

CALCULATOR F4

A powerful Heat Meter Calculator for district heating and cooling applications

Calculator F4 Data Sheet



Application field

F4 is designed for Metering and monitoring of larger heating and cooling customers, wishing more advanced functions of their calculator.

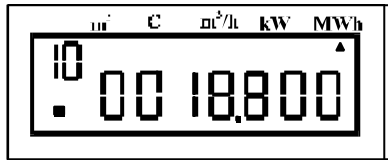
F4 is a calculator that can very easily be expanded via optional cards for various purposes, e.g. communication cards for different bus systems.

Measurement

F4 measures the difference between flow temperature and return temperature, for each pulse, provided the time between pulses is longer than or equal to 5 seconds. When the time between the pulses is less than 5 seconds, the measurements of the temperature difference are made every 5th second. The energy content in the volume measured by the flow meter is calculated from the measured temperature difference. If the time between the flow meter pulses exceeds 60 seconds, a measurement will be made every 60th second. The measurement only updates temperatures that can be read off at the calculator.

Display

F4 is equipped with a LCD (Liquid Crystal Display). As optional feature the LCD can be equipped with background light.



Example of a display image, showing accumulated energy.

Pulse outputs/pulse inputs

F4 has as a standard pulse outputs for energy and volume of the type "open collector". If you wish to use relay outputs, option card for this purpose has to be installed.

F4 is also furnished with two pulse inputs as a standard. The inputs can be used to read-off other meters with pulse outputs, e.g. cold and hot water meters. The meters can be read off via M-Bus.

Communication

F4 is, as standard, equipped with a M-Bus data output in accordance with EN1434-3. Read-off is possible either via an OPTO-interface or a bus connection. F4 can, as an option, be equipped with a SIOX-card for communication on a SIOX-bus. The SIOX-protocol is compatible with 820, that is all superior systems that, today, communicate with 820, can also communicate with F4.

Option cards

F4 is prepared for up to five places for different option cards, for example:

- Relay output
- SIOX-card
- Analogue output
- Tariff option board
- Max values

Data

In addition to accumulated energy, the following (among others) values are accessible in F4:

- ★ 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

F4 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
- * Pulse value
- * Account days

- * Communication address
- * Flow sensor placing, high or low temperature
- * Recommended date for battery replacement.

Furthermore, the total error time can be reset.

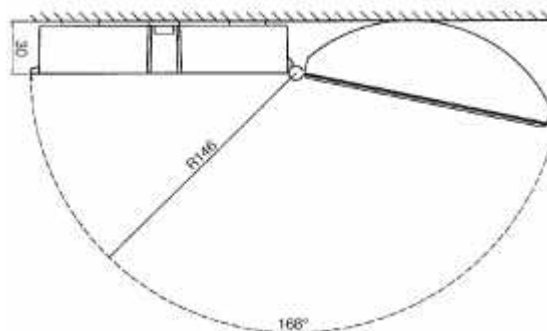
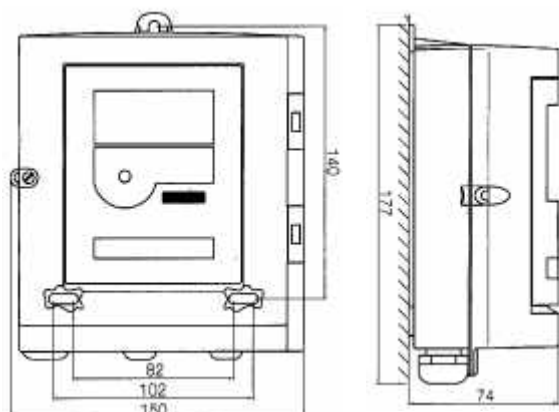
All parameters in F4 can be altered through a PC-program.

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	Temperature sensors	Approved and matching pairs type Pt100 or Pt500 are to be used.
						Max. cable length	2.5 m at 0.22 mm ² cable area 5.0 m at 0.50 mm ² cable area 7.5 m at 0.75 mm ² cable area 15.0 m at 1.50 mm ² cable area
						Max. sensor current	4 μA (RMS) for Pt 100
Power supply	Battery 3 V 2.2 Ah alt.2 x 2.2, Operation time max. 10 years	Mains 230 V ± 10%, 45-65 Hz, battery 2.2 Ah, as a spare				Display	7 + 2 digit LCD (back light as an option)
						Temperature Range	0 - 190° C
						Temperature Difference	2 - 120 K
Data output	M-Buss (EN1434-3) Via OPTP-interface (EN60870-5) and via bus connection (terminal)	SIOX Option card	LonWorks Via external interface			Pulse outputs	Open collector
						Pulse length	250 ms
						Max voltage	30 V
						Max current	20 mA
Ambient temperature	Operation +5°C to +55°C	Storage/transport -20° C till +70° C				Pulse inputs	
						Max. frequency	12 Hz
						Min. pulse length	40 ms
						Max. voltage	3 V
Protection class	IP54					Alarm output	Open collector
Environmental class	C according to EN1434.					Pulse length	250 ms

Dimensions

All dimensions are in mm.



Mounting

F4 has to be mounted on a wall.

Delivery

F4 is delivered in the transport mode, only the built-in real time clock is active. In this mode, power consumption is at its minimum.

Ordering key

Combine the right combination to order the meter

F4 ABCDEFGHI JKLM

Val ue	No.	Details
A	3	Pt100 2/4-wire measurement, flow in the low temp. ¹⁾
A	4	Pt100 2/4-wire measurement, flow in the high temp. ¹⁾
A	7	Pt500 2/4-wire measurement, flow in the low temp. ¹⁾
A	8	Pt500 2/4-wire measurement, flow in the low temp. ¹⁾
B	1	Battery supply
B	3	Mains supply (with back-up battery)
C	0	The pulse value below will be specified in plain text (note select numbers of decimal places in position S and E)
C	1	Pulse value, 2.5 l/p
C	2	Pulse value, 25 l/p
C	3	Pulse value, 250 l/p
C	4	Pulse value, 2500 l/p
C	5	Pulse value, 1 l/p
C	6	Pulse value, 10 l/p
C	7	Pulse value, 100 l/p
C	8	Pulse value, 1000 l/p
D	0	KWh
D	1	MWh
D	2	GJ
D	3	MBTU
E	-	Standard order.
E	S	Special, Extra information at the order, e.g. customer information
E	A	Option Board according to order, extra information on order
F	A	Extra pulse inputs, 2.5 l/p (+ pulse outputs)
F	B	Extra pulse inputs, 25 l/p (+ pulse outputs)
F	C	Extra pulse inputs, 250 l/p (+ pulse outputs)
F	D	Extra pulse inputs, 2500 l/p (+ pulse outputs)
F	E	Extra pulse inputs, 1 l/p (+ pulse outputs)
F	F	Extra pulse inputs, 10 l/p (+ pulse outputs)
F	G	Extra pulse inputs, 100 l/p (+ pulse outputs)
F	H	Extra pulse inputs, 1000 l/p (+ pulse outputs)
G	1	Back light on display, (+OPTO, + M-Buss) ²⁾
G	2	No back light on the display, (+OPTO, +M-Buss) ²⁾
G	4	Back light + M-Buss ²⁾
G	5	M-Buss ²⁾
H	0	Wall mounting
H	A	I100-01 1,2 DN15 G¼B 110 mm (R0)
H	B	I100-01 1,2 DN20 G1B 130 mm (R3)
H	C	I100-01 1,2 DN20 G1B 190 mm (R4), not in stock
H	D	I100-03 3,0 DN15 G¼B 110 mm (R0)
H	E	I100-03 3,0 DN20 G1B 130 mm (R3)
H	F	I100-03 3,0 DN20 G1B 190 mm (R4), not in stock
H	G	I110-05 5,0 DN20 G1B 190 mm (R4)
H	H	I110-09 9,0 DN20 G1B 190 mm (R4)
H	I	I110-16 16,0 DN20 G1B 190 mm (R4)
H	K	Equipped for HG flow sensor
I	1	Both connection terminals mounted
J	1	Package 1 pcs.
K	X	Country code
L	0	Standard,
L	X	Special meter display settings according to country code.
M	0	Standard

^{*)} All meters are delivered with jumpers mounted for 2-wire measurement.
The jumpers must be de-mounted for 4-wire measurement

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