

SHARKY 773

SAPPEL

ULTRASONIC COMPACT ENERGY METER



APPLICATION

SHARKY ultrasonic compact energy meter can be used for measuring the energy consumption in heating / cooling application for billing purposes. The measurement principle is static and based on the measurement of the transit time. Ultrasonic technology offers many benefits : no moving parts (avoids wear and tear of the metering components), low pressure loss, large metering dynamics and low start flowrate, insensitiveness to suspended particles...

FEATURES

- ▶ approved according EN 1434 and MID in class 2
- ▶ 1st approval in Europe for ultrasonic meter with dynamic range of 1:250 ($q_i:q_p$) in class 2
- ▶ complete range from ND 15 mm qp 1.5 m³ / h up to ND 100 mm qp 60 m³ / h
- ▶ available in threaded or flanged version
- ▶ extremely low power consumption enabling a long battery lifetime (16 years in standard use)
- ▶ modular version, options Radio, M-Bus, RS232, pulse outputs and pulse inputs.

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GENERAL

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Application	heating - cooling - heating/cooling
Approval	EN 1434 class 2: q_p 0.6 ... 6 m ³ /h; MID: q_p 0.6 ... 60 m ³ /h
Mounting position flow sensor	any position
Protection class flow sensor	heating: IP 54; cooling, heating/cooling: IP 68
Battery supply	3.0 VDC - max. 12 years lifetime; 3.6 VDC - max. 16 years lifetime
Mains supply	24 VAC; 230 VAC
Temperature sensor type	Pt 100 or Pt 500 with 2-wire leads; \varnothing 5.2 / 6 mm or direct sensor
Cable length of temperature sensor	Pt 100: 2 m; Pt 500: 2 / 3 / 5 / 10 m

CALCULATOR - BASIC FEATURES

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Ambient class	EN 1434 class C / MID class E1 + M1
Ambient Temperature	°C 5 ... 55
Protection class	IP 54
Interfaces standard	Optical ZVEI interface
Interfaces optional	2 slots for modules with Radio, M-Bus, RS232, pulse output, pulse input or combined pulse in-/output
Temperature range heatmeter	°C 5 ... 130 / 150
Temperature range cooling meter and heating/cooling meter	°C 5 ... 50 / 5 ... 105

DISPLAY

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Display indication	LCD, 7-digit
Units	MWh - kWh - GJ - Gcal - MBtu
Total values	9,999,999 - 999,999.9 - 99,999.99 - 9,999.999
Values displayed	Energy - Power - Flow - Flow rate - Temperature

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INTERFACES

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Optical	ZVEI interface, for communication and testing, M-Bus protocol
Radio	868 MHz, configurable telegram, unidirectional, transmission interval from 8...20 s
M-Bus	Configurable telegram, according to EN1434-3. Data reading and parametrization are via two wires with polarity reversal protection.
RS232	Serial interface for communication with external devices. A special data cable is required. M-Bus protocol.
Pulse output	Module with 2 Open Collector pulse outputs (potential-free). Configurable via HYDRO-SET software.
Pulse input	Module with 2 pulse inputs. Configurable via HYDRO-SET. Datas can be transferred remotely.
Combined pulse in-/output	Module with 2 pulse inputs and 1 pulse output. Configurable via HYDRO-SET.

TEMPERATURE INPUT

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Sensor current		mA	Pt 100 peak < 8; rms < 0.015, Pt 500 peak < 2; rms < 0.012
Measuring cycle	T	s	with mains unit: 2 s; with battery: 16 s
Starting temperature difference	$\Delta\Theta$	K	0.125
Min. temperature difference	$\Delta\Theta_{\min}$	K	3
Max. temperature difference	$\Delta\Theta_{\max}$	K	177
Absolute temperature measuring range	Θ	°C	0 ... 180

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TECHNICAL DATA FLOW SENSOR

Nominal flow rate	q _p	m ³ /h	1.5	2.5	6	6	10
Nominal diameter	DN	mm	15	20	25	32	40
Overall length	L	mm	110	130	260	260	300
Starting flow rate		l/h	2.5	4	7	7	20
Minimum flow rate	q _i	l/h	6	10	24	24	40 ³ /100
Maximum flow rate	q _s	m ³ /h	3	5	12	12	20
Overload flow rate		m ³ /h	4.6	6.7	18.4	18.4	24
Operating pressure	PN	bar	16 ¹	16 ¹	16 ¹	16 ¹	16 ¹
Pressure loss at q _p	Δp	mbar	75	100	128	128	95
Temp. range heating		°C	5 ... 130	5 ... 130	5 ... 150	5 ... 150	5 ... 150
Temp. range cooling		°C	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50
Temp. range heating/cooling		°C	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105
Flow resistance coefficient	Zeta		4.3	4	2.8	7.4	3.8

Nominal flow rate	q _p	m ³ /h	15	25	40	60
Nominal diameter	DN	mm	50	65	80	100
Overall length	L	mm	270	300	300	360
Starting flow rate		l/h	40	50	80	120
Minimum flow rate	q _i	l/h	60 ³ /150	100 ³ /250	160	240 ³ /600 ⁴ /1200 ⁵
Maximum flow rate	q _s	m ³ /h	30	50	80	120
Overload flow rate		m ³ /h	36	60	90	132
Operating pressure	PN	bar	25 ²	25 ²	25 ²	25 ²
Pressure loss at q _p	Δp	mbar	80	75	80	75
Temp. range heating		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Temp. range cooling		°C	5 ... 50	5 ... 50	5 ... 50	5 ... 50
Temp. range heating/cooling		°C	5 ... 105	5 ... 105	5 ... 105	5 ... 105
Flow resistance coefficient	Zeta		3.5	3.4	3.4	3.8

1: Also available in PN 25 bar

2: Also available in PN 40 bar

3: Only for horizontal installation

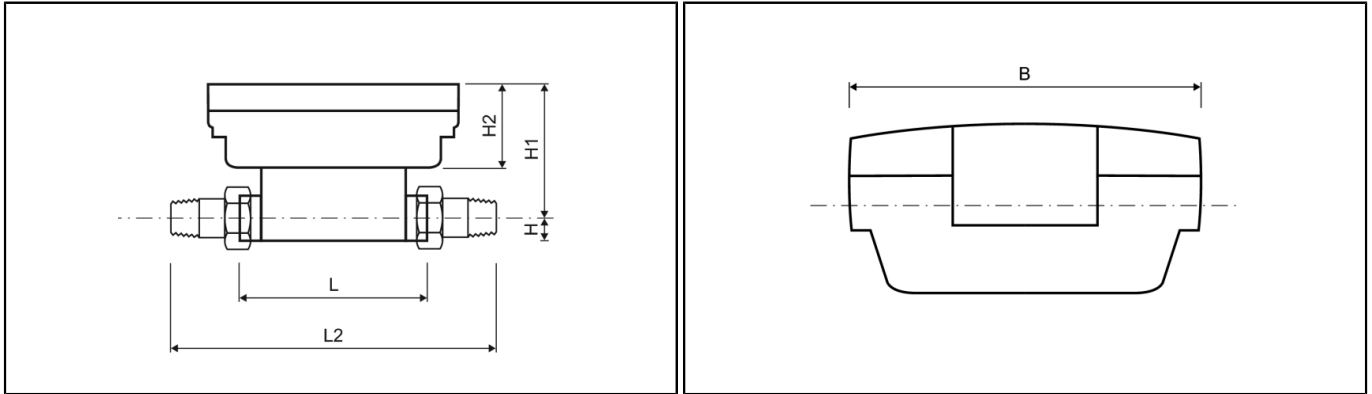
4: Only in rising or falling pipes or tilted installation

5: Only up side down installation

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DIMENSIONS THREAD VERSION



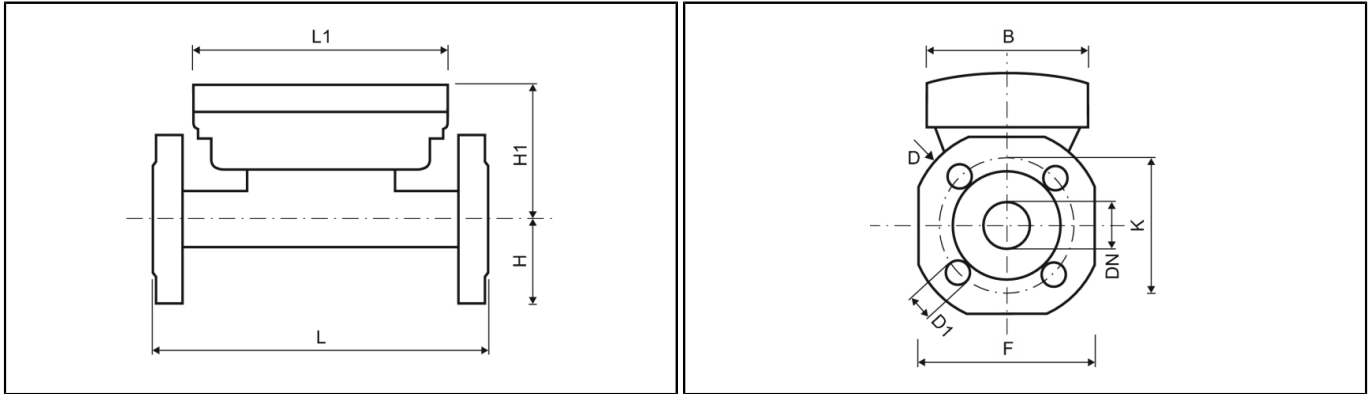
Nominal flow rate	q _p	m ³ /h	1.5	2.5	6	6	10
Nominal diameter	DN	mm	15	20	25	32	40
Overall length	L	mm	110	130	260	260	300
Overall length with coupling	L2	mm	190	230	380	-	440
Length of calculator	L1	mm	150	150	150	-	150
Height	H	mm	14.5	18	23	-	33
Height	H1	mm	78	80	84.5	-	90
Height of calculator	H2	mm	50	50	50	-	50
Width of calculator	B	mm	100	100	100	-	100
Connection thread on meter	Inch		G ³ / ₄ B	G1B	G1 ¹ / ₄ B	-	G2B
Connection thread of coupling	Inch		R ¹ / ₂	R ³ / ₄	R1	-	R1 ¹ / ₂
Weight	kg		0.76	0.85	1.5	-	3

Nominal flow rate	q _p	m ³ /h	15	25	40	60
Nominal diameter	DN	mm	50	65	80	100
Overall length	L	mm	270	300	300	360
Overall length with coupling	L2	mm	-	-	-	-
Length of calculator	L1	mm	-	-	-	-
Height	H	mm	-	-	-	-
Height	H1	mm	-	-	-	-
Height of calculator	H2	mm	-	-	-	-
Width of calculator	B	mm	-	-	-	-
Connection thread on meter	Inch		-	-	-	-
Connection thread of coupling	Inch		-	-	-	-
Weight	kg		-	-	-	-

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DIMENSIONS FLANGE VERSION



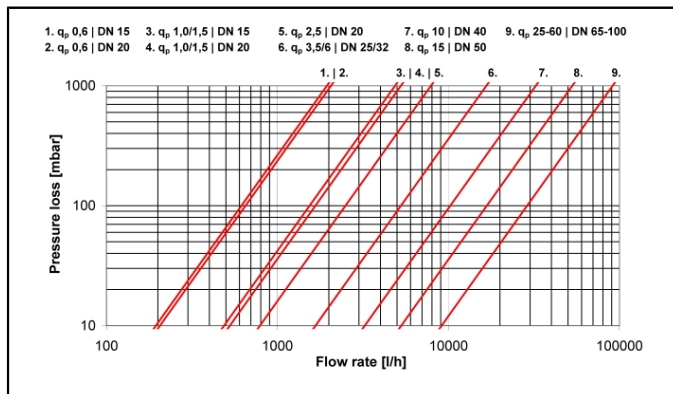
Nominal flow rate	q _p	m ³ /h	1.5	2.5	6	6	10
Nominal diameter	DN	mm	15	20	25	32	40
Overall length	L	mm	110	130	260	260	300
Length of calculator	L1	mm	-	-	150	150	150
Height	H	mm	-	-	50	62.5	69
Height	H1	mm	-	-	84.5	84.5	90
Height of calculator	H2	mm	-	-	50	50	50
Width of calculator	B	mm	-	-	100	100	100
Flange dimension	F	mm	-	-	100	125	138
Flange diameter	D	mm	-	-	114	139	148
Hole circle diameter	K	mm	-	-	85	100	110
Screw hole diameter	D1	mm	-	-	14	18	18
Number of screwholes		pcs	-	-	4	4	4
Weight		kg	-	-	3.5	4.8	6.8

Nominal flow rate	q _p	m ³ /h	15	25	40	60
Nominal diameter	DN	mm	50	65	80	100
Overall length	L	mm	270	300	300	360
Length of calculator	L1	mm	150	150	150	150
Height	H	mm	73.5	85	92.5	108
Height	H1	mm	95	102.5	110	115
Height of calculator	H2	mm	50	50	50	50
Width of calculator	B	mm	100	100	100	100
Flange dimension	F	mm	147	170	185	216
Flange diameter	D	mm	163	184	200	235
Hole circle diameter	K	mm	125	145	160	190
Screw hole diameter	D1	mm	18	18	19	22
Number of screwholes		pcs	4	8	8	8
Weight		kg	7.6	9.6	11.2	17

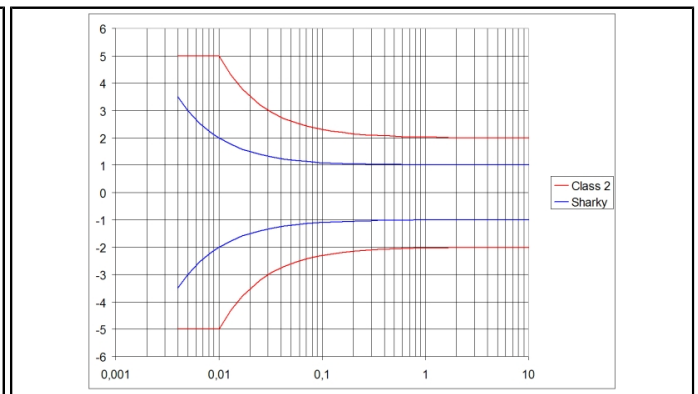
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PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph