

RMG MESSTECHNIK GMBH

PINTSCH-Gerätetechnik



INSPECTION CERTIFICATE

according to EUROPEAN Industrial
Standard EN-10204/3.1B
Testing of materials



Customer : Pietro Fiorentini S.P.A
Order-No. : 2100012400 VF 0428110001
Works-No. : 106594
Test specimen : **TURBINE GAS METER**

Type : TRZ 03
Size : G 6500
Q max : 10000 m³/h
Q min : 500 m³/h
Dimension DN : 16"
ANSI : 600
Marker's-No. : 27198
Year of
Construction : 2001

Terms of Delivery : Pressure Test with water and air according
DVGW G 492/II
with Material Certification List
with Material Inspection Certificate B

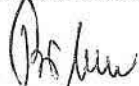
Pressure Test : Test pressure 150 bar water
and 110 bar with air/Nekal.

The Test results are according to the
terms of delivery.

Sign of
manufacturer : Inspection stamp. 150  110 

RMG MESSTECHNIK GMBH


Pintsch - Gerätetechnik



Works-Inspector
(Buberl)

Butzbach, den 25.10.2001

Encl.: Errorcurve
Materialcertificatelist with Materialcertificate

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*****
*          official test-facility          **          error curve          **
**          of weight and measures        **          - turbine meter -        **
**          authorized by PTB             **          approval : D 81/7.211.10  **
**                                         **          test person : Udo Wilk    **
**          R M G - MESSTECHNIK GMBH      **          date : 15.10.2001        **
**          35510 Butzbach/West Germany  **                                         **
*****

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type/diam/size: TRZ 03/400 mm/G 6500      Qmax-Qmin/H0: 10000-500/-- m3/h
number/year   : 27198/2001                press. class: PN 100
manufacturer  : RMG - MESSTECHNIK         connect. fl.: PN ANSI 600

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adjust. wheels: 50 / 55                    HF1 (I/m3): --
NF1 (I/m3) : .1                            HF2/3 (I/m3): 318 / 318

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	N(x)	t sec	Pr mber	tm sec	I	Va m3	Q m3/h	f %
NORMAL PRUEFLING	1	24.06 24.67	-25.30 -25.60	178.23 178.23	44821 50	499.3083 500.0000	%10085.34 %10099.31	0.08 -0.02
NORMAL PRUEFLING	1	24.27 25.07	-25.30 -25.60	178.47 178.47	50 159289	500.0000 500.9089	%10085.73 %10104.06	0.08 -0.04
NORMAL PRUEFLING	1	24.21 24.87	-12.75 -12.55	206.46 206.46	40 127829	400.0000 401.9781	6974.72 7009.21	-0.01 0.28
NORMAL PRUEFLING	4	23.58 24.33	-27.95 -4.30	177.10 177.10	200 62163	200.0000 195.4796	4065.62 3973.72	0.24 0.11
NORMAL PRUEFLING	4	23.37 23.84	-11.25 -1.95	186.46 186.46	130 40899	130.0000 128.6133	2509.99 2483.21	0.19 -0.10
NORMAL PRUEFLING	2	23.22 23.35	-12.45 -0.80	177.90 177.90	500 15679	50.0000 49.3035	1011.80 997.71	0.34 0.07
NORMAL PRUEFLING	2	23.18 23.19	-3.73 -0.74	178.91 178.91	250 7907	25.0000 24.8648	503.05 500.33	0.19 -0.05

```

N(x)
WERTIGKEIT      1      2      3      4      5      6
%89.76620 6704.76 15428.6 1064.00 27.6923 8444.50

```

```

PRUEFIMPULSGEBER (I/m3): 0.10          BAROMETERSTAND (mbar): 996.90

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Berechnung des Fehlers (fg) vom Pruefling:

$$f_g = \frac{(V_{A9} - V)}{V} * 100\% ; V = V_{A0} / (1 + (f_N / 100)) * \frac{(P_N + b) * (T_0 + 273.15)}{(P_0 + b) * (T_N + 273.15)}$$



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 ANSI : 600
 Marker's-No. : 27199
 Year of Construction : 2001

Terms of Delivery : Pressure Test with water and air according
 DVGW G 492/II
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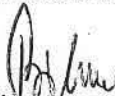
Pressure Test : Test pressure 150 bar water
 and 110 bar with air/Nekal.

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Sign of manufacturer : Inspection stamp. 150  110 

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Butzbach, den 25.10.2001

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Procedure di Gestione Ambientale

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Procedure Operative

**Nome File
Allegato 5**

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*****
**      official test-facility      **      error curve      **
**      of weight and measures     **      - turbine meter - **
**      authorized by PTB          **      approval : D 81/7.211.10 **
**      R M G - MESSTECHNIK GMBH   **      test person : Udo Wilk   **
**      35510 Butzbach/West Germany**      date : 27.09.2001      **
*****

```

type/diam/size: TRZ 03/400 mm/G 6500
 number/year : 27199/2001
 manufacturer : RMG - MESSTECHNIK

Gmax-Qmin/HD: 10000-500/-- m³/h
 press. class: PN 100
 connect. fl.: PN ANSI 600

adjust. wheels: 54 / 59
 NF1 (I/m³) : .1

HF1 (I/m³): --
 HF2/3 (I/m³): 315.859 / 315.859


	N(x)	t sec	Pr mbar	tm sec	I	V _A m ³	Q m ³ /h	f %
NORMAL PRUEFLING	1	22.76 22.88	-25.70 -26.20	179.13 179.13	44957 50	500.8233 500.0000	%10065.11 %10048.57	0.08 -0.18
NORMAL PRUEFLING	1	22.75 22.85	-25.70 -26.30	178.77 178.77	50 157661	500.0000 499.1484	%10069.09 %10051.94	0.08 -0.19
NORMAL PRUEFLING	1	22.51 22.40	-14.20 -14.10	205.53 205.53	40 126615	400.0000 400.8593	7006.45 7021.50	-0.01 0.25
NORMAL PRUEFLING	4	21.85 21.67	-29.10 -4.65	174.45 174.45	200 61469	200.0000 194.6090	4127.26 4016.01	0.24 0.07
NORMAL PRUEFLING	4	21.97 21.94	-11.40 -2.10	186.61 186.61	130 40462	130.0000 128.1014	2507.90 2471.28	0.19 -0.33
NORMAL PRUEFLING	2	21.79 21.62	-12.48 -0.82	178.40 178.40	500 15515	50.0000 49.1184	1008.97 991.18	0.34 -0.20
NORMAL PRUEFLING	2	21.79 21.55	-3.65 -0.70	179.92 179.92	250 7813	25.0000 24.7357	500.21 494.92	0.19 -0.50

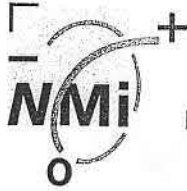
N(x)	1	2	3	4	5	6
WERTIGKEIT	%89.75620	6704.76	15428.6	1064.00	27.6923	8444.50

PRUEFIMPULSGEBER (I/m³): 0.10 BAROMETERSTAND (mbar): 995.20

Berechnung des Fehlers (f_c) vom Pruefling:

$$f_c = \frac{(V_{Ag} - V)}{V} * 100\% ; V = V_{An} / (1 + (f_N / 100)) * \frac{(P_N + b) * (T_G + 273.15)}{(P_G + b) * (T_N + 273.15)}$$

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Nederlands Meetinstituut

C E R T I F I C A T E

Number : 39402322

Projectnumber : 410461

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Customer RMG Messtechnik GmbH
 Otto Hahnstraße 5
 35510 Butzbach
 Deutschland

Submitted Turbine gas meter
 Manufacturer : RMG
 Type : TRZ03
 Series no : 27198


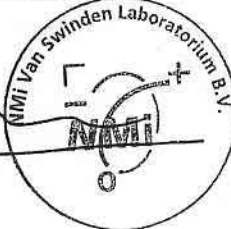
Calibration method The deviation of the meter under test is established with the master meter method. The references that are used are part of the national standard of gas measurement..

Date of calibration See page 2 of 2.

Result The results of the calibration are presented on page 2 of 2.
 The reported uncertainty of measurement is based on a standard uncertainty multiplied by a coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty had been determined in accordance with the 'Guide to the Expression of Uncertainty in Measurement' (GUM).

Traceability The results of the calibration services of NMI VSL are traceable to primary and/or (inter)nationally accepted measurement standards.

Westerbork, 9 November 2004.
 NMI Van Swinden Laboratorium B.V.

J.S. Douma
 NMI VSL-flow


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 website www.nmi.nl
 e-mail flow@nmi.nl

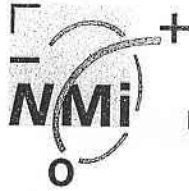
NMI B.V.
 (Chamber of Commerce no. 27.228.701)

Subsidiary Companies:
 NMI Van Swinden Laboratorium B.V. (27.228.703)
 NMI Certin B.V. (27.233.418)
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Nederlands Meetinstituut

CERTIFICATE

Number : 39402322

Projectnumber : 410461

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Meter under test

Meter kind	: Turbine gas meter	Gear wheel meterside	: 54
Manufacturer	: RMG	Gear wheel indexside	: 60
Number / year	: 27198 / 2001		
G-size / type / diam.	: G6500 / TRZ03 / 400 mm		
Q _{max} / Q _{min}	: 10000 / 500 m ³ /h	Number of pulses per m ³	:
P _{max}	: 100 bar	LF index head	: 0,1
Seals	: FRG	HF turbine wheel	: 321,212
Final index reading	: 00010889 m ³	HF serrated disc	: 321,212

Condition The conditions by the meter under test and references are converted to reference-conditions with use of the pressure and temperature measurement by the instrument and references.
In determination of this flow rate the pressure measurement point noted with P_r is normally established.

Result

Flow [m ³ /h]	Deviation [%]	CMC [%]	U _{tot} [%]
10000	-0,50	0,17	0,17
7000	+0,14	0,17	0,17
4000	-0,09	0,17	0,17
2500	+0,05	0,17	0,17
1000	+0,16	0,20	0,20
500	+0,07	0,23	0,23

Note deviation:

Location	Date	Medium	P [bar]	T [°C]	Density [kg/m ³]
Westerbork	041109	natural gas	58	11	53

The deviation calculation:

$$\text{Deviation} = \frac{\text{Indicated volume} - \text{Reference volume}}{\text{Reference volume}} * 100 \%$$

The CMC (Calibration and Measurement Capability) is the uncertainty of measurement available under normal conditions. U_{tot} is the total uncertainty of measurement.

