maddalena
METERING EXPERTISE

KUS ultrasonic flow meter

Ultrasonic flow meter consisting of a metal measuring insert connected to a calculator by means of a cable.

- Ideally suited for measuring thermal energy consumption in heating or cooling systems
- The measuring insert features a no-moving parts design
- Measuring interval: 1:100 according to EN 1434; total interval 1:1000
- No straight pipe requirements apply
- Sensitive to low flow rates
- Optical interface
- Standard installation point: return
- Monthly data storage for 36 months

FUNCTIONAL DESCRIPTION

The flow sensor has an optical interface complying with EN 62056-21.

The volume readings, maximum flow rates and hours of non-operation are stored monthly for 36 months.

The operating hours are detected as soon as the calculator is connected to the power supply. When an error occurs and thus the flow sensor cannot detect the flow, the hours of non-operation are summed.

POWER SUPPLY

Replaceable battery with a service life of 10 years.

Note: only batteries approved by the manufacturer may be used.

PULSE OUTPUT

The maximum cable length depends on:

- pulse length
- electrical properties of the cable (capacity)
- input circuit of the calculator to which the flow sensor is connected.

TECHNICAL DATA

General

Accuracy class	2 (EN 1434)
Environment class	A (EN 1434) for indoor installation
Mechanical class	M1
Electromagnetic class	E1
Storage temperature	-20 °C… +60 °C

Electronic unit

Ambient temperature	+5 °C… +55 °C
Protection class	IP65 according to EN 60529
Power supply	Battery, service life 10 years (Maddalena standard)
Optical interface	Standard, EN 62056-21

Pulse output

Type	Open drain
Pulse length	25 ms
Pulse sequence	In packages every 0.5 s (not regular)
Pulse options (pulses/litre)	DN 25-DN 40: 1/10 DN 50-DN 65: 1/25 DN 80-DN 100: 1/100
Cable length	2 m
Voltage	Maximum 30 V
Current	Maximum 30 mA
Voltage drop	<0.3 V at 10 mA
Polarity	Bipolar
Maximum frequency of output pulse	10 Hz

Flow sensor

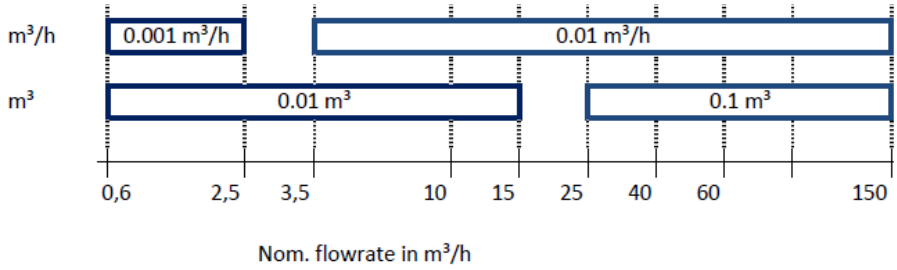
Protection rating	IP65 according to EN 60529
Installation position	Any
Measuring range	1:100 or 1:50
Temperature range	+5 °C… +130 °C
Recommended temperature range for heating applications	+10 °C… +130 °C
Recommended temperature range for cooling applications	+5 °C… +50 °C
Maximum temperature	150 °C for 2000 hours
Maximum overload	2.8 x q_p
Nominal pressure	PN 25 (PS 25)

TECHNICAL DATA - FLOW SENSOR (FLANGED CONNECTIONS)

q_p	L	FL	q_s	q_i	Head loss* at q_p	Kv flow rate at Δp 1 bar	Kv flow rate at Δp 100 mbar	Pulses/ litre	Weight
m^3/h	**mm**	**DN**	**m^3/h**	**l/h**	**mbar**	**m^3/h**	**m^3/h**	**p/l**	**kg**
3.5	260	DN 25	7	35	55	15	4.7	1/10	5
6	260	DN 25	12	60	140	16	5.1	1/10	5
10	300	DN 40	20	100	130	28	8.8	1/10	7
15	270	DN 50	30	150	110	45	14.3	1/25	8
25	300	DN 65	50	250	105	77	24.4	1/25	11
40	300	DN 80	80	400	160	100	31.6	1/100	13
60	360	DN 100	120	600	115	177	56.0	1/100	22

*Head loss tolerance: ±5%

RESOLUTION OF STORED VALUES



The number of the decimal positions of a value is given by the nominal flow rate.

HEAD LOSS

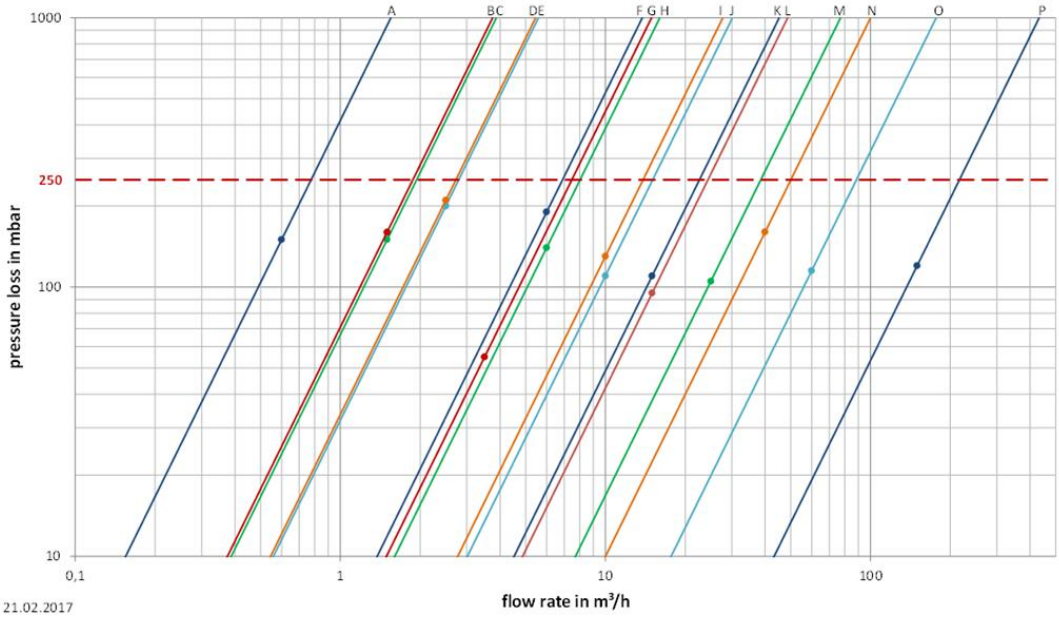
q_p	Length	Connection	Head loss at q_p	Kv at Δp 1 bar	Diagram
m³/h	**mm**	**DN**	**mbar**	**m³/h**	**Reference**
3.5	260	DN 25	55	15	G
6	260	DN 25	140	16	H
10	300	DN 40	130	28	I
15	270	DN 50	110	45	K
15	200	DN 50	95	49	L
25	300	DN 65	105	77	M
40	300	DN 80	160	100	N
60	360	DN 100	115	177	O

The head loss is calculated at the nominal flow rate q_p. It can be calculated at any flow rate using this formula with the Kv factor, which determines the flow rate at a head loss of 1 bar.

$$\Delta p = 1bar \times \left(\frac{Q}{K_v}\right)^2$$

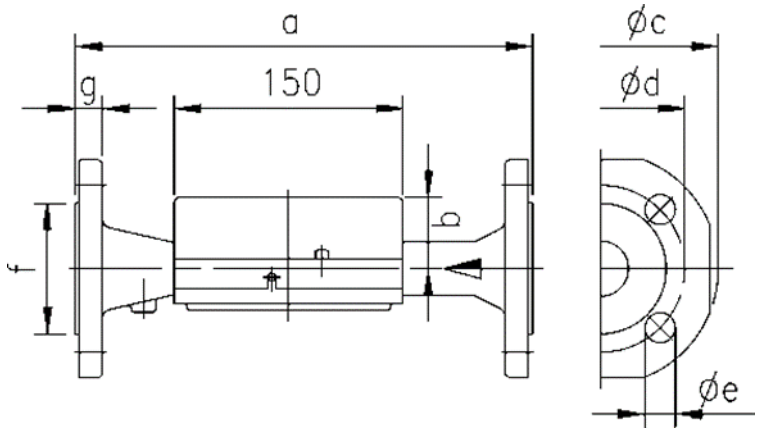
$\Delta p = head\ loss\ in\ bar$
$Q = flow\ rate\ in\ m^3/h$
$K_v = K_v - factor\ at\ \Delta p = 1\ bar$

Alternatively, the head loss can be determined from the following diagram.

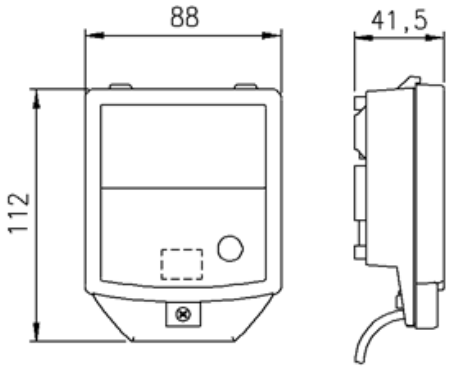


OVERALL DIMENSIONS

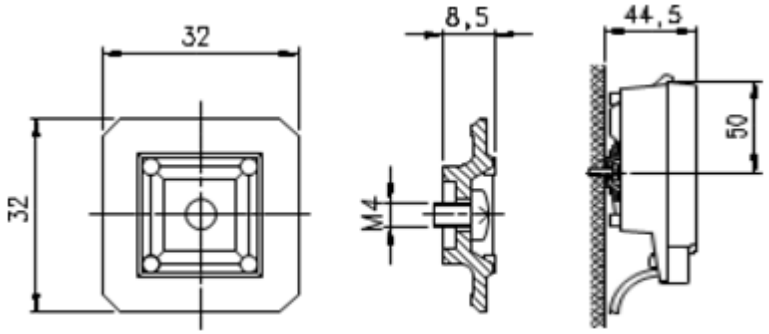
q_p m^3/h	PN bar	DN	a	b	Φc	Φd	Φe	Holes	f	g
3.5	25	25	260	51	115	85	14	4	68	18
6	25	25	260	51	115	85	14	4	68	18
10	25	40	300	48	150	110	18	4	88	18
15	25	50	270	46	165	125	18	4	102	20
25	25	65	300	52	185	145	18	8	122	22
40	25	80	300	56	200	160	18	8	138	24
60	25	100	360	68	235	190	22	8	158	24



CALCULATOR AND MOUNTING PLATE DIMENSIONS



Calculator: front and side view



Mounting plate: top and side view

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