

Energy metering | Product overview

# All it takes to **measure, collect and analyze** energy consumption in **heating and cooling applications**

Discover the full range of ultrasonic heat & cooling meters and monitoring solutions.



# SonoSelect™ 10

## High-end ultrasonic energy meter for heating and cooling

### Meter offerings

SonoSelect™ is a compact ultrasonic meter for measuring energy consumption in heating, cooling and combined heating/cooling applications in primarily residential buildings. Its high measuring accuracy and reliability makes it suitable for both tap water and district energy application measurements. The meter offers a new level of installation and commissioning simplicity by using SonoApp™ and meets all national certification requirements.

### Main product benefits

- Top of class meter accuracy ensures valid billing of heating, cooling and domestic hot water
- Best in class battery lifetime (up to 17 years) or 230V mains powered – lowers replacement frequency
- Upgradable and robust meter – lowers spendings for meter replacements
- Open communication protocols/interfaces increases flexibility
- Self diagnostics and high accuracy



## Target applications



1-2 FAMILY HOUSES



MULTI-FAMILY HOUSES



COMMERCIAL



DISTRICT ENERGY NETWORKS

## Technical data

|                           |   |
|---------------------------|---|
| Size   Flow               | DN15 – DN32   Qp 0.6 - 6.0 m³/h   |
| Temperature / Pressure    | 5-95°C / PN16   5-130°C / PN25  |
| Types                     | Compact meter (heat, cool, combined)  |
| Approvals                 | MID class II B+D (heating)   TS (DK)   PTB (DE)   BEV (AT)   METAS (CH) (cooling) |
| Flow sensor cable length  | 1.5m (approved for up to 3.0m)  |
| Temp. sensor cable length | 1.5m (approved for up to 10.0m)   |
| Configuration options     | Supply / Return   Energy units   Communication settings (radio, Mbus, pulses)     |
| Power                     | 3.6V battery* or 230V mains powered   |
| Modular                   | 1 slot for communication modules  |
| Communication             | 2x wired M-Bus   Wireless M-Bus (OMS)   2x Pulse in-/output                       |
| Data logging              | 4 years and supports daily logs   |
| Tools                     | Configurable via SonoApp™   |
| Calculator                | Separable and IP class 65   |

\*) up to 16+1 year lifetime, no transport restrictions

# SonoSafe™ 10

## Mainstream ultrasonic meter for heating applications

### Meter offerings

The ultrasonic meter SonoSafe™ is a compact and reliable meter offering basic features and functions. It can be installed in several heating applications within residential buildings and comes with all national certification requirements.

As SonoSelect™ it is manufactured in accordance with TS16949 automotive standards.

### Main product benefits

- MID class II compliant – makes the meter fulfill basic market requirements
- Upgradable and robust meter – lowers spendings for meter replacements
- Open communication protocols/interfaces increases flexibility



## Target applications



1-2 FAMILY HOUSES



MULTI-FAMILY HOUSES



COMMERCIAL



DISTRICT ENERGY NETWORKS

## Technical data

|                           |   |
|---------------------------|---|
| Size   Flow               | DN15 – DN32   Qp 0.6 - 6.0 m³/h                             |
| Temperature   Pressure    | 5-95°C   PN16   |
| Types                     | Compact meter (heat)  |
| Approvals                 | MID class II B+D (heating)                                  |
| Flow sensor cable length  | 0.5m (approved for up to 3.0m)                              |
| Temp. sensor cable length | 0.5m (approved for up to 10.0m)                             |
| Configuration options     | Communication settings (radio, Mbus, pulses)                |
| Power                     | 3.6V battery* or 230V mains powered                         |
| Modular                   | 1 slot for communication modules                            |
| Communication             | 2x wired M-Bus   Wireless M-Bus (OMS)   2x Pulse in-/output |
| Data logging              | 4 years and supports daily logs                             |
| Tools                     | Configurable via SonoApp™                                   |
| Calculator                | Separable and IP class 54                                   |

\*) up to 11 years of lifetime, no transport restrictions



## Primary side metering

# SonoMeter™ 30

Ultrasonic meter for demanding applications

### Meter offerings

SonoMeter™ 30 is a compact ultrasonic meter for measuring both heat and cooling consumption at the entrance of the building or within district energy networks. It can be configured for both supply and return and offers up to 11 years of battery lifetime.

The meter is MID Class II B+D certified.

### Main product benefits

- Multiple communication options available, e.g. for building automation purposes
- Comes with pulse in-/output as standard
- High dynamic range (1:250) improves measurement accuracy even on low flow rates
- Mains power with battery back-up secures no data loss even if power is lost
- Can be used in glycol applications (not MID certified)



## Target applications



1-2 FAMILY HOUSES



MULTI-FAMILY HOUSES



COMMERCIAL



DISTRICT ENERGY NETWORKS

## Technical data

|                           |   |
|---------------------------|---|
| Size   Flow               | DN15 – DN100   Qp 0.6-60 m³/h   |
| Temperature   Pressure    | 5-130°C   PN16/25   |
| Types                     | Compact meter<br>(heat, cool and combined)  |
| Approvals                 | MID class II B+D (heating)  |
| Flow sensor cable length  | 1.5m   2.0m   3.0m   5.0m   |
| Temp. sensor cable length | 1.5m standard<br>(replacable and approved for up to 10.0m)  |
| Configuration options     | Pulse input/output values   Tariffs  <br>Display parameters   Archive logs  <br>MBus settings   Set dates |
| Power                     | Battery AA-cell 3.6 VDC  <br>Mains unit: 230 V AC   24 VAC  |
| Modular                   | 1 slot for communication modules  |
| Communication             | Wired and Wireless M-Bus  <br>Pulse in-/output   RS 485 Modbus  |
| Data logging              | 3 years and supports daily logs   |
| Calculator                | Separable and IP class 65   |

## Primary side metering

# SonoSensor™ 30

## Individual flow sensor for most common applications

### Meter offerings

SonoSensor™ 30 is an ultrasonic flow sensor designed for heating, cooling or combined heating/cooling applications in medium sized local and district energy systems. Combined with the InfoCal™ 9 energy calculator it offers normal compact meter functionalities for medium sized hydronic applications.

The sensor is MID Class II certified.

### Main product benefits

- Offers a 12 year battery lifetime lowering the replacement costs
- Measures volume every 1 sec. increases measurement accuracy
- Insensitive to dirt lowering the needs for replacing the sensor
- Low pressure loss



## Target applications



1-2 FAMILY HOUSES



MULTI-FAMILY HOUSES



COMMERCIAL



DISTRICT ENERGY NETWORKS

## Technical data

|                          |   |
|--------------------------|---|
| Size                     | DN15 – DN100   Qp 0.6-60 m³/h                       |
| Temperature   Pressure   | 5-130°C   PN16/25                                   |
| Types                    | Flow sensor (heat, cool)                            |
| Approvals                | MID class II B+D (heating)                          |
| Flow sensor cable length | 1.2m   2.5m   5.0m                                  |
| Power                    | Battery AA-cell 3.6V   mains unit 24V AC   230 V AC |
| Communication            | Pulse output acc. to EN1434-2, type OD              |
| Protection class         | IP65 (IP67 upon request)                            |

# Sono 3500 CT™

## Large size flow meter for commercial applications

### Meter offerings

Sono 3500 CT™ is an ultrasonic flow meter designed for heating, cooling or combined heat/cool applications in larger sized local and district energy systems. Combined with a type approved heating/cooling energy calculator (e.g. InfoCal™ 9) it offers energy metering capabilities in larger applications.

The sensor is MID Class II certified.

### Main product benefits

- For high and very high temperatures applications
- Remote version for very high temperature applications enhances the meter lifetime and lowers replacement costs
- No pressure loss reduces pump power and energy used for circulation



## Target applications



## Technical data

|   |   |
|---|---|
| Size   Flow                               | DN100 – DN1200   Qp 60 - 9000 m³/h  |
| Temperature   Pressure                    | Compact: 2-120°C / Remote: 2-200°C<br>  PN16/25/40  |
| Types                                     | Flow meter (heat, cool and combined)<br>Compact or remote version                           |
| Approvals                                 | MID class II B+D (heating)  |
| Flow sensor cable length (remote version) | 5.0m   10.0m   20.0m   30.0m  |
| Flow measurement                          | Bi-directional  |
| Power                                     | 115 / 230 V AC with 3.6V single backup battery   3.6V battery with dual 3.6V backup battery |
| Communication                             | 2 Pulse outputs   |
| Optical interface                         | IRDA with Modbus RTU protocol   |
| Protection class                          | IP67  |



# InfoCal™ 9

Energy calculator for flow sensors in commercial applications

## Meter offerings

Infocal™ 9 is an energy calculator, e.g., for combination with SONO 3500 CT™ flow meters or SonoSensor™ 30 flow sensors. It is designed for heating, cooling or combined heat/cool applications in local and district energy systems. The calculator is MID Class II B+D certified and comes in either a 230 V AC mains power supply or battery powered version offering a 12 year battery lifetime.

## Main product benefits

- Covers a large range of sizes, from DN15 to DN1200
- High frequency of input pulses for flow sensor up to 200 Hz
- Wide temperature range increases the product usability
- Up to 100.0m flow cable length



## Target applications



## Technical data

|                           |  |
|---------------------------|--|
| Size                      | DN15– DN1200*  |
| Temperature               | 0–160°C  |
| Types                     | Energy calculator (heat, cool or combined)   |
| Approvals                 | MID class II B+D (heating)   |
| Flow sensor cable length  | Up to 100.0m (230 VAC)   10.0m (battery supply)  |
| Temp. sensor cable length | 2.0m   3.0m   5.0m   10.0m   |
| Configuration options     | Pulse outputs   Additional sensors for flow, pressure and temperature                        |
| Power                     | Battery D-cell 3.6V   Mains unit 230 V AC  |
| Modular                   | 1 slot for communication modules   |
| Communication             | Wired M-Bus   Wireless M-Bus (OMS)   2x Pulse outputs/inputs   RS 485 modbus RTU   2x 4-20mA |
| Data logging              | 36 months  |
| Protection class          | IP65   |

\*) Corresponds available sizes of matching SonoSensor™ 30 and Sono 3500 CT™

# SonoCollect™ 111 & 112

## Smart metering data concentrators

### Product offerings

SonoCollect™ 111 and 112 are smart metering data concentrators for energy meter reading. They both come with a standardized wired and wireless M-Bus interface. The SonoCollect™ 111 can collect the data from up to 500 energy meters. For the SonoCollect™ 112 this is up to 80 energy meters, and it has a built-in GSM option. The extracted metering data is communicated to the Cloud or other analyzing tools via IP technology.

The wireless M-Bus is offering a new technology compliant to OMS making it possible to capture energy- and consumption data via open communication standards and high security levels. This makes it useful in all present and prospective infrastructures.

### Main product benefits

- Highly flexible – reads non-proprietary standards eliminating complete meter replacements
- Easy remotely configuration and updating – eliminates on-site service
- Reading of up to 500 energy meters lowers the required number of concentrators



## Communication options



WIRED



WIRELESS



WALK-BY



CLOUD

## Technical data

|  |   |
|--|---|
| Installation                           | DIN rail  |
| M-Bus Interface                        | Up to 500 unit loads, auto-scan, compliant to EN 13757          |
| Wireless M-Bus Interface               | OMS Compliant, AES encryption, auto-scan, Mode: S, T, C         |
| Ethernet interface                     | 100 MB, RJ45, support of IPv6 and IPsec (VPN)                   |
| GSM interface                          | Optional, external antenna via SMA-Connector, slot for Mini-SIM |
| WAN connection to server system (push) | TCP/HTTP connection (XML)                                       |
| Encryption WAN (server communication)  | TLS, SSH, SSL (server- and client-side certification), OpenVPN  |
| E-Mail transmission (push)             | XML data  |
| FTP transfer (push, pull)              | CSV data  |
| Integrated web server                  | Yes   |
| Memory for local data storage          | 4 GB  |
| Firmware update                        | Directly or via WAN (Internet)                                  |
| Configuration                          | Complete remote control via LAN or WAN (Internet)               |



## Automatic Meter Reading

# SonoRead™ 868

## Wireless Radio Receiver for meter reading

### Product offerings

SonoRead™ 868 is a portable Wireless M-Bus T1 and C1 transceiver (OMS) with Bluetooth interface. It reads all OMS standardized meters.

Connecting the meter readings with the SonoApp™ Workspace via the SonoApp™ creates a powerful mobile radio meter reading system. This mobile radio meter reading system will administrate known and unknown meters and encryption keys.

### Main product benefits

- Plug & play startup and easy to use  
– lowers time spend for configuration
- Universal reading of all types of meters and measurement types – increases usability and lowers need for component replacements



## Communication options



WIRED



WIRELESS



WALK-BY



CLOUD

## Technical data

|                            |                               |
|----------------------------|-------------------------------|
| Wireless M-bus frequency   | 868 MHz                       |
| Wireless M-bus interface   | EN13757-4, Mode T1 and C1     |
| Antenna (changeable)       | External antenna (SMA)        |
| Communication interface    | Bluetooth 2.1 class 2 (10.0m) |
| Dimensions without antenna | 159 x 77 x 33 mm              |
| Integrated battery type    | Lithium ion                   |
| Operation time             | 20 hours (approximately)      |
| Protection class           | IP64                          |

# SonoEnergy™

## Smart meter reading Cloud

### Product offerings

SonoEnergy™ is a smart energy software offered as 'Software as a Service' (SaaS) platform for the overall integration of data, business processes and technologies. It collects measurements from SonoCollect™ or other data concentrators and communicates with 3<sup>rd</sup> party equipment, for reading out relevant information from the buildings and components in the field.

Consumption data supplied by SonoEnergy™ can be analyzed and ordered for further processes in other systems ex. billing solutions, energy advising solutions, optimization of grid, SCADA, BMS, etc.

### Main product benefits

- Supports multiple meter reading technologies – lowers needs for component replacements
- Storage and processing of various data streams such as power, water, heat, pressure, temperature, etc. in one system
- Enables the provision of entire service concepts or single end-customer products in the area of smart metering and energy management



## Communication options



## Technical data

Automatic monthly basic readout

Automatic advanced readout as often as necessary

Import installations from SonoApp™

Export to billing pre-defined format (.csv and .xml)

User rights management

Integrated map view for meters and data concentrators

Individual user dashboard view for monitoring

Graphics of measurements in meter details

Grouping and sub-grouping possibilities

E-mail or SMS notification on events and alarms

Analysis of data

Handling different business processes

Unlimited logging per meter

# Global coverage

Danfoss energy meters are the preferred choice by decision makers all over the world. Here you can find a small collection of our project references. Is yours next?

## Energy meters in cooling applications



- Arabian Gate
- Dubai, United Arab Emirates
- Residential apartments
- 700 pcs. SonoSelect™



- Steyn City
- Johannesburg, South Africa
- Residential homes
- 127 pcs. SonoSelect™



- The podium tower
- Manila, Philippines
- Offices
- 252 pcs. SonoSelect™



- Axis Towers
- Muntinlupa City, Philippines
- Offices
- 76 sets Sono 3500CT™ / Infocal 9

## Energy meters in heating applications



- District heating utility
- Tianjin, China
- Residential facilities
- 52,000 pcs. SonoSelect™ / SonoSafe™



- District heating utility
- Qingdao, China
- Residential facilities
- 20,000 pcs. SonoSelect™ / SonoSafe™



- District heating utility
- Qinhuangdao, China
- Residential facilities
- 34,000 pcs. SonoSelect™ / SonoSafe™



- District heating utility
- Moscow, Russia
- Residential and commercial facilities
- 1,200 pcs. SonoSelect™ / SonoSafe™



- Binko Yapi
- Konya, Turkey
- Residential apartments
- 750 pc. SonoSelect™



- Koza park
- Istanbul, Turkey
- Residential apartments
- 2,145 pc. SonoSafe™



- Officium
- Ankara, Turkey
- Offices and shopping centre
- 120 pc. SonoSelect™ / SonoSafe™ / SonoMeter™ 30



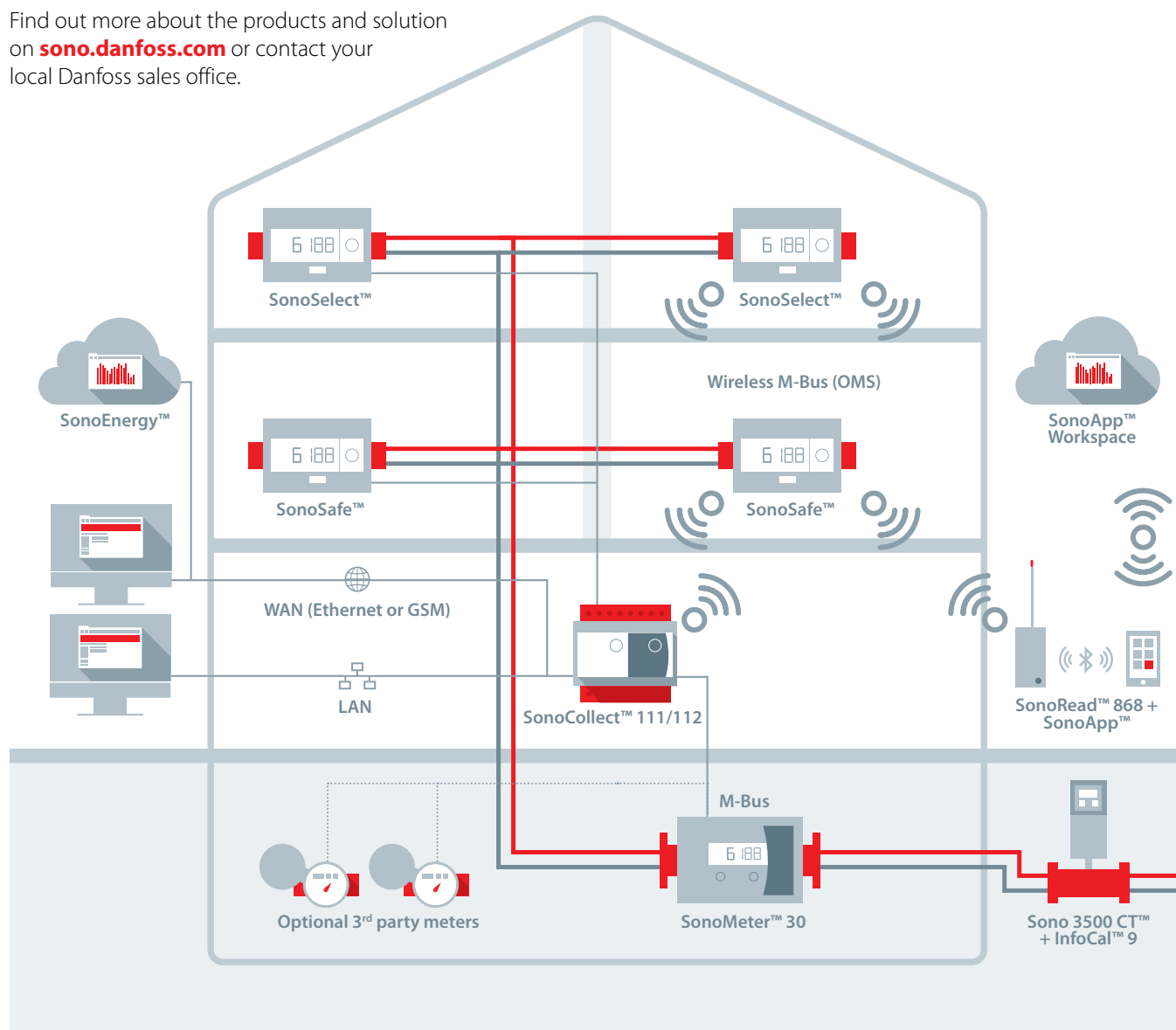
- Akademicheskii
- Ekaterinburg, Russia
- Residential apartments
- 2,500 pcs. SonoSafe™



# Danfoss Energy metering **solutions**

Danfoss offers a range of high quality energy metering products to measure, store and analyze heat and cooling consumption in buildings. With the Danfoss Energy Meter reading options the registered data can be accessed and managed from any place, creating wins at all project stages.

Find out more about the products and solution on [sono.danfoss.com](https://sono.danfoss.com) or contact your local Danfoss sales office.



## Danfoss A/S

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