SVM F2HC energy calculator

DATA SHEET

- **For use in combined heating and cooling applications**
- **Battery, mains 230VAC or M-Bus supply**
- **Use any type of flow meter; mechanical or ultrasonic**
- **Built-in M-Bus**
- **Wall mounted or compact mounted**
- **2 additional pulse inlets or pulse outlets**

Application

F2HC is a small and compact calculator with high flexibility, and designed to be used for billing purposes in combined heating and cooling applications. Systems for combined heating and cooling utilizes the same pipes for heat distribution during the cold season, and for chilled water distribution during the hot season. The calculator F2HC separates heating and cooling energy in two separate registers, by calculating heat when the temperature difference is positive, and calculating cooling when the temperature difference is negative.

F2HC is to a large extent identical with the F2 calculator, but is equipped with an additional energy register for cooling energy. This additional register replaces the control volume in sequence 70. The volume displayed in sequence 12 is the accumulated total volume for both heat and cooling.

F2HC can be used in combination with virtually any type of flow sensor, mechanical or ultrasonic, as long as they offer a standard pulse output. However, it is important to choose a flow sensor designed for the low temperatures that can occur when the F2HC operates as a cooling meter.

The calculator can be wall mounted by using the enclosed adapter, or mounted directly on top of the flow sensor as a compact heat/cooling meter.

F2HC offers great flexibility in terms of power supply, and may be delivered with battery supply or 230VAC mains supply. F2HC is also available in a version with power supply from the M-Bus loop. Each F2HC with M-Bus supply uses two bus loads (2×1,5mA).

The battery life exceeds 10 years. F2HC with mains supply or M-Bus supply also includes a super-cap to ensure operation during short term power cuts.

F2HC can be supplied with two pulse outputs for heat energy and cooling energy, or with two extra pulse inputs e.g. for connection to domestic water meters for cold and hot water.

These two extra volume registers are available when the meter is read remotely via M-bus or on the LCD of the meter.

F2HC may be selected for installation with Pt100 or Pt500 temperature sensors, using 2-wire connection.

The built-in service function makes it easy to change several operating parameters, such as the real time clock, date and primary communication address.

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Measurement

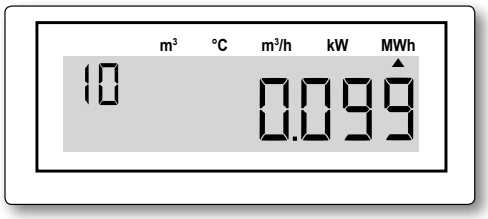
F2HC measures the temperature difference between the supply and return lines after each volume pulse received from the flow sensor. The recorded temperature difference and the pulse value are necessary parameters for the energy calculation.

The temperatures are measured and updated with every energy calculation. If no energy calculation takes place in 60 seconds, the temperatures are updated anyway. Power and flow rate are updated with every volume pulse, but not more frequently than every five seconds. If volume pulses are received more frequent than every five seconds, the pulses are added before the energy calculation takes place.

F2HC automatically switches between heating and cooling. When the temperature difference is positive, the energy is stored in the heat register in display sequence 10, and when the temperature difference is negative the energy is stored in the cooling register in display sequence 11. The volume is stored in a common register displayed in sequence 12.

Display

The F2HC is equipped with an LCD with 7+2 digits.



The F2HC LCD showing accumulated heat energy.

Pulse outputs/pulse inputs

F2HC is equipped with pulse outputs of the type “open collecter” for heat energy and cooling energy, as a standard. As an option, the F2HC can be ordered with pulse inputs instead of pulse outputs. The inputs can be used to collect pulses from other meters, e.g. cold and hot water meters. These extra pulse registers may also be read via M-Bus.

Communication

F2HC is equipped with a built in M-Bus data output in accordance with EN1434-3. The meter can be read through the OPTO-interface or the 2-wire bus connection.

Installation

F2HC is primarily a heat meter, with an extra register for cooling energy. During installation the F2HC shall always be installed as a heat meter, regardless if it is operating as a heat meter or a cooling meter at the time of installation.

If the calculator is parameterized for the flow sensor installed in the cold line, this means that the flow sensor shall be installed in the return line, which is the cold line when the meter operates as a heat meter.

The temperature sensor with a red label shall be installed in the supply line, and the temperature sensor with a blue label shall be installed in the return line.

Note! The F2HC shall be regarded as a heat meter during installation.

Displayed data

Accumulated values

- ☐ Accumulated heat energy
- ☐ Accumulated cooling energy
- ☐ Accumulated (total) volume
- ☐ Accumulated pulses “pulse input 1”*
- ☐ Accumulated pulses “pulse input 2” *

Momentary values

- ☐ Momentary power
- ☐ Momentary flow
- ☐ Supply line temperature (high temperature for heat)
- ☐ Return line temperature (high temperature for cooling)
- ☐ Temperature difference

Calculator settings

- ☐ Total operating time
- ☐ Time
- ☐ Date
- ☐ Pulse value
- ☐ Flow sensor placing (H=supply / L=return)
- ☐ Calculator S/N number
- ☐ Communication, primary address
- ☐ Communication, secondary address (S/N)

Calculator messages

- ☐ Error code
- ☐ Total error time
- ☐ Accumulated time for this error
- ☐ Preceding error code
- ☐ Recommended date for battery replacement

Historical values

Historical values are stored at the end of each month or period for account days.

There are 37 monthly registers + 2 account days in the calculator.

- ☐ Accumulated heating energy
- ☐ Accumulated cooling energy
- ☐ Accumulated volume
- ☐ Accumulated pulses “pulse input 1” *
- ☐ Accumulated pulses “pulse input 2” *
- ☐ Error code at saving

* Only if the calculator is ordered with pulse inputs

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Technical data

Flow sensor (with pulse output)	
— Max. frequency	12 Hz
— Min. pulse length	40 ms
— Max. voltage	3 V
— Max. cable length	15 m
— Pulse value	0.0001 – 9999 l/p
Power supply	
— Battery	3V, 2.2Ah, battery life 10 years
— Battery for flow sensor supply	3.6V, 3.6Ah, battery life 10 years
— Mains	230V ±10%, 45-65 Hz, battery 20mAh for short term power cuts
— Mains for flow sensor supply	230V ±10%, 45-65 Hz, super-cap for short term power cuts
— M-Bus suply	2 loads from Master, super-cap for short term power cuts
Data output	
— M-Bus (EN1434-3)	OPTO-interface (EN60870-5) and 2-wire bus connection (terminal)
Ambient temperature	
— Operation	+5°C to +55°C
— Storage/transport	-20° C to +70° C
Protection class	IP54
Environmental class	C according to EN1434
Temperature sensors	
— Approved and matched pairs type	Pt 100 or Pt 500
— Max. cable length, Pt100:	2,5 m at 0,22 mm² cable cross section 5,0 m at 0,50 mm² cable cross section 7,5 m at 0,75 mm² cable cross section 15,0 m at 1,50 mm² cable cross section For Pt500, 5 times the above lengths
— Max. sensor current	4 µA (RMS) för Pt 100
Display	7 + 2 digit LCD
Temperature	
— Range	0 ...190° C
— Difference	2...120 K
Pulse outputs Open collector	
— Pulse length	125 ms
— Max. voltage	30 V
— Max. current	20 mA
Pulse inputs	
— Max frequence	12 Hz
— Min pulse length	40 ms
— Max voltage	3 V
Alarm output Open collector	
— Pulse length	125 ms

Service

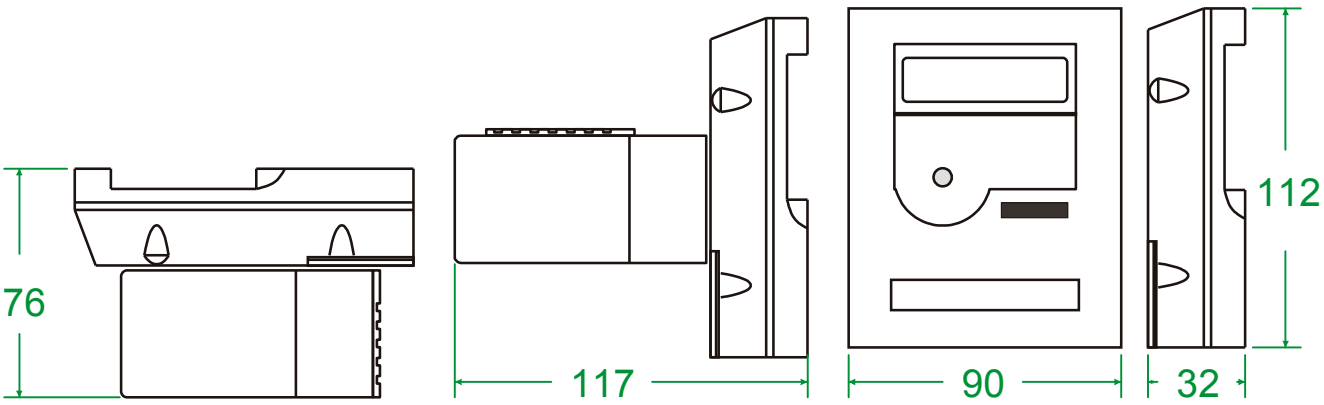
F2HC has a built-in service function that enables the user to change calculator settings using the push-button. The following parameters can be changed:

- Time
- Date
- Account day 1
- Account day 2
- Communication, primary address
- Flow sensor placing, supply or return line
- Recommended date for battery replacement
- Reset error time
- Exit service menu

F2HC can also be parameterized using a special service program, “HCServ”, where also the pulse value may be altered.

Dimensions

All dimensions are in mm



F2HC mounted horizontally on adapter for mechanical flow sensor

F2HC mounted vertically on adapter for mechanical flow sensor

F2HC wall mounted

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F2HC Article number

Use the below table to combine the correct article number.

H2 ABCDEFG	A	B	C	D	E	F	G
Sensor type							
Pt100 2-wired. Flow meter in return line	1						
Pt100 2-wired. Flow meter in supply line	2						
Pt500 2-wired. Flow meter in return line	5						
Pt500 2-wired. Flow meter in supply line	6						
Power supply							
None		0					
Battery std.		1					
M-Bus powered (2 Bus loads)		2					
Mains 230 VAC (w. backup batt.)		3					
Mains 230 VAC for flow meter supply (w. Supercap)		4					
Battery for flow meter supply		U					
Pulse value							
Kt: 2.5 l/p			1				
Kt: 25 l/p			2				
Kt: 250 l/p			3				
Kt: 2500 l/p			4				
Kt: 1 l/p			5				
Kt: 10 l/p			6				
Kt: 100 l/p			7				
Kt: 1000 l/p			8				
Energy unit							
kWh				0			
MWh				1			
GJ				2			
MBTU [m³ m³/h °C]				3			
Configuration							
Standard					–		
Customer number - Separate specification needed					E		
Special - Separate specification needed					S		
In/Outlets							
Pulse inlets: 2.5 l/p						1	
Pulse inlets: 25 l/p						2	
Pulse inlets: 250 l/p						3	
Pulse inlets: 1 l/p						5	
Pulse inlets: 10 l/p						6	
Pulse inlets: 100 l/p						7	
Pulse inlets: 1000 l/p						8	
Pulse outlets:						9	
Display							
No backlight. With Opto and M-Bus							1

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Article number HIJ KLM

H2 HIJ KLM	H	I	J	K L M
Montage				
For wall mounting. Walladapter is included. Packaging: 1 pc.	0			
Compact adapter is included. Packaging: 1 pc.	2			
Connections				
Standard connector		–		
Communication				
M-Bus, 300 baud			1	
M-Bus, 2400 baud			2	
Country				
English standard				300

F2HC Article number key

To acquire the right article number, just fill out the blanks.

	A	B	C	D	E	F	G	H	I	J	KLM
H2											**300**