

AMFLO® SONIC Dry-X II - Ultrasonic flow sensor

Technical data sheet

Product description

The AMFLO® SONIC Dry-X II flow sensor is based on an innovative exchange concept and requires no in and out sections.

The sensor can be exchanged during operation:

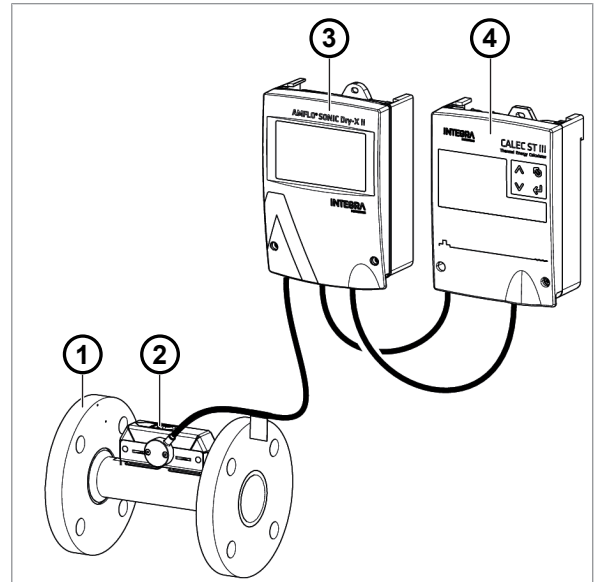
- Easy replacement or legal re-verification/calibration of the meter (no process interruption)
- Less planning
- Lower cost of ownership

The AMFLO® SONIC Dry-X II is designed for heat calculation applications. Flow is measured using ultrasound. The system consists of:

1. Measurement tube
2. Sensor head
3. Measurement electronics

The AMFLO® SONIC Dry-X II is designed and optimized to work together with the CALEC® ST III SMART energy calculator 4. The CALEC® ST III SMART energy calculator supplies the 24VDC power to the AMFLO® SONIC Dry-X II measurement electronics.

The AMFLO® SONIC Dry-X II pulse output is adapted to CALEC® ST III SMART abilities.

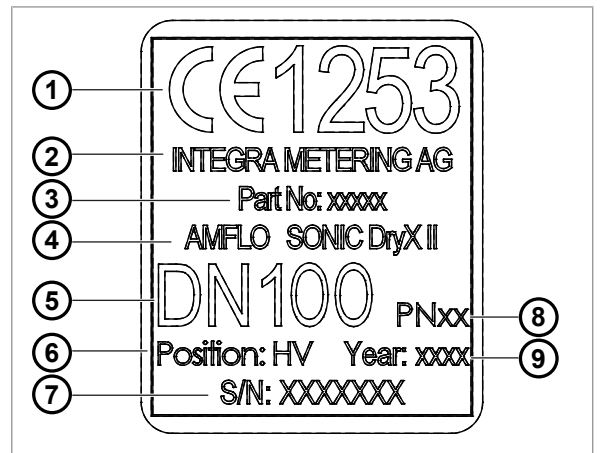


Product identification

The face plates of the AMFLO® SONIC Dry-X II state the following information:

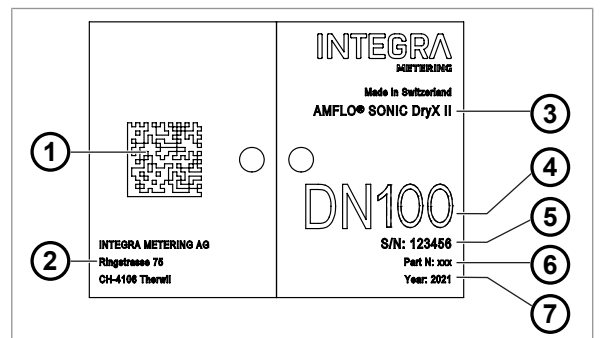
Type plate on the measurement tube

- | | |
|---|--------------------|
| 1 | CE 1253 |
| 2 | Manufacturer |
| 3 | Part number |
| 4 | Product name |
| 5 | Nominal diameter |
| 6 | Position |
| 7 | Serial number |
| 8 | Nominal pressure |
| 9 | Manufacturing year |



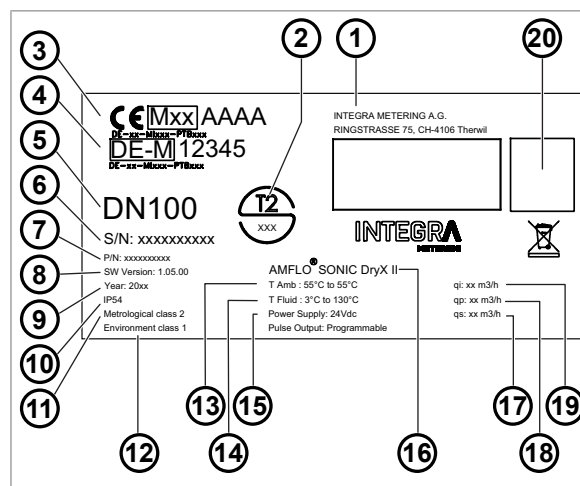
Identification label on the sensor head

- | | |
|---|--|
| 1 | Data matrix |
| 2 | Manufacturer |
| 3 | Product name |
| 4 | Nominal diameter of measurement tube |
| 5 | Serial number of electronics (sensor head and measurement electronics) |
| 6 | Part number |
| 7 | Manufacturing year |



Face plate on the measurement electronics

- 1 Manufacturer
- 2 Marking cooling (CH)
- 3 Marking heating (Europe CE)
- 4 Marking cooling (DE)
- 5 Nominal diameter of measurement tube
- 6 Serial number of electronics (sensor head and measurement electronics)
- 7 Part number
- 8 Software version
- 9 Manufacturing year
- 10 IP protection code
- 11 Metrological class
- 12 Environmental class
- 13 Range of ambient temperature
- 14 Range of medium temperature
- 15 Power supply specification
- 16 Product name
- 17 Maximum flow q_s
- 18 Nominal flow q_p
- 19 Minimum flow q_i
- 20 Data matrix



Technical data

General

Nominal diameter	DN 32 – DN 250
Measurement tube	AISI 316 L
Medium	Water
Nominal pressure	PN 40 / PN 25 / PN 16
Degree of protection	Sensor head: IP 68 / Measurement electronics: IP 54
Medium temperature	0 – 130 °C
Ambient temperature	5 – 55 °C
Accuracy	Class 2 acc. to EN 1434
Sensor head cable dimension	<ul style="list-style-type: none"> • Length: 10 m • External diameter: 7 mm • Bending radius: 100 mm
Sensor head cable description (*)	<ul style="list-style-type: none"> • Core: x2 2 poles coaxial cable RG178 • External shielding : mesh • External jacket: black • Measurement electronic side: x2 crimped SMB connectors • Sensor head side: fixed

(*) The sensor head cable has a fixed length and is fitted with matching connectors. It cannot be cut, shortened, disconnected from the head or modified in any way. Refer to the instructions for electrical installation.

Measurement electronics input and output specification

Power supply (*)	24 VDC, 150 mA
Pulse output type	Open collector, bidirectional (3 ways)

Pulse length	4 ms
Pulse pause	4 ms

(*) A dedicated power supply must be used.

Range of measurement

Approved according to EN 1434 class 2, measurement dynamic $q_i/q_p = 1:250$, $q_s/q_p = 1.25$

Nominal diameter	DN	mm	32	40	50	65	80	100	125	150	200	250
Minimum flow	q_i	m ³ /h	0.048	0.08	0.12	0.2	0.32	0.48	0.8	1.2	2.0	3.2
Nominal flow	q_p	m ³ /h	12	20	30	50	80	120	200	300	500	800
Maximum flow	q_s	m ³ /h	15	25	37.5	62.5	100	150	250	375	625	1000
Velocity (q_i)		m/s	0.017	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Velocity (q_p)		m/s	4.15	4.42	4.24	4.19	4.42	4.24	4.52	4.71	4.42	4.53
Δp ($q_p/2$)*		mbar	37	46	46	44	51	49	55	63	58	62
Flow at $\Delta p=100$ mbar		m ³ /h	9.9	14.7	22.1	37.9	56.1	85.5	135	189	328	508
Kvs		m ³ /h	31.2	46.6	69.7	120	178	270	426	597	1038	1606
Pulse weight		ml	100	100	100	200	200	1000	1000	1000	2000	2000

* Equivalent to standard values of q_p acc. to EN 1434.

Appendix A: Approved according to EN 1434 class 2, measurement dynamic $q_i/q_p = 1:100$, $q_s/q_p = 1.25$

Nominal diameter	DN	mm	32	40	50	65	80	100	125	150	200	250
Minimum flow	q_i	m ³ /h	0.12	0.2	0.3	0.5	0.8	1.2	2.0	3.0	5.0	8.0
Nominal flow	q_p	m ³ /h	12	20	30	50	80	120	200	300	500	800
Maximum flow	q_s	m ³ /h	15	25	37.5	62.5	100	150	250	375	625	1000
Velocity (q_i)		m/s	0.041	0.044	0.042	0.042	0.044	0.042	0.045	0.047	0.044	0.045
Velocity (q_p)		m/s	4.15	4.42	4.24	4.19	4.42	4.24	4.52	4.71	4.42	4.53

* Equivalent to standard values of q_p acc. to EN 1434.

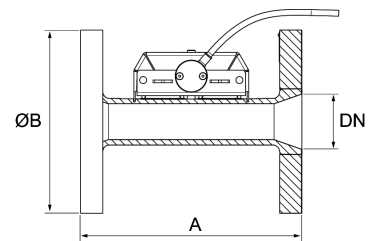
Appendix B: Approved according to EN 1434 class 2, measurement dynamic $q_i/q_p = 1:100$, $q_s/q_p = 2$

Nominal diameter	DN	mm	32	40	50	65	80	100	125	150	200	250
Minimum flow	q_i	m ³ /h	0.06	0.1	0.15	0.25	0.4	0.6	1.0	1.5	2.5	4.0
Nominal flow	q_p	m ³ /h	6	10	15	25	40	60	100	150	250	400
Maximum flow	q_s	m ³ /h	12	20	30	50	80	120	200	300	500	800
Velocity (q_i)		m/s	0.021	0.22	0.021	0.021	0.022	0.021	0.023	0.024	0.022	0.023
Velocity (q_p)		m/s	2.072	2.210	2.122	2.093	2.210	2.122	2.264	2.358	2.210	2.264

* Equivalent to standard values of q_p acc. to EN 1434.

Dimensions and device connection

All flange holes are according to EN 1092-1.



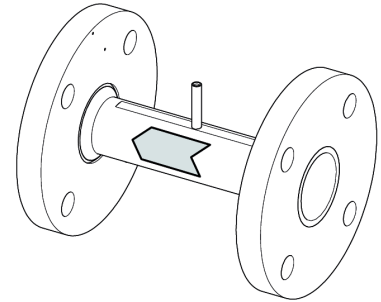
Nominal diameter	DN	mm	32	40	50	65	80
Minimum length*	A	mm	150	165	200	200	175
Flange diameter	ØB	mm	140	150	165	185	200
Weight		kg	5.5	6.5	8	10	12.5
Sensor head fixing screw (hexalobular, Torx)			T20	T20	T20	T20	T20

Nominal diameter	DN	mm	100	125	150	200	250
Minimum length*	A	mm	200	220	240	290	330
Flange diameter	Ø	mm	220	270	300	375	450

Nominal diameter	DN	mm	100	125	150	200	250
Weight		kg	19	18-27	28-35	35-61	86-97
Sensor head fixing screw (hexalobular, Torx)			T20	T30	T30	T30	T30

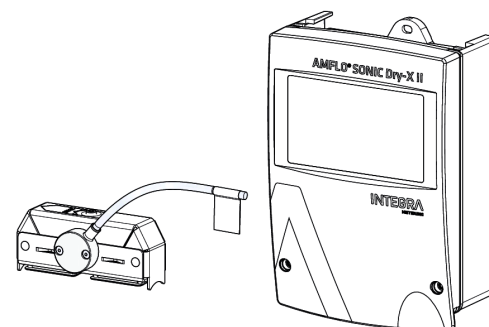
* The installation length can be customized to meet specific requirements.

System component: Measurement tube



Nominal diameter	Length in mm	Art. No.		
		PN40	PN25	PN16
DN 32	150	98277		
	200	98278		
	260	98279		
DN 40	165	98280		
	200	98281		
	220	98361		
DN 50	300	98282		
	200	98283		
	270	98284		
DN 65	300	98350		
	465	98362		
	475	98363		
DN 80	200	98285		
	300	98286		
	460	98364		
DN 100	475	98365		
	175	98287		
	200	98288		
DN 125	225	98289		
	300	98290		
	350	98366		
	380	98367		
	400	98368		
	200	98291		98294
DN 150	250	98291		98295
	350	98351		98352
	360	98293		98296
	375			98369
	400	98370		

Nominal diameter	Length in mm	Art. No.		
		PN40	PN25	PN16
DN 125	250	98297		98300
	350	98298		98301
	375			98371
	400	98299		98302
DN 150	300	98303		98307
	350	98304		98308
	360			98372
	400	98305		98309
	500	98306		98310
DN 200	350	98311	98315	98319
	400	98312	98316	98320
	450			98373
	490	98313	98317	98321
	500	98314	98318	98322
DN 250	400	98323	98327	98331
	450	98324	98328	98332
	575	98325	98329	98333
	600	98326	98330	98334

System component: Sensor head and measurement electronics


Nominal diameter	Art. No.	Art. No.	Art. No.
	qi/q _p =1:250, qs/q _p =1.25	qi/q _p =1:100, qs/q _p =2	qi/q _p =1:100, qs/q _p =1.25
DN 32	98335	99060	99070
DN 40	98336	99061	99071
DN 50	98337	99062	99072
DN 65	98338	99063	99073
DN 80	98339	99064	99074
DN 100	98340	99065	99075
DN 125	98341	99066	99076
DN 150	98342	99067	99077
DN 200	98343	99068	99078
DN 250	98344	99069	99079

System component: Calculator

Device	Art. No.
CALEC® STIII Smart	See CALEC® STIII documentation.

Conformity

CE guidelines	
2014/32/EU	Measuring Instruments Directive (MID)
2014/30/EU	Electromagnetic Compatibility (EMC)
2014/35/EU	Low Voltage Directive (LVD)
2012/19/EU	Waste Electrical and Electronic Equipment (WEEE)
2011/65/EU	Restriction of hazardous substances in electrical and electronic equipment (RoHS), amended by directive 2015/863/EU
2014/53/EU	Radio Equipment Directive (RED)
Standards	
EN 1434	
EN 61010-1	
EN 62368-1	
DIN 43863-5	
EN 301 489-1	
EN 301 489-3	
EN 61326-1	
EN 300 220-2	
EN 50364	
Specific	
PTB K7.2, Ordonnance of FDJP 941.231 (CH)	

Calibration and verification

In most countries energy metering systems used for commercial purposes are subject to compulsory verification.

The devices comprising the metering system must all possess official pattern approval. AMFLO® SONIC Dry-X II has been approved according to both the European Measuring Instruments Directive 2014/32/EU and the German PTB K 7.2 directive for cooling meters.

Officially verified heat and cooling meters must be re-verified before the verification period has expired. The operator is responsible for compliance with this requirement. (Re-)verification includes all parts (temperature and flow sensors, calculator) forming the complete heat meter.

One of the benefits of the AMFLO® SONIC Dry-X II flow sensor is that the measurement tube stays in the system for three verification periods. After that it has to be unmounted and cleaned to ensure proper functioning.

Exchange or verification, when required, is only necessary for the sensor head and the measurement electronics, without intervention in the hydraulics.

To be sent to the suited laboratory, they have to be packed up together in a suited and solid packaging to prevent any transit damage. Ideally, the original packaging is used.

Declaration of conformity

The declaration of conformity is available by scanning the QR-Code.

