

## Data sheet

# SONOMETER™1100

## Ultrasonic compact energy meter

### Description/Application

MID examination certificate  
no. : DE-10-MI004-PTB003



The SONOMETER™1100 is an ultrasonic static compact energy meter especially designed for heating, cooling or combined heating/cooling application in local and district energy systems.

The SONOMETER™1100 as a compact energy meter consists of the following components:

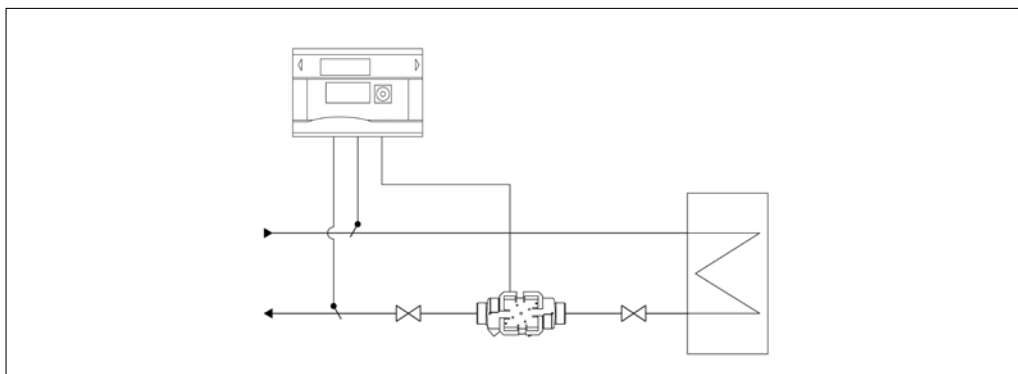
- Ultrasonic flow sensor;
- Calculator with integral hardware and software for measuring flow rate, temperature and energy consumption;
- Pair of temperature sensors.

### Features

- 1st. approval in Europe for ultrasonic energy meter with dynamic range of  $q_v/q_p$  1 : 250 in class 2 ( $q_p$  1.5 / 2.5 / 6 / 10 / 15 / 25 / 40 / 60 m<sup>3</sup>/h)
- Complete dynamic range:  $\geq$  1 : 1500
- Lithium battery, 230 V AC or 24 V AC mains unit
- Battery lifetime 11 years (16 years optional)
- Unique free- beam principle
- Improved service-friendly energy meter design
- Housings with thread and flange (PN 16 / 25)
- Can be configured for heating, cooling or combined heating/cooling application
- Temperature range: 5 - 130 / 150 °C
- Overload temperature up to 150 °C ( $q_p = 0.6 - 2.5$  m<sup>3</sup>/h)
- Swirl-free flow around reflector
- Lower pressure loss
- Robust stainless steel reflector
- Insensitive to dirt
- Available in nominal sizes  $q_p$  0.6 / 1.0 / 1.5 / 2.5 / 3.5 / 6 / 10 / 15 / 25 / 40 / 60 m<sup>3</sup>/h
- Approved according to MID in class 2 and 3, and PTB K 7.2 for cooling
- No calming sections necessary in the inlet and/or outlet (standard installation)

### Special Features

- Power save mode
- NOWA test capability
- 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
- 2 communication ports (e.g. M-Bus + pulse input)
- 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



**Ordering:**

The standard codes are used for ordering.

Heat meter standard codes <sup>1)</sup>:

Code no.	Flow sensor	Nominal pressure	Cable length <sup>2)</sup>	Module	Energy unit	Cable length <sup>3)</sup>
087G1040	qp 0.6 m <sup>3</sup> /h / 110mm thread / DN 15 / G¾B	PN16	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1041	qp 1.5 m <sup>3</sup> /h / 110mm thread / DN 15 / G¾B	PN16	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1042	qp 1.5 m <sup>3</sup> /h / 130mm thread / DN 20 / G1B	PN16	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1043	qp 2.5 m <sup>3</sup> /h / 130mm thread / DN 20 / G1B	PN16	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1044	qp 3.5 m <sup>3</sup> /h / 260mm thread / DN 25 / G1¼B	PN16	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1045	qp 6 m <sup>3</sup> /h / 260mm thread / DN 25 / G1¼B	PN16	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1046	qp 10 m <sup>3</sup> /h / 300mm thread / DN 40 / G2B	PN16	1.5m	M-Bus	MWh (with 3 digit after comma)	2m
087G1047	qp 6 m <sup>3</sup> /h / 260mm flange DN 32	PN25	1.5m	M-Bus	kWh (without digit after comma)	2m
087G1048	qp 10 m <sup>3</sup> /h / 300mm flange DN 40	PN25	1.5m	M-Bus	MWh (with 3 digit after comma)	2m
087G1049	qp 15 m <sup>3</sup> /h / 270mm flange DN 50	PN25	3m	M-Bus	MWh (with 3 digit after comma)	3m
087G1050	qp 25 m <sup>3</sup> /h / 300mm flange DN 65	PN25	3m	M-Bus	MWh (with 3 digit after comma)	3m
087G1051	qp 40 m <sup>3</sup> /h / 300mm flange DN 80	PN25	3m	M-Bus	MWh (with 2 digit after comma)	3m
087G1052	qp 60 m <sup>3</sup> /h / 360mm flange DN 100	PN25	3m	M-Bus	MWh (with 2 digit after comma)	3m
087G1118	qp 0.6 m <sup>3</sup> /h / 110mm thread / DN 15 / G¾B	PN16	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1119	qp 1.5 m <sup>3</sup> /h / 110mm thread / DN 15 / G¾B	PN16	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1120	qp 1.5 m <sup>3</sup> /h / 130mm thread / DN 20 / G1B	PN16	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1121	qp 2.5 m <sup>3</sup> /h / 130mm thread / DN 20 / G1B	PN16	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1122	qp 3.5 m <sup>3</sup> /h / 260mm thread / DN 25 / G1¼B	PN16	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1123	qp 6 m <sup>3</sup> /h / 260mm thread / DN 25 / G1¼B	PN16	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1124	qp 10 m <sup>3</sup> /h / 300mm thread / DN 40 / G2B	PN16	1.5m	Radio OMS	MWh (with 3 digit after comma)	2m
087G1125	qp 6 m <sup>3</sup> /h / 260mm flange DN 32	PN25	1.5m	Radio OMS	kWh (without digit after comma)	2m
087G1126	qp 10 m <sup>3</sup> /h / 300mm flange DN 40	PN25	1.5m	Radio OMS	MWh (with 3 digit after comma)	2m
087G1127	qp 15 m <sup>3</sup> /h / 270mm flange DN 50	PN25	3m	Radio OMS	MWh (with 3 digit after comma)	3m
087G1128	qp 25 m <sup>3</sup> /h / 300mm flange DN 65	PN25	3m	Radio OMS	MWh (with 3 digit after comma)	3m
087G1129	qp 40 m <sup>3</sup> /h / 300mm flange DN 80	PN25	3m	Radio OMS	MWh (with 2 digit after comma)	3m
087G1130	qp 60 m <sup>3</sup> /h / 360mm flange DN 100	PN25	3m	Radio OMS	MWh (with 2 digit after comma)	3m

<sup>1)</sup> These codes are EN version Heat meter with A-cell battery and 'low temperature' installation. For more characteristics of each code, please contact Danfoss local sales company.

<sup>2)</sup> Cable length between calculator and flow sensor.

<sup>3)</sup> Cable length of temperature sensor.

More standard codes are available regarding cooling meter, combined heating/cooling meter, high temperature installation, power supply and modules.

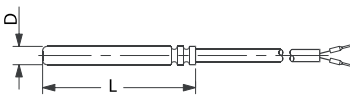
**Ordering continued**

Modules

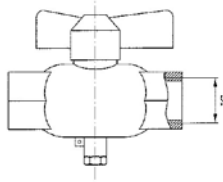
	Designation	Code No.
Communication	M-Bus module	<b>087G6027</b>
	L-Bus module (use for external radio)	<b>087G6035</b>
	RS232 module	<b>087G6029</b>
	RS485 module	<b>087G6032</b>
Function	Analogue output module (4-20mA)	<b>087G6034</b>
	Combined module (2 pulse inputs/1 pulse output)	<b>087G6041</b>
	Pulse input module (2 inputs)	<b>087G6037</b>
	Pulse output module (2 outputs)	<b>087G6039</b>
Supply voltage	battery 3.6 V DC (A-cell)	<b>087G6020</b>
	battery 3.6 V DC (D-cell)	<b>087G6022</b>
	mains unit 230 V AC	<b>087G6024</b>
	mains unit 24 V AC	<b>087G6025</b>

**Accessories**

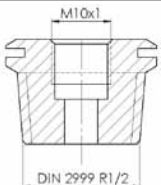
Temperature sensors

	Temperature sensors (pair)	pair	Code No.
		Pt 500/∅ 5.2 mm/10 m cable, MID	1

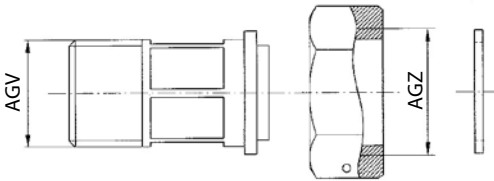
Ball valves

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

Adapter for mounting temperature sensors

	Coupling thread	Sensor thread	Set	Code No.
	R ½"	M 10 x 1	32 pcs	<b>087G6076</b>

Tailpieces

	Threaded	Dimension (AGV x AGZ)	Set	Code No.
		R ½" x G ¾ B	1 pc	<b>087G6071</b>
		R ¾" x G 1 B	1 pc	<b>087G6072</b>
		R 1" x G 1¼ B	1 pc	<b>087G6073</b>
		R 1½" x G 2 B	1 pc	<b>087G6074</b>

Software

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

It is used for:

- commissioning
- reading out measured values
- printing out energy meter logs
- energy meter configuration
- application analysis
- print the meter protocol

Technical data

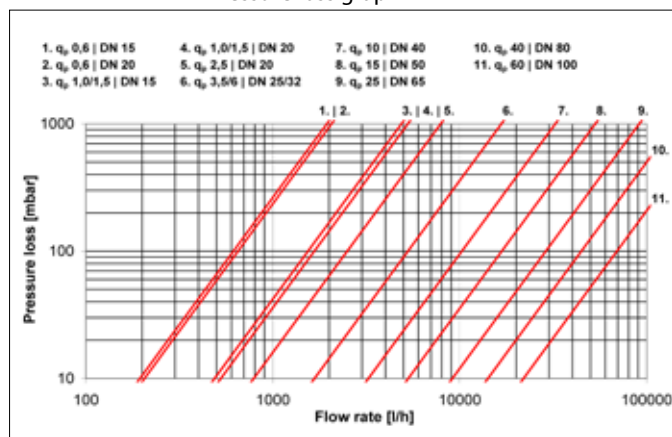
Flow rate ranges	Nominal	$q_n$ m <sup>3</sup> /h	0.6	1.5	2.5	3.5	6	10	15	25	40	60							
	Maximum	$q_s$ m <sup>3</sup> /h	1.2	3	5	7	12	20	30	50	80	120							
	Standard minimum	$q_i$ l/h	6	15	25	35	60	100	150	250	400	600							
	Extended minimum <sup>3)</sup>	$q_i$ l/h	–	6	10	–	24	40 <sup>1)</sup> /100	60 <sup>1)</sup> /150	100 <sup>1)</sup> /150	160	240 <sup>1)</sup> /600 <sup>2)</sup> /1200							
	Starting	l/h	1	2.5	4	7	7	20	40	50	80	120							
Diameter	Nominal	DN mm	15	20	15	20	20	25	32	25	32	40	50	65	80	100			
	Connection	AGZ	G 3/8	G 1/2	FL	G 3/8	G 1/2	FL	G 1/2	FL	G 1/4	FL	G 1/4	FL	G 2/8	FL	FL	FL	FL
	Tailpiece	AGV	R 1/2	R 3/4	-	R 1/2	R 3/4	-	R 3/4	-	R 1	-	R 1	-	R 1 1/2	-	-	-	-
Operating pressure	Maximum	PN bar	16/25	25	16/25	25	16/25	25	16/25	25	16/25	25	25	25	25	25	25	25	
Flow sensor Temp. range	heating	°C	5...130								5...150								
	cooling		5...90								5...90								
	heat./cool.		5...105								5...105								
Medium	circulation water (pH-value: 7 - 10)																		
Pressure loss	At $q_n$	$\Delta p$ mbar	85			36/75			100		44		128		95	80	75	80	75
			mm			110	130	190	110	130	190	130	190	260	260	300	270	300	300
Input	Temperature sensors	Type	Pt 500 with 2-wire leads																
	Sensor current	mA	Pt 500 peak < 2; rms < 0.012																
	Measuring cycle	T s	Mains unit supply: 1 A-cell battery: 16; D-cell battery: 4																
	Max. temperature difference	$\Delta\theta_{max}$ K	177																
	Min. temperature difference	$\Delta\theta_{min}$ K	3																
	Starting temperature difference	$\Delta\theta$ K	0.125																
	Absolute temperature measuring range	$\theta$ °C	1...180																
Supply voltage	Operating voltage	$U_N$	3.6 V DC (Lithium-battery)/230 V AC/24 V AC																
Basic features	Ambient class	class E1 + M1																	
	Protection class	calculator: IP 54 flow sensor: IP 54 (heating)/IP 68 (cooling)																	
	Ambient storage temperature	-25...+ 60 °C																	
	Type	Static energy meter																	
	Measuring process	Ultrasonic volume measurement																	
Display indication	Display	LCD, 8-digit																	
	Units	MWh - kWh - GJ - Gcal - MBtu - gal - GMP - °C - °F - m <sup>3</sup> - m <sup>3</sup> /h																	
	Total values	99 999 999 - 9999 999.9 - 999 999.99 - 99 999.999																	
	Values displayed	Power - energy - flow rate - temperature - volume																	

<sup>1)</sup> Only for horizontal installation

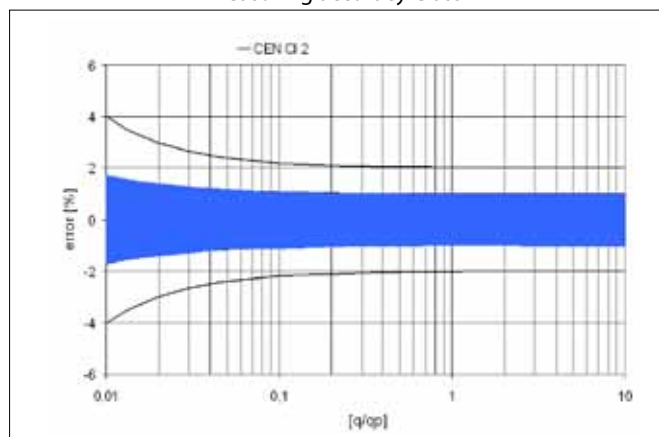
<sup>2)</sup> Only in rising or falling pipes or tilted installation

<sup>3)</sup> Extended minimum flow rate for dynamic range of 1:250. Available on request.

Pressure loss graph



Measuring accuracy Class 2



**Design and function**

The SONOMETER™1100 as a compact energy meter consists of the following components:

- Ultrasonic flow sensor;
- Calculator with integral hardware and software for measuring flow rate, temperature and energy consumption;
- Pair of temperature sensors.

The calculator contains all the necessary circuits for recording the flow rate and temperature and for calculating, logging and displaying the data. The calculator housing can be mounted directly on the flow sensor or on the wall. The energy meter 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.

**Ultrasonic flow sensor**

The ultrasonic technology of the flow sensor permits very high measuring accuracy and can be used in the supply or return line. The flow sensor meets the requirements of MID in class 2 and 3. The standard cable length between the calculator and the flow sensor is 1.5 m or 3 m (optional 5 m).

Supply voltage:

- Lithium battery 3.6 V DC A-cell (11 years typical lifetime)
- Lithium battery 3.6 V DC D-cell (16 years typical lifetime)
- Mains unit 230 V AC or 24 V AC with changeable backup battery

**Temperature Sensors**

Pairs of Pt 500  $\varnothing$ 5.2 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. A special data cable is required. M-Bus protocol.
- RS485: Serial interface for communication with external devices. Power supply with 12V  $\pm$  5V. M-Bus protocol.
- Pulse output: Module with 2 Open Collector pulse outputs (potential-free), 4 Hz (pulse width 125ms), 100 Hz (pulse width  $\geq$ 5ms), ratio: pulse duration / pulse break  $\sim$  1:1. Configurable via IZAR@SET software. Possible pulse output values are Energy, Volume, Tariff energy 1, Tariff energy 2, Tariff condition 1, Tariff condition 2, Energy error and Volume error.

- Pulse input: Module with 2 pulse inputs, max. 20 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.

**Slot 1**

- Analogue output module (4-20mA)
- Combined module (2 pulse inputs/1 pulse output)
- Pulse input module (2 inputs)
- M-Bus module
- L-Bus module (use for external radio)
- RS232 module
- RS485 module

**Slot 2**

- Pulse output module
- Combined module (2 pulse inputs/1 pulse output)
- Pulse input module (2 inputs)
- M-Bus module
- L-Bus module (use for external radio)
- RS232 module
- RS485 module

**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

**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.

**Tariff Function**

The calculator offers four optional tariff memories for monitoring plant load states for limit tariffs. Extensive tariff conditions make it possible to adapt the energy meter individually to the required customer-specific applications. The following limit types are possible: (This example applies to the display with 3 decimal places)

Type	LIMIT	LIMIT resolution
$\Delta T$	1 ... 255 °C	1 °C
$T_R T_F$	1 ... 255 °C	1 °C
P	1 ... 255 kW	1 kW
Q	100 ... 25 500 l/h	100 l/h
Z		15 minutes

According to above table the energy or the time (in hours) how long the tariff condition is fulfilled will be stored in the tariff memories.

**Display Control**

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

**Loop Structure**

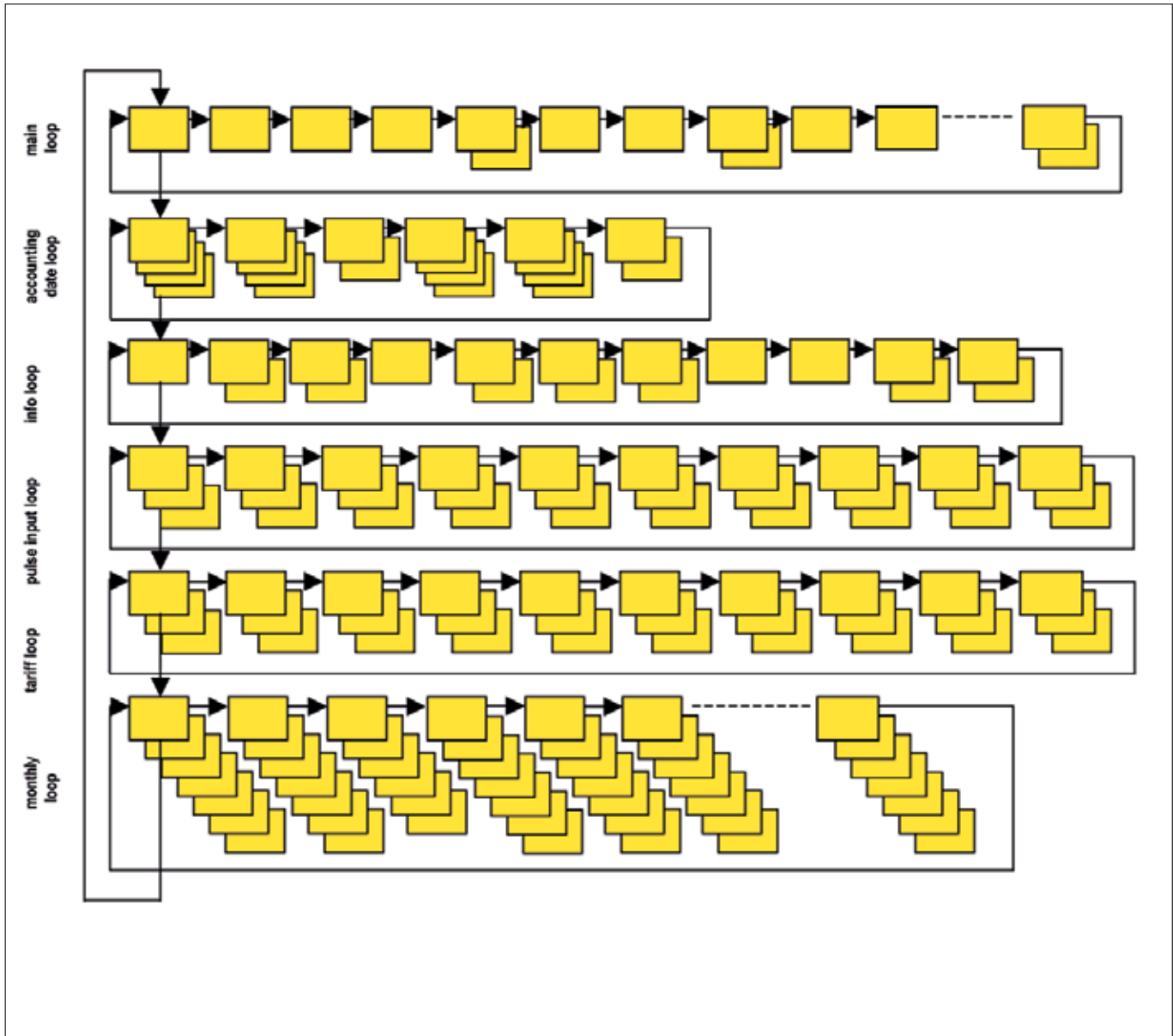
The SONOMETER™1100 display has six loops. Some display windows consist of two (to maximum seven) displays that are shown alternately at 4-second intervals. Some pictures in loops or a complete loop can be deactivated separately.



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

The main loop with the current data, e.g. for energy, volume and flow rate is programmed as default setting.

Overview of Loops



**Informative Displays (Standard)**

Loop	Sequence	Window 1	Window 2	Window 3	Window 4
"1" Main loop	1.1	Accumulated energy			
	1.2	Volume			
	1.3	Flow			
	1.4	Power			
	1.5	Forward/- return temperature			
	1.6	Difference temperature			
	1.7	Operating days			
	1.9	Error status			
	1.10	Display test			
	Loop	Sequence	Window 1	Window 2	Window 3 [off]
"2" Accounting date loop	2.1	Accounting date 1 date	Accounting date 1 energy	Accounting date 1 volume	,Accd 1A'
	2.2	Next accounting date 1 date	Next accounting date 1 energy	Next accounting date 1 volume	,Accd 1L'
	2.3	Previous accounting date 1 date	Previous accounting date 1 energy	Previous accounting date 1 volume	,Accd 1'
	2.4	,Accd 1'	Date of next accounting date 1		
	2.5	Accounting date 2 date	Accounting date 2 energy	Accounting date 2 volume	,Accd 2A'
	2.6	Next accounting date 2 date	Next accounting date 2 energy	Next accounting date 2 volume	,Accd 2L'
	2.7	Previous accounting date 2 date	Previous accounting date 2 energy	Previous accounting date 2 volume	,Accd 2'
	2.8	,Accd 2'	Date of next accounting date 2		
Loop	Sequence	Window 1	Window 2	Window 3	Window 4
"3" Info loop	3.1	Current date			
	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	,Port 1'	No. of the mounted module at port 1		
	3.7	,Port 2'	No. of the mounted module at port 2		
	3.8	Status integrated radio	(Sequence will be shown only in meters with integrated radio)		
	3.9	No. of error hours			
	3.10	software version	Checksum		
Loop	Sequence	Window 1	Window 2	Window 3	Window 4
"4" Pulse input loop	4.1	,In1'	Accumulated values pulse input 1	,PPI' pulse value 1	
	4.2	,In2'	Accumulated values pulse input 2	,PPI' pulse value 2	

[off] = not active



Loop	Sequence	Window 1	Window 2	Window 3	Window 4	Window 5	Window 6	Window 7
"5" Tariff loop	The tariff loop is switched off as a standard at the heat meter or meter for cooling.							
Loop	Sequence	Window 1	Window 2	Window 3 [off]	Window 4 [off]	Window 5	Window 6	Window 7
"6" Monthly value loop	6.1	,LOG'	date last month			energy	volume	
	6.2	,LOG'	date month - 1			energy	volume	
	6.3	,LOG'	date month - 2			energy	volume	
	...			...				
	6.24	,LOG'	date month - 23			energy	volume	

[off] = not active

### Simple operation

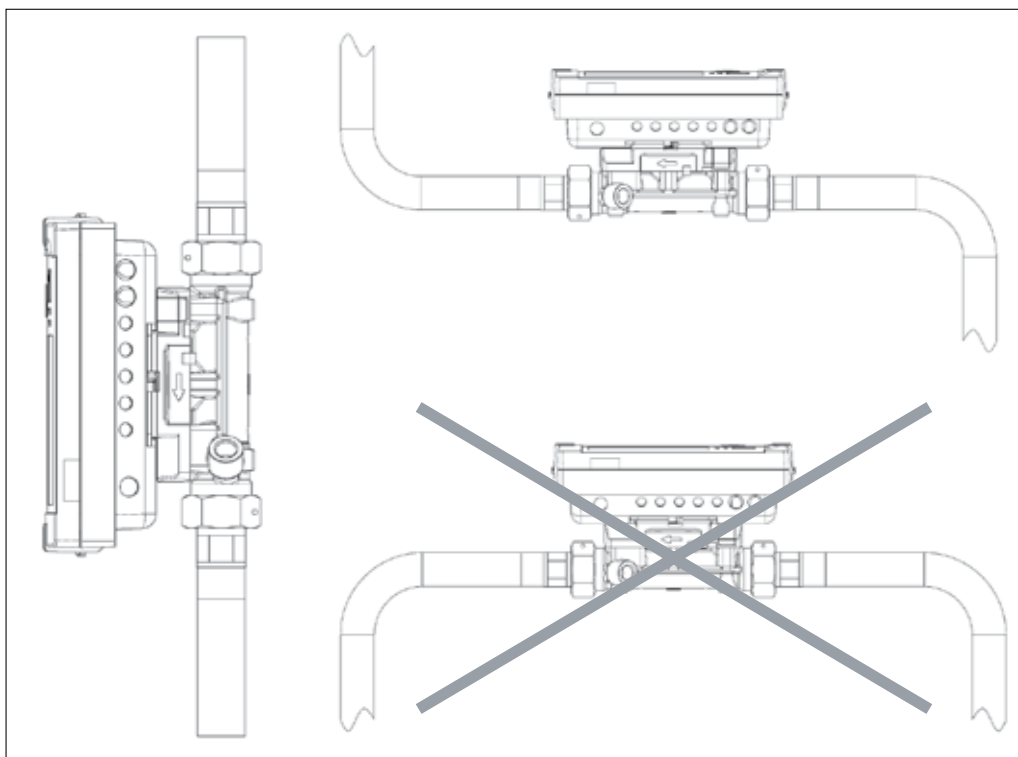
A push-button mounted on the front of the calculator is used to switch to the various displays. The button can be pressed for a short or long time. A short press of the button (< 3 seconds) switches to the next display within a loop and a long press (> 3 seconds) switches to the next display loop. The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

**Mounting**

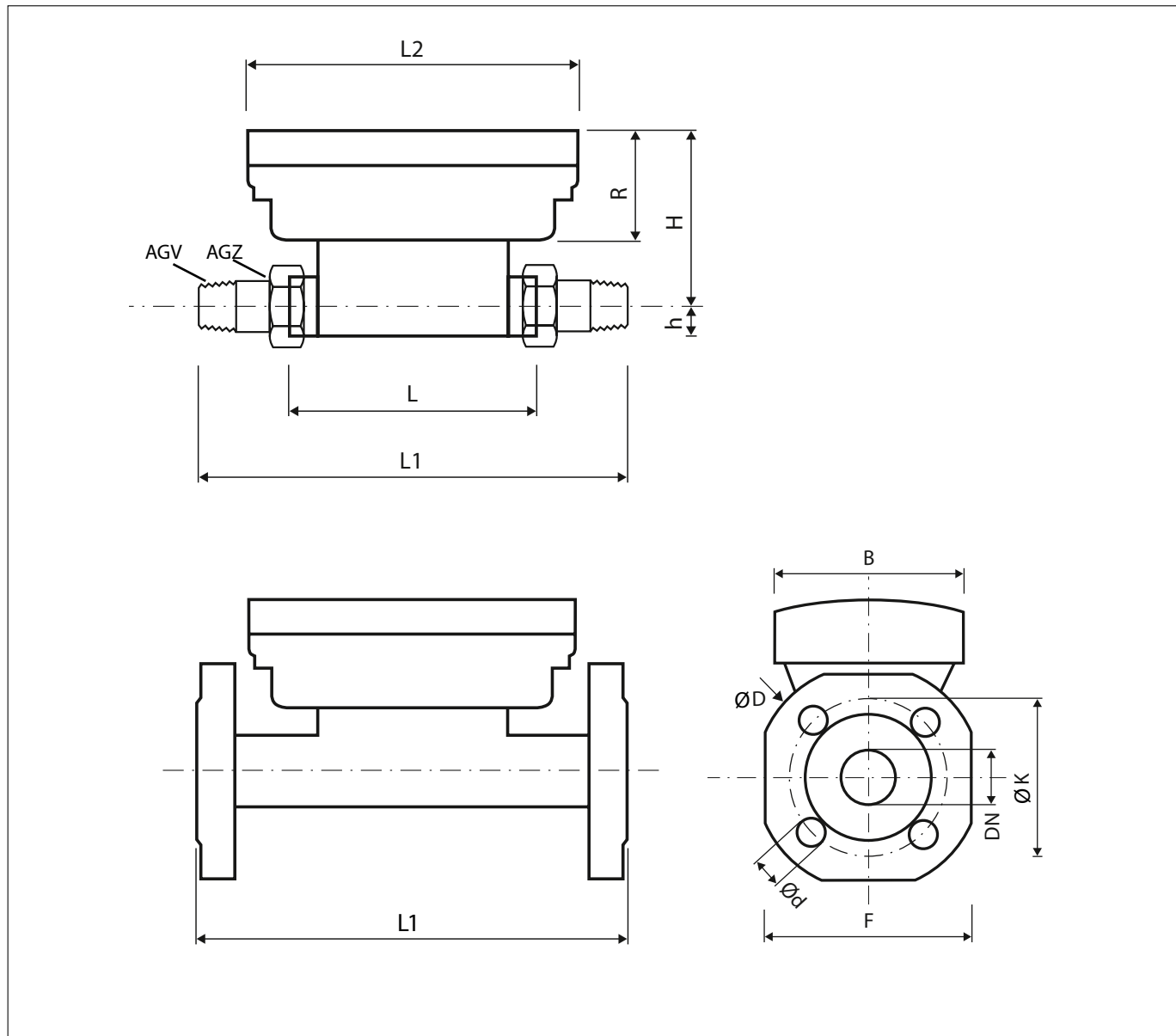
Depending on the design, the energy meter is installed either in the low temperature or high temperature line as indicated on the type plate. The energy meter is to be installed so that the direction of flow corresponds to the direction of the arrow on the flow sensor. Ensure that the flow sensor is always filled with liquid on completion of installation. **Straight inlet/outlet pipes (calming sections) are not required for the flow sensor.** The energy meter can be installed in both horizontal and vertical pipe sections, but every time so that air bubbles cannot collect in the flow sensor. For low flow we recommend to mount the flow sensor tilted 90° into the pipe.

Make sure the energy meter is installed sufficiently far away from possible sources of electromagnetic interference (switches, electric motors, fluorescent lamps, etc.). For cooling application and for medium temperatures more than 90° C, the calculator must be mounted on the wall at a sufficient distance away from heat sources using the holder supplied. It is recommended that stop valves be fitted before and after the energy meter to simplify dismantling the energy meter. The energy meter should be installed in a convenient position for service and operating personnel.



For the further information pls. refer to the SONOMETER™1100's instructions.

Dimensions



Nominal size	$q_p = 0.6 \text{ m}^3/\text{h}$				$q_p = 1.5 \text{ m}^3/\text{h}$				$q_p = 2.5 \text{ m}^3/\text{h}$				$q_p = 3.5 \text{ m}^3/\text{h}$				$q_p = 6 \text{ m}^3/\text{h}$			$q_p = 10 \text{ m}^3/\text{h}$		$q_p = 15 \text{ m}^3/\text{h}$		$q_p = 25 \text{ m}^3/\text{h}$		$q_p = 40 \text{ m}^3/\text{h}$		$q_p = 60 \text{ m}^3/\text{h}$
L [mm]	110	130	190	190	110	130	190	190	130	190	190	260	260	260	260	260	260	300	300	270	300	300	300	300	360			
L1 [mm]	180	225	285	190	180	225	285	190	225	285	190	355	260	260	355	260	260	434	300	270	300	300	300	300	360			
L2 [mm]	150								150								150											
B [mm]	100								100								100											
R [mm]	54								54								54											
H [mm]	82	84	84	84	82	84	84	84	84	84	84	88.5	88.5	88.5	88.5	88.5	88.5	94	94	99	106.5	114	114	119				
h [mm]	14.5	18	18	47.5	14.5	18	18	47.5	18	18	47.5	23	50	62.5	23	50	62.5	33	39	73.5	85	92.5	108					
AGZ	G $\frac{3}{4}$ B DN 15	G1B DN 20	G1B DN 20	FL DN 20	G $\frac{3}{4}$ B DN 15	G1B DN 20	G1B DN 20	FL DN 20	G1B DN 20	G1B DN 20	FL DN 20	G1 $\frac{1}{4}$ B DN 25	FL DN 25	FL DN 32	G1 $\frac{1}{4}$ B DN 25	FL DN 25	FL DN 32	G2B DN 40	FL DN 50	FL DN 65	FL DN 80	FL DN 100						
AGV	R $\frac{1}{2}$	R $\frac{3}{4}$	R $\frac{3}{4}$	-	R $\frac{1}{2}$	R $\frac{3}{4}$	R $\frac{3}{4}$	-	R $\frac{3}{4}$	R $\frac{3}{4}$	-	R1	-	-	R1	-	-	R1 $\frac{1}{2}$	-	-	-	-	-					
D [mm]	-	-	-	105	-	-	-	105	-	-	105	-	114	139	-	114	139	-	148	163	184	200	235					
d [mm]	-	-	-	14	-	-	-	14	-	-	14	-	14	18	-	14	18	-	18	18	18	19	22					
F [mm]	-	-	-	95	-	-	-	95	-	-	95	-	100	125	-	100	125	-	138	147	170	185	216					
K [mm]	-	-	-	75	-	-	-	75	-	-	75	-	85	100	-	85	100	-	110	125	145	160	190					
Weight [kg]	0.76	0.85	0.96	2.75	0.76	0.85	0.96	2.75	0.85	0.96	2.75	1.5	3.5	4.8	1.5	3.5	4.8	3.1	6.4	7.0	8.9	10.9	16.4					

**Dimensions, continued**

Temperature sensors

	Designation	Type	Dimension D (mm)	L (mm)
	Direct mounted	Pt 500	ø 5.2	45
	Pocket sensor	Pt 500	ø 5.2	45

Sensor pockets

	Type		Brass				Stainless steel			
	Sensor dimension	(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

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