

Ultrasonic volume measuring parts Series 473

- › MID-compliant ultrasonic flow sensor in all-metal design with nominal flow rates of q_p 0.6 ... 100
- › Flexible application due to high dynamic ratio, any installation position as well as medium temperatures up to 150 °C
- › Seamless integration into a Q walk-by system or Q AMR system by means of calculator unit R20/R21 and radio add-on module possible

Application

The ultrasonic flow sensor can be used to detect the flow in local and remote heating plants as well as in refrigeration plants.

Features

- 】 Dynamic range 1:100
- 】 Approved according to EN 1434 and MID in class 2
- 】 High long-term stability, confirmed by independent AGFW test
- 】 Temperature range 5 °C ... 150 °C due to external power supply
- 】 Special housings for rising and falling pipes
- 】 Up to nominal flow rate of 10,0 m³/h with 5.6 mm sensor hole in the flow sensor

Technical data - General

Application	heat - cold
Approval	MID (DE-07-MI004-PTB022)
Ambient class	EN 1434 class C / MID class E2 + M2
Ambient temperature	5 °C ... 55 °C (<35 °C has positive effects on the service life)
External power supply	3.0 V ... 5.5 V DC
Installation position	any
Protection class	IP 54
Interface	Open Collector Pulse output ¹ - Combined impulse output for testing and communication ²
Volume pulse value ³	10 ml ... 5000 l/impulse (depending on sensor size and supply)
Cable length of pulse cable	2.4 m
Material of the flow sensor body	Brass (q _p 0.6 ... 100 m ³ /h)

¹ Pulse output without galvanic isolation. The flow sensor has a 4-wire pulse cable by default.

² The flow sensor can either output a high-resolution test pulse (standard), or it can communicate via the same output.

³ The pulse duration is between 1 ms and 250 ms (default). It depends on the pulse value and the nominal flow rate q_p.
Standard pulse value: 0.1; 1; 10; 100 l/pulse

Temperature range

Temperature range heat - externally supplied	5 °C ... 130 °C / 150 °C (depending on meter size)
Temperature range cold - externally supplied	5 °C ... 50 °C

Technical data - Flow rate

Nominal flow rate	q _p	m ³ /h	0.6	0.6	0.6	1.5	1.5	1.5	2.5
Nominal width	DN	mm	15	20	20	15	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130
Starting value		l/h	1	1	1	2.5	2.5	2.5	4
Minimum flow rate (DR 1:250)	q _i	l/h	6	6	6	6	6	6	10
Minimum flow rate (DR 1:100)	q _i	l/h	6	6	6	15	15	15	25
Minimum flow rate (Overhead mounting)	q _i	l/h	6	6	6	6	6	6	10
Maximum flow rate	q _s	m ³ /h	1.2	1.2	1.2	3	3	3	5
Overload flow rate		m ³ /h	2.5	2.5	2.5	4.6	4.6	4.6	6.7
Pressure loss at q _p	Δp	mbar	95	85	85	120	75	75	100
Temperature range heat meter - Brass body		°C	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130
kv value (q _p ² (m ³ /h) = kv ² x Δp (bar))			1.95	2.06	2.06	4.33	5.48	5.48	7.91

Nominal flow rate	q _p	m ³ /h	2.5	3.5	3.5	3.5	3.5	3.5	6
Nominal width	DN	mm	20	25	25	25	32	32	25
Overall length	L	mm	190	135	150	260	150	260	135
Starting value		l/h	4	10	10	10	10	10	10
Minimum flow rate (DR 1:250)	q _i	l/h	10	-	-	-	-	-	24
Minimum flow rate (DR 1:100)	q _i	l/h	25	35	35	35	35	35	60
Minimum flow rate (Overhead mounting)	q _i	l/h	10	35	35	35	35	35	24
Maximum flow rate	q _s	m ³ /h	5	7	7	7	7	7	12
Overload flow rate		m ³ /h	6.7	18.4	18.4	18.4	18.4	18.4	18.4
Pressure loss at q _p	Δp	mbar	100	44	44	44	44	44	128
Temperature range heat meter - Brass body		°C	5 ... 130	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
kv value (q _p ² (m ³ /h) = kv ² x Δp (bar))			7.91	16.69	16.69	14.29	13.73	14.29	13.76

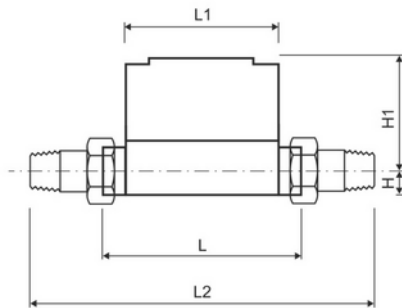
Nominal flow rate	q _p	m ³ /h	6	6	6	6	6	10
Nominal width	DN	mm	25	25	32	32	40	40
Overall length	L	mm	150	260	150	260	150	200
Starting value		l/h	10	10	10	10	10	20
Minimum flow rate (DR 1:250)	q _i	l/h	24	24	24	24	-	40
Minimum flow rate (DR 1:100)	q _i	l/h	60	60	60	60	60	100
Minimum flow rate (Overhead mounting)	q _i	l/h	24	24	24	24		100
Maximum flow rate	q _s	m ³ /h	12	12	12	12	12	20
Overload flow rate		m ³ /h	18.4	18.4	18.4	18.4	18.4	24
Pressure loss at q _p	Δp	mbar	128	128	128	128	190	140
Temperature range heat meter - Brass body		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
kv value (q _p ² (m ³ /h) = kv ² x Δp (bar))			16.77	16.77	13.76	14.77	13.76	26.73

Nominal flow rate	q _p	m ³ /h	10	15	25	40	60	100
Nominal width	DN	mm	40	50	65	80	100	100
Overall length	L	mm	300	270	300	300	360	360
Starting value		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/ 1200 ²	1000/ 1200 ²
Minimum flow rate (Overhead mounting)	q _i	l/h	100	150	250	400	1200	1200
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	134	120	140	130	210
Temperature range heat meter - Brass body		°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
kv value (q _p ² (m ³ /h) = kv ² x Δp (bar))			26.73	40.09	91.29	141.42	219.09	218

¹ Only in horizontal mounting position

² Vertical version

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
Nominal width	DN	mm	15	20	20	15	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130
Overall length with screw connection	L2	mm	190	230	-	190	230	-	230
Height	H	mm	14.5	18	18	14.5	18	18	18
Height	H1	mm	54.5	56.5	56.5	54.5	56.5	56.5	56.5
Length electronics	L1	mm	90	90	90	90	90	90	90
Width electronics	B	mm	65.5	65.5	65.5	65.5	65.5	65.5	65.5
Connection thread of meter		inch	G ³ / ₄ B	G1B	G1B	G ³ / ₄ B	G1B	G1B	G1B
Connection thread of screw connection		inch	R ¹ / ₂	R ³ / ₄	R ³ / ₄	R ¹ / ₂	R ³ / ₄	R ³ / ₄	R ³ / ₄
Operating pressure	PN	bar	16	16	16	16	16	16	16
Weight		kg	0.6	0.61	0.63	0.6	0.61	0.63	0.61

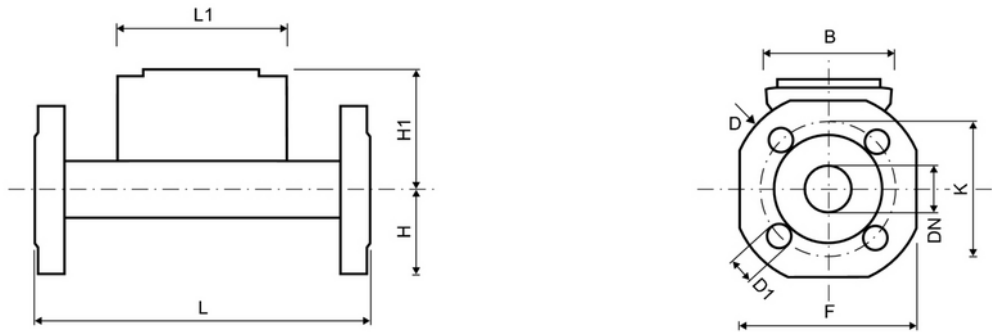
Nominal flow rate	q _p	m ³ /h	2.5	3.5	3.5	3.5	3.5	3.5	6
Nominal width	DN	mm	20	25	25	25	32	32	25
Overall length	L	mm	190	135	150	260	150	260	135
Overall length with screw connection	L2	mm	-	255	270	380	270	380	255
Height	H	mm	18	23	23	23	23	23	23
Height	H1	mm	56.5	61	61	61	61	61	61
Length electronics	L1	mm	90	90	90	90	90	90	90
Width electronics	B	mm	65.5	65.5	65.5	65.5	65.5	65.5	65.5
Connection thread of meter		inch	G1B	G1 ¹ / ₄ B	G1 ¹ / ₄ B	G1 ¹ / ₄ B	G1 ¹ / ₂ B	G1 ¹ / ₂ B	G1 ¹ / ₄ B
Connection thread of screw connection		inch	R ³ / ₄	R1	R1	R1	R1 ¹ / ₄	R1 ¹ / ₄	R1
Operating pressure	PN	bar	16	16	16	16	16	16	16

Nominal flow rate	q _p	m ³ /h	2.5	3.5	3.5	3.5	3.5	3.5	6
Weight		kg	0.63	0.88	0.93	1.35	1.08	1.35	0.88

Nominal flow rate	q _p	m ³ /h	6	6	6	6	6	6
Nominal width	DN	mm	25	25	32	32	40	40
Overall length	L	mm	150	260	150	260	150	200
Overall length with screw connection	L2	mm	270	380	270	380	-	340
Height	H	mm	23	23	23	23	33	33
Height	H1	mm	61	61	61	61	61	66.5
Length electronics	L1	mm	90	90	90	90	90	90
Width electronics	B	mm	65.5	65.5	65.5	65.5	65.5	65.5
Connection thread of meter		inch	G1 ¹ / ₄ B	G1 ¹ / ₄ B	G1 ¹ / ₂ B	G1 ¹ / ₂ B	G2B	G2B
Connection thread of screw connection		inch	R1	R1	R1 ¹ / ₄	R1 ¹ / ₄	R1 ¹ / ₂	R1 ¹ / ₂
Operating pressure	PN	bar	16	16	16	16	16	16
Weight		kg	0.93	1.35	1.08	1.35	1.52	2.4

Nominal flow rate	q _p	m ³ /h	10	15	25	40	60	100
Nominal width	DN	mm	40	50	65	80	100	100
Overall length	L	mm	300	270	300	300	360	360
Overall length with screw connection	L2	mm	440	-	-	-	-	-
Height	H	mm	33	-	-	-	-	-
Height	H1	mm	66.5	-	-	-	-	-
Length electronics	L1	mm	90	-	-	-	-	-
Width electronics	B	mm	65.5	-	-	-	-	-
Connection thread of meter		inch	G2B	-	-	-	-	-
Connection thread of screw connection		inch	R1 ¹ / ₂	-	-	-	-	-
Operating pressure	PN	bar	16	-	-	-	-	-
Weight		kg	2.6	-	-	-	-	-

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
Nominal width	DN	mm	15	20	20	15	20	20	20
Overall length	L	mm	110	130	190	110	130	190	130
Height	H	mm	-	-	47.5	-	-	47.5	-
Height	H1	mm	-	-	56.5	-	-	56.5	-
Length electronics	L1	mm	-	-	90	-	-	90	-
Width electronics	B	mm	-	-	65.5	-	-	65.5	-
Flange dimension	F	mm	-	-	95	-	-	95	-
Flange diameter	D	mm	-	-	105	-	-	105	-
Bolt circle diameter	K	mm	-	-	75	-	-	75	-
Diameter	D1	mm	-	-	14	-	-	14	-
Operating pressure	PN	bar	-	-	25	-	-	25	-
Number of flange holes		pcs.	-	-	4	-	-	4	-
Weight Brass body		kg	-	-	2.7	-	-	2.7	-

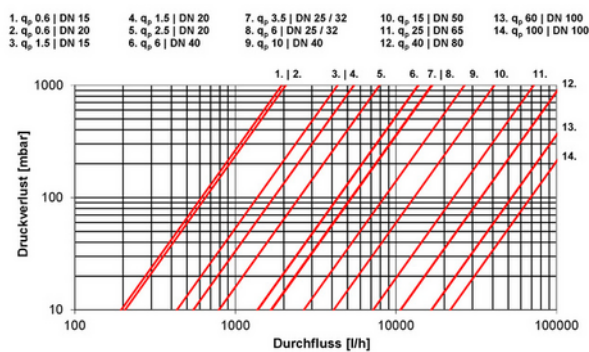
Nominal flow rate	q _p	m ³ /h	2.5	3.5	3.5	3.5	3.5	3.5	6
Nominal width	DN	mm	20	25	25	25	32	32	25
Overall length	L	mm	190	135	150	260	150	260	135
Height	H	mm	47.5	-	-	50	-	62.5	-
Height	H1	mm	56.5	-	-	61	-	61	-
Length electronics	L1	mm	90	-	-	90	-	90	-
Width electronics	B	mm	65.5	-	-	65.5	-	65.5	-
Flange dimension	F	mm	95	-	-	100	-	125	-
Flange diameter	D	mm	105	-	-	114	-	139	-
Bolt circle diameter	K	mm	75	-	-	85	-	100	-
Diameter	D1	mm	14	-	-	14	-	18	-
Operating pressure	PN	bar	25	-	-	25	-	25	-
Number of flange holes		pcs.	4	-	-	4	-	4	-
Weight Brass body		kg	2.7	-	-	3.35	-	4.65	-

Nominal flow rate	q _p	m ³ /h	6	6	6	6	6	10
Nominal width	DN	mm	25	25	32	32	40	40
Overall length	L	mm	150	260	150	260	150	200
Height	H	mm	-	50	-	62.5	-	-
Height	H1	mm	-	61	-	61	-	-
Length electronics	L1	mm	-	90	-	90	-	-
Width electronics	B	mm	-	65.5	-	65.5	-	-
Flange dimension	F	mm	-	100	-	125	-	-
Flange diameter	D	mm	-	114	-	139	-	-
Bolt circle diameter	K	mm	-	85	-	100	-	-
Diameter	D1	mm	-	14	-	18	-	-
Operating pressure	PN	bar	-	25	-	25	-	-
Number of flange holes		pcs.	-	4	-	4	-	-
Weight Brass body		kg	-	3.35	-	4.65	-	-

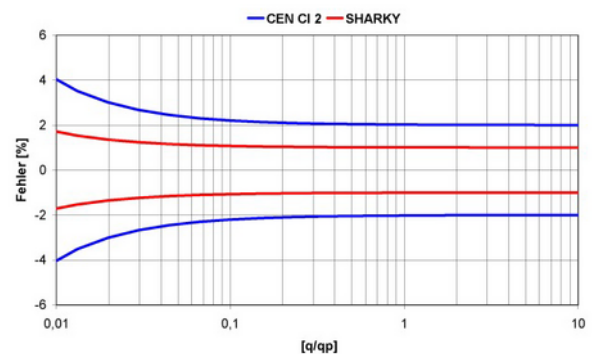
Nominal flow rate	q _p	m ³ /h	10	15	25	40	60	100
Nominal width	DN	mm	40	50	65	80	100	100
Overall length	L	mm	300	270	300	300	360	360
Height	H	mm	69	73.5	85	92.5	108	108
Height	H1	mm	66.5	71.5	79	86.5	96.5	95.5
Length electronics	L1	mm	90	90	90	90	90	90
Width electronics	B	mm	65.5	65.5	65.5	65.5	65.5	65.5
Flange dimension	F	mm	138	147	170	185	216	216
Flange diameter	D	mm	148	163	184	200	235	235
Bolt circle diameter	K	mm	110	125	145	160	190	190
Diameter	D1	mm	18	19	19	19	22	22
Operating pressure	PN	bar	25	25	25	25	25	25
Number of flange holes		pcs.	4	4	8	8	8	8
Weight Brass body		kg	6.6	7.45	9.45	11.1	16.9	16.9

Pressure loss curve and typical error curve

Pressure loss curve:



Typical error curve:



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