

EU-type examination certificate UK/0126/0216 Revision 4

Issued by:

NMO
Notified Body Number 0126

In accordance with the requirements of the Measuring Instruments Regulations 2016 (S.I. 2016 No. 1153) which implement, in the United Kingdom, Council Directive 2014/32/EU, this EU-type examination certificate has been issued to:

Arad Ltd.
Dalia - Ramot Menashe
POB19239
Dalia
Israel

In respect of a family of cold-water meters, designated Sonata, utilising a Ultrasonic measuring element and having a rated permanent flowrate Q_3 between $1.6 \text{ m}^3/\text{h}$ and $10 \text{ m}^3/\text{h}$.

The necessary data (principal characteristics, alterations, securing, functioning etc) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

This revision replaces previous versions of the certificate.

Issue Date: 07 November 2017
Valid Until 10 January 2027



Grégory Glas
Lead Technical Manager
For and on behalf of the Head of Technical Services



0135

Descriptive Annex

1 INTRODUCTION

This pattern is a family of liquid measuring instruments for measuring the volume of cold water which has passed through them having a Q_3 (permanent flowrate) from 1.6 m³/h for the 15 mm meter up to 10 m³/h for the 32 mm meter, all sizes with a Q_3/Q_1 turndown ratio of 500 (R500) or 800 (R800). An example meter is shown in Figure 1.

2 DESCRIPTION

2.1 The Sonata instruments are ultrasonic water meters which use the Transit time method. This method is based on the physical phenomena where the speed of an ultrasonic wave propagation is equal to the sum of the speed of the flow and the speed of sound of the media at rest. By measuring the time of the wave propagation of both the upstream and downstream the flow, it is possible to obtain the fluid's velocity along the acoustical beam.

2.2 The sensors may be either type 96211010 or 96211009 (Arad's internal catalogue numbers). The meters may be fitted with an LCD display type 99604109 and 99604209 (Arad's internal catalogue numbers) (Figures 2 and 3). The meters are powered via an integral lithium battery type C (3.6V).

3 TECHNICAL DATA

3.1 Flow designation

Table 1 Related flowrates according to meter size (R500)

Meter Size (mm)	15	15	20	20	25	25	25	32
Q_3/Q_1 (R)	500	500	500	500	500	500	500	500
Q_2/Q_1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Q_1 Minimum flowrate (m ³ /hr)	0.0032	0.005	0.005	0.008	0.008	0.0126	0.02	0.02
Q_2 Transitional flowrate (m ³ /hr)	0.00512	0.008	0.008	0.013	0.013	0.02016	0.032	0.032
Q_3 Permanent flowrate (m ³ /hr)	1.6	2.5	2.5	4	4	6.3	10	10
Q_4 Overload flowrate (m ³ /hr)	2	3.125	3.125	5	5	7.875	12.5	12.5
Head loss at Q_3 (bar) $r\Delta P$	0.16	0.16	0.16	0.16	0.16	0.16	0.4	0.4

Table 2 Related flowrates according to meter size (R800)

Meter Size (mm)	15	15	20	20	25	25	25	32
Q_3/Q_1 (R)	800	800	800	800	800	800	800	800
Q_2/Q_1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Q_1 Minimum flowrate (m ³ /hr)	0.002	0.00313	0.00313	0.005	0.005	0.00788	0.013	0.013
Q_2 Transitional flowrate (m ³ /hr)	0.0032	0.005	0.005	0.008	0.008	0.0126	0.02	0.02
Q_3 Permanent flowrate (m ³ /hr)	1.6	2.5	2.5	4	4	6.3	10	10
Q_4 Overload flowrate (m ³ /hr)	2	3.125	3.125	5	5	7.875	12.5	12.5
Head loss at Q_3 (bar) $r\Delta P$	0.16	0.16	0.16	0.16	0.16	0.16	0.4	0.4

3.2 Other designations

Temperature class:	T50 (0.1°C – 50°C)
Orientation requirements:	None
Maximum admissible pressure (MAP)	16 bar
Pressure Loss at Q_3	See table 1 and 2
Climatic environment:	-25°C to 55°C
Mechanical environment:	M1
Electromagnetic environment:	E1
Location:	Open, condensing
Reverse Flow:	The meter may or may not measure reverse flow depending on factory set-up - this should be marked on the Data Label
Minimum straight length of inlet and outlet pipe:	U0/D0

4 PERIPHERAL DEVICES AND INTERFACES

4.1 The Sonata supports the following AMR communication modules:

Communication type	Communication via	Transmitted data
3G / 4G (Arad Proprietary)	RF	Volume, Alerts, ID
CAT-M	RF	
Encoder	Wired	Volume, Alerts, ID
Pulse output (SSR)	Wired	Pulse per flow
IoT: - W-Mbus/OMS - Sigfox - LoRa - NB-IoT	RF	Volume, flow, Alerts, ID, RTC ... per protocol

5 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions.

5.1 Legends and inscriptions

The instrument bears the following legends:

- 'CE' marking
- Supplementary metrology marking
- Notified body identification number
- Permanent flow rate Q_3
- Flowrate range Q_3/Q_1 (R)
- Serial number
- Manufacturers mark or name and postal address
- Certificate number
- Software identification

6 LOCATION OF SEALS AND VERIFICATION MARKS

6.1 Securing method

Access to the PCB and software is prevented by the polyurethane case; opening the case will result in tamper-evident marks.

6.2 Software Security

The software complies with Welmec Guide 7.2 (2015), Type P, Risk Class C, no Extensions.

The software is identified by its version number, which shall be 5.01.

6.3 Location of verification markings

The verification markings identified in 5.1, and serial number, are permanently marked on the data label which is positioned on the face of the meter (Figure 4).

7 AUTHORISED ALTERNATIVES

There are currently no authorised alternatives.

8 SUPPORTING DOCUMENTATION

The meters are fully described in the technical file held at NMO.

9 ILLUSTRATIONS

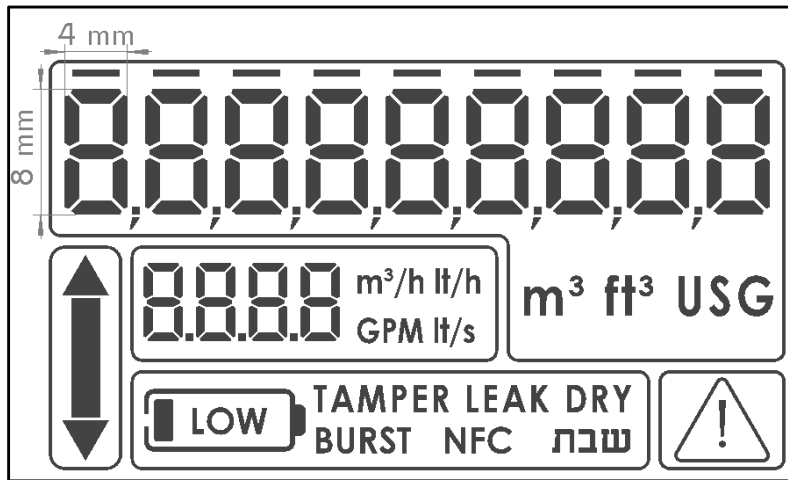
Figure 1 Sonata meter
Figure 2 LCD display (catalogue number 99604109)
Figure 3 LCD display (catalogue number 99604209)
Figure 4 Markings

10 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0216	11 January 2017	Type examination certificate first issued
UK/0126/0216 Revision 1	7 March 2017	DN25 (25mm Meter size) added.
UK/0126/0216 Revision 2	13 April 2017	Section 4.1 Pulse Output (SSR) and W-Mbus/OMS/Sigfox added.
UK/0126/0216 Revision 3	12 May 2017	DN32 (32mm Meter size) added : Section. 3.1 updated - Table 1 and Table 2 updated
UK/0126/0216 Revision 4	07 November 2017	Section 4.1, Revised to include additional AMR communication modules.

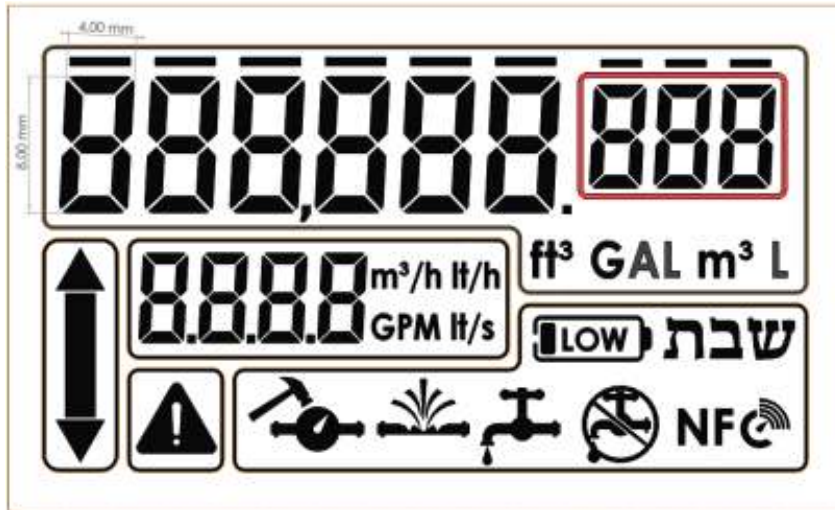


Figure 1 **Sonata meter**



No.	Annunciate	Description	Annotation
1	Volume accumulator include 9 large digits		 The upper bar marks the digits send to the AMR
2	Icons	1. Alarms indications: 2. Flow direction: 3. No measurement: 	Alarms released: 1. Low Battery 2. NFC 3. LEAK- subjected to pilots results
3	Units	1. Volume: 2. Flow: 	Default Units:

Figure 2 LCD display (catalogue number 99604109)












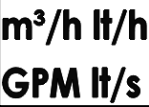

No.	Annunciate	Description	Annotation
1	Volume accumulator include 6 large digits +3 small digits	 <p>Configuration in Test Mode 0.0001 M³ (0.1 liter):</p> 	In Test Mode the Sonata could displayed resolution of 0.1 and 0.01 Liter. In this case the dot replaced with hyphen.
2	Icons	<p>1. Indications:</p>  <p>2. Flow direction:</p>  <p>3. No measurement:</p> 	<p>Implemented:</p> <p>1. Low Battery</p>  <p>2. NFC</p>  <p>3. 3G</p> 
3	Units	<p>3. Volume: </p> <p>4. Flow: </p>	<p>Default Units:</p> 

Figure 3 LCD display (catalogue number 99604209)

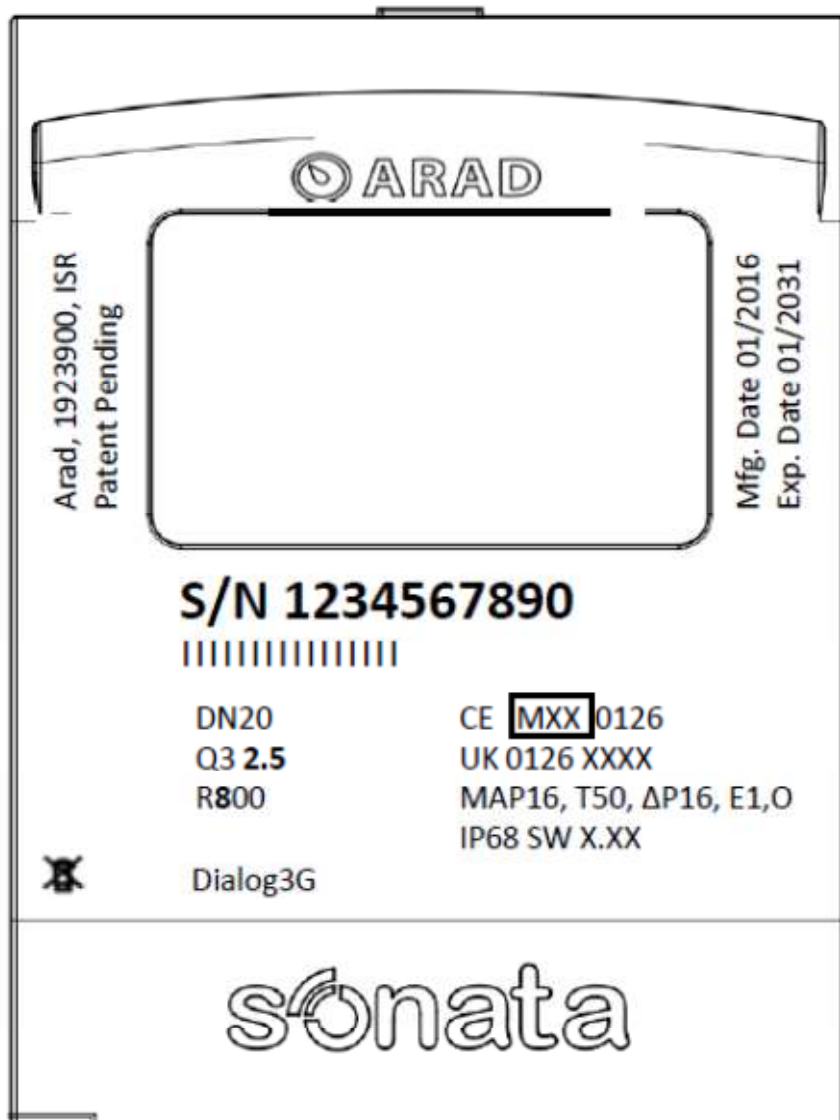


Figure 4 Markings