

SHARKY FS 473

ULTRASONIC FLOW SENSOR

DIEHL
Metering



APPLICATION

SHARKY FS ultrasonic flow sensor is designed for flow measuring in local and district heating and heating/cooling systems. The ultrasonic technology used is based on the static measurement of the transit time and offers many benefits : no moving parts (prevents wear and tear of the metering components), low pressure loss, large metering dynamics and low start flowrate, resistance to suspended particles...

FEATURES

- ▶ Approval with dynamic range up to 1:250 (qi:qp) MID in class 2 (depending on meter size), standard 1:100
- ▶ Complete range from DN 15 qp 0.6 m³/h up to DN 100 qp 100 m³/h
- ▶ Available in threaded or flanged version
- ▶ Heat-transfer fluid: glycol-free water
- ▶ External power supply as standard or battery-driven as an alternative
- ▶ Low power consumption ensuring optimum battery lifetime (up to 12 years)
- ▶ Applicable for calculators with pulse input
- ▶ Temperature range 5°C to 90°C / 5°C to 150°C

SHARKY FS 473

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GENERAL

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Application	Heating or bifunctional (heating/cooling) Heat-transfer fluid: glycol-free water
Approval	MID (DE-07-MI004-PTB022)
Ambient class	EN 1434 class C / MID class E2 + M2
Ambient temperature	°C +5 ... +55
Power supply	External power supply: 3.0 ... 5.5 VDC Battery supply: 3.0 VDC (up to 12 years lifetime)
Mounting position	Any position
Protection class	Heating: IP 54; heating/cooling: IP 65
Interfaces	Open Collector pulse output ¹ - output for testing and communication ²
Volume pulse value ³	10 ml ... 5,000 l/pulse (depending on sensor sizes and supply)
Pulse cable length	2.4 m (4.9 or 9.9 m optional)
Material of the flow sensor body	Brass (q_p 0.6 ... 10 m ³ /h), grey cast iron (q_p 15 ... 100 m ³ /h)

¹ The pulse output can be chosen without galvanic isolation (standard) or with galvanic isolation (only with battery supply). The flow sensor has by default a 4-wires pulse cable.

² The output for testing is a combined pulse output. The flow sensor can either emit a high resolution test pulse (standard) or communicate via the same output.

³ The pulse duration is between 1 and 250 ms depending on the pulse value and the nominal flow rate q_p . Standard pulse values: 1, 10, 100 l/pulse (other pulse values available on request).

TEMPERATURE RANGE

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Temperature range heating - battery supply	°C +5 ...+90 / +5 ... +105 ¹
Temperature range heating - external supply	°C +5 ... +130 / +150
Temperature range heating/cooling - battery supply	°C +5 ... +90 / +5 ... +105 ¹

¹ Only in rising or falling pipes or tilted horizontal installation

TECHNICAL DATA

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	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
Minimum flow rate (up side down installation)	q_i	l/h	6	6	6	10	24	24
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
Pressure loss at q_p	Δp	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

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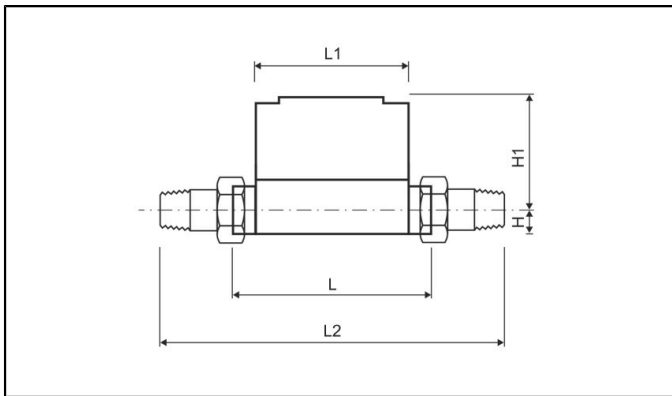
ULTRASONIC FLOW SENSOR

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 (DR 1:250)	q_i	l/h	40 ¹	60 ¹	100 ¹	160 ¹	240 ¹	400 ¹
Minimum flow rate (DR 1:100)	q_i	l/h	100	150	250	400	600/1,200 ²	1,000/1,200 ²
Minimum flow rate (up side down installation)	q_i	l/h	100	150	250	400	1,200	1,200
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
Pressure loss at q_p	Δp	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

¹ Valid for horizontal installation only

² Up side down installation

DIMENSIONS THREAD VERSION



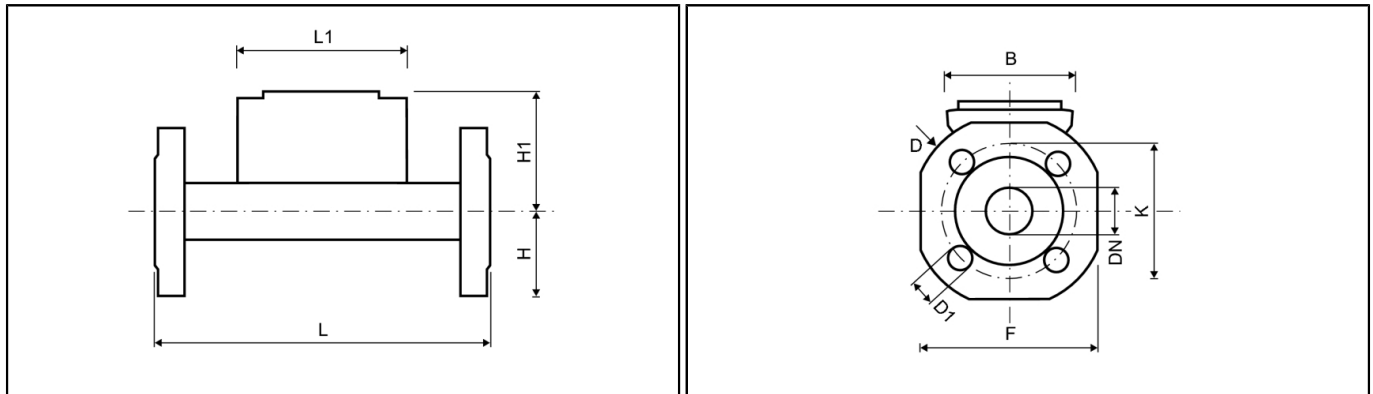
Nominal flow rate	q_p	m ³ /h	0.6	1.5	1.5	2.5	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32
Overall length	L	mm	110	110	130	130	260	260
Overall length with coupling	L2	mm	190	190	230	230	380	380
Height	H	mm	14.5	14.5	18	18	23	23
Height	H1	mm	54.5	54.5	56.5	56.5	61	61
Length of electronic	L1	mm	90	90	90	90	90	90
Width of electronic	B	mm	65.5	65.5	65.5	65.5	65.5	65.5
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 $\frac{1}{4}$
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25
Weight		kg	0.6	0.6	0.61	0.61	1.35	1.35

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	-	-	-	-	-
Height	H	mm	33	-	-	-	-	-
Height	H1	mm	66.5	-	-	-	-	-
Length of electronic	L1	mm	90	-	-	-	-	-
Width of electronic	B	mm	65.5	-	-	-	-	-
Connection thread on meter		Inch	G2B	-	-	-	-	-
Connection thread of coupling		Inch	R1 $\frac{1}{2}$	-	-	-	-	-
Operating pressure	PN	bar	16/25	-	-	-	-	-
Weight		kg	2.6	-	-	-	-	-

SHARKY FS 473

ULTRASONIC FLOW SENSOR

DIMENSIONS FLANGE VERSION



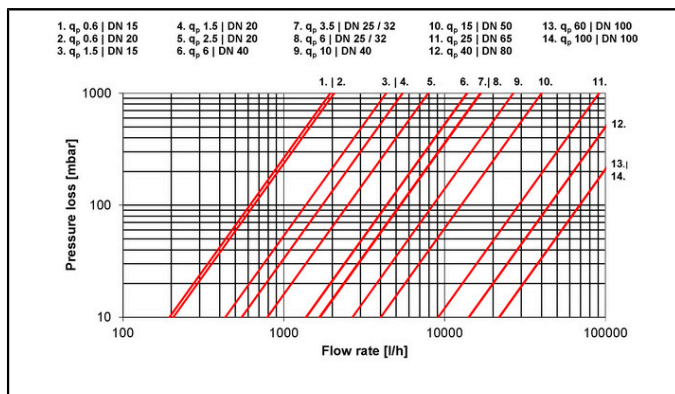
Nominal flow rate	q_p	m ³ /h	0.6	1.5	1.5	2.5	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32
Overall length	L	mm	110	110	130	130	260	260
Height	H	mm	-	-	-	-	50	62.5
Height	H1	mm	-	-	-	-	61	61
Length of electronic	L1	mm	-	-	-	-	90	90
Width of electronic	B	mm	-	-	-	-	65.5	65.5
Flange dimension	F	mm	-	-	-	-	100	125
Flange diameter	D	mm	-	-	-	-	114	139
Hole circle diameter	K	mm	-	-	-	-	85	100
Screw hole diameter	D1	mm	-	-	-	-	14	18
Operating pressure	PN	bar	-	-	-	-	16/25	16/25
Number of screwholes		pcs	-	-	-	-	4	4
Weight brass body ¹		kg	-	-	-	-	3.35	4.65
Weight grey cast iron body ¹		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
Height	H	mm	69	73.5	85	92.5	108	108
Height	H1	mm	66.5	71.5	79	86.5	96.5	95.5
Length of electronic	L1	mm	90	90	90	90	90	90
Width of electronic	B	mm	65.5	65.5	65.5	65.5	65.5	65.5
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
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	25	25
Number of screwholes		pcs	4	4	8	8	8	8
Weight brass body ¹		kg	6.6	7.45	9.45	11.1	16.9	16.9
Weight grey cast iron body ¹		kg	-	6.31	8.08	10.01	15.76	15.75

¹ Meter with battery and 2.4 m cable length of the pulse cable

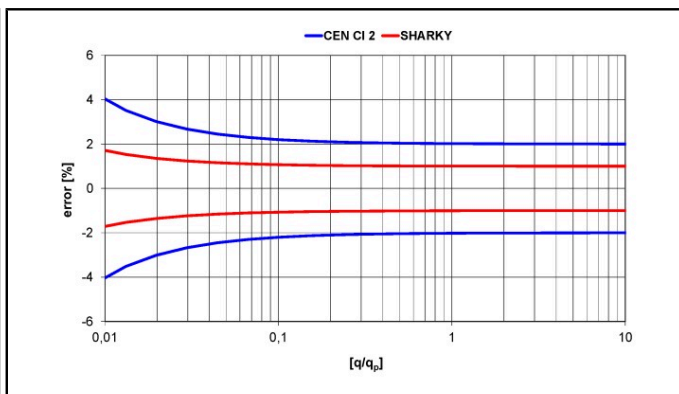
SHARKY FS 473

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PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph