

Data sheet

INFOCAL 8

Energy calculator

Description/Application

MID examination certificate
no.: DE-10-MI004-PTB008



The INFOCAL 8 is an energy calculator e.g. for combination with SONO 1500 CT especially designed for heating, cooling or combined heating/cooling application in local and district energy systems.

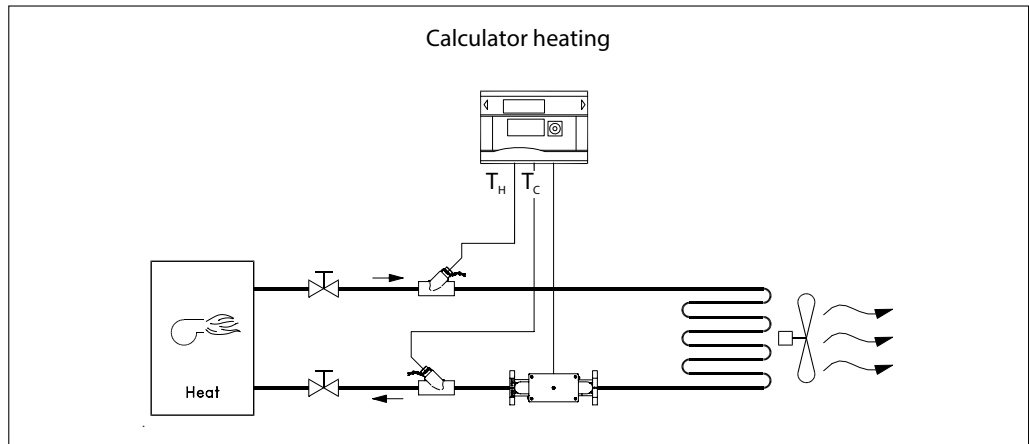
The INFOCAL 8 has been approved according to MID.

Features

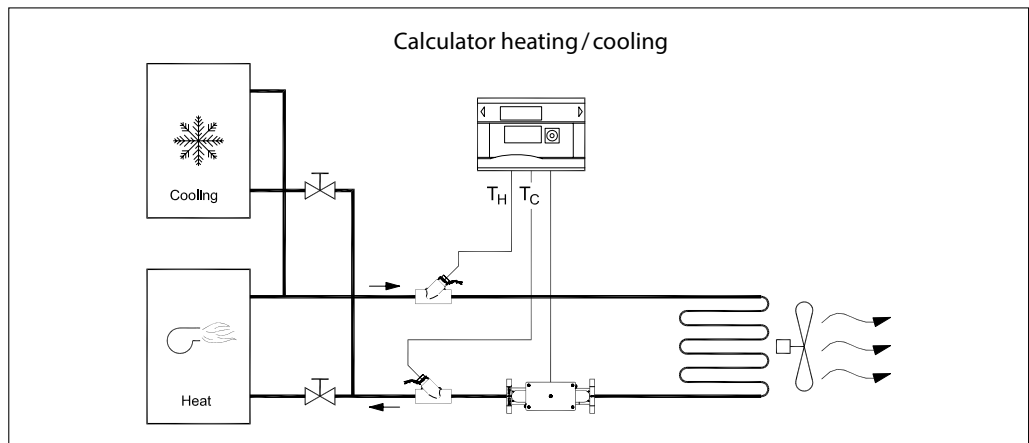
- Lithium battery with lifetime typical 11 years or 16 years optional (depending on selected functionality and connected flow sensor)
- Pair of Pt 500 temperature sensors included
- Temperature range: 0 to +180 °C
- Power save mode
- NOWA test capability
- connection possibility of 2- and 4-wire temperature sensor pairs
- Remote reading via M-Bus, L-Bus, RS 232, RS 485, Radio or optical interface
- Integrated Radio 868 MHz, Open Metering Standard (OMS)
- Individual remote reading (Automatic Meter Reading) with add on modules Plug&Play
- 3 communication ports (e.g. M-Bus + pulse input + radio)
- Improved radio performance
- Individual tariff functions
- History memory for 24 months
- Extensive diagnostic displays
- Dedicated district energy application telegram
- Suitable for Danfoss ECL Comfort controller and ECL 310 internet portal connection
- IZAR@SET parameterization software on Windows basis guarantees optimum adaptation to the user's specific needs

Description/Application, continued

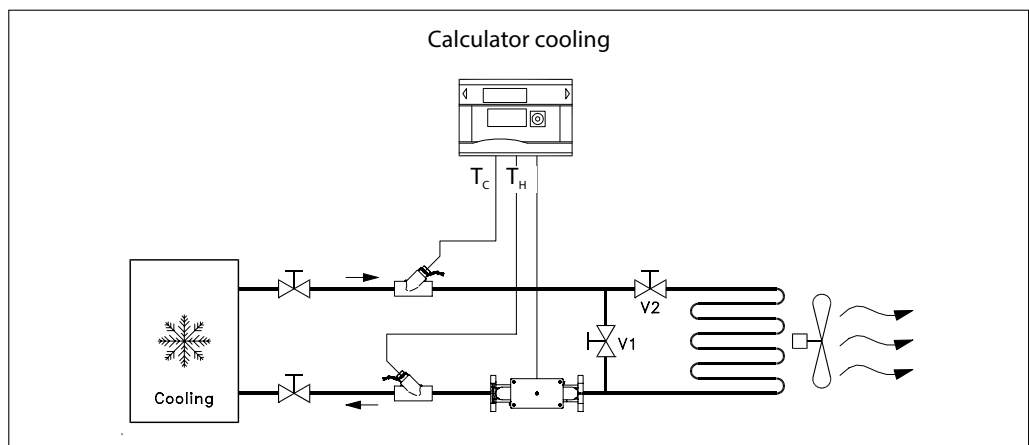
The INFOCAL 8 is able to handle 3 types of applications:



District heating/boiler application



Combined heating/cooling application



Chilled water application

Ordering:

The standard codes are used for ordering.

Heating application INFOCAL 8 standard codes:

Code no.	Application	Mainly for	Nominal flow rate range of flow sensor	Pulse value	Installation	Power supply	Module	Energy unit	Cable length ¹⁾
087G6217	heating	SONO 1500 CT	0.6-2.5 m ³ /h	1 liter / pulse	low temperature	mains unit	Pulse output	kWh	1,9m
087G6218	heating	SONO 1500 CT	3.5-25 m ³ /h	10 liter / pulse	low temperature	mains unit	Pulse output	MWh	1,9m
087G6219	heating	SONO 1500 CT	40-60 m ³ /h	100 liter / pulse	low temperature	mains unit	Pulse output	MWh	1,9m
087G6220	heating	SONO 1500 CT	0.6-2.5 m ³ /h	1 liter / pulse	low temperature	battery (A-cell)	Pulse output	kWh	1,9m
087G6221	heating	SONO 1500 CT	3.5-25 m ³ /h	10 liter / pulse	low temperature	battery (A-cell)	Pulse output	MWh	1,9m
087G6222	heating	SONO 1500 CT	40-60 m ³ /h	100 liter / pulse	low temperature	battery (A-cell)	Pulse output	MWh	1,9m
087G1307	heating	SONO 3500 CT	60-200 m ³ /h	2,5 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	4,9m
087G1308	heating	SONO 3500 CT	150-800 m ³ /h	10 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	4,9m
087G1311	heating	SONO 3500 CT	560-1900 m ³ /h	50 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	4,9m
087G1324	heating	SONO 3500 CT	1475-7600 m ³ /h	100 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	4,9m
187F8000	heat/cooling	SONO 3500 CT	60-200 m ³ /h	2,5 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	2,9m
187F8001	heat/cooling	SONO 3500 CT	150-800 m ³ /h	10 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	2,9m
187F8002	heat/cooling	SONO 3500 CT	560-1900 m ³ /h	50 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	2,9m
187F8003	heat/cooling	SONO 3500 CT	1475-7600 m ³ /h	100 liter / pulse	low temperature	battery (A-cell)	M-Bus module	MWh	2,9m
187F8004	heat/cooling	SONO 3500 CT	60-200 m ³ /h	2,5 liter / pulse	low temperature	mains unit	M-Bus module	MWh	2,9m
187F8005	heat/cooling	SONO 3500 CT	150-800 m ³ /h	10 liter / pulse	low temperature	mains unit	M-Bus module	MWh	2,9m
187F8006	heat/cooling	SONO 3500 CT	560-1900 m ³ /h	50 liter / pulse	low temperature	mains unit	M-Bus module	MWh	2,9m
187F8007	heat/cooling	SONO 3500 CT	1475-7600 m ³ /h	100 liter / pulse	low temperature	mains unit	M-Bus module	MWh	2,9m


¹⁾Cable length of temperature sensor.

More standard codes are available regarding cooling and heat/cooling application, high temperature installation, power supply and modules.

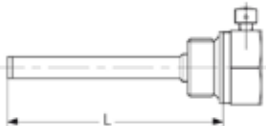
Accessories

Type	Designation	Set	Code No.
Communication	M-Bus module	1 pc	087G6027
	M-Bus module	72 pcs	087G6028
	RS232 module with cable	1 pc	087G6031
	RS485 module	1 pc	087G6032
Function	Pulse input module (2 inputs)	1 pc	087G6037
	Pulse input module (2 inputs)	72 pcs	087G6038
	Pulse output module (2 outputs)	1 pc	087G6039
	Pulse output module (2 outputs)	72 pcs	087G6040
	Combined module (2 pulse inputs / 1 pulse output)	1 pc	087G6041
	Combined module (2 pulse inputs / 1 pulse output)	72 pcs	087G6042
	Analogue output module (4–20mA)	1 pc	087G6034
Supply voltage	battery 3.6 V DC (A-cell)	1 pc	087G6020
	battery 3.6 V DC (D-cell)	1 pc	087G6022
	mains unit 230 V AC	1 pc	087G6024
	mains unit 24 V AC	1 pc	087G6025

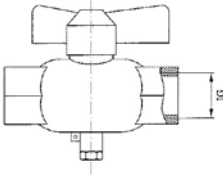
Temperature sensors

	ø 5.2 mm type	Pair	Code No.
	Pt 500/3 m cable, MID	1	087G6046
	Pt 500/5 m cable, MID	1	087G6047
	Pt 500/10 m cable, MID	1	087G6048

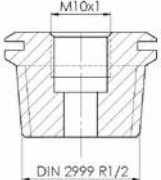
Sensor pockets

	For ø 5.2 mm type	Pair	Code No.
	brass /35 mm	1	087G6053
	brass /52 mm	1	087G6054
	brass /85 mm	1	087G6055
	brass /120 mm	1	087G6056
	stainless steel /85 mm	1	087G6057
	stainless steel /120 mm	1	087G6058
	stainless steel /155 mm	1	087G6059
stainless steel /210 mm	1	087G6060	

Ball valves

	Dimension (IG)	Set	Code No.
	G ½"	1 pc	187F0593
		12 pcs	087H0118
	G ¾"	1 pc	187F0592
		12 pcs	087H0119
	G 1"	1 pc	187F0591
12 pcs		087H0120	

Adapters for mounting temperature sensors

	Coupling thread	Sensor thread	Set	Code No.
	R ½"	M 10 x 1	1 pc	087G6075
	R ½"	M 10 x 1	32 pcs	087G6076

Software

The IZAR@SET parameterization software on windows basis is a convenient tool for handling the energy meter.

It is used for:

- commissioning and meter configuration
- reading out measured values
- application analysis
- print the meter protocol

Technical data
INFOCAL 8

Basic data	Ambient class		class E2 +M2
	Protection class		IP 54
	Max. ambient humidity		93% rel. humidity
Display indication	Display		LCD, 8-digit
	Units		MWh - kWh - GJ - Gcal - MBtu - gal - GMP - °C - °F - m ³ - m ³ /h
	Total values		99 999 999 - 9999 999.9 - 999 999.99 - 99 999.999
	Values displayed		Power - energy - flow rate - temperature - volume
Temperature	Ambient operating temperature	[°C]	+5 ... +55 (> 35 max. 4 weeks)
	Ambient storage temperature		-25 ... +60 (> 35 max. 4 weeks)
Input	Temperature sensors	Type	Pt 100 or Pt 500 with 2 or 4-wire leads; Ø 5.2 or Ø 6.0 mm < 10 m
	Sensor current	m [A]	Pt 500 peak < 2; rms < 0.012
	Measuring cycle	T [s]	Mains unit supply: 1 A-cell battery: 16; D-cell battery: 4
	Max. temp. difference	$\Delta\theta_{\max}$ [K]	177
	Min. temp. difference	$\Delta\theta_{\min}$ [K]	3
	Starting temp. difference	$\Delta\theta$ [K]	0.125
	Heating temp. measuring range	θ [°C]	0 ... 180
	Heat/cooling temp. measuring range	θ [°C]	0 ... 105
	Cooling temp. measuring range	θ [°C]	0 ... 90
Battery supply	3.6 VDC, A cell, 11 years lifetime 3.6 VDC, D cell, 16 years lifetime		
Mains supply	24 VAC, 230 VAC/0.15 W		

Design and function

The INFOCAL 8 is an energy calculator especially designed for heating, cooling or combined heating/cooling application in local and district heating systems.

Calculator

The calculator contains all the necessary circuits for recording the flow rate and temperature as well as for calculating, logging and displaying the data. The calculator housing can be mounted directly on the volume measuring component or on the wall. At application with medium temperature above 90 °C or at temperatures $T_{\text{water}} < T_{\text{environment}}$ the calculator has to be removed from the flowmeter.

The calculator can be conveniently read from a single line 8-digit display with units and symbols. A push-button provides user-friendly control of the various display loops. All failures and faults are recorded automatically and shown on the LC display. To protect the reading data, all the relevant data are saved in a non-volatile memory (EEPROM). This memory saves the measured values, device parameters and types of error at regular intervals.

Design and function

Temperature Sensors

Pairs of Pt 500 ø5.2 mm temperature sensors with 2-wire leads are used. Cable length 2 m, 3 m, 5 m or 10 m are available.

Integrated Radio

Integrated Radio is an interface for communication with radio receiver.

- Frequency band: 868 MHz
- Type of radio telegram: Open Metering Standard (OMS)
- Transmission data updating: Online - no time delay between value measurement and data transmission
- Data transmission: Unidirectional
- Sending interval: 12...20 s; depending on length of telegram (duty cycle)

Interfaces

- Optical: ZVEI interface as standard, for communication and testing, M-Bus protocol.
- M-Bus: Configurable telegram, according to EN13757-3. Data reading and parametrization are via two wires with polarity reversal protection.
- L-Bus: Adapter for external radio module; configurable telegram, according to EN13757-3. Data reading and parametrization are via two wires with polarity reversal protection. M-Bus protocol.
- RS232: Serial interface for communication with external devices. M-Bus protocol.
- RS485: Serial interface for communication with external devices. M-Bus protocol.
- Pulse output: Module with 2 Open Collector pulse outputs (potential-free). Configurable via IZAR@SET software. Default pulse outputs are energy and volume.

In AMR (Automatic meter reading) systems the fastest reading interval is every 3 minutes!

- Pulse input: Module with 2 pulse inputs, max. 8 Hz with minimum pulse duration of 10 msec, input resistance 2.2 M Ohms, terminal voltage 3V DC, cable length up to maximum 10m. The pulse value and the unit is configurable for energy, water, gas or electrical meter by IZAR@SET. Data can be transferred remotely. Also two accounting day's are available for both inputs.
- Combined pulse input / output: Module with 2 pulse inputs and 1 pulse output. Configurable via IZAR@SET software.
- Analogue output: Module for 4...20 mA with 2 programmable passive outputs, programmable value in case of error. Output values can be power, flow rate, temperatures. Configurable via IZAR@SET software. Only for mains powered energy meters!

		interface / slot 2					
		no modul	M-Bus	RS232	RS485	pulse input	L-Bus (for external radio)
interface / slot 1	no module	•	-	-	-	-	-
	M-Bus	•	•	•	•	-	•
	RS232	•	-	-	-	-	-
	RS485	•	-	-	-	-	-
	pulse input	•	•	•	•	-	•
	pulse output	•	•	•	•	•	•
	pulse in-/ output	•	•	•	•	-	•
	analogue output 4...20mA	•	-	-	-	-	-
	L-Bus (for external radio)	•	-	-	-	-	-

- combination is possible
- combination is not possible
- * integrated radio is always possible

Event Memory

Events such as changes and faults are stored in a non-volatile memory with a capacity of up to 127 entries. The following events are recorded:

- Checksum error
- Temperature measurement error
- Ultrasonic operating time measurement errors
- Start and end of test mode
- Changing of the main configuration

Monthly Memory

The SONOMETER™1100 has a history memory of 24 months. The following values are stored in the EEPROM on the programmable interval (daily, weekly, monthly):

- Date/ Time
- Cumulated energy
- Tariff energy 1
- Tariff energy 2
- Tariff definition 1
- Tariff definition 2
- Cumulated volume
- Error hour counter
- Value of max. flow
- Time max. flow
- Date max. flow
- Value of max. power
- Time max. power
- Date max. power
- Pulse input counter 1
- Pulse input counter 2
- Pulse 1 definition
- Pulse 2 definition
- Operating days
- Max. forward temperature
- Time max. forward temperature
- Date max. forward temperature
- Max. return temperature
- Time max. return temperature
- Date max. return temperature

Design and function, continued
Log Memory

The large two log memory blocks are used to store consumption values. The storage frequency can be selected from various storage intervals (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 minutes or the default setting of 24 hours, Day in the month, Day of the week, (1024 seconds), 15th or end of month).

The data saved in the log memory can be used for the following analyses:

- Reading the calculator on a certain day.
Example: If the day for reading is 01.10, the calculator reading is displayed for the period from 01.10 of the previous year to 30.09 of the current year.
- Comparison of the last consumption period with the preceding period

Extract of possible log memory settings

Memory block	Storage interval	Values	Date block size example	Number of data records	Recording period
area 1	1 hour	Error status, overload time temperature, overload time flow rate, supply temperature, return temperature, date and time, energy, tariff energy 1, tariff energy 2, tariff definition 1, tariff definition 2, volume, error day counter	16 byte	556	23 days
area 2	24 hours		16 byte	299	299 days
area 1	1 hour		8 byte	1113	46 days
area 2	24 hours		8 byte	599	599 days

Accounting date

The calculator includes two independent memories in which the accumulated energy at two programmable dates is stored.

- Last Accounting Date;
- Last but one Accounting Date;
- Values stored:
- Energy;
- Volume;
- Tariff counter 1;
- Tariff counter 2;
- Pulse counter 1;
- Pulse counter 2;
- Date.

Tariff Function

The calculator offers four optional tariff memories for monitoring plant load states for limit tariffs. Here it concerns threshold value tariffs. Extensive tariff conditions make it possible to adapt the calculator individually to the required customer-specific applications.

The tariffs are separately configurable and independent from each other. Energy or time can be measured alternatively per tariff register dependent on the tariff mode adjusted in each case.

With the “time triggered tariff function” (type Z) the switch-on time and the switch-off time are adjustable independent from each other for each day of the week in steps of 15 minutes.

The following limit types are possible: (This example applies to the display at 3 digit after volume comma)

Max. Actual Values Memories

The calculator creates maximum values for power, flow rate and temperatures based on consumption time, which are stored in the EEPROM. The integration intervals are adjustable to 6, 15, 30 or 60 minutes, 24 hours (and 1024 seconds). Default setting is 60 minutes.

Type	Description	LIMIT	LIMIT resolution
ΔT	Temperature difference	1 ... 255 °C	1 °C
$-\Delta T$	Negative temperature difference	1 ... 255 °C	1 °C
T_R	Low temperature (low)	1 ... 255 °C	1 °C
T_F	High temperature (high)	1 ... 255 °C	1 °C
P	Power	1 ... 255 kW	1 kW
Q	Flow	100 ... 25 500 l/h	100 l/h
FE	“Theoretically Supply Energy” with return temperature of 0 °C	-	-
Z	“Time triggered” counting energy	-	-
E	“External” counting energy	-	-

More detailed description concerning tariff functions on request.

Display Control

The readings are displayed on the calculator by a 8-digit LCD with units and symbols.

Design and function, continued

Loop Structure

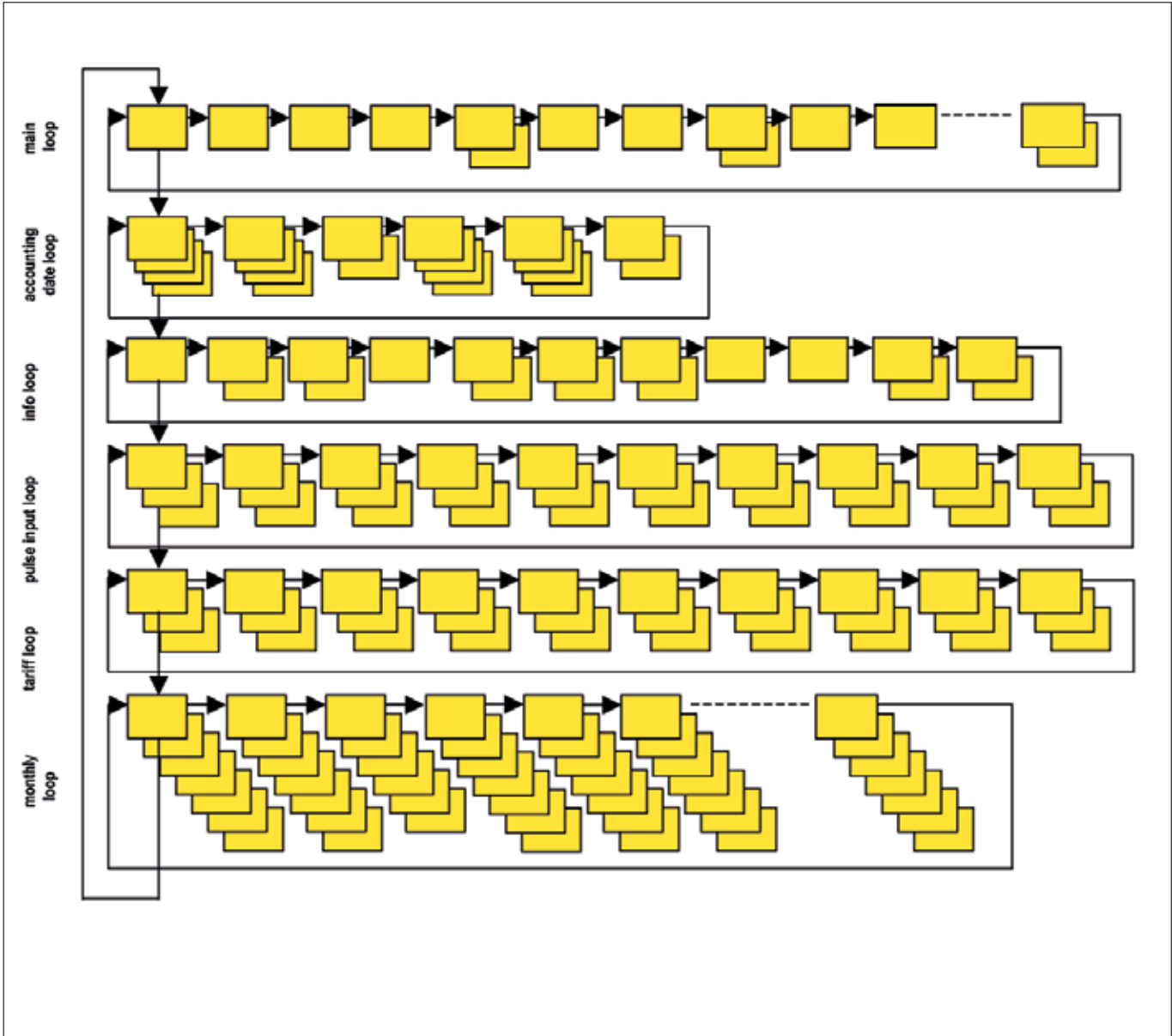
The INFOCAL 8 display has six loops. Some display windows consist of two (to maximum seven) displays that are shown alternately at 4-second intervals. Some pictures in loops or a complete loop can be deactivated separately.

The main loop with the current data, e.g. for energy, volume and flow rate, is programmed as default setting. In the standard setting the loop no. 5 (tariff loop) is not activated.



For quick visual guidance, the loops in the display are numbered from 1 to 6.

Overview of Loops



Informative Displays (Standard)

Loop	Sequence	Window 1	Window 2	Window 3			
"1" Main loop	1.1	Accumulated energy					
	1.2	Volume					
	1.3	Accumulated energy (cooling)	(Sequence will be shown only in a heat meter with cooling tariff)				
	1.4	Flow					
	1.5	Power					
	1.6	Forward/- return temperature					
	1.7	Temperature difference					
	1.8	Operating days	Error hours				
	1.9	Error status					
	1.10	Display test					
Loop	Sequence	Window 1	Window 2	Window 3			
"2" Accounting date loop	2.1	Accounting date 1	Accounting date 1 energy	,Accd 1A'			
	2.2	,Accd 1'	Future accounting date 1				
	2.3	Accounting date 1 previous year	Accounting date 1 previous year energy	,Accd 1L'			
	2.4	Accounting date 2	Accounting date 2 energy	,Accd 2A'			
	2.5	,Accd 2'	Future accounting date 2				
	2.6	Accounting date 2 previous year	Accounting date 2 previous year energy	,Accd 2L'			
	...						
2.14	Accounting date 2 previous year	Pulse input 2	Pulse input volume 2				
Loop	Sequence	Window 1	Window 2	Window 3			
"3" Info loop	3.1	Current date	Current time				
	3.2	,SEC_Adr'	Secondary address				
	3.3	,Pri_Adr 1'	Primary address 1				
	3.4	,Pri_Adr 2'	Primary address 2				
	3.5	Installation position					
	3.6	Pulse input 0	Volume				
	3.7	,Port 1'	No. of the mounted module at port 1				
	3.8	,Port 2'	No. of the mounted module at port 2				
	3.9	Status integrated radio	(Sequence will be shown only in meters with integrated radio)				
	3.10	software version	Checksum				
Loop	Sequence	Window 1	Window 2	Window 3			
"4" Pulse input loop	4.1	,In1'	Accumulated value pulse input 1	,PPI' pulse value 1			
	4.2	,In2'	Accumulated value pulse input 2	,PPI' pulse value 2			
Loop	Sequence	Window 1	Window 2	Window 3	Window 4	Window 5	Window 6
"5" Tariff loop	Only in a heat meter with cooling tariff.						
Loop	Sequence	Window 1	Window 2	Window 3	Window 4	Window 5	Window 6
"6" Monthly value loop	6.1	,LOG'	date last month	energy	volume	max. flow rate	max. power
	6.2	,LOG'	date month - 1	energy	volume	max. flow rate	max. power
	6.3	,LOG'	date month - 2	energy	volume	max. flow rate	max. power
	...						
	6.24	,LOG'	date month - 23	energy	volume	max. flow rate	max. power

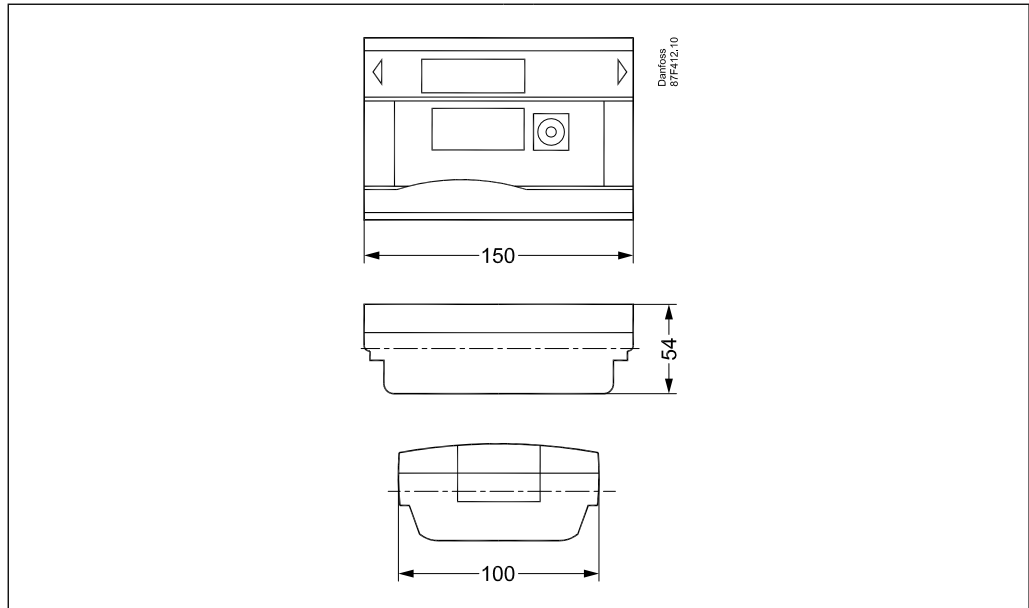
Simple operation

A push-button mounted on the front of the calculator is used to switch to the various displays. The button can be pressed for a short or long time. A short press of the button (< 3 seconds) switches to the next display within a loop and a long press (> 3 seconds) switches to the next display loop. The "Energy" window (sequence 1.1) in the main loop is the basic display.

The calculator switches automatically to power save mode if the button is not pressed for approx. 4 minutes and returns to the basic display when the button is pressed again. The loop settings can be programmed to suit the customer's individual requirements using the IZAR@SET software.

Dimensions

INFOCAL 8



Temperature sensors

	Installation	Type	Diameter D (mm)	Length L (mm)
	Immersed (direct) or in pocket (indirect)	Pt 500	ø 5.2	45

Sensor pockets

	Type		Brass				Stainless steel			
	Sensor diameter	(mm)	ø 5.2				ø 5.2			
	Length	L1 (mm)	47	60	93	128	98	133	168	223
L (mm)		35	52	85	120	85	120	155	210	

Ball valves

	Dimension IG (mm)	Length L (mm)	Height B (mm)
	G 1/2"	48	77
	G 3/4"	54	79
	G 1"	66	96

