

# SHARKY 775

ULTRASONIC COMPACT METER

**DIEHL**  
Metering



## 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 with dynamic range of 1:250 (qi:qp)
- ▶ Complete range from DN 15 mm qp 1.5 m<sup>3</sup>/h up to DN 100 mm qp 60 m<sup>3</sup>/h
- ▶ Externely low power consumption enabling a long battery lifetime (16 years in standard use)
- ▶ Radio option integrated
- ▶ Modular version, M-Bus, RS232, RS485, Analog outputs 4-20mA, pulse outputs and pulse inputs

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## ULTRASONIC COMPACT METER

### GENERAL

SHARKY	
Application	Heating - heating/cooling
Approval	MID (DE-10-MI004-PTB013)
Mounting position flow sensor	Any position, calming sections not necessary
Protection class flow sensor	Heating: IP 54; cooling: IP 65; heating/with cooling tariff: IP 65
Battery supply	3.6 VDC- D-cell max. 16 years lifetime
Mains supply	24 VAC (50 - 60 Hz); 230 VAC (50 - 60 Hz)
Temperature sensor type	Pt 500 with 2-wire leads; Ø 5.2 mm or direct sensor
Cable length of temperature sensor	Pt 500: 2 / 3 / 5 / 10m
Absolute temperature range calculator	Θ °C 1 ... 180
Volume measuring cycle	With power supply: 1/8 s; with D-cell battery: 1 s
Material of the flow sensor body	Brass or grey cast iron (only q <sub>p</sub> 15 up to q <sub>p</sub> 60 m <sup>3</sup> /h)
Test possibilities	Via display, optical test pulses, test output or via NOWA software

### CALCULATOR - BASIC FEATURES

SHARKY	
Environmental class	Class C
Ambient class	Class E2 + M2
Ambient operating temperature	°C 5 ... 55
Ambient storage temperature	°C -25 ... +60 (>35 °C max. 4 weeks)
Protection class	IP 54
Communication	2 communication slots (e. g. M-Bus + M-Bus; 2 primary addresses, 1 secondary address)
Integrated Radio	Optional
Interfaces standard	Optical ZVEI interface
Interfaces optional	2 Slots for modules with M-Bus, L-Bus, RS232, RS485, pulse output, pulse input, combined pulse in-/output or analogue output
Temperature range heating	°C 5 ... 130 / 150
Temperature range cooling	°C 5 ... 90
Temperature range heating/cooling meter	°C 5 ... 105
Extensive readable data memory	Periodical log <sup>1</sup> ; history log; event memory

<sup>1</sup>: Programmable storage interval (daily, weekly, monthly, ...)

### CALCULATOR - INTEGRATED RADIO

SHARKY	
Frequency band	868 or 434 MHz
Type of radio telegram	Real Data or Open Metering Standard (OMS)
Transmission data updating	Online - no time delay between value measurement and data transmission
Data transmission	Unidirectional
Sending interval	D-cell: 12 s ( max. 16 years lifetime); with mains unit: 12 s; depending on length of telegram (duty cycle)

### DISPLAY

SHARKY	
Display indication	LCD, 8-digit
Units	MWh - kWh - GJ - Gcal - MBtu - gal - GPM - °C - °F - m <sup>3</sup> - m <sup>3</sup> /h
Total values	99,999,999 - 9,999,999.9 - 999,999.99 - 99,999.999 (depending of th nominal diameter)
Values displayed	Energy - Power - Volume - Flow rate - Temperature

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### INTERFACES

SHARKY	
Optical	ZVEI interface, 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, auto baud detect (300 and 2400 baud), 2 M-Bus with 2 primary addresses.
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.
RS232	Serial interface for communication with external devices, a special data cable is required, M-Bus protocol, 300 and 2400 baud.
RS485	Serial interface for communication with external devices, power supply with 12 V $\pm$ 5 V, M-Bus protocol, 2400 baud.
Pulse output	Module with 2 Open Collector pulse outputs (potential-free), 4 Hz (pulse width 125 ms), 100 Hz (pulse width $\geq$ 5 ms), ratio: pulse duration / pulse break $\sim$ 1:1, configurable via IZAR@SET software <sup>1</sup> .
Pulse input	Module with 2 pulse inputs, max. 20 Hz, configurable via IZAR@SET software, data can be transferred remotely.
Combined pulse in-/output	Module with 2 pulse inputs and 1 pulse output, configurable via IZAR@SET software, needed for leak detection.
Analogue output	Module for 4 ... 20 mA with 2 programmable passive outputs, programmable value in case of error.

1 : only with SAPPEL support

### TEMPERATURE INPUT

SHARKY			
Measuring cycle	T	s	With mains supply: 2 s; with D-cell battery: 4 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

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### TECHNICAL DATA FLOW SENSOR

Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /h	1.5	1.5	2.5
Nominal diameter	DN	mm	15	20	20
Overall length	L	mm	110	130	130
Starting flow rate		l/h	2.5	2.5	4
Minimum flow rate	q <sub>i</sub>	l/h	6	6	10
Minimum flow rate (up side down installation)	q <sub>i</sub>	l/h	6	6	10
Maximum flow rate	q <sub>s</sub>	m <sup>3</sup> /h	3	3	5
Overload flow rate		m <sup>3</sup> /h	4.6	4.6	6.7
Operating pressure	PN	bar	16 <sup>1</sup>	16 <sup>1</sup>	16 <sup>1</sup>
Pressure loss at q <sub>p</sub>	Δp	mbar	75	75	100
Temp. range heating		°C	5 ... 130	5 ... 130	5 ... 130
Temp. range cooling		°C	5 ... 90	5 ... 90	5 ... 90
Temp. range heating/cooling		°C	5 ... 105	5 ... 105	5 ... 105
Kvs value (Δp=Q <sup>2</sup> /Kvs <sup>2</sup> )			5.48	5.48	7.91

Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /h	6	6	10
Nominal diameter	DN	mm	25	32	40
Overall length	L	mm	260	260	300
Starting flow rate		l/h	7	7	20
Minimum flow rate	q <sub>i</sub>	l/h	24	24	40 <sup>2</sup> /100
Minimum flow rate (up side down installation)	q <sub>i</sub>	l/h	24	24	100
Maximum flow rate	q <sub>s</sub>	m <sup>3</sup> /h	12	12	20
Overload flow rate		m <sup>3</sup> /h	18.4	18.4	24
Operating pressure	PN	bar	16 <sup>1</sup>	16 <sup>1</sup>	16 <sup>1</sup>
Pressure loss at q <sub>p</sub>	Δp	mbar	128	128	95
Temp. range heating		°C	5 ... 150	5 ... 150	5 ... 150
Temp. range cooling		°C	5 ... 90	5 ... 90	5 ... 90
Temp. range heating/cooling		°C	5 ... 105	5 ... 105	5 ... 105
Kvs value (Δp=Q <sup>2</sup> /Kvs <sup>2</sup> )			16.77	16.77	32.44

Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /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 <sub>i</sub>	l/h	60 <sup>2</sup> /150	100 <sup>2</sup> /250	160	240 <sup>2</sup> /600 <sup>3</sup>
Minimum flow rate (up side down installation)	q <sub>i</sub>	l/h	150	250	160	1200
Maximum flow rate	q <sub>s</sub>	m <sup>3</sup> /h	30	50	80	120
Overload flow rate		m <sup>3</sup> /h	36	60	90	132
Operating pressure	PN	bar	25	25	25	16/25
Pressure loss at q <sub>p</sub>	Δp	mbar	80	75	80	75
Temp. range heating		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Temp. range cooling		°C	5 ... 90	5 ... 90	5 ... 90	5 ... 90
Temp. range heating/cooling		°C	5 ... 105	5 ... 105	5 ... 105	5 ... 105
Kvs value (Δp=Q <sup>2</sup> /Kvs <sup>2</sup> )			53.03	91.29	141.42	219.09

<sup>1</sup>: Also available in PN 25 bar

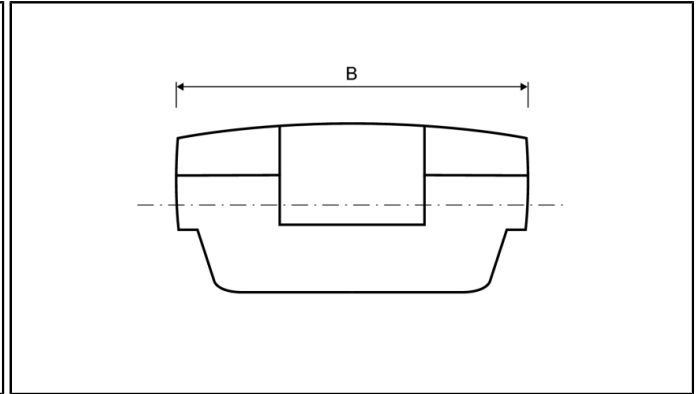
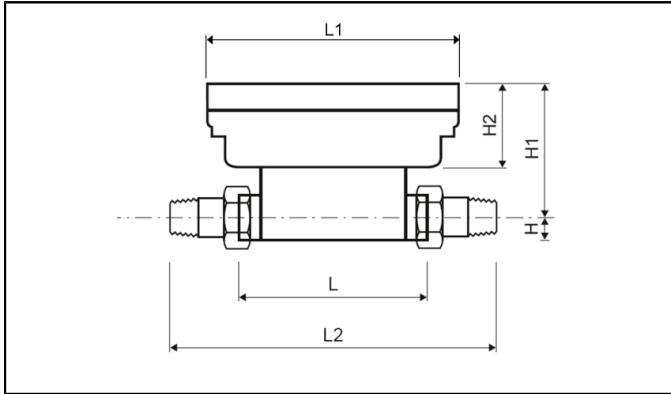
<sup>2</sup>: Only for horizontal installation

<sup>3</sup>: Only in rising or falling pipes or tilted installation

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### DIMENSIONS THREAD VERSION



Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /h	1.5	1.5	2.5
Nominal diameter	DN	mm	15	20	20
Overall length	L	mm	110	130	130
Overall length with coupling	L2	mm	190	230	230
Length of calculator	L1	mm	150	150	150
Height	H	mm	14.5	18	18
Height	H1	mm	82	84	84
Height of calculator	H2	mm	54	54	54
Width of calculator	B	mm	100	100	100
Connection thread on meter	Inch		G $\frac{3}{4}$ B	G1B	G1B
Connection thread of coupling	Inch		R $\frac{1}{2}$	R $\frac{3}{4}$	R $\frac{3}{4}$
Weight	kg		0.76	0.85	0.85

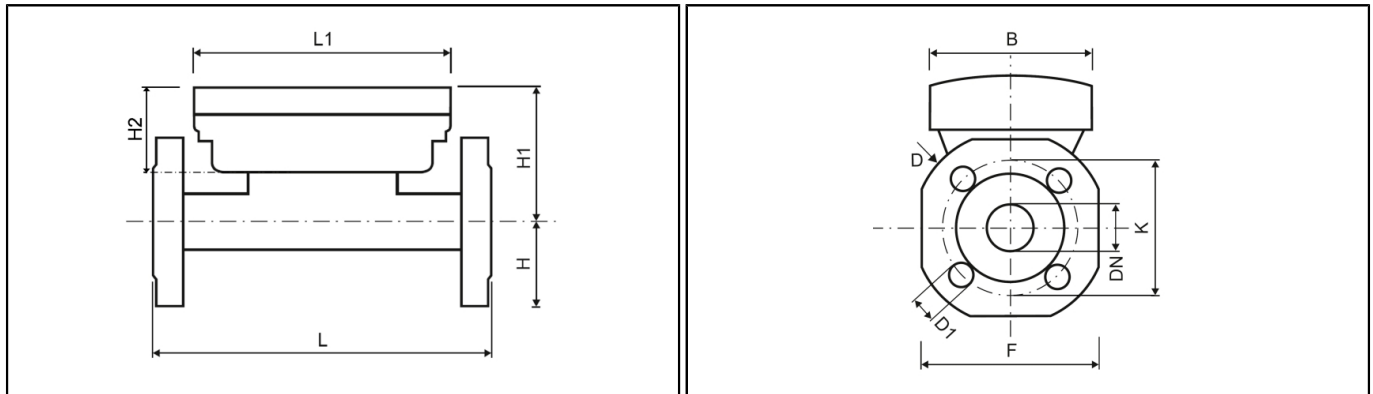
Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /h	6	6	10
Nominal diameter	DN	mm	25	32	40
Overall length	L	mm	260	260	300
Overall length with coupling	L2	mm	380	380	440
Length of calculator	L1	mm	150	150	150
Height	H	mm	23	23	33
Height	H1	mm	88.5	88.5	94
Height of calculator	H2	mm	54	54	54
Width of calculator	B	mm	100	100	100
Connection thread on meter	Inch		G1 $\frac{1}{4}$ B	G1 $\frac{1}{2}$ B	G2B
Connection thread of coupling	Inch		R1	R1 $\frac{1}{4}$	R1 $\frac{1}{2}$
Weight	kg		1.5	1.5	3.1

Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /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 <sub>p</sub>	m <sup>3</sup> /h	1.5	1.5	2.5
Nominal diameter	DN	mm	15	20	20
Overall length	L	mm	110	130	130
Length of calculator	L1	mm	-	-	-
Height	H	mm	-	-	-
Height	H1	mm	-	-	-
Height of calculator	H2	mm	-	-	-
Width of calculator	B	mm	-	-	-
Flange dimension	F	mm	-	-	-
Flange diameter	D	mm	-	-	-
Hole circle diameter	K	mm	-	-	-
Screw hole diameter	D1	mm	-	-	-
Number of screwholes		pcs	-	-	-
Weight brass body		kg	-	-	-
Weight grey cast iron body		kg	-	-	-

Nominal flow rate	q <sub>p</sub>	m <sup>3</sup> /h	6	6	10
Nominal diameter	DN	mm	25	32	40
Overall length	L	mm	260	260	300
Length of calculator	L1	mm	150	150	150
Height	H	mm	50	62.5	69
Height	H1	mm	88.5	88.5	94
Height of calculator	H2	mm	54	54	54
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 brass body		kg	3.5	4.8	6.4
Weight grey cast iron body		kg	-	-	-

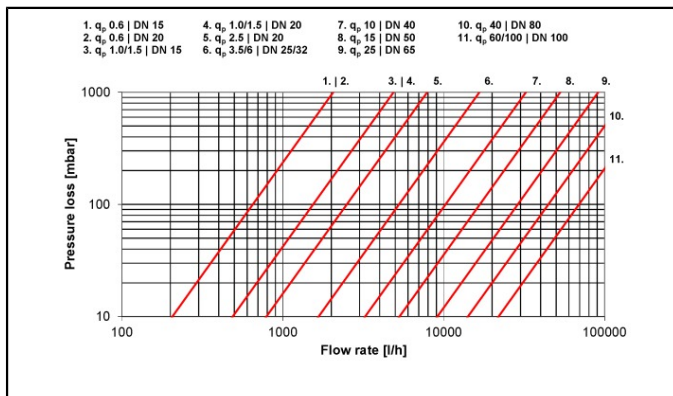
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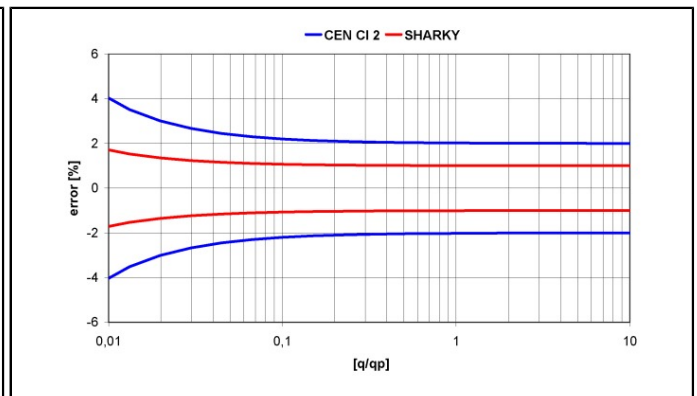
Nominal flow rate	$q_p$	$m^3/h$	15	25	40	60
Nominal diameter	DN	mm	50	65	80	100
Overall length	L	mm	270	300	300	360
Length of calculator	L1	mm	150	150	150	150
Height	H	mm	73.5	85	92.5	108
Height	H1	mm	99	106.5	114	119
Height of calculator	H2	mm	54	54	54	54
Width of calculator	B	mm	100	100	100	100
Flange dimension	F	mm	147	170	185	216
Flange diameter	D	mm	163	184	200	235
Hole circle diameter	K	mm	125	145	160	180 <sup>1</sup> /190
Screw hole diameter	D1	mm	18	18	19	19 <sup>1</sup> /22
Number of screw holes		pcs	4	8	8	8
Weight brass body		kg	7.0	8.9	10.9	16.4
Weight grey cast iron body		kg	5.9	7.7	9.6	15.2

<sup>1</sup>: Value for PN 16 housing

## PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph