

Data Sheet

SonoMeter 30

Energy Meters

Description



The Danfoss SonoMeter 30 is a range of ultrasonic, compact energy meters intended for measuring energy consumption in heating and cooling applications for billing purposes. The meters are designed for remote meter read-out (AMR).

SonoMeter 30 energy meters consist of an ultrasonic flow sensor, a pair of Pt500 temperature sensors and a calculator with integrated circuits for temperature measurement, flow calculation and energy calculation.

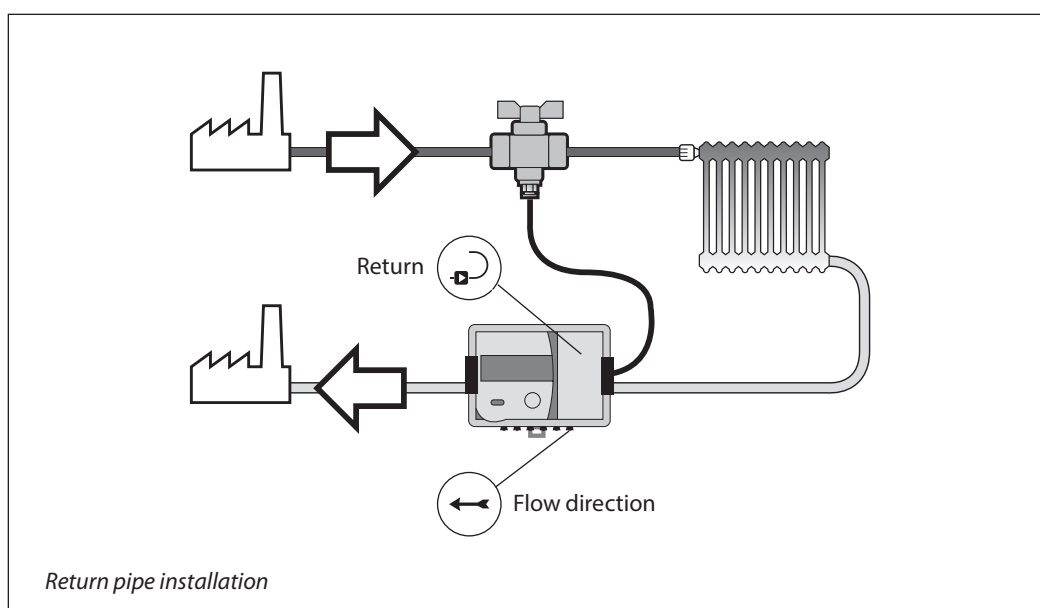
Features

- Available in nominal flow rates qp 0.6, 1.5, 2.5, 3.5, 6.0, 10.0, 15.0, 25.0, 40.0 and 60m³/h
- Housings with thread (G3/4 to G2) or flange (DN20 to DN100) connections
- MID approval for ultrasonic energy meter with dynamic range of 1:100 (qi:qp) in class 2
- Optional MID approved dynamic range of 1:250 in class 2 for qp 1.5, 2.5, 6.0, 10 and 15 m³/h
- Temperature range 5 - 130° C, PN 16 or 25 bar
- Short overload temperature up to 150° C
- Glycol mixtures as option up to incl. DN50 (not MID certified)
- Calculator with IP65 protection class as standard
- Flow sensor with IP65 protection class as standard (IP67 for combine heating and cooling applications)
- Return or supply pipe installation, for vertical or horizontal mounting
- Battery lifetime for at least 11 years
- Low pressure loss, insensitive to dirt
- No calming sections needed before or after the flow sensor (DN15-DN50)
- for DN65 to DN100 calming sections are needed (5xDN on inlet and 3 x DN on outlet of flow sensor)
- Remote reading via M-Bus, radio OMS 868 MHz, RS-485 Modbus RTU, pulse output or optical interface
- Two pulse inputs or outputs as standard(default delivered as pulse output - can be changed)

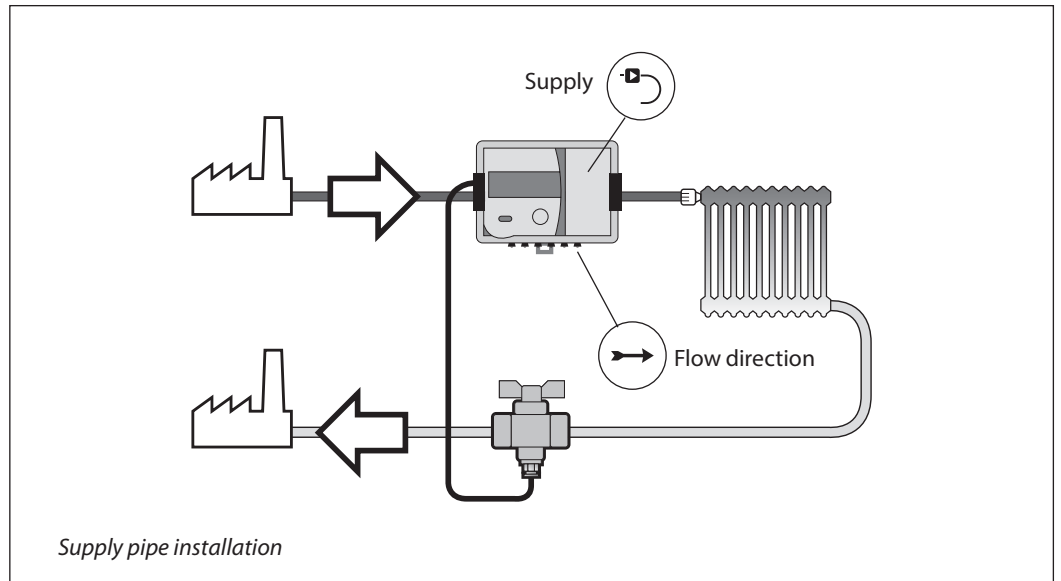
Technical specifications

Diameter	DN 15			DN 20			DN 25			DN 32			DN 40			DN 50			DN 65			DN 80			DN 100					
Connection type	G¾B	G1B	FL	G¾B	G1B	FL	G1B	G1B	FL	G1¼B	FL	G1¼B	FL	G2B	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL		
Overall length, mm	110	190	110	190	130	130	190	260	260	300	270	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Flow rate:																														
Nominal (m³/h)	0.6			1.5			2.5			3.5			6			10			15			25			40			60		
Maximum (m³/h)	1.2			3			5			7			12			20			30			50			80			120		
Standard min. (l/h)	6			15			25			35			60			100			150			0.25			0.4			0.6		
Pressure loss at qp (mbar)	70	9	171	58	72	198	94	40	100	180	120	200	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Kvs values (for nominal flow)	2.27	6.32	3.63	6.23	5.59	5.62	8.15	17.50	18.97	23.57	43.50	55.9	94.3	141.4																
Max. operating pressure	16 bar / 25 bar																													
Flow sensor temp. range	5 to 130°C (short overload to 150°C)																													
Flow sensor cable length	1.2m, 2.5m and 5m (optional)																													
Medium	Water quality with pH 7 to 9.5																													
Measuring cycles	Volume every 1 sec., energy, temperature sensors and display update every 16 sec.																													
Temperature sensors	Pt 500 ø 5.2 mm with 2-wire leads																													
Temp. sensor cable length	1.5m optional 3m, 5m and 10m cable																													
Max. temp. diff. (Δθmax)	150 K																													
Min. temp. diff. (Δθmin)	3.0 K																													
Starting temp. diff. (Δθ)	0.15 K																													
Temp. measuring range	0 to 180°C																													
Supply voltage	3.6 V DC Lithium-battery (AA cell) / Mains supply 24 V AC/DC. Mains supply 230 V AC (with external 230 V AC to 24 V AC transformer).																													
Battery life time	min. 11 years (including AMR communication)																													
Approval	EN1434 class 2																													
Environmental class	EN1434 class C																													
Ambient class	class E2 + M1																													
Protection class	Calculator: IP 65; Flow sensor: IP 65 (IP67 for heat and cooling meter)																													
Ambient operating temp.	Calculator: 5 to 55°C; Flow sensor: -30 to 55°C																													
Ambient storage and transportation temp.	5 to 55°C																													
Max. ambient humidity	93% rel. humidity																													
Display	LCD, 8-digit																													
Display units	MWh - kWh - GJ - Gcal - °C - m³ - m³/h																													
Display values	Energy - volume - flow rate - power - temperatures																													

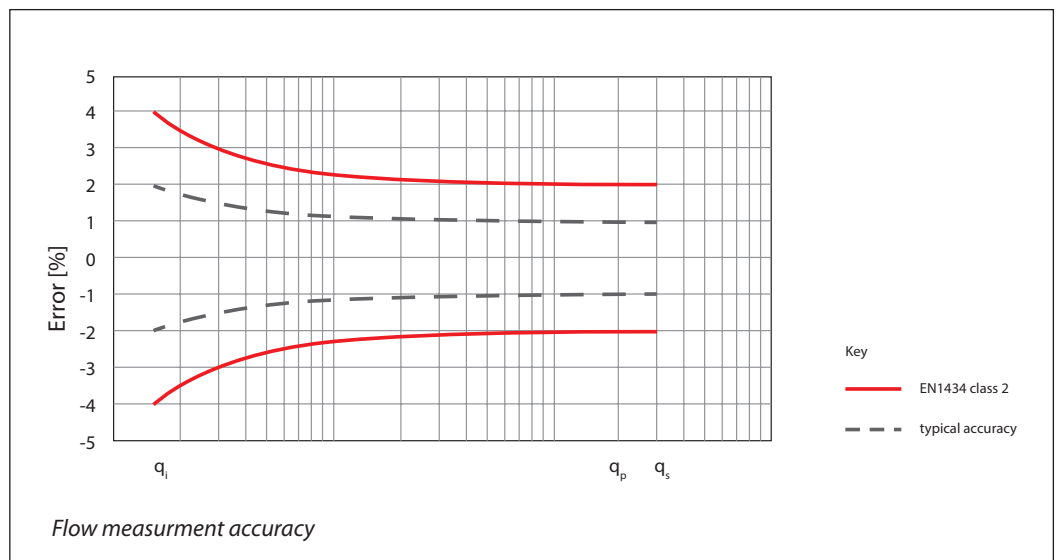
Application drawings



Application drawings
(continuous)



Accuracy



Design and function

Optical interface

Optical interface is integrated into the front panel of the calculator. It is designed for data reading via M-bus protocol and parameterization of the meter using SonoMeter 30 UserConfig software and optical head OG-1-USB.

The optical interface is activated by pressing the control button and shuts automatically off 5 minutes after the last pressing button or after completing data transmission via interface.

Wired M-Bus interface

The energy meter has 1 slot for an additional communication module. The internal M-Bus module provides data reading possibility via M-Bus protocol:

- M-Bus protocol according to EN13757-3 standard
- 2-wire with polarity reversal protection
- Electrical isolation
- Maximum voltage 50 V DC
- Current drawn: one M-Bus load (1.5 mA)
- Primary or secondary addressing
- Baud rate 2400 bps
- Battery lifetime min. 11 years (2 AA cell)
- Battery supply communication is limited on every 15 min at 2400 baud rate or faster, 70 meters on bus
- Fastest reading interval at mains supply: no limits

Radio OMS 868.95 MHz interface

The module can provide data reading via radio module:

- Wireless M-Bus protocol according to EN13757-4
- OMS (open metering system) compatible, compliant to OMS 4.0.2
- T1 mode (unidirectional)
- Sending interval every 90 seconds (suitable for 'walk by' readings)

Modbus RS-485 module

RS-485 module is Modbus RTU protocol and a serial interface for communication with external devices.

Baud rate	1200, 2400, 4800, 9600(default), 38400, 56000, 57600, 115200 bps
Power supply	Polarity independent connection for power supply – connectors 60 and 61. Voltage 12-24 V AC/DC. Maximum power consumption 2 W max. Typical supply current 50 mA.

2 pulse inputs or 2 pulse outputs (set up by jumpers)

There is a connector J on the calculator plate between the temperature sensors and pulse input / output connection terminals. By means of connecting or opening the connector contacts, the pulse inputs or outputs are activated.

Note: On delivery the heat meter is configured with two outputs.

Pulse inputs (not default, jumper set needed)

Number of pulse inputs	2
Measurement units	m ³ (51, 52), kWh (52, 53) or MWh, GJ, GCal
Pulse value	programmable by SonoMeter 30 UserConfig Software
Min. pulse time	100 ms
Pulse type	IB by class IB according to EN1434-2
Max. frequency of input pulses	3 Hz
Max. voltage of input pulses	3.6 V

Pulse outputs (default, no jumper set)

Number of pulse outputs	2
Measurement units	m ³ (51, 52), kWh (52, 53) or MWh, GJ, GCal,
Pulse value	according to the table below
Pulse type	open collector, permissible current up to 20 mA, voltage up to 50 V, class OB according to EN1434-2
Max. frequency of output pulses	3 Hz
Pulse duration	100 ms in normal mode, 1.6 ms in the test mode

Design and function
(continuous)

Energy pulse output values (V1)

Energy units	kWh or MWh	GJ	Gcal
Pulse value of thermal energy	1 kWh/pulse	0.005 GJ/pulse	0.001 Gcal/pulse

Volume pulse output values (V2)

Nominal flow rate (qp), m ³ /h	0.6 - 6	10; 15
Pulse value, l/pulse	1	10

Data logger

Data logger

Following hourly, daily and monthly parameter values are recorded in energy meter memory (can be configured by SonoMeter 30 UserConfig software):

- 1..... Integrated heating energy
- 2..... Integrated cooling energy
- 3..... Integrated energy of tariff 1
- 4..... Integrated energy of tariff 2
- 5..... Integrated volume of liquid
- 6..... Integrated pulse value in pulse input 1
- 7..... Integrated pulse value in pulse input 2
- 8..... Maximum thermal power value for heating and date
- 9..... Maximum thermal power value for cooling and date
- 10.... Maximum flow rate value and date
- 11.... Maximum value of flow temperature of heat conveying liquid and date
- 12.... Maximum value of return temperature of heat conveying liquid and date
- 13.... Minimum value of flow temperature of heat conveying liquid and date
- 14.... Minimum value of return temperature of heat conveying liquid and date
- 15.... Minimum value of temperature difference and date
- 16.... Average value of flow temperature of heat conveying liquid
- 17.... Average value of return temperature of heat conveying liquid
- 18.... Operating time without an error of thermal energy calculation
- 19.... Total error code
- 20.... Time when the flow rate exceeded 1.2 qs
- 21.... Time when the flow rate was less than qi

Data logger capacity

- up to 1480 h – for hourly records
- up to 1130 days - for daily records
- up to 36 last months - for monthly records
- Storage time of measured integrated parameters even if device is disconnected from power supply: not less than 15 years

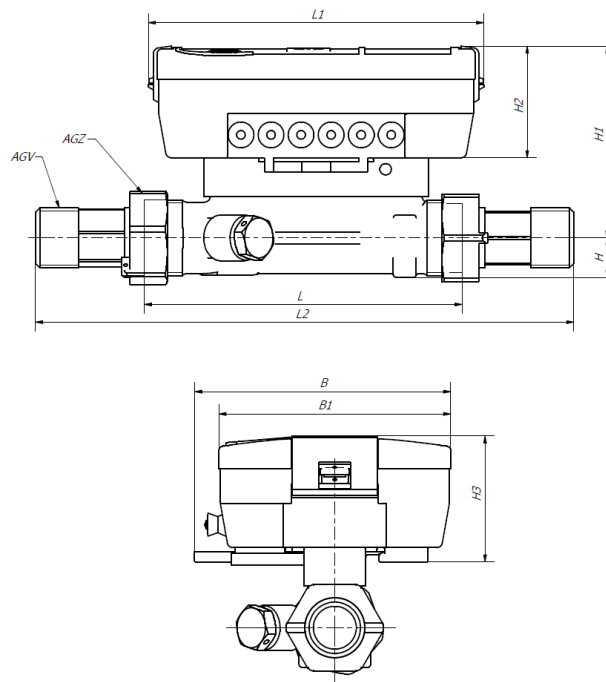
All data from archive can be read by means of the remote reading. In addition data logger records of monthly parameters can be seen on the display.

Power supply

Power supply (one of following depending on meter configuration):

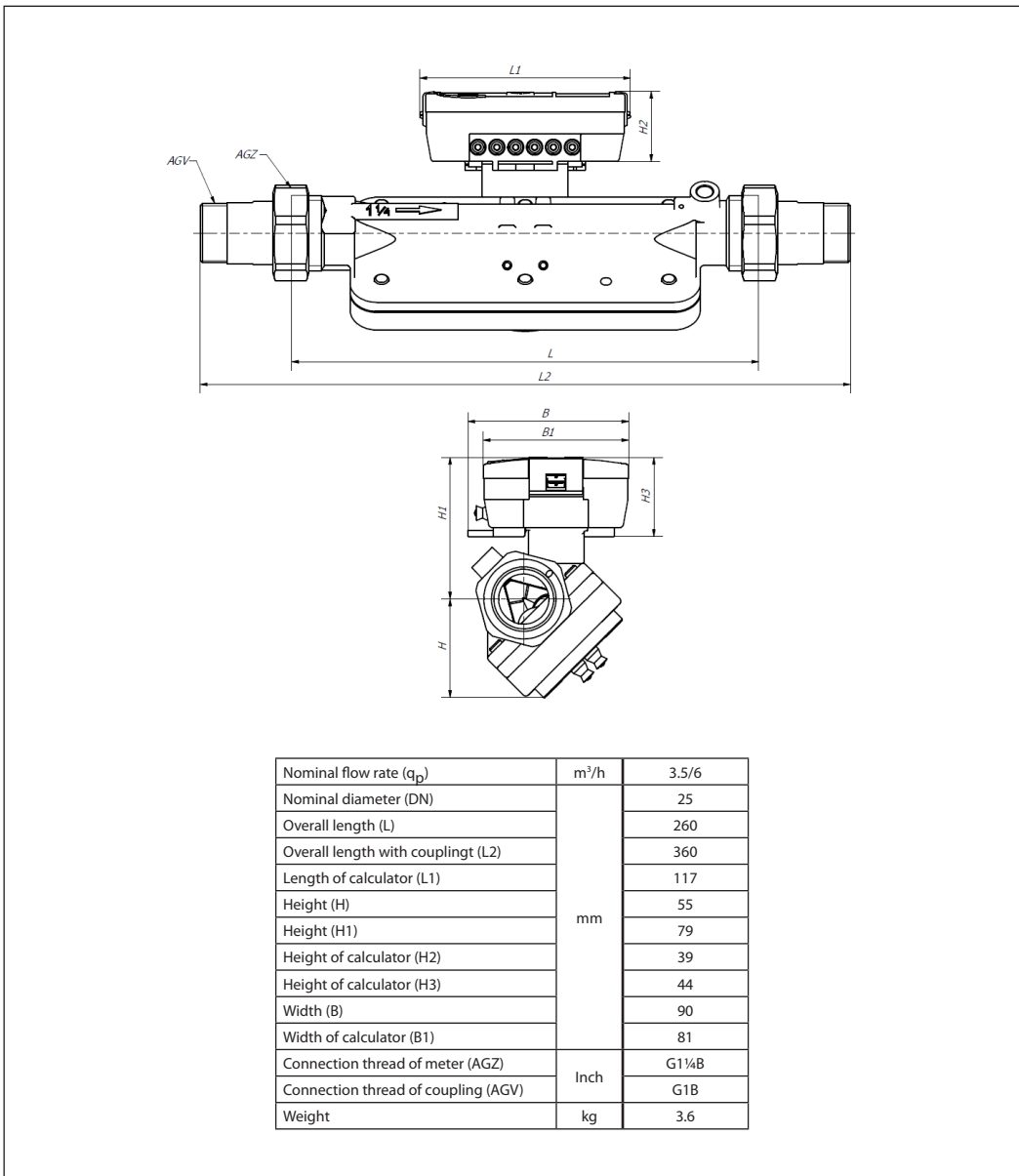
- 2 AA cell battery 3.6 V DC, 2.4 Ah (Li-SOCl₂) lithium battery, life time at least 11 years
- Mains power supply 12 V AC to 36 V AC (50/60 Hz) or 12 V DC to 42 V DC:
 - The mains power supply 24V AC/DC module is mounted inside in the meter
 - Consumption is max 20 mA
 - Galvanically isolated + internal backup battery size AA cell, 3.6 V, 2.4 Ah, lithium battery (Li-SOCl₂). When the external power supply is turned off, the battery life time is not less than 11 years (without data reading via a digital interface)
- Mains power supply 230 V AC (+10% / -30%) 50/60Hz:
 - The meter should be equipped with an internal power supply unit and an external transformer. The 230 V AC to 24 V AC transformer is used for connection to mains power supply 24 V AC/DC module inside the meter
 - Consumption is max 10 mA

**Dimensions,
DN15, DN20 thread**

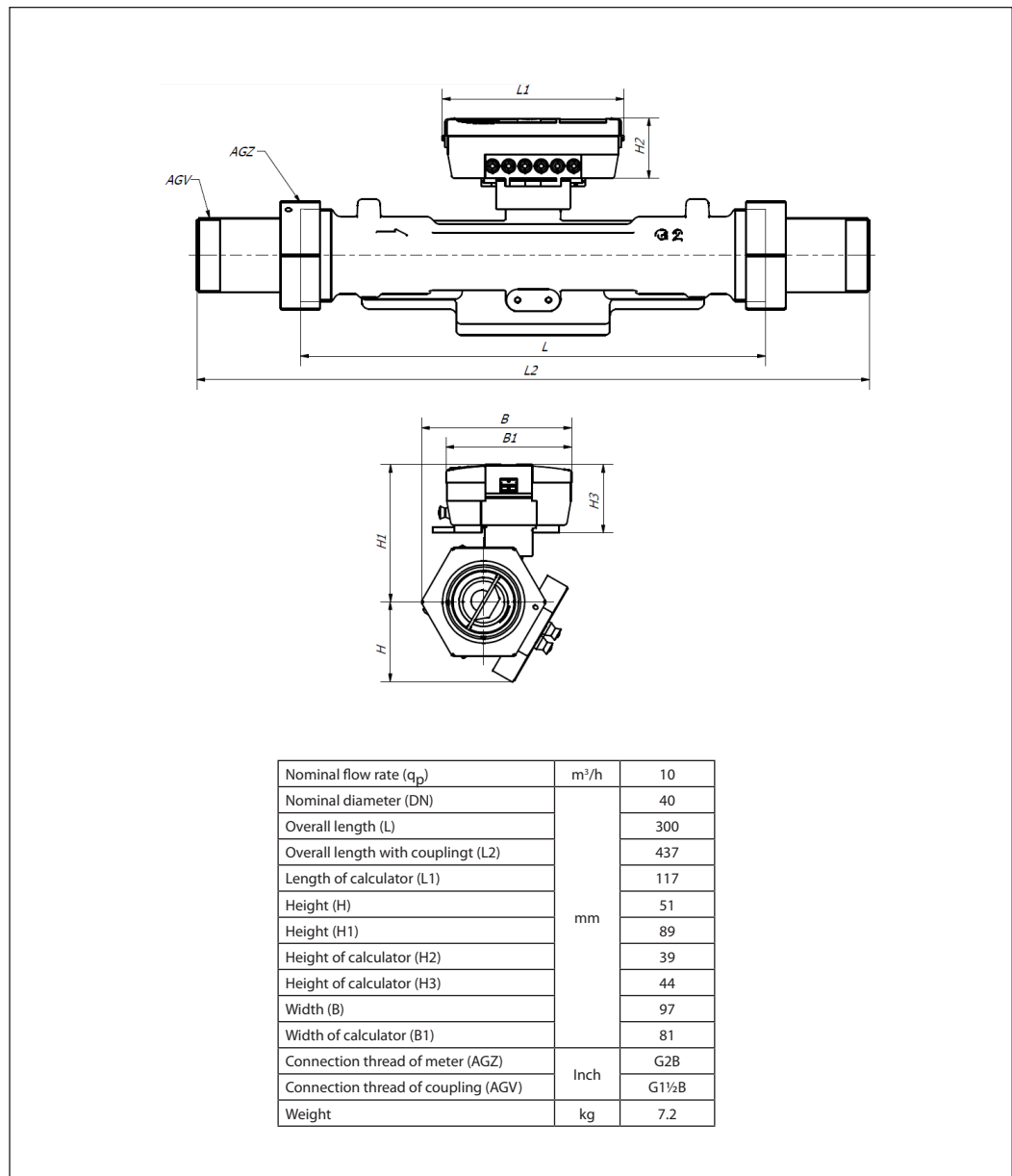


Nominal flow rate (q _p)	m ³ /h	0.6/1/1.5	1.5 / 2.5	0.6/1/1.5/2.5	
Nominal diameter (DN)		15	20	20	
Overall length (L)		110	130	190	
Overall length with coupling (L2)		185	224	284	
Length of calculator (L1)		117	117	117	
Height (H)		14	18	18	
Height (H1)	mm	67	67	68	
Height of calculator (H2)		39	39	39	
Height of calculator (H3)		44	44	44	
Width (B)		90	90	90	
Width of calculator (B1)		81	81	81	
Connection thread of meter (AGZ)		Inch	G¾B	G1B	G1B
Connection thread of coupling (AGV)			G½B	G¾B	G¾B
Weight	kg	0.8	0.9	1.0	

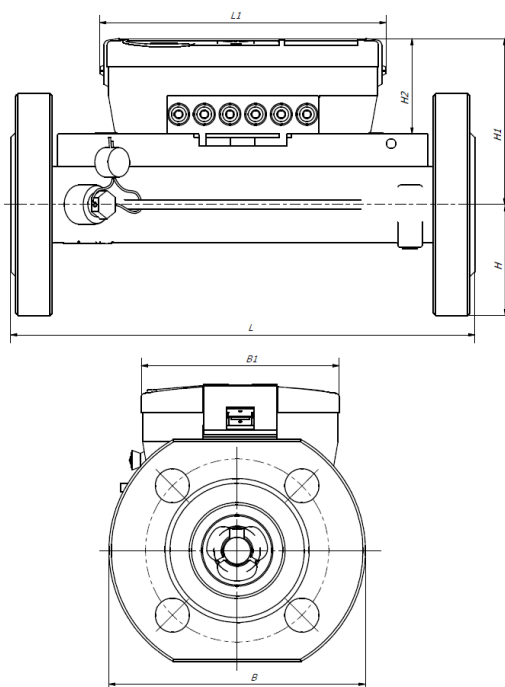
**Dimensions,
DN25 thread**



**Dimensions,
DN40 thread**



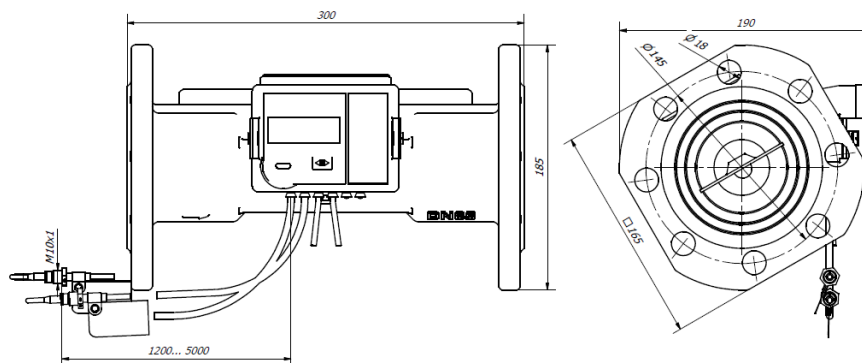
**Dimensions,
DN20, DN25, DN40,
DN50 flange**



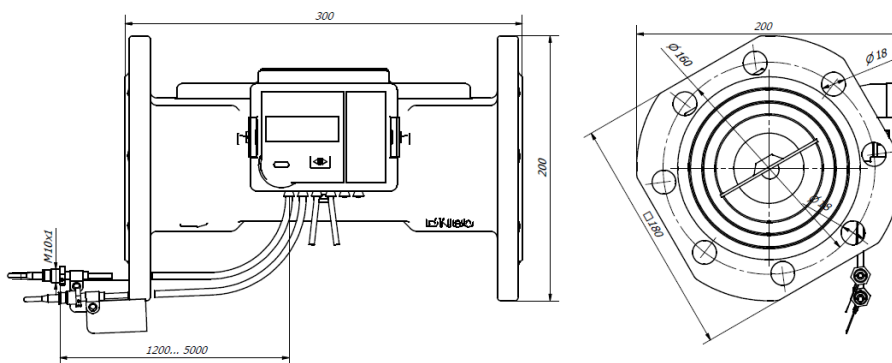
Nominal flow rate (q_p)	m ³ /h	0.6/1/1.5/2.5	3.5/6	10	15
Nominal diameter (DN)	mm	20	25	40	50
Overall length (L)		190	260	300	270
Length of calculator (L1)		117	117	117	117
Height (H)		46	58	73	79
Height (H1)		68	78	91	90
Height of calculator (H2)		39	39	39	39
Width (B)		105	116	150	159
Width of calculator (B1)		81	81	81	81
Connection flange of meter (DNFL)		20	25	40	50
Weight		kg	2.5	5.6	6.8

Dimensions,
DN65, DN80, DN100

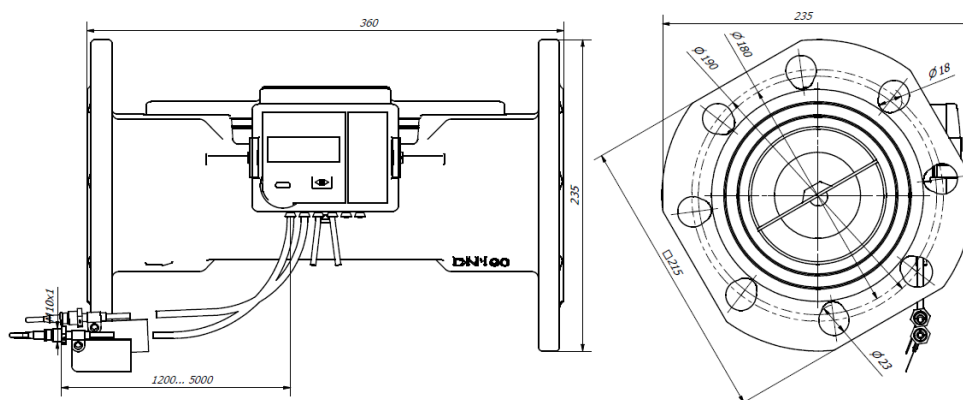
DN 65



DN 80



DN 100



Nominal flow rate (qp)	m ³ /h	25	40	60
Nominal diameter (DN)		65	80	100
Overall length (L)		300	300	360
Length of calculator (L1)		117	117	117
Height of calculator (H2)		44	44	44
Width (B)	mm	165	180	180
Width of calculator (B1)		90	90	90
Holes		18	18	18
Central pipe diameter		145	160	190
Weight	kg	13	15	18

Ordering

Energy meter application	Nominal flow, size and connection type	Comm. module	Energy unit	Installation	Temp. sensors length	Flow cable length ¹⁾	PN (bar)	Code no.
Heating	DN 15 / G¾B / qp 0.6 m³/h / 110 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3001
Heating	DN 15 / G¾B / qp 0.6 m³/h / 110 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3002
Heating / cooling	DN 15 / G¾B / qp 0.6 m³/h / 110 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3008
Heating / cooling	DN 15 / G¾B / qp 0.6 m³/h / 110 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3009
Heating	DN 15 / G¾B / qp 1.5 m³/h / 110 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3015
Heating	DN 15 / G¾B / qp 1.5 m³/h / 110 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3016
Heating / cooling	DN 15 / G¾B / qp 1.5 m³/h / 110 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3022
Heating / cooling	DN 15 / G¾B / qp 1.5 m³/h / 110 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3023
Heating	DN 20 / G1B / qp 1.5 m³/h / 130 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3130
Heating	DN 20 / G1B / qp 1.5 m³/h / 130 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3131
Heating / cooling	DN 20 / G1B / qp 1.5 m³/h / 130 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3134
Heating / cooling	DN 20 / G1B / qp 1.5 m³/h / 130 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3135
Heating	DN 20 / G1B / qp 2.5 m³/h / 130 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3029
Heating	DN 20 / G1B / qp 2.5 m³/h / 130 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3030
Heating / cooling	DN 20 / G1B / qp 2.5 m³/h / 130 mm thread	M-Bus	kWh	Return	1.5 m	1.2 m	16 bar	187F3036
Heating / cooling	DN 20 / G1B / qp 2.5 m³/h / 130 mm thread	OMS 868.95	kWh	Return	1.5 m	1.2 m	16 bar	187F3037
Heating	DN 25 / G1¼B / qp 3.5 m³/h / 260 mm thread	M-Bus	kWh	Return	2.0 m	1.2 m	16 bar	187F3043
Heating	DN 25 / G1¼B / qp 3.5 m³/h / 260 mm thread	OMS 868.95	kWh	Return	2.0 m	1.2 m	16 bar	187F3044
Heating / cooling	DN 25 / G1¼B / qp 3.5 m³/h / 260 mm thread	M-Bus	kWh	Return	2.0 m	1.2 m	16 bar	187F3050
Heating / cooling	DN 25 / G1¼B / qp 3.5 m³/h / 260 mm thread	OMS 868.95	kWh	Return	2.0 m	1.2 m	16 bar	187F3051
Heating	DN 25 / G1¼B / qp 6 m³/h / 260 mm thread	M-Bus	kWh	Return	2.0 m	1.2 m	16 bar	187F3057
Heating	DN 25 / G1¼B / qp 6 m³/h / 260 mm thread	OMS 868.95	kWh	Return	2.0 m	1.2 m	16 bar	187F3058
Heating / cooling	DN 25 / G1¼B / qp 6 m³/h / 260 mm thread	M-Bus	kWh	Return	2.0 m	1.2 m	16 bar	187F3064
Heating / cooling	DN 25 / G1¼B / qp 6 m³/h / 260 mm thread	OMS 868.95	kWh	Return	2.0 m	1.2 m	16 bar	187F3065
Heating	DN 40 / G2B / qp 10 m³/h / 300 mm thread	M-Bus	kWh	Return	2.0 m	2.5 m	25 bar	187F3071
Heating	DN 40 / G2B / qp 10 m³/h / 300 mm thread	OMS 868.95	kWh	Return	2.0 m	2.5 m	25 bar	187F3072
Heating / cooling	DN 40 / G2B / qp 10 m³/h / 300 mm thread	M-Bus	kWh	Return	2.0 m	2.5 m	25 bar	187F3078
Heating / cooling	DN 40 / G2B / qp 10 m³/h / 300 mm thread	OMS 868.95	kWh	Return	2.0 m	2.5 m	25 bar	187F3079
Heating	DN 40 / qp 10 m³/h / 300 mm flange	M-Bus	kWh	Return	2.0 m	2.5 m	25 bar	187F3085
Heating	DN 40 / qp 10 m³/h / 300 mm flange	OMS 868.95	kWh	Return	2.0 m	2.5 m	25 bar	187F3086
Heating / cooling	DN 40 / qp 10 m³/h / 300 mm flange	M-Bus	kWh	Return	2.0 m	2.5 m	25 bar	187F3092
Heating / cooling	DN 40 / qp 10 m³/h / 300 mm flange	OMS 868.95	kWh	Return	2.0 m	2.5 m	25 bar	187F3093
Heating	DN 50 / qp 15 m³/h / 270 mm flange	M-Bus	kWh	Return	2.0 m	2.5 m	25 bar	187F3099
Heating	DN 50 / qp 15 m³/h / 270 mm flange	OMS 868.95	kWh	Return	2.0 m	2.5 m	25 bar	187F3100
Heating / cooling	DN 50 / qp 15 m³/h / 270 mm flange	M-Bus	kWh	Return	2.0 m	2.5 m	25 bar	187F3106
Heating / cooling	DN 50 / qp 15 m³/h / 270 mm flange	OMS 868.95	kWh	Return	2.0 m	2.5 m	25 bar	187F3107
Heating	DN65 qp25m³/h flange 300mm	no module	MWh	Supply	3.0m	2.5m	PN25	187F3671
Heating	DN65 qp25m³/h flange 300mm	no module	MWh	Return	3.0m	2.5m	PN25	187F3672
Heating	DN65 qp25m³/h flange 300mm	Wired M-Bus	MWh	Supply	3.0m	2.5m	PN25	187F3673
Heating	DN65 qp25m³/h flange 300mm	Wired M-Bus	MWh	Return	3.0m	2.5m	PN25	187F3674
Heating	DN65 qp25m³/h flange 300mm	Radio OMS 868.95	MWh	Supply	3.0m	2.5m	PN25	187F3675
Heating	DN65 qp25m³/h flange 300mm	Radio OMS 868.95	MWh	Return	3.0m	2.5m	PN25	187F3676
Heating/cooling	DN65 qp25m³/h flange 300mm	Wired M-Bus	MWh	Return	3.0m	2.5m	PN25	187F3677
Heating/cooling	DN65 qp25m³/h flange 300mm	Radio OMS 868.95	MWh	Return	3.0m	2.5m	PN25	187F3678
Heating	DN80 qp40m³/h flange 300mm	no module	MWh	Supply	3.0m	2.5m	PN25	187F3679
Heating	DN80 qp40m³/h flange 300mm	no module	MWh	Return	3.0m	2.5m	PN25	187F3680
Heating	DN80 qp40m³/h flange 300mm	Wired M-Bus	MWh	Supply	3.0m	2.5m	PN25	187F3681
Heating	DN80 qp40m³/h flange 300mm	Wired M-Bus	MWh	Return	3.0m	2.5m	PN25	187F3682
Heating	DN80 qp40m³/h flange 300mm	Radio OMS 868.95	MWh	Supply	3.0m	2.5m	PN25	187F3683
Heating	DN80 qp40m³/h flange 300mm	Radio OMS 868.95	MWh	Return	3.0m	2.5m	PN25	187F3684
Heating/cooling	DN80 qp40m³/h flange 300mm	Wired M-Bus	MWh	Return	3.0m	2.5m	PN25	187F3685
Heating/cooling	DN80 qp40m³/h flange 300mm	Radio OMS 868.95	MWh	Return	3.0m	2.5m	PN25	187F3686
Heating	DN100 qp60m³/h flange 360mm	no module	MWh	Supply	3.0m	2.5m	PN25	187F3687
Heating	DN100 qp60m³/h flange 360mm	no module	MWh	Return	3.0m	2.5m	PN25	187F3688
Heating	DN100 qp60m³/h flange 360mm	Wired M-Bus	MWh	Supply	3.0m	2.5m	PN25	187F3689
Heating	DN100 qp60m³/h flange 360mm	Wired M-Bus	MWh	Return	3.0m	2.5m	PN25	187F3690
Heating	DN100 qp60m³/h flange 360mm	Radio OMS 868.95	MWh	Supply	3.0m	2.5m	PN25	187F3691
Heating	DN100 qp60m³/h flange 360mm	Radio OMS 868.95	MWh	Return	3.0m	2.5m	PN25	187F3692
Heating/cooling	DN100 qp60m³/h flange 360mm	Wired M-Bus	MWh	Return	3.0m	2.5m	PN25	187F3693
Heating/cooling	DN100 qp60m³/h flange 360mm	Radio OMS 868.95	MWh	Return	3.0m	2.5m	PN25	187F3694

¹⁾ Cable length between flow sensor and energy calculator.

DN15 and DN 20 meters with thread has one temperature sensor mounted in the body.
 All above codes are battery powered meters with two 3.6 V AA cell batteries (lifetime min 11 years).
 More standard codes are available at www.danfoss.com.
 Codes with special specifications are available as build up codes - if needed contact your local department.

Accessories

Product	Designation	Quantity	Code no.
Optical head	Optical head	1 pc.	187F3112
Power supply	Battery 3.6 V DC (AA cell)	1 pc.	187F3113
Power supply	Mains unit 230 V AC (external module)	1 pc.	187F3114
Power supply	Mains unit 24 V AC	1 pc.	187F3115
Communication module	M-Bus module	1 pc.	187F3116
Communication module	Radio OMS 868.95 MHz	1 pc.	187F3117
Communication module	RS-485 Modbus	1 pc.	187F3118
Temperature sensor	Pt 500 / f 5.2 mm / 1.5 m cable, MID	1 pc.	187F3125
Temperature sensor	Pt 500 / f 5.2 mm / 2 m cable, MID	1 pc.	187F3126
Temperature sensor	Pt 500 / f 5.2 mm / 3 m cable, MID	1 pc.	187F3127
Sensor pockets	Ø 5.2 mm, brass, 35 mm length	1 pair	087G6053
Sensor pockets	Ø 5.2 mm, brass, 52 mm length	1 pair	087G6054
Sensor pockets	Ø 5.2 mm, brass, 85 mm length	1 pair	087G6055
Sensor pockets	Ø 5.2 mm, brass, 120 mm length	1 pair	087G6056
Sensor pockets	Ø 5.2 mm, stainless steel, 85 mm length	1 pair	087G6057
Sensor pockets	Ø 5.2 mm, stainless steel, 120 mm length	1 pair	087G6058
Tailpiece connection set	Tailpiece connection set DN15 G3/4"-R1/2" PN25 130°C	pair	087G6071
Tailpiece connection set	Tailpiece connection set DN20 G1"-R3/4" PN25 130°C	pair	087G6072
Tailpiece connection set	Tailpiece connection set DN25 G1 1/4"-R1" PN25 130°C	pair	087G6073
Adapter for temperature sensor	R½ x M10 x 1	1 pc.	087G6075
Adapter for temperature sensor	R½ x M10 x 1	32 pcs.	087G6076
Plastic installation set for temperature sensors	Fittings PN16 95°C	20 pcs.	087G6077
Brass installation set for temperature sensors	Fittings PN16 130°C	20 pcs.	087G6078
Ball valve	G½" internal thread, Pt sensor connection M10	1 pc.	187F0593
Ball valve	G½" internal thread, Pt sensor connection M10	12 pcs.	087H0118
Ball valve	G¾" internal thread, Pt sensor connection M10	1 pc.	187F0592
Ball valve	G¾" internal thread, Pt sensor connection M10	12 pcs.	087H0119
Ball valve	G1" internal thread, Pt sensor connection M10	1 pc.	187F0591
Ball valve	G1" internal thread, Pt sensor connection M10	12 pcs.	087H0120
Brass-pockets, 40 mm, f6.0 pair	Fittings PN25 130°C	pair	087G6061
Brass-pockets, 85 mm, f6.0 pair	Fittings PN25 130°C	pair	087G6062
Brass-pockets, 120 mm, f6.0 pair	Fittings PN25 130°C	pair	087G6063
Stainless steel-pockets, 85mm f6.0 pair	Fittings PN25 130°C	pair	087G6064
Stainless steel-pockets, 120mm f6.0 pair	Fittings PN25 130°C	pair	087G6065
Stainless steel-pockets, 155mm f6.0 pair	Fittings PN25 130°C	pair	087G6066
Stainless steel-pockets, 210mm f6.0 pair	Fittings PN25 130°C	pair	087G6067

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