

SHARKY FS 473

FLOW SENSOR | ULTRASONIC

DIEHL
Metering



APPLICATION

The ultrasonic flow sensor can be used for flow measuring in local and district heating / cooling systems.

FEATURES

- ▶ 1st approval in Europe for ultrasonic flow sensor with a dynamic range (DR) of up to 1:250 ($q_i:q_p$) in class 2 (depends on meter size), standard 1:100
- ▶ Extreme low power consumption --> longer battery lifetime
- ▶ Approved according EN 1434 and MID in class 2 and 3
- ▶ High long term stability, verified with independent AGFW test
- ▶ Applicable for different calculators with impulse input
- ▶ Free selectable impulse values, time continuously pulse, no puls packages
- ▶ The temperature range depending on the application 5 ... 150 °C
- ▶ Battery or external power supply
- ▶ Specific housing for falling and rising pipes

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GENERAL

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Application	Heating - cooling
Approval	MID
Ambient class	EN 1434 class C / MID class E2 + M2
Ambient temperature	°C 5 ... 55
Power supply	3.0 VDC battery - up to 12 years lifetime; external supply 3.0 ... 5.5 VDC
Mounting position	Any position
Protection class	Heating: IP 54; cooling: IP 65
Interfaces	Open Collector pulse output ¹ - output for testing and communication ²
Volume pulse value ³	10 ml ... 5000 l/pulse (depending on sensor sizes and supply)
Cable length of impulse cable	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 ... 60 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-wire impulse 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. By using an adapter the flow sensor can be read via the HYDRO-SET software.

³: The pulse duration is between 1 and 250 ms. It depends on the pulse value and on the nominal flow rate q_p .
Standard pulse values: 1, 2.5, 10, 25, 100, 250 l/pulse

TEMPERATURE RANGE

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Temperature range heating - battery supplied	°C 5 ... 90 / 5 ... 105 ¹
Temperature range heating - external supplied	°C 5 ... 130 / 150
Temperature range cooling - battery supplied	°C 5 ... 90 / 5 ... 105 ¹
Temperature range cooling - external supplied	°C 5 ... 120

¹: Only in rising or falling pipes or tilted horizontal installation

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TECHNICAL DATA

Nominal flow rate	q_p	m ³ /h	0.6	0.6	0.6	1.5	1.5	1.5	2.5	2.5
Nominal diameter	DN	mm	15	20	20	15	20	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130	190
Starting flow rate		l/h	1	1	1	2.5	2.5	2.5	4	4
Minimum flow rate (DR 1:250)	q_i	l/h	6	6	6	6	6	6	10	10
Minimum flow rate (DR 1:100)	q_i	l/h	6	6	6	15	15	15	25	25
Minimum flow rate (up side down installation)	q_i	l/h	6	6	6	6	6	6	10	10
Maximum flow rate	q_s	m ³ /h	1.2	1.2	1.2	3	3	3	5	5
Overload flow rate		m ³ /h	2.5	2.5	2.5	4.6	4.6	4.6	6.7	6.7
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25	16/25	16/25
Pressure loss at q_p	Δp	mbar	85	85	85	75	75	75	100	100
Temp. range heating		°C	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130
Kvs value ($\Delta p=Q^2/Kvs^2$)			2.06	2.06	2.06	5.48	5.48	5.48	7.91	7.91

Nominal flow rate	q_p	m ³ /h	3.5	3.5	3.5	3.5	3.5	6	6	6
Nominal diameter	DN	mm	25	25	32	25	32	25	25	32
Overall length	L	mm	135	150	150	260	260	135	150	150
Starting flow rate		l/h	7	7	7	7	7	7	7	7
Minimum flow rate (DR 1:250)	q_i	l/h	-	-	-	-	-	24	24	24
Minimum flow rate (DR 1:100)	q_i	l/h	35	35	35	35	35	60	60	60
Minimum flow rate (up side down installation)	q_i	l/h	35	35	35	35	35	24	24	24
Maximum flow rate	q_s	m ³ /h	7	7	7	7	7	12	12	12
Overload flow rate		m ³ /h	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25	16/25	16/25
Pressure loss at q_p	Δp	mbar	44	44	44	44	44	128	128	128
Temp. range heating		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Kvs value ($\Delta p=Q^2/Kvs^2$)			16.69	16.69	16.69	16.69	16.69	16.77	16.77	16.77

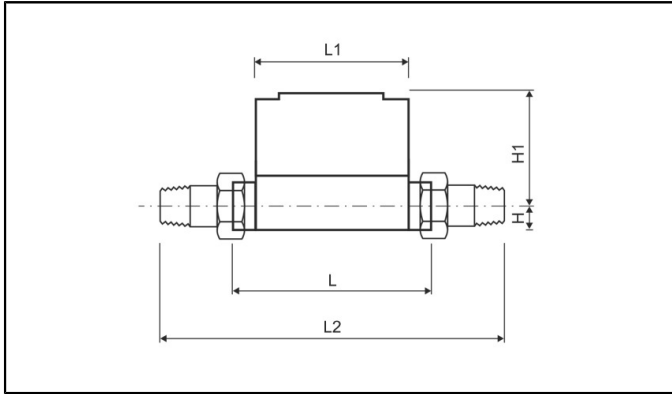
Nominal flow rate	q_p	m ³ /h	6	6	10	10	15	25	40	60
Nominal diameter	DN	mm	25	32	40	40	50	65	80	100
Overall length	L	mm	260	260	200	300	270	300	300	360
Starting flow rate		l/h	7	7	20	20	40	50	80	120
Minimum flow rate (DR 1:250)	q_i	l/h	24	24	40 ²	40 ²	60 ²	100 ²	160 ²	240 ²
Minimum flow rate (DR 1:100)	q_i	l/h	60	60	100	100	150	250	400	600
Minimum flow rate (up side down installation)	q_i	l/h	24	24	100	100	150	250	160	1200
Maximum flow rate	q_s	m ³ /h	12	12	20	20	30	50	80	120
Overload flow rate		m ³ /h	18.4	18.4	24	24	36	60	90	132
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25	16/25	16/25
Pressure loss at q_p	Δp	mbar	128	128	95	95	80	75	80	75
Temp. range heating		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Kvs value ($\Delta p=Q^2/Kvs^2$)			16.77	16.77	32.44	32.44	53.03	91.29	141.42	219.09

²: Valid for horizontal installation only

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DIMENSIONS THREAD VERSION



Nominal flow rate	q _p	m ³ /h	0.6	0.6	0.6	1.5	1.5	1.5	2.5	2.5
Nominal diameter	DN	mm	15	20	20	15	20	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130	190
Overall length with coupling	L2	mm	190	230	-	190	230	-	230	-
Height	H	mm	14.5	18	18	14.5	18	18	18	18
Height	H1	mm	54.5	56.5	56.5	54.5	56.5	56.5	56.5	56.5
Length of electronic	L1	mm	90	90	90	90	90	90	90	90
Width of electronic	B	mm	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5
Connection thread on meter		Inch	G3/4B	G1B	G1B	G3/4B	G1B	G1B	G1B	G1B
Connection thread of coupling		Inch	R1/2	R3/4	R3/4	R1/2	R3/4	R3/4	R3/4	R3/4
Weight		kg	0.6	0.61	0.63	0.6	0.61	0.63	0.61	0.63

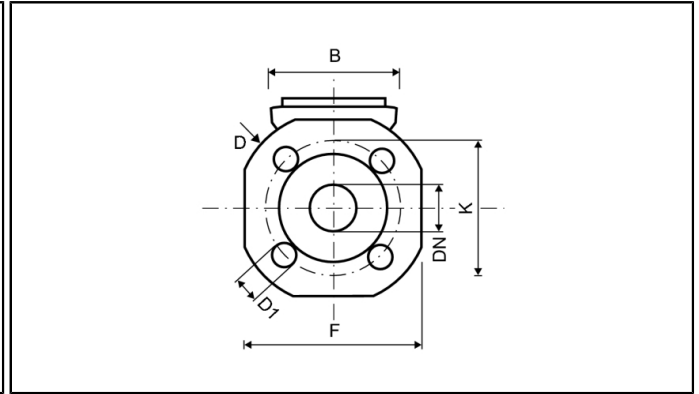
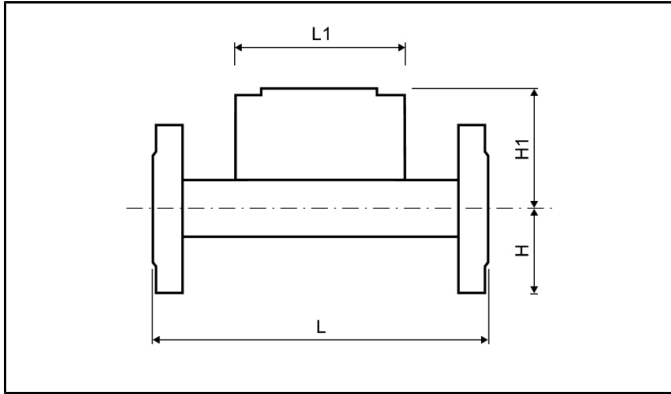
Nominal flow rate	q _p	m ³ /h	3.5	3.5	3.5	3.5	3.5	6	6	6
Nominal diameter	DN	mm	25	25	32	25	32	25	25	32
Overall length	L	mm	135	150	150	260	260	135	150	150
Overall length with coupling	L2	mm	255	270	270	380	380	255	270	270
Height	H	mm	23	23	23	23	23	23	23	23
Height	H1	mm	61	61	61	61	61	61	61	61
Length of electronic	L1	mm	90	90	90	90	90	90	90	90
Width of electronic	B	mm	65.5	65.5	65.5	65.5	65.5	65.5	65.5	65.5
Connection thread on meter		Inch	G1 1/4 B	G1 1/4 B	G1 1/2 B	G1 1/4 B	G1 1/2 B	G1 1/4 B	G1 1/4 B	G1 1/2 B
Connection thread of coupling		Inch	R1	R1	R1 1/4	R1	R1 1/4	R1	R1	R1 1/4
Weight		kg	0.88	0.93	1.08	1.35	1.35	0.88	0.93	1.08

Nominal flow rate	q _p	m ³ /h	6	6	10	10	15	25	40	60
Nominal diameter	DN	mm	25	32	40	40	50	65	80	100
Overall length	L	mm	260	260	200	300	270	300	300	360
Overall length with coupling	L2	mm	380	380	340	440	-	-	-	-
Height	H	mm	23	23	33	33	-	-	-	-
Height	H1	mm	61	61	66.5	66.5	-	-	-	-
Length of electronic	L1	mm	90	90	90	90	-	-	-	-
Width of electronic	B	mm	65.5	65.5	65.5	65.5	-	-	-	-
Connection thread on meter		Inch	G1 1/4 B	G1 1/2 B	G2 B	G2 B	-	-	-	-
Connection thread of coupling		Inch	R1	R1 1/4	R1 1/2	R1 1/2	-	-	-	-
Weight		kg	1.35	1.35	2.4	2.6	-	-	-	-

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DIMENSIONS FLANGE VERSION



Nominal flow rate	q _p	m ³ /h	0.6	0.6	0.6	1.5	1.5	1.5	2.5	2.5
Nominal diameter	DN	mm	15	20	20	15	20	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130	190
Height	H	mm	-	-	47.5	-	-	47.5	-	47.5
Height	H1	mm	-	-	56.5	-	-	56.5	-	56.5
Length of electronic	L1	mm	-	-	90	-	-	90	-	90
Width of electronic	B	mm	-	-	65.5	-	-	65.5	-	65.5
Flange dimension	F	mm	-	-	95	-	-	95	-	95
Flange diameter	D	mm	-	-	105	-	-	105	-	105
Hole circle diameter	K	mm	-	-	75	-	-	75	-	75
Screw hole diameter	D1	mm	-	-	14	-	-	14	-	14
Number of screwholes		pcs	-	-	4	-	-	4	-	4
Weight brass body ²		kg	-	-	2.7	-	-	2.7	-	2.7
Weight grey cast iron body ²		kg	-	-	-	-	-	-	-	-
Nominal flow rate	q _p	m ³ /h	3.5	3.5	3.5	3.5	3.5	6	6	6
Nominal diameter	DN	mm	25	25	32	25	32	25	25	32
Overall length	L	mm	135	150	150	260	260	135	150	150
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	-	-	-
Number of screwholes		pcs	-	-	-	4	4	-	-	-
Weight brass body ²		kg	-	-	-	3.35	4.65	-	-	-
Weight grey cast iron body ²		kg	-	-	-	-	-	-	-	-

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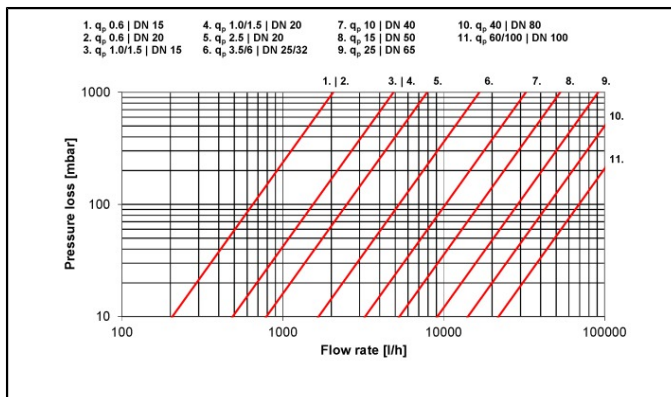
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Nominal flow rate	q_p	m^3/h	6	6	10	10	15	25	40	60
Nominal diameter	DN	mm	25	32	40	40	50	65	80	100
Overall length	L	mm	260	260	200	300	270	300	300	360
Height	H	mm	50	62.5	-	69	73.5	85	92.5	108
Height	H1	mm	61	61	-	66.5	71.5	79	86.5	96.5
Length of electronic	L1	mm	90	90	-	90	90	90	90	90
Width of electronic	B	mm	65.5	65.5	-	65.5	65.5	65.5	65.5	65.5
Flange dimension	F	mm	100	125	-	138	147	170	185	216
Flange diameter	D	mm	114	139	-	148	163	184	200	235
Hole circle diameter	K	mm	85	100	-	110	125	145	160	180 ¹ / 190
Screw hole diameter	D1	mm	14	18	-	18	18	18	19	19 ¹ / 22
Number of screw holes		pcs	4	4	-	4	4	8	8	8
Weight brass body ²		kg	3.35	4.65	-	6.6	7.45	9.45	11.1	16.9
Weight grey cast iron body ²		kg	-	-	-	-	6.31	8.08	10.01	15.76

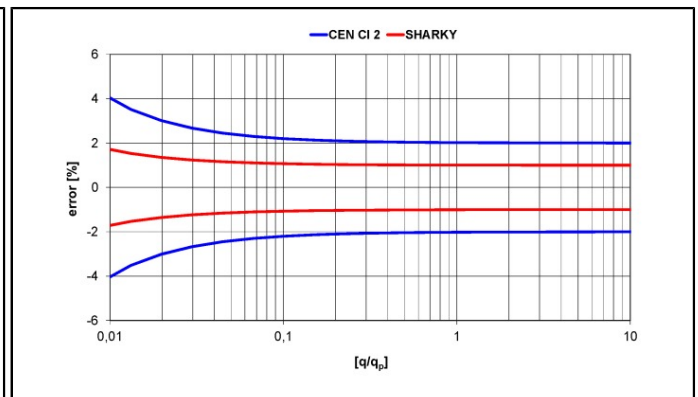
¹: Values for PN 16 housing

²: Meter with battery and 2.4 m cable length of the pulse cable

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph