Data sheet

SVM F27 / C27

Ultrasonic BTU meter for heating or cooling

SVM Metering

Application field

F27/C27 is a BTU meter for debiting and monitoring energy consumption (F27 for heating and C27 for cooling). F27/C27 is a flexible compact BTU meter with an ultrasonic flow sensor. The calculator part of F27/C27 can be mounted on the flow sensor in four different positions or on a wall (split), with a cable length of 1m.
The flow sensor of F27/C27 can be delivered for threaded connection or flanged. F27/C27 threaded Qp 0.6 – 2.5 [m³/h] are prepared for direct mounted temperature sensor.

Measurement

The energy calculation is based on measured volume and measured temperature difference between the temperature sensors (H/L). The temperatures are measured at each energy calculation or at least every 60 seconds. F27/C27 is designed for good dynamic behavior. The energy measurement is done every 5 seconds and the flow is measured twice every second.

Communication

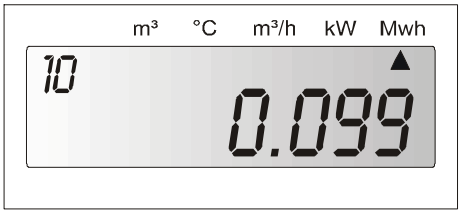
F27/C27 has a galvanic isolated M-Bus data output, according to EN1434-3. Data can be read through the optical interface or by two wire M-Bus connection (isolated).

Radio communication

The F27/C27 can be equipped with an option board for RF communication. The RF option is available for mains supplied and battery supplied meters. When equipped with an RF option board the 2-wire M-bus communication will be disabled.
F27/C27 with radio is delivered with a built-in antenna, or with an FME connection for external antenna.
For added flexibility the F27/C27 may also be delivered prepared for radio. In this version, an RF option board, with built-in or external antenna, can easily be fitted into meters already in operation. The 2-wire M-bus output for F27/C27 prepared for radio is always disabled for mains operated devices, but may be used in battery operated devices until the RF communication is installed.
F27/C27 is designed for use in both fixed installations and in walk by / drive by installations. The RF option board is transparent for M-Bus communication and all available information from the F27/C27 can be read from an AMR system, i.e. MCom3. Any F27/C27 with an RF option board can act as a repeater in the radio network.

Display

F27/C27 has a 7-digit LCD-display. The display can be ordered with backlight for mains supplied meters.



Example of a display image, showing accumulated energy.

Pulse inputs / pulse outputs

F27/C27 has two pulse outputs, energy (pulse 1) and volume (pulse 2). The pulse outputs are of the type “open collector”. In the F27/C27 there are jumpers to set the pulse outputs to pulse inputs. One or both outputs can be changed to pulse inputs.
Pulse inputs can be used to log and read other meters, e.g. cold, hot water meters.

Options

The F27/C27 can be equipped from the factory with the following options:

- Peek values
- Tariff option
- Log option

Technical data, radio

RF communication	
Frequency span	868-870,65 MHz
RF standard	EN300 220
Transmitter	
Output	3 mW (5dBm)
Channel span	25 kHz
Antenna	
Built-in or FME connection for external antenna	
Power supply	
Battery (3,6V) or 230 VAC	
Ambient temperature	
-20° C — +60° C	

Data

In addition to accumulated energy, the following (among others) values are accessible in F27/C27:

- Accumulated volume for the extra pulse inputs
- Error code and accumulated time for the relevant error
- Momentary power
- Momentary flow
- Flow temperature
- Return temperature
- Temperature difference
- Total operating time
- Meter number
- Manufacturing number
- Real time clock with date function
- Pulse value
- Flow sensor placing (high or low temp.)
- Accumulated volume according to flow sensor
- Accumulated volume registered in conjunction with energy calculation
- Total error time
- Preceding error code and accumulated time for this error
- Up to 37 monthly registers (same values as for account days, see below)
- Recommended date for battery replacement.
- Two account days. On each account day the following values are stored:
  - ❑ Date
  - ❑ Accumulated energy
  - ❑ Accumulated volume according to the flow sensor
  - ❑ Accumulated volume registered during energy calculation
  - ❑ Accumulated volume for the extra pulse inputs
  - ❑ Possible error code at the time of saving and accumulated time for the relevant error

Service

With a service button and the display button it is possible to change several parameters without using a special service tool. Following values can be changed:

- Time and Date
- Account days
- Communication address
- Flow sensor placing (H/L), supply (H) or return (L)
- Recommended date for battery replacement

Furthermore, the total error time can be reset. Other parameters in F27/C27 can be altered through a PC-program.

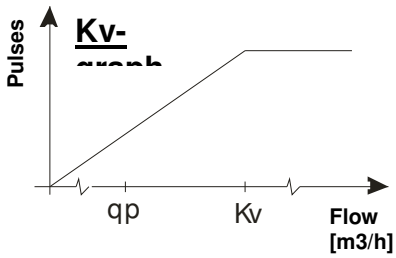
Technical data F27/C27

Power supply Battery Mains	 3.6 V – 16 Ah Operation time max. 10 years* 230 V ± 10%, 45-65 Hz, battery 3.6 V - 1.0 Ah as spare
Ambient temperature Operation Storage/transport	 +5° C to +55° C -20° C to +70° C
Protection Environmental class	IP54 (C27 flow part has IP 65) C according to EN1434
Data output M-Bus (EN1434-3)	 OPTO interface (EN60870-5) and buss connection, terminals (isolated)
Alarm output Pulse length	Open collector 250 ms

Temperature sensors Max. cable length Max sensor current	 Approved and matching pairs type Pt 100 can be used 2,5 m at 0,22 mm² cable area 5,0 m at 0,50 mm² cable area 4 µA (RMS) for Pt 100
Display	7 + 2 digits, LCD Backlight (option) only in mains supplied F27/C27
Temperature Range Difference	 0 - 190° C 2 - 120 K
Pulse outputs Pulse length Max voltage Max current	to be connected to inputs of the type "open collector" 250 ms 30 V 20 mA
Pulse inputs Max frequency Min pulse length Voltage from calculator	of the type "open collector" can be set with jumpers 12 Hz 40 ms 3.6 V
* *Vaild at normal operation. When F27/C27 is equipped with additional functions or operating at high load, contact SVM for battery calculation.*	

Technical data flow sensor

Accuracy class	2
Environmental class	C
Metrological class	1:100 (dynamic range)
Installation orientation	Horizontal or Vertical
Installation placing	Return or supply
Temperature range	+5/+10°C -- +130°C
Max. temperature	+150°C in max. 2000h
Max. flow	2.8 x qp (for some types even more)
Medium	Water



At flows higher than Kv the flow sensor will emitt pulses equal to Kv

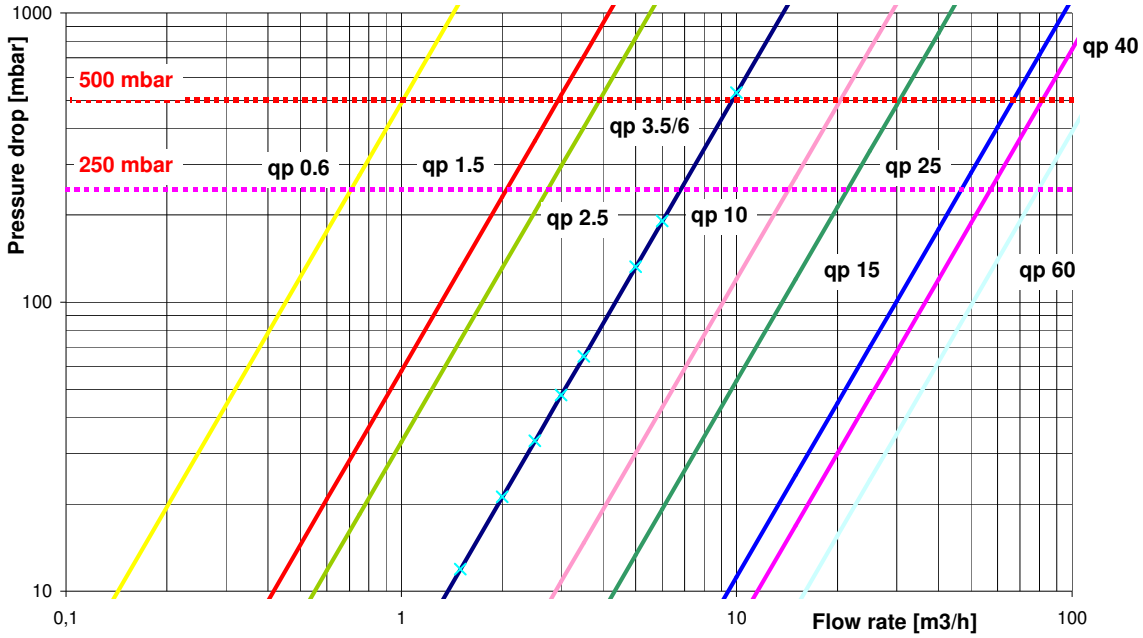
Threaded

Type	Qp	G	length	Qs max.fl.	Qi min.fl.	Qstart	Pressure drop at **qp**	PN	Kv	Weight	Pulse value
	[m³/h]		[mm]	[m³/h]	[l/h]	[l/h]	[mbar]	[bar]	[m³/h]	[kg]	[l/p]
0	0.6	G3/4"	110	1.2	6	2.4	140	16	1.6	1	1
1	1.5	G3/4"	110	3	15	6	130	16	4.2	1	1
2	0.6	G1"	130	1.2	6	2.4	140	16	1.6	1	1
3	1.5	G1"	130	3	15	6	130	16	4.2	1	1
4	2.5	G1"	130	5	25	10	205	16	6.7	1.5	1
5	3.5	G1¼"	260	7	35	14	65	16	14.3	3	2.5
6	6	G1¼"	260	12	60	24	190	16	14.6	3	2.5
7	10	G2"	300	20	100	40	120	16	29	4	10

Flanged

Type	Qp	DN	length	Qs max.fl.	Qi min.fl.	Qstart	Pressure drop at **qp**	PN	Kv	Weight	Pulse value
	[m³/h]		[mm]	[m³/h]	[l/h]	[l/h]	[mbar]	[bar]	[m³/h]	[kg]	[l/p]
A	3,5	25	260	7	35	14	65	25	14.3	5	2.5
B	6	25	260	12	60	24	190	25	14.6	5	2.5
C	10	40	300	20	100	40	120	25	29	7	10
D	15	50	270	30	150	60	120	25	43	8	10
E	25	65	300	50	250	100	70	25	94	11	10
F	40	80	300	80	400	160	120	25	115	13	25
G	60	100	360	120	600	240	140	16	160	22	25

Pressure drop characteristics

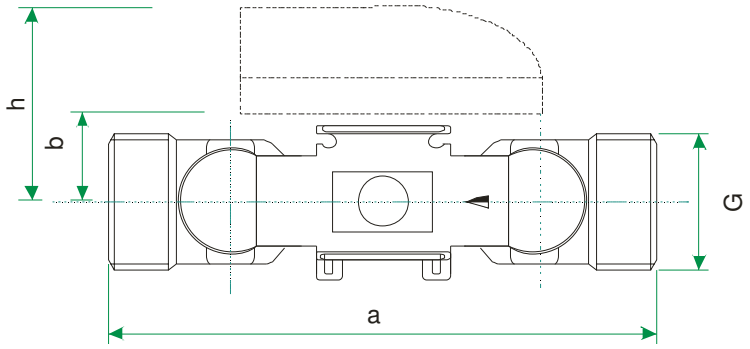


Dimensions

All dimensions are in mm

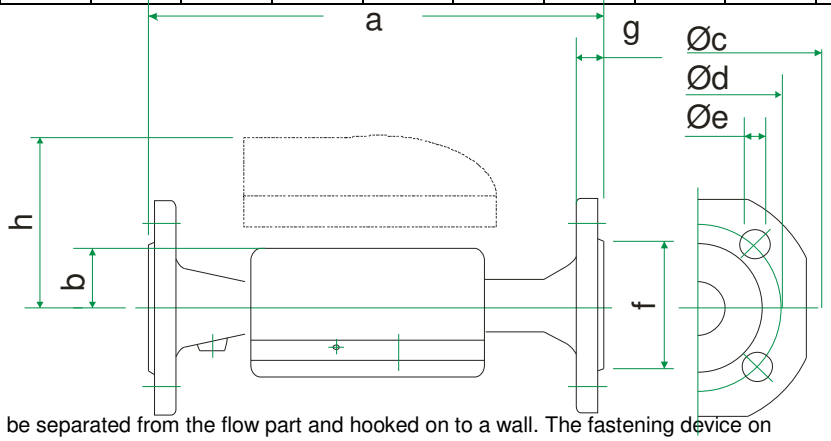
Threaded

Type	Qp [m³/h]	G	a	b	h
0	0.6	G3/4”	110	-	77
1	1.5	G3/4”	110	-	77
2	0.6	G1”	130	-	77
3	1.5	G1”	130	-	77
4	2.5	G1”	130	-	74
5	3.5	G1¼”	260	51	111
6	6	G1¼”	260	51	111
7	10	G2”	300	68	108



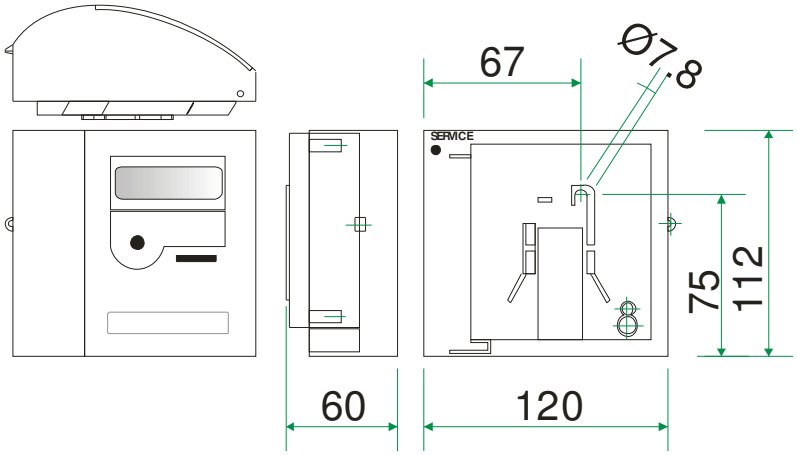
Flanged

Type	Qp [m³/h]	DN	a	b	h	Øc	Ød HCD	Øe	No.of holes	f	g
A	3,5	25	260	51	111	115	85	14	4	68	18
B	6	25	260	51	111	115	85	14	4	68	18
C	10	40	300	48	108	150	110	18	4	88	18
D	15	50	270	46	106	165	125	18	4	102	20
E	25	65	300	52	112	185	145	18	8	122	22
F	40	80	300	56	116	200	160	18	8	138	24
G	60	100	360	68	128	235	190	22	8	158	24



Electronics

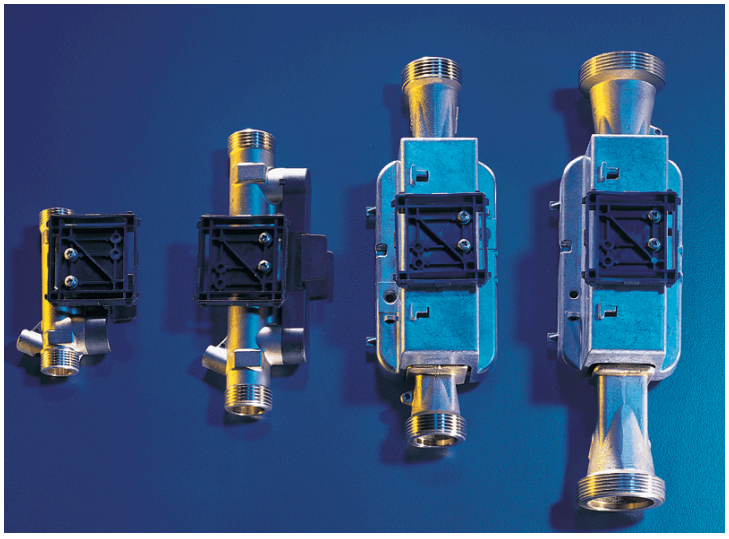
The electronic can be separated from the flow part and hooked on to a wall. The fastening device on flow part can be used to screw the electronics on the wall.



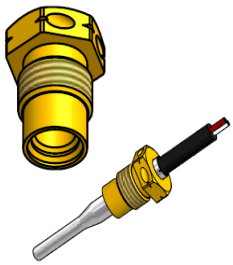
F27/C27 threaded

F27/C27 ABCDEFGHIJ KLM

A	1	Pt100 2-wire measurement, flow sensor in low (L) temp.
A	2	Pt100 2-wire measurement, flow sensor in high (H) temp.
B	1	Battery supply (3.6V - 16Ah)
B	3	Mains supplied 230V (with backup battery 1.0 Ah)
C	1	Pulse weight 2.5 [l/p] at qp= 3.5/6.0 [m³/h]
C	5	Pulse weight 1 [l/p] at qp= 0.6 / 1.5 / 2.5 [m³/h]
C	6	Pulse weight 10 [l/p] at qp= 10.0 [m³/h]
D	0	kWh [kW m³ m³/h]
D	1	MWh [kW m³ m³/h]
D	2	GJ [kW m³ m³/h]
D	3	MBTU [kW m³ m³/h]
D	4	MBTU [kUSG kW USG/m]
E	-	Standard order
E	S	Special, extra ordering information enclosed with order. Example customer information
F	H	Pulse output, STANDARD. Jumpers for pulse inputs 1000[l/p].
G	1	No backlight **(STANDARD)**
G	0	Backlight (option, ONLY in F27/C27 mains supplied)
H	0	qp= 0.6 [m³/h], 110[mm], G3/4" PN16 **C5 1 l/p**
H	1	qp= 1.5 [m³/h], 110[mm], G3/4" PN16 **C5 1 l/p**
H	2	qp= 0.6 [m³/h], 130[mm], G1" PN16 **C5 1 l/p**
H	3	qp= 1.5 [m³/h], 130[mm], G1" PN16 **C5 1 l/p**
H	4	qp= 2.5 [m³/h], 130[mm], G1" PN16 **C5 1 l/p**
H	5	qp= 3.5 [m³/h], 260[mm], G1 1/4" PN16 **C1 2.5 l/p**
H	6	qp= 6.0 [m³/h], 260[mm], G1 1/4" PN16 **C1 2.5 l/p**
H	7	qp=10.0 [m³/h], 300[mm], G2" PN16 **C6 10 l/p**
I	-	No temperature sensor eqipped with F27/C27
I	1	TDA26 temperature sensor, 2m silicone (ONLY qp=0.6 - qp=2.5 can a TDA26 be mounted directly in the flow sensor)
I	3	TL045, 2m silicone
I	S	Special temperature sensors, specified separately on order
J	1	Standard (not prepared for radio)
J	F	Prepared for radio (RF connector installed)
J	G	Prepared for radio, external antenna (RF connector and FME connection installed)
J	H	RF option board installed, built-in antenna
J	J	RF option board and FME connection installed
KLM	#00	Country code (300=English)



F27/C27 threaded flow parts



Only TDA26 temperature sensors with a cut in the screw may be used in the flow part.

F27/C27 Flanged

F27/C27 ABCDEFGHIJ KLM

A	1	Pt100 2-wire measurement, flow sensor in low (L) temp.
A	2	Pt100 2-wire measurement, flow sensor in high (H) temp.
B	1	Battery supplied (3.6 - 16Ah)
B	3	Mains supplied 230V (with backup battery 1.0 Ah)
C	1	Pulse weight 2.5 [l/p] endast qp=3.5/6 [m³/h]
C	2	Pulse weight 25 [l/p] endast qp=40/60 [m³/h]
C	6	Pulse weight 10 [l/p] endast qp=10/15/25 [m³/h]
D	0	KWh
D	1	MWh
D	2	GJ
D	3	MBTU
D	4	MBTU [kUSG kW USG/m]
E	-	Standard order
E	S	Special, extra information enclosed with order. Example customer information
F	H	Pulse output, STANDARD. Jumpers for pulse inputs 1000[l/p].
G	1	No backlight **(STANDARD)**
G	0	Backlight (option, ONLY in F27/C27 mains supplied)
H	A	qp= 3.5 [m³/h], 260[mm], DN25, flange PN25 C1 2.5 l/p
H	B	qp= 6.0 [m³/h], 260[mm], DN25, flange PN25 C1 2.5 l/p
H	C	qp=10.0 [m³/h], 300[mm], DN40, flange PN25 C6 10 l/p
H	D	qp=15.0 [m³/h], 270[mm], DN50, flange PN25 C6 10 l/p
H	E	qp=25.0 [m³/h], 300[mm], DN65, flange PN25 C6 10 l/p
H	F	qp=40.0 [m³/h], 300[mm], DN80, flange PN25 C2 25 l/p
H	G	qp=60.0 [m³/h], 360[mm], DN100, flange PN16 C2 25 l/p
I	-	No temperature sensor equipped with F27/C27
I	3	TL045, 2m silicone sensor
I	S	Special temperature sensors, specified separately on order
J	1	Standard (not prepared for radio)
J	F	Prepared for radio (RF connector installed)
J	G	Prepared for radio, external antenna (RF connector and FME connection installed)
J	H	RF option board installed, built-in antenna
J	J	RF option board and FME connection installed
KLM	#00	Country code (300=English)

F27/C27 flanged flow parts

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