

EC-Type Examination Certificate

Measuring Instrument Directive

Number: DK-0200-MI004-032

Issued by FORCE Certification A/S Denmark
EC-notified body number 0200

In accordance with The Danish Safety Technology Authority's statutory order no. 436 of 16th May 2006 with later amendments which implements the Directive 2004/22/EC of the European Parliament and Council of March 31st, 2004 on measuring instruments (MID) and later amendments.

Issued to: **Danfoss A/S**
 Nordborgvej 81
 6430 Nordborg
 Danmark

Reference No.: 114-21345.01

Type of instrument: Ultrasonic Flowmeter


Type designation: SONO 3500 CT

Valid until: Nov. 26, 2017


Number of pages: 7, including appendix

Date of issue: June 20, 2014

Approved by


Michael Møller Nielsen
Examiner

Processed by


Kurt Rasmussen
Certification Manager

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.
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Appendix to

EC-Type Examination Certificate Measuring Instrument Directive

Number: DK-0200-MI004-032

Issued by FORCE Certification A/S, Denmark
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Applied standards and documents:
EN1434: 2007

The instruments/measuring systems shall correspond with the following specifications:

Type designation:
SONO 3500 CT

Description:

The Volume meter SONO 3500 CT is an ultrasonic flow meter working after the transmission time difference principle.
The meters consists of a flow sensor and a transmitter.
The flow sensor has 2 sound tracks.

Technical documentation:

FORCE Certification A/S.

File no.: 80.970.6-0048/06, 80.976-116/09, 80.976-172/10, 80.976-190/10,
80.976-213/11 and 80.976-226/11.

Reference no.: 114-21345.01

Technical data

Instrument tested according to	: EN1434:2007
Software version	: 1.02, 1.04, 1.05, 2.01 or 2.03
Verification tolerance	: $\pm(2+0,02 q_p/q)\%$, max. $\pm 5\%$
Temperature	: $\theta_{\min} - \theta_{\max}$ 15°C...200°C
Pressure	: PN10, PN16, PN25 & PN40 (bar)
Power supply	: 115 - 230VAC or 3.6VDC battery
Environment class	: E2, M1
Accuracy class	: 2
Climatic class	: -10 - +55°C, condensing, closed
Durability specification	: 10 years

SONO 3500 CT FLOW meter Variants

Diameter	q _p [m ³ /h]	q _s [m ³ /h]
DN50	15	30
DN50	15	45
DN50	30	45
DN65	25	50
DN65	25	72
DN65	50	72
DN80	40	80
DN80	40	120
DN80	80	120
DN100	60	120
DN100	60	180
DN100	120	180
DN125	100	200
DN125	100	280
DN125	200	280
DN150	150	300
DN150	150	420
DN150	300	420
DN200	250	500
DN200	250	700
DN200	500	700
DN250	400	800
DN250	400	1120
DN250	800	1120
DN300	560	1120
DN300	560	1560
DN300	1120	1560
DN350	750	1500
DN350	750	2100
DN350	1500	2100
DN400	950	1900
DN400	950	2660
DN400	1900	2660
DN500	1475	2950
DN500	1475	4130
DN500	2950	4130
DN600	2150	4300
DN600	2150	6020
DN600	4300	6020
DN700	2900	5800
DN700	2900	8120
DN700	5800	8120
DN800	3800	7600
DN800	3800	10640
DN800	7600	10640
DN900	5000	10000
DN900	5000	14000
DN900	10000	14000
DN1000	6000	12000
DN1000	6000	16800
DN1000	12000	16800
DN1200	9000	18000
DN1200	9000	25200
DN1200	18000	25200

 Max. q_p/q_i = 100

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Verification

Errors: Maximum permissible errors according to Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments (MID), Annex MI-004.

Procedure: Verification requirements according to EN1434:2007

Test Points: $q_i \leq q \leq 1.1 q_i$
 $0.1 q_p \leq q \leq 0.11 q_p$
 $0.9 q_p \leq q \leq 1.0 q_p$

The meter shall be verified before becoming operational (initial verification).
The verification is done with water.

Temperature according to DS/EN 1434-5 Initial verification tests:

Initial verification at temperatures between 15°C and 50°C is approved provided a verification tolerance of max $\pm 1,5\%$ regardless of flow rate is applied.

Verification tolerance, according to DS/EN 1434-5:

When the verification is done the meter is sealed as described under sealing.

Sealing

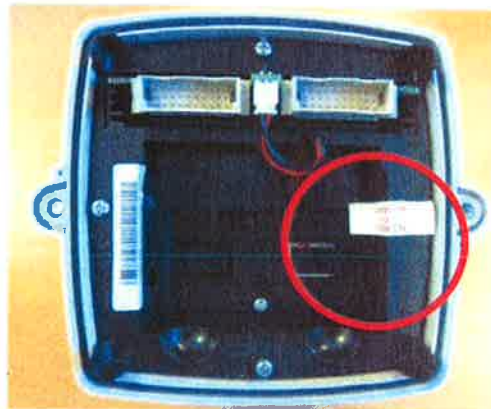
See the following 7 pictures.

Sealing

a) Sealing of electronics



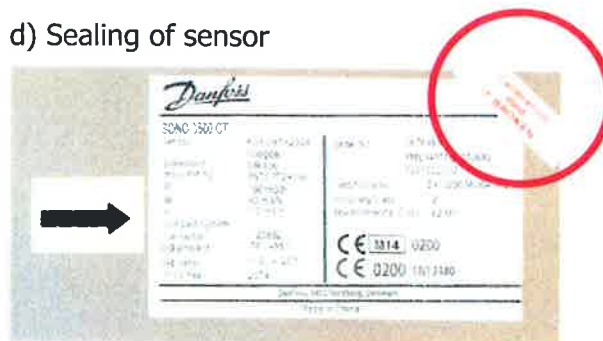
b) Sealing of electronics



c) Sealing of electronics



d) Sealing of sensor



e) Installation sealing



Installation

The flow sensor can be mounted horizontal or vertical.
Flow direction marked on the sensor.

The signal transmitter can be fitted compact on the sensor or remotely.

SONO 3500 CT \geq DN80 1.5 meter straight length of pipe before.

Labeling and inscriptions

Manufacturer, type, year
Serial no.
EC-Type examination certificate number
Tmax and Pmax
Application temperature range
Power supply
Accuracy class
Software version
Direction of flow
Mechanical and electromagnetic environment classes.

Example

Transmitter label

<i>Danfoss</i>	
SONO 3500 CT	
Order No.	187F3500 7ME34111QC013ER2 122500D502
Transmitter	7ME34510AA402AB0 412209H421
Sensor	FDK-087H2503 FC0208
qs	180 m ³ /h
qp	60 m ³ /h
Pulse Value	2.5 μ Pulse
Pulse Width	
Compact system	SWVers. 2.03
Cal.Factor	1.25832 Prod.Year 2014
⊖ ambient	-10...+55°C
Certificate No.	DK-0200-MI004-032
Accuracy Class:	2
Environmental Class:	E2,M1
CE M14 0200	
Danfoss, 6430 Nordborg, Denmark	
Made in China	

Sensor label

<i>Danfoss</i>	
SONO 3500 CT	
Sensor	FDK-087H2503
Dimension	FD0208
Press.Rating	DN 100
qs	PN16 PT24 bar
qp	180 m ³ /h
qi	60 m ³ /h
Compact system	1.2 m ³ /h
Cal.Factor	1.25832
⊖ ambient	-10...+55°C
⊖ water	-15...+20°C
Prod.Year	2014
Order No.	187F3500 7ME34111QC013ER2 122500D502
Certificate No.	DK-0200-MI004-032
Accuracy Class:	2
Environmental Class:	E2,M1
CE M14 0200	
CE 0200 EN13480	
Danfoss, 6430 Nordborg, Denmark	
Made in China	