

# SHARKY 775

ULTRASONIC COMPACT ENERGY METER

**DIEHL**  
Metering



## APPLICATION

SHARKY 775 is a ultrasonic compact energy meter designed for measuring the energy consumption in heating and bifunctional (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 (prevents wear and tear of the metering components), low pressure loss, large metering dynamics and low start flowrate, insensitiveness to suspended particles...

## FEATURES

- ▶ MID approval in class 2 with dynamic range (qi:qp) up to 1:250 (depending on DN), standard 1:100
- ▶ Heat-transfer fluid: water
- ▶ Complete range from DN 15 qp 0.6 m<sup>3</sup>/h up to DN 100 qp 100 m<sup>3</sup>/h
- ▶ Low power consumption enabling a long battery lifetime (up to 16 years)
- ▶ Integrated radio option
- ▶ Modular version, M-Bus, M-Bus RS232, M-Bus RS485, Modbus RTU RS485, Analog outputs 4-20mA, pulse outputs and inputs

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### GENERAL

SHARKY 775	
Application	Heating - bifunctional (heating/cooling)   Heat-transfer fluid: glycol-free water
Approval	MID (DE-10-MI004-PTB013)
Mounting position flow sensor	Any position, calming sections not necessary
Protection class flow sensor	Heating: IP 54   Bifunctional (heating/cooling): IP 65
Battery supply	3.6 VDC- D-cell up to 16 years lifetime*
Mains supply	24 VAC; 230 VAC
Temperature sensor type	Pt 500 with 2-wires ; Ø 5.2 mm or direct sensor
Cable length of temperature sensor	Pt 500: 2 / 3 / 5 / 10 m
Absolute temperature range calculator	θ °C +1 ... +180
Flow measuring cycle	With power supply: 1/8 s   with D-cell battery: 1 s
Material of the flow sensor body	Brass (q <sub>p</sub> 1.5 ... 10 m <sup>3</sup> /h) or cast iron (q <sub>p</sub> 15 ... 100 m <sup>3</sup> /h)
Test possibilities	Via display, optical test pulses, test output or via NOWA software

\*Standard conditions of use and temperature. Theoretical life, with no guarantee.

### CALCULATOR - BASIC FEATURES

SHARKY 775	
Environmental class (EN 1434)	Class C
Ambient class (MID)	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	3 communication slots (e. g. M-Bus + M-Bus + integrated radio; 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 (depending on meter size)
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 775	
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	12 s (up to 16 years lifetime*); depending on telegram length (duty cycle)

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### DISPLAY

SHARKY 775	
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 on the nominal diameter)
Displayed values	Energy - Volume - Flow rate - Power - Temperature

### INTERFACES

SHARKY 775	
Optical	ZVEI interface for communication and testing, M-Bus protocol
M-Bus	Configurable telegram, according to EN13757-3, data reading and parametrization via 2 wires with polarity reversal protection, auto baud detect (300 and 2,400 baud), 2 M-Bus outputs with 2 primary addresses
L-Bus	Adapter for external radio module, configurable telegram, according to EN13757-3, data reading and parametrization via 2 wires with polarity reversal protection
RS232	Serial interface for communication with external devices, a special data cable is required, M-Bus protocol, 300 and 2,400 baud
RS485	Serial interface for communication with external devices, power supply with 12 V ± 5 V, M-Bus protocol, 2,400 baud
Pulse output	Module with 2 Open Collector pulse outputs (potential-free), output 1: 4 Hz (pulse width 125 ms) pulse or static conditions (e.g. errors); output 2: 200 Hz (pulse width ≥ 5 ms), ratio: pulse duration/pulse break ~ 1:1, configurable via IZAR@MOBILE 2 software
Pulse input	Module with 2 pulse inputs, max. 20 Hz, configurable via IZAR@MOBILE 2 software, data can be transferred remotely
Combined pulse in-/output	Module with 2 pulse inputs and 1 pulse output, configurable via IZAR@MOBILE 2 software, needed for leak detection
Analogue output	Module for 4 ... 20 mA with 2 programmable passive outputs, programmable value in case of error

### TEMPERATURE INPUT

SHARKY 775			
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	175

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### TECHNICAL DATA FLOW SENSOR

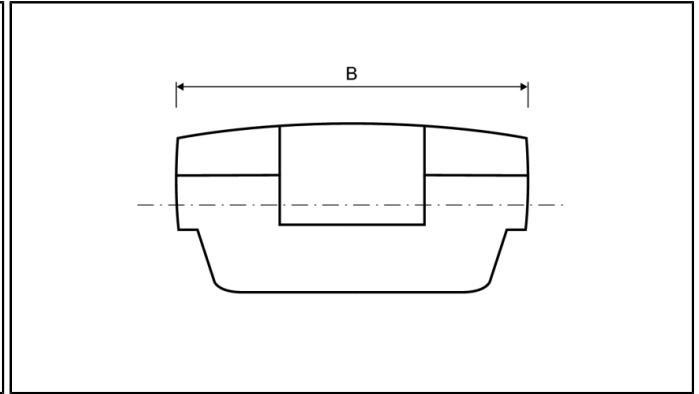
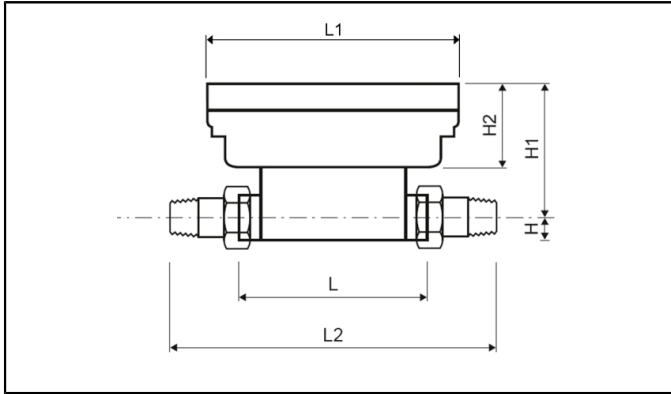
Nominal flow rate	$q_p$	m <sup>3</sup> /h	0.6	1.5	1.5	2.5	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32
Overall length	L	mm	110	110	130	130	260	260
Starting flow rate		l/h	1	2.5	2.5	4	10	10
Minimum flow rate (DR 1:250)	$q_i$	l/h	-	6	6	10	24	24
Minimum flow rate (DR 1:100)	$q_i$	l/h	6	15	15	25	60	60
Maximum flow rate	$q_s$	m <sup>3</sup> /h	1.2	3	3	5	12	12
Overload flow rate		m <sup>3</sup> /h	2.5	4.6	4.6	6.7	18.4	18.4
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25
Pressure loss at $q_p$	$\Delta p$	mbar	95	120	75	100	128	165
Temp. range heating		°C	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 150	5 ... 150
Kvs value ( $\Delta p=Q^2/Kvs^2$ )			1.95	4.33	5.48	7.91	16.77	14.77
Nominal flow rate	$q_p$	m <sup>3</sup> /h	10	15	25	40	60	100
Nominal diameter	DN	mm	40	50	65	80	100	100
Overall length	L	mm	300	270	300	300	360	360
Starting flow rate		l/h	20	40	50	80	120	120
Minimum flow rate (DR 1:250)	$q_i$	l/h	40 <sup>1</sup>	60 <sup>1</sup>	100 <sup>1</sup>	160	240 <sup>1</sup>	240 <sup>1</sup>
Minimum flow rate (DR 1:100)	$q_i$	l/h	100	150	250	400	600	1,000
Maximum flow rate	$q_s$	m <sup>3</sup> /h	20	30	50	80	120	120
Overload flow rate		m <sup>3</sup> /h	24	36	60	90	132	132
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	25	25
Pressure loss at $q_p$	$\Delta p$	mbar	140	140	75	80	75	210
Temp. range heating		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Kvs value ( $\Delta p=Q^2/Kvs^2$ )			26.73	40.09	91.29	141.42	219.09	218.22

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

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## DIMENSIONS THREAD VERSION



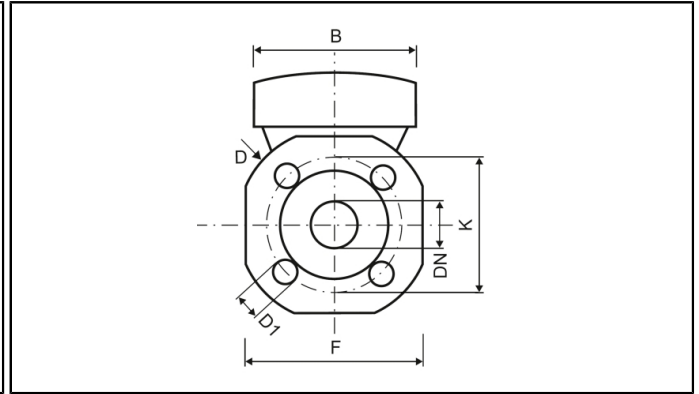
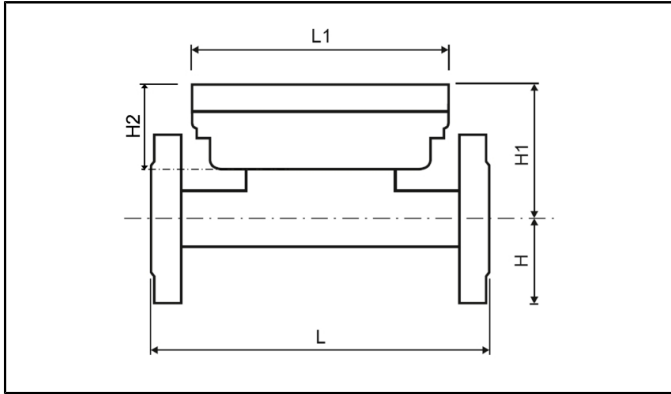
Nominal flow rate	$q_p$	$m^3/h$	0.6	1.5	1.5	2.5	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32
Overall length	L	mm	110	110	130	130	260	260
Overall length with coupling	L2	mm	190	190	230	230	380	380
Length of calculator	L1	mm	150	150	150	150	150	150
Height	H	mm	14.5	14.5	18	18	23	23
Height	H1	mm	82	82	84	84	88.5	88.5
Height of calculator	H2	mm	54	54	54	54	54	54
Width of calculator	B	mm	100	100	100	100	100	100
Connection thread on meter		Inch	G $\frac{3}{4}$ B	G $\frac{3}{4}$ B	G1B	G1B	G1 $\frac{1}{4}$ B	G1 $\frac{1}{2}$ B
Connection thread of coupling		Inch	R $\frac{1}{2}$	R $\frac{1}{2}$	R $\frac{3}{4}$	R $\frac{3}{4}$	R1	R1 $\frac{1}{4}$
Weight		kg	0.76	0.76	0.85	0.85	1.5	1.5

Nominal flow rate	$q_p$	$m^3/h$	10	15	25	40	60	100
Nominal diameter	DN	mm	40	50	65	80	100	100
Overall length	L	mm	300	270	300	300	360	360
Overall length with coupling	L2	mm	440	-	-	-	-	-
Length of calculator	L1	mm	150	-	-	-	-	-
Height	H	mm	33	-	-	-	-	-
Height	H1	mm	94	-	-	-	-	-
Height of calculator	H2	mm	54	-	-	-	-	-
Width of calculator	B	mm	100	-	-	-	-	-
Connection thread on meter		Inch	G2B	-	-	-	-	-
Connection thread of coupling		Inch	R1 $\frac{1}{2}$	-	-	-	-	-
Weight		kg	3.1	-	-	-	-	-

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## DIMENSIONS FLANGE VERSION

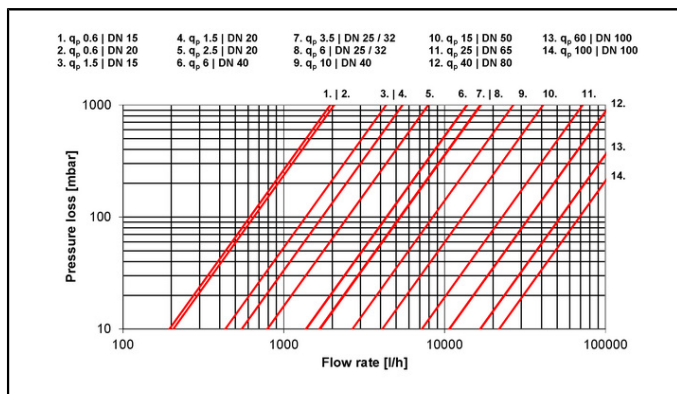


Nominal flow rate	$q_p$	m <sup>3</sup> /h	0.6	1.5	1.5	2.5	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32
Overall length	L	mm	110	110	130	130	260	260
Length of calculator	L1	mm	-	-	-	-	150	150
Height	H	mm	-	-	-	-	50	62.5
Height	H1	mm	-	-	-	-	88.5	88.5
Height of calculator	H2	mm	-	-	-	-	54	54
Width of calculator	B	mm	-	-	-	-	100	100
Flange dimension	F	mm	-	-	-	-	100	125
Flange diameter	D	mm	-	-	-	-	114	139
Hole circle diameter	K	mm	-	-	-	-	85	100
Screw hole diameter	D1	mm	-	-	-	-	14	18
Number of screwholes		pcs	-	-	-	-	4	4
Weight brass body		kg	-	-	-	-	3.5	4.8
Weight grey cast iron body		kg	-	-	-	-	-	-
Nominal flow rate	$q_p$	m <sup>3</sup> /h	10	15	25	40	60	100
Nominal diameter	DN	mm	40	50	65	80	100	100
Overall length	L	mm	300	270	300	300	360	360
Length of calculator	L1	mm	150	150	150	150	150	150
Height	H	mm	69	73.5	85	92.5	108	108
Height	H1	mm	94	99	106.5	114	119	119
Height of calculator	H2	mm	54	54	54	54	54	54
Width of calculator	B	mm	100	100	100	100	100	100
Flange dimension	F	mm	138	147	170	185	216	216
Flange diameter	D	mm	148	163	184	200	235	235
Hole circle diameter	K	mm	110	125	145	160	190	190
Screw hole diameter	D1	mm	18	18	18	19	22	22
Number of screwholes		pcs	4	4	8	8	8	8
Weight brass body		kg	6.4	7.0	8.9	10.9	16.4	16.4
Weight grey cast iron body		kg	-	5.9	7.7	9.6	15.2	15.2

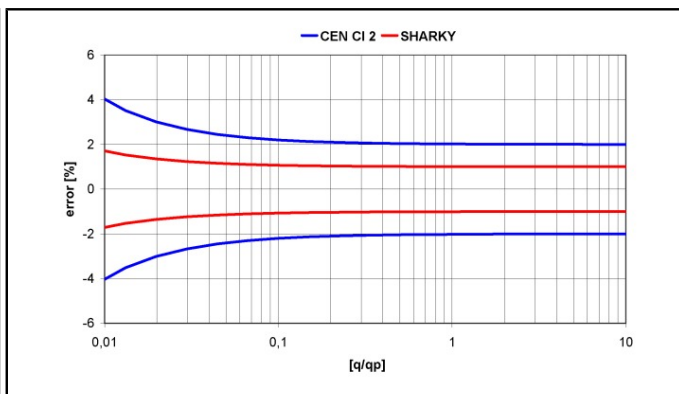
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## ULTRASONIC COMPACT ENERGY METER

### PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph