

Supercal 5 U

Compact thermal ultrasonic energy meter



The *Supercal 5 U* is a thermal energy meter with ultrasonic flow sensor for heating and/or cooling systems for nominal sizes: qp 3.5 to 6.0 m³/h.

The *Supercal 5 U* is designed for measuring heating and cooling energy in heating, cooling, and combined systems. It can be operated either with batteries or mains power and offers a high degree of flexibility in installation and operation.

The module-based communication platform enables measurement data transmission via radio-based interfaces such as LoRaWAN®, wM-Bus, and Sontex Radio. M-Bus, BACnet, Modbus, and pulse outputs are available for wired applications. NFC and the optical interface are used for easy configuration and parameterization on site.



Further information can be found at
www.sontex.ch

Main Features

- Calculator for heat meters, cooling meters or combined heating/cooling meters
- Battery or mains powered for increased flexibility
- Exchangeable calculator metrologic upper part while wiring remains in place
- Native M-Bus or one available slots for communication module (LoRaWAN[®], BACnet, Modbus, and other)
- Modules can be retrofitted or replaced at any time without affecting the approval
- Self-recognition of optional module
- Optical interface according to IEC 62056-21:2002
- 2- or 4-wire temperature sensors without any configuration
- 2 pulse/state inputs and 2 pulse/state open drain outputs
- Compact ultrasonic flow sensor
- No inlet outlet restrictions
- Longer flow sensor lifetime with no moving parts

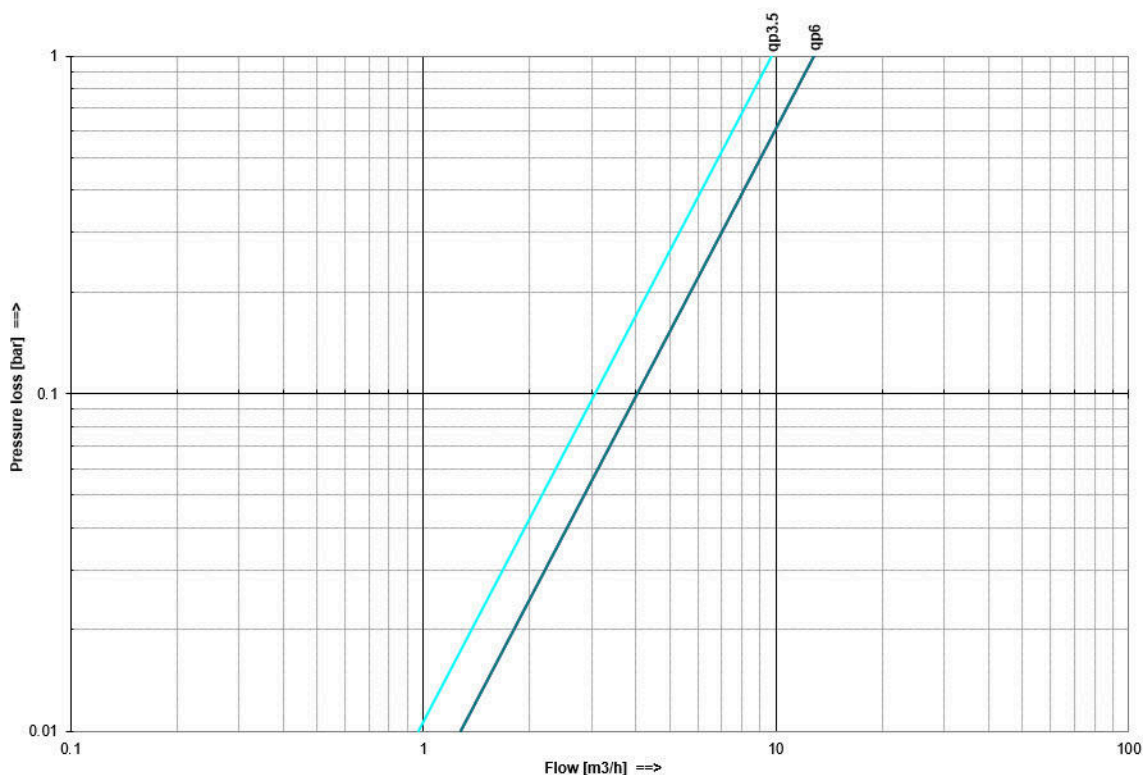
Technical data

General	
Application	<ul style="list-style-type: none"> ■ Heating or ■ Cooling or ■ Heating/cooling
Temperatures	<ul style="list-style-type: none"> ■ Ambient: +5°C...+55°C (< 95% relative humidity) ■ Storage / transportation: -20°C...+70°C (dry environment)
Protection rating	<ul style="list-style-type: none"> ■ Calculator unit: IP65 ■ Flow Sensor: IP68
Electromagnetic class	<ul style="list-style-type: none"> ■ E1
Mechanical class	<ul style="list-style-type: none"> ■ M1
Measuring accuracy class	<ul style="list-style-type: none"> ■ 2
Medium	<ul style="list-style-type: none"> ■ Only use water without chemical additives

Calculator unit	
Temperature measurement range	<ul style="list-style-type: none"> +2 °C ... +200 °C
Temperature difference range ΔT	<ul style="list-style-type: none"> Heat Meter: 3K - 150K Cold Meter: 3k - 150K Start of metering temperature difference: +/- 0.2K
Power supply Modules	<ul style="list-style-type: none"> D Battery 3,6 V Mains 24 V (12 VAC to 36 VAC or 12 VDC to 24 VDC) Mains 230 VAC (110 VAC to 240 VAC, 50/60 Hz)
D Battery 3,6V life	<ul style="list-style-type: none"> 12+1 years
Display	<ul style="list-style-type: none"> Illuminated dot-matrix 128x64 pixels
Display units	<ul style="list-style-type: none"> Energy: kWh, MWh, MJ, GJ, kBtu, MBtu, Mcal, Gcal Volume: L, m³, gal (US), kgal (US), ft³ (US) Temperature: °C, °F Additional pulse inputs: Energy or volume
Connection cable Calculator unit - flow sensor	<ul style="list-style-type: none"> 1.5 m
Interfaces	<ul style="list-style-type: none"> Configuration: <ul style="list-style-type: none"> NFC according to ISO/IEC 14443 Type A Optical interface according to IEC62056-21:2002 Data Forwarding <ul style="list-style-type: none"> wM-Bus M-Bus LoRaWAN[®] Sontex Radio
Data storage	<ul style="list-style-type: none"> Set day (Energy, Energy cold, Volume, Input1, Input2) 18 monthly values (Energy, Energy cold, Volume, Input1, Input2)
Auxiliary pulse inputs	<ul style="list-style-type: none"> Frequency in normal mode: Maximum 5Hz Frequency in fast mode: <ul style="list-style-type: none"> D battery: Maximum 3.5 kHz Mains: Maximum 12 kHz Input voltage: 0 to 30V
Pulse outputs	<ul style="list-style-type: none"> Frequencies: <ul style="list-style-type: none"> Normal mode: Maximum 5 Hz (+/-20%) Fast mode: Maximum 200 Hz (+/-20%) Output voltage: 0 to 30V
Measurement Cycles	<ul style="list-style-type: none"> Measurement period flow: 2 s Measurement period temperature: configurable on calculator
Temperature Sensor	
Measuring element	<ul style="list-style-type: none"> Pt500 according to EN 60751
Diameter	<ul style="list-style-type: none"> 5.2 mm / 6.0 mm (Only outside of flow meter)
Temperature sensor cable length	<ul style="list-style-type: none"> 2 m / 3 m / 5 m / 10 m optional

Flow sensor				
Nominal Flow Rate (qp) [m ³ /h]	3.5	3.5	6	6
DN	25	25	25	32
Overall length [mm]	160	260	260	260
Connection	G 1 ¼"	G 1 ¼"	G 1 ¼"	G 1 ½"
Material	Brass	Brass	Brass	Brass
Total meter weight [kg]	1.3	1.7	1.7	1.8
Temperature range as Heat meter [°C]	+5 ... +130	+5 ... +130	+5 ... +130	+5 ... +130
Temperature range as cold meter [°C]	+5 ... +130	+5 ... +130	+5 ... +130	+5 ... +130
Minimum flow qi [m ³ /h]	0.035	0.035	0.06	0.06
Maximum flow qs [m ³ /h]	7	7	12	12
Measuring accuracy class	2	2	2	2
Pressure loss at qp [mBar]	130	130	220	220
PN [Bar]	25	25	25	25
Upstream and downstream zone	U0 / D0	U0 / D0	U0 / D0	U0 / D0

Pressure loss curve:



Data Collection Interfaces

Radio communication			
	Sontex Radio	wM-Bus	LoRaWAN®
Radio protocol	Radian V1.0	EN 13757-4	<ul style="list-style-type: none"> LoRaWAN Certified® (acc. to Specification V1.0.2) LoRaWAN™ Swisscom IoT Qualified Product
Transmission mode / class	<ul style="list-style-type: none"> N.a. 	<ul style="list-style-type: none"> T1 C1 	<ul style="list-style-type: none"> Class A
Encryption mode	<ul style="list-style-type: none"> AES-128 CBC 	<ul style="list-style-type: none"> AES-128 - Mode 5/7 	<ul style="list-style-type: none"> AES-128 - AppKey
Encryption options	<ul style="list-style-type: none"> Individual key General key Unencrypted 	<ul style="list-style-type: none"> Individual key General key 	<ul style="list-style-type: none"> Individual key
Radio frequency	<ul style="list-style-type: none"> 433.82 MHz 	<ul style="list-style-type: none"> 868.95 MHz 	<ul style="list-style-type: none"> ISM Frequency band EU863-870
Transmission power	<ul style="list-style-type: none"> Max. 10 mW (10 dBm) Typ. -3 dBm 	<ul style="list-style-type: none"> Max. 25 mW (14 dBm) Typ. 5 dBm 	<ul style="list-style-type: none"> Max. 25 mW (14 dBm) Typ. 5 dBm
Communication	<ul style="list-style-type: none"> Bidirectional 	<ul style="list-style-type: none"> Unidirectional 	<ul style="list-style-type: none"> Bidirectional
Radio telegrams	<ul style="list-style-type: none"> Telegram 1 (current data) Telegram 2 (historical data) 	<ul style="list-style-type: none"> Telegram S (Short - OMS) Telegram L (Long - walk-by) 	<ul style="list-style-type: none"> Telegram S (SF10-12): 39 bytes Telegram L (SF7-9): 103 bytes
Transmission intervals ⁽¹⁾	<ul style="list-style-type: none"> When calling (after wake-up) 	Programmable: <ul style="list-style-type: none"> OMS: 30-7200 s (120 s) Walk-by: 30-14400 s (120 s) 	Programmable: <ul style="list-style-type: none"> SF7-9: 30-44640 min. (60 min.) SF10-12: 60-44640 min. (360 min.)
Radio activity	<ul style="list-style-type: none"> Configurable via calendar function 	<ul style="list-style-type: none"> Configurable via calendar function 	<ul style="list-style-type: none"> No calendar function
Radio activity standard ⁽¹⁾	<ul style="list-style-type: none"> Daily, 06:00 up 19:59 h 	<ul style="list-style-type: none"> Telegram S: <ul style="list-style-type: none"> 24 h/day 7 Days a week Telegram L: <ul style="list-style-type: none"> max. 14 h/day (06:00 - 19:59 h) 7 Days a week 	<ul style="list-style-type: none"> Periodic dispatch according to transmission intervals
Type of reading			
Mobile (Walk-by)	<ul style="list-style-type: none"> Radio modem <i>Supercom 636</i> 	<ul style="list-style-type: none"> Radio modem <i>Supercom 637</i> 	<ul style="list-style-type: none"> N.a.
Automatic Meter Reading (AMR)	<ul style="list-style-type: none"> Data concentrator <i>Supercom 646</i> Gateway <i>Superlink C</i> 	<ul style="list-style-type: none"> Data concentrator <i>Supercom 647</i> Gateway <i>Superlink C</i> 	<ul style="list-style-type: none"> Commercially available LoRaWAN® Gateway

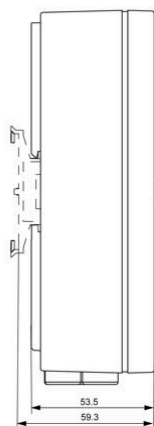
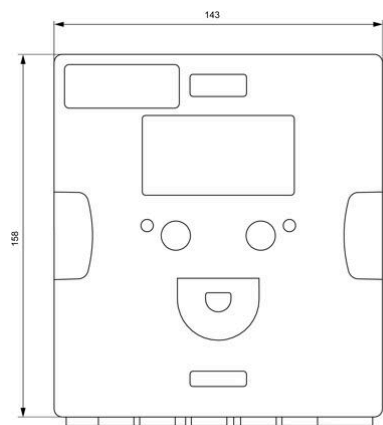
⁽¹⁾ Default value in brackets

Wired communication

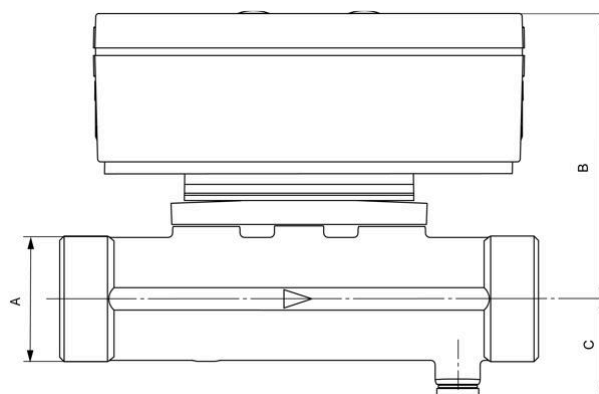
- M-Bus power supplied (2 loads) 1.0m with Galvanic Separation.

Mechanical Data (Dimensions)

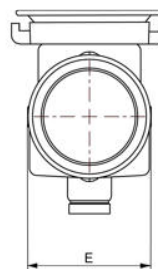
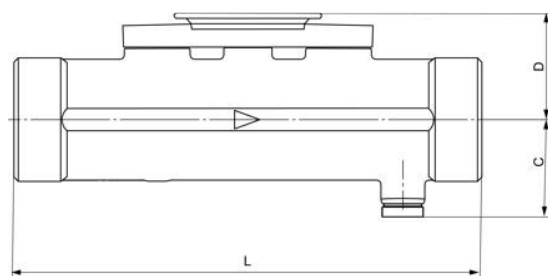
Calculator:



Thermal energy meter:



Flow meter:



qp [m ³ /h]	DN	L [mm]	A	B [mm]	C [mm]	D [mm]	E [mm]
3.5	25	160	G 1 ¼"	95.7	32.5	36.6	42.2
3.5	25	260	G 1 ¼"	95.7	32.5	36.6	42.2
6	25	260	G 1 ¼"	95.7	32.5	36.6	42.2
6	32	260	G 1 ½"	95.7	32.5	36.6	42.2

Variant Overview

Part number: SC5U-ABC7-EFSHH-*****-LL-MMM

Radio communication (A):		Power supply (B):	Module slot 1 - Left (C):	
0: Without radio R: Sontex radio W: wM-Bus		0: Without power supply 1: D Battery 3.6 V 2: Mains 110-230 VAC 50/60Hz 3: Mains 24VAC / 24VDC	0: Without module 1: Analog outputs module 2: Modbus module 3: M-Bus module 4: Relay outputs module 5: Digital inputs module 6: BACnet module L: LoRaWAN® module	
Energy (E):		Volume (F):	Homologation (HH):	
1: 0.001 kWh 2: 0.01 kWh 3: 0.1 kWh 4: 1 kWh 5: 0.001 MWh 6: 0.01 MWh 7: 0.1 MWh 8: 1 MWh 9: 0.001 MJ A: 0.01 MJ B: 0.1 MJ C: 1 MJ D: 0.001 GJ E: 0.01 GJ F: 0.1 GJ G: 1 GJ		H: 0.001 KBTU I: 0.01 KBTU J: 0.1 KBTU K: 1 KBTU L: 0.001 MBTU M: 0.01 MBTU N: 0.1 MBTU O: 1 MBTU P: 0.001 MCAL Q: 0.01 MCAL R: 0.1 MCAL S: 1 MCAL T: 0.001 GCAL U: 0.01 GCAL V: 0.1 GCAL W: 1 GCAL	1: 0.001 l 2: 0.01 l 3: 0.1 l 4: 1 l 5: 0.001m ³ 6: 0.01m ³ 7: 0.1m ³ 8: 1m ³ 9: 0.001 GAL A: 0.01GAL B: 0.1 GAL C: 1 GAL D: 0.001 KGAL E: 0.01 KGAL F: 0.1KGAL G: 1 KGAL	15: MID - Heat Meter 16: MID - Heat meter, double tariff (heating/cooling) 27: MID & PTB DE-M - Heat meter, double tariff (heating/cooling) 28: PTB DE-M - Cooling Meter
Flow sensor (LL):		Temperature sensors (MM):	Pockets (M):	
U0: qp3.5m ³ /h, 160 mm, G1 ¼, DN25 - 1.5 m Cable U1: qp3.5m ³ /h, 260 mm, G1 ¼, DN25 - 1.5 m Cable U2: qp6m ³ /h, 260 mm, G1 ¼, DN25 - 1.5 m Cable U3: qp6m ³ /h, 260 mm, G1 ½, DN32 - 1.5 m Cable		00: Without 11: Ø5.2 x 31 mm, M10, 2m, with 1 fitting 0460P101 12: Ø5.2 x 31 mm, M10, 3m, with 1 fitting 0460P101 13: Ø5.2 x 31 mm, M10, 5m, with 1 fitting 0460P101 17: Ø6 x 34 mm, 2m 18: Ø6 x 34 mm, 3m 19: Ø6 x 34 mm, 5m 1D: Ø6 x 84 mm, 2m 1E: Ø6 x 84 mm, 3m 1F: Ø6 x 84 mm, 5m 1I: Ø6 x 84 mm, Aluminium sensor head 1J: Ø6 x 84 mm, Plastic sensor head	0: Without A: ø6.0 x 34 mm x G3/8" B: ø6.0 x 34 mm x G1/2" D: ø6.0 x 84mm x G1/2"	

Accessories & Software Tools

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

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.

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:

