National Measurement & Regulation Office

UK/0126/0094

MI-001

EC type-examination certificate UK/0126/0094 Revision 9

Issued by:

The National Measurement and Regulation Office
Notified Body Number 0126

In accordance with the requirements of the Measuring Instruments (Cold-water Meters) Regulations 2006 (SI 2006/1268) and the Measuring Instruments (Non-Prescribed Instruments) Regulations 2006 which implement, in the United Kingdom, Council Directive 2004/22/EC, this certificate of EC type-examination has been issued to:

Arad Ltd.
Dalia - Ramot Menashe
POB19239
Dalia
Israel

in respect of a family of cold-water meters, designated Octave, utilising a Ultrasonic measuring element and having a rated permanent flowrate Q_3 between 40 m^3/h and 1000 m^3/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: **18 May 2015**
Valid Until: **27 October 2020**
Reference No: **T1132/0026**

G Stones
Technical Manager - Certification Services
For and on behalf of the Chief Executive

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Descriptive Annex

1 INTRODUCTION

This pattern for a family of liquid measuring instruments for measuring the volume of cold water which has passed through them. They are an ultrasonic, flanged water cold-water meter having a Q_3 (permanent flowrate) from 40 m^3/h for the 40 mm meter to 1000 m^3/h for the 300 mm meter, all sizes with a Q_3/Q_1 turndown ratio of 500 (R500). An example meter is shown in Figure 1

2 FUNCTIONAL DESCRIPTION

Octave family 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.

3 TECHNICAL DATA

3.1 Flow designation

Table 1 Related flowrates according to meter size

Meter Size (mm)	**50**	**65**	**80**	**100**	**150**	**200**
Q_3/Q_1 (R)	**500**	**500**	**500**	**500**	**500**	**500**
Q_2/Q_1	1.6	1.6	1.6	1.6	1.6	1.6
Q_1 Minimum flowrate (m^3/hr)	0.08	0.08	0.125	0.20	0.5	0.8
Q_2 Transitional flowrate (m^3/hr)	0.128	0.128	0.2	0.32	0.8	1.28
Q_3 Permanent flowrate (m^3/hr)	40	40	63	100	250	400
Q_4 Overload flowrate (m^3/hr)	50	50	80	125	313	500

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	0.16 bar max
Climatic environment:	-25°C to 55°C
Mechanical environment:	M1
Electromagnetic environment:	E1
Location:	Open/closed, condensing/non-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 Communication modules are mounted on the Comm. output connector using two screws. One screw cover is sealed as shown in figure 2.
Output options are:

- Pulse Output Module
- 4-20mA Output Module
- AMR Output Module
- Encoder Protocol Output Module

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
Certificate number

6 LOCATION OF SEALS AND VERIFICATION MARKS

6.1 Securing method (figure 2)

The Octave meter has five plastic seals:

- Two seals are placed on the Sensor Cover Plates screws, one on each plate.
  On plastic bodies the sensor covers are seals.
- Two seals are implemented on the meter Face Plate.
- One seal covers the screw of the Comm. output cover.

6.2 Software Security

The Octave Water Meter incorporates "Built for Purpose "software (Type P). Access to CPU, for software revisions, can only be done via a specific J-Tag connector on the PCB. In order to reach the PCB the meter must be disassembled:

- breaking two (2) seals,
- breaching the vacuumed Electronics Compartment.

The present software version 2.08 is shown on the data label (Figure 3).

6.2.1 Alternative Software version

Having an alternative software version, Ver. 3.15, which supports the measurement of reverse flow.

6.2.2 Alternative Software version For Octave 2

Having an alternative software version, Ver. 3.16.

Having an alternative software version, Ver. 3.17.

Having an alternative software version, Ver. 4.00

Having an alternative software version, Ver. 4.01

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 3).

7 AUTHORISED ALTERNATIVES

7.1 50 mm Threaded Body Meter

Having a 50mm meter with the same technical specifications as described in section 3, but with a threaded connection replacing the flanges.

7.2 40 and 50 mm Plastic Body (Figure 4)

As described in the certificate but having a plastic body meter with the following specifications**.**

Meter Size	Q_3/Q_1 (R)	Q_3 m³/h	PRESSURE LOSS	U/D
40mm	250	40	Δp 16	U0,D0
50mm	500	40	Δp 16	U0,D0

Meter Size	**40 mm**	**50 mm**
Q_3/Q_1 (R)	**250**	**500**
Q_2/Q_1	1.6	1.6
Q_1 Minimum flowrate (m^3/hr)	0.16	0.08
Q_2 Transitional flowrate (m^3/hr)	0.256	0.128
Q_3 Permanent flowrate (m^3/hr)	40	40
Q_4 Overload flowrate (m^3/hr)	50	50

7.3 250 mm Meter

Having the flanged design meter as described in section 1 but with 250 mm diameter having either a Q_3/Q_1 turndown ratio of 500 (R500) or 315 (R315), with the following related flowrates:

R	315	500
Q2/Q1	1.6	1.6
Q1	2	2
Q2	3.2	3.2
Q3	630	1000
Q4	787.5	1250

7.4 300 mm Meter

As described in 7.3 above but with flanges of 300 mm, all the related flowrates are identical.

7.5 Octave 2

As described in the certificate but having alternative internal electronics. The only visible difference to the meter is the software version number change as shown on the label. See section 6.2.2. The CPU and Water Measurement Unit have both been changed. The changes are documented in the document folder retained by NMO.

7.6 Octave 2 Hardware version 2.4

As described in the certificate but having alternative internal electronics and the following additional functionality:

NFC inductive Communication	Add the ability to communicate (set/get parameters of the meter) throght inductive Communication
Shabat mode	New measurement scheme for shabat. Vaild only for the Israeli market
LCD	Add new icons functionality
Data logger + Real time clock	Add ability to save flow and volume records/alarms/histograms
Tamper	Add vandal detection option
ModBus	Add the ability to communicate (set/get parameters of the meter) through ModBus Communication

.

The only visible changes are to the LCD display, see figure 5, and the software version number change as shown on the label. See section 6.2.2. The CPU and Water Measurement Unit have both been changed. The changes are documented in the document folder retained by NMO.

7.7 Protective Crown

As described in the certificate but having a protective crown to prevent vandalism as shown in figure 6

7.8 Additional Manufacturer

Having the additional manufacturer INSA on the data label as shown in figure 7.

8 SUPPORTING DOCUMENTATION

8.1 Octave Document Folder: TRIM File T1132/0026/14

9 ILLUSTRATIONS

10 CERTIFICATE HISTORY

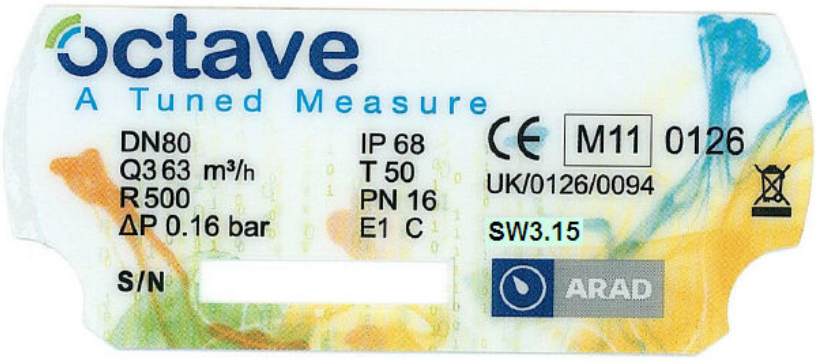
ISSUE NO.	DATE	DESCRIPTION
UK/0126/0094	01 November 2010	Certificate first issued
UK/0126/0094 Revision 1	17 August 2011	Revision 1 Issued: Section 3.1; 2½" (65mm) meter added Section 3.2; pressure loss corrected to 0.16 bar and reverse flow allowed. Section 6.2.1 added; alternative software version Addition of Section 7 Authorised alternatives & Section 7.1; Threaded body 2"(50mm) meter added. Subsequent sections renumbered.
UK/0126/0094 Revision 2	17 January 2012	Revision 2 Issued: Front Page and section 1 maximum Q3 of 400 m^2/h added Section 3.1, Table 2, 6"(150mm) and 8" (200mm) meter sizes added.
UK/0126/0094 Revision 3	12 April 2013	Revision 3 Issued: In the entire Certificate all meter sizes converted to metric Section 3.2, Installation Requirements added Section 7.2 Plastic body 40 and 50 mm added
UK/0126/0094 Revision 4	21 June 2013	Revision 4 Issued: Section 3.2 wording changed from "installation requirements" to "Minimum straight length inlet and outlet" Section 7.3 added 250 mm meter size. Front page maximum Q3 updated to 1000 m^3/h
UK/0126/0094 Revision 5	13 August 2013	Revision 5 Issued: Section1 updated from 40 mm to 300mm Section 6.2.1 removed "00" out of software version 3.15 Section 6.2.2 Alternative software for Octave 2 added Section 7.4 300 mm meter added Section 7.5 Octave 2 meter added Section 8 Supporting Documentation added, subsequent sections renumbered Figure 3 Data label added for SW 3.16

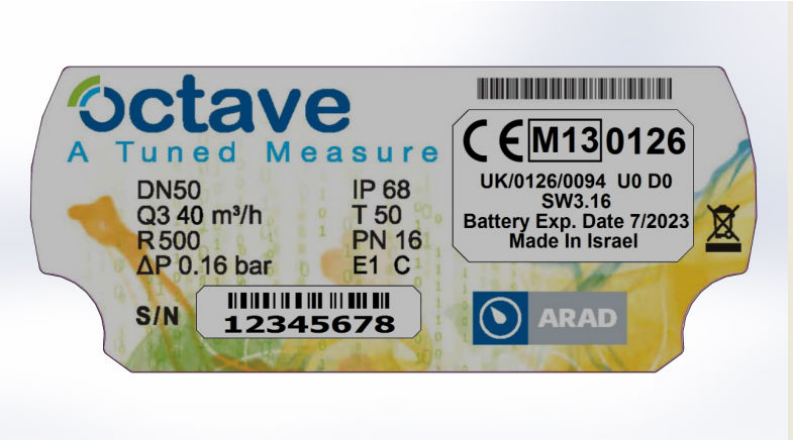
UK/0126/0094 Revision 6	01 August 2014	Revision 6 Issued: Section 6.2.2 Alternative software version 3.17 added. Figure 3 Data label added for SW 3.17
UK/0126/0094 Revision 7	01 October 2014	Revision 7 Issued: Section 6.2.2 Alternative software version 4.00 added. Figure 3 Data label added for SW 4.00 Section 7.6 Octave 2 Hardware version 2.4 and associated figure 5 added.
UK/0126/0094 Revision 8	13 March 2015	Revision 8 Issued: Section 7.7 Protective Crown, and Section 7.8 Additional manufacturer added with associated figures.
UK/0126/0094 Revision 9	18 May 2015	Revision 9 Issued: Section 6.2.2 Alternative software version 4.01 added.

Figure 1 Octave Meter

Figure 2 Sealing


octave
A Tuned Measure
DN80
Q3 63 m³/h
R 500
ΔP 0.16 bar
IP 68
T 50
PN 16
E1 C
CE M11 0126
UK/0126/0094
SW2.08
S/N
ARAD

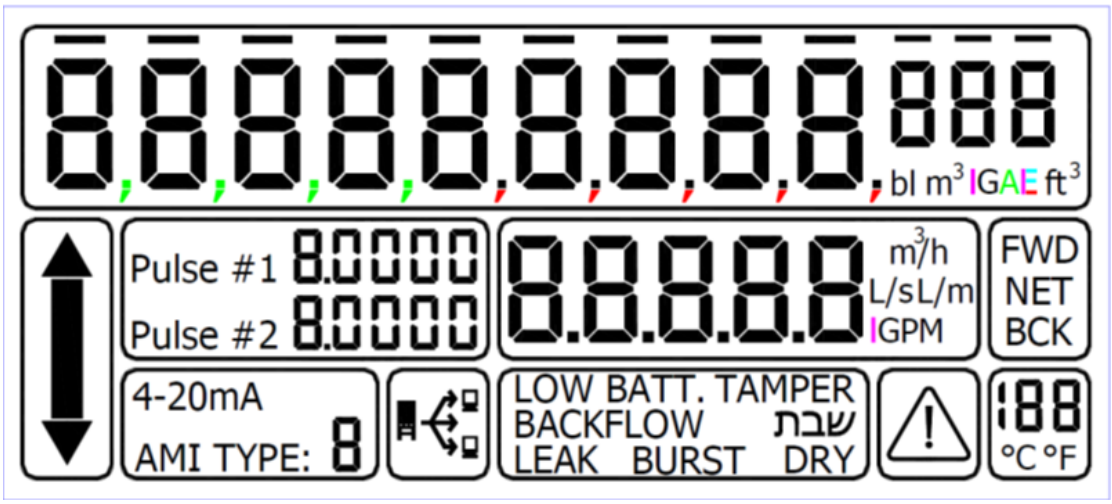

octave
A Tuned Measure
DN80
Q3 63 m³/h
R 500
ΔP 0.16 bar
IP 68
T 50
PN 16
E1 C
CE M11 0126
UK/0126/0094
SW3.15
S/N
ARAD


octave
A Tuned Measure
DN50
Q3 40 m³/h
R 500
ΔP 0.16 bar
IP 68
T 50
PN 16
E1 C
CE M13 0126
UK/0126/0094 U0 D0
SW3.16
Battery Exp. Date 7/2023
Made In Israel
S/N
12345678
ARAD


octave
A Tuned Measure
DN50
Q3 40 m³/h
R 500
ΔP 0.16 bar
IP 68
T 50
PN 16
E1 C
CE M14 0126
UK/0126/0094 U0 D0
SW 3.17
Battery Exp. Date 7/2024
Made In Israel
S/N
12345678
ARAD

Figure 3 Data Label

Figure 4 Plastic body example



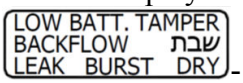
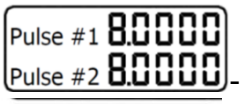
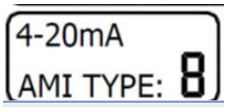
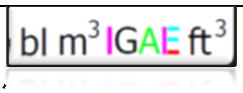
1	Volume accumulator include 9 large digits +3 small digits		
2	New Icons	1.  - Display volume 2.  - Detecting icons 3.  - Pulse resolution 4.  - Outputs	
3	Units	1.  - Volume 2.  - Flow	

Figure 5 New LCD display and key for Hardware Version 2.4

Figure 6 Protective Crown

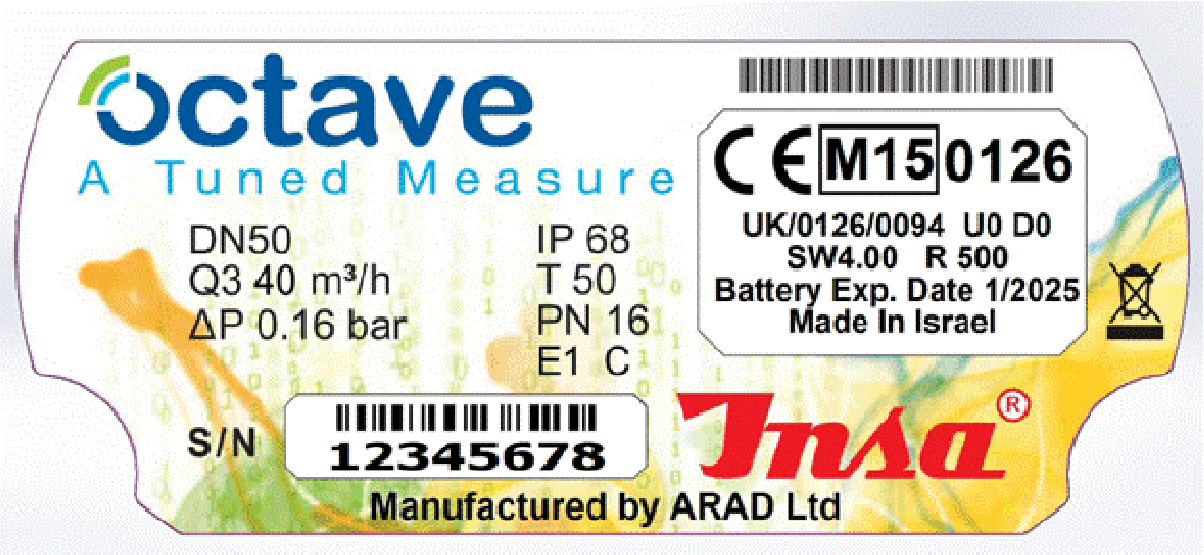


Figure 7 Additional manufacturer data label