ENGINEERING
TOMORROW

Data sheet

SONO 3500CT
Ultrasonic flow meter

Description/Application

The SONO3500CT is an ultrasonic flow meter especially designed for heating, cooling or combined heating/cooling application in local and district energy systems. In combination with INFOCAL 9 it becomes energy meter for heating or cooling.

The SONO 3500CT has been approved according to MID class 2. The approved flow meter consists of a flow sensor pipe, 4 transducers with cables and a transmitter with LCD display.

Features

- Ultrasonic 2-path flow sensor secures measurement and optimum accuracy
- Galvanically isolated digital output for easy connection to energy calculator INFOCAL 9
- 115 / 230 V mains-powered with back-up battery as standard version in case of mains power failure
- Optional battery-powered version (up to 6 years lifetime)
- Fast measuring frequency 15 Hz / 0.5 Hz (230 V AC / Battery)
- Compact (standard) or remote mounting
- No pressure drop
- Long-term stability
- Easy one-button straight forward display

MID examination certificate no. :
DK-0200-MI004-032

Ordering

The standard codes are used for ordering.
Compact flow meter SONO3500CT standard codes:

DN	Qp	Qs	Pulse values (l/p)	Operating pressure (bar)	Build up code	SONO3500 Code no.
100	120	180	2.5	16	**7ME3411-1RC02-3ER2**	**187F3530**
125	200	280	2.5	16	**7ME3411-1VC02-3ER2**	**187F3531**
150	300	420	2.5	16	**7ME3411-2DC02-3ER2**	**187F3532**
200	500	700	10	16	**7ME3411-2HC02-4ER2**	**187F3533**
250	800	1120	10	16	**7ME3411-2MC02-4ER2**	**187F3534**
300	1120	1560	10	16	**7ME3411-2RC02-4ER2**	**187F3535**
350	1500	2100	10	16	**7ME3411-2VC02-4ER2**	**187F3536**
400	1900	2660	50	16	**7ME3411-3DC02-5ER2**	**187F3537**
500	2950	4130	50	16	**7ME3411-3MC02-5ER2**	**187F3538**
600	4300	6020	100	16	**7ME3411-3VC02-6ER2**	**187F3539**
700	5800	8120	100	16	**7ME3411-4HC02-6ER2**	**187F3540**
800	7600	10640	100	16	**7ME3411-4RC02-6ER2**	**187F3541**
900	10000	14000	100	16	**7ME3411-5DC02-6ER2**	**187F3542**
1000	10000	14000	100	16	**7ME3411-5MC02-6ER2**	**187F3543**
1200	10000	14000	100	16	**7ME3411-5VC02-6ER2**	**187F3544**
100	120	240	2.5	40	**7ME3411-1RE02-3ER2**	**187F4500**
125	200	400	2.5	40	**7ME3411-1VE02-3ER2**	**187F4501**
150	300	420	2.5	40	**7ME3411-2DE02-3ER2**	**187F4502**
200	500	700	10	40	**7ME3411-2HE02-4ER2**	**187F4503**
200	500	700	10	25	**7ME3411-2HD02-4ER2**	**187F4504**
250	800	1120	10	25	**7ME3411-2MD02-4ER2**	**187F4505**
300	1120	1560	10	25	**7ME3411-2RD02-4ER2**	**187F4506**
350	1500	2100	50	25	**7ME3411-2VD02-4ER2**	**187F4507**
400	1900	2660	50	25	**7ME3411-3DD02-5ER2**	**187F4508**
500	2950	4130	100	25	**7ME3411-3MD02-5ER2**	**187F4509**
600	4300	6020	100	25	**7ME3411-3VD02-6ER2**	**187F4510**
700	5800	8120	100	25	**7ME3411-4HD02-6ER2**	**187F4511**
800	7600	10640	100	25	**7ME3411-4RD02-6ER2**	**187F4512**

The above codes are PN16 type of compact flow meters. The power supply is mains unit (115/230 V AC) with a 3.6 V back-up battery.
Two pulse output function included.
More standard codes are available regarding nominal diameter up to DN 1200, remote version and PN25.

Design and function

Compact / remote version
The unit is available in a compact or a remote version with up to 30 meter distance from flow meter to transmitter. When ordering a compact (standard) version the transducer cables are premounted and ready for installation. Compact mounting is only possible up to 120 °C. The flow sensor must be isolated to protect transmitter from heat. The transmitter is available in an IP67 enclosure.

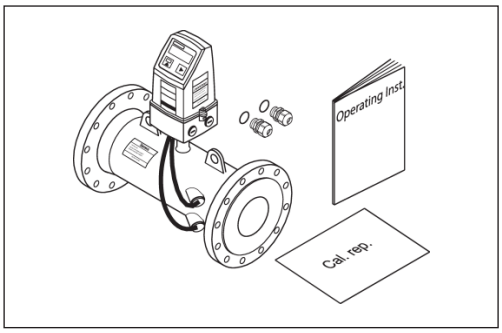
Power supply
The standard version contains a 115 / 230 V AC mains unit including 3.6 V single battery backup in case of mains power failure. It can be retrofitted to a battery version with a dual battery pack (6 year lifetime).

Pulse output
SONO3500CT has digital output functions. Output A is MID approved and used as input for energy meter INFOCAL 9, or as input for digital systems for remote reading. Output B is preset by the factory as alarm and can't be configured.

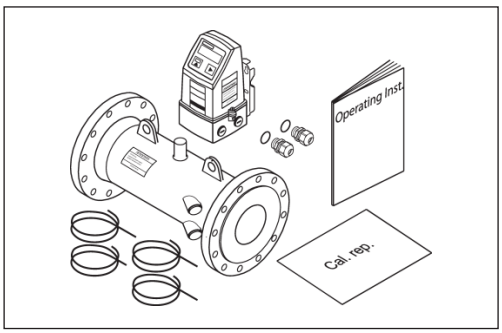
Items supplied

The device can be delivered as either a compact or a remote system.

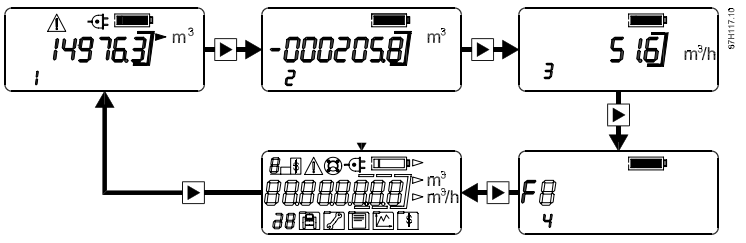
Compact system
- Sensor
- Transmitter
- Operating Instruction
- Calibration report



Remote system
- Sensor
- Transmitter
- Operating Instruction
- Calibration report
- Wall/pipe mounting kit with bracket and terminal box
- 4 Transducer coaxial cables



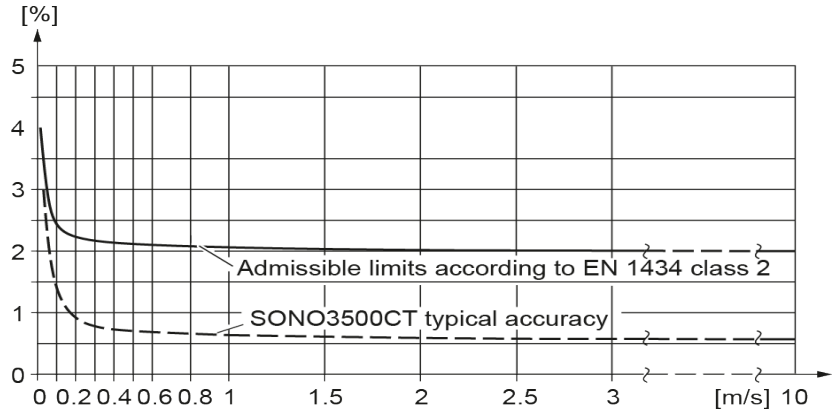
Overview of display menu sequence



Menu	Description
1	Flow volume totalizer 1 - forward
2	Flow volume totalizer 2 - reverse (not MID certified)
3	Current flow rate
4	Failure code F1 ... F9
5	Display test

Technical data

Diameter	**Nominal**	**DN** (mm)	**100**	**125**	**150**	**200**	**250**	**300**	**350**	**400**	**500**	**600**	**700**	**800**	**900**	**1000**	**1200**
Flow rate ranges	Nominal	q_p (m^3/h)	120	200	300	500	800	1120	1500	1900	2950	4300	5800	7600	10000	10000	10000
	Highest operatable	q_s (m^3/h)	180	280	420	700	1120	1560	2100	2660	4130	6020	8120	10640	14000	14000	14000
	Maximum	q_{max} (m^3/h)	189	294	441	735	1176	1638	2205	2793	4336.5	6321	8526	11172	14700	14700	14700
	Minimum	q_i (m^3/h)	1.2	2	3	5	8	11.2	15	19	29.5	43	58	76	100	100	200
	Cut–off	m^3/h	0.3	0.5	0.75	1.25	2	2.8	3.75	4.75	7.375	10.75	14.5	19	25	30	45
Operating pressure	Maximum	PN (bar)	16/40			16/25/40		16/25									16
Dynamic range		$q_i : q_p$	1:100														1:50
Pulse output value		l/p	2.5	2.5	2.5	10	10	10	10	50	50	100	100	100	100	100	100
Pulse width		ms	5														
Flow velocity		m/s	0.02 … 9														
Measuring frequency		Hz	15 Hz (mains supply - standard) / 0.5 Hz (battery supply)														
Power supply		Mains supply (standard)	115 / 230 V AC, including 3.6 V single battery backup														
		Battery supply	3.6 V battery version, incl. dual battery pack														
Medium			Heating water, according to VDI-2035 (pH 8.2 - 10.5), industrial VdTÜV 1466 and AGFW FW510														
Media/ surface temperature	Compact (standard)	°C	5 … 120														
	Remote	°C	5 … 200														
Basic features	Environmental class		MID class E2 + M1														
	Protection class		IP 67 according to EN 60529 and DIN 40050 (NEMA 4X/6)														
	Storage temperature	°C	–40 … 85														
	Ambient temperature	°C	–10 … 55														
Pipe material			Carbon Steel EN 1.0345 / P235 GH, painted in light-gray														
Remote version cable length			5 m / 10 m / 20 m / Max. 30 m between transmitter and flow sensor														



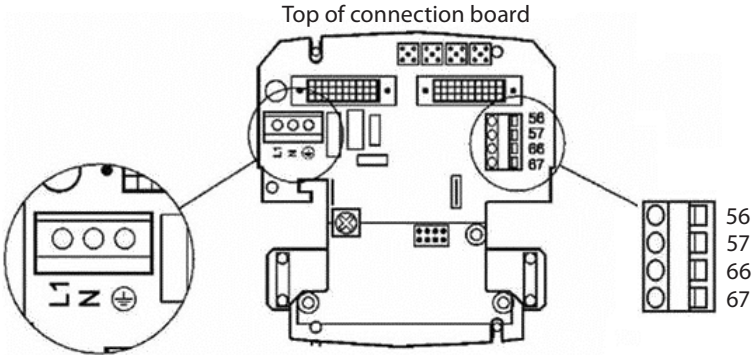
Measuring accuracy MID Class 2

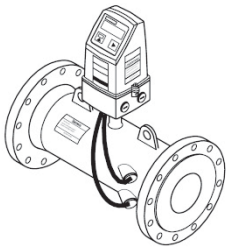
Wiring energy calculator type INFOCAL 9

Energy calculator is typically connected via the pulse output A (56, 57) of the transmitter.

SONO 3500 CT

Top of connection board





Wiring to flow meter SONO 3500 CT:

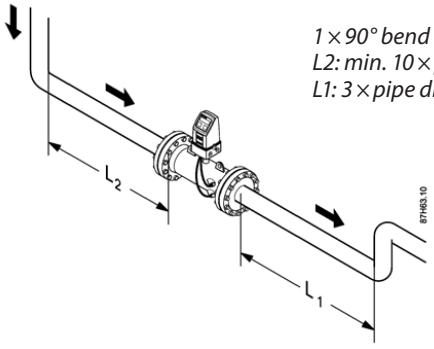
SONO 3500 CT in supply pipe	Infocal 9 terminal
56 (flow pulse)	10 (q1+)
57 (ground)	11 (q1-)

SONO 3500 CT in return pipe	Infocal 9 terminal
56 (flow pulse)	52 (q2+)
57 (ground)	11 (q2-)

Inlet/Outlet conditions

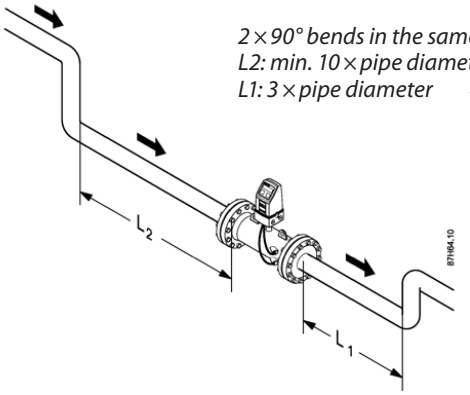
Single bend

1 × 90° bend
L2: min. 10 × pipe diameter
L1: 3 × pipe diameter



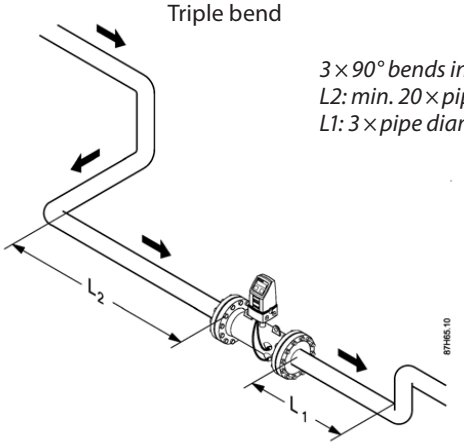
Dual bend

2 × 90° bends in the same plane
L2: min. 10 × pipe diameter
L1: 3 × pipe diameter



Triple bend

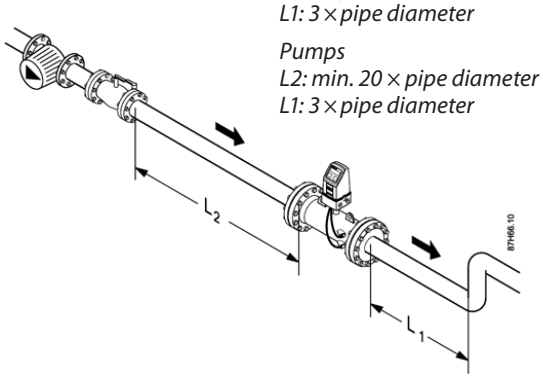
3 × 90° bends in two planes
L2: min. 20 × pipe diameter
L1: 3 × pipe diameter



Valves and pumps

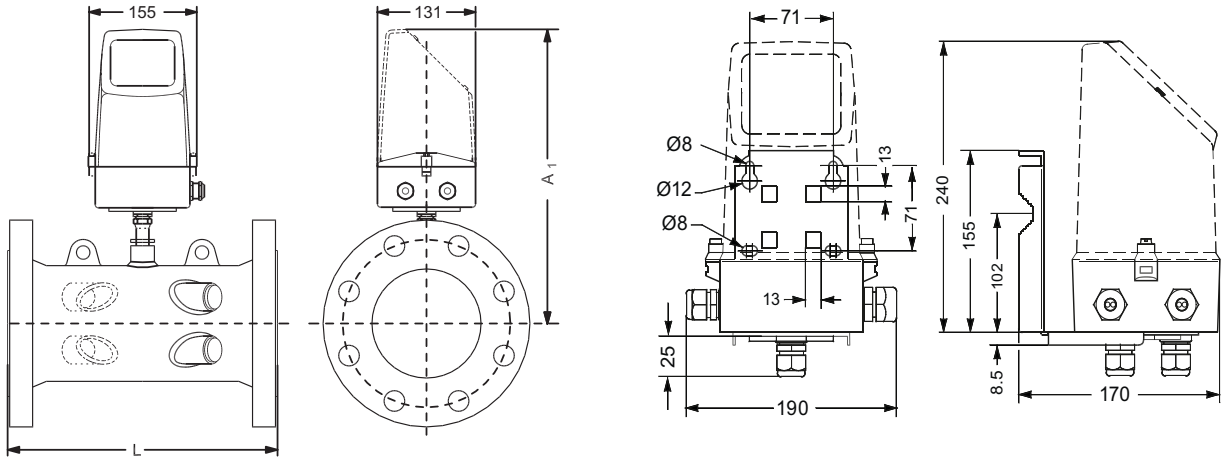
Valves
L2: min. 10 × pipe diameter, fully open valve
L1: 3 × pipe diameter

Pumps
L2: min. 20 × pipe diameter
L1: 3 × pipe diameter



Dimensions

Transmitter IP67, wall mounting



Diameter DN (mm)		**100**	**125**	**150**	**200**	**250**	**300**	**350**	**400**	**500**	**600**	**700**	**800**	**900**	**1000**	**1200**
PN 16	Length L (mm)	350	350	500	500	600	500	550	600	625	750	875	1000	1230	1300	1360
	Compact version approx. weight (kg)[1)]	15	18	28	38	60	66	94	124	194	303	361	494	475	594	732
PN 25	Lenght L (mm)	–	–	–	500	600	500	550	600	625	750	875	1000	1300	1370	–
	Compact version approx. weight (kg)[1)]	–	–	–	47	76	81	121	153	231	365	565	770	835	1000	–
A_1 (mm)		375	380	390	414	440	466	495	507	558	609	660	710	810	910	1110
Lift hug		No					Yes									

[1)] Weight including transmitter/electronics 1.5 kg (compact version). Weight of remote version is additional approx. 3.5 kg (remote version including 10 m cable set).

Note:
1. All weights are approximate.
2. For flange values, see norm EN 1092-1.

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