OIML Certificate of Conformity

OIML Member State
The Netherlands

Number R137/2012-NL1-16.07
Project number SO16201375

Issuing authority Person responsible:	NMi Certin B.V. C. Oosterman
Applicant and manufacturer	Delta Gas Mobin Group 8th St., Special Economic Zone, Kaveh Industrial City Saveh County, Markazi Province Iran
Identification of the certified type	A **turbine gas meter** Type: DTM
Characteristics	See page 2 and further

This Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML Type Evaluation Report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

R 137-1 (2012) "Gas meters"

Accuracy class 1.0

This Certificate relates only to the metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML International Recommendation identified above. This Certificate does not bestow any form of legal international approval.

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate was issued, partial quotation of the Certificate and of the associated OIML Type Evaluation Report(s) is not permitted, although either may be reproduced in full.

Issuing Authority **NMi Certin B.V., OIML Issuing Authority NL1**
1 August 2016

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The conformity was established by the results of tests and examinations provided in the associated OIML Type Evaluation Report:

- No. NMi-12200520-02 dated 22 September 2014 that includes 39 pages.

Characteristics of the gas meter:

Table 1 gives the general characteristics of the turbine gas meter. Table 2 up to and including 5 on the following pages specify in detail the characteristics and essential parts of the turbine meters.
The construction of the measuring instrument is recorded in the Documentation folder no. T10800-1.

Table 1: General characteristics	
Destined for the measurement of	Gas volume
Mechanical class	M1
Electromagnetic class	Not applicable (the meter has no electronics)
Ambient temperature range	+5 °C / +55 °C
Gas temperature range	+5 °C / +55 °C
Designed for humidity conditions	Not applicable (the meter has no electronics)
Orientation	Horizontal, vertical up and vertical down (all orientations)
Flow direction	Uni-directional (indicated with arrow)
Power supply voltage	Not applicable
Software identification	Not applicable

The measuring part consists of a cartridge including all metrological essential parts such as turbine wheel, bearings, shafts, primary gears and inlet flow straighteners. The number of blades, the appertaining angle of the blades and other essential dimensions of the turbine wheel are given below.

Table 2: Essential parts

Diameter [mm]	Type (G-value)	Impeller diameter [mm]	Blade height [mm]	Vane thickness [mm]	Blade angle [degrees]	Number of blades
50	65	51	5	15,5	45	12
80	100 160 250	83	12	22	45	14
100	160 250 400	103	15	28	45	14
150	400 650 1000	154	22	27	45	16
200	650 1000 1600	198	40	27	45	18
250	1000 1600 2500	246	32	30	45	20
300	1600 2500 4000	296	35,5	30	45	22

The characteristics of the deep groove ball bearings, including their lubrication method in the applicable operating pressure range, are given in the table below.

Table 3: Bearing characteristics

Diameter [mm]	Main shaft [mm]		Dynamic load rating C_r [N]		Static load rating C_{or} [N]		Maximum operating pressure	
	inlet	outlet	inlet	outlet	inlet	outlet	16 bar(g)	100 bar(g)
50	2	2	286	286	90	90	permanently lubricated bearings, double shielded	external oil pump lubricated bearings, single or double shielded
80	3	3	644	644	215	215		
100	4	3	1339	644	488	215		
150	5	4	1646	1339	663	488		
200	6	6	2522	2522	1057	1057	-	
250	8	8	3369	3369	1363	1363		
300	10	10	6100	6100	2600	2600		

The table below gives the essential characteristics regarding flow rate and pressure range.

Table 4: Bearing characteristics

DN	Type (G-value)	maximum Q_{max}	maximum Q_t	Minimum Q_{min} [m^3/h] for the specified pressure range			
				MR 1:20		MR 1:30	
[mm]		[m^3/h]	[m^3/h]	0..100 bar(g)	8..100 bar(g)	8..100 bar(g)	16..100 bar(g)
50	65	100	20	5	-	3,3	-
80	100	160	32	-	8	-	5,3
	160	250	50	12,5	-	8,3	-
	250	400	80	20	-	13,3	-
100	160	250	50	-	12,5	-	8,3
	250	400	80	20	-	13,3	-
	400	650	130	32,5	-	21,7	-
150	400	650	130	-	32,5	-	21,7
	650	1000	200	50	-	33,3	-
	1000	1600	320	80	-	53,3	-
200	650	1000	200	-	50	-	33,3
	1000	1600	320	80	-	53,3	-
	1600	2500	500	125	-	83,3	-
250	1000	1600	320	-	80	-	53,3
	1600	2500	500	125	-	83,3	-
	2500	4000	800	200	-	133,3	-
300	1600	2500	500	-	125	-	83,3
	2500	4000	800	200	-	133,3	-
	4000	6500	1300	325	-	216,7	-

Remarks regarding table 4:
- The application of permanently lubricated bearings limits the maximum operating pressure to 16 bar(g), see also table 3.
- MR = measuring range (Q_{max}/Q_{min} = 1:20 or 1:30).

The measured volume is presented by means of a conventional mechanical register which is built up as given in table 5.

Table 5: Verification scale interval

Type	number of drums		control-element
(G-value)	before the comma	behind the comma	[m3]
G65	6	2	0,002
G100 … G1600	7	1	0,02
G2000 … G4000	8	0	0,2

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Installation conditions:
The meter can operate in the following positions: horizontal flow, vertical flow up and vertical flow down.

Any components which cause severe flow disturbances and could affect the gas flow must be avoided within the extra prescribed inlet pipe length which is 2 DN. The inlet pipe must be designed as a straight pipe section of the same nominal diameter as the gas meter.

For mild flow disturbances there is no prescribed extra inlet pipe length necessary.