SVM F4HC Calculator

DATA SHEET

- **For use in combined heating and cooling applications**
- **1 extra pulse input**
- **2 pulse outputs for heat and cooling energy**
- **2 or 4-wire connection of temperature sensors**
- **Spacious screw terminal blocks**
- **Robust cable glands**

Application

The F4HC calculator is designed to be used in combined heating and cooling applications where the customer requires more advanced features from the calculator. 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. Heating and cooling energy is stored in two separate registers, by calculating heat when the temperature difference is positive, and calculating cooling when the temperature difference is negative.
F4HC is to a large extent identical with the F4 calculator, but is equipped with additional registers for cooling energy and cooling volume. These additional registers replace one of the extra pulse inputs and also the control volume register in sequence 70.

The option card slots in F4HC have only limited functionality where the relay option board (FCRC) and the Log option board (FCLG) can be installed. All other option boards will not function properly and should not be installed.

The F4HC has a built-in M-Bus output for remote readout where all standard values, including the additional cooling registers, are available.

The power supply options are mains supplied with 230 VAC, including a battery backup for full functionality, or battery supplied with up to 15 years battery life.

F4HC can be selected for installation with Pt100 or Pt500 temperature sensors, and supports both 2 wire and 4 wire connection.

F4HC is compatible with most flow sensors available on the market, that offers standard pulses. This includes mechanical flow sensors with reed relay pulse output, and static flow sensors with open collector pulse outputs. However, it is important to choose a flow sensor designed for the low temperatures that can occur when the F4HC operates as a cooling meter.

The F4HC has two pulse outputs for heat energy and cooling energy, and one extra pulse input that may be used e.g. for connection to a domestic water meter.

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

The spacious terminal block, superior cable glands and strain-reliefs, will, together with the enclosed documentation make the installation a true pleasure!

Kamstrup

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Measurement

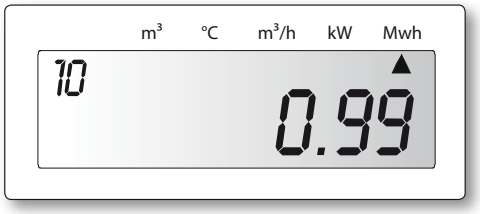
F4HC measures the temperature difference between the hot and cold lines after each volume pulse received from the flow sensor. The recorded temperature difference and the pulse value are necessary parameters for the energy calculation.

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.

F4HC 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 12. The corresponding volumes are also stored in separate registers by the same criteria. Heat volume is displayed in sequence 11, and cooling volume in sequence 13.

Display

F4 is equipped with an LCD (Liquid Crystal Display). The LCD can be equipped with backlight as an option.



Display showing accumulated heat energy

Pulse outputs and one pulse input

F4HC is equipped with pulse outputs of the type ”open collector” for heat energy and cooling energy. Relay outputs are also available when an option board for this purpose is installed.

F4HC is also equipped with a pulse input. This input can be used to collect pulses from another meter, e.g. a domestic water meter. The extra pulse register may also be read via M-Bus.

Communication

F4HC 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. All standard values including the additional registers for cooling energy and volume are available.

Option boards

F4HC has 5 option board slots but the number of option boards available is limited to the following:

- Relay option board (FCRC)
- Log option board (FCLG)

All other option boards will not function properly and may not be used in F4HC calculators.

Installation

F4HC is primarily a heat meter, with an additional register for cooling energy. During installation the F4HC 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 parametrized 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 F4HC shall be regarded as a heat meter during installation.

Displayed data

The following data is available on the LCD and via M-Bus from F4HC:

Accumulated values

- ☐ Heat energy
- ☐ Cooling energy
- ☐ Heat volume
- ☐ Cooling volume
- ☐ Pulse input register 1

Momentary values

- ☐ Power
- ☐ Flow
- ☐ Supply line temperature (high temperature for heat)
- ☐ Return line temperature (high temperature for cooling)
- ☐ Temperature difference

Calculator settings

- ☐ Date and time
- ☐ Pulse value
- ☐ Flow sensor placing (H=supply / L=return)
- ☐ Total operating time
- ☐ Serial number
- ☐ Communication address

Calculator messages

- ☐ Error code
- ☐ Accumulated time for current error
- ☐ Total error time
- ☐ Preceding error and accumulated time for this error
- ☐ Date for battery replacement

Historical values

Stored at the end of each month, or at the set date for account days.
37 monthly registers and 2 account days store the following values:

- ☐ Heat energy
- ☐ Cooling energy
- ☐ Heat volume
- ☐ Cooling volume
- ☐ Pulse input register 1
- ☐ Error code at date of storage

Service

F4HC has a built-in service function that facilitates alteration of certain parameters in the field without a special service tool.

The following parameters can be altered:

- Time and date
- Account days
- Communication address (primary)
- Flow sensor placing (supply or return)
- Recommended date for battery replacement
- Reset the error time

The total error time can be reset. Using the PC-program ”HCServ”, all the parameters can be altered.

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Technical data

Flow sensors (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	3.6V, 8.5Ah, operation time 10 years
— Battery	3.6V, 18.5Ah for flow meter supply, operation time 10 years
— Mains	230 V ± 10%, 45-65 Hz, battery back up 8.5Ah
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 till +70°C
Protection class	IP54
Environmental class	C according to EN1434.
Temperature sensors	
— Approved and matched pairs type	Pt100 or Pt500 may be used.
— 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) for Pt 100	
Display	7 +2 digit LCD (back light as an option)
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. frequency	12 Hz
— Min. pulse length	40 ms
— Max. voltage	3 V
Alarm output	Open collector
— Pulse length	125 ms

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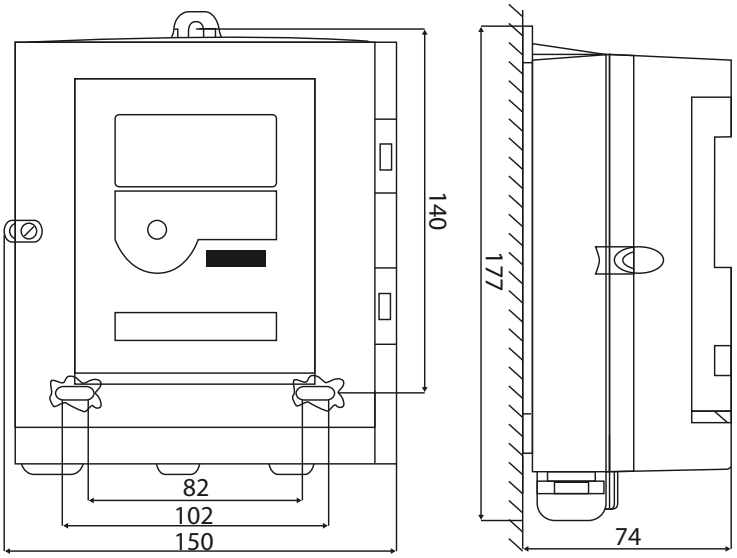
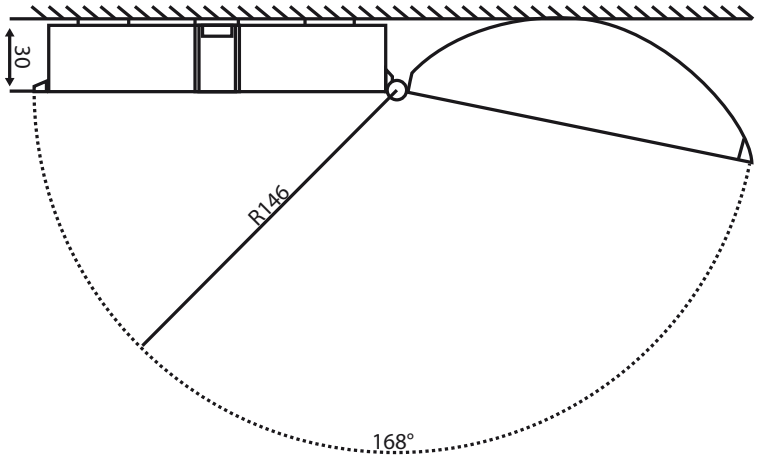
Dimensions

All dimensions are in mm.



Mounting

F4HC is designed for wall mounting.



Delivery

F4HC is delivered in "Transport mode" where only the real time clock is active. The power consumption is kept at a minimum in transport mode. This enables storage for many months without affecting the battery life.

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F4HC Article number

H4 ABCDEFG	A	B	C	D	E	F	G
Sensor type							
Pt100 2/4-wired. Flow meter in low temperature	3						
Pt100 2/4-wired. Flow meter in high temperature	4						
Pt500 2/4-wired. Flow meter in low temperature	7						
Pt500 2/4-wired. Flow meter in high temperature	8						
Power supply							
None		0					
Battery std. C-cell		1					
Mains 230 VAC (w. backup battery C-cell)		4					
Battery (D-cell) 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			
MBTU [kUSG USG/m °F]				4			
Configuration							
Standard					–		
Customer number - Separate specification needed					E		
Special - Separate specification needed					S		
In/Outlets							
Pulse inlets: 2,5 l/p + Pulse outlets						A	
Pulse inlets: 25 l/p + Pulse outlets						B	
Pulse inlets: 250 l/p + Pulse outlets						C	
Pulse inlets: 2500 l/p + Pulse outlets						D	
Pulse inlets: 1 l/p + Pulse outlets						E	
Pulse inlets: 10 l/p + Pulse outlets						F	
Pulse inlets: 100 l/p + Pulse outlets						G	
Pulse inlets: 1000 l/p + Pulse outlets						H	
Display							
Backlight with Opto and M-Bus							0
No backlight. With Opto and M-Bus							1

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F4HC Article number

H4 HIJ KLM	H	I	J	K L M
Montage				
For wall mounting	0			
Connections				
Both terminal blocks mounted		1		
Communication				
M-Bus, 300 baud			1	
M-Bus, 2400 baud			2	
Country				
English standard				300

Article number key

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

	A	B	C	D	E	F	G	H	I	J	KLM
H4								0	1		300