

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**

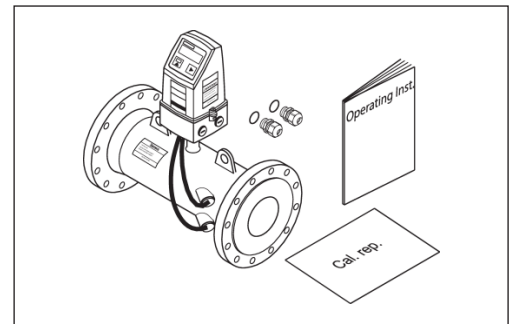
SONO3500CT has digital output functions. Output A is MID approved and used as input for energy meter INFOCAL 9, or as input for digital systems for remote reading. Output B is preset by the factory as alarm and can't be configured.

**Items supplied**

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

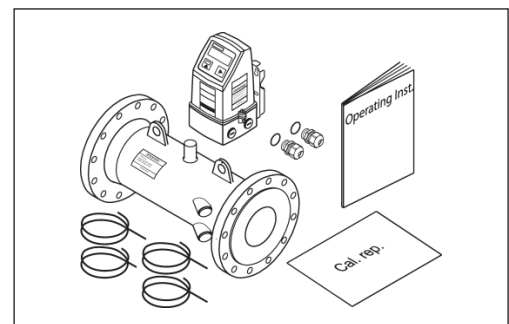
Compact system

- Sensor
- Transmitter
- Operating Instruction
- Calibration report

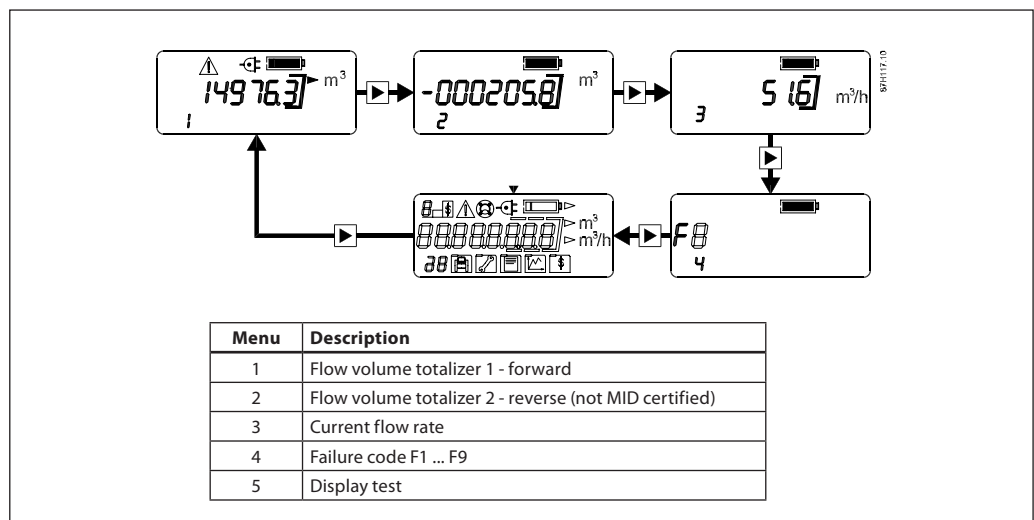


Remote system

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

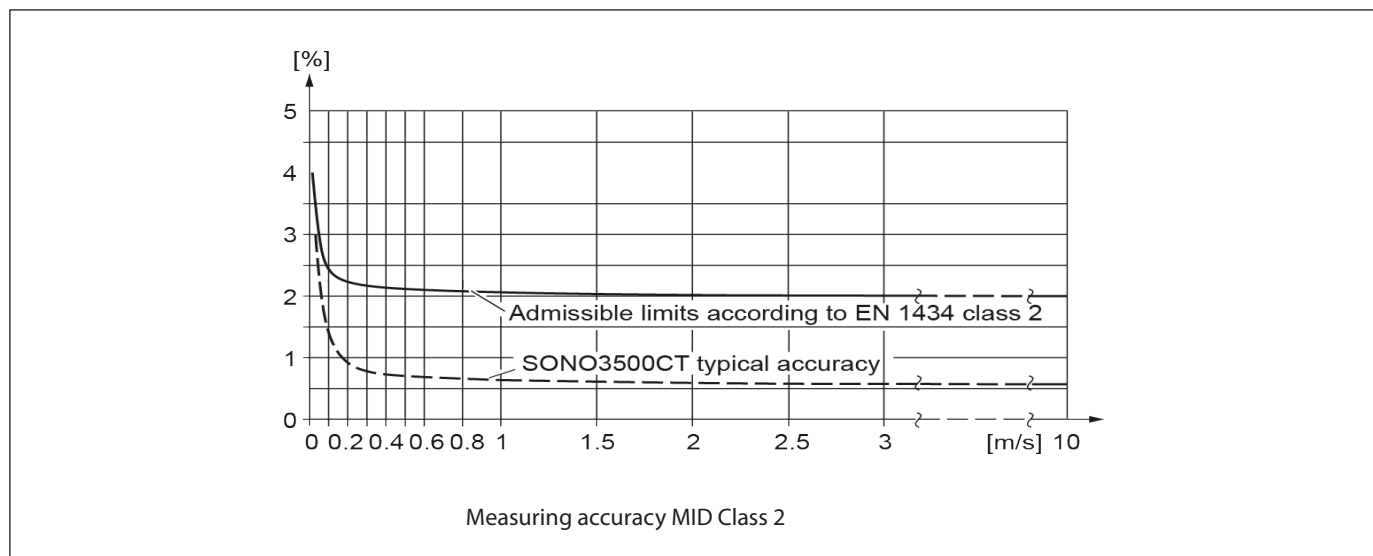


**Overview of display menu sequence**



Technical data

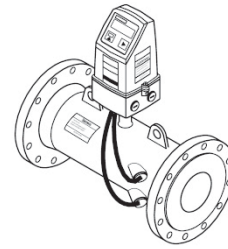
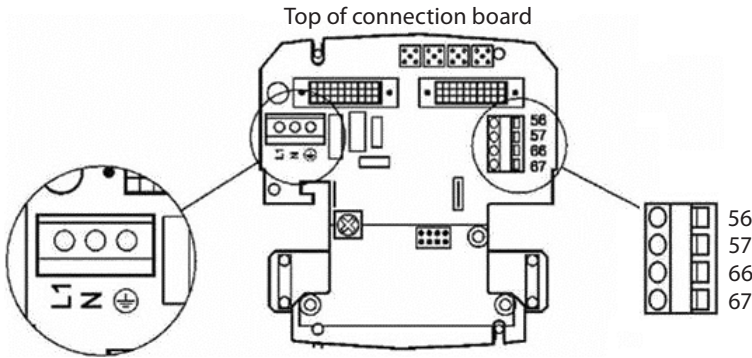
| Diameter                    | Nominal                 | DN (mm)                       | 100  | 125 | 150  | 200      | 250  | 300  | 350   | 400  | 500    | 600   | 700  | 800   | 900   | 1000  | 1200  |
|-----------------------------|-------------------------|-------------------------------|--|-----|------|----------|------|------|-------|------|--------|-------|------|-------|-------|-------|-------|
| Flow rate ranges            | Nominal                 | $q_p$ (m <sup>3</sup> /h)     | 120  | 200 | 300  | 500      | 800  | 1120 | 1500  | 1900 | 2950   | 4300  | 5800 | 7600  | 10000 | 10000 | 10000 |
|                             | Highest operatable      | $q_s$ (m <sup>3</sup> /h)     | 180  | 280 | 420  | 700      | 1120 | 1560 | 2100  | 2660 | 4130   | 6020  | 8120 | 10640 | 14000 | 14000 | 14000 |
|                             | Maximum                 | $q_{max}$ (m <sup>3</sup> /h) | 189  | 294 | 441  | 735      | 1176 | 1638 | 2205  | 2793 | 4336.5 | 6321  | 8526 | 11172 | 14700 | 14700 | 14700 |
|                             | Minimum                 | $q_l$ (m <sup>3</sup> /h)     | 1.2  | 2   | 3    | 5        | 8    | 11.2 | 15    | 19   | 29.5   | 43    | 58   | 76    | 100   | 100   | 200   |
|                             | Cut-off                 | m <sup>3</sup> /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 / 230V AC, including 3.6V 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                          |     |      |          |      |      |       |      |        |       |      |       |       |       |       |



Wiring energy calculator  
type INFOCAL 9

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

SONO 3500 CT

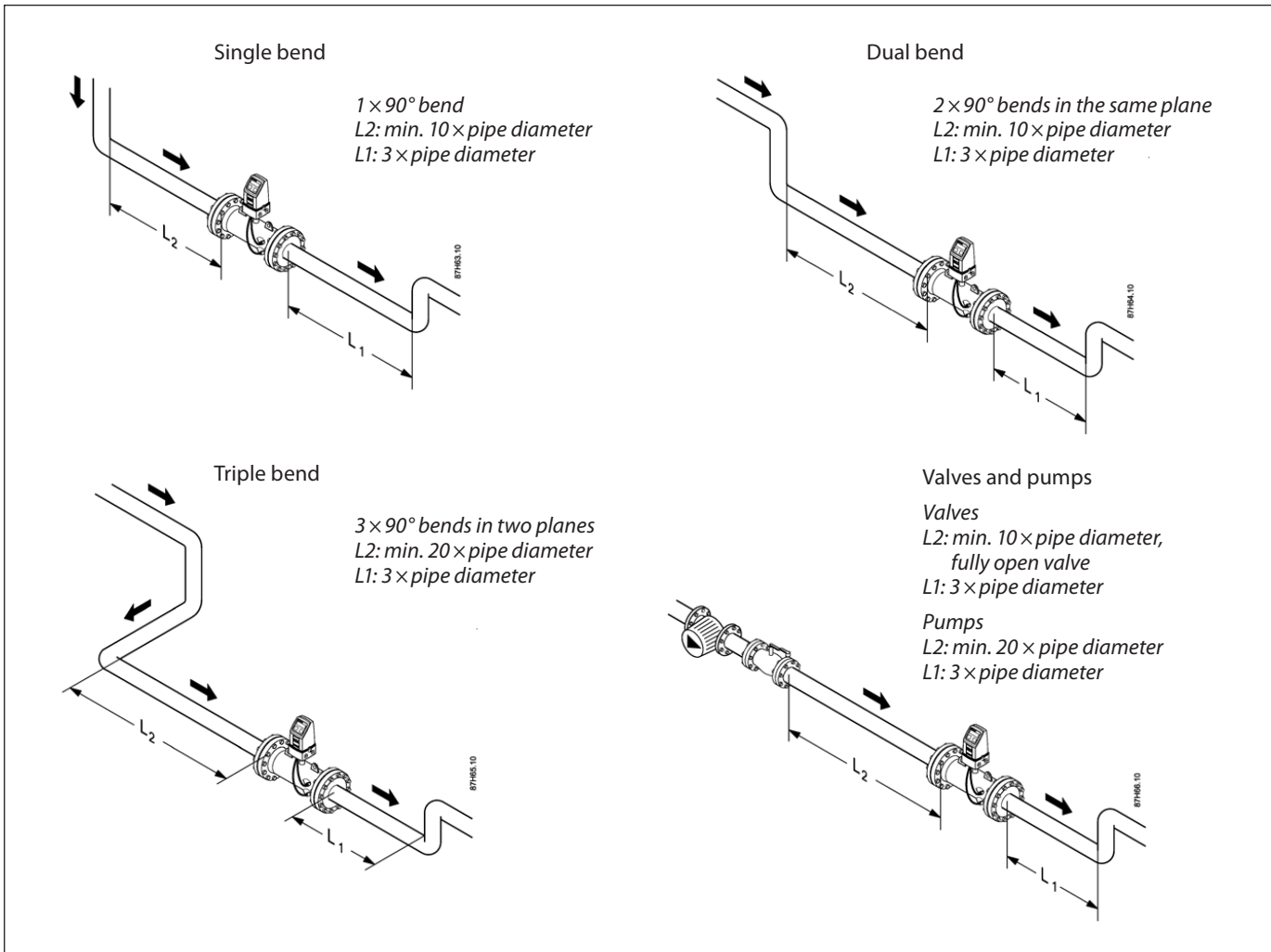


Wiring to flow meter SONO 3500 CT:

| 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



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) <sup>1)</sup> | 15  | 18  | 28  | 38  | 60  | 66  | 94  | 124 | 194 | 303 | 361 | 494  | 475  | 594  | 732  |  |
| PN 25               | Length L (mm)                                     | –   | –   | –   | 500 | 600 | 500 | 550 | 600 | 625 | 750 | 875 | 1000 | 1300 | 1370 | –    |  |
|                     | Compact version approx. weight (kg) <sup>1)</sup> | –   | –   | –   | 47  | 76  | 81  | 121 | 153 | 231 | 365 | 565 | 770  | 835  | 1000 | –    |  |
| A <sub>1</sub> (mm) |   | 375 | 380 | 390 | 414 | 440 | 466 | 495 | 507 | 558 | 609 | 660 | 710  | 810  | 910  | 1110 |  |
| Lift hug            |   | No  |     |     |     |     |     | Yes |     |     |     |     |      |      |      |      |  |

<sup>1)</sup> 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.





