DIEHL
Metering

SHARKY FS 473

FLOW SENSOR | ULTRASONIC

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

		SHARKY FS 473
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 choosen 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

		SHARKY FS 473
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**	**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
Pressure loss at q_p	Δp	mbar	95	85	85	130	115	115	110	110
Temp. range heating - brass body		°C	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130
Temp. range heating - spheroidal cast iron body / brass PN 40		°C	-	-	-	-	-	-	-	-
kv value		m^3/h	1.95	2.06	2.06	4.16	4.42	4.42	7.54	7.54

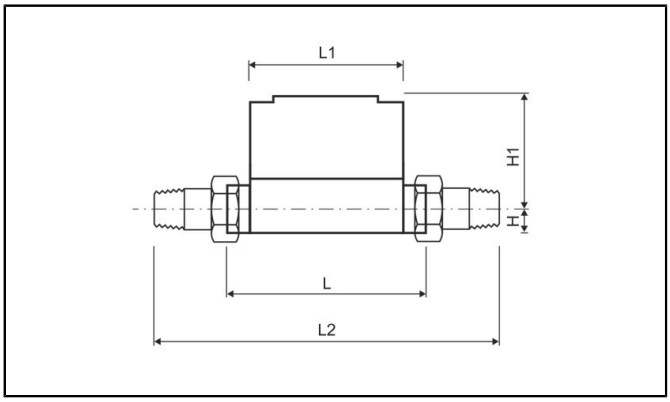
Nominal flow rate	q_p	m^3/h	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**6**	**6**	**6**
Nominal diameter	DN	mm	25	25	25	32	32	25	25	25
Overall length	L	mm	135	150	260	150	260	135	150	260
Starting flow rate		l/h	10	10	10	10	10	10	10	10
Minimum flow rate (DR 1:250)	q_i	l/h	-	-	-	-	-	24	24	24
Minimum flow 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
Pressure loss at q_p	Δp	mbar	65	65	65	65	65	190	190	190
Temp. range heating - brass body		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Temp. range heating - spheroidal cast iron body / brass PN 40		°C	-	-	-	-	-	-	-	-
kv value		m^3/h	13.73	13.73	13.73	13.73	13.73	13.76	13.76	13.76

Nominal flow rate	q_p	m^3/h	**6**	**6**	**6**	**10**	**10**	**15**	**15**	**25**
Nominal diameter	DN	mm	32	32	40	40	40	50	50	65
Overall length	L	mm	150	260	150	200	300	200	270	200
Starting flow rate		l/h	10	10	10	20	20	40	40	50
Minimum flow rate (DR 1:250)	q_i	l/h	24	24	-	40[1]	40[1]	60[1]	60[1]	100[1]
Minimum flow rate (DR 1:100)	q_i	l/h	60	60	60	100	100	150	150	250
Minimum flow rate (up side down installation)	q_i	l/h	24	24		100	100	150	150	250
Maximum flow rate	q_s	m^3/h	12	12	12	20	20	30	30	50
Overload flow rate		m^3/h	18.4	18.4	18.4	24	24	36	36	60
Pressure loss at q_p	Δp	mbar	190	190	190	140	140	165	165	75
Temp. range heating - brass body		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	-	5 ... 150	-
Temp. range heating - spheroidal cast iron body / brass PN 40		°C	-	-	-	-	-	5 ... 105	5 ... 105	5 ... 105
kv value		m^3/h	13.76	13.76	13.76	26.73	26.73	36.93	36.93	91.29

Nominal flow rate	q_p	m^3/h	**25**	**40**	**40**	**60**	**60**	**100**	**100**	**100**
Nominal diameter	DN	mm	65	80	80	100	100	100	100	125
Overall length	L	mm	300	225	300	250	360	250	360	250
Starting flow rate		l/h	50	80	80	120	120	120	120	120
Minimum flow rate (DR 1:250)	q_i	l/h	100[1]	160[1]	160[1]	240[1]	240[1]	400[1]	400[1]	400[1]
Minimum flow rate (DR 1:100)	q_i	l/h	250	400	400	600/1200[2]	600/1200[2]	1000/1200	1000/1200	1000/1200[2]
Minimum flow rate (up side down installation)	q_i	l/h	250	400	400	1200	1200	1200	1200	1200
Maximum flow rate	q_s	m^3/h	50	80	80	120	120	120	120	120
Overload flow rate		m^3/h	60	90	90	132	132	132	132	132
Pressure loss at q_p	Δp	mbar	75	80	80	75	75	210	210	210
Temp. range heating - brass body		°C	5 ... 150	-	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	5 ... 105	5 ... 105
kv value		m^3/h	91.29	141.42	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



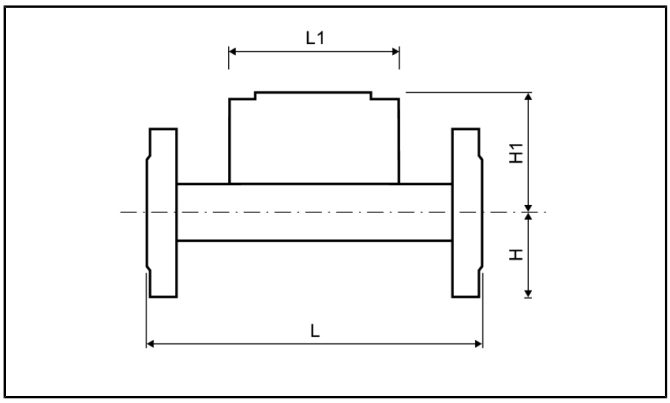
Nominal flow rate	q_p	m^3/h	0.6	0.6	0.6	1.5	1.5	1.5	2.5	2.5
Nominal diameter	DN	mm	15	20	20	15	20	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130	190
Overall length with coupling	L2	mm	190	230	-	190	230	-	230	-
Height	H	mm	14.5	18	18	14.5	18	18	18	18
Height	H1	mm	54.5	56.5	56.5	54.5	56.5	56.5	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	G¾B	G1B	G1B	G¾B	G1B	G1B	G1B	G1B
Connection thread of coupling		Inch	R½	R¾	R¾	R½	R¾	R¾	R¾	R¾
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25	16/25	16/25
Weight		kg	0.6	0.61	0.63	0.6	0.61	0.63	0.61	0.63

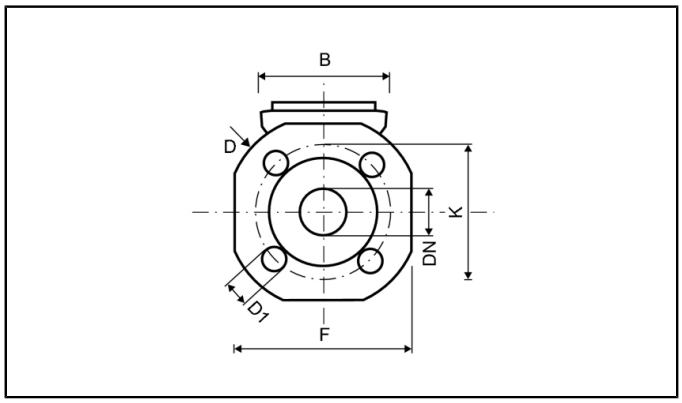
Nominal flow rate	q_p	m^3/h	3.5	3.5	3.5	3.5	3.5	6	6	6
Nominal diameter	DN	mm	25	25	25	32	32	25	25	25
Overall length	L	mm	135	150	260	150	260	135	150	260
Overall length with coupling	L2	mm	255	270	380	270	380	255	270	380
Height	H	mm	23	23	23	23	23	23	23	23
Height	H1	mm	61	61	61	61	61	61	61	61
Length of 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	G1¼B	G1¼B	G1¼B	G1½B	G1½ B	G1¼B	G1¼B	G1¼B
Connection thread of coupling		Inch	R1	R1	R1	R1¼	R1¼	R1	R1	R1
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	16/25	16/25	16/25
Weight		kg	0.88	0.93	1.35	1.08	1.35	0.88	0.93	1.35

Nominal flow rate	q_p	m^3/h	6	6	6	10	10	15	15	25
Nominal diameter	DN	mm	32	32	40	40	40	50	50	65
Overall length	L	mm	150	260	150	200	300	200	270	200
Overall length with coupling	L2	mm	270	380	-	340	440	-	-	-
Height	H	mm	23	23	33	33	33	-	-	-
Height	H1	mm	61	61	61	66.5	66.5	-	-	-
Length of electronic	L1	mm	90	90	90	90	90	-	-	-
Width of electronic	B	mm	65.5	65.5	65.5	65.5	65.5	-	-	-
Connection thread on meter		Inch	G1½B	G1½ B	G2B	G2B	G2B	-	-	-
Connection thread of coupling		Inch	R1¼	R1¼	R1½	R1½	R1½	-	-	-
Operating pressure	PN	bar	16/25	16/25	16/25	16/25	16/25	-	-	-
Weight		kg	1.08	1.35	1.52	2.4	2.6	-	-	-

Nominal flow rate	q_p	m^3/h	25	40	40	60	60	100	100	100
Nominal diameter	DN	mm	65	80	80	100	100	100	100	125
Overall length	L	mm	300	225	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	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
Screwhole diameter	D1	mm	-	-	14	-	-	14	-	14
Operating pressure	PN	bar	-	-	16/25	-	-	16/25/40[3]	-	16/25/40[3]
Number of screwholes		pcs	-	-	4	-	-	4	-	4
Weight brass body[2]		kg	-	-	2.7	-	-	2.7	-	2.7
Weight spheroidal cast iron body[2]		kg	-	-	-	-	-	-	-	-

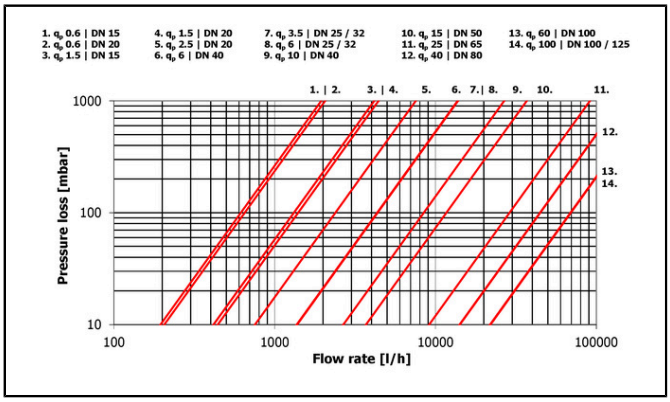
Nominal flow rate	q_p	m^3/h	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**6**	**6**	**6**
Nominal diameter	DN	mm	25	25	25	32	32	25	25	25
Overall length	L	mm	135	150	260	150	260	135	150	260
Height	H	mm	-	-	50	-	62.5	-	-	50
Height	H1	mm	-	-	61	-	61	-	-	61
Length of electronic	L1	mm	-	-	90	-	90	-	-	90
Width of electronic	B	mm	-	-	65.5	-	65.5	-	-	65.5
Flange dimension	F	mm	-	-	100	-	125	-	-	100
Flange diameter	D	mm	-	-	114	-	139	-	-	114
Hole circle diameter	K	mm	-	-	85	-	100	-	-	85
Screwhole diameter	D1	mm	-	-	14	-	18	-	-	14
Operating pressure	PN	bar	-	-	16/25/40[3]	-	16/25/40[3]	-	-	16/25/40[3]
Number of screwholes		pcs	-	-	4	-	4	-	-	4
Weight brass body[2]		kg	-	-	3.35	-	4.65	-	-	3.35
Weight spheroidal cast iron body[2]		kg	-	-	-	-	-	-	-	-

Nominal flow rate	q_p	m^3/h	**6**	**6**	**6**	**10**	**10**	**15**	**15**	**25**
Nominal diameter	DN	mm	32	32	40	40	40	50	50	65
Overall length	L	mm	150	260	150	200	300	200	270	200
Height	H	mm	-	62.5	-	-	69	73.5	73.5	85
Height	H1	mm	-	61	-	-	66.5	71.5	71.5	79
Length of electronic	L1	mm	-	90	-	-	90	90	90	90
Width of electronic	B	mm	-	65.5	-	-	65.5	65.5	65.5	65.5
Flange dimension	F	mm	-	125	-	-	138	147	147	170
Flange diameter	D	mm	-	139	-	-	148	163	163	184
Hole circle diameter	K	mm	-	100	-	-	110	125	125	145
Screwhole diameter	D1	mm	-	18	-	-	18	19	19	19
Operating pressure	PN	bar	-	16/25/40[3]	-	-	16/25/40[3]	16/25	16/25/40[3]	16/25
Number of screwholes		pcs	-	4	-	-	4	4	4	8
Weight brass body[2]		kg	-	4.65	-	-	6.6	-	7.45	-
Weight spheroidal cast iron body[2]		kg	-	-	-	-	-	5.27	6.31	6.59

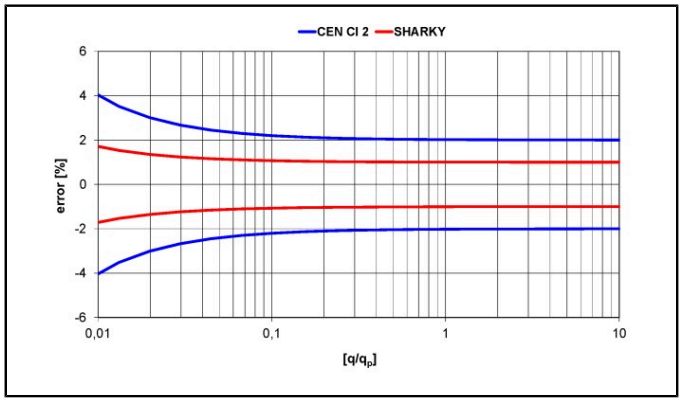
Nominal flow rate	q_p	m^3/h	**25**	**40**	**40**	**60**	**60**	**100**	**100**	**100**
Nominal diameter	DN	mm	65	80	80	100	100	100	100	125
Overall length	L	mm	300	225	300	250	360	250	360	250
Height	H	mm	85	92.5	92.5	108	108	108	108	128
Height	H1	mm	79	86.5	86.5	96.5	96.5	96.5	96.5	96.5
Length of electronic	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
Flange dimension	F	mm	170	185	185	216	216	216	216	255
Flange diameter	D	mm	184	200	200	235	235	235	235	270
Hole circle diameter	K	mm	145	160	160	180[1] / 190	180[1] / 190	180[1] / 190	180[1] / 190	210[1] / 220
Screwhole diameter	D1	mm	19	19	19	19[1] / 22	19[1] / 22	19[1] / 22	19[1] / 22	19[1] / 26
Operating pressure	PN	bar	16/25	16/25	16/25/40[3]	16/25	16/25	16/25	16/25	16/25
Number of screwholes		pcs	8	8	8	8	8	8	8	8
Weight brass body[2]		kg	9.45	-	11.1	-	16.9	-	16.9	-
Weight spheroidal cast iron body[2]		kg	8.08	8.4	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.

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EMPOWER A SUSTAINABLE FUTURE