

SHARKY FS 473

ULTRASONIC FLOW SENSOR



APPLICATION

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

FEATURES

- 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 (DN 125 only available in class 3) and PTB K 7.2 (cooling)
- High long term stability
- Applicable for different calculators with impulse input
- Continuous time-correct pulses - no pulse packages
- Free selectable impulse values
- The temperature range depending on the application up to 5 ... 150 °C
- Battery or external power supply
- Specific housing for falling and rising pipes

GENERAL

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Application	Heating - cooling
Approval	MID (DE-07-MI004-PTB022) and PTB K 7.2 for cooling (DE-19-M-PTB-0014)
Ambient class	EN 1434 class C / MID class E2 + M2
Ambient temperature	°C 5 ... 55 (<35 °C have a positive lifetime effect)
Battery 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; heating potted: IP 65; 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 ... 100 m ³ /h), spheroidal 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-wire impulse cable.

² 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 ... 105 / 130 / 150 (depends on meter size and material)
Temperature range cooling - battery supplied / external supplied	°C	5 ... 50 / 5 ... 90

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	6
Nominal diameter	DN	mm	15	15	20	20	25	32	40
Overall length	L	mm	110	110	130	130	260	260	150
Starting flow rate		l/h	1	2.5	2.5	4	10	10	10
Minimum flow rate (DR 1:250)	q_i	l/h	6	6	6	10	24	24	-
Minimum flow rate (DR 1:100)	q_i	l/h	6	15	15	25	60	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	12
Overload flow rate		m ³ /h	2.5	4.6	4.6	6.7	18.4	18.4	18.4
Pressure loss at q_p	Δp	mbar	95	130	115	110	190	190	190
Temp. range heating - brass body	°C		5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 150	5 ... 150	5 ... 150
Temp. range heating - spheroidal cast iron body / brass PN 40	°C		-	-	-	-	-	-	-
kv value		m ³ /h	1.95	4.16	4.42	7.54	13.76	13.76	13.76

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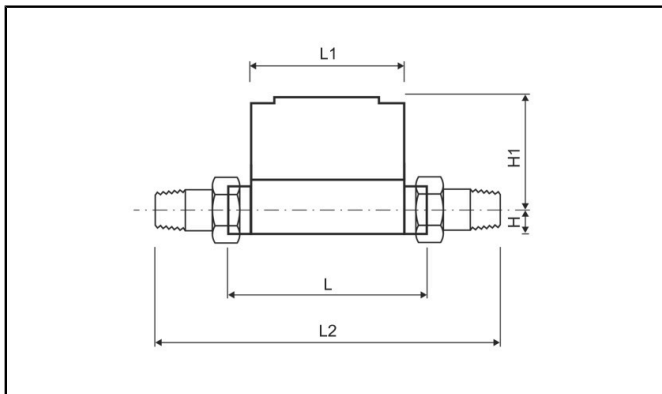
Nominal flow rate	q _p	m ³ /h	10	15	15	25	25	40
Nominal diameter	DN	mm	40	50	50	65	65	80
Overall length	L	mm	300	200	270	200	300	225
Starting flow rate		l/h	20	40	40	50	50	80
Minimum flow rate (DR 1:250)	q _i	l/h	40 ¹	60 ¹	60 ¹	100 ¹	100 ¹	160 ¹
Minimum flow rate (DR 1:100)	q _i	l/h	100	150	150	250	250	400
Minimum flow rate (up side down installation)	q _i	l/h	100	150	150	250	250	400
Maximum flow rate	q _s	m ³ /h	20	30	30	50	50	80
Overload flow rate		m ³ /h	24	36	36	60	60	90
Pressure loss at q _p	Δp	mbar	140	165	165	75	75	80
Temp. range heating - brass body		°C	5 ... 150	-	5 ... 150	-	5 ... 150	-
Temp. range heating - spheroidal cast iron body / brass PN 40		°C	-	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105
kv value		m ³ /h	26.73	36.93	36.93	91.29	91.29	141.42

Nominal flow rate	q _p	m ³ /h	40	60	60	100	100	100
Nominal diameter	DN	mm	80	100	100	100	100	125
Overall length	L	mm	300	250	360	250	360	250
Starting flow rate		l/h	80	120	120	120	120	120
Minimum flow rate (DR 1:250)	q _i	l/h	160 ¹	240 ¹	240 ¹	400 ¹	400 ¹	400 ¹
Minimum flow rate (DR 1:100)	q _i	l/h	400	600/1200 ²	600/1200 ²	1000/1200 ²	1000/1200 ²	1000/1200 ²
Minimum flow rate (up side down installation)	q _i	l/h	400	1200	1200	1200	1200	1200
Maximum flow rate	q _s	m ³ /h	80	120	120	120	120	120
Overload flow rate		m ³ /h	90	132	132	132	132	132
Pressure loss at q _p	Δp	mbar	80	75	75	210	210	210
Temp. range heating - brass body		°C	5 ... 150	-	5 ... 150	-	5 ... 150	-
Temp. range heating - spheroidal cast iron body / brass PN 40		°C	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105
kv value		m ³ /h	141.42	219.09	219.09	218.22	218.22	218.22

¹ Valid for horizontal installation only

² Up side down installation

DIMENSIONS THREAD VERSION

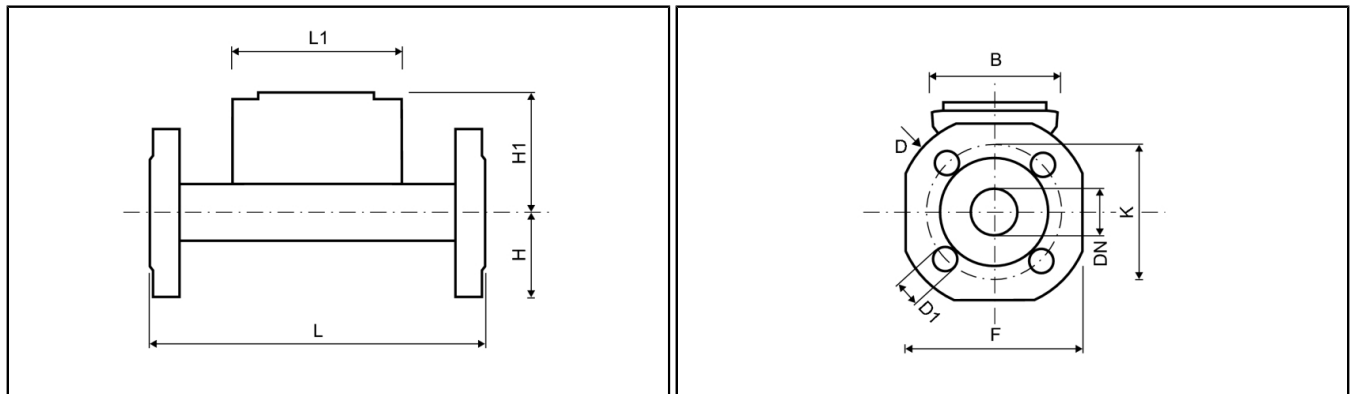


Nominal flow rate	q _p	m ³ /h	0.6	1.5	1.5	2.5	6	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32	40
Overall length	L	mm	110	110	130	130	260	260	150
Overall length with coupling	L2	mm	190	190	230	230	380	380	-
Height	H	mm	14.5	14.5	18	18	23	23	33
Height	H1	mm	54.5	54.5	56.5	56.5	61	61	61
Length of electronic	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
Connection thread on meter		Inch	G¾B	G¾B	G1B	G1B	G1¼B	G1½ B	G2B
Connection thread of coupling		Inch	R½	R½	R¾	R¾	R1	R1¼	R1½
Operating pressure	PN	bar	16/25	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	1.52

Nominal flow rate	q _p	m ³ /h	10	15	15	25	25	40
Nominal diameter	DN	mm	40	50	50	65	65	80
Overall length	L	mm	300	200	270	200	300	225
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	R1½	-	-	-	-	-
Operating pressure	PN	bar	16/25	-	-	-	-	-
Weight		kg	2.6	-	-	-	-	-

Nominal flow rate	q _p	m ³ /h	40	60	60	100	100	100
Nominal diameter	DN	mm	80	100	100	100	100	125
Overall length	L	mm	300	250	360	250	360	250
Overall length with coupling	L2	mm	-	-	-	-	-	-
Height	H	mm	-	-	-	-	-	-
Height	H1	mm	-	-	-	-	-	-
Length of electronic	L1	mm	-	-	-	-	-	-
Width of electronic	B	mm	-	-	-	-	-	-
Connection thread on meter		Inch	-	-	-	-	-	-
Connection thread of coupling		Inch	-	-	-	-	-	-
Operating pressure	PN	bar	-	-	-	-	-	-
Weight		kg	-	-	-	-	-	-

DIMENSIONS FLANGE VERSION



Nominal flow rate	q _p	m ³ /h	0.6	1.5	1.5	2.5	6	6	6
Nominal diameter	DN	mm	15	15	20	20	25	32	40
Overall length	L	mm	110	110	130	130	260	260	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	-
Operating pressure	PN	bar	-	-	-	-	16/25/40 ³	16/25/40 ³	-
Number of screw holes		pcs	-	-	-	-	4	4	-
Weight brass body ²		kg	-	-	-	-	3.35	4.65	-
Weight spheroidal cast iron body ²		kg	-	-	-	-	-	-	-

Nominal flow rate	q _p	m ³ /h	10	15	15	25	25	40
Nominal diameter	DN	mm	40	50	50	65	65	80
Overall length	L	mm	300	200	270	200	300	225
Height	H	mm	69	73.5	73.5	85	85	92.5
Height	H1	mm	66.5	71.5	71.5	79	79	86.5
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	147	170	170	185
Flange diameter	D	mm	148	163	163	184	184	200
Hole circle diameter	K	mm	110	125	125	145	145	160
Screw hole diameter	D1	mm	18	19	19	19	19	19
Operating pressure	PN	bar	16/25/40 ³	16/25	16/25/40 ³	16/25	16/25	16/25
Number of screw holes		pcs	4	4	4	8	8	8
Weight brass body ²		kg	6.6	-	7.45	-	9.45	-
Weight spheroidal cast iron body ²		kg	-	5.27	6.31	6.59	8.08	8.4

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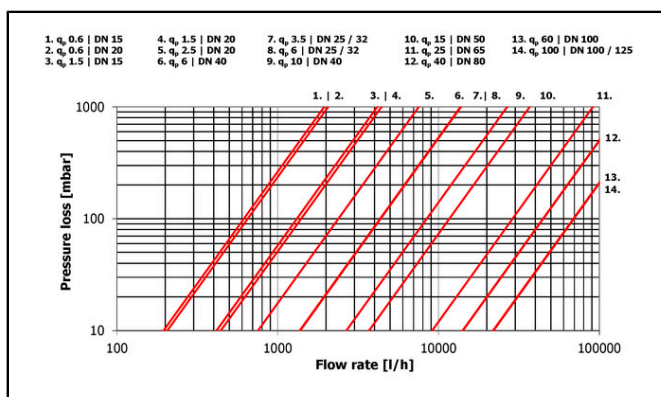
Nominal flow rate	q _p	m ³ /h	40	60	60	100	100	100
Nominal diameter	DN	mm	80	100	100	100	100	125
Overall length	L	mm	300	250	360	250	360	250
Height	H	mm	92.5	108	108	108	108	128
Height	H1	mm	86.5	96.5	96.5	96.5	96.5	96.5
Length of electronic	L1	mm	90	90	90	90	90	90
Width of electronic	B	mm	65.5	65.5	65.5	65.5	65.5	65.5
Flange dimension	F	mm	185	216	216	216	216	255
Flange diameter	D	mm	200	235	235	235	235	270
Hole circle diameter	K	mm	160	180 ¹ / 190	180 ¹ / 190	180 ¹ / 190	180 ¹ / 190	210 ¹ / 220
Screw hole diameter	D1	mm	19	19 ¹ / 22	19 ¹ / 22	19 ¹ / 22	19 ¹ / 22	19 ¹ / 26
Operating pressure	PN	bar	16/25/40 ³	16/25	16/25	16/25	16/25	16/25
Number of screw holes	pcs		8	8	8	8	8	8
Weight brass body ²	kg		11.1	-	16.9	-	16.9	-
Weight spheroidal cast iron body ²	kg		10.01	13	15.76	13	15.75	16.95

¹ Values for PN 16 housing

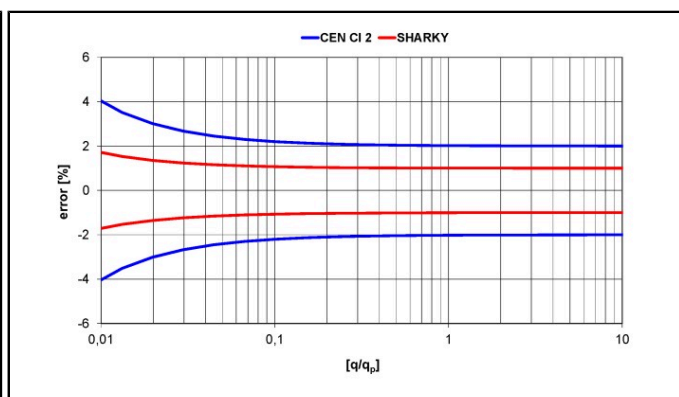
² Meter with battery and 2.4 m cable length of the pulse cable

³ Only up to 105 °C

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph

REACH

Information pursuant to Article 33 (1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006:

This product series contains components with the following substances in a concentration of more than 0.1% weight by weight (w/w):

- Lead (CAS no.: 7439-92-1)
- Lead titanium zirconium oxide (CAS no.: 12626-81-2)
- 1,2-dimethoxyethane (CAS no.: 110-71-4)

Economic Actor Information

Applicable regulation and legal obligations for products may change.

DIEHL METERING monitors applicable regulation to ensure their products comply at the date of placing on the market.

Each economic actor making products available on the market thereafter must independently keep informed about the current applicable regulation.

For questions, please contact: metering-germany-info@diehl.com

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