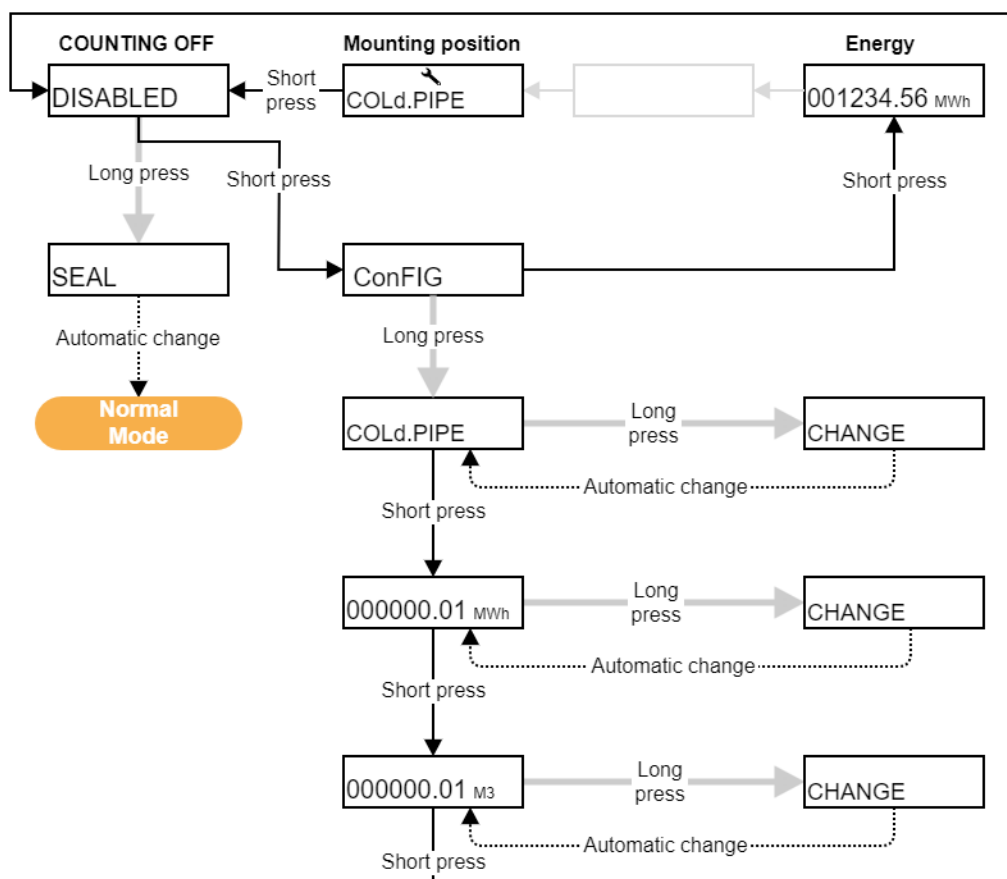
To activate the counting and communication (Short telegram for wM-Bus / OMS[®] or immediate join for LoRaWAN[®] if long telegram or join delay has not been activated before) follow below process:



In the Storage and Config mode you can set different parameters by making a long press when “DISABLED” is displayed.

A long press will change the settings below:

- 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 (0.01m³ and 0.001m³).



In the "ConFIG" menu any inaction (i.e. with no pressure on the navigation button) lasting 3 minutes causes the automatic exit and returns to "DISABLED". If changes were made in the "ConFIG" menu, the data remain stored.

⚠ CAUTION

When "DISABLED" is displayed, a long press on the navigation button validates the parameters of the thermal energy meter and activate the counting and communication (Short telegram for wM-Bus / OMS[®] or immediate join for LoRaWAN[®]). The

indication "Seal" flashes four times on the display and it changes to "Normal" counting mode.

From that moment, the storage mode ("DISABLED" and "CONFIG") is not accessible anymore.

12.2 Supercal 739 activation with Prog7x9

The thermal energy meter with Radio Sontex and in normal mode don't need any action to be active.

For all other configuration follow below steps.

Needed SW Tools and equipment

- Prog7x9
- Optical head compatible IEC62056-21b:2002.

Configuration of the Supercal 739 using Prog7x9:

- Make a device read out with Prog7x9 by using the optical head. Make sure that the LED of the optical head is well positioned on the optical interface.
- Navigate in the different menu to set the needed parameters.
- Activate the LoRaWAN® or wM-Bus / OMS® communication (if ordered) in the menu General settings.
- Change to Normal mode in the metrological menu.
- Click on Program device

13. Testing the installation

The following points must be checked when commissioning the product:

- Check the system for leaks.
- Display and check the measured values (flow rate, output, flow and return temperature) using the orange button.
- The flow rate must not exceed the maximum value of the product.
- Check data transmission via communication symbol on the display.

It is recommended to save a commissioning protocol with Prog7X9 (optical interface).

14. Error codes and troubleshooting

The calculator displays an error message with the 3 letters "Err" and a code. If several errors occur at the same time, the different codes are added together.

The error is displayed in the first position of the display menu. It will still be possible to select all the other display menus by pressing the navigation button. If the navigation button is no longer pressed for a period of 3 minutes, the error code will automatically appears again in the first position of a display menu.

Display of an error automatically disappears when the error is no longer present.

Error is also displayed in the telegram.

Err 1: Flow higher than $1.2 \times q_s$ or defective hydraulic sensor.

Err 2: Measured temperature outside the homologated range or temperature sensor defective.

Err 3: Corrupted CRC, firmware or metrological parameters.

To make sure that the temperature sensors have not been cross during assembly, the temperature difference between the outward and return temperatures can be checked on the display. Depending on the use (thermal or refrigerating), this temperature difference may be either positive or negative.

Error code / info on display	Error code in <i>Prog7x9</i>	Error code in M-Bus telegram	Status / Warning in <i>Tools Supercom</i>	Sonexa	Description	Troubleshooting procedure
Err 1	128	80 00 (detailed error <i>error</i>)	32 / Flow error	Flow error	Flow higher than 1.2 x qs or defective hydraulic sensor	Reduce the flow. If error is still displayed, the hydraulic sensor is defective, replace the <i>Supercal 739</i>
Err 2	1	01 00 (detailed error <i>error</i>)	64 / Temperature error	Temperature error	Reference resistance 1 in the calculator is damaged	Replace the <i>Supercal 739</i>
	2	02 00 (detailed error <i>error</i>)			Temperature sensor 1 is defective	Replace the <i>Supercal 739</i>
	4	04 00 (detailed error <i>error</i>)			Reference resistance 2 in the calculator is damaged	Replace the <i>Supercal 739</i>
	8	08 00 (detailed error <i>error</i>)			Temperature sensor 2 is defective	Replace the <i>Supercal 739</i>
	16	10 00 (detailed error <i>error</i>)			Temperature measurement timeout	Replace the <i>Supercal 739</i>
	32	20 00 (detailed error <i>error</i>)			Temperature 1 out of range	Reduce the temperature of the flow. If error is still displayed, replace the <i>Supercal 739</i>
	64	40 00 (detailed error <i>error</i>)			Temperature 2 out of range	Reduce the temperature of the flow. If error is still displayed, replace the <i>Supercal 739</i>
Err 3	N/A	08 (Status <i>st</i>)	8 / CRC error	CRC error	Corrupted CRC, firmware or metrological parameters	Replace the <i>Supercal 739</i>
Disabled	32768	00 80 (detailed error <i>error</i>)	00 / Device is in storage mode	Device is in storage mode	<i>Supercal 739</i> in Storage or Storage and Config mode	Seal the <i>Supercal 739</i> (See Chapter 12.1 or Chapter 12.2)

Status	Procedure troubleshooting
The <i>Supercal 739</i> is not counting	Check that the direction of flow circulation is the same as the arrow figuring on the flow meter as described in Chapter 11.1 . If the <i>Supercal 739</i> has been delivered in Storage/Storage & Config mode, check that the counting has been activated as described in Chapter 12.1 or Chapter 12.2 .
Telegram are not sent through wM-Bus / OMS [®] or LoRaWAN [®]	If the <i>Supercal 739</i> has been delivered in normal mode, check that you have activated the communication as described in Chapter 12.1 or Chapter 12.2 .

15. Maintenance Instructions

No specific maintenance is required for the electronic device.

The front of the calculator housing can be cleaned with a dry, soft cloth.

16. Legal and Compliance Information

Hereby, Sontex declares that the product is in compliance with Directive 2014/53/EU, 2014/32/EU and 2011/65/EU.

The full text of the CE Declaration of Conformity can be found on our website.

17. Support & Warranty Information

- For technical support, please contact your local agent.
- Warranty and guarantee claims are only valid if the device has been used in accordance with their intended use and if the technical requirements and any applicable technical regulations have been observed.
- Links to online documentation, declaration of conformity, manuals, or support forums:



18. Disposal



For the purposes of disposal, the device is considered a used electronics device in the sense of the European Guideline 2012/19/EU (WEEE). It must not be disposed of with household waste. Dispose only at authorized collection points.

19. Accesories & software tool

- *Prog7X9* Configuration Tool
- *Tools Supercom* for on-site read-out

19.1 Optical probe

The optical interface is available on every *Supercal 739*.

Communication between the *Prog7x9* software and *Supercal 739* can be done by means of an optical coupler.

The *Prog7x9* software is mainly used to configure the non-metrological parameters and for readout.

The transmission speed is set at 2400 bauds and cannot be changed.

We recommend the use of optical couplers supplied by:  Auslesetechnik

Should communication problems occur, please refer to the document User Guide *Prog7x9* (integrated as PDF in the software).

For the optical probe listed below, we have noted the filters needed to permit correct communication with *Prog7x9* software:

Optical probe	Filter
P+E Technik : "K1-98" or "K1-06"	No filter
P+E Technik : "K01-USB"	No filter

19.2 Sensor pocket

Sensor pockets for temperature sensors (with composite fitting)					
Temperature sensor	Versions	Pocket	Art.-N°	Material	Temperature range
Ø 5	Pt1000	M10x1	SCTW4A1	Brass	0... 100°C
Ø 5	Pt1000	G3/8"	SCTW4A2	Brass	0... 100°C

Ø 5	Pt1000	G1/2"	SCTW4A3	Brass	0... 100°C
Ø 5.2	Pt1000	M10x1	SCTW4A4	Brass	0... 100°C
Ø 5.2	Pt1000	G3/8"	SCTW4A5	Brass	0... 100°C
Ø 5.2	Pt1000	G1/2"	SCTW4A6	Brass	0... 100°C
Ø 6	Pt1000	G1/2"	SCTW1A1	Brass	0... 100°C