

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

- ▶ Approval with dynamic range up to 1:250 (qi:qp) MID in class 2 (depends on meter size), standard 1:100
- ▶ Complete range from DN 15 mm qp 0.6m³/h up to DN 100 mm qp 100m³/h
- ▶ Extremely low power consumption enabling a long battery lifetime (up to 16 years)
- ▶ Radio option integrated
- ▶ Modular version, M-Bus, RS232, RS485, Analog outputs 4-20mA, pulse outputs and pulse inputs

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GENERAL

| | | SHARKY | |
|---------------------------------------|------|---|--|
| Application | | Heating - heating with cooling tariff | |
| Approval | | MID (DE-10-MI004-PTB013) | |
| Mounting position flow sensor | | Any position, calming sections not necessary | |
| Protection class flow sensor | | Heating: IP 54; heating with cooling tariff: IP 65 | |
| Battery supply | | 3.6 VDC- D-cell up to 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 _p 15 m ³ /h up to q _p 100 m ³ /h) | |
| Test possibilities | | Via display, optical test pulses, test output or via NOWA software | |

CALCULATOR - BASIC FEATURES

| | | SHARKY | |
|---|----|--|--|
| 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 (depends on meter size) | |
| Temperature range heating/cooling meter | °C | +5 ... +105 | |
| Extensive readable data memory | | Periodical log ¹ ; history log; event memory | |

¹: 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 | | 12 s (up to 16 years lifetime); 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 ³ - m ³ /h | |
| Total values | | 99,999,999 - 9,999,999.9 - 999,999.99 - 99,999.999 (depending of the 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), output 1: 4 Hz (pulse width 125 ms) pulse or static conditions (e.g. errors); output 2: 100 Hz (pulse width \geq 5 ms), ratio: pulse duration / pulse break \sim 1:1, configurable via IZAR@SET software ¹ . |
| Pulse input | Module with 2 pulse inputs, max. 20 Hz, configurable via IZAR@SET software ¹ , data can be transferred remotely. |
| Combined pulse in-/output | Module with 2 pulse inputs and 1 pulse output, configurable via IZAR@SET software ¹ , 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 DIEHL 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_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 |
| Starting flow rate | | l/h | 1 | 2.5 | 2.5 | 4 | 7 | 7 |
| Minimum flow rate | q_i | l/h | 6 | 6 ¹ | 6 ¹ | 10 ¹ | 24 ¹ | 24 ¹ |
| Maximum flow rate | q_s | m ³ /h | 1.2 | 3 | 3 | 5 | 12 | 12 |
| Overload flow rate | | m ³ /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 | Δp | mbar | 85 | 75 | 75 | 100 | 128 | 128 |
| Temp. range heating | | °C | 5 ... 130 | 5 ... 130 | 5 ... 130 | 5 ... 130 | 5 ... 150 | 5 ... 150 |
| Kvs value ($\Delta p=Q^2/Kvs^2$) | | | 2.06 | 5.48 | 5.48 | 7.91 | 16.77 | 16.77 |

| | | | | | | | | |
|------------------------------------|------------|-------------------|-------------------|-------------------|--------------------|------------------|--------------------|--------------------|
| 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 |
| Starting flow rate | | l/h | 20 | 40 | 50 | 80 | 120 | 120 |
| Minimum flow rate | q_i | l/h | 40 ^{1,2} | 60 ^{1,2} | 100 ^{1,2} | 160 ¹ | 240 ^{1,2} | 400 ^{1,2} |
| Maximum flow rate | q_s | m ³ /h | 20 | 30 | 50 | 80 | 120 | 120 |
| Overload flow rate | | m ³ /h | 24 | 36 | 60 | 90 | 132 | 132 |
| Operating pressure | PN | bar | 16/25 | 16/25 | 16/25 | 16/25 | 16/25 | 16/25 |
| Pressure loss at q_p | Δp | mbar | 95 | 80 | 75 | 80 | 75 | 210 |
| Temp. range heating | | °C | 5 ... 150 | 5 ... 150 | 5 ... 150 | 5 ... 150 | 5 ... 150 | 5 ... 150 |
| Kvs value ($\Delta p=Q^2/Kvs^2$) | | | 32.44 | 53.03 | 91.29 | 141.42 | 219.09 | 219.09 |

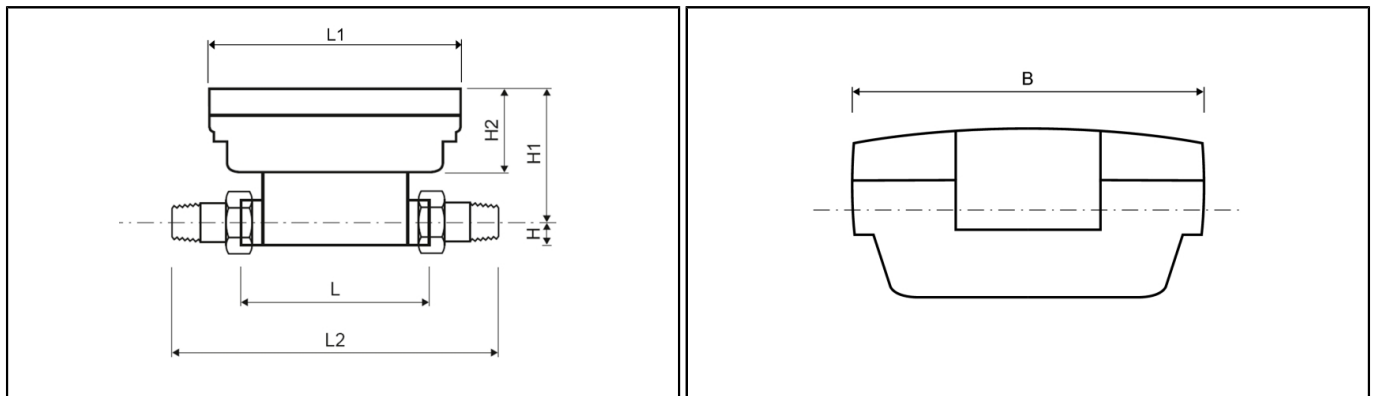
¹: For a dynamic range of 1:250

²: Only for horizontal installation

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ULTRASONIC COMPACT METER

DIMENSIONS THREAD VERSION



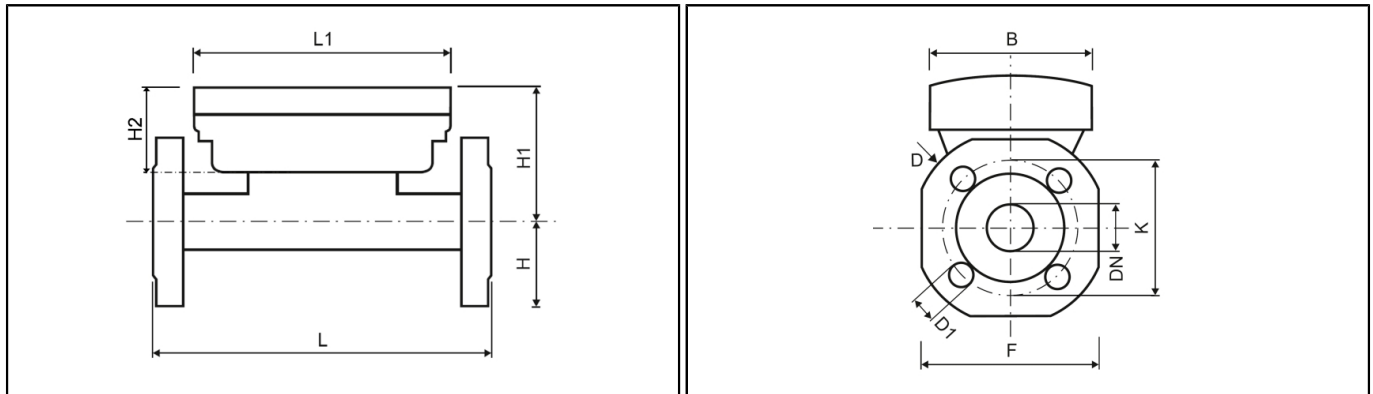
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|-------------------------------|-------|-------------------|-------------------|-------------------|-----------------|-----------------|--------------------|--------------------|
| Nominal flow rate | q_p | m ³ /h | 0.6 | 1.5 | 1.5 | 2.5 | 6 | 6 |
| 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



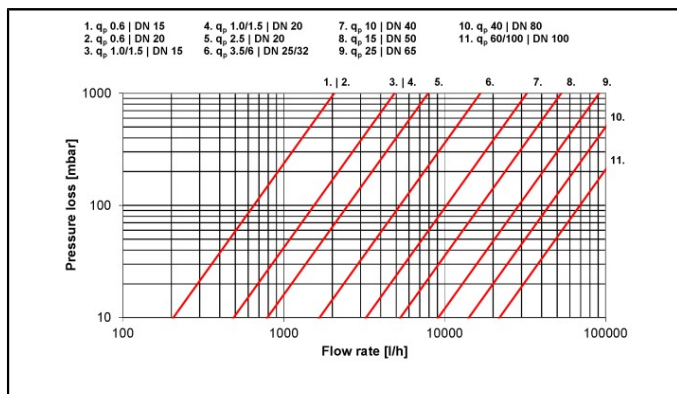
| | | | | | | | | |
|----------------------------|-------|---------|-----|------|-------|------|-----------------------|-----------------------|
| Nominal flow rate | q_p | m^3/h | 0.6 | 1.5 | 1.5 | 2.5 | 6 | 6 |
| Nominal diameter | DN | mm | 15 | 15 | 20 | 20 | 25 | 32 |
| Overall length | L | mm | 110 | 110 | 130 | 130 | 260 | 260 |
| 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^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 |
| 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 | 180 ¹ /190 | 180 ¹ /190 |
| Screw hole diameter | D1 | mm | 18 | 18 | 18 | 19 | 19 ¹ /22 | 19 ¹ /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 |

¹: Value for PN 16 housing

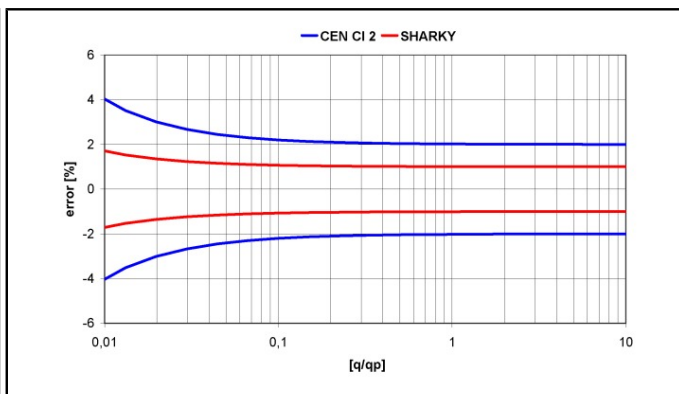
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PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph