

Data Sheet

SonoSelect 10 and SonoSafe 10 energy meters

Description

The Danfoss SonoSelect 10 and SonoSafe 10 are ultrasonic compact energy meters intended for measuring energy consumption in heating applications for billing purposes. The meters are designed for remote meter read-out (AMR).

The energy meters consist of an ultrasonic flow sensor, a pair of Pt1000 temperature sensors and a calculator with integrated circuits for temperature measurement, flow calculation and energy calculation.



Feature highlights:

- Proven ultrasonic measuring principle designed for long operating life time
- No calming section or inlet/outlet restrictions
- Low pressure drop down to 0.03 bar at q_p
- Large 85 x 35 mm LCD display with 8 digits (11.5 mm high), guiding menu and info panel
- Compact design
- Extensive change and error log
- Memory: 2 years of data, yearly and monthly values stored (incl. pulse input)
- Upgradable with communication modules
- Battery is replaceable
- Communication baud rate 300, 2400, 4800 and 9600 bps
- SonoApp usable for Android (Bluetooth LE via dongle)

Special features:	SonoSelect 10	SonoSafe 10
Battery	• 16 + 1 years battery life	• 10 + 1 years battery life
Flexibility	• Supply and return can be configured on site • Energy units can be configured on site • Slot for communication upgrade • 1.5 m cable PUR between calculator and flow sensor allow for flexible installation, e.g. in flat stations	• Slot for communication upgrade • 0.5 m cable PVC between calculator and flow sensor
Safe	• EN1434 class 2 + flow and energy calculated every 0.5 second • Tamper monitor sets alarm if meter is opened by unauthorized personnel • Diagnostic function to secure confidence in meter data • IP65 calculator • Reverse flow indication	• EN1434 class 2 + flow and energy calculated every 2 seconds • IP54 calculator
SonoApp	• Installer tool (Guides and configure e.g. AMR, Pulse, units, supply/return) • Commissioning tool (Link location to serial number) • Operation tool (data read out and display function + diagnostic)	• Operation tool (data read out and display function)

Ordering
SonoSelect 10

Meter size	Communication	Energy unit	Installation	Code no.
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0068
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0069
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0081
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0082
DN20 qp 1.5 G1A 130 mm ¹⁾	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0094
DN20 qp 1.5 G1A 130 mm ¹⁾	Wireless OMS 868.95 MHz with 2 pulse input	kWh	Supply	014U0095
DN20 qp 2.5 G1A 130 mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0107
DN20 qp 2.5 G1A 130 mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0108
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0120
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0121
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Return	014U0165
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Supply	014U0166
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Return	014U0167
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Supply	014U0168
DN20 qp 1.5 G1A 130 mm ¹⁾	With integrated M-Bus	kWh	Return	014U0169
DN20 qp 1.5 G1A 130 mm ¹⁾	With integrated M-Bus	kWh	Supply	014U0170
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus	kWh	Return	014U0171
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus	kWh	Supply	014U0172
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	With integrated M-Bus	kWh	Return	014U0173
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	With integrated M-Bus	kWh	Supply	014U0174
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0183
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0184
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0185
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0186
DN20 qp 1.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0187
DN20 qp 1.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0188
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0189
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0190
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0191
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0192

¹⁾ Add extension pipe 014U1957 for length of 190 mm.

²⁾ Add extension pipe 014U1958 for length of 260 mm.

Ordering
SonoSafe 10

Meter size	Communication	Energy unit	Installation	Code no.
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	None	kWh	Return	014U0001
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	None	kWh	Supply	014U0002
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Return	014U0003
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Supply	014U0004
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	None	kWh	Return	014U0005
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	None	kWh	Supply	014U0006
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Return	014U0007
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus	kWh	Supply	014U0008
DN20 qp 1.5 G1A 130 mm ¹⁾	None	kWh	Return	014U0009
DN20 qp 1.5 G1A 130 mm ¹⁾	None	kWh	Supply	014U0010
DN20 qp 1.5 G1A 130 mm ¹⁾	With integrated M-Bus	kWh	Return	014U0011
DN20 qp 1.5 G1A 130 mm ¹⁾	With integrated M-Bus	kWh	Supply	014U0012
DN20 qp 2.5 G1A 130 mm	None	kWh	Return	014U0013
DN20 qp 2.5 G1A 130 mm	None	kWh	Supply	014U0014
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus	kWh	Return	014U0015
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus	kWh	Supply	014U0016
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	None	kWh	Return	014U0017
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	None	kWh	Supply	014U0018
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	With integrated M-Bus	kWh	Return	014U0019
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm ²⁾	With integrated M-Bus	kWh	Supply	014U0020
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0203
DN15 qp 0.6 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0204
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0205
DN15 qp 1.5 G $\frac{3}{4}$ A 110 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0206
DN20 qp 1.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0207
DN20 qp 1.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0208
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0209
DN20 qp 2.5 G1A 130 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0210
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm	With integrated M-Bus, 2 pulse inputs	kWh	Return	014U0211
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160 mm	With integrated M-Bus, 2 pulse inputs	kWh	Supply	014U0212
DN15 qp 0.6 G $\frac{3}{4}$ A 110mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0235
DN15 qp 0.6 G $\frac{3}{4}$ A 110mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0236
DN15 qp 1.5 G $\frac{3}{4}$ A 110mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0237
DN15 qp 1.5 G $\frac{3}{4}$ A 110mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0238
DN20 qp 1.5 G1A 130mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0239
DN20 qp 1.5 G1A 130mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0240
DN20 qp 2.5 G1A 130mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0241
DN20 qp 2.5 G1A 130mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0242
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Return	014U0243
DN25 qp 3.5 G1 $\frac{1}{4}$ A 160mm	Wireless OMS 868.95 MHz with 2 pulse inputs	kWh	Supply	014U0244

¹⁾ Add extension pipe 014U1957 for length of 190 mm.

²⁾ Add extension pipe 014U1958 for length of 260 mm.

Accessories

Product	Designation	Quantity	Code no.
Tail piece set	DN15 R $\frac{1}{2}$ x G $\frac{3}{4}$	1 set	087G6071
Tail piece set	DN20 R $\frac{3}{4}$ x G1	1 set	087G6072
Tail piece set	DN25 R1 x G1 $\frac{1}{4}$	1 set	087G6073
Adaptor for temperature sensor	R $\frac{1}{2}$ x M10 x 1	1 pc.	087G6075
Adaptor for temperature sensor	R $\frac{1}{2}$ x M10 x 1	32 pcs.	087G6076
Ball valve	G $\frac{1}{2}$ " internal thread, Pt sensor connection M10	1 pc.	187F0593
Ball valve	G $\frac{1}{2}$ " internal thread, Pt sensor connection M10	12 pcs.	087H0118
Ball valve	G $\frac{3}{4}$ " internal thread, Pt sensor connection M10	1 pc.	187F0592
Ball valve	G $\frac{3}{4}$ " 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
Extension pipe, L = 60 mm	DN20 x G1	1 pc.	014U1957
Extension pipe, L = 100 mm	DN25 x G1 $\frac{1}{4}$	1 pc.	014U1958
Gasket	DN15	1 set	014U1964
Gasket	DN20	1 set	014U1965
Gasket	DN25	1 set	014U1966
O-ring mounting kit	O-ring \varnothing 4.3 x 2.4 + assembly tool	1 set	014U1967
Battery	Battery pack 1 AA cell	1 pc.	014U1968
Battery	Battery pack 2 AA cell	1 pc.	014U1969
Communication module	M-Bus module with 2 pulse inputs ¹⁾	1 pc.	014U1998
Communication module	Wireless OMS 868.95MHz with 2 pulse inputs ²⁾	1 pc.	014U1999
Communication module	2 pulse inputs	1 pc.	014U1995
Bluetooth dongle	IR2BLE	1 pc.	014U1963
Sealing kit	4 x wire with + 4 x snap lock seal	1 set	014U1962

¹⁾ Wired M-Bus to EN13757-3. Baud rate of 300, 2400, 4800 and 9600 supported. The two pulse inputs can be programmed independently of each other.

²⁾ Wireless M-Bus 868.95 MHz OMS and EN13757-4. T1 mode supported. The two pulse inputs can be programmed independently of each other.

**Technical specifications,
Complete energy meter**

Application	Heating		
Medium	Water quality with pH 7 to 9.5 VDI 2035, VdTÜV TCh 1466		
Approvals	EN1434 class 2, MID (DK-0200-MI004-034), CPA according to JGG225 -2010		
Measuring cycle	Flow: 0.5 sec. (SonoSelect 10), 2 sec. (SonoSafe 10) Energy: 0.5 sec. (SonoSelect 10), 2 sec. (SonoSafe 10) Temperature: 4 sec. (SonoSelect 10), 10 sec. (SonoSafe 10)		
Approved meteorological range	$\Delta\Theta$: 3 - 90K	Θ : 5 - 95°C	
Temperature limits (accounting)	$\Delta\Theta$: 0.25 - 100K	Θ : 0 - 105°C	
IP	65 (SonoSelect 10), 54 (SonoSafe 10)		
Cable strain relief	Withstand more than 5 kg		
Ambient operating temperature	Class A: 5 - 55° C		
Ambient storage temperature	-25 - 60° C		
Temperature media	5 - 95° C		
Humidity	<95%		
Vibration	Class M2		
EMC	Class E1		
Weight	DN15: 700 g	DN20: 800 g	DN25: 1100 g (160 mm)

**Technical specifications,
Calculator**

Battery	3.6 V DC lithium battery (1 or 2 AA-cells depending on lifetime)
Battery life time*	16+1 years (SonoSelect 10), 10+1 years (SonoSafe 10)
Display	85 x 35 mm LCD display with 8 digits (11.5 mm high main characters). Menu guide and info panel.
Units	MWh - kWh - GJ - Gcal - °C - K - m ³ - m ³ /h - l/h
Memory	2 years of data, yearly and monthly values stored (incl. pulse input)
Optical interface	Optical acc. to EN61107. Data protocol acc. to EN13757-3, supports 2400 or 4800 baud.
Communication	Wired M-Bus to EN13757-3, supports 300, 2400, 4800, 9600 baud. Delivered with 1 m cable (SonoSelect 10: PUR, SonoSafe 10: PVC)
Additional communication	1 slot for communication module (delivered from factory or later upgrade)

* Battery life time measured under following preconditions: enclosure temp. 45° C, communication every 15 min. at 2400 baud or faster, 80 meters on bus. For SonoSelect baudrate 300 the maximum communication interval is every 2 hours
Please contact Danfoss for further information.

**Technical specifications,
Temperature sensor**

Type	Pt1000 direct short, 2 wire
Size	Diameter: Ø5.2 mm, length: 26 mm
Nipple	M10 x 1 mm brass, with pin lock
Cable length	1.5 m
Accuracy	Class B (EN60751)
Temperature range	Θ : 0 - 105° C (SonoSelect 10), 5 - 95° C (SonoSafe 10 10)
IP	65
Approved temperature range to EN60751	Θ : 0 - 105° C
Difference temperature EN60751	$\Delta\Theta$: 3 - 105K
Pressure	25 bar

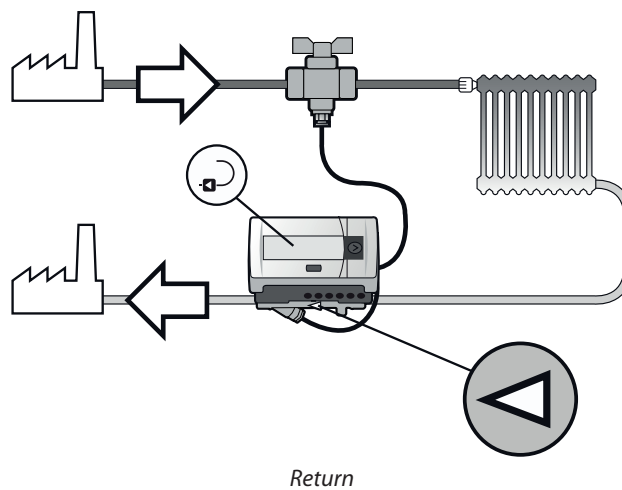
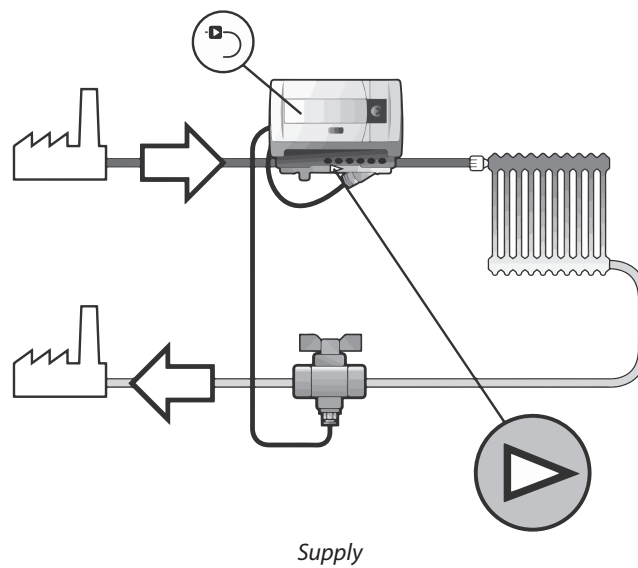
Technical specifications,
Flow sensor

DN		15	15	20	20	25	25
Nominal flow q_p	[m ³ /h]	0.6	1.5	1.5	2.5	3.5	3.5
Max flow q_s	[m ³ /h]	1.2	3	3	5	7	7
Minimum flow (1:100) q_i^*	[m ³ /h]	0.006	0.015	0.015	0.025	0.035	0.035
Cut off flow q_c	[m ³ /h]	0.0012	0.003	0.003	0.005	0.007	0.007
Overflow q_{ss}	[m ³ /h]	1.26	3.15	3.15	5.25	7.35	7.35

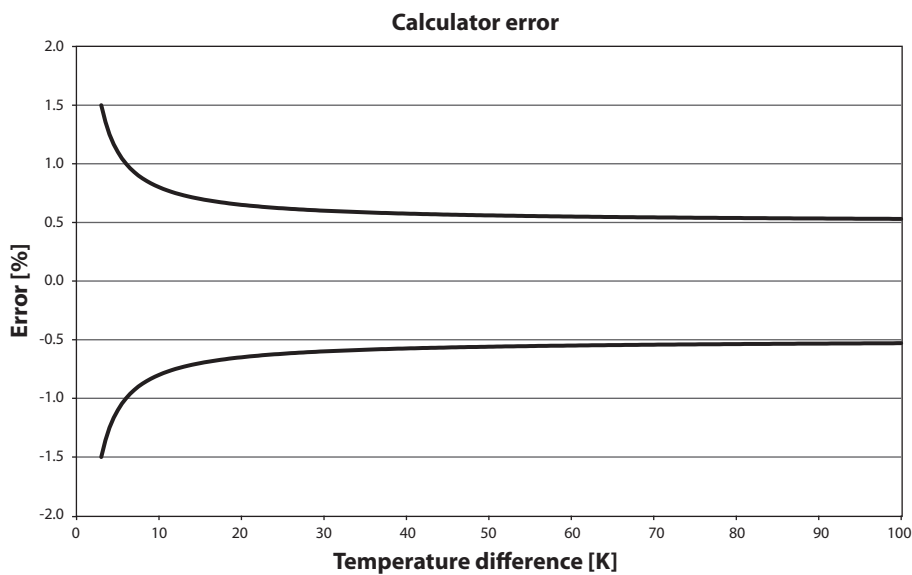
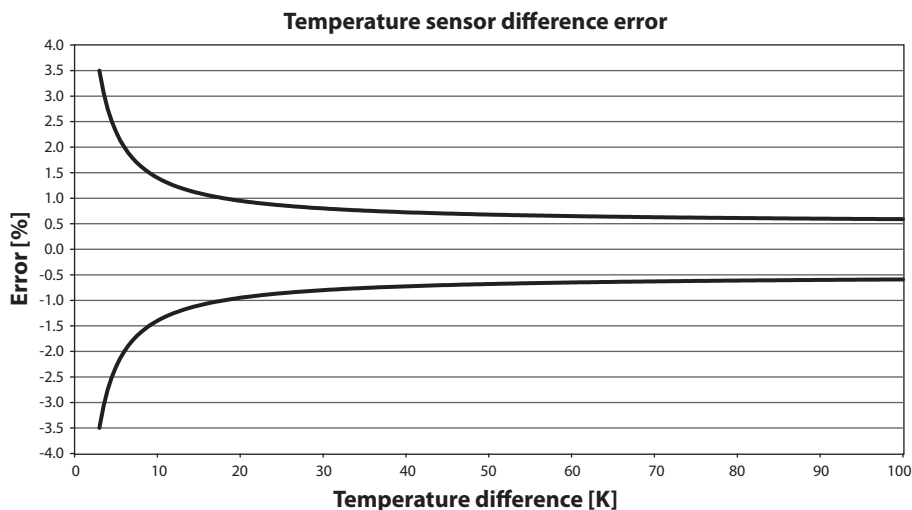
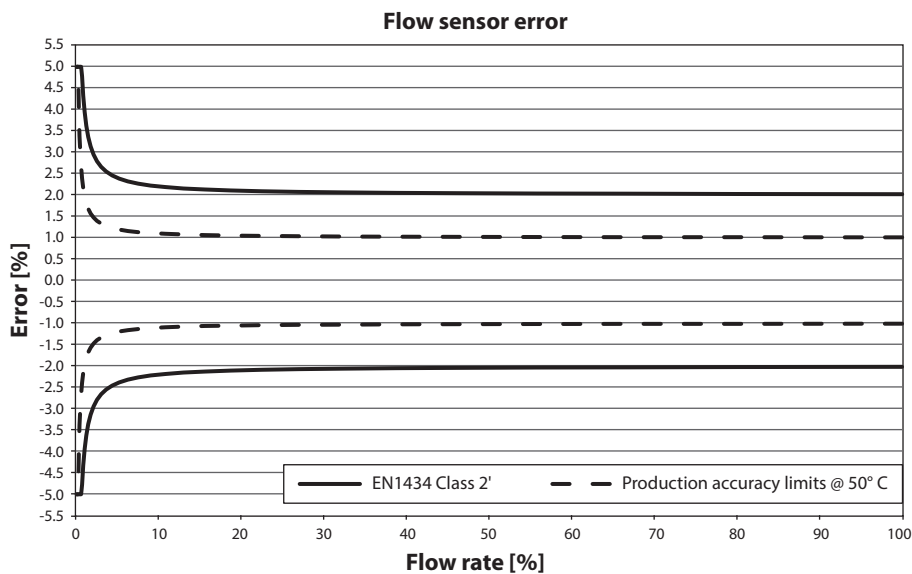
* (1:250) q_i on request

DN		15	15	20	20	25	25
Connection		G ³ / ₄ A" 110 mm		G1A" 130 mm		G1 ¹ / ₄ A" 160 mm	G1 ¹ / ₄ A" 260 mm
Pressure	PN [bar]	16					
Pressure drop (at q_p 50° C)	[mbar]	30	150	150	160	130	135
IP	[EN60529]	65					
Temperature limits	[°C]	0 to 105					
Cable length		1.5 m (SonoSelect 10: PUR), 0.5 m (SonoSafe 10: PVC)					
Mounting		Any position, no inlet or outlet restrictions					

Application drawings

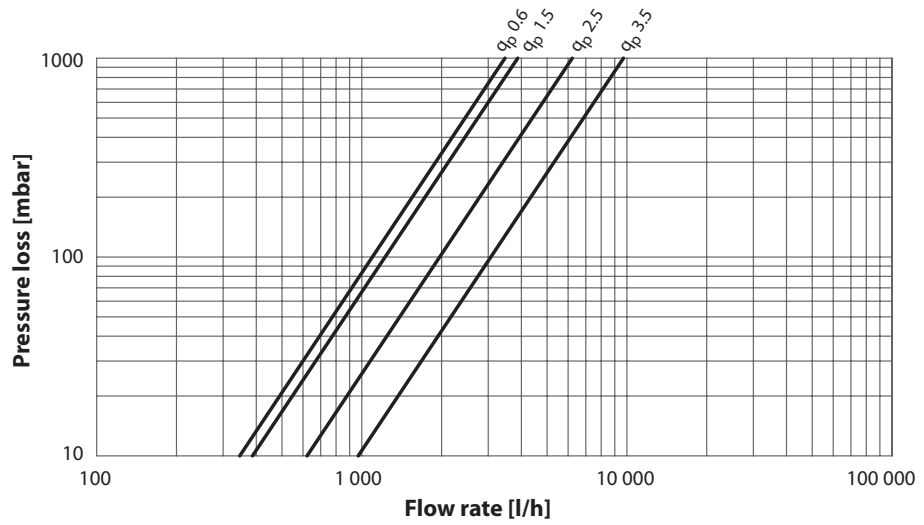


Accuracy

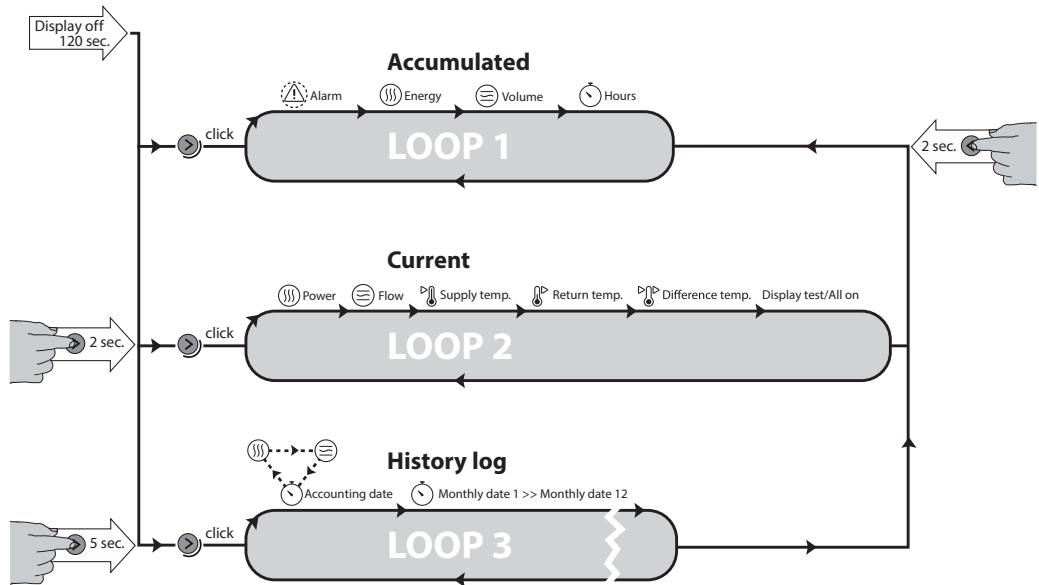


In accordance with EN1434.

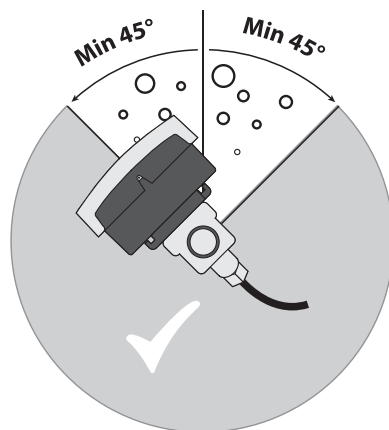
Pressure loss



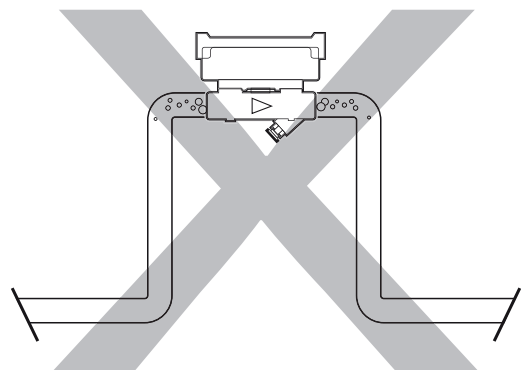
Menu structure



Mounting

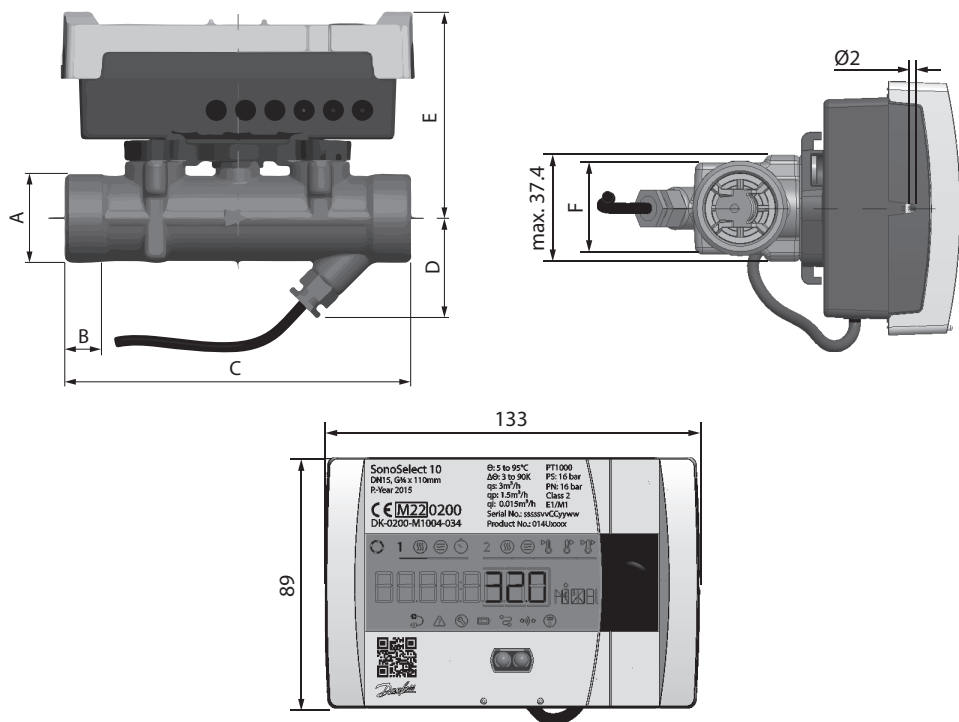


Rotation in pipe axis.



Pipe position: No limitations, but avoid position where air can be collected.

Dimensions



Dimension	DN15	DN20	DN20 + extension pipe 014U1957	DN25	DN25 + extension pipe 014U1958
A	G $\frac{3}{4}$ A	G1A	G1A	G1 $\frac{1}{4}$ A	G1 $\frac{1}{4}$ A
B	12	14	14	16	16
C	110 mm	130 mm	190 mm	160 mm	260 mm
D	33.5 mm	38 mm	38 mm	40.5 mm	40.5 mm
E	74.5 mm	77.5 mm	77.5 mm	80.5 mm	80.5 mm
F	32 mm	32 mm	32 mm	41 mm	41 mm
Weight	700 g	800 g	1100 g	1100 g	1600 g

ENGINEERING
TOMORROW



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